Village of Woodridge

**BID DOCUMENT**
**BID 2022-15**

PURCHASE OF PRODUCTS:

## Water System Products & Material

- **ALL SIGNATURES TO BE SWORN BEFORE A NOTARY PUBLIC**

| | |
|---|---|
| CONTRACT PERIOD: | August 15, 2022 through October 15, 2022 |
| BID DEPOSIT: | Not Required |
| DEADLINE FOR BID SUBMITTALS, AND, BID OPENING (DATE/TIME/LOCATION): | **Friday, July 22, 2022 - 11:00 a.m.**<br>Woodridge Village Hall<br>Five Plaza Drive<br>Woodridge, Illinois 60517-5014 |
| SUMBIT BID TO: | VILLAGE OF WOODRIDGE<br>Five Plaza Drive<br>Woodridge, Illinois 60517-5014 |

Issued by:

Public Works / Purchasing Department
Village of Woodridge, Illinois
5 Plaza Drive
Woodridge, Illinois 60517
(630) 719-2907

# VILLAGE OF WOODRIDGE

## BID# 2022–15
## PURCHASE OF WATER PRODUCTS

**LEGAL NOTICE**

The Village of Woodridge will be accepting sealed bids for the items listed below. Bids will be accepted at the Woodridge Village Hall, Five Plaza Drive, Woodridge, until **Friday, July 22, 2022, at 11:00 a.m. (CST),** at which time they will be opened and publicly read aloud.

**BID #2022-15 Water System Products & Material**

Specifications may be obtained on the Village of Woodridge website at www.woodridgeil.gov under "My Government", "Finance" and "Bids/Purchasing." or directly at https://www.woodridgeil.gov/my_government/finance/bids_purchasing.php. Questions may be directed by email to jmoline@woodridgeil.gov by 4:00 p.m. on Monday July 18, 2022. Any addendum issued for this Bid will be posted by 4:00 p.m., on Tuesday, July 19, 2022 on the Village website. Interested bidders are responsible to check the website for any issued addendum.

The Village of Woodridge reserves the right to reject any or all bids, to waive technicalities, and to accept any bid which is deemed to be in the best interest of the Village of Woodridge.

The Village of Woodridge does not discriminate on the basis of disability in the admission or access to, treatment or employment in, its services, programs, or activities. Upon request, accommodation will be provided to allow individuals with disabilities to participate in all Village of Woodridge services, programs, and activities. The Village has a designated coordinator to facilitate compliance with the Americans with Disabilities Act of 1990 (ADA), as required by Section 35.107 of the U.S. Department of Justice regulations, and to coordinate compliance with Section 504 of the Rehabilitation Act of 1973, as mandated by Section 8.5 of the U.S. Department of Housing and Urban Development regulations. For information, contact the Assistant Village Administrator, Village of Woodridge, Five Plaza Drive, Woodridge, Illinois, 60517; (630) 719-4705, TDD (630) 719-2497. Upon request, this information can be made available in large print, audiotape, and/or computer format.

# VILLAGE OF WOODRIDGE

## BID# 2022–15
## PURCHASE OF PRODUCTS

## I. GENERAL CONDITIONS

1. INTENT

It is the intent of these specifications and contract to purchase various water system products and materials as identified in the specifications herein.

The Village will accept submittals for items specified in this bid document. All items shall be new, in manufacturer's working order, and without any defect. The unit price shall be the full cost for the specific item as included in the schedule with no additional costs unless specifically broken out on the bid tab as a separate requested cost.

2. PREPARATION AND SUBMISSION OF PROPOSAL

The Bidder must submit his/her proposal on the forms furnished by the Village of Woodridge by the Bid Opening Date and Time for this Bid. All blank spaces on the proposal form must be filled in if applicable. Authorized signature must be the individual owner of a proprietorship, a general partner of a partnership or a duly authorized officer, attested to by the Corporate Secretary, of a Corporation. The proposal is contained in these documents and must remain attached thereto when submitted. All signatures and spaces are to be completed in ink or typewritten, where applicable. Prices/costs shall be in United States dollars. Incorrect completion, execution or submission of bids shall be sufficient grounds for rejection of a bid. The following documents shall be executed at the time of submission of a bid:

A) Bid Proposal – Page 9
B) Contractor's Certification – Pages 12 -14
C) Table 1 – List of Deviations (Exhibit A)
D) Non-Barred from Bidding Endorsement (Exhibit B)
E) Anti-Collusion Affidavit (Exhibit C)
F) Conflict of Interest Form (Exhibit D)
G) Tax Compliance (Exhibit E)

BIDDERS ARE RESPONSIBLE TO CHECK THE VILLAGE WEBSITE OR CONTACT THE WOODRIDGE PURCHASING DEPARTMENT FOR ANY ADDENDA THAT MAY BE ISSUED FOR THIS BID.

All proposals shall be submitted in sealed envelopes carrying the following information on the face:

1) Bidder's Name and Address
2) Bid Number
3) Subject Matter of Bid
4) Designated Date and Time of Bid Opening

3. WITHDRAWAL OF PROPOSAL

Bidders may withdraw their bids at any time prior to the time specified in the Bid Notice as the closing time for the receipt of bids. However, no bid shall be withdrawn or cancelled for a period of sixty (60) calendar days after said advertised closing time for the receipt of bids, nor shall the successful bid be withdrawn, cancelled, or modified after having been accepted by the Village.

4. BID DEPOSIT

When required on Page 1 of these Specifications, all bids shall be accompanied by a bid deposit in the amount specified. Bid deposits shall be in the form of a certified check, a bank cashier's check drawn on a responsible bank doing business in the United States and shall be made payable to the Village of Woodridge, or bid bond.

The bid deposit of all except the three lowest bidders on each contract will be returned within twenty (20) calendar days after the opening of the bids. The remaining bid deposits on each contract will be returned, with the exception of the accepted Bidder, after the contract is awarded. The bid deposit of the accepted Bidder will be returned after acceptance by the Village of satisfactory performance bond where such bond is required or completion of contract where no performance bond is required.

5. SECURITY FOR PERFORMANCE

When required on Page 1 of these Specifications, the successful Bidder or Bidders shall, within thirteen (13) calendar days after acceptance of the bid by the Village, furnish a performance bond in the full amount of the contract, in a form acceptable to the Village.

In the event that the successful Bidder(s) fails to furnish the performance bond within thirteen (13) calendar days after acceptance of the bid by the Village, then the bid deposit of the successful Bidder shall be retained by the Village as liquidated damages and not as a penalty, it being agreed by the successful Bidder that said sum is a fair estimate of the amount of damages that said Village will sustain due to the successful Bidder's failure to furnish said bond.

6. EQUIVALENT PRODUCTS

In cases where a specified item is identified by a manufacturer's name, trade name or other reference, it is understood that the Bidder proposes to furnish the item as identified and further clarified in Section II, Specifications. If the Bidder proposes to furnish an "equal" item, the proposed "equal" item must be so indicated in the bid proposal. The Village shall be the sole determiner of the equalness of the substitute offered.

7. BASIS OF AWARD

The Village reserves the right to accept or reject any and all bids, in whole or in part, and to waive technicalities.

8. ACCEPTANCE OF BID

The Village shall make its determination with respect to bids forty five (45) calendar days from the date of opening of bids. Should the Village fail to act within the times herein specified, all bids shall be rendered null and void.

9. CATALOGS

Each Bidder shall submit in DUPLICATE, catalogs, descriptive literature and detailed drawings, fully detailing features, designs, construction, appointments, finishes and the like, in order to fully describe the material or work proposed to be furnished.

10. COMPLIANCE WITH LAWS

The Bidder will strictly comply with all ordinances of the Village of Woodridge, the laws of the State of Illinois and United States Government.

11. MATERIAL INSPECTION AND RESPONSIBILITY

The Village does not assume any responsibility for the availability of any materials and equipment required under this contract.

12. CONTRACT TERM / TERMINATION OF CONTRACT

The Successful Bidder agrees to honor the pricing as included in this BID Proposal for a period of sixty (60) days from the date of bid award.

The Village may, by written notice of default to the successful Bidder, terminate the whole or part of this contract in any one of the following circumstances:

- If it is determined that successful Bidder knowingly falsified information provided to the Village.

- If it is determined that successful Bidder offered substantial gifts or gratuities to a Village official, employee, or agent whether in their official capacity or not.
- Any order is entered in any proceeding against the successful Bidder decreeing the dissolution of the successful Bidder and such order remains in effect for sixty (60) days.

The successful Bidder shall apply to any tribunal for the appointment of a trustee or receiver of any part of the assets of the successful Bidder, or commence any proceedings relating to the successful Bidder under any bankruptcy, reorganization, arrangement, insolvency, readjustment of debt, dissolution or other liquidation law of any jurisdiction, or any such application shall be filed, or any such proceedings shall be commenced, against the successful Bidder, and the successful Bidder indicates its approval, consent or acquiescence, or an order shall be entered appointing such trustee or receiver or adjudicating the successful Bidder bankrupt or insolvent, or approving the petition in any such proceeding, and such order remains in effect for sixty (60) days.

In the event the Village terminates this contract in whole or in part, the Village may procure, upon such terms in such manner as the Village Administrator may deem appropriate, products or services necessary to return property (vehicle) owned by the Village or equipment, including those materials paid for by the Village, or equipment or materials permanently attached to the property of the Village, and the successful Bidder shall be liable to the Village for any excess costs for such similar supplies or service, provided that the successful Bidder shall continue the performance of this contract to the extent not terminated under the provisions of this clause.

13. EQUAL EMPLOYMENT OPPORTUNITY

Each contracting agency shall ensure every contract to which it is a party shall contain the following clause.

In the event of the Bidder's non-compliance with the provisions of this equal employment opportunity clause, the Illinois Human Rights Act or the Rules and Regulations of the Illinois Department of the Human Rights ("Department"), the Bidder may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation. During the performance of this contract, the Bidder agrees as follows:

a) That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, marital status, national origin, or ancestry, age, physical or mental handicap unrelated to ability, or an unfavorable discharge from the military service; and further that it will examine all job classifications to determine if minority persons or women are under-utilized and will take appropriate affirmative action to rectify any such under-utilization.

b) That, if it hires additional employees in order to perform this contract or any portion thereof, it will determine the availability (in accordance with the department's rules and regulations) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not under-utilized.

c) That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental handicap unrelated to ability, or an unfavorable discharge from military service.

d) That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Bidder's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations.

If any such labor organization or representative fails or refuses to cooperate with the Bidder in its efforts to comply with such act and rules and regulations, the Bidder will promptly so notify the department and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

e) That it will submit reports as required by the department's rules and regulations, furnish all relevant information as may from time to time be requested by the department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's rules and regulations.

f) That it will permit access to all relevant books, records, accounts, and work sites by personnel of the contracting agency and the department for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's rules and regulations.

g) That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that such provisions will be binding upon such subcontractor. In the same manner as with other provisions of this contract, the Bidder will be liable for compliance with applicable provisions of this clause by such subcontractors; and further it will promptly notify the contracting agency and the department in the event any subcontractor fails or refuses to comply therewith. In addition, the Bidder will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations.

f) Each public subcontractor shall in turn include the equal employment opportunity clause set forth within these rules and regulations in each of its subcontracts under which any portion of the contract obligations are undertaken or assumed, said inclusion to be either verbatim or by reference so that the provisions of the clause will be binding upon such subcontractors.

The requirements of the equal employment clause set forth above with respect to non-discrimination because of religion shall not apply to a religious corporation, association, educational institution or society with respect to the employment of individuals of a particular religion for the carrying on by such corporation, association, educational institution or society of its activities.

14. INDEMNITY HOLD HARMLESS PROVISION

To the fullest extent permitted by law, the successful Bidder hereby agrees to defend, indemnify and hold harmless the Village, its officials, agents, employees, and volunteers, against all injuries, deaths, loss, damages, claims, patent claims, suits, liabilities, judgments, costs and expenses, which may in anywise accrue against the Village, its officials, agents, employees, and volunteers; arising in whole or in part or in consequence of the performance of the work by the successful Bidder, its employees, or subcontractors, or which may in anywise result therefore, except that arising out of the sole legal cause of the Village, its officials, agents, employees, and volunteers, and the successful Bidder shall, at its own expense, appear, defend and pay all charges of attorneys and all costs and other expenses arising therefore or incurred in connection therewith, and, if any judgment shall be rendered against the Village, its officials, agents, employees, and volunteers, in any such action, the successful Bidder shall, at its own expense, satisfy and discharge same.

The successful Bidder expressly understands and agrees that any performance bond or insurance policies required by the contract, or otherwise provided by the successful Bidder, shall in no way limit the responsibility to indemnify, keep and save harmless and defend the Village, its officials, agents, employees, and volunteers, as herein provided. The successful Bidder further agrees that to the extent that money is due the successful Bidder by virtue of the contract, an amount of said money as shall be considered necessary in the judgment of the Village, may be retained by the Village to protect itself against said loss until such claims, suits, or judgments shall have been settled or discharged and/or evidence to that effect shall have been furnished to the satisfaction of the Village.

15. COSTS

The undersigned hereby affirms and states that the prices quoted herein constitute the total cost to the Village for all work involved in the respective items. This cost also includes all proposal preparation costs, insurance, royalties, transportation charges, use of all tools and equipment, superintendent, overhead expense, inspection costs, all profits and all other work services and conditions necessarily involved in the work to be done in accordance with the requirements of the contract documents considered severally and collectively.

16. START OF WORK / PRODUCT DELIVERY

It is anticipated that the Bidder shall deliver the items contracted for purchase within ten (10) calendar days of notice of award.

17. DELIVERY / FREIGHT

The Bidder shall arrange with the Village for a mutually agreeable time and date to deliver the purchased equipment to the Village's designated delivery location:

DELIVER TO:

Woodridge Public Works
1 Plaza Drive
Woodridge IL 60517

(Delivered during normal business hours of Monday through Friday, 7:00 AM to 3:30PM (Central Standard Time)

Upon delivery of the equipment, the Village and Bidder shall jointly inspect the equipment to assure that all ordered equipment and options are accounted for and fully functioning. Should any items be omitted during this inspection, the Village shall notify the Bidder as soon as they are discovered and the Bidder shall repair or modify the equipment, at no cost to the Village, in order to add the missing and/or malfunctioning components.

18. WARRANTY

All equipment furnished under this contract shall be accompanied by the manufacturer's warranty for the individual product.

19. ACCEPTANCE AND PAYMENT

Payment shall be made in accordance with the Illinois Prompt Payment Act following the delivery to the Village of Woodridge and review and acceptance of the equipment in accordance with these specifications by the Village of Woodridge.

# VILLAGE OF WOODRIDGE

## BID# 2022–15
## PURCHASE OF PRODUCTS

# II. SPECIFICATIONS

1. EQUIPMENT REQUIREMENTS:

As indicated herein, this bid seeks proposal for the purchase of various water system parts, products, and materials including hydrants, hydrant extension kits, valves, valve boxes, miscellaneous water system hardware, and ductile iron pipe. All products included in this BID are required to be, and all items supplied under this BID must be, compliant with all lead free product regulations as well as compliant with any and all EPA requirements for products for potable drinking water systems.

2. EQUIVALENT PRODUCTS:

For all equipment requested in Bid 2022-15, the Village designed these bid specifications from specific makes and models in order to establish a standard. Where a specified item is identified by a manufacturer's name, trade name or other reference, it is understood that the Bidder proposes to furnish the item as identified. If the Bidder proposes to furnish an "equal or better" item, the proposed "equal or better" item must be so indicated in the bid proposal.

If an alternate make or model is submitted, or alternate model proposed that does not meet or exceed the specifications, the Bidder must indicate the product does not meet the specification as described by marking "No" on the Bid Proposal form and include general reason in the box labeled Deviations From Specifications and list in detail on Exhibit A, "Table 1 – List of Deviations" the deviation and proposed alternate. If an alternate to the specification is proposed that is not exact to the specification listed, but the bidder believes this alternate meets or exceeds the specification, detail must be provided with Exhibit 1. The Village shall be the sole determiner of the equalness of the substitute offered.

Further, equipment being requested is listed either generally, or specifically as indicated by "Make and Model Required", or "This Make (or Model) or Equal".

A. "THIS MAKE AND MODEL REQUIRED": References to specific makes or models of equipment, accessories, or components and noted as "This Make and Model Required" shall be required for the proposed equipment to be that given make and model. Mandatory make and model is required on specific equipment to maintain consistency with existing equipment and software, understanding of use and training for driver operators, equipment technician skill and stocking, and interchangeability of parts and equipment within fleet.

B. "THIS MAKE OR EQUAL" or "PREFERRED": Where reference is made to "This Make or Equal" or "Preferred" referencing a make or model, is for the purpose of establishing the preferred model and/or the minimum standards of performance, operation, maintenance, strength, efficiency, effectiveness, and life of the unit or its parts as required for the proposed application. Other makes and models shall also be acceptable under this classification, provided minimum specifications as described herein are met or exceeded, with documentation to support same submitted at the time of bid. Failure to submit said supporting documentation at the time of bid shall be understood as not meeting the bid requirement.

# VILLAGE OF WOODRIDGE
## PURCHASE OF PRODUCTS
## BID# 2022–15

### BID PROPOSAL FORM

Bidder, in submitting this proposal, hereby agrees to comply with all provisions and requirements of the specifications and contract documents attached hereto. This proposal shall remain in force and effect for the period so stated herein.

