

NEW WATER AND SEWER SYSTEM  
RESOLUTE BAY, NUNAVUT  
OPERATIONS AND MAINTENANCE MANUAL

PREPARED FOR:  
GOVERNMENT OF NUNAVUT  
DEPARTMENT OF COMMUNITY & GOVERNMENT SERVICES  
P.O. BOX 1000 STATION 700  
IQALUIT, NU  
X0A 0H0

PREPARED BY:  
EXP SERVICES INC.  
100-2650 QUEENSVIEW DRIVE  
OTTAWA, ON  
K2B 8H6

DEPARTMENT OF COMMUNITY & GOVERNMENT SERVICES PROJECT NO. 12012  
EXP PROJECT NO. OTT-000206333-A0

SEPTEMBER 2016

## **Resolute Water Sewer System Rehabilitation**

The scope of work included the rehabilitation of the water distribution system and sanitary sewers for the hamlet of Resolute Bay. The work included but was not limited to, removal of existing water mains, sanitary sewers and concrete manholes, installation of new HDPE water mains and sanitary sewers, installation of prefabricated access vaults, replacement of building service connections and provision of temporary water and sewage systems.

**ELECTRICAL**



## SHOP DRAWING REVIEW

Project: Resolute Utilidor Upgrade

Location: Resolute, NU

General Contractor: Tower Arctic.

Engineer: EXP Services Inc.

Signage

Reviewed by: Jesse Mailloux

**REVIEWED**

*By Jesse Mailloux at 2:48 pm, May 20, 2014*







## SHOP DRAWING REVIEW

Project: Resolute Utilidor Upgrade

Location: Resolute, NU

General Contractor: Tower Arctic.

Engineer: EXP Services Inc.

Electrical equipment for control panels

Reviewed by: Darren Fraser

**REVIEWED**

By Darren Fraser at 3:14 pm, Apr 10, 2014

Ryfan Kitikmeot Ltd.  
Box 297, Kugluktuk, NU X0E 0E0  
Email: [dfraser@ryfan.ca](mailto:dfraser@ryfan.ca)

- DETAILS ON CONTROL FUSE INFORMATION AND ASSOCIATE FUSE HOLDER
- PROVIDE CONTROL SCHEMATIC IN CONTROL PANEL
- PROVIDE DETAILS ON KEY SWITCH ISOLATION WITH PILOT LIGHT FOR CIRCULATING PUMPS AS PER C-331 DETAIL 3

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**CHRIS MARCON, CET.**

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓
MAY 4, 2014		
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# Alarm Silence Push Button

**REVIEWED**

By Darren Fraser at 3:18 pm, Apr 10, 2014

Product: 800T-A2D1

Description: 800T Momentary Contact, Non-Illuminated

## ASSEMBLY

Factory or User Assembled?

Factory Assembled

## PUSH BUTTON DATA

Hazardous Location

No

Finger Safe Guards

No Guards

Operator Type

Flush Head

Cap/Button Color

Black

Special Mushroom Head

No Special Head

Block Type

Standard

Contact Blocks

1 N.O.

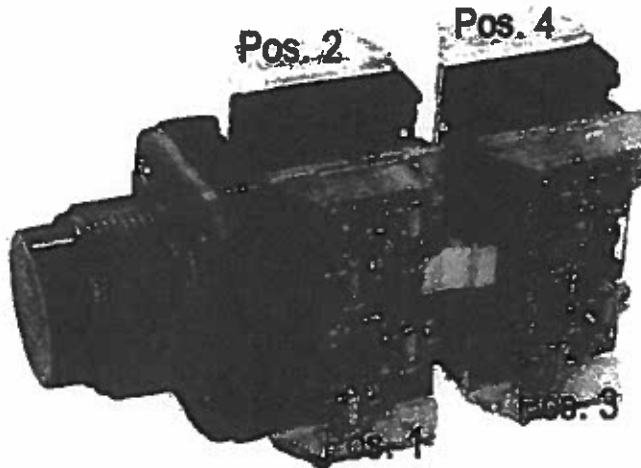
## CERTIFICATIONS AND APPROVALS

UL

Listed E14840, E10314; Guide #NCR, NOIV

CSA

LR1234, LR11924, 22.2 #14



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# PUSH BUTTON DEVICES

## MOMENTARY CONTACT PUSH BUTTONS, NON-ILLUMINATED

CONTACT CONFIGURATION	COLOR	TYPE 1 (METAL) (800T)	TYPE 2 (METAL) (800T)	TYPE 3 (PLASTIC) (800H)	TYPE 4 (PLASTIC) (800H)
		FLUSH HEAD	EXTENDED HEAD	BOOTLESS FLUSH HEAD	BOOTED
1 N.O.	●	800T-A1D1	800T-B1D1	800H-AR1D1	800H-R1D1
	●	800T-A2D1	800T-B2D1	800H-AR2D1	800H-R2D1
	●	800T-A6D1	800T-B6D1	800H-AR6D1	800H-R6D1
1 N.C.	●	800T-A1D2	800T-B1D2	800H-AR1D2	800H-R1D2
	●	800T-A2D2	800T-B2D2	800H-AR2D2	800H-R2D2
	●	800T-A6D2	800T-B6D2	800H-AR6D2	800H-R6D2
1 N.O. - 1 N.C.	●	800T-A1A	800T-B1A	800H-AR1A	800H-R1A
	●	800T-A2A	800T-B2A	800H-AR2A	800H-R2A
	●	800T-A6A	800T-B6A	800H-AR6A	800H-R6A

## MOMENTARY CONTACT PUSH BUTTONS, NON-ILLUMINATED WITH 2 COLOR MOLDED LEGEND CAP

CONTACT CONFIGURATION	BUTTON COLOR	LEGEND COLOR	LEGEND	HEAD TYPE	TYPE 1 (METAL) (800T)	TYPE 2 (METAL) (800T)
					FLUSH	EXTENDED
1 N.O. - 1 N.C.	●	○	START	FLUSH	800T-A103WA	800H-AR103WA
	●	○	STOP	EXTENDED	800T-B604WA	800H-BR604WA
1 N.O. - 1 N.C.	●	○	I	FLUSH	800T-A101WA	800H-AR101WA
	●	○	O	EXTENDED	800T-B602WA	800H-BR602WA
1 N.O. - 1 N.C.	●	○	FORWARD	FLUSH	800T-A210WA	800H-AR210WA
	●	○	REVERSE	FLUSH	800T-A210WA	800H-AR210WA
	●	○	JOG	FLUSH	800T-A212WA	800H-AR212WA
	●	○	UP	FLUSH	800T-A213WA	800H-AR213WA
	●	○	DOWN	FLUSH	800T-A214WA	800H-AR214WA
	●	○	R	FLUSH	800T-A711WA	800H-AR711WA

## MOMENTARY CONTACT PUSH BUTTONS, ILLUMINATED

TYPE	COLOR	TYPE 1 (METAL) (800T)	TYPE 2 (METAL) (800T)	TYPE 3 (PLASTIC) (800H)	TYPE 4 (PLASTIC) (800H)
		EXTENDED HEAD WITHOUT GUARD	EXTENDED HEAD WITH GUARD	EXTENDED HEAD WITHOUT GUARD	EXTENDED HEAD WITH GUARD
• UNIVERSAL LED	●	800T-QBH2R	800T-QAH2R	800H-QRBH2R	800H-QRAH2R
	●	800T-QBH2G	800T-QAH2G	800H-QRBH2G	800H-QRAH2G
	●	800T-QBH2A	800T-QAH2A	800H-QRBH2A	800H-QRAH2A
• TRANSFORMER	●	800T-PBH16R	800T-PAH16R	800H-PRBH16R	800H-PRAH16R
	●	800T-PBH16G	800T-PAH16G	800H-PRBH16G	800H-PRAH16G
	●	800T-PBH16A	800T-PAH16A	800H-PRBH16A	800H-PRAH16A
• LED	●	800T-PBH16R	800T-PAH16R	800H-PRBH16R	800H-PRAH16R
	●	800T-PBH16G	800T-PAH16G	800H-PRBH16G	800H-PRAH16G
• 120V AC, 50/60 HZ	●	800T-PBH16A	800T-PAH16A	800H-PRBH16A	800H-PRAH16A
	●	800T-PBH16G	800T-PAH16G	800H-PRBH16G	800H-PRAH16G
• 1 N.O. - 1 N.C.	●	800T-PBH16R	800T-PAH16R	800H-PRBH16R	800H-PRAH16R
	●	800T-PBH16G	800T-PAH16G	800H-PRBH16G	800H-PRAH16G

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CHRIS MARCON, CET.

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed ✓	Reviewed with Comments	Resubmit See Comments
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# Panel Reset Push Button

**REVIEWED**

By Darren Fraser at 3:18 pm, Apr 10, 2014

Product: 800T-A2D2

Description: 800T Momentary Contact, Non-Illuminated

## ASSEMBLY

Factory or User Assembled?

Factory Assembled

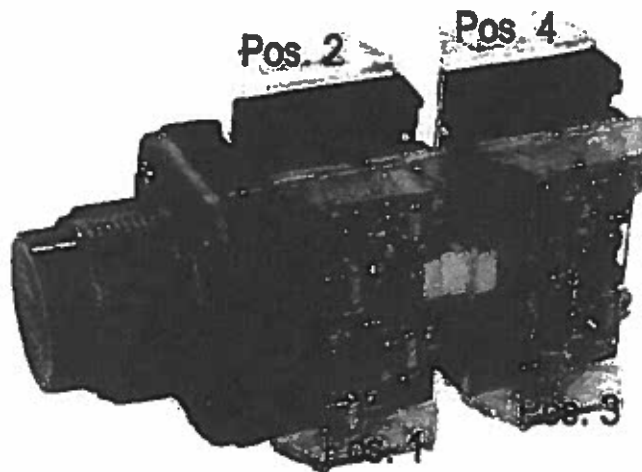
## PUSH BUTTON DATA

Hazardous Location	No
Finger Safe Guards	No Guards
Operator Type	Flush Head
Cap/Button Color	Black
Special Mushroom Head	No Special Head
Block Type	Standard
Contact Blocks	1 N.C.


## CERTIFICATIONS AND APPROVALS

UL  
CSA

Listed E14840, E10314; Guide #NRCR, NOIV  
LR1234, LR11924, 22.2 #14



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



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# PUSH BUTTON DEVICES

## MOMENTARY CONTACT PUSH BUTTONS, NON-ILLUMINATED

CONTACT CONFIGURATION	COLOR	TYPE 411X METAL (800T)		TYPE 400/13 PLASTIC (800H)	
		FLUSH HEAD	EXTENDED HEAD	BOOTLESS FLUSH HEAD	BOOTED
1 N.O.	●	800T-A1D1	800T-B1D1	800H-AR1D1	800H-R1D1
	●	800T-A2D1	800T-B2D1	800H-AR2D1	800H-R2D1
	●	800T-A6D1	800T-B6D1	800H-AR6D1	800H-R6D1
1 N.C.	●	800T-A1D2	800T-B1D2	800H-AR1D2	800H-R1D2
	●	800T-A2D2	800T-B2D2	800H-AR2D2	800H-R2D2
	●	800T-A6D2	800T-B6D2	800H-AR6D2	800H-R6D2
1 N.O. - 1 N.C.	●	800T-A1A	800T-B1A	800H-AR1A	800H-R1A
	●	800T-A2A	800T-B2A	800H-AR2A	800H-R2A
	●	800T-A6A	800T-B6A	800H-AR6A	800H-R6A


## MOMENTARY CONTACT PUSH BUTTONS, NON-ILLUMINATED WITH 2-COLOR MOLDED LEGEND CAP

CONTACT CONFIGURATION	BUTTON COLOR	LEGEND COLOR	LEGEND	HEAD TYPE	TYPE 411X METAL (800T)		TYPE 400/13 PLASTIC (800H)	
1 N.O. - 1 N.C.	●	○	START	FLUSH				
	●	○	STOP	EXTENDED				
1 N.O. - 1 N.C.	●	○	I	FLUSH				
	●	○	O	EXTENDED				
1 N.O. - 1 N.C.	●	○	FORWARD	FLUSH				
	●	○	REVERSE	FLUSH				
	●	○	JOG	FLUSH				
	●	○	UP	FLUSH				
	●	○	DOWN	FLUSH				
	●	○	R	FLUSH				

## MOMENTARY CONTACT PUSH BUTTONS, ILLUMINATED

TYPE	COLOR	TYPE 411X METAL (800T)		TYPE 400/13 PLASTIC (800H)	
		EXTENDED HEAD WITHOUT GUARD	EXTENDED HEAD WITH GUARD	EXTENDED HEAD WITHOUT GUARD	EXTENDED HEAD WITH GUARD
• UNIVERSAL LED • 12-130V AC/DC • 1 N.O. - 1 N.C.	●	800T-QBH2R	800T-QAH2R	800H-QRBH2R	800H-QRAH2R
	●	800T-QBH2G	800T-QAH2G	800H-QRBH2G	800H-QRAH2G
	■	800T-QBH2A	800T-QAH2A	800H-QRBH2A	800H-QRAH2A
• TRANSFORMER • LED • 120V AC, 50/60 HZ • 1 N.O. - 1 N.C.	●	800T-PBH16R	800T-PAH16R	800H-PRBH16R	800H-PRAH16R
	●	800T-PBH16G	800T-PAH16G	800H-PRBH16G	800H-PRAH16G
	●	800T-PBH16A	800T-PAH16A	800H-PRBH16A	800H-PRAH16A

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CHRIS MARCON, CET.

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Reviewed ✓	Reviewed with Comments	Resubmit See Comments
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# Flow "Push to Test" Green Pilot Light

**REVIEWED**

By Darren Fraser at 3:18 pm, Apr 10, 2014

Product: 800T-QT10G

Description: 800T Standard, Push-To-Test, Dual Input

## ASSEMBLY

Factory or User Assembled?

Factory Assembled

## PUSH BUTTON DATA

Hazardous Location

No

Finger Safe Guards

No Guards

Power Module Type

Full Voltage

Lamp Test Options

Push-to-Test

Illumination Options

Incandescent

Voltage

120V AC

Lens Color

Green

Block Type

Standard

Contact Blocks

1 N.O. - 1 N.C. (Standard with Push-to-Test)

— Provide LED Lamp

## CERTIFICATIONS AND APPROVALS

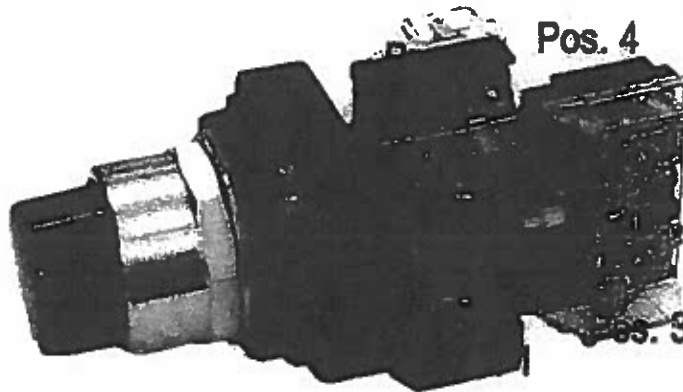
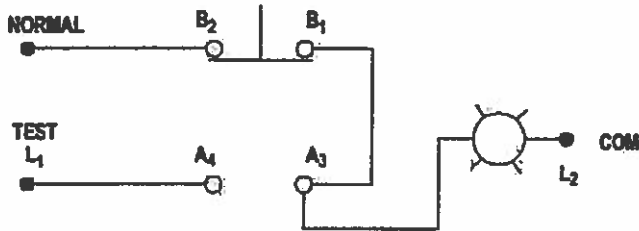
UL

Listed E14840, E10314; Guide #NKCRC, NOIV


CSA

LR1234, LR11924, 22.2 #14

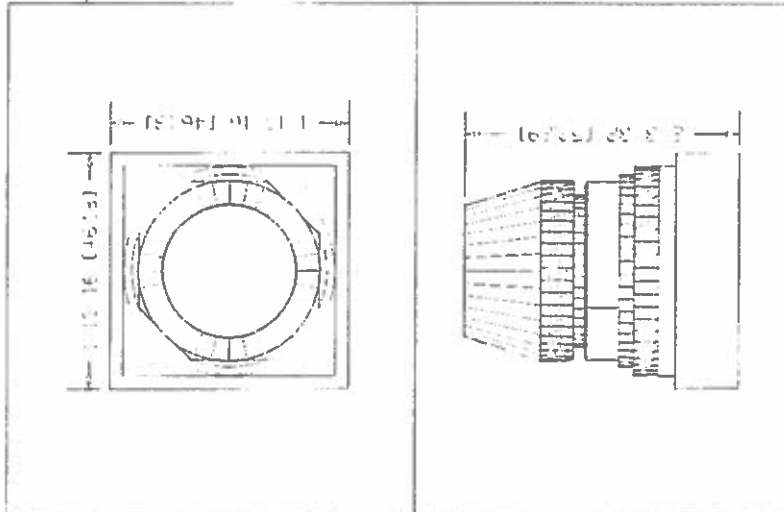
## Push-to-Test Pilot Light Device Schematic




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BOUILLON À VIS  
 1/2" x 1/2" x 1/2" - 1/2"



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/		
 <b>MAY 4, 2014</b>		
<small>This review of this drawing does not in any way  relieve the contractor of responsibility for its  accuracy or for compliance with the contract  documents.</small>		

# No Flow "Push to Test" Red Pilot Light

**REVIEWED**

By Darren Fraser at 3:19 pm, Apr 10, 2014

Product: 800T-QT10R

Description: 800T Standard, Push-To-Test, Dual Input

## ASSEMBLY

Factory or User Assembled?

Factory Assembled

## PUSH BUTTON DATA

Hazardous Location	No
Finger Safe Guards	No Guards
Power Module Type	Full Voltage
Lamp Test Options	Push-to-Test
Illumination Options	Incandescent
Voltage	120V AC
Lens Color	Red
Block Type	Standard
Contact Blocks	1 N.O. - 1 N.C. (Standard with Push-to-Test)

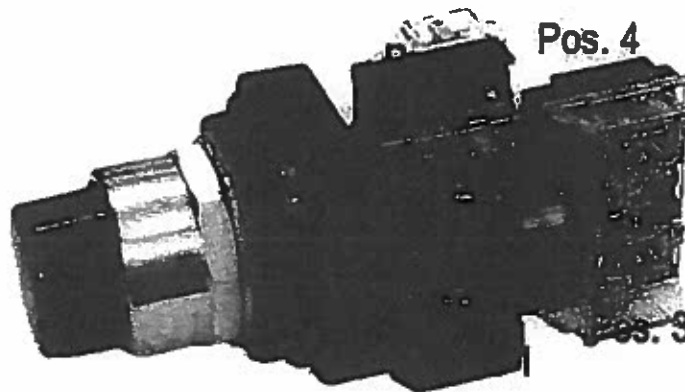
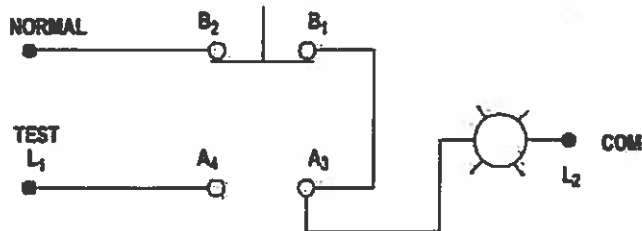
Provide LED  
TYPE LAMP

## CERTIFICATIONS AND APPROVALS


UL  
CSA

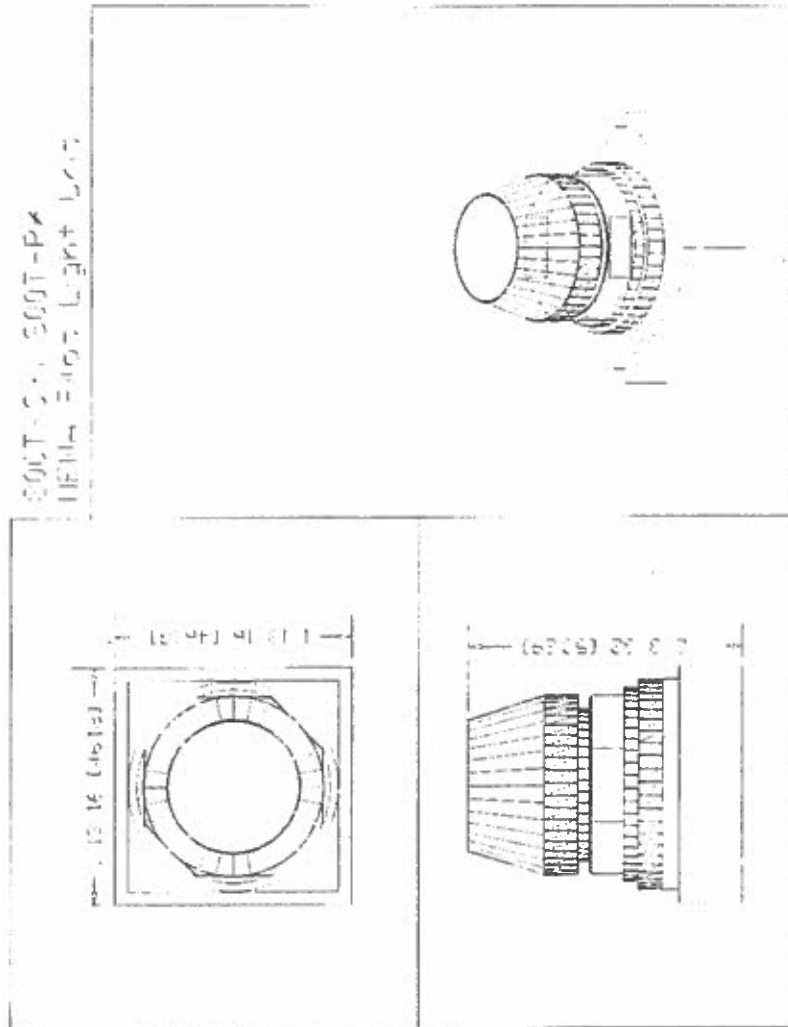
Listed E14940, E10314; Guide #NCCR, NOV  
LR1234, LR11924, 22.2 #14


## Push-to-Test Pilot Light Device Schematic



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Relay R1

**REVIEWED**

By Darren Fraser at 3:19 pm, Apr 10, 2014


## LY2 AC110/120

### Standard Model , Plug-In Type , DPDT

#### Ratings

Product classification	Monostable relays Standard type
Coil ratings	110 VAC 9.9 mA (50 Hz), 110 VAC 8.4 mA (60 Hz), 120 VAC 10.9 mA (50 Hz), 120 VAC 9.2 mA (60 Hz)
Coil resistance	4430 Ohm
Operate voltage (Set voltage)	80% Max.
Release voltage (Reset voltage)	30% Min. (50 Hz), 30% Min. (60 Hz)
Max. voltage	110% (of rated voltage)
Power consumption (Single stable)	Approx. 0.9 to 1.1 VA (60 Hz)
Operating indicator	Not equipped
Coil surge killer	Not equipped
Contact Type	DPDT
Contact method	Single
Contact material	Contact body material: Ag alloy Contact finish: Nothing
Contact rated load	110 VAC 10 A (Resistive load ( $\cos \phi = 1$ )) 110 VAC 7.5 A (Inductive load ( $\cos \phi = 0.4$ )) 24 VDC 10 A (Resistive load) 24 VDC 5 A (Inductive load ( $L/R = 7$ ms))
Maximum switching voltage	250 VAC (Resistive load ( $\cos \phi = 1$ )) 250 VAC (Inductive load ( $\cos \phi = 0.4$ )) 125 VDC (Resistive load) 125 VDC (Inductive load ( $L/R = 7$ ms))
Maximum switching current	AC: 10 A (Resistive load ( $\cos \phi = 1$ )) AC: 10 A (Inductive load ( $\cos \phi = 0.4$ )) DC: 10 A (Resistive load) DC: 10 A (Inductive load ( $L/R = 7$ ms))
Maximum switching power	AC: 1100 VA (Resistive load ( $\cos \phi = 1$ )) AC: 825 VA (Inductive load ( $\cos \phi = 0.4$ )) DC: 240 W (Resistive load) DC: 120 W (Inductive load ( $L/R = 7$ ms))
Failure rate	100 mA at 5 VDC (failure level: P Reference value)
Ambient temperature	Operating: -25 to 55 CEL (with no icing or condensation)
Ambient humidity	Operating: 5 to 85% RH (with no icing or condensation)

Provide 110/120 VOLT  
AC RATED RELAY.  
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# Characteristics

Contact resistance	Max 50 mOhm, Measuring the voltage drop across the contacts by applying test voltage/current as 5 VDC 1 A
Operating time (set time)	25 ms Max.
Release time (Reset time)	25 ms Max.
Max. operating frequency (Mechanical)	18000 opn /h
Max. operating frequency (Electrical)	1800 opn /h
Insulation resistance	Between coil and contacts: 10C MOhm Min. (at 500 VDC) Between contacts of different polarity: 100 MOhm Min. (at 500 VDC) Between contacts of same polarity: 100 MOhm Min. (at 500 VDC)
Dielectric strength	Between coil and contacts: 2000 VAC 50/60 Hz for 1 min (Leakage current 3 mA 50/60 Hz 1 min) Between contacts of different polarity: 2000 VAC 50/60 Hz for 1 min (Leakage current 3 mA 50/60 Hz 1 min) Between contacts of same polarity: 1000 VAC 50/60 Hz for 1 min (Leakage current 3 mA 50/60 Hz 1 min)
Vibration resistance (Destruction)	10 to 55 to 10 Hz 0.5-mm single amplitude (1.0-mm double amplitude) for 2 hours each in X, Y, and Z directions (No defect in appearance and construction after applying variable vibration in each directions for 2 hours )
Vibration resistance (Malfunction)	10 to 55 to 10 Hz 0.5-mm single amplitude (1.0-mm double amplitude) in each direction
Shock resistance (Destruction)	1000 m/s**2 each direction 3 times (No defect in appearance and construction after applying shock in each directions 3 times.)
Shock resistance (Malfunction)	200 m/s**2 (Contacts must not open for 1 ms or longer after the relay is subjected to a shock in each direction 3 times.)
Endurance (Mechanical)	5000000 operations Min.
Endurance (Electrical)	500000 operations Min.
Protective structure	Closed type (cover)
Applicable standard (UL)	Standard No.: UL508 File No.: E41643
Applicable standard (CSA)	Standard No.: C22.2 No 0, No 14 File No.: LR31928
Applicable standard (TUV)	R50030064
Applicable standard (SEV)	98 5 50071.02
Applicable standard (LR)	00/10047
Applicable standard (Other)	Conformed standard 2: Electrical Appliance and Matenal Safety Law
Terminal structure	Plug-in
Weight	Approx. 40 g

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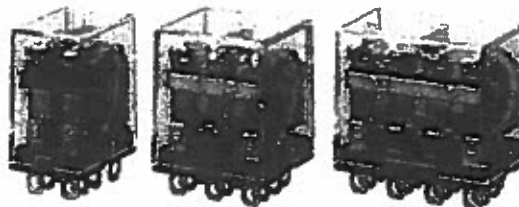


# Bi-power Relays

# LY

## Power-switching Compact General-purpose Relays

- The standard models include models that are compliant with the UL, CSA, and SEV safety standards and with the Electrical Appliances and Material Safety Act.
- Equipped with an arc barrier for arc interruption.
- Withstand voltages up to 2,000 V.
- New built-in diode and built-in CR circuit models have joined the series.
- The lineup also includes models that are compliant with the LR and VDE safety standards.
- Single-pole and double-pole models have AC4 ratings and DC2 ratings (operating coil ratings: 100/110 VAC, 110/120 VAC, 200/220 VAC, 220/240 VAC, and 100/110 VDC).
- Three-pole and four-pole models have AC4 ratings and DC2 ratings (operating coil ratings: 100/110 VAC, 200/220 VAC and 100/110 VDC).



Refer to the standards certifications and compliance section of your OMRON website for the latest information on certified models.

Refer to the Common Relay Precautions.

### Model Number Structure

Classification	Structure Number of poles	Relays with Plug-in Terminals		Relays with PCB Terminals	Case-surface mounting
			With operation indicators		
Standard models Compliance with Electrical Appliances and Material Safety Act	1	*LY1	*LY1N	*LY1-0	*LY1F
	2	*LY2	*LY2N	*LY2-0	*LY2F
	2	*LY2Z	*LY2ZN	*LY2Z-0	*LY2ZF
	4	*LY4	*LY4N	*LY4-0	*LY4F
Models with diode for coil surge absorption (DC coil specification only) 	1	*LY1-D	*LY1N-D2	—	—
	2	*LY2-D	*LY2N-D2	—	—
	2	*LY2Z-D	*LY2ZN-D2	—	—
	4	*LY4-D	*LY4N-D2	—	—
Models with CR circuits for coil surge absorption  (AC coil specification only)	1	—	—	/	/
	2	*LY2-CR	*LY2N-CR		
	2	*LY2Z-CR	*LY2ZN-CR		

- Note: 1. Cells with a diagonal line cannot be manufactured. Ask your OMRON representative for details on manufacturing products for cells containing "—" in the above table.  
 2. If #187 tab terminals are required, use the LY1F-T2 or LY2F-T2 (single-pole or double-pole models only).  
 3. Refer to page 12 for information on plug-in terminal and socket combinations.  
 4. Items with an asterisk (\*) in the table are certified for UL, CSA, and SEV. This is indicated with a certification mark on the products.  
 5. Items with two asterisks (\*\*) in the table are certified for UL and CSA. This is indicated with a certification mark on the products.  
 6. All models in the table are certified for IEC (TUV).  
 7. The models with plug-in terminals (single-pole, double-pole, and 4-pole) were combined with the PTF-E for the EC Declaration of Conformity. These products display the CE Marking.

ORIGINAL SIGNED BY  
**CHRIS MARCON, CET.**

PROVIDE 110/120VOLT  
AC RATED RELAY.

BOUTHILLETTE PARIZEAU INC. (BPA)		
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	✓	
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## Ordering Information

## Models with Plug-in Terminals

Number of poles		1 pole		2 poles		3 poles		4 poles	
Classification	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	
Models with single contacts	Standard models	LY1 12, 24, 100/110, 110/120, or 200/220 VAC 12, 24, 48, or 100/110 VDC	LY2 12, 24, 100/110, 110/120, 200/220, or 220/240 VAC 12, 24, 48, or 100/110 VDC	LY3 12, 24, 100/110, 110/120, 200/220, or 220/240 VAC 12, 24, 48, or 100/110 VDC	LY8 12, 24, 100/110, 110/120, 200/220 VAC 12, 24, 48, or 100/110 VDC	LY9 12, 24, 100/110, 110/120, 200/220 VAC 12, 24, 48, or 100/110 VDC			
	Models with built-in operation indicators	LY1H 12, 24, 100/110, 110/120, or 200/220 VAC 12, 24, 48, or 100/110 VDC	LY2H 12, 24, 100/110, 110/120, 200/220, or 220/240 VAC 12, 24, 48, or 100/110 VDC	LY3H 12, 24, 100/110, 110/120, 200/220, or 220/240 VAC 12, 24, 48, or 100/110 VDC	LY8H 12, 24, 100/110, 110/120, 200/220 VAC 12, 24, 48, or 100/110 VDC	LY9H 12, 24, 100/110, 110/120, 200/220 VAC 12, 24, 48, or 100/110 VDC			
	Models with built-in diodes	LY1-D 12, 24, 48, or 100/110 VDC	LY2-D 12, 24, 48, or 100/110 VDC	LY3-D 12, 24, 48, or 100/110 VDC	LY8-D 12, 24, 48, or 100/110 VDC	LY9-D 12, 24, 48, or 100/110 VDC			
	Models with built-in diodes and operation indicators	LY1H-D 12, 24, 48, or 100/110 VDC	LY2H-D 12, 24, 48, or 100/110 VDC	LY3H-D 12, 24, 48, or 100/110 VDC	LY8H-D 12, 24, 48, or 100/110 VDC	LY9H-D 12, 24, 48, or 100/110 VDC			
	Models with built-in CR circuits	—	—	LY3-CR 100/110, 110/120, 200/220, or 220/240 VAC	—	—			
Models with built-in CR circuits and operation indicators	—	—	LY3H-CR 100/110, 110/120, 200/220, or 220/240 VAC	—	—				
Bifurcated contacts	Standard models	—	LY2Z 100/110, 110/120, 200/220, or 220/240 VAC 12, 24, 48, or 100/110 VDC	—	—	—			
		—		—	—				
	Models with built-in operation indicators	—	LY2ZH 100/110, 110/120, 200/220, or 220/240 VAC 12, 24, 48, or 100/110 VDC	—	—	—			
	Models with built-in diodes	—	LY2Z-D 12, 24, 48, or 100/110 VDC	—	—	—			
	Models with built-in diodes and operation indicators	—	LY2ZH-D 12, 24, 48, or 100/110 VDC	—	—	—			
	Models with built-in CR circuits	—	LY2Z-CR 100/110 VAC	—	—	—			
Models with built-in CR circuits and operation indicators	—	LY2ZH-CR 100, 110, 110/120, or 200/220 VAC	—	—	—				

## Relays with PCB Terminals

Number of poles		1 pole		2 poles		3 poles		4 poles	
Classification	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	
Models with single contacts	LY1-0	24, 100/110, 110/120, or 200/220 VAC	LY2-0	12, 24, 100/110, 110/120, 200/220, or 220/240 VAC	LY3-0	24, 100/110, or 200/220 VAC	LY4-0	24, 100/110, or 200/220 VAC	
		12 or 24 VDC		12, 24, 48, or 100/110 VDC		12, 24, 48, or 100/110 VDC			
Bifurcated contacts	—	—	LY2Z-0	100/110 VAC 24, 48, or 100/110 VDC	—	—	—	—	

## Case-surface Mounting

Number of poles		1 pole		2 poles		3 poles		4 poles	
Classification	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	
Modules with single contacts	LY1F	24, 100/110, 110/120, 200/220, or 220/240 VAC	LY2F	12, 24, 100/110, 110/120, 200/220, or 220/240 VAC	LY3F	12, 24, 100/110, or 200/220 VAC	LY4F	12, 24, 100/110, or 200/220 VAC	
		8, 12, 24, or 100/110 VDC		12, 24, 48, or 100/110 VDC		12, 24, or 100/110 VDC		12, 24, or 100/110 VDC	
Bifurcated contacts	---	---	LY2ZF	24, 100/110, or 200/220 VAC 12 or 24 VDC	---	---	---	---	

## Minimum Order

When ordering the following models, please order the minimum amount that is specified in the following table.

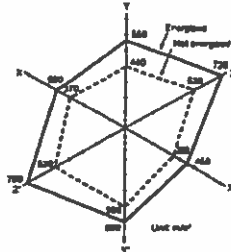
Number of poles		2 poles		4 poles		Minimum order (No. of Relays)
Classification	Model	Rated voltage (V)	Model	Rated voltage (V)		
Standard models	LY2	100/110, 200/220 VAC, 12 or 24 VDC	LY4	100/110, 200/220 VAC, or 24 VDC	10	
Models with built-in operation indicators	LY2H	100/110, 200/220 VAC, or 24 VDC	LY4H	100/110, 200/220 VAC, or 24 VDC		
Models with built-in diodes	LY2-D	24 VDC	—	—		
Models with built-in diodes and operation indicators	LY2H-D2	24 VDC	LY4H-D2	24 VDC		

Provide 110/120 VOLT  
AC RELAY

ORIGINAL SIGNED BY  
CHRIS MARCON, CE

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	
MAY 4, 2014		
This review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.		

# Malfunctioning Shock LY2 100/110 VAC



N = 20  
Measurement: Shock was applied 2 times each in 6 directions along 3 axes with the Relay energized and not energized to check the shock values that cause the Relay to malfunction.  
Criteria: Non-energized: 200 m/s<sup>2</sup>, Energized: 200 m/s<sup>2</sup>

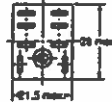
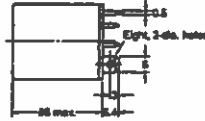


## Dimensions

(Unit: mm)

## Solder terminals

LY1  
LY1N  
LY1-D  
LY1N-D2



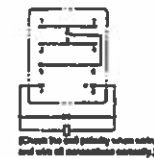
## Terminal Arrangement/Internal Connections (Bottom View)

LY1



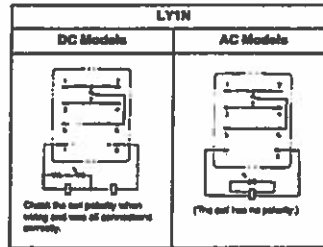
(The coil has no polarity.)

LY1N-D



(Check the coil polarity when wiring and wire all connections correctly.)

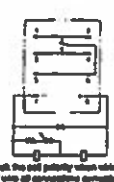
- Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.  
2. The indicator is red for AC and green for DC.  
3. The operation indicator indicates the energization of the coil and does not represent contact operation.



(Check the coil polarity when wiring and wire all connections correctly.)

(The coil has no polarity.)

LY1N-D2



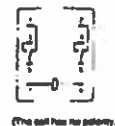
(Check the coil polarity when wiring and wire all connections correctly.)

LY2  
LY2Z  
LY2N  
LY2ZN

LY2-D  
LY2Z-D  
LY2N-D2  
LY2ZN-D2

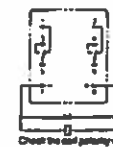
## Terminal Arrangement/Internal Connections (Bottom View)

LY2(Z)



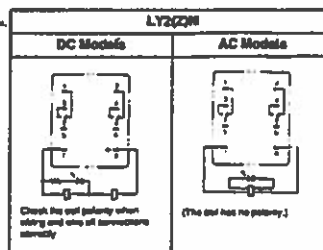
(The coil has no polarity.)

LY2(Z)-D



(Check the coil polarity when wiring and wire all connections correctly.)

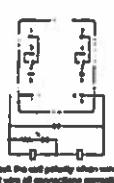
- Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.  
2. The indicator is red for AC and green for DC.  
3. The operation indicator indicates the energization of the coil and does not represent contact operation.



(Check the coil polarity when wiring and wire all connections correctly.)

(The coil has no polarity.)

LY2(Z)-D2



(Check the coil polarity when wiring and wire all connections correctly.)

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VERIFY COIL VOLTAGE  
PROVIDE 110/120VAC  
TYPE UNIT

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓
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**Connection Sockets** (Refer to *Common Socket* and *DIN Track Products* for external dimensions.)

Item	Front-mounting Sockets	Back-mounting Sockets		
	Track or screw mounting	Solder terminals	Wrapping terminals	Relays with PCB Terminals
1 or 2	PTF08A(-E)	PT08	PT08CN	PT08-0
3	PTF11A	PT11	PT11CN	PT11-0
4	PTF14A(-E)	PT14	PT14CN	PT14-0

The following front connector sockets are all individually certified for UL/CSA: PTF08A, PTF11A, and PTF14A.

Model	Standards	No.
PTF08A	UL	File No. E37929
PTF11A	CSA	File No. LR31828
PTF14A		

Note: The PTF14A-E Relays have finger protection. Round terminals cannot be used. Use forked terminals.

**Relay Hold-down Clips** (Refer to *Common Socket* and *DIN Track Products* for external dimensions.)

Used with Socket		Used with Socket mounting plate	For models with built-in CR circuits	
LYC-A1	LYC-P	LYC-S	Y92H-3	LYC-1

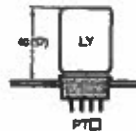
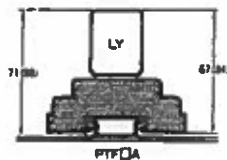
**Connection Socket and Hold-down Clip Application Table**

Applicable Relay	Item	Front-mounting Sockets				Back-mounting Sockets			
	Number of poles	Track or screw mounting				Solder terminals, wrapping terminals, or PCB terminals			
		PTF08A	PTF11A	PTF14A	Applicable Hold-down Clips	PT08(CN) PT08-0	PT11(CN) PT11-0	PT14(CN) PT14-0	Applicable Hold-down Clips
• Standard models: LYC • Bifurcated contact models: LYCZ • Models with built-in operation indicators: LYCN • Models with built-in diodes: LYC-D(2)	1 or 2	●			PYC-A1	●			PYC-P
	3		●				●		
	4			●				●	
• Models with built-in CR circuits: LYC-CR	2	●			Y92H-3	●			PYC-1

**Mounting Height with Sockets**

Front-mounting Sockets

Back-mounting Sockets



Note: 1. The PTF08A can be mounted on a track or with screws.  
2. The measurements in parentheses are for the LYC-CR (built-in CR circuit).

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BASE TO MATCH  
120 VOLT AC TYPE  
RELAY

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓
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Relay R2

**REVIEWED**

By Darren Fraser at 3:19 pm, Apr 10, 2014

**LY3 AC120**

**Standard Model , Plug-In Type , 3PDT**

**Ratings**

Product classification	Monostable relays Standard type
Coil resistance	4430 Ohm
Operate voltage (Set voltage)	80% Max.
Release voltage (Reset voltage)	30% Min. (50 Hz), 30% Min. (60 Hz)
Max. voltage	110% (of rated voltage)
Power consumption (Single stable)	Approx. 1.6 to 2.0 VA (60 Hz)
Operating indicator	Not equipped
Coil surge killer	Not equipped
Contact Type	3PDT
Contact method	Single
Contact material	Contact body material: Ag alloy Contact finish: Nothing
Contact rated load	11C VAC 10 A (Resistive load (cos phi = 1)) 110 VAC 7.5 A (Inductive load (cos phi = 0.4)) 24 VDC 10 A (Resistive load) 24 VDC 5 A (Inductive load (L/R = 7 ms))
Maximum switching voltage	250 VAC (Resistive load (cos phi = 1)) 250 VAC (Inductive load (cos phi = 0.4)) 125 VDC (Resistive load) 125 VDC (Inductive load (L/R = 7 ms))
Maximum switching current	AC: 10 A (Resistive load (cos phi = 1)) AC: 10 A (Inductive load (cos phi = 0.4)) DC: 10 A (Resistive load) DC: 10 A (Inductive load (L/R = 7 ms))
Maximum switching power	AC: 1100 VA (Resistive load (cos phi = 1)) AC: 825 VA (Inductive load (cos phi = 0.4)) DC: 240 W (Resistive load) DC: 120 W (Inductive load (L/R = 7 ms))
Failure rate	100 mA at 5 VDC (failure level: P Reference value)
Ambient temperature	Operating: -25 to 40 CEL (with no icing or condensation)
Ambient humidity	Operating: 5 to 85% RH (with no icing or condensation)

**Characteristics**

VERIFY COIL VOLTAGE  
120 VAC SPECIFIED

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CHRIS MARCON, CET

Provide 110/120VAC  
TYPE UNIT

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓
MAY 4, 2014		
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Contact resistance	Max. 50 mOhm. Measuring the voltage drop across the contacts by applying test voltage/current as 5 VDC 1 A
Operating time (set time)	25 ms Max
Release time (Reset time)	25 ms Max
Max. operating frequency (Mechanical)	18000 opn./h
Max. operating frequency (Electrical)	1800 opn./h
Insulation resistance	Between coil and contacts: 10C MOhm Min. (at 500 VDC) Between contacts of different polarity: 100 MOhm Min. (at 500 VDC) Between contacts of same polarity: 100 MOhm Min. (at 500 VDC)
Dielectric strength	Between coil and contacts: 2000 VAC 50/60 Hz for 1 min (Leakage current 3 mA 50/60 Hz 1 min) Between contacts of different polarity: 2000 VAC 50/60 Hz for 1 min (Leakage current 3 mA 50/60 Hz 1 min) Between contacts of same polarity: 1000 VAC 50/60 Hz for 1 min (Leakage current 3 mA 50/60 Hz 1 min)
Vibration resistance (Destruction)	10 to 55 to 10 Hz 0.5-mm single amplitude (1 0-mm double amplitude) for 2 hours each in X, Y, and Z directions (No defect in appearance and construction after applying variable vibration in each directions for 2 hours)
Vibration resistance (Malfunction)	10 to 55 to 10 Hz 0.5-mm single amplitude (1 0-mm double amplitude) in each direction
Shock resistance (Destruction)	1000 m/s**2 each direction 3 times (No defect in appearance and construction after applying shock in each directions 3 times)
Shock resistance (Malfunction)	200 m/s**2 (Contacts must not open for 1 ms or longer after the relay is subjected to a shock in each direction 3 times)
Endurance (Mechanical)	50000000 operations Min.
Endurance (Electrical)	200000 operations Min.
Protective structure	Closed type (cover)
Applicable standard (UL)	Standard No. UL508 File No. E41643
Applicable standard (CSA)	Standard No. C22.2 No.0, No.14 File No. LR31928
Applicable standard (TUV)	R50030064
Applicable standard (SEV)	98 5 50071.02
Applicable standard (Other)	Conformed standard 2: Electrical Appliance and Material Safety Law
Terminal structure	Plug-in
Weight	Approx. 50 g

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CHRIS MARCON, CET.

