

BEEHOOGHAN (AZ-12-176 KAIBETO) NHA HOUSING EMERGENCY WATER
LINE INTERTIE NHA WATERLINE SYSTEM TO NTUA 4" WATERLINE AT
BEEHOOGHAN NHA HOUSING



Tab 1

IN THIS SECTION:

- WATER PRESSURE TEST
CERTIFICATION
- TEST RESULTS
- BACTI TEST
- BACTI TEST II

PRESSURE TEST DATA SHEET

Date: 12-24-19

Page ____ of ____

Gage's Manufacturer Name and Model Number (2 required): 1. RVS 0-300 PSI

2. RVS 0-300 PSI

Conducted by: Jeremiah Notchman 6184
(contractor/NECA representative)

Observed by: [Signature] TCNTUA
(NTUA/IHS representative)

Test Section Line Designation (Sta. to Sta.)	Pipe Pressure Rating (psi)	Test Pressure at Pump (psi)	Gage Response Check (✓)	Observed Test Pressure Range at Pump (psi)	Total Leakage (gallons/2 hr)	Allowable Leakage (gallons/2 hr)
NHA inter tie site.	160 PSI	160 PSI	✓	160 PSI Start: 10:00 AM Finish: 12:00 PM PASSED!	0	0.04

Highest Point in Elevation = _____ Lowest Point in Elevation = _____ Test Pump Elevation = _____

Description of Test Pump Location EOL injection point.

Differential in Elevation from Highest Point to Lowest Point = _____ feet x 0.433 = _____ psi

Differential in Elevation from Pump Location to Lowest Point = _____ feet x 0.433 = _____ psi (A)

Test Pressure at Pump = 160 psi - _____ psi = _____ psi
(pipe press rating) (A) (test press at pump)

$$Q = (N \cdot D \cdot P^{3/2}) + 7400$$

Where:
Q = Allowable leakage
N = Number of Joints of Pipes Being Tested
D = Nominal Pipe Diameter in Inches
P = Pipe Pressure Rating

For 6" inch (PVC/PE/DI) $Q = [(2) \cdot (6) \cdot (160)] + 7400 =$ _____ gal/hr

For _____ inch (PVC/PE/DI) $Q = [(2) \cdot (6) \cdot (12.64)] + 7400 =$ 0.02 gal/hr

For _____ inch (PVC/PE/DI) $Q = [() \cdot () \cdot ()] + 7400 =$ _____ gal/hr

SUM TOTAL = _____ gal/hr

TOTAL ALLOWABLE LEAKAGE FOR TEST SECTION = SUM TOTAL X 2 = 0.04 gal/2 hrs



Backflow Prevention Device Test and Maintenance Form

Facility Information	Protection Information
Facility Name: <u>Kaibeto NHA</u>	Manufacturer: <u>WILKINS</u>
Address: _____	Size: <u>4"</u>
City: <u>Kaibeto</u> St: <u>AZ</u> Zip: _____	Model: <u>375</u>
Phone: _____	Serial Number: <u>L125843</u>

Test Information		
Test Date: <u>12/31/2019</u>	Tester: <u>Timothy Toledo</u>	Test Kit SN: <u>11082299</u>

	Reduced Pressure Assembly			PVB / SVB	AVB
	Double Check Assembly		Relief Valve		
	Check Valve #1	Check Valve #2			
Initial Test	Held At (psid) <u>10.6</u> Closed Tight <input checked="" type="checkbox"/> Leaked <input type="checkbox"/>	Held At (psid) <u>4.6</u> Closed Tight <input checked="" type="checkbox"/> Leaked <input type="checkbox"/>	Opened At <u>3.0</u> Did Not Open <input type="checkbox"/> Buffer (CV#1-RV) _____	Air Inlet Opened At _____ Did Not Open <input type="checkbox"/> Check Valve Held At _____ Leaked <input type="checkbox"/>	Air Inlet Closes when water flows Opens when no water flows <input type="checkbox"/> Height above outlets (in.) _____ Physical Condition: _____
Repair	Cleaned <input type="checkbox"/> Replaced <input type="checkbox"/>	Cleaned <input type="checkbox"/> Replaced <input type="checkbox"/>	Cleaned <input type="checkbox"/> Replaced <input type="checkbox"/>	Cleaned <input type="checkbox"/> Replaced <input type="checkbox"/>	
Give Detail Here					
Final Test	Held At (psid) <u>10.6</u> Closed Tight <input checked="" type="checkbox"/>	Held At (psid) <u>4.6</u> Closed Tight <input checked="" type="checkbox"/>	Opened At <u>3.0</u> Buffer (CV#1-RV) <u>7.6</u>	Air Inlet Opened At _____ Check Valve Held At _____	Air Gap Pass <input type="checkbox"/> Fail <input type="checkbox"/>

Comments: APP Reading - 8.6 PSI - 38 (NECA open 4" incoming Gate valve to pressurize Assembly. The Assembly kept discharging Ice due to very low freezing Temp. Waited until all Ice discharge and the discharge valve was able to close. Now it was able to test Assembly.

Test Result Passed

Tester Information	
Tester Name: <u>Timothy Toledo</u>	Certification No: <u>3-2592</u>
Phone: <u>(928) 729-5721</u>	Signature: <u>Timothy Toledo</u>
I certify that all information on this test is true and correct	

NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY



P.O. BOX 969

SHIPROCK, NEW MEXICO 87420

PHONE: (505) 368-5151

TO: Navajo Tribal Utility Authority

POST OFFICE BOX 170

Fort Defiance, Arizona 86504-0170

LETTER OF TRANSMITTAL

DATE 26 DEC 2019

JOB NO. RWO 4485749

ATTENTION: RONALD BEGAY

RE:

EMERGENCY WATERLINE INTER-TIE AT

BEEHOOGHAN NHA HOUSING; KAIBETO, AZ

NECA PROJ. NO. 819141 - KAIBETO INTER-TIE

GENTLEMEN:

WE ARE SENDING YOU

☒ ATTACHED ☐ UNDER

Separate cover via _____ THE FOLLOWING ITEMS:

☐ SHOP DRAWINGS

☐ PRINTS

☐ PLANS

☐ SAMPLES

☐ SPECIFICATIONS

☐ COPY OF LETTER

☐ CHANGE ORDER

☒ OTHER - DRINKING WATER ANALYSIS REPORT

COPIES	DATE	NO.	DESCRIPTION
1	08-14-2019		

THESE ARE TRANSMITTED As checked below:

☐ FOR APPROVAL

☐ APPROVED AS SUBMITTED

☐ RESUBMIT _____ COPIES FOR APPROVAL

☒ FOR YOUR USE

☐ APPROVED AS NOTED

☐ SUBMIT _____ COPIES FOR DISTRIBUTION

☒ AS REQUESTED

☐ RETURNED FOR CORRECTIONS

☐ RESUBMIT _____ CORRECTED PRINTS

☐ FOR REVIEW AND COMMENT

☐ FOR YOUR SIGNATURE _____

Remarks:

Bacti Sample Testing Report.

PLEASE SIGN, DATE, AND RETURN THE YELLOW COPY.

RECEIVED BY: _____

DATE: _____

COPY TO: NTUA (RB, AT, DS, DS, JD, EH)

NECA (PM, GL, WB, BG, FS, JJ, AB)

SIGNED: _____

REVIEWED

By Ammerson Barber at 8:34 am, Dec 26, 2019

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE

**Arizona Department of Environmental Quality
Revised Total Coliform Rule Distribution System Monitoring
Drinking Water Microbiological Analysis Report**

PWS ID Number:	PWS Name: <u>KAIBETO NHA INTERTIE</u>
Sample Date: <u>12-23-19</u>	Owner / Contact Person: <u>GENE LAUGHLEN</u>
Sample Time (24-hr. clock): <u>10:40 AM</u>	Phone Number: <u>(505) 879-5285</u>
	Email Address: <u>GENE@NAVAJO.NET</u>

☐ Special Purpose Sample for state information only (NOT FOR COMPLIANCE)

Repeat Samples Only – Check One
Use if Initial Sample was Positive

Lab Specimen ID # of Initial Sample

- ☐ Original Location (Distribution System)
☐ Upstream Location (Distribution System)
☐ Downstream Location (Distribution System)
☐ Dual Purpose Sample Taken at Well
 (raw water) Must have regulatory agency approval

Well 55- _____ Cl₂ _____ mg/L (Not for MRDL reporting)

Location ID:

Ex. RTCR001

Sampling Site/ Tap Location:

KAIBETO NHA INTERTIE
KAIBETO AZ.
 Ex. 1234 Main St. tap

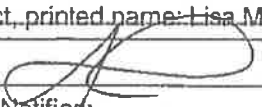
Microbiological Analysis (To be filled out by lab personnel)

Lab Specimen ID	3100 Total Coliform		3014 E. coli		Analysis Start		Analysis Complete	
	Method	Result	Method	Result	Date	Time	Date	Time
<u>19-1709</u>	<u>9223B</u>	<u>A</u>	<u>9223B</u>		<u>12/23/19</u>	<u>1400</u>	<u>12/24/19</u>	<u>1111</u>

If reporting for Ground Water Rule, Dual Purpose (raw water sample), must use method that provides E. coli as a result, and specify is E. Coli if detected.

In the case of any E. coli detect, contact your RTCR ADEQ contact by the end of the business day (5pm)

Laboratory Information (To be filled out by lab personnel)

Lab Name: <u>Nortest Analytical</u>	Lab Certified ID Number: <u>AZ0420</u>
Lab Contact, printed name: <u>Lisa Macario</u>	Lab Phone Number: <u>928-774-2312</u>
Signature: 	
Date PWS Notified: _____	PWS Person Notified: _____
Any positive routine or increased routine RTCR sample triggers the GWR and requires ADEQ notification.	
Date ADEQ Notified: _____	ADEQ Person Notified: _____

Comments:

C18

Please mail completed form to:
 Arizona Department of Environmental Quality
 Water Quality Data Unit, 5415B-1
 1110 West Washington Street
 Phoenix, AZ 85007

OR Email to: WQD_Compliance_Data@azdeq.gov

Revised Total Coliform Rule Questions:

Call (800) 234-5677, ext. 771-9200
 within AZ (602) 771-9200
<http://www.azdeq.gov/environ/water/dw/rtcr.html>

Please do not submit multiple times.

Relinquished By: L. Lli Date/Time: 12/23/19 14:04 PM

Received By: 1404 Date/Time: 12/23/19

Temperature 1.2 °C

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BEEHOOGHAN (AZ-12-176 KAIBETO) NHA HOUSING EMERGENCY
WATER LINE INTERTIE NHA WATERLINE SYSTEM TO NTUA 4"
WATERLINE AT BEEHOOGHAN NHA HOUSING



Tab 2

IN THIS SECTION:

- WASTEWATER MAIN CERTIFICATION
- MANHOLE TEST CERTIFICATION
- TEST RESULTS NTUA APPROVED

WASTEWATER MAIN CERTIFICATION

NOT APPLICABLE

MANHOLE TEST CERTIFICATION

NOT APPLICABLE

TEST RESULTS NTUA APPROVED

NOT APPLICABLE

BEEHOOGHAN (AZ-12-176 KAIBETO) NHA HOUSING EMERGENCY WATER
LINE INTERTIE NHA WATERLINE SYSTEM TO NTUA 4" WATERLINE AT
BEEHOOGHAN NHA HOUSING



Tab 3

IN THIS SECTION:

- EXECUTED TRANSFER AGREEMENT
- COST OF PLANT

AS-BUILT NOTEBOOK



**UTILITY TRANSFER AGREEMENT
WATER AND WASTEWATER FACILITIES**

This agreement is made between _____, hereinafter called the Grantor and the **NAVAJO TRIBAL UTILITY AUTHORITY**, hereinafter called the Grantee.

WHEREAS, the Grantor has constructed or caused to have constructed water and wastewater facilities located at or near _____ as shown on the plans titled _____, designed by _____, and dated _____ and said facilities and related final as-built plans already have been inspected, accepted and approved by the Grantee, and;

WHEREAS, the Grantor wishes to convey to the Grantee all his interest in these facilities and appurtenances constructed at the above-mentioned location on or about the above-mentioned time, along with all rights, rights of way, and privileges so that the Grantee may own, operate, and maintain all such facilities and appurtenances.

NOW THEREFORE IT IS AGREED:

For consideration of \$1.00 the receipt of which already has been acknowledged, the Grantor transfers, assigns, grants, and conveys to the Grantee all rights, titles, interests, easements, and rights of way in the aforementioned facilities, and;

The Grantee agrees to accept such aforementioned facilities, and further agrees to own, operate, and maintain such facilities in a reasonable and prudent manner until such facilities are determined to be no longer of any value.

Further, the Grantor hereby warranties all such facilities against defects in workmanship and materials, and for design deficiencies, errors and omissions for the period of one year beginning on _____ and ending on _____.

A listing of the total inventory and Cost of Plant determined by the Grantor to be transferred to the Grantee is attached as EXHIBIT _____ and made a part of this Utility Transfer Agreement. The total Cost of Plant as appears on this document is \$ _____.

IN WITNESS THEREOF, both parties have signed and dated this agreement.

Grantor:

Signature

Date:

Print Name/Title

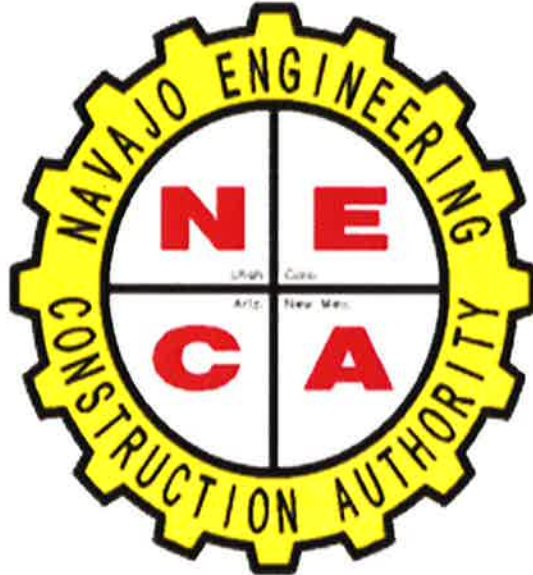
Navajo Tribal Utility Authority:

Signature

Date

Print Name/Title

BEEHOOGHAN (AZ-12-176 KAIBETO) NHA HOUSING EMERGENCY
WATER LINE INTERTIE NHA WATERLINE SYSTEM TO NTUA 4"
WATERLINE AT BEEHOOGHAN NHA HOUSING



IN THIS SECTION:

- WATER METER SERIAL
NUMBER LISTING
- CURRENT WATER METER
READINGS

Tab 4

WATER METER SERIAL NUMBER LISTING
CURRENT METER READINGS
Kaibeto, Coconino County, Arizona
Beehooghan (AZ-12-176-Kaibeto) NHA Housing Emergency Waterline Inter-Tie
NTUA PO No. 4500078174
RWO 4485749

Water Meter Serial Number 16040435

Current Meter Reading 0

Water Meter Serial Number

Current Meter Reading

Meter Reading Taken By Jimmy Dugan

Agency T/C NTUA

Date: 02/27/2020

BEEHOOGHAN (AZ-12-176 KAIBETO) NHA HOUSING EMERGENCY WATER
LINE INTERTIE NHA WATERLINE SYSTEM TO NTUA 4" WATERLINE AT
BEEHOOGHAN NHA HOUSING



IN THIS SECTION:

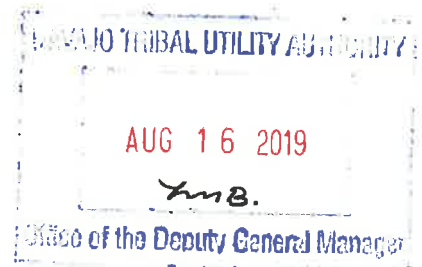
- APPROVED TAPPING PERMIT

Tab 5

NAVAJO TRIBAL UTILITY AUTHORITY

PERMISSION TO TAP

WATER & WASTEWATER FACILITIES



District: Tuba City

Project Name: Kaibeto Inter-tie

Project Description: Intertie to NHA Housing Development for NTUA

Location: Kaibeto, Coconino County, Arizona

Residential ☐ Commercial ☒ Industrial ☐



**PERMISSION TO TAP
EXISTING N.T.U.A. WATER / WASTEWATER LINE**

This packet is for submitting Permission to Tap an existing NTUA Water / Wastewater Line for new or upgraded services. **PLEASE PRINT CLEARLY.**

1. Customer/Owner

Name: Navajo Engineering & Construction Auth.	Facility Name:
Title:	Organization:
Permanent Address: 1 Uranium BLVD	Local Address: Kaibeto, Arizona
Shiprock, New Mexico 87420	
Telephone #: 505-210-7070	Local Phone #: 928-612-2032
c. Vicinity/location of Tap Beehooghan NHA Housing Kaibeto, Arizona	

2. Person/Contractor Responsible for Tap

3. Engineer Responsible for Design

Name: Patrick Martinez	Name: Adrian Showalter
Title: Superintendent	Title: Engineering Technician
Organization: Navajo Eng. & Const. Auth.	Organization: Navajo Tribal Utility Authority
Address: 1 Uranium Blvd. Shiprock, NM 87420	Address: PO Box 170
PO Box 969 Shiprock, NM 87420	Fort Defiance, Arizona 86504-0170
Telephone #: 928-612-2032	Telephone #: 928-729-2340

4. Customer/Owner Responsible for Payment to NTUA for Water/Wastewater Service(s).

Name: Navajo Engineering & Const. Auth.	Telephone #: 505-210-7070
Title:	Organization:
Address: PO Box 969 Shiprock, New Mexico 87420	
1 Uranium BLVD Shiprock, New Mexico 87420	

5. Customer Submitting Tap Request

6. Received at NTUA by:

Date: 01 AUG 2019	Name: <i>Tuba City NTUA</i>
Name: Patrick Martinez	Title: <i>W/WW Dept.</i>
Telephone #: 928-612-2032	NTUA Office: <i>Tuba City District</i>

7. Drawings, Specifications and Location Map of proposed construction attached? No (Yes / No).

8. Type of Services Requested by Customer:

☐ Residential

☒ Commercial

☐ Industrial

Length of Service: ☒ Permanent Service ☐ Temporary Service

METER SIZE :

Type of Building Served:

Number of Water Connections:

Number of Wastewater Connections:

New Water/Wastewater Facilities as part of the service connection

	On-Site	Off-Site		On-Site	Off-Site
Water main	✓		Gravity Sewer Main	✓	
Water Service Line	✓		Sewer Service Line	✓	
Well		✓	Force Main		
Chlorination		✓	Lift Station		
Storage Tank		✓	Septic Tank		
Booster Station		✓	Drain field		
Backflow Protection	✓		Lagoon	✓	



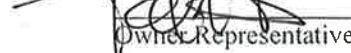
9. Water Demand and Minimum Pressures Requested by Customer

DOMESTIC FLOW	UNITS	FIRE FLOWS	FIRE SPRINKLER	FIRE HYDRANT	UNITS
Normal	GPM	Quantity			GPM
Peak	GPM	Duration			MINS.
Pressure 20 min to 75 min	PSI	Static Pressure	NA		PSI
Elevation 0.15 + 50 ft TAP - TO HIGH Hm.	FT	Residual Pressure			PSI

NTUA DOES NOT GUARANTEE FIRE PROTECTION FLOWS.

10. Customer Requested Date and Time of the actual tap construction: _____
Please schedule tap construction at least 3 days in advance with NTUA District office.

11. I agree to adhere to the Navajo Tribal Utility Authority (NTUA) requirements for the material standards, line test procedures, disinfections, water and wastewater construction methods and policies, As-built drawings, and the tariff, as they pertain to tapping the existing NTUA water and wastewater facilities for services provided by the NTUA; and the constructed utilities to be transferred to NTUA for operations and maintenance thereafter.

	Patricke Martinez	2/27/2020
Owner Signature	Print	Date
	Patricke Martinez	2/27/2020
Contractor Signature	Print	Date
	Patricke Martinez	2/27/2020
Owner Representative Signature	Print	Date

NTUA Review and Approvals

12. Is this service downstream from a previous Master Metered area? No (Yes/No).

13. Specifications and proposed construction drawings reviewed by:

NA per [Signature] 2/27/20
 NTUA District Engineering Dept. Date

14. Specifications and proposed construction drawings reviewed and approved by:

[Signature] 8/2/19
 NTUA District W/WW Foreman Date *OCP? (Yes/No)

* "OC/P" = Operational constraints/problems. If YES, attach list of operating problems.

15. Assigned NTUA inspector's name.

The Tulsa City water crew
 NTUA Inspector's Name/Title

16. Reviewed By District Manager.

[Signature] for ALICIA RICHARDS 8/9/19
 NTUA District Manager Signature Date

17. Approved time and date of construction of tap.

Time and Date: When scheduled with 3 days notice

18. Permission to Tap reviewed and approved by.

[Signature] NTUA ENG TECH 2/27/2020
 NTUA HQ Civil Engineering Dept./Title Date

19. Comments / Remarks:

BEEHOOGHAN (AZ-12-176 KAIBETO) NHA HOUSING EMERGENCY WATER
LINE INTERTIE NHA WATERLINE SYSTEM TO NTUA 4" WATERLINE AT
BEEHOOGHAN NHA HOUSING



IN THIS SECTION:

- APPROVED WATER MATERIAL
SUBMITTALS

Tab 6

NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY
P.O. BOX 969
SHIPROCK, NEW MEXICO 87420
PHONE: (505) 210-7070

LETTER OF TRANSMITTAL

DATE	2-Aug-2019	JOB NO.
ATTENTION:	Ronald Begay	
RE:	NTUA Beehooghaan NHA Housing Inter-tie Material List	

TO: Navajo Tribal Utility Authority

PO Box 170

Fort Defiance, Arizona 86504-0170

GENTLEMEN:

WE ARE SENDING YOU

☒ ATTACHED ☐ UNDER

Separate cover via _____ THE FOLLOWING ITEMS:

- ☒ SHOP DRAWINGS ☐ PRINTS ☐ PLANS ☐ SAMPLES ☐ SPECIFICATIONS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐ As-Built

COPIES	DATE	NO.	DESCRIPTION
1	2-Aug-2019	1	Material list

THESE ARE TRANSMITTED As checked below:

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☐ AS REQUESTED ☐ RETURNED FOR CORRECTIONS ☐ RESUBMIT ____ CORRECTED PRINTS
☒ FOR REVIEW AND COMMENT ☒ FOR YOUR SIGNATURE _____

Remarks: Shop Drawings for review and action.

PLEASE SIGN, DATE, AND RETURN THE YELLOW COPY.

RECEIVED BY: SEE EMAIL AUG 9/19 DAY

DATE: 02/27/2020

COPY TO: HZ, BG, WB, AB, FS, GL

SIGNED: Am T Barber

Ammerson T. Barber, Estimator/Coordinator

2-Aug-19

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE

Ammerson Barber

From: Ronald Begay <ronaldb@ntua.com>
Sent: Friday, August 9, 2019 11:47 AM
To: Ammerson Barber; Adrian Toledo; Daniel Stevens
Cc: Patrick Martinez; Quinn Montoya; Carmine Stanley
Subject: RE: Kaibeto Intertie; Submittal No. 01 Shop Drawing - PRV Vault

Follow Up Flag: Follow up
Flag Status: Completed

Ammerson,

The PRV vault is approved.

Sincerely,

Ron Begay

W/WW Project Manager

HQ W/WW Department

P.O. Box 170

Ft. Defiance, AZ 86504-0170

Office: (928)729-5721 x2371

Email: ronaldb@ntua.com



From: Ammerson Barber <Ammerson@navajo.net>
Sent: Friday, August 2, 2019 10:05 AM
To: Ronald Begay <ronaldb@ntua.com>; Adrian Toledo <adriant@ntua.com>; Daniel Stevens <DanielS@ntua.com>
Cc: Patrick Martinez <Patrick@navajo.net>; Quinn Montoya <Quinn@navajo.net>; Carmine Stanley <carmine@navajo.net>
Subject: Kaibeto Intertie; Submittal No. 01 Shop Drawing - PRV Vault

Gentlemen,

For your review and action.

Thank you,

Ammerson Barber
Estimator/Project Coordinator

NECA Navajo Engineering & Construction Authority

#1 Uranium Blvd | P.O. Box 969 | Shiprock, NM 87420

T: 505-210-7070 | F: 505-210-7009

E: ammerson@navajo.net

W: navajo.net

Ammerson Barber

From: Brett Grubbs
Sent: Friday, July 19, 2019 07:34 AM
To: Herman Patterson; Patrick Martinez; Quinn Montoya; Ammerson Barber; Tom Chee
Cc: Frank Smith
Subject: FW: Kaibeto Inter Tie Project
Attachments: Kaibeto Inner Tie NHA Housing Cost of Plant estimate_Updated2.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Below is the approval order the long lead items for the Kaibeto inter tie. Please proceed with the procurement of the long lead items and all material. Please go through the W/H. I will be setting up a new job following this email. Please stand by.
Thank you,

Brett Grubbs
Manager of Engineering

NECA Navajo Engineering & Construction Authority
C: 505-801-6995 | W: Navajo.net

From: Ronald Begay <ronaldb@ntua.com>
Sent: Thursday, July 18, 2019 4:46 PM
To: Brett Grubbs <Brett@navajo.net>
Cc: Frank Smith <Frank-Smith@navajo.net>; Daniel Stevens <DanielS@ntua.com>; David Yazzie <DavidYa@ntua.com>
Subject: RE: Kaibeto Inter Tie Project

Brett,

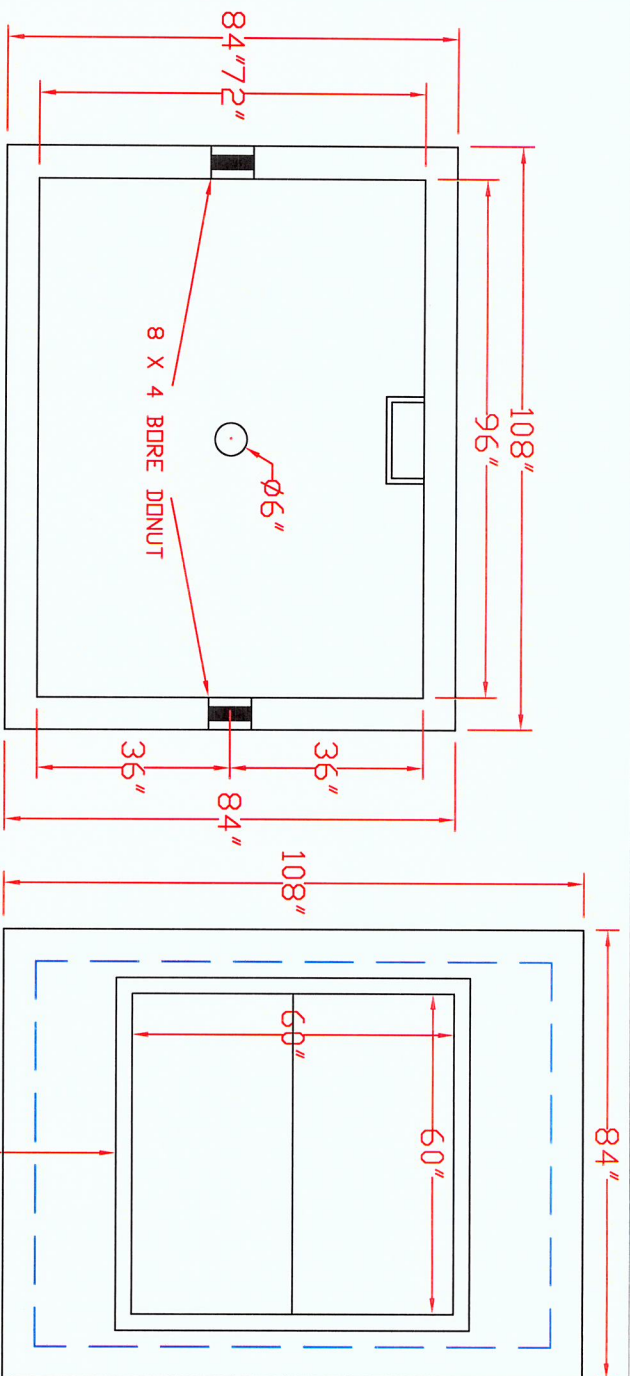
We received a letter of commitment from NHA for the Kaibeto Inter-Tie project. With that stated, please proceed with placing the order for the long lead items, such as the PRV Vault, Backflow Preventer and any other items you might think are long lead items. Please ensure the items meet NTUA specifications prior to ordering.

We will be notifying NECA sometimes next week to inform you of what process will take place.

Lastly, we will be needing a project schedule from NECA.

Thank you,

Ron Begay
W/WW Project Manager
HQ W/WW Department
P.O. Box 170
Ft. Defiance, AZ 86504-0170
Office: (928)729-5721 x2371
Email: ronaldb@ntua.com



HALLIDAY
S2S-6060

HALLIDAY
S2S-6060

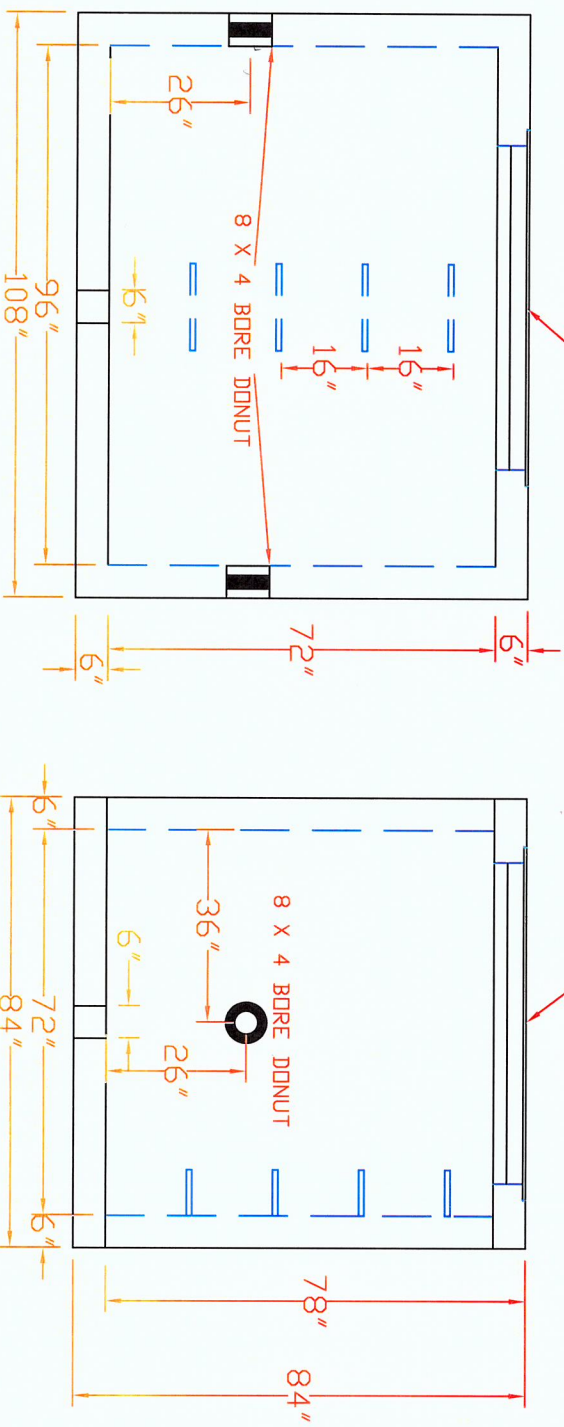
96" x 72" ID X 72" 4"x2" PRV VAULT

DESIGN NOTES:

1. 4000 PSI DESIGN MIX
2. MEETS OR EXCEEDS ASTM C-913 SPECIFICATIONS.

REBAR NOTES:

1. LID, FLOOR & WALLS
- SINGLE MAT OF # 4 REBAR @ 10" OCEW



FOUR CORNERS
PRE-CAST, INC.

A SUBDIVISION OF NAVAJO ENGINEERING
& CONSTRUCTION AUTHORITY

PH 505-327-4874 - FAX 505-327-1262

DRAWN BY: KP
DATE: 8-1-19

CHECKED BY: R.T.

TITLE: 96" X 72" X 72" NTUA 4" X 2" PRV VAULT
PROJECT: KAIBETO WATER PRV VAULT

FOR: NAVAJO ENGINEERING AND CONSTRUCTION AUTH

SIGNATURE
DATE:

TITLE

APPROVED FOR BUILD

NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY

**P.O. BOX 969
SHIPROCK, NEW MEXICO 87420
PHONE: (505) 210-7070**

LETTER OF TRANSMITTAL	
DATE	2-Aug-2019
JOB NO.	
ATTENTION:	Ronald Begay
RE:	NTUA Beehooghaan NHA Housing Inter-tie Submittal No. 2 Backflow Preventer

TO: Navajo Tribal Utility Authority

PO Box 170

Fort Defiance, Arizona 86504-0170

GENTLEMEN:

WE ARE SENDING YOU

☒ ATTACHED ☐ UNDER

Separate cover via _____ THE FOLLOWING ITEMS:

- ☐ SHOP DRAWINGS ☐ PRINTS ☐ PLANS ☐ SAMPLES ☒ SPECIFICATIONS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐ As-Built

COPIES	DATE	NO.	DESCRIPTION
1	2-Aug-2019	2	Wilkins 975 Backflow Preventer Specification

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☐ FOR YOUR USE ☐ APPROVED AS NOTED ☐ SUBMIT _____ COPIES FOR DISTRIBUTION
☐ AS REQUESTED ☐ RETURNED FOR CORRECTIONS ☐ RESUBMIT _____ CORRECTED PRINTS
☒ FOR REVIEW AND COMMENT ☐ FOR YOUR SIGNATURE _____

Remarks: Wilkins 975 Backflow Specification

PLEASE SIGN, DATE, AND RETURN THE YELLOW COPY.

RECEIVED BY: EMAIL DAY

DATE: 2/27/2020

COPY TO: RB, AT, PM, QM

SIGNED:

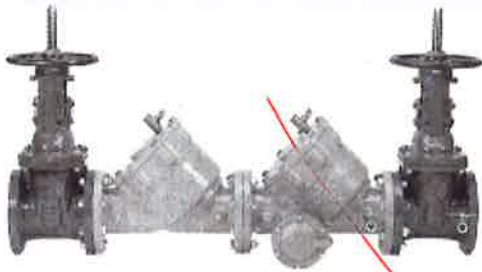
[Signature]

2-Aug-19

Ammerson T. Barber, Estimator/Coordinator

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE

SPECIFICATION SUBMITTAL SHEET



FEATURES

Sizes: ☐ 2 1/2" ☐ 3" ☒ 4" ☐ 6" ☐ 8" ☐ 10"

Maximum working water pressure 175 psi
Maximum working water temperature 140° F
End connections flanged ANSI B16.1 Class 125

OPTIONS

(Suffixes can be combined)

- ☐ - with NRS gate valves (standard)
- ☐ G - with grooved by flanged NRS gate valves
- ☐ L - less shut-off valves
- ☐ OSY - with OS & Y gate valves
- ☐ OSYG - with grooved by flanged OS & Y gate valves
- ☐ FS - with cast iron "Y" type flanged strainer
- ☐ FSC - with cast iron "Y" type flanged strainer, fusion epoxy coated, inside and out
- ☐ BMS - with integral battery-operated relief valve monitor switch
- ☐ MS - with integral relief valve monitor switch

ACCESSORIES

- ☐ Repair kit (rubber only)
- ☐ Air gap (Model AG)
- ☐ Water thermal expansion tank (Model WXTP)

APPLICATION

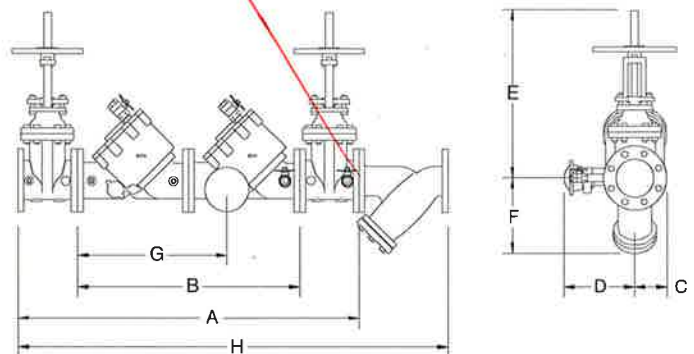
Designed for installation on potable water lines to protect against both backsiphonage and backpressure of contaminated water into the potable water supply. The Model 975 provides protection where a potential health hazard exists.

STANDARDS COMPLIANCE

- ASSE® Listed 1013
- IAPMO® Listed
- CSA® Certified
- UL® Classified
- C-UL® Classified
- FM® Approved
- AWWA Compliant C511
- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California

MATERIALS

Main valve body Cast iron, ASTM A 126 Class B
Access covers Cast iron, ASTM A 126 Class B
Coatings Fusion epoxy finish (FDA approved)
Internals Stainless steel, 300 Series
Cast bronze, ASTM B 584
Elastomers EPDM (FDA approved)
Buna nitrile (FDA approved)
Polymers Acetal (Delrin™), NSF® Listed
Springs Stainless steel, 300 Series

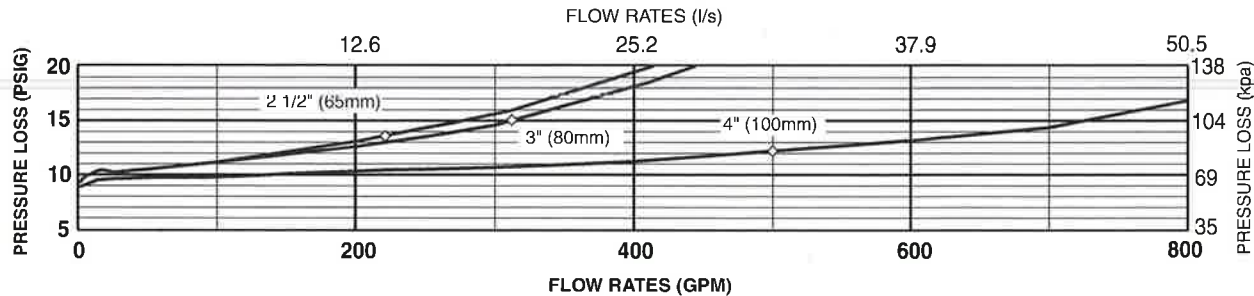


DIMENSIONS & WEIGHTS (do not include pkg.)

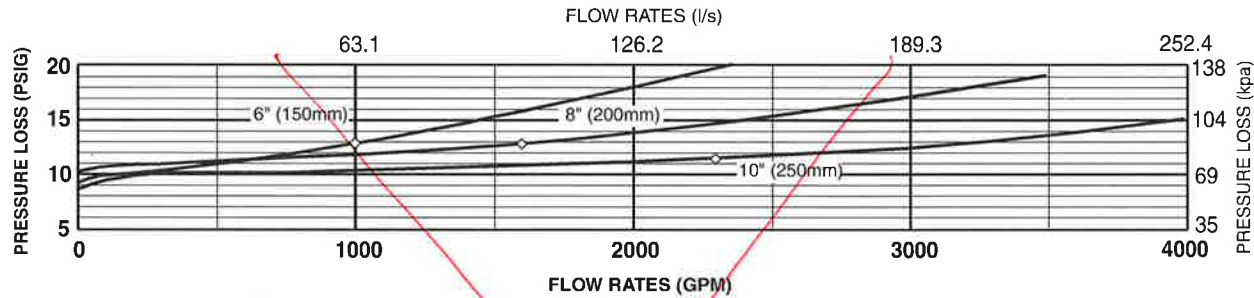
MODEL SIZE		DIMENSIONS (approximate)																WEIGHT							
		A		B WITHOUT GATE VALVES		C		D		E OS&Y GATE VALVE OPEN		E OS&Y GATE VALVE CLOSED		E NRS GATE VALVE		F		G		WITHOUT GATE VALVES		WITH NRS GATE VALVES		WITH OS&Y GATE VALVES	
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg	lbs.	kg
2 1/2	65	37 1/8	943	22	559	4	102	10	254	16 3/8	416	13 7/8	352	11 3/8	289	8 3/8	213	16	406	91	41.3	193	87.6	201	91.3
3	80	38 1/8	968	22	559	4	102	10	254	18 7/8	479	15 5/8	397	12 3/8	314	9 1/4	235	16	406	91	41.3	215	97.6	221	100.3
4	100	50 1/4	1276	32 1/8	816	5	127	10	254	22 3/4	578	18 1/4	464	14 3/4	375	12 1/2	318	22	559	232	105.3	412	187	422	191.6
6	150	62 1/8	1578	41	1041	6	152	11	279	30 1/8	765	23 3/4	603	19	483	14	356	30	762	526	238.8	810	367.7	826	375
8	200	71 1/8	1807	48	1219	7 1/2	191	12	305	37 3/4	959	29 1/4	743	22 1/2	572	17 3/4	451	31	787	837	380	1289	585.2	1313	596
10	250	84 1/8	2137	58	1473	9	229	14	356	45 3/4	1162	35 3/8	899	26 1/2	673	21 1/4	540	41	104	1400	635.6	2160	980.6	2218	1007

FLOW CHARACTERISTICS

MODEL 975 2 1/2", 3" & 4" (STANDARD & METRIC)



MODEL 975 6", 8" & 10" (STANDARD & METRIC)

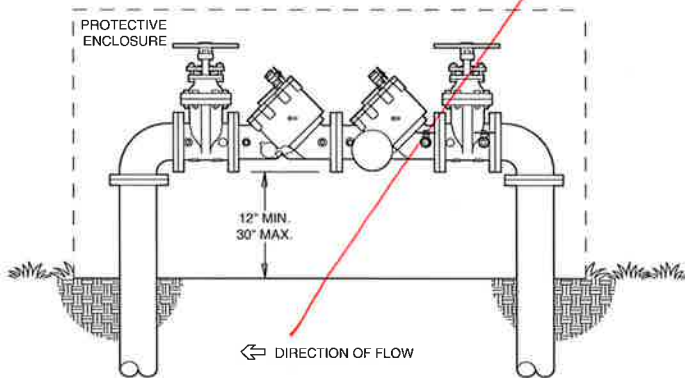


◇ Rated Flow (Established by approval agencies)

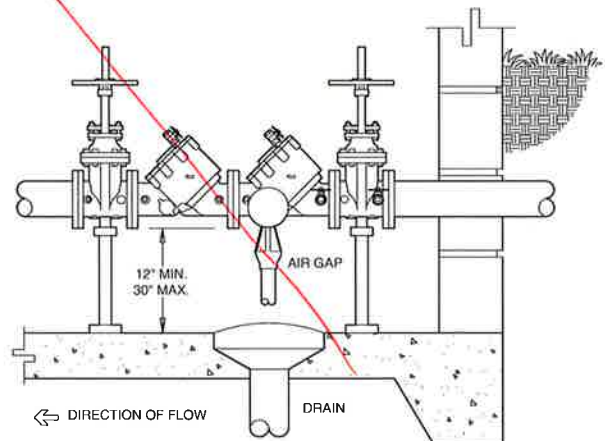
TYPICAL INSTALLATION

Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted in accordance with the manufacturers' instructions and the latest edition of the Uniform Plumbing Code. Assembly shall be installed with adequate drain and sufficient side clearance for testing and maintenance. The installation shall be made so that no part of the unit can be submerged or where relief valve discharge could cause damage.

Capacity thru Schedule 40 Pipe (GPM)				
Pipe size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687



TYPICAL OUTDOOR INSTALLATION



TYPICAL INDOOR INSTALLATION

SPECIFICATIONS

The Reduced Pressure Principle Backflow Prevention Assembly shall be ASSE® 1013 Listed and supplied with full port gate valves. The main body and access covers shall be epoxy coated cast iron (ASTM A 126 Class B), the seat and check valve shall be cast bronze (ASTM B 584), the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM (FDA approved). The first and second checks shall be accessible for maintenance without removing the relief valve or the entire device from the line. If installed indoors, the installation shall be supplied with an air gap adapter and integral relief valve monitor switch. The Reduced Pressure Principle Backflow Prevention Assembly shall be a WILKINS Model 975.

NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY



P.O. BOX 969

SHIPROCK, NEW MEXICO 87420

PHONE: (505) 368-5151

LETTER OF TRANSMITTAL

DATE 06 AUG 2019

JOB NO.

ATTENTION: Ron Begay

RE:

Kaibeto Intertie

TO: Navajo Tribal Utility Authority

POST OFFICE BOX 170

Fort Defiance, Arizona 86504-0170

GENTLEMEN:

WE ARE SENDING YOU

☒ ATTACHED ☐ UNDER

Separate cover via _____ THE FOLLOWING ITEMS:

- ☐ SHOP DRAWINGS ☐ PRINTS ☐ PLANS ☐ SAMPLES ☐ SPECIFICATIONS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐

COPIES	DATE	NO.	DESCRIPTION
1	08-08-2019	03	Product Data Sheets

THESE ARE TRANSMITTED As checked below:

- ☒ FOR APPROVAL ☐ APPROVED AS SUBMITTED ☒ RESUBMIT _____ COPIES FOR APPROVAL
☐ FOR YOUR USE ☐ APPROVED AS NOTED ☐ SUBMIT _____ COPIES FOR DISTRIBUTION
☐ AS REQUESTED ☐ RETURNED FOR CORRECTIONS ☐ RESUBMIT _____ CORRECTED PRINTS
☒ FOR REVIEW AND COMMENT ☐ FOR YOUR SIGNATURE _____

Remarks:

Please review and approve the attached material data sheets for ordering.

PLEASE SIGN, DATE, AND RETURN THE YELLOW COPY.

RECEIVED BY: _____

DATE: 02/27/2020

COPY TO: rb, at, jd, pm, qm

SIGNED: _____

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE



Baker Utility Supply
4320 2nd ST. NW
Albuquerque, NM 87107
PH: 505-884-0990
Fax: 505-881-4615

KAIBETO INTERTIE

Contractor: NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY

ITEMS AND MANUFACTURER:

4" MJ SKIN PACK REG GSK w/T-BOLTS NO GLAND, DOM:	TYLER
4" MJ TRANS GASKET, DOMESTIC:	STAR
DI SPOOL, DOMESTIC:	WHEATLAND
4" STRAINER, DOMESTIC:	WILKINS
4" TUFF GRIP MEGALUG FOR DI PIPE, DOMESTIC:	TYLER
4" BACKFLOW PREVENTER, DOMESTIC:	WILKENS
36"x100"x56" ALUMINUM ENCLOSURE W/HEATER, DOM:	SAFE-T-COVER
MJ FITTINGS, DOMESTIC:	TYLER
VALVE BOX TOP, BOTTOM, LID, DOMESTIC:	TYLER
2" FLGxFLG GATE VALVE w/HANDWHEEL, DOMESTIC:	AFC
EXPOY SADDLE, DOMESTIC:	FORD



SUBMITTAL

(Current revisions for the noted Standards apply)

Tyler Union Waterworks provides that our *Mechanical and Push-On joint gaskets and dimensions conform to the specifications in ANSI/AWWA C111/A21.11 (current revision). Markings include size, mold number, gasket manufacturer's mark, country where molded, and product identification letters. No markings are placed on sealing surfaces per the AWWA C111 standard.

*Note: Push-On and Mechanical Joint transition gasket design standards and markings are not addressed by ANSI/AWWA C111/A21.11 (current revision). Transition gaskets provided by Tyler Union follow the material testing standards and specifications established for ANSI/AWWA C111/A21.11 gaskets.

Gasket material is vulcanized styrene butadiene rubber (SBR). Purchaser may request special application elastomers (EPDM, Nitrile, Neoprene & FKM) which will be identified on all documentation and corresponding gaskets. Gaskets are free of foreign materials, porous areas, or other defects that make them unfit for the intended use.

Tyler Union gaskets are manufactured under quality control standards and procedures that are maintained by the gasket supplier. Appropriate documentation is maintained by the manufacturer and available for review upon request. Properties and test methods for SBR, EPDM, Nitrile, Neoprene and FKM gaskets are as provided.

Property	ASTM Test Method	Required Value
Hardness, Shore "A"	D2240-86	75 (+-5)
Minimum Tensile	D412-87	1500 psi (10MPa)
Minimum Elongation	D412-87	150 %
Minimum Aging	D572-88	60 %
Maximum Compression Set	D395-89, Method B	20 %
Resistance to surface	D1149-86	No cracking
Ozone cracking		

Tyler Union's approved suppliers maintain a quality assurance program that is reviewed and updated on an ongoing basis to ensure product quality. Tyler Union's gasket suppliers submit gaskets for testing and provide materials for testing to Underwriters Laboratories, Inc. Tyler Union's gasket providers are recognized under the component program (UL 194/ UL 157) of Underwriters Laboratories, Inc.. Tyler Union UL approved gaskets meet NSF-61, NSF-372 and Annex G.

Tyler Union provides that our Mechanical and Push-On joint gaskets for potable or wastewater projects will perform as designed when selected per the chart provided and installed per AWWA C600-10.

SBR (Styrene Butadiene rubber)(Buna-S) <u>Not Recommended for Hydrocarbon Service</u>	20°F to 180°F	Suitable for Water, Wastewater, most moderate chemicals, wet or dry organic acids, alcohols, ketones, and aldehydes
EPDM (Ethylene Propylene) <u>Not Recommended for Hydrocarbon Service</u>	-10°F to 250°F	Ideal for water, wastewater, ozone, & strong oxidizing chemicals May be used on steam and air within its temperature range
CR (Neoprene)	-10°F to 200°F	Recommended for moderate chemicals and acids, oil fats, greases, many solvents and air with hydrocarbons. Will not support combustion
NBR (Nitrile)(Buna-N)(Hycar)	-40°F to 250°F	Ideally suited for gasoline, petroleum products, hydrocarbons, water, mineral and vegetable oils
*FKM(Fluoroelastomer) <u>*Check with Customer Service for availability</u>	10°F to 425°F	Ideally suited for hydrocarbons, acids, vegetable oils & petroleum
Gasket Types Offered:		
(1)Mechanical Joint std.(2) Push-On Joint std.(3)Mechanical Joint DUO (4)Mechanical & Push-on Joint Transition(5)Push-on Restraining (6)Mechanical Joint Armor Tip Conductivity(7)Compact tapping Sleeve		

Unless other wise requested by the purchaser upon order placement, all gaskets provided will be of our standard SBR material.

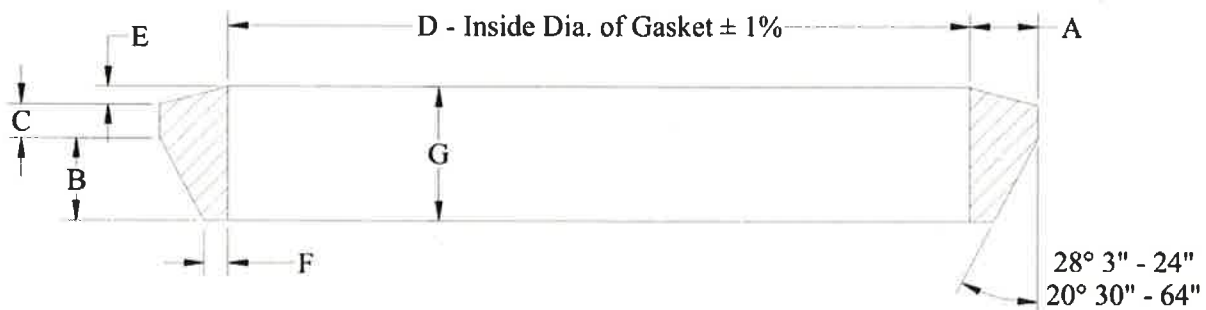
Mechanical Joint Gaskets

ANSI/AWWA C111/A21.11-12

*MJ Tru-Lock Gaskets 30-48 inch

Pipe Size	Pipe OD	A ±0.01"	B	C	D ±1%	E ±0.01%	F ±0.01"	G ±0.02"
**2	2.50	0.48	0.62	0.31	2.48	0.12	0.15	1.05
3	3.96	0.48	0.62	0.31	3.86	0.12	0.15	1.05
4	4.80	0.62	0.75	0.31	4.68	0.16	0.22	1.22
6	6.90	0.62	0.75	0.31	6.73	0.16	0.22	1.22
8	9.05	0.62	0.75	0.31	8.85	0.16	0.22	1.22
10	11.10	0.62	0.75	0.31	10.87	0.16	0.22	1.22
12	13.20	0.62	0.75	0.31	12.95	0.16	0.22	1.22
14	15.30	0.62	0.75	0.31	14.99	0.16	0.22	1.22
16	17.40	0.62	0.75	0.31	17.07	0.16	0.22	1.22
18	19.50	0.62	0.75	0.31	19.13	0.16	0.22	1.22
20	21.60	0.62	0.75	0.31	21.20	0.16	0.22	1.22
24	25.80	0.62	0.75	0.31	25.34	0.16	0.22	1.22
30	32.00	0.73	1.00/* .50	.38/* .50	31.47	0.16	.37/* .55	1.54/* 1.16
36	38.30	0.73	1.00/* .50	.38/* .50	37.67	0.16	.37/* .55	1.54/* 1.16
42	44.50	0.73	1.00/* .50	.38/* .50	43.78	0.16	.37/* .55	1.54/* 1.16
48	50.80	0.73	1.00/* .50	.38/* .50	49.98	0.16	.37/* .55	1.54/* 1.16

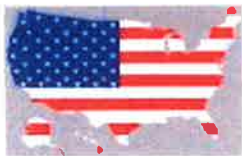
** Not included in AWWA C111. Manufacture's Standard does not meet AWWA C111



** Mechanical Joint Transition Gasket Dimensions in Inches

Pipe Size	A ±0.01"	B	C	D ±1%	E	F ±0.01"	G ±0.02"
2	0.57	0.52	0.31	2.28	0.16	0.24	1.08
3	0.70	0.62	0.31	3.45	0.16	0.37	1.11
4	0.77	0.75	0.31	4.43	0.16	0.37	1.26
6	0.76	0.75	0.31	6.53	0.16	0.36	1.25
8	0.82	0.75	0.31	8.50	0.16	0.42	1.27
10	0.79	0.75	0.31	10.59	0.16	0.52	1.26
12	0.84	0.75	0.31	12.56	0.16	0.44	1.28

** Not included in AWWA C111. Manufacture's Standard does not meet AWWA C111



"Buy America(n)" & Product Certificate of Compliance

Address: 1501 W. 17th Street – Anniston, AL 36201

Telephone No.: (800) 226-7601

Fax Number: (800) 226-0806

Date: January 6, 2014

To: Whom It May Concern

Re: Buy America /Buy American Certification for Tyler Union Waterworks Made in the U.S.A Products

We appreciate the opportunity to supply our products for your projects requiring to some or full extent product that is substantially or wholly manufactured in the U.S.A. Tyler Union Waterworks certifies that its Domestic manufactured fittings and cast iron municipal castings are wholly manufactured in the U.S.A. using only raw materials that wholly originate in the U.S.A..

