CLACKAMAS
WATER ENVIRONMENT SERVICES

GREGORY L. GEIST | DIRECTOR

Water Quality Protection
Surface Water Management
Wastewater Collection & Treatment

December 10, 2026 BCC Agenda Item: _____

Board of County Commissioners
Acting as the governing body of Water Environment Services
Clackamas County

Approval of Amendment #3 for Contract #1801 with Slayden Constructors, Inc. authorizing the second Early Work Package of the Tri-City Water Resource Recovery Facility Influent Pump Station Expansion Project. The amendment value is $2,950,949.72, increasing the Total Contract Value to $4,172,137.26. Funding through WES Sanitary Sewer Construction Funds. No County General Funds are involved.

Previous Board Action/Review: On October 2, 2025, the Board approved an exemption from competitive bidding under ORS 279C.335 authorizing use of the CM/GC alternative delivery method for this project. On April 30, 2026, the Board approved the CM/GC Agreement with Slayden Constructors, Inc. in the amount of $235,212. Amendment #1, in the amount of $67,574 for additional contractor field investigation services, was executed under delegated authority. On October 1, 2026, the Board approved Amendment #2 in the amount of $918,401.54, authorizing the first Early Work Package for procurement of electrical equipment and the influent sluice gate.

Performance Clackamas: 1. This project supports WES' strategic plan to upgrade WES' infrastructure to ensure the sustainable delivery of reliable, high-quality, and climate-resilient clean water services that support the growth and vitality of our communities, natural environment, and economy.
2. This project supports the County's Strategic Priorities of Strong Infrastructure, Vibrant Economy, and Safe, Secure and Livable Communities.

Counsel Review: Yes **Procurement Review:** Yes
Contact Person: Jeff Stallard **Contact Phone:** 503-742-4694

EXECUTIVE SUMMARY: WES is requesting approval of Amendment #3 to Contract #1801 with Slayden Constructors, Inc., authorizing the second Early Work Package for the Tri-City Water Resource Recovery Facility Influent Pump Station Expansion Project.

The influent pump station is the primary means by which wastewater enters the Tri-City Facility. Constructed in 1985, it is operating near capacity with many components at the end of their useful life. The project will increase firm pumping capacity from 47.6 to 72.3 million gallons per day by replacing five influent pumps, associated electrical gear, controls, and piping, entirely within the continuously operating facility.

Amendment #3 authorizes Slayden to purchase the five new influent pumps and ten large-diameter knife gate valves for the new pumping system. The pumps are the centerpiece of the project and among its longest-lead equipment, with delivery approximately 24 weeks after submittal approval. Xylem's pricing is held only through December 27, 2026, ahead of an anticipated price increase. Ordering now keeps the equipment on schedule for construction during the 2027 dry season and locks in current pricing.

The amendment also adds preconstruction services for potholing to locate existing utilities within the footprint of the planned temporary bypass pumping excavation. This information is needed to finalize the bypass plan.

For Filing Use Only

This is a contractor procurement, not an owner pre-purchase. Slayden, not WES, will hold the purchase orders with the pump manufacturer and valve supplier. Under the CM/GC contract, Slayden is responsible for managing submittals, fabrication, and delivery, for ensuring the equipment conforms to the contract documents, and for correcting defective equipment under its contract warranty. Slayden's performance and payment bonds cover this work. The same contractor that buys the equipment will install, start up, and test it under the anticipated future Guaranteed Maximum Price (GMP) amendment, giving WES a single point of responsibility from purchase through commissioning. Manufacturer warranties are assigned to WES. WES retains responsibility for the equipment design and specifications, prepared by WES's design engineer, Carollo Engineers.

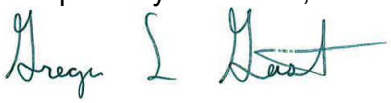
The following summarizes each action under this CM/GC contract to date, this request, and the anticipated future phases of the project.

Phase: Preconstruction services, **Scope**: CM/GC Agreement, **Board Action**: Approved 4/30/2026, **Amount**: $235,512.00
Phase: Amendment #1, **Scope**: Field Investigation, **Board Action**: N/A – Delegated authority, **Amount**:
Phase: Amendment #2 (EWA 1), **Scope**: Transformers, switchboards, sluice gate, electrical subcontractor preconstruction, **Board Action**: Approved 10/1/2026, **Amount**: $918,401.54
Phase: (current) Amendment #3 (EWA 2), **Scope**: Pumps, knife gates, potholing, **Board Action**: in process, **Amount**: $2,950,949.72
Phase: EWA 3 (anticipated) **Scope**: VFDs, harmonic filters, bypass pumping system, **Board Action**: Early 2027, **Amount**: TBD
Phase: GMP Amendment (anticipated), **Scope**: Balance of construction, **Board Action**: Spring 2027, **Amount**: TBD

This project is in WES's approved Capital Improvement Plan and approved Budget.

RECOMMENDATION: Staff recommends that the Board of County Commissioners of Clackamas County, acting as the governing body of Water Environment Services, approve Amendment #3 for Contract #1801 with Slayden Constructors, Inc. authorizing the second Early Work Package of the Tri-City Water Resource Recovery Facility Influent Pump Station Expansion Project.

Respectfully submitted,



Greg Geist
Director, WES

Attachment: Amendment #3, Contract #1801 Slayden Constructors, Inc.

AMENDMENT #3
TO THE CONTRACT DOCUMENTS WITH SLAYDEN CONSTRUCTORS, INC.
FOR THE TRI-CITY WRRF INFLUENT PUMP STATION EXPANSION
EARLY WORK PACKAGE NO. 2
Contract #1801

This Amendment No. 3 ("Amendment #3") to the Contract, which constitutes the second Early Work Package Amendment, is entered into between **Slayden Constructors, Inc.** ("Contractor") and Water Environment Services ("Owner") and shall become part of the Contract documents entered into between both parties on **April 30, 2026** ("Contract").

Pursuant to Article 2, Section 2.4 - Early Work Packages, Contractor and Owner may agree to execute one or more Early Work Package Amendments. By execution of this Amendment #3, the parties agree as follows:

1. Article 2, Scope of Work is hereby amended to add the following Early Work Package Services and additional Preconstruction Services:

This Amendment constitutes the second Early Work Package Amendment under Section 2.4 of the Agreement, and is referred to by the parties as Early Work Amendment 2 ("EWA 2"). Upon execution of this Amendment #3, Contractor shall perform the following:

(a) Procurement of five submersible large capacity centrifugal influent pumps, consisting of two 185 horsepower pumps, designated 110-1121 and 110-1125, and three 325 horsepower pumps, designated 110-1122, 110-1123, and 110-1124, including service sleds, the pump monitoring system, spare parts and special tools, factory testing, and manufacturer's services.

(b) Procurement of ten cast stainless steel bidirectional knife gate valves with bevel gear actuators, consisting of three 36-inch, three 30-inch, two 24-inch, and two 20-inch valves.

(c) Contractor Procurement Administration. Contract administration, submittal review, and vendor coordination by Contractor in support of the procurement activities described in subsections (a) and (b) above.

(d) Additional Preconstruction Services. Utility locates, visual inspection of existing manholes and vaults, and potholing of existing utilities within the planned bypass excavation area and adjacent roadway, including surface restoration, to confirm the location of existing utilities and inform final bypass planning and development of the Guaranteed Maximum Price.

The Cost Summary and detail of work for this Amendment #3 are attached as Exhibit "A" and incorporated by reference.

2. Article 4, Section 4.1 Contract Price is hereby amended as follows:

In consideration for Contractor performing the Early Work Package described in subsections 1(a) through 1(c), Owner will pay Contractor an amount not to exceed $2,879,883.72 (the "EWA 2 Early Work Price"). The EWA 2 Early Work Price is a not-to-exceed amount that includes the Contractor's Fee and Performance and Payment Bonds. In consideration for Contractor performing the additional Preconstruction Services described in subsection 1(d), the Preconstruction Services Compensation is increased by an amount not to exceed $71,066.00. Payment of these amounts will be in accordance with the terms of the Contract. The total Contract compensation will not exceed $4,172,137.26.

ORIGINAL CONTRACT	$ **235,212.00**
AMENDMENT #1	$ 67,574.00
AMENDMENT #2	$ 918,401.54
AMENDMENT #3	**$ 2,950,949.72**
TOTAL AMENDED CONTRACT	**$ 4,172,137.26**

Signature Page Follows

Except as expressly amended above, all other terms and conditions of the Contract shall remain in full force and effect. By signature below, the parties agree to this Amendment #3, effective upon the date of the last signature below.

Slayden Constructors, Inc.

11/16/26

Authorized Signature Date

ANDREW PHARIS, PRESIDENT

Printed Name

Water Environment Services

Signature Date

Name: _____

Title: _____

Approved for Legal Sufficiency:

11/19/2026

County Counsel Date

Exhibit A
Amendment #3 Scope of Work

Tri-City IPS Improvements Project

Clackamas Water Environment Services

Early Work Amendment #2 (EWA2)

IPS Pumps
Valve Procurement
Potholing

November 6th, 2026

CLACKAMAS WATER ENVIRONMENT SERVICES

Slayden part of MWHC

Tri-City IPS Improvements Project

Early Work Amendment #2 (EWA2)

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Section 3: Detailed Cost Report (Potholing)

Section 4: Supplier Quotes

Section 5: Assumptions and Clarifications Log

Section 6: Allowances Log

Section 7: Labor Rates

~~Section 8: CPM Schedule~~ (Not Used)

Section 9: Supplemental Documents

- Spec List
- Pothole Plan

November 6th, 2026

CLACKAMAS WATER ENVIRONMENT SERVICES

Slayden part of MWHC

Section 1: Tri-City IPS Improvements Project

Early Work Amendment #2 (EWA2)

Description of Work

The Tri-City IPS Improvements Project Early Work Package #2 (EWA2) includes early procurement in order to maintain project schedule. This work includes the following procurement:

- Influent Centrifugal Pumps (5 Total per Attached Quote)
- Knife Gates (10 per Attached Quote)

The process equipment & knife gates itemized above is estimated per EWA 2 design documents dated October 2026. Proposal includes procurement including contracting, submittal reviews, & coordination with design team. All other work including delivery, unloading, or storage are excluded from this EWA 2.

Amendment also includes potholing of utilities in the bypass excavation area to inform final bypass planning and early procurement.

Tri-City IPS Improvements Project
Clackamas Water Environment Services
Early Work Amendment 2

Created By: Slayden Constructors, Inc. Last Revision: 11/18/2026

COST OF WORK			
Description	Value		Notes
IPS Pump Procurement	$	2,176,860.72	
Knife Gate Valve Procurement	$	435,050.00	
Contracts	$	1,792.00	16 Hr
Submittal & Vendor Coordination	$	4,344.00	24hr PM
Subtotal - Cost of Work	**$**	**2,618,046.72**	
FEES			
CM/GC Fee	$	222,533.97	8.5%
Subtotal - Fees	**$**	**222,533.97**	
CONTINGENCY & ALLOWANCES			
Allowances	$	21,700.00	
Subtotal - Contingency & Allowances	**$**	**21,700.00**	
SUBTOTAL w/ Contingency & Allowances	**$**	**2,862,280.69**	
MARKUPS			
Payment & Performance Bond	$	17,603.03	0.615%
Builder Risk Insurance	$	-	Excluded from EWA, to be funded in GMP when work onsite is contracted
Subtotal	**$**	**17,603.03**	
TOTAL CONSTRUCTION COST	**$**	**2,879,883.72**	
PRECONSTRUCTION CHANGES			
Potholing	$	71,066.00	
Subtotal	**$**	**71,066.00**	
TOTAL CONTRACT CHANGE	**$**	**2,950,949.72**	

OTHER CONTRACTS (Previously Approved)			
Preconstruction Services	$	235,212.00	
Amendment #1 - Preconstruction Change Order 1	$	67,574.00	
Amendment #2 - Early Work Amendment 1	$	918,401.54	
Subtotal - Other Contracts	**$**	**1,221,187.54**	
TOTAL CONTRACT VALUE	**$**	**4,172,137.26**	

Cost Report

Activity / Resource	Desc	Pcs	Quantity	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total

PARENT ITEM = 20000
Description = BYPASS SYSTEM Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

Listing of Sub-Biditems of Parent Item 20000:

BID ITEM = 20100 Land Item SCHEDULE: 1 100
Description = POTHOLING Unit = LS Takeoff Quan: 1.000 Engr Quan: 0.000

333-0500 Potholing **Quan: 20.00 EA Hrs/Shft: 8.00 Cal: 40 WC: NONE**

Pothole entire area where potential utilties exist prior to excavation and installation of slide rail system. Also includes pothole in road north or pit for utility relocations required for conflicts with utilities in pit footprint.

1. 2 day of visual inspections in manholes & vaults
2. 7 days of potholing
3. 1 day of restorations & cleanup

OPC2	Composite Op crew - 2man		80.00	CH	**Prod:**	**4.0000 HU**		Lab Pcs: 3.00		Eqp Pcs: 4.00	
2AGDCR0.75M	3/4" Minus Delivered	1.00	20.00	TN	38.000		760				760
3AGDACCP	AC Cold Patch Delivered	1.00	20.00	BAG	20.000			400			400
3TLSTSS	STS-Standard	1.00	240.00	MHR	2.000			480			480
4GUL	Utility Locates - Sub	1.00	1.00	LS	2,500.000					2,500	2,500
5TRSCGH	SCG Trucking HR	1.00	12.00	HR	150.000			1,800			1,800
5TRVAC	Vac Truck	1.00	40.00	HR	280.000			11,200			11,200
8CISTS	Total Station	1.00	80.00	HR	5.114				409		409
8EX030ZS	Exc 30K LB (PC1 %75	1.00	80.00	HR	91.926				6,663		6,663
8LSKID	Skid-Steer %75	1.00	80.00	HR	70.450				5,077		5,077
8RTCR	Plate Compactor %75	1.00	80.00	HR	36.885				2,672		2,672
LAB2	Laborer - Pipelayer	1.00	80.00	MH	42.470	6,260					6,260
OPEX4	Op - Excavator 20-80K Lbs	1.00	80.00	MH	55.600	7,481					7,481
OPF	Operator Foreman	1.00	80.00	MH	66.080	8,515					8,515
ZBIM	==> Digital Delivery (BIM)	1.00	8.00	MH	136.000	1,088					1,088
ZSUP1	==> General Superintendent	1.00	80.00	MH	197.000	15,760					15,760
$71,066.22	16.4000 MH/EA		328.00	MH	[1499]	39,105	760	13,880	14,822	2,500	71,066
=====> Item Totals:	**20100**	**- POTHOLING**									
$71,066.22	328.0000 MH/LS		328.00	MH	[29980]	39,105	760	13,880	14,822	2,500	**71,066**
71,066.220	1 LS					39,104.62	760.00	13,880.00	14,821.60	2,500.00	71,066.22

Total of Above Sub-Biditems

=====> Item Totals:	**20000**	**- BYPASS SYSTEM**									
$71,066.22	**328.0000 MH/LS**		**328.00**	**MH**	**[29980]**	**39,105**	**760**	**13,880**	**14,822**	**2,500**	**71,066**
71,066.220	**1 LS**					**39,104.62**	**760.00**	**13,880.00**	**14,821.60**	**2,500.00**	**71,066.22**

Slayden Constructors, Inc.

Tri-City Water Resource Recovery Facility Influent Pump Station Expansion Project,
Clackamas, Oregon

Request for Proposal
Procurement

IPS Pumps

RFP No. P-01 REV No. 0

Slayden part of MWH

PROJECT Tri-City Water Resource Recovery Facility Influent Pump Station

BID PACKAGE: P-01 IPS Pumps

Rev. 0

BID SCHEDULE

BIDDER NAME: Xylem- Flygt

DRAWINGS:	**As listed in RFP**
SPECIFICATIONS:	**As listed in RFP**

BID ITEM		DESCRIPTION	UNIT OF MEASURE	QUANTITY	UNIT PRICE	EXTENDED PRICE
	01	Supply of Pumps 110-1121&110-1125 including Service Carts	EA	2		$590,067.96
	02	Supply of Pumps 110-1122, 110-1123, & 110-1124 including Service Carts	EA	3		$1,208,137.94
	03	Spare Parts & Special Tools	LS	1		$76,994.69
	04	Furnish Submittals (max 5%)	LS	1		$21,768.61
	05	Manufacturer's Services	LS	1		$161,248.49
	06	Furnish O&M Manuals (min 5%)	LS	1		$108,843.04
	07	Supply Bond	LS	1		$9,800.00
		Optional Pricing:			**TOTAL BID PRICE**	$2,176,860.72
		Additional Manufacturer's Services - 8 hour day	DAY	1		
		Additional Manufacturer's Services - Trip Cost	TRIP	1		

PLEASE PROVIDE THE FOLLOWING INFORMATION:

> Provide the number of weeks for submittal preparation and submission from notice of award	4
> Provide the number of weeks after submittal approval for delivery of materials.	24

Bidder acknowledges receipt of the listed Addenda to the RFP. Such Addenda were received prior to submittal of this bid and are made part of Bidder's quote are:

Addendum No.: _____ Addendum No.: _____

Date: _____ Date: _____

Addendum No.: _____ Addendum No.: _____

Date: _____ Date: _____

The undersigned Bidder agrees, if the bid is accepted, to furnish and deliver all the goods and services specified in this RFP for the Bid Price FOB Jobsite as specified and in accordance with all the terms and conditions of this RFB and its attachments.

Bidder shall not qualify their bid based on receiving all the equipment specification sections quoted if Bidder is quoting more than one specification section. However, Bidder should base their quote for goods and ancillary services with the knowledge that the goods and ancillary services may be awarded on a per type basis (i.e., by specification section/type of goods and ancillary services as determined by Slayden for all phases of work). Bidder shall accept the referenced Purchase Agreement Terms and Conditions, which shall be considered and included in Bidder's pricing. Alternate terms and conditions may not be considered, and Bidder's submission of alternate purchase agreement terms and conditions may result in rejection of the Bidder's bid. Bidder's standard terms and conditions will not be considered.

SUBMITTED BY:

Authorized Signature: Dalton Oyler

Name (Print): Dalton Oyler

Title: Sales Rep

Date: 10/28/26

FOR:

Company Name: Xylem- Flygt

Address: 9625 Tualatin-Sherwood RD, Tualatin OR, 97062

Phone Number: 503-913-0119

Fax Number:

E-mail Address: simon.cartwright@xylem.com

NOTE TO BIDDERS:

CONTRACTING ENTITY: If this Bid is selected, the contracting entity for any resulting Purchase Agreement will be the Bidder specified above.

WARRANTY TERM: The warranty term is Two (2) year after project substantial completion, unless the RFP or Agreement Documents require a longer period.

COMMERCIAL AND TECHNICAL EXCEPTIONS: If exceptions are taken to SCI Purchase Agreement and Technical Documents, complete the Exceptions Form Attached.
Commercial Exceptions Noted: ___ YES _____NO Technical Exceptions Noted: ____ YES _____NO

END OF BID FORM

BID SCHEDULE - ATTACHMENT 1
TECHNICAL AND COMMERCIAL EXCEPTIONS FORM

(Return with the Bid)

EXCEPTIONS TO BIDDING DOCUMENTS
Listed below are exceptions to the Bid Documents. NOTE THAT EXCEPTIONS MAY BE CAUSE FOR BID REJECTION. If no exceptions to the Bid Documents are proposed, state "NONE". Commercial Exceptions shall include any exceptions to SCI Purchase Agreement Sample provided in the RFP.

Technical Exceptions:

See attached documents "Purchase Agreement – Cross Comments 10.6.2026" and "Slayden – Xylem Supplemental Conditions

Commercial Exceptions:

ATTACHMENT 2
RFP Coversheet Checklist Form
(Must be returned with proposal)

Tri-Cities Water Resource Recovery Facility Influent Pump Station Expansion
Oregon City, OR

Initial in the corresponding cell that the bidder acknowledges deliverable

Failure to acknowledge all below items may be grounds to reject the bid

ITEM #	INITIALS	ITEMS
1	DO	Bids received after the bid date and time may not be opened or evaluated.
2	DO	Acknowledged all Addendums on the Bid Form.
3	DO	~~Proposal is valid for 90 days from Bid Date.~~ Proposal is valid for 60 days from Bid Date
4	DO	Bond and Insurance pricing is included
5	DO	Acknowledge anything other than "None" listed on the Commercial & Technical Exceptions Form may be grounds for rejection. If the Commercial & Technical Exceptions Form is left blank, this may be grounds for rejection.
6	DO	Acknowledge any Bidder Commercial Terms included with proposal are grounds for rejection.
7	DO	Two (2) year Warranty as specified is included
8	DO	The Proposal Form has been completely populated and verified no required entries have been left blank
9	DO	I have included in my proposal Commercial & Technical Exceptions Form.
10	DO	All shipping Incoterms DDP 2023 to jobsite is included.

Xylem Water Solutions USA, Inc.
Flygt Products

9625 SW Tualatin Sherwood Road
Tualatin, Oregon 97062
Tel (503) 240-1980
Fax (503) 240-3445

October 28, 2026

ALL BIDDING CONTRACTORS

Quote # 2026-POR-0283
Project Name: Tri-City IPS Improvements
Job Name: Tri-City IPS Improvements

Xylem Water Solutions USA, Inc. is pleased to provide a quote for the following Flygt equipment.

NZ 3400 12 MGD @ 49' TDH

Item#	Qty	Description
1.1	2	Flygt NZ 3400/746 3~ 870 CLC, FM, HI, 16" Discharge, 185HP. Price includes 50 ft of shielded power and sensor cable.

NZ 3400 12 MGD @ 49' TDH Price USD $ 403,630.07

NZ 3400 Service Sled

Item#	Qty	Description
2.1	2	Custom service stand, inlet, and sled for the Flygt NZ 3400

NZ 3400 Service Sled Price USD $ 221,540.80

NZ 3400 Spare Parts

Item#	Qty	Description
3.1	1	KIT,REPAIR BASIC
3.2	1	IMPELLER UNIT,N 490MM HC 3400
3.3	1	RING,INSERT HC

NZ 3400 Spare Parts Price USD $ 65,808.80

CZ 3501 24.2 MGD @ 50' TDH

Item#	Qty	Description
4.1	3	Flygt CZ 3501/876 3~ 1030, CLC, FM, HI, 20", 325HP. Price includes 50 ft of shielded power and sensor cable.

CZ 3501 24.2 MGD @ 50' TDH Price USD $ 800,886.15

CZ 3501 Service Sled

Item#	Qty	Description
5.1	3	Service sled, stand, inlet for the Flygt CZ 3501

CZ 3501 Service Sled Price USD $ 442,354.70

CZ 3501 Spare Parts

FLYGT
a xylem brand

Item#	Qty	Description
6.1	1	KIT,REPAIR BASIC
6.2	1	IMPELLER,C 580MM CI 3501

CZ 3501 Spare Parts Price USD $ 46,288.80

MAS 801 Monitoring

Item#	Qty	Description
7.1	1	MONITOR,PUMP MAS800 CU
7.2	5	MONITOR,PUMP MAS800 BU812
7.3	1	HMI,OPERATOR T-80 15"

MAS 801 Monitoring Price USD $ 22,818.40

Factory Testing

Item#	Qty	Description
8.1	1	Flygt factory witness testing- One person.
8.2	5	TEST FAL 2.2 3001-5570-7000 + HI GRADE 1 FAL 15-900006
8.3	5	TEST FAL 2.3 HYDRO 3001-7000+ VOLUTE ONLY FAL 15-900010
8.4	5	TEST FAL 2.8 VIBRATN 3001-7000 FAL 15-900015
8.5	2	ENG SERVICES-FINITE ELEMENT ANALYSIS LEVEL 3 (NO TAX)

Factory Testing Price USD $ 88,454.00

Start Up

Item#	Qty	Description
9.1	3	START UP CHARGE FLYGT 1-TP MODELS: 3000,7000,8000

Start Up Price USD $ 5,115.00

Total Price $ 2,096,896.72

Freight Charge $ 79,964.00

Total Price $ 2,176,860.72

Terms & Conditions

This order is subject to the Standard Terms and Conditions of Sale – Xylem Americas effective on the date the order is accepted which terms are available at http://www.xyleminc.com/en-us/Pages/terms-conditions-of-sale.aspx and incorporated herein by reference and made a part of the agreement between the parties.

As of October 14th, 2024, all orders must meet a minimum dollar value of $1,200. Xylem reserves the right to refuse to process any order that does not meet the minimum order value requirement. Xylem will support order adjustments to meet the minimum order value threshold.

Purchase Orders: Please make purchase orders out to: Xylem Water Solutions USA, Inc.
Freight Terms: 3 DAP - Delivered At Place 08 - Jobsite (per IncoTerms 2020)

FLYGT
a xylem brand

See Freight Payment (Delivery Terms) below.

Taxes: State, local and other applicable taxes are not included in this quotation.

Back Charges: Buyer shall not make purchases nor shall Buyer incur any labor that would result in a back charge to Seller without prior written consent of an authorized employee of Seller.

Tariff Changes: The prices quoted herein are based on the current tariff rates, duties, government charges, and trade regulations as of the date of this quote. If any new tariffs, duties, taxes, or similar charges are imposed, or any existing tariffs, duties, or charges are increased or modified by any government or regulatory authority (collectively, "Tariff Changes"), and such Tariff Changes result in an increase in the cost of goods, Xylem reserves the right to adjust the pricing of the affected goods to reflect the increased costs.

Shortages: Xylem will not be responsible for apparent shipment shortages or damages incurred in shipment that are not reported within two weeks from delivery to the jobsite. Damages should be noted on the receiving slip and the truck driver advised of the damages. Please contact our office as soon as possible to report damages or shortages so that replacement items can be shipped and the appropriate claims made.

Terms of Delivery: PP/Add Order Position

Terms of Payment: 100% N45 after invoice date.
Xylem's payment shall not be dependent upon Purchaser being paid by any third party unless Owner denies payment due to reasons solely attributable to items related to the equipment being provided by FLYGT.

Validity: This Quote is valid for thirty (60) days.
Please note that this pricing is valid for 60 days and contingent upon final approval of submittals and release to fabrication by (within 90 days of bid date).
This quotation is subject to change if any changes to the specifications or plans are made that alter the scope of supply.

Schedule: Please consult your local Flygt Branch Office to get fabrication and delivery lead times.

Warranty: Xylem Water Solutions USA, Inc.offers a commercial warranty to the original end purchaser against defects in workmanship and material.

Exclusions:

- **This Quote includes only the items listed specified above**

Thank you for the opportunity to provide this quotation. Please contact us if there are any questions.

Sincerely,



Dalton Oyler
Sales Representative

Cell: 406-417-1984
dalton.oyler@xylem.com

FLYGT
a xylem brand

Customer Acceptance

This order is subject to the Standard Terms and Conditions of Sale – Xylem Americas effective on the date the order is accepted which terms are available at http://www.xyleminc.com/en-us/Pages/terms-conditions-of-sale.aspx and incorporated herein by reference and made a part of the agreement between the parties.

A signed copy of this Quote is acceptable as a binding contract.

Purchase Orders: Please make purchase orders out to: Xylem Water Solutions USA, Inc.