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓
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# Bi-power Relays

# LY

## Power-switching Compact General-purpose Relays

- The standard models include models that are compliant with the UL, CSA, and SEV safety standards and with the Electrical Appliances and Material Safety Act.
- Equipped with an arc barrier for arc interruption.
- Withstand voltages up to 2,000 V.
- New built-in diode and built-in CR circuit models have joined the series.
- The lineup also includes models that are compliant with the LR and VDE safety standards.
- Single-pole and double-pole models have AC4 ratings and DC2 ratings (operating coil ratings: 100/110 VAC, 110/120 VAC, 200/220 VAC, 220/240 VAC, and 100/110 VDC).
- Three-pole and four-pole models have AC4 ratings and DC2 ratings (operating coil ratings: 100/110 VAC, 200/220 VAC and 100/110 VDC).



Refer to the standards certifications and compliance section of your OMRON website for the latest information on certified models.

Refer to the Common Relay Precautions.

### Model Number Structure

Classification	Structure	Relays with Plug-In Terminals		Relays with PCB Terminals	Case-surface mounting
		Number of poles	With operation indicators		
Standard models Compliance with Electrical Appliances and Material Safety Act	1	#LY1	**#LY1N	#LY1-0	#LY1F
	2	#LY2	**#LY2N	#LY2-0	#LY2F
	2 Biturcated	**#LYZZ	**#LYZZN	**#LYZZ-0	**#LYZZF
	3	#LY3	**#LY3N	#LY3-0	#LY3F
Models with diode for coil surge absorption (DC coil specification only)	4	#LY4	**#LY4N	#LY4-0	#LY4F
	1	**#LY1-D	**#LY1N-D2	—	—
	2	**#LY2-D	**#LY2N-D2	—	—
	2 Biturcated	**#LYZZ-D	**#LYZZN-D2	—	—
Models with CR circuits for coil surge absorption (AC coil specification only)	3	**#LY3-D	**#LY3N-D2	—	—
	4	**#LY4-D	**#LY4N-D2	—	—
	1	—	—	/	/
	2	**#LY2-CR	**#LY2N-CR		
	2 Biturcated	**#LYZZ-CR	**#LYZZN-CR		

- Note: 1. Cells with a diagonal line cannot be manufactured. Ask your OMRON representative for details on manufacturing products for cells containing "—" in the above table.
2. If #187 tab terminals are required, use the LY1F-T2 or LY2F-T2 (single-pole or double-pole models only).
3. Refer to page 12 for information on plug-in terminal and socket combinations.
4. Items with an asterisk (\*) in the table are certified for UL, CSA, and SEV. This is indicated with a certification mark on the products.
5. Items with two asterisks (\*\*) in the table are certified for UL and CSA. This is indicated with a certification mark on the products.
6. All models in the table are certified for IEC (TUV).
7. The models with plug-in terminals (single-pole, double-pole, and 4-pole) were combined with the PTF-E for the EC Declaration of Conformity. These products display the CE Marking.

VERIFY COIL VOLTAGE 120VAC  
SPECIFIED  
PROVIDE 110/120VAC TYPE  
UNIT

ORIGINAL SIGNED BY  
CHRIS MARCON, CET.

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓
MAY 4, 2014		
This review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.		

## Ordering Information

## Models with Plug-In Terminals

Number of poles		1 pole		2 poles		3 poles		4 poles		
Classification		Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	
Models with single contacts	Standard models	LY1	12, 24, 100/110, 110/120, or 200/220 VAC	LY2	12, 24, 100/110, 110/120, 200/220, or 220/240 VAC	LY3	12, 24, 100/110 or 200/220 VAC	LY4	12, 24, 100/110, or 200/220 VAC	
			12, 24, 48, or 100/110 VDC		12, 24, 48, or 100/110 VDC		12, 24, 48, or 100/110 VDC		12, 24, 48, or 100/110 VDC	
	Models with built-in operation indicators	LY1N	12, 24, 100/110, 110/120, or 200/220 VAC	LY2N	12, 24, 100/110, 110/120, 200/220, or 220/240 VAC	LY3N	12, 24, 100/110, or 200/220 VAC	LY4N	12, 24, 100/110, or 200/220 VAC	
			12, 24, or 100/110 VDC		12, 24, 48, or 100/110 VDC		12, 24, 48, or 100/110 VDC		12, 24, 48, or 100/110 VDC	
	Models with built-in diodes	LY1-D	12, 24, 48, or 100/110 VDC	LY2-D	12, 24, 48, or 100/110 VDC	LY3-D	12, 24, 48, or 100/110 VDC	LY4-D	12, 24, 48, or 100/110 VDC	
	Models with built-in diodes and operation indicators	LY1N-D2	12, 24, or 48 VDC	LY2N-D2	12, 24, 48, or 100/110 VDC	LY3N-D2	12, 24, or 100/110 VDC	LY4N-D2	12, 24, 48, or 100/110 VDC	
Bifurcated contacts	Models with built-in CR circuits	—	—	LY2-CR	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—	
		—	—	LY2N-CR	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—	
	Standard models	—	—	LY2Z	100/110 or 200/220 VAC	—	—	—	—	
		—	—	LY2Z	12, 24, 48, or 100/110 VDC	—	—	—	—	
		Models with built-in operation indicators	—	—	LY2ZN	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—
		—	—	LY2ZN	12 or 24 VDC	—	—	—	—	
Models with built-in diodes	—	—	LY2Z-D	12, 24, or 48 VDC	—	—	—	—		
Models with built-in diodes and operation indicators	—	—	LY2ZN-D2	12, 24, or 100/110 VDC	—	—	—	—		
Models with built-in CR circuits	—	—	LY2Z-CR	100/110 VAC	—	—	—	—		
Models with built-in CR circuits and operation indicators	—	—	LY2ZN-CR	100, 110, 110/120, or 200/220 VAC	—	—	—	—		

## Relays with PCB Terminals

Number of poles	1 pole		2 poles		3 poles		4 poles	
Classification	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)
Models with single contacts	LY1-D	24, 100/110, 110/120, or 200/220 VAC	LY2-D	12, 24, 100/110, 110/120, 200/220, or 220/240 VAC	LY3-D	24, 100/110, or 200/220 VAC	LY4-D	24, 100/110, or 200/220 VAC
		12 or 24 VDC		12, 24, 48, or 100/110 VDC		12, 24, 48, or 100/110 VDC		
Bifurcated contacts	—	—	LY2Z-D	24, 48, or 100/110 VDC	—	—	—	—

## Case-surface Mounting

Number of poles	1 pole		2 poles		3 poles		4 poles	
Classification	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)	Model	Rated voltage (V)
Models with single contacts	LY1F	24, 100/110, 110/120, 200/220, or 220/240 VAC	LY2F	12, 24, 100/110, 110/120, 200/220, or 220/240 VAC	LY3F	12, 24, 100/110, or 200/220 VAC	LY4F	12, 24, 100/110, or 200/220 VAC
		6, 12, 24, or 100/110 VDC		12, 24, 48, or 100/110 VDC		12, 24, or 100/110 VDC		12, 24, or 100/110 VDC
Bifurcated contacts	—	—	LY2ZF	24, 100/110, or 200/220 VAC 12 or 24 VDC	—	—	—	—

## Minimum Order

When ordering the following models, please order the minimum amount that is specified in the following table.

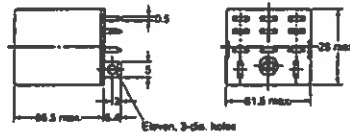
Number of poles		2 poles		4 poles		Minimum order (No. of Relays)
Classification	Model	Rated voltage (V)	Model	Rated voltage (V)		
Standard models	LY2	100/110, 200/220 VAC, 12 or 24 VDC	LY4	100/110, 200/220 VAC, or 24 VDC		
Models with built-in operation indicators	LY2N	100/110, 200/220 VAC, or 24 VDC	LY4N	100/110, 200/220 VAC, or 24 VDC		
Models with built-in diodes	LY2-D	24 VDC	—	—		
Models with built-in diodes and operation indicators	LY2N-D2	24 VDC	LY4N-D2	24 VDC		10

VERIFY COIL VOLTAGE  
120 VOLT AC SOURCE  
SPECIFIED.  
110/120 VAC AVAILABLE  
IN 2POLE RELAY BUT NOT  
3POLE.  
110/120 VAC TO BE  
SUPPLIED.

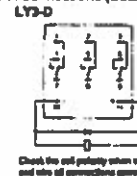
ORIGINAL SIGNED BY  
CHRIS MARCON, CET.

BOUTHILLETTE PARIZEAU INC. (SPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓
MAY 4, 2014		
This review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.		

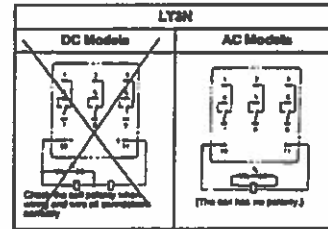
LY3  
LY3N  
LY3-D



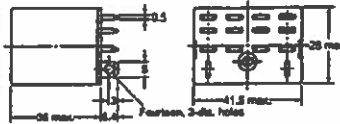
Terminal Arrangement/Internal Connections (Bottom View)



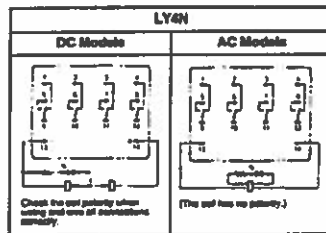
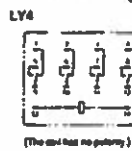
- Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.  
2. The indicator is red for AC and green for DC.  
3. The operation indicator indicates the energization of the coil and does not represent contact operation.



LY4  
LY4N  
LY4-D  
LY4N-D2

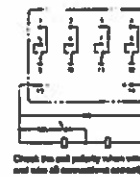


Terminal Arrangement/Internal Connections (Bottom View)

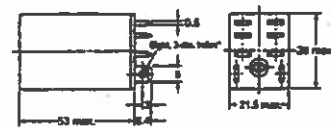


- Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.  
2. The indicator is red for AC and green for DC.  
3. The operation indicator indicates the energization of the coil and does not represent contact operation.

LY4N-D2

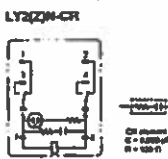
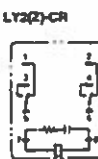


LY2-CR  
LY2Z-CR  
LY2N-CR  
LY2ZN-CR



\*These dimensions are for the LY2N-CR.


Terminal Arrangement/Internal Connections (Bottom View)



(The coil has no polarity.)

VERIFY COIL VOLTAGE  
FOR RELAYS. 120 VOLT  
CIRCUIT OF SUPPLY  
SPECIFIED

ORIGINAL SIGNED BY  
CHRIS MARCON, CET.

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓
 MAY 6, 2014		
This review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.		

# Part # PTF11A

LY

## Connection Sockets (Refer to Common Socket and DIN Track Products for external dimensions.)

Item	Front-mounting Sockets	Back-mounting Sockets		
	Track or screw mounting	Solder terminals	Wrapping terminals	Relays with PCB Terminals
1 or 2	PTF08A-E	PT08	PT08QN	PT08-0
3	PTF11A	PT11	PT11QN	PT11-0
4	PTF14A-E	PT14	PT14QN	PT14-0

The following front connector sockets are all individually certified for UL/CSA: PTF08A, PTF11A, and PTF14A.

Model	Standard	No.
PTF08A	UL	File No. E87029
PTF11A	CSA	File No. LR31929
PTF14A		

Note: The PTF08A-E Relays have finger protection. Round terminals cannot be used. Use forked terminals.

## Relay Hold-down Clips (Refer to Common Socket and DIN Track Products for external dimensions.)

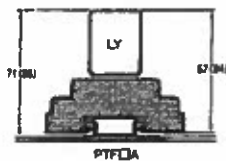
Used with Sockets		Used with Socket mounting plate	For models with built-in CR circuits	
LYC-A1	LYC-P	LYC-S	Y82H-3	LYC-1

## Connection Socket and Hold-down Clip Application Table

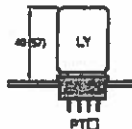
Applicable Relay	Number of poles	Front-mounting Sockets			Back-mounting Sockets			Applicable Hold-down Clips
		PTF08A	PTF11A	PTF14A	PT08(QN) PT08-0	PT11(QN) PT11-0	PT14(QN) PT14-0	
Standard models: LYD	1 or 2	•			•			LYC-P
Bifurcated contact models: LYDZ	3		•			•		
Models with built-in operation indicators: LYDN	4			•			•	
Models with built-in diodes: LYD-DQ2								
Models with built-in CR circuits: LYD-CR	2	•			•			LYC-1

## Mounting Height with Sockets

Front-mounting Sockets



Back-mounting Sockets



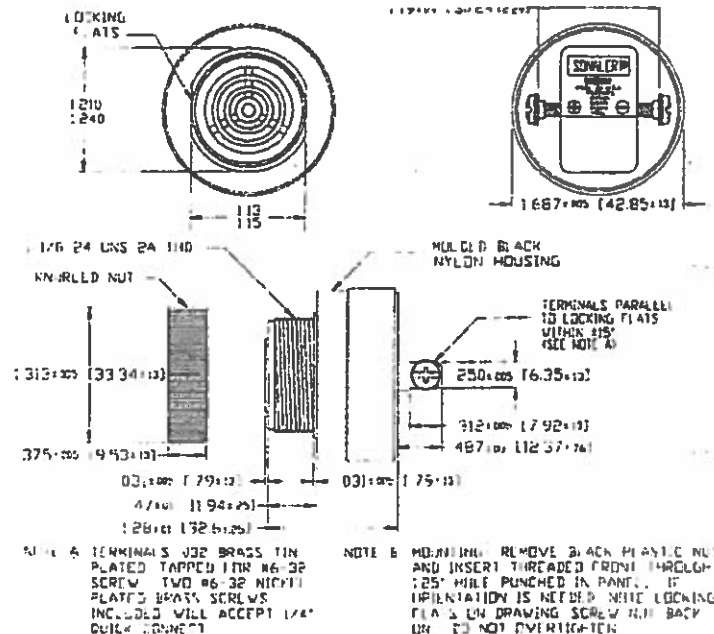
Note: 1. The PTF08A can be mounted on a track or with screws.  
2. The measurements in parentheses are for the LYD-CR (built-in CR circuit).

VERIFY COIL VOLTAGE  
FOR RELAYS  
120 VOLT CIRCUIT  
OF SUPPLY SPECIFIED. RELAY  
BASE TO MATCH 120VOLT  
RELAY.

ORIGINAL SIGNED BY  
CHRIS MARCON, CET.

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	
MAY 4, 2014		
This review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.		

<b>Mallory</b>	<b>Mallory Sonalert Products, Inc.</b>	Part #:	<b>SC110N</b>
<b>Sales Outline Drawing</b>		Revision:	<b>H</b>
<b>Specifications:</b>			
Sound Level Category	Loud		
Mode of Operation	Continuous		
Voltage Rating	30 to 120 VAC/DC		
Frequency	2800 $\pm$ 500 Hz		
Loudness @ 2 FT	90 to 102 dB(A) Typ.		
Loudness @ Min Vdc	80 dB(A) @ 2 Feet and 30 Vdc		
Loudness @ Max Vdc	95 dB(A) @ 2 Feet and 120 Vdc		
Current Draw	6-24 mA		
Housing Material	6/8 Nylon, Color: Black		
Storage Temperature	-40° to +85° C		
Operating Temperature	-30° to +85° C		
Panel Mounting	Recommended hole size is 1.25"(31.75mm). Thread front will fit standard 30mm(1.181") hole.		
Knurled Nut	Used to attach part to panel. The max recommended torque is 10 in-lbs.		
Weight (Typical)	1.6 oz (45g)		
NEMA 3R, 4X, & 12	Approved with use of ACC03.		
Options	Please contact factory.		

**REVIEWED**

By Darren Fraser at 3:19 pm, Apr 10, 2014

ORIGINAL SIGNED BY  
CHRIS MARCON, CET.

BOUTHILLETTE PARIZEAU INC. (BPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
✓		
MAY 4, 2014		
This review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.		



Part # VWHC 12126

**MANUFACTURING Ltd.**  
Advanced technology... Simple solutions.

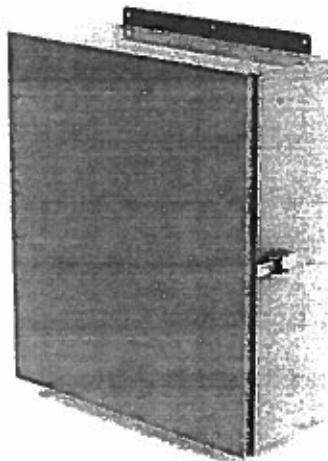
**REVIEWED**

By Darren Fraser at 3:19 pm, Apr 10, 2014

## WEATHERPROOF HINGED JUNCTION BOX

### VWHC

The VWHC junction box comes with padlockable hinged lid to be used in outdoor applications for protection from rain, sleet and snow. These enclosures are rated Type 3R and manufactured with galvanized steel for additional corrosion protection. Backpans are standard for ease of mounting equipment. Junction boxes are finished with PC101 (ANSI 61) grey powder coat paint.



#### Features/Specifications

- Galvanized steel construction
- Pour in place gasket
- CSA Type 3R rated
- Wall mount ears top and bottom
- Hinged door with gasket
- Padlockable hasp
- Galvanized backpan standard
- Optional no backpanel & backpanel mounting studs: Add '-NB' to P/N
  - Example: VWHC10106-NB
- Custom sizes, material and colour available
- PC101 (ANSI 61) Grey powder coat finish

PART NUMBER	HEIGHT (INCHES)	WIDTH (INCHES)	DEPTH (INCHES)
VWHC664	6	6	4
VWHC864	8	6	4
VWHC1084	10	8	4
VWHC1086	10	8	6
VWHC10106	10	10	6
VWHC12104	12	10	4
VWHC12106	12	10	6
VWHC12108	12	10	8
VWHC12126	12	12	6
VWHC12128	12	12	8
VWHC14126	14	12	6
VWHC16146	16	14	6
VWHC16168	16	16	8
VWHC18166	18	16	6
VWHC18168	18	16	8
VWHC18186	18	18	6
VWHC20168	20	18	8
VWHC20188	20	18	8
VWHC24106	24	10	6
VWHC24168	24	16	8
VWHC24186	24	18	6
VWHC24246	24	24	6
VWHC24248	24	24	8
VWHC242410	24	24	10
VWHC30248	30	24	8
VWHC302410	30	24	10
VWHC30306	30	30	6
VWHC30308	30	30	8
VWHC303010	30	30	10
VWHC362410	36	24	10
VWHC363010	36	30	10
VWHC363612	36	36	12
VWHC483612	48	36	12

19003-14891

Toll Free Phone: 888-632-6477

Phone: 250-832-6477

Fax: 250-832-7746

E-mail: sales@validmanufacturing.com

[www.validmanufacturing.com](http://www.validmanufacturing.com)

SOUTHILLETTE PARIZEAU INC. (SPA)		
Reviewed	Reviewed with Comments	Resubmit See Comments
✓		

ORIGINAL SIGNED BY  
CHRIS MARCONI

CET. MAY 4 2014

This review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.



114 

① 25mm  
REQUIRED.

TYPE 1: COPPER PIPE LENGTH AS

② 25mm FORD B44-444 BALL VALVE

③ CIRCULATION PUMP, GRUNDFOS UP ~~2000~~ 15-29SF, 115V, 2050 RPM, STAINLESS STEEL BODY, FLANGE MOUNT.

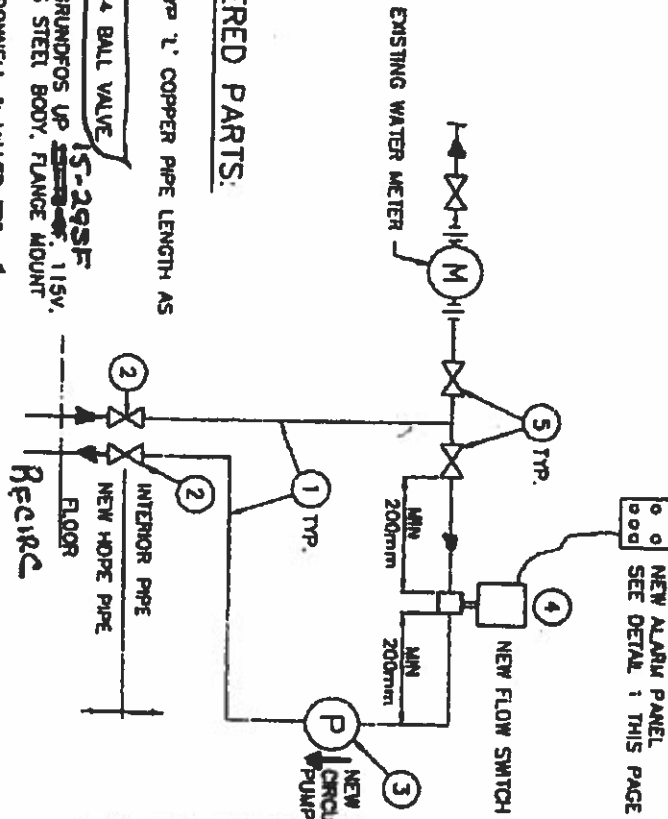
④ FLOW SWITCH, ITT McDONNELL & MILLER F55-1

③ 25mm KITE BALU VABUG

٢٥٨

Note: 15-18yf IS no longer

**MAOE.**



**1** TYPICAL WATER SERVICE  
RECIRCULATION SCHEMATIC

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.

SERVICE THEMATIC		<b>DRAWING REVIEW</b> The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.		Submission No. <u>1</u> Project No. <u>CGSC-HQ-12012</u> By <u>ABDOL ZAHED</u> Date <u>19 MAR 2011</u>	206333
		X NO EXCEPTIONS TAKEN	EXCEPTIONS NOTED - RESUBMIT		
N.T.S. 10/12/2013	CLIENT: <b>RESOLUTE</b> TITLE: <b>WATER</b>	BAY NEW <b>exp.</b> <b>CHIEF OF DESIGN</b> 2050 Chippewa Drive, Suite 100 Chicago, Illinois 60640 Tel: (613) 688-1800 Fax: (613) 235-5387	FIG2		

[illegible]

REVIEWED BY TOWER ARCTIC LTD.  
DATED 3/12/14 *ET*

**GRUNDFOS** 

## Submittal Data

PROJECT: _____	UNIT TAG: _____	QUANTITY: _____
REPRESENTATIVE: _____	TYPE OF SERVICE: _____	DATE: _____
ENGINEER: _____	SUBMITTED BY: _____	DATE: _____
CONTRACTOR: _____	APPROVED BY: _____	DATE: _____
	ORDER NO.: _____	DATE: _____

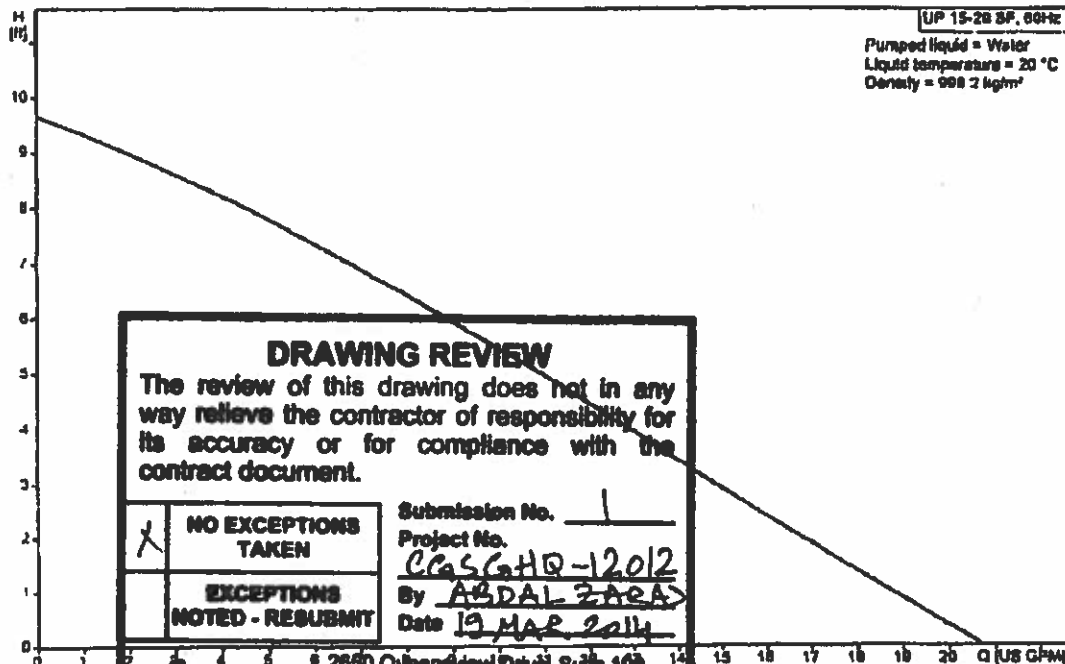


**UP 15-29 SF**

Circulator pumps

Please refer to the product literature for the latest product information.

Conditions of Service	Pump Data	Motor Data
Flow: _____	Maximum operating pressure: 145 psi	Max. power input: 87 W
Head: _____	Liquid temperature range: 2 .. 110 °C	Rated power - P2: 0.121 HP
Efficiency: _____	Maximum ambient temperature: 40 °C	Rated voltage: 115 V
Liquid: Water	Approvals: UL, CSA	Mains frequency: 60 Hz
Temperature: 20 °C	Type of connection: S.B. Flange	Insulation class: F
NPSH required: _____	Flange standard: USA Oval	Motor protection: CONTACT
Viscosity: 1 mm <sup>2</sup> /s	Pipe connection: 2 - Bolt Flange	Thermal protection: internal
Specific Gravity: 1.000	Product number: 59896771	

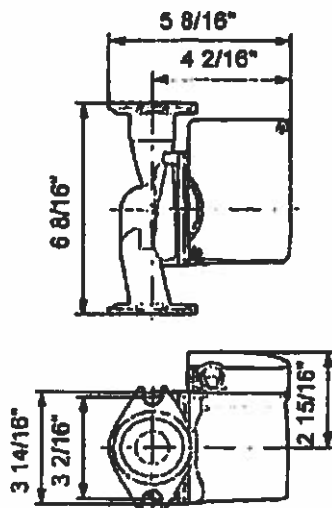


**exp.**

2850 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 8H8  
Tel: (613) 688-1899  
Fax: (613) 225-7337



## Submittal Data



### Materials:

Pump housing: Stainless steel  
DIN W.-Nr. 1.4301  
AISI 304  
Impeller: Composite, PES

REVIEWED BY TOWER ARCTIC LTD.  
DATED 3/12/14

### DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.

☒ NO EXCEPTIONS  
TAKEN

☐ EXCEPTIONS  
NOTED - RESUBMIT

Submission No. 1

Project No.

CALC HQ

By ABDAL ABDU

Date 13 MAR 2014

exp.

2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 6H8  
Tel: (613) 688-1899  
Fax: (613) 225-7337



## Flow Switches - Liquid

### Series FS5 (for specified models) General Purpose Liquid Flow Switches

- For general purpose applications requiring low flow rate sensitivity
- In-line configuration eliminates need for a pipe tee
- Sizes available
  - 3/4" NPT
  - 1" NPT
- Materials of construction
  - Brass, carbon & EPDM elastomer (for water); Models FS5 & FS5-D
  - Stainless steel, carbon & Buna N (for water or water and petroleum base compounds) Models FS5-S & FS5-DS
- Single pole, double throw snap switch
- Sensitivity adjusting screw makes flow adjustment easy
- Optional feature
  - BSPT threads
- Minimum temperature (fluid or ambient) 32°F (0°C)
- Maximum temperature
  - 225°F (107°C) - Stainless Steel models
  - 250°F (121°C) - Brass
- Maximum operating pressure 150 psi (10.5 kg/cm<sup>2</sup>)

#### Electrical Ratings

Voltage	Motor Switch Rating (Amps)		Pilot Duty
	Full Load	Locked Rotor	
120 VAC	7.4	44.4	125 VA at 120 or 240 VAC 50 or 60 cycles
240 VAC	3.7	22.2	

#### Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
FS5-3/4	114780	General purpose flow switch 3/4" NPT	2.5 (1.1)
FS5-D-3/4	114783	FS5-3/4 w/2 SPDT switches	2.5 (1.1)
FS5-J-3/4	114785	FS5-3/4 w/BSPT connections	2.5 (1.1)
FS5-1	114780	General purpose flow switch 1" NPT	2.5 (1.1)
FS5-D-1	114783	FS5-1 w/2 SPDT switches	2.5 (1.1)
FS5-J-1	114785	FS5-1 w/BSPT connections	2.5 (1.1)
FS5-S-1	114795	FS5-1 w/SS body	2.3 (1.0)
FS5-DS-1	114793	FS5-1 w/SS body, 2 SPDT switches	2.5 (1.1)
FS5-J-3/4-E	114786	FS5-J-3/4 - CE conformance rated	2.5 (1.1)
FS5-J-1-E	114787	FS5-J-1 - CE conformance rated	2.5 (1.1)

See page 132 for CE Conformance information

REVIEWED BY TOWER ARCTIC LTD.  
DATED 3/12/14

## DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.

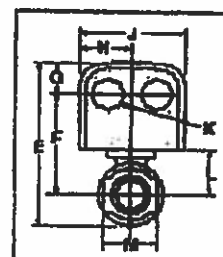
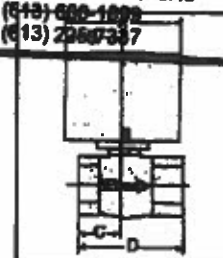
EXCEPTIONS  
NOTED - RESUBMIT

By  
Date

2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 8H6  
Tel: (613) 688-1899  
Fax: (613) 225-7337



Series FS5



#### Dimensions, in. (mm)

A	B	C	D
3/4 (87)	1 1/8 (40)	1 1/8 (33)	3 1/8 (56)

E	F	G	H
5 1/8 (129)	3 1/4 (83)	1/4 (22)	1 1/2 (40.5)

J	K	L	M
3 1/4 (81)	1/4 (22)	1 1/4 (35)	1 1/8 (43)

#### Flow Rates

Pipe Size NPT	Mode of Operation			Max. Flow Rate gpm (lpm) m³/h
	Flow	No Flow	Reverse	

3/4	Factor	Factor	Factor	Factor
-----	--------	--------	--------	--------

NOTE: DO NOT USE LIQUID FLOW SWITCHES ON SYSTEMS WITH FLUORANTHERMIXAN

NO FURTHER SECOND

EXCEPTIONS  
NOTED - RESUBMIT

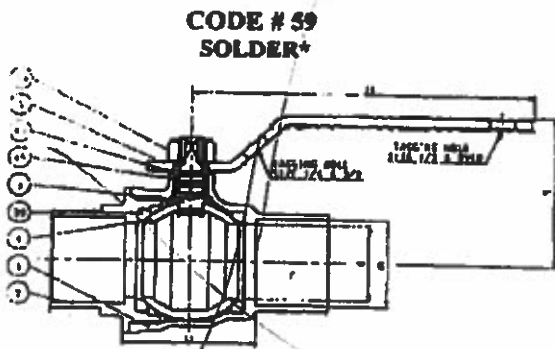
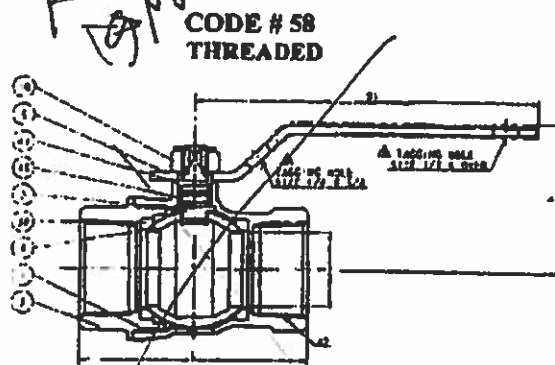
By  
Date

2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 8H6  
Tel: (613) 688-1899  
Fax: (613) 225-7337

②  
RESUBMIT  
Abdul Javed  
13 MAR 2014

# FORGED BRASS BALL VALVE DRAWING REVIEW

MAINTENANCE FREE DOUBLE O-RING STEM SEALS  
Two Piece Body • Full Port  
Blowout Proof Stem (Ni Plated)  
Chrome Plated Ball  
PTFE Seats  
CSA (US/C) • UL  
The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.



\*REFERENCE VALVE INSTALLATION TIPS FOR  
GROUND SOLDER JOINTS ONCE IN 10 OF 100  
INSTALLATION SHEET PACKAGED WITH VALVE

REVIEWED BY TOWER ARCTIC LTD.  
DATED 3/10/14

## SPECIFICATION

Approved valve shall have two piece forged brass body, blowout proof stem (Ni Plated), PTFE seats, maintenance free double o-ring stem seals, chrome plated ball and full port design. Valves shall be pressure rated to 150 WSP/600 WOG and conform to MSS-SP 110 and certified to CSA, UL & FM.

KITZ Code No. 58 Threaded Ends  
59 Solder Ends

BV-8 2009-10-15

NO EXCEPTIONS TAKEN	Submission No. _____ Project No. _____
END EXCEPTIONS NOTED - RESUBMIT	By: <u>Abdul Javed</u> Date: <u>13 MAR 2014</u>
SOLDER JOINT ENDS WELD THICKNESS CONFORM TO MSS-SP 110 SPEC. WWW.P-358.TEM-1 (401) 224-7337	

PRESSURE/TEMPERATURE  
150 PSI SATURATED STEAM TO 366°F  
600 PSI - NON-SHOCK COLD WATER, OIL OR GAS  
NOTE: PRESSURE/TEMPERATURE CHART - PAGE BV-29

MATERIAL LIST		
NO.	NAME OF PART	SPECIFICATION
1	BODY	FORGED BRASS (B283, C37700)
2	BODY CAP	FORGED BRASS (B283, C37700)
3	STEM	(1) BRASS ROD (B16)
4	BALL	(2) FORGED BRASS (B283, C37700)
		STRAIGHT OR HOLLOW BALL
9	HANDLE	(3) CARBON STEEL
10	HANDLE NUT	CARBON STEEL
30	BALL SEATS	PTFE
45	O-RINGS	FPM
47	THRUST WASHER	PBT

NOTES: (1) NI PLATING  
(2) CR. PLATING  
(3) ELECTROPLATED ZINC WITH PLASTIC COVERING

DIMENSIONS - WEIGHTS - QUANTITIES								
d2 SIZE	d	H	D1	L	L1	d1 Max. Min.	APPROX. NET WT.	CARTON QTY
1/4	.39	1.46	2.76	1.65	1.11	.381 .377	29	120
3/8	.39	1.46	2.76	1.65	1.05	.306 .302	29	120
1/2	.59	1.57	3.15	2.08	1.13	.631 .627	29	96
3/4	.79	1.69	3.15	2.36	1.37	.881 .877	45	60

→ 1 26 2.16 4.33 3.31 2.00 1.32 1.178 60 36  
1 1/4 26 2.16 4.33 3.31 2.00 1.32 1.178 60 24  
1 1/2 27 2.52 5.90 5.82 2.11 1.65 1.601 50 16  
2 27 2.52 5.90 5.82 2.11 1.65 1.601 50 16

NO EXCEPTIONS TAKEN	Submission No. _____ Project No. _____
END EXCEPTIONS NOTED - RESUBMIT	By: <u>Abdul Javed</u> Date: <u>13 MAR 2014</u>
SOLDER JOINT ENDS WELD THICKNESS CONFORM TO MSS-SP 110 SPEC. WWW.P-358.TEM-1 (401) 224-7337	



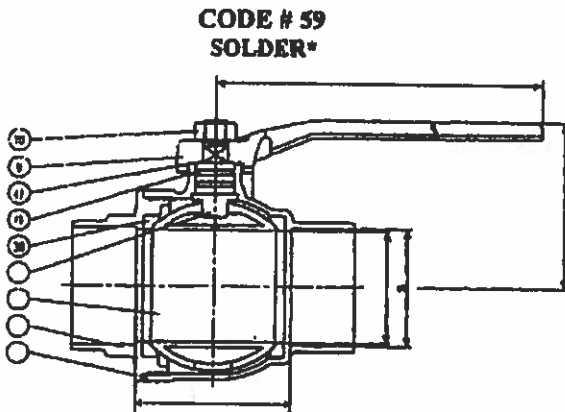
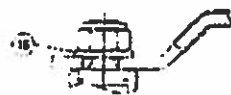
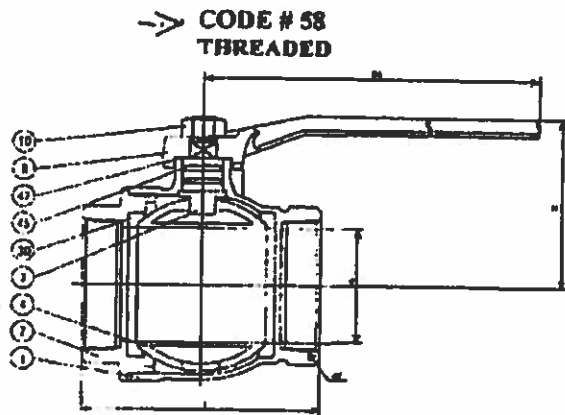
exp.

2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 8H6  
Tel: (613) 688-1899  
Fax: (613) 225-7337

# CAST BRONZE BALL VALVE

## MAINTENANCE FREE DOUBLE O-RING STEM SEALS

Two Piece Body • Full Port • Chrome Plated Ball  
Blowout Proof Stem (Ni Plated) • PTFE Seats



\*REFERENCE VALVE INSTALLATION TIPS FOR  
SOLDER JOINTS (PAGE BV-66) OR SEE  
INSTALLATION SHEET PACKAGED WITH VALVE.

### SPECIFICATION

Approved valve shall have two piece forged brass body, blowout proof stem (Ni Plated), PTFE seats, maintenance free double o-ring stem seals, chrome plated ball and full port design. Valves shall be pressure rated to 150 WSP/600 WOG and conform to MSS-SP 110.

KITZ Code No. 58 Threaded Ends  
59 Solder Ends

**KITZ®**

### STANDARDS

END TO END KITZ  
THREADED ENDS ANSI B1.20.1  
SOLDER JOINT ENDS ANSI B16.18  
WALL THICKNESS KITZ  
CONFORMS TO MSS-SP 110 - REPLACES U.S. FED.  
SPEC. WWW-V-35B, TYPE II, CLASS A, STYLE 3

### PRESSURE/TEMPERATURE

150 PSI SATURATED STEAM TO 366°F  
600 PSI - NON-SHOCK COLD WATER, OIL OR GAS

NOTE: PRESSURE/TEMPERATURE CHART - PAGE BV-29

### MATERIAL LIST

NO.	NAME OF PART	SPECIFICATION
1	BODY	CAST BRONZE (B62)
2	BODY CAP	CAST BRONZE (B62)
3	STEM	(1) BRASS ROD (B16)
4	BALL (2 1/2") (3" & 4")	(3) FORGED BRASS (2) CAST BRASS STRAIGHT OR HOLLOW BALL
9	HANDLE (2 1/2") (3" & 4")	(3) CARBON STEEL DUCTILE IRON
10	HANDLE NUT	CARBON STEEL
16	WASHER (2 1/2")	CARBON STEEL
30	BALL SEATS	PTFE
45	O-RINGS	FPM
47	THRUST WASHER	PTFE

NOTES: (1) NI PLATING  
(2) CR. PLATING  
(3) ELECTROPLATED ZINC WITH PLASTIC COVERING

### DIMENSIONS - WEIGHTS - QUANTITIES

d2 SIZE	d	H	D1	L	L1	d1 Max. Min.	APPROX. NET WT.	CARTON QTY
2 1/2	2.56	3.98	7.87	5.35	3.51	2.633 2.628	18	57
3	2.99	4.42	11.81	6.14	4.06	3.133 3.128	31	64
4	3.94	5.15	11.81	7.80			27	54

### DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.

REVIEWED BY: POWER ARCTIC LTD.  
DATE: 3/12/14

NO EXCEPTIONS  
TAKEN

EXCEPTIONS  
NOTED - RESUBMIT

Submission No. 1

Project No.