After a thorough review of "Buy America/Buy American" acts; Tyler Union certifies that our Domestic ANSI/AWWA fittings and ASTM cast iron municipal castings meet all applicable requirements and provisions as provided for by the U.S. Department of Transportation and the Federal standards noted for domestic iron and steel construction materials incorporated into your project. These standards/laws/acts and revisions date from 1933 through current year 2014.

Buy American:

- American Recovery and Reinvestment Act of 2009 (ARRA), Section 1605
- Federal Aviation Administration (FAA), 49 U.S.C. § 50101

Buy America:

- Federal Highway Administration (FHWA), 23 U.S.C. § 50101§ 313 – Buy America; 23 C.F.R. § 635.410
- Federal Railroad Administration (FRA), 49 U.S.C. Chapters 244, 246: § 24405 – Buy America
- National Railroad Passenger Corporation (AMTRAK), 49 U.S.C. § 24305
- Federal Transit Administration (FTA), 49 U.S.C. § 5323(j); 49 C.F.R. Part 661 (Buy America Requirements)

If your domestic project material requires additional certifications as provided; you must advise the Tyler Union Waterworks product Distributor or Customer Service Agent upon order placement. Additional certifications available include **1) mill certification, 2) project and/or product specific certificate for accessories, and 3) coating certificate.** Our purchase order system maintains purchase and shipping order information for a minimum of 12 months. For tracking purposes these orders indicate if the product processed and shipped was domestic in origin.

Tyler Union certifies its 2" through 48" Domestic ANSI/AWWA fittings are cast with tested and traceable ASTM A536 compliant ductile iron that is designed for use with and conforms to all the applicable terms and requirements of ANSI/AWWA C153/A21.53, ANSI/AWWA C151/A21.51, ANSI/AWWA C115/A21.15, ANSI/AWWA C111/A21.11, ANSI/AWWA C116/A21.16, ANSI/AWWA C110/A21.10, and ANSI/AWWA C104/A21.4. Additionally Tyler Union certifies its Domestic made in the U.S.A. cast iron municipal products (Valve box, Service box, and Accessories) are produced in accordance with and meet all applicable terms and provisions of ASTM-A48. Current revisions apply for each noted standard.

Best Regards,

Roger Dunning
Roger Dunning

Technical Support Manager

Tyler Union Waterworks

Email: roger.dunning@tylerunion.com

Tel.: (800)527-8478

Project Name: _____

Project Location: _____

Project Material: _____

Location of Mfg.: _____

Project Contractor: _____

Tyler Union Distributor: _____

Project No.: _____

Union Foundry - Anniston, AL 36201 – U.S.A.

Subscribed and sworn to before me this 6th Day of January 2014

Sandra C. Smith

Sandra Smith – Notary Public – Smith County, Texas



Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478

Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601

Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

Elmira: 1021 East Water • Elmira, NY 14902

New Lenox: 2200 West Haven • New Lenox, IL 60451

Portland: 6204 N. Marine Dr. • Portland, OR 97203

www.tylerunion.com

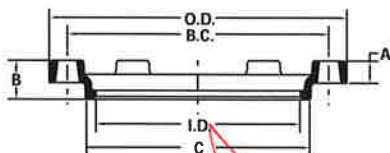
This document is void if modified in any manner other than the addition of project information, name of contractor and/or product distributor



GLANDS, GASKETS, BOLTS & NUTS

GENERAL SPECIFICATION

MATERIAL:	Ductile Iron per ASTM A536
PRESSURE:	350 PSI rating for 2" - 24" sizes, 250 PSI rating for 30" - 48" sizes and 150 PSI rating for 54" - 64" sizes
TESTING:	In accordance with ANSI/AWWA C111/A21.11 and UL requirements
DIMENSIONS:	Are in accordance with ANSI/AWWA C111/A21.11, UL and FM requirements and are in inches unless noted otherwise
WEIGHTS:	Are in pounds, unless noted otherwise and do not include accessories
COATING:	Asphaltic seal coat is in accordance with ANSI/AWWA C104/A21.4 unless otherwise specified.
APPROVALS:	Compact Glands 3" - 12" Underwrites Laboratories & ULC Listed. Factory Mutual approved 3"-16".



MJ COMPACT GLANDS

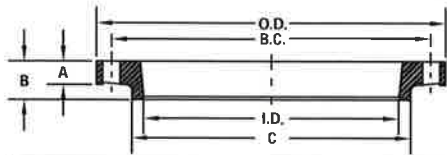
NOM. SIZE	O.D.	A	B	C	I.D.	B.C.	BOLT HOLE	BOLT QTY	WT (LBS.)
2	6.12	0.62	1.18	3.40	2.61	4.75	Ø0.75	2	1
3	7.69	0.62	1.37	4.84	4.06	6.19	Ø0.75	4	2
4	9.12	0.75	1.50	5.92	4.90	7.50	Ø0.88	4	3
6	11.12	0.88	1.63	8.02	7.00	9.50	Ø0.88	6	4
8	13.37	1.00	1.75	10.17	9.15	11.75	Ø0.88	6	5
10	15.62	1.00	1.75	12.22	11.20	14.00	Ø0.88	8	7
12	17.88	1.00	1.75	14.32	13.30	16.25	Ø0.88	8	8
14	20.25	1.25	2.00	16.40	15.44	18.75	Ø0.88	10	11
16	22.50	1.31	2.06	18.50	17.54	21.00	Ø0.88	12	14
18	24.75	1.38	2.13	20.60	19.64	23.25	Ø0.88	12	19
20	27.00	1.44	2.19	22.70	21.74	25.50	Ø0.88	14	27
24	31.50	1.56	2.31	26.90	25.94	30.00	Ø0.88	16	36
30	39.12	2.00	2.75	33.29	32.17	36.88	Ø1.13	20	90
36	46.00	2.00	2.75	39.59	38.47	43.75	Ø1.13	24	118
42	53.12	2.00	2.75	45.79	44.67	50.62	Ø1.38	28	151
48	60.00	2.00	2.75	52.09	50.97	57.50	Ø1.38	32	187





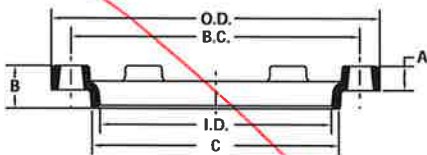
MJ Accessories

ANSI/AWWA C111/A21.11



MJ FULLBODY GLANDS

NOM. SIZE	O.D.	A	B	C	I.D.	B.C.	BOLT HOLE	BOLT QTY	WT (LBS.)
2	6.12	0.62	1.18	3.40	2.61	4.75	Ø0.75	2	1
3	7.69	0.62	1.37	4.84	4.06	6.19	Ø0.75	4	5
4	9.12	0.75	1.50	5.92	4.90	7.50	Ø0.88	4	6
6	11.12	0.88	1.63	8.02	7.00	9.50	Ø0.88	6	10
8	13.37	1.00	1.75	10.17	9.15	11.75	Ø0.88	6	14
10	15.62	1.00	1.75	12.22	11.20	14.00	Ø0.88	8	20
12	17.88	1.00	1.75	14.32	13.30	16.25	Ø0.88	8	24
14	20.25	1.25	2.00	16.40	15.44	18.75	Ø0.88	10	45
16	22.50	1.31	2.06	18.50	17.54	21.00	Ø0.88	12	55
18	24.75	1.38	2.13	20.60	19.64	23.25	Ø0.88	12	55
20	27.00	1.44	2.19	22.70	21.74	25.50	Ø0.88	14	66
24	31.50	1.56	2.31	26.90	25.94	30.00	Ø0.88	16	90
30	39.12	2.00	2.75	33.29	32.17	36.88	Ø1.13	20	220
36	46.00	2.00	2.75	39.59	38.47	43.75	Ø1.13	24	286
42	53.12	2.00	2.75	45.79	44.67	50.62	Ø1.38	28	288
48	60.00	2.00	2.75	52.09	50.97	57.50	Ø1.38	32	400



MJ OVERSIZE GLANDS

NOM. SIZE	O.D.	A	B	C	I.D.	B.C.	BOLT HOLE	BOLT QTY	WT (LBS.)
4	9.12	0.75	1.50	5.92	5.10	7.50	Ø0.88	4	3
6	11.12	0.88	1.63	8.02	7.20	9.50	Ø0.88	6	5
8	13.37	1.00	1.75	10.17	9.40	11.75	Ø0.88	6	6
10	15.62	1.00	1.75	12.22	11.50	14.00	Ø0.88	8	8
12	17.88	1.00	1.75	14.32	13.60	16.25	Ø0.88	8	9
16	22.50	1.31	2.06	18.50	17.94	21.00	Ø0.88	12	14



STAR[®] PIPE PRODUCTS

**Standard Mechanical Joint Gaskets**

(SBR, NBR, EPDM, Neoprene, FKM)

ANSI/AWWA C111/A21.11

GASKET GENERAL SPECIFICATIONS

Star Pipe Products Mechanical Joint (MJ) Gasket dimensions conform to the drawings set forth in ANSI/AWWA C111/A21.11. Gasket markings include size, Manufacturer's mark, Country of origin and product identification. No markings are positioned on sealing surfaces per the ANSI/AWWA C111/A21.11 standard. MJ transition gaskets follow the requirements of ANSI/AWWA C111/A21.11 where applicable.

Standard gasket material is vulcanized styrene butadiene rubber (SBR). Special application elastomers (EPDM, Nitrile, Neoprene & FKM) are available and shall be identified on all documentation and corresponding gaskets.

Star Pipe gaskets are manufactured under quality control standards and procedures that are maintained by the gasket supplier. Appropriate documentation is maintained by the manufacturer and available for review upon request.

Star Pipe gasket suppliers maintain a quality assurance program and manual that is reviewed and updated on an ongoing basis to ensure product quality. Star Pipe gasket suppliers perform in house testing and submit to random testing by Underwriters Laboratories, Inc. Star Pipe gasket providers are recognized under the component program (UL 194/ UL 157) of Underwriters Laboratories, Inc.

Star Pipe provides that our Mechanical Joint gaskets for potable or wastewater projects will perform as designed, based on the published chemical and environmental resistance data for "generic" rubber compounds. Star Pipe should be consulted for specific recommendations or for unusual applications.

GASKET PROPERTIES

PROPERTY	ASTM TEST METHOD	REQUIRED VALUE
Hardness, Shore "A"	D2240	75 ± 5
Minimum Tensile	D412	1500 psi
Minimum Elongation	D412	150%
Minimum Aging	D573	60%
Maximum Compression Set	D395, Method B	20%
Resistance to Surface Ozone Cracking	D1149	No Cracking

GASKET TYPE	MAXIMUM CONTINUOUS TEMP	MAXIMUM EXPOSURE TEMP	STANDARD USAGE
SBR (Styrene Butadiene Rubber / Buna-S)	160 F	180 F	Drinking water, Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water. Not Recommended for Hydrocarbon Service
EPDM (Ethylene Propylene)	250 F	300 F	Alcohols, Dilute Acids, Dilute Alkalis, Ketones (MEK/Acetone), Strong Oxidizing Chemicals; Drinking Water, Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water. Not Recommended for Hydrocarbon Service
Neoprene (Polychloroprene / CR)	225 F	300 F	Hydrocarbons, Unrefined Petroleum Products, Greasy Waste; Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water.
Nitrile (NBR / Buna-N)	160 F	180 F	Refined Oils and Fluids, Fats, Greases and Waste; Drinking Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water.
FKM (Fluoroelastomer / Viton [®])	400 F	500 F	Aromatic Hydrocarbons, Chlorinated Hydrocarbons, Vegetable Oils, Most Chemicals; Drinking Water, Reclaimed Water, Raw Water, Storm Water.

Viton[®] is a registered trademark of E.I. Du Pont De Nemours & Company.

UCAT.14.02

* REGISTERED TRADEMARK OF STAR PIPE PRODUCTS

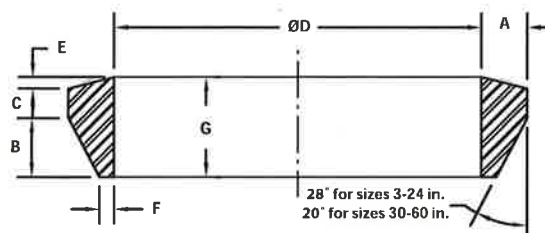
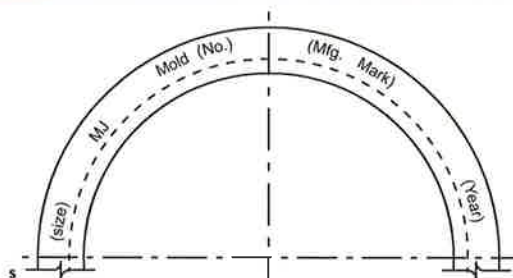
STAR PIPE PRODUCTS
HOUSTON CORPORATE | TOLL FREE 1-800-999-3009 | FAX 281-558-9000
www.starpipeproducts.com





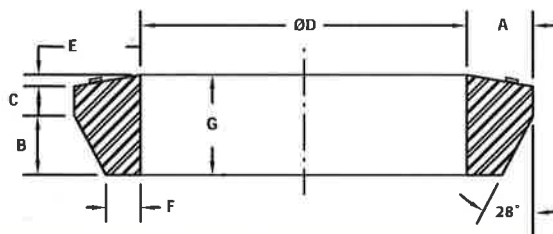
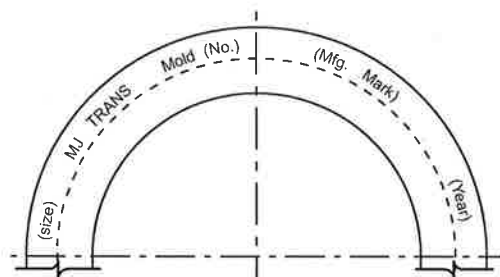
MJ Accessories

ANSI/AWWA C111/A21.11



MECHANICAL-JOINT GASKET

NOM. SIZE	PIPE O.D.	A	B	C	ØD ±1 %	E	F	G
2	2.50	0.48	0.62	0.31	2.48	0.12	0.15	1.05
3	3.96	0.48	0.62	0.31	3.86	0.12	0.15	1.05
4	4.80	0.62	0.75	0.31	4.68	0.16	0.22	1.22
6	6.90	0.62	0.75	0.31	6.73	0.16	0.22	1.22
8	9.05	0.62	0.75	0.31	8.85	0.16	0.22	1.22
10	11.10	0.62	0.75	0.31	10.87	0.16	0.22	1.22
12	13.20	0.62	0.75	0.31	12.95	0.16	0.22	1.22
14	15.30	0.62	0.75	0.31	14.99	0.16	0.22	1.22
16	17.40	0.62	0.75	0.31	17.07	0.16	0.22	1.22
18	19.50	0.62	0.75	0.31	19.13	0.16	0.22	1.22
20	21.60	0.62	0.75	0.31	21.20	0.16	0.22	1.22
24	25.80	0.62	0.75	0.31	25.34	0.16	0.22	1.22
30	32.00	0.73	1.00	0.38	31.47	0.16	0.37	1.54
36	38.30	0.73	1.00	0.38	37.67	0.16	0.37	1.54
42	44.50	0.73	1.00	0.38	43.78	0.16	0.37	1.54
48	50.80	0.73	1.00	0.38	49.98	0.16	0.37	1.54



TRANSITION MECHANICAL-JOINT GASKET

NOM. SIZE	PIPE O.D.	A	B	C (REF.)	ØD ±1 %	E	F	G
2	2.375	0.56	0.66	0.31	2.32	0.12	0.21	1.10
3	3.500	0.72	0.64	0.34	3.43	0.12	0.38	1.10
4	4.500	0.76	0.73	0.33	4.43	0.20	0.37	1.26
6	6.625	0.75	0.73	0.32	6.53	0.20	0.36	1.25
8	8.625	0.82	0.73	0.34	8.50	0.20	0.43	1.27
10	10.750	0.79	0.75	0.31	10.59	0.20	0.39	1.26
12	12.750	0.84	0.75	0.33	12.56	0.20	0.44	1.28



STAR[®] PIPE PRODUCTS



T-Bolts, Double Ended Rods & Nuts

HSLA STEEL

SPECIFICATIONS:

- Bolts & Nuts are manufactured in accordance with ANSI / AWWA C111 / A21.11.
- Material is High Strength Low Alloy Steel per ANSI/AWWA C111/A21.11.
- Threads per ASME B1.1 unified standard coarse (Class 2A & 2B)

MECHANICAL PROPERTIES

- Yield Strength 45000 PSI (min)
- Elongation in 2in. 20% (min)

CHEMICAL PROPERTIES

Carbon	0.20% Max
Manganese	1.25% Max
Sulfur	0.05% Max
Nickel	0.25% Min
Copper	0.20% Min
Combined	1.25% Min (Ni, Cu, Cr)

BLUE BOLT/NUT/ROD

T-Bolts, Rods & Nuts have fluoropolymer coating material which is VOC-compliant, resin-bonded, thermally cured and dry lubricant.

COATING PHYSICAL PROPERTIES

Film Thickness:	0.3 to 0.4 mil per coat
Number of Coats:	3 to 4 coats
Adhesion:	1 mm cross hatch test + 5 Pulls. Good knife resistance
Cure Test:	50+Rubs with MEK. No substrate exposure
Pencil Hardness:	Pencil Hardness: 4-6H
Volatile Organic Compounds	2.74lbs/gal

Stainless Steel T-Bolts & Nuts

ALLOYS SS 304 & SS 316 PER ASTM F593

SPECIFICATIONS:

- T-bolt dimensions are manufactured in accordance with ANSI / AWWA C111 / A21.11.
- T-bolt alloys SS 304 and SS 316 per ASTM F593
- Heavy Hex Nut Alloys SS 304 & SS 316 per ASTM F594.

MECHANICAL PROPERTIES

- Tensile Strength: 85,000 PSI to 140,000 PSI
- Yield Strength: 45,000 PSI (min)

COATING SPECIFICATION

Nuts have fluoropolymer coating material which is VOC-Compliant, resin-bonded, thermally cured and dry lubricant.

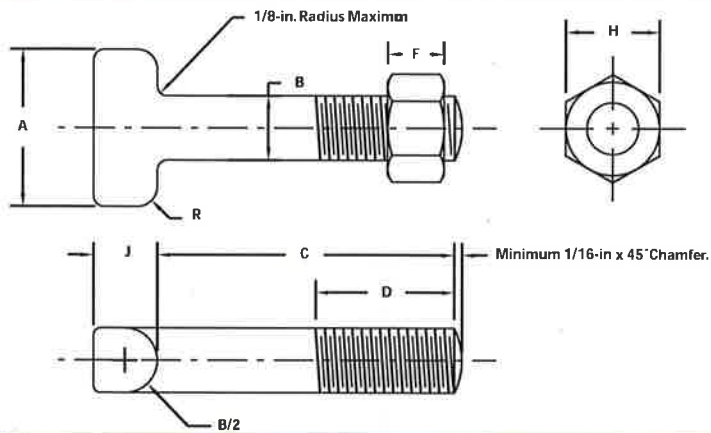
COATING PHYSICAL PROPERTIES

- | | |
|---|---|
| • Film Thickness: 0.3 to 0.4 mil per coat | • Pencil Hardness: 4-6H |
| • Number of Coats: 3 to 4 coats | • Volatile Organic Compounds 2.74 lbs/gal |
| • Adhesion: 1mm cross hatch test + 5 Tape Pulls. | • Continuous use temperature - 356°F |
| • Cure Test: 50+ Rubs with MEK, no substrate exposure | • Color: SS 304 is green, SS 316 is red |



Accessories

ANSI/AWWA C111/A21.11

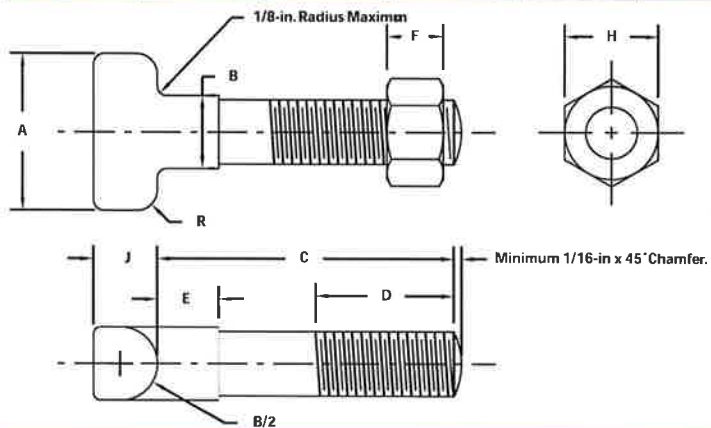


MECHANICAL JOINT BOLT TORQUE		
PIPE SIZE (IN)	BOLT SIZE (IN)	RANGE ¹ OF TORQUE (FT-LBS)
2-3	5/8	45-60
4-24	3/4	75-90
30-36	1	100-120
42-48	1 1/4	120-150

¹These torque ranges are requirements of AWWA C600

T-HEAD (LOW ALLOY STEEL) BOLT & NUT

NOM. SIZE	A	B	C	D	THREADS PER IN.	F	H	J	R
5/8 x 3	1.50	0.625	3.00	2.00	11	0.625	1.062	0.625	0.312
5/8 x 3 1/2	1.50	0.625	3.50	2.70	11	0.625	1.062	0.625	0.312
3/4 x 3 1/2	1.75	0.750	3.50	2.50	10	0.750	1.250	0.750	0.375
3/4 x 4	1.75	0.750	4.00	3.00	10	0.750	1.250	0.750	0.375
3/4 x 4 1/2	1.75	0.750	4.50	3.00	10	0.750	1.250	0.750	0.375
3/4 x 5	1.75	0.750	5.00	3.00	10	0.750	1.250	0.750	0.375
3/4 x 5 1/2	1.75	0.750	5.50	3.70	10	0.750	1.250	0.750	0.375
1 x 5 1/2	2.25	1.000	5.50	3.00	8	1.000	1.625	1.000	0.500
1 x 6	2.25	1.000	6.00	3.00	8	1.000	1.625	1.000	0.500
1 1/4 x 6	2.50	1.250	6.00	3.00	7	1.250	2.000	1.250	0.625
1 1/4 x 6 1/2	2.50	1.250	6.50	3.50	7	1.250	2.000	1.250	0.625
1 1/4 x 8 1/2	2.50	1.250	8.50	3.50	7	1.250	2.000	1.250	0.625



ANTI-ROTATION T-HEAD (LOW ALLOY STEEL) BOLT & NUT

NOM. SIZE	A	B	C	D	E	THREADS PER IN.	F	H	J	R
5/8 x 3	1.50	0.625	3.00	2.00	0.63	11	0.625	1.062	0.625	0.312
5/8 x 3 1/2	1.50	0.625	3.50	2.50	0.63	11	0.625	1.062	0.625	0.312
3/4 x 3 1/2	1.75	0.750	3.50	2.50	0.63	10	0.750	1.250	0.750	0.375
3/4 x 4	1.75	0.750	4.00	3.00	0.63	10	0.750	1.250	0.750	0.375
3/4 x 4 1/2	1.75	0.750	4.50	3.00	0.63	10	0.750	1.250	0.750	0.375
3/4 x 5	1.75	0.750	5.00	3.00	0.63	10	0.750	1.250	0.750	0.375



STAR[®] PIPE PRODUCTS



Date: _____

Domestic Fitting Product Certificate of Compliance

Star Distributor: _____

Contractor: _____

Project Name: _____

Project Location: _____

Re: Buy America / Buy American Certification for Star Pipe Products Made in the USA fittings

We certify country of origin compliance per below:

100% Domestic Fittings: This option consists of 100% domestic fittings that are melted, poured, machined, and coated 100% in the United States. SPP performs the machining, packaging and Quality Control checks in its Houston, Texas facility. This product is compliant with the Consolidated Appropriations Act of 2014 (AIS), with the American Recovery and Reinvestment Act of 2009 (ARRA) and The Buy America Act of 1983 and 1933. Domestic Fittings can be identified by item codes ending with the suffix "D".

Star Pipe Products certifies that all fitting products are made of ductile iron per ASTM A536, Grade 65-45-12 and conform to the following standards:

- AWWA C104(ANSI A21.4) for cement-mortar lining of ductile iron pipe and fittings for water
- AWWA C110(ANSI A21.10) for cast iron/ductile iron mechanical joint and flanged fittings
- AWWA C111(ANSI A21.11) for ductile iron mechanical joint glands and gaskets
- AWWA C153(ANSI A21.53) for compact mechanical joint and push-on ductile iron fittings

Star Pipe Products offers a variety of coatings and linings for the fittings it supplies. When a cement-lined and asphaltic-coated fitting is ordered, the asphaltic coating is applied inside and out in accordance with AWWA C104 (ANSI A21.4). The cement lining is applied in accordance with AWWA C104 (ANSI 21.4). These standards are met with both domestic and imported fittings, and they are met regardless of outlet style: standard mechanical joint, flange, or push-on.

Vivek Sharma
Director (Product Management Group)
Star Pipe Products

This document is void if modified in any manner other than the addition of distributor, contractor, or project details.

STAR PIPE PRODUCTS

4018 WESTHOLLOW PARKWAY HOUSTON, TEXAS 77082-4604
www.starpipeproducts.com

T: 800.999.3009
F: 281.556.9000





Customer Name:
Customer PO #:
Sales Order #: 4900051498
Delivery #: 80994892
Date of Creation: 3/21/2014
Plant: EnergeX - Warren, OH

JMC Steel Group
Wheatland Tube Division, USA
700 Dock St. Sharon, PA 16146 USA

CERTIFIED MATERIAL TEST REPORT

Type 3.1/3.1.B in accordance with EN 10204/ISO 10204/EN 10474/ISO 10474/DIN50049

Heat Analysis

Heat/Run	Value	Date	Item Description	C	Mn	P	S	CU	NI	Cr	Mo	V	Si	Al	T/S	Y/S	El
Heat#	A70209	2/12/2014	4.500 OD STD BLK A53-B ERW PE	.210	.840	.010	.003	.080	.030	.040	.010	.001	.030	.030	.76130	.62368	31
Heat#	C68976	2/12/2014	4.500 OD STD BLK A53-B ERW PE	.220	.840	.010	.003	.090	.040	.040	.020	.001	.020	.025	.79162	.64326	30

COMMENTS

This is to certify that the product described herein was manufactured or supplied by the Wheatland Tube Division, USA and sampled, tested and/or inspected in accordance with the latest revision, at the time of manufacture, of the specification listed above and fulfills the requirements in such respects. All the required mechanical, physical, hydrostatic, non-destructive, flattening, and bend tests have been successfully completed. The products described above meet one of the following specifications: Continuous Butt Weld Steel Pipe meeting the requirements of ASTM A53 2012 /ASME SA53 2001 Type F, Grade A. Steel Coupling Stock meeting the requirements of ASTM A865. Electric Resistance Welded Steel Pipe meeting the requirements of ASTM A53 2012/ASME SA53 2001, Type E, Grade B. Electric Resistance Welded Steel Pipe meeting the requirements of ASTM A135 2009, Type E, Grade A. Electric Resistance Welded Steel Pipe meeting the requirements of ASTM A795 2012, Type E, Grade A. Seamless Carbon Steel Pressure Pipe Grades B&C and is acceptable to NACE standard MR0103-2012 Edition and A106 2011/ASME SA106 2011 Seamless Carbon Steel Pressure Pipe Grades B&C and is acceptable to NACE standard MR0103-2012 Edition and MR0175/ISO 15156-2, 2009 Edition. Seamless Pipe is Nondestructive Electric Tested (full body eddy current). API pipe meeting the requirements of ANSI/API Specification 5L 45th Edition or ANSI/API Specification 5CT 9th Edition.

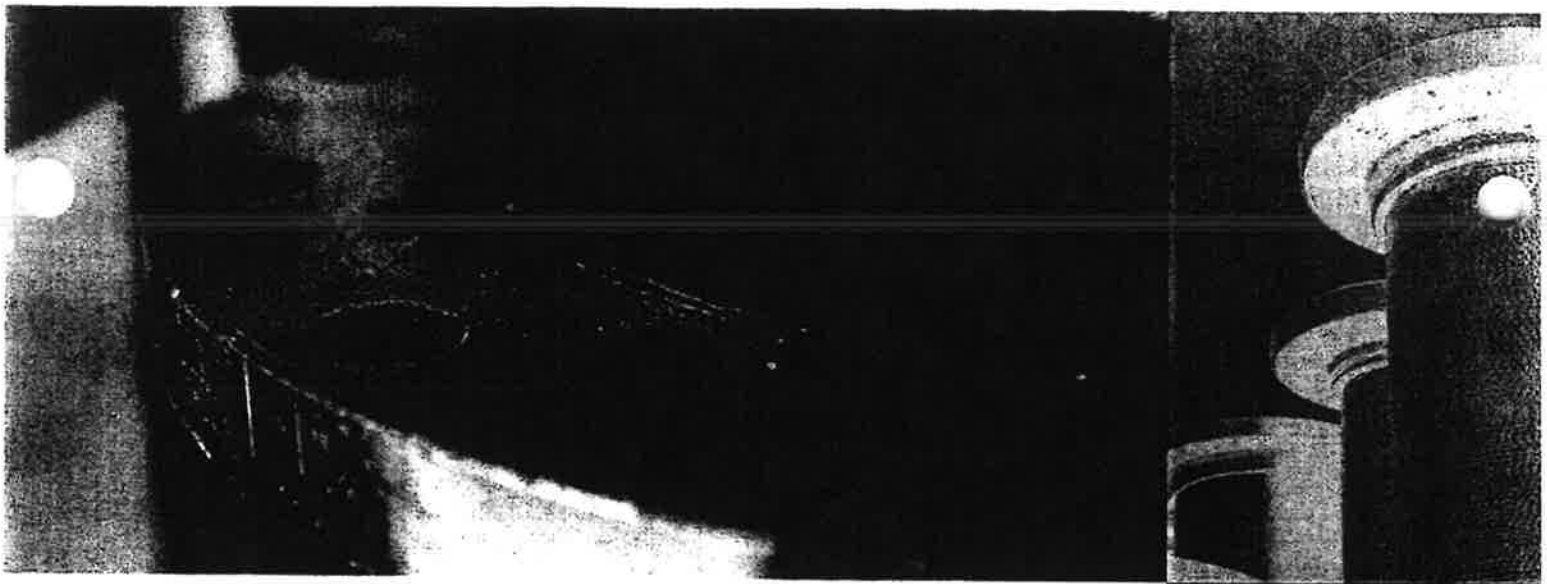
Michael S. Ryan

Michael S Ryan
Manager Technical Services

CERTIFICATE OF COMPLIANCE TO STANDARDS

101 Vertical Fabrication's Ductile Iron pipe is fabricated to the following standards.

1. Ductile Iron pipe is manufactured in accordance with all applicable requirements of ANSI A12.51 and AWWA C151 Standards.
2. Ductile Iron flanges are drilled and faced to meet ANSI B16.1 Standard. Upon request Class 250# flange, meeting ANSI B16.6 are available
3. Flange Ductile Iron pipe spools are fabricated in accordance with all applicable requirements of ANSI 21.15 and AWWA C115.
4. Grooved Ductile Iron pipe spools are fabricated in accordance with all applicable requirements of ANSI/AWWA C606. Rigid groove is standard. Flex groove is available.
5. Ductile Iron pipe cement lining is manufactured in accordance with the requirements of ANSI A21.4/AWWA C104. Standard or double thickness as required. Other linings available upon request.
6. Ductile Iron pipe exterior will be coated with asphalt tar in accordance with ANSI A21.51/AWWA C151. Other coatings available upon request.
7. All coating and lining for exterior piping and all lining for interior piping, is certified to be in compliance with NSF 61 for potable water. Conforms to ANSI A.4/AWWA C104.



DUCTILE IRON

101 Pipe & Casing's reputation for quality materials, prompt service and meticulous workmanship are our highest priority for the threaded and grooved ductile iron pipe spools. All threaded pipe ends are separately machined to match the threads of each individual ductile iron flange. This creates a near-perfect fit with face-to-face measurements conforming to the specified length dimensions.

All threaded surfaces are coated with a threading compound/sealant, then machine power-tightened and aligned. Unless otherwise specified, all of our ductile iron pipe has cement lining on the interior wall. Other linings such as glass, epoxy, polyethylene or bare can be supplied as requested. All ductile iron pipe used has a class 53 minimum thickness.

Tight industry tolerances restrict us from offering threaded pipe with loose flanges unless the customer waives our responsibility for meeting specifications.

The following specifications are met or exceeded in the manufacturing of our flanged or grooved spools:

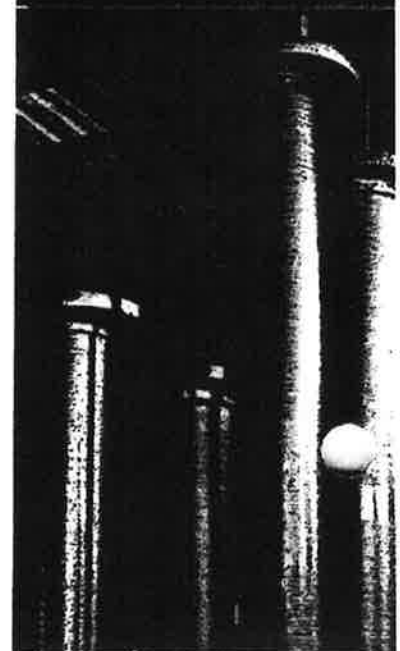
MATERIAL SPECIFICATIONS

AWWA C 151 or ANSI A 21.5	Ductile iron centrifugally cast in metal mold
AWWA C 104 or ANSI A 21.4	Cement mortar lining for ductile iron pipe
ASTM 536	Ductile iron flanges
ANSI B2.1 (NPT)	Threaded for flanges class 125 & 250
ANSI B 16.1	Facing and drilling for class 125 flanges
ANSI B 16.6	Facing and drilling for class 250 flanges

FABRICATION SPECIFICATIONS

AWWA C 115 or ANSI 21.15	Ductile iron spool fabrication
ANSI B2.1 (NPT)	Threaded for ductile iron pipe
ANSI A 21.15 Section 15-8.4	Flange two-hole
AWWA C 115 or ANSI A 21.15	Flange face-to-face parallelism
AWWA C 606	Pipe grooving

**We maintain
an inventory of
Ductile Iron Pipe
in diameters from
3" - 36".**





Model FSC

Ductile Iron "Y" Type Strainer

Application

Designed for installation on potable water lines to protect downstream equipment from malfunction or premature failure due to build-up of sediment or debris.

Standards Compliance

- MIL-S 16293F Type 2
- Certified to NSF/ANSI 372* by IAPMO R&T
*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

Main valve body Ductile Iron ASTM A536
Access cover Ductile Iron ASTM A536
Coatings FDA Approved Fusion Epoxy Finish
(Meets requirements of NSF/ANSI 61)
Screens Perforated Stainless Steel, 300 Series

Features

Sizes: 2 1/2", 3", 4", 6", 8", 10", 12"

Pressure/temperature: 200 psi @ 150°F WOG
125 psi @ 450°F Steam

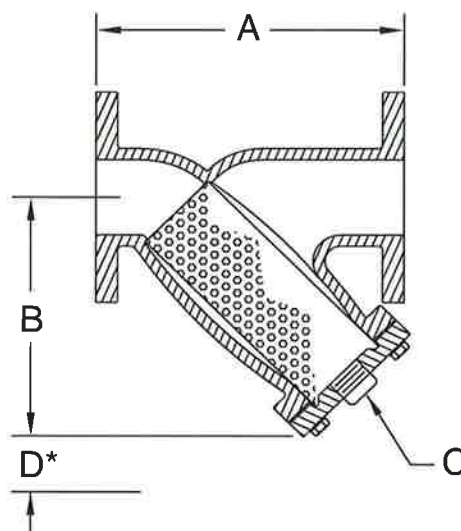
End connections: Flanged Class 125 lb

Screen

SIZE inch	OPENINGS (dia.)	MATERIAL THICKNESS	HOLES PER sq(in)
2 1/2	0.045	0.020	225
3	0.045	0.020	225
4	0.062	0.020	98
6	0.062	0.020	98
8	0.125	0.020	29
10	0.125	0.032	29
12	0.125	0.025	35

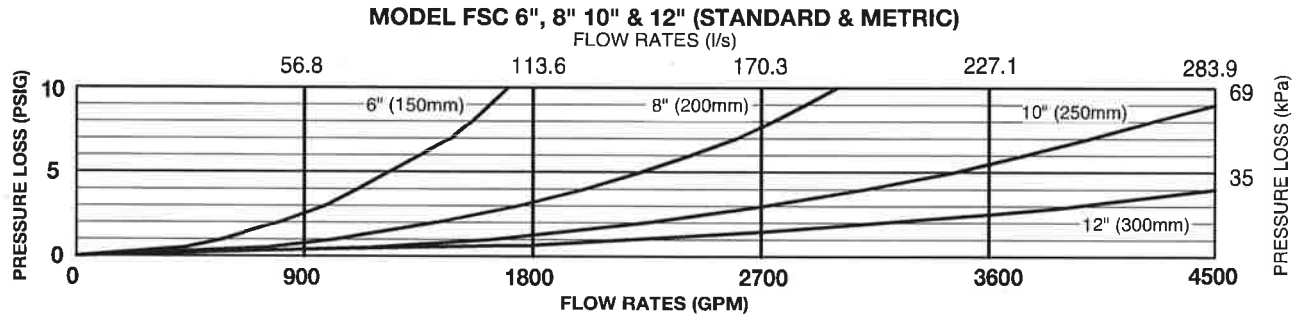
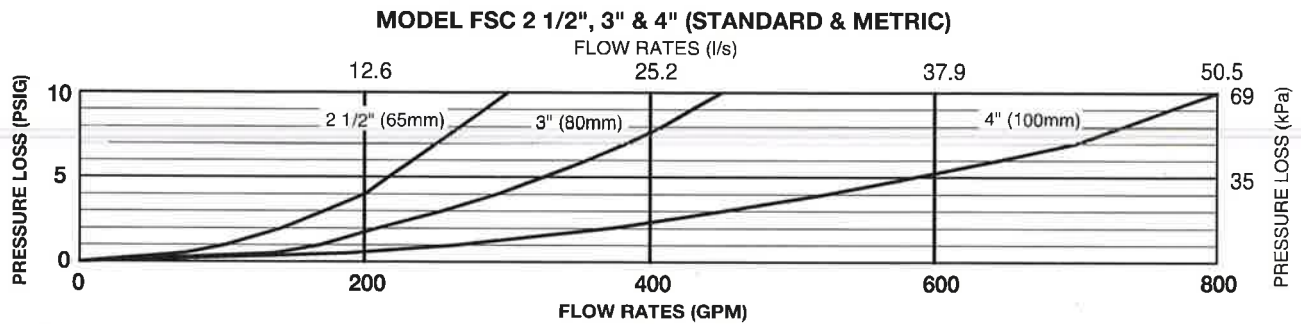


LEAD FREE



SIZE		DIMENSIONS (approximate)							WEIGHT	
		A		B		C	D*			
in	mm	in	mm	in	mm		in	mm	lbs.	kg.
2 1/2	65	10	254	8 1/4	210	1 1/4 NPT	6	152	35	16
3	80	10 1/2	267	9 1/4	235	1 1/4 NPT	6	152	45	20.5
4	100	15	381	12 1/2	318	2 NPT	9	229	61	27.5
6	150	18	457	14	356	2 NPT	10	254	165	75
8	200	24 1/4	616	17 3/4	451	2 NPT	11	279	239	108.5
10	250	29 1/2	749	21 1/4	540	2 NPT	14	356	394	178.5
12	300	33 3/4	857	24	610	2 NPT	17	432	500	227

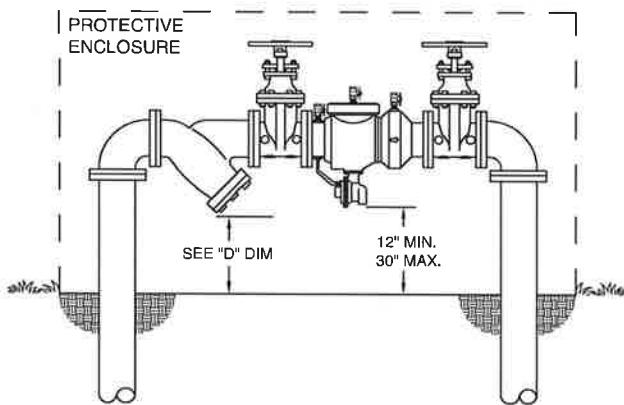
*Vertical clearance for screen removal



Typical Installation

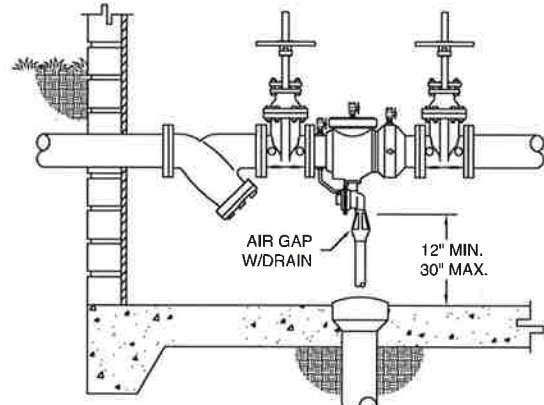
Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted with sufficient clearance for maintenance in accordance with the manufacturers' instructions and the latest edition of the Uniform Plumbing Code. The installation shall be made so that no part of the unit can be submerged. Horizontal installation with the strainer cap facing downward is the preferred installation orientation; however the strainer will provide protection in any orientation

Capacity thru Schedule 40 Pipe (GPM)				
Pipe Size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687
12"	1744	2617	3489	5233



DIRECTION OF FLOW ➡

Outdoor Installation



DIRECTION OF FLOW ➡

Indoor Installation

Specifications

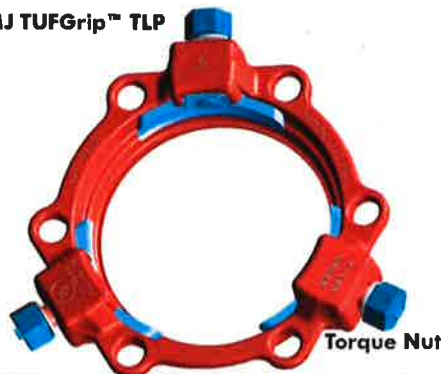
The Ductile Iron "Y" type strainer meet the requirements of NSF/ANSI 372, and in compliance with MIL-S-16293F Type 2. The main body and access cover shall be ductile iron ASTM A536 with an FDA Approved Fusion Epoxy Finish coating inside and out. The integral strainer screen shall be accessible for cleaning without removing the device from the line. The Ductile Iron "Y" type strainer shall be a ZURN WILKINS Model FSC.



TUFGRIP™

Series 2000 for PVC & PVCO Pipe
"A Proven Third Generation Mechanical Joint Restraint"

MJ TUF Grip™ TLP



Tyler Union's TUF Grip restraints represent the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC pipe.



Designed by Harold Kennedy & Associates, Inc.

"BETTER BY DESIGN"

SPECIFICATIONS:

- Proven to restrain plain end PVC pipe in diameters 3" thru 36" and PVCO pipe in diameters 4" thru 12"
- Restraint design conforms to applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated for working water pressure of 305 psi for 3"-12", 235 psi for 14"-24", 150 psi for 30", and 125 psi for 36" (details on page 2)
- Cast of ASTM compliant 65-45-12 ductile iron complete with cast on date code and country of origin for traceability
- Restraint and all components are designed and proven for a 2:1 safety factor based on the PVC and PVCO pipe pressure rating
- Deflection rating when installed on pipe with nominal diameter shall be 3° for 3" thru 12", 2° for 14" thru 16", and 1.5° for 18" thru 36"
- Standard coating for Domestic restraint is 4-6 mil of TUF-Bond™ (thermoset polyester for impact, corrosion, and UV protection)
- Gripping wedge, wedge collar bolt and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 3" thru 12" applications
- Color coded red for pipe type (C900 PVC/C905 PVC/ *C909 PVCO/D2241 PVC) - ***Note: Refer to page 2 for C909 pipe applications**

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- There is no washer or spacer to remove when installing restraints on 3" to 12" ASTM D2241 PVC pipe with IPS outside diameter
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications
- Approved for use on multiple classes of pipe - Additional pressure ratings and associated pipe classes provided on pages 2 and 3

ISO 9001-2008 Registered

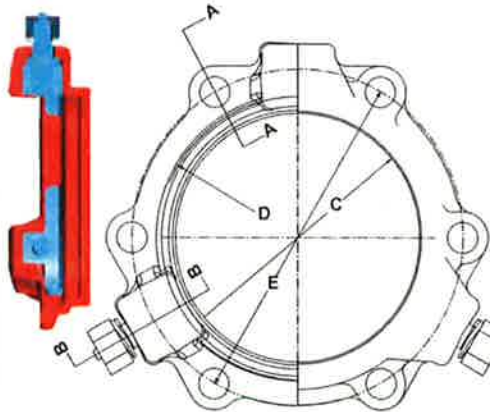
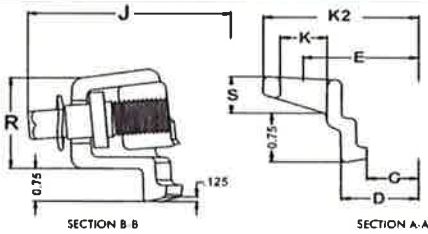
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Factory Mutual Approved

Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478
Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601
Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471



TUFGrip™ MJ Restraint Dimensions

Size (Inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53

SERIES 2000 TLP-PVC TUF Grip™ - APPLICATION CHART

Size (Inches)	Part No. - Gland Only		Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight(lbs.)	Weight (w/Acc.)	*Pressure Rating	Pipe O.D. (Inches)
	Domestic	Non-Domestic							
3	CALL	/ 113928	2	4	5/8" x 3"	7.0	11.0	*305 / DR14	3.50
4	516002	/ 113935	2	4	3/4" x 3.5"	8.3	12.2	*305 / DR14	4.50-4.80
6	516019	/ 113942	3	6	3/4" x 4"	12.4	18.3	*305 / DR14	6.63-6.90
8	516026	/ 113959	3	6	3/4" x 4"	14.9	20.8	*305 / DR14	8.63-9.12
10	516033	/ 113973	6	8	3/4" x 4"	25.7	33.4	*305 / DR14	10.75-11.10
12	516040	/ 113980	8	8	3/4" x 4"	34.1	42.0	*305 / DR14	12.75-13.20
14	516248	/ 113997	10	10	3/4" x 4.5"	45.1	55.4	*235 / DR18	15.30
16	516262	/ 114000	12	12	3/4" x 4.5"	56.2	68.4	*235 / DR18	17.40
18	516286	/ 114017	12	12	3/4" x 4.5"	62.4	74.8	*235 / DR25	19.50
20	516309	/ 114024	14	14	3/4" x 4.5"	72.9	86.9	*235 / DR25	21.60
24	516323	/ 114031	16	16	3/4" x 5"	93.2	109.8	*235 / DR25	25.80
30	CALL	/ 461302	20	20	1" x 7.5"	251	293	*150 / DR25	32.00
36	CALL	/ 461357	24	24	1" x 7.5"	281	331	*125 / DR25	38.30

*Note: The pressure ratings are rated working water pressures for the restraint. See page 3 for additional ratings.

ISO 9001-2008 Registered

Listed with Underwriters Laboratory

Factory Mutual Approved

STOP-LOOK :

- Extra length T-Head bolts are provided with 30"- 36" restraints to facilitate mechanical joint assembly per AWWA C600
- For UL/FM Approvals, 3"- 12" were tested to 755 psi, 14"-16" were tested to 755 psi and 18"- 24" inch were tested to 535 psi
- TUF Grip 30-36 inch provided with TRU-Lock™ mechanical joint gasket to ensure pressure rating & safety factors are met
- Mechanical joint T-head bolt torques for C909 applications are as provided; *55-65 ft.-lbs for 4" to 8" and *65 to 75 ft.-lbs. for 10" to 12" assembly. You must specify restraints are for C909 PVCO pipe upon order placement. Call for availability
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651
- TUF Grip 4" to 24" restraints shall meet the requirements of ASTM F1674, current revision
- **Caution:** Pressure testing of piping systems restrained or un-restrained with insufficient backfill or bracing is not recommended

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**ADDITIONAL SERIES 2000 TLP-TUF GRIP™ RESTRAINT RATINGS									
SIZE (Inches)	AWWA C900			AWWA C905			ASTM D2241		
	DR14	DR18	DR25	DR18	DR25	DR32.5	SDR17	SDR21	SDR26
3	-	-	-	-	-	-	250	200	160
4	305	235	165	-	-	-	250	200	160
6	305	235	165	-	-	-	250	200	160
8	305	235	165	-	-	-	250	200	160
10	305	235	165	-	-	-	250	200	160
12	305	235	165	-	-	-	250	200	-
14	-	-	-	235	165	125	-	-	-
16	-	-	-	235	165	125	-	-	-
18	-	-	-	200	165	-	-	-	-
20	-	-	-	200	165	-	-	-	-
24	-	-	-	165	165	125	-	-	-
30	-	-	-	-	165	125	-	-	-
36	-	-	-	-	125	125	-	-	-

****Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only**

****Note: AWWA C909 PVCO Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe**

Assembly steps for (3"-12" ASTM D2241 IPS PVC), (4"-12" AWWA C909 PVCO), and (4"-36" AWWAC900/C905 PVC)



1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the RED TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the ****MJ gasket** over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. ****NOTE:** Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T-Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 3", 5° max for 4"-12", 2° max for 14"-16", 1.5° max for 18"-36". **NOTE:** Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 3"- 45-60 ft.-lbs., 4"- 24"-75-90 ft.-lbs., and 30"- 36"- 100-120 ft.-lbs.
NOTE: The C909 PVCO T-Head bolt and nut torque is 55-65 ft.-lbs. for 4"-8" and 65-75 ft.-lbs. for 10"-12" restraints.
DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVCO PIPE!
6. ****Hand-tighten** the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. **NEVER** turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount!
****NOTE:** For IPS and PVCO applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

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www.tylerunion.com

Model 375

Reduced Pressure Principle Assembly

Application

Designed for installation on potable water lines to protect against both backsiphonage and backpressure of contaminated water into the potable water supply. The Model 375 provides protection where a potential health hazard exists. Ideal for use where lead-free* valves are required.

Standards Compliance

(Unless Otherwise Noted, Sizes 2 1/2" Thru 10")

- ASSE® Listed 1013
- IAPMO® Listed
- CSA® Certified B64.4 (2 1/2" thru 8")
- AWWA Compliant C511, and C550
- FM® Approved
- UL® Classified
- C-UL® Classified
- NYC MEA 49-01-M Vol 2
- Approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California.
- Meets the requirements of NSF/ANSI 61*

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

Main valve body	Ductile Iron ASTM A 536
Access covers	Ductile Iron ASTM A 536
Coatings	NSF Approved fusion epoxy finish
Internals	Stainless steel, 300 Series NORYL™
Fasteners	Stainless Steel, 300 Series
Seal rings	EPDM (FDA approved)
O-rings	Buna Nitrile (FDA approved)
Springs	Stainless Steel, 300 Series
Sensing line	Stainless Steel, braided hose

Features

Sizes:	2 1/2", 3", 4", 6", 8", 10"
Maximum working water pressure	175 PSI
Maximum working water temperature	140°F
Hydrostatic test pressure	350 PSI
End connections (Grooved for steel pipe)	AWWA C606
(Flanged)	ANSI B16.1
	Class 125

Attention:

Model 375 (flange body) and Model 375A (grooved body) have different lay lengths.



Options

(Suffixes can be combined)

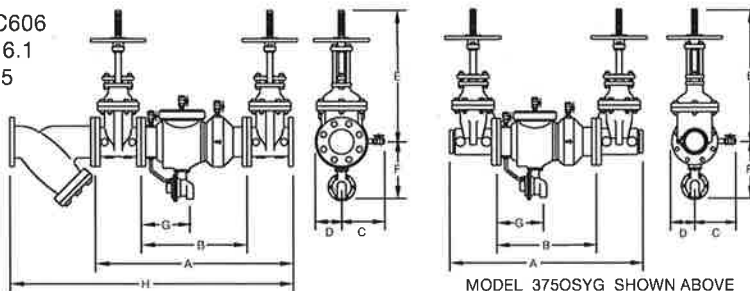
- ☐ - with NRS shut-off valves (standard)
- ☐ FSC - with epoxy coated wye type strainer (flanged only)
- ☐ G - with grooved end NRS gate valves
- ☐ GF - with grooved inlet connection and flanged outlet connection
- ☐ FG - with flanged inlet connection and grooved outlet connection
- ☐ L - less shut-off valves (flanged body connections)
- ☐ MS - with Integral Relief Valve Monitor Switch
- ☐ OSY - with OS&Y gate valves
- ☐ PI - with Post Indicator gate valve
- ☐ BG - with grooved end butterfly valves with integral supervisory switches
- ☐ -509 - with AWWA C509 gate valves

Accessories

- ☐ Repair kit (rubber only)
- ☐ Thermal expansion tank (Model XT)
- ☐ OS & Y Gate valve tamper switch (OSY-40)
- ☐ Air gap (Model AG)
- ☐ Electronic Solenoid Timer (Model EST)
- ☐ QT-SET Quick Test Fitting Set

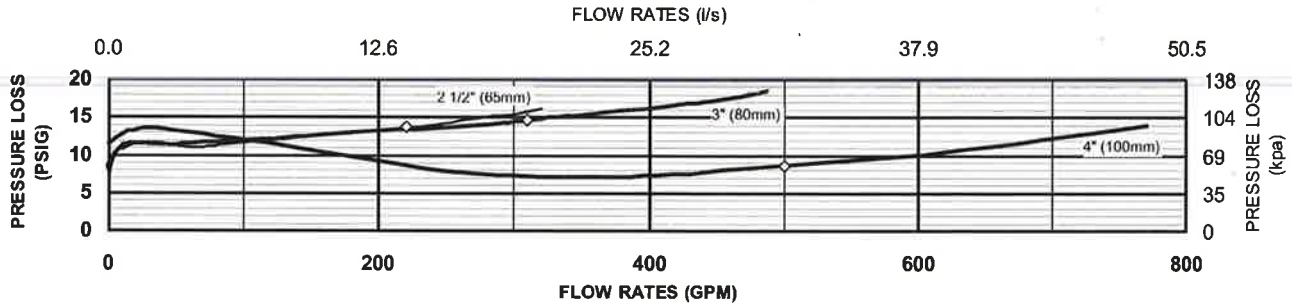
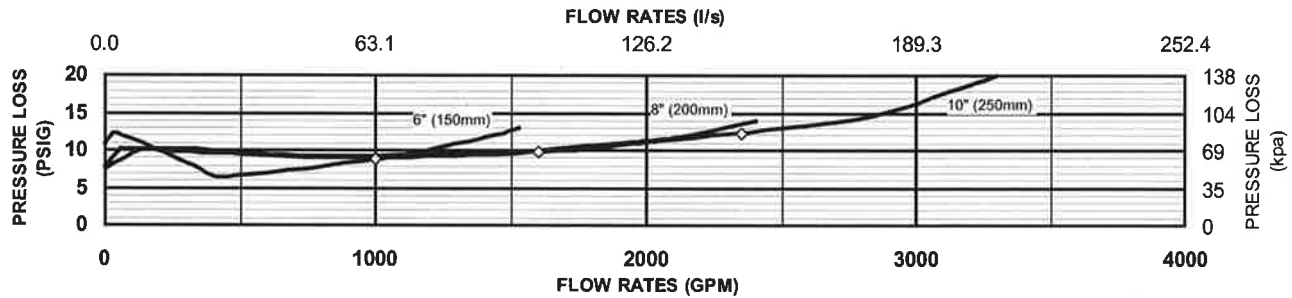
Relief Valve discharge port:

2 1/2" - 6"	- 2.75 sq. in.
8" - 10"	- 3.69 sq. in.