**BASE PROPOSAL:**

| WATER SYSTEM PRODUCTS & MATERIALS | | | | | | |
|---|---|---|---|---|---|---|
| # | Description | This MAKE / MODEL REQUIRED | Reference Material Attachment # | Unit Price | Quantity | Total Price |
| 1 | Fire Hydrant: Waterous Pacer WB 67-250 Hydrants - Waterous 5.25". Traffic Model. Hydrant Color Red | | | | | |
| A | Waterous Hydrant 5' 6" Bury - Flanged | Yes | A | $ | 9 | $ |
| B | Waterous Hydrant 5' 6" Bury - MJ | Yes | A | $ | 6 | $ |
| 2 | Hydrant Extension Kits: Waterous Pacer WB67-250 Hydrant Extension Kits | | | | | |
| A | 6" Extension Kit | Yes | | $ | 10 | $ |
| B | 12" Extension Kit | Yes | | $ | 5 | $ |
| C | 18" Extension Kit | Yes | | $ | 5 | $ |
| D | 24" Extension Kit | Yes | | $ | 5 | $ |
| 3 | Gate Valves: American Flow Control Gate Valves - Series 2500-1 Resilient Wedge Gate Valve | | | | | |
| A | 6" Flanged to MJ - with Gasket & Stainless Steel Bolts/Nuts | Yes | B | $ | 9 | $ |
| B | 6" - MJ to MJ Valve | Yes | B | $ | 9 | $ |
| 4 | Megalug: Series 1100 Mechanical Joint Restraints (Megalug) with Gaskets | | | | | |
| A | 6" Black #1106 | Yes | C | $ | 33 | $ |
| B | 6" Grey "F" Dimmensions 7.20 Oversized | Yes | C | $ | 43 | $ |
| 5 | Valve Box Items | | | | | |
| A | Rubber Valve Box Stabilizer - 6 inch | | | $ | 15 | $ |
| B | BLR Grips Valve Attached Style | Yes | D | $ | 9 | $ |
| C | BLR Grips MJ Style | Yes | D | $ | 6 | $ |
| 6 | T-Bolts & Nuts Stainless Steel | | | | | |
| A | 3.5" | | | $ | 300 | $ |
| 7 | Valve Boxes - Tops - Bottoms - Lids Marked Water | | | | | |
| A | 6850 Screw Type Cast Iron 2 Pc Valve Box 5.25 Shaf | | E | $ | 15 | $ |
| B | Lids Marked "WATER" | | | $ | 15 | $ |
| 8 | Ductile Iron Pipe American Fastite Joint Pipe | | | | | |
| | 6" DIP, 20' stick | | F | $ | 2 | $ |
| | | | | | TOTAL COST: | $ |

# BID PROPOSAL SUMMARY

The undersigned, having familiarized ourselves with the local conditions affecting the cost of the work and with the Contract Documents, including the Advertisement for Bids, Instructions to Bidders, Standard Specifications, Special Provisions, Form of Proposal, Form of Contract, and addenda thereto if any on file in the office of the Village of Woodridge, and understanding that in making this proposal waives all right to plead any misunderstanding regarding the same; the undersigned hereby proposes to perform all specified work and to provide and furnish all labor, materials, tools, expendable equipment, and all utility and transportation services necessary to complete in a workmanlike manner all work required in connection with **BID 2022–15** by the said Municipality, all in accordance with the plans and specifications including Addenda Nos. ___ , and ____, issued thereto, for the following prices; it being understood that each of the items is to be completed and ready for use, including all labor, materials and equipment of every kind and nature necessary to complete the work as specified and that the work shall be completed in all respects so as to accomplish the purpose for which the same was intended by the said plans and specifications.

1. It is understood and agreed by the undersigned that the Municipality reserves the unrestricted privilege to reject any bid should any unit prices be abutted, or any bid which is noticeably unbalanced, all at the sole discretion of the Municipality.
2. The aggregate total of the above lump sum (if any) and unit price items, based on the estimated quantities, shall be the basis for the establishing of the amount of the performance bond, payment bond, and for comparison of bids. Said total in the case of unit price bids, shall not be understood to be a single lump sum proposal or contract price.
3. If awarded this contract, the undersigned agrees to hold the pricing proposed for a period of sixty (60) days and deliver items within thirty (30) calendar days of receipt of purchase order from the Village, unless a later date is agreed to by both parties.
4. The unit price shall govern if there is a discrepancy between the product of the unit price multiplied by the quantity.
5. The undersigned firm certifies that it has not been convicted of bribery or attempting to bribe an officer or employee of the State of Illinois, nor has the firm made an admission of guilt of such conduct which is a matter of record, nor has an official, agent, or employee of the firm committed bribery or attempted bribery on behalf of the firm and pursuant to the direction or authorization of a responsible official of the firm.
6. In submitting this bid, the Bidder guarantees if any defects become apparent with the item following delivery and not related to install, the Bidder shall replace the item to the satisfaction of the owner.

The undersigned hereby certifies that they have read and understand the contents of this solicitation and agree to furnish at the products and services to complete the work at the prices shown for any or all of the items above, subject to all instructions, conditions, specifications and attachments hereto. Failure to have read all the provisions of this solicitation shall not be cause to alter any resulting contract or to accept any request for additional compensation. By signing this bid document, the bidder hereby certifies that they are not barred from bidding on this contract as a result of a violation of either Section 33E-3 or 33E-4 of the Illinois Criminal Code of 1961, as amended.

THE SECTION BELOW MUST BE COMPLETED IN FULL AND SIGNED

Name of Bidder: _____

Address: _____

Telephone No. _____ Fax No._____

Signature: _____

Title: _____

Date: _____

Subscribed and sworn before me this _____ day of , 20____.

My Commission Expires: _____

_____

Notary Public

# BIDDER'S CERTIFICATION - BID PROPOSAL

_____, as part of its bid on a
(Name of Bidder)

Contract purchase for **WATER SYSTEM PRODUCTS AND MATERIALS** to The Village of Woodridge, Illinois, hereby certifies that said Bidder is not barred from bidding on the aforementioned contract as a result of a violation of either 720 ILCS 5/33E-3 or 5/33E-4.

By: _____
Authorized Agent of Bidder

SUBSCRIBED AND SWORN BEFORE ME

This _____ day of

_____, 20 _____.

MY COMMISSION EXPIRES:

_____

_____
NOTARY PUBLIC

**CONTRACT – *Page One of Two***

1. This agreement, made and entered into this _____ day of _____ 2022, between the Village of Woodridge, acting by and through its Mayor and Board of Trustees and _____.

2. That for and in consideration of the payments and agreements mentioned in the Specifications and Contract Document attached hereto, _____ (Bidder) agrees with the Village of Woodridge at his/her own proper cost and expense to furnish the products, equipment, material, labor, supplies and/or services as provided therein in full compliance with all of the terms of such specifications and contract documents attached hereto.

3. It is understood and agreed that the specifications and contract documents hereto attached, prepared by the Village of Woodridge, are all essential documents of this contract and are a part hereof.

4. In witness whereof, the said parties have executed these presents on the date above mentioned.

==========

**(Village Seal)** **VILLAGE OF WOODRIDGE**

Attest:

By: _____ By: _____
Village Clerk Village Administrator

==========

***IF A CORPORATION***

**(Corporate Seal)** **CORPORATE NAME**

Attest: _____

By: _____ By: _____
Secretary President

**SUBSCRIBED AND SWORN BEFORE ME**

This _____ day of _____, 20_____.

MY COMMISSION EXPIRES: _____

_____
NOTARY PUBLIC

**CONTRACT - *Page Two of Two***

***IF A PARTNERSHIP***

_____ (Seal)

_____ (Seal)

_____ (Seal)

_____ (Seal)

PARTNERS DOING BUSINESS UNDER THE NAME OF

_____

**SUBSCRIBED AND SWORN BEFORE ME**

This _____ day of _____ , 20_____.

MY COMMISSION EXPIRES: _____

_____

NOTARY PUBLIC

==========

***IF AN INDIVIDUAL***

_____ (Seal)

**SUBSCRIBED AND SWORN BEFORE ME**

This _____ day of _____ , 20_____.

MY COMMISSION EXPIRES: _____

_____

NOTARY PUBLIC

Exhibit A

Table 1 – List of Deviations

| ITEM # | ITEM REQUESTED BY VILLAGE | VENDOR PROPOSED ALTERNATE: | TOTAL COST: |
|---|---|---|---|
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# VILLAGE OF WOODRIDGE
## NON BARRED FROM BIDDING DISQUALIFICATION
## PERSONS AND ENTITIES SUBJECT TO DISQUALIFICATION

No person or business entity shall be awarded a contract or subcontract, for a stated period of time, from the date of conviction or entry of a plea or admission of guilt, if the person or business entity,

(A) has been convicted of an act committed, within the State of Illinois or any state within the United States, of bribery or attempting to bribe an officer or employee in the State of Illinois, or any State in the United States in that officer's or employee's official capacity;

(B) has been convicted of an act committed, within the State of Illinois or any state within the United States, of bid rigging or attempting to rig bids as defined in the Sherman Anti-Trust Act and Clayton Act 15 U.S.C.;

(C) has been convicted of bid rigging or attempting to rig bids under the laws of the State of Illinois, or any state in the United States;

(D) has been convicted of bid rotating or attempting to rotate bids under the laws of the State of Illinois, or any state in the United States;

(E) has been convicted of an act committed, within the State of Illinois or any state in the United States, of price-fixing or attempting to fix prices as defined by the Sherman Anti-Trust Act and Clayton Act 15 U.S.C. Sec. 1 et seq.;

(F) has been convicted of price-fixing or attempting to fix prices under the laws of the State of Illinois, or any state in the United States;

(G) has been convicted of defrauding or attempting to defraud any unit of state or local government or school district within the State of Illinois or in any state in the United States;

(H) has made an admission of guilt of such conduct as set forth in subsection (A) through (F) above which admission is a matter of record, whether or not such person or business entity was subject to prosecution for the offense or offenses admitted to;

(I) has entered a plea of nolo contendere to charges of bribery, price fixing, bid rigging, bid rotating, or fraud; as set forth in subparagraphs (A) through (F) above.

Business entity, as used herein, means a corporation, partnership, limited liability company trust, association, unincorporated business or individually owned business.

By signing this document, the bidder hereby certifies that they are not barred from bidding on this contract as a result of a violation of either Section 33E-3 or 33E-4 of the Illinois Criminal Code of 1961, as amended.

_____

(Signature of Offeror if the Offeror is an Individual)
(Signature of Partner if the Offeror is a Partnership)
(Signature of Officer if the Offeror is a Corporation)

The above statements must be subscribed a sworn to before a notary public. Subscribed and

Sworn to this_____day of_____, 2022.

_____

Notary Public

*Failure to complete and return this form may be considered sufficient reason for rejection of the bid..*

Exhibit C

# VILLAGE OF WOODRIDGE

## ANTI-COLLUSION AFFIDAVIT AND BIDDER'S CERTIFICATION

_____, being first duly sworn, deposes and says that

he/she is _____(Partner, Officer, Owner, Etc.)

of _____

(Bidder)

The party making the foregoing proposal or bid, that such bid is genuine and not collusive, or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference with any person; to fix the bid price element of said bid, or of that of any other bidder, or to secure any advantage against any other bidder or any person interested in the proposed contract.

The undersigned certifies that they are not barred from bidding on this contract as a result of a conviction for the violation of State laws prohibiting bid-rigging or bid-rotating.

_____

(Name of Bidder if the Bidder is an Individual)
(Name of Partner if the Bidder is a Partnership)
(Name of Officer if the Bidder is a Corporation)

The above statements must be subscribed a sworn to before a notary public. Subscribed and Sworn to this_____day of_____, 2022.

_____

Notary Public

*Failure to complete and return this form may be considered sufficient reason for rejection of the bid.*

Exhibit D

# VILLAGE OF WOODRIDGE
## CONFLICT OF INTEREST

_____, hereby certifies that

it has conducted an investigation into whether an actual or potential conflict of interest exists between the bidder, its owners and employees and any official or employee of a Municipality identified herein.

Bidder further certifies that it has disclosed any such actual or potential conflict of interest and acknowledges if bidder has not disclosed any actual or potential conflict of interest, the Village of Woodridge may disqualify the bid or the affected the Municipality may void any award and acceptance that the Municipality has made.

_____

(Name of Bidder if the Bidder is an Individual)
(Name of Partner if the Bidder is a Partnership)
(Name of Officer if the Bidder is a Corporation)

The above statements must be subscribed a sworn to before a notary public. Subscribed and Sworn to this_____day of_____, 2022.

_____

Notary Public

*Failure to complete and return this form may be considered sufficient reason for rejection of the bid.*

Exhibit E

# VILLAGE OF WOODRIDGE

## TAX COMPLIANCE AFFIDAVIT

_____,being first duly sworn, deposes and says that

he or she is a _____ of _____.

(Partner, Officer, Owner, Etc.)

The individual or entity making the foregoing proposal or bid certifies that he is not barred from contracting with the any of the Municipalities identified herein because of any delinquency in the payment of any tax administered by the Department of Revenue unless the individual or entity is contesting, in accordance with the procedures established by the appropriate revenue act. The individual or entity making the proposal or bid understands that making a false statement regarding delinquency in taxes is a Class A Misdemeanor and, in addition, voids the contract and allows the municipality to recover all amounts paid to the individual or entity under the contract in civil action

_____

(Name of Bidder if the Bidder is an Individual)
(Name of Partner if the Bidder is a Partnership)
(Name of Officer if the Bidder is a Corporation)

The above statements must be subscribed and sworn to before a notary public. Subscribed and

Sworn to this_day of_____, 2022.

_____

Notary Public

Failure to complete and return this form may be considered sufficient reason for rejection of the bid.

# Attachment A

# PRODUCT MANUAL

## 5-1/4" WATEROUS PACER®
## FIRE HYDRANT

AMERICAN

FLOW CONTROL

THE RIGHT WAY

# INDEX

## 5-1/4" WATEROUS PACER® FIRE HYDRANT


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# 5-1/4" WATEROUS PACER® FIRE HYDRANT

The 5-1/4" Waterous Pacer's sleek and stylish design blends perfectly with today's modern architecture. The Pacer is rated for 250 psig and meets or exceeds all of the requirements of ANSI/AWWA C-502. Ductile iron construction assures strength and durability.

Introduced in 1967, the 5-1/4" Waterous Pacer fire hydrant provides real solutions to today's system demands. With many cities experiencing increased pressure to stretch their dollars, it is important to note that the Pacer hydrant can be maintained by just one person. The removal of four bolts and nuts allows access to all working parts.

The 5-1/4" Waterous Pacer hydrant has all the features you expect from a high quality fire hydrant. The epoxy primer and polyurethane top coat system on external surfaces of the upper barrel provide a durable, high-gloss finish that will continue to look good for years without repainting. The all bronze valve seat and bronze seat insert help assure that the Pacer hydrant remains easy to repair. The Pacer has been manufactured for more than forty years while still maintaining parts interchangeability.