CG-SC-HQ-12012

By: ASDAL 9-11-14

Date: 15 MAR 2014



2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 8H6  
Tel: (613) 688-1888  
Fax: (613) 225-7337

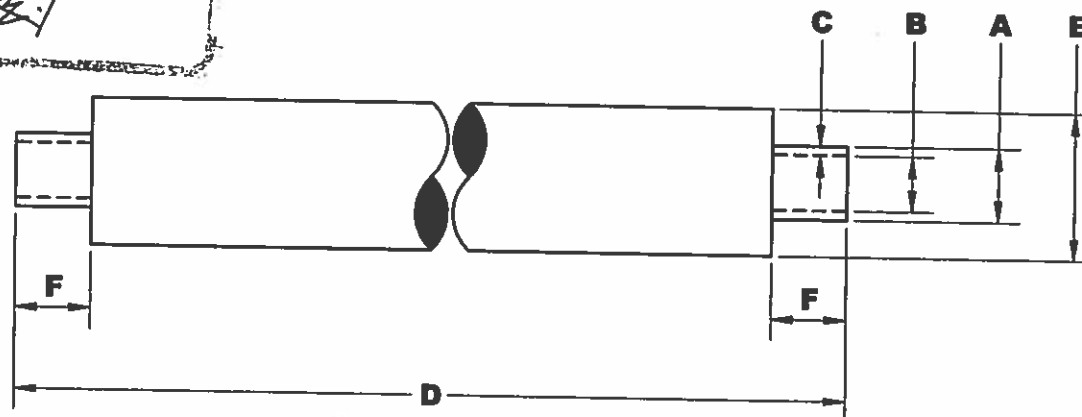
**PIPE**

# **URECON PRE-INSULATED HIGH DENSITY POLYETHYLENE PIPE WITH POLYETHYLENE JACKET SHOP DRAWING**

REVIEWED BY TOWER ARCTIC LTD.  
DATED

4/25/14

*[Signature]*



## **PIPE**

Nominal Diameter :

Series/Class :

Pipe service :

Joint type :

Outside diameter "A" :

Inside diameter "B" :

Wall thickness "C" :

Overall length "D" : 

## **INSULATION**

Thickness :

Outside diameter "E" :

Cutback "F" :

Mastic on ends :

## **TRACING**

Number of trace conduit :

Size of trace conduit :

Location :

Cable type :

## **JACKET**

Thickness :

Color :

UV inhibited :

URECON U.I.P. PRE-INSULATED PIPE

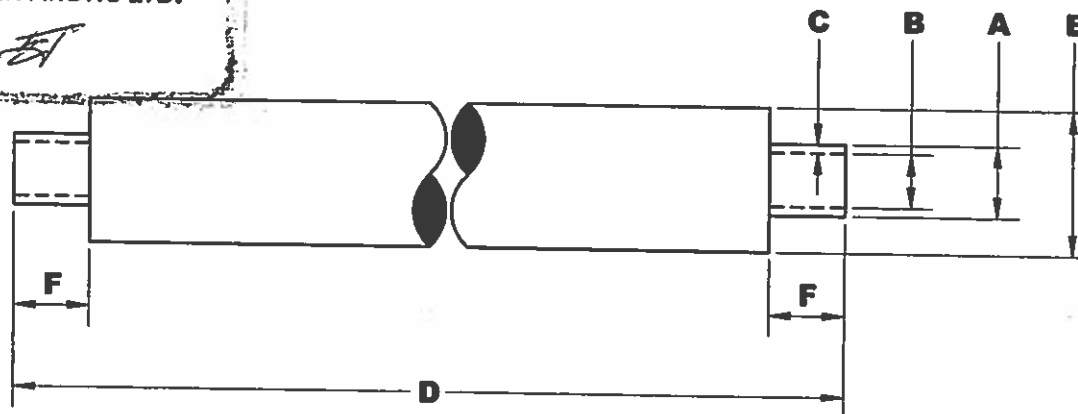
PROJECT	Resolute Bay New Utilidor Design
OWNER	Government of Nunavut
ENGINEER	EXP Services
DATE	April 1, 2014
CONTRACT NUMBER	CGSHQ-12012



# URECON PRE-INSULATED HIGH DENSITY POLYETHYLENE PIPE WITH POLYETHYLENE JACKET SHOP DRAWING

REVIEWED BY TOWER ARCTIC LTD.  
DATED

4/25/14 *ET*



## PIPE

Nominal Diameter :	4"
Series/Class :	DR-13.5
Pipe service :	-----
Joint type :	Butt Fused
Outside diameter "A" :	4.50"
Inside diameter "B" :	3.79"
Wall thickness "C" :	0.33"
Overall length "D" :	50'

## INSULATION

Thickness :	3"
Outside diameter "E" :	10.75"
Cutback "F" :	9"
Mastic on ends :	No

## TRACING

Number of trace conduit :	----
Size of trace conduit :	----
Location :	----
Cable type :	----

## JACKET

Thickness :	1.27mm
Color :	Black
UV inhibited :	No

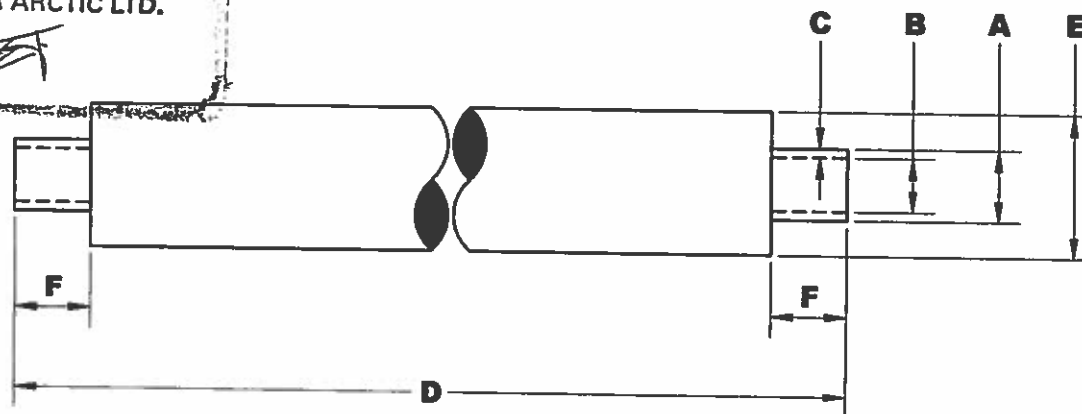
### URECON U.I.P.® PRE-INSULATED PIPE

PROJECT	Resolute Bay New Utilidor Design
OWNER	Government of Nunavut
ENGINEER	EXP Services
DATE	April 1, 2014
CONTRACT NUMBER	CGSHQ-12012

# URECON PRE-INSULATED HIGH DENSITY POLYETHYLENE PIPE WITH POLYETHYLENE JACKET SHOP DRAWING

REVIEWED BY TOWER ARCTIC LTD.

DATED 4/25/14



## PIPE

Nominal Diameter :	6"
Series/Class :	DR-13.5
Pipe service :	-----
Joint type :	Butt Fused
Outside diameter "A" :	6.625"
Inside diameter "B" :	5.58"
Wall thickness "C" :	0.49"
Overall length "D" :	50'

## INSULATION

Thickness :	3"
Outside diameter "E" :	12.88"
Cutback "F" :	9" 22
Mastic on ends :	No

## TRACING

Number of trace conduit :	----
Size of trace conduit :	----
Location :	----
Cable type :	----

## JACKET

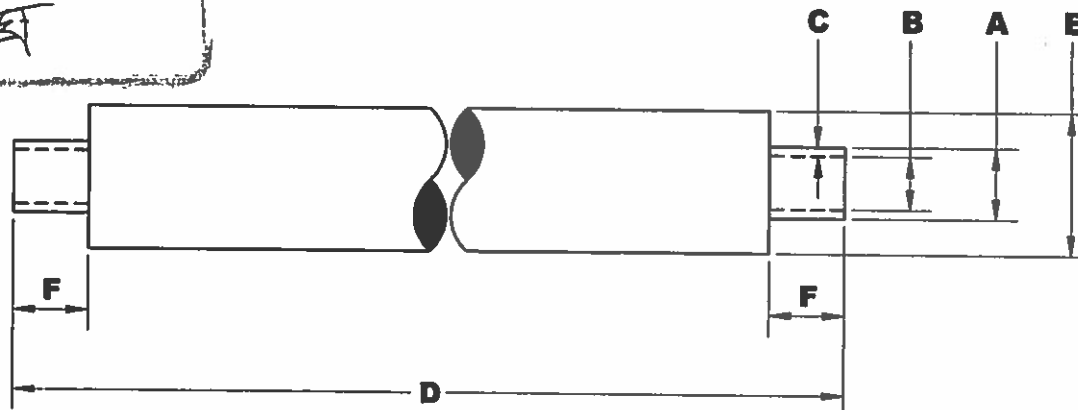
Thickness :	1.27mm
Color :	Black
UV inhibited :	No

### URECON U.I.P. PRE-INSULATED PIPE

PROJECT	Resolute Bay New Utilidor Design
OWNER	Government of Nunavut
ENGINEER	EXP Services
DATE	April 1, 2014
CONTRACT NUMBER	CGSHQ-12012

# URECON PRE-INSULATED HIGH DENSITY POLYETHYLENE PIPE WITH POLYETHYLENE JACKET SHOP DRAWING

REVIEWED BY TOWER ARCTIC LTD.  
DATED 4/25/14 *BT*



## PIPE

Nominal Diameter :	8"
Series/Class :	DR-13.5
Pipe service :	-----
Joint type :	Butt Fused
Outside diameter "A" :	8.625"
Inside diameter "B" :	7.27"
Wall thickness "C" :	0.64"
Overall length "D" :	50'

## INSULATION

Thickness :	3"
Outside diameter "E" :	15"
Cutback "F" :	9' 2"
Mastic on ends :	No

## TRACING

Number of trace conduit :	----
Size of trace conduit :	----
Location :	----
Cable type :	----

## JACKET

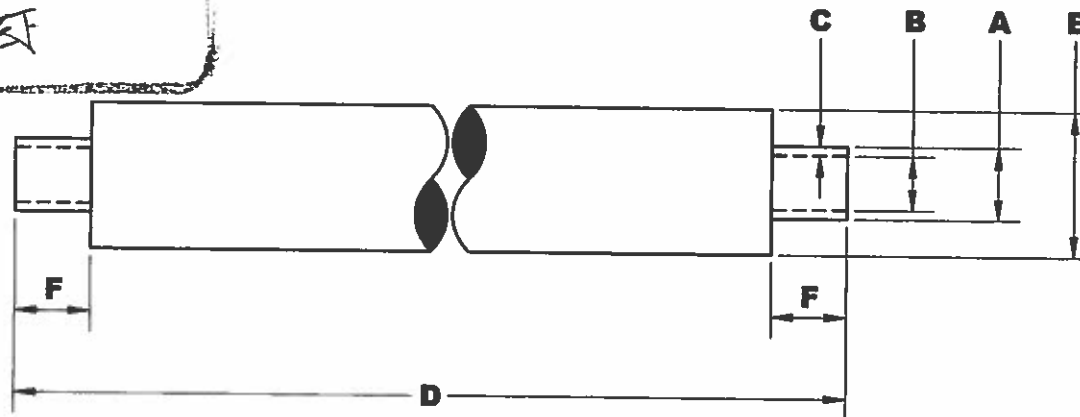
Thickness :	1.27mm
Color :	Black
UV inhibited :	No

### URECON U.I.P. - PRE-INSULATED PIPE

PROJECT	Resolute Bay New Utilidor Design
OWNER	Government of Nunavut
ENGINEER	EXP Services
DATE	April 1, 2014
CONTRACT NUMBER	CGSHQ-12012

# **URECON PRE-INSULATED HIGH DENSITY POLYETHYLENE PIPE WITH POLYETHYLENE JACKET SHOP DRAWING**

REVIEWED BY TOWER ARCTIC LTD.  
DATED 4/25/14 *EF*



## **PIPE**

Nominal Diameter :	10"
Series/Class :	DR-13.5
Pipe service :	-----
Joint type :	Butt Fused
Outside diameter "A" :	10.75"
Inside diameter "B" :	9.06"
Wall thickness "C" :	0.80"
Overall length "D" :	50'

## **INSULATION**

Thickness :	3"
Outside diameter "E" :	17.13"
Cutback "F" :	8" 22
Mastic on ends :	No

## **TRACING**

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Size of trace conduit :	----
Location :	----
Cable type :	----

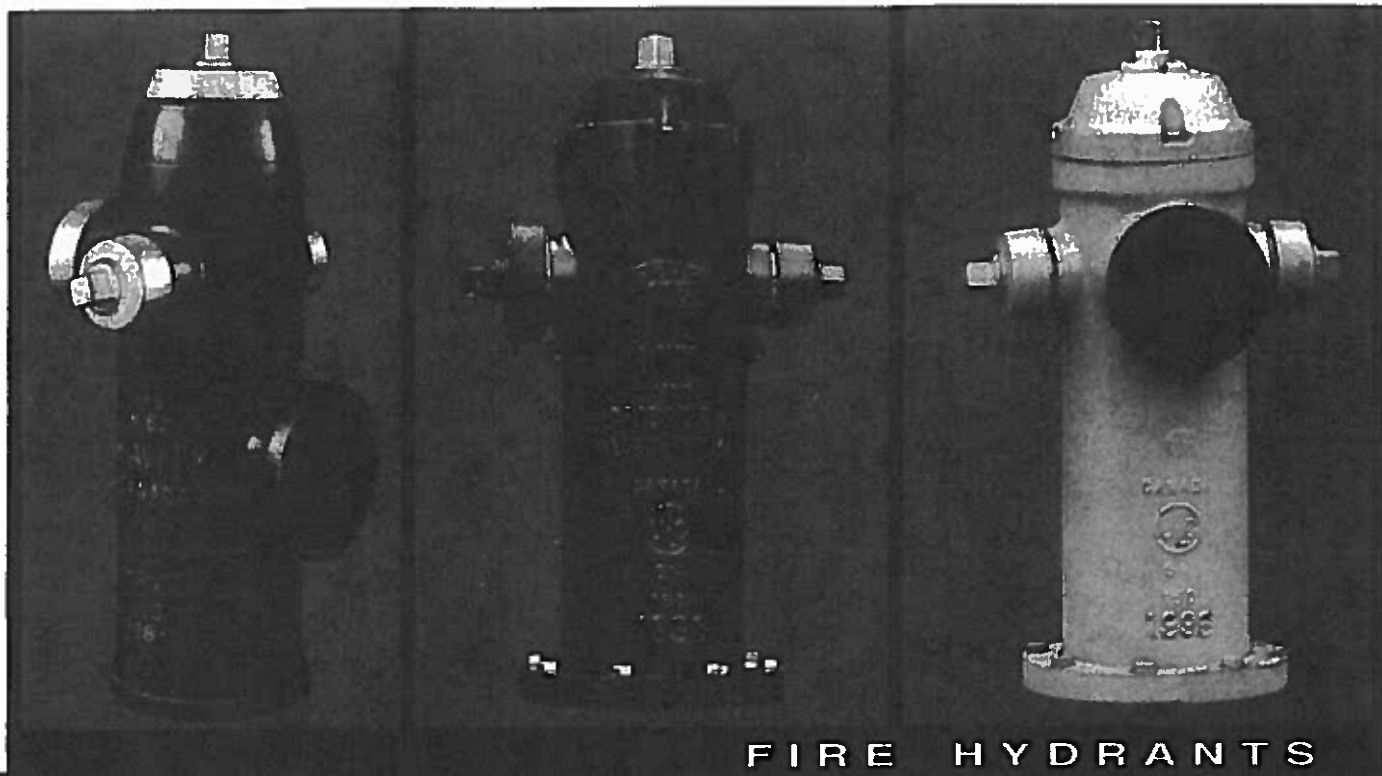
## **JACKET**

Thickness :	1.27mm
Color :	Black
UV inhibited :	No

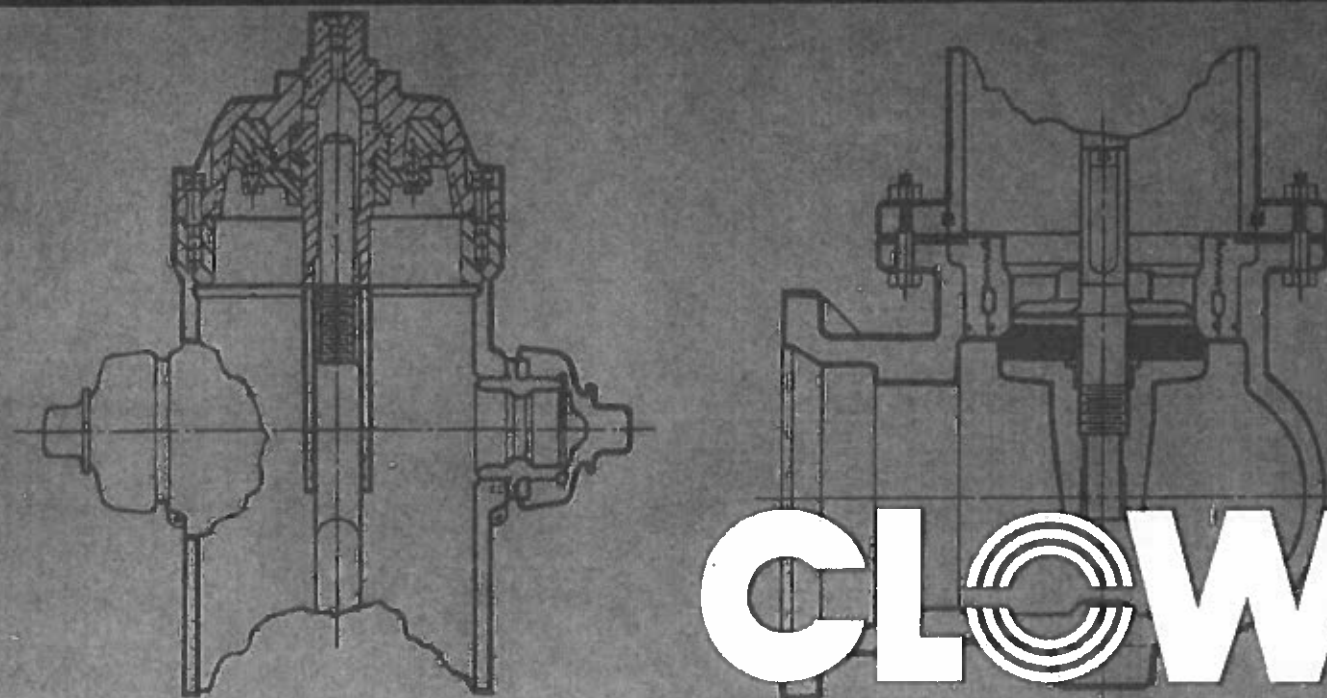
### URECON U.I.P. - PRE-INSULATED PIPE

PROJECT	Resolute Bay New Utilidor Design
OWNER	Government of Nunavut
ENGINEER	EXP Services
DATE	April 1, 2014
CONTRACT NUMBER	CGSHQ-12012

# **FIRE HYDRANTS**



FIRE HYDRANTS

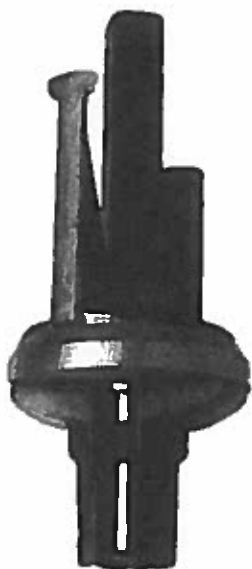


**CLOW**

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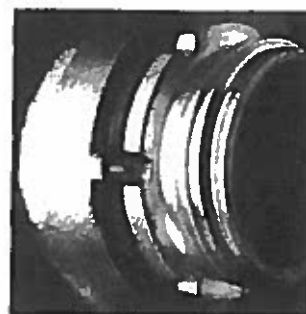
[www.clowcanada.com](http://www.clowcanada.com)

**BRIGADIER**  
SERIES M



**Lower valve assembly**

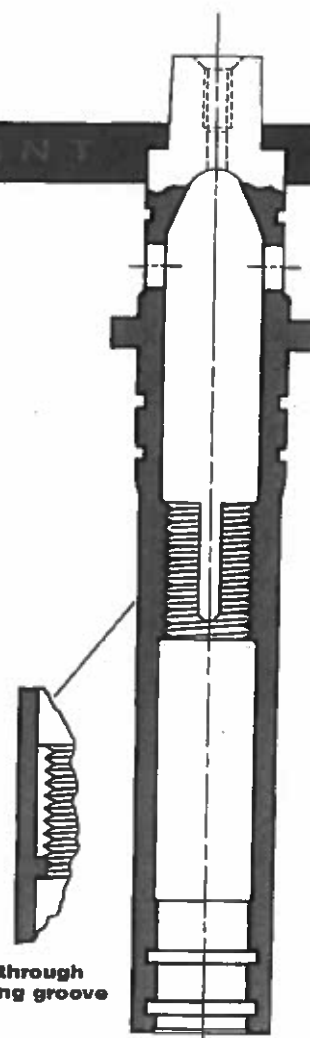
Clow Canada is committed to the manufacture and delivery of superior products, supported by superior services. Strict quality control measures govern every step of the manufacturing process, to ensure precision and consistency. We provide the knowledge, the technology and the products to serve industry's changing needs, efficiently and effectively. For more information about our products or services, please contact the Clow Canada sales office nearest you.



**External allen screw locks nozzle into place**

Clow Canada's Brigadier SERIES M incorporates several new design features and improved components for increased performance in firefighting, along with greater durability, economy and convenience. These hydrants are manufactured in Canada to the highest standards of quality — every unit is thoroughly tested before leaving the Clow factory. Lubrication is assured through the Brigadier's unique Hydra-lube™ mechanism. The Brigadier can be rotated to any position — during or after installation — without disturbing the working mechanism. The rugged Brigadier SERIES M stands up easily to traffic damage. It is designed for easy upkeep, repair and replacement of parts; its internal assembly can be removed and replaced in 20 minutes, without excavation. Alternative design options and accessories serve a wide range of municipal and industrial needs. The Brigadier's advantages include:

- **efficient compression-type hydrant**
- **factory-lubricated operating mechanism effectively O-ring sealed for long and efficient operation**
- **very low opening and closing torques**
- **automatic drainage**
- **positive sealing with O-rings at operating nut, operating housing, seat, bronze casing and seat**
- **durable and positive seating**
- **easy multiple positioning**
- **safety stem coupling and four safety segments**
- **internal parts easily removed — bury easily increased**
- **threaded hose and pumper nozzles — simple replacement if needed**
- **complete interchangeability with previous M-67 and M-59-M model hydrants**
- **conforms to AWWA specifications**



**Section through lubricating groove**

**Hydra-lube™ operating nut**



### Hydra-lube™

The Brigadier's innovative Hydra-lube™ system incorporates an internal grease channel for self-lubrication during operation.

### Stainless steel rod

Stainless steel upper stem provides corrosion-free seating for O-rings.

### Nozzles

An external allen screw mechanically locks nozzles into place; this offers greater assurance that nozzles will not turn or back out.

### Safety flanges

The safety flange consists of four identical segments grooved on the underside. The strength of these sections is less than the strength of the intermediate section flange; if severe impact occurs, breakage will be at the safety segment. The hydrant body, working mechanism, intermediate section and connecting flange remain undamaged.



### Automatic drain

To prevent corrosion and freeze-up, the hydrant body is automatically drained quickly through the drip valve after each use.

### Lower valve assembly

The lower valve plate assembly is extended to fully encapsulate the lower rod threads. This allows for increased corrosion resistance and ease of disassembly.

### Epoxy coating

A durable epoxy coating on the interior and exterior of the elbow guards against corrosion.

CLOSED

OPEN



Listed by Underwriters'  
Laboratories of Canada.

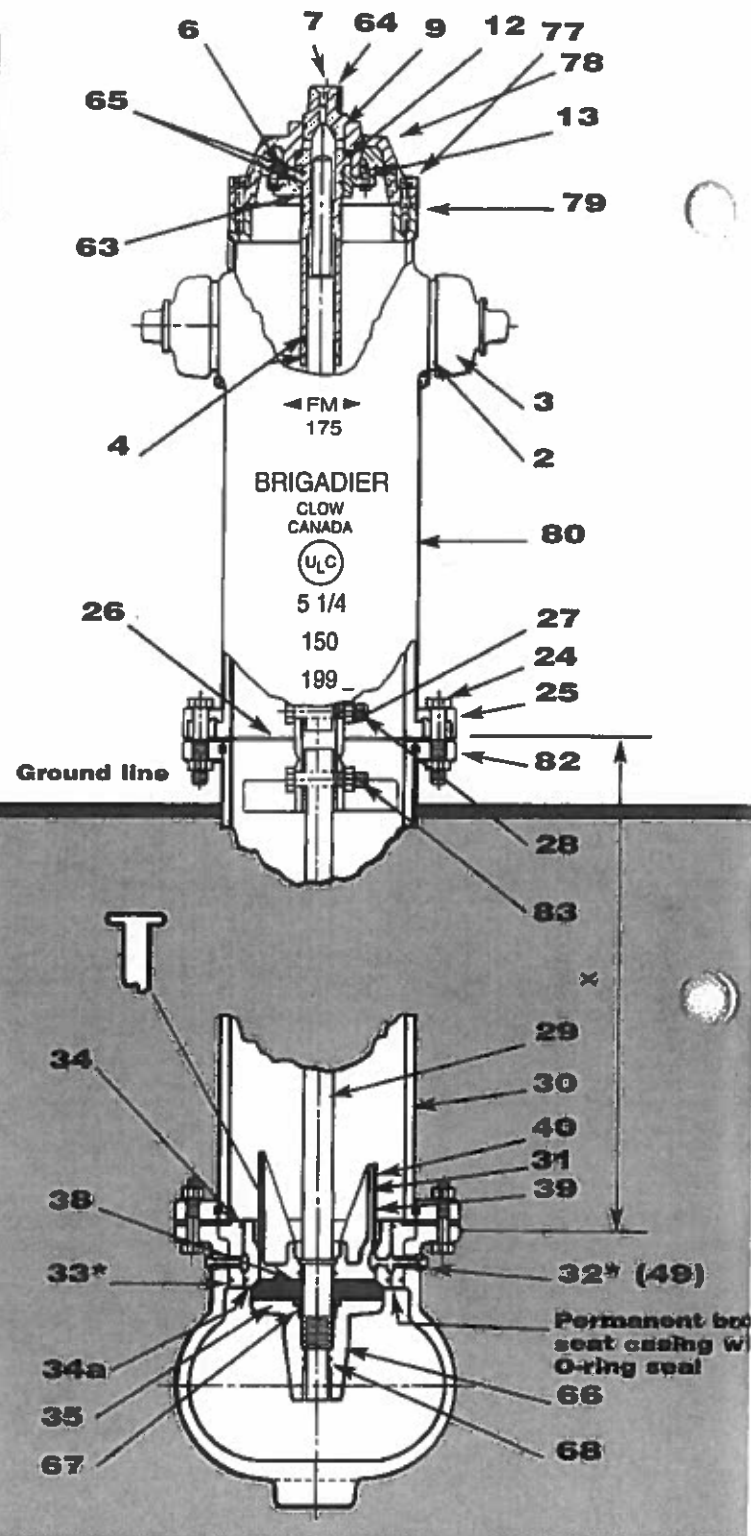


Factory Mutual Approved

**CLOW**  
CLOW CANADA

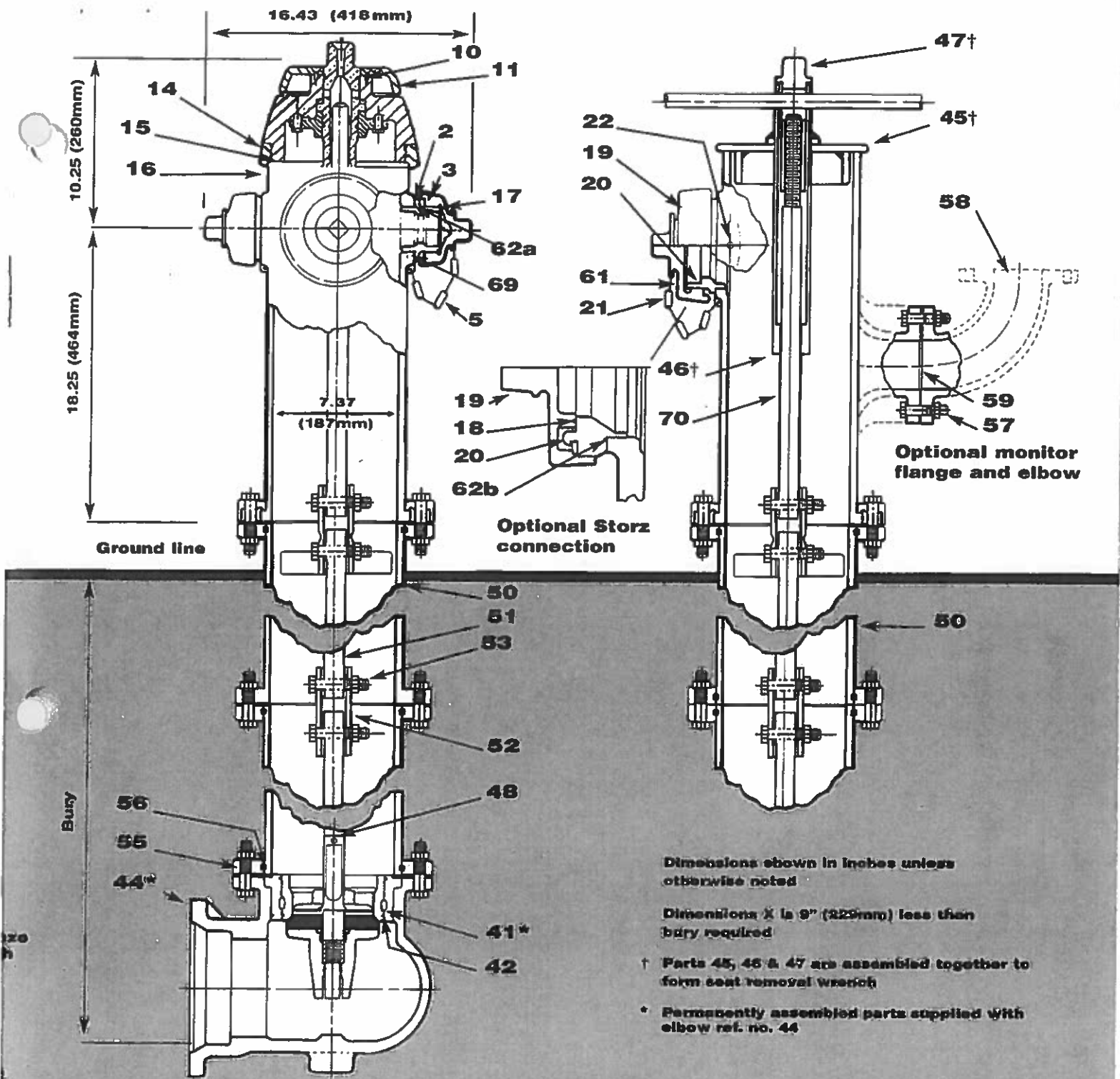


NO.	DESCRIPTION	MATERIAL
2	HOSE NOZZLE	COPPER ALLOY
3	HOSE NOZZLE CAP	CAST IRON
4	HOUSING STEM "O" RING	BUNA N
5	HOSE CAP CHAIN & "S" HOOK	STEEL ZINC PLATED
6	HOUSING JOINT GASKET	COMPRESSED NON ASBESTOS
7	OIL HOLE SCREW	BRASS
9	OPERATING NUT "O" RING	BUNA N
12	OPERATING NUT BEARING	DELRIN
13	CAP SCREW (RETAINING GLAND)	STEEL Z.P.
17	HOSE CAP GASKET	RED RUBBER
18	PUMPER CAP "O" RING STORZ 100	BUNA N
19	PUMPER NOZZLE CAP	CAST IRON
20	PUMPER NOZZLE	COPPER ALLOY
21	PUMPER CAP CHAIN & "S" HOOK	STEEL Z.P.
24	INTERSECTION BOLTS & NUTS	STEEL Z.P.
25	SAFETY FLANGE (SEGMENTS)	CAST IRON
26	INTERSECTION GASKET	RED RUBBER
27	SAFETY COUPLING	CAST IRON
28	SAFETY COUPLING BOLT & NUT	STEEL Z.P.
29	OPERATING STEM LOWER	STEEL
30	INTERMEDIATE SECTION	DUCTILE
31	DRIP VALVE	COPPER ALLOY
*32	DRAIN HOLE LINING	BRASS
34	SEAT "O" RING TOP	BUNA N
34 A	SEAT "O" RING BOTTOM	BUNA N
35	MAIN VALVE DISC	RUBBER
38	MAIN VALVE "O" RING	BUNA N
39	DRIP VALVE FACING	RUBBER
40	HOLDING CLAMP	PLASTIC
42	MAIN VALVE SEAT	COPPER ALLOY
*44	ELBOW (STATE INLET REQUIRED)	CAST IRON
**45†	GUIDE PLATE ASSEMBLY	STEEL
**46†	INTERIOR WRENCH	STEEL
47†	HOLDING NUT	COPPER ALLOY
48	HOLDING CLAMP SCREW	BRASS
49	DRAIN HOLE PLUG	BRASS
50	INTERSECTION EXTENSION	DUCTILE IRON
51	INTER-EXTENSION STEM	STEEL
52	ALIGNMENT COUPLING	CAST IRON
53	EXTENSION STEM BOLT & NUT	STEEL Z.P.
55	PIPE FLANGE (BOTTOM)	CAST IRON
56	RETAINING RING (SQUARE)	STEEL Z.P.
57	MONITOR BOLT & NUT	STEEL Z.P.
58	MONITOR ELBOW	CAST IRON
59	MONITOR GASKET	RED RUBBER
61	PUMPER CAP GASKET	RED RUBBER
62 A	HOSE NOZZLE "O" RING	BUNA N
62 B	PUMPER NOZZLE "O" RING	BUNA N
63	OPERATING NUT RETAINING GLAND	CAST IRON
64	OPERATING NUT	COPPER ALLOY
65	OPERATING NUT "O" RING	BUNA N
66	LOWER VALVE PLATE	CAST IRON
67	LOCKWASHER	STAINLESS STEEL
68	LOWER VALVE PLATE "O" RING	BUNA N
69	H. NOZ. SET SCREW, PUMP. NOZ. PIN	ST. STL., BRASS
70	OPERATING STEM UPPER	STAINLESS STEEL
71	STORZ 100 PUMPER NOZZLE	STAINLESS STEEL
72	STORZ 65 HOSE NOZZLE	COPPER ALLOY
73	STORZ 65 HOSE CAP "O" RING	BUNA N
74	STORZ 65 HOSE CAP	CAST IRON
75	STORZ 100 PUMPER NOZZLE	COPPER ALLOY
76	STORZ 100 PUMPER CAP	CAST IRON



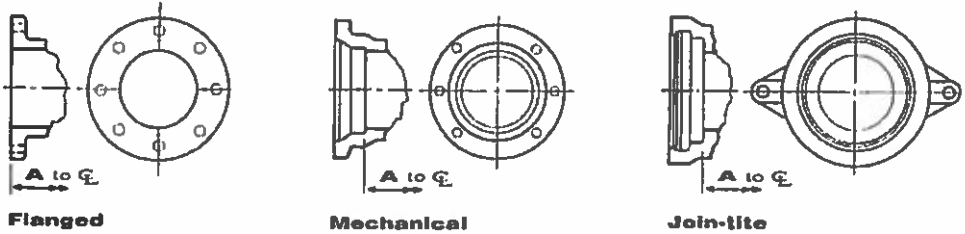
NO.	DESCRIPTION	MATERIAL
77	BODY CAP BOLTS	STAINLESS STEEL
78	BODY CAP	CAST IRON
79	BODY CAP GASKET	RED RUBBER
80	BODY	CAST IRON
*81	SEAT RING	COPPER ALLOY
82	PIPE FLANGE (TOP)	CAST IRON
83	SAFETY COUPLING CLEVIS BOLT & PIN	STEEL Z.P.

\* BOLT DOWN: 77/78/79/80  
† SCREW DOWN: 10/14/15/16



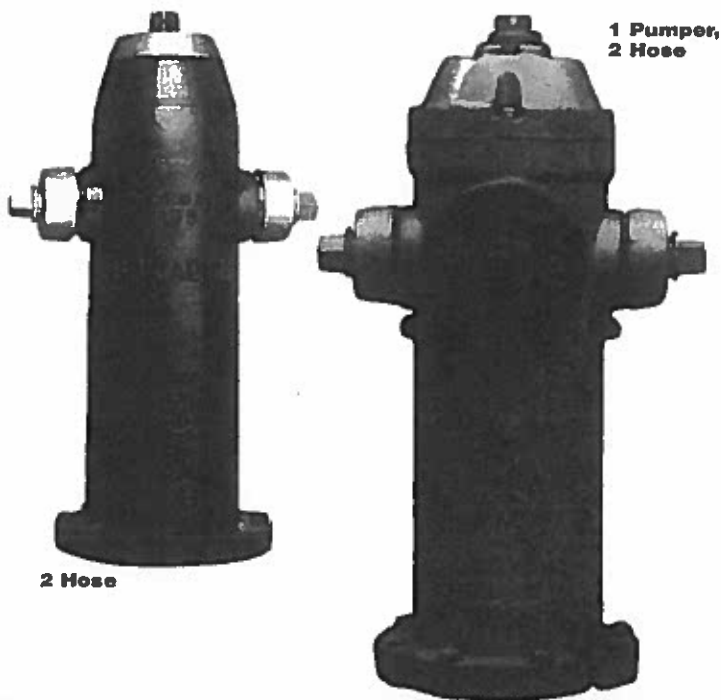
# BRIGADIER M

## Hydrant end joints



	4"	6"	8"
Flanged	8.25"	8.75"	
Mechanical	5.50"	6.00"	7.50"
Join-tite		4.62"	

DIMENSION A



## BRIGADIER M

- Hydrant shall be manufactured in accordance with AWWA Standard C502, and shall be listed with ULC and FM.
- Hydrant shall be designed for 175 p.s.i. working pressure and tested to 350 p.s.i. hydrostatic pressure.
- Hydrant shall be backed by manufacturer's 5 year limited warranty.
- Hydrant shall be a compression type, dry barrel design with centre operating stem construction.
- The O-ring seating surface on the upper operating stem shall be constructed of stainless steel.
- Hydrant lower operating rod shall be 1-1/4 inches in diameter.
- Hydrant shall have an internally lubricated bronze operating nut with O-ring seals. Operating nut shall be of the Hydra-lube™ design to ensure self-lubrication during operation.
- Hydrant hose nozzles shall be mechanically locked into place by an external allen screw, and have O-ring seals.
- Epoxy coating to be applied to interior and exterior of hydrant shoe for corrosion protection.
- Hydrant shall be manufactured with operating nut and integral thrust collar made of bronze. Delrin washer bearing shall be located above thrust collar for ease of hydrant operation.
- Hydrant shall have a lower valve assembly that fully encapsulates the lower operating rod threads. This allows for increased corrosion resistance and ease of disassembly.
- Hydrant shall be manufactured with a lower valve plate that bottoms out in the shoe for maximum opening.
- Hydrant shall have a main valve opening of 5-1/4 inches.
- Hydrant shall be a traffic model, complete with safety flanges and stem coupling. Nozzle section must rotate 360 degrees.
- Intermediate section shall be ductile iron.
- Hydrant shall be the Clow Canada Brigadier as manufactured by Clow Canada.

## Accessories/Alternatives/Options

### Monitor flange

The Brigadier is available with monitor flange for use in industrial fire protection in pulp and paper mills, lumber yards or storage areas for inflammable materials. The hydrant's 3" (76mm) flanged outlet is faced and drilled to ANSI 125, suitable for connecting a long radius flanged elbow and standpipe for mounting a monitor nozzle.

### Conversion kit

Previous M-67 models may be converted to incorporate important features of the Brigadier — easily and without excavation.

Kit consists of:

Operating nut conversion:

- two-piece stainless upper stem
- Hydra-lube™ operating nut
- nut retainer gland, gasket and fasteners
- Delrin thrust bearing

Lower valve plate conversion:

- Brigadier extended lower valve plate complete with O-ring and locking device
- valve disc (urethane or SBR)

All Brigadier components are fully interchangeable with previous M-67 and M-59 models

### On-line hydrant

Clow's on-line fire hydrant is suitable for service in cold climates where buries are lengthy, and it is feasible and economical to bolt the hydrant directly on a tee installed on a main. An 8" (203mm) flanged spool piece replaces the conventional hydrant elbow; the spool piece flange has 8 holes of 7/8" (22mm) diameter, on a 9 1/2" (242mm) bolt circle diameter.

### Flush hydrant

Clow provides a flush-type hydrant especially designed for areas which must be kept clear of all obstructions, such as airports. Nozzles and operating nut are located in a cast iron box, the top of which is level with the groundline. "Clow" and year of manufacture are cast on the cover, with special lettering supplied to order. Other industrial applications include places where the surface is kept clear of snow or ice by underground heating. This hydrant is available with two hose connections or one hose and one pumper connection. Surface box may have piped drain (which could be connected to elbow drain) or with drain plugged requiring pumping out after each use.

### Wall hydrant

Clow's wall-type hydrant is of special interest where space is at a premium. The interior parts of the hydrant are located inside the building, and the hydrant protrudes from the face of the wall approximately 8" (203mm).

Note: When ordering, please specify wall thickness (X) and distance from outside of wall to centre of hydrant inlet (Y), as well as other required specifications.

Further details on Clow Canada's Brigadier options and/or accessories are available upon request.