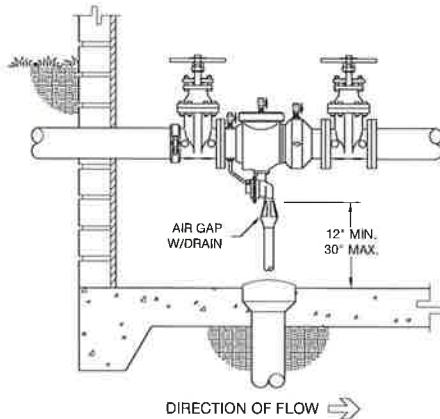
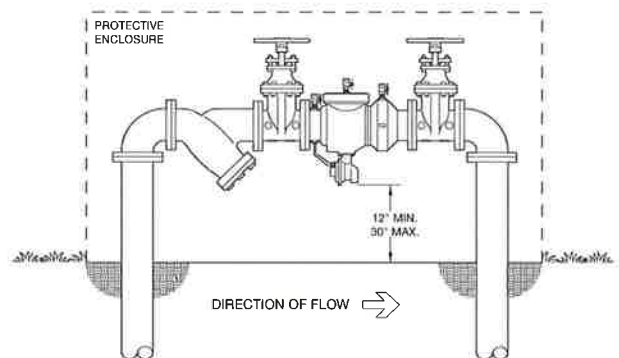
Dimensions & Weights (do not include pkg.)

MODEL 375 SIZE	DIMENSION (approximate)																				WEIGHT																
	A		A WITH BUTTERFLY VALVES		B LESS GATE VALVES		C		D		E OS&Y OPEN		E OS&Y CLOSED		E NRS GATE		E WITH BUTTERFLY VALVES		F	G	H	LESS SHUT-OFF VALVES	NRS GATE VALVES FLANGED	NRS GATE VALVES GROOVED	OS&Y GATE VALVES FLANGED	OS&Y GATE VALVES GROOVED	BUTTERFLY VALVES GROOVED										
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg							
2 1/2	65	31	787	26	711	15 7/8	403	7 1/4	184	3 3/4	95	17 3/4	451	15 3/8	391	11 1/2	292	8 1/4	210	9 1/2	241	8 3/8	213	41 1/4	1048	60	27	162	73	144	65	170	77	152	69	132	60
3	80	32	813	28 1/2	724	15 7/8	403	7 1/4	184	3 3/4	95	17 3/4	451	15 3/8	391	11 1/2	292	8 1/4	210	9 1/2	241	8 3/8	213	41 1/4	1048	60	27	162	73	144	65	170	77	152	69	132	60
4	100	37 5/8	956	32 8/9	835	19 1/2	495	8	203	4 1/2	114	22 1/2	572	18 1/4	464	14 1/2	368	9	229	11	279	9 1/4	235	52 3/4	1340	98	44	276	126	260	118	268	131	274	124	182	83
6	150	44 3/4	1137	37 5/8	956	23 1/2	597	10	264	6	152	30 1/2	775	24 1/4	616	18	457	10 1/4	260	12 3/8	314	10 3/4	273	62 3/4	1594	176	79	459	208	451	196	475	215	449	204	293	133
8	200	60 3/4	1543	53 7/8	1369	37 3/4	959	11	279	10	254	37	940	28 1/2	724	21 1/8	537	12	305	15 3/8	391	16 3/4	425	85	2159	377	171	829	376	795	361	853	387	805	365	551	250
10	250	83 3/4	1619	57 7/8	1470	37 3/4	959	11	279	10	254	45 5/8	1159	34 3/4	883	24 3/4	629	13	330	15 3/8	391	16 3/4	425	93 1/4	2369	407	185	1167	529	1101	499	1225	556	1159	526	795	361

MODEL 375 2 1/2", 3" & 4" (STANDARD & METRIC)**MODEL 375 6", 8" & 10" (STANDARD & METRIC)****Typical Installation**

Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted at a minimum of 12" (305mm) and a maximum of 30" (762mm) above adequate drains with sufficient side clearance for testing and maintenance. The installation shall be made so that no part of the unit can be submerged.

Capacity thru Schedule 40 Pipe (GPM)				
Pipe size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687
12"	1763	2644	3525	5288

**INDOOR INSTALLATION (375GF)****OUTDOOR INSTALLATION****Specifications**

The Reduced Pressure Principle Backflow Prevention Assembly shall be certified to NSF/ANSI 61, ASSE® Listed 1013, and supplied with full port gate valves. The main body and access cover shall be epoxy coated ductile iron (ASTM A 536), the seat ring and check valve shall be NORYL™, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The checks and the relief valve shall be accessible for maintenance without removing the device from the line. The Reduced Pressure Principle Backflow Prevention Assembly shall be a ZURN WILKINS Model 375.



Specification Submittal Sheet

Series 600 – Panel Design

Insulated Enclosures

Materials

- Roof, walls, and drain panel – 5052-H32 marine grade aluminum (.050/18 gauge), mill finish, ASTM B209 outside
- Drain panel hinge and spring – stainless steel
- Insulation 1 ½" (9 "R" value) minimum thickness polyisocyanurate foam laminated to a glass fiber reinforced facer (each side), non-wicking
- Mounting hardware – 300 series stainless steel or T-6 aluminum
- Wedge anchors – Powers SDI – ½" x 3 ¾"

Standards

- ASSE 1060
- ASTM B209



Heating Required

- ☐ Yes – see separate specification submittal sheet
- ☐ No

Dimensions

Model	Inside Diameter			Concrete Pad			Ship Wt	Access Panels	Access Panel Size		Drain Opening	
	W	L	H	W	L	H			W	H	W	H
600-AL	36	100	56	50	114	6	364	2	38 ¼	56	38 ¼	6 ½
600D-AL	70	108	56	84	122	6	515	2	38 ¼	56	38 ¼	6 ½
600DS-AL	70	128	56	84	142	6	575	4	38 ¼	56	38 ¼	6 ½
600LU880-AL*	36	38	48	50	52	6	245	2	28	48	28	6 ½
600T-AL	36	100	64	50	114	6	500	2	38 ¼	64	38 ¼	6 ½
600TM-AL	36	100	70	50	114	6	534	2	38 ¼	70	38 ¼	6 ½
600TD-AL	70	108	64	84	122	6	560	2	38 ¼	64	38 ¼	6 ½
600TDS-AL	70	128	64	84	142	6	590	4	38 ¼	64	38 ¼	6 ½
600TLU880-AL*	44	38	48	58	52	6	212	2	36	48	36	6 ½
600TS-AL	38	120	64	52	134	6	524	2	38 ¼	64	38 ¼	6 ½

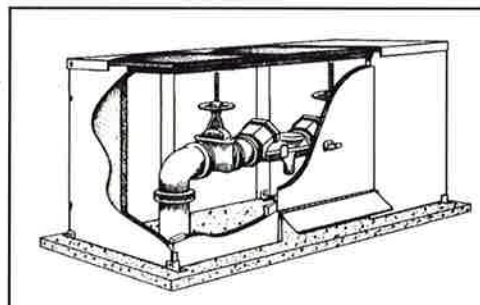
*Standard compact design models include hinged lift-up roof

All dimensions in inches.

Specifications

A freeze and vandal protective enclosure shall be installed over above ground plumbing systems. The enclosure shall be constructed of 5052-H32 marine grade aluminum with a minimum R9 in the walls and R18 in the roof. Molded fiberglass enclosures will be rejected. Cut board insulation shall be used for uniform insulation thickness. Sprayed insulation shall be reason for rejection. Redwood post and beams shall be utilized for structural support. The use of "Particle board" shall be reason for rejection. The roof of the enclosure shall be removable for maintenance. Enclosures requiring tape to seal the roof seams are prohibited. The enclosures shall have a fully insulated drain panel designed to remain closed, except when discharging water. The drain panel shall be sized to accommodate the maximum discharge for backflow installations. The enclosure shall be mounted securely to a concrete pad and remain locked even if outside screws are removed. All mounting hardware shall be furnished. The enclosure shall withstand straight line winds up to 110 mph with standard anchoring hardware. Sturdier anchoring hardware shall be made available to withstand straight line winds up to 130 mph.

When heat is required, a slab mounted UL or ETL listed heater shall be provided that has been independently certified to meet the UL-2021 "Rain Test" for damp or wet conditions. Wall-mounted air heaters and self-regulating cables shall not be used as the heat source. The enclosure shall be certified to the most recent ASSE Standard 1060 (Class I or Class II). The insulated enclosure shall be a Safe-T-Cover Series 600.



Description

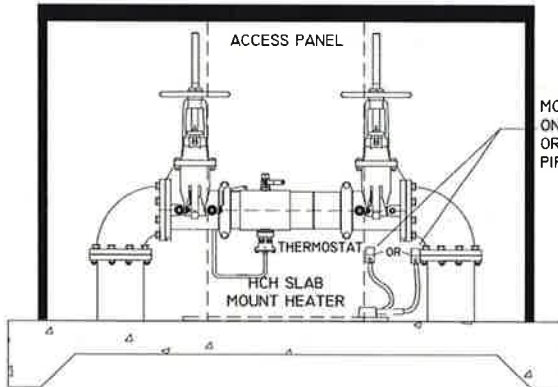
The enclosure is designed to provide freeze and vandal protection of above ground backflow prevention assemblies, meters, PRV, etc. The enclosure provides for safe and easy testing and maintenance. The enclosure disassembles easily if full equipment replacement is needed.



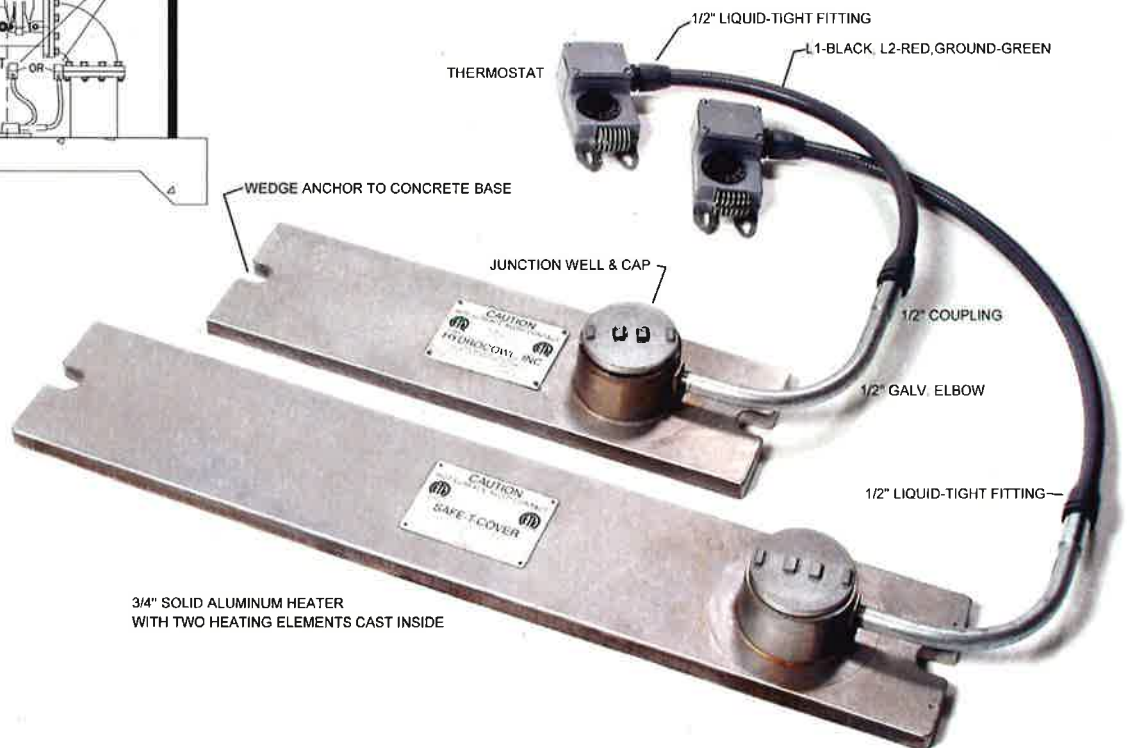
ENCLOSURES DESIGNED FOR THE WORLD'S WATER SYSTEMS™

600T-AL HEATED ENCLOSURE

Electric HCHS/HCH Heating Systems



Note: Remove heater from carton and check for shipping damage. Damage Claims should be entered immediately with carrier.



3/4" SOLID ALUMINUM HEATER
WITH TWO HEATING ELEMENTS CAST INSIDE



READ CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT DESCRIBED. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS AND SAFETY INFORMATION COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

Maintenance & Servicing

1. DANGER — Hazard of electric shock! Disconnect all power before attempting to service this heater.

After long periods of idleness, accumulated combustible particles should be removed.

Specifications

20 AMP BREAKER REQUIRED

Catalog No.	Voltage	Wattage	BTUH	Phase	Amps
HCHS500-120	120	500	1707	Single	4.16
HCHS1000-120	120	1000	3413	Single	8.33
HCHS1000-240	240	1000	3413	Single	4.16
HCH2000-120	120	2000	6824	Single	16.66
HCH2000-240	240	2000	6824	Single	8.33

DANGER!

DO NOT DEPEND UPON THE THERMOSTAT AS THE SOLE MEANS OF DISCONNECTING THE POWER WHEN INSTALLING OR SERVICING THE PRODUCT IT IS CONTROLLING. ALWAYS DISCONNECT POWER AT THE MAIN CIRCUIT BREAKER. FAILURE TO DO SO CAN RESULT IN FATAL ELECTRIC SHOCK.

DANGER!

NE DÉPENDEZ PAS DU THERMOSTAT COMME LES SEULS MOYENS DE DÉBRANCHER LE POUVOIR EN INSTALLANT OU EN ASSURANT L'ENTRETIEN DU PRODUIT QU'IL CONTRÔLE. DÉBRANCHEZ TOUJOURS LE POUVOIR AU DISJONCTEUR PRINCIPAL. L'ÉCHEC DE FAIRE PEUT AVOIR POUR RÉSULTAT AINSI LE DÉCHARGE ÉLECTRIQUE FATAL.

INSTALLATION INSTRUCTIONS



Note: Read entire instructions before installation. Installation must be made by trained, experienced service person.



PROVIDE GROUND-FAULT INTERRUPTER DEVICE IN ELECTRICAL CIRCUIT. ALL WIRING SHOULD BE AS PER THE GOVERNING LOCAL AND NATIONAL CODES AND ORDINANCES.

Do not use connection methods which are non-watertight or that are not approved for NEMA 4X installation. Failure to prevent water entry may result in electrical failure with risk of fire, property damage or fatal injury.

1. Install 1/2" Galvanized elbow into threaded hole of junction well on the heater. **NOTE:** Because of the heat, ONLY the 1/2" Galvanized elbow should be installed in the junction well.
2. Install 1/2" coupling on the end of the Galvanized elbow.
3. Install 1/2" male "liquid tight" fitting into coupling. **NOTE:** These joints should be "liquid tight".
4. Remove desired knock-out from thermostat and install "liquid tight" fitting.
5. Install desired length of flexible conduit.
6. Remove threaded cap from junction well of heater and feed wires thru conduit. **NOTE:** Wire and terminal ends must be rated for high temperature use. Wire as per wiring schedule for required wattage. (See Wiring, TABLE 1)
7. Wire thermostat as per thermostat manufacturer's installation instructions. Ground wire must be used.
8. Replace cap and tighten to seal. The torque for the cover is 13 Nm.

MOUNTING INSTRUCTIONS

1. Do **not** attempt to cut, saw or alter in any way the size of the heater.
2. Place and **center** the heater directly on concrete **underneath** the installed device.
3. **Center heater** on concrete **between side walls** of the enclosure.
4. Mount heater to concrete using two (2) fasteners w/large washers. **NOTE:** Leave heater **loosely mounted** to allow for expansion and contraction.
5. Mount thermostat on vertical support adjacent to the access opening of the enclosure or wire-tie to the nearest riser pipe
6. For heater to be most effective, thermostat should be 8"-12" above the slab.

OPERATION INSTRUCTIONS

Caution: HAZARD OF FIRE. Keep combustible materials at least 6" away from heater.

Prudence: HASARD DE FEU. Gardez des matières combustibles au moins 6" loin du réchauffeur.

Danger: HAZARD OF FIRE. This heater is not intended for use in hazardous atmospheres where flammable vapors, gases, liquids, or other combustible atmospheres are present as defined in the National Electric Code. Failure to comply can result in explosion or fire.

Danger: HASARD DE FEU. Ce réchauffeur n'est pas destiné pour l'utilisation dans les atmosphères dangereuses où les vapeurs inflammables, les gaz, les liquides, ou d'autres atmosphères combustibles sont présents comme défini dans le Code Électrique national. L'échec de se conformer peut avoir pour résultat l'explosion ou le feu.

Danger: PERSONAL INJURY OR DEATH could result from electric shock. Disconnect all power to heater at main panel before attempting to install, service or repair this device.

Danger: la BLESSURE PERSONNELLE OU LA MORT pourraient provenir du décharge électrique. Débranchez tout le pouvoir du réchauffeur au comité principal avant d'essayer d'installer, assurer l'entretien ou réparer cet appareil.



WIRING (Table 1)

As per following diagrams
Model No. Drawing No.

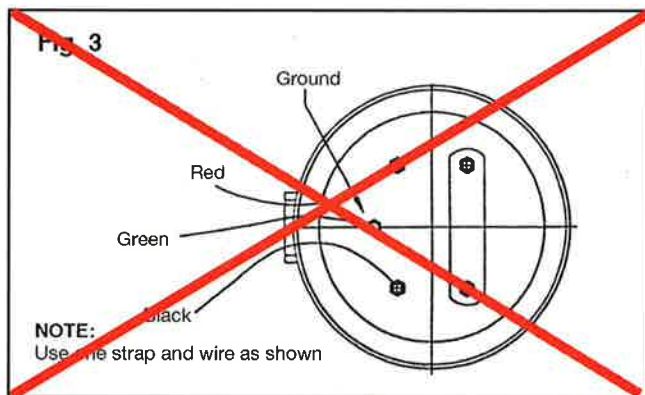
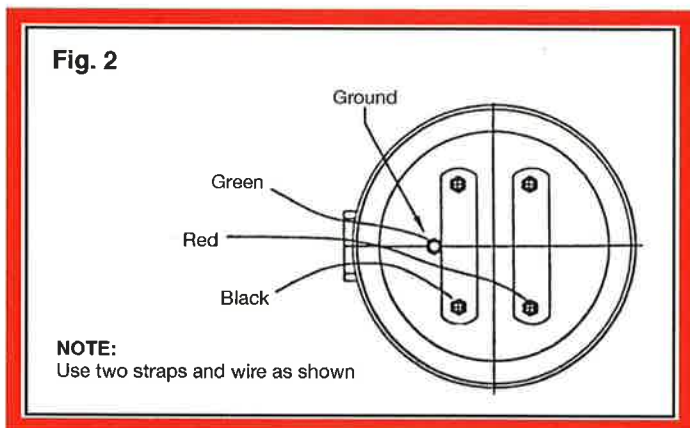
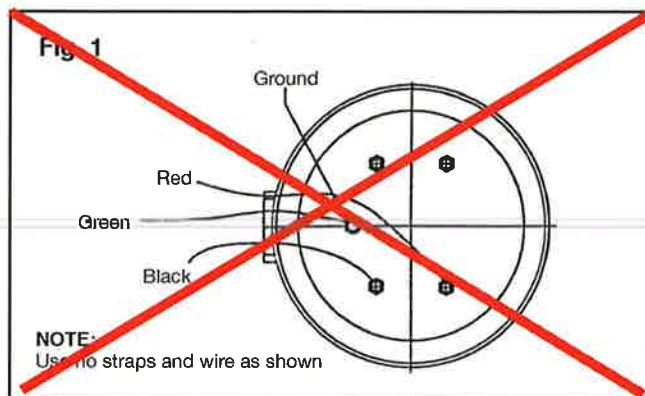
~~HCHS500-120 Fig. 1~~

~~HCHS1000-120 Fig. 2~~

~~HCHS1000-210 Fig. 3~~

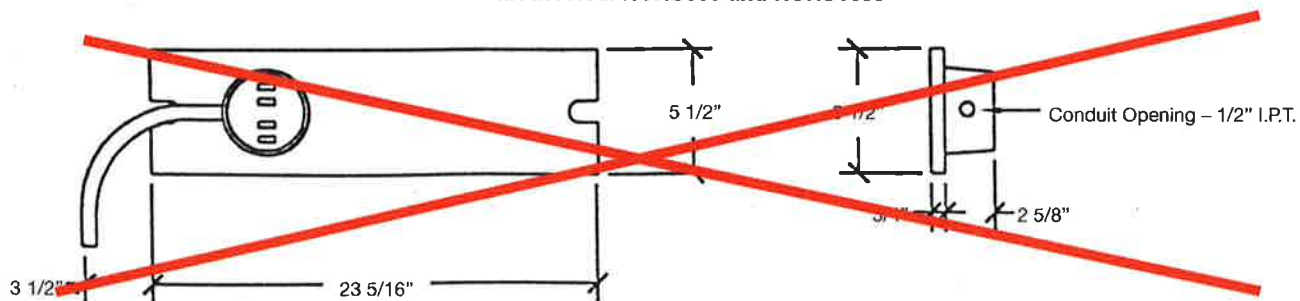
HCH2000-120 Fig. 2

~~HCH2000-210 Fig. 2~~

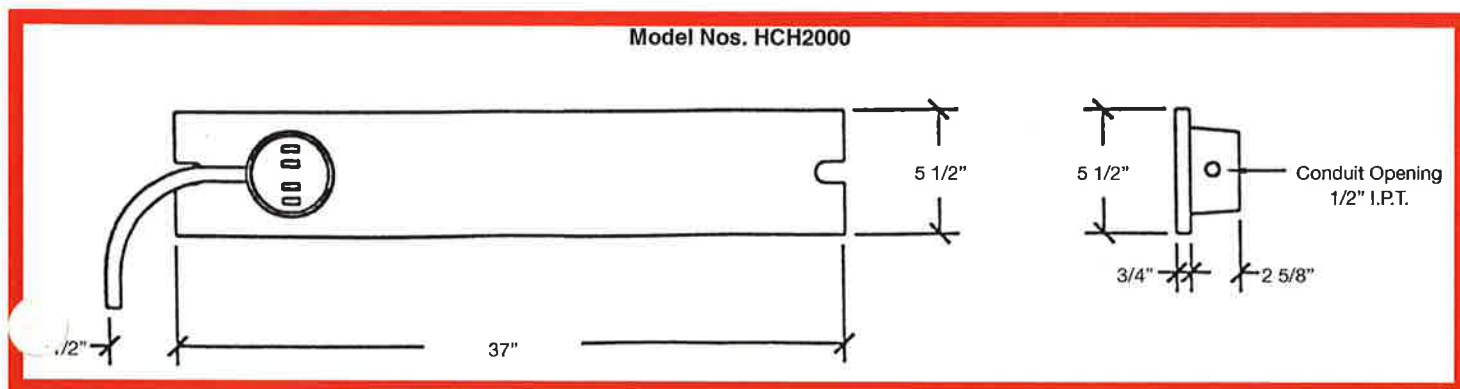


HEATER DIMENSIONS

Model Nos. HCHS500 and HCHS1000



Model Nos. HCH2000



Replacement Parts Identification

Item	Part Name	Qty	Catalog No.
1	Heater	1	HCHS001
2	Thermostat w/mounting screws	1	HCHS002
3	Wiring kit	1	HCHS003

Replacement Parts Identification

Item	Part Name	Qty	Catalog No.	Item	Part Name	Qty	Catalog No.
1	Fasteners	1	HCHS004	6	Ground screw	1	HCHS009
2	1/2" x 10" nipple	1	HCHS005	7	12 ga. high temp wire L-1 (black)	48"	HCHS010
3	1/2" coupling	1	HCHS006	8	12 ga. high temp wire L-2 (white)	48"	HCHS011
4	1/2" "liquidtight" fitting	2	HCHS007	9	12 ga. high temp wire ground (green)	48"	HCHS012
5	1/2" "liquidtight" conduit	28"	HCHS008	10	High temperature terminal ends	3	HCHS013

LIMITED WARRANTY

THREE YEAR LIMITED WARRANTY: Safe-T-Cover by HydroCowl warrants to the original purchaser for a period of three (3) years from the date of original shipment that the HCH Heater is free from defects in materials and workmanship. For limited warranty claim procedures, see CLAIM DISPOSITION below.

LIMITATION OF LIABILITY: In no event shall Safe-T-Cover by HydroCowl be liable for incidental or consequential damages. Safe-T-Cover by Safe-T-Cover by HydroCowl's liability in all events is limited to, and shall not exceed, the purchase price paid.

WARRANTY DISCLAIMER: Safe-T-Cover by HydroCowl makes no other representation or warranty of any kind, expressed or implied, in fact or in law, including without limitation, the warranty of merchantability or the warranty of fitness for a particular purpose. There are no warranties which extend beyond the description on the face hereof.

PRODUCT SUITABILITY: Many states and localities have codes and regulations which may vary from those in neighboring areas. Safe-T-Cover by HydroCowl attempts to assure that its products comply with such codes, however, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Review the product application, all national and local codes and regulations, and be sure that the product, installation and use will comply with them.

CLAIM DISPOSITION: The limit of Safe-T-Cover by HydroCowl's liability for failure of this product to meet the foregoing warranty shall be, at Safe-T-Cover by HydroCowl's sole option, for repair or replacement of the defective product and shall exclude any damage caused by accident, misuse or abuse of the product. For any product believed to be defective within the limited warranty time, write or call the supplier from whom the product was purchased. If unable to obtain satisfactory results, call Safe-T-Cover by HydroCowl at telephone number listed below. Furnish name of the supplier, address, date and number of supplier's invoice. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.



ENCLOSURES DESIGNED FOR THE WORLD'S WATER SYSTEMS™

800-245-6333



SAFE-T-COVER®

by Hydrocowl

Superior Freeze and Vandal Protective Enclosures Since 1988

**MATERIAL SUPPLIER'S CERTIFICATE CERTIFYING COMPLIANCE WITH
ARRA BUY AMERICAN PROVISIONS**
(To be attached to each specification / drawing)

PROJECT OWNER: _____

CONTRACT NO: _____

CONTRACT NAME: _____

PROJECT NAME: _____

SPECIFICATION / DRAWING DESCRIPTION: **Aluminum Enclosures**

CERTIFICATION:

I, the undersigned, hereby certify that the above noted item(s) is in full and complete conformance with the **ARRA BUY AMERICAN** provisions contained in the American Recovery and Reinvestment Act of 2009.

MATERIAL SUPPLIER: **SAFE-T-COVER** DATE: _____

Name: **LORI PATTON**

Signed: *Lori Patton*

Title: **OPERATIONS MANAGER**

Address: **2710 LANDERS AVENUE**

NASHVILLE, TN 37211

Telephone: **(615) 259-4495**

Fax: **(615) 259-4481**

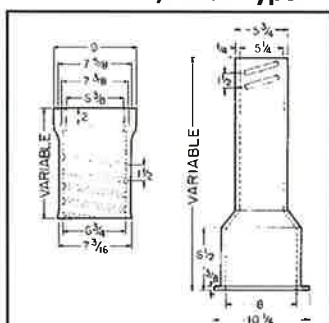
Employer ID Number: **62-1610488**

SUBMITTAL

(Current Revisions for All Standards Apply)

- SIZES:** Adjustable Slip and Screw type with standard assembled 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 access., lids, rings, bases, risers, meter covers, etc.
- STANDARDS:** Produced with Class 35 cast iron in accordance with and meeting all applicable terms and provisions of ASTM A-48. 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 exposed to cold or sticky when exposed to the sun.

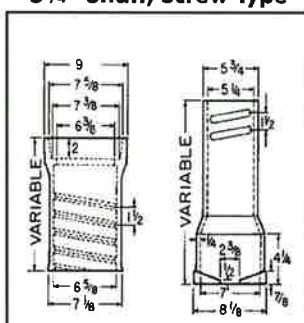
**For 4" to 12" Valves
5 1/4" Shaft, Screw Type**



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

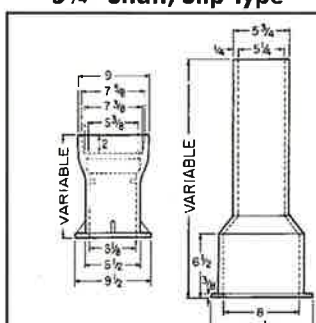


**6860 SCREW TYPE
VALVE BOX
Cast Iron - 3 piece**

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

NOTE: Base Required,
Order Separately

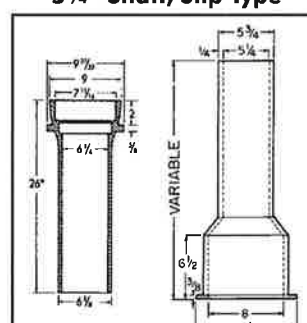
**For 4" to 12" Valves
5 1/4" Shaft, Slip Type**



**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

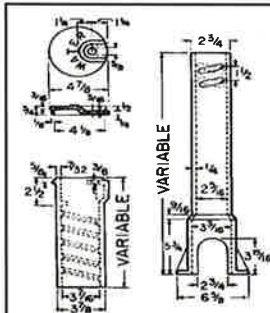
**For 4" to 12" Valves
5 1/4" Shaft, Slip Type**



**7126 SLIP TYPE
VALVE BOX**

Components	Extension Height
26T + 24B	28-48
26T + 30B	34-54
26T + 36B	40-60
26T + 24B + #60 Ext	52-72
26T + 36B + #60 Ext	60-80

NOTE: Use the 6855 Bottoms
with these Tops



For 1/2" to 2" Curbstops

**6500 SCREW TYPE
CURB / SERVICE BOX**

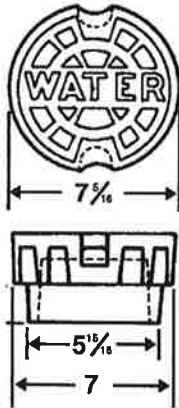
Components	Extension In Inches
18T & 27B	30-42
18T & 33B	36-48
24T & 33B	36-54
24T & 39B	42-60
30T & 39B	41-64

*Enlarged Base Available

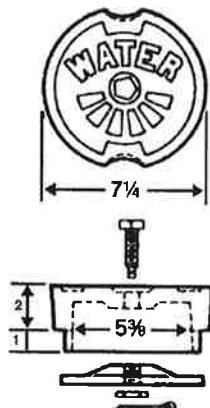
**T = Top
B = Bottom
EXT = Extension**

Tyler/Union

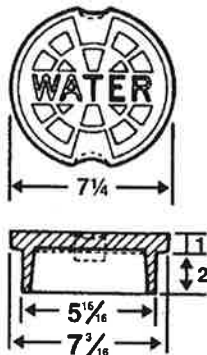
STANDARD & SPECIAL DROP & LOCK LIDS



Drop Lid



Lock Lid

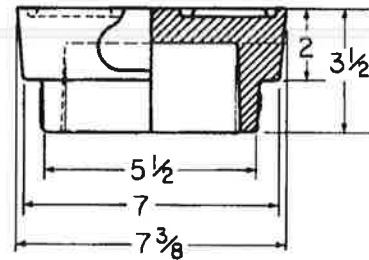


1 1/8" Lid

LIDS ("WATER")

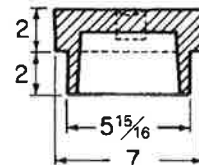
Item/Description	UPC No.	Weight
5 1/4 Drop Lid	145325	12
5 1/4 Lock Lid	145462	11
1 1/8 Lid*	145509	11

*Use with 1 1/8" Riser Only.



5 1/4" MWW DROP LID

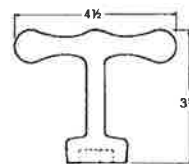
UPC No	Weight
670610	
145370	12



5 1/4" OMA DROP LID

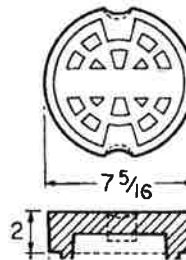
UPC No.	Special Markings	Weight
670610		
145301	WATER OMA*	12

*OMA marking is inside lid.



WRENCH Fits Standard Waterworks Pentagon Head 27/32" Brass Screws

UPC No	Ship Code	Description	Weight
670610			
144908	S	Wrench	0.5



5 1/4" DROP LID W/SPECIAL MARKINGS*

UPC No.	Special Mark	Weight
670610		
145332	GAS	12
145349	SEWER	12
145356	PLAIN	12

*Lids marked with "WATER" will be shipped unless otherwise specified.



"Buy America(n)" & Product Certificate of Compliance

Address: 1501 W. 17th. Street -- Anniston, AL 36201

Telephone No.: (800) 226-7601

Fax Number: (800) 226-0806

Date: January 6, 2014

To: Whom It May Concern

Re: Buy America /Buy American Certification for Tyler Union Waterworks Made in the U.S.A Products

We appreciate the opportunity to supply our products for your projects requiring to some or full extent product that is substantially or wholly manufactured in the U.S.A. Tyler Union Waterworks certifies that its Domestic manufactured fittings and cast iron municipal castings are wholly manufactured in the U.S.A. using only raw materials that wholly originate in the U.S.A..

After a thorough review of "Buy America/Buy American" acts; Tyler Union certifies that our Domestic ANSI/AWWA fittings and ASTM cast iron municipal castings meet all applicable requirements and provisions as provided for by the U.S. Department of Transportation and the Federal standards noted for domestic iron and steel construction materials incorporated into your project . These standards/laws/acts and revisions date from 1933 through current year 2014.

Buy American:

- American Recovery and Reinvestment Act of 2009 (ARRA), Section 1605
- Federal Aviation Administration (FAA), 49 U.S.C. § 50101

Buy America:

- Federal Highway Administration (FHWA), 23 U.S.C. § 50101§ 313 – Buy America; 23 C.F.R. § 635.410
- Federal Railroad Administration (FRA), 49 U.S.C. Chapters 244, 246: § 24405 – Buy America
- National Railroad Passenger Corporation (AMTRAK), 49 U.S.C. § 24305
- Federal Transit Administration (FTA), 49 U.S.C. § 5323(j); 49 C.F.R. Part 661 (Buy America Requirements)

If your domestic project material requires additional certifications as provided; you must advise the Tyler Union Waterworks product Distributor or Customer Service Agent upon order placement. Additional certifications available include **1) mill certification, 2) project and/or product specific certificate for accessories, and 3) coating certificate.** Our purchase order system maintains purchase and shipping order information for a minimum of 12 months. For tracking purposes these orders indicate if the product processed and shipped was domestic in origin.

Tyler Union certifies its 2" through 48" Domestic ANSI/AWWA fittings are cast with tested and traceable ASTM A536 compliant ductile iron that is designed for use with and conforms to all the applicable terms and requirements of ANSI/AWWA C153/A21.53, ANSI/AWWA C151/A21.51, ANSI/AWWA C115/A21.15, ANSI/AWWA C111/A21.11, ANSI/AWWA C116/A21.16, ANSI/AWWA C110/A21.10, and ANSI/AWWA C104/A21.4. Additionally Tyler Union certifies its Domestic made in the U.S.A. cast iron municipal products (Valve box, Service box, and Accessories) are produced in accordance with and meet all applicable terms and provisions of ASTM-A48. Current revisions apply for each noted standard.

Best Regards,

Roger Dunning
Roger Dunning

Technical Support Manager

Tyler Union Waterworks

Email: roger.dunning@tylerunion.com

Tel.: (800)527-8478

Project Name: _____

Project Location: _____

Project Material: _____

Location of Mfg.: _____

Project Contractor: _____

Tyler Union Distributor: _____

Project No.: _____

Union Foundry - Anniston, AL 36201 – U.S.A.

Subscribed and sworn to before me this 6th. Day of January 2014

Sandra C Smith

Sandra Smith – Notary Public – Smith County, Texas



Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478

Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601

Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

Elmira: 1021 East Water • Elmira, NY 14902

New Lenox: 2200 West Haven • New Lenox, IL 60451

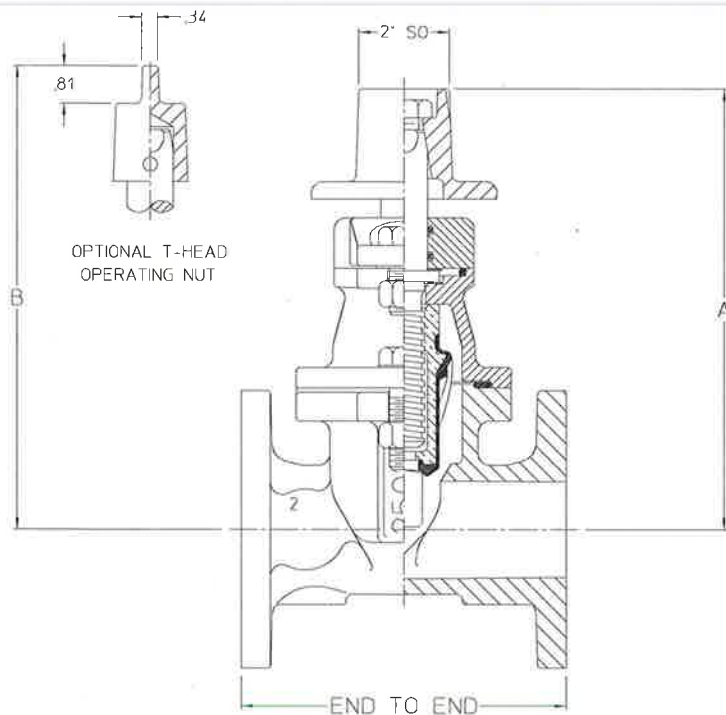
Portland: 6204 N. Marine Dr. • Portland, OR 97203

www.tylerunion.com

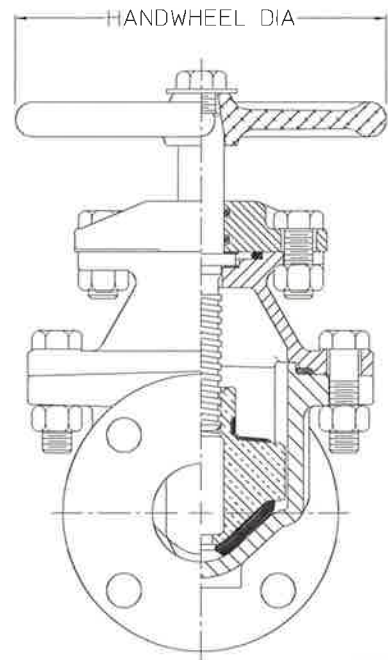
This document is void if modified in any manner other than the addition of project information, name of contractor and/or product distributor

AMERICAN Flow Control Submittal Information

2" SERIES 2500 RESILIENT WEDGE GATE VALVE, NRS

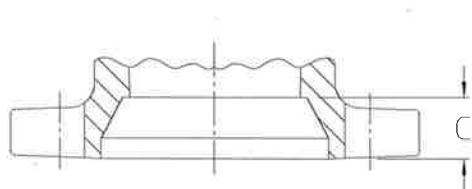


SHOWN WITH 2" OPERATING NUT

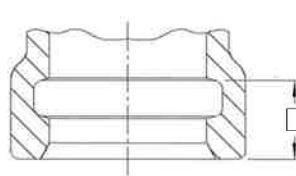


SK951010-6

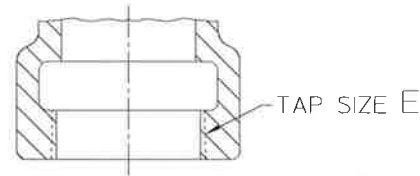
SHOWN WITH OPTIONAL HANDWHEEL



MECHANICAL JOINT (MJ)



PVC



THREADED (SCREW)

OPTIONAL END CONNECTIONS

DIMENSION	2" VALVE SIZE
End to End - MJ/MJ	8.25
End to End - FL/FL	7.00
End to End - PVC/PVC	10.75
End to End - Threaded	6.25
A	9.25
B	10.22
C	2.50
D	3.75
E	2 NPT
Handwheel Diameter	8.00
No. of Turns to open	9

NOTES:

1. Bolt pattern of flanged ends are in accordance with ASME B16.1, Class 125.
2. Mechanical joint ends are in accordance with ANSI/AWWA C153/A21.53.
3. PVC ends are for steel (IPS) sizes of PVC or steel pipe.
4. Threaded ends are in accordance with ASME B16.4, Class 125 (see dimension E).



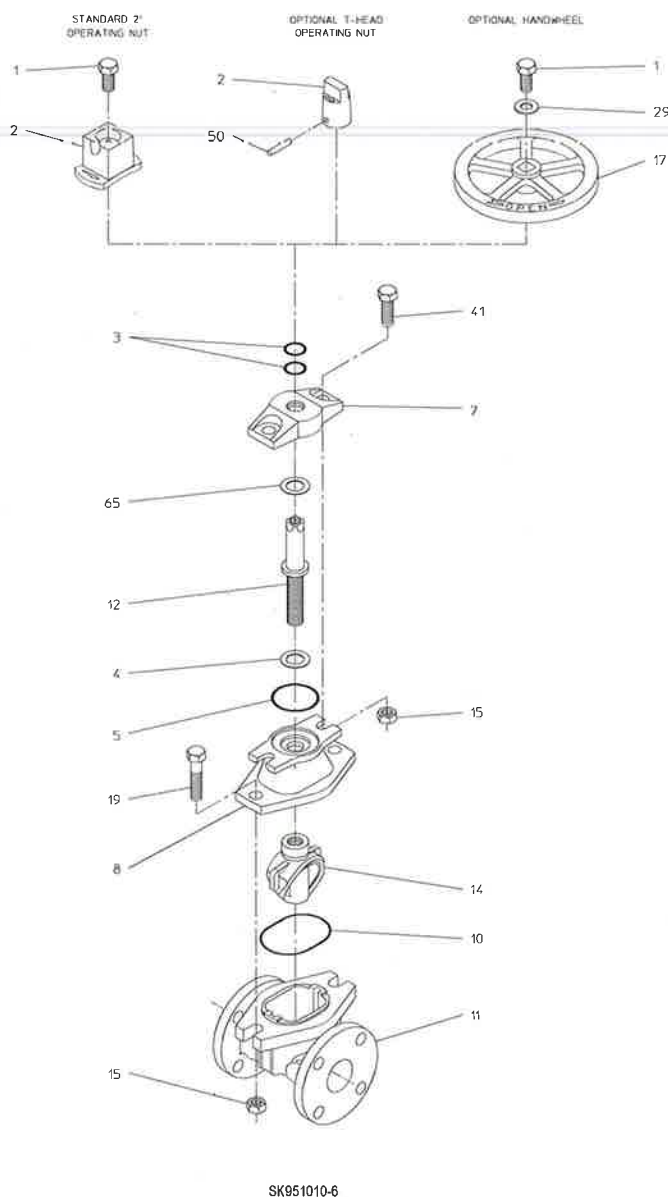
AMERICAN
FLOW CONTROL

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



SK951010-6

Construction shown is typical of the 2-inch size with flanged end connections and is illustrative only. Construction of other end connection types vary slightly. See elsewhere on this submittal for specific details.

REF NO.	DESCRIPTION	MATERIAL
1	Hex Head Bolt, 5/8-11 x 1"	304 Stainless Steel
2	Operating Nut	2" Square & T-Head: Ductile Iron, ASTM A536
3	O-Ring	Rubber
4	Lower Thrust Washer	Nylon 101, Federal Spec No. L-P-401A
5	Stuffing Box Gasket	Rubber O-ring
7	Stuffing Box	Ductile Iron, ASTM A536
8	Bonnet	Ductile Iron, ASTM A536
10	Bonnet Gasket	Rubber O-ring
11	Body	Ductile Iron, ASTM A536
12	Stem	Manganese Bronze, ASTM B763, UNS C86700
14	Resilient Wedge	EPDM Rubber Coated Cast NDZ-S Bronze, ASTM B763, UNS C99500
15	Hex Nut, 5/8-11	304 Stainless Steel
17	Handwheel	Cast Aluminum, ASTM B26, Alloy 535
19	Hex Head Bolt, 5/8-11 x 2-1/4"	304 Stainless Steel
29	Flat Washer, 5/8	304 Stainless Steel
41	Hex Head Bolt, 5/8-11 x 1-1/2"	304 Stainless Steel
50	Spiral Pin, 5/16 x 1-1/2"	302 Stainless Steel
65	Upper Thrust Washer	304 Stainless Steel

OPTIONAL MATERIALS ARE AS FOLLOWS

BOLTS and NUTS: 316 Stainless Steel

STEM: Stainless Steel

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

NOTES:

1. Meets applicable requirements of ANSI/AWWA C515 with 250 psig rated working pressure although the standard does not cover valves smaller than 3-inch.
2. Fusion-bonded epoxy-coated in accordance with ANSI/AWWA C550.
3. Certified to NSF/ANSI 61 and 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



AMERICAN

**FLOW CONTROL
WATEROUS**

THE RIGHT WAY

Shana Quick
Baker Utility Supply
2351 Aztec Road NE
Albuquerque, NM 87107

February 5, 2014

Subject: Certificate of Origin – Buy American
Product: AMERICAN Flow Control Series 2500/2500-1
Resilient Wedge Gate Valve
AMERICAN Waterous Pacer Fire Hydrant

Dear Ms. Quick:

This is to certify that the product listed above is manufactured by the Waterous Company in South Saint Paul, Minnesota, in the United States of America, and these products comply with requirements of the federal American Recovery and Reinvestment Act of 2009 (ARRA) including the Buy American provision in Section 1605.

Waterous Company is a subsidiary of AMERICAN and manufactures products marketed and sold by the AMERICAN Flow Control division of AMERICAN.

Sincerely,

Allan Nelson
Senior Product Engineer

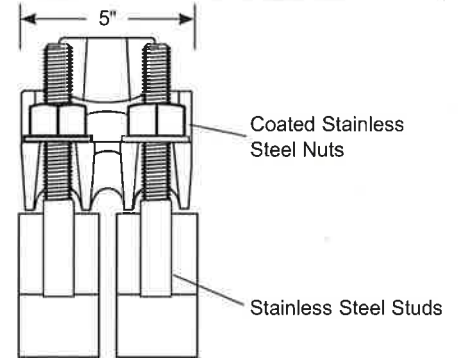
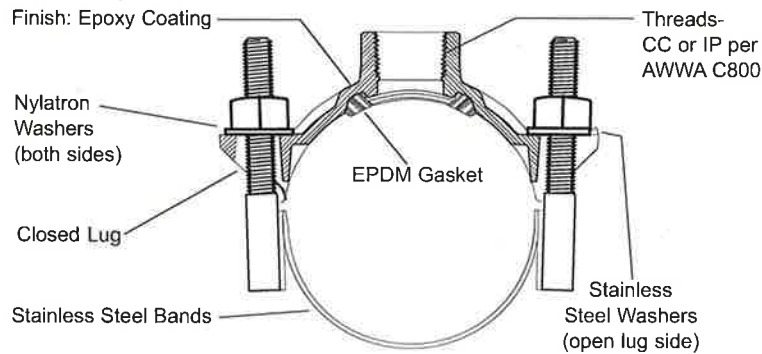
abnelson@waterousco.com
P: 651.450.5275
Waterous Company
125 Hardman Avenue South
South Saint Paul, MN 55075-2456

SUBMITTAL INFORMATION

Iron Service Saddles - (FCD202-xxx-TAP-I style)



DUAL BAND EPOXY COATING IRON SERVICE SADDLES FOR USE ON DUCTILE IRON AND A/C PIPE



NOM. PIPE SIZE	O.D. RANGE	APPROX. WT. LBS.	CATALOG NUMBER	✓ SUBMITTED ITEM(S)
2"	2.35 - 2.50	2.8	FCD202-250-TAP-I	
2-1/2"	2.75 - 2.90	2.8	FCD202-290-TAP-I	
3"	*3.46 - 3.80	4.8	FCD202-380-TAP-I	
	*3.80 - 4.25	5.5	FCD202-425-TAP-I	
4"	**4.26 - 4.80	5.4	FCD202-480-TAP-I	
	*4.74 - 5.26	5.4	FCD202-526-TAP-I	
	*4.50 - 5.40	5.4	FCD202-540-TAP-I	
6"	5.94 - 6.69	5.7	FCD202-669-TAP-I	
	6.63 - 6.90	5.7	FCD202-690-TAP-I	
	6.84 - 7.60	6.7	FCD202-760-TAP-I	
	6.63 - 7.61	6.7	FCD202-761-TAP-I	
8"	7.93 - 8.71	6.8	FCD202-871-TAP-I	
	8.63 - 9.05	8.2	FCD202-905-TAP-I	
	8.99 - 9.79	8.4	FCD202-979-TAP-I	
	8.63 - 9.80	8.4	FCD202-980-TAP-I	
10"	10.00 - 10.75	9.4	FCD202-1075-TAP-I	
	10.75 - 11.10	9.0	FCD202-1110-TAP-I	
	11.10 - 12.12	10.8	FCD202-1212-TAP-I	
	10.64 - 12.13	10.8	FCD202-1213-TAP-I	
	12.00 - 12.75	11.0	FCD202-1275-TAP-I	
12"	12.75 - 13.20	9.0	FCD202-1320-TAP-I	
	13.20 - 14.38	12.8	FCD202-1438-TAP-I	
	12.62 - 14.39	12.8	FCD202-1439-TAP-I	

I = Imported casting

* Saddles with this pipe range are not available with 2" CC (CC7) or 2-1/2" IP (IP8) threads.

** These saddles with 1-1/4" through 2-1/2" taps fit the top of the listed range only.
Example: FCD202-480-CC7-I fits 4.80" pipe O.D. only.

OUTLET TAP CODE CC (AWWA) THREAD

THREAD	CODE NUMBER	✓ SUBMITTED ITEM(S)
3/4" CC	CC3	
1" CC	CC4	
1-1/4" CC	Δ CC5	
1-1/2" CC	CC6	
2" CC	CC7	

IP THREAD

THREAD	CODE NUMBER	✓ SUBMITTED ITEM(S)
3/4" IP	IP3	
1" IP	IP4	
1-1/4" IP	Δ IP5	
1-1/2" IP	IP6	
2" IP	IP7	
2-1/2" IP	IP8	

Δ Contact factory for availability

FEATURES

- Body made of high strength ductile iron per ASTM A536
- Each dual band and 5/8" UNC threaded studs are 18-8 type 304 stainless steel. For saddles 3" or smaller, studs are 1/2"
- Gasket is EPDM rubber, ASTM D2000
- Finish on saddle body is fusion-bonded epoxy coating
- UL Classified to ANSI/NSF Standard 61

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.



The Ford Meter Box Company, Inc.
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
www.fordmeterbox.com

12/20/17

Submitted By:



The Ford Meter Box Company, Inc.

775 Manchester Avenue • P.O. Box 443, Wabash, Indiana U.S.A. 46992-0433
Phone: 260-563-3171 • Fax: 800-826-3487 • Overseas Fax: 260-563-0167 • www.fordmeterbox.com

April 20, 2010

Compliance to the Buy American Clause of the American Recovery and Reinvestment Act (ARRA) of 2009

CERTIFICATION of ORIGIN

For

F202, FS202, FSD202, FC202 & FCD202 SERVICE SADDLES

This is to certify that Ford Iron Service Saddles, sizes 2" through 30", shall be manufactured in the United States of America, of ductile iron per ASTM A536. Gaskets shall be EPDM rubber per ASTM D2000. The ductile iron saddles shall have an E-coat (style F202, FS202 or FSD202) or fusion bonded epoxy finish (style FC202 or FCD202), taps are provided with either Iron Pipe or CC (AWWA) threads.

This certification applies to styles F202, FC202, and FS202 service saddles (example: F202-690-CC4). Any saddle having an "I" at the end of the part number, does not comply with this certification (example: F202-690-CC4-I).

THE FORD METER BOX COMPANY, INC.

Melanie Boyll
Marketing Manager



MUNICIPAL PRODUCT SPECIFICATION

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell

NAPCO's ASTM D2241 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of water distribution and irrigation systems. With top quality raw materials and modern processing technology, our D2241 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our D2241 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.

Short Form Specification		
Pipe Standard:	ASTM D2241	
Diameter Std.:	Iron Pipe Size (IPS)	
Nominal Sizes:	1½", 2", 2½", 3", 4", 6", 8", 10", 12"	
Dimension Ratios & Pressure Ratings:	SDR 41 – 100 psi	SDR 21 – 200 psi
	SDR 32.5 – 125 psi	SDR 17 – 250 psi
	SDR 26 – 160 psi	SDR 13.5 – 315 psi
Lay Length:	14' – Made-to-order	
	20' – All Sizes	
	40' and 42' – 2" to 6" Sizes	
Pipe Compound:	ASTM D1784 Cell Class 12454	
Pipe Joint Std.:	ASTM D3139	
Max. Angular Joint Deflection:‡	1°	
Gasket Standard:	ASTM F477	
Gasket Material Offerings:	Standard – SBR Optional – NBR or EPDM	
Installation Std.:	ASTM D2774	

Applications	Potable Water	Wastewater	Reclaimed Water
Color:	White	Green	Purple
Certifications:*	NSF 14 NSF 61	None	None

‡See Installation Guide for more information.