# 5-1/4" WATEROUS PACER® - DIMENSIONS

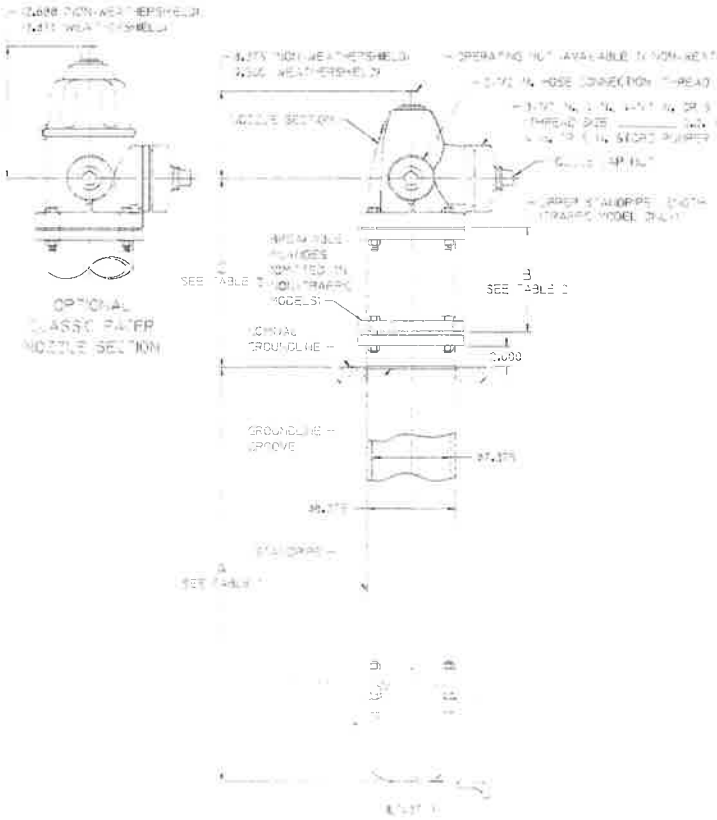


TABLE 1

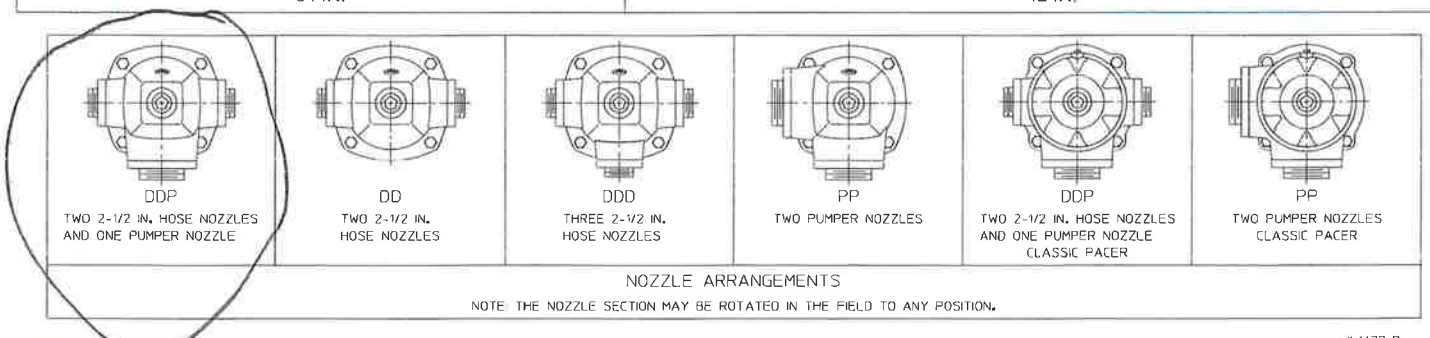
| *Bury Depth | Dim. A | | Rod Length | |
|---|---|---|---|---|
| | With Flanged, Mech. Joint or TYTON® Bottom | ** With Vertical Entry Bottom | Traffic Model (Lower Rod Length) | Non - Traffic Model |
| FT - IN | FT - IN | FT - IN | FT - IN | FT - IN |
| 3 - 0 | 3 - 0.750 | 3 - 3.125 | 2 - 9.312 | 4 - 6.062 |
| 3 - 6 | 3 - 6.750 | 3 - 9.125 | 3 - 3.312 | 5 - 0.062 |
| 4 - 0 | 4 - 0.750 | 4 - 3.125 | 3 - 9.312 | 5 - 6.062 |
| 4 - 6 | 4 - 6.750 | 4 - 9.125 | 4 - 3.312 | 6 - 0.062 |
| 5 - 0 | 5 - 0.750 | 5 - 3.125 | 4 - 9.312 | 6 - 6.062 |
| 5 - 6 | 5 - 6.750 | 5 - 9.125 | 5 - 3.312 | 7 - 0.062 |
| 6 - 0 | 6 - 0.750 | 6 - 3.125 | 5 - 9.312 | 7 - 6.062 |
| 6 - 6 | 6 - 6.750 | 6 - 9.125 | 6 - 3.312 | 8 - 0.062 |
| 7 - 0 | 7 - 0.750 | 7 - 3.125 | 6 - 9.312 | 8 - 6.062 |
| 7 - 6 | 7 - 6.750 | 7 - 9.125 | 7 - 3.312 | 9 - 0.062 |
| 8 - 0 | 8 - 0.750 | 8 - 3.125 | 7 - 9.312 | 9 - 6.062 |
| 8 - 6 | 8 - 6.750 | 8 - 9.125 | 8 - 3.312 | 10 - 0.062 |
| 9 - 0 | 9 - 0.750 | 9 - 3.125 | 8 - 9.312 | 10 - 6.062 |
| 9 - 6 | 9 - 6.750 | 9 - 9.125 | 9 - 3.312 | 11 - 0.062 |
| 10 - 0 | 10 - 0.750 | 10 - 3.125 | 9 - 3.312 | 11 - 6.062 |

***NOTE:** Bury depth is the nominal distance from groundline to bottom of connecting pipe. 1 ft 6 in. - 11 ft 6 in. bury depth's are available.

****NOTE:** For vertical entry bottoms, bury depth is measured to the face of the inlet flange. See detail on next page.

TABLE 2

| DIM. B Upper Standpipe Length (Traffic Models Only) | DIM. C Nozzle Elevation Above Groundline | |
|---|---|---|
| | Traffic Model (WB67-250) | Non-Traffic Model (WB67-250) |
| 10 IN. | 18 IN. | 18 IN. |
| 16 IN. | 24 IN. | |
| 22 IN. | 30 IN. | |
| 28 IN. | 36 IN. | |
| 34 IN. | 42 IN. | |



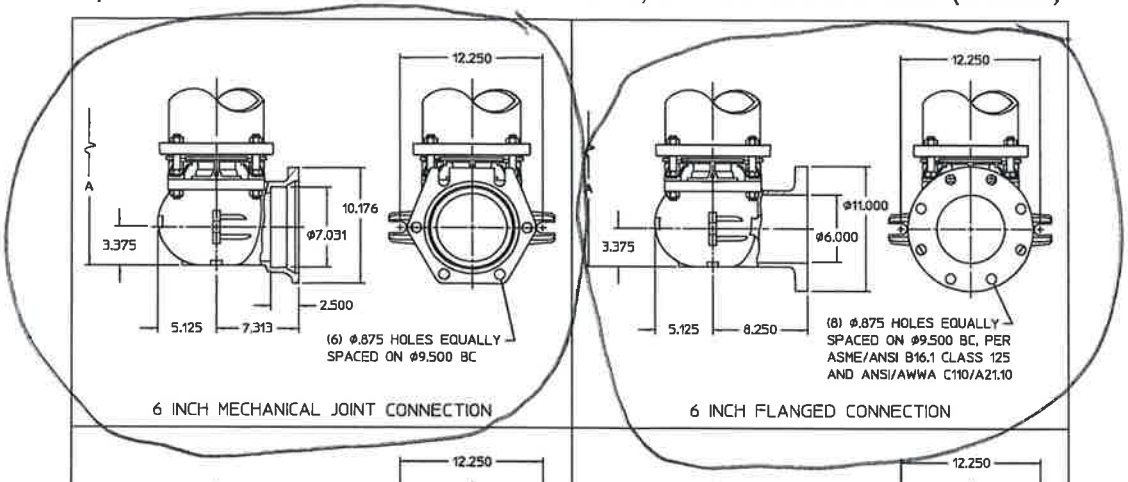

NOZZLE ARRANGEMENTS

NOTE: THE NOZZLE SECTION MAY BE ROTATED IN THE FIELD TO ANY POSITION.

IL1437-B

**NOTES:**
1. 250 psig rated working pressure.
2. Meets or exceeds requirements of AWWA C502, latest revision.
3. UL Listed and Approved by FM Approvals at 250 psig in allowable configurations.
4. Certified to NSF/ANSI Standard 61 and NSF/ANSI 372.
5. TYTON® is a registered trademark of United States Pipe and Foundry Co., LLC.

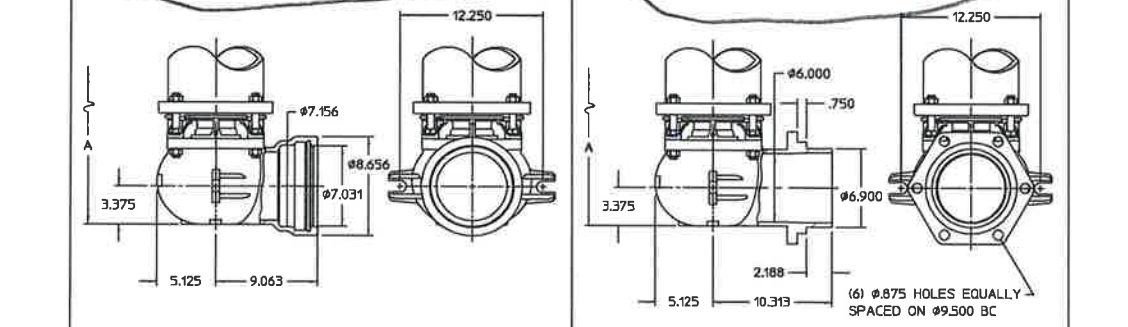
# 5-1/4" WATEROUS PACER® - DIMENSIONS, OPTIONAL BOTTOMS (BASES)




6 INCH MECHANICAL JOINT CONNECTION




6 INCH FLANGED CONNECTION

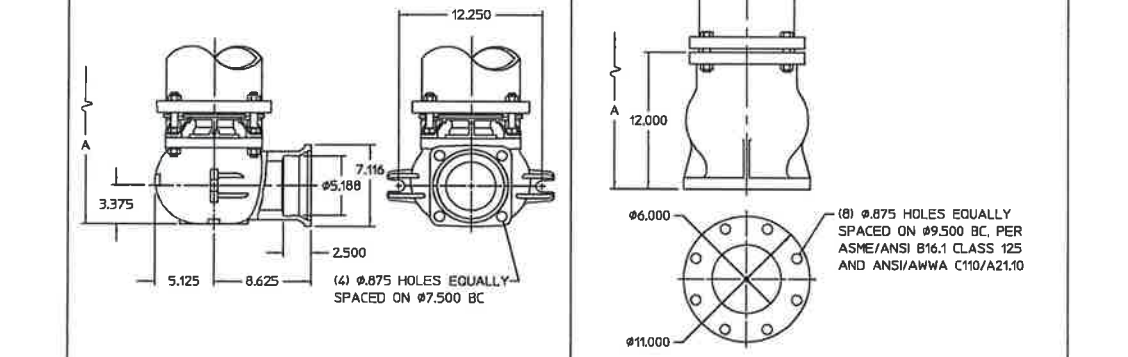



6 INCH TYTON® JOINT CONNECTION

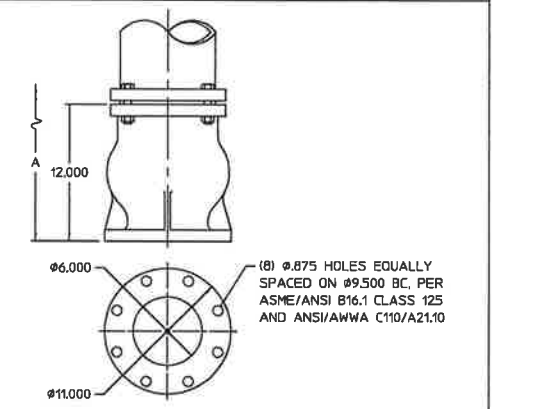
TYTON® is a registered trademark of United States Pipe and Foundry Co., LLC.



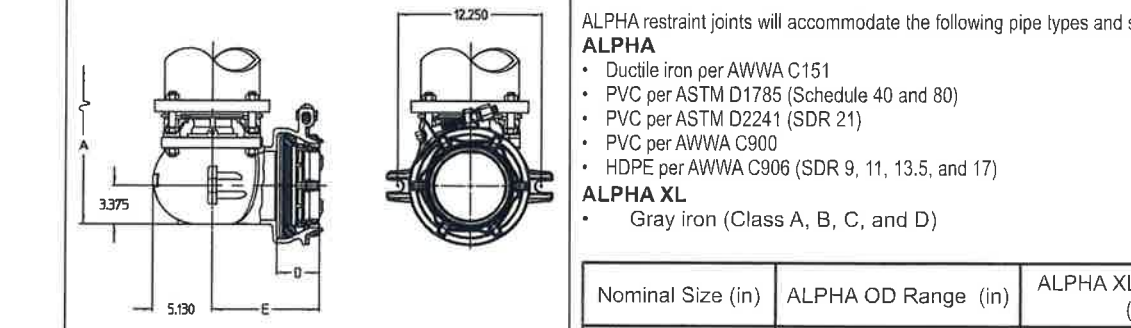

6 INCH PLAIN END W/INTEGRAL MJ GLAND CONNECTION




4 INCH MECHANICAL JOINT CONNECTION




6 INCH FLANGED VERTICAL ENTRY CONNECTION




| JOINT | D | E |
|---|---|---|
| ALPHA™ | 3.748 | 9.50 |
| ALPHA™ XL | 4.042 | 9.875 |

6" ALPHA™ AND ALPHA™ XL JOINT CONNECTION

IL1437-2A ALPHA™ is a trademark of Romac Industries, Inc. (U.S. Patent 8,894,100)

ALPHA restraint joints will accommodate the following pipe types and sizes:

**ALPHA**

- Ductile iron per AWWA C151
- PVC per ASTM D1785 (Schedule 40 and 80)
- PVC per ASTM D2241 (SDR 21)
- PVC per AWWA C900
- HDPE per AWWA C906 (SDR 9, 11, 13.5, and 17)

**ALPHA XL**

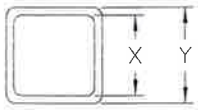
- Gray iron (Class A, B, C, and D)

| Nominal Size (in) | ALPHA OD Range (in) | ALPHA XL OD Range (in) |
|---|---|---|
| 6 | 6.60 - 7.00 | 6.90 - 7.10 |

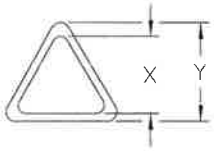
NOTE: See Table 1 on Page 2B-3 for Dimension A.

# 5-1/4" WATEROUS PACER® - OPERATING NUT SIZES

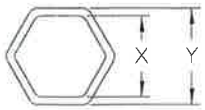

PENTAGON
POINT TO FLAT



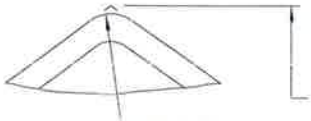

SQUARE
FLAT TO FLAT



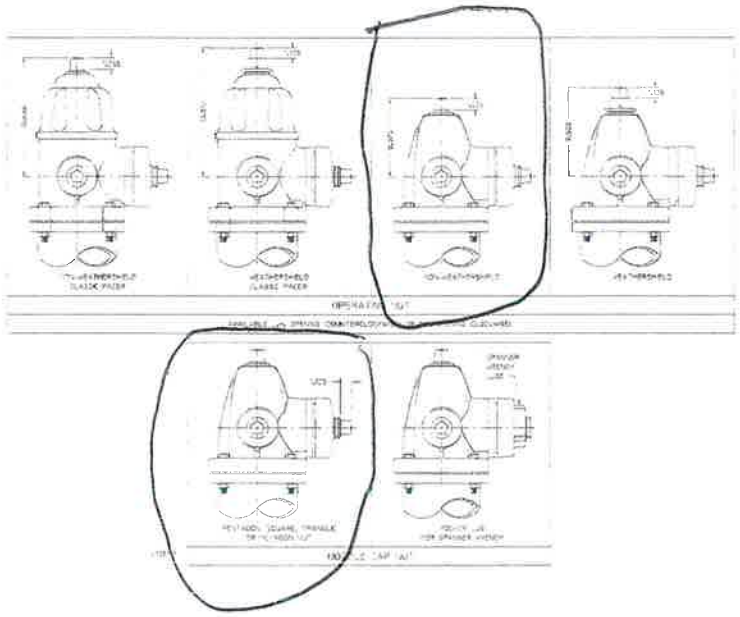

TRIANGLE
POINT TO FLAT




HEXAGON
FLAT TO FLAT




PENTAGON AND TRIANGLE
NUT DIMENSIONS ARE TO
THIS POINT



| Nut Shape | Waterous Nut No. | Nominal Nut Size | X (Top) | Y (Bottom) |
|---|---|---|---|---|
| Pentagon | 1 | 15/16 | .866 / .835 | .962 / .931 |
| | 2 | 1-1/8 | 1.059 / 1.028 | 1.155 / 1.124 |
| | 3 | 1-7/32 | 1.155 / 1.124 | 1.251 / 1.220 |
| | 3A | 1-9/32 | 1.204 / 1.171 | 1.299 / 1.268 |
| | 4 | 1-5/16 | 1.251 / 1.220 | 1.348 / 1.317 |
| | 4A | 1-3/8 | 1.309 / 1.278 | 1.406 / 1.375 |
| | 5 | 1-1/2 | 1.443 / 1.412 | 1.540 / 1.509 |
| Square | 6 | 7/8 | .750 / .719 | .875 / .844 |
| | 7 | 1 | .875 / .844 | 1.000 / .969 |
| Triangle | 8 | 1-1/2 | 1/520 / 1.480 | 1.582 / 1.542 |
| Pentagon | 9 | 1-19/32 | 1.540 / 1.509 | 1.637 / 1.606 |
| | *10 | 1-11/16 | 1.637 / 1.606 | 1.732 / 1.701 |
| | *11 | 1-25/32 | 1.732 / 1.701 | 1.827 / 1.796 |
| | *12 | 1-7/8 | 1.827 / 1.796 | 1.923 / 1.892 |
| Square | 13 | 1-1/8 | 1.000 / .969 | 1.125 / 1.094 |
| | 14 | 1-1/4 | 1.187 / 1.156 | 1.250 / 1.219 |
| | *15 | 2 | 1.875 / 1.844 | 2.000 / 1.969 |
| Hexagon | 17 | 1-5/16 | 1.320 / 1.280 | 1.395 / 1.355 |
| | 17A | 1-1/4 | 1.190 | 1.280 |
| Square | 19 | 15/16 | .812 / .781 | .937 / .906 |
| Triangle | 20 | 1-3/8 | 1.375 / 1.344 | 1.437 / 1.406 |
| Square | *21 | 1-3/8 | 1.312 / 1.281 | 1.375 / 1.344 |
| Hexagon | 22 | 1-1/2 | 1.437 / 1.406 | 1.531 / 1.500 |
| | 22A | 1-7/16 | 1.406 / 1.375 | 1.500 / 1.469 |
| Square | *23 | 1-3/4 | 1.718 / 1.687 | 1.781 / 1.750 |
| Rocker Lug | 41 | Rocker lug for spanner wrench (caps only) | | |

* NOTE: Operating nuts in these sizes are available only as weathershield type.