Quote #:	2026-POR-0283
Customer Name:	ALL BIDDING CONTRACTORS
Job Name:	Tri-City IPS Improvements
Total Amount: (excluding freight)	$ 2,096,896.72

Signature: _____ Name:_____
(PLEASE PRINT)

Company/Utility:_____ PO:_____

Address:_____ Date:_____

_____ Phone:_____

_____ Email:_____

_____ Fax:_____

Erik Brahmer

From: Oyler, Dalton - Xylem <dalton.oyler@xylem.com>
Sent: Tuesday, November 3, 2026 2:48 PM
To: Erik Brahmer; Cartwright, Simon - Xylem; Donnie Pate
Cc: Keith Beckman
Subject: RE: WES Tri-Cities IPS Pumps- Quote

Follow Up Flag: Follow up
Flag Status: Completed

CAUTION: This message originated externally, please use caution when clicking on links or opening attachments.

Hi Erik,

Regarding the cable length, do you have a specific measurement available? I overlooked that requirement in the specifications, but regardless, we will cover the difference up to 100 feet.

Regarding the impeller and wear ring, I triple-checked with our engineering team to confirm the details. The part number included in my quote is for an *Impeller Unit,* which includes both the impeller and wear ring as a single assembly. Although our quoting software only lists it as an impeller, I can confirm that the quoted item includes both components.

Please let me know if you have any additional questions or need any further clarification. I appreciate your time and look forward to hearing from you.

xylem

Dalton Oyler

Flygt Sales Representative | Montana, Wyoming

7 Wonder Road

Clancy, MT 59634

o: 406-495-1335 | m: 406-417-1984 **Preferred**

Web | LinkedIn | X | Facebook | YouTube | Instagram

Erik Brahmer

From: Cartwright, Simon - Xylem <Simon.Cartwright@xylem.com>
Sent: Monday, November 2, 2026 10:26 AM
To: Erik Brahmer; Oyler, Dalton - Xylem; Donnie Pate
Cc: Keith Beckman
Subject: RE: WES Tri-Cities IPS Pumps- Quote

Follow Up Flag: Follow up
Flag Status: Completed

CAUTION: This message originated externally, please use caution when clicking on links or opening attachments.

Hi Erik,
Thanks for taking my call. We were expecting the components to be in a bucket in the MCC and the wiring supplied by the electrician. We are happy to supply a stand-alone panel which I would budget as an absolute max $20,000 for it. However, I feel we might want to have a discussion together with the electrician and engineer once you have the VFD's and MCC worked out on the best positioning of the supervisory system. Personally, I like to see the MAS screen close to the PLC screen, so you don't have to bounce between the two when doing diagnostics.

Si

xylem
How are we doing?
Simon Cartwright
Municipal Projects - Representative
9625 Tualatin - Sherwood Rd | Tualatin, OR, 97062
m: + 503 913 0119
simon.cartwright@xylem.com
LEAVE FEEDBACK
Web | LinkedIn | X | Facebook | YouTube | Instagram



From: Erik Brahmer <Erik.Brahmer@mwhconstructors.com>
Sent: Monday, November 2, 2026 10:00 AM
To: Oyler, Dalton - Xylem <dalton.oyler@xylem.com>; Donnie Pate <Donnie.Pate@mwhconstructors.com>
Cc: Keith Beckman <Keith.Beckman@mwhconstructors.com>; Cartwright, Simon - Xylem <Simon.Cartwright@xylem.com>
Subject: RE: WES Tri-Cities IPS Pumps- Quote

Dalton,

FERGUSON WATERWORKS

FEL PORTLAND WATERWORKS #3011
9129 NORTH TYNDALL AVENUE
PORTLAND, OR 97217-6964

Phone: 503-240-6747

Deliver To: BRENDA 720-547-5410
From: John Herbst
john.herbst@ferguson.com
Comments:

13:19:25 NOV 06 2026

FERGUSON ENTERPRISES LLC #3011
Price Quotation
Phone: 503-240-6747

Bid No: B520718
Bid Date: 10/29/26
Quoted By: XJH

Cust Phone: 503-769-1969
Terms: NET 10TH PROX

Customer: SLAYDEN CONSTRUCTORS INC
550 HAWTHORNE AVE SE
SALEM, OR 97301

Ship To: SLAYDEN CONSTRUCTORS INC
550 HAWTHORNE AVE SE
SALEM, OR 97301

Cust PO#:

Job Name: TRI CITY IPS GATE

Item	Description	Quantity	Net Price	UM	Total
	DEZURIK KGC MODEL				
MISCFAB	MISC FAB 30 KGV W/ BEVEL GEAR CW 30,BD,F1,S2,SMP,S2-EPDM*MNB-CW30-S1 24 WEEKS	3	53302.438	EA	159907.31
MISCFAB	MISC FAB 20 KGV W/ BEVEL GEAR CW 20,BD,F1,S2,SMP,S2-EPDM*MNB-CW20-S1 10 WEEKS	2	16865.855	EA	33731.71
MISCFAB	MISC FAB 36 KGV W/ BEVEL GEAR HW 36,BD,F1,S2,SMP,S2-EPDM*MNB-HD30-S1 24 WEEKS	3	66262.195	EA	198786.59
MISCFAB	MISC FAB 24 KGV W/ BEVEL GEAR HW 24,BD,F1,S2,SMP,S2-EPDM*MNB-HD24-S1 16 WEEKS	2	21312.195	EA	42624.39

Net Total:	$435050.00
Tax:	$0.00
Freight:	$0.00
Total:	$435050.00

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https://survey.medallia.com/?bidsorder&fc=1615&on=48885

FERGUSON WATERWORKS

FERGUSON ENTERPRISES LLC #3011
Price Quotation

13:19:25 NOV 06 2026
Reference No: B520718

Quoted prices are based upon receipt of the total quantity for immediate shipment (48 hours). SHIPMENTS BEYOND 48 HOURS SHALL BE AT THE PRICE IN EFFECT AT TIME OF SHIPMENT UNLESS NOTED OTHERWISE. QUOTES FOR PRODUCTS SHIPPED FOR RESALE ARE NOT FIRM UNLESS NOTED OTHERWISE.

Due to the uncertain impact of potential tariffs, Ferguson's quotation/proposal has not included any provision or contingency for future tariffs or increase of existing tariffs. Ferguson reserves the right to adjust prices to reflect the impact of any new or increased tariffs that affect our costs at the time of shipment. Ferguson will provide notice of any such adjustments along with documentation supporting the changes.

CONTRACTOR CUSTOMERS: IF YOU HAVE DBE/MBE/WBE//VBE/SDVBE/SBE GOOD FAITH EFFORTS DIVERSITY GOALS/ REQUIREMENTS ON A FEDERAL, STATE, LOCAL GOVERNMENT, PRIVATE SECTOR PROJECT, PLEASE CONTACT YOUR BRANCH SALES REPRESENATIVE IMMEDIATELY PRIOR TO RECEIVING A QUOTE/ORDER.

Seller not responsible for delays, lack of product or increase of pricing due to causes beyond our control, and/or based upon Local, State and Federal laws governing type of products that can be sold or put into commerce. This Quote is offered contingent upon the Buyer's acceptance of Seller's terms and conditions, which are incorporated by reference and found either following this document, or on the web at https://www.ferguson.com/content/website-info/terms-of-sale
Govt Buyers: All items are open market unless noted otherwise.

LEAD LAW WARNING: It is illegal to install products that are not "lead free" in accordance with US Federal or other applicable law in potable water systems anticipated for human consumption. Products with *NP in the description are NOT lead free and can only be installed in non-potable applications. Buyer is solely responsible for product selection.

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https://survey.medallia.com/?bidsorder&fc=1615&on=48885

October 29, 2026

APPROVAL DRAWINGS

PROJECT NAME

Tri-City IPS Improvement gate

PURCHASE ORDER

VALVE TYPE

Cast Stainless Steel Knife Gate Valve (KGC)

CUSTOMER:	FERGUSON ENTERPRISES SUBMIT INVOICES TO APINVOICES@FERGUSON.COM NEWPORT NEWS VA 23602 United States
LOCAL SUPPLIER:	CB ENGINEERING PACIFIC INC 5000 ROBB ST, BLDG 3A WHEAT RIDGE CO 80033 United States
MANUFACTURER:	DeZURIK US 250 Riverside Ave North Sartell MN 56377

Factory Quote	QUO459310

TABLE OF CONTENTS

A Data Sheet is included for each line item on the purchase order.
Document numbers are listed at the bottom of the Data Sheet.
Any one drawing may apply to more than one item number.
All documents are assembled in alpha/numeric order within each section.

Replaceable Wear Parts
Data Sheets
Installation Drawing
Materials Of Construction
Cross Section Drawings
Instruction Manuals
Recommended Long & Short Term Storage Procedures

EQUIPMENT DATA FORM

(MAINTENANCE SUMMARY FORM)

PROJECT: Tri-City IPS Improvement gate
PURCHASE ORDER:
EQUIPMENT ITEM: Cast Stainless Steel Knife Gate Valve (KGC)
EQUIPMENT / TAG NUMBERS:
WEIGHT(APPROX.): 0 lbs/ 0 kgs
MANUFACTURER: DeZURIK
PART NUMBER: 9XXXXXX (KGC,30,BD,F1,S2,SMP,S2-EPDM*MNB-CW30-S1)
MANUFACTURERS LOCAL REPRESENTATIVE:
CB ENGINEERING PACIFIC INC **Telephone:**425.822.1702 5000 ROBB ST, BLDG 3A WHEAT RIDGE CO 80033 United States
MOTOR DATA PLATE (HP, Voltage, Speed, etc.):

MAINTENANCE REQUIREMENTS

- DeZURIK recommends exercising your valve every 30 days.
- Valve lubrication required upon disassembly only.
- For valve maintenance and lubrication refer to instruction manual(s):D11061
- For actuator maintenance and lubrication refer to instruction manual(s):DP00129

REPLACEABLE WEAR PARTS

See Drawings : A67539,A68907,A68189,D11061

Part No	Description	Quantity	Line
1251551	PACKING SQ 3/4 IN TFE	198.75	A02
3358721	30" ANTI-EXTRUSION GUIDE	2	A09
3363299	30" PERIMETER SEAT W FULL METAL INSERT EPDM KGC BD	1	A10
1014191	BRG FLG 1.002X1.252X1-1/4	1	B28

For current parts pricing, contact local manufacturers representative listed above.

EQUIPMENT DATA FORM

(MAINTENANCE SUMMARY FORM)

PROJECT: Tri-City IPS Improvement gate
PURCHASE ORDER:
EQUIPMENT ITEM: Cast Stainless Steel Knife Gate Valve (KGC)
EQUIPMENT / TAG NUMBERS:
WEIGHT(APPROX.): 0 lbs/ 0 kgs
MANUFACTURER: DeZURIK
PART NUMBER: 9759264 (KGC,20,BD,F1,S2,SMP,S2-EPDM*MNB-CW20-S1)
MANUFACTURERS LOCAL REPRESENTATIVE:
CB ENGINEERING PACIFIC INC **Telephone:**425.822.1702 5000 ROBB ST, BLDG 3A WHEAT RIDGE CO 80033 United States
MOTOR DATA PLATE (HP, Voltage, Speed, etc.):

MAINTENANCE REQUIREMENTS

- DeZURIK recommends exercising your valve every 30 days.
- Valve lubrication required upon disassembly only.
- For valve maintenance and lubrication refer to instruction manual(s):D11061
- For actuator maintenance and lubrication refer to instruction manual(s):DP00129

REPLACEABLE WEAR PARTS

See Drawings : A67534,A68907,A68189,D11061

Part No	Description	Quantity	Line
1251550	PACKING SQ 5/8 IN TFE	135.75	A02
3358515	20" ANTI-EXTRUSION GUIDE	2	A09
3361952	20" PERIMETER SEAT W FULL METAL INSERT EPDM KGC BD	1	A10
1014191	BRG FLG 1.002X1.252X1-1/4	1	B28

For current parts pricing, contact local manufacturers representative listed above.

EQUIPMENT DATA FORM

(MAINTENANCE SUMMARY FORM)

PROJECT: Tri-City IPS Improvement gate
PURCHASE ORDER:
EQUIPMENT ITEM: Cast Stainless Steel Knife Gate Valve (KGC)
EQUIPMENT / TAG NUMBERS:
WEIGHT(APPROX.): 0 lbs/ 0 kgs
MANUFACTURER: DeZURIK
PART NUMBER: 9XXXXXX (KGC,36,BD,F1,S2,SMP,S2-EPDM*MNB-HD30-S1)
MANUFACTURERS LOCAL REPRESENTATIVE:
CB ENGINEERING PACIFIC INC **Telephone:**425.822.1702 5000 ROBB ST, BLDG 3A WHEAT RIDGE CO 80033 United States
MOTOR DATA PLATE (HP, Voltage, Speed, etc.):

MAINTENANCE REQUIREMENTS

- DeZURIK recommends exercising your valve every 30 days.
- Valve lubrication required upon disassembly only.
- For valve maintenance and lubrication refer to instruction manual(s):D11061
- For actuator maintenance and lubrication refer to instruction manual(s):DP00129

REPLACEABLE WEAR PARTS

See Drawings : A67538,A68907,A68189,D11061

Part No	Description	Quantity	Line
1251551	PACKING SQ 3/4 IN TFE	237	A02
3358722	36" ANTI-EXTRUSION GUIDE	2	A09
3355963	36" PERIMETER SEAT EPDM KGC BD	1	A10
3363322	36" PERIMETER SEAT W FULL METAL INSERT EPDM KGC BD	1	A10

For current parts pricing, contact local manufacturers representative listed above.

EQUIPMENT DATA FORM

(MAINTENANCE SUMMARY FORM)

PROJECT: Tri-City IPS Improvement gate
PURCHASE ORDER:
EQUIPMENT ITEM: Cast Stainless Steel Knife Gate Valve (KGC)
EQUIPMENT / TAG NUMBERS:
WEIGHT(APPROX.): 0 lbs/ 0 kgs
MANUFACTURER: DeZURIK
PART NUMBER: 9716613 (KGC,24,BD,F1,S2,SMP,S2-EPDM*MNB-HD24-S1)
MANUFACTURERS LOCAL REPRESENTATIVE:
CB ENGINEERING PACIFIC INC **Telephone:**425.822.1702 5000 ROBB ST, BLDG 3A WHEAT RIDGE CO 80033 United States
MOTOR DATA PLATE (HP, Voltage, Speed, etc.):

MAINTENANCE REQUIREMENTS

- DeZURIK recommends exercising your valve every 30 days.
- Valve lubrication required upon disassembly only.
- For valve maintenance and lubrication refer to instruction manual(s):D11061
- For actuator maintenance and lubrication refer to instruction manual(s):DP00129

REPLACEABLE WEAR PARTS

See Drawings : A67533,A68907,A68189,D11061

Part No	Description	Quantity	Line
1251550	PACKING SQ 5/8 IN TFE	160.5	A02
3358232	24" ANTI-EXTRUSION GUIDE	2	A09
3361488	24" PERIMETER SEAT W FULL METAL INSERT EPDM KGC BD	1	A10

For current parts pricing, contact local manufacturers representative listed above.

Submittal Data Sheet
Date:October 29, 2026

FERGUSON ENTERPRISES
S U B M I T I N V O I C E S T O
APINVOICES@FERGUSON.COM
NEWPORT NEWS VA 23602
United States

P.O.
FACTORY QUOTE QUO459310
PROJ. NAME Tri-City IPS Improvement gate

LINE #	Cust LINE #	QTY	PART NO.	DESCRIPTION
1		3	9XXXXXX	KGC,30,BD,F1,S2,SMP,S2-EPDM*MNB-CW30-S1

Style	KGC	Cast Stainless Steel Knife Gate Valve (KGC)
Size	30	30 Inch (750mm)
Body Style	BD	Bi-Directional Valve
End Connection	F1	Flanged Drilling; ASME Class 150
Body Material	S2	316 Stainless Steel Cast
Packing	SMP	PTFE Braided Packing; Temperature to 500° F. (260° C.); pH Range 0 to 14
Gate Material	S2	316 Stainless Steel
Seat Material	EPDM	Terpolymer of Ethylene Propylene & A Diene; Temperature to 250° F. (122° C.)
Coating	SB0	Exterior: 4 mils minimum of Blue DeZURIK Epoxy with Standard (SP10) surface prep
Actuator	MNB-CW30-S1	Chainwheel; Bevel Gear; 30 In Dia; 304 Stainless Steel Yoke

Temperature Range to 250 Degrees F.

RELATED DOCUMENTS

A67539: DWG INST KGC BD P100 MNB-CW 30 & 36"
A68907: DWG VALVE ASSY 2-36" KGC BD W GUIDES
A68189: DWG ACT BEVEL GEAR 3-48" HD/CW KGC BD
D11061: IM VALVE KGC BD 2-36"
DP00129: IM ACT DYNATORQUE BEVEL GEAR KNIFE GATE

Submittal Data Sheet
Date:October 29, 2026

FERGUSON ENTERPRISES
SUBMIT INVOICES TO
APINVOICES@FERGUSON.COM
NEWPORT NEWS VA 23602
United States

P.O.
FACTORY QUOTE QUO459310
PROJ. NAME Tri-City IPS Improvement gate

LINE #	Cust LINE #	QTY	PART NO.	DESCRIPTION
2		2	9759264	KGC,20,BD,F1,S2,SMP,S2-EPDM*MNB-CW20-S1

Style	KGC	Cast Stainless Steel Knife Gate Valve (KGC)
Size	20	20 Inch (500mm)
Body Style	BD	Bi-Directional Valve
End Connection	F1	Flanged Drilling; ASME Class 150
Body Material	S2	316 Stainless Steel Cast
Packing	SMP	PTFE Braided Packing; Temperature to 500° F. (260° C.); pH Range 0 to 14
Gate Material	S2	316 Stainless Steel
Seat Material	EPDM	Terpolymer of Ethylene Propylene & A Diene; Temperature to 250° F. (122° C.)
Coating	SB0	Exterior: 4 mils minimum of Blue DeZURIK Epoxy with Standard (SP10) surface prep
Actuator	MNB-CW20-S1	Chainwheel; Bevel Gear; 20 In Dia; 304 Stainless Steel Yoke

Temperature Range to 250 Degrees F.

RELATED DOCUMENTS

A67534: DWG INST KGC BD MNB-CW 14-24"
A68907: DWG VALVE ASSY 2-36" KGC BD W GUIDES
A68189: DWG ACT BEVEL GEAR 3-48" HD/CW KGC BD
D11061: IM VALVE KGC BD 2-36"
DP00129: IM ACT DYNATORQUE BEVEL GEAR KNIFE GATE

Submittal Data Sheet
Date:October 29, 2026

FERGUSON ENTERPRISES
S U B M I T I N V O I C E S T O
APINVOICES@FERGUSON.COM
NEWPORT NEWS VA 23602
United States

P.O.
FACTORY QUOTE QUO459310
PROJ. NAME Tri-City IPS Improvement gate

LINE #	Cust LINE #	QTY	PART NO.	DESCRIPTION
3		3	9XXXXXX	KGC,36,BD,F1,S2,SMP,S2-EPDM*MNB-HD30-S1

Style	KGC	Cast Stainless Steel Knife Gate Valve (KGC)
Size	36	36 Inch (900mm)
Body Style	BD	Bi-Directional Valve
End Connection	F1	Flanged Drilling; ASME Class 150
Body Material	S2	316 Stainless Steel Cast
Packing	SMP	PTFE Braided Packing; Temperature to 500° F. (260° C.); pH Range 0 to 14
Gate Material	S2	316 Stainless Steel
Seat Material	EPDM	Terpolymer of Ethylene Propylene & A Diene; Temperature to 250° F. (122° C.)
Coating	SB0	Exterior: 4 mils minimum of Blue DeZURIK Epoxy with Standard (SP10) surface prep
Actuator	MNB-HD30-S1	Handwheel; Bevel Gear; 30 In Dia; 304 Stainless Steel Yoke

Temperature Range to 250 Degrees F.

RELATED DOCUMENTS

A67538: DWG INST KGC BD P100 MNB-HD 30 & 36"
A68907: DWG VALVE ASSY 2-36" KGC BD W GUIDES
A68189: DWG ACT BEVEL GEAR 3-48" HD/CW KGC BD
D11061: IM VALVE KGC BD 2-36"
DP00129: IM ACT DYNATORQUE BEVEL GEAR KNIFE GATE

Submittal Data Sheet
Date:October 29, 2026

FERGUSON ENTERPRISES
SUBMIT INVOICES TO
APINVOICES@FERGUSON.COM
NEWPORT NEWS VA 23602
United States

P.O.
FACTORY QUOTE QUO459310
PROJ. NAME Tri-City IPS Improvement gate

LINE #	Cust LINE #	QTY	PART NO.	DESCRIPTION
4		2	9716613	KGC,24,BD,F1,S2,SMP,S2-EPDM*MNB-HD24-S1

Style	KGC	Cast Stainless Steel Knife Gate Valve (KGC)
Size	24	24 Inch (600mm)
Body Style	BD	Bi-Directional Valve
End Connection	F1	Flanged Drilling; ASME Class 150
Body Material	S2	316 Stainless Steel Cast
Packing	SMP	PTFE Braided Packing; Temperature to 500° F. (260° C.); pH Range 0 to 14
Gate Material	S2	316 Stainless Steel
Seat Material	EPDM	Terpolymer of Ethylene Propylene & A Diene; Temperature to 250° F. (122° C.)
Coating	SB0	Exterior: 4 mils minimum of Blue DeZURIK Epoxy with Standard (SP10) surface prep
Actuator	MNB-HD24-S1	Handwheel; Bevel Gear; 24 In Dia; 304 Stainless Steel Yoke

Temperature Range to 250 Degrees F.

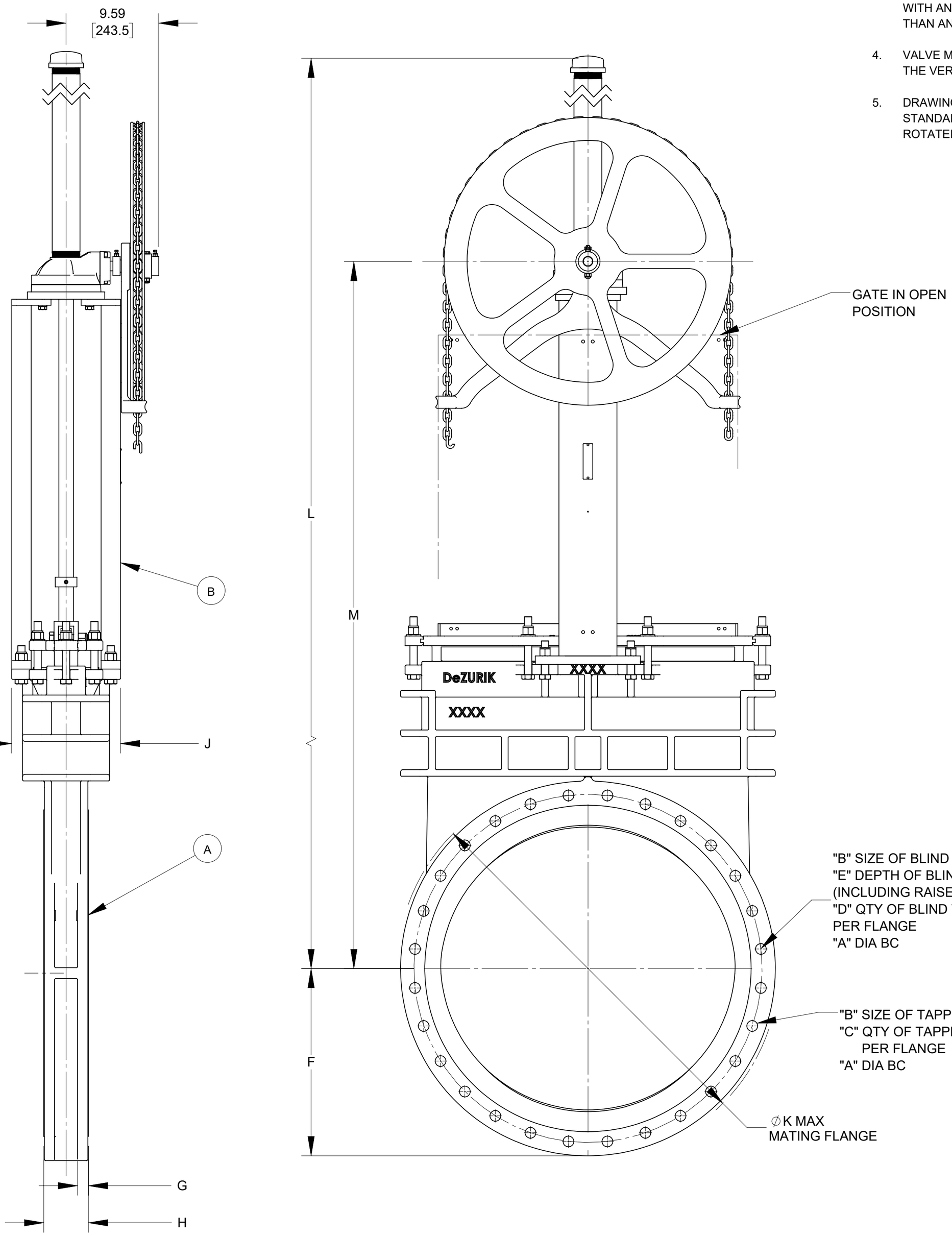
RELATED DOCUMENTS

A67533: DWG INST KGC BD MNB-HD 14-24" STD/180 DEG
A68907: DWG VALVE ASSY 2-36" KGC BD W GUIDES
A68189: DWG ACT BEVEL GEAR 3-48" HD/CW KGC BD
D11061: IM VALVE KGC BD 2-36"
DP00129: IM ACT DYNATORQUE BEVEL GEAR KNIFE GATE

VALVE SIZE		DIMENSIONS INCHES / MILLIMETERS												
INCH	MM	A	B	C	D	E	F	G	H	J	K	L	M	N
30	750	36.00 914	1-1/4-7 UNC	16	12	0.71 18	19.38 492	1.06 27	4.63 117	11.25 286	39.62 1006	109.48 2781	73.09 1856	30.00 762
36	900	42.75 1086	1-1/2-6 UNC	18	14	0.83 21	23.00 584	1.31 33	4.63 117	12.00 305	47.88 1216	123.58 3139	84.59 2149	30.00 762

No.	PART NAME
A	VALVE
B	ACTUATOR

NOTICE
THIS DRAWING DOES NOT SHOW ACTUATOR ACCESSORIES. IF ACCESSORIES ARE REQUIRED, REFER TO THE APPROPRIATE ACCESSORY INSTALLATION DRAWING FOR DIMENSIONS AND OTHER RELATED INFORMATION.



NOTE:

1. VALVE IS SHOWN IN CLOSED POSITION.
2. VALVES ORDERED WITH THRU BOLTING HAVE ALL HOLES, EXCEPT THOSE THAT ARE BLIND TAPPED, DRILLED TO ANSI STANDARDS CLASS 125 & 150.
3. DRAWING SHOWS FLANGES TAPPED FOR USE WITH ANSI FLANGES, FOR USE WITH OTHER THAN ANSI FLANGES SEE A-52587.
4. VALVE MUST BE INSTALLED WITH THE GATE IN THE VERTICAL UPRIGHT POSITION.
5. DRAWING SHOWS ACTUATOR MOUNTED IN THE STANDARD POSITION, ACTUATOR MAY BE ROTATED 180° FROM THE POSITION SHOWN.