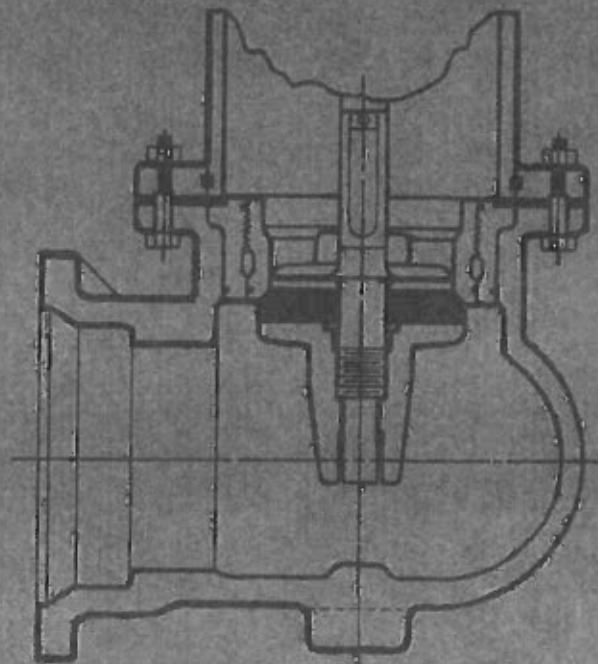
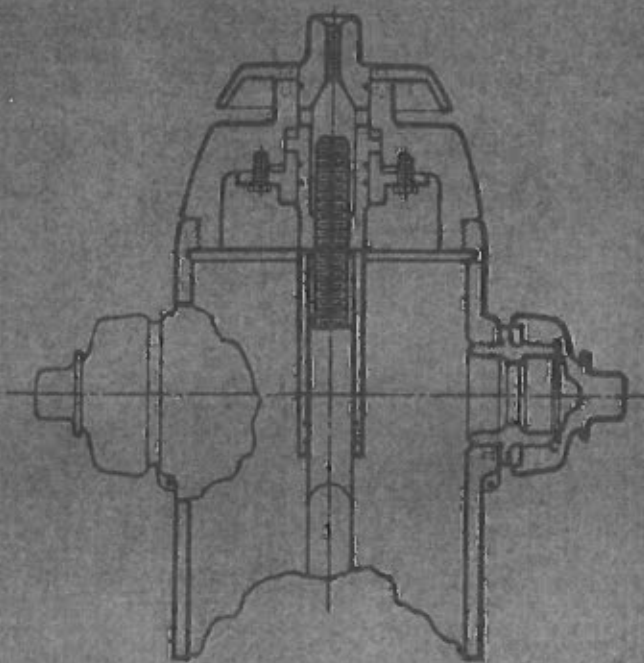
**CLOW**  
CLOW CANADA

**HAMILTON, ONTARIO**  
**TOLL FREE NUMBER**

1-800-561-9931

Tel. (905) 548-9604 Fax (905) 547-0113

[www.clowcanada.com](http://www.clowcanada.com)



**EASTERN CANADA**

P.O. Box 700  
Saint John, N.B. E2L 4B3  
Tel. (506) 633-2541  
Fax (506) 634-8936

**WESTERN CANADA**

801 Smelter Ave. S.E.  
P.O. Box 1000  
Medicine Hat, AB T1A 7H1  
Tel. (403) 527-3553  
Fax (403) 527-7454

**CLOW**  
CLOW CANADA

**HEAD OFFICE**

1757 Burlington Street East  
P.O. Box 2849  
Hamilton, ON L8H 3L5  
Tel. (905) 548-9604  
Fax (905) 548-6885

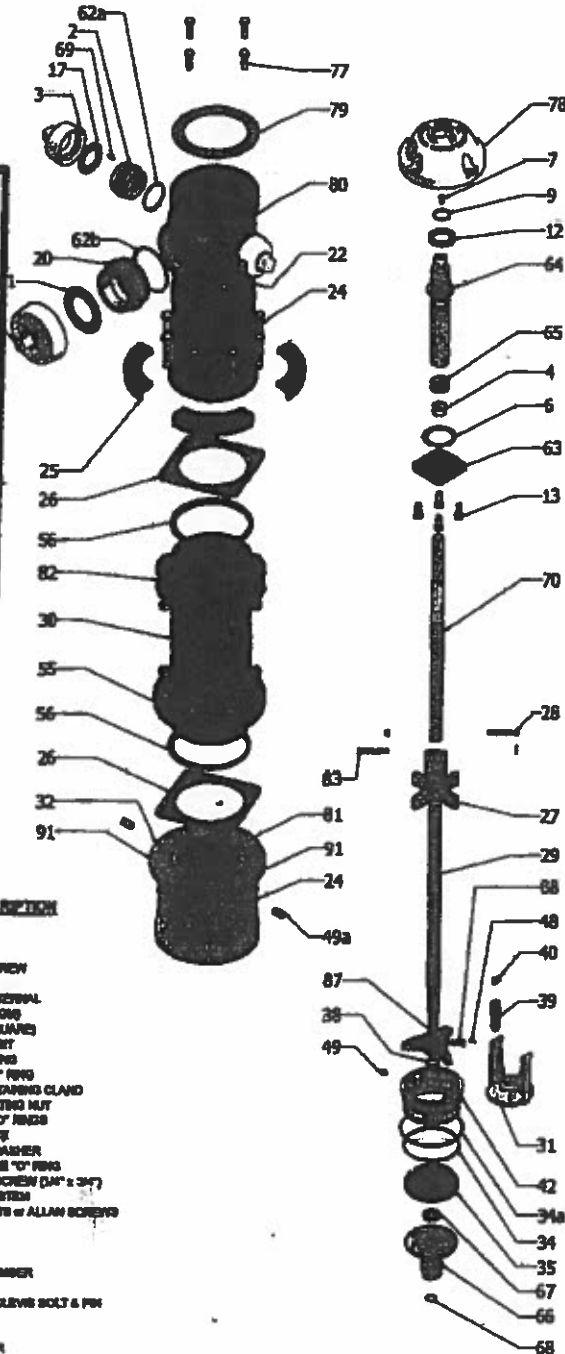
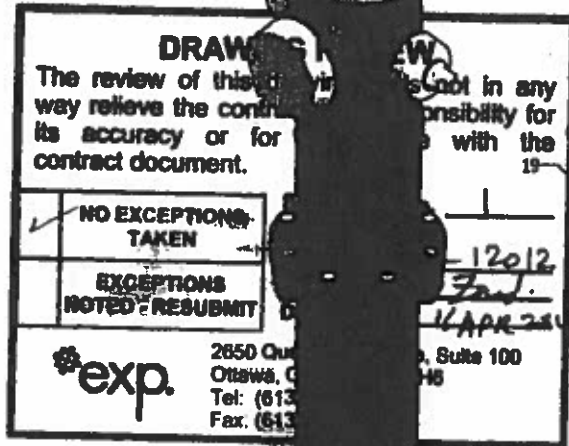
# CLOW

CLOW CANADA

## BRIGADIER

### 6" ON-LINE HYDRANT

### 250 PSI FM APPROVED



LIST OF 6" ON-LINE HYDRANT STANDARD PARTS

Ref No	DESCRIPTION	Ref No	DESCRIPTION
2	HOSE NOZZLE	40	HOLDING CLAMP
3	HOSE NOZZLE CAP	42	MAIN VALVE SEAT
4	HOLDING STEM "O" RING	44	HOLDING CLAMP SCREW
5	HOSE CAP CHAIN & "O" HOOK	46	CHAIN HOLE PLUG
6	HOLDING JOINT GASKET	48a	3/4" PIPE PLUGS EXTERNAL
7	OIL HOLE SCREW	50	PIPE FLANGE BOTTOM
9	OPERATING NUT "O" RING	52	RETURNING RING (GLAND)
12	OPERATING NUT BEARING	54	PUMPER CAP GASKET
13	CAP SCREW (1/2" x 1 1/4")	56a	HOSE NOZZLE "O" RING
17	HOSE CAP GASKET	56b	PUMPER NOZZLE "O" RING
19	PUMPER NOZZLE CAP	62	OPERATING NUT RETURNING CLAND
20	PUMPER NOZZLE	64	HYDRAULIC OPERATING NUT
21	PUMPER CAP CHAIN & "O" HOOK	66	RETURNING GLAND "O" RING
22	PUMPER NOZZLE PIN	68	LOWER VALVE PLATE
24	INTERMEDIATE BOLTS & NUTS	67	MAIN VALVE LOCKWASHER
25	SAFETY PLATE (SEGMENTS)	69	LOWER VALVE PLATE "O" RING
26	INTERMEDIATE GASKET	70	HOSE NOZZLE SET SCREW (3/4" x 3/4")
27	SAFETY COUPLING	72	UPPER OPERATING STEM
28	SAFETY COUPLING BOLT & NUT (3/4" x 3/4")	74	BODY CAP HEX BOLTS & ALLAN SCREWS
29	OPERATING STEM LOWER	76	BODY CAP
30	INTERMEDIATE SECTION	78	BODY CAP GASKET
31	DRIP WARE	80	BODY
32	CHAIN HOLE LUBING OIL CHAMBER	81	SEAT RING OIL CHAMBER
34a	SEAT "O" RING (TOP)	82	PIPE FLANGE TOP
34b	SEAT "O" RING (BOTTOM)	83	SAFETY COUPLING CLEVIS BOLT & PIN
36	MAIN VALVE O-RING	87	CHASSIS SPINDLE
38	MAIN VALVE "O" RING	89	3/4" x 1 1/4" BOLT
39	DRIP VALVE FACING	91	6" ON-LINE CHAMBER

MADE IN CANADA



www.clowcanada.com

## DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for contract documents.

### Link-Seal® Modular Seal Model Properties



EPDM (Black)  
EPDM (Blue) Low Ductility

Substitution of L-Link-Seal Modular Seal  
Standard for use in water, direct ground burial and atmospheric conditions. Provide electrical isolation system cathodic protection is required.  
Design: Standard  
Seal Element: EPDM (Black) or EPDM (Blue)  
Pressure Plates: Reinforced Nylon Polymer  
Bolts & Nuts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.  
Temp. Range: -40 to +250°F (-40 to +121°C)\*

\* = Sustained operation near temperature limits may affect life expectancy.

### with Nitrile Seal Elements



Nitrile (Green)

Model "O" Link-Seal Modular Seal  
Nitrile rubber is resistant to oils, fuel and many solvents (gasoline, motor oil, kerosene, methane, jet fuel, hydraulic fluid, water, etc.).  
Type: Oil Resistant  
Seal Element: Nitrile (Green) Note: Not UV resistant.  
Pressure Plates: Reinforced Nylon Polymer  
Bolts & Nuts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.  
Temp. Range: -40 to +210°F (-40 to +99°C)\*

### with Silicone Seal Elements



Silicone (Grey)

Model "T" Link-Seal Modular Seal  
Silicone rubber is ideal for temperature extremes. The "T" model is one-hour Factory Mutual approved.  
Type: High/Low Temperature  
Seal Element: Silicone (Grey)  
Pressure Plates: Steel Zinc Dichromate  
Bolts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.  
Temp. Range: -67 to +400°F (-55 to +204°C)\*

**ex**

NO EXCEPT TAKE

EXCEPT TAKE

NOTED - REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for contract documents.

Model "FD/F8" Link-Seal Modular Seal  
Double seal for added protection.  
Type: Fire Seals  
Seal Element: Silicone (Grey)  
Pressure Plates: Steel zinc dichromate  
Bolts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.  
Temp. Range: -67 to +400°F (-55 to +204°C)\*  
NOTE: Sustain a constant temp. of 325°F. (163°C.)  
\* = Sustained operation near temperature limits may affect life expectancy.

### Material Properties of Link-Seal Modular Seal Elements

PROPERTY	ASTM METHOD	EPDM (EPDM L)	NITRILE	SILICONE
Hardness (shore A)	D-2240	50 ±5 (40 ±5)	50 ±5	50 ±5
Tensile	D-412	1450 psi	1300 psi	860 psi
Elongation	D-412	400%	300%	250%
Compression Set	S-395	15%	45%	40%
		22 hrs. @ 158°F (70°C)	22 hrs. @ 212°F (100°C)	22 hrs. @ 360°F (177°C)
Specific Gravity	D-297	1.10	1.15	1.40

### Material Properties of Composite Pressure Plates

PROPERTY	ASTM METHOD	VALUE
Izod Impact - Notched	D-256	2.05 ft-lb/in
Tensile Strength @ Yield	D-638	20,000 psi
Tensile Strength - Break	D-638	20,250 psi
Flexural Strength @ Yield	D-790	30,750 psi
Flexural Modulus	D-790	1,124,000 psi
Elongation, Break	D-638	11.07%
Specific Gravity	D-792	1.38
Moisture Content	-	0.18%

### Bolt & Nut Specifications

Standard: Carbon Steel  
Carbon steel, zinc dichromated per ASTM B833, with an additional corrosion inhibiting proprietary organic coating. (passes 1470 hour salt spray test)  
Tensile Strength = 80,000 psi, minimum.

Option: Stainless Steel  
ANSI Type = 316, Per ASTM F593-95  
Tensile Strength = 85,000 psi, average.



PSI-Thunderline/Link-Seal®  
6525 Goforth Street, Houston TX 77021 U.S.A.  
Tel: 713-747-6948, Fax: 713-747-6028, Toll Free: 800-423-2410  
www.linkseal.com, e-mail: info@psipal.com

LSTECH-8/27/10  
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NO EXCEPTIONS  
TAKEN  
EXCEPTIONS  
NOTED - RESUBMIT

Project No.   
By *AS*  
Date   
2850 Queen's Ave. East  
Ottawa, Ontario  
K1M 1Y1 (613) 735-1111  
Fax: (613) 735-1112

2850 Queen's Ave. East  
Ottawa, Ontario  
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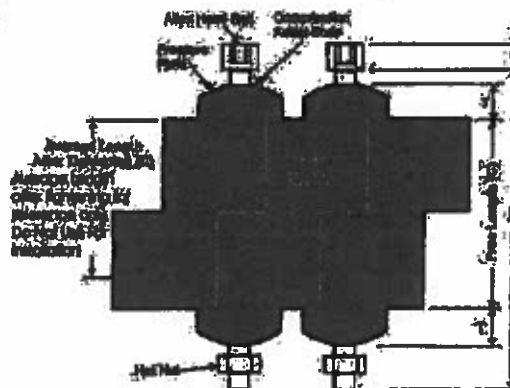
Pressure Plate Length (A)

Sealant, Casing or  
Well Hole I.D.

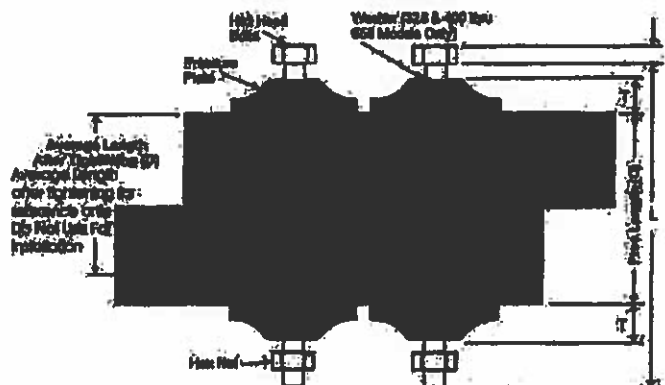
Drawings for Reference Only



For LS-200 through LS-315



For LS-325 through LS-650



## Technical Data Submittal Sheet Supplement 12/15/10

\*Dimensional Data for Models C, L, O, S-316, LS-316 and OS-316

LINK SEAL MODEL NO.	RUBBER SEALING ELEMENT			PRESSURE PLATE		BOLT				WEIGHT FOR 10 LINK SECTION (LBS)	MIN. REQUIRED SEATING WIDTH
	ACTUAL THICKNESS (B)	FREE LENGTH (C)	Avg. LENGTH AFTER TIGHTENING (D)	(A)	(T)	ALLEN HEAD HEX ACROSS FLATS	Ø	THREAD SIZE	(F)		
LS-200-A	0.48"	1.75"	1.38"	1.08"	0.31"	4mm Allen (0.157")	4.95mm (0.195")	M5-0.8	70mm (2.755")	0.70	2.25"
LS-275-A	0.81"	1.75"	1.38"	0.97"	0.31"	4mm Allen (0.157")	4.95mm (0.195")	M5-0.8	70mm (2.755")	0.75	2.25"
LS-300-A	0.65"	2.31"	1.87"	1.58"	0.44"	6mm Allen (0.236")	7.87mm (0.310")	M6-1.25	90mm (3.543")	2.15	3.00"
LS-316-A	0.81"	2.31"	1.87"	1.44"	0.44"	6mm Allen (0.236")	7.87mm (0.310")	M6-1.25	90mm (3.543")	2.20	3.00"
LS-325-A	0.65"	2.83"	2.00"	3.13"	1.00"	13mm (0.511")	8.30mm (0.328")	M8-1.25	90mm (3.543")	5.50	4.00"
LS-340-A	1.00"	2.70"	2.25"	1.48"	0.68"	13mm (0.511")	8.30mm (0.328")	M8-1.25	120mm (4.720")	3.30	4.00"
LS-380-A	1.24"	2.70"	2.25"	2.05"	0.77"	13mm (0.511")	8.30mm (0.328")	M8-1.25	120mm (4.720")	5.10	4.00"
LS-400-A	1.36"	3.60"	2.75"	3.50"	1.06"	17mm (0.669")	8.40mm (0.331")	M10-1.5	130mm (5.118")	12.00	5.00"
LS-410-A	1.43"	3.37"	2.67"	2.52"	0.88"	17mm (0.669")	8.40mm (0.331")	M10-1.5	130mm (5.118")	8.20	5.00"
LS-425-A	1.06"	3.00"	2.25"	3.50"	1.19"	17mm (0.669")	8.40mm (0.331")	M10-1.5	130mm (5.118")	10.00	5.00"
LS-475-A	1.56"	3.38"	2.63"	2.63"	0.88"	17mm (0.669")	8.40mm (0.331")	M10-1.5	130mm (5.118")	10.00	5.00"
LS-500-A	2.25"	3.75"	2.75"	3.63"	1.06"	19mm (0.748")	7.50mm (0.300")	M12-1.75	140mm (5.511")	22.50	6.00"
LS-625-A	2.06"	3.75"	2.67"	3.63"	1.06"	19mm (0.748")	7.50mm (0.300")	M12-1.75	140mm (5.511")	21.00	6.00"
LS-675-A	1.81"	3.75"	3.00"	3.00"	1.00"	19mm (0.748")	7.50mm (0.300")	M12-1.75	140mm (5.511")	16.50	6.00"
LS-800-A	3.09"	4.00"	3.00"	6.00"	1.90"	30mm (0.748")	12.50mm (0.490")	M20-2.5	180mm (7.086")	60.00	6.00"
LS-650-A	2.71"	3.86"	3.00"	3.96"	1.19"	19mm (0.748")	7.50mm (0.300")	M12-1.75	140mm (5.511")	26.10	6.00"



VISIT [WWW.LINKSEAL.COM](http://WWW.LINKSEAL.COM) FOR LITERATURE AND INSTALLATION INSTRUCTIONS



# Standard Flexible Coupling

STYLE 77

## INSTALLATION


Reference should always be made to the I-100 Victaulic Field Installation Handbook for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

## WARRANTY

Refer to the Warranty section of the current Price List or contact Victaulic for details.

## NOTE

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

DRAWING REVIEW	
The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.	
<input checked="" type="checkbox"/> NO EXCEPTIONS TAKEN	Submission No. <u>1</u>
<input type="checkbox"/> EXCEPTIONS NOTED - RESUBMIT	Project No. <u>CCASHQ-12012</u>
	By <u>Abdel Zaid</u>
	Date <u>16 APR 2014</u>
	2650 Queensview Drive, Suite 100 Ottawa, Ontario K2B 8H6 Tel: (613) 686-1899 Fax: (613) 225-7337

For complete contact information, visit [www.victaulic.com](http://www.victaulic.com)

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06.04



# Standard Flexible Coupling

STYLE 77

## DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.

NO EXCEPTIONS  
TAKEN

Submission No. 1

Project No. CASHQ-12012

EXCEPTIONS

By: [Signature]

### DIMENSIONS

Size	Weight	Length	End Load	Working Pressure	Deflection	Separation	End Load	Working Pressure	Deflection	Separation
14	8.625	800	46740	0-0.13	0'-30"	0.08	14	13.63	14.75	20.9
14	219.1	5500	252995	0-3.2	0'-30"	0.14	14	279	375	94
20	10.750	800	73280	0-0.13	0'-40"	0.12	2-1x6	13.63	17.13	26.3
20	273.0	5500	326100	0-3.2	0'-40"	0.12	2-1x6	246	435	141
24	12.750	800	102000	0-0.13	0'-34"	0.12	2-1x6 1/2	15.63	19.25	26.3
24	323.9	5500	459900	0-3.2	0'-34"	0.12	2-1x6 1/2	397	480	126
24	14.800	300	46180	0-0.13	0'-37"	0.11	2-1x3 1/2	16.75	20.25	30.0
24	355.6	2065	206500	0-3.2	0'-37"	0.11	2-1x3 1/2	425	514	178
24	14.842	300	51875	0-0.13	0'-37"	0.11	2-1x3 1/2	17.39	20.96	28
24	377.0	2065	236845	0-3.2	0'-37"	0.11	2-1x3 1/2	442	531	221
30	16.000	300	60320	0-0.13	0'-27"	0.10	2-1x3 1/2	18.75	22.25	30.0
30	406.4	2065	268425	0-3.2	0'-27"	0.10	2-1x3 1/2	476	565	204
30	16.772	300	66345	0-0.13	0'-27"	0.10	2-1x3 1/2	19.09	22.92	28.2
30	426	2065	294795	0-3.2	0'-27"	0.10	2-1x3 1/2	500	581	257
36	18.000	300	76340	0-0.13	0'-24"	0.08	2-1 1/2 x 4	21.56	25.00	31.3
36	457.2	2065	339710	0-3.2	0'-24"	0.08	2-1 1/2 x 4	548	635	291
36	18.898	300	84105	0-0.13	0'-24"	0.08	2-1 1/2 x 4	22.38	25.86	30.4
36	48	2065	374265	0-3.2	0'-24"	0.08	2-1 1/2 x 4	569	655	315
42	20.000	300	94000	0-0.13	0'-22"	0.08	2-1 1/2 x 4	23.63	27.00	33.3
42	508.0	2065	418900	0-3.2	0'-22"	0.08	2-1 1/2 x 4	600	686	340
42	22.00	300	114000	0-0.13	0'-19"	0.07	2-1 1/2 x 4	25.63	29.13	31.3
42	559.0	2065	507900	0-3.2	0'-19"	0.07	2-1 1/2 x 4	651	740	325
48	20.866	300	102535	0-0.13	0'-22"	0.08	2-1 1/2 x 4	24.29	27.8	30.7
48	530	2065	456280	0-3.2	0'-22"	0.08	2-1 1/2 x 4	617	704	317
48	22.895	300	108380	0-0.13	0'-19"	0.07	2-1 1/2 x 4	26.76	30.01	31.2
48	580	2065	485591	0-3.2	0'-19"	0.07	2-1 1/2 x 4	680	763	329
60	24.000	250	113000	0-0.13	0'-18"	0.07	2-1 1/2 x 4	27.75	31.00	31.9
60	606.6	1725	502850	0-3.2	0'-18"	0.07	2-1 1/2 x 4	705	787	331
60	24.803	250	108790	0-0.13	0'-18"	0.07	2-1 1/2 x 4	28.42	32.16	31.2
60	630	1725	457416	0-3.2	0'-18"	0.07	2-1 1/2 x 4	722	817	344

5 Couplings 8, 10, 12/200, 250, 300 mm sizes available to JIS standards. Refer to Section 06.17 for details.

\* Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cast grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1 1/2 times the figures shown.

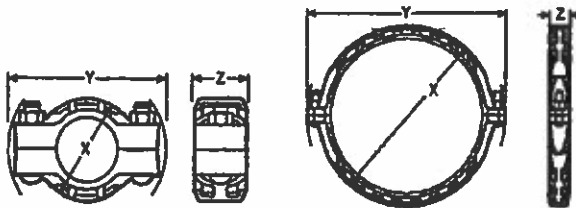
† Allowable Pipe End Separation and Deflection figures show the maximum nominal range of movement available at each joint for standard roll grooved pipe. Figures for standard cast grooved pipe may be doubled. These figures are maximums; for design and installation purposes these figures should be reduced by: 50% for 1/2 - 3 1/2" (20 - 90 mm); 25% for 4" (100 mm) and larger.

@ Number of bolts required equals number of housing segments.

Metric thread size bolts are available (color coded gold) for all coupling sizes upon request. Contact Victaulic for details.

‡ For 14 - 24/350 - 600 mm Roll Groove systems Victaulic offers the Advanced Groove System (AGS) line of products. Request publication 20.03 for information on the Style W77 flexible AGS coupling.

‡ CS size product is designed with two housings and requires two bolts.



14 - 12/200 - 300 MM SIZES

14 - 34/7750 - 600 MM SIZES

# Standard Flexible Coupling

STYLE 77

## MATERIAL SPECIFICATIONS

Housing: Ductile iron conforming to ASTM A-536, grade 65-45-12. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

Housing Coating: Orange enamel.

- Optional: Hot dipped galvanized and others.

Coupling Gaskets (specify choice\*)†

- Grade "E" EPDM (All other sizes)  
EPDM (Green color code). Temperature range -30°F to +230°F/-34°C to +110°C.  
Recommended for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL classified in accordance with ANSI/NSF 61 for cold +86°F/+30°C and hot +180°F/+82°C potable water service. NOT RECOMMENDED FOR PETROLEUM SERVICES.
- Grade "T" nitrile  
Nitrile (Orange color code). Temperature range -20°F to +180°F/-29°C to +82°C.  
Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range. Not recommended for hot water services over +150°F/+66°C or for hot dry air over +140°F/+60°C.
- Services listed are General Service Recommendations only. It should be noted that there are services for which these gaskets are not recommended. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific gasket service recommendations and for a listing of services which are not recommended.

NOTE: Additional gasket styles are available. Contact Victaulic for details.


Bolts/Nuts: Heat-treated plated carbon steel, trackhead meeting the physical and chemical requirements of ASTM A-449 and physical requirements of ASTM A-183.

- Optional Bolts: ASTM F-593, Group 2, Type 316 stainless steel oval neck track bolts.
- Optional Nuts: ASTM F-594, Group 2, Type 316 stainless steel heavy hex nuts with galling resistant coating.

† Supplemental lubricant is recommended for services installed at or continuously operating below 0°F/-18°C.

## DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.

<input checked="" type="checkbox"/>	NO EXCEPTIONS TAKEN	Submission No. <u>1</u>
<input type="checkbox"/>	EXCEPTIONS NOTED - RESUBMIT	Project No. <u>CGSHQ-12012</u>
		By <u>Abdul Zaman</u>
		Date <u>16 APR 2018</u>
 2650 Queensview Drive, Suite 100 Ottawa, Ontario K2B 8H6 Tel: (613) 688-1899 Fax: (613) 225-7337		

# Standard Flexible Coupling

## STYLE 77



Style 77 couplings are designed with cross-ribbed construction to provide a strong component for pressure piping systems. The coupling is offered in a two piece housing design from 1/4 - 24" / 20 - 600mm sizes for pressures up to 1000 psi/6900 kPa.

All sizes are provided with plated bolts and nuts. Galvanized and stainless steel housings are also available.

Independent testing has shown the Style 77 coupling to be an effective stress relief and vibration attenuation device providing performance superior to braided steel and elastomeric arch-type connectors when used in close proximity to the source of vibration. Refer to 26.04 for vibration information.

Independent testing has shown that Victaulic Style 77 flexible couplings provide exceptional functionality during and after earthquakes conditions. Refer to 26.12 for further information.

Performance data presented in this document is based on use with standard wall, carbon steel pipe. For use with stainless steel pipe, please reference document 17.09 for pressure ratings and end loads. When used on light wall stainless steel pipe, the Victaulic RX roll set must be used to roll groove the pipe. For further information regarding roll grooving stainless steel, refer to document 17.01.

For 14 - 24" / 350 - 600mm flexible roll groove systems, Victaulic recommends Style W77 AGS couplings. For more information, request submittal publication 20.03.



1/4 - 12" / 20 - 300MM SIZES



14 - 24" / 350 - 600MM SIZES

### DRAWING REVIEW

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<input checked="" type="checkbox"/>	NO EXCEPTIONS TAKEN
<input type="checkbox"/>	EXCEPTIONS NOTED - RESUBMIT

Submission No. 1  
Project No. Abdel Fawad  
By 16 APR 2014  
Date

**\*exp.**

2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 8H8  
Tel: (613) 688-1899  
Fax: (613) 225-7337

JOB/OWNER	CONTRACTOR	ENGINEER
System No. _____	Submitted By _____	Spec Sect _____ Para _____
Location _____	Date _____	Approved _____
		Date _____

# DRAWING REVIEW

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DATE: OCT. 6/1998

BY: [Signature]

PROJECT NO. 2650

DATE: OCT. 6/1998

2 of 3

REV.

EXP 1316 OCT. 2000 L.M.

CONTRACT DOCUMENT NO. 7 BRIGADIER HYD. WITH BOLTED BODY CAP MATERIAL LIST

ITEM NO.	DESCRIPTION	PROJECT NO.	COMP. ALLOY	ITEM NO.	DESCRIPTION	COMP. ALLOY
2	HOSE NOZZLE	TAKEN	CAST IRON	49	DRINK HOLE PLUG	BRASS
3	HOSE NOZZLE CAP	BY	BLU-A-N	50	INTERSECTION EXTENSION	DUCTILE IRON
4	HOSE NOZZLE GASKET	BY	BLU-A-N	51	EXTENSION STEM	STEEL
5	HOSE NOZZLE GASKET	BY	STEEL ZINC PLATED	52	ALIGNMENT COUPLING	CAST IRON
6	HOSE NOZZLE GASKET	BY	STEEL ZINC PLATED	53	EXTENSION STEM BOLTS & NUTS (S&T)	STEEL ZINC PLATED
7	HOSE NOZZLE GASKET	BY	STEEL ZINC PLATED	54	PIPE FLANGE (BOTTOM)	CAST IRON
8	OPERATING NUT	BY	DELUMIN	55	RETAINING RING (GROUDED)	STEEL ZINC PLATED
9	OPERATING NUT	BY	DELUMIN	56	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
10	OPERATING NUT	BY	DELUMIN	57	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
11	OPERATING NUT	BY	DELUMIN	58	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
12	OPERATING NUT	BY	DELUMIN	59	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
13	OPERATING NUT	BY	DELUMIN	60	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
14	OPERATING NUT	BY	DELUMIN	61	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
15	OPERATING NUT	BY	DELUMIN	62	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
16	OPERATING NUT	BY	DELUMIN	63	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
17	OPERATING NUT	BY	DELUMIN	64	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
18	OPERATING NUT	BY	DELUMIN	65	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
19	OPERATING NUT	BY	DELUMIN	66	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
20	OPERATING NUT	BY	DELUMIN	67	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
21	OPERATING NUT	BY	DELUMIN	68	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
22	OPERATING NUT	BY	DELUMIN	69	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
23	OPERATING NUT	BY	DELUMIN	70	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
24	OPERATING NUT	BY	DELUMIN	71	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
25	OPERATING NUT	BY	DELUMIN	72	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
26	OPERATING NUT	BY	DELUMIN	73	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
27	OPERATING NUT	BY	DELUMIN	74	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
28	OPERATING NUT	BY	DELUMIN	75	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
29	OPERATING NUT	BY	DELUMIN	76	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
30	OPERATING NUT	BY	DELUMIN	77	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
31	OPERATING NUT	BY	DELUMIN	78	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
32	OPERATING NUT	BY	DELUMIN	79	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
33	OPERATING NUT	BY	DELUMIN	80	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
34	OPERATING NUT	BY	DELUMIN	81	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
35	OPERATING NUT	BY	DELUMIN	82	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
36	OPERATING NUT	BY	DELUMIN	83	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
37	OPERATING NUT	BY	DELUMIN	84	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
38	OPERATING NUT	BY	DELUMIN	85	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
39	OPERATING NUT	BY	DELUMIN	86	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
40	OPERATING NUT	BY	DELUMIN	87	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
41	OPERATING NUT	BY	DELUMIN	88	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
42	OPERATING NUT	BY	DELUMIN	89	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
43	OPERATING NUT	BY	DELUMIN	90	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
44	OPERATING NUT	BY	DELUMIN	91	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
45	OPERATING NUT	BY	DELUMIN	92	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
46	OPERATING NUT	BY	DELUMIN	93	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
47	OPERATING NUT	BY	DELUMIN	94	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
48	OPERATING NUT	BY	DELUMIN	95	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
49	OPERATING NUT	BY	DELUMIN	96	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED
50	OPERATING NUT	BY	DELUMIN	97	MONITOR BOLT & NUT (S&T)	STEEL ZINC PLATED

## DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.

NO EXCEPTIONS TAKEN

EXCEPTIONS NOTED - REVISION

exp

2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 8H6  
Tel: (613) 688-1800  
Fax: (613) 225-7337

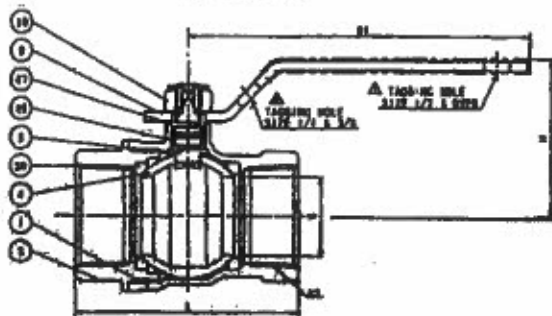


# FORGED BRASS BALL VALVE

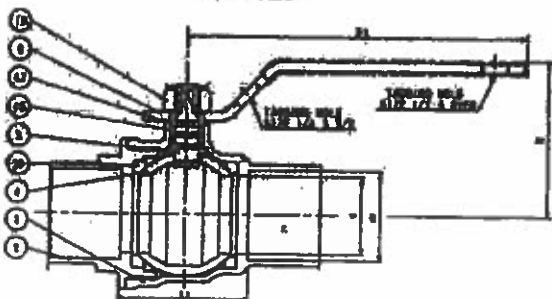
## MAINTENANCE FREE DOUBLE O-RING STEM SEALS

Two Piece Body • Full Port • Chrome Plated Ball  
Blowout Proof Stem (NI Plated) • PTFE Seats  
CSA (USC) TYPE 1

**CODE # 58  
THREADED**



**CODE # 59  
SOLDER\***



\*REFERENCE VALVE INSTALLATION TIPS FOR  
SOUND SOLDER JOINTS (PAGE BV-66) OR SEE  
INSTALLATION SHEET PACKAGED WITH VALVE.

### SPECIFICATION

Approved valve shall have two piece forged brass body, blowout proof stem (NI Plated), PTFE seats, maintenance free double o-ring stem seals, chrome plated ball and full port design. Valves shall be pressure rated to 150 WSP/150 WOG and conform to MSS-SP 110 and certified to CSA, UL & FM.

KITZ Code No. 58 Threaded Ends  
59 Solder Ends

### STANDARDS

END TO END KITZ  
THREADED ENDS ANSI B1.20.1  
SOLDER JOINT ENDS ANSI B16.12  
WALL THICKNESS KITZ  
CONFORMS TO MSS-SP 110 - REPLACES US FED.  
SPEC. RHW-V-35B, TYPE II, CLASS A, TITLE 3

### PRESSURE/TEMPERATURE

150 PSI SATURATED STEAM TO 350°F  
650 PSI - NON-SHOCK COLD WATER, OIL OR GAS

NOTE: PRESSURE/TEMPERATURE CHART - PAGE BV-39.

### RECEIPT LIST

NO.	NAME OF PART	SPECIFICATION
1	BODY	FORGED BRASS (B22, C17700)
2	BODY CAP	FORGED BRASS (B22, C17700)
3	STEM	(1) BRASS ROD (B16)
4	BALL	(2) FORGED BRASS (B22, C17700) STRAIGHT OR HOLLOW BALL
9	HANDLE	(3) CARBON STEEL
10	HANDLE NUT	CARBON STEEL
30	BALL SEATS	PTFE
45	O-RINGS	FFKM
47	THRUST WASHER	PHI

NOTES: (1) NI PLATING  
(2) CR. PLATING  
(3) ELECTROPLATED ZINC WITH PLASTIC COATING

### DIMENSIONS - DIMENSIONS - DIMENSIONS

d2 SIZE	d	H	D1	L	L1	d1 Max. Min.	APPROX. CARTON NET WT. QTY
1/4	.39	1.46	2.76	1.65	1.11	.381 .377	29 120
3/8	.39	1.46	2.76	1.65	1.05	.308 .302	29 120
1/2	.69	1.69	3.16	2.00	1.10	.591 .587	29 60
3/4	.79	1.69	3.16	2.00	1.10	.591 .587	29 60
1	1.19	1.69	3.16	2.00	1.10	.591 .587	29 60
1 1/4	1.19	1.69	3.16	2.00	1.10	.591 .587	29 60
1 1/2	1.19	1.69	3.16	2.00	1.10	.591 .587	29 60
2	1.97	2.00	3.50	2.53	2.13	2.128 2.124	71 16

### DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.

NO EXCEPTIONS  
TAKEN

EXCEPTIONS  
NOTED: RESUBMIT

\*\*CSA (USC)

ASME B1.20.1 - 1990

AGA 3-4 - 240

CGA 9.2 - 1997

CGA 8.1 - 1997

CGA 9.1 - 1997

CGA 9.2 - 1997

UL-258 - 75 WSP (Fire Protection)

FM-1140 - 150 WSP (Fire Protection)

Submission No.

Project No.

CGS HQ - 12012

By Abdul Jaleel

Date 16 Apr 2014

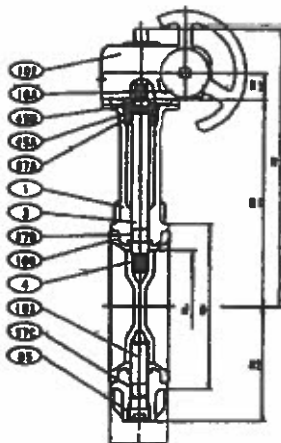
2650 Queensview Drive, Suite 100

Ottawa, Ontario K2B 8H6

Tel: (613) 688-1899

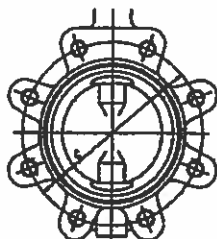
Fax: (613) 688-2255





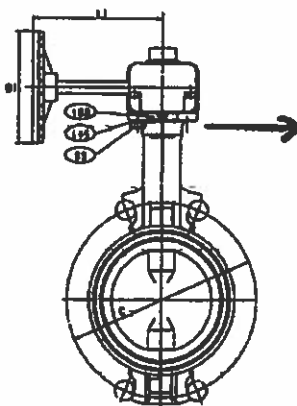
NO.	NAME OF PART	SPECIFICATION
1	BODY	DUCTILE IRON (A536 Gc. 65-45-12)
3	STEM*	STAINLESS STEEL (A276, Type 410 or 316)
4	DISC	DUCTILE IRON, AL. BRONZE, AND 316 SS
16A/B	NAME PLATE	ALUMINUM
45A/B	O-RING	NBR/EPDM
67A	BEARING	POLYACETAL
67B/C	STEM BEARING	OPP FTPE
85	PLUG	ZINC DIE-CAST (2)
99	SET BOLTS	CARBON STEEL
102	GEAR LINK	ALUMINUM DIE-CAST
103	BOTTOM STEM*	STAINLESS STEEL (A276, TYPE 410 or 316)
106	SEAT RUBBER (3)	NBR/EPDM
145	SPRING WASHER	CARBON STEEL

(1) Line scribed on top of the stem indicates the disc direction.  
 (2) Chromium Coating  
 (3) Vulcanized to the Body



SIZE	A	D	C	B	H1	H2	L	D1	L1	Water Lug
in. 2	1.97	3.54	4.75	7.64	5.79	2.64	1.69	3.15	4.78	4.9 7.1
in. 2½	2.56	4.09	5.50	7.95	6.18	2.95	1.81	3.15	4.78	5.7 8.4
in. 3	3.15	4.88	6.00	8.29	6.81	3.50	1.81	4.33	5.31	8.6 13.0
in. 4	3.94	5.75	7.50	9.69	7.28	3.96	2.06	4.33	5.31	9.2 19.0
in. 5	4.92	6.93	8.50	10.79	8.31	5.00	2.19	4.33	5.31	14.0 26.0
in. 6	5.91	8.11	9.50	11.26	8.78	5.47	2.19	4.33	5.31	19.0 32.0
in. 8	7.76	10.12	11.25	12.80	9.76	6.45	2.38	6.69	7.89	30.0 49.0

For gear operator details, refer to page 20.



#### NOTE:

KITZ lug style butterfly valves are tested for bi-directional dead end service to full working pressure of the valve with the downstream flange removed. In dead end service exceeding 96 hours, a downstream flange is recommended.

EXCEPTIONS  
NOTED - RESUBMIT



Code # 5112 (B/E)G  
Disc: Ductile Iron  
(A536 + ENF)

Code # 5122 (B/E)G  
Disc: Aluminum Bronze  
(C95400)

\*Code # 5141 (B/E)G  
Disc: 316 SS  
(A351 Gc. CF8M)

\*316 stem rated for 150 PSI max.



Code # 6112 (B/E)G  
Disc: Ductile Iron  
(A536 + ENF)

Code # 6122 (B/E)G  
Disc: Aluminum Bronze  
(C95400)

\*Code # 6141 (B/E)G  
Disc: 316 SS  
(A351 Gc. CF8M)

#### DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.

NO EXCEPTIONS  
NOTED - RESUBMIT

Submission No. 1  
Project No. CG540-12012  
By Arnel Zamora  
Date 16 APR 2014

\*exp.

2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 6H6  
Tel: (613) 688-1899  
Fax: (613) 225-7337

KITZ



REVIEWED BY TOWER ARCTIC LTD.  
DATED 4/15/14



## Link-Seal® Modular Seal Model Properties

### with EPDM Seal Elements



EPDM (Black)  
EPDM (Blue) Low Durometer

**Model "C" or "L" Link-Seal Modular Seal**  
Suitable for use in water, direct ground burial and atmospheric conditions. Provides electrical isolation where cathodic protection is required.

Type: Standard  
Seal Element: EPDM (Black) or EPDM (Blue)  
Pressure Plates: Reinforced Nylon Polymer  
Bolts & Nuts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.  
Temp. Range: -40 to +250°F (-40 to +121°C)\*

**Model "S-316" or "LS-316" Link-Seal Modular Seal**  
For chemical processing & waste water treatment. EPDM rubber is resistant to most inorganic acids and alkalis, some organic chemicals (acetone, alcohol, ketones).

Type: Stainless  
Seal Element: EPDM (Black) or EPDM (Blue)  
Pressure Plates: Reinforced Nylon Polymer  
Bolts & Nuts: 316 Stainless Steel  
Temp. Range: -40 to +250°F (-40 to +121°C)\*

\* = Sustained operation near temperature limits may affect life expectancy.

### with Nitrile Seal Elements



Nitrile (Green)

**Model "O" Link-Seal Modular Seal**  
Nitrile rubber is resistant to oils, fuel and many solvents (gasoline, motor oil, kerosene, methane, jet fuel, hydraulic fluid, water, etc.).

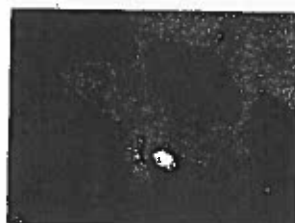
Type: Oil Resistant  
Seal Element: Nitrile (Green) Note: Not U.V. resistant.  
Pressure Plates: Reinforced Nylon Polymer  
Bolts & Nuts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.  
Temp. Range: -40 to +210°F (-40 to +99°C)\*

**Model "OS-316" Link-Seal Modular Seal**  
Combination of oil resistant rubber and stainless steel hardware.

Type: Oil Resistant  
Seal Element: Nitrile (Green) Note: Not U.V. resistant.  
Pressure Plates: Reinforced Nylon Polymer  
Bolts & Nuts: 316 Stainless Steel  
Temp. Range: -40 to +210°F (-40 to +99°C)\*

\* = Sustained operation near temperature limits may affect life expectancy.

### with Silicone Seal Elements



Silicone (Grey)

**Model "T" Link-Seal Modular Seal**  
Silicone rubber is ideal for temperature extremes. The "T" model is one-hour Factory Mutual approved.

Type: High/Low Temperature  
Seal Element: Silicone (Grey)  
Pressure Plates: Steel Zinc Dichromate  
Bolts: Steel with 2-part Zinc Dichromate & proprietary corrosion inhibiting coating.  
Temp. Range: -57 to +400°F (-55 to +204°C)\*

**Model "FD/FS" Link-Seal Modular Seal**  
Double seal for added protection.

Type: Fire Seals  
Seal Element: Silicone (Grey)  
Pressure Plates: Steel zinc dichromate  
Bolts: Steel with 2-part Zinc Dichromate proprietary corrosion inhibiting coating.  
Temp. Range: -67 to +400°F (-55 to +204°C)\*

NOTE: Sustains a constant temp. of 325°F. (163° C.)  
\* = Sustained operation near temperature limits may affect life expectancy.