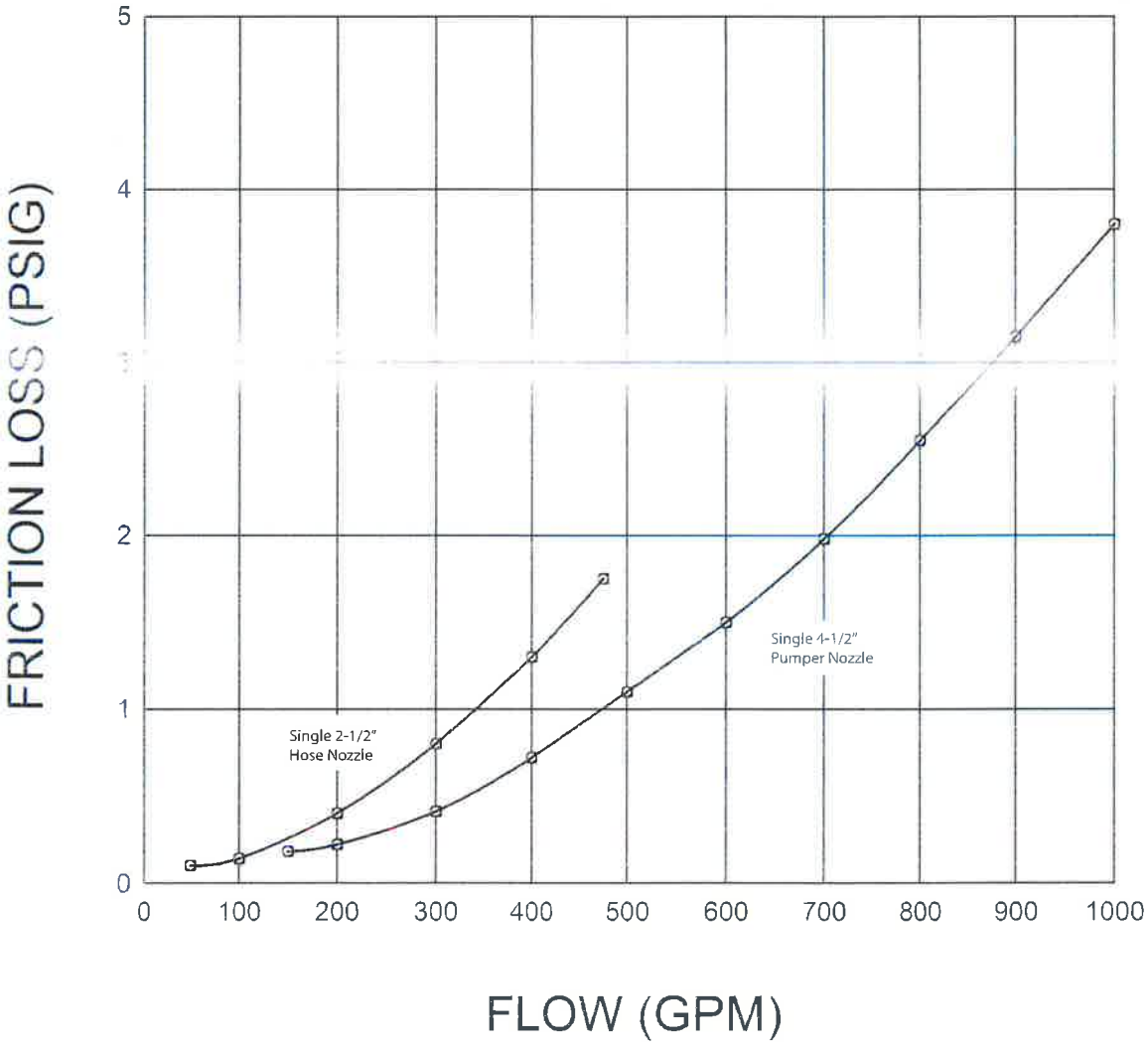
# 5-1/4" WATEROUS PACER® - WEIGHTS
## With 6" Mechanical Joint Bottom (Less Accessories)

| BURY DEPTH | WEIGHT (LBS) | |
|---|---|---|
| | NON-TRAFFIC MODEL W67-250 | TRAFFIC MODEL WB67-250 |
| FT - IN. | DDP | DDP |
| 3-0 | 338 | 357 |
| 3-6 | 358 | 377 |
| 4-0 | 379 | 398 |
| 4-6 | 399 | 418 |
| 5-0 | 420 | 439 |
| 5-6 | 440 | 458 |
| 6-0 | 461 | 580 |
| 6-6 | 481 | 500 |
| 7-0 | 502 | 521 |
| 7-6 | 522 | 541 |
| 8-0 | 543 | 562 |
| 8-6 | 563 | 582 |
| 9-0 | 584 | 603 |
| 9-6 | 604 | 623 |
| 10-0 | 625 | 644 |

**NOTES:**

1. Deduct 11 lbs for DD (2 hose)
2. 16 in. Breakoff Section - Use weight for 6 in. longer hydrant
3. 22 in. Breakoff Section - Use weight for 12 in. longer hydrant
4. Add 11 lbs for 4 in. Mechanical Joint accessories
5. Add 17 lbs for 6 in. Mechanical Joint accessories
6. Add 12 lbs for Classic Pacer (DDP & PP)

## 5-1/4" Waterous Pacer
## Hydrant Flow vs. Friction Loss

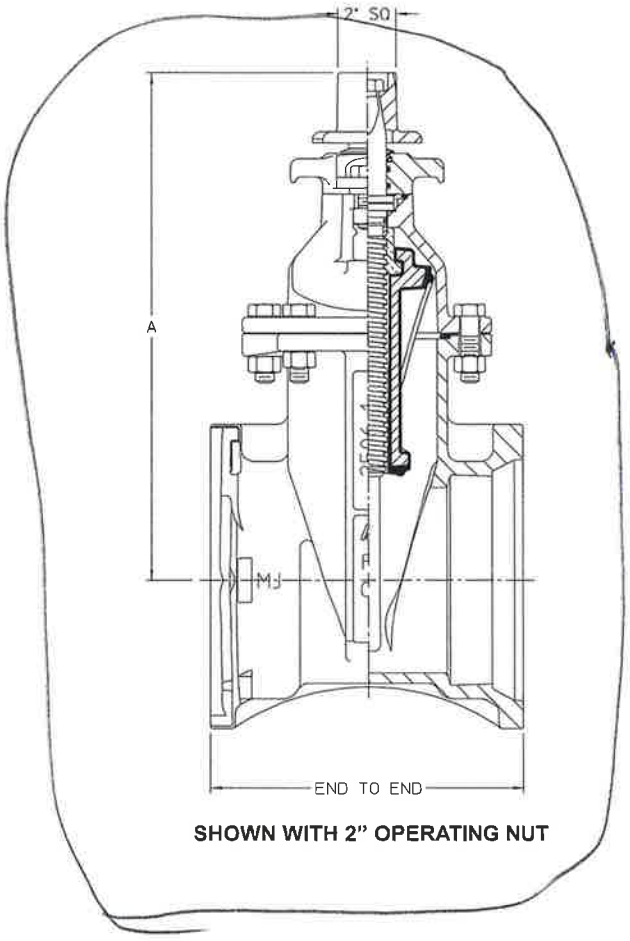



IL1073

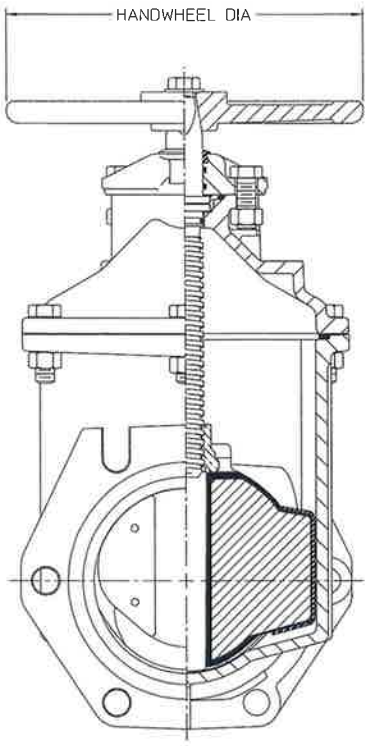
# Attachment B

# AMERICAN Flow Control Submittal Information

## 4" - 12" SERIES 2500-1 RESILIENT WEDGE GATE VALVE, NRS



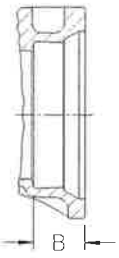

SHOWN WITH 2" OPERATING NUT



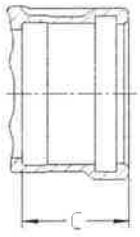

SK20041101-1

SHOWN WITH OPTIONAL HANDWHEEL

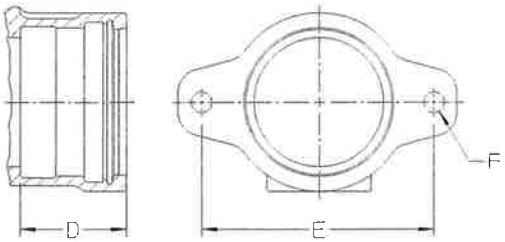
| DIMENSION | VALVE SIZE | | | | |
|---|---|---|---|---|---|
| | 4" | 6" | 8" | 10" | 12" |
| End to End - MJ/MJ | 10.00 | 10.50 | 11.50 | 12.50 | 13.50 |
| End to End - FL/FL | 9.00 | 10.50 | 11.50 | 13.00 | 14.00 |
| End to End - TY/TY | 13.00 | 15.88 | 17.50 | 18.75 | 19.75 |
| End to End - FL/MJ | 9.50 | 10.50 | 12.38 | 13.62 | 14.38 |
| End to End - FL/TY | 11.00 | 13.19 | 14.50 | 15.88 | 16.88 |
| End to End - PVC/ PVC | 13.00 | 15.88 | 17.50 | - | - |
| A | 13.91 | 17.12 | 20.47 | 24.06 | 27.59 |
| B | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 |
| C | 4.00 | 5.22 | 5.50 | - | - |
| D | 4.00 | 5.22 | 5.50 | 5.62 | 5.62 |
| E | 9.00 | 11.19 | 13.50 | 15.88 | 18.00 |
| F DIA | 1.00 | 1.00 | 1.00 | 1.31 | 1.31 |
| Handwheel Diameter | 10.00 | 12.00 | 14.00 | 16.00 | 16.00 |
| No. of Turns to Open | 14 | 20 | 26 | 32 | 38 |




MECHANICAL JOINT (MJ)




PVC
(NOT AVAILABLE FOR UL/FM)




TYTON® (TY)



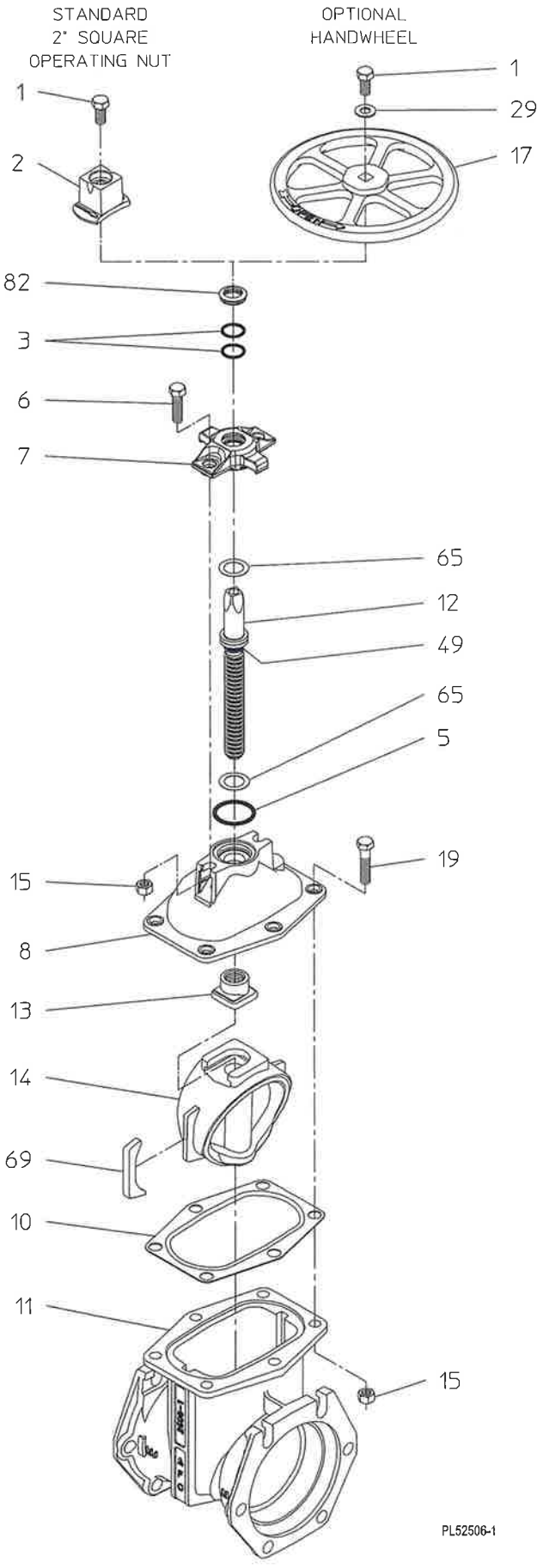
OPTIONAL END CONNECTIONS

AMERICAN
FLOW CONTROL
THE RIGHT WAY

AMERICAN Flow Control
P.O. Box 2727
Birmingham, Al. 35202-2727
Phone: 1-800-326-8051
Fax: 1-800-610-3569
E-mail: afcsales@american-usa.com

Waterous Company
125 Hardman Avenue South
South St. Paul, Mn. 55075-1191
Phone: 1-888-266-3686
Fax: 1-800-601-2809
E-mail: afcsales@american-usa.com

WWW.AMERICAN-USA.COM




Construction shown is typical of the 6-inch size with mechanical joint end connections and is illustrative only. Construction of other sizes vary slightly.

| REF NO. | DESCRIPTION | MATERIAL |
|---|---|---|
| 1 | Hex Head Bolt, 5/8-11 x 1" | 304 Stainless Steel |
| 2 | Operating Nut, 2" Square | Ductile Iron, ASTM A536 |
| 3 | O-Ring | Rubber |
| 5 | Stuffing Box Gasket | Rubber O-ring |
| 6 | Hex Head Bolt, 5/8-11 x 1-3/4" | 304 Stainless Steel |
| 7 | Stuffing Box | Ductile Iron, ASTM A536 |
| 8 | Bonnet | Ductile Iron, ASTM A536 |
| 10 | Bonnet Gasket | Rubber |
| 11 | Body | Ductile Iron, ASTM A536 |
| 12 | Stem | Manganese Bronze, ASTM B763, UNS C86700 |
| 13 | Wedge Nut | Manganese Bronze, ASTM B763, UNS C86700 |
| 14 | Resilient Wedge | EPDM Rubber Encapsulated Ductile Iron ASTM A536 |
| 15 | Hex Nut, 5/8-11 | 304 Stainless Steel |
| 17 | Handwheel | Ductile Iron, ASTM A536 |
| 19 | Hex Head Bolt, 5/8-11 x 2-1/4" | 304 Stainless Steel |
| 29 | Flat Washer, 5/8 | 304 Stainless Steel |
| 49 | O-Ring | Rubber |
| 65 | Thrust Washer | 304 Stainless Steel |
| 69 | Wedge Cover | Acetal Polymer |
| 82 | Debris Seal | Rubber |

## OPTIONAL MATERIALS ARE AS FOLLOWS

BOLTS and NUTS: 316 Stainless Steel
STEM: Cast NDZ-S Bronze, ASTM B763, UNS C99500
STEM: Stainless Steel
WEDGE NUT: Silicon Bronze, ASTM B584, UNS C87600

Open Direction: ☒ Left (C.C.W.) ☐ Right (C.W.)

## NOTES:

1. Available in configurations that are UL Listed and FM Approved with 250 psig rated working pressure.
2. Meets requirements of ANSI/AWWA C515 with 250 psig rated working pressure.
3. Fusion-bonded epoxy-coated in accordance with ANSI/AWWA C550.
4. Certified to NSF/ANSI 61 & 372.