Only products bearing the
NSF Mark are Certified



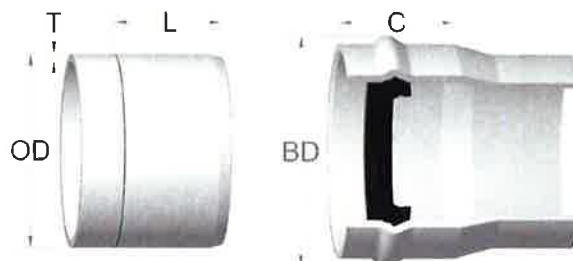
napcopipe.com | 1.855.624.7473

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MUNICIPAL PRODUCT SPECIFICATION

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell



D2241/IB PIPE DIMENSIONS & PERFORMANCE								
Nom. Size	Outside Diameter (OD)	SDR	Pressure Rating (psi)	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	Insertion Mark (L)
1 1/2"	1.900	21	200	0.090	1.720	2.625	3.250	2.625
		17	250	0.112	1.676			
		13.5	315	0.141	1.618			
2"	2.375	26	160	0.091	2.193	3.250	3.500	2.750
		21	200	0.113	2.149			
		17	250	0.140	2.095			
2 1/2"	2.875	13.5	315	0.176	2.023	4.000	4.125	3.125
		26	160	0.110	2.655			
		21	200	0.137	2.601			
3"	3.500	17	250	0.169	2.537	4.750	4.125	3.625
		13.5	315	0.213	2.449			
		41	100	0.085	3.330			
4"	4.500	32.5	125	0.108	3.284	5.875	4.625	4.000
		26	160	0.135	3.230			
		21	200	0.167	3.166			
4"	4.500	17	250	0.206	3.088	5.875	4.625	4.000
		13.5	315	0.259	2.982			
		41	100	0.110	4.280			
4"	4.500	32.5	125	0.138	4.224	5.875	4.625	4.000
		26	160	0.173	4.154			
		21	200	0.214	4.072			
4"	4.500	17	250	0.265	3.970	5.875	4.625	4.000
		13.5	315	0.333	3.834			

Notes:

1. These dimensions are for estimating purposes only. All dimensions are in inches unless otherwise specified.
2. SDR = Standard Dimension Ratio
3. ASTM Pressure Rating @ 73°F and includes 2:1 safety factor.
4. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
5. Dimension given for Approx. Bell Diameter (BD) is for highest pressure rating.



MUNICIPAL PRODUCT SPECIFICATION

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell

D2241/IB PIPE DIMENSIONS & PERFORMANCE								
Nom. Size	Outside Diameter (OD)	SDR	Pressure Rating (psi)	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	Insertion Mark (L)
6"	6.625	41	100	0.162	6.301	8.500	6.250	5.375
		32.5	125	0.204	6.217			
		26	160	0.255	6.115			
		21	200	0.316	5.993			
		17	250	0.390	5.845			
		13.5	315	0.491	5.643			
8"	8.625	41	100	0.210	8.205	10.625	7.250	6.375
		32.5	125	0.265	8.095			
		26	160	0.332	7.961			
		21	200	0.410	7.805			
		17	250	0.508	7.609			
10"	10.750	41	100	0.262	10.226	13.125	7.500	6.625
		32.5	125	0.331	10.088			
		26	160	0.413	9.924			
		21	200	0.511	9.728			
		17	250	0.632	9.486			
12"	12.750	41	100	0.311	12.128	15.550	8.250	7.375
		32.5	125	0.392	11.966			
		26	160	0.490	11.770			
		21	200	0.606	11.538			
		17	250	0.750	11.250			

Notes:

1. These dimensions are for estimating purposes only. All dimensions are in inches unless otherwise specified.
2. SDR = Standard Dimension Ratio
3. ASTM Pressure Rating @ 73°F and includes 2:1 safety factor.
4. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
5. Dimension given for Approx. Bell Diameter (BD) is for highest pressure rating.

NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY
P.O. BOX 969
SHIPROCK, NEW MEXICO 87420
PHONE: (505) 210-7070

LETTER OF TRANSMITTAL	
DATE	9-Sep-2019
JOB NO.	
ATTENTION:	Ronald Begay
RE:	NTUA Kiabeto Inter-tie
	Kaibeto, Arizona
	NECA Proj. No. 819141 - Kaibeto Inter-tie

TO: Navajo Tribal Utility Authority
PO Box 170
Fort Defiance, Arizona 86504-0170

GENTLEMEN:

WE ARE SENDING YOU

☒ ATTACHED ☐ UNDER

Separate cover via _____ THE FOLLOWING ITEMS:

- ☐ SHOP DRAWINGS ☐ PRINTS ☐ PLANS ☐ SAMPLES ☒ SPECIFICATIONS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐ As-Built

COPIES	DATE	NO.	DESCRIPTION
1	9-Sep-2019	4	NECA Material Take-Off List (13 pages)

THESE ARE TRANSMITTED As checked below:

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Remarks:

PLEASE SIGN, DATE, AND RETURN THE YELLOW COPY.

RECEIVED BY: _____

DATE: _____

COPY TO: NTUA (RB, AT, DS, DS, JD, AM, CH, DY) NHA (KD, VM, LL,
NN) NECA (WB, PM, GL, HP, BG)

SIGNED: _____
Ammerson T. Barber, Estimator/Coordinator

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE

2019-07-24

Kaibeto Inter-tie Item #1

8-19-141

NTUA - Waterline 4in C900 Pipe

Part#	Material Description	U/M	Summary
A4000042	Pipe, Pvc SDR21 4" 200PSI	LGTH	2

2019-07-24

Kaibeto-Item #2

8-19-141

NTUA - Waterline 6in Pipe

Part#	Material Description	U/M	Summary
A4000062	Pipe, PVC SDR21 6" 200PSI	LGTH	5

2019-07-24

Kaibeto-Item #3

8-19-141

NTUA - 4in Gate Valve


Part#	Material Description	U/M	Summary
D4010434	Valve, Gate DI 4" MJ	ea	3
S4000298	Rebar #4 (½"x20')	Lgth	2
S4000428	Tape, 10mil Poly Pipe Wrap 2"	RO	8
S4000263	Cement, Premix Concrete 80#	ea	16
	Valve Collar 24" x 24" x 4"	cuft	4
	Valve Thrust Block 4" Gate	cuft	6.94
<i>Special Order</i>	MJ Kit, DI 4" Trans Gasket w/bolts, <i>Ferguson</i>	ea	4
<i>Special Order</i>	MJ Kit, DI 4" Standard DI Gasket w/bolts, <i>Ferguson</i>	ea	2
<i>Special Order</i>	Megalug, 4" PVC Restraint, <i>Ferguson</i>	ea	4
<i>Special Order</i>	Megalug, 4" DI Restraint, <i>Ferguson</i>	ea	2
<i>Special Order</i>	Valve Box, 2-Piece Screw Type, 5-¼" Shaft w/Cast Iron Drop Lid, <i>Ferguson</i>	ea	3
<i>Special Order</i>	Blue, Carsonite Marker Post, <i>Ferguson</i>	ea	6

2019-07-24

Kaibeto-Item #4

8-19-141

NTUA - 6in Gate Valve

Part#	Material Description	U/M	Summary
D4010436	Valve, Gate DI 6" MJ	ea	1
S4000298	Rebar #4 (½"x20")	Lgth	1
S4000263	Cement, Premix Concrete 80#	ea	8
	Valve Collar 24" x 24" x 4"	cuft	1.33
	Valve Thrust Block 6"Gate	cuft	3.24
<i>Special Order</i>	MJ Kit, DI 6" Transition Gasket w/bolts, <i>Ferguson</i>	ea	2
<i>Special Order</i>	Megalug, 6" PVC Restraint, <i>Ferguson</i>	ea	2
<i>Special Order</i>	Valve Box, 2-Piece Screw Type, 5-¼" Shaft w/Cast Iron Drop Lid, <i>Ferguson</i>	ea	1
<i>Special Order</i>	Blue, Carsonite Marker Post, <i>Ferguson</i> 	ea	2

2019-07-24
8-19-141

Kaibeto-Item #5
NTUA - 6in MJ Elbow 22½°

Part#	Material Description	U/M	Summary
<i>Special Order</i>	Bend 22½°, 6" MJ DI, <i>Ferguson</i>	ea	1
<i>Special Order</i>	MJ Kit, DI 6" Transition Gasket w/bolts, <i>Ferguson</i>	ea	2
<i>Special Order</i>	Megalug, 6" PVC Restraint, <i>Ferguson</i>	ea	2
S4000263	Cement, Premix Concrete 80#	ea	3
	Thrust block 6" Elbow 22½°	cuft	1.96

2019-07-24
8-19-141

Kaibeto-Item #6
NTUA - Reducer 4x6 MJ

Part#	Material Description	U/M	Summary
Special Order	Reducer, DI 4" x 6" MJ, <i>Ferguson</i>	ea	1
Special Order	MJ Kit, DI 4" Trans w/bolts, Domestic, <i>Ferguson</i>	ea	1
Special Order	Megalug, 4" PVC Restraint, <i>Ferguson</i>	ea	1
Special Order	MJ Kit, DI 6" Trans w/bolts, Domestic, <i>Ferguson</i>	ea	1
Special Order	Megalug, 6" PVC Restraint, <i>Ferguson</i>	ea	1
S4000263	Cement, Premix Concrete 80#	ea	7
	Thrust block	cuft	4.63

2019-07-24
8-19-141

Kaibeto-Item #7
NTUA - Tee 4x4x4 MJ

Part#	Material Description	U/M	Summary
<i>Special Order</i>	Solid Sleeve, DI 4" MJ	ea	1
<i>Special Order</i>	MJ Kit, DI 4" Trans Gasket w/bolts	ea	5
<i>Special Order</i>	Megalug, 4" PVC Restraint	ea	5
<i>Special Order</i>	Tee, DI 4" MJ	ea	1
S4000263	Cement, Premix Concrete 80#	ea	3
	Thrust block 4" Tee	cuft	2.27

2019-07-24
8-19-141

Kaibeto-Item #08
NTUA - PRV 4"x2"

Part#	Material Description	U/M	Summary
<i>Special Order</i>	4" Flange x 8ft Plain End, DI Pipe, Baker Supply	Lgth	2
<i>Special Order</i>	Pipe Supporter 18"min. - 36"max. <i>Core & Main</i>	ea	5
	<u>Concrete Vault 6ft Wide x 8ft Length</u>		
<i>Special Order</i>	Plastic Coated Steel or Aluminum Step @ 16" O.C., Install to 12" above vault floor. 6' Depth x 6' Width x 8' Length (Int. Dim.) Precast Concrete Vault (4,000 psi Min.), 6" Thick Walls w/6" Thick Reinforced concrete top(non-traffic rated) and 6" reinforced concrete base. Vault Joints to be sealed w/bitumastic gasket. 2" Floor Drain center of vault. Vault Bore Donut, 6" w/4" Hole 5' x 5' SQ., Insulated, double door cover and safety grate, aluminum channel frame s/t-handle slam lock and covered padlock clip	As Req'd	1
S4000270	Portland Cement, Non-Shrink Grout 50#	ea	1
	<u>6" DIA. Bollards at 12" Min.</u>		
<i>Special Order</i>	6"DIA. X 5ft, Bollards painted blue cut @ 5ft, <i>HD Supply/Firebird, Baker Supply</i>	ea	4
S4000263	Cement, Premix Concrete 80#	ea	7
	Valve Collar V=3.14 x 3.3 ² x 60	cuft	4.75

2019-07-24
8-19-141

Kaibeto-Item #09
NTUA - Backflow Enclosure Assembly

Part#	Material Description	U/M	Summary
D4010091	Thread Stud, 5/8" x 4" w/Hex Nut	ea	40
H4060054	Flange, Gasket, 4" FF CL150	ea	5
S4000263	Cement, Premix Concrete 80#	ea	45
	Thrust Block for 2-bend 90's 4"	cuft	5.93
	Concrete base enclosure 50"x 114"x 6"	cuft	19.79
	Thrust Block for Reducer 6" x 4"	cuft	4.63
<i>Special Order</i>	MJ Kit, DI 4" Standard Gasket, w/bolts, Baker Supply	ea	2
<i>Special Order</i>	MJ Kit, PVC 4" Trans Gasket, w/bolts, Baker Supply	ea	2
<i>Special Order</i>	4"Flange x 7ft Plain End, DI Pipe, Baker Supply	Lgth	2
<i>Special Order</i>	Wye, Strainer(Flange), Cast Iron, <i>Wilkins</i> 4" Model 'FS' Series, Baker Supply	ea	1
<i>Special Order</i>	4" Tyler, Tuff Grip megalug for DI pipe, 1000S Series, Baker Supply	ea	2
<i>Special Order</i>	Backflow Preventer Assembly, 4" Wilkins Model 975 ,Baker Supply	ea	1
<i>Special Order</i>	Enclosure, Safe-T-Cover , Model #600 T AL, Baker Supply	ea	1
<i>Special Order</i>	Pipe Supporters, range from 24"min. - 48"max. Core & Main	ea	2
<i>Special Order</i>	Bend-90, DI 4" Flanged Ends, Baker Supply	ea	2
<i>Special Order</i>	Bend-90, DI 4" MJ, Baker Supply	ea	2

2019-07-24
8-19-141

Kaibeto-Item #10
NTUA - WS-11 Flush Valve

Part#	Material Description	U/M	Summary
A4000022	Pipe, PVC SDR21 2" 200psi	Lgth	1
A4010003	Adapt,PVC 2"P/OxMIPT 200PSI	EA	4
D4010402	Valve, Gate DI 2"FIPT	EA	2
E4030022	PIPE, Galv 2"x21' T&C LF	Lgth	2
E4030230	Cap, Galv 2"FIPT	EA	2
E4030352	Elbow-45°, Galv 2"	EA	2
G4010702	Valve, Ball CORP Stop 2" MxF	EA	2
S4000263	Cement, Premix Concrete 80#	ea	10
S4000428	Tape, 10mil Poly Pipe Wrap 2"	roll	4
<i>Special Order</i>	Valve Box, 2-Piece Screw Type, 5-¼" Shaft w/Cast Iron Drop Lid, <i>Ferguson</i>	ea	2

2019-07-24

8-19-141

Kaibeto-Item #11

NTUA - EVOQ4 Water Meter 4"

Part#	Material Description	U/M	Summary
H4060054	Flange, Gasket, 4" FF CL150	EA	2
<i>Special Order</i>	Thread Stud S.S. 5/8"x4" w/Hex Nut, <i>Ferguson</i>	EA	8
<i>Special Order</i>	4", EVOQ4, Water meter, Flanged ends, ANSI150, 14in	EA	1

2019-07-24

8-19-141

Kaibeto-Item #12

NTUA - Fencing 150FT

Part#	Material Description	U/M	Summary
I4000001	Band, Fence Tension Bar	EA	54
I4000002	Band, Fence Top-Barbed Wire	EA	72
I4000003	Brace, Fence Diag.-Cor/Gate Post	EA	16
I4000004	Fence Rail End 1-5/8"	EA	16
I4000006	Post, Fence Corner/Gate 3"x10.5'	EA	10
I4000007	C-L Ped. Gate 3'x 6' (Walk-in)	ea	1
I4000008	GATE, TRAFFIC C-LINK 6' DOUBLE	set	1
I4000010	CLIP, HOG WIRE / TENSION WIRE	lb	20
I4000011	POST, FENCE LINE 2"x 10'	ea	8
I4000012	TENSION BAR, FENCE 3/4"x 6'	ea	16
I4000014	WIRE, FENCE TENSION 9ga. 300'	roll	1
I4000030	WIRE, BARBED 1320'/ROLL	roll	1
I4000033	WIRE, FENCE TIE 8-1/2"L	ea	64
S4000263	CONCRETE, PREMIX 80# BAG	bag	30
	* CONCRETE, POST HOLE		14
	* CONCRETE, DIAG. BRACE		16

2019-07-24

8-19-141

Kaibeto-Item #13

NTUA - 14in Casing

Part#	Material Description	U/M	Summary
<i>Special Orders</i>	Pipe, Steel Road X-ing 14" x 20ft, Sch40. A53B, <i>ABQ Pipe & Supply</i>	LFT	60
<i>Special Orders</i>	End Seals w/ SS Bands., <i>Ferguson</i>	EA	2
<i>Special Orders</i>	Casing Spacers, S.S. 6.63 O.D. x 13.12 I.D., <i>Ferguson</i>	EA	10

NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY
P.O. BOX 969
SHIPROCK, NEW MEXICO 87420
PHONE: (505) 210-7070

LETTER OF TRANSMITTAL

DATE	9-Sep-2019	JOB NO.
ATTENTION:	Ronald Begay	
RE:	NTUA Kiabeto Inter-tie	
	Kaibeto, Arizona	
	NECA Proj. No. 819141 - Kaibeto Inter-tie	

TO: Navajo Tribal Utility Authority
PO Box 170
Fort Defiance, Arizona 86504-0170

GENTLEMEN:

WE ARE SENDING YOU

☒ ATTACHED ☐ UNDER

Separate cover via _____ THE FOLLOWING ITEMS:

- ☐ SHOP DRAWINGS ☐ PRINTS ☐ PLANS ☐ SAMPLES ☒ SPECIFICATIONS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐ As-Built

COPIES	DATE	NO.	DESCRIPTION
1	9-Sep-2019	5	Baker Supply Submittal Packet
1	9-Sep-2019	6	CLOW AWWA Resilient Wedge Gate Valves
1	9-Sep-2019	7	Quickrete Concrete Mix Product No. 1101
1	9-Sep-2019	8	QUICKRETE Non-Shrink Precision Grout Product No. 1585-00
1	9-Sep-2019	9	Ferguson Submittal Packet

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☒ FOR REVIEW AND COMMENT ☐ FOR YOUR SIGNATURE _____

Remarks:

PLEASE SIGN, DATE, AND RETURN THE YELLOW COPY.

RECEIVED BY: _____

DATE: _____

COPY TO: NTUA (RB, AT, DS, DS, JD, AM, CH, DY) NHA (KD, VM, LL,
NN) NECA (WB, PM, GL, HP, BG)

SIGNED: _____
Ammerson T. Barber, Estimator/Coordinator

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE



Baker Utility Supply
4320 2nd ST. NW
Albuquerque, NM 87107
PH: 505-884-0990
Fax: 505-881-4615

KAIBETO INTERTIE

Contractor: NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY

ITEMS AND MANUFACTURER:

4" MJ SKIN PACK REG GSK w/T-BOLTS NO GLAND, DOM:	TYLER
4" MJ TRANS GASKET, DOMESTIC:	STAR
DI SPOOL, DOMESTIC:	WHEATLAND
4" STRAINER, DOMESTIC:	WILKINS
4" TUFF GRIP MEGALUG FOR DI PIPE, DOMESTIC:	TYLER
4" BACKFLOW PREVENTER, DOMESTIC:	WILKENS
36"x100"x56" ALUMINUM ENCLOSURE W/HEATER, DOM:	SAFE-T-COVER
MJ FITTINGS, DOMESTIC:	TYLER
VALVE BOX TOP, BOTTOM, LID, DOMESTIC:	TYLER
2" FLGxFLG GATE VALVE w/HANDWHEEL, DOMESTIC:	AFC
EXPOY SADDLE, DOMESTIC:	FORD

SUBMITTAL

(Current revisions for the noted Standards apply)

Tyler Union Waterworks provides that our *Mechanical and Push-On joint gaskets and dimensions conform to the specifications in ANSI/AWWA C111/A21.11 (current revision). Markings include size, mold number, gasket manufacturer's mark, country where molded, and product identification letters. No markings are placed on sealing surfaces per the AWWA C111 standard.

*Note: Push-On and Mechanical Joint transition gasket design standards and markings are not addressed by ANSI/AWWA C111/A21.11 (current revision). Transition gaskets provided by Tyler Union follow the material testing standards and specifications established for ANSI/AWWA C111/A21.11 gaskets.

Gasket material is vulcanized styrene butadiene rubber (SBR). Purchaser may request special application elastomers (EPDM, Nitrile, Neoprene & FKM) which will be identified on all documentation and corresponding gaskets. Gaskets are free of foreign materials, porous areas, or other defects that make them unfit for the intended use.

Tyler Union gaskets are manufactured under quality control standards and procedures that are maintained by the gasket supplier. Appropriate documentation is maintained by the manufacturer and available for review upon request. Properties and test methods for SBR, EPDM, Nitrile, Neoprene and FKM gaskets are as provided.

Property	ASTM Test Method	Required Value
Hardness, Shore "A"	D2240-86	75 (+-5)
Minimum Tensile	D412-87	1500 psi (10MPa)
Minimum Elongation	D412-87	150 %
Minimum Aging	D572-88	60 %
Maximum Compression Set	D395-89, Method B	20 %
Resistance to surface Ozone cracking	D1149-86	No cracking

Tyler Union's approved suppliers maintain a quality assurance program that is reviewed and updated on an ongoing basis to ensure product quality. Tyler Union's gasket suppliers submit gaskets for testing and provide materials for testing to Underwriters Laboratories, Inc. Tyler Union's gasket providers are recognized under the component program (UL 194/ UL 157) of Underwriters Laboratories, Inc.. Tyler Union UL approved gaskets meet NSF-61, NSF-372 and Annex G.

Tyler Union provides that our Mechanical and Push-On joint gaskets for potable or wastewater projects will perform as designed when selected per the chart provided and installed per AWWA C600-10.

SBR (Styrene Butadiene rubber)(Buna-S) Not Recommended for Hydrocarbon Service	20°F to 180°F	Suitable for Water, Wastewater, most moderate chemicals, wet or dry organic acids, alcohols, ketones, and aldehydes
EPDM (Ethylene Propylene) Not Recommended for Hydrocarbon Service	-10°F to 250°F	Ideal for water, wastewater, ozone, & strong oxidizing chemicals May be used on steam and air within its temperature range
CR (Neoprene)	-10°F to 200°F	Recommended for moderate chemicals and acids, oil fats, greases, many solvents and air with hydrocarbons. Will not support combustion
NBR (Nitrile)(Buna-N)(Hycar)	-40°F to 250°F	Ideally suited for gasoline, petroleum products, hydrocarbons, water, mineral and vegetable oils
*FKM(Fluoroelastomer) *Check with Customer Service for availability	10°F to 425°F	Ideally suited for hydrocarbons, acids, vegetable oils & petroleum

Gasket Types Offered:

- (1)Mechanical Joint std.(2) Push-On Joint std.(3)Mechanical Joint DUO
(4)Mechanical & Push-on Joint Transition(5)Push-on Restraining
(6)Mechanical Joint Armor Tip Conductivity(7)Compact tapping Sleeve

Unless other wise requested by the purchaser upon order placement, all gaskets provided will be of our standard SBR material.

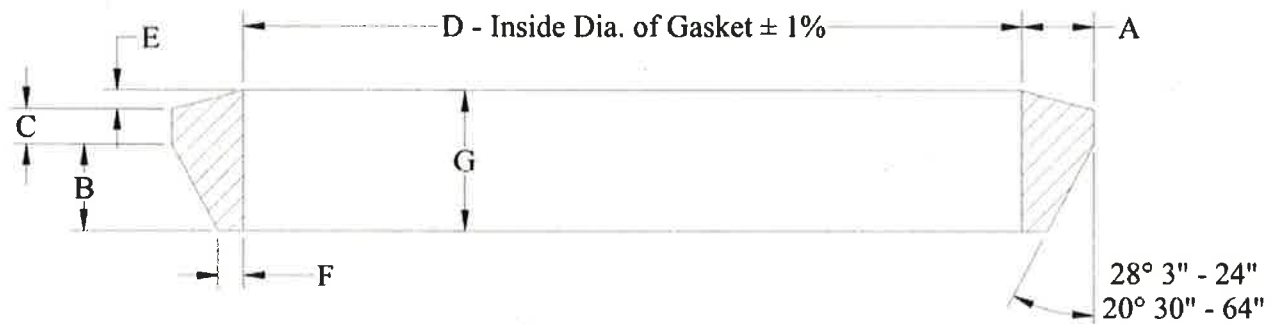
Mechanical Joint Gaskets

ANSI/AWWA C111/A21.11-12

*MJ Tru-Lock Gaskets 30-48 inch

Pipe Size	Pipe OD	A ±0.01"	B	C	D ±1%	E ±0.01%	F ±0.01"	G ±0.02"
**2	2.50	0.48	0.62	0.31	2.48	0.12	0.15	1.05
3	3.96	0.48	0.62	0.31	3.86	0.12	0.15	1.05
4	4.80	0.62	0.75	0.31	4.68	0.16	0.22	1.22
6	6.90	0.62	0.75	0.31	6.73	0.16	0.22	1.22
8	9.05	0.62	0.75	0.31	8.85	0.16	0.22	1.22
10	11.10	0.62	0.75	0.31	10.87	0.16	0.22	1.22
12	13.20	0.62	0.75	0.31	12.95	0.16	0.22	1.22
14	15.30	0.62	0.75	0.31	14.99	0.16	0.22	1.22
16	17.40	0.62	0.75	0.31	17.07	0.16	0.22	1.22
18	19.50	0.62	0.75	0.31	19.13	0.16	0.22	1.22
20	21.60	0.62	0.75	0.31	21.20	0.16	0.22	1.22
24	25.80	0.62	0.75	0.31	25.34	0.16	0.22	1.22
30	32.00	0.73	1.00/*50	.38/*50	31.47	0.16	.37/*55	1.54/*1.16
36	38.30	0.73	1.00/*50	.38/*50	37.67	0.16	.37/*55	1.54/*1.16
42	44.50	0.73	1.00/*50	.38/*50	43.78	0.16	.37/*55	1.54/*1.16
48	50.80	0.73	1.00/*50	.38/*50	49.98	0.16	.37/*55	1.54/*1.16

** Not included in AWWA C111. Manufacture's Standard does not meet AWWA C111



** Mechanical Joint Transition Gasket Dimensions in Inches

Pipe Size	A ±0.01"	B	C	D ±1%	E	F ±0.01"	G ±0.02"
2	0.57	0.62	0.31	2.28	0.12	0.24	1.08
3	0.70	0.62	0.31	3.45	0.16	0.37	1.11
4	0.77	0.75	0.31	4.43	0.16	0.37	1.26
6	0.76	0.75	0.31	6.53	0.16	0.36	1.25
8	0.82	0.75	0.31	8.50	0.16	0.42	1.27
10	0.75	0.75	0.31	10.59	0.16	0.39	1.26
12	0.84	0.75	0.31	12.56	0.16	0.44	1.28

** Not included in AWWA C111. Manufacture's Standard does not meet AWWA C111



Buy America(n)" & Product Certificate of Compliance

Address: 1501 W. 17th. Street – Anniston, AL 36201

Telephone No.: (800) 226-7601

Fax Number: (800) 226-0806

Date: January 6, 2014

To: Whom It May Concern

Re: Buy America /Buy American Certification for Tyler Union Waterworks Made in the U.S.A Products

We appreciate the opportunity to supply our products for your projects requiring to some or full extent product that is substantially or wholly manufactured in the U.S.A. Tyler Union Waterworks certifies that its Domestic manufactured fittings and cast iron municipal castings are wholly manufactured in the U.S.A. using only raw materials that wholly originate in the U.S.A..

After a thorough review of "Buy America/Buy American" acts; Tyler Union certifies that our Domestic ANSI/AWWA fittings and ASTM cast iron municipal castings meet all applicable requirements and provisions as provided for by the U.S. Department of Transportation and the Federal standards noted for domestic iron and steel construction materials incorporated into your project. These standards/laws/acts and revisions date from 1933 through current year 2014.

Buy American:

- American Recovery and Reinvestment Act of 2009 (ARRA), Section 1605
- Federal Aviation Administration (FAA), 49 U.S.C. § 50101

Buy America:

- Federal Highway Administration (FHWA), 23 U.S.C. § 50101§ 313 – Buy America; 23 C.F.R. § 635.410
- Federal Railroad Administration (FRA), 49 U.S.C. Chapters 244, 246: § 24405 – Buy America
- National Railroad Passenger Corporation (AMTRAK), 49 U.S.C. § 24305
- Federal Transit Administration (FTA), 49 U.S.C. § 5323(j); 49 C.F.R. Part 661 (Buy America Requirements)

If your domestic project material requires additional certifications as provided; you must advise the Tyler Union Waterworks product Distributor or Customer Service Agent upon order placement. Additional certifications available include 1) mill certification, 2) product and/or product specific certificate for accessories, and 3) coating certificate. Our purchase order system maintains purchase shipping order information for a minimum of 12 months. For tracking purposes these orders indicate if the product processed and shipped was domestic in origin.

Tyler Union certifies its 2" through 48" Domestic ANSI/AWWA fittings are cast with tested and traceable ASTM A536 compliant ductile iron that is designed for use with and conforms to all the applicable terms and requirements of ANSI/AWWA C153/A21.53, ANSI/AWWA C151/A21.51, ANSI/AWWA C115/A21.15, ANSI/AWWA C111/A21.11, ANSI/AWWA C116/A21.16, ANSI/AWWA C110/A21.10, and ANSI/AWWA C104/A21.4. Additionally Tyler Union certifies its Domestic made in the U.S.A. cast iron municipal products (Valve box, Service box, and Accessories) are produced in accordance with and meet all applicable terms and provisions of ASTM-A48. Current revisions apply for each noted standard.

Best Regards,

Roger Dunning
Roger Dunning

Technical Support Manager

Tyler Union Waterworks

Email: roger.dunning@tylerunion.com

Tel.: (800)527-8478

Project Name:

Project Location:

Project Material:

Location of Mfg.:

Project Contractor:

Tyler Union Distributor:

Project No.:

Union Foundry - Anniston, AL 36201 – U.S.A.

Subscribed and sworn to before me this 6th. Day of January 2014

Sandra C Smith

Sandra Smith – Notary Public – Smith County, Texas



Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478

Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601

Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

Elmira: 1021 East Water • Elmira, NY 14902

New Lenox: 2200 West Haven • New Lenox, IL 60451

Portland: 6204 N. Marine Dr. • Portland, OR 97203

www.tylerunion.com

This document is void if modified in any manner other than the addition of project information, name of contractor and/or product distributor



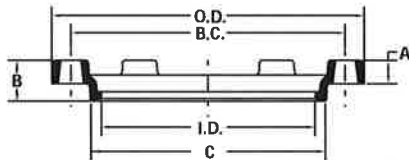
MJ Accessories

ANSI/AWWA C111/A21.11

GLANDS, GASKETS, BOLTS & NUTS

GENERAL SPECIFICATION

MATERIAL:	Ductile Iron per ASTM A536
PRESSURE:	350 PSI rating for 2" - 24" sizes, 250 PSI rating for 30" - 48" sizes and 150 PSI rating for 54" - 64" sizes
TESTING:	In accordance with ANSI/AWWA C111/A21.11 and UL requirements
DIMENSIONS:	Are in accordance with ANSI/AWWA C111/A21.11, UL and FM requirements and are in inches unless noted otherwise
WEIGHTS:	Are in pounds, unless noted otherwise and do not include accessories
COATING:	Asphaltic seal coat is in accordance with ANSI/AWWA C104/A21.4 unless otherwise specified.
APPROVALS:	Compact Glands 3" - 12" Underwrites Laboratories & ULC Listed. Factory Mutual approved 3"-16".



MJ COMPACT GLANDS

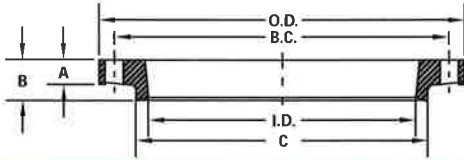
NOM. SIZE	O.D.	A	B	C	I.D.	B.C.	BOLT HOLE	BOLT QTY	WT (LBS.)
2	6.12	0.62	1.18	3.40	2.61	4.75	Ø0.75	2	1
3	7.69	0.62	1.37	4.84	4.06	6.19	Ø0.75	4	2
4	9.12	0.75	1.50	5.92	4.90	7.50	Ø0.88	4	3
6	11.12	0.88	1.63	8.02	7.00	9.50	Ø0.88	6	4
8	13.37	1.00	1.75	10.17	9.15	11.75	Ø0.88	6	5
10	15.62	1.00	1.75	12.22	11.20	14.00	Ø0.88	8	7
12	17.88	1.00	1.75	14.32	13.30	16.25	Ø0.88	8	8
14	20.25	1.25	2.00	16.40	15.44	18.75	Ø0.88	10	11
16	22.50	1.31	2.06	18.50	17.54	21.00	Ø0.88	12	14
18	24.75	1.38	2.13	20.60	19.64	23.25	Ø0.88	12	19
20	27.00	1.44	2.19	22.70	21.74	25.50	Ø0.88	14	27
24	31.50	1.56	2.31	26.90	25.94	30.00	Ø0.88	16	36
30	39.12	2.00	2.75	33.29	32.17	36.88	Ø1.13	20	90
36	46.00	2.00	2.75	39.59	38.47	43.75	Ø1.13	24	118
42	53.12	2.00	2.75	45.79	44.67	50.62	Ø1.38	28	151
48	60.00	2.00	2.75	52.09	50.97	57.50	Ø1.38	32	187





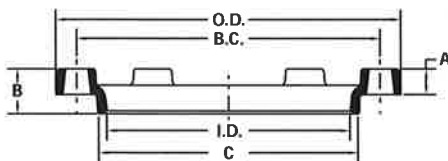
MJ Accessories

ANSI/AWWA C111/A21.11



MJ FULLBODY GLANDS

NOM. SIZE	O.D.	A	B	C	I.D.	B.C.	BOLT HOLE	BOLT QTY	WT (LBS.)
2	6.12	0.62	1.18	3.40	2.61	4.75	Ø0.75	2	1
3	7.69	0.62	1.37	4.84	4.06	6.19	Ø0.75	4	5
4	9.12	0.75	1.50	5.92	4.90	7.50	Ø0.88	4	6
6	11.12	0.88	1.63	8.02	7.00	9.50	Ø0.88	6	10
8	13.37	1.00	1.75	10.17	9.15	11.75	Ø0.88	6	14
10	15.62	1.00	1.75	12.22	11.20	14.00	Ø0.88	8	20
12	17.88	1.00	1.75	14.32	13.30	16.25	Ø0.88	8	24
14	20.25	1.25	2.00	16.40	15.44	18.75	Ø0.88	10	45
16	22.50	1.31	2.06	18.50	17.54	21.00	Ø0.88	12	55
18	24.75	1.38	2.13	20.60	19.64	23.25	Ø0.88	12	55
20	27.00	1.44	2.19	22.70	21.74	25.50	Ø0.88	14	66
24	31.50	1.56	2.31	26.90	25.94	30.00	Ø0.88	16	90
30	39.12	2.00	2.75	33.29	32.17	36.88	Ø1.13	20	220
36	46.00	2.00	2.75	39.59	38.47	43.75	Ø1.13	24	286
42	53.12	2.00	2.75	45.79	44.67	50.62	Ø1.38	28	288
48	60.00	2.00	2.75	52.09	50.97	57.50	Ø1.38	32	400



MJ OVERSIZE GLANDS

NOM. SIZE	O.D.	A	B	C	I.D.	B.C.	BOLT HOLE	BOLT QTY	WT (LBS.)
4	9.12	0.75	1.50	5.92	5.10	7.50	Ø0.88	4	3
6	11.12	0.88	1.63	8.02	7.20	9.50	Ø0.88	6	5
8	13.37	1.00	1.75	10.17	9.40	11.75	Ø0.88	6	6
10	15.62	1.00	1.75	12.22	11.50	14.00	Ø0.88	8	8
12	17.88	1.00	1.75	14.32	13.60	16.25	Ø0.88	8	9
16	22.50	1.31	2.06	18.50	17.94	21.00	Ø0.88	12	14





Standard Mechanical Joint Gaskets

(SBR, NBR, EPDM, Neoprene, FKM)

ANSI/AWWA C111/A21.11

GASKET GENERAL SPECIFICATIONS

Star Pipe Products Mechanical Joint (MJ) Gasket dimensions conform to the drawings set forth in ANSI/AWWA C111/A21.11. Gasket markings include size, Manufacturer's mark, Country of origin and product identification. No markings are positioned on sealing surfaces per the ANSI/AWWA C111/A21.11 standard. MJ transition gaskets follow the requirements of ANSI/AWWA C111/A21.11 where applicable.

Standard gasket material is vulcanized styrene butadiene rubber (SBR). Special application elastomers (EPDM, Nitrile, Neoprene & FKM) are available and shall be identified on all documentation and corresponding gaskets.

Star Pipe gaskets are manufactured under quality control standards and procedures that are maintained by the gasket supplier. Appropriate documentation is maintained by the manufacturer and available for review upon request.

Star Pipe gasket suppliers maintain a quality assurance program and manual that is reviewed and updated on an ongoing basis to ensure product quality. Star Pipe gasket suppliers perform in house testing and submit to random testing by Underwriters Laboratories, Inc. Star Pipe gasket providers are recognized under the component program (UL 194/ UL 157) of Underwriters Laboratories, Inc.

Star Pipe provides that our Mechanical Joint gaskets for potable or wastewater projects will perform as designed, based on the published chemical and environmental resistance data for "generic" rubber compounds. Star Pipe should be consulted for specific recommendations or for unusual applications.

GASKET PROPERTIES

PROPERTY	ASTM TEST METHOD	REQUIRED VALUE
Hardness, Shore "A"	D2240	75 ± 5
Minimum Tensile	D412	1500 psi
Minimum Elongation	D412	150%
Minimum Aging	D573	60%
Maximum Compression Set	D395, Method B	20%
Resistance to Surface Ozone Cracking	D1149	No Cracking

GASKET TYPE	MAXIMUM CONTINUOUS TEMP	MAXIMUM EXPOSURE TEMP	STANDARD USAGE
SBR (Styrene Butadiene Rubber/ Buna-S)	160 F	180 F	Drinking water, Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water. Not Recommended for Hydrocarbon Service
EPDM (Ethylene Propylene)	250 F	300 F	Alcohols, Dilute Acids, Dilute Alkalis, Ketones (MEK/Acetone), Strong Oxidizing Chemicals; Drinking Water, Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water. Not Recommended for Hydrocarbon Service
Neoprene (Polychloroprene / CR)	225 F	300 F	Hydrocarbons, Unrefined Petroleum Products, Greasy Waste; Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water.
Nitrile (NBR / Buna-N)	160 F	180 F	Refined Oils and Fluids, Fats, Greases and Waste; Drinking Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water.
FKM (Fluoroelastomer / Viton [®])	400 F	500 F	Aromatic Hydrocarbons, Chlorinated Hydrocarbons, Vegetable Oils, Most Chemicals; Drinking Water, Reclaimed Water, Raw Water, Storm Water.

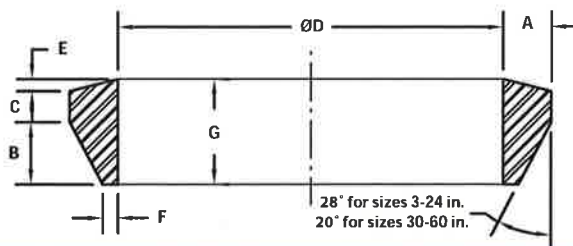
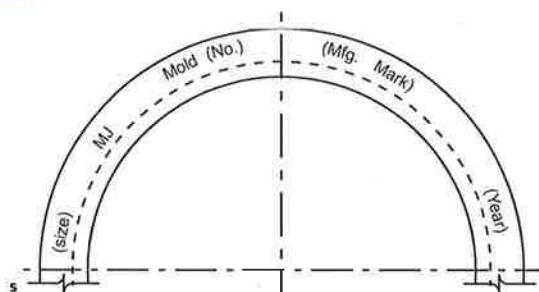
Viton[®] is a registered trademark of E.I. Du Pont De Nemours & Company.





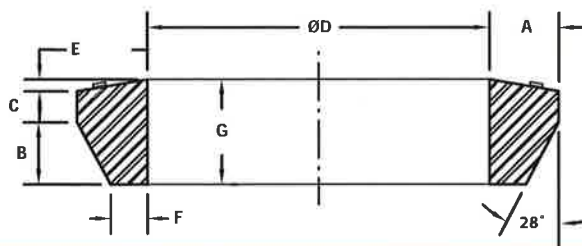
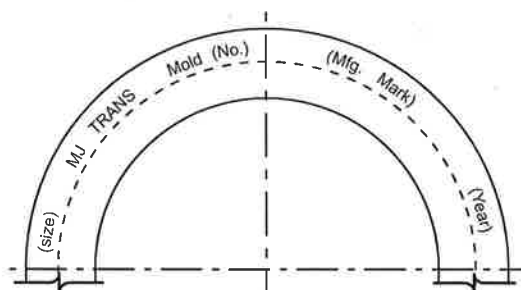
MJ Accessories

ANSI/AWWA C111/A21.11



MECHANICAL-JOINT GASKET

NOM. SIZE	PIPE O.D.	A	B	C	ØD ±1 %	E	F	G
2	2.50	0.48	0.62	0.31	2.48	0.12	0.15	1.05
3	3.96	0.48	0.62	0.31	3.86	0.12	0.15	1.05
4	4.80	0.62	0.75	0.31	4.68	0.16	0.22	1.22
6	6.90	0.62	0.75	0.31	6.73	0.16	0.22	1.22
8	9.05	0.62	0.75	0.31	8.85	0.16	0.22	1.22
10	11.10	0.62	0.75	0.31	10.87	0.16	0.22	1.22
12	13.20	0.62	0.75	0.31	12.95	0.16	0.22	1.22
14	15.30	0.62	0.75	0.31	14.99	0.16	0.22	1.22
16	17.40	0.62	0.75	0.31	17.07	0.16	0.22	1.22
18	19.50	0.62	0.75	0.31	19.13	0.16	0.22	1.22
20	21.60	0.62	0.75	0.31	21.20	0.16	0.22	1.22
24	25.80	0.62	0.75	0.31	25.34	0.16	0.22	1.22
30	32.00	0.73	1.00	0.38	31.47	0.16	0.37	1.54
36	38.30	0.73	1.00	0.38	37.67	0.16	0.37	1.54
42	44.50	0.73	1.00	0.38	43.78	0.16	0.37	1.54
48	50.80	0.73	1.00	0.38	49.98	0.16	0.37	1.54



TRANSITION MECHANICAL-JOINT GASKET

NOM. SIZE	PIPE O.D.	A	B	C (REF.)	ØD ±1 %	E	F	G
2	2.375	0.56	0.66	0.31	2.32	0.12	0.21	1.10
3	3.500	0.72	0.64	0.34	3.43	0.12	0.38	1.10
4	4.500	0.76	0.73	0.33	4.43	0.20	0.37	1.26
6	6.625	0.75	0.73	0.32	6.53	0.20	0.36	1.25
8	8.625	0.82	0.73	0.34	8.50	0.20	0.43	1.27
10	10.750	0.79	0.75	0.31	10.59	0.20	0.39	1.26
12	12.750	0.84	0.75	0.33	12.56	0.20	0.44	1.28



STAR[®] PIPE PRODUCTS



T-Bolts, Double Ended Rods & Nuts

HSLA STEEL

SPECIFICATIONS:

- Bolts & Nuts are manufactured in accordance with ANSI / AWWA C111 / A21.11.
- Material is High Strength Low Alloy Steel per ANSI/AWWA C111/A21.11.
- Threads per ASME B1.1 unified standard coarse (Class 2A & 2B)

MECHANICAL PROPERTIES

- Yield Strength 45000 PSI (min)
- Elongation in 2in. 20% (min)

CHEMICAL PROPERTIES

Carbon	0.20% Max
Manganese	1.25% Max
Sulfur	0.05% Max
Nickel	0.25% Min
Copper	0.20% Min
Combined	1.25% Min (Ni, Cu, Cr)

BLUE BOLT/NUT/ROD

T-Bolts, Rods & Nuts have fluoropolymer coating material which is VOC-compliant, resin-bonded, thermally cured and dry lubricant.

COATING PHYSICAL PROPERTIES

Film Thickness:	0.3 to 0.4 mil per coat
Number of Coats:	3 to 4 coats
Adhesion:	1 mm cross hatch test + 5 Pulls. Good knife resistance
Cure Test:	50+Rubs with MEK. No substrate exposure
Pencil Hardness:	Pencil Hardness: 4-6H
Volatile Organic Compounds	2.74lbs/gal

Stainless Steel T-Bolts & Nuts

ALLOYS SS 304 & SS 316 PER ASTM F593

SPECIFICATIONS:

- T-bolt dimensions are manufactured in accordance with ANSI / AWWA C111 / A21.11.
- T-bolt alloys SS 304 and SS 316 per ASTM F593
- Heavy Hex Nut Alloys SS 304 & SS 316 per ASTM F594.

MECHANICAL PROPERTIES

- Tensile Strength: 85,000 PSI to 140,000 PSI
- Yield Strength: 45,000 PSI (min)

COATING SPECIFICATION

Nuts have fluoropolymer coating material which is VOC-Compliant, resin-bonded, thermally cured and dry lubricant.

COATING PHYSICAL PROPERTIES

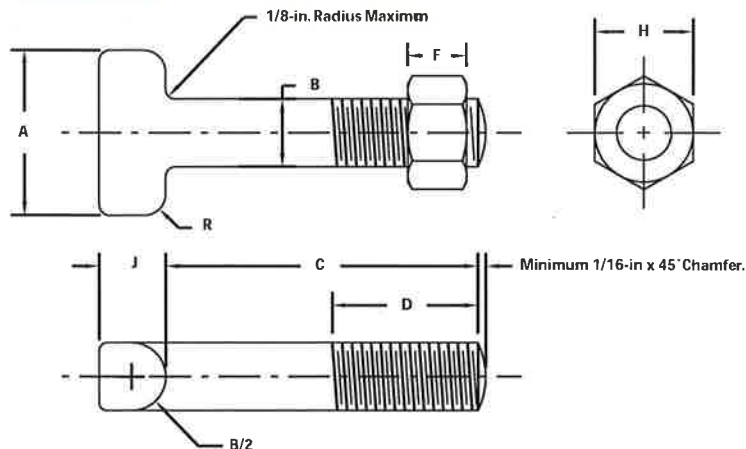
- | | |
|---|---|
| • Film Thickness: 0.3 to 0.4 mil per coat | • Pencil Hardness: 4-6H |
| • Number of Coats: 3 to 4 coats | • Volatile Organic Compounds 2.74 lbs/gal |
| • Adhesion: 1mm cross hatch test + 5 Tape Pulls. | • Continuous use temperature - 356°F |
| • Cure Test: 50+ Rubs with MEK, no substrate exposure | • Color: SS 304 is green, SS 316 is red |





Accessories

ANSI/AWWA C111/A21.11

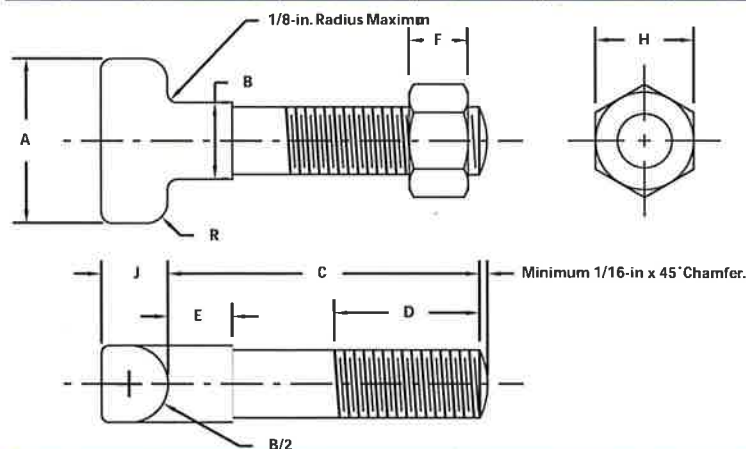


MECHANICAL JOINT BOLT TORQUE		
PIPE SIZE (IN)	BOLT SIZE (IN)	RANGE ¹ OF TORQUE (FT-LBS)
2-3	5/8	45-60
4-24	3/4	75-90
30-36	1	100-120
42-48	1 1/4	120-150

¹These torque ranges are requirements of AWWA C600

T-HEAD (LOW ALLOY STEEL) BOLT & NUT

NOM. SIZE	A	B	C	D	THREADS PER IN.	F	H	J	R
5/8 x 3	1.50	0.625	3.00	2.00	11	0.625	1.062	0.625	0.312
5/8 x 3 1/2	1.50	0.625	3.50	2.70	11	0.625	1.062	0.625	0.312
3/4 x 3 1/2	1.75	0.750	3.50	2.50	10	0.750	1.250	0.750	0.375
3/4 x 4	1.75	0.750	4.00	3.00	10	0.750	1.250	0.750	0.375
3/4 x 4 1/2	1.75	0.750	4.50	3.00	10	0.750	1.250	0.750	0.375
3/4 x 5	1.75	0.750	5.00	3.00	10	0.750	1.250	0.750	0.375
3/4 x 5 1/2	1.75	0.750	5.50	3.70	10	0.750	1.250	0.750	0.375
1 x 5 1/2	2.25	1.000	5.50	3.00	8	1.000	1.625	1.000	0.500
1 x 6	2.25	1.000	6.00	3.00	8	1.000	1.625	1.000	0.500
1 1/4 x 6	2.50	1.250	6.00	3.00	7	1.250	2.000	1.250	0.625
1 1/4 x 6 1/2	2.50	1.250	6.50	3.50	7	1.250	2.000	1.250	0.625
1 1/4 x 8 1/2	2.50	1.250	8.50	3.50	7	1.250	2.000	1.250	0.625



ANTI-ROTATION T-HEAD (LOW ALLOY STEEL) BOLT & NUT

NOM. SIZE	A	B	C	D	E	THREADS PER IN.	F	H	J	R
5/8 x 3	1.50	0.625	3.00	2.00	0.63	11	0.625	1.062	0.625	0.312
5/8 x 3 1/2	1.50	0.625	3.50	2.50	0.63	11	0.625	1.062	0.625	0.312
3/4 x 3 1/2	1.75	0.750	3.50	2.50	0.63	10	0.750	1.250	0.750	0.375
3/4 x 4	1.75	0.750	4.00	3.00	0.63	10	0.750	1.250	0.750	0.375
3/4 x 4 1/2	1.75	0.750	4.50	3.00	0.63	10	0.750	1.250	0.750	0.375
3/4 x 5	1.75	0.750	5.00	3.00	0.63	10	0.750	1.250	0.750	0.375



STAR[®] PIPE PRODUCTS



Date: _____

Domestic Fitting Product Certificate of Compliance

Star Distributor: _____

Contractor: _____

Project Name: _____

Project Location: _____

Re: Buy America / Buy American Certification for Star Pipe Products Made in the USA fittings

We certify country of origin compliance per below:

100% Domestic Fittings: This option consists of 100% domestic fittings that are melted, poured, machined, and coated 100% in the United States. SPP performs the machining, packaging and Quality Control checks in its Houston, Texas facility. This product is compliant with the Consolidated Appropriations Act of 2014 (AIS), with the American Recovery and Reinvestment Act of 2009 (ARRA) and The Buy America Act of 1983 and 1933. Domestic Fittings can be identified by item codes ending with the suffix "D".

Star Pipe Products certifies that all fitting products are made of ductile iron per ASTM A536, Grade 65-45-12 and conform to the following standards:

- *AWWA C104(ANSI A21.4) for cement-mortar lining of ductile iron pipe and fittings for water*
- *AWWA C110(ANSI A21.10) for cast iron/ductile iron mechanical joint and flanged fittings*
- *AWWA C111(ANSI A21.11) for ductile iron mechanical joint glands and gaskets*
- *AWWA C153(ANSI A21.53) for compact mechanical joint and push-on ductile iron fittings*

Star Pipe Products offers a variety of coatings and linings for the fittings it supplies. When a cement-lined and asphaltic-coated fitting is ordered, the asphaltic coating is applied inside and out in accordance with AWWA C104 (ANSI A21.4). The cement lining is applied in accordance with AWWA C104 (ANSI 21.4). These standards are met with both domestic and imported fittings, and they are met regardless of outlet style: standard mechanical joint, flange, or push-on.

Vivek Sharma
Director (Product Management Group)
Star Pipe Products

This document is void if modified in any manner other than the addition of distributor, contractor, or project details.

STAR PIPE PRODUCTS

4018 WESTHOLLOW PARKWAY HOUSTON, TEXAS 77082-4604
www.starpipeproducts.com

T: 800.999.3000
F: 281.558.9000



Wheatland Tube Division Material Test Report



JMC Steel Group
Wheatland Tube Division, USA
700 Dock St. Sharon, PA 16146 USA

Customer Name:
Customer PO #:
Sales Order #: 4900051498
Delivery #: 80994892
Date of Creation: 3/21/2014
Plant: EnergeX - Warren, OH

CERTIFIED MATERIAL TEST REPORT
Type 3.1/3.1.B in accordance with EN 10204/ISO 10204/JEN 10474/ISO 10474/DIN50049

Heat Analysis

Heat/Run	Value	Date	Item Description	C	Mn	P	S	CU	NI	Cr	Mo	V	Si	AI	T/S	Y/S	EI
Heat#	A70209	2/12/2014	4.500 OD STD BLK A53-B ERW PE	.210	.840	.010	.003	.080	.030	.040	.010	.001	.030	.030	76130	62368	31
Heat#	C68976	2/12/2014	4.500 OD STD BLK A53-B ERW PE	.220	.840	.010	.003	.090	.040	.040	.020	.001	.020	.025	79162	64326	30

COMMENTS

This is to certify that the product described herein was manufactured or supplied by the Wheatland Tube Division, USA and sampled, tested and/or inspected in accordance with the latest revision, at the time of manufacture, of the specification listed above and fulfills the requirements in such respects. All the required mechanical, physical, hydrostatic, non-destructive, flattening, and bend tests have been successfully completed. The products described above meet one of the following specifications: Continuous Butt Weld Steel Pipe meeting the requirements of ASTM A53 2012 /ASME SA53 2001 Type F, Grade A. Steel Coupling Stock meeting the requirements of ASTM A865. Electric Resistance Welded Steel Pipe meeting the requirements of ASTM A53 2009, Type E, Grade A. 2012/ASME SA53 2001, Type E, Grade B. Electric Resistance Welded Steel Pipe meeting the requirements of ASTM A795 2012, Type E, Grade A. Seamless Pipe meeting the requirements of ASTM Electric Resistance Welded Steel Pipe meeting the requirements of ASTM A106 2011/ASME SA106 2011 Seamless Carbon Steel Pressure Pipe Grades B&C and is acceptable to NACE standard MR0103-2012 Edition and MR0175/ISO15156-2, 2009 Edition. Seamless Pipe is Nondestructive Electric Tested (full body eddy current). API pipe meeting the requirements of ANSI/API Specification 5L 45th Edition or ANSI/API Specification SCT 9th Edition.