### Material Properties of Link-Seal Modular Seal Elements

PROPERTY	ASTM METHOD	EPDM (EPDM L)	NITRILE	SILICONE
Hardness (shore A)	D-2240	50 ±5 (40 ±5)	50 ±5	50 ±5
Tensile	D-412	1450 psi	1300 psi	880 psi
Elongation	D-412	400%	300%	250%
Compression Set	S-395	15%	45%	40%
		22 hrs. @ 158°F (70°C)	22 hrs. @ 212°F (100°C)	22 hrs. @ 350°F (177°C)
Specific Gravity	D-297	1.10	1.15	1.40

### Material Properties of Composite Pressure Plates

PROPERTY	ASTM METHOD	VALUE
Izod Impact - Notched	D-256	2.05 ft-lb/in
Tensile Strength @ Yield	D-638	20,000 psi
Tensile Strength - Break	D-638	20,250 psi
Flexural Strength @ Yield	D-790	30,750 psi
Flexural Modulus	D-790	1,124,000 psi
Elongation, Break	D-638	11.07%
Specific Gravity	D-792	1.38
Moisture Content	-	0.18%

### Bolt & Nut Specifications

**Standard: Carbon Steel**  
Carbon steel, zinc dichromated per ASTM B633, with an additional corrosion inhibiting proprietary organic coating. (passes 1470 hour salt spray test)  
Tensile Strength = 60,000 psi, minimum.

**Option: Stainless Steel**  
ANSI Type = 316, Per ASTM F593-95  
Tensile Strength = 85,000 psi, average.



PSI-Thunderline/Link-Seal®  
6525 Goforth Street, Houston TX 77021 U.S.A.  
Tel: 713-747-8948, Fax: 713-747-6029, Toll Free: 800-423-2410  
www.linkseal.com, e-mail: info@psipsi.com

LSTECH-8/27/10  
©2010, Pipeline Seal & Insulator, Inc

# **INSULATION**

# 1 PRODUCT NAME

## STYROFOAM™ Highload 40, 60 and 100 Extruded Polystyrene Insulation

### 2 Manufacturer

The Dow Chemical Company  
Building Solutions  
200 Larkin  
Midland, MI 48674  
1-866-583-BLUE (2583)  
Fax 1-989-832-1465  
www.dowstyrofoam.com/architect

Dow Chemical Canada Inc.  
Building Solutions  
250 - 6th Ave. SW, Suite 2200  
Calgary, AB T2P 3H7  
1-866-583-BLUE (2583) (English)  
1-800-363-6210 (French)  
www.dowstyrofoam.ca/4architects

### 3 Product Description

STYROFOAM™ Highload extruded polystyrene insulation is a closed-cell foam insulation. Available in compressive strengths of 40, 60 and 100 psi (275, 415 and 690 kPa),

STYROFOAM Highload insulation features superior moisture resistance and R-value\* retention. All three STYROFOAM Highload insulation products resist compressive creep and fatigue, delivering long-term compressive strength. Like all STYROFOAM insulation products, STYROFOAM Highload 40, 60 and 100 are durable, versatile and reusable – making them the preferred choices for a variety of high-load applications.

#### BASIC USE

STYROFOAM™ Highload insulation is ideal for use in low-temperature (freezer floor) applications, highways, airport runways, bridge abutments, parking decks, utility lines, ice rinks and plaza decks. It is the responsibility of the designer to select the proper STYROFOAM Highload insulation product based on the dead and live loads expected in the application.

#### SIZES

##### IN THE U.S.:

Butt Edge  
Thickness:

2" or 3" STYROFOAM™

Highload 40 and 60

2" STYROFOAM™ Highload 100

Width and length:

2' x 8' STYROFOAM

Highload 40, 60 and 100

4' x 8' STYROFOAM

Highload 40

##### IN CANADA:

Butt Edge

Thickness:

1", 1.5", 2" or 3" (25 mm,

38 mm, 50 mm or 75 mm)

STYROFOAM Highload

40 and 60

2" or 3" (50 mm or 75 mm)

STYROFOAM Highload 100

Width and length:

2' x 8' (600 mm x 2,400 mm)

STYROFOAM Highload

40, 60 and 100

#### U.S. PROPERTY CHART

TABLE 1

Physical Properties of STYROFOAM™ 40, 60 and 100 Insulation			
Property and Test Method	Value		
	Highload 40	Highload 60	Highload 100
Thermal Resistance <sup>(1)</sup> , per inch, ASTM C518, C177, @ 75°F mean temp., ft <sup>2</sup> •h•°F/Btu, R-value, min.	5.0	5.0	5.0
Compressive Strength <sup>(2)</sup> , ASTM D1621, psi, min.	40	60	100
Water Absorption, ASTM D2842, % by volume, max.	0.1	0.1	0.1
Water Vapor Permeance <sup>(3)</sup> , ASTM E96, perms	0.8	0.8	0.8
Maximum Use Temperature, °F	165	165	165
Coefficient of Linear Thermal Expansion, ASTM D696, in/in•°F	3.5 x 10 <sup>-4</sup>	3.5 x 10 <sup>-4</sup>	3.5 x 10 <sup>-4</sup>
Flexural Strength, ASTM C203, psi, min.	60	75	100
Complies with ASTM C578-01, Type	VI	VII	V

(1) For 1" material

(2) Vertical compressive strength is measured at 5 percent deformation or at yield, whichever occurs first. Since STYROFOAM insulations are visco-elastic materials, adequate design safety factors should be used to prevent long-term creep. For static loads, 3:1 is suggested. For dynamic loads, call 1-866-583-BLUE (2583) for safety factor recommendation.

(3) Water vapor permeance varies with product type and thickness. Values are based on the desiccant method and they apply to insulation 1" or greater in thickness.

REVIEWED BY TOWER ARCTIC LTD.

DATED 4/23/14 *BJ*

CANADA PROPERTY CHART

TABLE 2

Physical Properties of STYROFOAM™ Highload 40, 60 and 100 Insulation			
Property and Test Method	Value		
	Highload 40	Highload 60	Highload 100
Thermal Resistance <sup>(1)</sup> , per inch (25 mm), ASTM C518, C177, @ 75°F (24°C) mean temp., ft <sup>2</sup> ·h·°F/Btu (m <sup>2</sup> ·°C/W), R-value (RSI), min.	5.0 (.88)	5.0 (.88)	5.0 (.88)
Compressive Strength <sup>(2)</sup> , ASTM D1621, psi (kPa), min.	40 (275)	60 (415)	100 (690)
Water Absorption, ASTM D2842, % by volume, max.	0.7	0.7	0.7
Water Vapour Permeance <sup>(3)</sup> , ASTM E96, perms (ng/Pa·s·m <sup>2</sup> )	0.6 (35)	0.6 (35)	0.6 (35)
Maximum Use Temperature, °F (°C)	165 (74)	165 (74)	165 (74)
Coefficient of Linear Thermal Expansion, ASTM D696, in/in·°F (mm/m·°C)	3.5 × 10 <sup>-4</sup> (6.3 × 10 <sup>-5</sup> )	3.5 × 10 <sup>-4</sup> (6.3 × 10 <sup>-5</sup> )	3.5 × 10 <sup>-4</sup> (6.3 × 10 <sup>-5</sup> )
Flexural Strength, ASTM C203, psi (kPa), min.	70 (480)	85 (585)	85 (585)
Compressive Modulus (typical), ASTM D1621, psi (kPa)	1,400 (9,650)	2,200 (15,170)	3,700 (25,510)
Complies with CAN/ULC 5701, Type	4	4	4

(1) For 1" (25 mm) material

(2) Vertical compressive strength is measured at 5 percent deformation or at yield, whichever occurs first. Since STYROFOAM insulations are visco-elastic materials, adequate design safety factors should be used to prevent long-term creep. For static loads, 3:1 is suggested. For dynamic loads, call 1-866-583-BLUE (2583) for safety factor recommendation.

(3) Water vapour permeance varies with product type and thickness. Values are based on the desiccant method and they apply to insulation 1" (25 mm) or greater in thickness.

## 4 Technical Data

**APPLICABLE STANDARDS**  
STYROFOAM™ Highload 40, 60 and 100 insulation meets ASTM C578 – Standard Specification for Rigid Cellular Polystyrene Thermal Insulation. Applicable standards include:

- C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- C177 – Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
- D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- D2842 – Standard Test Method for Water Absorption of Rigid Cellular Plastics
- E96 – Standard Test Methods for Water Vapor Transmission of Materials
- D696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer
- C203 – Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

TABLE 3

Chemical Resistance of STYROFOAM™ Highload 40, 60 and 100 Insulation	
Acid, inorganic, weak	Excellent
Acid, inorganic, strong	Excellent
Acid, organic, weak	Excellent
Acid, organic, strong	Good
Bases	Excellent
Alcohols, including isopropyl alcohol	Excellent
Methyl ethyl ketone	Not recommended
Polyglycols, including propylene glycol	Excellent
Hydrocarbons	Not recommended
Salts	Excellent
Insecticides	Not recommended
Kerosene	Poor
Mineral oil USP	Excellent
Naphtha (VMP)	Not recommended
Turpentine	Not recommended
Beer	Good
Gasoline	Not recommended
Fruit juices	Good

(1) Explanation of ratings:

Excellent = The plastic was unaffected for the duration of the test.  
Good = A very slight clouding or discoloration of the plastic.  
Poor = Considerable change in plastic during exposure.  
Not recommended = Severe attack of the plastic. Became soft and unusable after a few hours of exposure.

NOTE: This table should be used as a guide only. For design purposes, specific test data on the intended application may be needed.

### CODE COMPLIANCE

STYROFOAM™ Highload 40, 60 and 100 insulation complies with the following codes:

- International Residential Code (IRC) and International Building Code (IBC); see ICC-ES NER-699, BOCA-ES RR 21-02
- ICBO-ES ER-2275

- Calif. Std. Reg. #CA T064
- Underwriters Laboratories, Inc. (UL) Classified, see Classification Certificate D369

Contact your Dow sales representative or local authorities for state/provincial and local building code requirements and related acceptances.

REVIEWED BY TOWER ARCTIC LTD.

DATED 4/23/14

## PHYSICAL/CHEMICAL PROPERTIES

STYROFOAM™ Highload 40, 60 and 100 insulation products exhibit the physical properties indicated in Tables 1 and 2 when tested as represented.

For chemical resistance properties of STYROFOAM Highload 40, 60 and 100 insulation products, see Table 3.

## ENVIRONMENTAL DATA

STYROFOAM™ Highload 40, 60 and 100 insulation is manufactured with HCFC blowing agents which have 94 percent less ozone depletion potential than standard CFC blowing agents.

STYROFOAM extruded polystyrene insulation products are reusable in many applications.

## FIRE PROTECTION

STYROFOAM™ Highload 40, 60 and 100 insulation is combustible; protect from high heat sources. Local building codes may require a protective or thermal barrier. For more information, consult MSDS, call Dow at 1-866-583-BLUE (2583) or contact your local building inspector.

## 5 Installation

STYROFOAM™ Highload 40, 60 and 100 insulation boards are easy to handle and install. They can be cut with a utility knife or any sharp blade. Contact a local Dow representative or access the literature library at [www.dowstyrofoam.com/architect](http://www.dowstyrofoam.com/architect) or [www.dowstyrofoam.ca/4architects](http://www.dowstyrofoam.ca/4architects) for more specific instructions.

## 6 Availability

STYROFOAM™ Highload 40, 60 and 100 insulation products are distributed through an extensive network. For more information, call:  
1-800-232-2436 (English)  
1-800-565-1255 (French)

## 7 Warranty

In the United States, a 15-year limited thermal warranty is available.

## 8 Maintenance

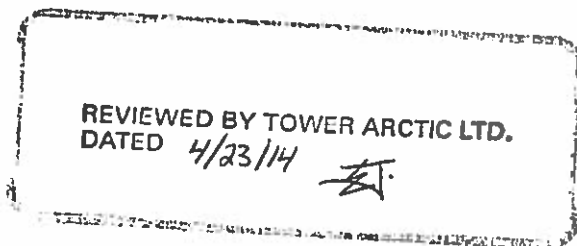
Not applicable.

## 9 Technical Services

Dow can provide technical information to help address questions when using STYROFOAM™ 40, 60 and 100 insulation products. Technical personnel are available to assist with any insulation project. For technical assistance call:  
1-866-583-BLUE (2583) (English)  
1-800-363-6210 (French)

## 10 Filing Systems

- [www.dowstyrofoam.com/architect](http://www.dowstyrofoam.com/architect)
- [www.dowstyrofoam.ca/4architects](http://www.dowstyrofoam.ca/4architects)
- [www.sweets.com](http://www.sweets.com)



REVIEWED BY TOWER ARCTIC LTD.

DATED 4/23/14 *ET*

**IN THE U.S.:**

- For Technical Information: 1-866-583-BLUE (2583)
- For Sales Information: 1-800-232-2436

**THE DOW CHEMICAL COMPANY**

- Building Solutions • 200 Larkin • Midland, MI 48674
- [www.dowstyrofoam.com/architect](http://www.dowstyrofoam.com/architect)

**IN CANADA:**

- For Technical Information: 1-866-583-BLUE (2583) (English); 1-800-363-6210 (French)
- For Sales Information: 1-800-232-2436 (English); 1-800-565-1255 (French)

**DOW CHEMICAL CANADA INC.**

- Building Solutions • Suite 2200 • 250 – 6th Ave. SW • Calgary, AB T2P 3H7
- [www.dowstyrofoam.ca/4architects](http://www.dowstyrofoam.ca/4architects)

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**COMBUSTIBLE:** Protect from high heat sources. Local building codes may require a protective or thermal barrier. For more information, consult MSDS, call Dow at 1-866-583-BLUE (2583) or contact your local building inspector. In an emergency, call 1-989-636-4400 in the U.S. or 1-519-339-3711 in Canada.

Building and/or construction practices unrelated to building materials could greatly affect moisture and the potential for mold formation. No material supplier including Dow can give assurance that mold will not develop in any specific system.

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Form No. 179-02548X-0107P&M  
178-00202X-0107P&M

# **SEWER SERVICE**

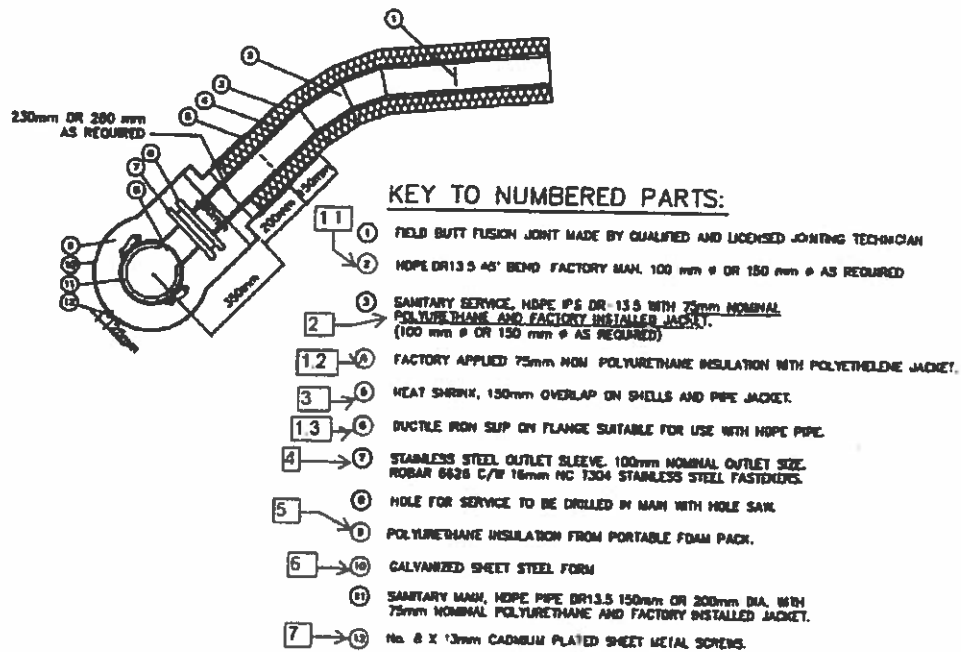


***Sewer service connection kit for main and house for 8 x 4 in  
IPS (200 x 100 mm) and 8 x 6 in IPS (200 x 150 mm)***

***(Style Resolute)***

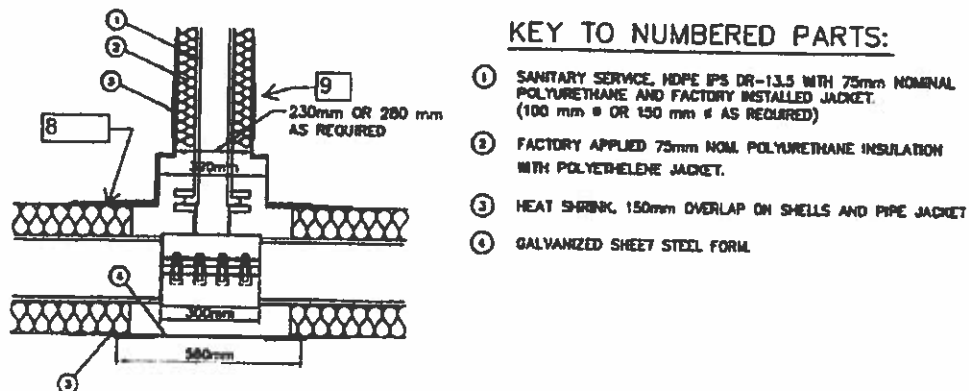
Re-Submittal 3 - June 5th, 2014





**2 TYPICAL SEWER SERVICE CONNECTION AT MAIN**

**Figure 1 : Detail 2 - from Drawing C-332 - Sewer service connection Kit at main**



**3 TYPICAL SEWER SERVICE STUB FRONT VIEW**

**Figure 2: Detail 3 - from drawing C-332 - Sewer service connection kit at main - Front view**

***Figure 2 – removed as per Engineer's note on June 3<sup>rd</sup>, 2014***


**Table 1:** Fittings and accessories supplied by Urecon for 8in x 4 in (200 mm x 100mm) Sewer Service connection kit at main: (Reference Figure 1 & 2)

No.	Qty	Part	Description
1	1	Elbow	Combining items 1.1;1.2,1.3 - Nominal 3.0 in (75 mm) thick pre-insulated fitting with polymer coating 4 in $\phi$ (100 mm) HDPE fabricated DR-11** x 45° elbow with one plain end and one flanged end with ductile Iron ring.
2	1	Insulation shells	5 in ID x 11 in OD x 18 in long – without polymer coating.
3	1	Heat shrink sleeve	24 in (600 mm) wide x 39 in (991 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 11 in (275 mm) OD.
4	1	Outlet Sleeve	Stainless steel outlet sleeve Robar no. 6626 - 8 x 4 - 8.625 OD; 8 in IPS (8.625 in OD) main x 4 in flanged outlet with nuts, fasteners, ring seal and liner.
5	1	Portable insulation	Portable insulation #200 – shipped at a later date for expiry date reasons.
6	1	Mold form Tee	22 Ga. Metal form for insulation for Resolute Bay Style Sewer Service kit 8 in x 4 in with 3 sets of Stainless steel strapping 60 in long x 1/2 in x 0.15 in with gear clamp
7	1	Accessories	1 x 4in x 1/8 in thick Full Face Red Rubber for Flanged connection 8 x 5/8in - 11 UNC Grade 2 Hex Reg. 8 x 5/8in - 11 UNC x 5 in long Grade 2 Hex head zinc coated. 16 x Washer USS plate 5/8 in (11/16 hole) Zinc coated. Motor Oil 10W30 1L
8	2	Heat shrink sleeve	18 in (450 mm) wide x 54 in (1372 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 16 in (400 mm) OD.
9	1	Heat shrink sleeve	6 in (150 mm) wide x 39 in (991 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 11 in (275 mm) OD.

\*\* DR-11 is accepted by engineer as per Kirk Stokes (Emco) email on June 5th, 2014

**Table 2:** Fittings and accessories supplied by Urecon for the Sewer Service connection kit for 4 in (100 mm) riser at Building: (Reference Figure 3)

No.	Qty	Part	Description
1	1	Reducer	Not Supplied
2	1	Wood sheet	Not supplied as requested
3	1	Silicone tube	Not supplied as requested
4	1	Portable insulation	Portable insulation #200 – shipped at a later date for expiry date reasons.
5	1	Insulation shells	Not supplied as requested
6	1	Pre-insulated 90° elbow	Not supplied as requested
7	3	Heat shrink sleeve	Not supplied as requested
7	1	Insulation shells	5 in ID x 11 in OD x 18 in long – without polymer coating.

<b>DRAWING REVIEW</b>	
The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.	
<input checked="" type="checkbox"/> NO EXCEPTIONS <input type="checkbox"/> EXCEPTIONS NOTED - RESUBMIT	Submission No. <u>2</u> Project No. <u>C45 HQ 12 b1</u> By <u>Abdel Jassal</u> Date <u>6 June 2014</u>
 2850 Queensview Drive, Suite 100 Ottawa, Ontario K2B 8H6 Tel: (613) 688-1899 Fax: (613) 225-7337	


**Table 3:** Fittings and accessories supplied by Urecon for an 8 x 6 in (200 x 150 mm) Sewer Service connection kit at main: (Reference Figure 1 & 2)

No.	Qty	Part	Description
1	1	Elbow	Combining Items 1.1;1.2,1.3 - Nominal 3.0 in (75 mm) thick pre-insulated fitting with polymer coating 6 in ø (150 mm) HDPE fabricated DR-11** x 45° elbow with one plain end and one flanged end with ductile Iron ring.
2	1	Insulation shells	7 in ID x 13 in OD x 18 in long – without polymer coating.
3	1	Heat shrink sleeve	24 in (600 mm) wide x 45 in (1143 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 13 in (325 mm) OD.
4	1	Outlet Sleeve	Stainless steel outlet sleeve Robar no. 6626 -8 x 6 - 8.625 OD; 8in IPS (8.625 in OD) main x 6 in Flanged outlet with nuts, fasteners, ring seal and liner.
5	1	Portable insulation	Portable insulation #200 – shipped at a later date for expiry date reasons.
6	1	Mold form Tee	22 Ga. Metal form for insulation for Resolute Bay Style Sewer Service kit 8 in x 6 in with 3 sets of Stainless steel strapping 60 in long x 1/2 in x 0.15 in with gear clamp
7	1	Accessories	1 x 6in x 1/8 in thick Full Face Red Rubber for Flanged connection 8 x 5/8in - 11 UNC Grade 2 Hex Reg. 8 x 5/8in - 11 UNC x 5 in long Grade 2 Hex head zinc coated. 16 x Washer USS plate 5/8 in (11/16 hole) Zinc coated. Motor Oil 10W30 1L
8	2	Heat shrink sleeve	18 in (450 mm) wide x 54 in (1372 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 16 in (400 mm) OD.
9	1	Heat shrink sleeve	6 in (150 mm) wide x 45 in (1143 mm) long heat shrink wrap (K60-B) with closure seal an insulated pipe of 13 in (325 mm) OD.

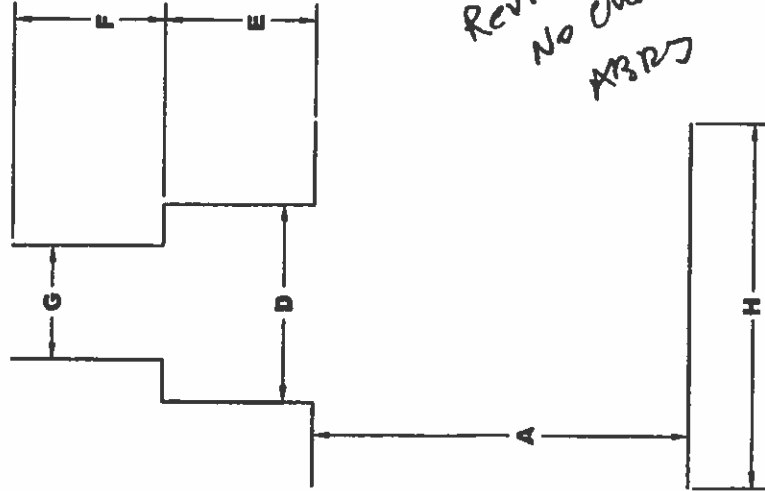
\*\* DR-11 is accepted by engineer as per Kirk Stokes (Emco) email on June 5th, 2014

**Table 4:** Fittings and accessories supplied by Urecon for the 6 in Sewer Service connection kit for rise at Building: (Reference Figure 3)

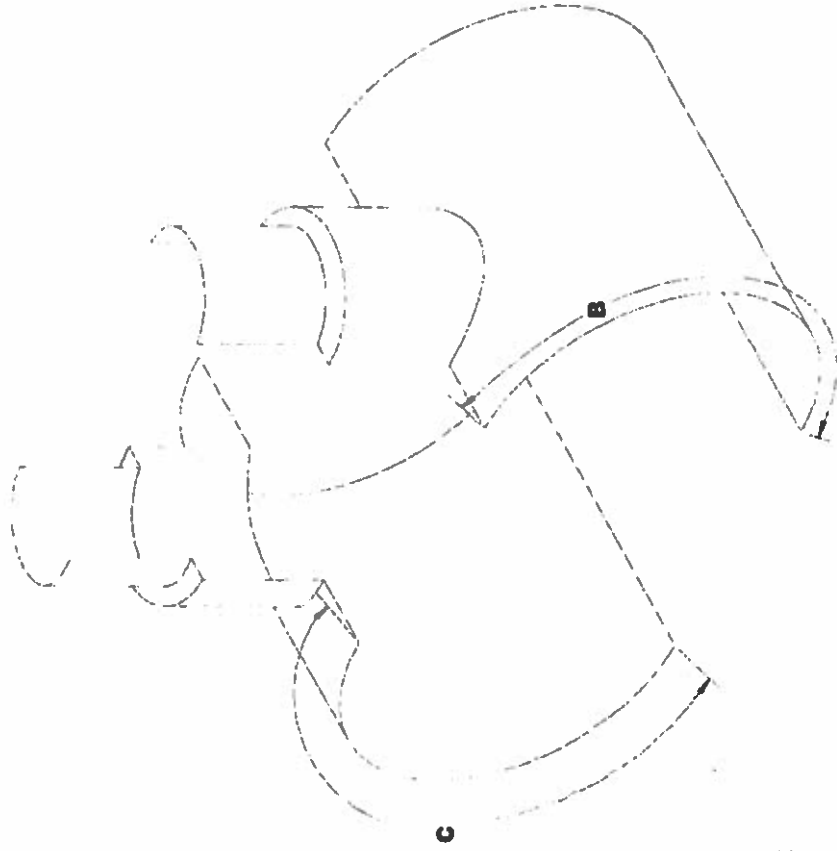
Item No.	Qty	Part	Description
1	1	Reducer	Not supplied as requested
2	1	Wood sheet	Not supplied as requested
3	1	Silicone tube	Not supplied as requested
4	1	Portable insulation	Portable insulation #200 – shipped at a later date for expiry date reasons.
5	1	Insulation shells	Not supplied as requested
6	1	Pre-insulated 90° elbow	Not supplied as requested
7	3	Heat shrink sleeve	Not supplied as requested
7	1	Insulation shells	7 in ID x 13 in OD x 18 in long

DRAWING REVIEW	
The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.	
<input checked="" type="checkbox"/> NO EXCEPTIONS <input type="checkbox"/> EXCEPTIONS NOTED - RESUBMIT	Submission No. <u>2</u> Project No. <u>265-HR-12012</u> By <u>Abdul Jani</u> Date <u>6 June 2014</u>
 2650 Queensview Drive, Suite 100 Ottawa, Ontario K2B 8H6 Tel: (613) 688-1899 Fax: (613) 225-7337	

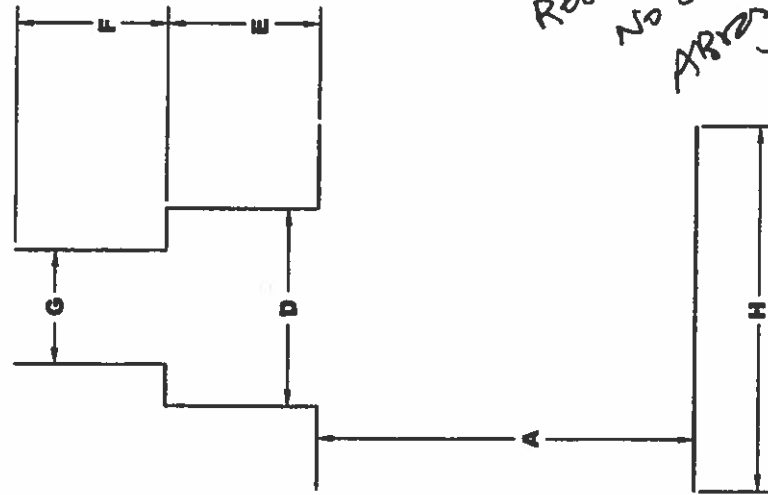
	A	B	C	D	E	F	G	H
DIMENSIONS	15 1/2"	30"	25"	13 1/2"	6"	4"	11 1/4"	28"



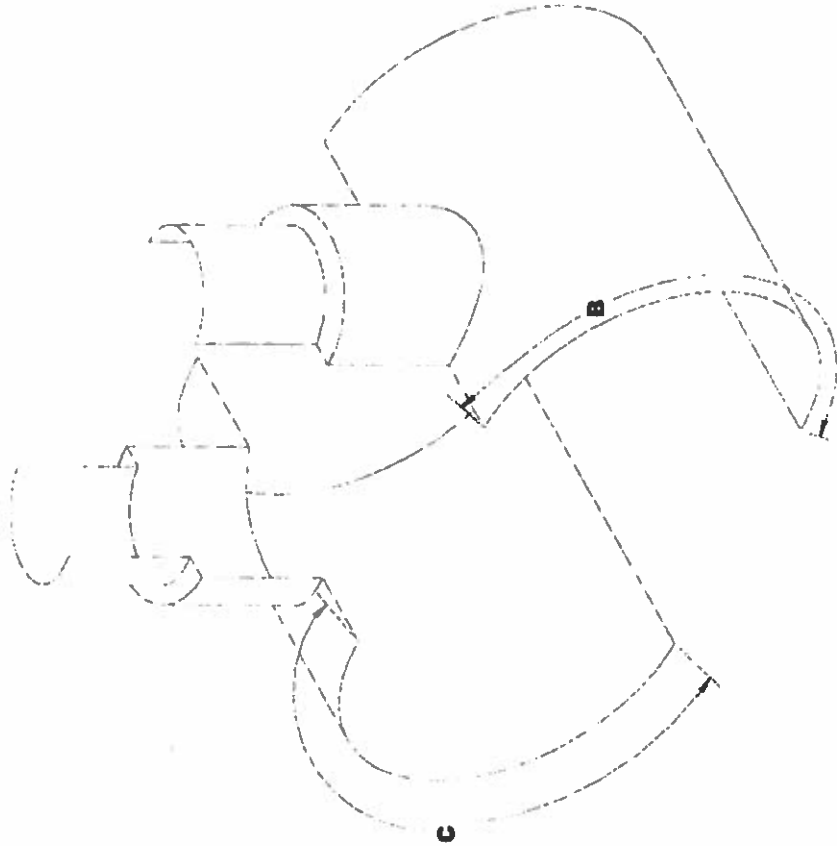
Reviewed 3 June 2014  
 No changes.  
 ABP



	A	B	C	D	E	F	G	H
DIMENSIONS	15 1/2"	30"	25"	15 1/2"	6"	4"	13 1/4"	28"



Reviewed 3 June 2014  
 No changes.  
 ARB



Removed as per note on June 3<sup>rd</sup>, 2014

Removed as per note on June 3<sup>rd</sup>, 2014





# 6626

## STAINLESS STEEL OUTLET SLEEVE

### APPLICATIONS

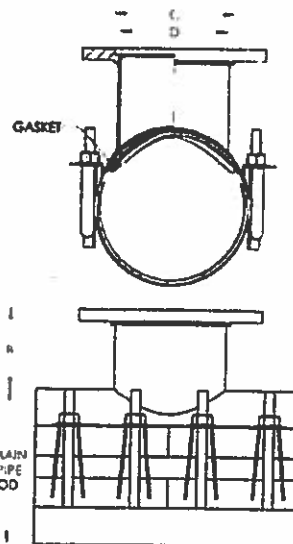
ROBAR 6626 Outlet Sleeves are used for "DRY TAP" applications. Outlet options are 3" through 12" including size on size for 4" and above. Particularly suited for use on High Density Polyethylene (HDPE).

### MATERIAL SPECIFICATIONS:

Shell: T-304 Stainless Steel, fully passivated.\*\*  
 Fasteners: 5/8" NC T304 Stainless Steel,  
 Rolled threads. Nuts coated with anti-galling compound.  
 Torque is 70-80 ft. lbs.  
 Gaskets: Ringseal: NBR (Buna N) Rubber.  
 Liner: SBR (Buna S) Rubber.  
 Flange: T-304 Stainless Steel\* as per AWWA C-207 Class D.  
 Outlet: T-304 Stainless Steel\*.

OUTLET SLEEVE DATA					
NOMINAL OUTLET SIZE	A	B	C (DIA.)	D (DIA.)	BOLT SIZE
3	12	4	3.25	3	5/8
4	12	4	4.25	4	5/8
6	16	4.5	6.25	6	5/8
8	20	5	8.25	8	5/8
10	20	5.5	10.25	10	5/8
12	24	5.75	12.25	12	5/8

*Reviewed  
3 June 2014  
ABR/23*



All dimensions are in inches.

NOMINAL PIPE SIZE	BY X	OUTLET SIZE	FITTING LENGTH	NUMBER OF BOLTS	APPROXIMATE SHIPPING WEIGHT		WORKING RANGE	
					LBS.	KG.	LOW	HIGH
4	X	3	12	8	33	15.0	4.70	4.85
		4"			36	16.4	4.95	5.20
6	X	3	12	8	38	18.4	6.40	6.60
		4			39	17.7	6.60	7.20
		6"	16	10	43	19.6	7.20	7.60
							7.75	7.00
8	X	3	12	8	40	18.2	6.85	7.10
		4			43	19.6	7.00	7.25
		6"	16	10	47	21.4	7.25	7.50
							8.40	8.60
10	X	3	12	8	40	18.2	8.40	8.60
		4			43	19.6	8.60	9.20
12	X	3	12	8	47	21.4	9.20	9.60
		4			54	24.1	9.60	9.50

6626 rated for 150 PSI working pressure (contact Robar for higher pressure ratings).

- Note:
- Contact ROBAR for tapping into HDPE DR21 and higher.
  - \*\*Refers to chemically treating Stainless Steel after welding ("Pickled/Passivated") to return it to its original appearance.
  - \* Size on size for IPSOD is not available.
  - For size on size tapping an undersize cutter is used.



This product is tested and certified by WQA to NSF/ANSI standard 61

### ROBAR INDUSTRIES LTD.

Surrey, British Columbia  
 Phone: 1-800-863-8553

Boucherville, Quebec  
 Phone: 1-800-315-9525

Calhoun, Georgia  
 Phone: 1-706-624-4404

Website: [www.robarindustries.com](http://www.robarindustries.com) / E-mail: [waterworks@robarindustries.com](mailto:waterworks@robarindustries.com)

Submittal 3 June 5th 2014



# 6626

## STAINLESS STEEL OUTLET SLEEVE

NOMINAL PIPE SIZE	BY X	OUTLET SIZE	FITTING LENGTH	NUMBER OF BOLTS	APPROXIMATE SHIPPING WEIGHT		WORKING RANGE	
					LBS.	KG.	LOW	HIGH
10	X	3	12	8	43	19.6	10.55	10.95
		4			46	20.9		
		6	16	10	50	22.7		
		8			66	30.9		
		10"	20	14	73	33.2		
12	X	3	12	8	46	20.9	12.15	12.55
		4			49	22.3		
		6	16	10	53	24.1		
		8			72	32.7		
		10	20	14	77	35.0		
		12"			111	50.5		
14	X	3	12	8	67	30.5	15.10	15.50
		4			70	31.8		
		6	16	10	74	33.6		
		8			83	42.3		
		10	20	14	98	44.6		
		12			132	60.0		
16	X	3	12	8	71	32.3	17.20	17.60
		4			75	34.1		
		6	16	10	79	35.8		
		8			100	45.5		
		10	20	14	105	47.7		
		12			141	64.1		
18	X	3	12	12	74	33.6	19.30	19.70
		4			77	35		
		6	16	15	81	36.8		
		8			103	46.6		
		10	20	21	108	49.1		
		12			144	65.5		
20	X	3	12	12	84	38.2	21.40	21.80
		4			87	39.6		
		6	16	15	91	41.4		
		8			115	52.3		
		10	20	21	120	54.6		
		12			158	71.8		
24	X	3	12	12	90	40.9	23.20	23.60
		4			93	42.3		
		6	16	15	97	44.1		
		8			121	55.0		
		10	20	21	127	57.7		
		12			167	75.9		

### HOW TO ORDER:

All dimensions are in inches.

Determine the product number (6626), nominal main size, nominal outlet size and the high limit number (see table above) and then order by using the appropriate ordering code as shown in the following example. If a Stainless Steel Outlet Sleeve, with a 6" nominal outlet is required for a 12" nominal diameter HDPE pipe (12.75" OD), the ordering code is:

6626 - 12" x 6" - 12.95" i.e. 6626 - 12 x 6 - 12.95  
product nom. main nom. outlet high end of  
number size size range

6626 Tapping Sleeves come in 3 sections for nominal pipe sizes of 18" - 24".

Note: \* - Size on size for IPS OD is not available.  
- For sizes not listed above, call ROBAR for availability.  
- The working range displayed is only a guideline, other ranges are available.