REV.	DESCRIPTION	DATE	APPROVED
C	PCN #70612	11/1/2019	SW
B	PCN #62697	20/05/2016	SW
A	PCN #62697	01/26/2015	SW

REVISIONS

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THIRD ANGLE PROJECTION

VALVE			
MATERIAL			
WEIGHT			
RAW PART NO			
DRAFTER		07/17/2014 (MM/DD/YYYY)	
APPROVER	DB	07/17/2014 (MM/DD/YYYY)	

DeZURIK Sartell, MN USA 56377 www.dezurik.com

TITLE: KGC-BD KNIFE GATE VALVES SIZE 26" - 36"
MNB-CW BEVEL GEAR CHAINWHEEL ACTUATOR
STANDARD & 180° MOUNTING POSITIONS

DWG NO: A67539

SIZE: C

VALVE SIZE		DIMENSIONS INCHES / MILLIMETER												
INCH	MM	A	B	C	D	E	F	G	H	J	K	L	M	N
14	350	18.75 476	1-8 UNC	8	4	.69 18	10.50 267	.81 21	3.00 76	8.25 210	21.00 533	56.82 1443	37.78 960	20.00 508
16	400	21.25 540	1-8 UNC	10	6	.75 19	11.75 298	.88 22	3.50 89	8.69 221	24.50 622	62.51 1588	41.47 1053	20.00 508
18	450	22.75 578	1-1/8-7 UNC	10	6	.78 20	12.50 318	.94 24	3.50 89	9.06 230	25.50 648	69.95 1777	47.03 1195	20.00 305
20	500	25.00 635	1-1/8-7 UNC	12	8	.85 22	13.75 349	1.00 25	4.50 114	9.19 233	28.50 724	73.63 1870	50.59 1285	20.00 508
24	600	29.50 749	1-1/4-7 UNC	12	8	.85 22	16.00 406	1.00 25	4.50 114	9.19 233	33.50 851	85.60 2174	58.57 1488	30.00 762

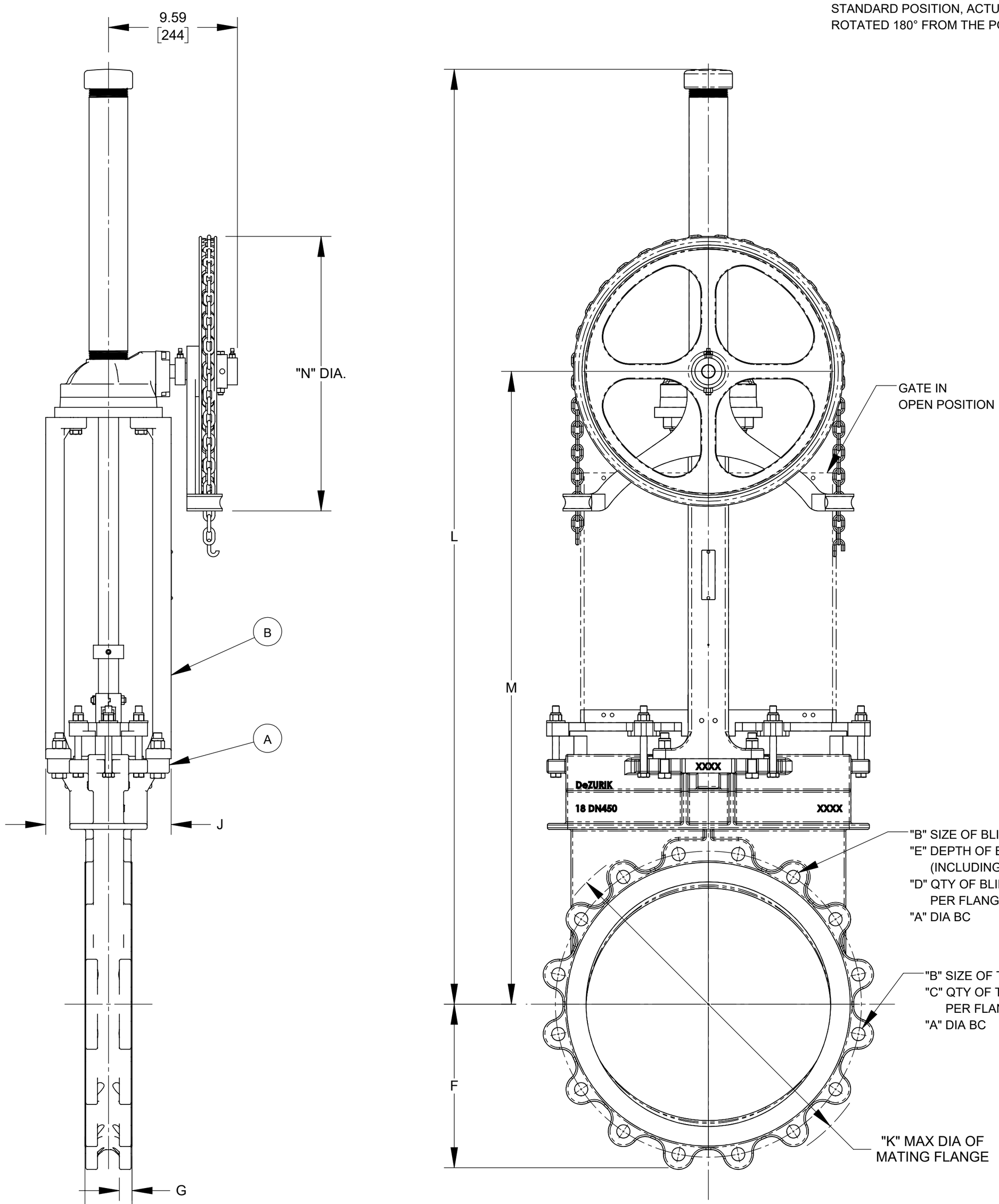
A	VALVE
B	ACTUATOR

NOTE:

1. VALVE IS SHOWN IN CLOSED POSITION.
2. VALVE ORDERED WITH THRU BOLTING HAVE ALL HOLES, EXCEPT THOSE THAT ARE BLIND TAPPED, DRILLED TO ANSI STANDARDS CLASS 125 & 150.
3. DRAWING SHOWS FLANGES TAPPED FOR THE USE WITH ANSI FLANGES, FOR USE WITH OTHER THAN ANSI FLANGES SEE A-52587.
4. THE SIZE 24" VALVE MUST BE INSTALLEDWITH THE GATE IN THE VERTICAL UPRIGHT POSITION.
5. DRAWING SHOWS ACTUATOR MOUNTED IN THE STANDARD POSITION, ACTUATOR MAY BE ROTATED 180° FROM THE POSITION SHOWN.

NOTICE

THIS DRAWING DOES NOT SHOW ACTUATOR ACCESSORIES, IF ACCESSORIES ARE REQUIRED, REFER TO THE APPROPRIATE ACCESSORY INSTALLATION DRAWING FOR DIMENSIONS AND OTHER RELATED INFORMATION.



REV.	DESCRIPTION	DATE	APPROVED
C	PCN #70761	4/17/2020	VD
B	PCN # 70612	11/1/2019	SW
A	PCN #62697	05/20/2016	SW

REVISIONS

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THIRD ANGLE PROJECTION

VALVE			
MATERIAL			
WEIGHT	LBS		
RAW PART NO			
DRAFTER		07/17/2014	
APPROVER	DB	07/17/2014	

DeZURIK Sartell, MN USA 56377 www.dezurik.com

TITLE KGC - BD KNIFE GATE VALVES SIZE 14" - 24"
MNB-CW BEVEL GEAR CHAINWHEEL ACTUATOR
STANDARD AND 180° MOUNTING POSITION

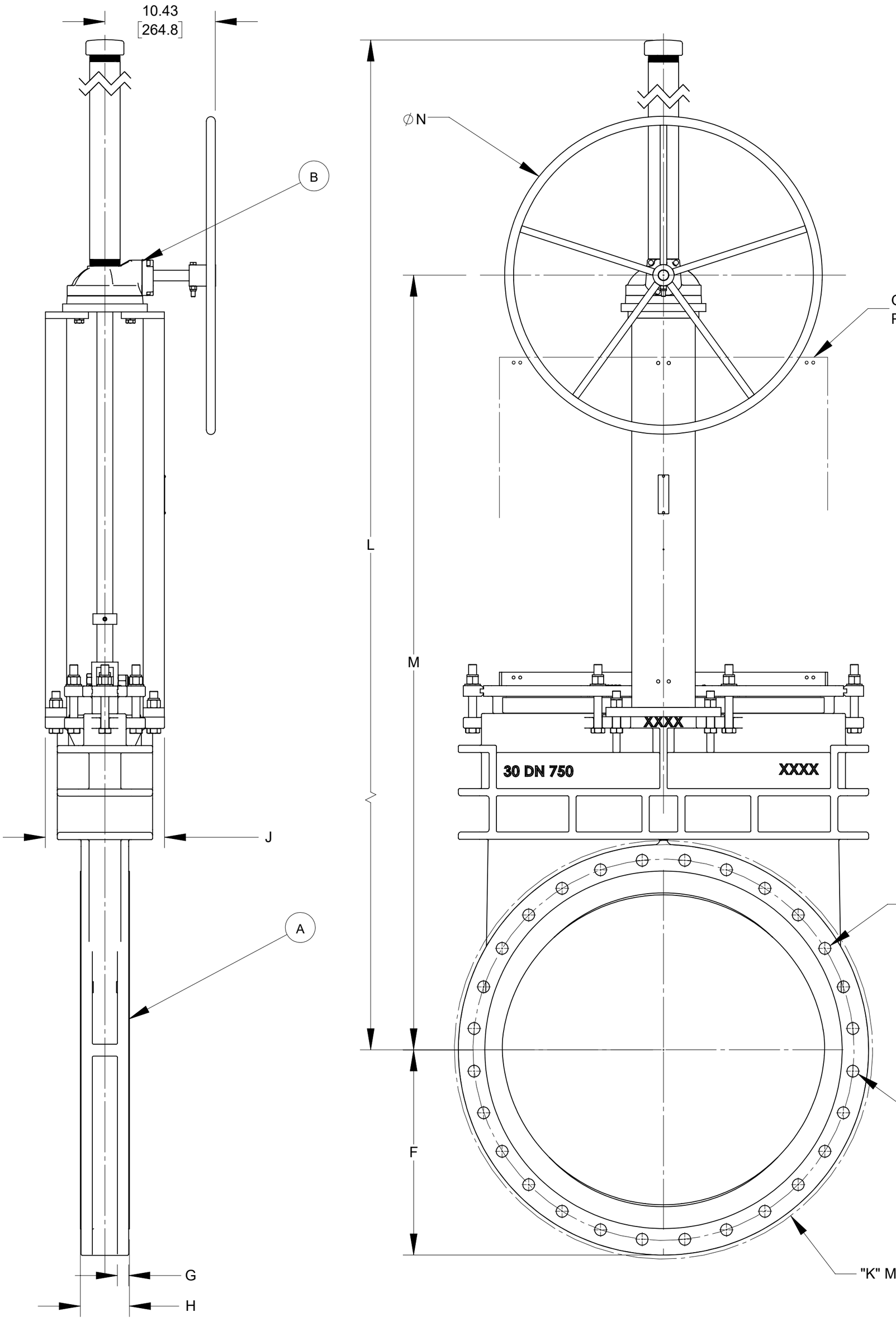
DWG NO A67534

SIZE C

VALVE SIZE		DIMENSIONS INCHES / MILLIMETERS												
INCH	MM	A	B	C	D	E	F	G	H	J	K	L	M	N
30	750	36.00 914	1-1/4-7 UNC	16	12	0.71 18	19.38 492	1.06 27	4.63 117	11.25 286	39.62 1006	109.48 2781	73.09 1856	30.00 762
36	900	42.75 1086	1-1/2-6 UNC	18	14	0.83 21	23.00 584	1.31 33	4.63 117	11.25 286	47.88 1216	123.58 3139	84.59 2149	30.00 762

No.	PART NAME
A	VALVE
B	ACTUATOR

NOTICE
THIS DRAWING DOES NOT SHOW ACTUATOR ACCESSORIES. IF ACCESSORIES ARE REQUIRED, REFER TO THE APPROPRIATE ACCESSORY INSTALLATION DRAWING FOR DIMENSIONS AND OTHER RELATED INFORMATION.



NOTE:

1. VALVE IS SHOWN IN CLOSED POSITION.
2. VALVES ORDERED WITH THRU BOLTING HAVE ALL HOLES, EXCEPT THOSE THAT ARE BLIND TAPPED, DRILLED TO ANSI STANDARDS CLASS 125 & 150.
3. DRAWING SHOWS FLANGES TAPPED FOR USE WITH ANSI FLANGES, FOR USE WITH OTHER THAN ANSI FLANGES SEE A-52587.
4. VALVE MUST BE INSTALLED WITH THE GATE IN THE VERTICAL UPRIGHT POSITION.
5. DRAWING SHOWS ACTUATOR MOUNTED IN THE STANDARD POSITION, ACTUATOR MAY BE ROTATED 180° FROM THE POSITION SHOWN.

REV.	DESCRIPTION	DATE	APPROVED
C	PCN #70612	11/1/2019	SW
B	PCN #62697	05/20/2016	SW
A	PCN #62697	01/26/2015	SW
REVISIONS			

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THIRD ANGLE PROJECTION

VALVE		
MATERIAL		
WEIGHT	VARIES	
RAW PART NO		
DRAFTER		07/17/2014
APPROVER	DB	07/17/2014

DeZURIK Sartell, MN USA 56377 www.dezurik.com

TITLE: KGC - BD KNIFE GATE VALVES SIZE 26" - 36"
MNB-HD BEVEL GEAR HANDWHEEL ACTUATOR
STANDARD & 180° MOUNTING POSITIONS

DWG NO A67538 SIZE C

VALVE SIZE		DIMENSIONS INCHES / MILLIMETER												
INCH	MM	A	B	C	D	E	F	G	H	J	K	L	M	N
14	350	18.75 476	1-8 UNC	8	4	.67 17	10.50 267	.81 21	3.00 76	8.25 210	21.00 533	56.82 1443	37.78 960	16.00 406
16	400	21.25 540	1-8 UNC	10	6	.67 17	11.75 298	.88 22	3.50 89	8.69 221	24.50 622	62.51 1588	41.47 1053	16.00 406
18	450	22.75 578	1-1/8-7 UNC	10	6	.67 17	12.50 318	.94 24	3.50 89	9.06 230	25.50 648	69.95 1777	47.03 1195	24.00 610
20	500	25.00 635	1-1/8-7 UNC	12	8	.67 17	13.75 349	1.00 25	4.50 114	9.19 233	28.50 724	73.63 1870	50.59 1285	24.00 610
24	600	29.50 749	1-1/4-7 UNC	12	8	.85 22	16.00 406	1.00 25	4.50 114	9.19 233	33.50 851	85.60 2174	58.57 1488	24.00 610

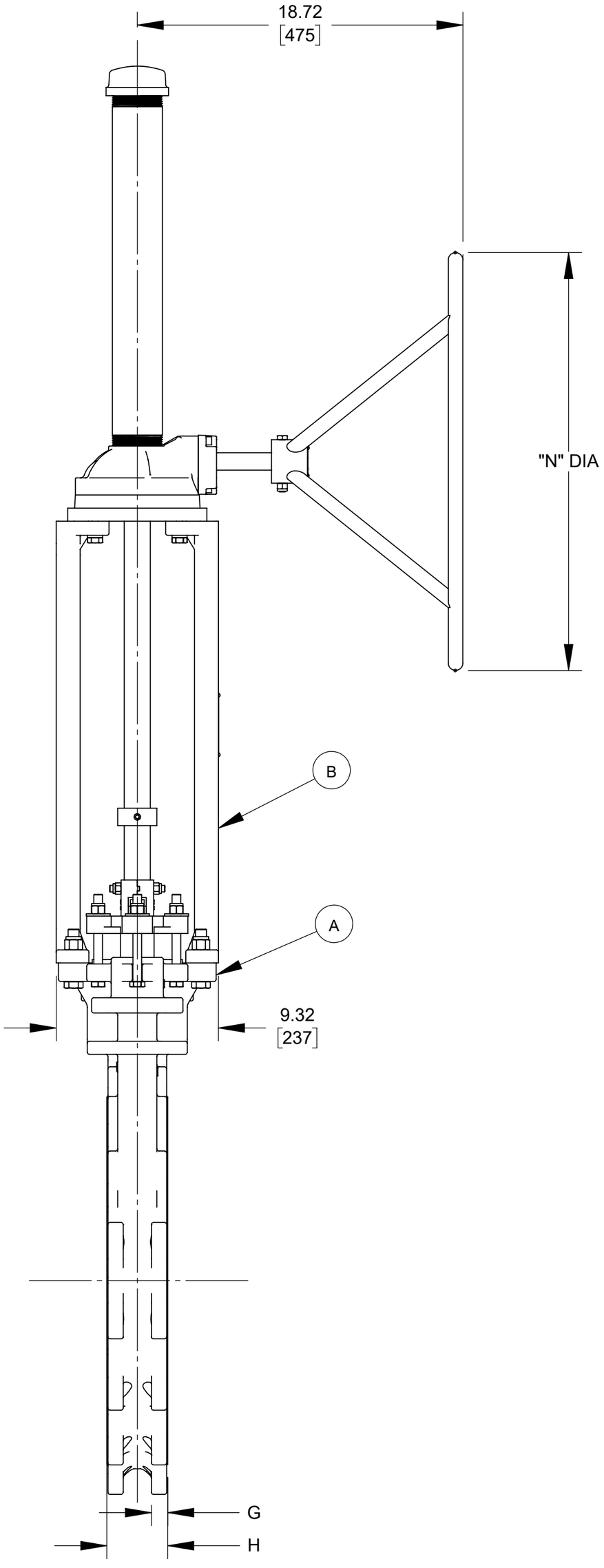
A	VALVE
B	ACTUATOR

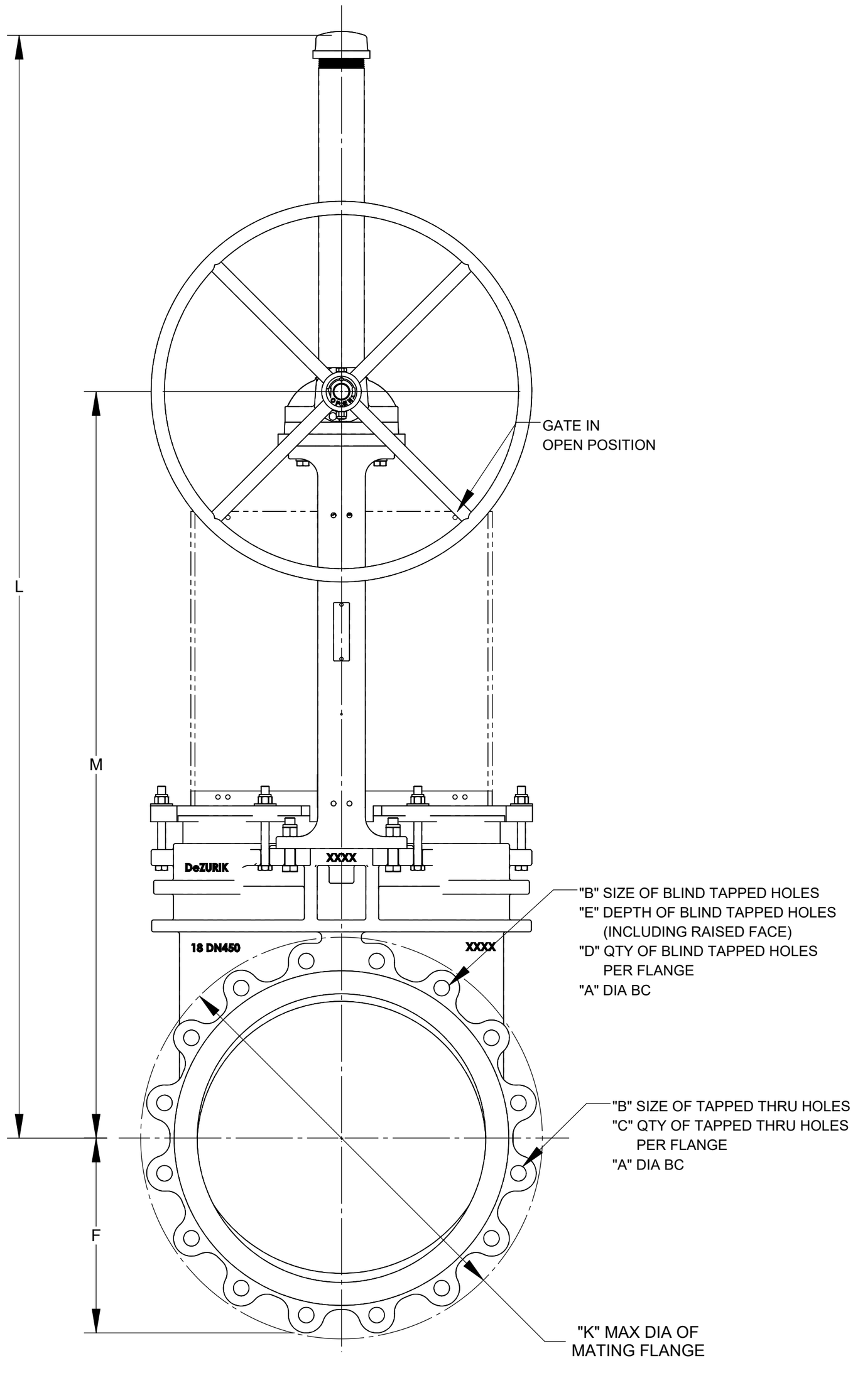
NOTE:

1. VALVE IS SHOWN IN CLOSED POSITION.
2. VALVES ORDERED WITH THRU BOLTING HAVE ALL HOLES, EXCEPT THOSE THAT ARE BLIND TAPPED, DRILLED TO ANSI STANDARDS CLASS 125 & 150.
3. DRAWING SHOWS FLANGES TAPPED FOR USE WITH ANSI FLANGES, FOR USE WITH OTHER THAN ANSI FLANGES SEE A-52587.
4. THE SIZE 24" VALVE MUST BE INSTALLED WITH THE GATE IN THE VERTICAL UPRIGHT POSITION.
5. DRAWING SHOWS ACTUATOR MOUNTED IN THE STANDARD POSITION, ACTUATOR MAY BE ROTATED 180° FROM THE POSITION SHOWN.

NOTICE

THIS DRAWING DOES NOT SHOW ACTUATOR ACCESSORIES, IF ACCESSORIES ARE REQUIRED, REFER TO THE APPROPRIATE ACCESSORY INSTALLATION DRAWING FOR DIMENSIONS AND OTHER RELATED INFORMATION.





G							
F							
E							
D	72822	09/09/2025					
C	70761	04/17/2020					
B	70612	11/01/2019					
A	62697	05/20/2016					

DeZURIK

DeZURIK.com

MANUALLY ACTUATED
FUW HD STD/180 BEVEL GEAR
KGC BD 14

DOCT. CODE	DRAWN	APPROVED	
C1		07/17/2014	A67533
	CHECKED DB	DATE 07/17/2014	

Materials Of Construction

DRAWING(S): A68907(A00), A68189(B00)

QUOTE: QUO459310

DESCRIPTION: KGC,30,BD,F1,S2,SMP,S2-EPDM*MNB-CW30-S1

ITEM	MATERIAL
A01	STAINLESS STEEL, ASTM A351, TYPE CF-8M, CERTIFIED
A02	PACKING, SQUARE BRAID, TFE YARN, DEZURIK TYPE T
A03	STAINLESS STEEL, TYPE 316, ASTM A240, CERTIFIED
A04	STAINLESS STEEL, ASTM A351, TYPE CF-8M, CERTIFIED
A05	STAINLESS STEEL, TYPE 18-8
A06	STAINLESS STEEL, TYPE 18-8
A07	STAINLESS STEEL, TYPE 18-8
A09	TEFLON, GLASS FILLED
A10	ETHYLENE, PROPYLENE & DIENE TERPOLYMER (EPDM)
B01	STAINLESS STEEL, TYPE 304, ASTM A276, CONDITION A
B02	STAINLESS STEEL, TYPE 303, ASTM A582, CONDITION A
B03	STAINLESS STEEL, TYPE 18-8
B04	STAINLESS STEEL, TYPE 18-8
B05	STAINLESS STEEL, TYPE 18-8
B07	STAINLESS STEEL, TYPE 18-8
B08	STAINLESS STEEL, TYPE 316
B10	STAINLESS STEEL, TYPE 18-8
B11	STAINLESS STEEL, TYPE 18-8
B12	STEEL, STANDARD-WALL BLACK
B14	STAINLESS STEEL, TYPE 303, ASTM A582, CONDITION A
B15	STAINLESS STEEL, TYPE 18-8
B16	STAINLESS STEEL, TYPE 18-8

B17	STAINLESS STEEL, TYPE 18-8
B19	STAINLESS STEEL, TYPE 18-8
B20	DUCTILE IRON
B21	STEEL, ASTM A36
B22	STAINLESS STEEL, TYPE 304, ASTM A-193, GRADE B8
B23	STAINLESS STEEL, TYPE 18-8
B24	STAINLESS STEEL, TYPE 18-8
B26	STAINLESS STEEL, TYPE 304, ASTM A276, CONDITION A
B27	STAINLESS STEEL, TYPE 18-8
B28	OIL IMPREGNATED BRONZE
B29	IRON, ASTM A126, CLASS B
B30	IRON, ASTM A126, CLASS B
B32	CARBON STEEL, ZINC PLATED

Materials Of Construction

DRAWING(S): A68907(A00), A68189(B00)

QUOTE: QUO459310

DESCRIPTION: KGC,20,BD,F1,S2,SMP,S2-EPDM*MNB-CW20-S1

ITEM	MATERIAL
A01	STAINLESS STEEL, ASTM A351, TYPE CF-8M, CERTIFIED
A02	PACKING, SQUARE BRAID, TFE YARN, DEZURIK TYPE T
A03	STAINLESS STEEL, TYPE 316, ASTM A240, CERTIFIED
A04	STAINLESS STEEL, ASTM A351, TYPE CF-8M, CERTIFIED
A05	STAINLESS STEEL, TYPE 18-8
A06	STAINLESS STEEL, TYPE 18-8
A07	STAINLESS STEEL, TYPE 18-8
A09	TEFLON, GLASS FILLED
A10	ETHYLENE, PROPYLENE & DIENE TERPOLYMER (EPDM)
B01	STAINLESS STEEL, TYPE CF-8, ASTM A351, CERTIFIED
B02	STAINLESS STEEL, TYPE 304, ASTM A276, CONDITION A
B03	STAINLESS STEEL, TYPE 18-8
B04	STAINLESS STEEL, TYPE 18-8
B05	STAINLESS STEEL, TYPE 18-8
B06	STAINLESS STEEL, TYPE CF-8, ASTM A743
B07	STAINLESS STEEL, TYPE 18-8
B08	STAINLESS STEEL, TYPE 316
B10	STAINLESS STEEL, TYPE 18-8
B11	STAINLESS STEEL, TYPE 18-8
B12	STEEL, STANDARD-WALL BLACK
B14	STAINLESS STEEL, TYPE 303, ASTM A582, CONDITION A
B15	STAINLESS STEEL, TYPE 18-8