Michael S. Ryan

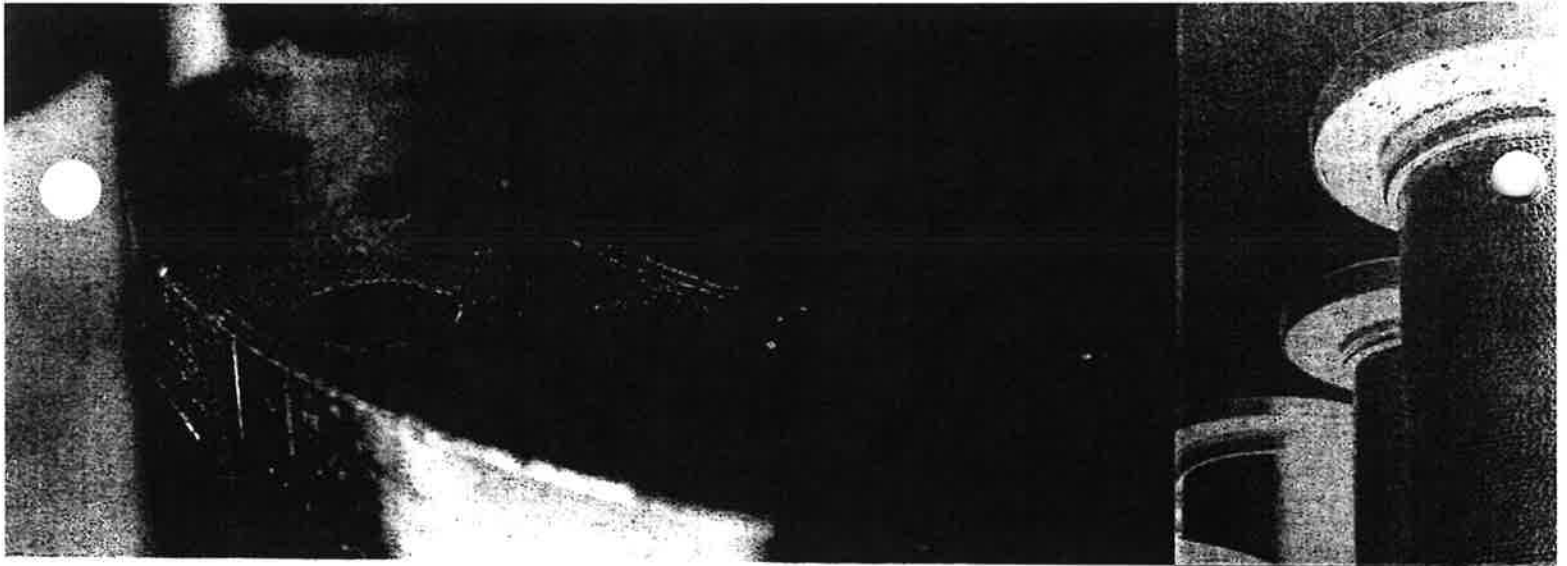
Michael S Ryan
Manager Technical Services

3/21/2014

CERTIFICATE OF COMPLIANCE TO STANDARDS

101 Vertical Fabrication's Ductile Iron pipe is fabricated to the following standards.

1. Ductile Iron pipe is manufactured in accordance with all applicable requirements of ANSI A12.51 and AWWA C151 Standards.
2. Ductile Iron flanges are drilled and faced to meet ANSI B16.1 Standard. Upon request Class 250# flange, meeting ANSI B16.6 are available
3. Flange Ductile Iron pipe spools are fabricated in accordance with all applicable requirements of ANSI 21.15 and AWWA C115.
4. Grooved Ductile Iron pipe spools are fabricated in accordance with all applicable requirements of ANSI/AWWA C606. Rigid groove is standard. Flex groove is available.
5. Ductile Iron pipe cement lining is manufactured in accordance with the requirements of ANSI A21.4/AWWA C104. Standard or double thickness as required. Other linings available upon request.
6. Ductile Iron pipe exterior will be coated with asphalt tar in accordance with ANSI A21.51/AWWA C151. Other coatings available upon request.
7. All coating and lining for exterior piping and all lining for interior piping, is certified to be in compliance with NSF 61 for potable water. Conforms to ANSI A.4/AWWA C104.



DUCTILE IRON

101 Pipe & Casing's reputation for quality materials, prompt service and meticulous workmanship are our highest priority for the threaded and grooved ductile iron pipe spools. All threaded pipe ends are separately machined to match the threads of each individual ductile iron flange. This creates a near-perfect fit with face-to-face measurements conforming to the specified length dimensions.

All threaded surfaces are coated with a threading compound/sealant, then machine power-tightened and aligned. Unless otherwise specified, all of our ductile iron pipe has cement lining on the interior wall. Other linings such as glass, epoxy, polyethylene or bare can be supplied as requested. All ductile iron pipe used has a class 53 minimum thickness.

Tight industry tolerances restrict us from offering threaded pipe with loose flanges unless the customer waives our responsibility for meeting specifications.

The following specifications are met or exceeded in the manufacturing of our flanged or grooved spools:

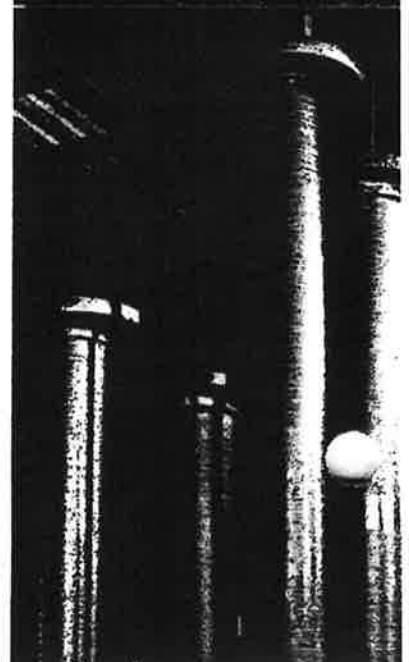
MATERIAL SPECIFICATIONS

AWWA C 151 or ANSI A 21.5	Ductile iron centrifugally cast in metal mold
AWWA C 104 or ANSI A 21.4	Cement mortar lining for ductile iron pipe
ASTM 536	Ductile iron flanges
ANSI B2.1 (NPT)	Threaded for flanges class 125 & 250
ANSI B 16.1	Facing and drilling for class 125 flanges
ANSI B 16.6	Facing and drilling for class 250 flanges

FABRICATION SPECIFICATIONS

AWWA C 115 or ANSI 21.15	Ductile iron spool fabrication
ANSI B2.1 (NPT)	Threaded for ductile iron pipe
ANSI A 21.15 Section 15-8.4	Flange two-hole
AWWA C 115 or ANSI A 21.15	Flange face-to-face parallelism
AWWA C 606	Pipe grooving

We maintain
an inventory of
Ductile Iron Pipe
in diameters from
3" - 36".



Application

Designed for installation on potable water lines to protect downstream equipment from malfunction or premature failure due to build-up of sediment or debris.

Standards Compliance

- MIL-S 16293F Type 2
 - Certified to NSF/ANSI 372* by IAPMO R&T
- *(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

Main valve body Ductile Iron ASTM A536
 Access cover Ductile Iron ASTM A536
 Coatings FDA Approved Fusion Epoxy Finish
 (Meets requirements of NSF/ANSI 61)
 Screens Perforated Stainless Steel, 300 Series

Features

Sizes: 2 1/2", 3", 4", 6", 8", 10", 12"

Pressure/temperature: 200 psi @ 150°F WOG
 125 psi @ 450°F Steam

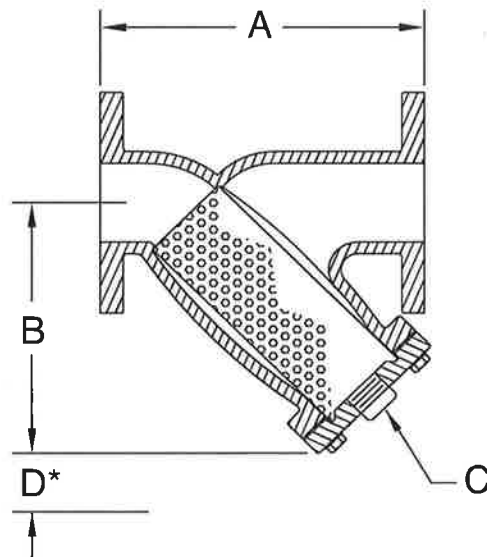
End connections: Flanged Class 125 lb

Screen

SIZE inch	OPENINGS (dia.)	MATERIAL THICKNESS	HOLES PER sq(in)
2 1/2	0.045	0.020	225
3	0.045	0.020	225
4	0.062	0.020	98
6	0.062	0.020	98
8	0.125	0.020	29
10	0.125	0.032	29
12	0.125	0.025	35

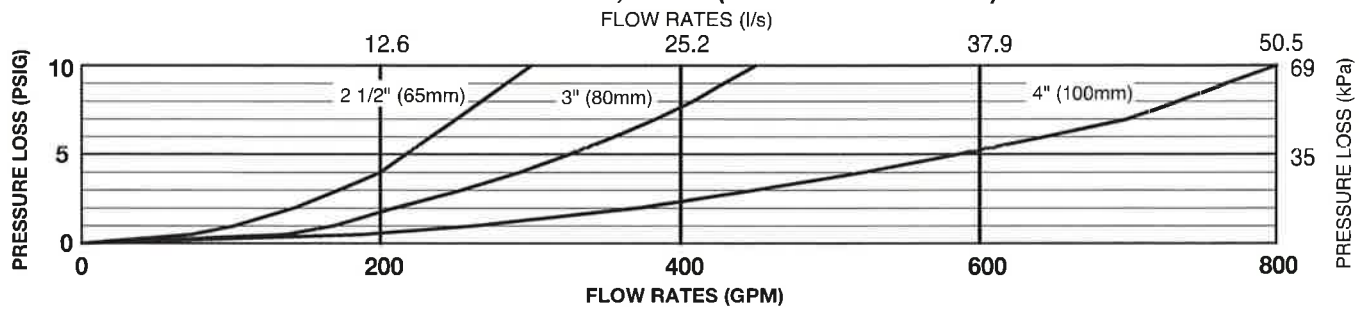
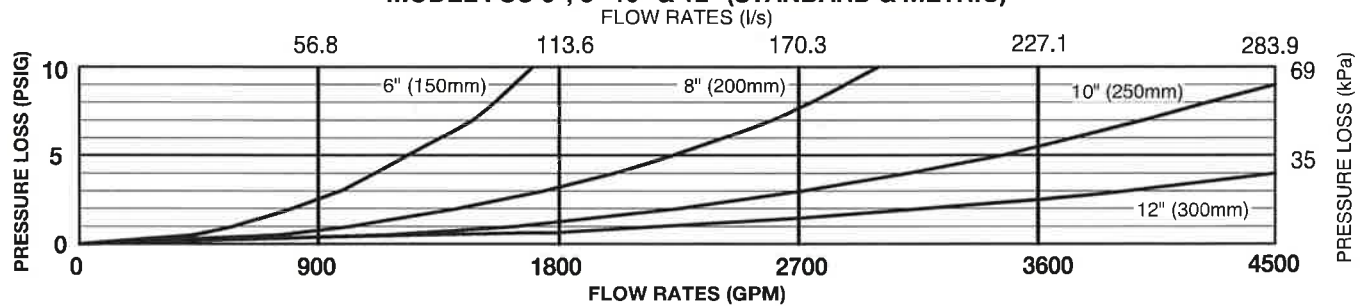


LEAD FREE



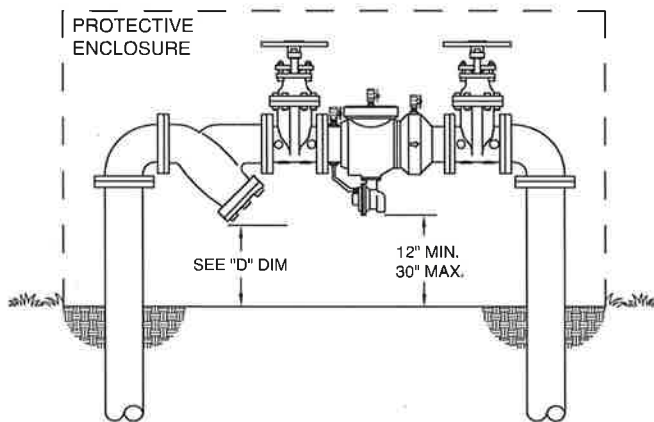
SIZE		DIMENSIONS (approximate)							WEIGHT	
		A		B		C	D*			
in	mm	in	mm	in	mm		in	mm	lbs.	kg.
2 1/2	65	10	254	8 1/4	210	1 1/4 NPT	6	152	35	16
3	80	10 1/2	267	9 1/4	235	1 1/4 NPT	6	152	45	20.5
4	100	15	381	12 1/2	318	2 NPT	9	229	61	27.5
6	150	18	457	14	356	2 NPT	10	254	165	75
8	200	24 1/4	616	17 3/4	451	2 NPT	11	279	239	108.5
10	250	29 1/2	749	21 1/4	540	2 NPT	14	356	394	178.5
12	300	33 3/4	857	24	610	2 NPT	17	432	500	227

*Vertical clearance for screen removal

MODEL FSC 2 1/2", 3" & 4" (STANDARD & METRIC)**MODEL FSC 6", 8" 10" & 12" (STANDARD & METRIC)****Typical Installation**

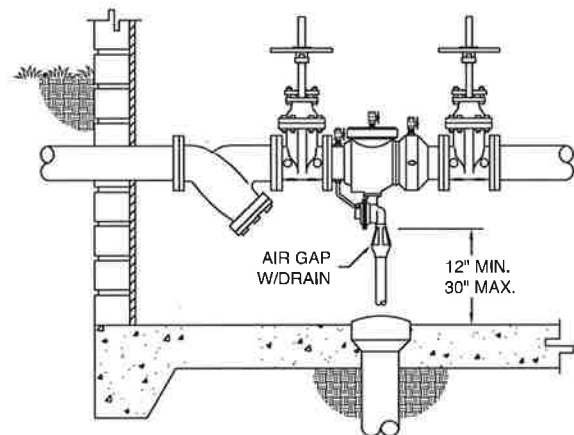
Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted with sufficient clearance for maintenance in accordance with the manufacturers' instructions and the latest edition of the Uniform Plumbing Code. The installation shall be made so that no part of the unit can be submerged. Horizontal installation with the strainer cap facing downward is the preferred installation orientation; however the strainer will provide protection in any orientation.

Capacity thru Schedule 40 Pipe (GPM)				
Pipe Size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687
12"	1744	2617	3489	5233



DIRECTION OF FLOW ➡

Outdoor Installation



DIRECTION OF FLOW ➡

Indoor Installation

Specifications

The Ductile Iron "Y" type strainer meet the requirements of NSF/ANSI 372, and in compliance with MIL-S-16293F Type 2. The main body and access cover shall be ductile iron ASTM A536 with an FDA Approved Fusion Epoxy Finish coating inside and out. The integral strainer screen shall be accessible for cleaning without removing the device from the line. The Ductile Iron "Y" type strainer shall be a ZURN WILKINS Model FSC.

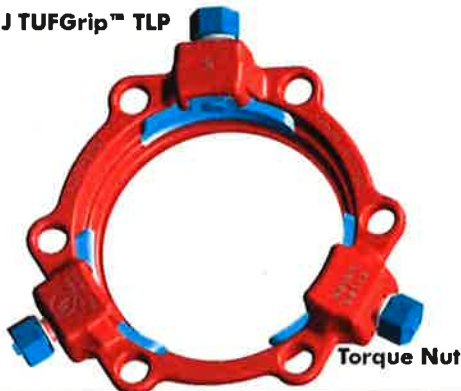


DOMESTIC PRODUCT SUBMITTAL

TUFGRIP™

Series 2000 for PVC & PVCO Pipe
"A Proven Third Generation Mechanical Joint Restraint"

MJ TUF Grip™ TLP



Tyler Union's TUF Grip restraints represent the culmination of 20 years of engineering and testing. As a 3rd generation restraint, TUF Grip is the best available technology in the Waterworks market for use in restraining PVC pipe.



Designed by Harold Kennedy & Associates, Inc.

"BETTER BY DESIGN"

SPECIFICATIONS:

- Proven to restrain plain end PVC pipe in diameters 3" thru 36" and PVCO pipe in diameters 4" thru 12"
- Restraint design conforms to applicable requirements of ANSI/AWWA C111, ANSI/AWWA C153, and ANSI/AWWA C110
- Restraint engineered for securing plain end pipe to mechanical joint fittings conforming to ANSI/AWWA C110, C111, and C153
- Rated for working water pressure of 305 psi for 3"-12", 235 psi for 14"-24", 150 psi for 30", and 125 psi for 36" (details on page 2)
- Cast of ASTM compliant 65-45-12 ductile iron complete with cast on date code and country of origin for traceability
- Restraint and all components are designed and proven for a 2:1 safety factor based on the PVC and PVCO pipe pressure rating
- Deflection rating when installed on pipe with nominal diameter shall be 3° for 3" thru 12", 2° for 14" thru 16", and 1.5° for 18" thru 36"
- Standard coating for Domestic restraint is 4-6 mil of TUF-Bond™ (thermoset polyester for impact, corrosion, and UV protection)
- Gripping wedge, wedge collar bolt and twist off torque limiting nut shall be e-coated
- FM approved for 4" thru 12" applications and UL listed and approved for 3" thru 12" applications
- Color coded red for pipe type (C900 PVC/C905 PVC/ *C909 PVCO/D2241 PVC) - *Note: Refer to page 2 for C909 pipe applications

FEATURES & ADVANTAGES:

- Torque limiting nut on gripping wedge assembly twists off within a designed torque range eliminating the need for specialized tools
- Gripping wedge assembly pivots providing stronger engagement of pipe wall at lower torque requirement (45-60 ft.-lbs.)
- Proven restraint technology utilizing fewer gripping wedges in frequently applied diameters, reducing trench time and project cost
- There is no washer or spacer to remove when installing restraints on 3" to 12" ASTM D2241 PVC pipe with IPS outside diameter
- Restraint's heavy duty construction and design eliminates the need for costly thrust blocks and tie rods
- Suitable for Potable and Wastewater applications
- Approved for use on multiple classes of pipe - Additional pressure ratings and associated pipe classes provided on pages 2 and 3

ISO 9001-2008 Registered

Listed with Underwriters Laboratory

Factory Mutual Approved

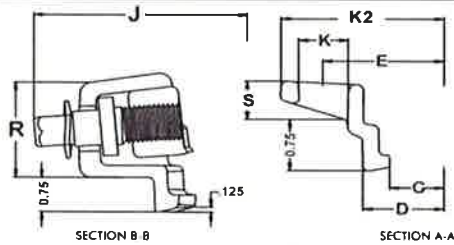
Product Source/Type	Name of Project	Name of Contractor	Project Engineer	Spec. Section and/or Project No.

Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478

Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601

Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471



TUFGrip™ MJ Restraint Dimensions

Size (Inches)	C	D	E	K2	J	K	R	S
3	4.08	4.88	6.19	7.67	9.82	3/4	2.20	0.86
4	4.93	5.92	7.50	8.98	10.67	7/8	2.20	0.73
6	7.03	8.02	9.50	10.98	12.77	7/8	2.24	0.82
8	9.18	10.17	11.75	13.23	14.92	7/8	2.28	0.82
10	11.23	12.22	14.00	15.70	16.97	7/8	2.37	0.93
12	13.33	14.32	16.25	17.95	19.07	7/8	2.40	0.93
14	15.44	16.40	18.75	20.43	21.18	7/8	2.57	0.91
16	17.54	18.50	21.00	22.88	23.28	7/8	2.57	1.05
18	19.64	20.60	23.25	25.43	25.38	7/8	2.57	1.05
20	21.74	22.70	25.50	27.50	27.48	7/8	2.66	1.15
24	25.94	26.90	30.00	32.00	31.68	7/8	2.72	1.35
30	32.18	33.30	36.88	39.42	39.78	1-1/8	3.86	1.53
36	38.48	39.60	43.75	46.29	46.08	1-1/8	3.86	1.53

SERIES 2000 TLP-PVC TUF Grip™ - APPLICATION CHART

Size (Inches)	Part No. - Gland Only Domestic / Non-Domestic	Wedge Qty.	T-Head Bolt Qty.	Bolt Size	Gland Weight (lbs.)	Weight (w/Acc.)	*Pressure Rating	Pipe O.D. (Inches)
3	CALL / 113928	2	4	5/8" x 3"	7.0	11.0	*305 / DR14	3.50
4	516002 / 113935	2	4	3/4" x 3.5"	8.3	12.2	*305 / DR14	4.50-4.80
6	516019 / 113942	3	6	3/4" x 4"	12.4	18.3	*305 / DR14	6.63-6.90
8	516026 / 113959	3	6	3/4" x 4"	14.9	20.8	*305 / DR14	8.63-9.12
10	516033 / 113973	6	8	3/4" x 4"	25.7	33.4	*305 / DR14	10.75-11.10
12	516040 / 113980	8	8	3/4" x 4"	34.1	42.0	*305 / DR14	12.75-13.20
14	516248 / 113997	10	10	3/4" x 4.5"	45.1	55.4	*235 / DR18	15.30
16	516262 / 114000	12	12	3/4" x 4.5"	56.2	68.4	*235 / DR18	17.40
18	516286 / 114017	12	12	3/4" x 4.5"	62.4	74.8	*235 / DR25	19.50
20	516309 / 114024	14	14	3/4" x 4.5"	72.9	86.9	*235 / DR25	21.60
24	516323 / 114031	16	16	3/4" x 5"	93.2	109.8	*235 / DR25	25.80
30	CALL / 461302	20	20	1" x 7.5"	251	293	*150 / DR25	32.00
36	CALL / 461357	24	24	1" x 7.5"	281	331	*125 / DR25	38.30

*Note: The pressure ratings are rated working water pressures for the restraint. See page 3 for additional ratings.

ISO 9001-2008 Registered

Listed with Underwriters Laboratory

Factory Mutual Approved

STOP-LOOK :

- Extra length T-Head bolts are provided with 30" - 36" restraints to facilitate mechanical joint assembly per AWWA C600
- For UL/FM Approvals, 3" - 12" were tested to 755 psi, 14" - 16" were tested to 755 psi and 18" - 24" inch were tested to 535 psi
- TUF Grip 30-36 inch provided with TRU-Lock™ mechanical joint gasket to ensure pressure rating & safety factors are met
- Mechanical joint T-head bolt torques for C909 applications are as provided; *55-65 ft.-lbs for 4" to 8" and *65 to 75 ft.-lbs. for 10" to 12" assembly. You must specify restraints are for C909 PVC pipe upon order placement. Call for availability
- Installation and hydrostatic testing shall be in accordance with AWWA C600 and AWWA C651
- TUF Grip 4" to 24" restraints shall meet the requirements of ASTM F1674, current revision

Caution: Pressure testing of piping systems restrained or un-restrained with insufficient backfill or bracing is not recommended

Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478
Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601
Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

TUFGRIP™

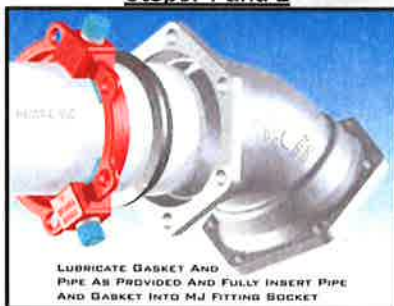
**ADDITIONAL SERIES 2000 TLP-TUF GRIP™ RESTRAINT RATINGS									
SIZE (Inches)	AWWA C900			AWWA C905			ASTM D2241		
	DR14	DR18	DR25	DR18	DR25	DR32.5	SDR17	SDR21	SDR26
3	-	-	-	-	-	-	250	200	160
4	305	235	165	-	-	-	250	200	160
6	305	235	165	-	-	-	250	200	160
8	305	235	165	-	-	-	250	200	160
10	305	235	165	-	-	-	250	200	160
12	305	235	165	-	-	-	250	200	-
14	-	-	-	235	165	125	-	-	-
16	-	-	-	235	165	125	-	-	-
18	-	-	-	200	165	-	-	-	-
20	-	-	-	200	165	-	-	-	-
24	-	-	-	165	165	125	-	-	-
30	-	-	-	-	165	125	-	-	-
36	-	-	-	-	125	125	-	-	-

****Note: Pressure Ratings for Ordinary Water Works Restraint Application with Transitory Surges Only**

****Note: AWWA C909 PVC Restraint Pressure Rating is per the Pressure Rating Listed on the Pipe**

Assembly steps for (3"-12" ASTM D2241 IPS PVC), (4"-12" AWWA C909 PVC), and (4"-36" AWWAC900/C905 PVC)

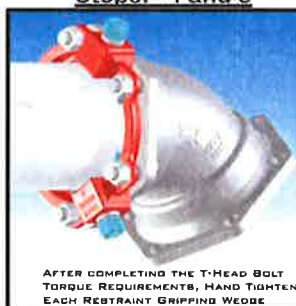
Steps: 1 and 2



Step: 3



Steps: 4 and 5



Steps: 6 and 7



1. Insure the beveled pipe end to be joined and mechanical joint socket are clean and free of debris. Slide the RED TUF Grip onto the beveled end of the pipe to be restrained. The TUF Grip compression lip extension must be toward the beveled end of the pipe being restrained.
2. Evenly lubricate the beveled pipe end, exterior pipe wall, and inside surface of the gasket with a lubricant that meets the requirements of AWWA C111. Now place the ****MJ gasket** over the plain beveled end of the pipe with the narrow edge of the tapered gasket toward the pipe end. ****NOTE:** Use MJ transition gasket with IPS diameter pipe.
3. Fully insert the beveled pipe end into the MJ socket pipe landing. Keeping the pipe straight in the MJ socket, slide/push the MJ gasket firmly and evenly into the MJ socket recess. Joint must be kept straight during assembly.
4. Push the TUF Grip compression lip extension evenly against the thick side of the MJ gasket and insert all T-Head bolts with nuts. Use only T-Head bolts and nuts that meet AWWA C111 requirements. With the TUF Grip restraint lip extension against the MJ gasket, evenly hand-tighten the nuts on the T-Head bolts making sure the restraint body is centered on the pipe and within in the MJ socket. If joint deflection is needed, deflect the pipe only after hand tightening of all nuts is completed. Joint deflection is 3° max for 3", 5° max for 4"-12", 2° max for 14"-16", 1.5° max for 18"-36". **NOTE:** Maximum deflection values provided apply with nominal pipe, fitting, and restraint diameters.
5. Using a wrench, tighten the T-Head bolts and nuts a few turns at a time in an alternating or star pattern. Maintain equal spacing or distance between the TUF Grip bolt flange and the MJ socket bolt flange as the MJ gasket is compressed. Repeat the process in an alternating pattern for all T-Head bolts and nuts. The T-Head bolt and nut torque requirement for restraints is 3"- 45-60 ft.-lbs., 4"- 24"-75-90 ft.-lbs., and 30"- 36"- 100-120 ft.-lbs.
NOTE: The C909 PVC T-Head bolt and nut torque is 55-65 ft.-lbs. for 4"-8" and 65-75 ft.-lbs. for 10"-12" restraints.
DO NOT OVER-TORQUE T-HEAD BOLTS and NUTS WHEN ASSEMBLING PVC and PVC PIPE!
6. ****Hand-tighten** the torque limiting nuts attached to the TUF Grip wedge assemblies in a clockwise direction with an alternating or star pattern until all gripping wedges are in contact with the pipe wall. Rotational direction of torque nut is indicated by recessed arrow on the face of the nut. With a wrench (box, socket, or pneumatic), continue to tighten each torque nut ½ turn in an alternating or star pattern around the restraint until all torque limiting nuts twist off. **NEVER** turn a torque limiting nut more than ½ turn without turning the remaining torque nuts an equal amount!
****NOTE:** For IPS and PVC applications, ensure step 5 is completed before engaging wedges. Failure to comply will result in excessive pipe wall deflection and torque nuts will not twist off as designed.
7. When all torque limiting nuts twist off, the mechanical joint and restraint assembly are complete.

Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478
Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601
Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471
www.tylerunion.com

Application

Designed for installation on potable water lines to protect against both backsiphonage and backpressure of contaminated water into the potable water supply. The Model 375 provides protection where a potential health hazard exists. Ideal for use where lead-free* valves are required.

Standards Compliance

(Unless Otherwise Noted, Sizes 2 1/2" Thru 10")

- ASSE® Listed 1013
- IAPMO® Listed
- CSA® Certified B64.4 (2 1/2" thru 8")
- AWWA Compliant C511, and C550
- FM® Approved
- UL® Classified
- C-UL® Classified
- NYC MEA 49-01-M Vol 2
- Approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California.

• Meets the requirements of NSF/ANSI 61*

*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

Main valve body	Ductile Iron ASTM A 536
Access covers	Ductile Iron ASTM A 536
Coatings	NSF Approved fusion epoxy finish
Internals	Stainless steel, 300 Series NORYL™
Fasteners	Stainless Steel, 300 Series
Seal rings	EPDM (FDA approved)
O-rings	Buna Nitrile (FDA approved)
Springs	Stainless Steel, 300 Series
Sensing line	Stainless Steel, braided hose

Features

Sizes:	2 1/2", 3", 4", 6", 8", 10"
Maximum working water pressure	175 PSI
Maximum working water temperature	140°F
Hydrostatic test pressure	350 PSI
End connections (Grooved for steel pipe)	AWWA C606
(Flanged)	ANSI B16.1 Class 125

Attention:

Model 375 (flange body) and Model 375A (grooved body) have different lay lengths.



Options

(Suffixes can be combined)

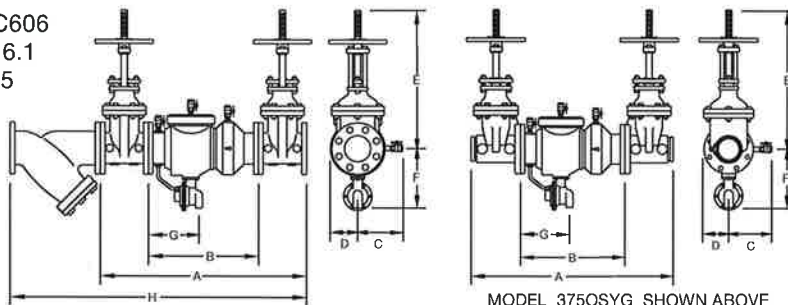
- ☐ - with NRS shut-off valves (standard)
- ☐ FSC - with epoxy coated wye type strainer (flanged only)
- ☐ G - with grooved end NRS gate valves
- ☐ GF - with grooved inlet connection and flanged outlet connection
- ☐ FG - with flanged inlet connection and grooved outlet connection
- ☐ L - less shut-off valves (flanged body connections)
- ☐ MS - with Integral Relief Valve Monitor Switch
- ☐ OSY - with OS&Y gate valves
- ☐ PI - with Post Indicator gate valve
- ☐ BG - with grooved end butterfly valves with integral supervisory switches
- ☐ -509 - with AWWA C509 gate valves

Accessories

- ☐ Repair kit (rubber only)
- ☐ Thermal expansion tank (Model XT)
- ☐ OS & Y Gate valve tamper switch (OSY-40)
- ☐ Air gap (Model AG)
- ☐ Electronic Solenoid Timer (Model EST)
- ☐ QT-SET Quick Test Fitting Set

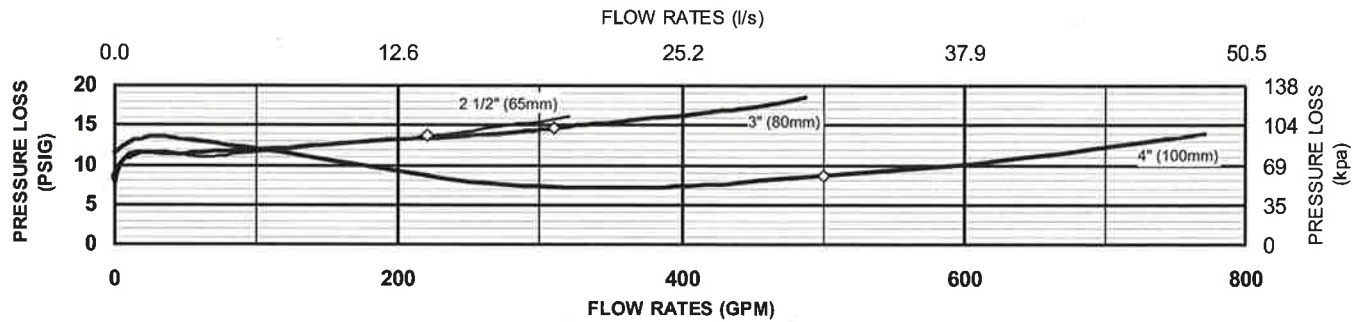
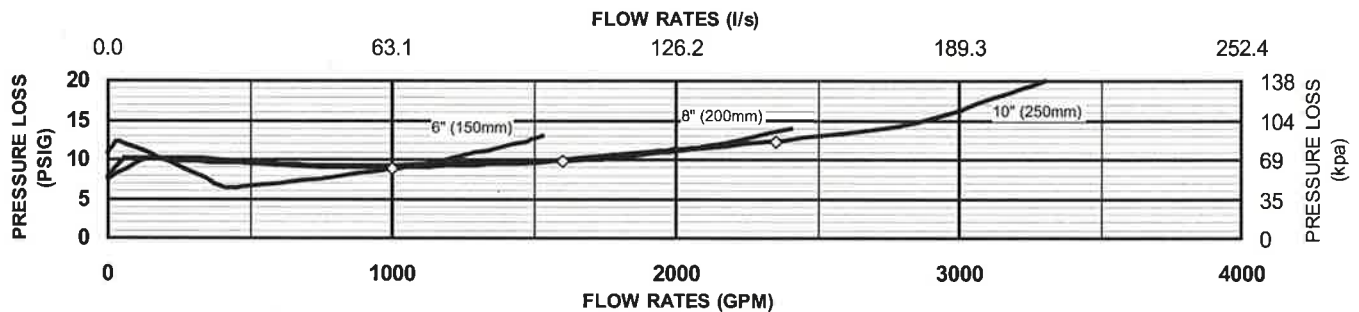
Relief Valve discharge port:

2 1/2" - 6"	-	2.75 sq. in.
8" - 10"	-	3.69 sq. in.



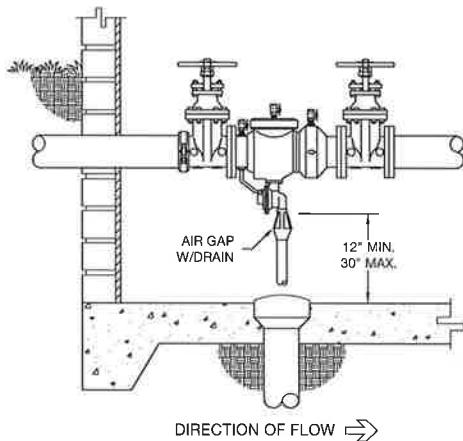
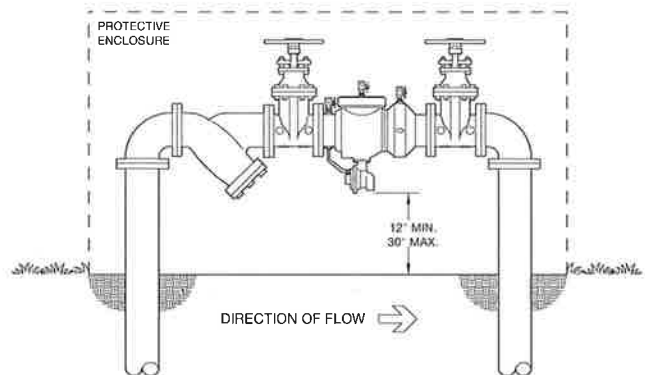
Dimensions & Weights (do not include pkg.)

MODEL 375 SIZE	DIMENSION (approximate)																				WEIGHT																
	A		A WITH BUTTERFLY VALVES		B LESS GATE VALVES		C		D		E OS&Y OPEN		E OS&Y CLOSED		E NRS GATE		E WITH BUTTERFLY VALVES		F		G		H		LESS SHUT- OFF VALVES		NRS GATE VALVES FLANGED		NRS GATE VALVES GROOVED		OS&Y GATE VALVES FLANGED		OS&Y GATE VALVES GROOVED		BUTTERFLY VALVES GROOVED		
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	
2 1/2	65	31	787	28	711	15 7/8	403	7 1/4	184	3 3/4	95	17 3/4	451	15 3/8	391	11 1/2	292	8 1/4	210	9 1/2	241	8 3/8	213	41 1/4	1048	60	27	162	73	144	65	170	77	152	69	132	60
3	80	32	914	30 1/2	774	16 1/8	409	7 1/2	190	3 1/2	91	18 1/2	463	15 1/2	393	12 1/4	315	8 1/2	213	9 3/4	250	8 1/2	213	43 1/4	1106	66	30	177	80	154	70	180	80	162	74	142	64
4	100	37 5/8	956	32 8/9	835	19 1/2	495	8	203	4 1/2	114	22 1/2	572	18 1/4	464	14 1/2	368	9	229	11	279	9 1/4	235	52 3/4	1340	98	44	278	126	260	118	288	131	274	124	182	83
6	150	44 3/4	1137	37 5/8	956	23 1/2	597	10	254	6	152	30 1/2	775	24 1/4	616	18	457	10 1/4	260	12 3/8	314	10 3/4	273	62 3/4	1594	175	79	459	208	431	196	475	215	449	204	293	133
8	200	60 3/4	1543	53 7/8	1369	37 3/4	959	11	279	10	254	37	940	28 1/2	724	21 1/8	537	12	305	15 3/8	391	16 3/4	425	85	2159	377	171	829	376	795	361	853	387	805	365	551	250
10	250	63 3/4	1619	57 7/8	1470	37 3/4	959	11	279	10	254	45 5/8	1159	34 3/4	883	24 3/4	629	13	330	15 3/8	391	16 3/4	425	93 1/4	2369	407	185	1167	529	1101	499	1225	556	1159	526	795	361

MODEL 375 2 1/2", 3" & 4" (STANDARD & METRIC)**MODEL 375 6", 8" & 10" (STANDARD & METRIC)****Typical Installation**

Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted at a minimum of 12" (305mm) and a maximum of 30" (762mm) above adequate drains with sufficient side clearance for testing and maintenance. The installation shall be made so that no part of the unit can be submerged.

Capacity thru Schedule 40 Pipe (GPM)				
Pipe size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687
12"	1763	2644	3525	5288

**INDOOR INSTALLATION (375GF)****OUTDOOR INSTALLATION****Specifications**

The Reduced Pressure Principle Backflow Prevention Assembly shall be certified to NSF/ANSI 61, ASSE® Listed 1013, and supplied with full port gate valves. The main body and access cover shall be epoxy coated ductile iron (ASTM A 536), the seat ring and check valve shall be NORYL™, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The checks and the relief valve shall be accessible for maintenance without removing the device from the line. The Reduced Pressure Principle Backflow Prevention Assembly shall be a ZURN WILKINS Model 375.

Materials

- Roof, walls, and drain panel – 5052-H32 marine grade aluminum (.050/18 gauge), mill finish, ASTM B209 outside
- Drain panel hinge and spring – stainless steel
- Insulation 1 ½" (9 "R" value) minimum thickness polyisocyanurate foam laminated to a glass fiber reinforced facer (each side), non-wicking
- Mounting hardware – 300 series stainless steel or T-6 aluminum
- Wedge anchors – Powers SDI – ½" x 3 ¾"

Standards

- ASSE 1060
- ASTM B209



Heating Required

- ☐ Yes – see separate specification submittal sheet
- ☐ No

Dimensions

Model	Inside Diameter			Concrete Pad			Ship Wt	Access Panels	Access Panel Size		Drain Opening	
	W	L	H	W	L	H			W	H	W	H
600-AL	36	100	56	50	114	6	364	2	38 ¼	56	38 ¼	6 ½
600D-AL	70	108	56	84	122	6	515	2	38 ¼	56	38 ¼	6 ½
600DS-AL	70	128	56	84	142	6	575	4	38 ¼	56	38 ¼	6 ½
600LU880-AL*	36	38	48	50	52	6	245	2	28	48	28	6 ½
600T-AL	36	100	64	50	114	6	500	2	38 ¼	64	38 ¼	6 ½
600TM-AL	36	100	70	50	114	6	534	2	38 ¼	70	38 ¼	6 ½
600TD-AL	70	108	64	84	122	6	560	2	38 ¼	64	38 ¼	6 ½
600TDS-AL	70	128	64	84	142	6	590	4	38 ¼	64	38 ¼	6 ½
600TLU880-AL*	44	38	48	58	52	6	212	2	36	48	36	6 ½
600TS-AL	38	120	64	52	134	6	524	2	38 ¼	64	38 ¼	6 ½

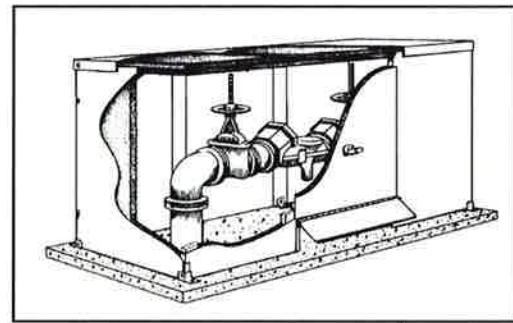
*Standard compact design models include hinged lift-up roof

All dimensions in inches.

Specifications

A freeze and vandal protective enclosure shall be installed over above ground plumbing systems. The enclosure shall be constructed of 5052-H32 marine grade aluminum with a minimum R9 in the walls and R18 in the roof. Molded fiberglass enclosures will be rejected. Cut board insulation shall be used for uniform insulation thickness. Sprayed insulation shall be reason for rejection. Redwood post and beams shall be utilized for structural support. The use of "Particle board" shall be reason for rejection. The roof of the enclosure shall be removable for maintenance. Enclosures requiring tape to seal the roof seams are prohibited. The enclosures shall have a fully insulated drain panel designed to remain closed, except when discharging water. The drain panel shall be sized to accommodate the maximum discharge for backflow installations. The enclosure shall be mounted securely to a concrete pad and remain locked even if outside screws are removed. All mounting hardware shall be furnished. The enclosure shall withstand straight line winds up to 110 mph with standard anchoring hardware. Sturdier anchoring hardware shall be made available to withstand straight line winds up to 130 mph.

When heat is required, a slab mounted UL or ETL listed heater shall be provided that has been independently certified to meet the UL-2021 "Rain Test" for damp or wet conditions. Wall-mounted air heaters and self-regulating cables shall not be used as the heat source. The enclosure shall be certified to the most recent ASSE Standard 1060 (Class I or Class II). The insulated enclosure shall be a Safe-T-Cover Series 600.



Description

The enclosure is designed to provide freeze and vandal protection of above ground backflow prevention assemblies, meters, PRV, etc. The enclosure provides for safe and easy testing and maintenance.

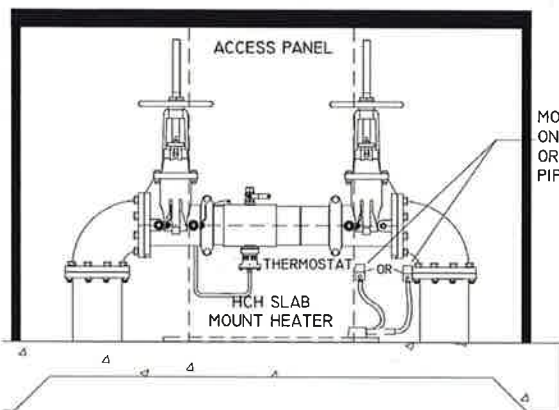
The enclosure disassembles easily if full equipment replacement is needed.



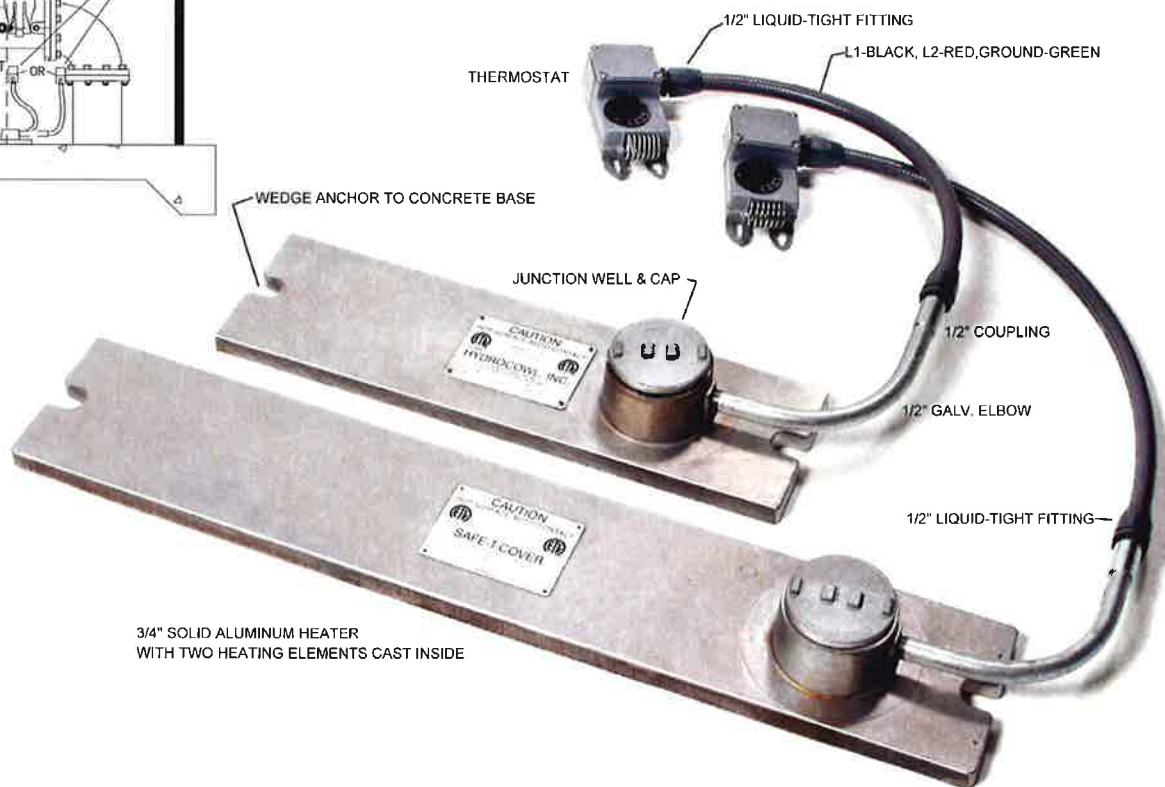
ENCLOSURES DESIGNED FOR THE WORLD'S WATER SYSTEMS™

600T-AL HEATED ENCLOSURE

Electric HCHS/HCH Heating Systems



MOUNT THERMOSTAT
ON VERTICAL SUPPORT
OR WIRE-TIE TO RISER
PIPE



3/4" SOLID ALUMINUM HEATER
WITH TWO HEATING ELEMENTS CAST INSIDE

Note: Remove heater
from carton and check
for shipping damage.
Damage Claims
should be entered
immediately with
carrier.



READ CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR MAINTAIN THE PRODUCT DESCRIBED. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH INSTRUCTIONS AND SAFETY INFORMATION COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

Maintenance & Servicing

- 1. DANGER — Hazard of electric shock!**
Disconnect all power before attempting to service this heater.
2. After long periods of idleness, accumulated combustible particles should be removed.

Specifications

20 AMP BREAKER REQUIRED

Catalog No.	Voltage	Wattage	BTUH	Phase	Amps
HCHS500-120	120	500	1707	Single	4.16
HCHS1000-120	120	1000	3413	Single	8.33
HCHS1000-240	240	1000	3413	Single	4.16
HCH2000-120	120	2000	6824	Single	16.66
HCH2000-240	240	2000	6824	Single	8.33

DANGER!

DO NOT DEPEND UPON THE THERMOSTAT AS THE SOLE MEANS OF DISCONNECTING THE POWER WHEN INSTALLING OR SERVICING THE PRODUCT IT IS CONTROLLING. ALWAYS DISCONNECT POWER AT THE MAIN CIRCUIT BREAKER. FAILURE TO DO SO CAN RESULT IN FATAL ELECTRIC SHOCK.



DANGER!

NE DÉPENDEZ PAS DU THERMOSTAT COMME LES SEULS MOYENS DE DÉBRANCHER LE POUVOIR EN INSTALLANT OU EN ASSURANT L'ENTRETIEN DU PRODUIT QU'IL CONTRÔLE. DÉBRANCHEZ TOUJOURS LE POUVOIR AU DISJONCTEUR PRINCIPAL. L'ÉCHEC DE FAIRE PEUT AVOIR POUR RÉSULTAT AINSI LE DÉCHARGE ÉLECTRIQUE FATAL.

INSTALLATION INSTRUCTIONS



Note: Read entire instructions before installation. Installation must be made by trained, experienced service person.



PROVIDE GROUND-FAULT INTERRUPTER DEVICE IN ELECTRICAL CIRCUIT. ALL WIRING SHOULD BE AS PER THE GOVERNING LOCAL AND NATIONAL CODES AND ORDINANCES.

Do not use connection methods which are non-watertight or that are not approved for NEMA 4X installation. Failure to prevent water entry may result in electrical failure with risk of fire, property damage or fatal injury.

1. Install 1/2" Galvanized elbow into threaded hole of junction well on the heater. **NOTE:** Because of the heat, ONLY the 1/2" Galvanized elbow should be installed in the junction well.
2. Install 1/2" coupling on the end of the Galvanized elbow.
3. Install 1/2" male "liquid tight" fitting into coupling. **NOTE:** These joints should be "liquid tight".
4. Remove desired knock-out from thermostat and install "liquid tight" fitting.
5. Install desired length of flexible conduit.
6. Remove threaded cap from junction well of heater and feed wires thru conduit. **NOTE:** Wire and terminal ends must be rated for high temperature use. Wire as per wiring schedule for required wattage. (See Wiring, TABLE 1)
7. Wire thermostat as per thermostat manufacturer's installation instructions. Ground wire must be used.
8. Replace cap and tighten to seal. The torque for the cover is 13 Nm.

MOUNTING INSTRUCTIONS

1. Do **not** attempt to cut, saw or alter in any way the size of the heater.
2. Place and **center** the heater directly on concrete **underneath** the installed device.
3. **Center heater** on concrete **between side walls** of the enclosure.
4. Mount heater to concrete using two (2) fasteners w/large washers. **NOTE:** Leave heater **loosely mounted** to allow for expansion and contraction.
5. Mount thermostat on vertical support adjacent to the access opening of the enclosure or wire-tie to the nearest riser pipe
6. For heater to be most effective, thermostat should be 8"-12" above the slab.

OPERATION INSTRUCTIONS

Caution: HAZARD OF FIRE. Keep combustible materials at least 6" away from heater.

Prudence: HASARD DE FEU. Gardez des matières combustibles au moins 6" loin du réchauffeur.

Danger: HAZARD OF FIRE. This heater is not intended for use in hazardous atmospheres where flammable vapors, gases, liquids, or other combustible atmospheres are present as defined in the National Electric Code. Failure to comply can result in explosion or fire.

Danger: HASARD DE FEU. Ce réchauffeur n'est pas destiné pour l'utilisation dans les atmosphères dangereuses où les vapeurs inflammables, les gaz, les liquides, ou d'autres atmosphères combustibles sont présents comme défini dans le Code Électrique national. L'échec de se conformer peut avoir pour résultat l'explosion ou le feu.

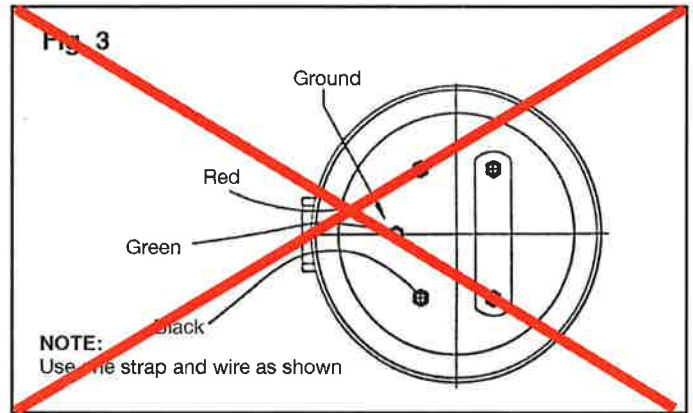
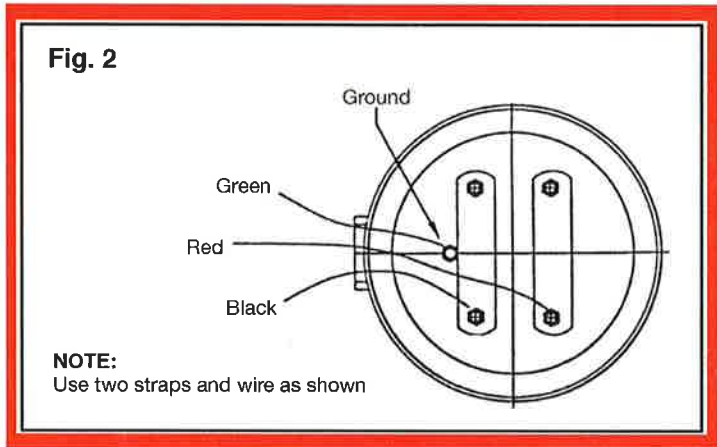
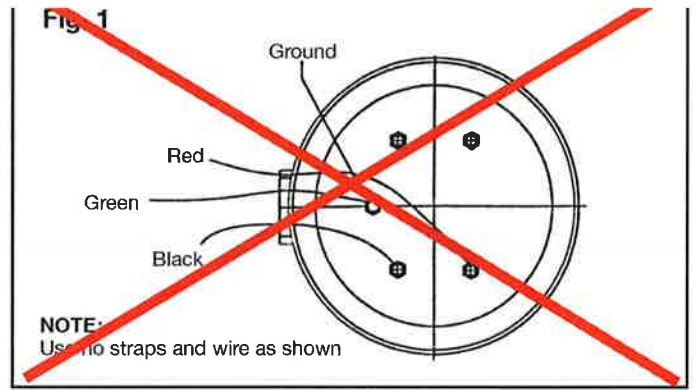
Danger: PERSONAL INJURY OR DEATH could result from electric shock. Disconnect all power to heater at main panel before attempting to install, service or repair this device.

Danger: la BLESSURE PERSONNELLE OU LA MORT pourraient provenir du décharge électrique. Débranchez tout le pouvoir du réchauffeur au comité principal avant d'essayer d'installer, assurer l'entretien ou réparer cet appareil.



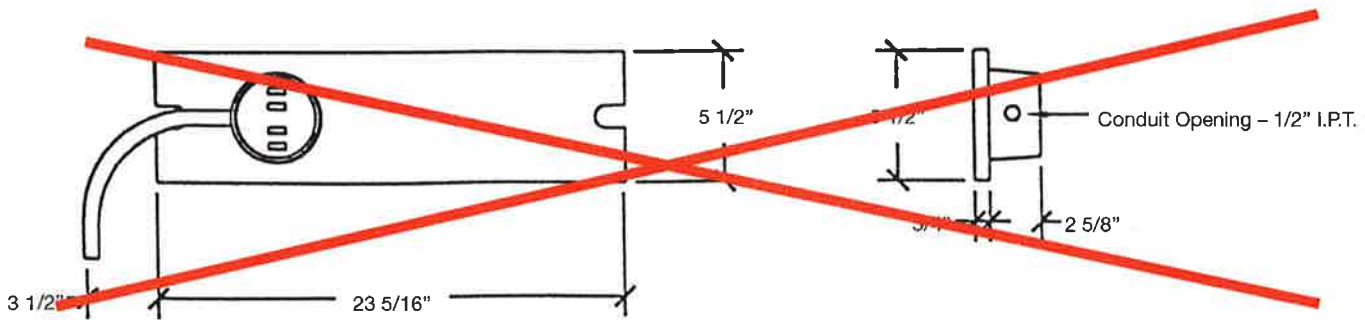
As per following diagrams
Model No. Drawing No.