### ROBAR INDUSTRIES LTD.

Surrey, British Columbia  
Phone: 1-800-663-6553

Boucherville, Quebec  
Phone: 1-800-315-9525

Calhoun, Georgia  
Phone: 1-706-624-4404

Website: [www.robarindustries.com](http://www.robarindustries.com) / E-mail: [waterworks@robarindustries.com](mailto:waterworks@robarindustries.com)

Submittal 3 June 5th 2014

11

Effective: January 1, 2013

6.3.2

Reviewed  
3 June 2014  
ABR

# **WATER SERVICE**

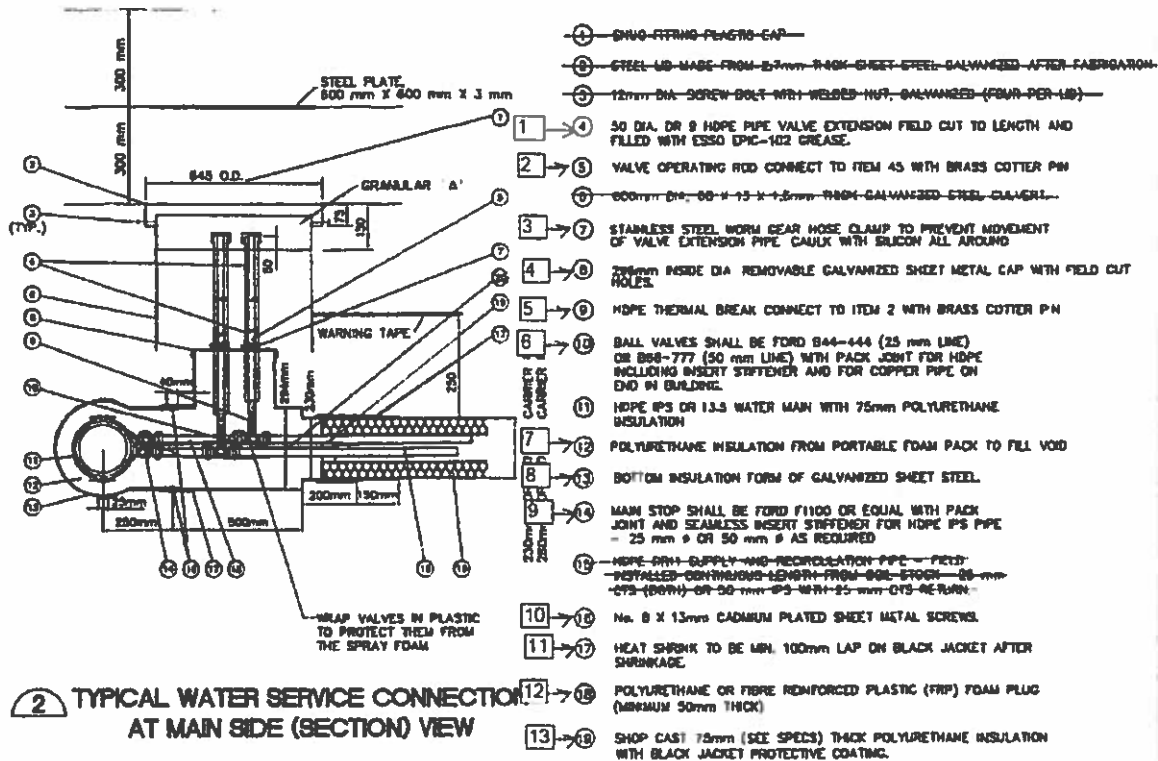


***Water service connection kit for main and house for :  
8 x 4 in IPS (200 x 100 mm) carrier branch with 2 x 1 in (25  
mm) CTS Service and recirculation line***

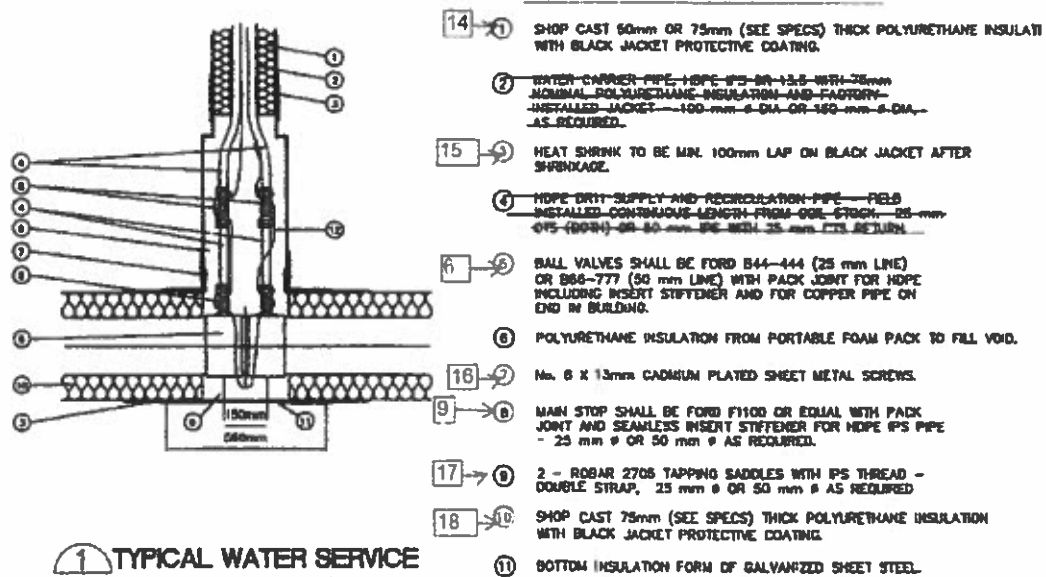
***&***

***8 x 6 in IPS (200 x 150 mm) carrier branch with 1 in (25 mm)  
CTS Service and 2 in (50 mm) IPS recirculation line***

***(Style Resolute)***



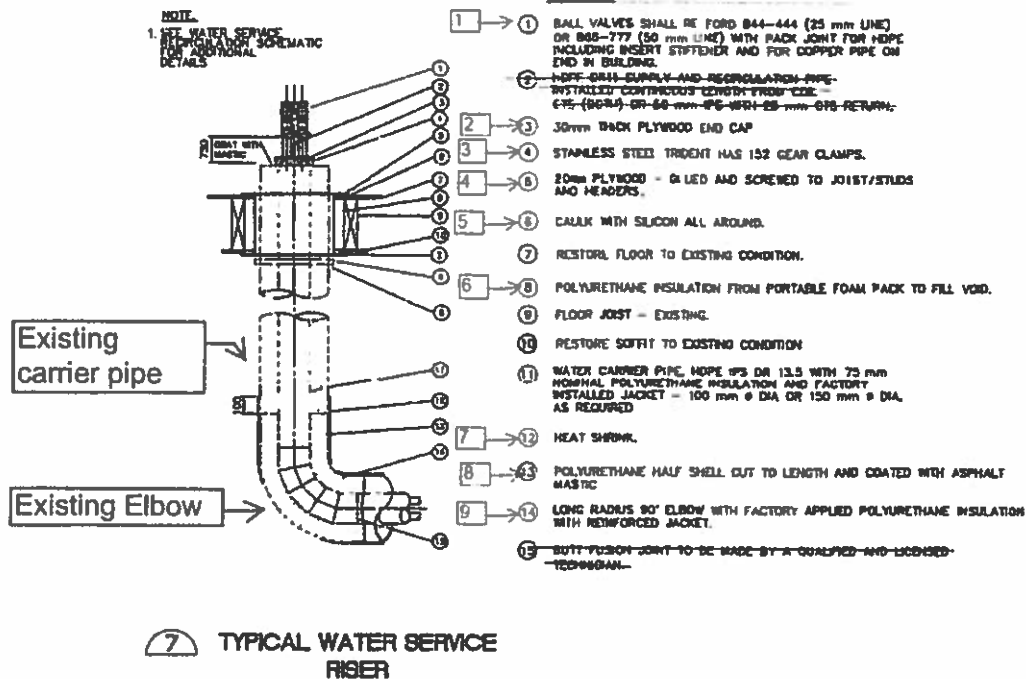
**Figure 4 : Detail 2 - from Drawing C-330 - Water service connection Kit at main**



**Figure 5 : Detail 1 - from drawing C-330 - Water service connection kit at main - Plan view**

**Table 5:** Fittings and accessories supplied by Urecon for the 8 x 4 in IPS (200 x 100 mm) for 2 x 1 in CTS lines  
Water Service connection kit at main: (Reference Figure 4 & 5)

No.	Qty	Part	Description
1	2	Pipe	2 in (50 mm) IPS DR-9 HDPE pipe x 6 ft
1.1	10	Grease	Grease Esso Epic #102
1.2	2	End cap	2 in (50 mm) Slip-on closed end pipe caps.
2	2	Rods	Valve operating Rods with Cotter pin
3			
4	1	Mold form Tee	22 Ga. Metal form for insulation for Resolute Bay Style Water Service kit 8 in x 4 in with 4 sets of Stainless steel strapping 60 in long x 1/2 in x 0.15 in with gear clamp
5	2	Frost stop	Provided outside the kit assembly
6	2	Curb Stops	1 in (25 mm) ball valve B44-444 Pack Joint for Copper or Plastic Tubing (CTS) Both Ends.
6.1	4	Curb stop Accessories	1 in CTS (25 mm) Ford Insert Stiffeners - Model INSERT-52 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service line
7	2	Portable insulation	Portable insulation #200 – shipped at a later date for expiry date reasons.
8	1	Mold form Tee	Part of item 4.
9	2	Main stops	1 in (25 mm) M.I.P. x C.T.S. comp Main stop Ford F1100-4
9.1	2	Main stops Accessories	1 in CTS (25 mm) Ford Insert Stiffeners - Model INSERT-52 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service line
10	6	Metal mold accessories	Sheet Metal screws #8 x 13 mm (1/2 in), 100/bx Zinc plated (hex head)
10.1	1	Accessories	Motor Oil 10W30 1L
11	3	Heat shrink Sleeve metal mold	18 in (450 mm) wide x 52 in (1321 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 15.5 in (388 mm) OD.
11.1	1	Heat shrink Sleeve metal mold at 4 in end	18 in (450 mm) wide x 39 in (991 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 11 in (275 mm) OD.
12	1	Foam plug	2 x 1 in Flexible insulation plug
13	1	Insulation shells	5 in ID x 11 in OD x 36 in long – with factory applied polymer coating. ( cut to length on site)
14	1	Insulation shells	See item 13
15	1	Heat shrink sleeve	See item 11.1
16		Accessories	See item 10
17	2	Saddles	Cast Bronze Service Saddle Robar no. 2706 - 8.625 x1-CC - DS ; 8in main x 1 in outlet size , CC outlet thread, double strap and provided with flat washers.
18	1		9 in ID x 15 in OD x 36 in long – with factory applied polymer coating. ( cut to length on site)



**Figure 6 : Detail 7 - from drawing C-330 - Water service connection kit for riser at building**

**Table 6:** Fittings and accessories supplied by Urecon for the Water Service connection kit for 4 in riser at Building: (Reference Figure 6)

Item No.	Qty	Part	Description
1	2	Valve	1 in (25 mm) Ball valve B44-444 Pack Joint for Copper or Plastic Tubing (CTS) Both Ends.
1.1	4	Accessories	1 in CTS (25 mm) Ford Insert Stiffeners - Model INSERT-52 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service line.
2	1	Security cap	Wood security cap
3	1	1	Stainless steel strapping 16 in long x 1/2 in x 0.15 in with gear clamp
4	1	Wood sheet	Not supplied as requested
5	1	Silicone tube	Not supplied as requested
6	1	Portable insulation	Portable insulation #200 - shipped at a reasons.
7	2	Heat shrink sleeve	Not supplied as requested
8	1	Insulation shells	Not supplied as requested
9	1	Pre-insulated 90° elbow	Not supplied as requested

**DRAWING REVIEW**

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract document.

☒ NO EXCEPTIONS TAKEN

☐ EXCEPTIONS NOTED - RESUBMIT

Submission No. 2

Project No. CG5 H2-12012

By Abdel Fattah

Date June 2014

**\*exp.**

2650 Queensview Drive, Suite 100  
Ottawa, Ontario K2B 8H6  
Tel: (613) 688-1899  
Fax: (613) 225-7337

**Table 7: Fittings and accessories supplied by Urecon for the 8 x 6 in IPS (200 x 100 mm) for 1 in CTS and 2 in (50 mm) IPS lines Water Service connection kit at main: (Reference Figure 4 & 5)**

No.	Qty	Part	Description
1	2	Pipe	2 in (50 mm) IPS DR-9 HDPE pipe x 6 ft
1.1	10	Grease	Grease Esso Epic #102
1.2	2	End cap	2 in (50 mm) Slip-on closed end pipe caps.
2	2	Rods	Valve operating Rods with Cotter pin
3			Part not supplied
4	1	Mold form Tee	22 Ga. Metal form for insulation for Resolute Bay Style Water Service kit 8 in x 6 in with 4 sets of Stainless steel strapping 60 in long x 1/2 in x 0.15 in with gear clamp
5	2	Frost stop	Provided outside the kit assembly
6	1	Curb Stop 1 in	1 in (25 mm) ball valve B44-444 Pack Joint for Copper or Plastic Tubing (CTS) Both Ends.
6.1	2	Curb stop 1 in accessories	1 in CTS (25 mm) Ford Insert Stiffeners - Model INSERT-52 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service line
6.2	1	Curb Stop 2 in	2 in (50 mm) ball valve B77-777 Pack Joint for IPS HDPE pipe Both Ends.
6.3	2	Curb stop 2 in accessories	2 in IPS (50 mm) Ford Insert Stiffeners - Model INSERT-75-DR11 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service
7	2	Portable insulation	Portable insulation #200 – shipped at a later date for expiry date reasons.
8	1	Mold form Tee	Part of item 4.
9	1	Main stop 1 in	1 in (25 mm) M.I.P. x C.T.S. comp Main stop Ford F1100-4
9.1	1	Main stop 1 in accessories	1 in CTS (25 mm) Ford Insert Stiffeners - Model INSERT-52 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service line
9.2	1	Main stop 2 in	2 in (50 mm) M.I.P. x I.P.S. comp Main stop Ford FB1102-7
9.3	1	Main stop 2 in accessories	2 in IPS (50 mm) Ford Insert Stiffeners - Model INSERT-75-DR11 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service
10	6	Metal mold accessories	Sheet Metal screws #8 x 13 mm (1/2 in), 100/bx Zinc plated (hex head)
10.1	1	Accessories	Motor Oil 10W30 1L
11	3	Heat shrink Sleeve metal mold	18 in (450 mm) wide x 52 in (1321 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 15.5 in (388 mm) OD.
11.1	1	Heat shrink Sleeve metal mold at 4 in end	18 in (450 mm) wide x 45 in (1143 mm) long heat shrink wrap (K60-B) with closure seal for an insulated pipe of 13 in (325 mm) OD.
12	1	Foam plug	2 x 1 in Flexible insulation plug
13	1	Insulation shells	7 in ID x 13 in OD x 36 in long – with factory applied polymer coating. ( cut to length on site)
14	1	Insulation shells	See item 13

Reviewed  
3 June 2014  
ABR3



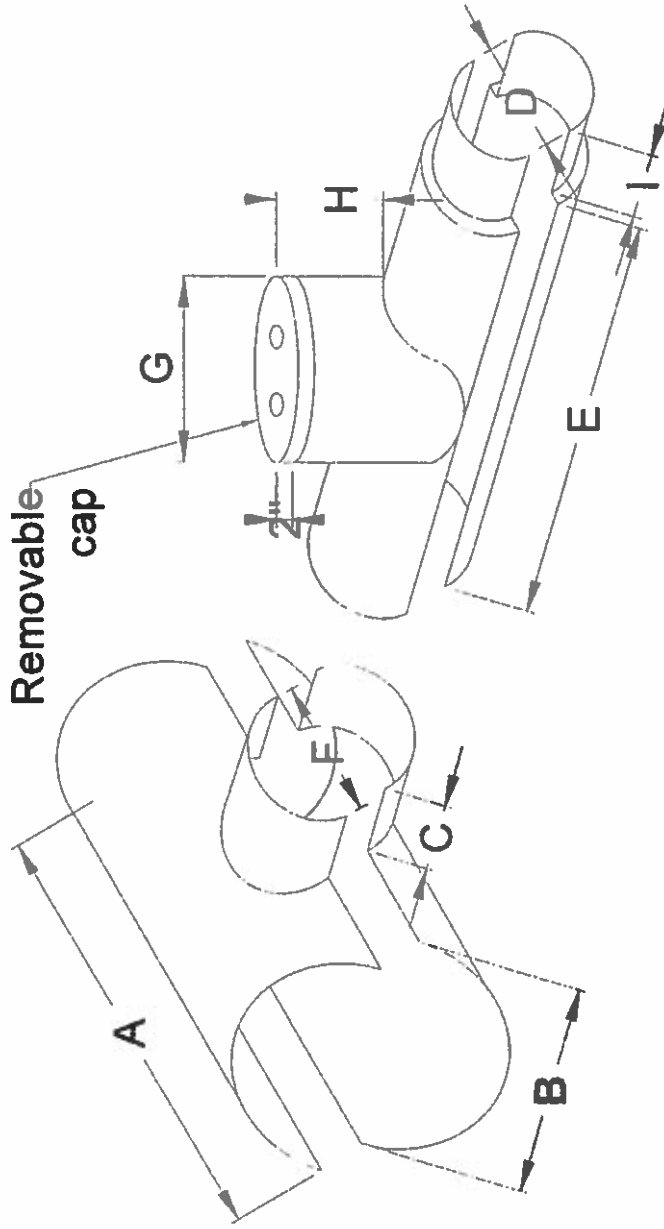
15	1	Heat shrink sleeve	See item 11.1
16		Accessories	See item 10
17	1	Saddle	Cast Bronze Service Saddle Robar no. 2706 - 8.625 x1-CC - DS ; 8in main x 1 in outlet size , CC outlet thread, double strap and provided with flat washers.
17.1	1	Saddle	Cast Bronze Service Saddle Robar no. 2706 - 8.625 x 2- IP - DS ; 8in main x 2 in outlet size , IP outlet thread, double strap and provided with flat washers.
18	1		9 in ID x 15 in OD x 36 in long – with factory applied polymer coating. ( cut to length on site)

**Table 6:** Fittings and accessories supplied by Urecon for the Water Service connection kit for 4 in riser at Building: (Reference Figure 6)

Item No.	Qty	Part	Description
1	1	Valve	1 in (25 mm) Ball valve B44-444 Pack Joint for Copper or Plastic Tubing (CTS) Both Ends.
1.1	2	Accessories	1 in CTS (25 mm) Ford Insert Stiffeners - Model INSERT-52 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service line.
1.2	1	Valve	2 in (50 mm) M.I.P. x I.P.S. comp Main stop Ford FB1102-7
1.3	2	Accessories	2 in IPS (50 mm) Ford Insert Stiffeners - Model INSERT-75-DR11 - solid 304 tubular stainless steel, dimpled and flanged to retain placement within the service
2	1	Security cap	Wood security cap
3	1	1	Stainless steel strapping 16 in long x 1/2 in x 0.15 in with gear clamp
4	1	Wood sheet	Not supplied as requested
5	1	Silicone tube	Not supplied as requested
6	1	Portable insulation	Portable insulation #200 – shipped at a later date for expiry date reasons.
7	2	Heat shrink sleeve	Not supplied as requested
8	1	Insulation shells	Not supplied as requested
9	1	Pre-insulated 90° elbow	Not supplied as requested

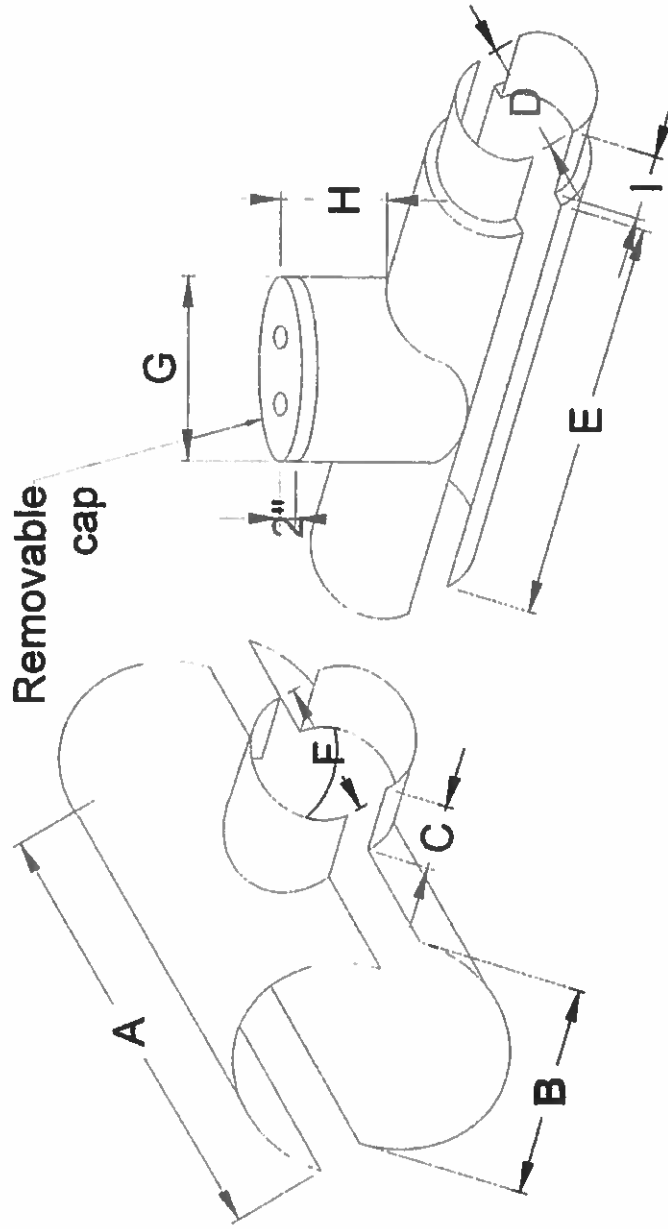
Reviewed  
3 June 2014  
ABR3

	A	B	C	D	E	F	G	H	I
DIMENSIONS	22"	15 1/4"	3"	13 1/4"	20"	15 1/2"	11"	10"	8"



Reviewed  
3 June 2014  
ABP3

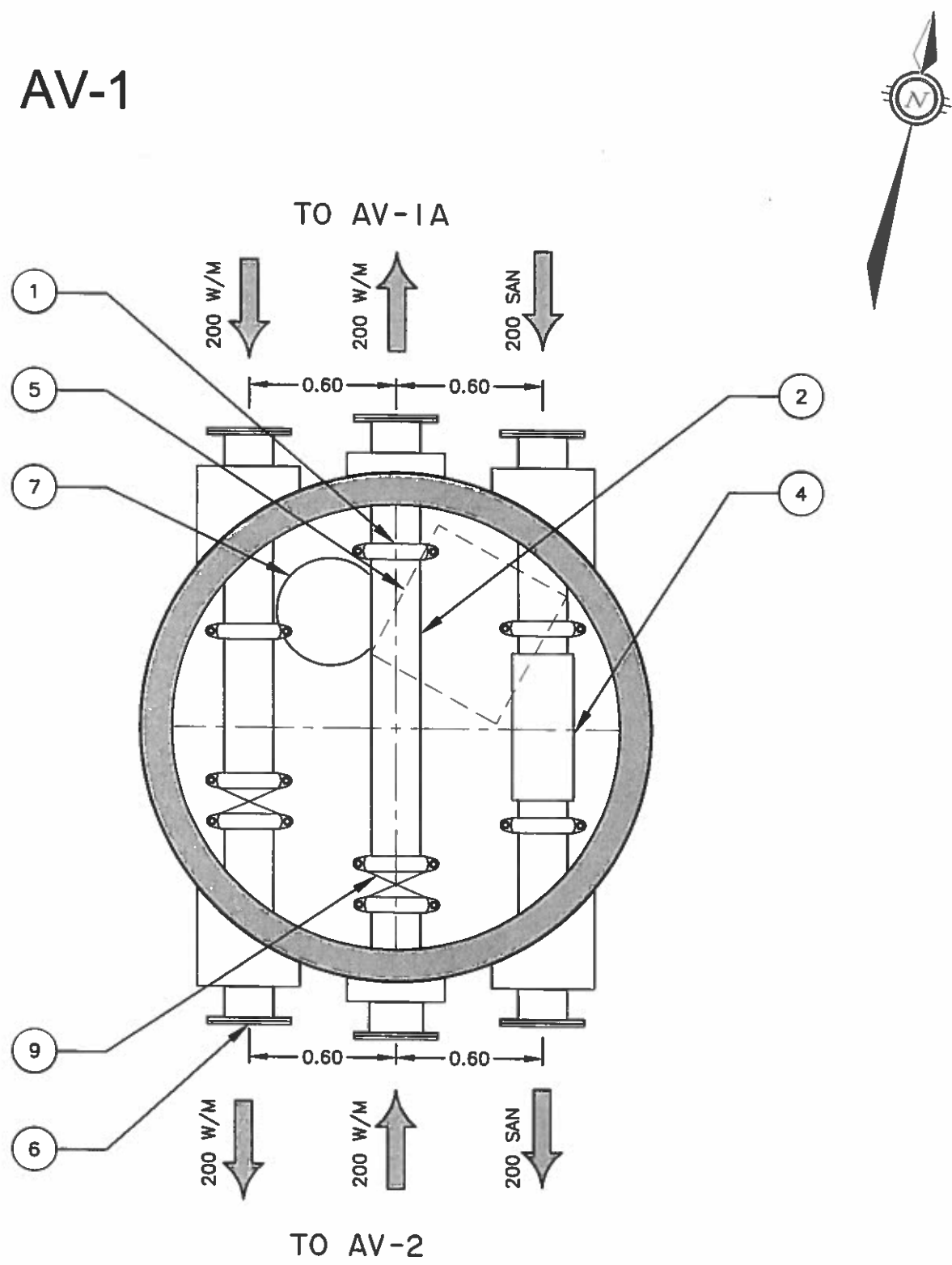
	A	B	C	D	E	F	G	H	I
DIMENSIONS	22"	15 1/4"	3"	11 1/4"	20"	15 1/4"	11"	10"	8"



Reviewed  
3 June 2014  
BPP3

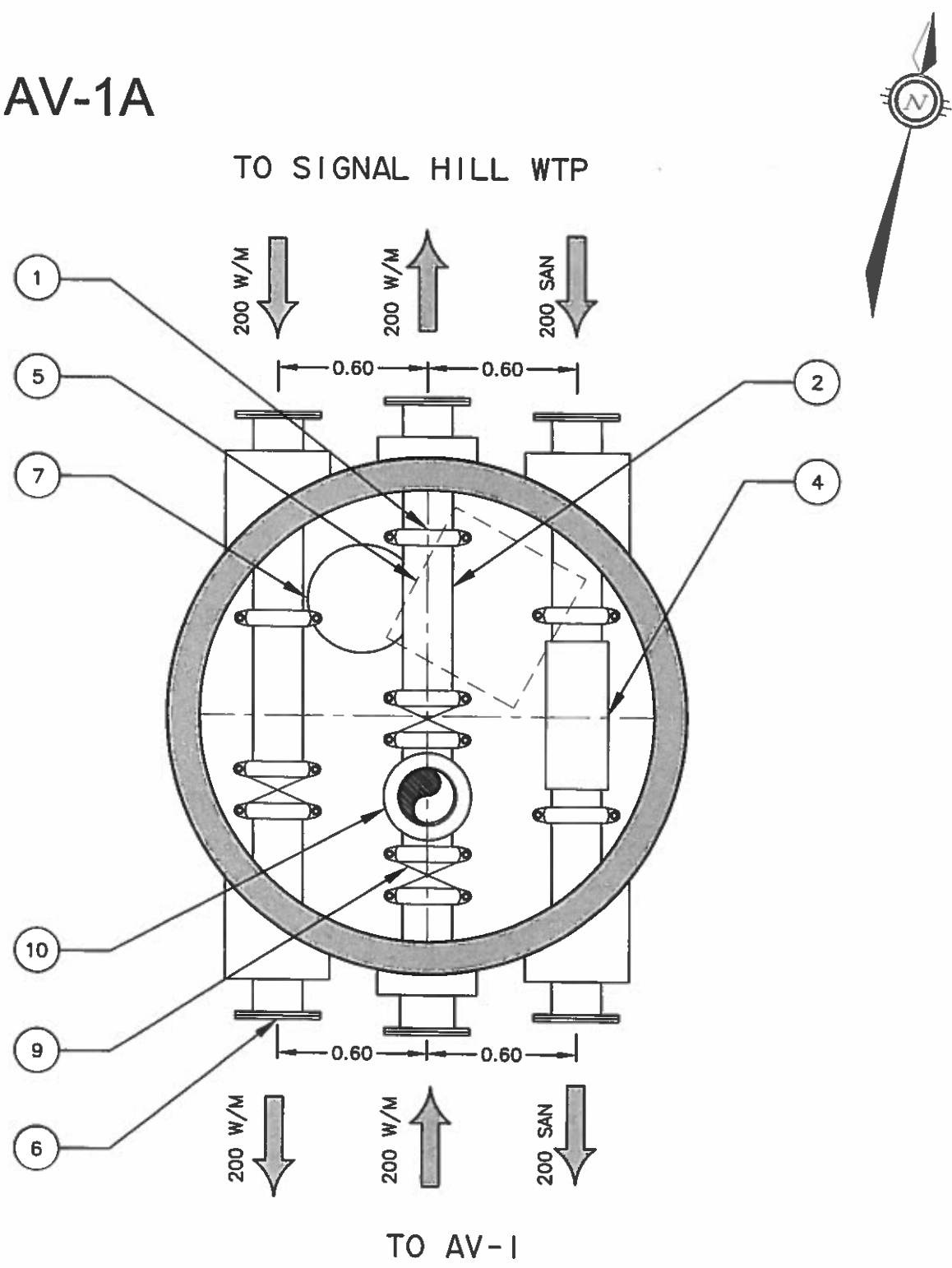
# **ACCESS VAULTS**

AV-1



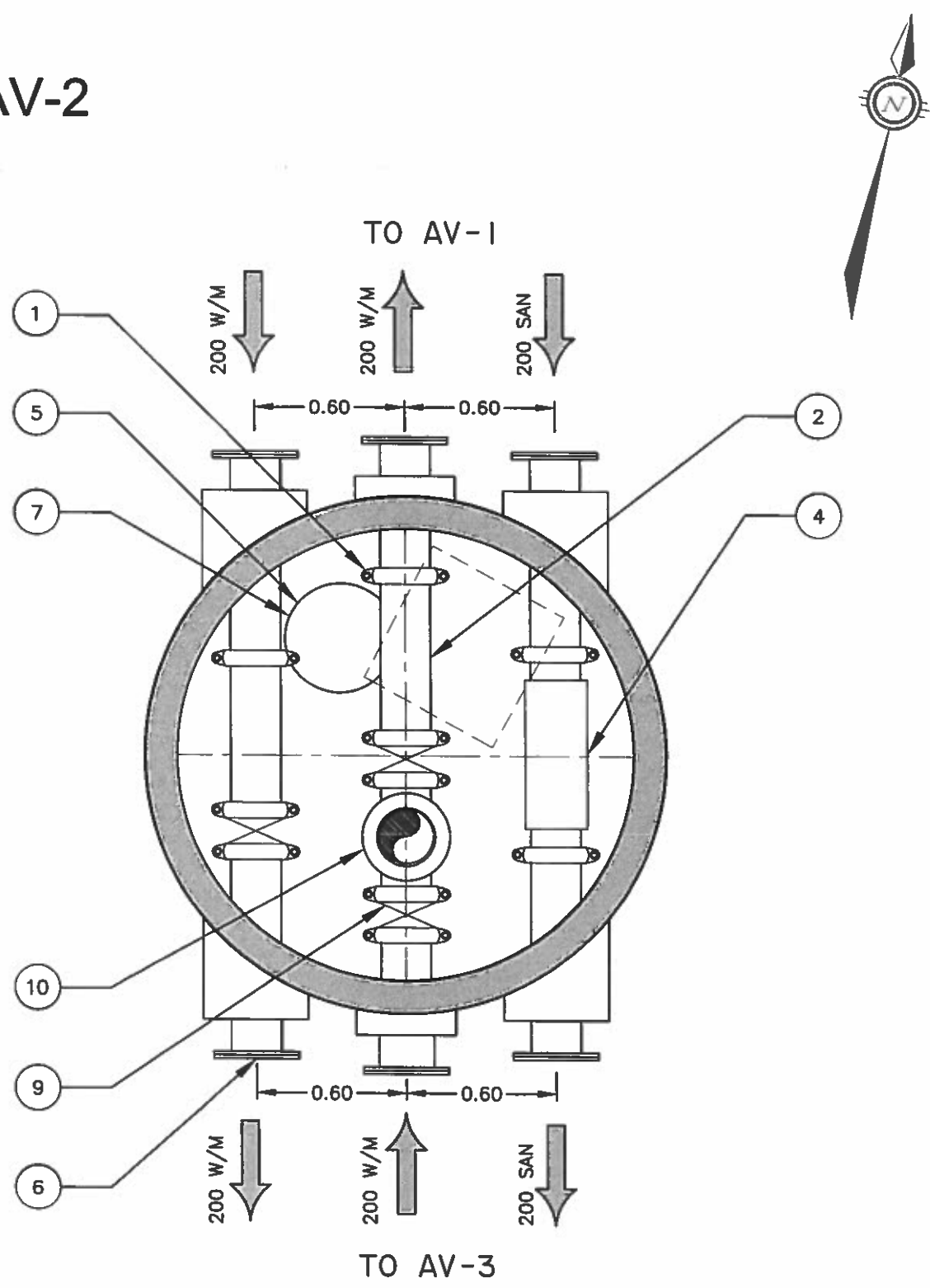
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-1	183m	53.79m	4.29m	50.00	50.00			50.75

AV-1A

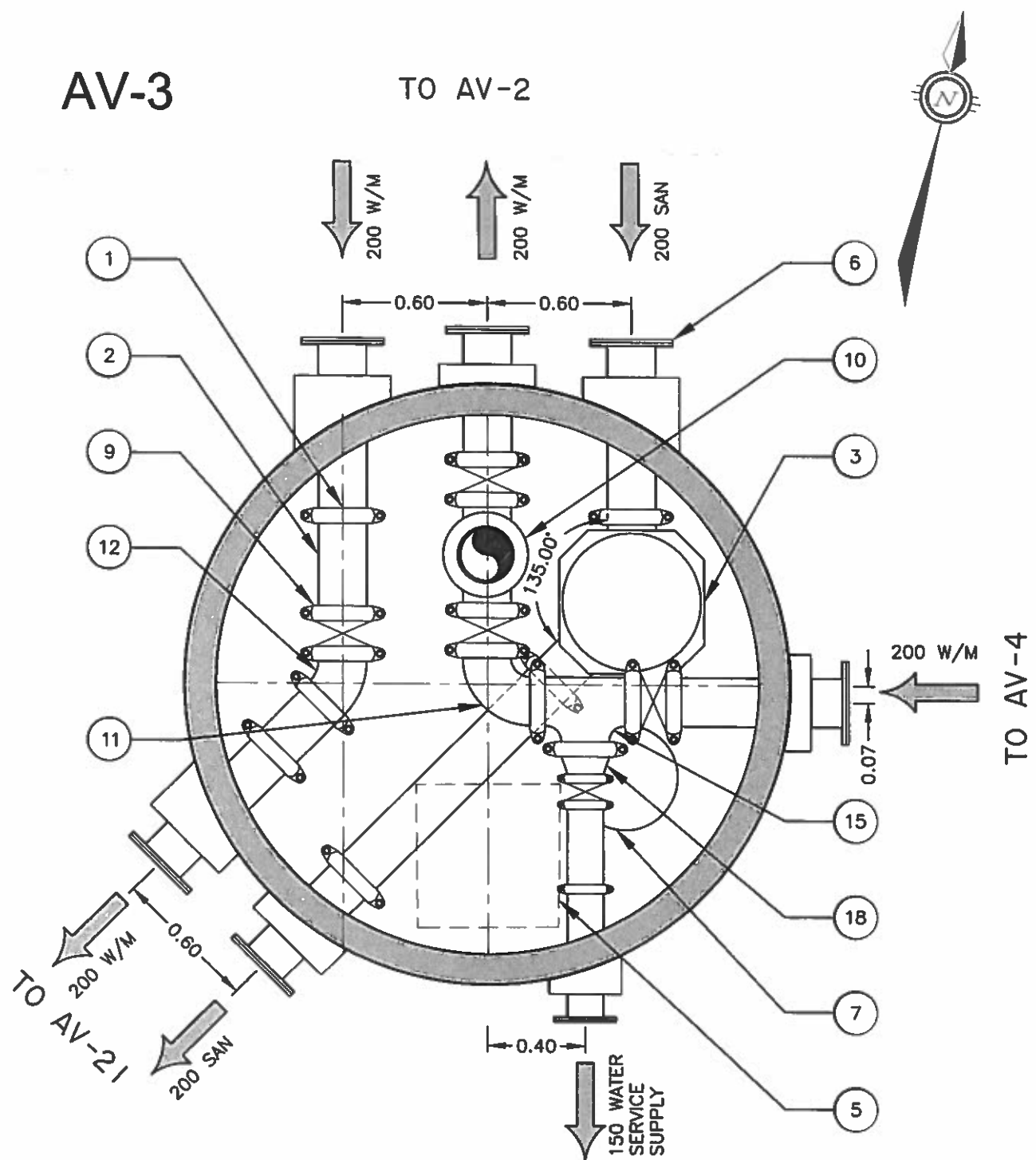


AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-1A	183m	73.09m	4.09m	69.50	69.50			70.25

AV-2



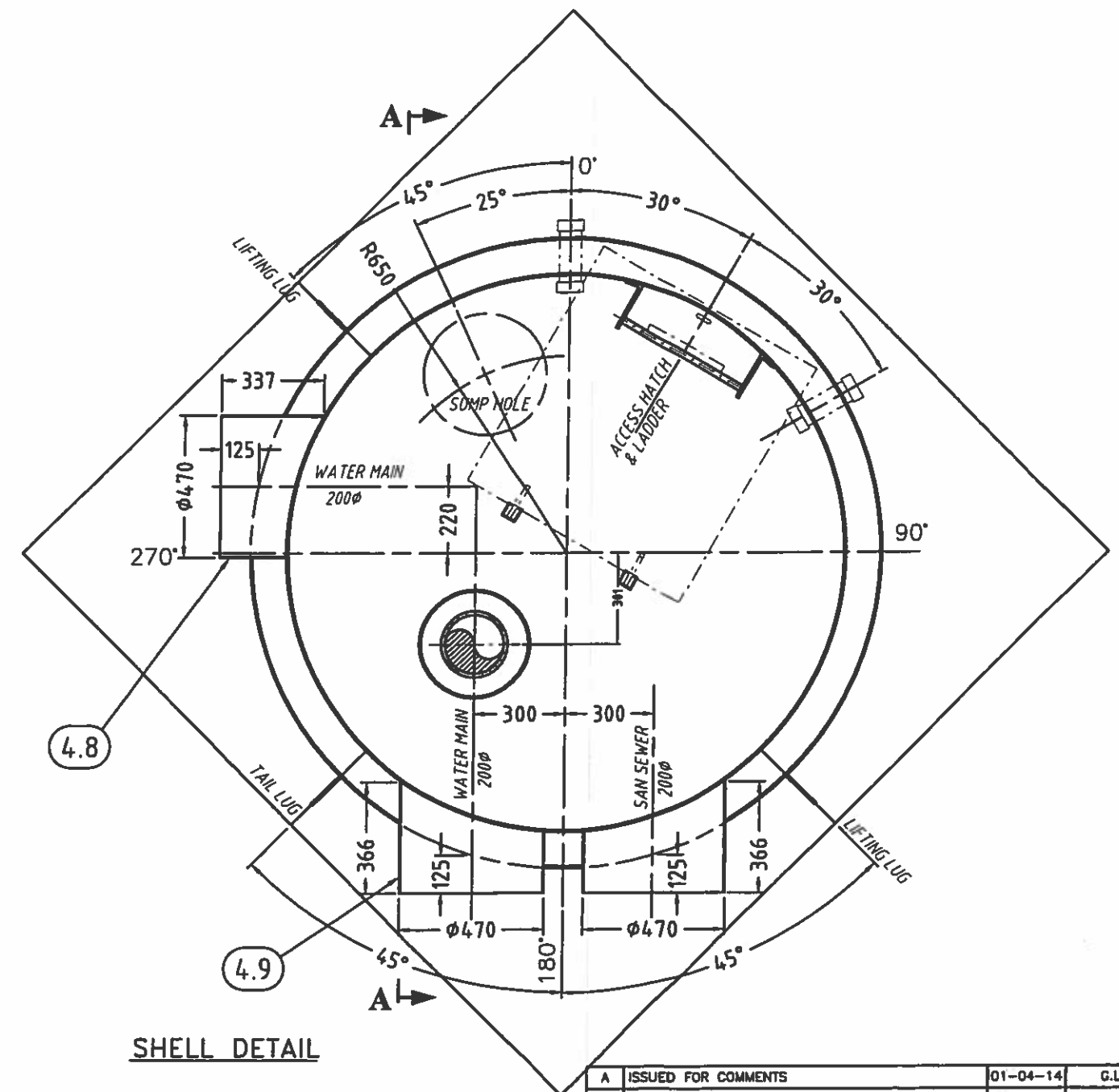
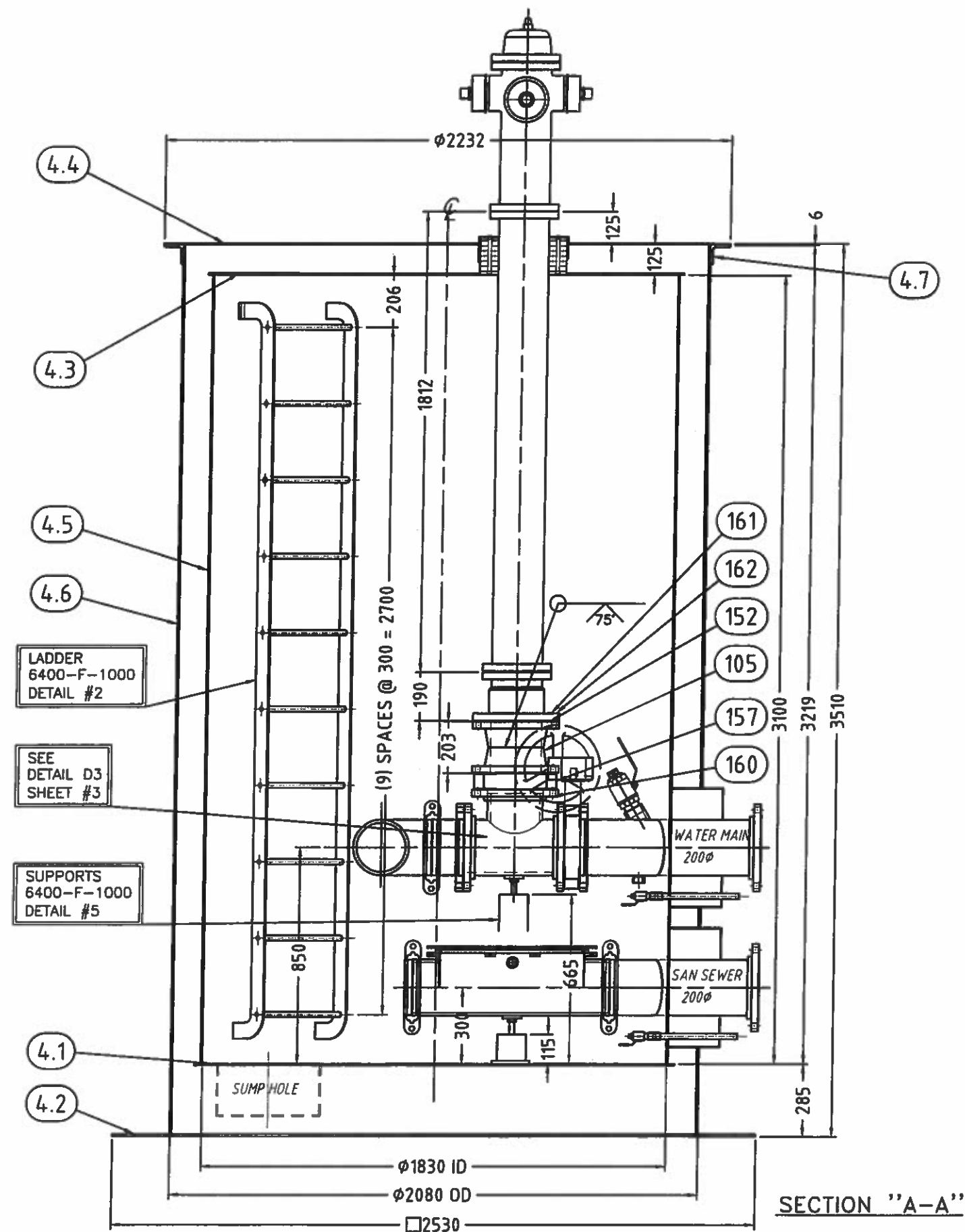
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-2	183m	38.87m	3.97m	35.40	35.40			36.15



**NOTE:**  
 AV-3 TO BE FITTED WITH 1" WATER BLEED FROM THE WATER RETURN LINE TO THE SEWER MAIN. COMPLETE WITH BACKFLOW PREVENTER. (SEE DETAIL NO. 4 ON DWG. C-328)

AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-3	225m	27.95m	4.45m	24.00	24.00			24.75