B16	STAINLESS STEEL, TYPE 18-8
B17	STAINLESS STEEL, TYPE 18-8
B19	STAINLESS STEEL, TYPE 18-8
B20	DUCTILE IRON
B21	STEEL, ASTM A36
B22	STAINLESS STEEL, TYPE 304, ASTM A-193, GRADE B8
B23	STAINLESS STEEL, TYPE 18-8
B24	STAINLESS STEEL, TYPE 18-8
B26	CARBON STEEL, ASTM A108, GRADE 1018
B27	STAINLESS STEEL, TYPE 18-8
B28	OIL IMPREGNATED BRONZE
B29	IRON, ASTM A126, CLASS B
B30	IRON, ASTM A126, CLASS B
B32	CARBON STEEL, ZINC PLATED

Materials Of Construction

DRAWING(S): A68907(A00), A68189(B00)

QUOTE: QUO459310

DESCRIPTION: KGC,36,BD,F1,S2,SMP,S2-EPDM*MNB-HD30-S1

ITEM	MATERIAL
A01	STAINLESS STEEL, ASTM A351, TYPE CF-8M, CERTIFIED
A02	PACKING, SQUARE BRAID, TFE YARN, DEZURIK TYPE T
A03	STAINLESS STEEL, TYPE 316, ASTM A240, CERTIFIED
A04	STAINLESS STEEL, TYPE 316, ASTM A240
A05	STAINLESS STEEL, TYPE 18-8
A06	STAINLESS STEEL, TYPE 18-8
A07	STAINLESS STEEL, TYPE 18-8
A09	TEFLON, GLASS FILLED
A10	ETHYLENE, PROPYLENE & DIENE TERPOLYMER (EPDM)
A10	ETHYLENE, PROPYLENE & DIENE TERPOLYMER (EPDM)
B01	STAINLESS STEEL, TYPE 304, ASTM A276, CONDITION A
B02	STAINLESS STEEL, TYPE 303, ASTM A582, CONDITION A
B03	STAINLESS STEEL, TYPE 18-8
B04	STAINLESS STEEL, TYPE 18-8
B05	STAINLESS STEEL, TYPE 18-8
B07	STAINLESS STEEL, TYPE 18-8
B08	STAINLESS STEEL, TYPE 316
B10	STAINLESS STEEL, TYPE 18-8
B11	STAINLESS STEEL, TYPE 18-8
B12	STEEL, ASTM A53, GRADE A OR GRADE B
B14	STAINLESS STEEL, TYPE 303, ASTM A582, CONDITION A
B15	STAINLESS STEEL, TYPE 18-8

B16	STAINLESS STEEL, TYPE 18-8
B17	STAINLESS STEEL, TYPE 18-8
B19	STAINLESS STEEL, TYPE 18-8
B20	DUCTILE IRON
B21	STEEL, ASTM A36
B22	STAINLESS STEEL, TYPE 304, ASTM A-193, GRADE B8
B23	STAINLESS STEEL, TYPE 18-8
B25	STEEL, ASTM A36, AISI 1020

Materials Of Construction

DRAWING(S): A68907(A00), A68189(B00)

QUOTE: QUO459310

DESCRIPTION: KGC,24,BD,F1,S2,SMP,S2-EPDM*MNB-HD24-S1

ITEM	MATERIAL
A01	STAINLESS STEEL, ASTM A351, TYPE CF-8M, CERTIFIED
A02	PACKING, SQUARE BRAID, TFE YARN, DEZURIK TYPE T
A03	STAINLESS STEEL, TYPE 316, ASTM A240, CERTIFIED
A04	STAINLESS STEEL, ASTM A351, TYPE CF-8M, CERTIFIED
A05	STAINLESS STEEL, TYPE 18-8
A06	STAINLESS STEEL, TYPE 18-8
A07	STAINLESS STEEL, TYPE 18-8
A09	TEFLON, GLASS FILLED
A10	ETHYLENE, PROPYLENE & DIENE TERPOLYMER (EPDM)
B01	STAINLESS STEEL, TYPE CF-8, ASTM A351, CERTIFIED
B02	STAINLESS STEEL, TYPE 304, ASTM A276, CONDITION A
B03	STAINLESS STEEL, TYPE 18-8
B04	STAINLESS STEEL, TYPE 18-8
B05	STAINLESS STEEL, TYPE 18-8
B06	STAINLESS STEEL, TYPE CF-8, ASTM A743
B07	STAINLESS STEEL, TYPE 18-8
B08	STAINLESS STEEL, TYPE 316
B10	STAINLESS STEEL, TYPE 18-8
B11	STAINLESS STEEL, TYPE 18-8
B12	STEEL, ASTM A53, GRADE A OR GRADE B
B14	STAINLESS STEEL, TYPE 303, ASTM A582, CONDITION A
B15	STAINLESS STEEL, TYPE 18-8

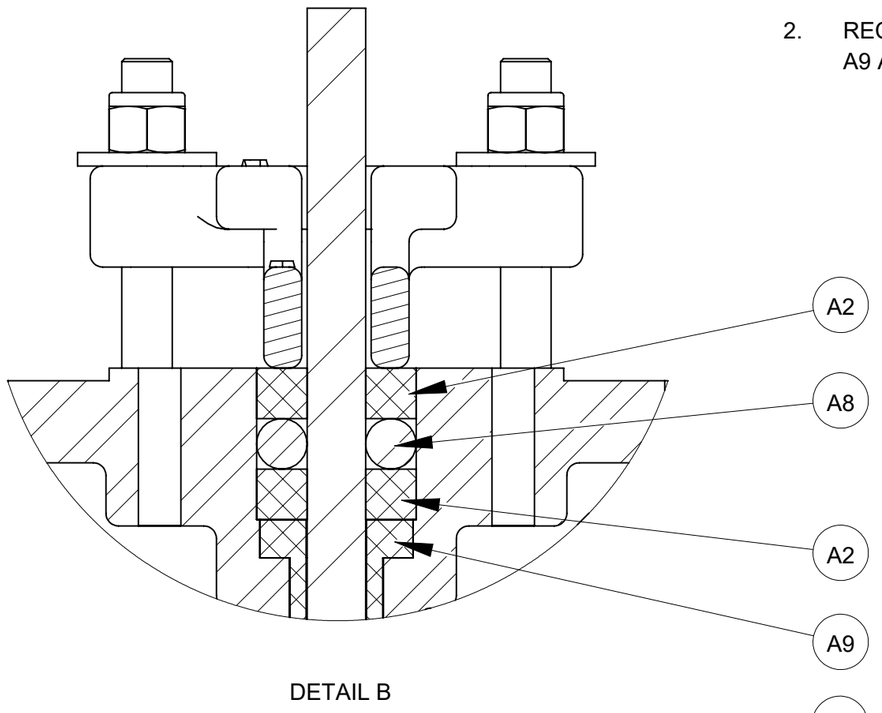
B16	STAINLESS STEEL, TYPE 18-8
B17	STAINLESS STEEL, TYPE 18-8
B19	STAINLESS STEEL, TYPE 18-8
B20	DUCTILE IRON
B21	STEEL, ASTM A36
B22	STAINLESS STEEL, TYPE 304, ASTM A-193, GRADE B8
B23	STAINLESS STEEL, TYPE 18-8
B25	IRON, ASTM A126, CLASS B

NOTE:

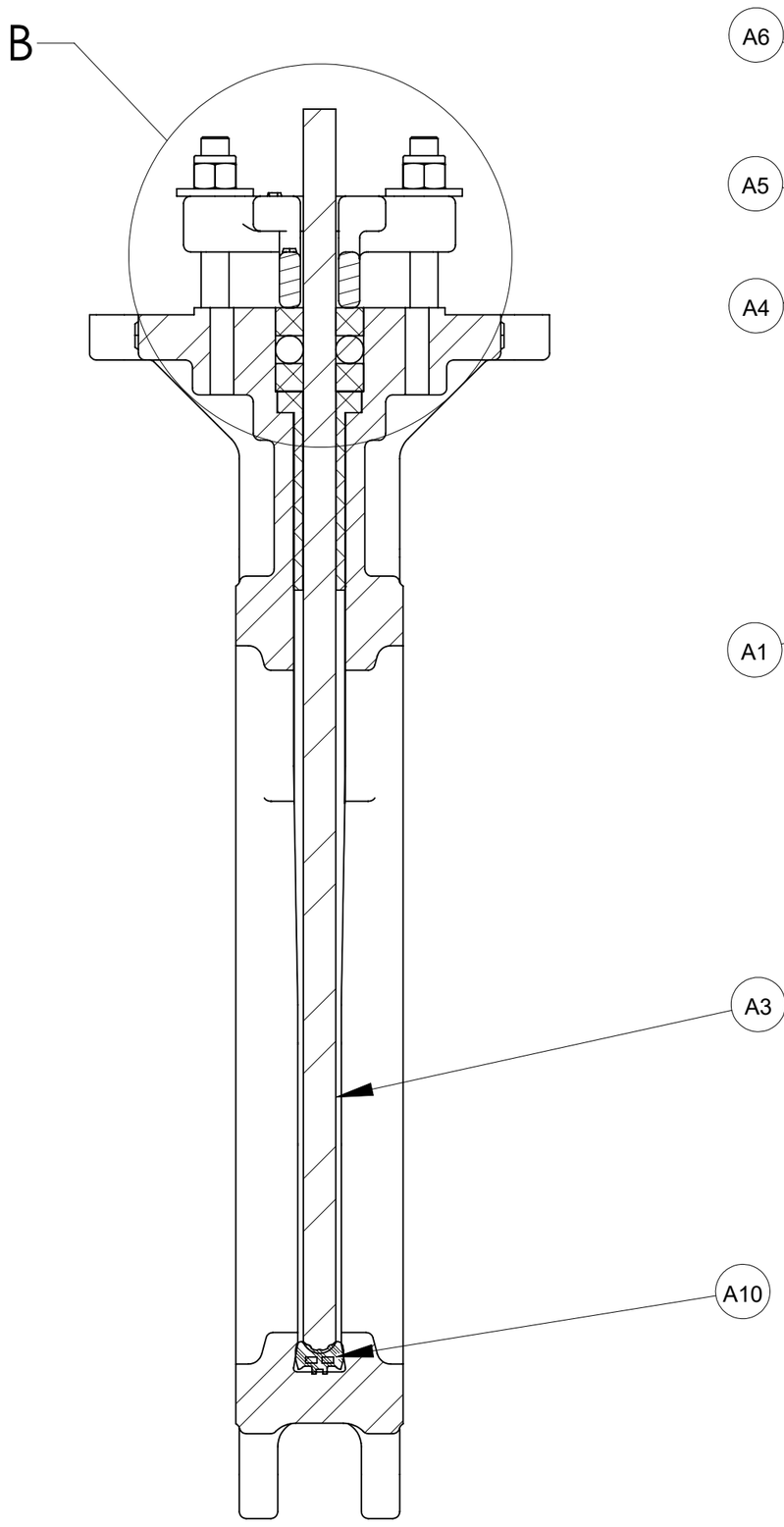
1. WHEN ORDERING PARTS, INCLUDE VALVE SIZE AND PART NUMBER FROM DATA PLATE. ALSO INCLUDE THIS DRAWING NUMBER WITH PART NAME, NUMBER AND QUANTITY.

2. RECOMMENDED SPARE PARTS ARE ITEMS NO. A2, A8, A9 AND A10

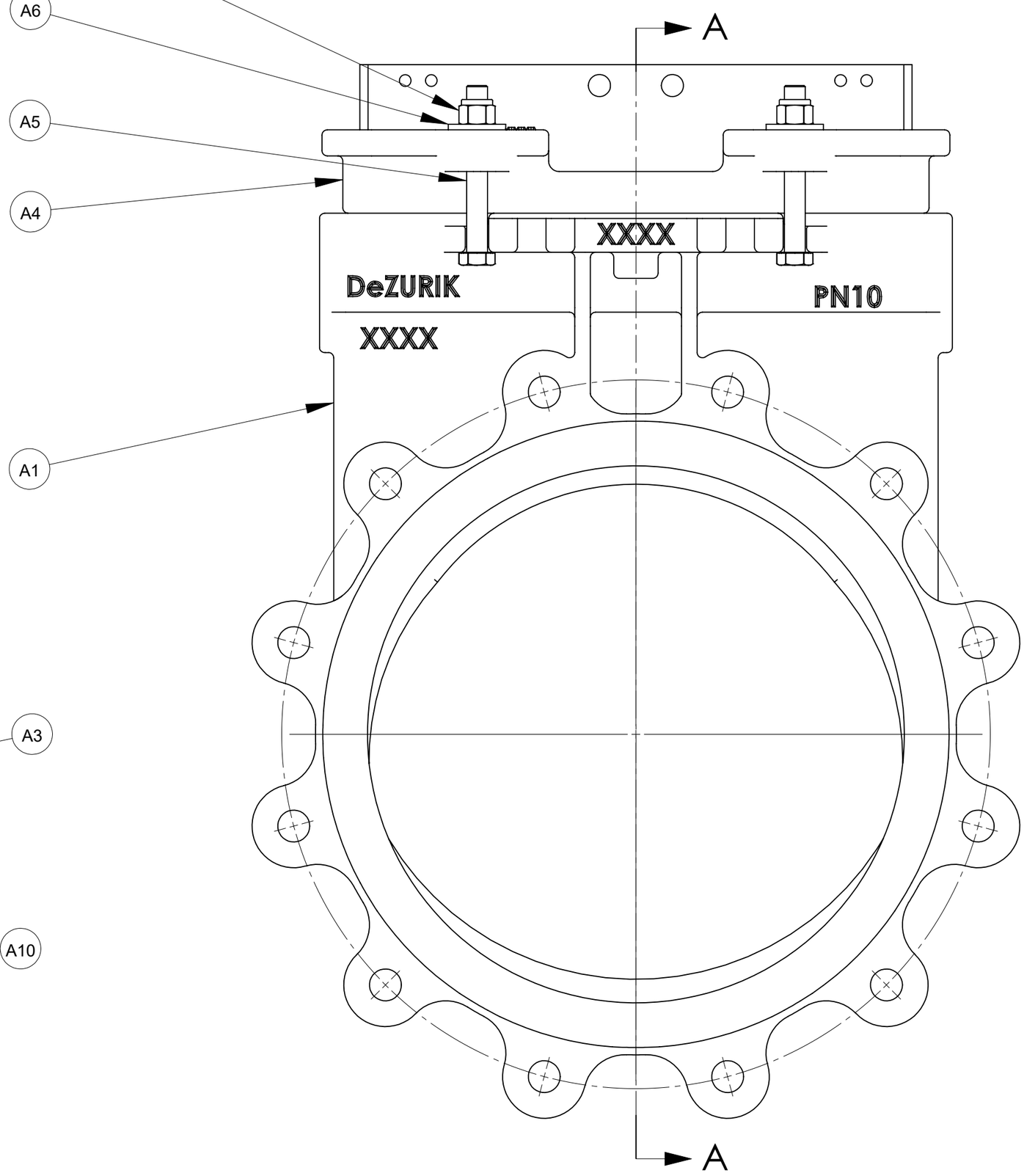
No.	PART NAME	QTY
A1	BODY	1
A2	PACKING	3
A3	GATE	1
A4	GLAND	1
A5	BOLT (2 - 6 VALVE)	2
A5	BOLT (8 - 12 VALVE)	4
A5	BOLT (14 - 36 VALVE)	6
A6	WASHER (2 - 6 VALVE)	2
A6	WASHER (8 - 12 VALVE)	4
A6	WASHER (14 - 36 VALVE)	6
A7	NUT (2 - 6 VALVE)	2
A7	NUT (8 - 12 VALVE)	4
A7	NUT (14 - 36 VALVE)	6
A8	PACKING CORD	1
A9	ANTI EXTRUSION GUIDE	2
A10	SEAT	1



DETAIL B



SECTION A-A



REV.	DESCRIPTION	DATE	APPROVED	DRAWN
A	62697	06/07/2016	SM	SW

REVISIONS

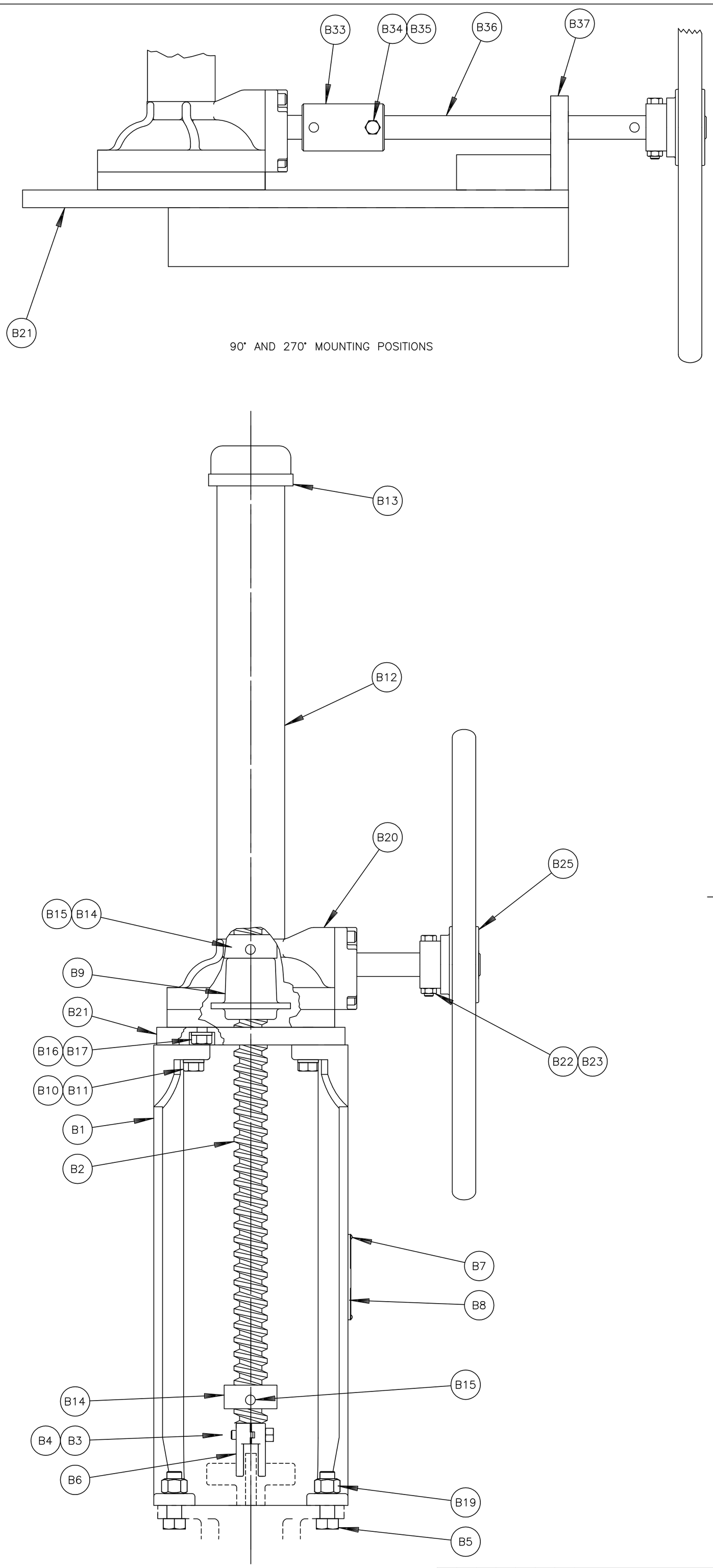
DeZURIK

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DeZURIK Sartell, MN, USA 56377 www.dezurik.com

KGC BD VALVE ASSEMBLY 2-36"
KNIFE GATE VALVE

DOCT. CODE	DRAWN	APPROVED	
C1	SW	05/17/2016	A68907 SIZE C
	CHECKED SM	DATE 05/18/2016	



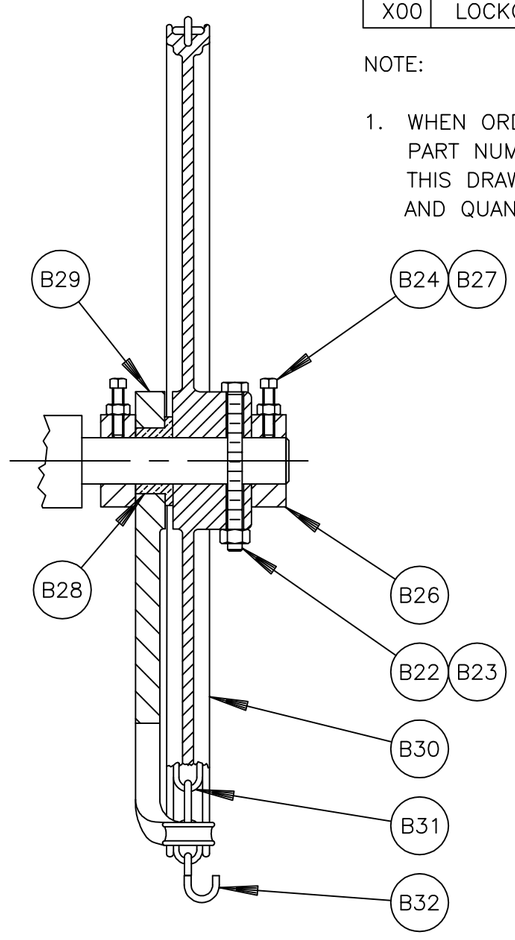
90° AND 270° MOUNTING POSITIONS

MNB–HD_ BEVEL GEAR HANDWHEEL ACTUATOR
STANDARD AND 180° MOUNTING POSITIONS

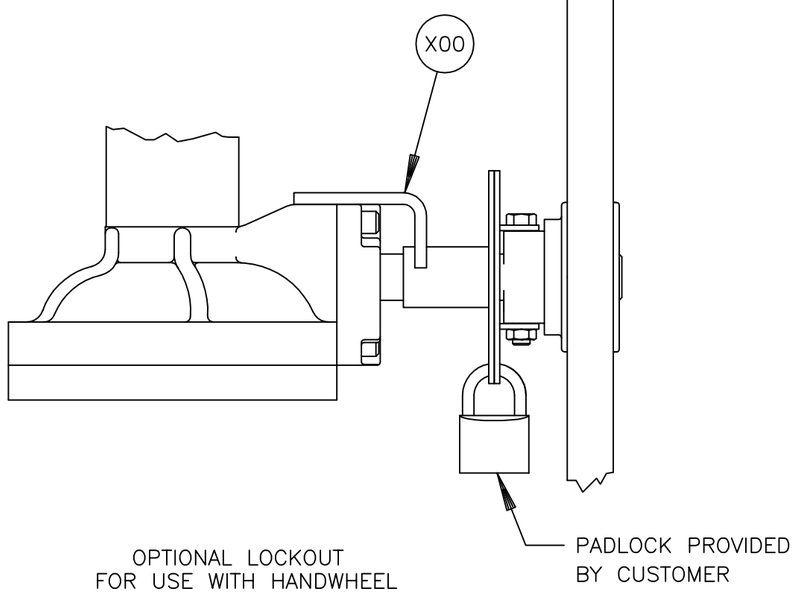
NO	PART NAME	QTY
B1	LEG	2
B2	STEM	1
B3	LOCK NUT	2
B4	SCREW	2
B5	SCREW	4
B6	CLIP (2" – 24")	2
B7	POP RIVET	2
B8	DATA PLATE	1
B9	DRIVE SLEEVE	1
B10	SCREW	4
B11	LOCKWASHER	4
B12	EXTENSION TUBE	1
B13	CAP	1
B14	STOP COLLAR	2
B15	SET SCREW	4
B16	SCREW	4
B17	LOCKWASHER	4
B18		
B19	NUT	4
B20	ACTUATOR	1
B21	ADAPTER PLATE	1
B22	SCREW	1
B23	LOCKNUT	1
B24	SET SCREW	2
B25	HANDWHEEL	1
B26	COLLAR	2
B27	LOCKNUT	2
B28	BEARING	1
B29	CHAIN GUIDE	1
B30	CHAINWHEEL	1
B31	CHAIN	–
B32	CLOSING LINK	1
B33	COUPLING	1
B34	SCREW	2
B35	NUT	2
B36	SHAFT EXTENSION	1
B37	BEARING	1
X00	LOCKOUT ASSEMBLY	1

NOTE:

1. WHEN ORDERING PARTS, INCLUDE VALVE SIZE AND PART NUMBER FROM DATA PLATE, ALSO INCLUDE THIS DRAWING NUMBER WITH PART NAME, NUMBER AND QUANTITY.



MNB–CW_ BEVEL GEAR
CHAINWHEEL ACTUATOR



OPTIONAL LOCKOUT
FOR USE WITH HANDWHEEL

G F E D C B A

DeZURIK
Sartell, MN USA 56377
www.dezurik.com

MNB–HD_ BEVEL GEAR HANDWHEEL ACTUATOR AND MNB–CW_
BEVEL GEAR CHAINWHEEL ACTUATOR FOR USE
WITH KGC BD KNIFE GATE VALVE

DOCT. CODE	DRAWN	APPROVED	
C1	SW	SP	A68189
	CHECKED SP	DATE 14/4/15	PDF

DEZURIK VENDOR INSTRUCTIONS

DYNATORQUE INC – GENERAL MAINTENANCE AND OPERATION MANUAL

Instruction DP00129
June 2011

DeZURIK, Inc. Sartell, Minnesota USA | Phone: 320-259-2000 | www.dezurik.com | info@dezurik.com

DYNATORQUE
VALVE ACTUATORS AND ACCESSORIES

MMDT05

General Maintenance Manual

1. Scope: It is the purpose of this document to provide general storage and maintenance instructions for all DynaTorque quarter-turn and multi-turn products.

2. Instructions:

   A. Storage: For best results, DynaTorque operators should be stored in a clean, dry area in their shipping containers. If operators are stored in high humidity areas, steps should be taken to reduce the amount of moisture the units will be exposed to. Operator input shafts are plated to prevent corrosion. If operators are being stored for a long period of time, operator mounting surfaces should be lightly greased to prevent corrosion.
   B. Maintenance: DynaTorque manual operators do not require periodic maintenance. They are, for most applications, lubricated for life, with all components designed to have a life equal to or exceeding the wear life of the operator gearing.
   C. Lubrication: If for any reason, lubrication replacement is necessary, DynaTorque recommends replacement of that lubrication with:

DynaTorque Standard Grease Specification:

NLGI Grade: Grade 2 EP
Grease Base: Polyurea Complex
Color: Black
Anti-Wear EP Additives: Yes
Dropping Point: ASM D2265 280Deg(60Deg C)/350Deg(100 Deg C)
4 Ball Wear KG Load ASTM 2596: 400(0.42)
Timken OK Load Lbs. ASTM 2509: 60
Base Oil Viscosity @100 Deg. F. Sus: 899
Base Oil Viscosity @ 210 Deg. F. Sus: 80
Base Oil Viscosity Index (min) ASTM D2270: 150
Pour Point ASTM D97: 5 Deg. (-15 Deg C)

   D. Spare Parts: DynaTorque warranty's work performed by the factory or by factory trained personnel only. Please consult the factory or your local DynaTorque representative to arrange assistance. DynaTorque modifies a great percentage of its operators to meet specific customer requirements. Please refer to the operator part list number as supplied on the shipping document, acknowledgement, or invoice, when ordering spare parts.