HCHS500-120	Fig. 1
HCHS1000-120	Fig. 2
HCHS1000-240	Fig. 3
HCH2000-120	Fig. 2
HCH2000-240	Fig. 3

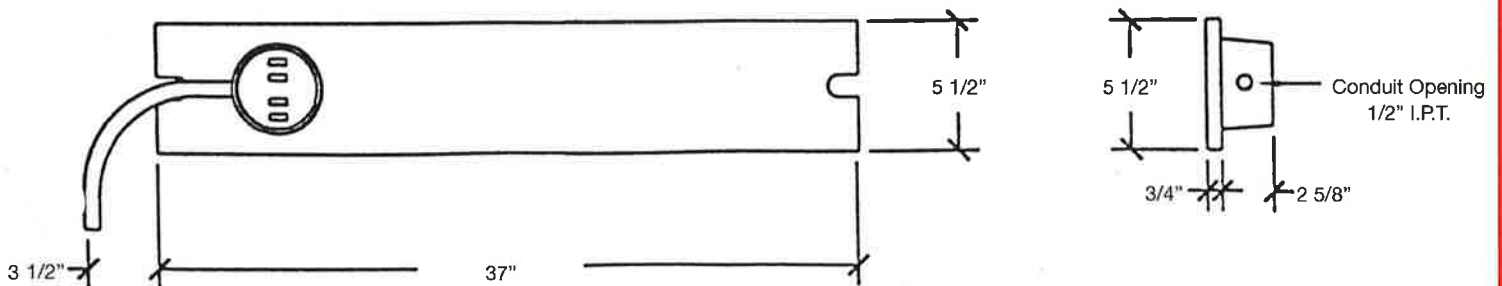


HEATER DIMENSIONS

Model Nos. HCHS500 and HCHS1000



Model Nos. HCH2000



Replacement Parts Identification

Item	Part Name	Qty	Catalog No.
1	Heater	1	HCHS001
2	Thermostat w/mounting screws	1	HCHS002
3	Wiring kit	1	HCHS003

Replacement Parts Identification

Item	Part Name	Qty	Catalog No.
1	Fasteners	1	HCHS004
2	1/2" x 10" nipple	1	HCHS005
3	1/2" coupling	1	HCHS006
4	1/2" "liquidtight" fitting	2	HCHS007
5	1/2" "liquidtight" conduit	28"	HCHS008

Item	Part Name	Qty	Catalog No.
6	Ground screw	1	HCHS009
7	12 ga. high temp wire L-1 (black)	48"	HCHS010
8	12 ga. high temp wire L-2 (white)	48"	HCHS011
9	12 ga. high temp wire ground (green)	48"	HCHS012
10	High temperature terminal ends	3	HCHS013

LIMITED WARRANTY

THREE YEAR LIMITED WARRANTY: Safe-T-Cover by HydroCowl warrants to the original purchaser for a period of three (3) years from the date of original shipment that the HCH Heater is free from defects in materials and workmanship. For limited warranty claim procedures, see CLAIM DISPOSITION below.

LIMITATION OF LIABILITY: In no event shall Safe-T-Cover by HydroCowl be liable for incidental or consequential damages. Safe-T-Cover by Safe-T-Cover by HydroCowl's liability in all events is limited to, and shall not exceed, the purchase price paid.

WARRANTY DISCLAIMER: Safe-T-Cover by HydroCowl makes no other representation or warranty of any kind, expressed or implied, in fact or in law, including without limitation, the warranty of merchantability or the warranty of fitness for a particular purpose. There are no warranties which extend beyond the description on the face hereof.

PRODUCT SUITABILITY: Many states and localities have codes and regulations which may vary from those in neighboring areas. Safe-T-Cover by HydroCowl attempts to assure that its products comply with such codes, however, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Review the product application, all national and local codes and regulations, and be sure that the product, installation and use will comply with them.

CLAIM DISPOSITION: The limit of Safe-T-Cover by HydroCowl's liability for failure of this product to meet the foregoing warranty shall be, at Safe-T-Cover by HydroCowl's sole option, for repair or replacement of the defective product and shall exclude any damage caused by accident, misuse or abuse of the product. For any product believed to be defective within the limited warranty time, write or call the supplier from whom the product was purchased. If unable to obtain satisfactory results, call Safe-T-Cover by HydroCowl at telephone number listed below. Furnish name of the supplier, address, date and number of supplier's invoice. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.



ENCLOSURES DESIGNED FOR THE WORLD'S WATER SYSTEMS™

800-245-6333



SAFE-T-COVER®

by Hydrowall

Superior Freeze and Vandal Protective Enclosures Since 1988

**MATERIAL SUPPLIER'S CERTIFICATE CERTIFYING COMPLIANCE WITH
ARRA BUY AMERICAN PROVISIONS**
(To be attached to each specification / drawing)

PROJECT OWNER: _____

CONTRACT NO: _____

CONTRACT NAME: _____

PROJECT NAME: _____

SPECIFICATION / DRAWING DESCRIPTION: **Aluminum Enclosures**

CERTIFICATION:

I, the undersigned, hereby certify that the above noted item(s) is in full and complete conformance with the **ARRA BUY AMERICAN** provisions contained in the American Recovery and Reinvestment Act of 2009.

MATERIAL SUPPLIER: **SAFE-T-COVER** DATE: _____

Name: **LORI PATTON**

Signed: *Lori Patton*

Title: **OPERATIONS MANAGER**

Address: **2710 LANDERS AVENUE**

NASHVILLE, TN 37211

Telephone: **(615) 259-4495**

Fax: **(615) 259-4481**

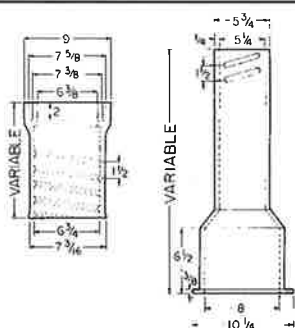
Employer ID Number: **62-1610488**

SUBMITTAL

(Current Revisions for All Standards Apply)

- SIZES:** Adjustable Slip and Screw type with standard assembled 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 access., lids, rings, bases, risers, meter covers, etc.
- STANDARDS:** Produced with Class 35 cast iron in accordance with and meeting all applicable terms and provisions of ASTM A-48. 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 exposed to cold or sticky when exposed to the sun.

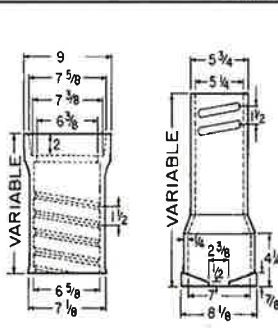
**For 4" to 12" Valves
5 1/4" Shaft, Screw Type**



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

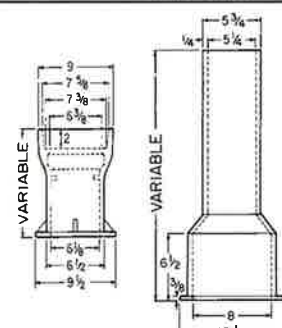


**6860 SCREW TYPE
VALVE BOX
Cast Iron - 3 piece**

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

NOTE: Base Required,
Order Separately

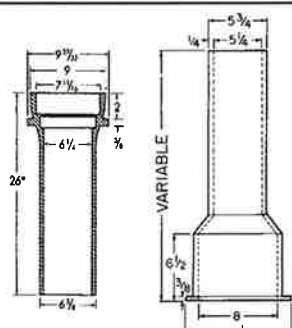
**For 4" to 12" Valves
5 1/4" Shaft, Slip Type**



**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

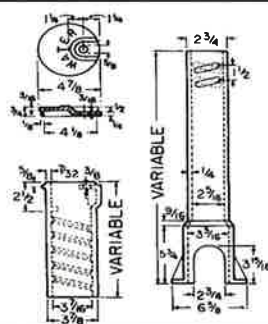
**For 4" to 12" Valves
5 1/4" Shaft, Slip Type**



**7126 SLIP TYPE
VALVE BOX**

Components	Extension Height
26T + 24B	28-48
26T + 30B	34-54
26T + 36B	40-60
26T + 24B + #60 Ext	52-72
26T + 36B + #60 Ext	60-80

NOTE: Use the 6855 Bottoms
with these Tops



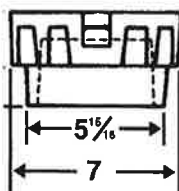
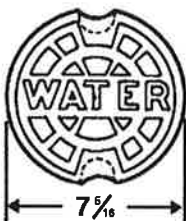
For 1/2" to 2" Curbstops

**6500 SCREW TYPE
CURB / SERVICE BOX**

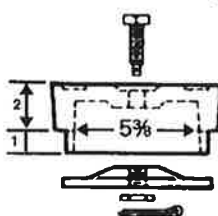
Components	Extension In Inches
18T & 27B	30-42
18T & 33B	36-48
24T & 33B	36-54
24T & 39B	42-60
30T & 39B	41-64

*Enlarged Base Available

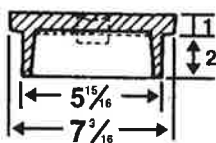
**T = Top
B = Bottom
EXT = Extension**



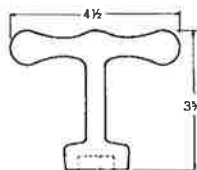
Drop Lid



Lock Lid

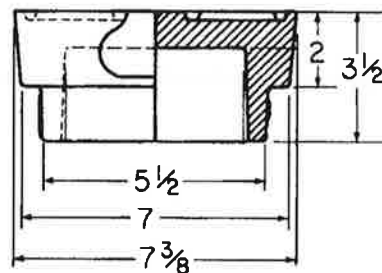


1 1/8" Lid



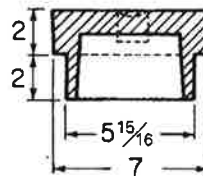
WRENCH
Fits Standard Waterworks
Pentagon Head 27/32" Brass
Screws

UPC No.	Ship		
670610	Code	Description	Weight
144908	S	Wrench	0.5



5 1/4" MWW DROP LID

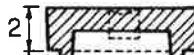
UPC No.	Weight
670610	
145370	12



5 1/4" OMA DROP LID

UPC No.	Special	Weight
670610	Markings	
145301	WATER OMA*	12

*OMA marking is inside lid.



5 1/4" DROP LID W/SPECIAL MARKINGS*

UPC No.	Special	Weight
670610	Mark	
145332	GAS	12
145349	SEWER	12
145356	PLAIN	12

*Lids marked with "WATER" will be shipped unless otherwise specified.

LIDS ("WATER")

Item/Description	UPC No.	Weight
5 1/4 Drop Lid	145325	12
5 1/4 Lock Lid	145462	11
1 1/8 Lid*	145509	11

*Use with 1 1/8" Riser Only.



Buy America(n)™ & Product Certificate of Compliance

Address: 1501 W. 17th Street – Anniston, AL 36201
Telephone No.: (800) 226-7601
Fax Number: (800) 226-0806

Date: January 6, 2014

To: Whom It May Concern

Re: Buy America /Buy American Certification for Tyler Union Waterworks Made in the U.S.A Products

We appreciate the opportunity to supply our products for your projects requiring to some or full extent product that is substantially or wholly manufactured in the U.S.A. Tyler Union Waterworks certifies that its Domestic manufactured fittings and cast iron municipal castings are wholly manufactured in the U.S.A. using only raw materials that wholly originate in the U.S.A..

After a thorough review of "Buy America/Buy American" acts; Tyler Union certifies that our Domestic ANSI/AWWA fittings and ASTM cast iron municipal castings meet all applicable requirements and provisions as provided for by the U.S. Department of Transportation and the Federal standards noted for domestic iron and steel construction materials incorporated into your project. These standards/laws/acts and revisions date from 1933 through current year 2014.

Buy American:

- American Recovery and Reinvestment Act of 2009 (ARRA), Section 1605
- Federal Aviation Administration (FAA), 49 U.S.C. § 50101

Buy America:

- Federal Highway Administration (FHWA), 23 U.S.C. § 50101§ 313 – Buy America; 23 C.F.R. § 635.410
- Federal Railroad Administration (FRA), 49 U.S.C. Chapters 244, 246: § 24405 – Buy America
- National Railroad Passenger Corporation (AMTRAK), 49 U.S.C. § 24305
- Federal Transit Administration (FTA), 49 U.S.C. § 5323(j); 49 C.F.R. Part 661 (Buy America Requirements)

If your domestic project material requires additional certifications as provided; you must advise the Tyler Union Waterworks product Distributor or Customer Service Agent upon order placement. Additional certifications available include 1) mill certification, 2) product and/or product specific certificate for accessories, and 3) coating certificate. Our purchase order system maintains purchase shipping order information for a minimum of 12 months. For tracking purposes these orders indicate if the product processed and shipped was domestic in origin.

Tyler Union certifies its 2" through 48" Domestic ANSI/AWWA fittings are cast with tested and traceable ASTM A536 compliant ductile iron that is designed for use with and conforms to all the applicable terms and requirements of ANSI/AWWA C153/A21.53, ANSI/AWWA C151/A21.51, ANSI/AWWA C115/A21.15, ANSI/AWWA C111/A21.11, ANSI/AWWA C116/A21.16, ANSI/AWWA C110/A21.10, and ANSI/AWWA C104/A21.4. Additionally Tyler Union certifies its Domestic made in the U.S.A. cast iron municipal products (Valve box, Service box, and Accessories) are produced in accordance with and meet all applicable terms and provisions of ASTM-A48. Current revisions apply for each noted standard.

Best Regards,

Roger Dunning

Roger Dunning

Technical Support Manager

Tyler Union Waterworks

Email: roger.dunning@tylerunion.com

Tel.: (800)527-8478

Project Name: _____

Project Location: _____

Project Material: _____

Location of Mfg.: _____

Project Contractor: _____

Tyler Union Distributor: _____

Project No.: _____

Union Foundry - Anniston, AL 36201 – U.S.A.

Subscribed and sworn to before me this 6th Day of January 2014

Sandra C. Smith

Sandra Smith – Notary Public – Smith County, Texas



Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478

Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601

Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

Elmira: 1021 East Water • Elmira, NY 14902

New Lenox: 2200 West Haven • New Lenox, IL 60451

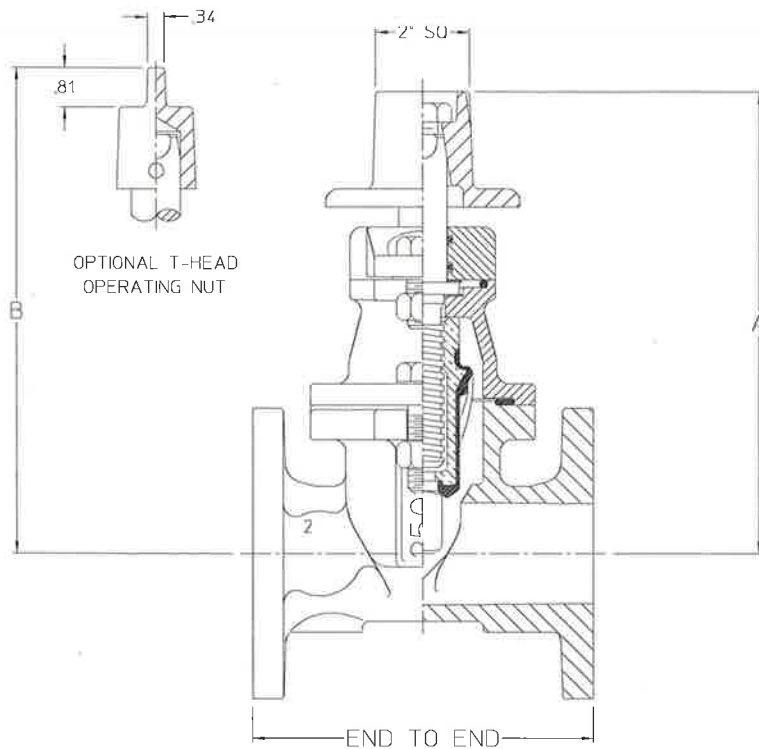
Portland: 6204 N. Marine Dr. • Portland, OR 97203

www.tylerunion.com

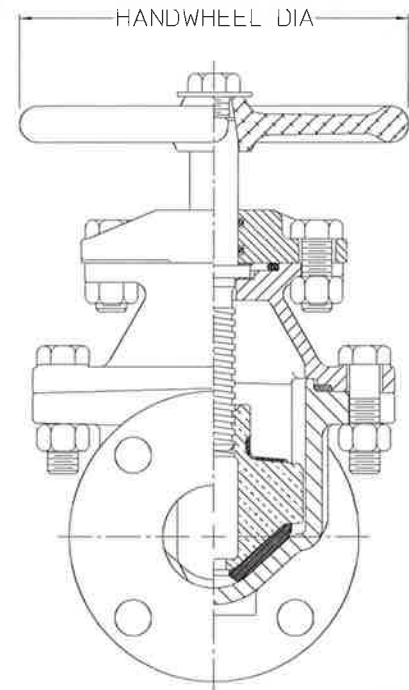
This document is void if modified in any manner other than the addition of project information, name of contractor and/or product distributor

AMERICAN Flow Control Submittal Information

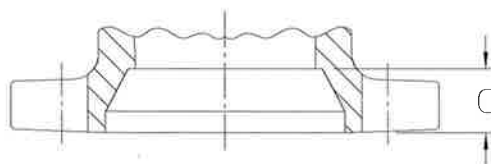
2" SERIES 2500 RESILIENT WEDGE GATE VALVE, NRS



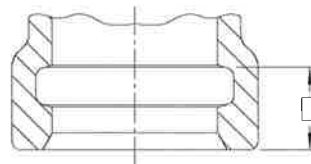
SHOWN WITH 2" OPERATING NUT



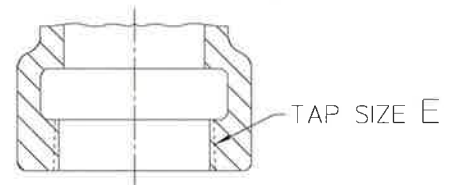
SHOWN WITH OPTIONAL HANDWHEEL



MECHANICAL JOINT (MJ)



PVC



THREADED (SCREW)

OPTIONAL END CONNECTIONS

NOTES:

1. Bolt pattern of flanged ends are in accordance with ASME B16.1, Class 125.
2. Mechanical joint ends are in accordance with ANSI/AWWA C153/A21.53.
3. PVC ends are for steel (IPS) sizes of PVC or steel pipe.
4. Threaded ends are in accordance with ASME B16.4, Class 125 (see dimension E).

DIMENSION	2" VALVE SIZE
End to End - MJ/MJ	8.25
End to End - FL/FL	7.00
End to End - PVC/PVC	10.75
End to End - Threaded	6.25
A	9.25
B	10.22
C	2.50
D	3.75
E	2 NPT
Handwheel Diameter	8.00
No. of Turns to open	9



AMERICAN

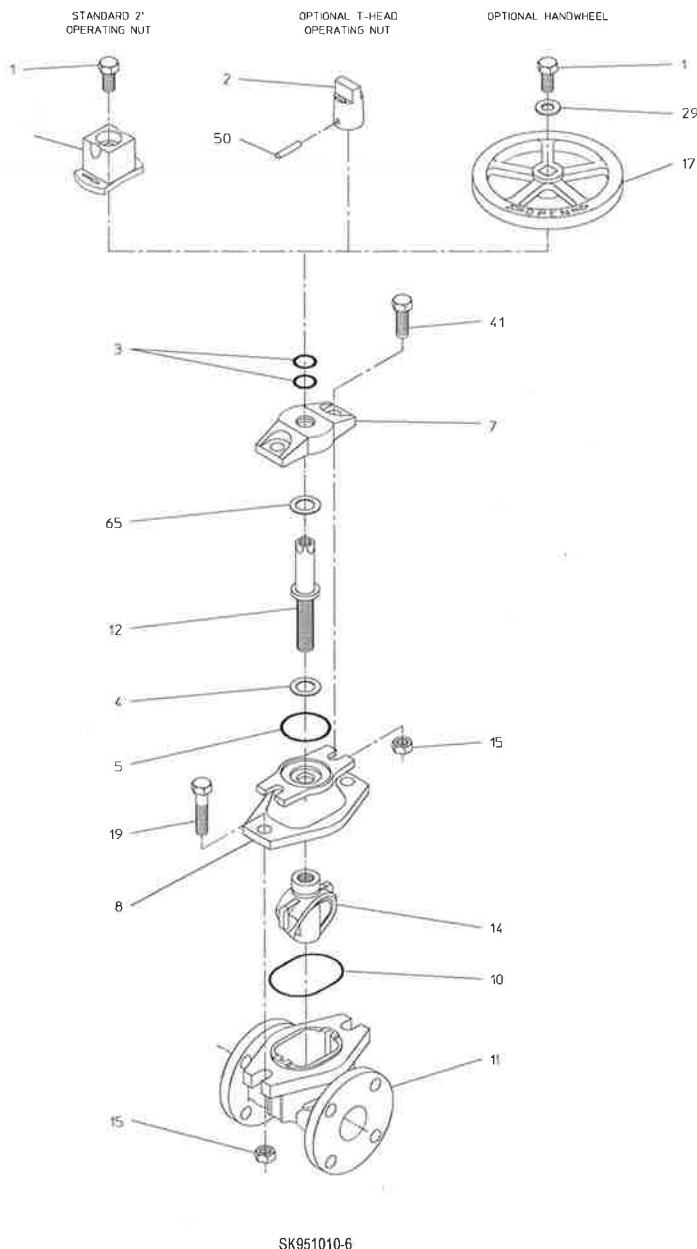
FLOW CONTROL

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



REF NO.	DESCRIPTION	MATERIAL
1	Hex Head Bolt, 5/8-11 x 1"	304 Stainless Steel
2	Operating Nut	2" Square & T-Head: Ductile Iron, ASTM A536
3	O-Ring	Rubber
4	Lower Thrust Washer	Nylon 101, Federal Spec No. L-P-401A
5	Stuffing Box Gasket	Rubber O-ring
7	Stuffing Box	Ductile Iron, ASTM A536
8	Bonnet	Ductile Iron, ASTM A536
10	Bonnet Gasket	Rubber O-ring
11	Body	Ductile Iron, ASTM A536
12	Stem	Manganese Bronze, ASTM B763, UNS C86700
14	Resilient Wedge	EPDM Rubber Coated Cast NDZ-S Bronze, ASTM B763, UNS C99500
15	Hex Nut, 5/8-11	304 Stainless Steel
17	Handwheel	Cast Aluminum, ASTM B26, Alloy 535
19	Hex Head Bolt, 5/8-11 x 2-1/4"	304 Stainless Steel
29	Flat Washer, 5/8	304 Stainless Steel
41	Hex Head Bolt, 5/8-11 x 1-1/2"	304 Stainless Steel
50	Spirol Pin, 5/16 x 1-1/2"	302 Stainless Steel
65	Upper Thrust Washer	304 Stainless Steel

OPTIONAL MATERIALS ARE AS FOLLOWS

BOLTS and NUTS: 316 Stainless Steel

STEM: Stainless Steel

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

NOTES:

1. Meets applicable requirements of ANSI/AWWA C515 with 250 psig rated working pressure although the standard does not cover valves smaller than 3-inch.
2. Fusion-bonded epoxy-coated in accordance with ANSI/AWWA C550.
3. Certified to NSF/ANSI 61 and 372.

Construction shown is typical of the 2-inch size with flanged end connections and is illustrative only. Construction of other end connection types vary slightly. See elsewhere on this submittal for specific details.



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



AMERICAN

**FLOW CONTROL
WATEROUS**

THE RIGHT WAY

Shana Quick
Baker Utility Supply
2351 Aztec Road NE
Albuquerque, NM 87107

February 5, 2014

Subject: Certificate of Origin – Buy American
Product: AMERICAN Flow Control Series 2500/2500-1
Resilient Wedge Gate Valve
AMERICAN Waterous Pacer Fire Hydrant

Dear Ms. Quick:

This is to certify that the product listed above is manufactured by the Waterous Company in South Saint Paul, Minnesota, in the United States of America, and these products comply with requirements of the federal American Recovery and Reinvestment Act of 2009 (ARRA) including the Buy American provision in Section 1605.

Waterous Company is a subsidiary of AMERICAN and manufactures products marketed and sold by the AMERICAN Flow Control division of AMERICAN.

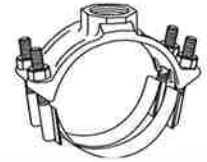
Sincerely,

Allan Nelson
Senior Product Engineer

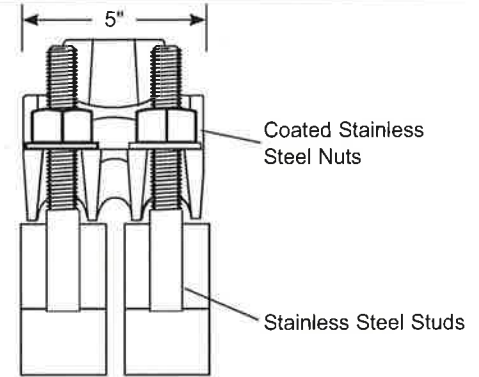
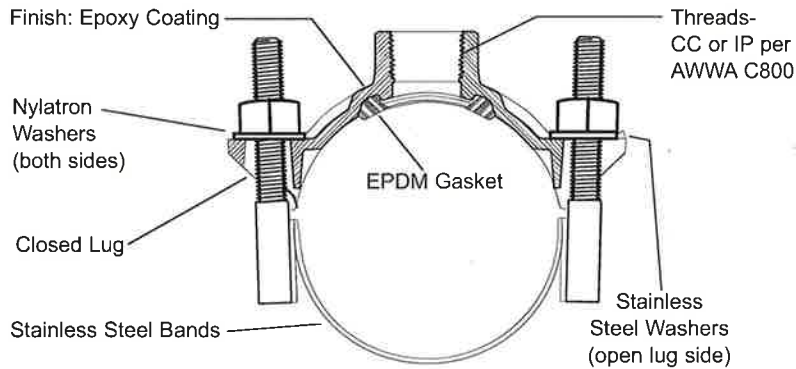
abnelson@waterousco.com
P: 651.450.5275
Waterous Company
125 Hardman Avenue South
South Saint Paul, MN 55075-2456

SUBMITTAL INFORMATION

Iron Service Saddles - (FCD202-xxx-TAP-I style)



DUAL BAND EPOXY COATING IRON SERVICE SADDLES FOR USE ON DUCTILE IRON AND A/C PIPE



NOM. PIPE SIZE	O.D. RANGE	APPROX. WT. LBS.	CATALOG NUMBER	✓ SUBMITTED ITEM(S)
2"	2.35 - 2.50	2.8	FCD202-250-TAP-I	
2-1/2"	2.75 - 2.90	2.8	FCD202-290-TAP-I	
3"	*3.46 - 3.80	4.8	FCD202-380-TAP-I	
	*3.80 - 4.25	5.5	FCD202-425-TAP-I	
	**4.26 - 4.80	5.4	FCD202-480-TAP-I	
4"	*4.74 - 5.26	5.4	FCD202-526-TAP-I	
	*4.50 - 5.40	5.4	FCD202-540-TAP-I	
	5.94 - 6.69	5.7	FCD202-669-TAP-I	
6"	6.63 - 6.90	5.7	FCD202-690-TAP-I	
	6.84 - 7.60	6.7	FCD202-760-TAP-I	
	6.63 - 7.61	6.7	FCD202-761-TAP-I	
	7.93 - 8.71	6.8	FCD202-871-TAP-I	
8"	8.63 - 9.05	8.2	FCD202-905-TAP-I	
	8.99 - 9.79	8.4	FCD202-979-TAP-I	
	8.63 - 9.80	8.4	FCD202-980-TAP-I	
	10.00 - 10.75	9.4	FCD202-1075-TAP-I	
10"	10.75 - 11.10	9.0	FCD202-1110-TAP-I	
	11.10 - 12.12	10.8	FCD202-1212-TAP-I	
	10.64 - 12.13	10.8	FCD202-1213-TAP-I	
	12.00 - 12.75	11.0	FCD202-1275-TAP-I	
12"	12.75 - 13.20	9.0	FCD202-1320-TAP-I	
	13.20 - 14.38	12.8	FCD202-1438-TAP-I	
	12.62 - 14.39	12.8	FCD202-1439-TAP-I	

I = Imported casting

* Saddles with this pipe range are not available with 2" CC (CC7) or 2-1/2" IP (IP8) threads.

** These saddles with 1-1/4" through 2-1/2" taps fit the top of the listed range only.
Example: FCD202-480-CC7-I fits 4.80" pipe O.D. only.

OUTLET TAP CODE

CC (AWWA) THREAD

THREAD	CODE NUMBER	✓ SUBMITTED ITEM(S)
3/4" CC	CC3	
1" CC	CC4	
1-1/4" CC	Δ CC5	
1-1/2" CC	CC6	
2" CC	CC7	

IP THREAD

THREAD	CODE NUMBER	✓ SUBMITTED ITEM(S)
3/4" IP	IP3	
1" IP	IP4	
1-1/4" IP	Δ IP5	
1-1/2" IP	IP6	
2" IP	IP7	
2-1/2" IP	IP8	

Δ Contact factory for availability

FEATURES

- Body made of high strength ductile iron per ASTM A536
- Each dual band and 5/8" UNC threaded studs are 18-8 type 304 stainless steel. For saddles 3" or smaller, studs are 1/2"
- Gasket is EPDM rubber, ASTM D2000
- Finish on saddle body is fusion-bonded epoxy coating
- UL Classified to ANSI/NSF Standard 61

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.



The Ford Meter Box Company, Inc.

P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
www.fordmeterbox.com

12/20/17

Submitted By:



The Ford Meter Box Company, Inc.

775 Manchester Avenue • P.O. Box 443, Wabash, Indiana U.S.A. 46992-0433
Phone: 260-563-3171 • Fax: 800-826-3487 • Overseas Fax: 260-563-0167 • www.fordmeterbox.com

April 20, 2010

Compliance to the Buy American Clause of the American Recovery and Reinvestment Act (ARRA) of 2009

CERTIFICATION of ORIGIN

For

F202, FS202, FSD202, FC202 & FCD202 SERVICE SADDLES

This is to certify that Ford Iron Service Saddles, sizes 2" through 30", shall be manufactured in the United States of America, of ductile iron per ASTM A536. Gaskets shall be EPDM rubber per ASTM D2000. The ductile iron saddles shall have an E-coat (style F202, FS202 or FSD202) or fusion bonded epoxy finish (style FC202 or FCD202), taps are provided with either Iron Pipe or CC (AWWA) threads.

This certification applies to styles F202, FC202, and FS202 service saddles (example: F202-690-CC4). Any saddle having an "I" at the end of the part number, does not comply with this certification (example: F202-690-CC4-I).

THE FORD METER BOX COMPANY, INC.

Melanie Boyll
Marketing Manager

RESILIENT WEDGE VALVES
CLOW VALVE COMPANY

**CLOW AWWA Resilient Wedge Gate Valves
Meet or Exceed the Requirements of
AWWA Standard C509**

Size Range	Water Working Pressure psi	Bubble Tight Test psi	Hydrostatic Shell Test psi
AWWA 2"-12"	250	250	500
ULFM 2 1/2"-12"	200	200	400

Available in either non-rising stem, outside screw & yoke.

Available End Connections & Size Range

FLG End (NRS)	2"-12"	Figure No.
M.J.	2"-12" (except 2 1/2")	F-6102
FLG & M.J.	3"-12"	F-6100
Push-on for PVC (SDR)	2"-12"	F-6106
FLG End (OS & Y)	2"-12"	F-6110
M.J. for Tapping	2"-12"	F-6136
Tyton for D.I. & C900 PVC	3"-12"	F-6114
M.J. Cutting-in	4"-12"	F-6112
Tyton for D.I. X FLG	4"-12"	F-6111
Threaded	4"-12"	F-6113
	2"-3"	F-6103

Accessories (Illustrated in the Gate Valve Section)

Indicator Posts	2" Sq. Operating Nuts
"T" Handles	Handwheels



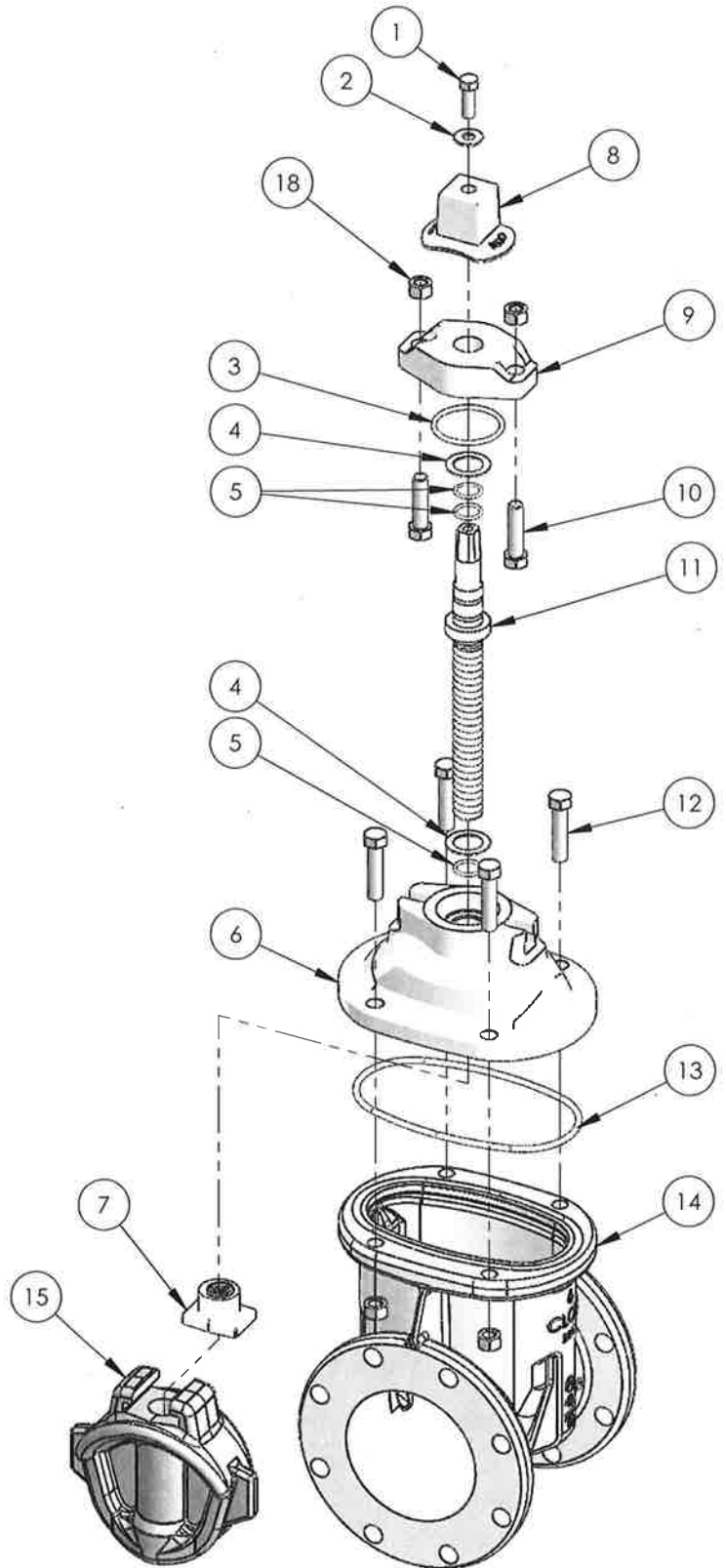
Complies with applicable
requirements of AWWA C509

2"-12" R/S VALVE NRS
EXPLODED VIEW MATERIAL LIST

CLOW VALVE COMPANY

MODELS 2639 & 2640

ITEM NO.	DESCRIPTION	Material - 2639	Material - 2640	QTY.
1	Hex Head Bolt	Stainless Steel	Stainless Steel	1
2	Flat Washer	Stainless Steel	Stainless Steel	1
3	O-Ring	Rubber	Rubber	1
4	Thrust Washer	Delrin	Delrin	2
5	O-Ring	Rubber	Rubber	3
6	Cover	Ductile Iron	Gray Iron	1
7	Stem Nut	Copper Alloy	Copper Alloy	1
8	Operating Nut	Gray Iron	Gray Iron	1
9	Follower Plate	Ductile Iron	Ductile Iron	1
10	Hex Head Bolt	Stainless Steel	Stainless Steel	2
11	Stem	Copper Alloy	Copper Alloy	1
12	Cover Bolt	Stainless Steel	Stainless Steel	--
13	Cover O-Ring	Rubber	Rubber	1
14	Body	Ductile Iron	Gray Iron	1
15	Wedge	Ductile Iron / Rubber	Ductile Iron / Rubber	1
18	Hex Nut	Stainless Steel	Stainless Steel	6

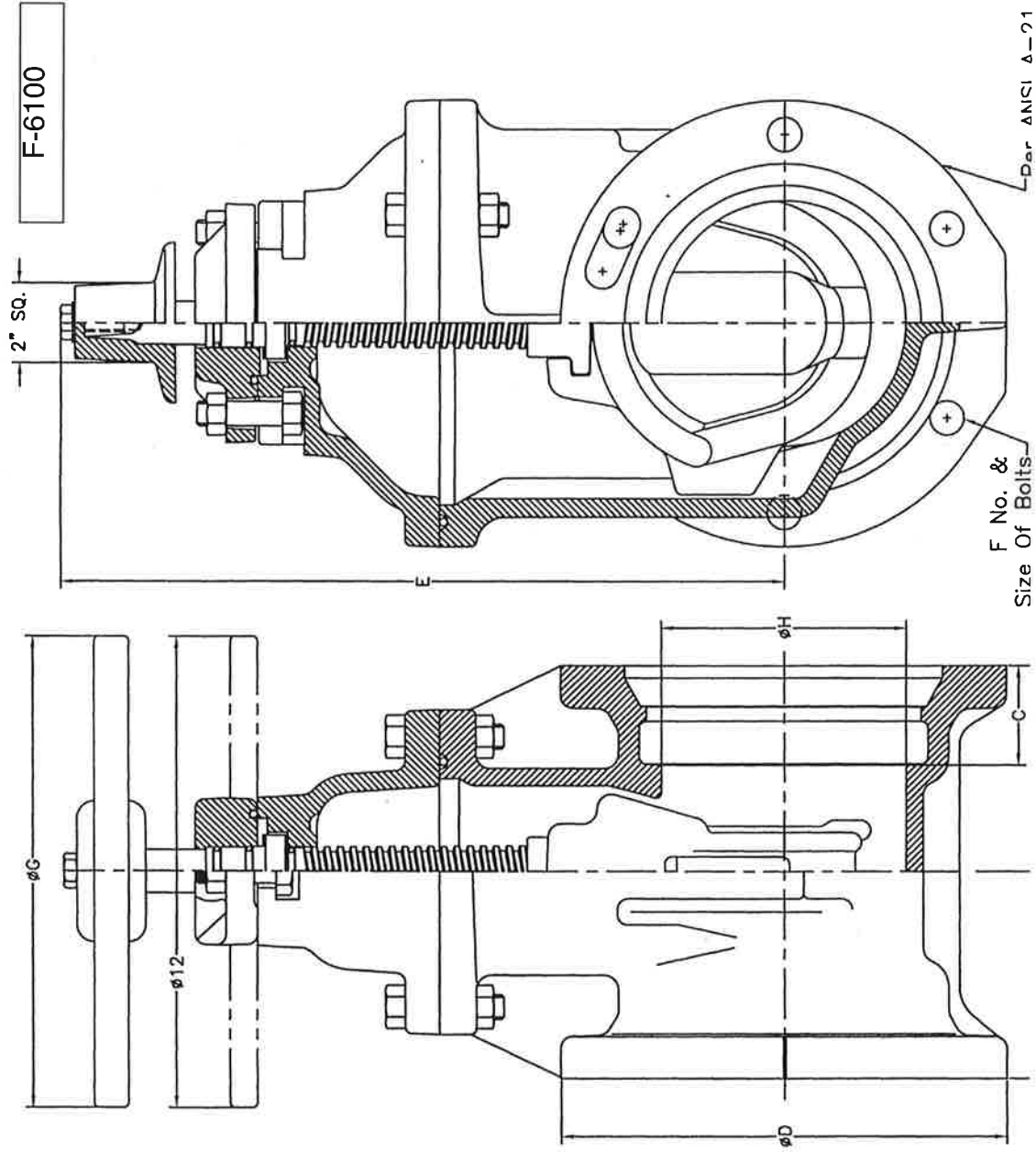


Complies with applicable
requirements of AWWA C509

2"-12" R/W VALVE MECHANICAL JOINT
ENDS GENERAL DIMENSIONS

CLOW VALVE COMPANY

MODEL 2639 & 2640



QUIKRETE®

CEMENT & CONCRETE PRODUCTS™

CONCRETE MIX

PRODUCT NO. 1101

PRODUCT DESCRIPTION

QUIKRETE® Concrete Mix is a pre-blended mixture of cement and aggregates for general structural uses, requiring only the addition of water.

PRODUCT USE

QUIKRETE® Concrete Mix is designed for pouring concrete 2" (51 mm) thick or more and building or repairing anything out of concrete, including:

- Foundation walls and footings
- Sidewalks, curbs, steps, ramps and walkways
- Appliance and equipment platforms
- Pipe and post footings
- Floor slabs and patios
- Pools, fish pools, stepping stones
- Splashblocks and bird baths
- Riprap & slope protection
- Driveway repairs

SIZES

QUIKRETE® Concrete Mix is available in:

40 lb (18.1 kg) bags

60 lb (27.2 kg) bags

80 lb (36.3 kg) bags

YIELD

- An 80 lb (36.3 kg) bag yields approximately 0.60 cu ft (17 L)
- A 60 lb (27.2 kg) bag yields approximately 0.45 cu ft (12.7 L)
- A 40 lb (18.1 kg) bag yields approximately 0.30 cu ft (8.5 L)

TECHNICAL DATA

APPLICABLE STANDARDS

ASTM International - ASTM C387 Standard Specifications for Packaged, Dry, Combined Materials for Mortar and Concrete

PHYSICAL/CHEMICAL PROPERTIES

QUIKRETE® Concrete Mix exceeds the compressive strength requirements of ASTM C387, as shown in Table 1.

TABLE 1 TYPICAL COMPRESSIVE STRENGTH¹

Compressive strength, ASTM C39

Age	Typical Values
7 days	2500 psi (17.2 MPa)
28 days	4000 psi (27.6 MPa)
Slump Range	2" - 3" (51-76 mm)

¹Tested under laboratory conditions in accordance with ASTM C387

DIVISION 3

Structural Concrete
03 31 00



INSTALLATION

PREPARATORY WORK

Stake out the planned area and remove sod or soil to the desired depth. Nail and stake forms securely in place. Tamp and compact the sub-base until firm.

MACHINE MIXING INSTRUCTIONS

QUIKRETE® Concrete Mix can be mixed in a barrel type concrete mixer or a mortar mixer.

- Choose the mixer size most appropriate for the size of the job to be done
- Allow at least 1 cu ft (28 L) of mixer capacity for each 80 lb (36.3 kg) bag of QUIKRETE® Concrete Mix to be mixed at one time
- For each 80 lb (36.3 kg) bag of QUIKRETE® Concrete Mix to be mixed, add approximately 6 pt (2.8 L) of fresh water to the mixer
- Turn on the mixer and begin adding the concrete to the mixer
- If the material becomes too difficult to mix, add additional water until a workable mix is obtained
- If a slump cone is available, adjust water to achieve a 2" - 3" (51 - 76 mm) slump

Note - Final water content should be approximately 6 - 9 pt (2.8 - 4.3 L) of water per 80 lb (36.3 kg) bag of concrete. For other bag sizes, use Table 2 to determine water content.

HAND MIXING INSTRUCTIONS

- Empty concrete bags into a suitable mixing container
- For each 80 lb (36.3 kg) bag of mix, add approximately 6 pt (2.8 L) of clean water
- Work the mix with a shovel, rake or hoe and add water as needed until a stiff, moldable consistency is achieved
- Be sure all material is wet
- Do not leave standing puddles

Note - For other bag sizes, use Table 2 to determine water content.

TABLE 2 MIXING WATER FOR QUIKRETE® CONCRETE MIX

Package size, lb (kg)	Starting Water Content, pt (L)	Final Water Content, pt (L)
80 (36.3)	6 (2.8)	6-9 (2.8-4.3)
60 (27.2)	4 (1.9)	4-7 (1.9-3.3)
40 (18.1)	3 (1.4)	3-4.5 (1.4-2.1)

APPLICATION

Method for Pouring a Slab

- Dampen the sub-grade before concrete is placed
- Do not leave standing puddles
- Shovel or place concrete into the form; fill to the full depth of the form
- After concrete has been compacted and spread to completely fill the forms without air pockets, strike off and float immediately
- To strike off, use a straight board (screed), moving the edge back and forth with a saw-like motion to smooth the surface
- Use a darby or bull float to float the surface; this levels any ridges and fills voids left by the straight edge
- Cut the concrete away from the forms by running an edging tool or trowel along the forms to compact the slab edges
- Cut 1" (25.4 mm) deep control joints into the slab every 6' - 8' (1.8 - 2.4 m) using a grooving tool
- Allow concrete to stiffen slightly, waiting until all water has evaporated from the surface before troweling or applying a broom finish

Note - For best results, do not overwork the material.

Method for Setting Fence Posts

- Dig post hole about 3 times the diameter of the post. Hole depth should be 1/3 the overall post height
- Place 6" (152 mm) of dry concrete mix in the bottom of the hole. Position the post, checking that it is level and plumb. Combine concrete mix with water and place into the hole
- When standing water has evaporated from the concrete, smooth the surface. Taper it away from the post so rain will flow in that direction. Wait 24 hours before post is subjected to any strain
- For load-bearing applications, follow local building codes for proper footing specifications

FINISHING

Any standard concrete finishing technique is acceptable for use with QUIKRETE® Concrete Mix. Concrete can be hand troweled, power-troweled, broom finished or finished with other specialty finishes.

CURING

General

Curing is one of the most important steps in concrete construction. Proper curing increases the strength and durability of concrete,

and a poor curing job can ruin an otherwise well-done project. Proper water content and temperature are essential for good curing. In near freezing temperatures the hydration process slows considerably. When weather is too hot, dry or windy, water is lost by evaporation from the concrete, and hydration stops, resulting in finishing difficulties and cracks. The ideal circumstances for curing are ample moisture and moderate temperature and wind conditions. Curing should be started as soon as possible and should continue for a period of 5 days in warm weather at 70°F (21°C) or higher or 7 days in colder weather at 50 - 70°F (10 - 21°C).

Specific Curing Methods

- QUIKRETE® Acrylic Cure & Seal – Satin Finish provides the easiest and most convenient method of curing. Apply by spray, brush or roller soon after the final finishing operation when the surface is hard. The surface may be damp, but not wet, when applying curing compound. Complete coverage is essential
- Other methods of providing proper curing include covering the surface with wet burlap; keeping the surface wet with a lawn sprinkler and sealing the concrete surface with plastic sheeting or waterproof paper to prevent moisture loss
- If burlap is used, it should be free of chemicals that could weaken or discolor the concrete. New burlap should be washed before use. Place it when the concrete is hard enough to withstand surface damage and sprinkle it periodically to keep the concrete surface continuously moist
- Water curing with lawn sprinklers, nozzles or soaking hoses must be continuous to prevent interruption of the curing process
- Curing with plastic sheets is convenient. They must be laid flat, thoroughly sealed at joints and anchored carefully along edges

PRECAUTIONS

- Curing compounds should not be applied if rain or temperatures below 50°F (10°C) are expected within 24 hours
- Curing with plastic or burlap can cause patchy discoloration in colored concrete. For colored concrete, wet curing or the use of QUIKRETE® Acrylic Cure & Seal – Satin Finish is recommended
- Do not use curing compounds during late fall on surfaces where de-icers will be used to melt ice and snow. Using curing compounds at that time may prevent proper air drying of the concrete, which is necessary to enhance its resistance to damage caused by de-icers
- Protect concrete from freezing during the first 48 hours. Plastic sheeting and insulation blankets should be used if temperatures are expected to fall below 32°F (0°C)

WARRANTY

NOTICE: Obtain the applicable LIMITED WARRANTY: at www.quikrete.com/product-warranty or send a written request to The Quikrete Companies, LLC, Five Concourse Parkway, Atlanta, GA 30328, USA. Manufactured under the authority of The Quikrete Companies, LLC. © 2018 Quikrete International, Inc.

NON-SHRINK PRECISION GROUT

PRODUCT NO. 1585-00

DIVISION 3

Non-Shrink Grouting
03 62 00

PRODUCT DESCRIPTION

QUIKRETE® Non-Shrink Precision Grout is a high strength, non-metallic, Portland cement based material with expansive additives designed for grouting all types of machinery, steel columns, bearing plates, pre-cast concrete, and anchoring applications.

PRODUCT USE

Typical applications for QUIKRETE® Non-Shrink Precision Grout include grouting of:

- All types of machinery
- Steel columns
- Bearing plates
- Precast concrete
- Other anchoring conditions that require high in-service strength

The non-shrink characteristics of Non-Shrink Precision Grout make it stable and capable of handling high load transfers.

SIZES

QUIKRETE® Non-Shrink Precision Grout – 50 LB (22.7 kg) bags

YIELD

• Each 50 lb (22.7 kg) bag of QUIKRETE® Non-Shrink Precision Grout will yield 0.45 cu ft (12.7 L) at flowable consistency.

TECHNICAL DATA

APPLICABLE STANDARDS

ASTM International

- ASTM C109/C109M Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
- ASTM C827 Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures
- ASTM C939 Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)
- ASTM C1090 Standard Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout
- ASTM C1107 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
- ASTM C1107 Standard Test Method for Flow of Hydraulic Cement Mortar
- ASTM E488 Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements

U.S. Army Corps of Engineers (USACE) - CRD 621



PHYSICAL/CHEMICAL PROPERTIES

QUIKRETE® Non-Shrink Precision Grout complies with all properties of ASTM C1107 and CRD 621 producing the results shown in Table 1.

TABLE 1 TYPICAL PHYSICAL PROPERTIES AT 73°F (23°C)

Compressive strength, ASTM C109 modified per ASTM C1107

Plastic consistency

1 day	3000 psi (20.7 MPa)
3 days	9500 psi (65.5 MPa)
7 days	10,000 psi (68.9 MPa)
28 days	14,000 psi (96.5 MPa)

Height change, ASTM C1090

1, 3, 7 and 28 days 0 - 0.2%

Height change, ASTM C827

+ 0.6%

Flowable consistency

1 day	3000 psi (20.7 MPa)
3 days	9000 psi (62.1 MPa)
7 days	9500 psi (65.5 MPa)
28 days	12,500 psi (86.2 MPa)

Height change, ASTM C1090

1, 3, 7 and 28 days 0 - 0.2%

Height change, ASTM C827

+ 0.4%

Fluid consistency

1 day	2500 psi (17.2 MPa)
3 days	5000 psi (34.5 MPa)
7 days	6000 psi (41.4 MPa)
28 days	8000 psi (55.2 MPa)

Height change, ASTM C1090

1, 3, 7 and 28 days 0 - 0.2%

Height change, ASTM C827

+ 0.3%

Pull-out strength, ASTM E488¹

35,000 lbf

¹ 1 1/4" (31 mm) bolts embedded 9" (225 mm) deep in 3" (75 mm) hole in 2000 psi (13.8 MPa) concrete.

INSTALLATION

SURFACE PREPARATION

Surfaces to receive the grout must be clean and free of any type of foreign matter, grease, paint, oil, dust or efflorescence. In some cases it may be necessary to roughen smooth surfaces or etch old ones with acid. The area should be flushed and soaked with clean water prior to grouting leaving no standing water. Place the grout quickly and continuously using light rodding to eliminate air bubbles.

MIXING

Add the minimum amount of water necessary to produce the desired flow characteristics as indicated in Table 2. Do not add more water than the amount needed to produce a 20-second flow per ASTM Test Method C 939. QUIKRETE® Non-Shrink Precision Grout should be mechanically mixed for a minimum of 5 minutes.

TABLE 2

APPROXIMATE WATER REQUIRED FOR 50 LB (22.7 KG) OF GROUT	
Plastic	1 gal (3.8 L)
Flowable	1 gal + 1 pt (4.3 L)
Fluid	1 gal + 3 pt (5.2 L)

WORKING TIME

When properly mixed to a fluid consistency QUIKRETE® Non-Shrink Precision Grout will comply with all portions of ASTM C1107 and CRD 1 and retain a fluid consistency for the maximum usable working times stated in Table 3.

TABLE 3

WORKING TIME	
Temperature	Working time
50°F (10°C)	25 min
73°F (23°C)	25 min
90°F (32°C)	15 min

CURING

A damp cure of at least 3 days is necessary to control the non-shrink characteristics and maintain strength levels.

PRECAUTIONS

- Additions of cement or other materials will eliminate the designed product qualities
- Water quantities may be affected by temperature, mixing method and batch size
- QUIKRETE® Non-Shrink Precision Grout should not be re-tempered
- Grout temperature should be maintained from 50 - 90 degrees F (10 - 32 degrees C) to achieve specified results. Use cold water in hot weather or hot water in cold weather to achieve desired grout temperature.
- Do not pour grout if temperature is expected to go below 32 degrees F (0 degrees C) within a 12 hour period.
- Mix no more than can be used in 30 minutes

WARRANTY

NOTICE: Obtain the applicable LIMITED WARRANTY: at www.quikrete.com/product-warranty or send a written request to The Quikrete Companies, LLC, Five Concourse Parkway, Atlanta, GA 30328, USA. Manufactured under the authority of The Quikrete Companies, LLC. © 2018 Quikrete International, Inc.