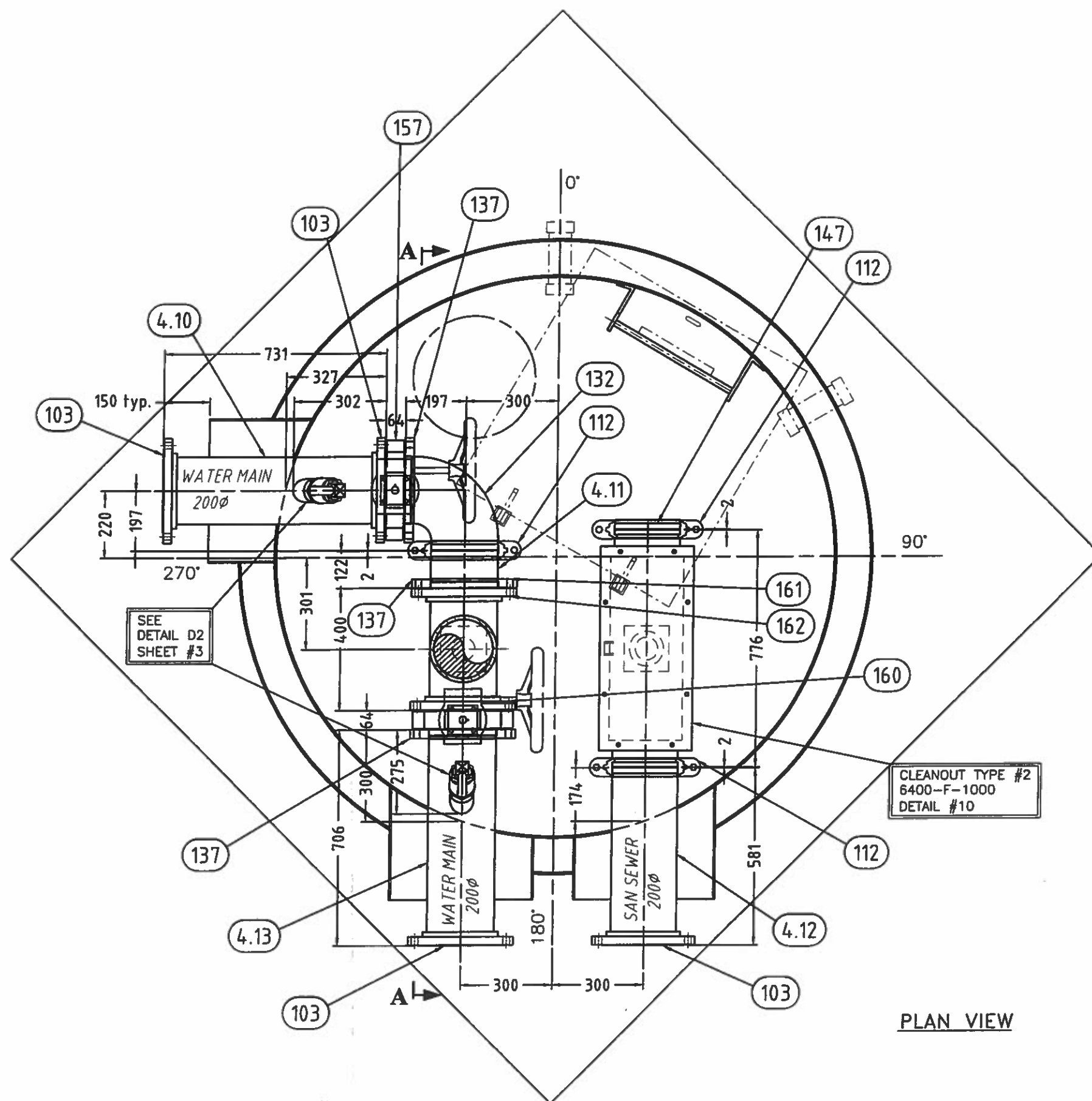





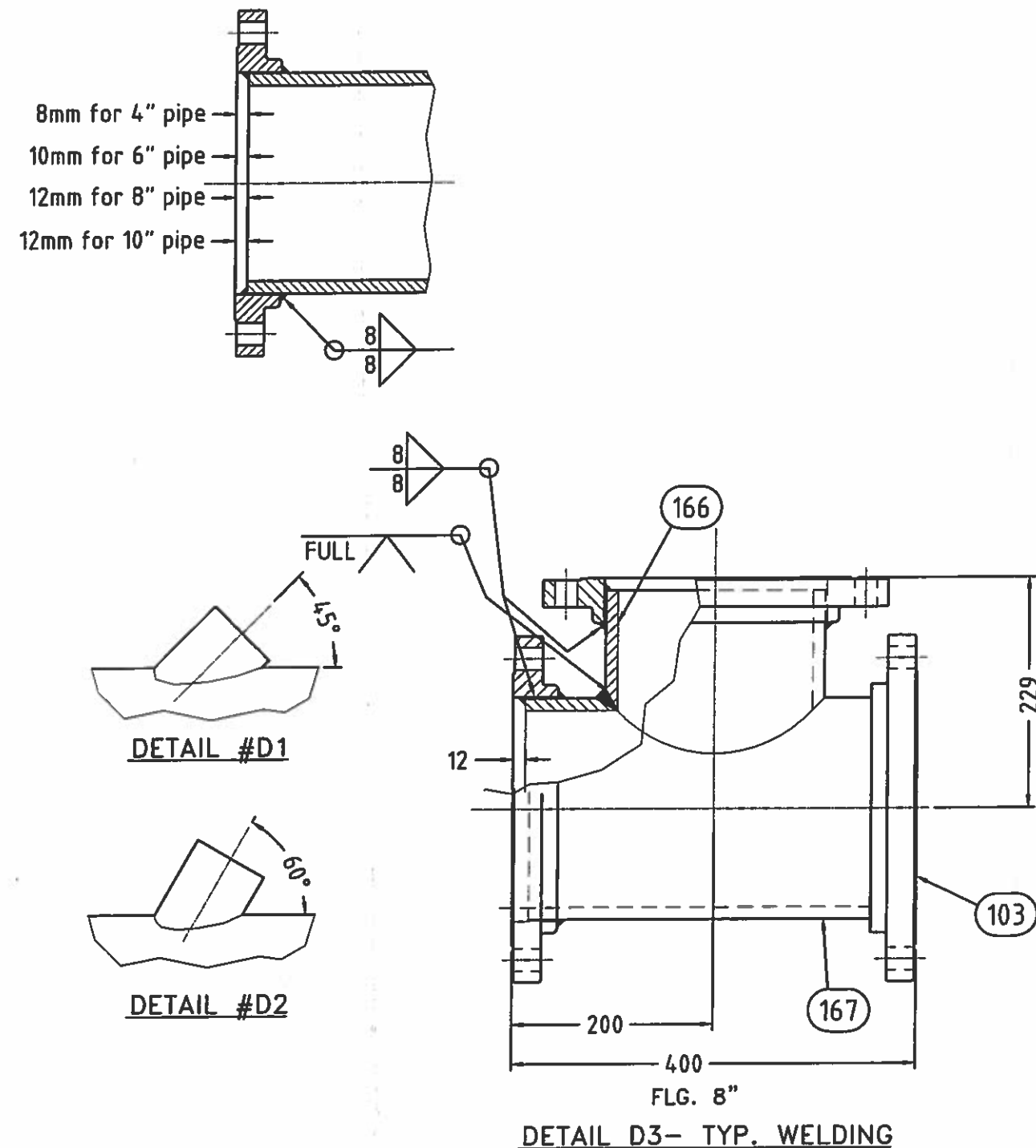
#### GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS


REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.
<p>1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com</p> <p>CE DOCUMENT EST LA PROPRIÉTÉ DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNÉ SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ÊTRE UTILISÉ, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PRÉJUDICABLE AUX INTÉRÊTS DE FALCO TECHNOLOGIES INC.</p> <p>THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p> <p>CLIENT: GOVERNEMENT OF NUNAVUT</p> <p>TITRE: ACCESS VAULT AV4 NEW UTILIDOR DESIGN RESOLUTE BAY, NU</p> <p>DESSIN No.: 6400-F-AV4 DRAUING No.: 6400-F-AV4</p> <p>DESS. PAR: G.L. DRAUING BY: G.L.</p> <p>SCALE: X/X" = X"</p> <p>QTE: 1 DATE: 01-04-14 FEUILLE: 1/3 REV: A</p>			



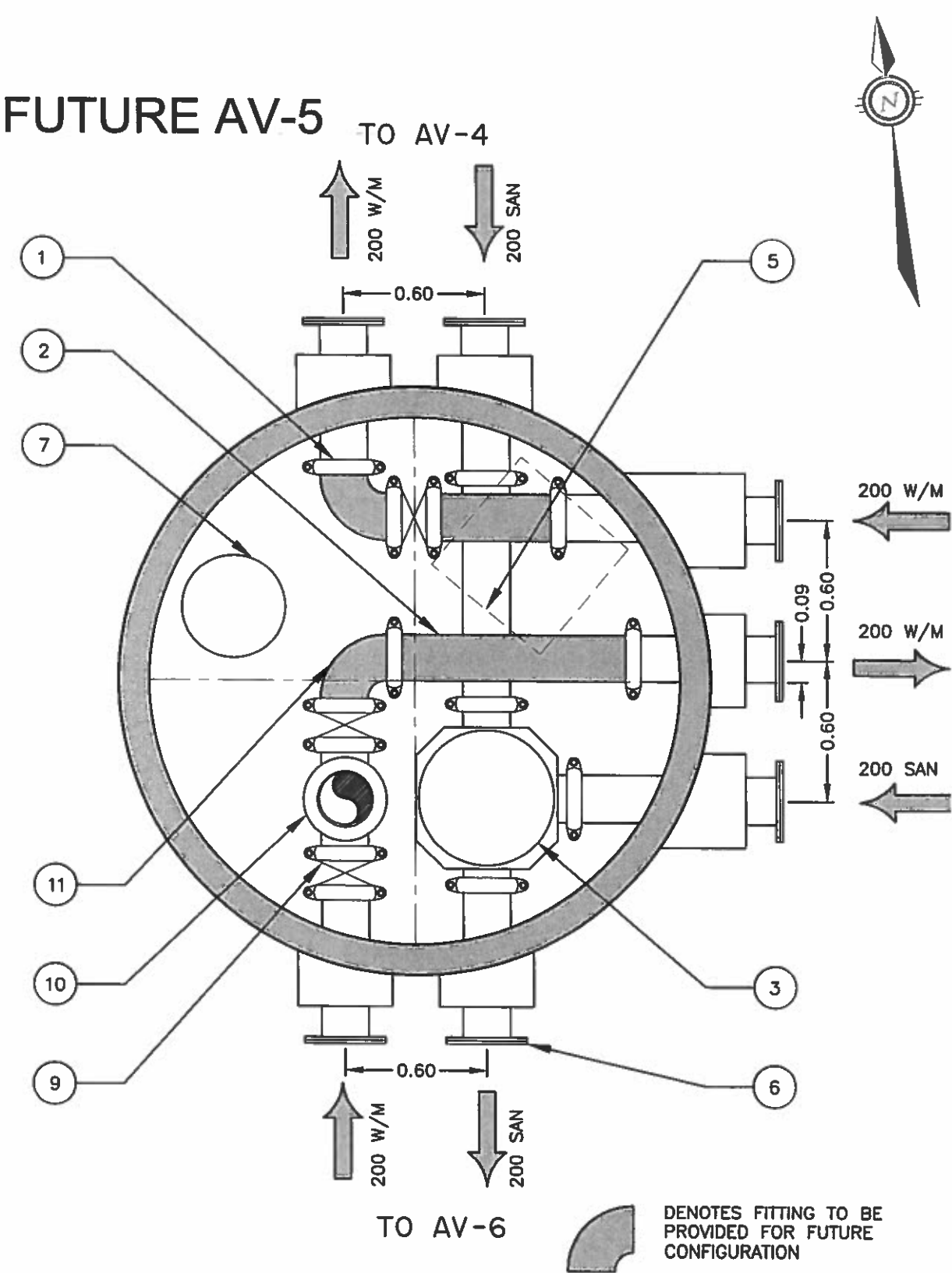
A	ISSUED FOR COMMENTS	01-04-14	G.L.	
REV	DESCRIPTION	DATE	DESS/DRAWN	
 Falco Technologies Inc., a company of <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com		
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CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT		
TITRE: TITLE:		ACCESS VAULT AV4 NEW UTILIDOR DESIGN RESOLUTE BAY , NU		
DESSIN No.: DRAWING No:		DESS. PAR: DRAWBY:		
6400-F-AV4		G.L.		
.....	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
SCALE: X/X" = X"	1	01-04-14	2 / 3	A



Item	Qty	Description	Material
4.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
4.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
4.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
4.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
4.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 3219mm LG.	A36
4.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 3488mm LG.	A36
4.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
4.8	1	PL. 1/4" THK. x 337 x 1456mm LG.	A36
4.9	2	PL. 1/4" THK. x 366 x 1456mm LG.	A36
4.10	1	PIPE 8" SCH.80 x 707mm LG.	A-53-B
4.11	1	PIPE 8" SCH.80 x 122mm LG. vic groove 2 end	A-53-B
4.12	1	PIPE 8" SCH.80 x 569mm LG. vic groove 1 end	A-53-B
4.13	1	PIPE 8" SCH.80 x 706mm LG.	A-53-B
103	7	FLANGE SORF 8" - 150#	SA 105
105	2	FLANGE WN 8" 150#, BORE	SA-105
112	3	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	3	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
147	1	8" VICTAULIC CAP, #60	GALV C.S.
152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER
157	3	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	48	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.
161	16	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.
162	16	3/4-10 HEX. NUT	PLATED C.S.
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B
167	1	PIPE 8" SCH.80 x 376mm LG.	A-53-B

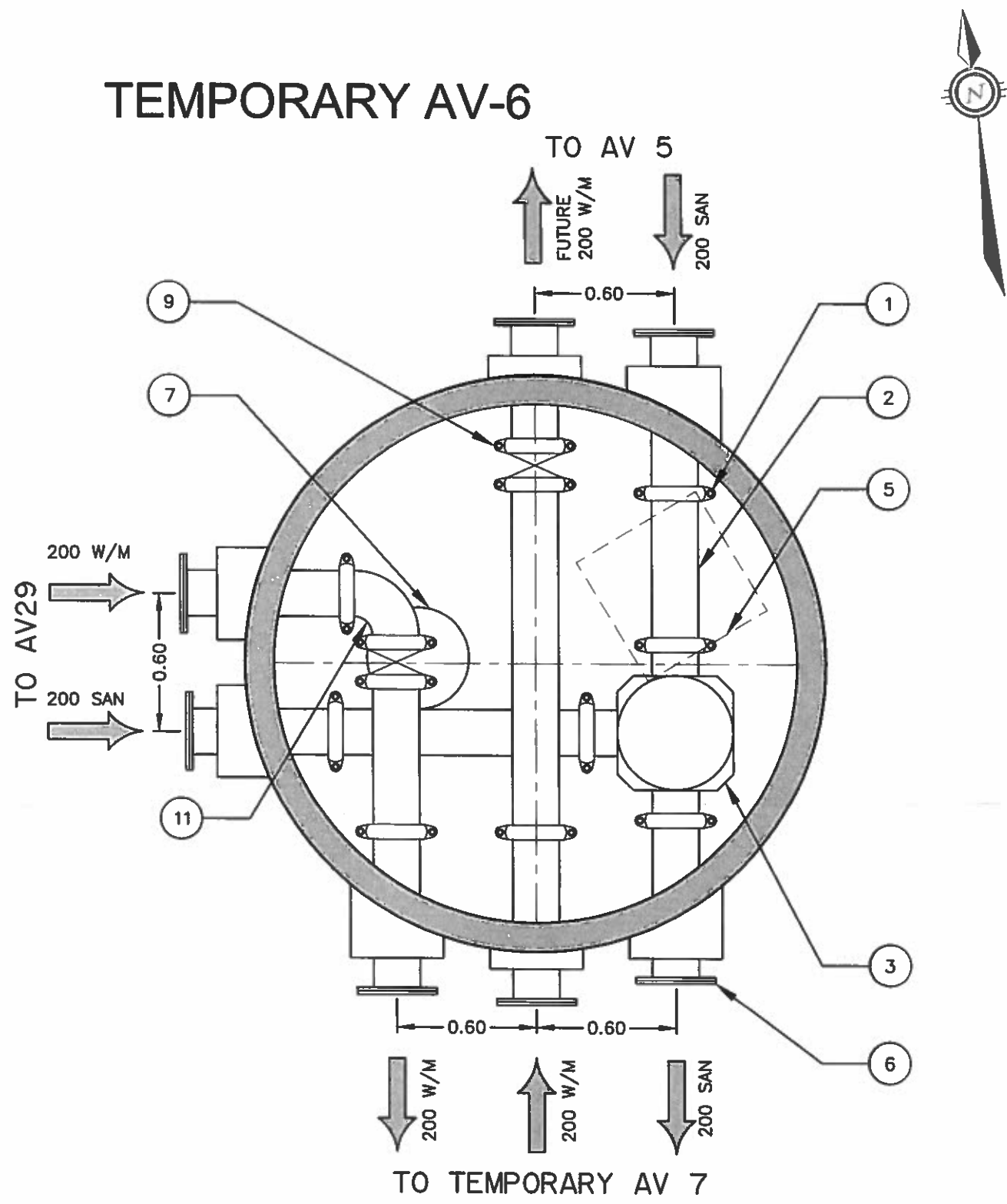
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV4 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No. DRAWING No. 6400-F-AV4		DESS. PAR: DRAW BY: G.L.	
..... SCALE: X/X" = X"	OTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 3 / 3 REV: A

FUTURE AV-5



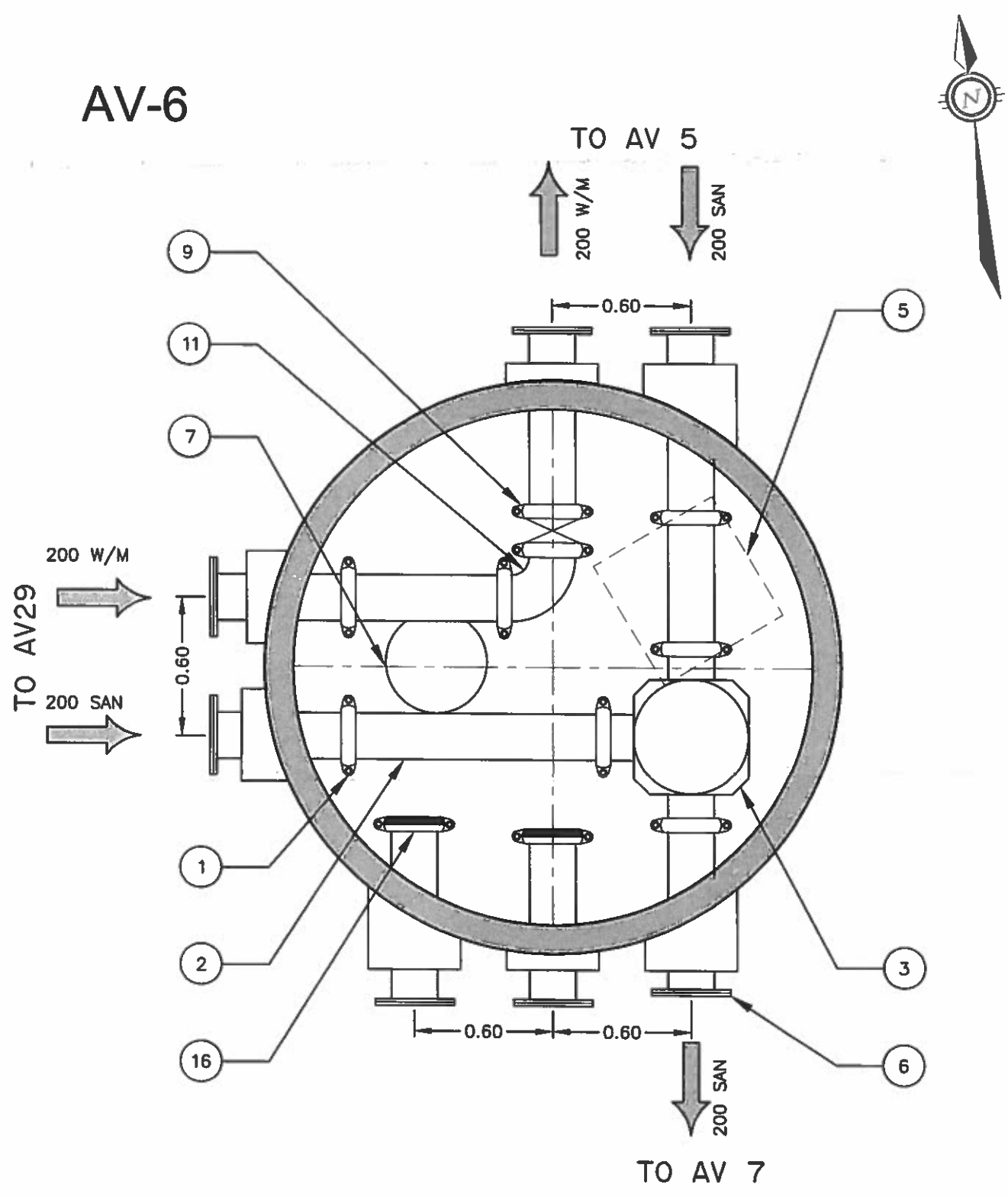
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
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AV-05	2.25m	21.64m	4.13m	18.01	18.01	18.01		18.76

TEMPORARY AV-6

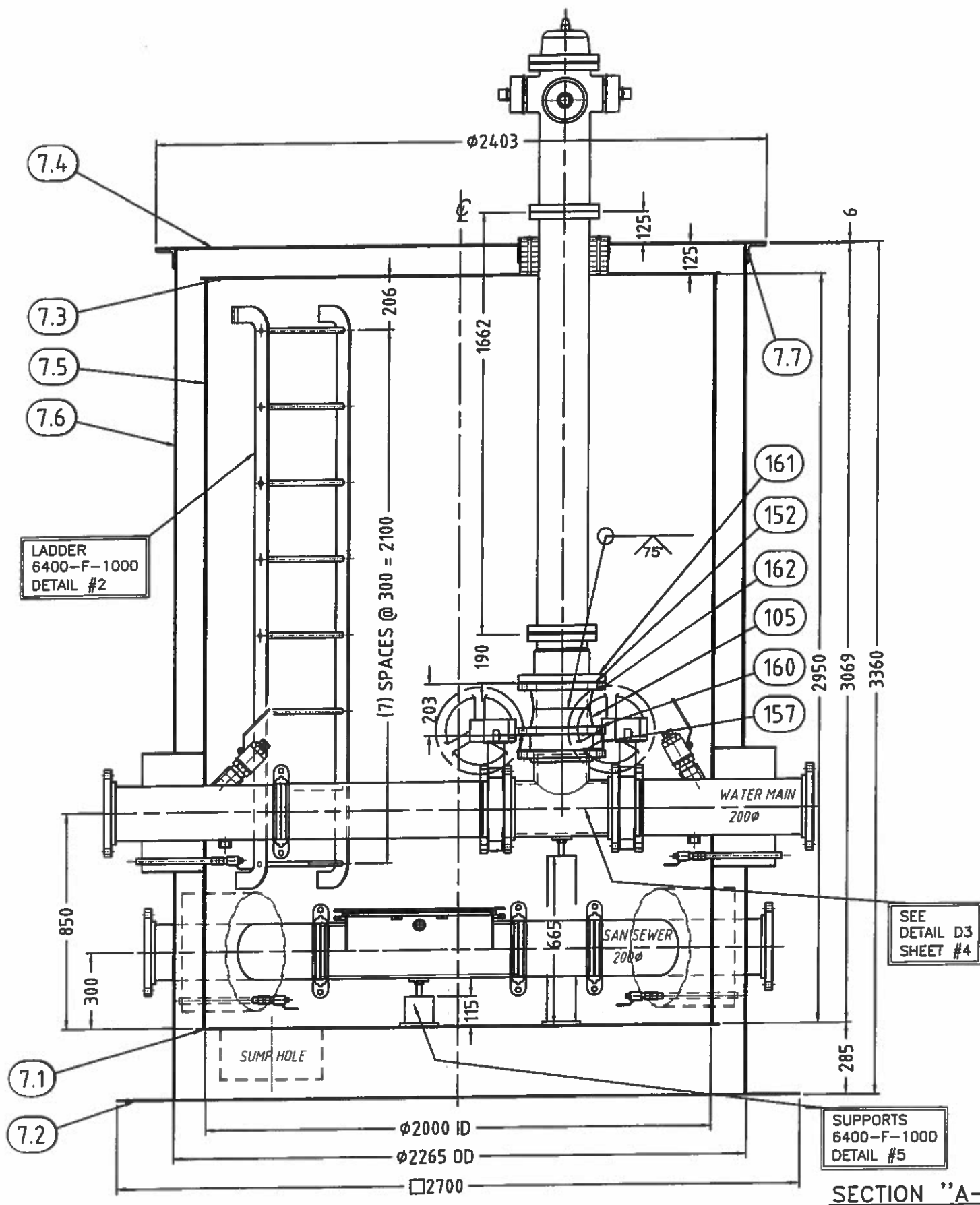


AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-6	225m	18.64m	3.42m	15.72	15.72		15.72	16.47

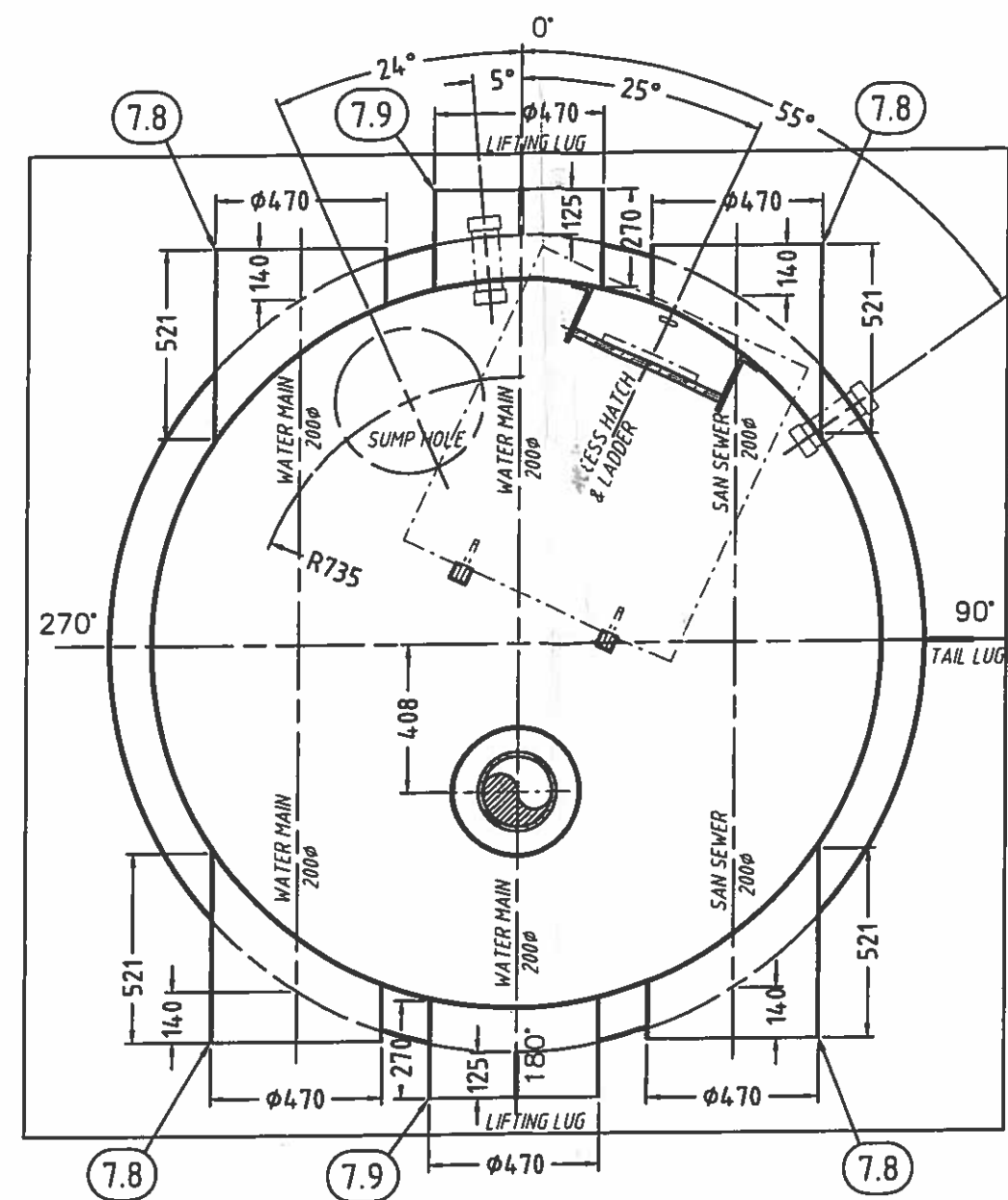
AV-6



AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-6	2.25m	18.64m	3.42m	15.72	15.72		15.72	18.47




SECTION "A-A"

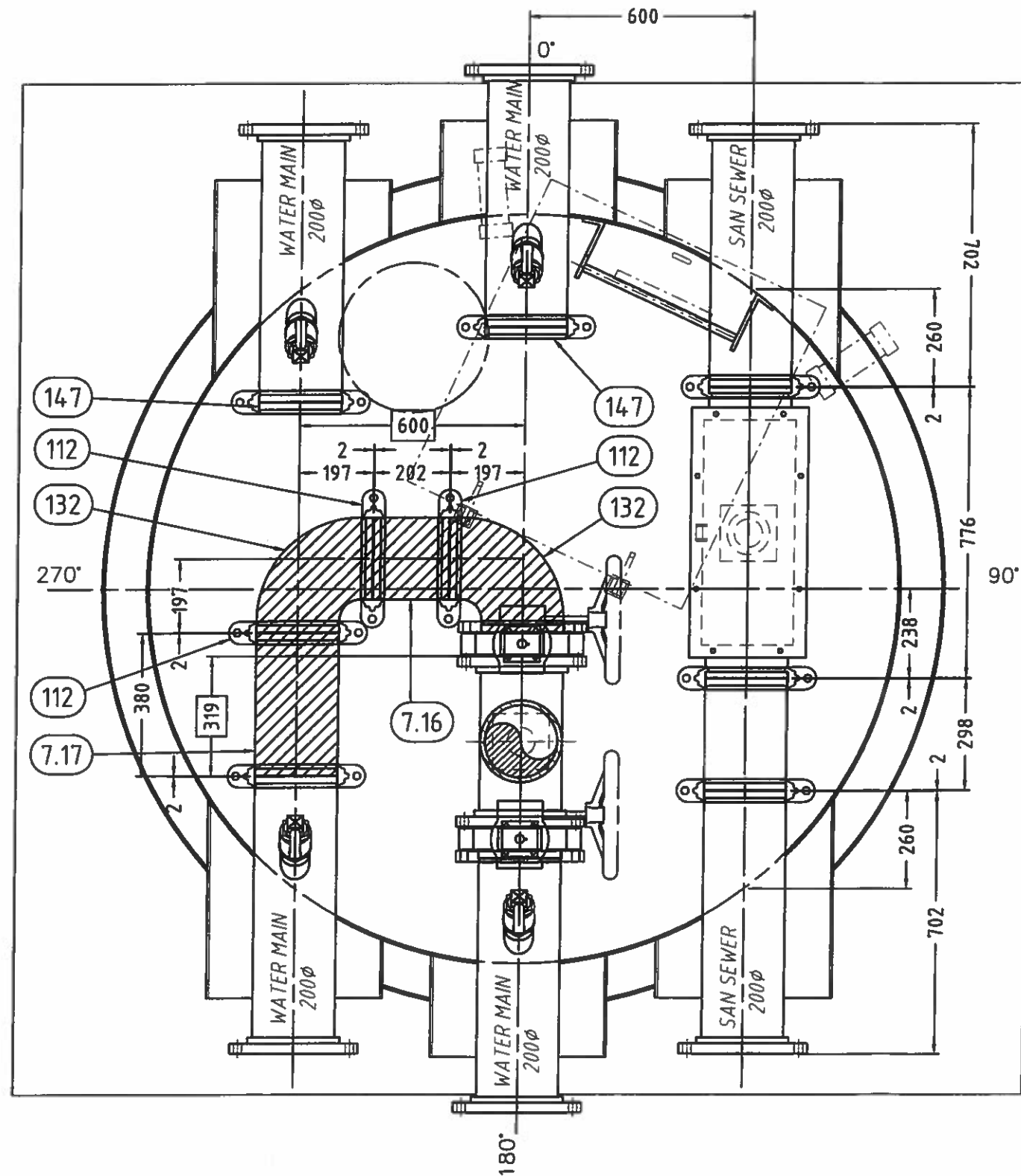


SHELL DETAIL


GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
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- 4 - VALVE:  
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VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

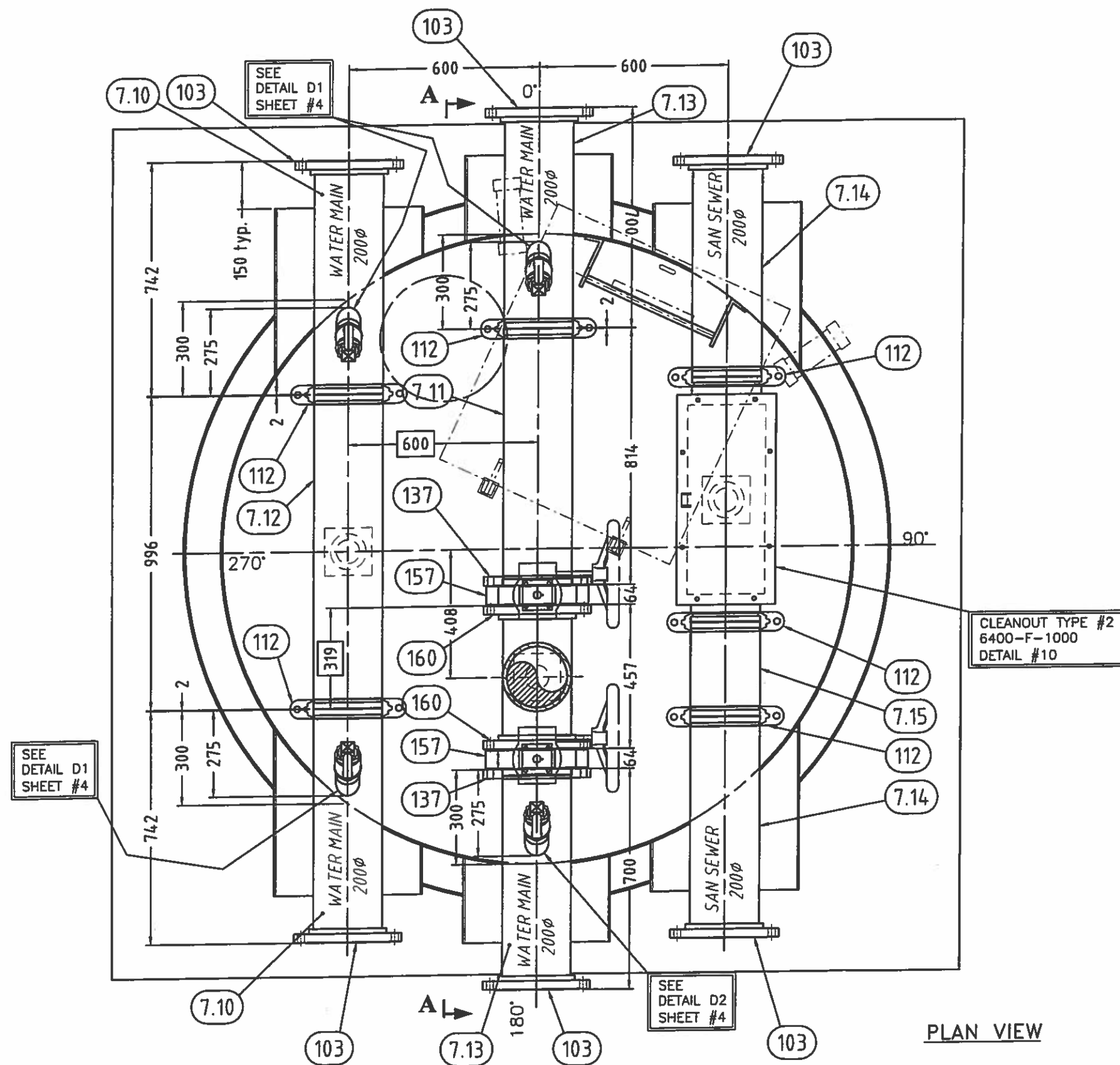
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
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CLIENT:		GOVERNEMENT OF NUNAVUT	
CUSTOMER:			
TITRE:		ACCESS VAULT AV7	
TITLE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.:		DESS. PAR:	
DRAWING No.:		DRAWBY:	
6400-F-AV7		G.L.	
.....	QTE:	DATE	FEUILLE:
SCALE:	QTY:	1	SHEET:
X/X" = X"	1	01-04-14	1 / 4
			REV:
			A




PLAN VIEW  
(FUTURE)

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
<p>  <b>Falco Technologies Inc., a company of</b>  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com </p>			
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<p> CLIENT:  CUSTOMER: <b>GOVERNEMENT OF NUNAVUT</b> </p>			
<p> TITRE:  TITLE: <b>ACCESS VAULT AV7 NEW UTILIDOR DESIGN RESOLUTE BAY, NU</b> </p>			
<p> DESSIN No.:  DRAWING No.: <b>6400-F-AV7</b> </p>		<p> DESS. PAR:  DRAW BY: <b>G.L.</b> </p>	
<p> .....  SCALE: <b>X/X" = X"</b> </p>	<p> QTE:  QTY: <b>1</b> </p>	<p> DATE:  <b>01-04-14</b> </p>	<p> FEUILLE:  SHEET: <b>3 / 4</b> </p>
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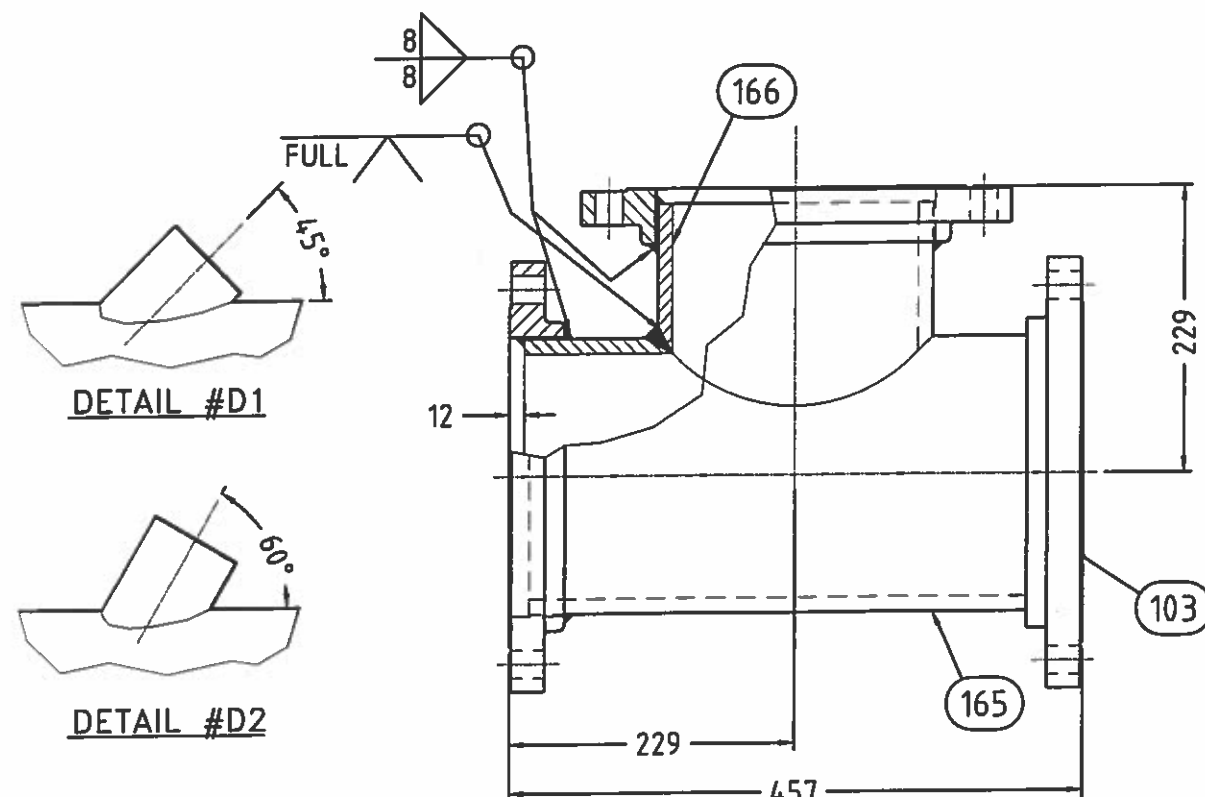
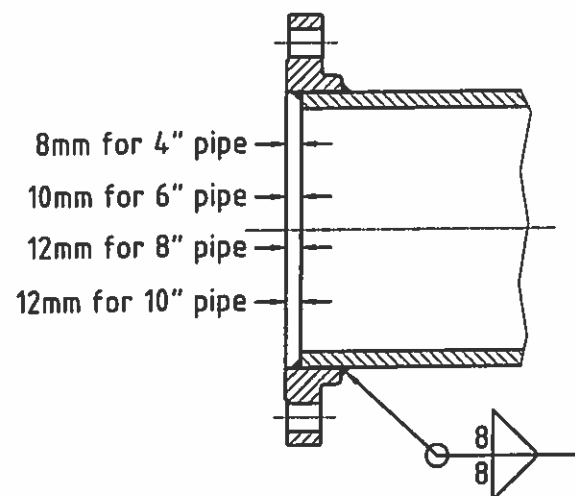





PLAN VIEW

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 Falco Technologies Inc., a company of <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com	
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CLIENT: CUSTOMER: GOVERNEMENT OF NUNAVUT			
TITRE: TITLE: ACCESS VAULT AV7 NEW UTILIDOR DESIGN RESOLUTE BAY , NU			
DESSIN No. DRAWING No: 6400-F-AV7		DESS. PAR: DRAW BY: G.L.	
..... SCALE: $X/X'' = X''$	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 2 / 4
			REV: A

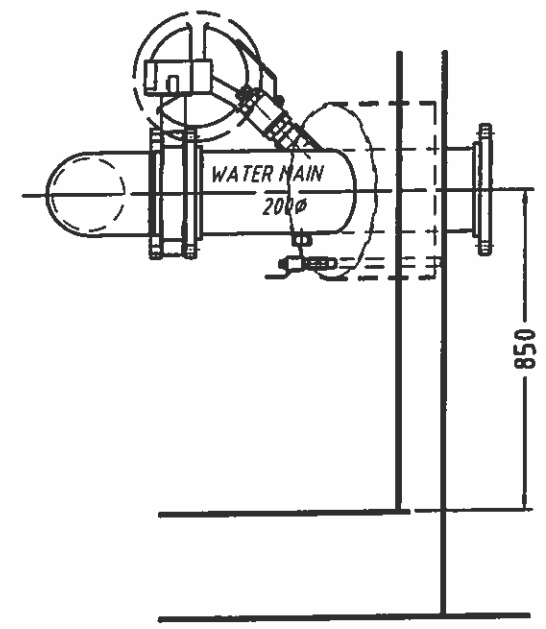
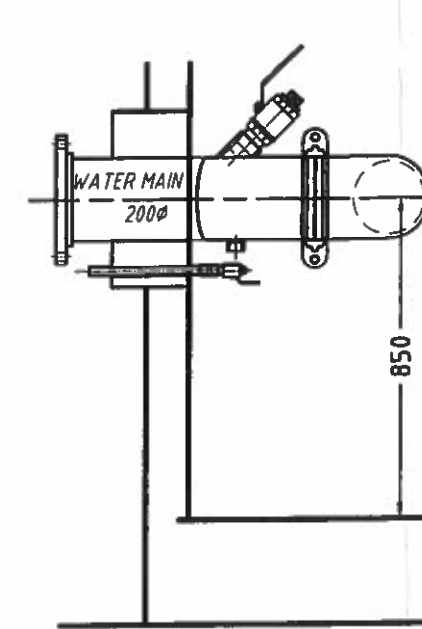
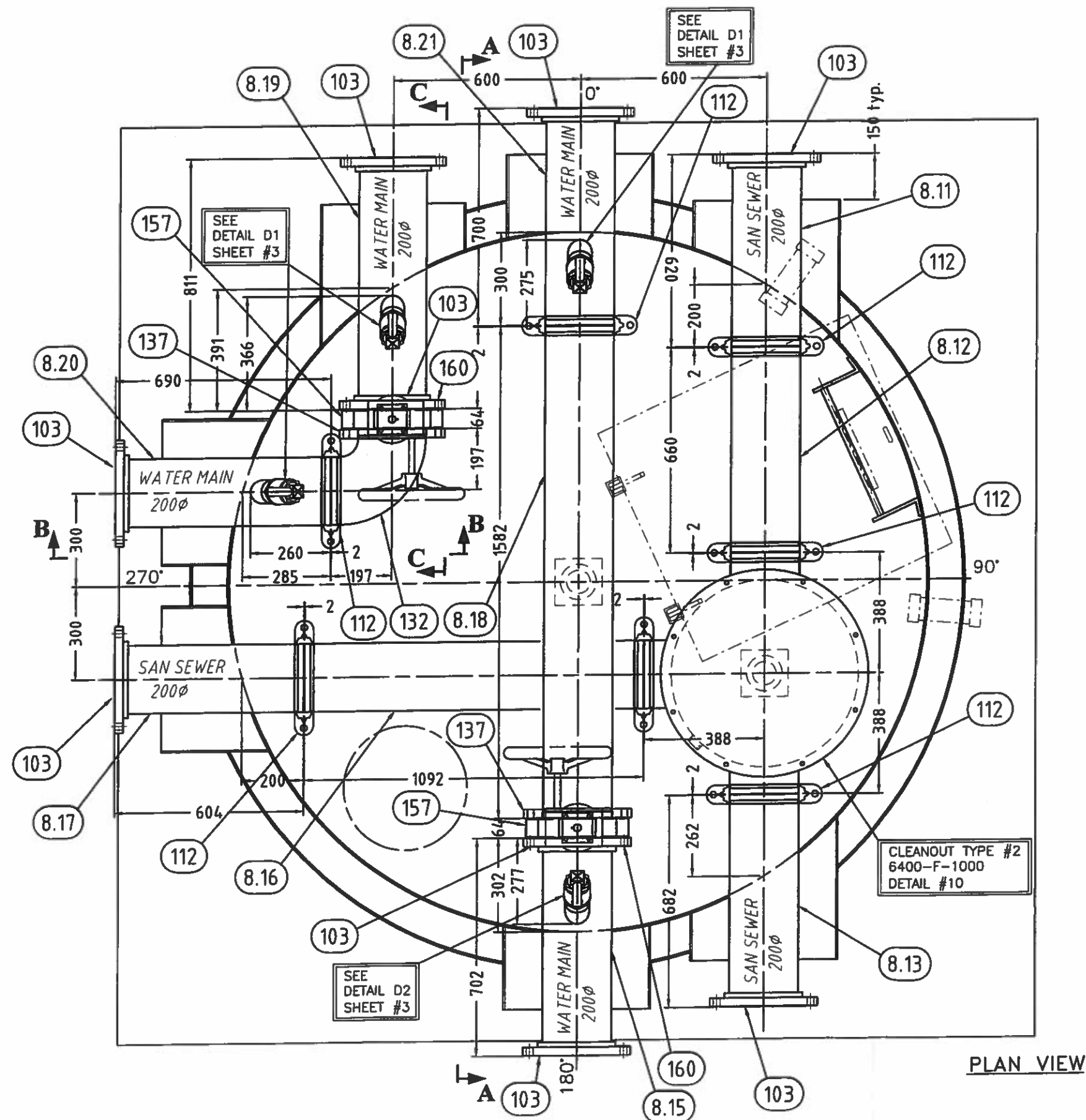
Item	Qty	Description	Material	Item	Qty	Description	Material
162	8	3/4-10 HEX. NUT	PLATED C.S.	7.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2062mm	A36
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B	7.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2700mm x 2700mm	A36
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B	7.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2048mm	A36
				7.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2403mm	A36
				7.5	1	INTERNAL SHELL PL. 1/4" THK. x 6303mm x 2950mm LG.	A36
				7.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7048mm x 3338mm LG.	A36
				7.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
				7.8	4	PL. 1/4" THK. x 521 x 1456mm LG.	A36
				7.9	2	PL. 1/4" THK. x 270 x 1456mm LG.	A36
				7.10	2	PIPE 8" SCH.80 x 730mm LG. vic groove 1 end	A-53-B
				7.11	1	PIPE 8" SCH.80 x 814mm LG. vic groove 2 end	A-53-B
				7.12	1	PIPE 8" SCH.80 x 996mm LG. vic groove 2 end	A-53-B
				7.13	2	PIPE 8" SCH.80 x 688mm LG. vic groove 1 end	A-53-B
				7.14	2	PIPE 8" SCH.80 x 690mm LG. vic groove 1 end	A-53-B
				7.15	1	PIPE 8" SCH.80 x 298mm LG. vic groove 2 end	A-53-B
				7.16	1	PIPE 8" SCH.80 x 202mm LG. vic groove 2 end	A-53-B
				7.17	1	PIPE 8" SCH.80 x 380mm LG. vic groove 2 end	A-53-B
				103	9	FLANGE SORF 8" - 150#	SA 105
				105	2	FLANGE WN 8" 150#, BORE	SA-105
				112	9	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
				132	2	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
				137	2	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
				147	2	8" VICTAULIC CAP, #60	GALV C.S.
				152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER
				157	3	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
				160	48	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.
				161	8	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.