   E. Spare Parts: For your records, please enter the operator part number from you shipping documents, acknowledgement, or invoice here:

      Part Number: _____

      Date Stamp: _____(Located on the bottom of the operator housing.)

Please Note:
When assembling DynaTorque products to a valve or to an automated valve package, standard engineering practices must be utilized to assure proper mounting orientation, configuration, and distribution of weights and forces. Failure to do so could cause product damage and/or malfunction, ***and void warranty consideration***. If there are any questions please contact the factory at info@dynatorque.com.

2076 Northwoods Dr. • MUSKEGON, MI 49442
PHONE **(231) 788-7025** • FAX **(231) 788-7029**
ISO 9001:2000 CERTIFIED

DynaTorque Inc.
Multi-Turn Bevel Gear (BG Type)
Installation & Operation Instructions

Installation Tips:
All DynaTorque operators & accessories have been designed to transmit the rated output torque of the operator with a safety factor. When designing mounting kits, torque transmission devices, or specifying mounting hardware the operator rating should be considered. DynaTorque recommends using grade 5 and higher bolts with lock washers for mounting operators to valve operator flanges and valve adaptation kits. DynaTorque components should not be installed in areas where those components will be subjected to high temperatures, corrosive atmospheres, or high pressures without prior knowledge by DynaTorque or unless originally designed for that purpose. Doing so may affect the product warranty.

Installation:
Before assembly is begun please insure that mounting bolt patterns have been machined correctly for the application.
The following steps should be taken to install the DynaTorque BG manual multi-turn operator. DynaTorque recommends operator mounting while on the test stand with the valve in the closed position.

Yoke Nut Driver Installation:
1. Move the valve in the closed position and insure valve seal has been attained.
2. Install the Yoke Nut Driver on the bottom of the bevel gear using the bolt pattern supplied.
3. Before installing the operator, liberally grease the Yoke Nut and the Yoke Nut Driver. This will reduce the possibility of corrosion between the two components.
4. Align the operator with the Yoke Nut and lower the operator into position on the valve flange or mounting kit.
5. Install and tighten the valve to operator mounting bolts.
6. Rotate the operator handwheel counterclockwise moving the valve from the closed to the open position checking to make sure the operator turns smoothly through the complete cycle. Visually verify that the open position has been achieved.
7. Rotate the valve from closed to open several times to insure proper operation.

Threaded Stem Nut Installation:
1. Move the valve in the closed position and insure valve seal has been attained.
2. Install the Threaded Stem Nut on the bottom of the bevel gear using the bolt pattern supplied.
3. Before installing the operator, liberally grease the Valve Stem and the Threaded Stem Nut. This will reduce the possibility of corrosion between the two components.
4. Position the Stem Nuts threaded hole over the valve stem. As you lower the operator, turn the input shaft. This rotation should engage the male with the female threads in the nut. Continue to rotate the input shaft until the unit comes into contact with the mounting adapter or valve operator-mounting flange.
5. Align the mounting holes by rotating the operator while allowing the input shaft to rotate freely. (If the operator-input shaft is held the valve position may move off the seat.)
6. Install and tighten the valve to operator mounting bolts.
7. Rotate the operator handwheel counterclockwise moving the valve from the closed to the open position checking to make

sure the operator turns smoothly through the complete cycle. Visually verify that the open position has been achieved.

8. Rotate the valve from closed to open several times to insure proper operation.

Safety:

DynaTorque operators have been designed and manufactured to the highest quality standards. In most cases, operator and handwheel packages have been sized to produce rated torque with a maximum of 80 lbs. of handwheel rim effort. The use of larger handwheels, cheater bars, etc. will void the override warranty and may cause damage to the operator, valve stem, drive shafts, or other torque transmitting devises as well as being dangerous to the user. Additionally, the use of chainwheels on operators that are not recommend for those applications will result voiding operator warranty.

Operation:

Once the valve assembly has been installed, operation of multi-turn manual gear operators is very simple. Assuming a clockwise to close valve as in the assembly instructions, rotating the handwheel clockwise will result in clockwise output rotation or clockwise to close. Reversing rotation of the handwheel, counterclockwise, will result in counterclockwise rotation of the output or counterclockwise to open.

Please Note:

When assembling DynaTorque products to a valve or to an automated valve package, standard engineering practices must be utilized to assure proper mounting orientation, configuration, and distribution of weights and forces. Failure to do so could cause product damage and/or malfunction, ***and void warranty consideration***. If there are any questions please contact the factory at info@dynatorque.com.

Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:

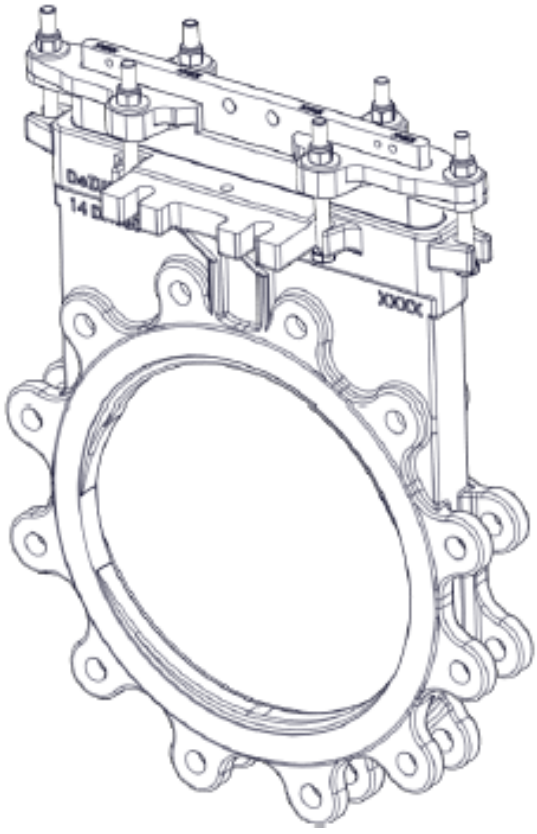
Web site: www.dezurik.com E-Mail: info@dezurik.com

250 Riverside Ave. N., Sartell, MN 56377 ● Phone: 320-259-2000 ● Fax: 320-259-2227

DeZURIK, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation.
Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only and should not be relied upon unless confirmed in writing by DeZURIK, Inc. Certified drawings are available upon request.

Printed in U.S.A.

DeZURIK KGC-BD BIDIRECTIONAL KNIFE GATE VALVE



Instruction **D11061**
October 2019

DeZURIK, Inc. Sartell, Minnesota USA | Phone: 320-259-2000 | www.dezurik.com | info@dezurik.com

Instructions

These instructions are for use by personnel who are responsible for the installation, operation and maintenance of DeZURIK valves, actuators or accessories.

Safety Messages

All safety messages in the instructions are identified by a general warning sign and the signal word CAUTION, WARNING or DANGER. These messages indicate procedures to avoid injury or death.

Safety label(s) on the product indicate hazards that can cause injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact DeZURIK for replacement label(s).

⚠WARNING

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves which have been removed from service with suitable protection for any potential pipeline material in the valve.

Inspection

Your DeZURIK product has been packaged to provide protection during shipment; however, items can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

Parts

Replaceable wear parts are listed on the assembly drawing. These parts can be stocked to minimize downtime. Order parts from your local DeZURIK sales representative or directly from DeZURIK. When ordering parts please provide the following information:

If the valve has a data plate: please include the 7-digit part number with either 4-digit revision number (example: 9999999R000) or 8-digit serial number (example: S1900001) whichever is applicable. The data plate will be attached to the valve assembly. Also, include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

If there isn't any data plate visible on the valve: please include valve model number, part name, and item number from the assembly drawing. You may contact your local DeZURIK Representative to help you identify your valve.

DeZURIK Service

DeZURIK service personnel are available to maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services. For more information, contact your local DeZURIK sales representative or visit our website at DeZURIK.com.

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Description

KGC-BD knife gate valves have a stainless steel body, gate and a resilient perimeter seat. The KGC-BD knife gate valve is available in 2-36" (50-900mm) sizes. A choice of several actuators and accessories is available.

Handling

WARNING!
A potential hazard exists with handling valves. Failure to handle valves properly may cause a valve to shift, slip or fall causing serious injury or death and/or equipment damage.

The points below are for reference purposes only. Use safe and proper lifting and support techniques. DO NOT lift valves with any adjoining pipe or other equipment attached. Lift with properly rated lifting equipment. Follow jurisdictional safety requirements.

Suggested lifting points are as shown below to lift valve assemblies that are in a horizontal orientation. Eye bolts in flange through holes can be used to lift the valve body or, for 2-12" valves, a sling can be strapped around the top of the valve body.

For valves with bevel gear actuators, a sling or chain can a wrapped around the bevel gear actuator body, between the mounting plate and the input shaft housing. This would be in conjunction with lifting from the valve body as well. See Figure 1.

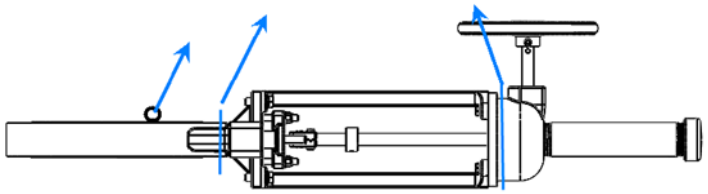


Figure 1— Knife Gate Valve with Bevel Gear Actuator, Horizontal Lifting

For valves with pneumatic cylinder actuators, a sling can be wrapped around the cylinder, near the cylinder head (piston rod end). This would be in conjunction with lifting from the valve body. Utilize caution to not bump, dent or damage the cylinder tube. DO NOT utilize the cylinder tie-rod ends to lift. See Figure 2.

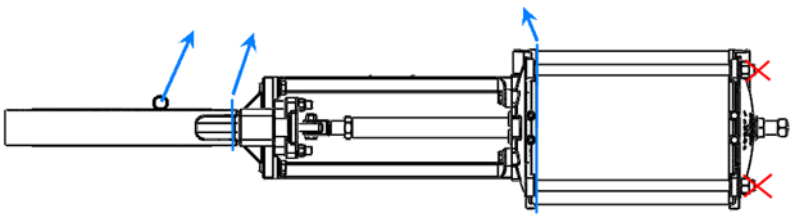


Figure 2, Knife Gate Valve with Pneumatic Cylinder Actuator, Horizontal Lifting

Handling *continued*

For valves with handwheel actuators, a sling or chain can be wrapped through the rim of the hand-wheel. For chainwheel actuators, a sling can be wrapped in the area between the yoke/legs and the chainwheel/guide assembly. This would be in conjunction with lifting from the valve body as well. See Figure 3.

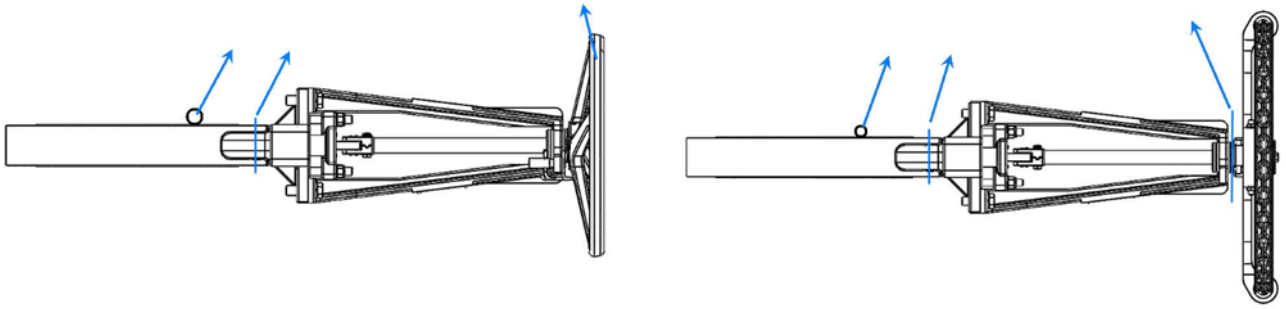


Figure 3, Knife Gate Valve with Handwheel or Chainwheel Actuator, Horizontal Lifting

Suggested lifting options are as shown below to lift valve assemblies that are in a vertical orientation. For valves with bevel gear actuators, wrap slings or chains around the top of each leg. Use caution not to put any side load on the bevel gear input shaft or on the valve's threaded stem. See Figure 4.

For valves with pneumatic cylinder actuators, wrap slings around the top of each leg. Use caution to not bump, dent or damage the cylinder tube and avoid any side load on the cylinder piston rod. DO NOT utilize the cylinder tie-rod ends to lift. See Figure 5.

For valves with handwheel or chainwheel actuators, wrap slings or chains around the top of the each leg or yoke side. Use caution to not put any side load on the valve's threaded stem. See Figure 6.

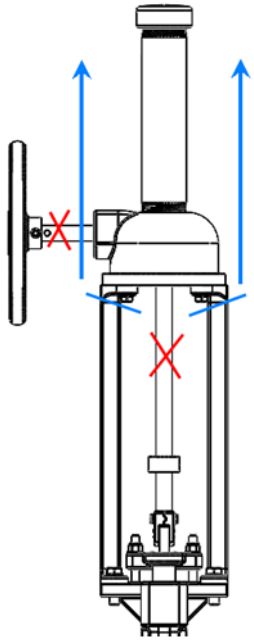


Figure 4- Knife Gate Valve with Bevel Gear Actuator, Vertical Lifting

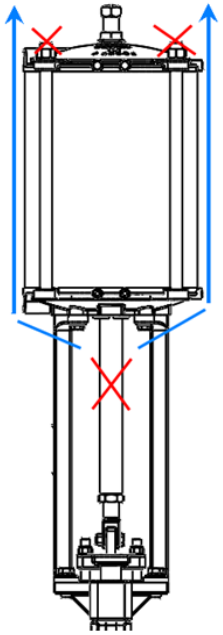


Figure 5- Knife Gate Valve with Pneumatic Cylinder Actuator, Vertical Lifting

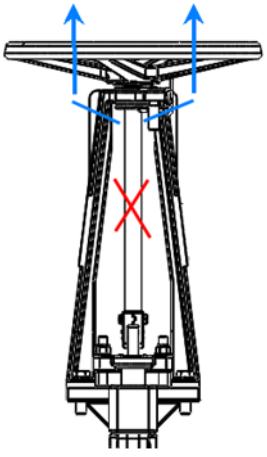


Figure 6- Knife Gate Valve with Handwheel or Chainwheel Actuator, Vertical Lifting

Installation

Install the valve between ASME Class 125 or Class 150 pipeline flanges, or other flanges that match valve end connection. Flange gaskets are required. Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the valve and pipeline.

Normal Installations

The bi-directional KGC-BD knife gate valve can be oriented either way in the pipeline. The perimeter seat in the valve will seal the valve in the closed position in both directions.

The bi-directional KGC-BD knife gate valves are not intended for gravity (dry) service applications.

General Guidelines

Observe the following points to prevent distortion of the valve body and gate when the flange bolts are tightened:

- Align the mating pipeline flanges.
- Select the length of the flange bolts so that the bolts used in the blind holes near the chest area of the valve do not bottom out when tightened. We recommend using studs with nuts in the blind holes.
- Tighten the flange bolts evenly, in a crisscross pattern. Refer to Table A for recommended flange bolt/stud torques.

Note: Torque ranges are based on ASME Pressure Vessel Code Calculations and lab test data. These torques are only for the listed gasket types. For other gasket types listed in ASME, consult DeZURIK.

After installing the valve, pressurize pipeline and ensure the packing is not leaking. If the packing leaks, adjust the packing as described on the next page.

Table A: Recommended Flange Bolt/Stud Torque Range in ft-lbs (non-lubricated)

Valve Size	ASME Gasket Types	
	Rubber with Soft Fabric Filler, & 1/8" Thick Hard	Soft Elastomer Gasket Shore Durometer < 75A
2" (50mm)	26 - 29	8 - 9
3" (80mm)	37 - 41	14 - 16
4" (100mm)	26 - 29	11 - 12
5" (125mm)	36 - 40	17 - 19
6" (150mm)	41 - 45	22 - 24
8" (200mm)	55 - 61	35 - 39
10" (250mm)	56 - 62	40 - 44
12" (300mm)	80 - 88	59 - 65
14" (350mm)	107 - 118	81 - 89
16" (400mm)	103 - 114	79 - 87
18" (450mm)	128 - 141	102 - 112
20" (500mm)	123 - 136	99 - 109
24" (600mm)	188 - 207	155 - 171
30" (750mm)	198 - 218	168 - 185
36" (900mm)	289 - 318	248 - 273

Operation

The gate in the valve is positioned by the valve actuator. The actuator moves the gate over the valve port in the closed position, and withdraws the gate from the port in the open position. Refer to the Actuator Instructions for adjustment and maintenance requirements for the actuator.

Lubrication

The valve does not require lubrication. If applicable, ensure that valve threaded stems are maintained with proper lubrication. Refer to the Actuator Instructions for lubrication requirements for the actuator.

Packing

The gate packing (A2) is contained and compressed by the packing gland (A4). See Figure 1 for component identification.

Note: The packing gland (A4) is slightly loosened prior to shipping. This is done to increase the life of the packing during extended storage.

Adjustment

If packing leaks, tighten the adjustment nuts (A7) on top of the packing gland. Tighten the nuts evenly and gently just enough to stop the leak. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

Drawings

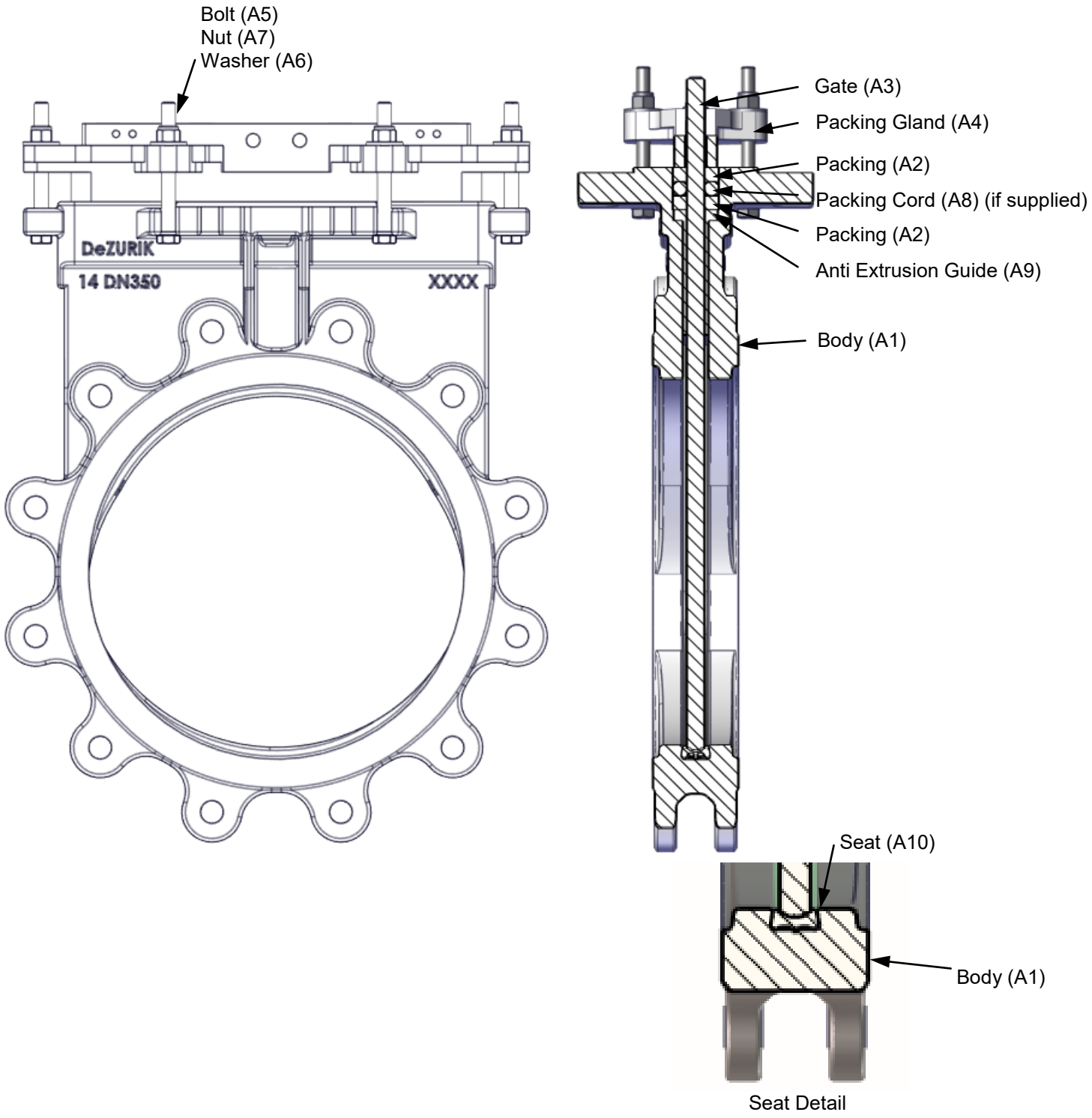


Figure 1—Component Identification

Packing Replacement

Removing the Old Packing



WARNING!
Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing gate stem and packing gland nuts.

1. Relieve the pressure in the pipeline and close the valve.



WARNING!
Accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.

2. If the actuator is powered, disconnect and lock out power to prevent accidental operation of the actuator.

3. Remove the two screws and nuts near the top of the gate and disengage the stem from the gate by stroking the actuator (not the valve) to the open position.

4. Remove the gland nuts (A7), bolts (A5), washer (A6) and packing gland (A4).

5. Remove the used packing (A2) and packing cord (A8), if supplied. Inspect and replace anti-extrusion guides (A9) if damaged.

Installing the New Packing

Packing (A2) strip length and quantity are shown in Table B. DeZURIK provides extra packing in the packing kits, but do not try to put more packing into a layer than shown in Table B.

Do not compress the packing any more than needed to stop leaks.

1. Ensure the gate (A3) is well within and centered in the body before packing.

2. Place the anti-extrusion guides (A9) in the bottom of the packing chamber (machined slots).

3. Assemble and pack the rings one at a time, with the ends together, but not overlapped

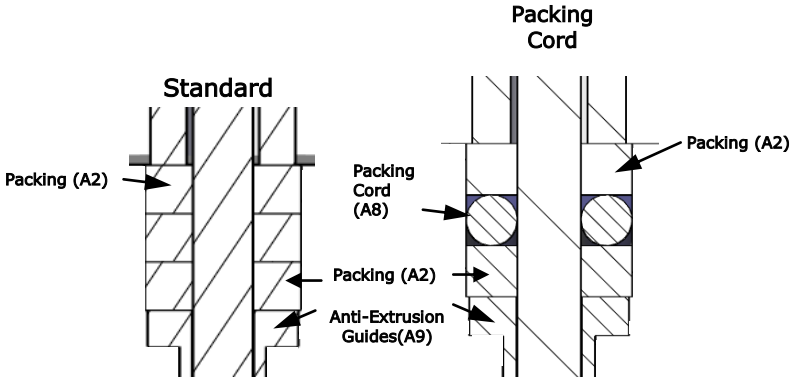
Note: Stagger the joints, on the long side of the packing chamber. Use a square-ended wood or plastic tool, driven by a hammer or mallet, to pack the rings. Do not use a sharp tool to pack the rings.

Ensure the inside and outside edges of each ring are packed against the gate and packing chamber, so that each strip is compressed flat and evenly.

4. For packing systems with packing cord (A8), assemble and pack one row of packing (A2) and then insert the packing cord (A8). Assemble and pack the last row of packing. See detail below:

Table B: Packing Ring and Packing Cord Length & Quantity

Valve Size	Square Size	Length, inches	Quantity (A2)	Qty Cord (A8)
2” (50mm)	3/8”	7.50	3 w/o cord 2 with cord	1
3” (80mm)		9.50		
4” (100mm)		11.50		
5” (125mm)		13.50		
6” (150mm)		15.50		
8” (200mm)		20.00		
10” (250mm)	1/2”	25.00		
12” (300mm)		29.00		
14” (350mm)		32.00		
16” (400mm)		36.75		
18” (450mm)	5/8”	41.25		
20” (500mm)		45.25		
24” (600mm)		53.50		
30” (750mm)	3/4”	66.25		
36” (900mm)		79.0		



Reassembling Valve

1. Replace the packing gland (A4), bolts (A5), washer (A6) and nuts (A7). Tighten the nuts evenly and finger tight, plus 1/2 turn.
2. Reconnect the stem to the gate with the two screws and nuts.
3. If the actuator is a powered actuator, reconnect power to the actuator.
4. Pressurize the pipeline and inspect packing for leakage.
5. If packing leaks, tighten the adjustment nuts (A7) on top of the packing gland (A4). Tighten the nuts (A7) evenly and gently - just enough to stop the leak. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

Replacing the Seat

Description

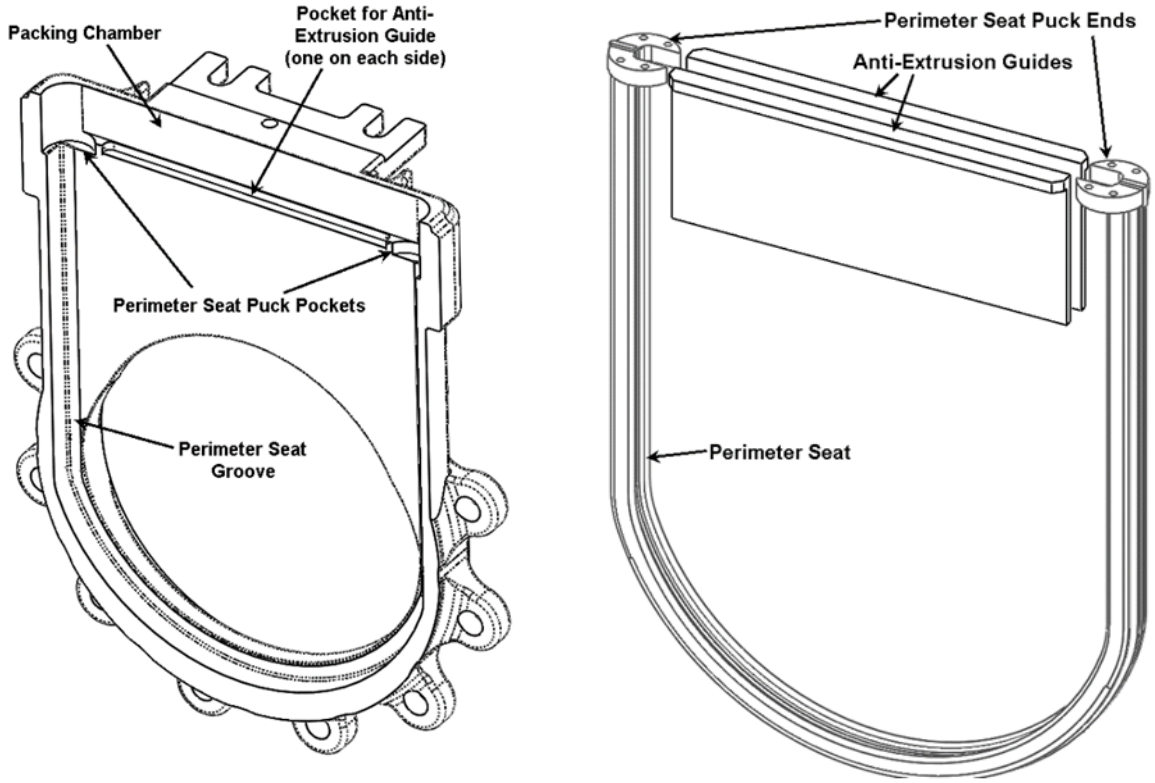
The perimeter seat in KGC-BD style valves is a U-shaped seat with round pucks at each end which fit into a groove with pocketed ends within the valve body. Replacement of the perimeter seat can be accomplished with access to the top of the valve body, such as if the valve body was still mounted to the mating pipe flanges.
If there are any difficulties encountered while following these instructions, please contact DeZURIK for assistance.