AMERICAN
FLOW CONTROL
THE RIGHT WAY

AMERICAN Flow Control
P.O. Box 2727
Birmingham, Al. 35202-2727
Phone: 1-800-326-8051
Fax: 1-800-610-3569
E-mail: afcsales@american-usa.com

Waterous Company
125 Hardman Avenue South
South St. Paul, Mn. 55075-1191
Phone: 1-888-266-3686
Fax: 1-800-601-2809
E-mail: afcsales@american-usa.com

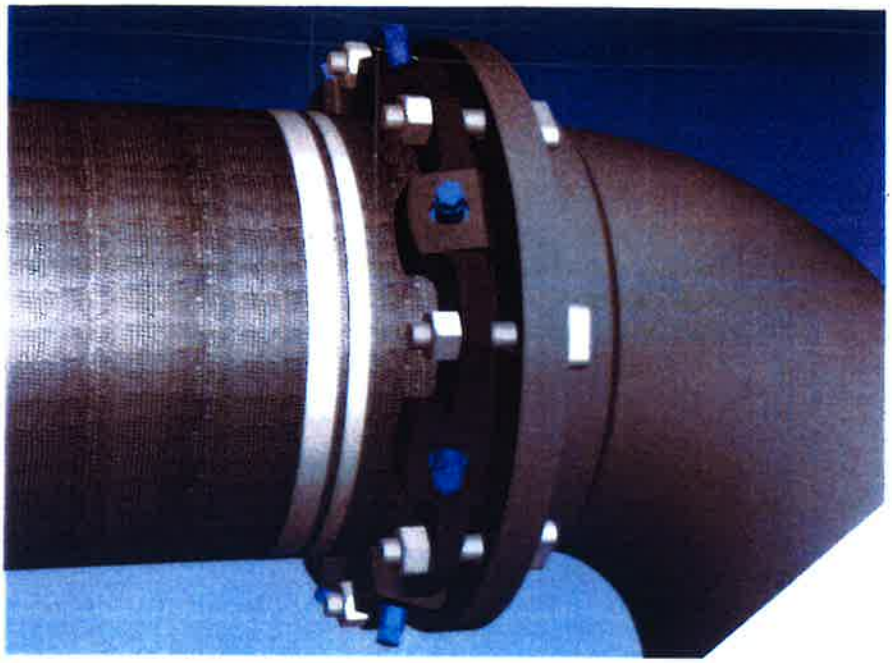
WWW.AMERICAN-USA.COM

# Attachment C

EBAA IRON INC

# MEGALUG® Series 1100

## Mechanical Joint Restraint for Ductile Iron Pipe



| Nominal Pipe Size | Series Number | Shipping Weights | Post Assembly Deflection | Pressure Rating (PSI) |
|---|---|---|---|---|
| 3 | 1103 | 6.1 | 3° | 350 |
| 4 | 1104 | 7.7 | 3° | 350 |
| 6 | 1106 | 11.9 | 3° | 350 |
| 8 | 1108 | 14.8 | 3° | 350 |
| 10 | 1110 | 23.9 | 3° | 350 |
| 12 | 1112 | 31.2 | 3° | 350 |
| 14 | 1114 | 48.5 | 2° | 350 |
| 16 | 1116 | 56.4 | 2° | 350 |
| 18 | 1118 | 63.1 | 1½° | 250 |
| 20 | 1120 | 72.3 | 1½° | 250 |
| 24 | 1124 | 133.1 | 1½° | 250 |
| 30 | 1130 | 194.6 | 1° | 250 |
| 36 | 1136 | 234.0 | 1° | 250 |
| 42 | 1142 | 536.0 | 1° | 250 |
| 48 | 1148 | 653.0 | 1° | 250 |
| 54 | 1154 | 700.2 | 0.5° | 250 |

NOTE: For applications or pressures other than those shown please contact EBAA for assistance.

Made In The USA

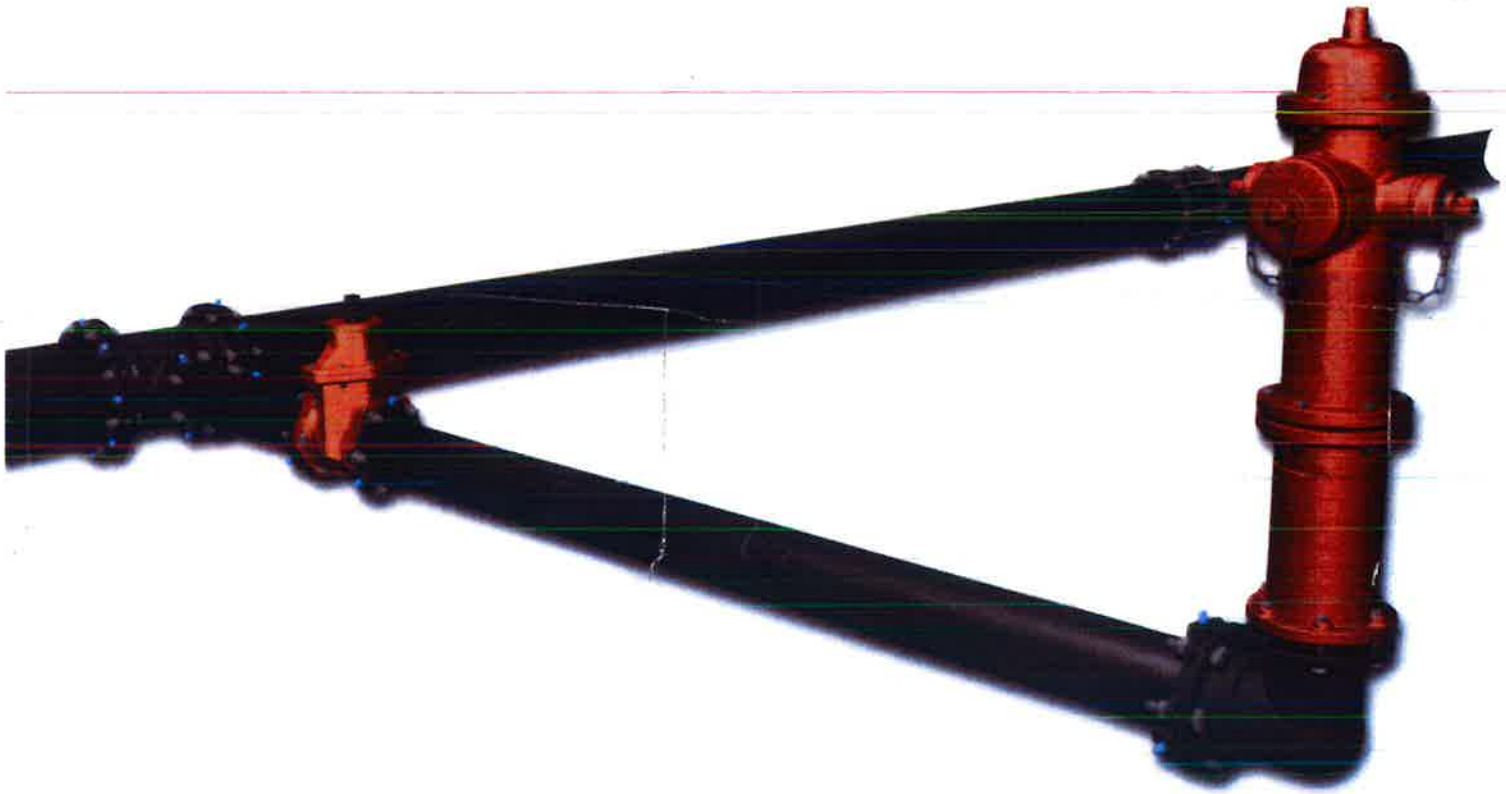
U.S. Patent Nos.
4092036, 4627774, 4779900, 4896903, 5544922

**Features and Applications:**

- Sizes 3 inch through 54 inch
- Constructed of ASTM A536 Ductile Iron
- Torque Limiting Twist-Off Nuts
- MEGA-BOND®
  Restraint Coating System
  For more information on MEGA-BOND, refer to www.ebaa.com
- The Mechanical Joint Follower Gland is incorporated into the restraint
- Heavy Duty thick wall design
- Support Products Available:
  Split repair style available 3 inch through 48 inch.
  EBAA Series 1100SD

  Solid restraint harness available for push-on pipe bells.
  EBAA Series 1700

  Split restraint harness available for existing push-on bells.
  EBAA Series 1100HD
- All MEGALUG and related restraint products can be furnished as packaged accessories complete with appropriate restraint, gasket, lubrication, and bolting hardware
- For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600 or ASTM D2774



## MEGALUG: THE PRODUCT OF PREFERENCE SINCE 1984

ater and wastewater pipelines and systems have come to rely n the EBAA Series 1100 MEGALUG Mechanical Joint Restraint s the "Product of Preference" for effectively and economically estraining ductile iron pipe connections above or below ground. MEGALUG Mechanical Joint Restraints replace external re-traints such as cumbersome concrete thrust blocks and corrod-ble metal tie rods creating a quicker, safer and more economical nstallation.

[illegible] are Underwriters Laboratories [illegible] sizes are Factory Mutual (FM) approved.

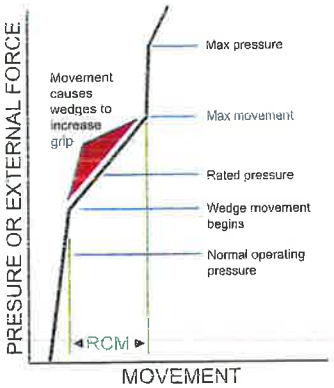
For use on all classes of ductile iron pipe (PC350 through PC150 and CL56 through CL50), for practically any application including valves, hydrants and pipe, the MEGALUG Mechanical Joint Restraint effectively and safely performs without damage to the pipe or cement linings.

## THE MEGALUG GRIPPING WEDGE... PERFORMANCE PROVEN

The wedge style MEGALUG design reacts o the amount of force acting on the joint. When each wedge is set, the wedge teeth enetrate the pipe's outer surface, and he wedge does not move on the pipe. here is very little change in this interface ntil the wedge movement begins inside he pocket of the main casting. Once the edge starts moving, the formation of the uttress begins.

This "dam" of material (the wedge mpression) is cold formed as the wedging ction continues. If the force of pressure cting on the joint is released, the wedge noves back to near its original position. his engages the reserve-controlled move-ment or "RCM". The wedge is then ready or another round.

After the wedge has moved to the back




of the pocket at the maximum pressure or load, the wedge buttress are in shear. The maximum movement is about 0.3 inch through the thirty-six inch size and 0.4 inch for forty-two and forty-eight inch.

The RCM is available even with severe cyclic loads. This has been tested to very high-pressure differentials and the wedge impressions look the same as if a single test had been performed.

Typically, the depth of pipe wall penetration, or wedge impression at around 25,000 pounds of force per wedge (200 PSI on a six inch and 150 PSI on a twelve inch) is 0.03". Finally, at roughly twice that force the penetration is around 0.05" At these high pressures, there is no affect on the design thickness of ductile iron pipe made according to AWWA C150. The lack of damage to the cement lining clearly indicates that the thrust load is primarily longitudinal.

This ability to move in the pocket allows for angular flexibility as well as longitudinal flexibility.

## THE ORIGINAL PATENTED GRIPPING WEDGES

Since 1964 EBAA Iron has responded aggressively to the needs of the water industry for better solutions to joint restraint problems - thus the development of the family of self actuating MEGALUG wedge action restraints.

### TOOLS



MEGALUGS install using an ordinary wrench (box, ratchet, or air-driven), because the torque-limiting, twist-off nuts automatically shear during tightening when the proper torque is reached. The same 1¼ wrench used to tighten the T-bolts on the 4" through 24" sizes can be used to tighten and shear the twist off nuts in all sizes. If removal becomes necessary, a 5/8 hex head remains so the screws can be loosened, and retightened with a torque-indicating wrench. During removal, the wedges are held in place by retainer clips.

### DEFLECTION

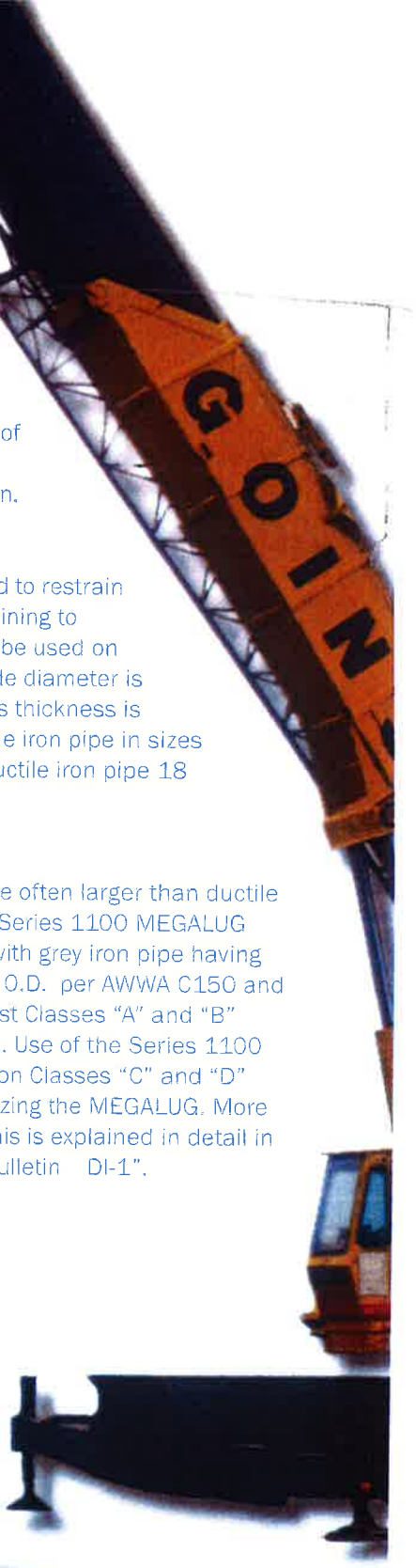
The MEGALUG gripping wedges provide resiliency to your pipeline design. In addition to deflecting as much as allowed by the mechanical joint during installation, it can also deflect after assembly. Sizes of 12" and below are capable of up to 3 degrees of deflection after installation (depending on the preset deflection.) The 14" and 16" sizes are capable of 2 degrees deflection. The 18" through 24" sizes are capable of 1.5 degrees deflection. The 30" through 48" sizes are capable of 1 degree deflection. The 54" size has a 0.5 degree deflection.

### STEEL PIPE

The 1100 Series MEGALUG can be used to restrain 3" - 8" SCH 40 or 80 steel pipe when joining to mechanical appurtenances. It can also be used on steel pipe in all sizes if the pipe's outside diameter is the same as the ductile iron pipe and its thickness is equal to or greater than PC350 ductile iron pipe in sizes of 16 inch and below and PC250 ductile iron pipe 18 inches and above.

### CAST IRON PIPE

Grey iron pipe diameters are often larger than ductile iron pipe diameters. The Series 1100 MEGALUG restraint may be used with grey iron pipe having standardized cast iron O.D. per AWWA C150 and C151, and with pit cast Classes "A" and "B" without modification. Use of the Series 1100 with pit cast grey iron Classes "C" and "D" will require over sizing the MEGALUG. More information on this is explained in detail in "Connections Bulletin DI-1".






**MEGALUG**
**Takes the Load**

**On April 11, 1997 EBAA Iron performed a remarkable force demonstration of their series 1100 MEGALUG Joint Restraint. With the use of EBAA's Series 1100 MEGALUG using a standard mechanical joint installation on 12 inch Ductile Iron Pipe, and a 80 Ton motor crane, EBAA Iron lifted a D7 Caterpillar Track Type Tractor weighing in at 50,350 lbs. Along with this, the Series 1100 MEGALUG has been tested to over 700 PSI. Concluding that EBAA's MEGALUGS can take the load.**

# Mechanical Joint Restraint Sample Specification

*(The text of the specifications below can be copied pasted from www.ebaa.com/download/1100Spec.DOC)*

Restraint devices for mechanical joint fittings and appurtenances conforming to either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53, shall conform to the following:

**Design**
Restraint devices for nominal pipe sizes 3 inch through 54 inch shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.

The devices shall have a working pressure rating of 350 psi for 3-16 inch, 250 psi for 18-48 inch and 200 psi for the 54 inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes.

**Material**
Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.

For applications requiring restraint 30 inch and greater, an alternate grade of [illegible] meeting the material requirements of [illegible] device meets all end product performance requirements.

Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.

Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) Specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.

Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.

**Traceability**
An identification number consisting of year, day, plant and shift (YYDDD)(plant designation)(Shift number), shall be cast into each gland body.

All physical and chemical test results shall be recorded such that they can be accessed via the identification number on the casting. These Material Traceability Records (MTR's) are to be made available, in hard copy, to the purchaser that requests such documentation and submits his gland body identification number.

Production pieces that are too small to accommodate individual numbering, such as fasteners and wedges, shall be controlled in segregate inventory until such time as all quality control tests are passed. These component parts may then be released to a general inventory for final assembly and packaging.

All components shall be manufactured and assembled in the United States. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense.

**Installation**
Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.

Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

**Approvals**
Restraint devices shall be Listed by Underwriters Laboratories (3" through 24" inch size) and Approved by Factory Mutual (3" through 12" inch size).

Mechanical joint restraint for ductile iron pipe shall be Megalug Series 1100 produced by EBAA Iron Inc. or approved equal.

**MEGA-BOND® Restraint Coating System**
All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.

[illegible] pre-heated with a [illegible] and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and U[illegible] resistance.

The coating system shall be MEGA-BOND by EBAA Iron, Inc. or approved equal. Request for approved equal must submit coating material and process details for review prior to bid.