* Refer to www.quikrete.com for the most current technical data, SDS, and guide specifications

Revised 16 August 2018

evoQ₄ Electromagnetic meter

Sizes: 2" - 8"



Size:	2"	3"	4"	6"	8"
<u>Performance:</u>					
Starting flow GPM	0.2	0.4	0.6	2.4	4
Low flow GPM > 95%	0.25	0.6	0.88	3.3	5.2
Low flow GPM $\pm 0.75\%$	1	1	2	4	6
Max. continuous flow GPM $\pm 0.75\%$	220	550	880	1400	3500
Max. flow GPM $\pm 0.75\%$	220	550	880	1400	3500
Max. operating pressure psi	230	230	230	230	230

Materials

Body	Stainless steel grade 304
Flow tube	Stainless steel grade 316
Electrodes	Stainless steel grade 316
Flanges	Epoxy coated cast iron
Register	Stainless steel with glass cover
Register housing/lid	UV resistant plastic
Environmental class	IP68 hermetically sealed unit Waterproof to 30 ft depth

Features

10 year continuous life
No moving parts
0.5 second sampling rate
Wide measuring range
Simple installation
Pulse connectivity

AWWA lay lengths
IP68 sealed

Benefits

No need for costly, time consuming battery replacements
Maintenance free
Highest accuracy
Suitable for all commercial applications
No additional training required, no programming
Pre-equipped or retro-fitted for your AMR and telemetry needs
Simple changeout
Provides long, trouble-free life

Operation. The evoQ₄ is a battery powered electromagnetic water meter that is suitable for a wide range of metering applications. Using Faraday's law of Electromagnetic Induction, two magnets provide a magnetic field within the pipe that measures the flow of the conductive water. The evoQ₄ does not contain any moving parts so regular maintenance is not required. It is designed for 10 years of continuous operation with no battery changes necessary, and with a sampling rate of 0.5 sec, the evoQ₄ has excellent accuracy over a wide flow range, allowing the utility to use a single meter for turbine, compound, single jet and mag meter applications.

Application. The evoQ₄ is designed to work in both potable cold water and wastewater applications up to 120°F (50°C). The meter will register at $\pm 0.75\%$ accuracy at normal and high flows and better than 95% accuracy at low flows. Wastewater applications include primary, secondary and tertiary applications. Accuracy tests are made before shipment, so no adjustments need to be made before installation.

Pulse output. The evoQ₄ can be fitted with a pulse output device that can be attached to an AMR device, data logger or SCADA system. The pulse output unit can be programmed in the factory to meet the needs of the utility.

The evoQ₄ is a single meter that meets the needs of traditional turbine, compound, single jet and mag meters.

Additionally, the pulse output device can be easily retro-fitted in the field if the evoQ₄ is not initially ordered with the pulse output feature.

Remote display. The evoQ₄ can be attached to a remote display. A two channelled output can provide both forward and reverse totals and be configured to display all 6 digits or only the billable units.

Connections. The evoQ₄ comes standard with AWWA C701 Class II Turbine meter lay lengths. The flanges are epoxy coated cast iron to reduce weight and prevent corrosion. The 2" evoQ₄ uses an oval flange and the 3"- 8" use a round flange. All flanges conform to ANSI B16.1 Class 125 standards. Allow for 5 pipe diameters of straight pipe upstream and 3 pipe diameters of straight pipe downstream for maximum performance.

LCD display. Bright, large and easy-to-read LCD display incorporating integrating volume and flow-rate for real-time network control and water management. Alarm functions provide real-time status ensuring no loss in measuring continuity. An IP68 seal ensures the meter electronics are safely protected thus ensuring long-term reliability.

Display functions. A low-battery indicator will appear when the battery voltage requirement is closing towards the end of its useful life. A no-water indicator will blink indicating an empty pipe, or when there is no water within the meter. The flow rate will be displayed in forward and reverse; if water is flowing in the reverse direction a minus sign will be displayed. The net volume of water measured will be displayed at all times.

2" - 4"
USG

2" - 4"
CuFt

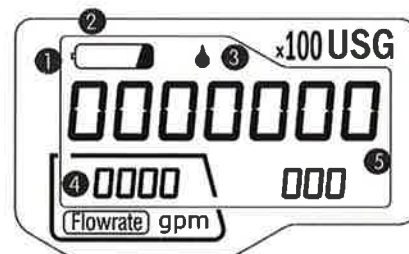


6" - 8"
USG

6" - 8"
CuFt

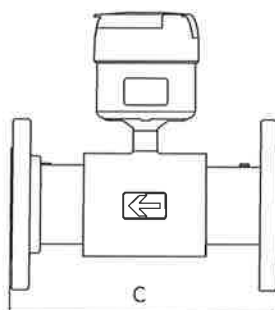
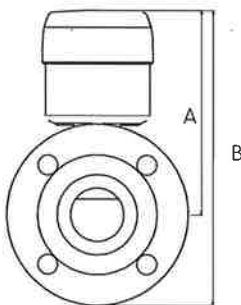


- ❶ Low-battery. The indicator will blink when the meter has approximately 3 months working life remaining.
- ❷ End-of-life-battery. Measurement stopped. The indicator will appear permanently when the meter life has expired. Data is stored for up to 9 months.
- ❸ No-water. The indicator will blink when there is an empty pipe or no water in the meter.
- ❹ Flow rate. If water is flowing in reverse direction a minus sign is displayed to the left of the values.
- ❺ Net volume. Any reverse flow will be subtracted from the volume display. The decimal places are shown below the main billable units.



Dimensions & Net Weights

Meter Size	Dimensions (Inches)			Weight (lbs.)
	A	B	C	
2"	8.12	11.24	10	11
3"	8.52	12.27	12	22.5
4"	8.72	13.22	14	35.5
6"	9.82	15.32	18	55.5
8"	10.41	17.16	20	81.5



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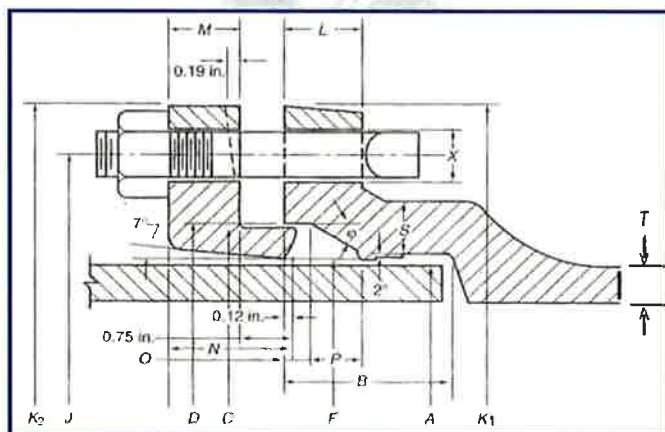
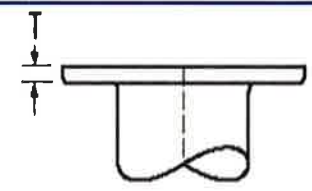
The company's policy is one of continuous product improvement and the right is reserved to modify the specifications contained herein without notice. These products have been manufactured with current technology and in accordance with applicable AWWA Standards.

evoQ₄/08-08


DOMESTIC PRODUCT SUBMITTAL

Current Revisions Apply for all Listed Standards

- SIZES:**..... 2" through *64" (2" not included in ANSI/AWWA C153)(*Contact Tyler Union for 54"-64" information)
- STANDARDS:**..... ANSI/AWWA C153/A21.53, NFPA 13/24, 3"-12" UL and 3-10"FM listed & approved (File - Tyler Union)
Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.
- PRESSURE RATING:**.... *Flanged fittings rated at 250 psi. Mechanical joints 2" – 24" rated at 350 psi and 30" – 48" at 250 psi.
*Note: With the use of rubber annular ring flange gasket, 2" – 24" fittings can be rated at 350 psi.
Note: Wyes over 16" are not pressure rated. Contact Tyler Union for rating in your application.
- DEFLECTION:**..... Max joint deflection 2" – 12", 5° and 14" – 48", 3°. Reduces by 50% at nominal pipe & fitting diameters
- NSF-61 & NSF-372:**..... Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.
- ASPHALTIC COATING:** Per ANSI/AWWA C104/A21.4 and ANSI/AWWA C153/A21.53.
- CEMENT LINING:**..... Per ANSI/AWWA C104/A21.4, with double cement lining available upon request.
- EPOXY COATING:**..... Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.
- BARE:**..... Available upon request
- FASTENERS:**..... Per ANSI/AWWA C111/A21.11 and/or ASTM A242 high strength low alloy weathering steel
- INSTALLATION:**..... Per AWWA C600 and C651 using pipe conforming to ANSI/AWWA C151/A21.51 or AWWA C900/905.

Size	T	Size	T	Size	T
3	.60	10	.75	18	.93
4	.63	12	.81	20	.96
6	.63	14	.87	24	1.00
8	.70	16	.90	36	1.10

		MECHANICAL JOINT - NOMINAL JOINT DIMENSIONS IN INCHES												BOLTS	
Size Inches	A Dia. DI Pipe	B Hub Depth	C Dia. GLAND	D Dia.	F Dia.	J Dia. GLAND	K¹ Dia.	K² Dia. GLAND	L	M GLAND	S	T	X	Size	Qty.
2	2.51	2.50	3.50	3.60	2.61	4.75	6.19	6.89	0.58	0.62	0.36	0.30	3/4	5/8x3.0	2
3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	0.58	0.62	0.39	0.33	3/4	5/8x3.0	4
4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	0.60	0.75	0.39	0.34	7/8	3/4x3.5	4
6	6.90	2.50	8.02	8.12	7.00	9.50	11.06	11.12	0.63	0.88	0.43	0.36	7/8	3/4x3.5	6
8	9.05	2.50	10.17	10.27	9.15	11.75	13.31	13.37	0.66	1.00	0.45	0.38	7/8	3/4x4.0	6
10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	0.70	1.00	0.47	0.40	7/8	3/4x4.0	8
12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	0.73	1.00	0.49	0.42	7/8	3/4x4.0	8
14	15.30	3.50	16.40	16.54	15.44	18.75	20.31	20.25	0.79	1.25	0.55	0.47	7/8	3/4x4.5	10
16	17.40	3.50	18.50	18.64	17.54	21.00	22.56	22.50	0.85	1.31	0.58	0.50	7/8	3/4x4.5	12
18	19.50	3.50	20.60	20.74	19.64	23.25	24.83	24.75	1.00	1.38	0.68	0.54	7/8	3/4x4.5	12
20	21.60	3.50	22.70	22.84	21.74	25.50	27.08	27.00	1.02	1.44	0.69	0.57	7/8	3/4x4.5	14
24	25.80	3.50	26.90	27.04	25.94	30.00	31.58	31.50	1.02	1.56	0.75	0.61	7/8	3/4x5.0	16
30	32.00	4.50	33.29	33.46	32.17	36.88	39.12	39.12	1.31	2.00	0.82	0.66	1-1/8	1x6.0	20
36	38.30	4.50	39.59	39.76	38.47	43.75	46.00	46.00	1.45	2.00	1.00	0.74	1-1/8	1x6.0	24
42	44.50	4.50	45.79	45.96	44.67	50.62	53.12	53.12	1.45	2.00	1.25	0.82	1-3/8	1-1/4x6.5	28
48	50.80	4.50	52.09	52.26	50.97	57.50	60.00	60.00	1.45	2.00	1.35	0.90	1-3/8	1-1/4x6.5	32

Tyler Union Waterworks Contact Information

Tyler: 11910 CR 492 • Tyler, Texas 75706 • (800) 527-8478

Anniston: 1501 W 17th St. • Anniston, AL 36201 • (800) 226-7601

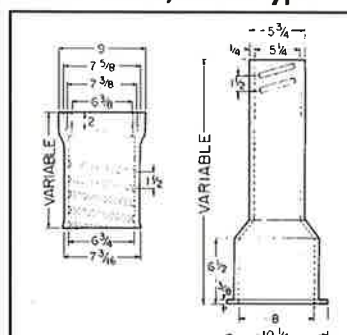
Corona: 1001 El Camino Ave. • Corona, CA 92879 • (866) 527-8471

SUBMITTAL

(Current Revisions for All Standards Apply)

- SIZES:** Adjustable Slip and Screw type with standard assembled 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 access., lids, rings, bases, risers, meter covers, etc.
- STANDARDS:** Produced with Class 35 cast iron in accordance with and meeting all applicable terms and provisions of ASTM A-48. 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 exposed to cold or sticky when exposed to the sun.

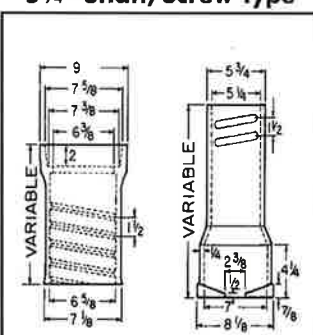
**For 4" to 12" Valves
5 1/4" Shaft, Screw Type**



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

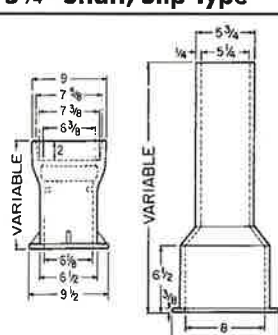


**6860 SCREW TYPE
VALVE BOX
Cast Iron - 3 piece**

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

NOTE: Base Required,
Order Separately

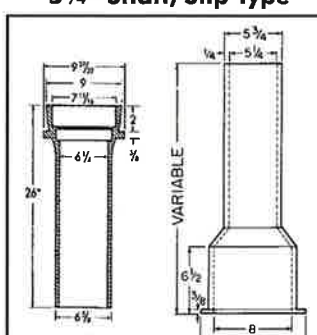
**For 4" to 12" Valves
5 1/4" Shaft, Slip Type**



**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

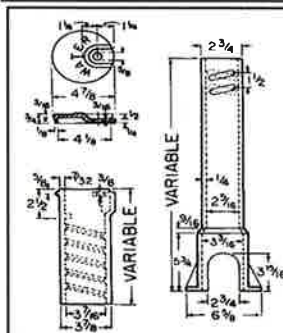
**For 4" to 12" Valves
5 1/4" Shaft, Slip Type**



**7126 SLIP TYPE
VALVE BOX**

Components	Extension Height
26T + 24B	28-48
26T + 30B	34-54
26T + 36B	40-60
26T + 24B + #60 Ext	52-72
26T + 36B + #60 Ext	60-80

NOTE: Use the 6855 Bottoms
with these Tops



For 1/2" to 2" Curbstops

**6500 SCREW TYPE
CURB / SERVICE BOX**

Components	Extension In Inches
18T & 27B	30-42
18T & 33B	36-48
24T & 33B	36-54
24T & 39B	42-60
30T & 39B	41-64

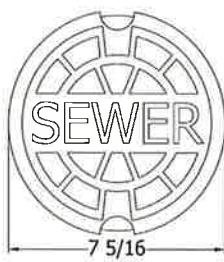
*Enlarged Base Available

**T = Top
B = Bottom
EXT = Extension**

Water Lid



Sewer Lid



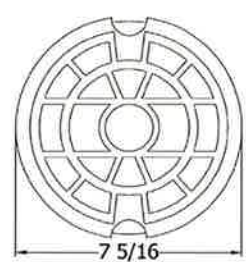
Gas Lid



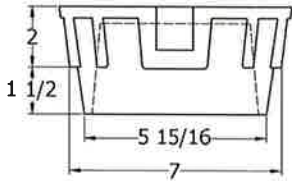
Reuse Lid



Plain Lid



***5 1/4 Drop Lid**



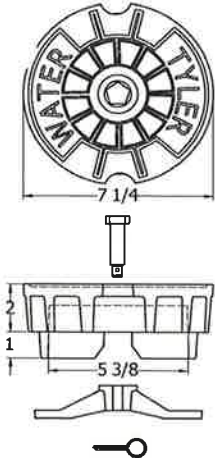
Item/Description	**(D-HD) UPC		Weight	**(ND-Std) UPC		Special Mark
	670610	Weight		670610	Weight	
5 1/4 Drop Lid	145325	12		136910	9	WATER
5 1/4 Drop Lid	145349	12		136903	9	SEWER
5 1/4 Drop Lid	145332	12		136873	9	GAS
5 1/4 Drop Lid	458975	12		REUSE
5 1/4 Drop Lid	145356	12		136897	9	PLAIN

** D=Domestic ND=Non-Domestic HD=Heavy Duty Weight
Std.=Standard Weight

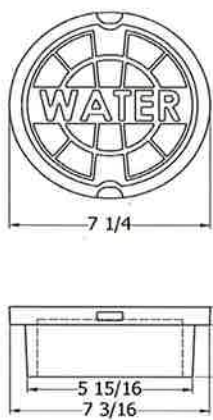
*Lids marked WATER will be shipped unless otherwise specified.

Specialty Lids

Lock Lid



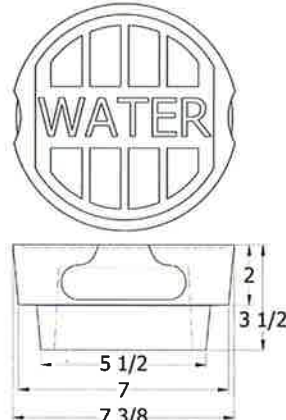
1 1/8" Lid



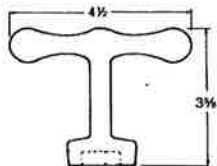
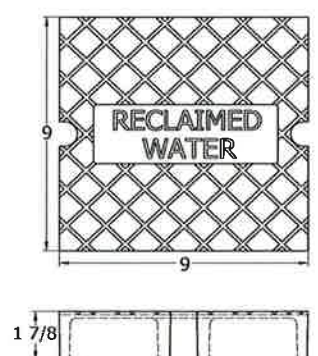
OMA Lid



MWW Lid



*****Square
Reclaimed Lid**



Wrench

Fits Standard Waterworks
Pentagon Head 27/32" Brass
Screws

Item/Description	**(D-HD) UPC		Weight	**(ND-Std) UPC		Special Mark
	670610	Weight		670610	Weight	
5 1/4 Lock Lid	145462	11		136866	11	WATER
*1 1/8 Drop Lid	145509	11		112532	9	WATER
5 1/4 OMA Drop Lid	145301	12		136927	12	WATER
5 1/4 MWW Drop Lid	145370	12		136880	12	WATER
***Square Drop Lid	458982	14		RECLAIMED WATER

*Note: Use with 1 1/8 Riser only

** D=Domestic ND=Non-Domestic HD=Heavy Duty Weight Std.=Standard Weight

***Note: Use with 9T Top #144622

UPCode	Weight	Description
0610	0.5	Wrench
4908		

CRM

High Performance Utility Marker™



Impact resistant, three-rail marker

The Utility Marker, with its three-rail design, was the first fiberglass composite utility marker in the industry and remains the most widely used fiberglass marker on the market. Two ribs on the side protect decals from vehicle impacts while the back rib adds strength for driving into hard soil conditions.

How to Order:

CRM 3

Product number

072

Length (in.)
See chart for availability by color.

01

Color (See chart below)

Post color	Standard Lengths (in.)
01-White	60, 62, 66, 72, 84
02-Yellow	60, 62, 66, 72
03-Brown	72
04-Orange	60, 62, 66, 72
05-Red	60, 62, 66
07-Green	72
08-Blue	66, 72

Other lengths and colors are available. Contact your representative.

Material: Fiberglass Composite, high-performance construction

Options and Accessories: Reflective sheeting
Stock or custom decals
Direct Graphics
Visibility Enhancer
Anchor Barb

Installation tools: Post Driver (PDR, PDRL)
Post Puller
Pilot Hole Driver

Carsonite High Performance RoadMarkers are designed to stand up to nature as well as vehicular impacts, controlled ditch burns, and even small arms gunfire.





"THE STANDARD OF EXCELLENCE IN THE INDUSTRY"

CASING SPACERS (Stainless Steel) - STYLE – CCS08-CTD

Casing Spacers shall be two-piece shells per carrier pipe and made of T304 stainless steel, 8 inches wide, and a minimum of 14 gauge thickness. Each shell section shall be lined with a 0.090" thick, ribbed PVC extrusion with a retaining section that overlaps the edges of the shell and prevents slippage. PVC Liner shall have a hardness of 85-90 durometer. Bearing surfaces (runners) shall be ultra-high molecular weight polyethylene (UHMW) to provide abrasion resistance and a low coefficient of friction (0.12) with variable heights to meet desired position and a width of one and one half inches. The runners shall be 7 inches long and mechanically bolted to the spacer. Risers shall be MIG welded to the shell, where applicable, and shall be made of T304 stainless steel of a maximum 10 gauge with bolt heads welded to the inside of the risers for strength. Bottom risers 6" and over in height shall be reinforced. All reinforcing plates shall be 10 gauge T304 stainless steel and shall be MIG welded to mating parts. ***CENTERED (CTD) & restrained positioning within the casing pipe*** shall be sized such that the height of the risers and runners are to center the carrier pipe in the casing pipe with a top clearance of three-fourths inch minimum. Special reinforcing plates may be required to stabilize and support structure. **All weldments shall be fully chemically passivated in accordance with ASTM A380.** Due to the numerous application possibilities, consult factory for spacing requirements. Casing spacers shall be Model **CCS08** as manufactured by Cascade Waterworks Mfg. Co. of Yorkville, IL.

These specifications are accurate at time of publication and are subject to change without prior notice.



08.16.2017

CASCADE WATERWORKS MANUFACTURING COMPANY

1213 Badger Street • Yorkville, IL 60560 • (630) 553-0840 • (800) 426-4301 • FAX (630) 553-0181

www.cascademfg.com



"THE STANDARD OF EXCELLENCE IN THE INDUSTRY"

CASING SPACERS END SEALS - STYLE – CCES

Casing spacer end seals shall be a pull-over type construction and made from 0.090" (3/32") thick Neoprene with T304 stainless steel bands for securing the ends of the end seal to the casing pipe and carrier pipe. Casing spacer end seals shall be Model CCES as manufactured by Cascade Waterworks Mfg. Co. of Yorkville, IL or approved equal.

These specifications are accurate at time of publication and are subject to change without prior notice.



08.16.2017

CASCADE WATERWORKS MANUFACTURING COMPANY

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www.cascademfg.com



Stargrip® series 3000

Mechanical Joint Wedge Action Restraint
for Ductile Iron Pipe
Patent #5,772,252

Stargrip® series 3000 for Ductile Iron Pipe

SUBMITTAL INFORMATION

PROJECT NAME: ENGINEER: CONTRACTOR: SPEC. SECTION: 

FEATURES & ADVANTAGES

- The Wedge Assembly is designed with a Break-Off Torque Control Nut that will only break off in one direction, ensuring proper installation.
- The Stargrip® offers a full 5° deflection through 12" size, 3° on 14"-24", 2° on 30"-36" and 1° on 42"-48".
- Minimum safety factor of 2:1
- Stargrip® sizes 3"-36" are listed with Underwriters Laboratories Inc. and sizes 3"-12" are approved by Factory Mutual Research.
- The Wedge Assembly is designed to fit specific pipe sizes and is field repairable.
- No special tools are required for installation of the Stargrip®.
- Stargrip® eliminates tie rods and thrust blocks.
- Stargrip® may also be used on steel pipe* up to 12" (*transition gasket required on 12" and under). For 14" and larger steel applications, contact Star Pipe.

MATERIAL SPECIFICATIONS:

- Gland: Ductile Iron per ASTM A536, Grade 65-45-12
- Wedges: Ductile Iron per ASTM A536, Grade 65-45-12 heat treated to a minimum of 370 BHN
 - ♦ Wedge Finish: Thermally cured fluoropolymer epoxy coating

GLAND FINISH OPTIONS (Please check one):

- ☐ Standard: alkyd enamel coating
- ☐ Optional: Starbond™ TGIC polyester powder coating applied by an electrostatic spray process
- ☐ Optional: Other (specify) _____

HARDWARE OPTIONS (Please check one):

- ☐ Standard: T-bolts are high strength low alloy steel manufactured in accordance with ANSI/AWWA C111/A21.11-00
- ☐ Optional: T-bolts and nuts alloy SS 304 per ASTM F593
- ☐ Optional: T-bolts and nuts alloy SS 316 per ASTM F593
- ☐ Optional: T-bolts and nuts Fluoropolymer Star-Blue coated high strength low alloy steel manufactured in accordance with ANSI/AWWA C111/A21.11-00

COUNTRY OF ORIGIN OPTION (Please check one):

- ☐ Import
- ☒ 100% Domestic¹
- ☐ Domestic gland with import components¹

(¹Please see [Domestic Restraint Options Available](#) on our website.)

REV.13-1



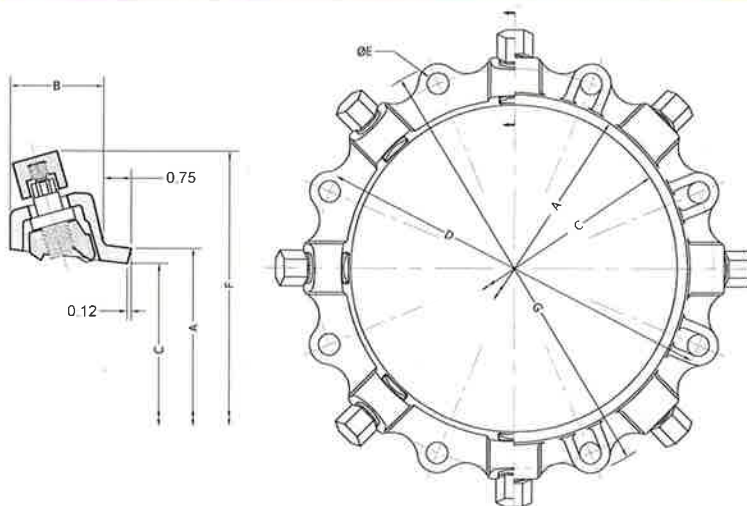
© REGISTERED TRADEMARK OF STAR PIPE PRODUCTS

STAR® PIPE PRODUCTS
HOUSTON CORPORATE | TOLL FREE 1-800-999-3009 | FAX 281-558-9000
www.starpipeproducts.com

Stargrip[®] series 3000

Mechanical Joint Wedge Action Restraint
for Ductile Iron Pipe
Patent #5,772,252

TECHNICAL INFORMATION



Please
check sizes:

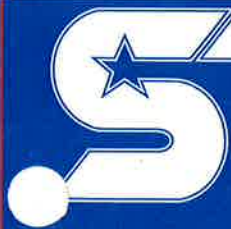
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<input type="checkbox"/>	16	350	18.50	2.91	17.54	21.00	7/8	23.34	22.22	23.00	12	12	56
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<input type="checkbox"/>	24	250	26.90	3.50	25.94	30.00	7/8	33.86	32.34	31.54	16	16	139
<input type="checkbox"/>	30	250	33.29	3.49	32.17	36.88	1-1/8	40.12	38.62	39.12	20	20	199
<input type="checkbox"/>	36	250	39.59	3.49	38.47	43.75	1-1/8	46.42	44.92	46.00	24	24	232
<input type="checkbox"/>	42	250	45.79	5.15	44.75	50.62	1-3/8	54.86	53.32	53.12	28	28	400
<input type="checkbox"/>	48	250	52.09	5.15	51.05	57.50	1-3/8	61.16	59.62	60.00	32	32	488

*All dimensions in inches except where indicated.

Notes:

- Stargrips[®] must be adequately wrapped or protected if they are covered by concrete to ensure that concrete does not enter the wedge pocket.
- For applications exceeding the maximum pressure ratings listed, please contact Star Pipe Products for recommendations (see Tandem Stargrip[®]).
- For applications on existing pipe, the pipe needs to be structurally sound and the surface needs to be relatively free of any corrosive by-products in order for the wedges to function properly. Please contact Star Pipe Products for technical assistance.
- Sizes 42" & 48" require extra long 1 1/4" x 8 1/2" T-bolts.



**PVC Stargrip® series 4000**Mechanical Joint Wedge Action Restraint
for AWWA C900/C905 and IPS PVC Pipe**SUBMITTAL INFORMATION**PROJECT NAME: ENGINEER: CONTRACTOR: SPEC. SECTION: **FEATURES & ADVANTAGES**

- The design eliminates tie rods and thrust blocks and has been proven in the market since 1992.
- Can be used on 4"-12" AWWA C900, 14"-36" AWWA C905 PVC pipe or 3"-12" IPS PVC pipe* (***transition gasket required on IPS PVC Pipe 12" and under**).
- Listed with Underwriters Laboratories in sizes 4"-12" for use on DR18 class 235 C900 PVC pipe at 150 PSI. Approved by Factory Mutual Research in sizes 4"-12" for use on DR18 class 235 at 150 PSI and for sizes 4"-10" DR14 class 305 C900 PVC pipe at 200 PSI.
- Tested to and meets the requirements of ASTM F1674 through 14" size for DR18 PVC pipe.
- The safety factor is twice (2:1) the standardized pressure rating listed on Page 18 of the catalog.
- Will fit any Mechanical Joint configuration, meaning compatibility with different types of installations.
- PVC Stargrip® offers 5° deflection through 12", 3° on 14"-24" and 2° on 30"-36".
- Larger ID allows easier installation on out-of-round pipe.
- All sizes have curved wedges that will not flatten pipe.
- For use on HDPE or C909 pipe, please contact Star Engineering.

MATERIAL SPECIFICATIONS:

- Gland: Ductile Iron per ASTM A536, Grade 65-45-12
- Wedges: Ductile Iron per ASTM A536, Grade 65-45-12 heat treated to a minimum of 370 BHN
 - Wedge Finish: Thermally cured fluoropolymer epoxy coating

GLAND FINISH OPTIONS (Please check one):

- ☐ Standard: alkyd enamel coating
- ☐ Optional: Starbond™ TGIC polyester powder coating applied by an electrostatic spray process
- ☐ Optional: Other (specify) _____

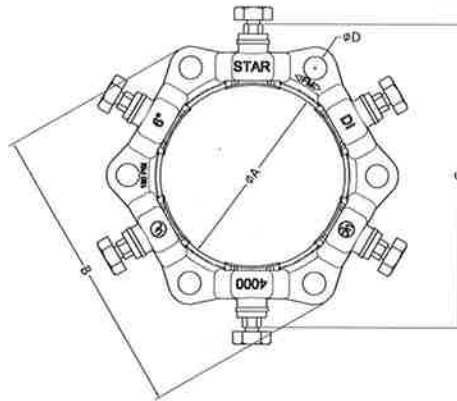
COUNTRY OF ORIGIN OPTION (Please check one):

- ☐ ~~Import~~
- ☒ 100% Domestic¹
- ☐ Domestic gland with import components¹
- ¹Please see [Domestic Restraint Options Available](#) on our website.

HARDWARE OPTIONS (Please check):

- ☐ Standard: T-bolts are high strength low alloy steel manufactured in accordance with ANSI/AWWA C111/A21.11-00
- ☐ Optional: T-bolts and nuts alloy SS 304 per ASTM F593
- ☐ Optional: T-bolts and nuts alloy SS 316 per ASTM F593
- ☐ Optional: T-bolts and nuts Fluoropolymer Star-Blue coated high strength low alloy steel manufactured in accordance with ANSI/AWWA C111/A21.11-00



**PVC Stargrip[®] series 4000**Mechanical Joint Wedge Action Restraint
for AWWA C900/C905 and IPS PVC Pipe**TECHNICAL INFORMATION**6" PVC Stargrip[®] Series 4000 for PVC PipePlease
check sizes:☐
☐
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☐**PVC STARGRIP[®] 4000 SPECIFICATIONS***

NOM. SIZE	C900/C905 PIPE CI OD	IPS PIPE OD (TRANSITION GASKET REQUIRED)	ØA	B	C'	ØD	T-BOLTS SIZE (QTY)	WEDGES (QTY)	APPROX WT. (LBS)
3	N/A	3.50	4.09	7.69	8.50	3/4	5/8 (4)	4	7
4	4.80	4.50	4.93	9.12	9.53	7/8	3/4 (4)	4	9
6	6.90	6.63	7.03	11.12	11.63	7/8	3/4 (6)	6	13
8	9.05	8.63	9.18	13.37	13.97	7/8	3/4 (6)	6	17
10	11.10	10.75	11.23	15.62	16.18	7/8	3/4 (8)	8	23
12	13.20	12.75	13.33	17.87	18.18	7/8	3/4 (8)	8	28
14	15.30	N/A	15.45	20.75	20.36	7/8	3/4 (10)	10	50
16	17.40	N/A	17.55	23.00	22.46	7/8	3/4 (12)	12	60
18	19.50	N/A	19.65	25.25	24.56	7/8	3/4 (12)	12	65
20	21.60	N/A	21.75	27.50	26.66	7/8	3/4 (14)	14	76
24	25.80	N/A	25.95	32.00	30.86	7/8	3/4 (16)	16	98
30	32.00	N/A	32.18	39.38	36.82	1-1/8	1 (20)	20	173
36	38.30	N/A	38.48	46.25	43.12	1-1/8	1 (24)	24	219

*All dimensions in inches except where indicated.

1 - dimension after assembly on pipe

MAXIMUM WORKING PRESSURE RATING WITH OCCASSIONAL & RECURRING SURGES										
NOM. SIZE (IN)	C900			C905				ASTM D2241		
	DR14	DR18	DR25	DR18	DR21	DR25	DR32.5	SDR17	SDR21	SDR26
3								250	200	160
4	305	235	165					250	200	160
6	305	235	165					250	200	160
8	305	235	165					250	200	160
10	305	235	165					250	200	160
12	305	235	165					250	200	160
14				235	200	165	125			
16				235	200	165	125			
18				200	200	165	125			
20				200	200	165	125			
24				165	165	165	125			
30						165	125			
36						165	125			



**100%
DOMESTIC**

Standard Mechanical Joint Gaskets

(SBR, NBR, EPDM, Neoprene, FKM)
ANSI/AWWA C111/A21.11

GASKET GENERAL SPECIFICATIONS

Star Pipe Products Mechanical Joint (MJ) Gasket dimensions conform to the drawings set forth in ANSI/AWWA C111/A21.11. Gasket markings include size, Manufacturer's mark, Country of origin and product identification. No markings are positioned on sealing surfaces per the ANSI/AWWA C111/A21.11 standard. MJ transition gaskets follow the requirements of ANSI/AWWA C111/A21.11 where applicable.

Standard gasket material is vulcanized styrene butadiene rubber (SBR). Special application elastomers (EPDM, Nitrile, Neoprene & FKM) are available and shall be identified on all documentation and corresponding gaskets.

Star Pipe gaskets are manufactured under quality control standards and procedures that are maintained by the gasket supplier. Appropriate documentation is maintained by the manufacturer and available for review upon request.

Star Pipe gasket suppliers maintain a quality assurance program and manual that is reviewed and updated on an ongoing basis to ensure product quality. Star Pipe gasket suppliers perform in house testing and submit to random testing by Underwriters Laboratories, Inc. Star Pipe gasket providers are recognized under the component program (UL 194/ UL 157) of Underwriters Laboratories, Inc.

Star Pipe provides that our Mechanical Joint gaskets for potable or wastewater projects will perform as designed, based on the published chemical and environmental resistance data for "generic" rubber compounds. Star Pipe should be consulted for specific recommendations or for unusual applications.

GASKET PROPERTIES

PROPERTY	ASTM TEST METHOD	REQUIRED VALUE
Hardness, Shore "A"	D2240	75 ± 5
Minimum Tensile	D412	1500 psi
Minimum Elongation	D412	150%
Minimum Aging	D573	60%
Maximum Compression Set	D395, Method B	20%
Resistance to Surface Ozone Cracking	D1149	No Cracking

GASKET TYPE	MAXIMUM CONTINUOUS TEMP	MAXIMUM EXPOSURE TEMP	STANDARD USAGE
SBR (Styrene Butadiene Rubber/ Buna-S)	160 F	180 F	Drinking water, Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water. Not Recommended for Hydrocarbon Service
EPDM (Ethylene Propylene)	250 F	300 F	Alcohols, Dilute Acids, Dilute Alkalis, Ketones (MEK/Acetone), Strong Oxidizing Chemicals; Drinking Water, Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water. Not Recommended for Hydrocarbon Service
Neoprene (Polychloroprene / CR)	225 F	300 F	Hydrocarbons, Unrefined Petroleum Products, Greasy Waste; Salt Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water.
Nitrile (NBR / Buna-N)	160 F	180 F	Refined Oils and Fluids, Fats, Greases and Waste; Drinking Water, Sanitary Sewage, Reclaimed Water, Raw Water, Storm Water.
FKM (Fluoroelastomer / Viton [®])	400 F	500 F	Aromatic Hydrocarbons, Chlorinated Hydrocarbons, Vegetable Oils, Most Chemicals; Drinking Water, Reclaimed Water, Raw Water, Storm Water.

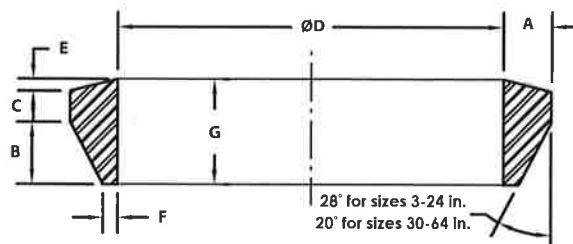
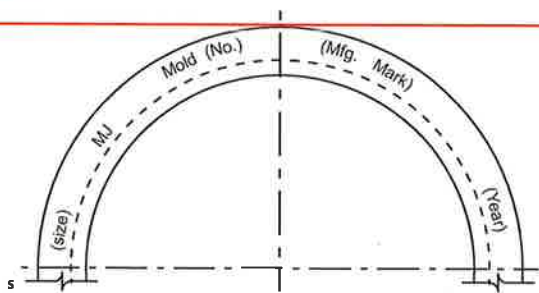
Viton[®] is a registered trademark of E.I. Du Pont De Nemours & Company.



100%
DOMESTIC

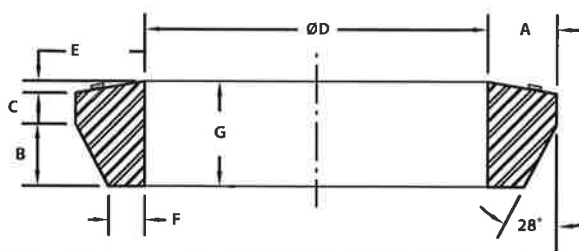
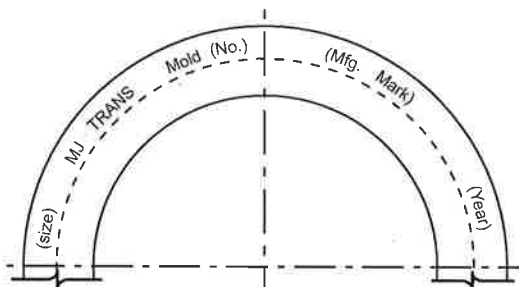
MJ Accessories

ANSI/AWWA C111/A21.11



MECHANICAL-JOINT GASKET

NOM. SIZE	PIPE O.D.	A	B	C	ØD ±1 %	E	F	G
2	2.50	0.48	0.62	0.31	2.48	0.12	0.15	1.05
3	3.96	0.48	0.62	0.31	3.86	0.12	0.15	1.05
4	4.80	0.62	0.75	0.31	4.68	0.16	0.22	1.22
6	6.90	0.62	0.75	0.31	6.73	0.16	0.22	1.22
8	9.05	0.62	0.75	0.31	8.85	0.16	0.22	1.22
10	11.10	0.62	0.75	0.31	10.87	0.16	0.22	1.22
12	13.20	0.62	0.75	0.31	12.95	0.16	0.22	1.22
14	15.30	0.62	0.75	0.31	14.99	0.16	0.22	1.22
16	17.40	0.62	0.75	0.31	17.07	0.16	0.22	1.22
18	19.50	0.62	0.75	0.31	19.13	0.16	0.22	1.22
20	21.60	0.62	0.75	0.31	21.20	0.16	0.22	1.22
24	25.80	0.62	0.75	0.31	25.34	0.16	0.22	1.22
30	32.00	0.73	1.00	0.38	31.47	0.16	0.37	1.54
36	38.30	0.73	1.00	0.38	37.67	0.16	0.37	1.54
42	44.50	0.73	1.00	0.38	43.78	0.16	0.37	1.54
48	50.80	0.73	1.00	0.38	49.98	0.16	0.37	1.54
54	57.56	0.73	1.00	0.38	56.65	0.16	0.37	1.54
60	61.61	0.73	1.00	0.38	60.67	0.16	0.37	1.54
64	65.67	0.73	1.00	0.38	64.70	0.16	0.37	1.54



TRANSITION MECHANICAL-JOINT GASKET

NOM. SIZE	PIPE O.D.	A	B	C (REF.)	ØD ±1 %	E	F	G
2	2.375	0.56	0.66	0.31	2.32	0.12	0.21	1.10
3	3.500	0.72	0.64	0.34	3.43	0.12	0.38	1.10
4	4.500	0.76	0.73	0.33	4.43	0.20	0.37	1.26
6	6.625	0.75	0.73	0.32	6.53	0.20	0.36	1.25
8	8.625	0.82	0.73	0.34	8.50	0.20	0.43	1.27
10	10.750	0.79	0.75	0.31	10.59	0.20	0.39	1.26
12	12.750	0.84	0.75	0.33	12.56	0.20	0.44	1.28

**100% DOMESTIC****MJ Accessories**

ANSI/AWWA C111/A21.11

T-Bolts, Double Ended Rods & Nuts

HSLA STEEL

SPECIFICATIONS:

- Bolts & Nuts are manufactured in accordance with ANSI / AWWA C111 / A21.11.
- Material is High Strength Low Alloy Steel per ANSI/AWWA C111/A21.11.
- Threads per ASME B1.1 unified standard coarse (Class 2A & 2B)

MECHANICAL PROPERTIES

- Yield Strength 45000 PSI (min)
- Elongation in 2in. 20% (min)

CHEMICAL PROPERTIES

Carbon	0.20% Max
Manganese	1.25% Max
Sulfur	0.05% Max
Nickel	0.25% Min
Copper	0.20% Min
Combined	1.25% Min (Ni, Cu, Cr)

BLUE BOLT/NUT/ROD

T-Bolts, Rods & Nuts have fluoropolymer coating material which is VOC-compliant, resin-bonded, thermally cured and dry lubricant.

COATING PHYSICAL PROPERTIES

Film Thickness:	0.3 to 0.4 mil per coat
Number of Coats:	3 to 4 coats
Adhesion:	1 mm cross hatch test + 5 Pulls. Good knife resistance
Cure Test:	50+Rubs with MEK. No substrate exposure
Pencil Hardness:	Pencil Hardness: 4-6H
Volatile Organic Compounds	2.74lbs/gal

Stainless Steel T-Bolts & Nuts

ALLOYS SS 304 & SS 316 PER ASTM F593

SPECIFICATIONS:

- T-bolt dimensions are manufactured in accordance with ANSI / AWWA C111 / A21.11.
- T-bolt alloys SS 304 and SS 316 per ASTM F593
- Heavy Hex Nut Alloys SS 304 & SS 316 per ASTM F594.

MECHANICAL PROPERTIES

- Tensile Strength: 85,000 PSI to 140,000 PSI
- Yield Strength: 45,000 PSI (min)

COATING SPECIFICATION

Nuts have fluoropolymer coating material which is VOC-Compliant, resin-bonded, thermally cured and dry lubricant.

COATING PHYSICAL PROPERTIES

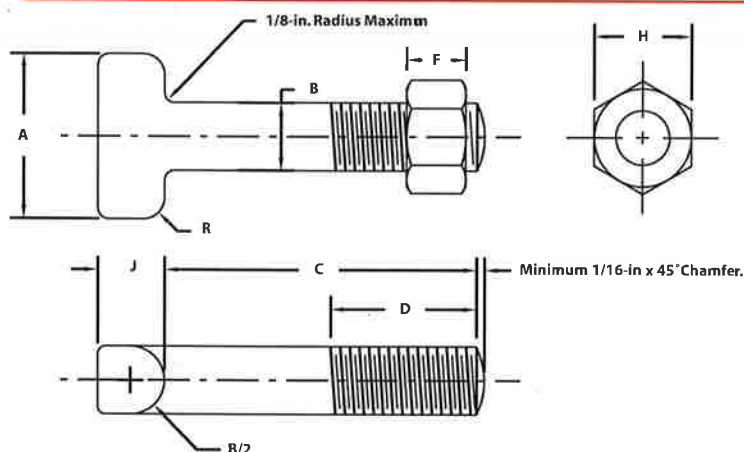
- | | |
|---|---|
| • Film Thickness: 0.3 to 0.4 mil per coat | • Pencil Hardness: 4-6H |
| • Number of Coats: 3 to 4 coats | • Volatile Organic Compounds 2.74 lbs/gal |
| • Adhesion: 1mm cross hatch test + 5 Tape Pulls. | • Continuous use temperature - 356°F |
| • Cure Test: 50+ Rubs with MEK, no substrate exposure | • Color: SS 304 is green, SS 316 is red |



100% DOMESTIC

Accessories

ANSI/AWWA C111/A21.11

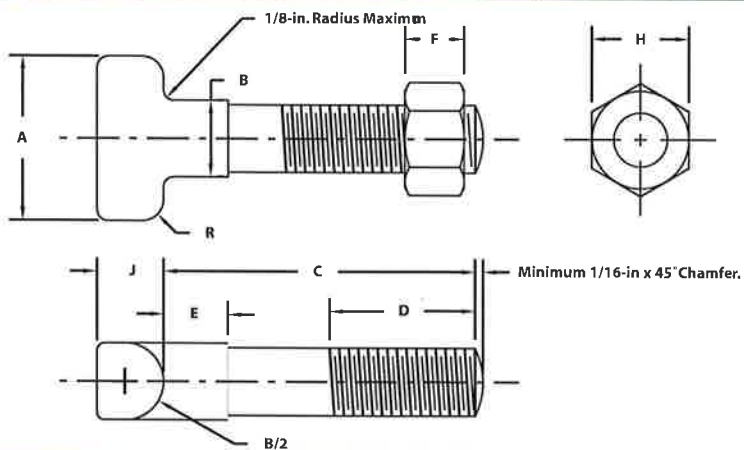


MECHANICAL JOINT BOLT TORQUE		
PIPE SIZE (IN)	BOLT SIZE (IN)	RANGE ¹ OF TORQUE (FT-LBS)
2-3	5/8	45-60
4-24	3/4	75-90
30-36	1	100-120
42-48	1 1/4	120-150

¹These torque ranges are requirements of AWWA C600

T-HEAD (LOW ALLOY STEEL) BOLT & NUT

NOM. SIZE	A	B	C	D	THREADS PER IN.	F	H	J	R
5/8 x 3	1.50	0.625	3.00	2.00	11	0.625	1.062	0.625	0.312
5/8 x 3 1/2	1.50	0.625	3.50	2.70	11	0.625	1.062	0.625	0.312
3/4 x 3 1/2	1.75	0.750	3.50	2.50	10	0.750	1.250	0.750	0.375
3/4 x 4	1.75	0.750	4.00	3.00	10	0.750	1.250	0.750	0.375
3/4 x 4 1/2	1.75	0.750	4.50	3.00	10	0.750	1.250	0.750	0.375
3/4 x 5	1.75	0.750	5.00	3.00	10	0.750	1.250	0.750	0.375
3/4 x 5 1/2	1.75	0.750	5.50	3.70	10	0.750	1.250	0.750	0.375
1 x 5 1/2	2.25	1.000	5.50	3.00	8	1.000	1.625	1.000	0.500
1 x 6	2.25	1.000	6.00	3.00	8	1.000	1.625	1.000	0.500
1 1/4 x 6	2.50	1.250	6.00	3.00	7	1.250	2.000	1.250	0.625
1 1/4 x 6 1/2	2.50	1.250	6.50	3.50	7	1.250	2.000	1.250	0.625
1 1/4 x 8 1/2	2.50	1.250	8.50	3.50	7	1.250	2.000	1.250	0.625



ANTI-ROTATION T-HEAD (LOW ALLOY STEEL) BOLT & NUT

NOM. SIZE	A	B	C	D	E	THREADS PER IN.	F	H	J	R
5/8 x 3	1.50	0.625	3.00	2.00	0.63	11	0.625	1.062	0.625	0.312
5/8 x 3 1/2	1.50	0.625	3.50	2.50	0.63	11	0.625	1.062	0.625	0.312
3/4 x 3 1/2	1.75	0.750	3.50	2.50	0.63	10	0.750	1.250	0.750	0.375
3/4 x 4	1.75	0.750	4.00	3.00	0.63	10	0.750	1.250	0.750	0.375
3/4 x 4 1/2	1.75	0.750	4.50	3.00	0.63	10	0.750	1.250	0.750	0.375
3/4 x 5	1.75	0.750	5.00	3.00	0.63	10	0.750	1.250	0.750	0.375

NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY
P.O. BOX 969
SHIPROCK, NEW MEXICO 87420
PHONE: (505) 210-7070

TO: Navajo Tribal Utility Authority

PO Box 170

Fort Defiance, Arizona 86504-0170

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WE ARE SENDING YOU

☐ SHOP DRAWINGS

☐ PRINTS

☐ PLANS

☐ SAMPLES

☐ SPECIFICATIONS

☐ COPY OF LETTER

☐ CHANGE ORDER

☐ As-Built

☒ ATTACHED ☐ UNDER

Separate cover via

THE FOLLOWING ITEMS:

COPIES	DATE	NO.	DESCRIPTION
1	9-Sep-2019	10	HARCO PVC-IPS Fittings Data
1	9-Sep-2019	11	NAPCO IPS Pipe Submittal
1	9-Sep-2019	12	Poly Tape 10mil Specs

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SIGNED:

Ammerson T. Barber, Estimator/Coordinator

9-Sep-19

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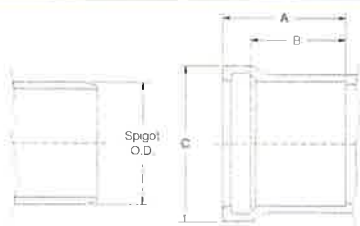
HARCO PVC IPS GASKETED FITTINGS

DESIGN DATA

Applicable Standards:

Materials:	ASTM D-1784, NSF 61
Joints:	ASTM D-3139
Gaskets:	ASTM F-477
Wall Thickness:	SDR-21
NSF 14 Certification	
Vacuum Qualification:	22"-Hg for 4 hours with no loss per method of ASTM D-3139

BELL SPECIFICATIONS



SIZE	STYLE	A	B	C	Spigot O.D.
1½	M	3.17	2.42	2.8	1.90
2	M	3.27	2.52	3.3	2.38
2½	M	3.38	2.63	3.8	2.88
3	M	3.52	2.77	4.5	3.50
4	M	4.10	2.99	5.9	4.50
6	M	4.57	3.46	8.3	6.63
8	M	5.16	3.90	10.4	8.63
10	Fab	5.75	4.70	11.5	10.75
	Fab	6.15	4.90	12.0	12.75

Notes:

- All lay lengths & weights are approximate and are subject to change without notice
- Fabricated fitting configurations may vary

Style Legend:

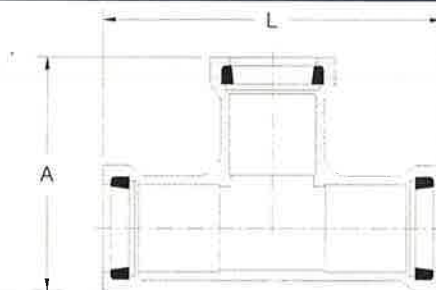
- M - One piece molded
A - Assembled using one piece molded fitting with MIPT x Gasketed adapter or Spigot adapter for branch or Bell
Fab - Fabricated using SCH-40 PVC fittings with HARCO Spigot adapters (or pipe) solvent welded together (See pressure rating warning on this page)

Fab Style: These fittings use SCH-40 PVC fittings. SCH-40 PVC fittings do not have a long term pressure rating. See section 6.3.2 of ASTM D2466-97. Use of these fittings in pressure systems is at user's risk.

The use of anything but properly designed and installed thrust blocks will reduce the life of plastic fittings. Thrust blocks must be poured concrete only and sized for the soil conditions. Joint restraint products are available.

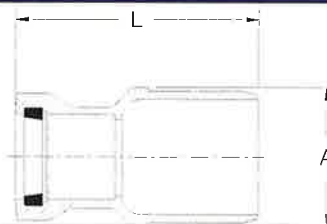
WARNING: Cyclical pressure surges (WATER HAMMER) can reduce the life of PVC fittings. Where such conditions may exist, HARCO DEEP BELL DUCTILE IRON FITTINGS for IPS size PVC pipe should be considered. HARCO DEEP BELL DUCTILE IRON FITTINGS are available in sizes 1½" through 12".

TEE (GxGxG)



SIZE	PART #	STYLE	A	L	WT
1½ x 1½	112-150	M	6.0	9.1	1.0
2 x 1½	112-215	M	6.1	9.1	1.3
2 x 2	112-220	M	6.1	9.1	1.4
2½ x 1½	112-251	A	8.4	9.9	1.4
2½ x 2	112-252	M	6.8	9.9	2.0
2½ x 2½	112-255	M	6.8	9.9	1.7
3 x 1½	112-315	A	9.4	10.9	2.5
3 x 2	112-320	M	7.7	11.4	2.8
3 x 2½	112-325	M	8.0	11.9	3.1
3 x 3	112-330	M	7.7	10.9	2.8
4 x 2	112-420	M	8.6	13.1	4.3
4 x 2½	112-425	M	8.5	13.1	4.9
4 x 3	112-430	M	8.8	13.1	4.9
4 x 4	112-440	M	9.3	13.1	5.6
5 x 5	112-550	M	11.0	14.8	10.0
6 x 2	112-620	A	12.2	11.6	2.8
6 x 3	112-630	M	11.5	12.5	3.0
6 x 4	112-640	M	11.8	16.3	11.0
6 x 6	112-660	M	11.5	16.4	12.3
8 x 4	112-840	M	13.9	19.5	18.7
8 x 6	112-860	M	14.4	19.5	19.3
8 x 8	112-880	M	14.9	19.5	21.3

REDUCER S.E.B. (SxG)



SIZE	PART #	STYLE	A	L	WT
2 x 1½	116-215	M	2.8	7.0	0.5
2½ x 2	116-252	M	3.4	7.0	0.8
3 x 2	116-320	M	3.7	7.9	0.9
3 x 2½	116-325	M	4.2	7.4	1.3
4 x 2	116-420	M	4.7	10.0	1.5
4 x 2½	116-425	M	5.0	8.3	1.8
4 x 3	116-430	M	4.7	10.1	1.9
5 x 4	116-540	Fab	5.8	7.8	3.0
6 x 3	116-630	M	7.0	9.0	3.5
6 x 4	116-640	M	6.9	8.0	2.7
6 x 5	116-650	M	7.0	10.0	4.9
8 x 6	116-860	M	9.0	9.3	5.8

Call For Other Sizes, Configurations & Gasket Materials



THE HARRINGTON CORPORATION

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6/18/18

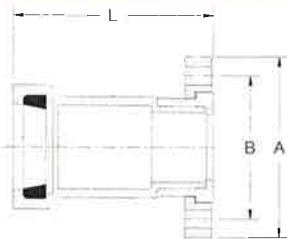
HARCO PVC IPS GASKETED FITTINGS

DESIGN DATA

Applicable Standards:

Materials:	ASTM D-1784, NSF 14
Joints:	ASTM D-3139
Gaskets:	ASTM F-477
Wall Thickness:	SDR-21
NSF 14 Certification	
Vacuum Qualification:	22"-Hg for 4 hours with no loss per method of ASTM D-3139

GASKET x FLANGE ADAPTER



SIZE	PART #	STYLE	A	B	L	WT (approx.)
1½	154-015	Fab	5.0	3.9	4.8	0.8
2	154-020	Fab	6.0	4.8	5.1	1.2
2½	154-025	Fab	7.0	5.5	5.8	1.7
3	154-030	Fab	7.5	6.0	6.0	2.4
4	154-040	Fab	9.0	7.5	7.0	6.0
	154-060	Fab	11.0	9.5	8.3	12.0
	154-080	Fab	13.5	11.8	17.7	20.0

NOTES:

- All lay lengths & weights are approximate and are subject to change without notice
- Fabricated fitting configurations may vary

STYLE LEGEND:

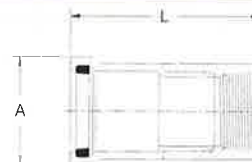
- M - One piece molded
- Fab - Fabricated using SCH-40 PVC fittings with Harco Spigot adapters (or pipe) solvent welded together (See pressure rating warning on this page)

Fab Style: These fittings use SCH-40 PVC fittings. SCH-40 PVC fittings do not have a long term pressure rating. See section 6.3.2 of ASTM D2466-97. Use of these fittings in pressure systems is at user's risk.