Definitions

For the purpose of the seat replacement, the following valve features are defined:

- Packing Chamber – this is the area at the top of the valve body which contains the layers of packing that seal between the gate and the body.
- Perimeter Seat Groove – this is the U-shape groove within the valve body in which the perimeter seat will nest into.
- Perimeter Seat Puck Pockets – located at the bottom ends of the body packing chamber, these pockets locate the perimeter seat puck ends.
- Perimeter Seat – the KGC-BD style perimeter seat is a U-shaped rubber seal that fits within the body's perimeter seat groove.
- Perimeter Seat Puck Ends – these are the ends of the U-shape KGC-BD style perimeter seat which are to be located within the pockets under the packing chamber of the body.
- Anti-Extrusion Guides – these are at the bottom of the packing chamber, between the perimeter seat puck ends, one on each side of the gate, and also located in appropriate pockets within the body.

Replacing the Seat *continued*



Seat Removal

WARNING!
Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing gate stem and packing gland nuts.

For removal of the actuator top works, gland and old packing.

1. Relieve the pressure in the pipeline and close the valve.

2. If the actuator is powered, disconnect and lock out power to prevent accidental operation of the actuator.

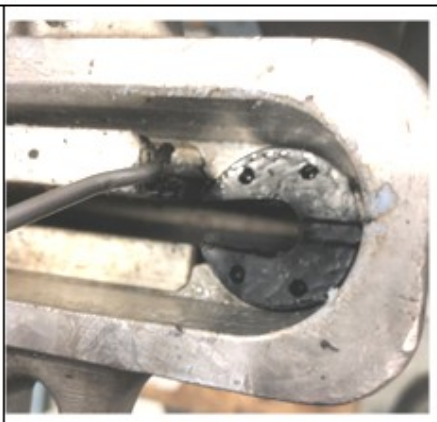
3. Remove the two screws and nuts near the top of the gate and disengage the stem from the gate by stroking the actuator (not the valve) to the open position.

4. Remove the gland nuts (A7), bolts (A5), washers (A6) and packing gland (A4).

5. Remove the used packing (A2) and packing cord (A8), if supplied. Inspect and replace anti-extrusion guides (A9) if damaged.

With the packing removed, the following steps illustrate recommended techniques for the removal of the valve's anti-extrusion guide and perimeter seat.

Replacing the Seat *continued*

After the gate has been removed, use a bearing pick or similar tool to carefully remove the guides, with attention to preventing the guides from falling into the port area.	
Once the guides have been removed, use a flat end screwdriver to pry the puck ends of the perimeter seat inward. This allows a better grasp of the puck for the next step.	
Using channel lock pliers, grasp as much of the puck as possible. With the use of a screwdriver, pry bar or other appropriate tool for leverage, pry up the pliers and puck gradually. Concurrently, observe that the plier jaws maintain a firm grip of the puck. Repeat this on the other side. Once the pucks are high enough to grasp – pull the seat straight up to remove.	

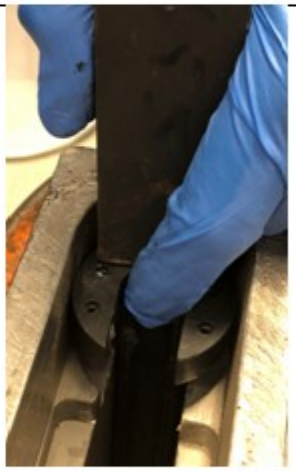
Replacing the Seat *continued*

Seat Installation

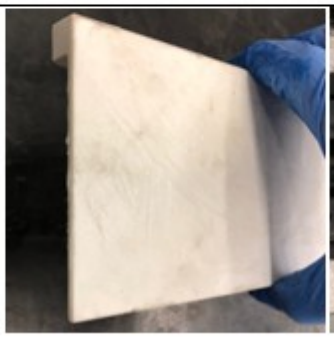
Prior to installation of new perimeter seat and anti-extrusion guides, check the gate for any significant wear which could be detrimental to the function of the seat and packing.

The seat is the U-shape similar to the port or the gate. Prior to installation, inspect the condition of the new seat, ensuring the rubber has no tears and that the shape does not have any kinks.	
Apply a liberal amount of lubricant to the outer surfaces of the seat. A silicone based lubricant is recommended, such as Dow Corning Molykote 111 or 44. Slide the seat into the top of packing area, pushing down evenly on both pucks as far as possible by hand. Excessive force should be avoided.	

Replacing the Seat *continued*

If the perimeter seat is still evenly protruding well out of the body, grasp directly below the puck with one hand and use a soft faced mallet to tap the seat down into the body – do this evenly a few inches at a time to both sides. It is important to grasp the perimeter seat under the puck to keep the seat free from buckling.	
Once the seat puck ends are close to or within the top of the valve body, use a piece of flat or round bar to finish seating the puck. Alternate back and forth until the puck is seated. As the pucks get close to their pockets, be sure to hold the pucks back as they go down so that they align with the pockets. It is allowable for the puck to be sitting slightly proud of the top surface of the pocket. At this point, check that at the bottom of the body port, the seat is still within its groove. If it is slightly raised at the bottom of the port, the installation of the gate should finish locating the perimeter seat within the groove.	  

Replacing the Seat *continued*

Apply a small amount of the lubricant to the inner profile of the seat as shown (both sides). A silicone based lubricant is recommended, such as Dow Corning Molykote 111 or 44.	
Apply a small amount of lubricant to the back and front of the anti-extrusion guides and install them carefully. The grease on the back side will allow it to stick to the inner chest wall of the body.	 

Before proceeding further with valve assembly, clean the gate and remove any burrs that may have formed from usage. Install new packing and reassemble valve as per the *Installing the New Packing and Reassembling Valve* sections.

Replacing the Gate

See Figure 1 for component identification.

WARNING!
Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing gate stem and packing gland nuts.

1. Relieve the pressure in the pipeline and close the valve.

WARNING!
Accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.

2. If the actuator is powered, disconnect and lock out power to prevent accidental operation of the actuator.
3. Remove the pipeline flange bolts, and remove the valve from the pipeline.
4. Remove the actuator, actuator yoke, packing gland (A4), and packing (A2) from the valve. Remove and inspect anti-extrusion guides (A9). Replace if damaged.

Replacing the Gate *continued*

5. Remove and inspect the gate (A3). If the gate appears to be scratched or galled due to too-long flange bolts in the chest area of the body, check for body damage in the tapped flange holes and within the chest cavity. Carefully check the body for damage. Repair or replace the body, as appropriate.
6. Inspect the seat components.
7. If seat replacement is required refer to section Replacing the Seat.
8. Place the new gate (A3) in the body, in the fully closed position.
9. Replace or reinstall the packing (A2) as described in “Installing the New Packing”.
10. Replace the yoke and actuator on the valve.

Note: Tighten the nuts evenly and slowly, just enough to stop the leakage. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

Troubleshooting

Condition	Possible Causes	Corrective Action
Packing leaks, with no evidence of galling on gate	Packing is loose	Adjust packing gland
	Packing is worn or torn	Replace packing
Packing leaks and gate is galled	Packing is worn or torn	Replace packing and gate, check seat for damage or wear
Valve leaks when fully closed, with no evidence of galling on gate	Seat is worn or torn	Replace Seat
Valve leaks when fully closed	Seat is worn or torn	Replace Seat, check gate condition

Limited Warranty

DeZURIK, Inc. (“Seller”) manufactured products, auxiliaries and parts thereof that we manufacture for a period of twenty-four (24) months from date of shipment from Seller’s factory, are warranted to the original purchaser only against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with Seller’s recommendations and instructions.

For items proven to be defective within the warranty period, your exclusive remedy under this limited warranty is repair or replacement of the defective item, at Seller’s option, FCA Incoterms 2020 Seller’s facility with removal, transportation, and installation at your cost.

Products or parts manufactured by others but furnished by Seller are not covered by this limited warranty. Seller may provide repair or replacement for other’s products or parts only to the extent provided in and honored by the original manufacturer’s warranty to Seller, in each case subject to the limitations contained in the original manufacturer’s warranty.

No claim for transportation, labor, or special or consequential damages or any other loss, cost or damage is being provided in this limited warranty. You shall be solely responsible for determining suitability for use and in no event shall Seller be liable in this respect.

This limited warranty does not warrant that any Seller product or part is resistant to corrosion, erosion, abrasion or other sources of failure, nor does Seller warrant a minimum length of service.

Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than Seller or its authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to store, install, or operate said products and parts according to the recommendations and instructions furnished by Seller shall be a waiver by you of all rights under this limited warranty.

This limited warranty is voided by any misuse, modification, abuse or alteration of Seller’s product or part, accident, fire, flood or other Act of God, or your failure to pay entire contract price when due.

The foregoing limited warranty shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to; an actuator is attached to the item by anyone other than a Seller factory authorized service personnel.

All orders accepted shall be deemed accepted subject to this limited warranty, which shall be exclusive of any other or previous warranty, and this shall be the only effective guarantee or warranty binding on Seller, despite anything to the contrary contained in the purchase order or represented by any agent or employee of Seller in writing or otherwise, notwithstanding, including but not limited to implied warranties.

THE FOREGOING REPAIR AND REPLACEMENT LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS AND LIABILITIES, INCLUDING, BUT NOT LIMITED TO, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE SELLER’S ENTIRE AND EXCLUSIVE LIABILITY AND YOUR EXCLUSIVE REMEDY FOR ANY CLAIM IN CONNECTION WITH THE SALE AND FURNISHING OF SERVICES, GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION OR OPERATIONS. NEITHER ANY PERFORMANCE OR OTHER CONDUCT, NOR ANY ORAL OR WRITTEN INFORMATION, STATEMENT, OR ADVICE PREPARED BY SELLER OR ANY OF OUR EMPLOYEES OR AGENTS WILL CREATE A WARRANTY, OR IN ANY WAY INCREASE THE SCOPE OR DURATION OF THE LIMITED WARRANTY.

Disclaimer

Metric fasteners should not be used with ASME Class 150/300 bolt holes and flange bolt patterns. If you use metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns, it may lead to product failure, injury, and loss of life. DeZURIK Inc. disclaims all liability associated with the use of metric fasteners with ASME Class 150/300 bolt holes and flange patterns, including but not limited to personal injury, loss of life, loss of product, production time, equipment, property damage, lost profits, consequential damages of any kind and environment damage and/or cleanup. Use of metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns is a misuse that voids all warranties and contractual assurances. If you use metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns, you do so at your sole risk and any liability associated with such use shall not be the responsibility of DeZURIK, Inc. In addition to the foregoing, DeZURIK’s Manufacturer’s Conditions apply.

Limitation of Liability

IN NO EVENT SHALL SELLER BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO; DAMAGE TO OR LOSS OF OTHER PROPERTY OR EQUIPMENT, BUSINESS INTERUPTION, COST OF SUBSTITUTE PRODUCTS, LOSS OF TIME, LOSS OF PROFITS OR REVENUE, COST OF CAPTIAL, LOSS OF USE, OR DIMINUTION IN VALUE) WHATSOEVER, AND SELLER’S LIABILITY, UNDER NO CIRCUMSTANCES, WILL EXCEED THE CONTRACT PRICE FOR THE GOODS AND/OR SERVICES FOR WHICH LIABILITY IS CLAIMED. ANY ACTION FOR BREACH OF CONTRACT BY YOU, OTHER THAN RIGHTS RESPECTING OUR LIMITED WARRANTY DESCRIBED ABOVE, MUST BE COMMENCED WITHIN 12 MONTHS AFTER THE DATE OF SALE.

Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:

Web site: www.dezurik.com E-Mail: info@dezurik.com

250 Riverside Ave. N., Sartell, MN 56377 ● Phone: 320-259-2000 ● Fax: 320-259-2227

DeZURIK, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation. Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only and should not be relied upon unless confirmed in writing by DeZURIK, Inc. Certified drawings are available upon request.

December 2022

DeZURIK APCO HILTON WILLAMETTE

Red Valve Tideflex RKL Controls

RECOMMENDED SHORT & LONG TERM STORAGE PROCEDURES

SHORT TERM STORAGE (LESS THAN 6 MONTHS)

1. All valves shall be stored in the position in which they were shipped. Do not stack (or store) items on top of the rubber components.

2. Valves shall be protected from dirt, debris, excessive moisture and UV exposure. Store at temperatures ranging from 35°F to 95°F (2°C to 35°C) with humidity levels not exceeding 50%.

LONG TERM STORAGE (6 MONTHS +)

1. All valves shall be stored in the position in which they were shipped. Do not stack (or store) items on top of the rubber components.

2. Valves shall be stored fully enclosed in a crate or on a skid. It is acceptable to store the valves uncrated but protected from any dirt, debris or UV exposure as long as the environmental conditions as described in item 3 are met. Any desiccant packages received with the original shipment should be replaced before putting valves into long term storage. Please follow your desiccant manufacturer's recommended usage of any desiccant based on the volume of the enclosed area.

3. Valves shall be stored in a well ventilated, clean, dry indoor facility on skids or raised racks with temperatures ranging from 35°F to 95°F (2°C to 35°C) with humidity levels not exceeding 50%. Rubber components shall be stored within temperature range 59°F to 77°F (15°C to 25°C)

4. If the above conditions cannot be met, valves shall be separately packaged inside sealed heavy duty plastic sheeting and a weather resistant enclosure, or a standard crate lined with moisture proof paper, to protect the valves from dirt, debris and UV exposure. Desiccant packages shall be used to control moisture both inside the enclosure and the sealed heavy duty plastic covering. Please follow your desiccant manufacturer's recommended usage of any desiccant based on the volume of the enclosed area.

5. Do not store valves next to operating electric motors or equipment which may emit ozone, which can cause deterioration of valve elastomers. Store in an environment with less than 0.1 ppm concentration, at least 25 feet from ozone emitting devices, with ventilation.

6. Valves with cylinder actuators and control valves which are stored for extended periods may be subject to cylinder blow-by caused by permanent distortion of any of the seals. Valves should be operated prior to installation and damaged seals replaced. If possible, it is recommended that cylinders be cycled every 4-6 months to maintain seals.

7. Valves with electric motor operators shall be stored in accordance with the individual motor manufacturer's recommended long term storage procedures.

8. All electrical components shall be visually inspected prior to valve installation.

SHELF LIFE (RUBBER COMPONENTS)

For rubber components or elastomers stored for longer than the time shown below contact the manufacturer to coordinate a visual inspection.

- Three (3) years for Natural (Pure Gum) Rubber and Styrene-Butadiene (SBR) components.

- Five (5) years for Chloroprene (Neoprene), Acrylonitrile-Butadiene (Nitrile, Buna-N), Chlorosulfonated Polyethylene (Hypalon), Chloro-Isobutylene-Isoprene (Chlorobutyl), EPDM, and Fluoroelastomer components.

Manufacturer Main Office
250 Riverside Avenue N
Sartell, MN 56377 USA
Ph: 320-259-2000

Assumptions and Clarifications

Project:	**Tri-City IPS Improvements Project**
Deliverable:	**Early Work Amendment #2 (EWA2)**

Slayden part of MWH

11/6/2026

Item No.	Division	Drawing or Specification	Comment	Assumption / Clarification / Exclusion
1	N/A	All	Proposal remains valid for a period of 45 days.	Clarification
2	Quotes	All	EWA2 proposal is for procurement only and does not include unloading, installation, storage, or facility commissioning.	Clarification
3	Quotes	All	Several quotes state pricing is valid for less than 90 days, or price may be adjusted to market rates at time materials are released for fabricated. Due to current market conditions, we are unable to get this language removed from quotes. Proposal assumes all escalations due to current project schedule will be negotiated as contingency usage.	Clarification
4	Quotes	N/A	Pricing is predicated upon selected vendor clarifications as further described in their quotes in section 4 herein.	Clarification
5	Pothole	N/A	Assume all pothole spoils can be dumped in staging area to be disposed of in GMP, or used to backfill potholes outside of roadway.	Clarification
6	IPS Pumps	43 25 13.30	Xylem quote includes pump cables up to 100'.	Clarification
7	IPS Pumps	43 25 13.30	Xylem pump quote includes monitoring relays supplied loose for installation in VFD cabinet. Vendor is willing to work with the designer & WES to supply a separate control enclosure with cost impacts of this change to be funded from the allowance included in EWA2.	Clarification

Attachment 6.0
Allowance Log

Update:

11/5/2026

Item #	Description	Notes		Value
1	IPS Pump Control Panel	Xylem IPS Pump stand-alone control panel	$	20,000
		TOTAL	**$**	**20,000**
		Fee on Allowances (8.5%)	$	1,700
		TOTAL OWNER ALLOWANCE AMOUNT	**$**	**21,700**

Tri-City IPS Improvements Project
Clackamas Water Environmental Services

2026 Staff Rates	
Position	**Hourly Rate**
Preconstruction Manager	$ 246.00
Project Manager	$ 181.00
Lead Estimator	$ 192.00
Estimators	$ 135.00
Superintendent	$ 197.00
Project Engineer	$ 110.00
Project executive	$ 233.00
Project Controls	$ 137.00
Digital Delivery	$ 136.00
Commissioning Rep	$ 160.00
Contracts Manager	$ 112.00
Administrative Support	$ 77.00
QA/QC Manager	$ 129.00
Safety Manager	$ 129.00
Scheduler	$ 137.00

Docusign Envelope ID: B3765AC8-8FF4-805A-8185-38D55E98DE9A

Job Name	Tri-City IPS
City, County	14275 Clackamas River Drive, Oregon City, OR 97045 (Clackamas County) BOLI January 5, 2026, Prevailing Wage Rate Book
Wage Publication & Date	BOLI February 18, 2026, Prevailing Wage Rate Amendment BOLI April 5, 2026, Prevailing Wage Rate Amendment

SLAYDEN CRAFT LABOR RATES - 2026

Class	Reference	PR Code	(Minimum Required Package) Base	Zone	Fringe	Pkg Total	Burden Total	Wage + Burden Actual
Carp Foreman (+ $6) (General)		CP04	60.69	-	17.01	77.70	20.97	**$ 98.67**
Carpenter - Grp 1	BOLI Amend 4/5/26	CP02	54.69	-	17.01	71.70	19.60	**$ 91.30**
Laborer Foreman (+ $6)		LB04	48.47	-	18.30	66.77	18.48	**$ 85.25**
Laborer - General	BOLI Book 1/5/26	LG1	41.10	-	18.30	59.40	16.81	**$ 76.21**
Laborer - Grp 2 (Pipelayer)	BOLI Book 1/5/26	LG2	42.47	-	18.30	60.77	17.48	**$ 78.25**
Laborer - Grp 3	BOLI Book 1/5/26	LG3	43.00	-	18.30	61.30	17.60	**$ 78.90**
Plumber/Pipefitter Foreman (+ 20%)			72.92	-	37.10	110.02	26.57	**$ 136.60**
Plumber/Pipe Fitter	BOLI Book 1/5/26	PF02	60.77	-	37.10	97.87	24.00	**$ 121.87**
Millwright Foreman (+$6)			67.57	-	22.38	89.95	23.44	**$ 113.39**
Millwright - (Carp Grp 3)	BOLI Amend 4/5/26	MILL	61.57	-	22.38	83.95	22.10	**$ 106.05**
Cement Mason - Grp 1	BOLI Book 1/5/26	CME1	46.13	-	22.31	68.44	19.78	**$ 88.22**
Pile Buck/Driver Foreman (+ $6)			62.06	-	16.81	78.87	21.23	**$ 100.10**
Pile Buck/Driver	BOLI Book 1/5/26	CP06	56.06	-	16.81	72.87	19.87	**$ 92.74**
Ironworker Foreman (+ $6)			55.80	-	34.98	90.78	25.89	**$ 116.67**
Ironworker	BOLI Book 1/5/26		49.80	-	34.98	84.78	24.39	**$ 109.17**
Operator Foreman (+ $6)			66.08	-	17.55	83.63	22.81	**$ 106.44**
Tower Crane up to 175',< 200 ft jib	BOLI Amend 2/18/26	OP01	61.99	-	17.55	79.54	21.86	**$ 101.40**
Crane, Hydraulic, 90-199 tons	BOLI Amend 2/18/26	OP02	60.08	-	17.55	77.63	21.41	**$ 99.04**
Crane, Hydraulic, 50-89 tons	BOLI Amend 2/18/26	OP03	58.93	-	17.55	76.48	21.14	**$ 97.62**
Crane, Hydraulic < 50 ton	BOLI Amend 2/18/26	OP04	55.60	-	17.55	73.15	20.37	**$ 93.52**
Loader 60,000 - 120,000 lbs	BOLI Amend 2/18/26	OP03	58.93	-	17.55	76.48	21.14	**$ 97.62**
Loader 25,000 - 60,000 lbs	BOLI Amend 2/18/26	OP04	55.60	-	17.55	73.15	20.37	**$ 93.52**
Bulldozer 70,000 - 120,000 lbs	BOLI Amend 2/18/26	OP03	58.93	-	17.55	76.48	21.14	**$ 97.62**
Bulldozer 20,000 - 70,000 lbs	BOLI Amend 2/18/26	OP04	55.60	-	17.55	73.15	20.37	**$ 93.52**
Excavator over 130,000 lbs	BOLI Amend 2/18/26	OP02	60.08	-	17.55	77.63	21.41	**$ 99.04**
Excavator 80,000 - 130,000 lbs	BOLI Amend 2/18/26	OP03	58.93	-	17.55	76.48	21.14	**$ 97.62**
Excavator 20,000 - 80,000 lbs	BOLI Amend 2/18/26	OP04	55.60	-	17.55	73.15	20.37	**$ 93.52**
Excavator < 20,000 lbs	BOLI Amend 2/18/26	OP05	54.36	-	17.55	71.91	20.08	**$ 91.99**
Bobcat (Skid-Steer), Forklift, Boat	BOLI Amend 2/18/26	OP06	51.14	-	17.55	68.69	19.33	**$ 88.02**
Truck, Offroad	BOLI Amend 2/18/26	OP05	54.36	-	17.55	71.91	20.08	**$ 91.99**

SPECS LIST | 2602 Tri-City IPS Imp - EWA2

PUMP PROCUREMENT

DIVISION 1 - General Requirements

SECTION NO.	SPECIFICATION TITLE	REVISION	DATE
01 33 00	SUBMITTAL PROCEDURES	Pump Procurement	Oct-26
01 35 73	DELEGATED DESIGN REQUIREMENTS	Pump Procurement	Oct-26
01 41 00	REGULATORY REQUIREMENTS	Pump Procurement	Oct-26
01 60 00	PRODUCT REQUIREMENTS	Pump Procurement	Oct-26
01 78 24	OPERATION AND MAINTENANCE MANUALS	Pump Procurement	Oct-26
01 81 50	DESIGN CRITERIA	Pump Procurement	Oct-26

DIVISION 43 - Process Gas and Liquid Handling, Purification, and Storage Equipment

43 25 13.30	SUBMERSIBLE LARGE CAPACITY CENTRIFUGAL PUMPS	Pump Procurement	Oct-26

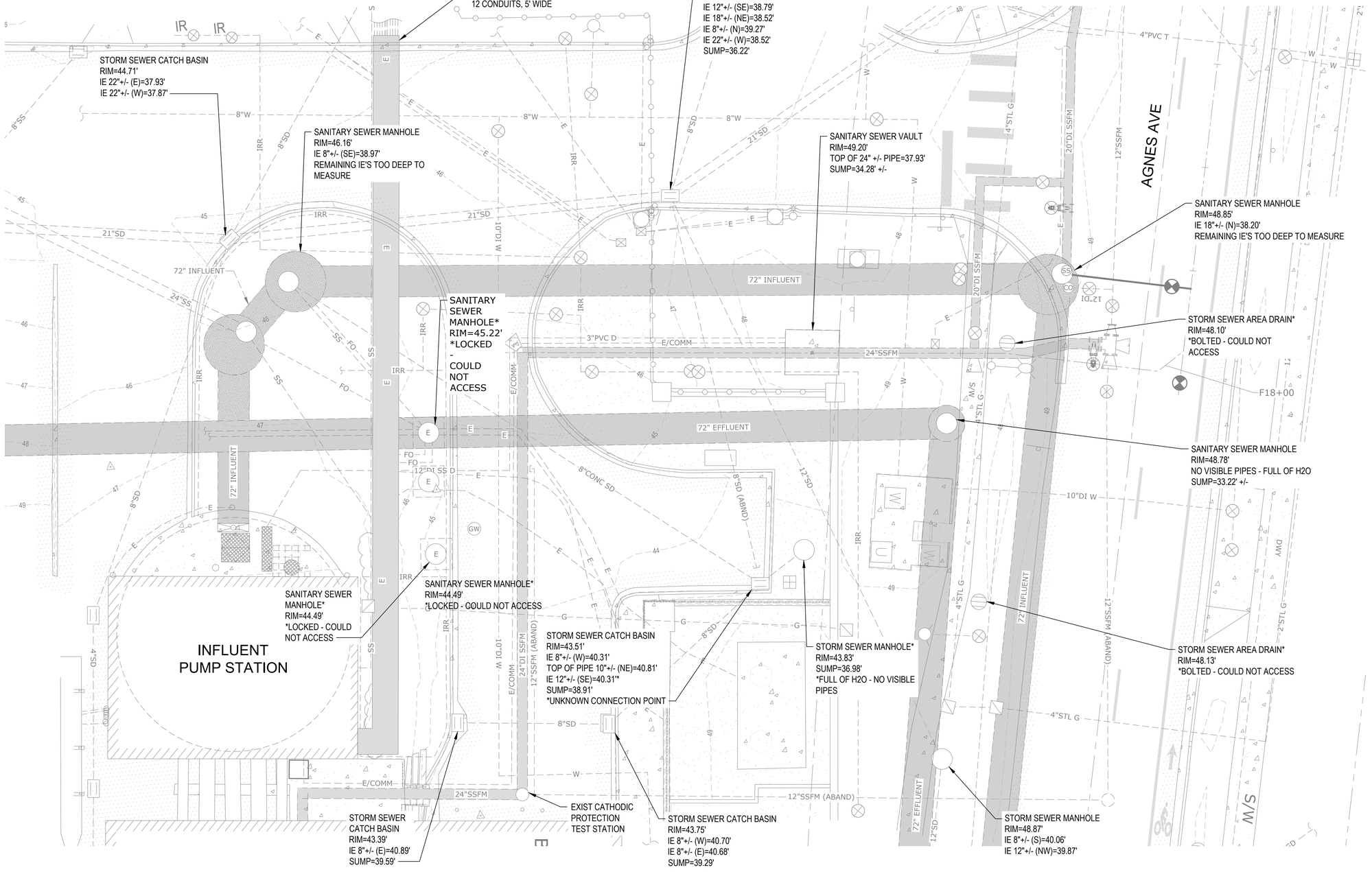
DIVISION 46 - Water and Wastewater Equipment

46 05 10	COMMON WORK RESULTS FOR MECHANICAL EQUIPMENT	Pump Procurement	Oct-26
46 05 94	MECHANICAL EQUIPMENT TESTING	Pump Procurement	Oct-26

KNIFE GATE VALVE PROCUREMENT

DIVISION 40 - Process Integration

40 05 65.01	GATE, GLOBE, AND ANGLE VALVES	Knife Gate Valve Procurement	Oct-26



PLAN
SCALE: 1" = 10'

SPACE RESERVED FOR CLACKAMAS COUNTY APPROVAL STAMP

SURVEY NOTES:

1. THE VERTICAL DATUM FOR THIS SURVEY IS NGVD29.
SITE BENCHMARK: PBS CONTROL POINT #4
ELEVATION=62.92'
N:120249.84'
E:370697.09'
THE VERTICAL BENCHMARK IS A MAG NAIL IN SIDEWALK LOCATED AT THE NORTHWEST CORNER OF 82ND DR AND COLUMBIA AVE APPROXIMATELY 19.0' NORTH OF A WATER VALVE AND 10.6' SOUTHEAST OF A FIRE HYDRANT.
*ELEVATION WAS TRANSFERRED FROM N.G.S. CONTROL POINT ID AE1867 "TERM RESET" (NGVD29 ELEVATION=37.95') THROUGH GPS OBSERVATIONS AND DIFFERENTIAL LEVELS.