*For more information regarding MEGA-BOND, refer to the MEGA-BOND brochure or visit www.ebaa.com.*

## Support Products

*for more information concerning these products please consult the catalog or www.ebaa.com*

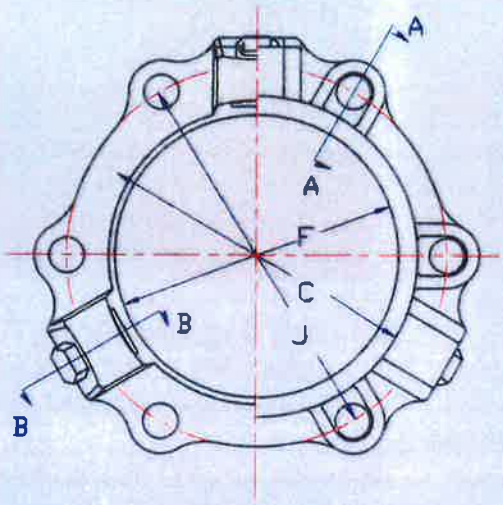
**Series 1100SD**
Split MEGALUG Restraint
For Existing Mechanical Joints

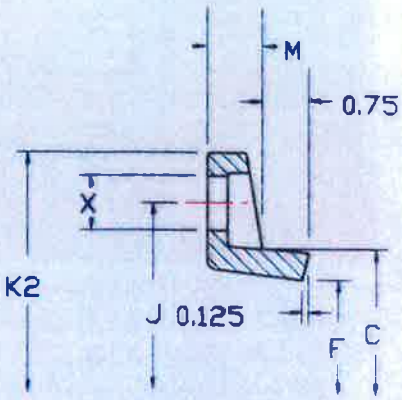
**Series 1700**
MEGALUG Restraint Harness
For Push-On Bell Joints

**Series 1100SDB**
Split MEGALUG Restraint
For Mid-Span Applications

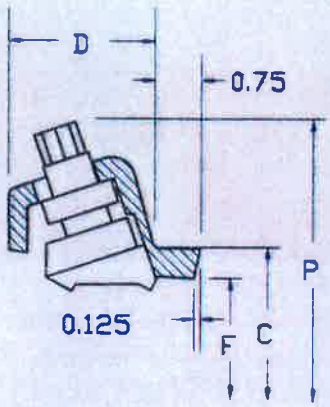
**Series 1100HD**
Split MEGALUG Restraint
Harness for Existing Push-On Bells

EBAA IRON




SECTION A-A




SECTION B-B

MADE IN USA

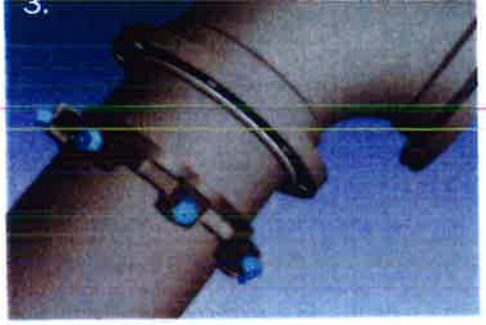
| Nominal Pipe Size | Series Number | C | D | F | M | P* | X | J | K2 | Wedge QTY. | Bolt (QTY.-Size) | Weight (LBS.) | Pressure Rating (PSI) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 1103 | 4.48 | 2.27 | 4.06 | 0.62 | 9.06 | 0.750 | 6.19 | 7.69 | 2 | 4 - ⅝ x 3 | 6.1 | 350 |
| 4 | 1104 | 5.92 | 2.27 | 4.90 | 0.75 | 9.90 | 0.875 | 7.50 | 9.12 | 2 | 4 - ¾ x 3½ | 7.7 | 350 |
| 6 | 1106 | 8.02 | 2.27 | 7.00 | 0.88 | 12.00 | 0.875 | 9.50 | 11.12 | 3 | 6 - ¾ x 3½ | 11.9 | 350 |
| 8 | 1108 | 10.17 | 2.31 | 9.15 | 1.00 | 14.15 | 0.875 | 11.75 | 13.37 | 4 | 6 - ¾ x 4 | 14.8 | 350 |
| 10 | 1110 | 12.22 | 2.37 | 11.20 | 1.00 | 16.20 | 0.875 | 14.00 | 15.62 | 6 | 8 - ¾ x 4 | 23.9 | 350 |
| 12 | 1112 | 14.32 | 2.37 | 13.30 | 1.25 | 18.30 | 0.875 | 16.25 | 17.88 | 8 | 8 - ¾ x 4 | 31.2 | 350 |
| 14 | 1114 | 16.40 | 2.69 | 15.44 | 1.50 | 20.94 | 0.875 | 18.75 | 20.25 | 10 | 10 -¾ x 4½ | 48.5 | 350 |
| 16 | 1116 | 18.50 | 2.69 | 17.54 | 1.56 | 22.90 | 0.875 | 21.00 | 22.50 | 12 | 12 -¾ x 4½ | 56.4 | 350 |
| 18 | 1118 | 20.60 | 2.69 | 19.64 | 1.63 | 25.00 | 0.875 | 23.25 | 24.75 | 12 | 12 -¾ x 4½ | 63.1 | 250 |
| 20 | 1120 | 22.70 | 2.69 | 21.74 | 1.69 | 27.10 | 0.875 | 25.50 | 27.00 | 14 | 14 -¾ x 4½ | 72.3 | 250 |
| 24 | 1124 | 26.90 | 3.20 | 25.94 | 1.81 | 32.64 | 0.875 | 30.00 | 31.50 | 16 | 16 -¾ x 5 | 133.1 | 250 |
| 30 | 1130 | 33.29 | 3.20 | 32.17 | 2.25 | 38.87 | 1.125 | 36.88 | 39.12 | 20 | 20 - 1 x 6 | 194.6 | 250 |
| 36 | 1136 | 39.59 | 3.20 | 38.47 | 2.25 | 45.17 | 1.125 | 43.75 | 46.00 | 24 | 24 - 1 x 6 | 234.0 | 250 |
| 42 | 1142 | 45.79 | 4.56 | 44.67 | 3.88 | 55.57 | 1.375 | 50.62 | 53.48 | 28 | 28 - 1¼ x 8½ | 536.0 | 250 |
| 48 | 1148 | 52.09 | 4.56 | 50.97 | 3.88 | 61.87 | 1.375 | 57.50 | 60.36 | 32 | 32 - 1¼ x 8½ | 653.0 | 250 |
| 54 | 1154 | 58.82 | 4.56 | 57.73 | 3.88 | 66.40 | 1.375 | 63.20 | 66.33 | 36 | 36 - 1¼ x 9½ | 700.3 | 250 |

* With Twist-Off Nuts twisted of

NOTE: Dimensions are in inches (±1%) and are subject to change without notice

## Important Notes

- The Series 1100 MEGALUG should not be used on plain end fittings.
- If encased in concrete, polyethylene wrap must be used to prevent concrete intrusion into the wedge pocket.
- For test pressures above the rated pressures shown, contact EBAA for recommendations, such as tandem restraint for high pressure applications.
- If you experience the need to install the Series 1100 MEGALUG in an unconventional manner please consult our engineering department.
- EBAA-Seal™ Mechanical Joint Gaskets are provided with 30 inch through 54 inch MEGALUG restraints. These are required on the above referenced sizes to accommodate the pressure ratings and safety factors shown.
- Extra length T-bolts are provided with the 42 inch, 48 inch and 54 inch sizes to facilitate easier assembly of the mechanical joint.
- All Series 1100 MEGALUG components are made of ductile iron conforming to ASTM A536. The wedges are heat treated to a hardness range of 370 to 470 BHN.
- LISTINGS AND APPROVALS: Sizes 3 inch through 24 inch are listed by Underwriters Laboratories, Inc. Category HJKF "Fittings, Retainer Type" with a deflection angle of 5 degrees (3 inch through 12 inch) and 2½ degrees (14 inch through 24 inch). The listing file number is EX2836. Sizes 3 inch through 12 inch are Factory Mutual approved.
- The Series 1100 MEGALUG is intended for use on ductile iron pipe. The restraint can be used on grey iron pipe if the pipe is not severely corroded and is in sound condition and has an outside diameter that can be accommodated. For more information on the use of the MEGALUG restraint on grey iron pipe ask for Connections Bulletin DI-1.



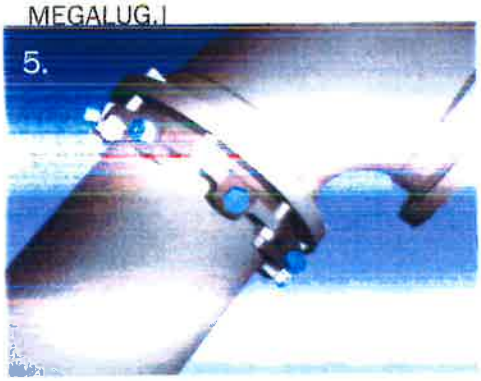
. The Series 1100 MEGALUG® joint restraint is designed for use on ductile iron pipe conforming to ANSI/AWWA C151/A21.51 (all thickness classes) when restraining mechanical joint pipe fittings.

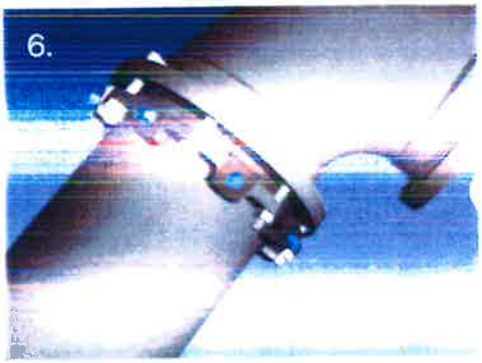
. Clean the socket and the plain end. Lubrication and additional cleaning should be provided by brushing both the gasket and the plain end with soapy water or an approved pipe lubrication meeting the requirement of ANSI/AWWA C111/A21.11 just prior to slipping the gasket onto the plain end for joint assembly. Place the gland on the plain end with lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end. [The gasket provided may be the EBAA-SEAL® Improved Mechanical Joint Gasket, there is no narrow end as the gasket is bi-directional. In certain sizes, use of the EBAA-SEAL is required to achieve the pressure ratings of the MEGALUG.]

NOTE: In cold weather it is preferable to warm the gasket to facilitate assembly of the joint.

3. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.

4. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket.


Insert bolts and hand tighten nuts. Make deflection after joint assembly but before tightening bolts.

. Tighten the bolts to the normal range of torque as indicated [3-inch 45-60 ft.-lbs., 4 through 24 inch 75-90 ft-lbs., 30 and 36-inch 100-120 ft.-lbs., and 42, 48 and 54-inch 120-150 ft.-lbs.] While at all times maintaining approximately the same distance between the gland and the face of the flange at all points around the socket. This can be accomplished by partially tightening the bottom bolt first, then top bolt, next the bolts at either side, finally the remaining bolts. Repeat the process until all bolts are within the appropriate range of torque.

In large sizes (30 through 64-inch [762mm – 1,600mm]), five or more repetitions may be required. The use of a torque-indicating wrench will facilitate this procedure.

6. Tighten the torque limiting twist off nuts in a clockwise direction (direction indicated by arrow on top of nut) until all wedges are in firm contact with the pipe surface. Continue tightening in an alternating manner until all of the nuts have been twisted off.

7. If removal is necessary, utilize the 5/8 inch hex heads provided. If reassembly is required, assemble the joint in the same manner as above, by tightening the wedge bolts to 90 ft-lbs. If the series 1100 restraint is removed from the pipe, be sure that all the collar bolts and wedges are in place before the restraint is reassembled.

Steps 2-5 are requirements of AWWA Standard C600-17

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**For More Information**

For more information about MEGALUG restraints call EBAA today and request "EBAA Connections Bulletin DI-1" concerning use o. the MEGALUG restraint on grey iron pipe, or "EBAA Connections Bulletin DI-2" covering the background and operation of the MEGALUG system of restraint.

"Restraint Length Calculation" Software is available for PC/Windows applications. Support documentation about the software can be found in "EBAA Connections Bulletin PD-1 through PD-5"

EBAA IRON
Connections™
TECHNICAL DATA FOR THE WATER & WASTEWATER PROFESSIONAL
DI-1

## USE OF MEGALUG® RESTRAINT PRODUCTS ON GREY IRON PIPE

As users have become more familiar with joint restraint and EBAA Iron's Series 1100 MEGALUG® restraint, we have sought ways to apply this technology to restraining existing grey iron pipelines. Because MEGALUG restraints were designed for use with ductile iron pipe, applications involving grey iron pipe have been limited. The Series 1100 can be a valuable restraint tool for many grey iron piping applications however. Use of the 1100 Series with grey iron requires recognition of the fundamental differences between ductile and grey iron piping systems and informed application of restraint principles.

Three factors limit the use of MEGALUG restraints on existing grey iron systems:

1. The strength limitations of grey iron,
2. The condition of the existing grey iron pipeline, and
3. Dimensional differences between grey and ductile iron pipe standards.

### GREY IRON

Ductile iron pipe became the industry standard in the early 1960's. Prior to 1960 most of the iron pressure pipe installed in the U.S. was grey iron. Ductile iron quickly replaced grey iron as the industry's standard because ductile's higher tensile and yield strengths permitted manufacturers to produce lighter weight pipe and fittings with superior strength and resilience.

The MEGALUG wedge takes advantage of ductile iron's higher strengths by cold-working a slight groove and buttress at the surface of the pipe during installation. As pressure on the system increases, the wedge design responds by increasing the depth of the groove penetration and thus the shear resistance provided to resist joint separation. This "positive restraint" is dependent on the ductile yield of the pipe material to provide increased shear resistance.

It has been our experience that the Series 1100 MEGALUG restraint will perform well in normal installations when installed on good quality grey iron pipe. EBAA has tested the 1100 Series on samples of grey iron pipe in various sizes through twenty-four inch. On the basis of these tests the restraint may be used on sizes through twelve inch for working pressures to 250 psi, and sizes fourteen inch through twenty-four inch to 150 psi. While we have not beer able to test 1100 Series on the larger sizes, field experience indicates that sized thirty and thirty-six inch may be safely restrained using the MEGALUG restraint. Due to the variety and conditions of the pipe in the field, these pressure ratings cannot be guaranteed.

### CONDITION OF THE PIPE

A major concern when tying into an existing piping system is the condition of the pipe in the ground. MEGALUG restraints should only be used with piping that is in good condition, structurally sound, and relatively free of corrosior products. Prior to attempting to use a Series 1100 on a sectio of grey iron pipe, the pipe should be closely inspected to insure its structural integrity.

Of particular concern with grey iron is a form of corrosion called "graphitization". Graphitization occurs when iron is dissolved and removed from the grain structure leaving behind a porous carbon matrix. This carbon is in the form of graphite. Graphitization may result in a pipe that appears outwardly competent and continues to hold water under pressure, but fails brittlely when jarred by a shovel. Graphiti corrosion often occurs in highly acidic soils, soils high in sulfates, or in the presence of sulfate-reducing bacteria.

MEGALUG joint restraint should not be used in corroded or graphitized pipe. Where significant corrosion or graphitization is evident, the corroded section of pipe should be replaced back to the nearest competent pipe section. Restraint utilizing thrust blocking and tie rodding may be advisable in some situations.

### CAST IRON PIPE DIMENSIONS

Prior to 1908 pipe wall thickness and outside diameters were often specified by the customer. In 1908 the AWWA adopted a standard specification for pit cast grey iron pipe that established eight pressure classes lettered "A" through "H". Pipe wall thickness and outside diameters (OD's) were varie to meet the strength requirements of these various classes. Predominant pressure classes were "A" through "D".

Centrifugal casting methods developed in the 1920's prompted standardization of the outside pipe diameters to

ere carried over into AWWA C150 and C151.

ıe Series 1100 may be used with Class "A" and Class "B" pe with no modification to the gland. Using the Series 1100 ith Classes "C" and "D" pipe will require modification of e gland to accommodate the greater OD's. The 1100 Series ınnot be modified to accommodate Class "D" pipe in the irty and thirty-six inch sizes. See Table 1.

lodern mechanical joint was standardized in the 1930's. vailability of Class "C" and "D" fittings with oversized echanical joints may be a limiting factor, particularly for rge diameter applications.

ttaching new piping to an existing grey iron line may quire use of a bolted sleeve type coupling. A MEGALUG ırness with special tie- bars can be used to retrain across the ɔupling. The gasket lips of the restraint rings must face each her to provide restraint.

**UMMARY**

he Series 1100 MEGALUG joint restraint for use with ıctile iron pipe may be used with grey iron pipe for e-ins and modifications where adequate understanding f the limitations of grey iron pipe are understood and strengths and lower pressure ratings, may be safely restrained to 250 psi working pressure in sizes three through twelve inch, and 150 psi in sizes fourteen through twenty-four inch. Grey iron pipe may be restrained using the Series 1100 in pipe sizes through thirty-six inch. Because of the variety of pipe and conditions these pressures ratings cannot be guaranteed by EBAA Iron.

Grey iron pipe diameters are often larger than ductile iron pipe diameters. The Series 1100 MEGALUG restraint may be used with grey iron pipe having standardized cast iron O.D.' per AWWA C150 and C151, and with pit cast Classes "A" and "B" without modification. Use of the Series 1100 with pit cast grey iron Classes "C" and "D" will require oversizing the MEGALUG gland. Table I is a summary of pit cast O.D.'s and available oversized MEGALUG restraints.

**Reference**

Handbook of Ductile Iron Pipe, Sixth Edition: Ductile Iron Pipe Research Assoc., 1984

| NOMINAL SIZE | PIPE BARRELL O.D.'S PIT CAST GREY IRON CLASSES | | | | OVERSIZED MEGALUG "F" Dim |
|---|---|---|---|---|---|
| | Class A | Class B | Class C | Class D | |
| 3" | 3.8 | 3.96 | 3.96 | 3.96 | 4.06 |
| 4" | 4.8 | 5.00 | 5.00 | 5.00 | 5.10 |
| 6" | 6.9 | 7.10 | 7.10 | 7.10 | 7.20 |
| 8" | 9.05 | 9.05 | 9.30 | 9.30 | 9.40 |
| 10" | 11.10 | 11.10 | 11.40 | 11.40 | 11.50 |
| 12" | 13.20 | 13.20 | 13.50 | 13.50 | 13.60 |
| 14" | 15.30 | 15.30 | 15.65 | 15.65 | 15.80 |
| 16" | 17.40 | 17.40 | 17.80 | 17.80 | 17.94 |
| 18" | 19.50 | 19.50 | 19.92 | 19.92 | 20.06 |
| 20" | 21.60 | 21.60 | 22.06 | 22.06 | 22.20 |
| 24" | 25.80 | 25.80 | 26.32 | 26.32 | 26.46 |
| 30" | 31.74 | 32.00 | 32.40 | (32.74) | 32.57 |
| 36" | 37.96 | 38.30 | 38.70 | (39.16) | 38.87 |

Table 1: Pit cast barrel O.D.'s for Classes "A" through "D" pipe and maximum Series 1100 Oversized I.D.'s.