The use of anything but properly designed and installed thrust blocks will reduce the life of plastic fittings. Thrust blocks must be poured concrete only and sized for the soil conditions. Joint restraint products are available.

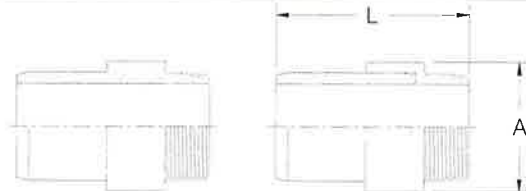
WARNING: Cyclical pressure surges (WATER HAMMER) can reduce the life of PVC fittings. Where such conditions may exist, HARCO DEEP BELL DUCTILE IRON FITTINGS for IPS size PVC pipe should be considered. HARCO DEEP BELL DUCTILE IRON FITTINGS are available in sizes 1½" through 12".

GASKET x FEMALE NPT ADAPTER



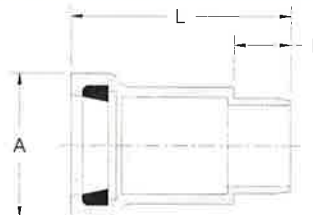
SIZE	PART #	STYLE	A	L	WT (approx.)
1½	132-015	Fab	2.7	5.7	0.5
2	132-020	Fab	3.3	6.1	0.7
2½	132-025	Fab	3.8	7.3	1.2
3	132-030	Fab	4.5	7.5	1.5
4	132-040	Fab	5.8	9.4	2.6
5	132-050	Fab	7.0	10.5	5.0
6	132-060	Fab	8.1	12.1	6.0

PE (Plain End) x MALE NPT ADAPTER



SIZE	PART #	STYLE	A	L	WT (approx.)
1½	133-015	Fab	2.2	5.2	0.3
2	133-020	M	2.6	4.1	0.3
2½	133-025	Fab	3.3	6.3	0.8
3	133-030	Fab	4.0	6.9	1.3
4	133-040	Fab	5.0	7.5	2.0
6	133-060	Fab	7.3	9.8	5.3

SPIGOT x GASKET ADAPTER



SIZE	PART #	STYLE	A	B	L	WT (approx.)
1½	130-015	M	2.7	1.1	4.5	0.3
2	130-020	M	3.3	1.4	4.9	0.5
2½	130-025	M	3.8	2.0	5.3	0.7
3	130-030	M	4.5	2.0	5.8	0.9
4	130-040	M	5.9	2.3	6.4	1.7
5	130-050	M	7.0	3.0	9.1	3.0
6	130-060	M	8.3	3.0	8.0	3.8



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20180618

HARCO PVC IPS GASKETED FITTINGS

DESIGN DATA

Applicable Standards:

Materials:	ASTM D-1784, NSF 14
Joints:	ASTM D-3139
Gaskets:	ASTM F-477
Wall Thickness:	SDR-21
NSF 14 Certification	
Vacuum Qualification:	22"-Hg for 4 hours with no loss per method of ASTM D-3139

NOTES:

- All lay lengths & weights are approximate and are subject to change without notice
- Fabricated fitting configurations may vary

STYLE LEGEND:

- M - One piece molded
 HB - Harco style one piece molded, reduced by use of flush style thread x thread bushing
 FB - Flo style one piece molded, reduced by use of flush style thread x thread bushing
 Fab - Fabricated using SCH-40 PVC fittings with Harco Spigot adapters (or pipe) solvent welded together (See pressure rating warning on this page)

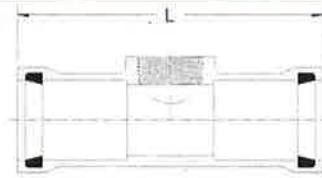
Flush Style: These fittings use SCH-40 PVC fittings. SCH-40 PVC fittings do not have a long term pressure rating. See section 6.3.2 of ASTM D2466-97. Use of these fittings in pressure systems is at user's risk.

The use of anything but properly designed and installed thrust blocks will reduce the life of plastic fittings. Thrust blocks must be poured concrete only and sized for the soil conditions. Joint restraint products are available.

WARNING: Cyclical pressure surges (WATER HAMMER) can reduce the life of PVC fittings. Where such conditions may exist, HARCO DEEP BELL DUCTILE IRON FITTINGS for IPS size PVC pipe should be considered. HARCO DEEP BELL DUCTILE IRON FITTINGS are available in sizes 1½" through 12".

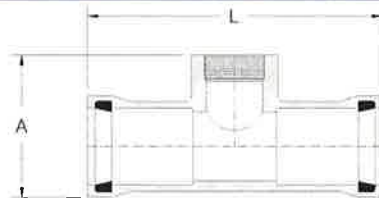
Call For Other Sizes, Configurations & Gasket Materials

SERVICE TEE (GxGxFIPT) (Tapered NPT Thread)



SIZE	PART #	STYLE	L	WT (approx.)
1½ x ¾	151-153	FB	8.5	0.8
1½ x 1	151-154	M	8.5	0.8
1½ x 1¼	151-155	Fab	10.9	0.8
2 x ½	151-202	HB	9.2	1.2
2 x ¾	151-203	M	9.2	1.2
2 x 1	151-204	M	9.2	1.2
2 x 1¼	151-205	M	9.2	1.2
2 x 1½	151-206	M	9.2	1.2
2½ x ½	151-252	HB	9.9	1.5
2½ x ¾	151-253	HB	9.9	1.5
2½ x 1	151-254	M	9.9	1.5
2½ x 1¼	151-255	M	9.9	1.5
2½ x 1½	151-256	M	9.9	1.5
2½ x 2	151-258	M	9.9	1.5
3 x ½	151-302	HB	11.0	2.5
3 x ¾	151-303	HB	11.0	2.5
3 x 1	151-304	M	11.0	2.5
3 x 1¼	151-305	M	11.0	2.5
3 x 1½	151-306	M	11.0	2.5
3 x 2	151-308	M	11.0	2.5
4 x ½	151-402	HB	10.7	3.1
4 x ¾	151-403	HB	10.7	3.1
4 x 1	151-404	M	10.7	3.1
4 x 1¼	151-405	M	10.7	3.1
4 x 1½	151-406	M	10.7	3.1
4 x 2	151-408	M	10.7	3.1
6 x ½	151-602	HB	9.3	5.8
6 x ¾	151-603	HB	9.3	5.8
6 x 1	151-604	HB	9.3	5.8
6 x 1¼	151-605	HB	9.3	5.8
6 x 1½	151-606	M	9.3	5.8
6 x 2	151-608	M	11.5	5.8

ACME SERVICE TEE (GxGxACME) (315psi rated)



SIZE	PART #	STYLE	A	L	WT (approx.)
2 x 1	153-204	M	4.5	9.2	1.4
2 x 1¼	153-205	M	4.5	9.2	1.4
2 x 1½	153-206	M	4.5	9.2	1.5
2½ x 1	153-254	M	4.4	9.6	1.9
2½ x 1¼	153-255	M	4.4	9.6	1.9
2½ x 1½	153-256	M	4.4	9.6	1.9
3 x 1	153-304	M	3.9	10.2	2.8
3 x 1¼	153-305	M	3.9	10.2	2.7
3 x 1½	153-306	M	3.8	10.2	2.6



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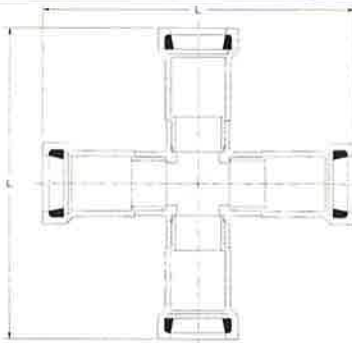
HARCO PVC IPS GASKETED FITTINGS

DESIGN DATA

Applicable Standards:

Materials:	ASTM D-1784, NSF 14
Joints:	ASTM D-3139
Gaskets:	ASTM F-477
Wall Thickness:	SDR-21
NSF 14 Certification	
Vacuum Qualification:	22"-Hg for 4 hours with no loss per method of ASTM D-3139

CROSS (GxGxGxG)



SIZE	PART #	STYLE	L	WT (approx.)
1½	172-015	Fab	11.6	1.7
2	172-020	Fab	12.1	3.4
	172-025	Fab	14.3	4.4
	172-030	Fab	15.1	5.3
4	172-040	Fab	17.9	9.0

NOTES:

- All lay lengths & weights are approximate and are subject to change without notice
- Fabricated fitting configurations may vary

STYLE LEGEND:

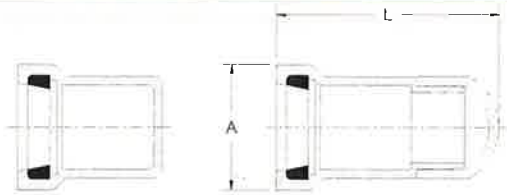
- M - One piece molded
 Fab - Fabricated using SCH-40 PVC fittings with Harco Spigot adapters (or pipe) solvent welded together (See pressure rating warning on this page)

Fab Style: These fittings use SCH-40 PVC fittings. SCH-40 PVC fittings do not have a long term pressure rating. See section 6.3.2 of ASTM D2466-97. Use of these fittings in pressure systems is at user's risk.

The use of anything but properly designed and installed thrust blocks will reduce the life of plastic fittings. Thrust blocks must be poured concrete only and sized for the soil conditions. Joint restraint products are available.

WARNING: Cyclical pressure surges (WATER HAMMER) can reduce the life of PVC fittings. Where such conditions may exist, HARCO DEEP BELL DUCTILE IRON FITTINGS for IPS size PVC pipe should be considered. HARCO DEEP BELL DUCTILE IRON FITTINGS are available in sizes 1½" through 12".

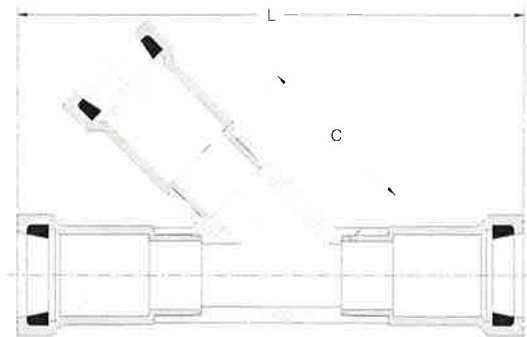
CAP (Gasket)



Poured concrete thrust blocks only.

SIZE	PART #	STYLE	A	L	WT (approx.)
1½	149-015	Fab	2.8	5.3	0.5
2	149-020	M	3.3	3.7	0.5
2½	149-025	Fab	3.8	6.4	1.0
3	149-030	Fab	4.5	6.7	1.4
4	149-040	Fab	5.9	7.6	2.7
5	149-050	Fab	7.0	10.0	4.4
6	149-060	Fab	8.5	9.8	6.9

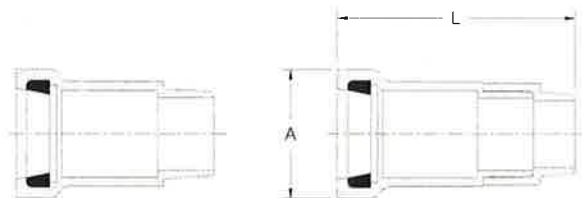
NON-PRESSURE WYE (GxGxG)



SIZE	PART #	STYLE	C	L	WT (approx.)
3 x 3	101-0303	Fab	6.8	10.1	5.0
4 x 4	101-0404	Fab	8.4	12.3	10.0

GASKET x MALE NPT ADAPTER

Do not use joint restraint.



Size on size and reducing sizes of these adapters also available in HARCO Ductile Iron.

SIZE	PART #	STYLE	A	L	WT (approx.)
1½	131-015	M	2.8	4.3	0.5
2	131-020	M	3.3	4.6	0.5
2½	131-025	M	3.8	4.8	1.2
3	131-030	M	4.5	5.0	1.5
4	131-040	Fab	5.9	8.5	2.8
5	131-050	M			3.0
6	131-060	Fab	8.3	10.9	10.3

Call For Other Sizes, Configurations & Gasket Materials



THE HARRINGTON CORPORATION

P.O. BOX 10335 • LYNCHBURG, VIRGINIA 24506 • 3721 COHEN PLACE • LYNCHBURG, VIRGINIA 24501
 PHONE: (434) 845-7094 • FAX: (434) 845-8562 • E-MAIL: sales@harcofittings.com • WEB: www.harcofittings.com
 20180618

HARCO PVC IPS GASKETED FITTINGS

DESIGN DATA

Applicable Standards:

Materials:	ASTM D-1784, NSF 14
Joints:	ASTM D-3139
Gaskets:	ASTM F-477
Wall Thickness:	SDR-21
NSF 14 Certification	
Vacuum Qualification:	22"-Hg for 4 hours with no loss per method of ASTM D-3139

11¼° BEND (GxG)



SIZE	PART #	STYLE	B	WT (approx.)
2	126-020	Fab		2.0
3	126-030	Fab		3.0
4	126-040	Fab		5.0
6	126-060	Fab		11.0

NOTES:

- All lay lengths & weights are approximate and are subject to change without notice
- Indicated fitting configurations may vary

STYLE LEGEND:

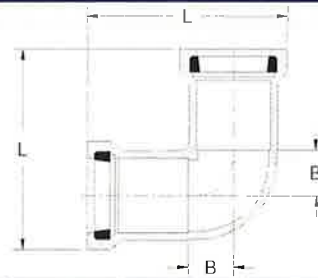
- M - One piece molded
 Fab - Fabricated using SCH-40 PVC fittings with Harco Spigot adapters (or pipe) solvent welded together (See pressure rating warning on this page)

Fab Style: These fittings use SCH-40 PVC fittings. SCH-40 PVC fittings do not have a long term pressure rating. See section 6.3.2 of ASTM D2466-97. Use of these fittings in pressure systems is at user's risk.

The use of anything but properly designed and installed thrust blocks will reduce the life of plastic fittings. Thrust blocks must be poured concrete only and sized for the soil conditions. Joint restraint products are available.

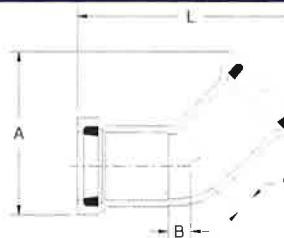
WARNING: Cyclical pressure surges (WATER HAMMER) can reduce the life of PVC fittings. Where such conditions may exist, HARCO DEEP BELL DUCTILE IRON FITTINGS for IPS size PVC pipe should be considered. HARCO DEEP BELL DUCTILE IRON FITTINGS are available in sizes 1½" through 12".

90° BEND (GxG)



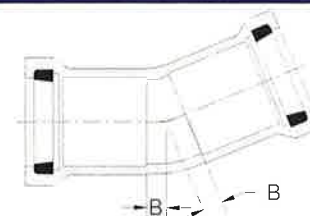
SIZE	PART #	STYLE	B	L	WT (approx.)
1½	118-015	M	1.0	4.8	0.6
2	118-020	M	1.3	6.2	0.8
2½	118-025	M	1.6	6.8	1.3
3	118-030	M	2.0	7.7	1.8
4	118-040	M	2.5	9.5	3.8
5	118-050	Fab			3.8
6	118-060	M	3.6	12.3	9.0
8	118-080	M	4.5	14.9	16.3

45° BEND (GxG)



SIZE	PART #	STYLE	A	B	L	WT (approx.)
1½	122-015	Fab	5.8	0.9	9.1	0.9
2	122-020	M	5.3	0.6	7.8	0.8
2½	122-025	M	6.1	0.7	8.3	1.1
3	122-030	M	6.6	0.9	9.1	1.6
4	122-040	M	8.4	1.1	11.0	3.4
6	122-060	M	11.3	1.6	13.6	7.8
8	122-080	M	13.8	2.0	15.8	13.3

22½° BEND



SIZE	PART #	STYLE	B	WT (approx.)
2	124-020	Fab	2.0	2.0
2½	124-025	Fab	2.0	3.0
3	124-030	Fab	2.3	3.0
4	124-040	Fab	2.6	5.0
6	124-060	Fab	4.3	11.0

Call For Other Sizes, Configurations & Gasket Materials



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 20180618

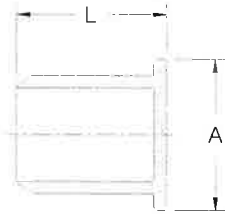
HARCO PVC IPS GASKETED FITTINGS

DESIGN DATA

Applicable Standards:

Materials:	ASTM D-1784, NSF 14
Joints:	ASTM D-3139
Gaskets:	ASTM F-477
Wall Thickness:	SDR-21
NSF 14 Certification	
Vacuum Qualification:	22"-Hg for 4 hours with no loss per method of ASTM D-3139

PLUG (Spigot)



Poured concrete thrust blocks only.

SIZE	PART #	STYLE	A	L	WT (approx.)
1½	144-015	Fab	2.7	5.2	0.2
2	144-020	M	3.0	2.7	0.2
2½	144-025	Fab	3.4	5.3	0.8
3	144-030	M	3.8	3.5	0.4
4	144-040	M	5.0	3.5	0.4
6	144-060	M	6.8	5.4	2.3
8	144-080	M	8.9	6.4	3.8

NOTES:

- All lay lengths & weights are approximate and are subject to change without notice
- Fabricated fitting configurations may vary

STYLE LEGEND:

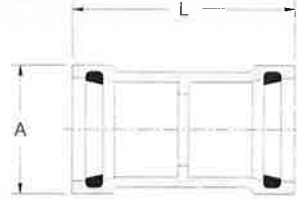
M - One piece molded
 C - Manufactured by Certain-Teed Corporation
 Fab - Fabricated using SCH-40 PVC fittings with Harco Spigot adapters (or pipe) solvent welded together (See pressure rating warning on this page)

Fab Style: These fittings use SCH-40 PVC fittings. SCH-40 PVC fittings do not have a long term pressure rating. See section 6.3.2 of ASTM D2466-97. Use of these fittings in pressure systems is at user's risk.

The use of anything but properly designed and installed thrust blocks will reduce the life of plastic fittings. Thrust blocks must be poured concrete only and sized for the soil conditions. Joint restraint products are available.

WARNING: Cyclical pressure surges (WATER HAMMER) can reduce the life of PVC fittings. Where such conditions may exist, HARCO DEEP BELL DUCTILE IRON FITTINGS for IPS size PVC pipe should be considered. HARCO DEEP BELL DUCTILE IRON FITTINGS are available in sizes 1½" through 12".

LINE COUPLING (GxG) (w/ Stop)



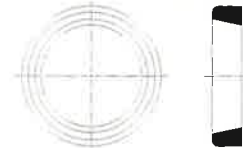
SIZE	PART #	STYLE	A	L	WT (approx.)
1½	108-015	M	2.8	6.5	0.5
2	108-020	M	3.3	6.7	0.7
2½	108-025	M	3.8	7.0	0.9
3	108-030	M	4.5	7.2	1.3
4	108-040	M	5.9	10.6	2.7
6	108-060	M	8.3	9.3	5.6
8	108-080	M	10.4	11.1	10.3
10	108-100	C	11.5	11.5	14.0
12	108-120	C	12.0	12.0	22.0

REPAIR COUPLING (GxG) KNOCK-ON STYLE (No Stop)



SIZE	PART #	STYLE	A	L	WT (approx.)
1½	109-015	M	2.8	6.5	0.5
2	109-020	M	3.3	7.8	0.7
2½	109-025	M	3.8	8.4	0.9
3	109-030	M	4.5	9.0	1.3
4	109-040	M	5.9	10.6	2.7
5	109-050	M	7.0	11.2	4.1
6	109-060	M	8.3	11.6	5.6
8	109-080	M	10.4	11.1	10.3
10	109-100	C	11.5	11.5	14.0
12	109-120	C	12.0	12.0	22.0

REPLACEMENT HARCO PRESSURE GASKET



SIZE	PART #	STYLE	WT (approx.)
1½	195-015	M	0.1
2	195-020	M	0.1
2½	195-025	M	0.1
3	195-030	M	0.1
4	195-040	M	0.2
6	195-060	M	0.3
8	195-080	M	0.3

Call For Other Sizes, Configurations & Gasket Materials



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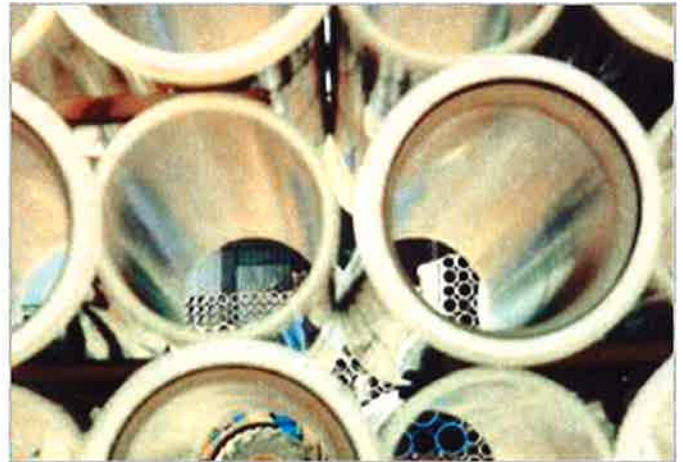
✓ CHECK

MUNICIPAL PRODUCT SPECIFICATION

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell

NAPCO's ASTM D2241 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of water distribution and irrigation systems. With top quality raw materials and modern processing technology, our D2241 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our D2241 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.

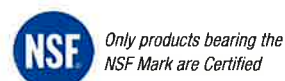


Short Form Specification		
Pipe Standard:	ASTM D2241	
Diameter Std.:	Iron Pipe Size (IPS)	
Nominal Sizes:	1½", 2", 2½", 3", 4", 6", 8", 10", 12"	
Dimension Ratios & Pressure Ratings:	SDR 41 – 100 psi SDR 32.5 – 125 psi SDR 26 – 160 psi	SDR 21 – 200 psi SDR 17 – 250 psi SDR 13.5 – 315 psi
Lay Length:	14' – Made-to-order 20' – All Sizes 40' and 42' – 2" to 6" Sizes	
Pipe Compound:	ASTM D1784 Cell Class 12454	
Pipe Joint Std.:	ASTM D3139	
Max. Angular Joint Deflection:†	1°	
Gasket Standard:	ASTM F477	
Gasket Material Offerings:	Standard – SBR Optional – NBR or EPDM	
Installation Std.:	ASTM D2774	



Applications	Potable Water	Wastewater	Reclaimed Water
Color:	White	Green	Purple
Certifications:*	NSF 14 NSF 61	None	None

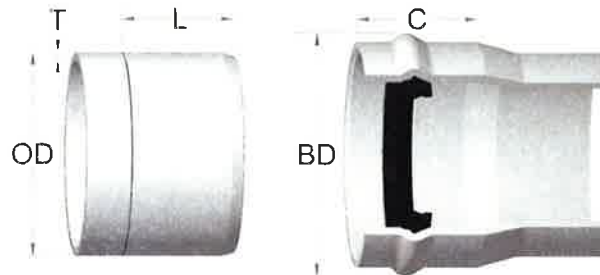
†See Installation Guide for more information.





MUNICIPAL PRODUCT SPECIFICATION

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell



D2241/IB PIPE DIMENSIONS & PERFORMANCE								
Nom. Size	Outside Diameter (OD)	SDR	Pressure Rating (psi)	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	Insertion Mark (L)
1 1/2"	1.900	21	200	0.090	1.720	2.625	3.250	2.625
		17	250	0.112	1.676			
		13.5	315	0.141	1.618			
2"	2.375	26	160	0.091	2.193	3.250	3.500	2.750
		21	200	0.113	2.149			
		17	250	0.140	2.095			
2 1/2"	2.875	13.5	315	0.176	2.023	4.000	4.125	3.125
		26	160	0.110	2.655			
		21	200	0.137	2.601			
3"	3.500	17	250	0.169	2.537	4.750	4.125	3.625
		13.5	315	0.213	2.449			
		41	100	0.085	3.330			
4"	4.500	32.5	125	0.108	3.284	5.875	4.625	4.000
		26	160	0.135	3.230			
		21	200	0.167	3.166			
		17	250	0.206	3.088			
		13.5	315	0.259	2.982			
		41	100	0.110	4.280			
		32.5	125	0.138	4.224			
		26	160	0.173	4.154			
		21	200	0.214	4.072			
		17	250	0.265	3.970			
		13.5	315	0.333	3.834			

Notes:

1. These dimensions are for estimating purposes only. All dimensions are in inches unless otherwise specified.
2. SDR = Standard Dimension Ratio
3. ASTM Pressure Rating @ 73°F and includes 2:1 safety factor.
4. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
5. Dimension given for Approx. Bell Diameter (BD) is for highest pressure rating.



MUNICIPAL PRODUCT SPECIFICATION

ASTM D2241/IB PVC Pressure Pipe | Gasketed Integral Bell

D2241/IB PIPE DIMENSIONS & PERFORMANCE								
Nom. Size	Outside Diameter (OD)	SDR	Pressure Rating (psi)	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	Insertion Mark (L)
6"	6.625	41	100	0.162	6.301	8.500	6.250	5.375
		32.5	125	0.204	6.217			
		26	160	0.255	6.115			
		21	200	0.316	5.993			
		17	250	0.390	5.845			
		13.5	315	0.491	5.643			
8"	8.625	41	100	0.210	8.205	10.625	7.250	6.375
		32.5	125	0.265	8.095			
		26	160	0.332	7.961			
		21	200	0.410	7.805			
		17	250	0.508	7.609			
10"	10.750	41	100	0.262	10.226	13.125	7.500	6.625
		32.5	125	0.331	10.088			
		26	160	0.413	9.924			
		21	200	0.511	9.728			
		17	250	0.632	9.486			
12"	12.750	41	100	0.311	12.128	15.550	8.250	7.375
		32.5	125	0.392	11.966			
		26	160	0.490	11.770			
		21	200	0.606	11.538			
		17	250	0.750	11.250			

Notes:

1. These dimensions are for estimating purposes only. All dimensions are in inches unless otherwise specified.
2. SDR = Standard Dimension Ratio
3. ASTM Pressure Rating @ 73°F and includes 2:1 safety factor.
4. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
5. Dimension given for Approx. Bell Diameter (BD) is for highest pressure rating.

PIPE WRAP TAPE

Product Features

- Used for industrial identification, color coding and pipe wrap purposes
- Suitable use at not more than 140° F (60° C)
- Pipe wrapping tape is moisture resistant
- Adheres to metal and plastic
- Non-corrosive pressure-sensitive adhesive
- Does not require heat, moisture or other manner of preparation to apply
- No known hazards
- Approved for above or below ground use as a rust preventer and UV inhibitor
- Approved for use on all types of pipe including gas and oil pipe



PSPWT110

Model Numbers

PSPWT110	1 x 100 10 mil pipe wrap
PSPWT210	2 x 100 10 mil pipe wrap
PSPWT210Y	2 x 100 10 mil pipe wrap, yellow
PSPWT220	2 x 100 20 mil pipe wrap
PSPWT410	4 x 100 10 mil pipe wrap
PSPWT410Y	4 x 100 10 mil pipe wrap, yellow

Application

NO PRIMER REQUIRED.

Surface preparation: Steel surfaces should be cleaned of rust and other contaminants by wire brushing, blasting or other methods. Pipe surface should be free of frost and moisture. Pipe heated by welding should be allowed to cool to 120° F to 140° F. Wrap is applied by spiral wrapping with a minimall overlap so no pipe is exposed. Tension in wrapping should be enough to obtain conformability to the surface being coated.

Backfilling: No delay is necessary. Backfilling may be done immediately after wrapping.

Technical Performance

(Applies to PSPWT110, PSPWT210, PSPWT410, PSPWT210Y, PSPWT410Y)

DESCRIPTION	UNITS	VALUE	TEST METHOD
Tape thickness	mm/mils	0.25 / 10	ASTM D-1000
Adhesion to steel	kg/cm , oz/in	0.23 / 20	ASTM D-1000
Adhesion to backing	kg/cm , oz/in	0.23 / 20	ASTM D-1000
Elongation at break	%	200	ASTM D-1000
Tensile strength	kg/cm , lbs/in	4.6 / 25.7	ASTM D-1000
Dielectric strength	volts/mil	1250	ASTM D-1000

(Applies to PSPWT220)

DESCRIPTION	UNITS	VALUE	TEST METHOD
Tape thickness	mm/mils	0.50 / 20	ASTM D-1000
Adhesion to steel	kg/cm , oz/in	0.23 / 20	ASTM D-1000
Adhesion to backing	kg/cm , oz/in	0.23 / 20	ASTM D-1000
Elongation at break	%	250	ASTM D-1000
Tensile strength	kg/cm , lbs/in	8 / 44.7	ASTM D-1000

Warranty and Codes

This product meets MIL. SPEC.T27730A. It is recommended that the buyer determine the suitability through for his own best purpose.

NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY

**P.O. BOX 969
SHIPROCK, NEW MEXICO 87420
PHONE: (505) 210-7070**

LETTER OF TRANSMITTAL

DATE	24-Sep-2019	JOB NO.	4500078174
ATTENTION:	Ronald Begay		
RE:	NTUA Emergency Inter-tie		
	Kaibeto, Arizona		
	NECA Proj. # 819141 - Kaibeto Inter-Tie		
	Submittal # 13		

TO: Navajo Tribal Utility Authority

PO Box 170

Fort Defiance, Arizona 86504-0170

GENTLEMEN:

WE ARE SENDING YOU

☒ ATTACHED ☐ UNDER

Separate cover via _____ THE FOLLOWING ITEMS:

- ☐ SHOP DRAWINGS ☐ PRINTS ☐ PLANS ☐ SAMPLES ☐ SPECIFICATIONS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐ As-Built

COPIES	DATE	NO.	DESCRIPTION
1	24-Sep-2019	13	Temporary Traffic Control Plan

THESE ARE TRANSMITTED As checked below:

- ☒ FOR APPROVAL ☐ APPROVED AS SUBMITTED ☐ RESUBMIT ____ COPIES FOR APPROVAL
☐ FOR YOUR USE ☐ APPROVED AS NOTED ☐ SUBMIT ____ COPIES FOR DISTRIBUTION
☐ AS REQUESTED ☐ RETURNED FOR CORRECTIONS ☐ RESUBMIT ____ CORRECTED PRINTS
☒ FOR REVIEW AND COMMENT ☐ FOR YOUR SIGNATURE _____

Remarks:

PLEASE SIGN, DATE, AND RETURN A COPY.

RECEIVED BY: _____

DATE: _____

BY TO: NTUA (RF, AT, DS, DS, JD, DY) NECA (WB, PM, GL, HP, BG)

SIGNED:

REVIEWED


By Ammerson Barber at 10:09 am, Sep 24, 2019


24-Sep-19


Ammerson T. Barber, Estimator/Coordinator

IF ENCLOSURES ARE NOT AS NOTED, KINDLY NOTIFY US AT ONCE

Legend

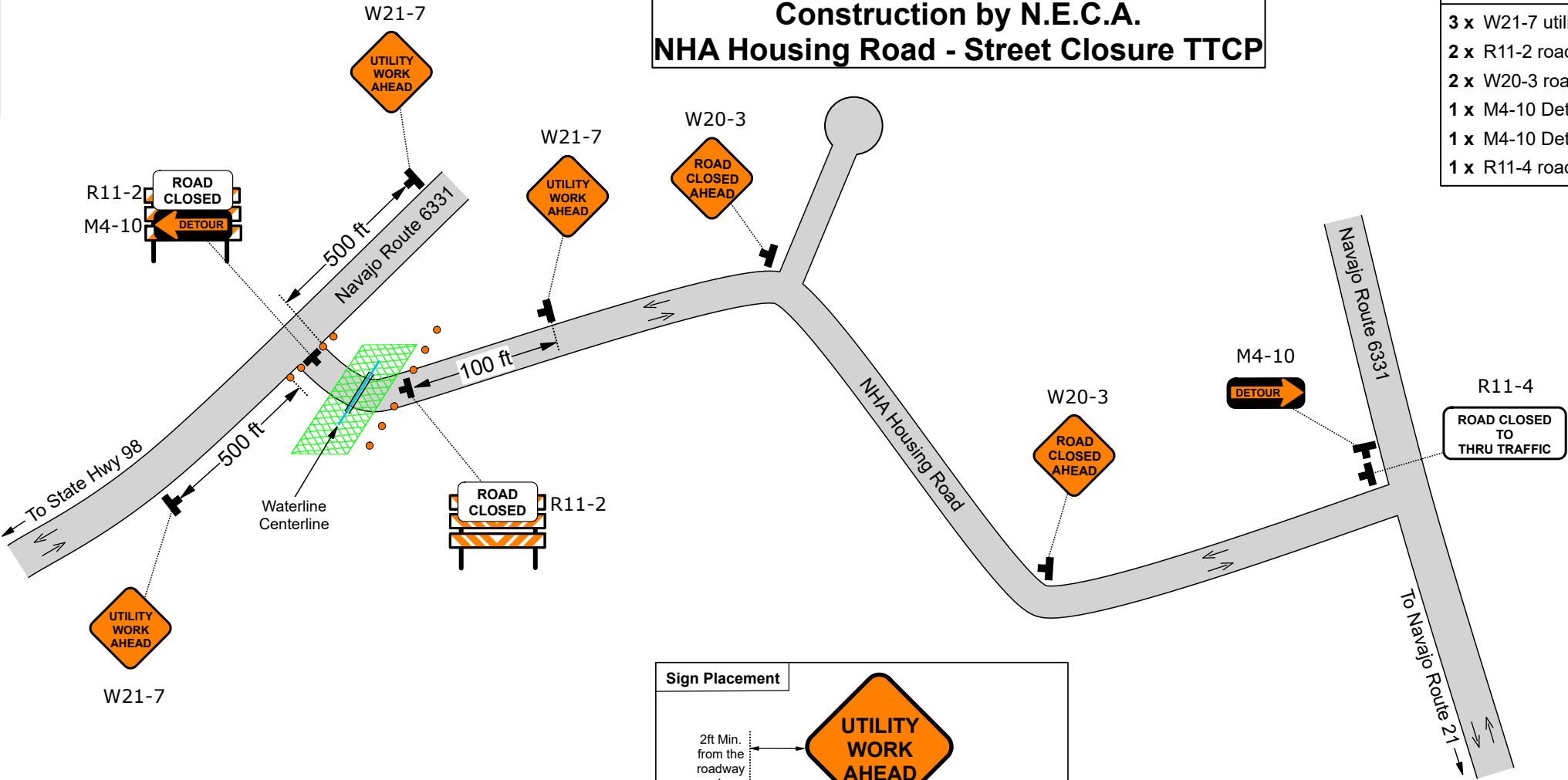
 Work Area

 Traffic Flow

 IHS Waterline

I.H.S. 4" & 6" Waterline Installation
Construction by N.E.C.A.
NHA Housing Road - Street Closure TTCP

Manifest
3 x W21-7 utility work ahead
2 x R11-2 road closed R11-2
2 x W20-3 road closed ahead
1 x M4-10 Detour Left
1 x M4-10 Detour Right
1 x R11-4 road closed to thru traffic



- General Notes:
1. All traffic control devices and signs shall be in accordance with the MUTCD manual (latest edition).

2. At least 24 hour notice shall be given to all effected NHA residence prior to street closure.

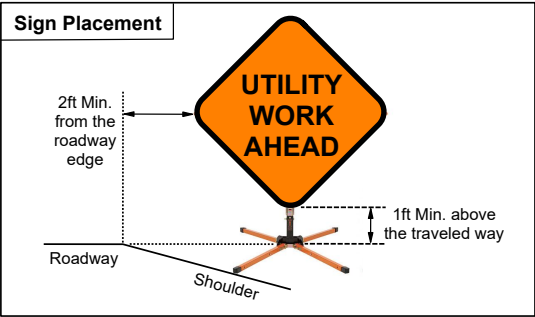
2. All TTC signs and devices shall be maintained for cleanliness, visibility and correct positioning.


3. This TTC zone is temporary and shall be limited to working hours only. At the end of the shift, all TTC devices and signs shall be removed.

4. Final location and spacing of work space, temporary detour lane, signs and devices may be adjusted to fit onsite field conditions based on the daily Job Hazard Analysis.

7. All workers shall wear high-visibility safety apparel that meets Class 2 minimum requirements.

8. Orange Flags may be used to call attention to the advanced warning signs.






Date: 09/16/2019 Author: Byron Smith Project: Beehooghan NHA Housing Emergency Waterline Inter-Tie

Project Number: RWO 4485749 Sheet Number: 1 of 1 Engineer: Ivan L. Whitehair

Comments:

Open Cut TTCP - Street Closure with off-site Detour
NHA Housing Road - Kaibeto, Arizona
TTC Plan is not to scale.



BEEHOOGHAN (AZ-12-176 KAIBETO) NHA HOUSING EMERGENCY
WATER LINE INTERTIE NHA WATERLINE SYSTEM TO NTUA 4"
WATERLINE AT BEEHOOGHAN NHA HOUSING



IN THIS SECTION:

- PLAN SET ON CD



Tab 7

NAVAJO ENGINEERING AND CONSTRUCTION AUTHORITY
 P.O. BOX 969 SHIPROCK, NM 87420 TELE: 505-210-7070

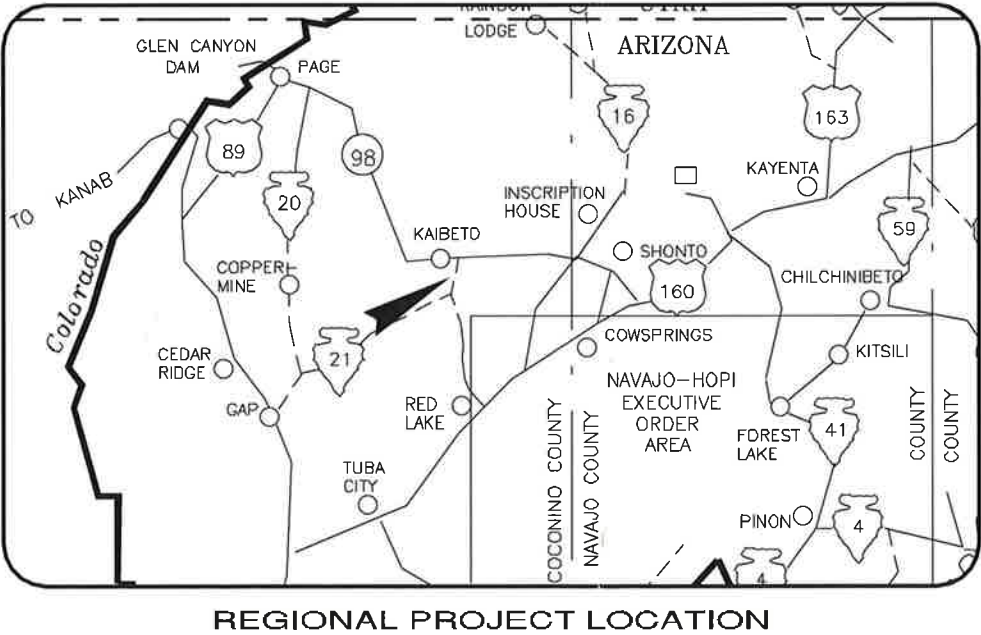
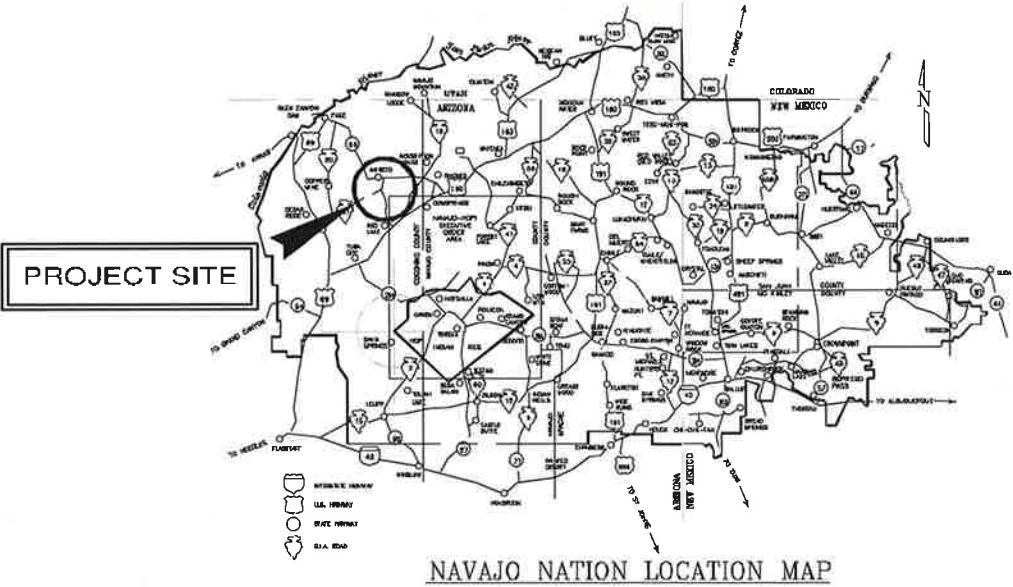
BEEHOOGHAN (AZ-12-176-Kaibeto) NHA HOUSING
 EMERGENCY WATERLINE INTER-TIE
 NHA WATERLINE SYSTEM TO NTUA 4" WATERLINE
 CONSTRUCTION COMPLETE: JANUARY 2020

PROJECT LOCATION:
 KAIBETO, COCONINO COUNTY, ARIZONA
 (NTUA TUBA CITY DISTRICT)


NOTICE-TO-PROCEED:	SEPT. 09, 2019
NTUA P.O. #:	4500078174
NTUA PROJECT I.D. NO.:	RWD 4485749
NTUA PROJ. ENG./MGR.:	RONALD BEGAY
NTUA SERVICE DISTRICT:	TUBA CITY
NECA PROJECT NUMBER:	819141
NECA FOREMAN :	GENE LAUGHLIN
NECA PROJ. COORD.:	AMMERSON BARBER

AS-BUILT
 KAYENTA DISTRICT
 KAYENTA, NAVAJO COUNTY, ARIZONA
 NAVAJO ENGINEERING &
 CONSTRUCTION AUTHORITY (NECA)
 DATE 02/26/20 BY



SHEET INDEX	
NO.	SHEET TITLE
1.	COVER SHEET
2.	SURVEYOR'S AFFIDAVIT
3.	CONSTRUCTION AS-BUILT R.O.W. MAP
4.	AERIAL MAP OVERLAY
5.	NTUA STANDARD DETAILS

DATE: 11/15/20 REVISIONS: FIELD AS-BUILT INT. A.B.	
NAVAJO TRIBAL UTILITY AUTHORITY FORT DEFENCE HEADQUARTERS NAVAJO ENGINEERING & CONSTRUCTION AUTHORITY	
	
BEEHOOGHAN NHA HOUSING INTER-TIE KAIBETO, COCONINO COUNTY, ARIZONA - NAVAJO NATION PROJECT NO. AZ-12-176-Kaibeto DRAWN BY: WC, 02/25/20 CHECKED BY: AB, 02/26/20 APPROVED BY: xx FILE NAME: Kaibeto Beahoghan NHA Housing Map.dwg LAYOUT NAME: 11x17 Title 1of5 SCALE: 1"=1"	
SHEET 1 OF 5	

SURVEYOR'S AFFIDAVIT
AS-BUILT RIGHT-OF-WAY MAP OF
BEEHOOGHAN NHA HOUSING INTER-TIE
AZ-12-176-Kaibeto
KAIBETO, ARIZONA

STATE OF ARIZONA }
COUNTY OF COCONINO }

I, Lemont L. Yazzie, Sr., Arizona Registered Professional Land Surveyor No. 51013, do hereby certify that I am employed by Navajo Engineering and Construction Authority performing work for the Department of Health and Human Services, United States Public Health Service, Indian Health Service; that I reviewed this plat and field notes made by the construction field foreman of an as-built waterline right-of-way on the Navajo Nation, Kaibeto, Coconino County, Arizona, as described and shown on this map, to be granted to the Navajo Nation, hereinafter designated as the "Applicant"; that the survey of such as-built right-of-way made under the "Applicant's" authority as provided by Memorandum of Agreement commenced on September 09, 2016 and ended on November 29, 2016 and that such survey is accurately represented on this map.



Expires: June 30, 2022.

Subscribed and sworn to before me this _____ day of _____, 2020.

Notary Public (signature)

Notary Public (print name)

APPLICANT'S CERTIFICATION

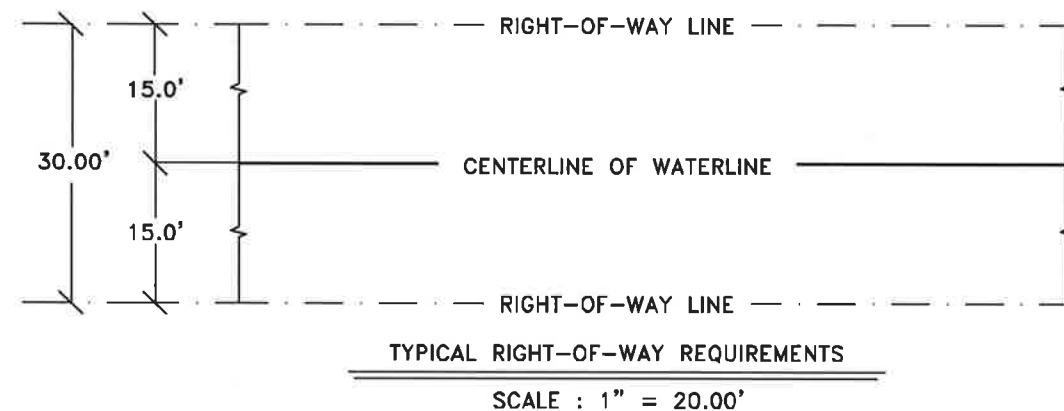
I, W. Mike Halona, do hereby certify that I am the Department Manager III of the Navajo Land Department, Division of Natural Resources, The Navajo Nation, hereinafter designated as the "Applicant"; that Lemont L. Yazzie, Sr., PLS, who subscribed the foregoing affidavit was authorized by Memorandum of Agreement, to survey the location of an as-built waterline right-of-way on and across the Navajo Nation, Kaibeto, Coconino County, Arizona, and to prepare this map; that the survey and map accurately represent the location of the as-built waterline right-of-way; that such survey as represented on this map has been adopted by the "Applicant" as the definite location of the as-built waterline right-of-way shown thereby; and that the map has been prepared to be filed for the approval of the Secretary of the Interior or his duly authorized representative as part of the application of said Right-of-Way.

DATE _____









Department Manager III
Navajo Land Department, DNR
The Navajo Nation

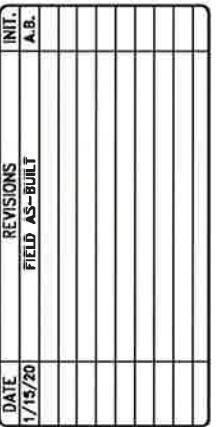
SURVEYORS'S NOTES:

1. This map depicts a right-of-way easement survey and is not a boundary survey.
2. Interior and exterior section lines are referenced to found BLM section corners as noted. Section lines are protracted from found corners using BLM township plats and are estimates of the true land division lines.
3. The Basis of Bearing synonymously the Land Tie Line for this map was derived from a survey grade Global Positioning System (G.P.S.) survey.



LEGEND

	CENTERLINE OF RIGHT-OF-WAY
	EXISTING WATERLINE
	LAND TIE LINE
	TOWNSHIP/RANGE LINE/SECTION LINE
	1/2" REBAR (OR AS NOTED)
	SECTION CORNER MONUMENT
	1/4 CORNER MONUMENT
	U.S.G.S. TRIANGULATION STATION



NAVAJO TRIBAL UTILITY AUTHORITY
FORT DEFIANCE HEADQUARTERS

NAVAJO ENGINEERING &
CONSTRUCTION AUTHORITY

BEEHOOGHAN NHA HOUSING INTER-TIE
KABETO COCONINO COUNTY ARIZONA - NAVAJO NATION

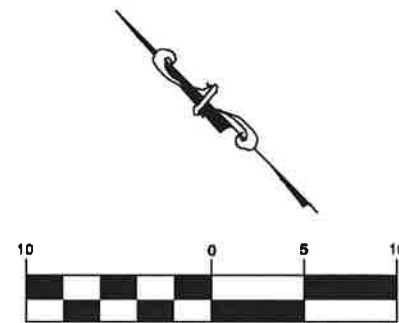
AZ -12-176 Kalbeto

FILE NAME:	Kalbert Beekingham RMA Housing W. Jny
LAYOUT NAME:	11X17 Affidavit 2of5
SCALE:	1"=1'

SHEET

2 of 5

Add FENCE

[illegible]

NAVAJO TRIBAL UTILITY AUTHORITY
FORT DEFENCE HEADQUARTERS

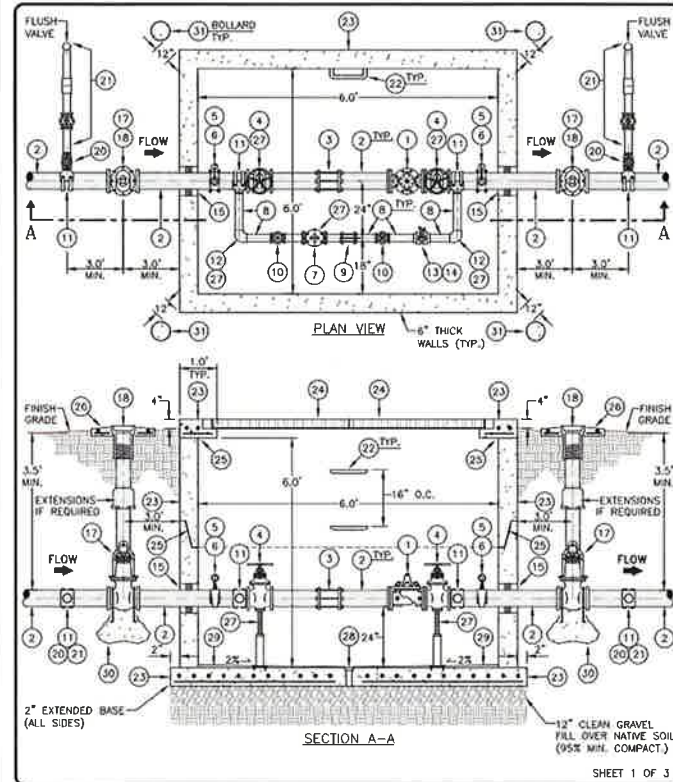


BEEHOUGHAN NHA HOUSING INTER-TIE
KABETO, COCONINO COUNTY, ARIZONA - NAVAJO NATION
AZ -12-176 Kabeto

FILE NAME:	Kullerås Baskbollsplan RHA, Housling Wl.dwg
LAYOUT NAME:	11X17 As-Built ROW 3of5
SCALE:	1"=10'

SHEET

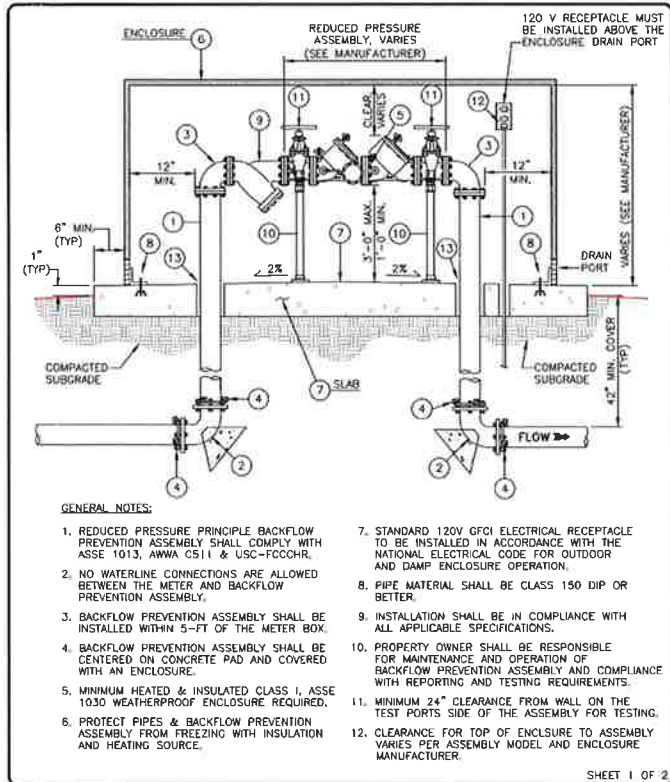
3 OF 5



DESIGNED BY: J. L. LARSEN	DATE: 01/15/20	PROJECT NO.: 11X17-176	SCALE: 1\"/>
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4\"/>

DESIGNED BY: J. L. LARSEN	DATE: 01/15/20	PROJECT NO.: 11X17-176	SCALE: 1\"/>
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DESIGNED BY: J. L. LARSEN	DATE: 01/15/20	PROJECT NO.: 11X17-176	SCALE: 1\"/>
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3\"/>

DESIGNED BY: J. L. LARSEN	DATE: 01/15/20	PROJECT NO.: 11X17-176	SCALE: 1\"/>
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DATE	REVISIONS	INITIALS
1/15/20	FIELD AS-BUILT	A.B.

NAVAJO TRIBAL UTILITY AUTHORITY
FORT DEFENCE HEADQUARTERS

NAVAJO ENGINEERING &
CONSTRUCTION AUTHORITY



BEEHOOGHAN NHA HOUSING INTER-TIE
KABETO, COCONINO COUNTY, ARIZONA - NAVAJO NATION
AZ - 12-176 Kabeto

FILE NAME: Kabeto Beshooghan NHA Housing T.I. Log
DRAWN BY: MC, 02/25/20
CHECKED BY: AB, 02/26/20
LAYOUT NAME: 11X17 Standard Details Set 5
SCALE: 1\"/>