2. HORIZONTAL: OREGON COORDINATE REFERENCE SYSTEM (OCRS) - PORTLAND ZONE
DISTANCES SHOWN HEREON ARE GROUND DISTANCES.

3. THIS TOPOGRAPHIC SURVEY WAS PERFORMED FOR THE PURPOSE OF DESIGNING SANITARY SEWER FORCE MAIN IMPROVEMENTS.

4. CONTOURS DERIVED BY DIRECT FIELD OBSERVATIONS. ELEVATION AND CONTOUR ACCURACY IS ONE-HALF THE CONTOUR INTERVAL.

5. THIS MAP HAS BEEN PRODUCED FOR DESIGN PURPOSES AND SHOWS AN ACCURATE BOUNDARY DEPICTION.

6. BOUNDARIES SHOWN HAVE BEEN DETERMINED.

7. THE UNDERGROUND UTILITIES SHOWN ARE BASED ON FIELD MEASUREMENT OF UTILITY LOCATE PAINT MARKS SUPPLIED BY THE OREGON UTILITY NOTIFICATION CENTER (PRE-SURVEY TICKET REQUESTS SUBMITTED ON 4/25/2022 AND PROCESSED AS TICKET NUMBERS 22117986 AND 22118022.) AS WELL AS SURFACE EVIDENCE AND PRIVATE ASBUILT RECORDS. CONTRACTOR SHALL CONDUCT FIELD RECONNAISSANCE, INCLUDING UTILITY POTHOLING AND EXPLORATORY EXCAVATIONS, AS REQUIRED TO CONFIRM EXISTING CONDITIONS. SEE GENERAL NOTE 2 ON SHEET G-005 FOR FURTHER DETAILS.

Consultant: consor

This document, ideas, and designs incorporated herein, are an instrument of professional service, and is not to be used, in whole or in part, for any other project without the written authorization of CONSOR.

Sub Consultant:

BID SET

Engineer's Seal: REGISTERED PROFESSIONAL ENGINEER PE80998 Justin R Luce OREGON MAY 23, 2003 JUSTIN RUSSELL LUCE RENEWS 12-31-24

Client / Owner: CLACKAMAS WATER ENVIRONMENT SERVICES

Project Title: WATER ENVIRONMENT SERVICES INTERTIE 2 DIVERSION FACILITY - PUMP STATION EXPANSION PROJECT

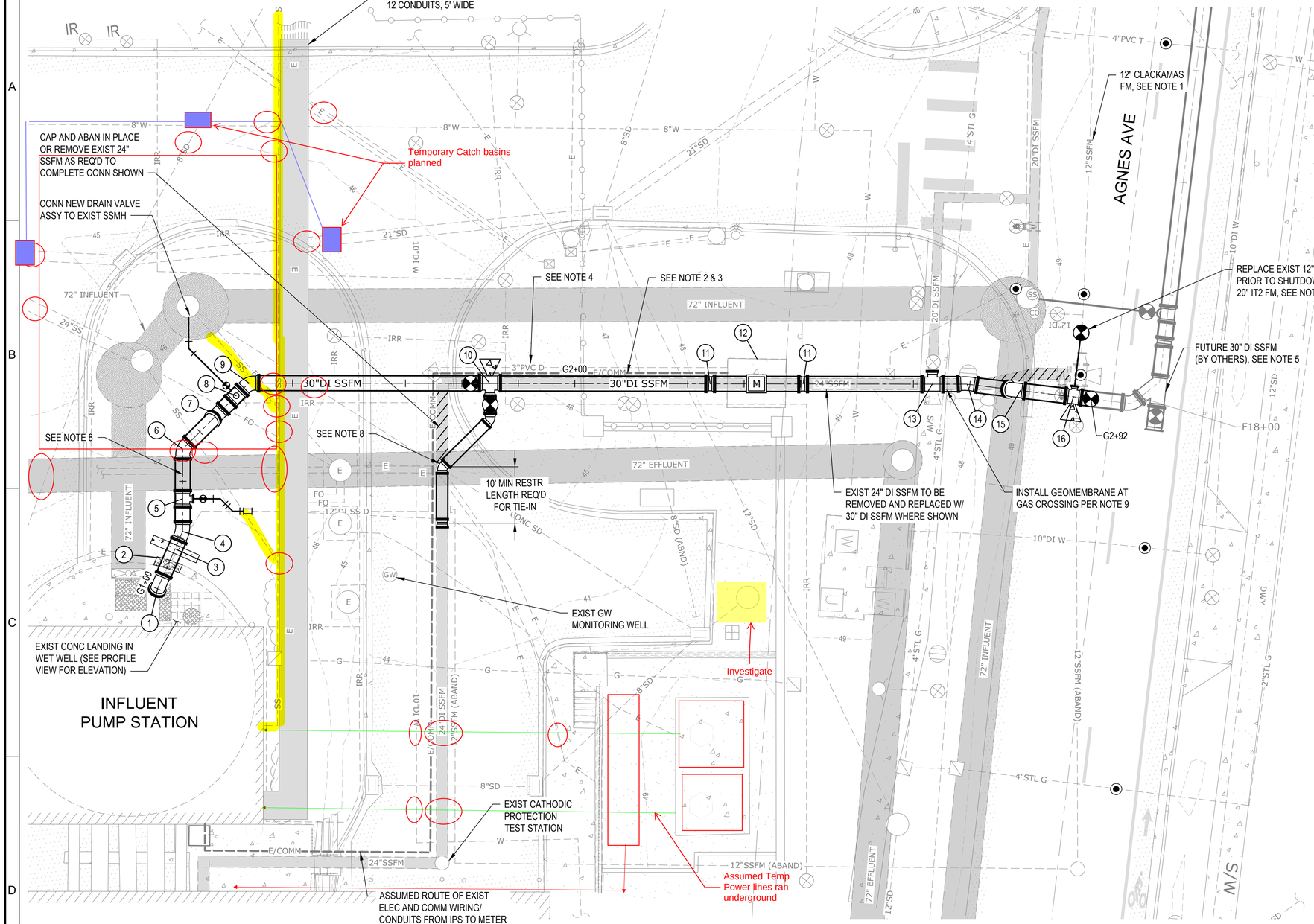
TRI-CITY FM IMPROVEMENTS

EXISTING CONDITIONS AND SURVEY CONTROL

Designed By:	JI
Drawn By:	MBE
Checked By:	AJC
Approved By:	JRL
Consor Project No.:	W223440OR
Issued On:	OCTOBER 2024
Sheet:	FM-C-020

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: G:\PDX_Projects\223440 - WES - Intertie 2 PS & Force Main - Phase 1\CAD\12.6 Sheets\Pump Station\223440_FM-C-020.dwg, Plotted Date: October 4, 2024 3:12 PM By: Jared Cloud



PLAN
SCALE: 1" = 10'

NOTES:

1. 30" SSFM IMPROVEMENTS AND MAG METER REPLACEMENT WORK SHOWN REQUIRES SHUTDOWN OF 20" IT2 FM AND RE-DIRECTION OF FLOWS FROM 12" CLACKAMAS FM TO INFLUENT MANHOLE IN AGNES AVENUE. PRIOR TO SHUTTING DOWN 20" IT2 FM TO BEGIN WORK, CONTRACTOR TO COORDINATE WITH WES TO TEMPORARILY SHUTDOWN 12" CLACKAMAS FM TO REPLACE EXISTING 12" GATE VALVE AT STA G2+89 (APPROX 12' LT), TO FACILITATE REDIRECTING FLOWS TO INFLUENT MANHOLE IN AGNES AVENUE DURING LATER SHUTDOWN OF 20" IT2 FM. SEE SECTION 01 12 16, WORK SEQUENCE, FOR REQUIREMENTS FOR SHUTTING DOWN EXISTING FORCE MAINS.

2. CONTRACTOR TO UTILIZE EXISTING CONDUIT ROUTE (AND EXISTING CONDUITS WHERE FEASIBLE) BETWEEN IPS BUILDING AND METER VAULT TO INSTALL WIRING FOR NEW 30" MAG METER. SEE SHEETS FM-I-601 FOR ASSOCIATED P&ID AND FM-E-104 & FM-E-105 FOR ASSOCIATED ELECTRICAL PLANS.

3. CONDUIT ROUTE SHOWN BETWEEN IPS AND METER VAULT IS INFERRED FROM LIMITED ASBUILT INFORMATION AND ONSITE FIELD OBSERVATIONS. FURTHER, IT IS ANTICIPATED THAT EXISTING CONDUITS WITHIN SHOWN ROUTE WERE INSTALLED WITHIN TRENCH (OR CLOSELY NEARBY) OF EXISTING 24" SSFM AND DAMAGE TO PORTIONS OF EXISTING CONDUITS DURING INSTALLATION OF NEW 30" SSFM IS ASSUMED TO BE UNAVOIDABLE. CONTRACTOR TO CONFIRM EXISTING CONDITIONS TO THE FULLEST EXTENT POSSIBLE PRIOR TO ORDERING MATERIALS TO COMPLETE NEW MAG METER WIRING WORK. CONTRACTOR SHALL ALSO REPAIR ANY DAMAGED CONDUITS AS REQUIRED PER THE SPECIFICATIONS TO ALLOW REUSE FOR ROUTING NEW WIRING.

4. ROUTING OF EXISTING 3" PVC DISCHARGE DRAIN PIPING FROM SUMP PUMP IN METER VAULT TO EXISTING 12" DI DRAIN TO IPS WET WELL AS SHOWN IS INFERRED FROM LIMITED ASBUILT INFORMATION AND ONSITE FIELD OBSERVATIONS. FURTHER, IT IS ANTICIPATED THAT EXISTING DISCHARGE PIPE WAS INSTALLED WITHIN TRENCH (OR CLOSELY NEARBY) OF EXISTING 24" SSFM AND DAMAGE TO PORTIONS OF EXISTING DISCHARGE DRAIN PIPE DURING INSTALLATION OF NEW 30" SSFM IS ASSUMED TO BE UNAVOIDABLE. CONTRACTOR TO REPAIR DISCHARGE DRAIN PIPE AS REQUIRED TO REINSTATE AFTER ALL OTHER CONFLICTING WORK IS COMPLETED.

5. 30" DI SANITARY SEWER FM SHOWN IN GREY WILL BE INSTALLED BY OTHERS AS PART OF THE INTERTIE 2 (IT2) DIVERSION FACILITY - 30" FM IMPROVEMENT PROJECT(ALSO REFERRED TO AS THE IT2 FM PROJECT), AND THIS PORTION OF PIPING IS SHOWN HERE FOR INFORMATIONAL PURPOSES. CONTRACTOR TO COORDINATE WITH AND FM CONTRACTOR (TAPANI) TO CONFIRM REQUIRED INSTALL DEPTH OF 30" FM PIPING FOR FUTURE CONNECTION (FROM STA G2+79 TO G2+89) PRIOR TO PROCEEDING WITH INSTALLATION. IT IS CURRENTLY ANTICIPATED THAT FM CONTRACTOR (TAPANI) WILL COMPLETE FINAL CONNECTION. CONTRACTOR TO COORDINATE SCHEDULING OF WORK SHOWN TO ACCOMMODATE FM CONTRACTOR SCHEDULE IF POSSIBLE.

6. EXISTING REINFORCED CONCRETE WALL FOR IPS WET WELL TO BE FIELD CORED IS ANTICIPATED TO BE 18" THICK, WITH REINFORCEMENT AS SHOWN ON TRI-CITY TREATMENT PLANT RECORD DRAWINGS INCLUDED AS SUPPLEMENTARY INFORMATION IN THE CONTRACT DOCUMENTS.

7. CONTRACTOR TO RESTORE TREATMENT PLANT SITE TO PRECONSTRUCTION CONDITIONS, INCLUDING RESTORING ALL EXISTING SURFACES, DRAINAGE, IRRIGATION SYSTEM, ETC.

8. CONTRACTOR TO POTHOLE AND CONFIRM TOP OF EXISTING 72" EFFLUENT PIPELINE PRIOR TO ORDERING MATERIALS. DEPTH SHOWN ON SHEET FM-C-131 BASED ON LIMITED FIELD OBSERVATIONS AND ASBUILT DATA. COORDINATE WITH ENGINEER AND OWNER OF ANY REQUIRED DESIGN REVISIONS IMMEDIATELY.

9. INSTALL 10-FT X 5-FT WIDE GEOMEMBRANE IN TRENCH, BETWEEN STEEL GAS PIPE AND 30-INCH DI WATER MAIN. SEE SPECIFICATIONS FOR MATERIAL REQUIREMENTS FOR GEOMEMBRANE.

SPACE RESERVED FOR CLACKAMAS COUNTY APPROVAL STAMP

KEY NOTES

1. STA G1+00
FURNISH & INSTALL:
1-30" DI 45° VERT DISCHARGE BEND, MJ, IN WET WELL

2. CORE NEW WALL PENETRATION IN EXIST WET WELL WALL, SEE DET 4, SHT D-501 AND NOTE 6

3. STA G1+08
FURNISH & INSTALL:
1-CONC ANCHOR BLOCK, SEE DET 2, SHT FM-D-521

4. STA G1+11
FURNISH & INSTALL:
1-30" DI 22.5° HORIZ BEND, MJ

5. STA G1+17
CONNECT TO EXIST 12" DI DRAIN
FURNISH & INSTALL:
1-30"x12" DI TEE, MJxFLG
1-12" GV, FLGxMJ
2-12" DI 45° BENDS, MJ
3-12" DI SPL, PE, LENGTHS AS REQ'D
1-12" DI LS, MJ

6. STA G1+26
FURNISH & INSTALL:
1-30" DI 45° HORIZ BEND, MJ, ROLLED DN

7. STA G1+34
11.25 VERT BEND, UP
(SEE PROFILE VIEW ON SHT FM-C-131)

8. STA G1+38
CONSTRUCT DRAIN VALVE ASSY, CONNECT TO NEARBY EXIST INFLUENT SSMH (48" UPPER SECTION)
FURNISH & INSTALL:
1-30"x8" DI TEE, MJ, ROLLED DN
1-30" FOSTER ADPTR
1-8" DI 90 BEND, MJ
1-8" GV, MJ
1-8" DI 45 BEND, MJ
4-8" DI SPL, PE, LENGTHS AS REQ'D
FIELD CORE WALL PENETRATION INTO EXIST 48" MH AND INSTALL MH FLEX CONN, SEE STD DWG SWM-29 ON SHT C-510

9. STA G1+42
FURNISH & INSTALL:
1-30" DI 45° HORIZ BEND, MJ

10. STA G1+85
FURNISH & INSTALL:
1-30"x24" DI TEE, MJ
1-30" GV, MJ
1-30" FOSTER ADAPTR
1-24" GV, MJ
2-24" FOSTER ADAPTR
2-24" DI 45° HORIZ BEND, MJ, ROLLED AS REQ'D
1-24" DI LS, MJ
DEMO EXIST TB ON EXIST 24" DI ELBOW AND POUR REPLACEMENT TB FOR NEW 30"x24" TEE PER DET 1, SHT FM-D-521

11. STA G2+24 & G2+40
FURNISH & INSTALL:
2-30" DI LS, MJ

12. INSTALL NEW 30" METER IN EXISTING PRECAST CONC METER VAULT, SEE SHT FM-D-520 AND NOTE 2

13. STA G2+63
CONNECT TO EXIST 20" GV, FLG
FURNISH & INSTALL:
1-30"x20" DI TEE, MJxFLG,
DEMO EXIST TB AND POUR REPLACEMENT TB
PER DET 1, SHT FM-D-521

14. STA G2+70
22.5 DI VERT BEND ROLLED RT
(SEE PROFILE VIEW ON SHT C-131)

15. STA G2+79
22.5° VERT BEND, DN
(SEE PROFILE VIEW ON SHT FM-C-131)

16. STA G2+89
CONNECT TO EXIST 12" SSFM & END 'G' ALIGN FOR FUTURE CONN BY OTHERS
FURNISH & INSTALL:
1-30"x12" DI TEE, MJ, ROLLED UP
1-30" FOSTER ADPTR
1-30" GV, MJ
1-30" DI PLUG, MJ (FOR TESTING)
2-12" DI SPL, PE, LENGTH AS REQ'D
1-12" DI 22.5° VERT BEND, MJ
1-12" GV, MJ
REPLACEMENT TB FOR NEW TEE PER DET 1, SHT FM-D-521

Consultant: consor
This document, ideas, and designs incorporated herein, are an instrument of professional service, and is not to be used, in whole or in part, for any other project without the written authorization of CONSOR.

Sub Consultant:

BID SET

Engineer's Seal: REGISTERED PROFESSIONAL ENGINEER, PE80998, Justin R Luce, OREGON, MAY 23, 2003, JUSTIN RUSSELL LUCE
RENEWS 12-31-24

Client / Owner: CLACKAMAS WATER ENVIRONMENT SERVICES

Project Title: WATER ENVIRONMENT SERVICES INTERTIE 2 DIVERSION FACILITY - PUMP STATION EXPANSION PROJECT

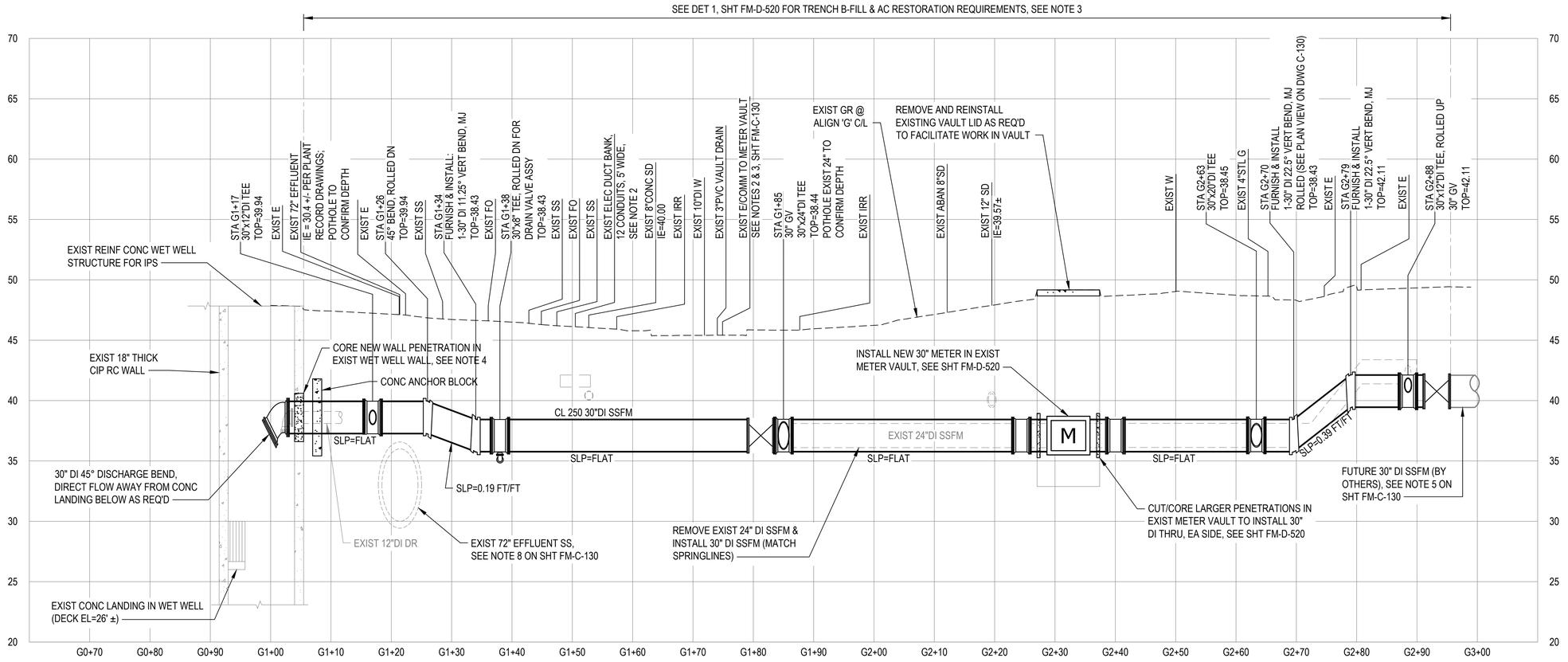
TRI-CITY FM IMPROVEMENTS

TRI-CITY 30" DI FORCE MAIN PLAN

Designed By: JI	Consor Project No.: W223440OR
Drawn By: NEM	Issued On: OCTOBER 2024
Checked By: AJC	Sheet: FM-C-130
Approved By: JRL	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: G:\PDX_Projects\223440 - WES - Intertie 2 PS & Force Main - Phase 1\CAD\12.6 Sheets\Pump Station\223440_FM-C-130.dwg, Plotted Date: October 4, 2024 3:18 PM By: Jared Cloud

SPACE RESERVED FOR CLACKAMAS COUNTY APPROVAL STAMP



PROFILE

SCALE: 1"=10' HORIZ, 1"=5' VERT

NOTES:

1. LOCATIONS AND DEPTHS OF UTILITIES (WHERE SHOWN) IS BASED ON LIMITED DATA PER GENERAL NOTE 2 ON SHEET G-005. CONTRACTOR SHALL ANTICIPATE UTILIZING VACUUM EXCAVATION EXTENSIVELY TO CONFIRM EXISTING CONDITIONS PRIOR TO ORDERING MATERIALS AND DURING PIPE INSTALLATION WORK TO AVOID DAMAGING EXISTING PLANT UTILITIES.

2. SIZE, LOCATION AND DEPTH OF EXISTING ELECTRICAL DUCT BANK IS APPROXIMATE AND BASED ON INFORMATION INCLUDED IN THE TRI-CITY WPCP PHASE 1 EXPANSION RECORD DRAWINGS AND PHOTOS TAKEN DURING CONSTRUCTION. CONTRACTOR TO VACUUM EXCAVATE AND EXPOSE EXISTING ELECTRICAL DUCT BANK TO CONFIRM SIZE, DEPTH AND LOCATION. CONTRACTOR TO SUPPORT EXISTING DUCT BANK AND PROTECT IN PLACE DURING 30" SSFM INSTALLATION. PROVIDE UTILITY PROTECTION PLAN FOR REVIEW BY ENGINEER/OWNER PRIOR TO BEGINNING CROSSING WORK.

3. BACKFILL TRENCH WITH CLASS B CRUSHED ROCK MATERIAL UNLESS OTHERWISE APPROVED BY ENGINEER/OWNER.

4. APPROXIMATELY MATCH SPRINGLINE OF EXISTNG 12" PIPELINE FOR INSTALL OF 30" PIPELINE THROUGH WET WELL WALL. REMOVE EXISTING, PENETRATING 12" DI PIPELINE PRIOR TO CONDUCTING CORING OPERATIONS FOR NEW 30" DI SSFM.

Consultant: consor

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Sub Consultant:

BID SET

Engineer's Seal: REGISTERED PROFESSIONAL ENGINEER — PE80998 — Justin R Luce — OREGON — MAY 23, 2013 — JUSTIN RUSSELL LUCE — RENEWS 12-31-24

Client / Owner: CLACKAMAS WATER ENVIRONMENT SERVICES

Project Title: WATER ENVIRONMENT SERVICES INTERTIE 2 DIVERSION FACILITY - PUMP STATION EXPANSION PROJECT

TRI-CITY FM IMPROVEMENTS

TRI-CITY 30" DI FORCE MAIN PROFILE

Designed By:	JI
Drawn By:	NEM
Checked By:	AJC
Approved By:	JRL
Consor Project No.:	W223440OR
Issued On:	OCTOBER 2024
Sheet:	FM-C-131

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

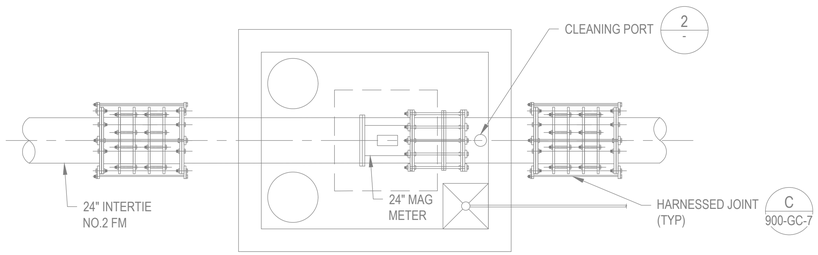
Drawing Path and Name: G:\pdx_projects\223440 - wes - intertie 2 ps & force main - phase 1\CAD\12.6 sheets\pump station\223440_FM-C-131.dwg, Plotted Date: October 4, 2024 4:15 PM By: Nick McFaddin

NOTES:

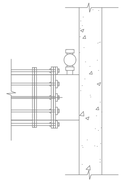
1. DETAIL INCLUDED BELOW DEPICTS THE ANTICIPATED EXSTING CONDITIONS AT THE MAG METER VAULT AT TRI-CITY WPCP. SEE SHEET 70-C-74 OF TRI-CITY WPCP PHASE 1 EXPANSION RECORD DRAWINGS, AND OTHER SHEETS/DETAILS REFERENCED BELOW INCLUDED IN RECORD DRAWING SET FOR BUBBLE NOTES AND OTHER PERTINENT INFO REGARDING EXISTING CONDITIONS AT MAG METER VAULT. SHEETS OF REFERENCED RECORD DRAWINGS INCLUDED AS SUPPLEMENTARY INFORMATION IN THE CONTRACT DOCUMENTS.

2. NOT SHOWN BELOW ARE THE CONTROL AND POWER CONDUITS PENETRATING INTO EXISTING VAULT AND EXISTING 3" LOW POINT DRAIN VALVE ASSEMBLY PIPED TO VAULT SUMP. SEE NOTE 2 ON SHEET FM-C-130 REGARDING REUSE OF EXISTING CONTROL AND POWER CONDUITS. CONTRACTOR MAY UTILIZE LOW POINT DRAIN TO ASSIST IN DRAINING EXISTING 24" SSFM PRIOR TO CUT-IN.