# Attachment D

ZIEBELL Ring Z-Bell For Service

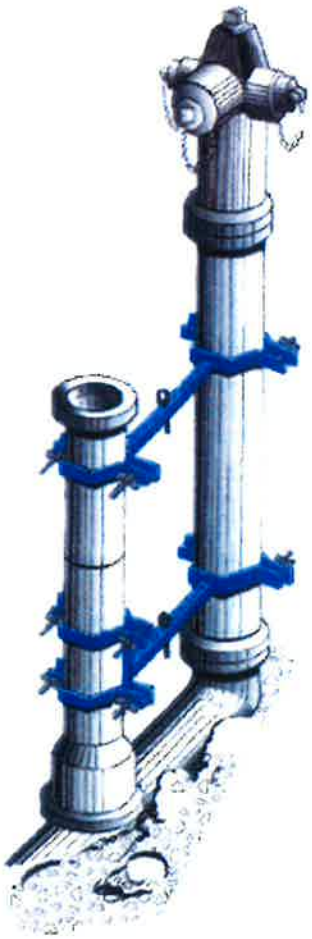


**Does Your municipality still have the Traverse City Fire Hydrant in its system? If it does, we are your source for the parts necessary to keep your fire hydrants on line.**

Ziebell Water Service Products, Inc. is an authorized and fully stocking distributor of TCIW hydrant

# BLR GRIP

Get a GRIP On Your Fire Hydrant Installation and Safety



We've just changed the procedures required for hydrant and valve box installation and maintenance forever! Our new HYDRANT AND VALVE BOX GRIP is a revolutionary product designed to provide maximum stability assuring proper fire hydrant and auxiliary valve box installation and valve key operation...the first time. The GRIP eliminates annoying valve key adjustment problems and reduces unnecessary, expensive punch list repairs. It can even help minimize disturbance of the existing landscaping, pavement and restoration.

- **Eliminates Valve Box Movement**
- **Insures Proper Valve Keying**
- **Improves Safety Conditions**
- **Lightweight & Durable**
- **Available in Two Models**
- **Economical & Affordable**
- **Reduces Installation Time**
- **Adjustable Up to 36" Wide**

The GRIP also offers a real breakthrough in installation safety! When properly installed, the need for an individual to stand in the hole and hold the auxiliary valve box in place during the backfilling operation is totally eliminated. Upon completion, the final results not only look better, but insure the proper alignment of the valve box for trouble-free key insertion and operation.

parts. We stock everything from the seat to the operating nut, and all parts in between, including stems.

Reduces Hazardous Situations

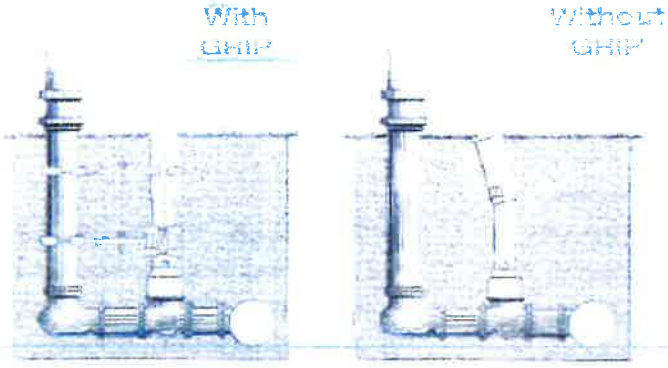
Using conventional installation methods, the individual standing in the evacuated area is subject to a variety of injuries from slipping, backfill materials or collapsing of the walls. After the GRIP is correctly installed, the individual can safely stand aboveground and supervise the backfill operation.

Insures Proper Operation

Even the most careful installations cannot insure or guarantee a perfect operation every time. But with the GRIP, you can greatly reduce the odds of valve key misalignment problems due to improper installation or ground shifting.

Simple Installation

minimal components, the GRIP can be installed quickly and easily, without the use of any tools. Just position either of the GRIPS around the hydrant and valve box and hand tighten the wingnuts on the threaded rods. That's it for a permanent, reliable fit.



# Attachment E

TYLER UNION®
Quality Waterworks Products

**30U – Non- Domestic**
**Standard Duty Valve and Service Boxes and Components**
**Revised 11/2016**

# SUBMITTAL:

(Current revisions for the noted Standards apply)

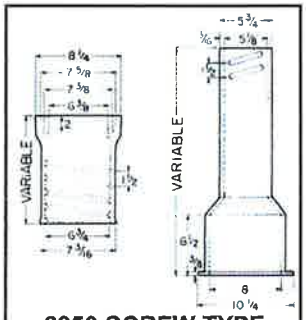
**SIZES:** Adjustable Slip and Screw type with standard assembly lengths ranging from 19" to 72" (Lengths noted do not include the addition of risers, extensions, and/or bases). See the catalog or List Price guide for accessories, lids, bases, risers, meter covers, etc.

**STANDARDS:** Produced with Class 35 cast iron in accordance with and meeting all applicable terms and provisions of ASTM A48. All Tyler Union valve boxes when properly installed are suitable for use in conjunction with projects utilizing American Association of State Highway and Transportation Officials (AASHTO) standards and provisions.

**INSTALLATION:** Per AWWA M44, Manual of Water Supply Practices

**COATING:** The asphaltic bituminous coating is applied to a minimum thickness of 1.5 mil and the coating once dry is neither brittle when cold or sticky when exposed to the sun

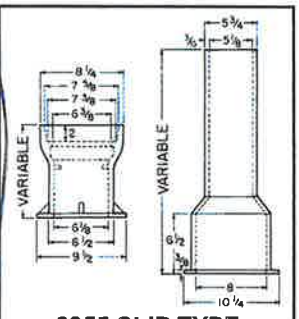
**For 4" - 12" Valves**
**5-1/4" Shaft, Screw Type**




**6850 SCREW TYPE VALVE BOX**
**Cast Iron - 2 piece**

| Components | Extension Height |
|---|---|
| 10T + 15B | 19-22 |
| 10T + 24B | 27-32 |
| 16T + 24B | 27-37 |
| 16T + 30B | 33-43 |
| 16T + 36B | 39-50 |
| 26T + 30B | 36-52 |
| 26T + 36B | 39-60 |
| 26T + 24B + #60 Ext | 53-71 |
| 26T + 36B + #60 Ext | 64-82 |

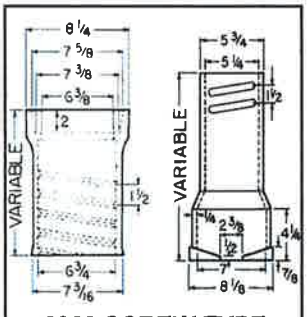
**For 4" - 12" Valves**
**5-1/4" Shaft, Slip Type**




**6855 SLIP TYPE VALVE BOX**
**Cast Iron - 2 piece**

| Components | Extension Height |
|---|---|
| 10T + 15B | 19-22 |
| 10T + 24B | 27-32 |
| 16T + 24B | 27-37 |
| 16T + 30B | 33-43 |
| 16T + 36B | 39-50 |
| 26T + 30B | 36-52 |
| 26T + 36B | 39-60 |
| 26T + 24B + #60 Ext | 53-71 |
| 26T + 36B + #60 Ext | 64-82 |

**For 3" - 20" Valves**
**5-1/4" Shaft, Screw Type**




**6860 SCREW TYPE VALVE BOX**
**Cast Iron - 3 piece**

| Components | Extension Height |
|---|---|
| 10T + 12B | 27-37 |
| 10T + 18B | 33-42 |
| 16T + 24B | 39-49 |
| 16T + 30B | 45-54 |
| 16T + 36B | 51-60 |
| 26T + 30B | 45-66 |
| 26T + 36B | 51-72 |
| 16T + 24B + #60 Ext | 63-72 |
| 26T + 24B + #60 Ext | 63-84 |
| 26T + 36B + #60 Ext | 74-94 |

**NOTE:** Base Required, Order Separately

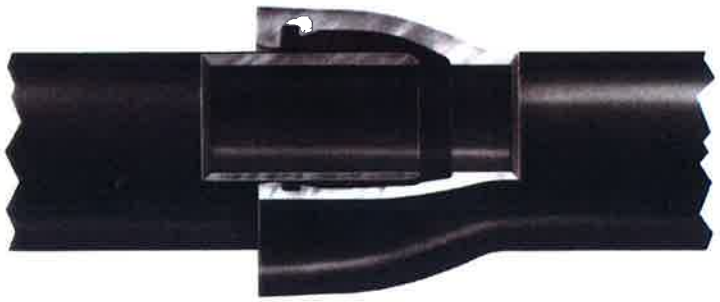
**T = Top B = Bottom Ext = Extension**


**Anniston:** 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601
**Corona:** 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471
**Tyler:** 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478
**Dallas:** 1201 Ave. S. Suite100 • Grande Prairie, TX 75050
**Elmer:** 701 Kenyon Ave. Elmer, New Jersey 03318
**New Lenox:** 2200 West Haven• New Lenox, IL 60451
**Portland:** 15670 N. Lombard St. • Portland, OR 97203
**Oxford:** 1800 Greenbrier Dear Road •Anniston, AL 36207

# Attachment F

# AMERICAN Fastite® Joint Pipe

## For Water, Sewage or Other Liquids



AMERICAN Fastite Joint Pipe in sizes 4"-64" for water, sewage or other liquids has the proven long-life and high-strength qualities inherent in pipe produced centrifugally in accordance with AWWA C151. In addition, this significant AMERICAN development, a dependable, single gasket, push-on type joint meeting the requirements of AWWA C111, affords the customer lower joint cost and time-saving advantages in installation. It provides exceptional strength and flexibility and has been widely accepted by engineers, contractors and utility officials since the 1950s. For added flexibility during construction, and for possible elimination of bends, a liberal 5° allowable deflection is standard in all sizes through 30", offering 21" offset in a 20' length of pipe. Liberal deflection can also be provided in larger diameter pipe with standard and Special Fastite Deflection Bells.

The patented AMERICAN Fastite Joint embodies many advanced design features and is rated for a water working pressure of 350 psi. For specific conditions, ductile iron piping with this joint has been approved for much higher pressure conditions. The socket, which is scientifically designed with two gasket recesses and a dividing buttress, is manufactured to close tolerances so that the gasket is self-centered, securely confined, and firmly compressed for a permanent, tight, trouble-free joint. The Fastite joint seal, bubble-tight under vacuum and external pressure, becomes even tighter with the application of internal pressure due to a specially designed wedging surface in the socket.

### Fastite Joint Assembly

The bell opening is slightly tapered to provide easy entry of the pipe end; the flared socket design permits liberal joint deflection. The plain end of the pipe is tapered or rounded to facilitate entry into the bell and self-centering in the gasket. On pipe cut in the field, the plain end can be easily beveled and smoothed by the use of a portable grinding wheel or other suitable apparatus. Methods of cutting ductile iron pipe are described in Section 3.

A stripe is painted on the plain end of AMERICAN Fastite Joint Pipe to provide a visual means of checking the joint alignment and to assure proper insertion. See page 2-10 for detailed assembly instructions.

### Fastite Gasket

The Fastite Joint sealing component—a molded synthetic rubber ring gasket of two hardnesses, shaped to fit the configuration of the gasket socket—is manufactured per all requirements of ANSI/AWWA C111/A21.11 and under AMERICAN's own rigid specifications, assuring closely controlled dimensional and hardness properties. The smaller end of the gasket is of harder rubber, approximately 85 durometer hardness, which provides a strong shoulder for self-centering on the gasket buttress, a permanent seal against cold flow, and protection from deterioration. The larger end of the gasket is of softer rubber, approximately 65 durometer hardness, providing ease of assembly and positive sealing. The design assures effective sealing at low or high pressures and in straight or deflected joint alignment. It also eliminates any concerns of infiltration or root intrusion, and assures positive sealing against negative pressure, thus preventing gasket "pullout" should a vacuum be created in the line.

A taper on the inside of the gasket allows the entering pipe to locate and center on the hard section and along with a coated and

lubricated spigot reduces friction loads during subsequent assembly. The snug fit and the hard section of the gasket, in conjunction with the design of the buttress, act to restrain the gasket against dislodgment during assembly. Additional internal pressure results in increased tightness of the seal when pipe is either in straight alignment or deflected.

Gaskets made of SBR (Styrene Butadiene Rubber) are standard. For information on gaskets made of special types of rubber, for applications involving air or liquid temperatures in excess of 150°F, or for chemical, hydrocarbon or other special service applications, and for installations in contaminated soils where permeation through gaskets might be a concern, consult AMERICAN for recommendations. See Table 2-1.

**Fastite Lubricant**

AMERICAN Fastite Joint Lubricant is a non-toxic water soluble material imparting neither taste nor odor to the conveyed water and is ANSI/NSF 61 approved. The lubricant is suitable for use in hot or cold weather and will adhere to wet or dry pipe. AMERICAN Fastite Joint Pipe can be assembled when submerged, though for such installation, special AMERICAN underwater joint lubricant is recommended. See Table No. 2-5 for appropriate lubricant quantities.

**Fastite Joint Materials**

Standard joint materials include Fastite plain rubber gaskets and a sufficient supply of Fastite joint lubricant. Fastite pipes are most often readily joined with available excavating equipment; however, assembly tools can be supplied by AMERICAN on a loan basis with a nominal deposit which is refundable upon return of tools in good condition.

**Coating and Lining**

AMERICAN Fastite Joint Pipe can be furnished asphaltic coated, cement lined, or with special coating or lining where required. See Section 11.

## Fastite Gaskets

Table No. 2-1

| Common Name or Trade Name* | Chemical Name | Maximum Service Temperature** | | Common Uses |
|---|---|---|---|---|
| | | Water & Sewer | Air | |
| Plain Rubber | Styrene Butadiene Copolymer(SBR) | 150°F | 150°F | Fresh Water, Salt Water, Sanitary Sewage |
| Plain Rubber (conductive) | Styrene Butadiene Copolymer(SBR) | 150°F | 150°F | Electrical continuity for thawing of Service Water and Sewage |
| EPDM | Ethylene Propylene Diene Monomer | 212°F | 200°F | Water, Sewage, Ketones, Dilute Acids and Alkalies, Vegetable Oil, Alcohols, Air |
| Neoprene | Polychloroprene(CR) | 200°F | 180°F | Fresh Water, Sewage |
| Nitrile Buna–N | Acrylonitrile Butadiene(NBR) | 150°F | 150°F | Non–Aromatic Hydrocarbons, Petroleum Oil, Hydraulic Fluids, Fuel Oil, Fats, Oil, Grease† |
| Fluoroelastomer Fluorel Viton®*** | FKM | 212°F | 300°F | Aromatic Hydrocarbons, Gasoline, Refined Petroleum Products, most Chemicals and Solvents, High Temp., Air (Least permeable of all available Fastite gasket rubbers) |

*AMERICAN reserves the right to furnish any Trade or Brand rubber for the chemical formulation specified.
**Temperature is in reference to conveyed fluid. **Lubricating oil in air can adversely affect SBR and EPDM performance. SBR, Nitrile and Neoprene are not recommended for hot air exposure in wastewater treatment systems.**
***Viton® is a registered trademark of DuPont Dow Elastomers.
Refer to Section 11 for temperature and service capabilities of pipe linings.
Refer higher temperatures or other special requirements to AMERICAN for recommendations regarding suitable gasket material.
†This gasket rubber is chemically resistant in the non-potable water uses shown but is not as resistant to permeation in potable water applications as FKM.
All Fastite gaskets made from the materials in the above table are suitable for use with water containing normal concentrations of chloramine. Where increased resistance to chloramine is desired, neoprene or fluoroelastomer materials should be considered.

# AMERICAN Fastite® Joint for Ductile Iron Pipe

## ANSI/AWWA C111/A21.11 Standard Dimensions

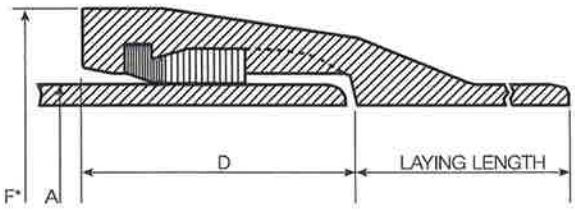



Table No. 2-2

| Size in. | Nominal Laying Length ft. | Dimensions in Inches | | |
|---|---|---|---|---|
| | | A Outside Diameter | D Depth of Socket | F* Bell O.D. |
| 4 | 20 | 4.80 | 3.31 | 6.40 |
| 6 | 20 | 6.90 | 3.38 | 8.60 |
| 8 | 20 | 9.05 | 3.75 | 10.96 |
| 10 | 20 | 11.10 | 3.75 | 13.12 |
| 12 | 20 | 13.20 | 3.75 | 15.22 |
| 14 | 20 | 15.30 | 5.23 | 17.61 |
| 16 | 20 | 17.40 | 5.23 | 19.74 |
| 18 | 20 | 19.50 | 5.50 | 22.16 |
| 20 | 20 | 21.60 | 5.50 | 24.28 |
| 24 | 20 | 25.80 | 5.50 | 28.50 |
| 30 | 20 | 32.00 | 6.50 | 34.95 |
| 36 | 20 | 38.30 | 6.50 | 41.37 |
| 42 | 20 | 44.50 | 7.50 | 48.27 |
| 48 | 20 | 50.80 | 8.00 | 54.71 |
| 54 | 20 | 57.56 | 8.50 | 61.65 |
| 60 | 20 | 61.61 | 8.75 | 65.80 |
| 64 | 20 | 65.67 | 9.00 | 70.04 |

*Dimensions subject to change at our option. Check AMERICAN if exact dimensions required.
See Section 3 for additional information on ductile iron pipe.
See Sections 4 and 7 for information on Fastite fittings.

# AMERICAN Fastite® Joint Pipe

## Allowable Joint Deflection

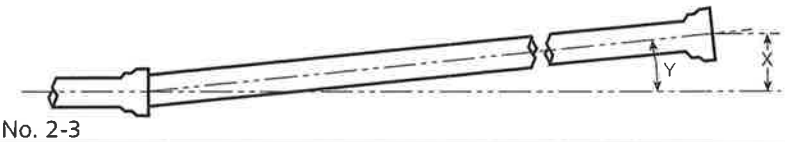



Table No. 2-3

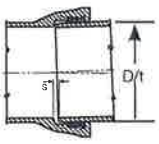
| Size in. | Nominal Laying Length ft. | Maximum Recommended Deflection† | | | | | |
|---|---|---|---|---|---|---|---|
| | | Standard Bell | | | Special Deflection Bell | | |
| | | X Offset per Nominal Length in. | Y Deflection Angle | Radius of Curve* ft. | X Offset per Nominal Length in. | Y Deflection Angle | Radius of Curve* ft. |
| 4 | 20 | 21 | 5° | 230 | – | – | – |
| 6 | 20 | 21 | 5° | 230 | – | – | – |
| 8 | 20 | 21 | 5° | 230 | – | – | – |
| 10 | 20 | 21 | 5° | 230 | – | – | – |
| 12 | 20 | 21 | 5° | 230 | – | – | – |
| 14 | 20 | 21 | 5° | 230 | – | – | – |
| 16 | 20 | 21 | 5° | 230 | – | – | – |
| 18 | 20 | 21 | 5° | 230 | – | – | – |
| 20 | 20 | 21 | 5° | 230 | – | – | – |
| 24 | 20 | 21 | 5° | 230 | – | – | – |
| 30 | 20 | 21 | 5° | 230 | – | – | – |
| 36 | 20 | 17 | 4° | 285 | 21 | 5° | 230 |
| 42 | 20 | 12 | 3° | 380 | 21 | 5° | 230 |
| 48 | 20 | 12 | 3° | 380 | 17 | 4° | 285 |
| 54 | 20 | 12 | 3° | 380 | 17 | 4° | 285 |
| 60 | 20 | 12 | 3° | 380 | 17 | 4° | 285 |
| 64 | 20 | 12 | 3° | 380 | 17 | 4° | 285 |

*Approximate radius of curve produced by a succession of nominal lengths of pipe fully deflected.
†Special Deflection Bells must be specifically ordered and will be marked with white bell face for easy identification. For easiest assembly, the joints should be assembled with the pipe in reasonably straight alignment. After joint assembly, the pipe may be deflected up to the maximum shown above. Offset distances are based on 20-ft lengths.

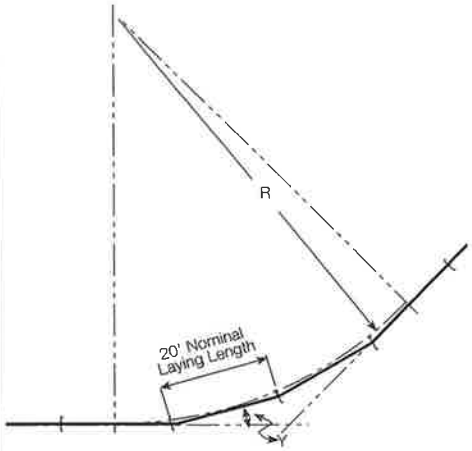
## Maximum Allowable Separation

Table No. 2-4

| Size in. | S Separation in. |
|---|---|
| 4 | 3/8 |
| 6 | 9/16 |
| 8 | 3/4 |
| 10 | 15/16 |
| 12 | 1 1/8 |
| 14 | 1 5/16 |
| 16 | 1 1/2 |
| 18 | 1 5/8 |
| 20 | 1 7/8 |
| 24 | 2 1/4 |
| 30 | 2 3/4 |
| 36 | 2 5/8 |
| 42 | 2 1/4 |
| 48 | 2 1/2 |
| 54 | 2 7/8 |
| 60 | 3 1/8 |
| 64 | 3 3/8 |




Maximum Allowable Separation, "S", in Standard Bell pipe is approximately equal to the median pipe diameter in inches times the sine of the deflection angle. This is provided for information only and should not be used to determine precise joint deflection.




R = Radius of Curve (ft.)

Y = Deflection Angle (degrees)

$$\text{Radius of Curve} = \frac{\text{Nominal Laying Length}}{2 \times \text{Tangent } (Y \div 2)}$$

## AMERICAN Fastite® Joint Pipe Assembly Instructions

The AMERICAN Fastite Joint is a push-on type joint meeting all the rigorous requirements of AWWA C111. The ANSI/AWWA C600 Standard covers in detail the installation of ductile iron water mains, including assembly instructions for push-on joint pipe.

Field-cutting of AMERICAN Ductile Iron Pipe can be easily performed, thus eliminating the necessity for factory-made special lengths of Fastite pipe. The plain end of Fastite pipe cut in the field requires little or no preparation for assembly into the socket of a mechanical joint fitting. Where a cut pipe is to be assembled into a Fastite socket, the required beveling or rounding of the plain end can be easily accomplished by the use of a portable grinding wheel or other suitable apparatus. Methods of cutting ductile iron pipe are described in Section 3.

The AMERICAN Fastite Joint requires only one joint component, the rubber gasket*, which when properly installed, fits snugly in the gasket recess in the bell socket. A special lubricant supplied with the pipe is applied to the plain end and the inside surface of the gasket before assembly. The pipe end is tapered or rounded to provide self-centering of the plain end in the gasket and ease of assembly. A circumferential stripe on the plain end provides a visual indication for checking the proper insertion of the joint. The stripe, shown in the photographs illustrating assembly methods, passes fully into the bell when the plain end is fully inserted into the socket with the two lengths of pipe in straight alignment. Joints can then be safely deflected up to the extent shown in Table No. 2-3. In deflected joints, the stripe will typically be visible to some extent after assembly.

Easier assembly is effected if the pipe is suspended an inch or so off the bottom of the trench during the jointing operation.

The following instructions should be followed in order to properly assemble the joints and to fully realize the maximum speed and ease of assembly of the Fastite Joint:

1. Clean socket and plain end thoroughly, **removing** mud, gravel, or **any** other **matter that might cause the front of the gasket to protrude into the path of the entering spigot.**

2. Insert gasket fully into the gasket recess of the socket, large end of the gasket entering first. Gasket may be installed with one or two V-shaped folds as shown (Photo 1). After the gasket is in place at the bottom, the top of the gasket is positioned fully into the gasket recess. Gaskets and lubricant to be installed in very cold weather should be warmed first (as by storage in a heated equipment cab or pick-up, etc.) for optimum assembly.

3. Apply a thin film of regular AMERICAN Fastite Joint Lubricant to the rounded or tapered spigot end of the pipe, the immediate outside pipe surface between the stripe and the nose of the pipe (Photo 2), and also to the inside surface of the gasket. **Special AMERICAN Fastite Joint Lubricant intended specifically for underwater or very wet installations can be supplied when requested.**

**Photo 1**

**Photo 2**

*Gaskets not used immediately should be stored in a cool location, out of direct sunlight.

**Caution:** If a spigot end contacts the ground or trench side after lubrication, any adhering dirt or rocks should be cleaned off and the area re-lubricated prior to assembly.

4. Insert the plain end in the socket. For optimum assembly it is preferable that the entering pipe be in reasonably straight alignment; however, the Fastite Joint may be assembled if necessary with the pipe deflected within its rated deflection. (Exception: If Fast-Grip gaskets are being used, straight alignment must be maintained.) Push the plain end into the socket using any of the applicable assembly methods described hereinafter. If the joint cannot be assembled with a moderate force, remove the pipe and check for the cause of the difficulty, such as improper positioning of gasket, insufficient or wrong type lubricant, dirt under or behind the gasket, dirt adhering to the pipe, or any other cause which would result in obstruction or increased friction between pipe end and gasket surface. **For assurance of proper assembly, a thin automotive, blade-type feeler gauge can also be used if desired for quick and easy probe confirmation of correctly installed axial gasket position around the joint.**

5. "Backwards" installation. AMERICAN does not recommend "backward laying" (bells assembled over spigots, rather than spigots inserted into bells as pictured in this literature) of large-diameter ductile iron pipe in buried installations. AMERICAN can furnish bell and plain end fittings to minimize the need for backward pipe laying. Other devices such as sleeves and couplings may also be employed for this reason. However, if this condition cannot be avoided, we strongly recommend that installers contact AMERICAN for instructions on how to reduce the potential for problems that could occur when assembling pipe in this manner.

## AMERICAN Pipe Assembly Mechanisms

In general, Fastite joints or other Fastite gasketed pipes may be readily pushed or pulled together without the need for complicated tools or substantial manpower. This is most often accomplished with the procedures discussed on page 2-14. In general, the joints of AMERICAN push-on pipes are purposefully "tight," and most joints require an assembly force of about 100 to 200 pounds or more of assembly force per inch of pipe diameter (i.e. a 12" joint might require about 12 x 100 or 1,200 pounds of assembly force).

In pulling operations, simply wrap a sound wire rope choker cable or nylon sling around the barrel of the entering pipe. Secure the thimble eye or other end loop of the choker to a suitably anchored pulling device (e.g. backhoe, come-along, etc.). Use the mechanism to pull the cable taut in the assembly direction (Photo 3). Continue pulling the cable in a smooth, continuous motion until the joint is in the fully assembled position. If desired for special conditions, AMERICAN can furnish suitable, simple come-alongs and choker cables for manpower assembly of

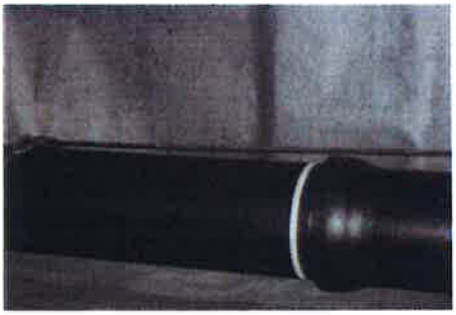


**Photo 3**

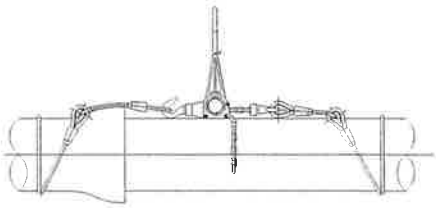


**Figure 1**

most **4"-24"** pipes (See Figure 1 and specify pipe sizes involved).

The joints may normally be disassembled in a similar manner, reversing the direction of the pull with the choker cable (Photo 4). It is also sometimes helpful to use rebating or wiggling deflection to aid in the disassembly of push-on joint pipes, particularly when pipes have been installed for some time prior to removal.

**30"-64" Pipe**

**Photo 4**

Large pipes are most often readily pushed or pulled together with heavy excavating/earthmoving equipment available on-site (see page 2-14). In cases where assembly of pipes by manpower is desired, AMERICAN can provide special assembly tools and rigging which can be used for assembling most pipes of all sizes (Photo 5). These tools consist of a heavy-duty roller chain hoist, a steel pipe-end hook and snatch block, and associated wire rope and chain tackle (Photo 5) to attach all the rigging together to effect "double line" assembly from the top of the pipe (Photo 6). The snatch block pulley and twin line rigging approximately doubles the assembly force from the strong come-along, making possible the assembly of up to 64" full-length pipe joints from the top of the pipe (Photo 7).

**Photo 5**

**Photo 6**

**Photo 7**

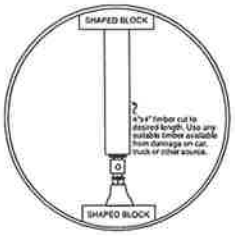
**Fittings and Short Pipes**

Push-on fitting or short pipe joint assembly is basically the same as that of standard length pipe, though special rigging may be necessary to hold these short items reasonably stable for assembly. See also Push-On Fittings Assembly Instructions in Section 4.

**Field Rounding**

Occasionally, field rounding of pipe ends may be necessary to accomplish assembly, particularly when large-diameter pipes are cut to be assembled into mechanical joints or couplings. Need for rounding in assembly of mechanical or stuffing-box-type joints can be predetermined by a difficulty in sliding the gland or end ring over the end of the pipe. Rounding may be accomplished in the following manner using a mechanical jack and shaped blocks. (Note: This procedure may also be used with the assemblies involving push-on joint pipe, fittings, valves, etc.; however, rounding is less frequently necessary for assembly of push-on joints.)

1. Measure/determine the minimum (minor) diameter of the ends to be rounded.
2. Place the jack and the shaped blocks in line with the minor diameter as shown in the attached sketch using a sound 4"x4" spacer timber cut square to the required length to take up the space.
3. Apply a load carefully with the jack only until the "minimum diameter," or until the gland will easily slip over the end. No more jacking should be attempted or necessary - **DO NOT ATTEMPT TO PERMANENTLY ROUND END.**
4. When no mechanical joint restraint device is used, carefully relax and remove the jack and timbers from the pipe after joint assembly.
5. When using a mechanical joint restraint device not manufactured by AMERICAN, contact the applicable manufacturer of the restraint device regarding installation guidelines.




Note: Field rounding operations should be conducted without backfill on any part of large-diameter pipes and prior to encasing any part of pipe in concrete. If the inside of the pipe cannot be accessed to remove jacking materials, pipe ends can alternatively be rounded using external clamping means.

## AMERICAN Fastite® Joint Lubricant Requirement by Size of Pipe

**64" AMERICAN Fastite Joint pipe being installed in a wastewater application.**

Table No. 2-5

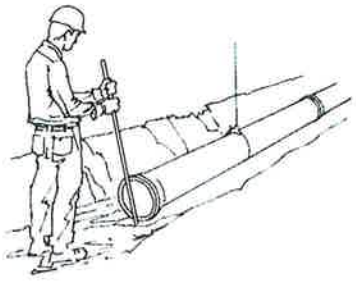
| Pipe Size in. | Approx. Pounds of Lubricant per Joint | Approx. No. of Joints per Pound of Lubricant |
|---|---|---|
| 4 | .03 | 33 |
| 6 | .045 | 22 |
| 8 | .06 | 17 |
| 10 | .07 | 14 |
| 12 | .08 | 12 |
| 14 | .09 | 11 |
| 16 | .11 | 9 |
| 18 | .12 | 8 |
| 20 | .14 | 7 |
| 24 | .17 | 6 |
| 30 | .30 | 3 |
| 36 | .36 | 3 |
| 42 | .44 | 2 |
| 48 | .50 | 2 |
| 54 | .59 | 2 |
| 60 | .66 | 1 |
| 64 | .71 | 1 |

# AMERICAN Fastite® Joint
## Common Assembly Methods

In seeking ways to take even greater advantage of the cost-reducing features of the Fastite Joint, utility contractors have developed other methods of assembling this joint without special tools. The following methods are described for the information of the user, who may elect to use them at his discretion, keeping in mind that these methods may not be effective for all installations and under all field conditions.

### Spade or Crowbar Method

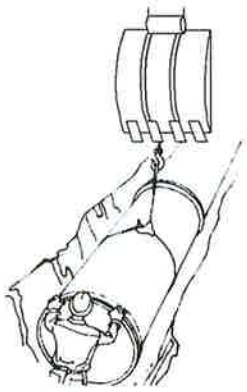
This is applicable to the smaller sizes of AMERICAN Fastite Joint Pipe, and consists of centering the lubricated end of the entering pipe in the gasket and then pushing against the bell face of the entering pipe with a spade or crowbar driven into the ground in front of the bell face. This method requires the trench bottom to be fairly firm soil. The method may not be effective in a rocky trench or with a trench that is soft, muddy or sandy. A wooden block between the bell face and the pry bar may increase the leverage. Easier assembly is effected if the pipe is suspended an inch or so off the bottom of the trench.



**Spade or Crowbar Method**

### Backhoe and Heavy Equipment Methods

These methods are usually applicable to the intermediate and larger sizes of AMERICAN Fastite Joint Pipe where the bar method might not be effective. It consists of centering the end of the entering pipe in the gasket as the pipe to be assembled is suspended from the backhoe. Then it can be pulled into the adjoining socket with the pipe sling by moving the backhoe arm toward the previously assembled pipe. In other instances, the pipe may be assembled by placing the backhoe or other earth mover bucket or blade against the bell face of the entering pipe and pushing it into the socket. When pushing against the bell face, care should be taken to avoid very small contact areas and possible damage to the pipe bells or spigots. Wood cushions between the backhoe bucket and the pipe are particularly effective in preventing damage.



**Backhoe and Heavy Equipment Methods**