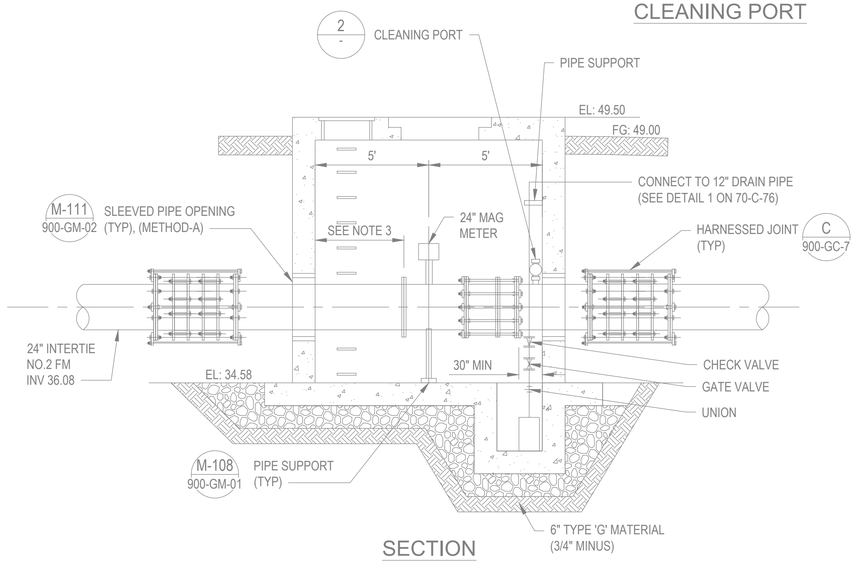
3. NO PROPOSED WORK IS DESCRIBED IN THIS DETAIL (DETAIL 1). SEE DETAIL 2 ON THIS SHEET, FOR PROPOSED WORK TO REPLACE 24" PIPING AND METER WITH 30" PIPING AND METER.



PLAN



CLEANING PORT



SECTION

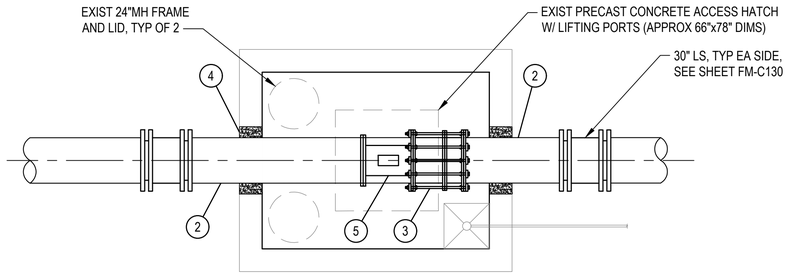
1 EXISTING MAG METER VAULT
FM-C-130 SCALE: NTS

NOTES:

1. CONTRACTOR TO EXCAVATE AROUND VAULT AS REQUIRED TO REMOVE PRECAST VAULT LID AND ALLOW REMOVAL OF EXISTING AND INSERTION OF NEW PIPE AND FITTINGS INTO VAULT.

2. SEE NOTE 2 ON SHEET FM-C-130 REGARDING REUSE OF EXISTING CONTROL AND POWER CONDUITS (NOT SHOWN) FOR RUNNING WIRING TO NEW MAG METER.

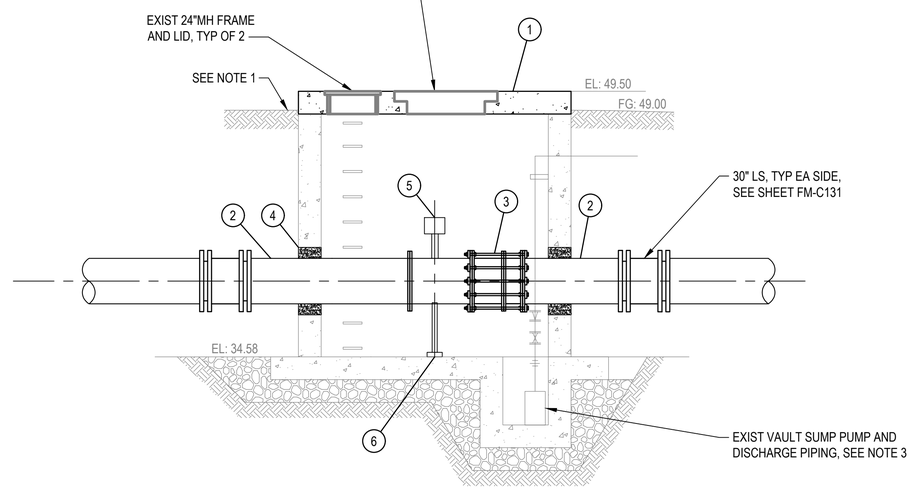
3. EXIST VAULT SUMP PUMP AND DISCHARGE PIPING TO REMAIN AFTER WORK IS COMPLETED. CONTRACTOR MAY ELECT TO REPLACE THESE ITEMS NEW (IN LIKE AND KIND) AS REQUIRED TO FACILITATE WORK IN VAULT.



PLAN

KEY NOTES

1. REMOVE AND REINSTALL EXIST VAULT TOP AS REQ'D, SEE NOTE 1
2. 30" DI SPL, PExFLG, LENGTH AS REQ'D
3. 30" DISMANTLING JOINT, FLG
4. CORE NEW/EXPAND EXISTING WALL PENETRATION IN EXIST CONC METER VAULT TO ACCOMODATE INSTALL OF NEW 30" DI SSRM, TYP OF 2. SEE DET 4, SHT D-501
5. 30" MAG METER, SEE SPEC SECTION 40 91 23
6. FLOOR PIPE SUPPORT, SEE DET 3, SHT D-501



SECTION

2 PROPOSED IMPROVEMENTS TO EXISTING MAG METER VAULT
FM-C-130 SCALE: NTS

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Consultant: consor

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Sub Consultant:

BID SET

Engineer's Seal: REGISTERED PROFESSIONAL ENGINEER, PE80998, Justin R Luce, OREGON, MAY 23, 2008, JUSTIN RUSSELL LUCE, RENEWS 12-31-24

Client / Owner: CLACKAMAS WATER ENVIRONMENT SERVICES

Project Title: WATER ENVIRONMENT SERVICES INTERTIE 2 DIVERSION FACILITY - PUMP STATION EXPANSION PROJECT

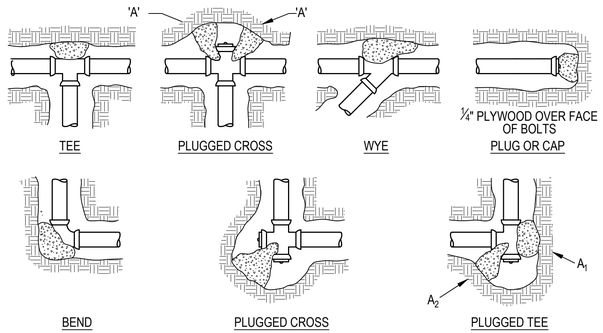
TRI-CITY FM IMPROVEMENTS

TRI-CITY FM CIVIL DETAILS - 1

Designed By:	JI
Drawn By:	NEM
Checked By:	AJC
Approved By:	JRL
Consor Project No.:	W223440OR
Issued On:	OCTOBER 2024
Sheet:	FM-D-520

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: G:\PDX_Projects\223440 - WES - Intertie 2 PS & Force Main - Phase 1\CAD\12.6 Sheets\Pump Station\223440_FM-D-520.dwg, Plotted Date: October 4, 2024 3:26 PM By: Jared Cloud



NOTES:

1. CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH.

2. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES. INSTALL ISOLATION MATERIAL BETWEEN PIPE AND/OR FITTINGS BEFORE POURING BLOCKING.

3. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS; e.g. 15 INDICATES 15 SQUARE FEET BEARING AREA REQUIRED

4. IF NOT SHOWN ON PLANS, REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED IN TABLE, ADJUSTED IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) STATED IN THE SPECIFICATIONS.

5. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS DETAIL.

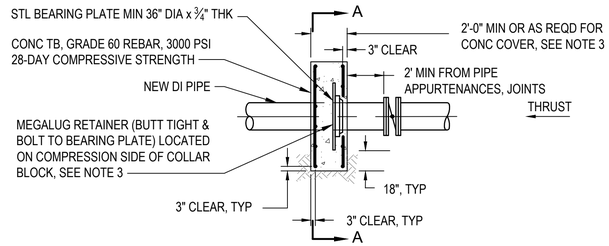
6. CONCRETE SHALL BE 3000 PSI MINIMUM 28 DAY COMPRESSIVE STRENGTH.

7. BEARING AREAS WHERE EXISTING PIPE WILL BE ABANDONED IN PLACE, AS SHOWN ON PLAN, SHALL INCLUDE ½" STEEL PLATE AT THE BASE OF THE THRUST BLOCK. THE MINIMUM BEARING AREA OF THE STEEL PLATE SHALL BE BASED ON DATA FROM THE TABLE.

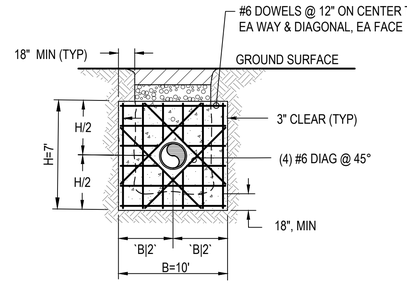
BEARING AREA, 'A', OF THRUST BLOCKS IN SQUARE FEET *							
FITTING SIZE	TEE, WYE, PLUG OR CAP	90°BEND, PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22 ° BEND	11¡° BEND
	A	A	A_1	A_2	A	A	A
4	1.4	1.9	2.7	1.9	1.0	-	-
6	2.8	4.0	5.6	4.0	2.1	1.1	-
8	4.8	6.8	9.6	6.8	3.7	1.9	0.9
10	7.3	10.3	14.5	10.3	5.6	2.8	1.4
12	10.3	14.5	20.4	14.5	7.9	4.0	2.0
14	13.8	19.5	27.5	19.5	10.6	5.4	2.7
16	17.8	25.2	35.5	25.2	13.6	7.0	3.5
18	22.4	31.7	44.7	31.7	17.1	8.7	4.4
20	27.5	38.9	54.8	38.9	21.0	10.7	5.4
24	39.2	55.5	78.3	55.5	30.0	15.3	7.7

*ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION: BEARING AREA=(TEST PRESSURE/150) X (2000/SOIL BEARING STRESS) X (TABLE VALUE).

1 FM-C-130 STANDARD THRUST BLOCK DETAILS
SCALE: NTS



PLAN



SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE COMMERCIAL GRADE CONCRETE, 3,000 PSI COMPRESSIVE STRENGTH OR GREATER.

2. CONCRETE BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH ON SIDES AND BOTTOM OR 95% COMPACTED GRANULAR BACKFILL.

3. PROVIDE POLYETHYLENE (PE) ENCASEMENT FOR ALL PIPING AND RESTRAINT DEVICES IN CONTACT WITH CONCRETE AND WITHIN 1 FOOT OF ANCHOR WALL. PROVIDE MINIMUM OF 3" CONCRETE COVER OVER RESTRAINT DEVICES WITHIN ANCHOR WALL.

2 FM-C-130 CONCRETE ANCHOR BLOCK
SCALE: NTS

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Sub Consultant:

BID SET

Engineer's Seal: REGISTERED PROFESSIONAL ENGINEER, PE80998, Justin R Luce, OREGON, MAY 23, 2013, JUSTIN RUSSELL LUCE
RENEWS 12-31-24

Client / Owner: CLACKAMAS WATER ENVIRONMENT SERVICES

Project Title: WATER ENVIRONMENT SERVICES INTERTIE 2 DIVERSION FACILITY - PUMP STATION EXPANSION PROJECT

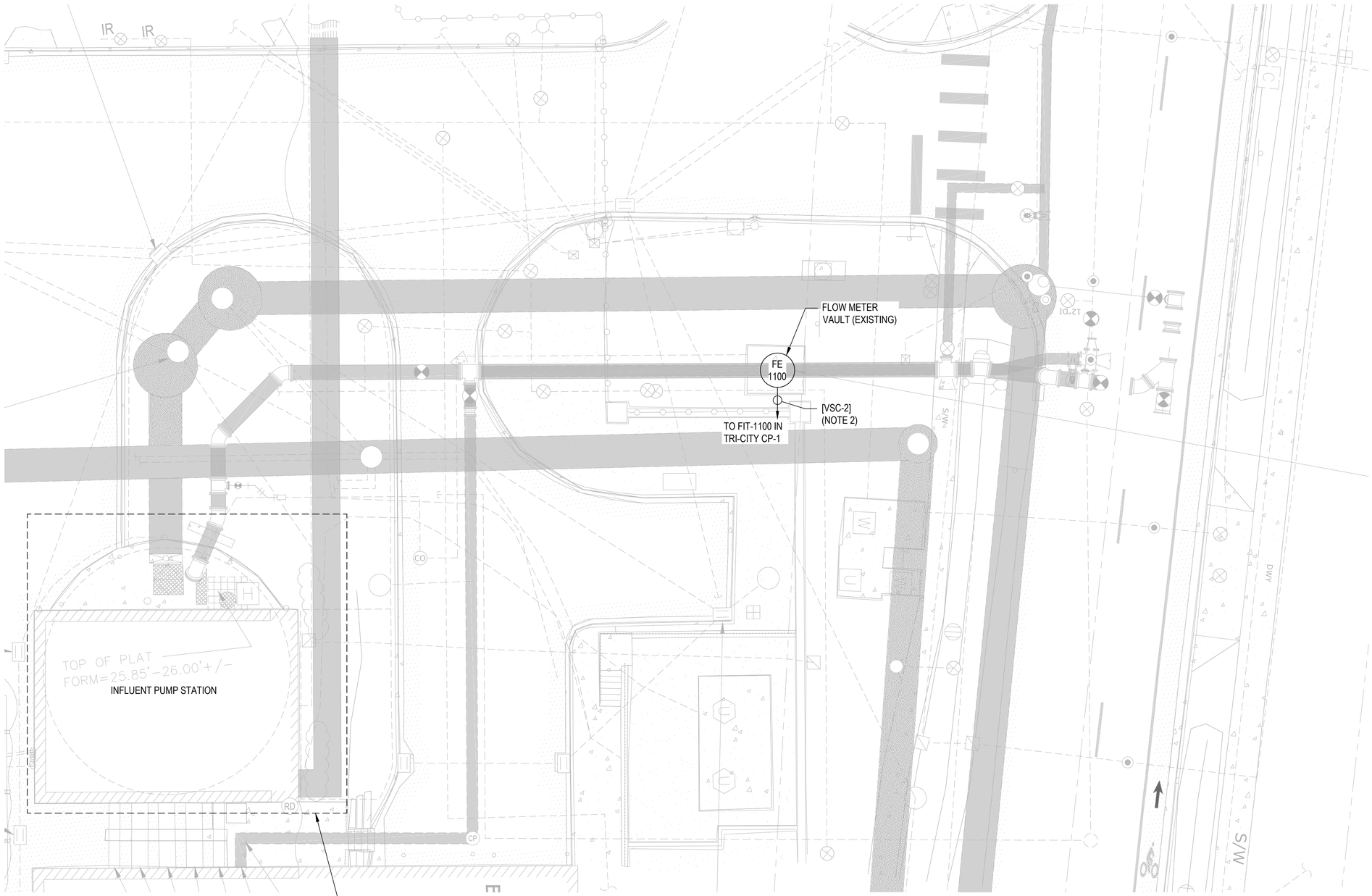
TRI-CITY FM IMPROVEMENTS

TRI-CITY FM CIVIL DETAILS - 2

Designed By:	JI
Drawn By:	NEM
Checked By:	AJC
Approved By:	JRL
Consor Project No.:	W223440OR
Issued On:	OCTOBER 2024
Sheet:	FM-D-521

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

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PLAN
SCALE: 1" = 10'

NOTES:

1. DISCONNECT EXISTING FLOW METER AND MAKE ELECTRICALLY SAFE PRIOR TO DEMOLITION. DEMOLISH EXISTING CABLES BETWEEN EXISTING FLOW METER AND FIT-1100 IN TRI-CITY CP-1. RETAIN EXISTING CONDUITS FOR REUSE. RETAIN ALL CIRCUITS IN VAULT NOT ASSOCIATED WITH EXISTING FLOW METER.
2. INSTALL (2) VENDOR SUPPLIED CABLES WITHIN EXISTING DUCT BANKS AND CONDUITS BETWEEN NEW FE-1100 AND NEW FIT-1100. CONTRACTOR TO CONFIRM EXISTING DUCT BANK ROUTING AND REQUIRED CABLE LENGTH PRIOR TO INSTRUMENT PROCUREMENT.

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Consultant: Jacobs

BID SET

Engineer's Seal: REGISTERED PROFESSIONAL ENGINEER 103888PE Digital Signature OREGON NOVEMBER 14, 2023 CHRISTOPHER ALEXANDER, USA
EXP. 6-30-2026

Client / Owner: CLACKAMAS WATER ENVIRONMENT SERVICES

Project Title:
WATER ENVIRONMENT SERVICES
INTERTIE 2 DIVERSION FACILITY
PUMP STATION EXPANSION
PROJECT

Drawing Title:
ELECTRICAL
TRI-CITY WPCP
INFLUENT PUMP STATION
ELECTRICAL SITE PLAN

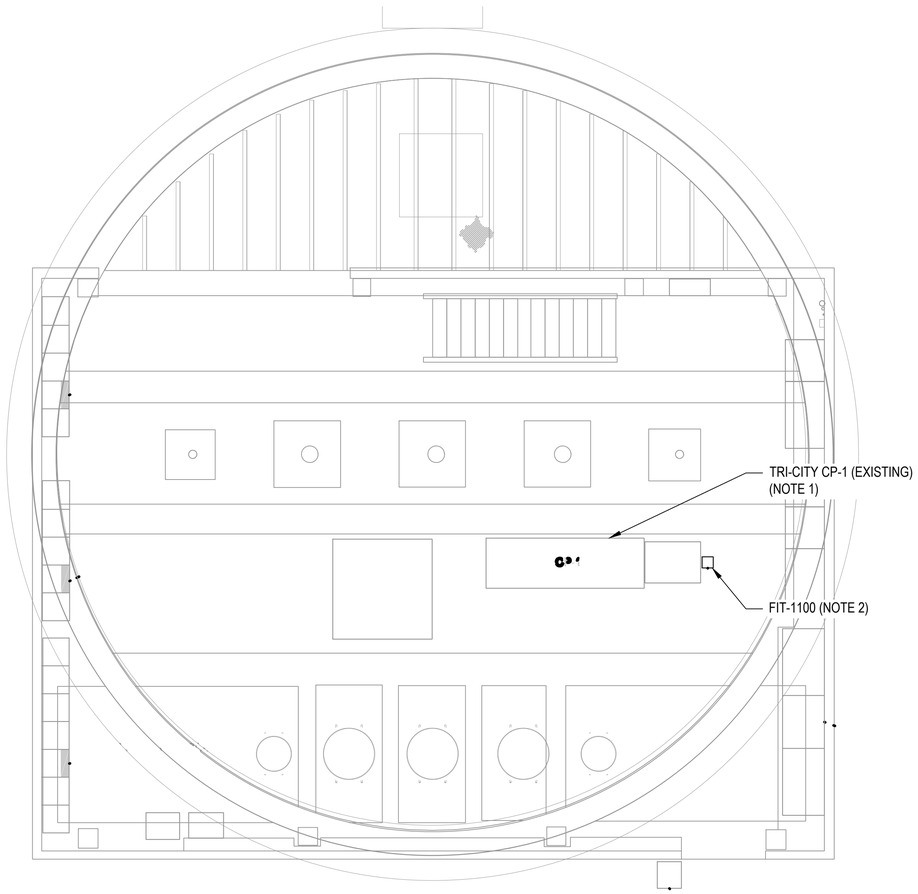
Designed By: CV	CONSOR Project No.: 223440
Drawn By: GK	Issued On: OCTOBER 2024
Checked By:	Drawing No.: FM-E-104
Approved By:	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\pw_workdir\jacobs-us-va-pw-02\d01701061\FM-E-104_D3640400.dwg, Plotted Date: September 26, 2024 12:20 PM By: King, Gavy

NOTES:

1. DEMOLISH EXISTING FLOW TRANSMITTER INSIDE EXISTING PANEL CP-1. DEMOLISH ALL SIGNAL WIRES ASSOCIATED BETWEEN THE EXISTING FLOW METER AND TRANSMITTER. RETAIN CONDUITS AND 120V CIRCUIT TO FIT-1100 FOR REUSE.

2. MOUNT FIT-1100 ON THE OUTSIDE OF EXISTING PANEL CP-1. RETAIN AND REUSE EXISTING 120V CIRCUIT TO FLOW TRANSMITTER LOCATION.



PLAN
SCALE: 1/4" = 1'-0"

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EXP. 6-30-2026

Client / Owner: CLACKAMAS WATER ENVIRONMENT SERVICES

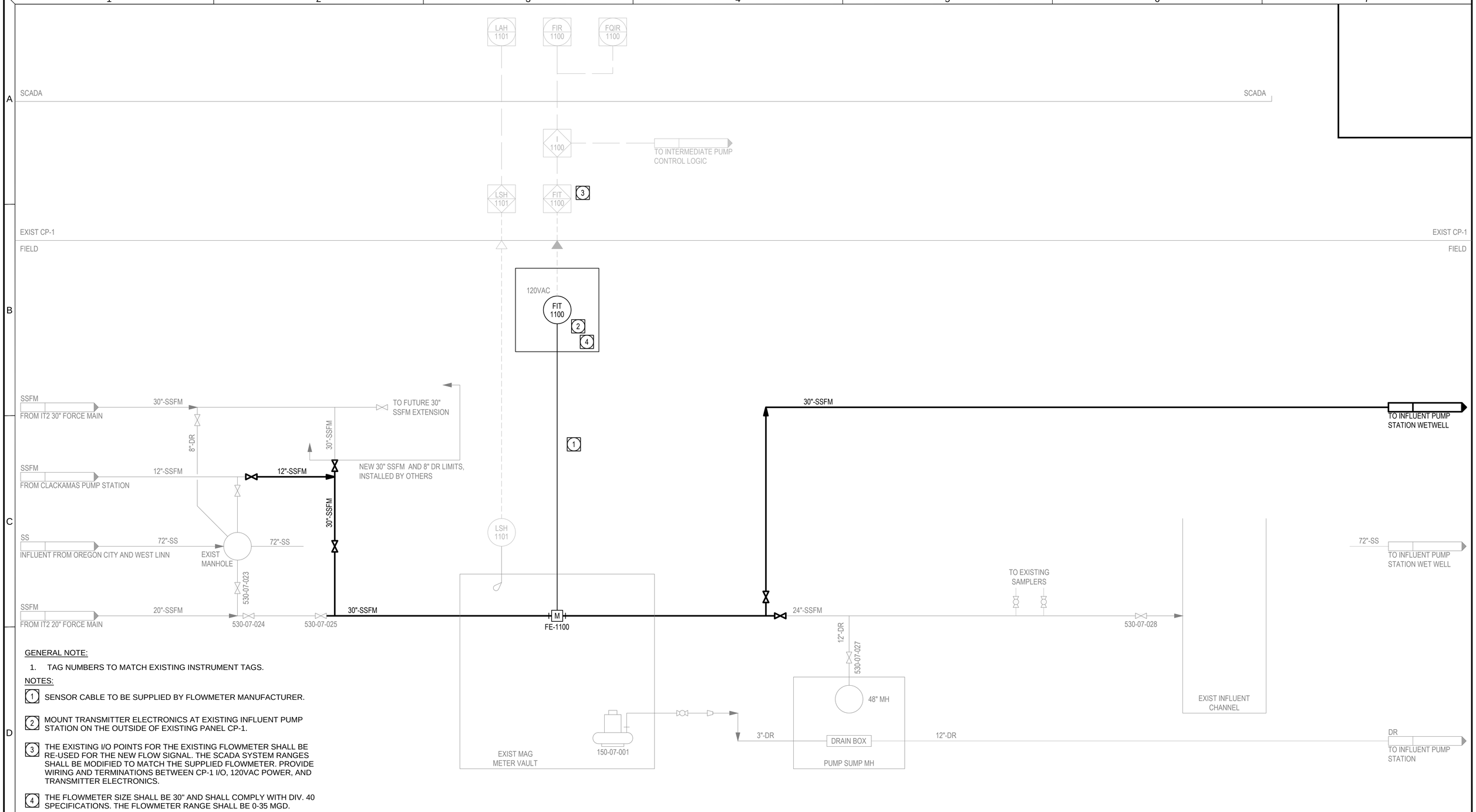
Project Title: WATER ENVIRONMENT SERVICES INTERTIE 2 DIVERSION FACILITY PUMP STATION EXPANSION PROJECT

Drawing Title: ELECTRICAL

TRI-CITY WPCP
INFLUENT PUMP STATION
ELECTRICAL PLAN

Designed By: CV	CONSOR Project No.: 223440
Drawn By: GK	Issued On: OCTOBER 2024
Checked By:	Drawing No.: FM-E-105
Approved By:	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\pw_workdir\jacobs-us-va-pw-02\d0170106\FM-E-105_D3640400.dwg, Plotted Date: September 30, 2024 11:46 AM By: King, Gavy



GENERAL NOTE:

1. TAG NUMBERS TO MATCH EXISTING INSTRUMENT TAGS.

NOTES:

1. SENSOR CABLE TO BE SUPPLIED BY FLOWMETER MANUFACTURER.
2. MOUNT TRANSMITTER ELECTRONICS AT EXISTING INFLUENT PUMP STATION ON THE OUTSIDE OF EXISTING PANEL CP-1.
3. THE EXISTING I/O POINTS FOR THE EXISTING FLOWMETER SHALL BE RE-USED FOR THE NEW FLOW SIGNAL. THE SCADA SYSTEM RANGES SHALL BE MODIFIED TO MATCH THE SUPPLIED FLOWMETER. PROVIDE WIRING AND TERMINATIONS BETWEEN CP-1 I/O, 120VAC POWER, AND TRANSMITTER ELECTRONICS.
4. THE FLOWMETER SIZE SHALL BE 30" AND SHALL COMPLY WITH DIV. 40 SPECIFICATIONS. THE FLOWMETER RANGE SHALL BE 0-35 MGD.

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Consultant: Jacobs

BID SET

Engineer's Seal: REGISTERED PROFESSIONAL ENGINEER 72449PE OREGON Digital Signature 12/20/23 NATHAN JOHN WAGNER
EXP. 6-30-2026

Client / Owner: CLACKAMAS WATER ENVIRONMENT SERVICES

Project Title: WATER ENVIRONMENT SERVICES INTERTIE 2 DIVERSION FACILITY PUMP STATION EXPANSION PROJECT

Drawing Title: TRI-CITY FM IMPROVEMENTS INSTRUMENTATION AND CONTROL

TRI-CITY FLOW METER P&ID

Designed By:	NW
Drawn By:	WR
Checked By:	
Approved By:	
CONSOR Project No.:	223440
Issued On:	OCTOBER 2024
Drawing No.:	FM-I-601

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

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