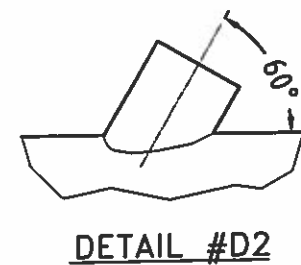
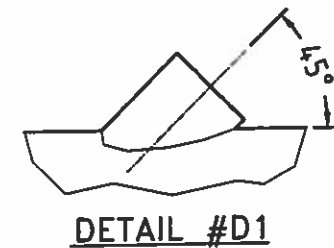
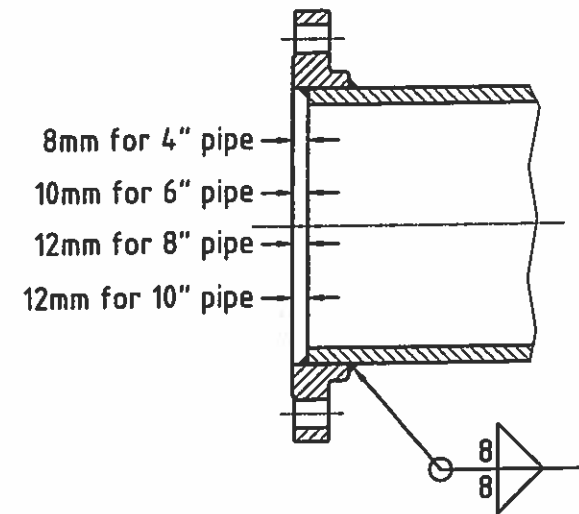
FLG. 8"  
DETAIL D3- TYP. WELDING

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
	 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b> 1245 rue Industrielle La Prairie (Quebec) JSR 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com		
CE DOCUMENT EST LA PROPRIÉTÉ DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNÉ SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ÊTRE UTILISÉ, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PRÉJUDICABLE AUX INTÉRÊTS DE FALCO TECHNOLOGIES INC. THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.			
CLIENT: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV7 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No: 6400-F-AV7		DESS. PAR: G.L.	
DRAWING No:		DRAW BY:	
SCALE: X/X" = X"	QTE: 1	DATE: 01-04-14	FEUILLE: 4 / 4 REV: A




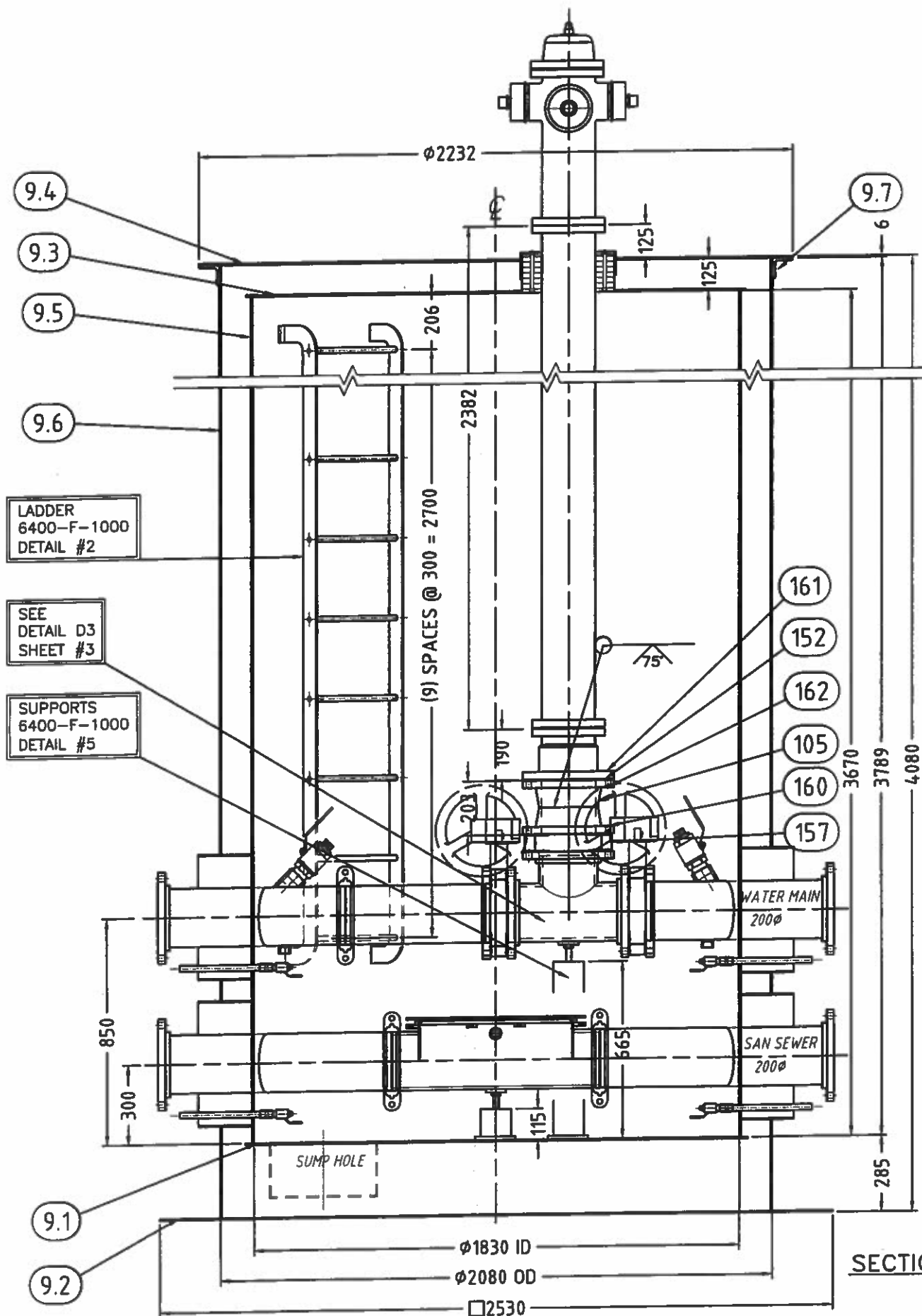


A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
			1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com
<p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICIABLE AUX INTERETS DE FALCO TECHNOLOGIES INC.</p> <p>THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p>			
CLIENT: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV8 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.: 6400-F-AV8		DESS PAR: G.L.	
SCALE: X/X" = X"	QTE: 1	DATE: 01-04-14	FEUILLE: 2 / 3
			REV: A

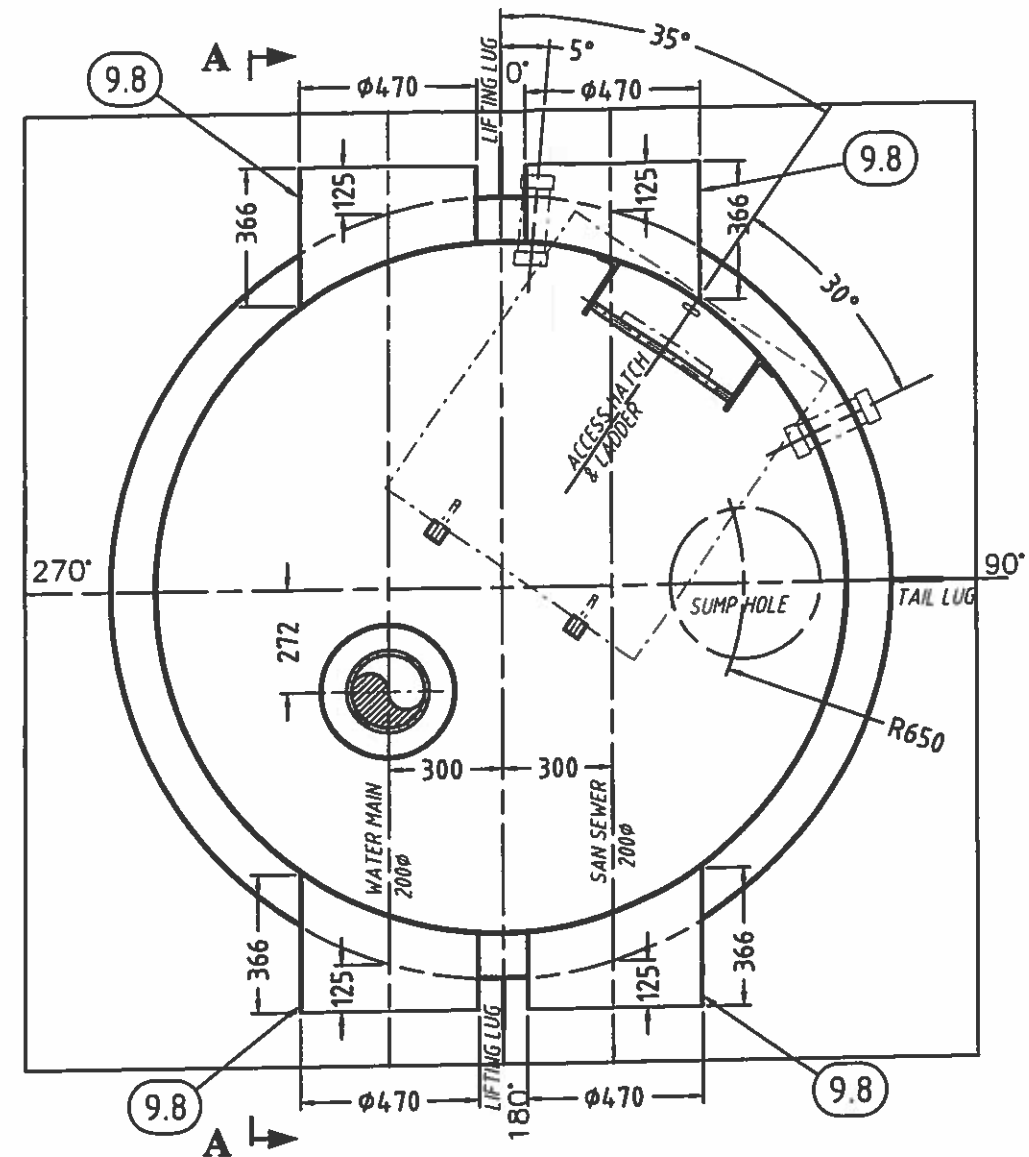


Item	Qty	Description	Material
8.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
8.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
8.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
8.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
8.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 3240mm LG.	A36
8.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7834mm x 3628mm LG.	A36
8.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
8.8	3	PL. 1/4" THK. x 452 x 1456mm LG.	A36
8.9	2	PL. 1/4" THK. x 338 x 1456mm LG.	A36
8.10	2	PL. 1/4" THK. x 267 x 1456mm LG.	A36
8.11	1	PIPE 8" SCH.80 x 608mm LG. vic groove 1 end	A-53-B
8.12	1	PIPE 8" SCH.80 x 660mm LG. vic groove 2 end	A-53-B
8.13	1	PIPE 8" SCH.80 x 670mm LG. vic groove 1 end	A-53-B
8.15	1	PIPE 8" SCH.80 x 680mm LG.	A-53-B
8.16	1	PIPE 8" SCH.80 x 1092mm LG. vic groove 2 end	A-53-B
8.17	1	PIPE 8" SCH.80 x 592mm LG. vic groove 1 end	A-53-B
8.18	1	PIPE 8" SCH.80 x 1582mm LG. vic groove 2 end	A-53-B
8.19	1	PIPE 8" SCH.80 x 787mm LG.	A-53-B
8.20	1	PIPE 8" SCH.80 x 678mm LG. vic groove 1 end	A-53-B
8.21	1	PIPE 8" SCH.80 x 688mm LG. vic groove 1 end	A-53-B
103	9	FLANGE SORF 8" - 150#	SA 105
112	7	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	2	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
157	2	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	32	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel. (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com	
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CLIENT:			
CUSTOMER: <b>GOVERNEMENT OF NUNAVUT</b>			
TITRE:			
TITLE: <b>ACCESS VAULT AVB NEW UTILIDOR DESIGN RESOLUTE BAY, NU</b>			
DESSIN No.:		DESS. PAR:	
DRAWING No: <b>6400-F-AVB</b>		DRAW BY: <b>G.L.</b>	
.....	QTE:	DATE:	FEUILLE:
SCALE: <b>X/X" = X"</b>	QTY: <b>1</b>	<b>01-04-14</b>	SHEET: <b>3 / 3</b>
			REV: <b>A</b>




SECTION "A-A"

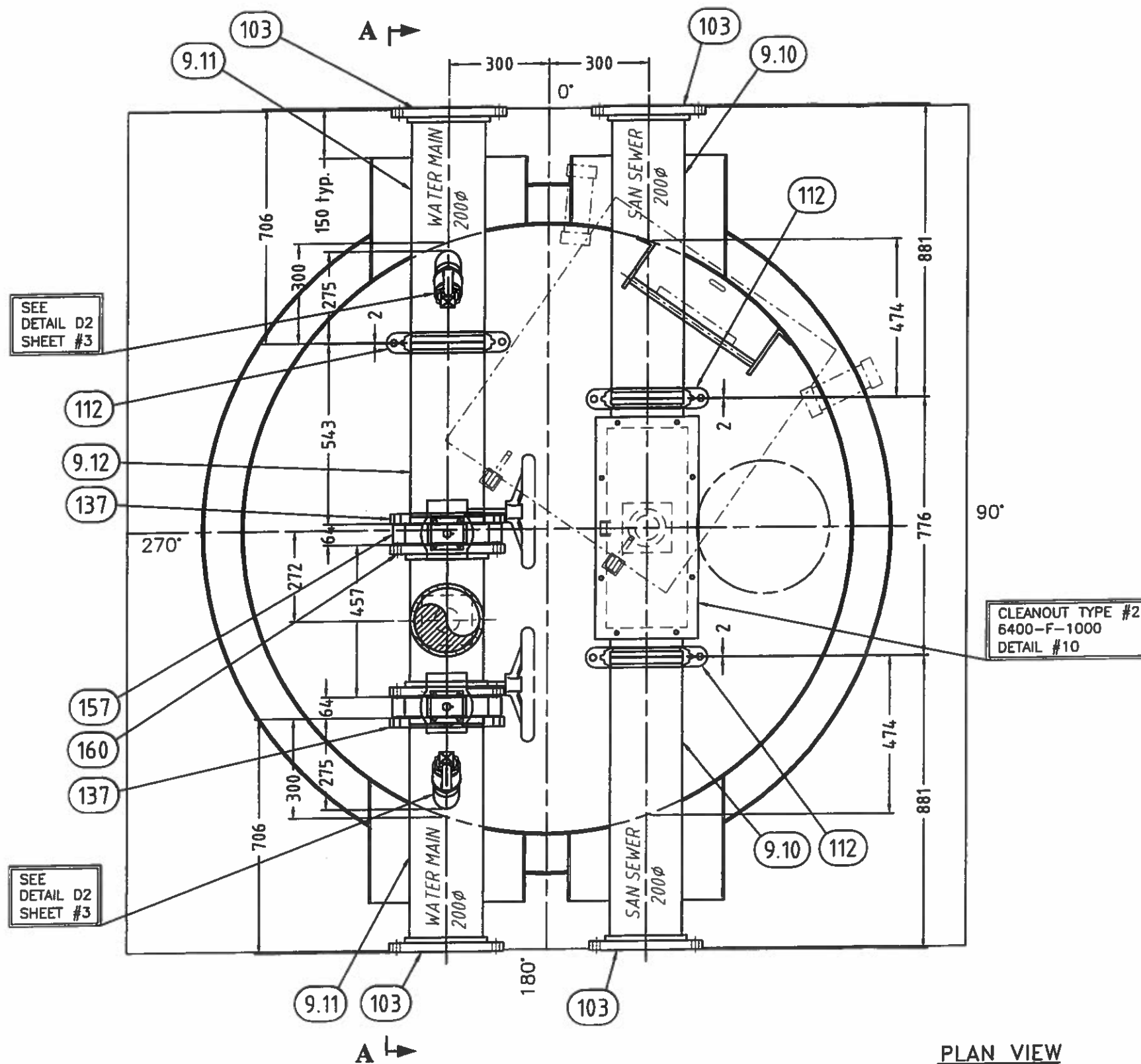


SHELL DETAIL

GENERAL NOTES:

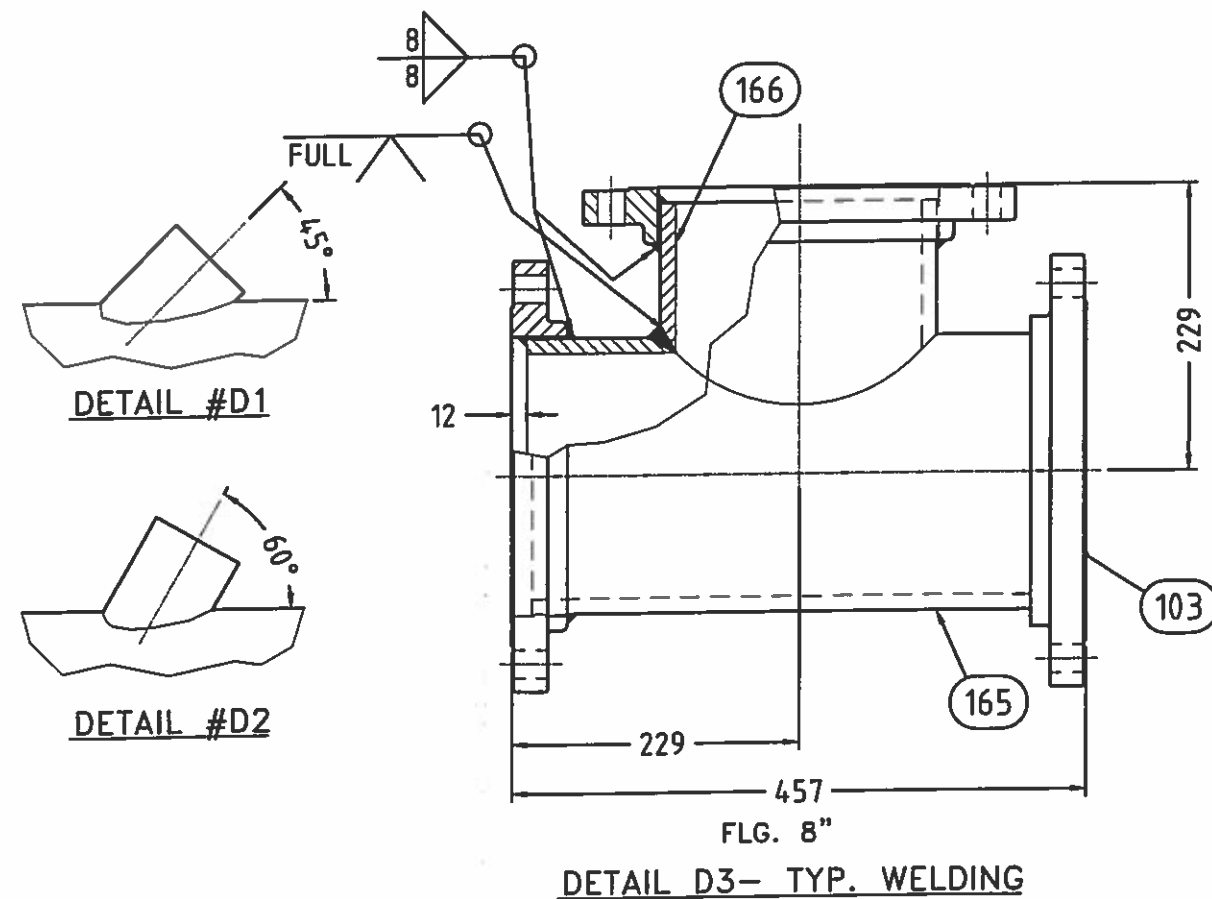
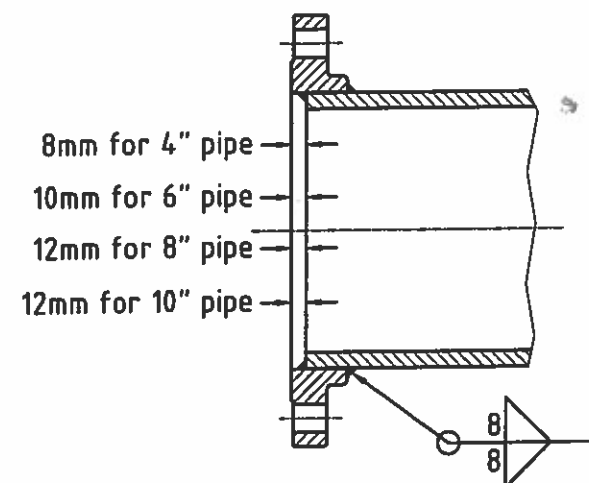
- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

A ISSUED FOR COMMENTS		01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b></p>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
<p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICIABLE AUX INTERETS DE FALCO TECHNOLOGIES INC.</p> <p>THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p>			
CLIENT:		GOVERNEMENT OF NUNAVUT	
CUSTOMER:			
TITRE:		ACCESS VAULT AV9	
TITLE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV9		DRAW BY: G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE:	QTY:		SHEET:
X/X" = X"	1	01-04-14	1 / 3
			REV:
			A




PLAN VIEW

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel (450) 444-0566  Fax (450) 444-2227  www.berliefalco.com</p> <p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICIALE AUX INTERETS DE FALCO TECHNOLOGIES INC.  THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p>			
CLIENT:	GOVERNEMENT OF NUNAVUT		
TITRE:	ACCESS VAULT AV9 NEW UTILIDOR DESIGN RESOLUTE BAY, NU		
DESSIN No.:	6400-F-AV9		DESS PAR:
DRAWING No.:			DRAW BY: G.L.
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	QTY: 1	01-04-14	SHEET: 2 / 3
			REV: A

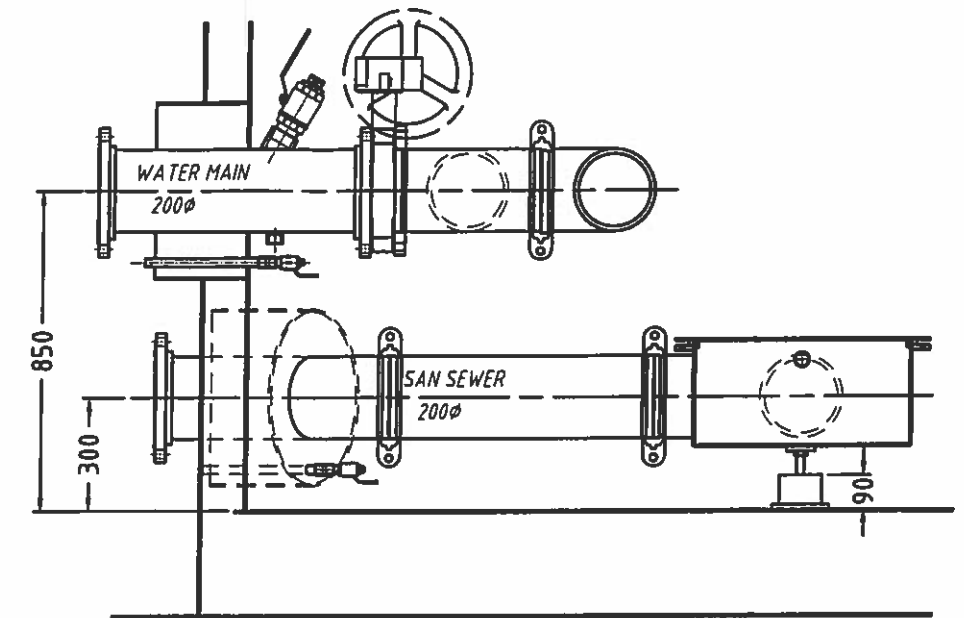
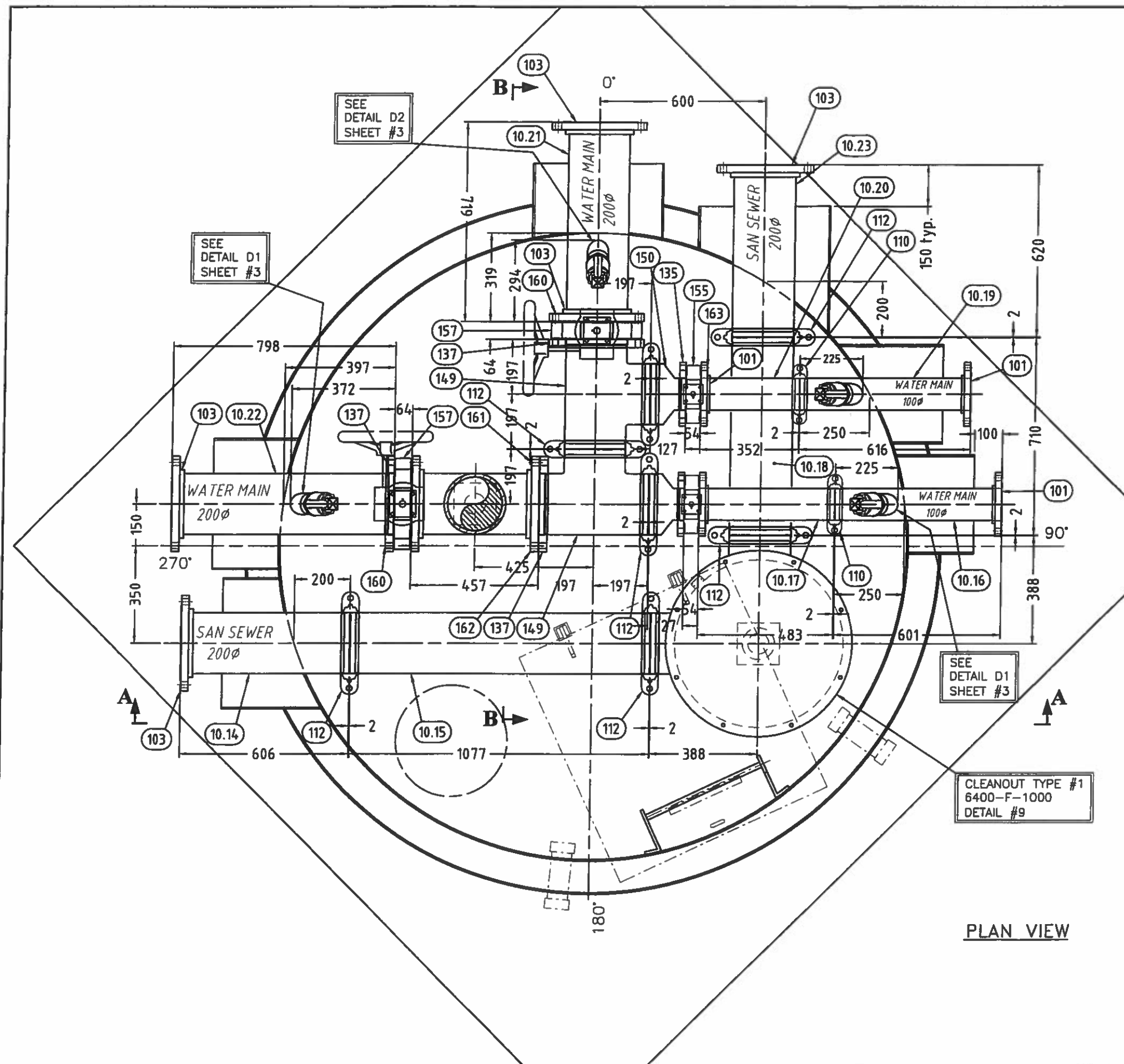


Item	Qty	Description	Material
9.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
9.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
9.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
9.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
9.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 3670mm LG.	A36
9.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 4058mm LG.	A36
9.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
9.8	4	PL. 1/4" THK. x 366 x 1456mm LG.	A36
9.10	2	PIPE 8" SCH.80 x 869mm LG. vic groove 1 end	A-53-B
9.11	2	PIPE 8" SCH.80 x 694mm LG. vic groove 1 end	A-53-B
9.12	1	PIPE 8" SCH.80 x 543mm LG. vic groove 2 end	A-53-B
103	7	FLANGE SORF 8" - 150#	SA 105
105	2	FLANGE WN 8" 150#, BORE	SA-105
112	3	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
137	2	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER
157	3	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	48	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.
161	8	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.
162	8	3/4-10 HEX. NUT	PLATED C.S.
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV9 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.: 6400-F-AV9		DESS. PAR: G.L.	
SCALE: X/X" = X"	QTE: 1	DATE: 01-04-14	FEUILLE: 3 / 3
			REV: A







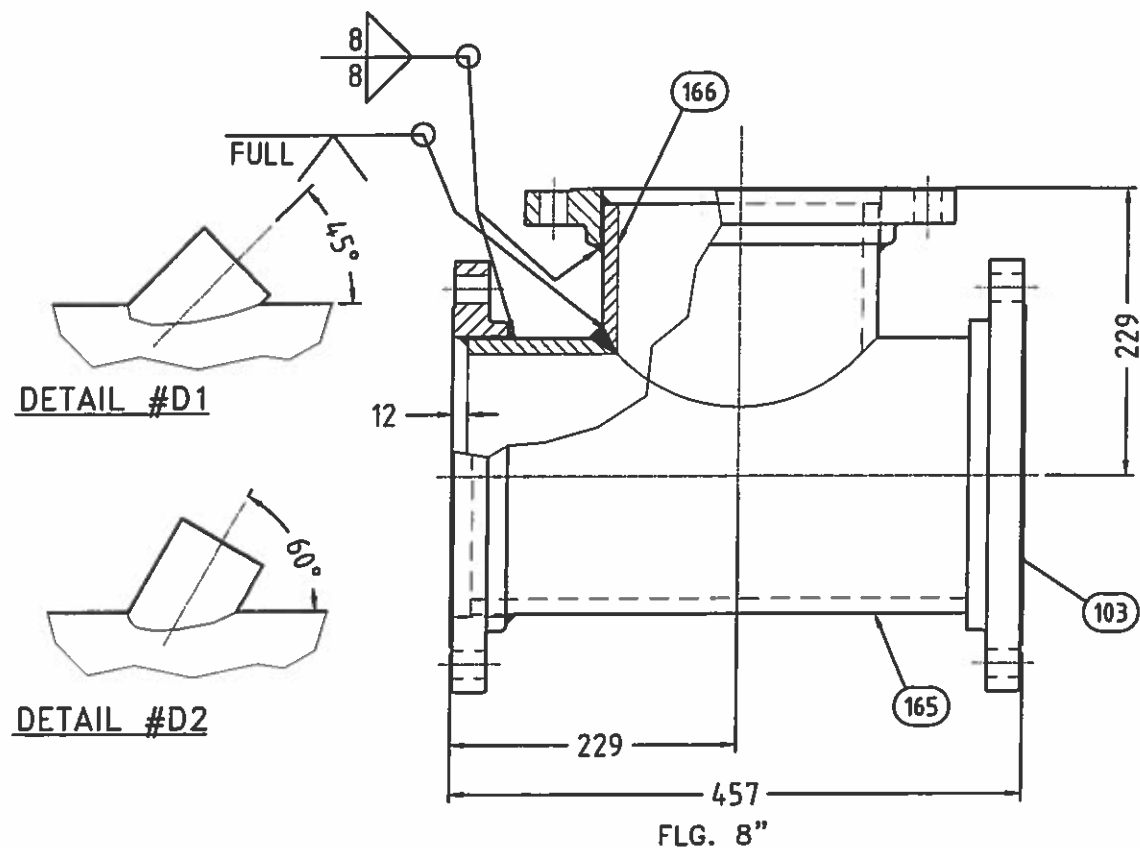
SECTION "B-B"

CLEANOUT TYPE #1  
6400-F-1000  
DETAIL #9

PLAN VIEW

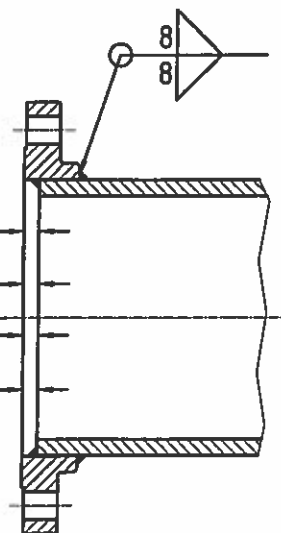
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel.: (450) 444-0566  Fax.: (450) 444-2227  www.berliefalco.com</p>			
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CLIENT: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV10 TITLE: NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.: 6400-F-AV10		DESS. PAR: G.L.	
DRAWING No:		DRAW BY:	
.....	QTE: 1	DATE: 01-04-14	FEUILLE: 2 / 3
SCALE: X/X" = X"	QTY:	DATE:	REV: A


Item	Qty	Description	Material	Item	Qty	Description	Material
112	7	8" VICTAULIC COUPLING STYLE 77	GALV C.S.	10.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
135	2	4" VICTAULIC FLANGE STYLE 741	GALV C.S.	10.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
137	3	8" VICTAULIC FLANGE STYLE 741	GALV C.S.	10.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
149	2	8" VICTAULIC TEE, #20	GALV.	10.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
150	2	8" @ 4" VICTAULIC CONCENTRIC REDUCER , #50	GALV C.S.	10.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 2490mm LG.	A36
152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER	10.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7834mm x 2878mm LG.	A36
				10.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
155	2	4" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)		10.8	1	PL. 1/4" THK. x 267 x 1456mm LG.	A36
				10.9	1	PL. 1/4" THK. x 452 x 1456mm LG.	A36
157	3	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)		10.10	1	PL. 1/4" THK. x 375 x 1098mm LG.	A36
				10.11	1	PL. 1/4" THK. x 281 x 1098mm LG.	A36
160	48	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.	10.12	1	PL. 1/4" THK. x 353 x 1456mm LG.	A36
161	16	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.	10.13	1	PL. 1/4" THK. x 300 x 1456mm LG.	A36
162	16	3/4-10 HEX. NUT	PLATED C.S.	10.14	1	PIPE 8" SCH.80 x 594mm LG. vic groove 1 end	A-53-B
163	32	BOLT 5/8-11UNC x 1 3/4"LG + FLAT WASHER	PLATED C.S.	10.15	1	PIPE 8" SCH.80 x 1077mm LG. vic groove 2 end	A-53-B
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B	10.16	1	PIPE 4" SCH.80 x 593mm LG. vic groove 1 end	A-53-B
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B	10.17	1	PIPE 4" SCH.80 x 475mm LG. vic groove 1 end	A-53-B
				10.18	1	PIPE 8" SCH.80 x 710mm LG. vic groove 2 end	A-53-B
				10.19	1	PIPE 4" SCH.80 x 608mm LG. vic groove 1 end	A-53-B
				10.20	1	PIPE 4" SCH.80 x 344mm LG. vic groove 1 end	A-53-B
				10.21	1	PIPE 8" SCH.80 x 695mm LG.	A-53-B
				10.22	1	PIPE 8" SCH.80 x 786mm LG. vic groove 1 end	A-53-B
				10.23	1	PIPE 8" SCH.80 x 608mm LG. vic groove 1 end	A-53-B
				101	4	FLANGE SORF 4" - 150#	SA 105
				103	8	FLANGE SORF 8" - 150#	SA 105
				105	2	FLANGE WN 8" 150#, BORE	SA-105
				110	2	4" VICTAULIC COUPLING STYLE 77	GALV C.S.

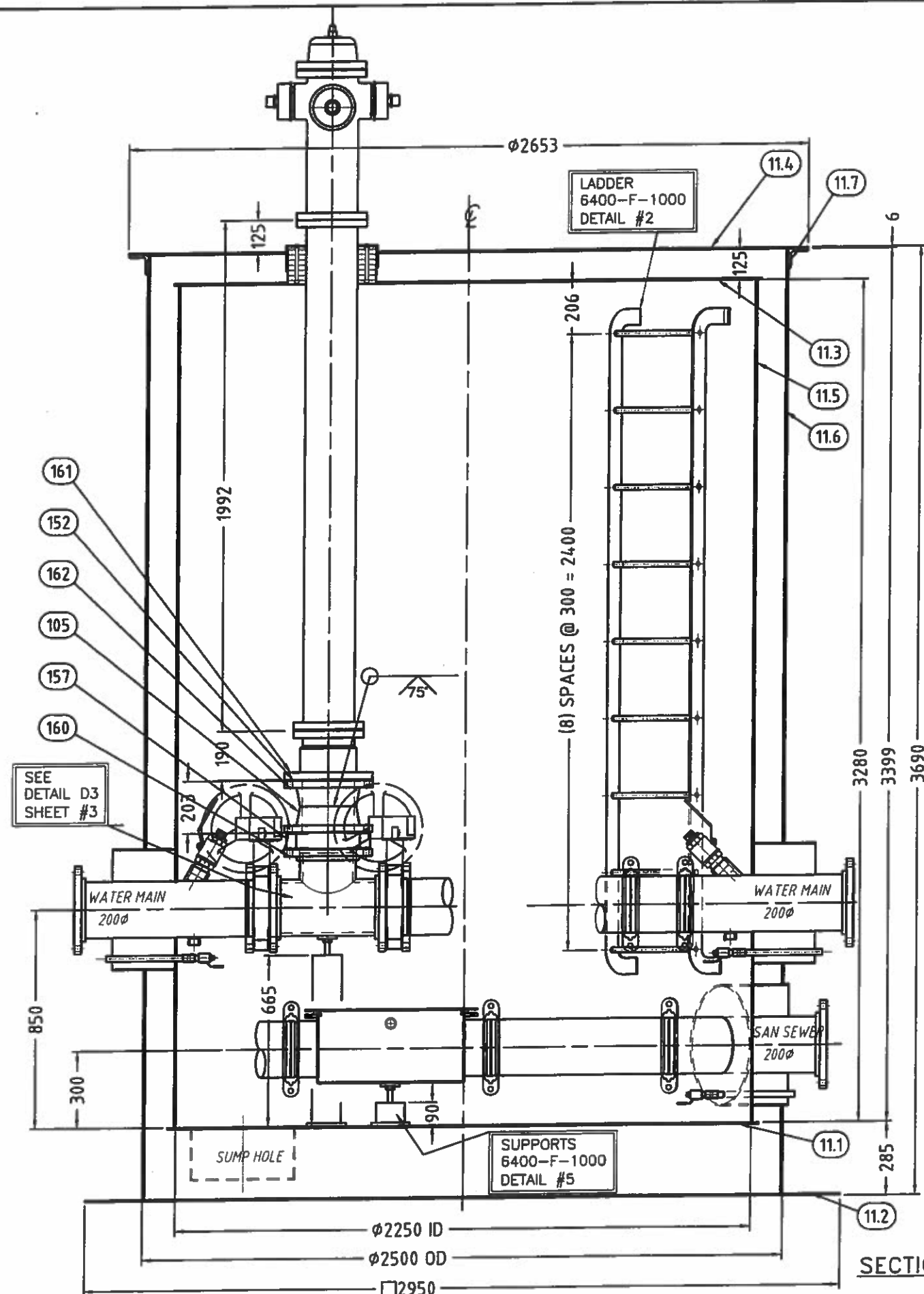


DETAIL D3- TYP. WELDING

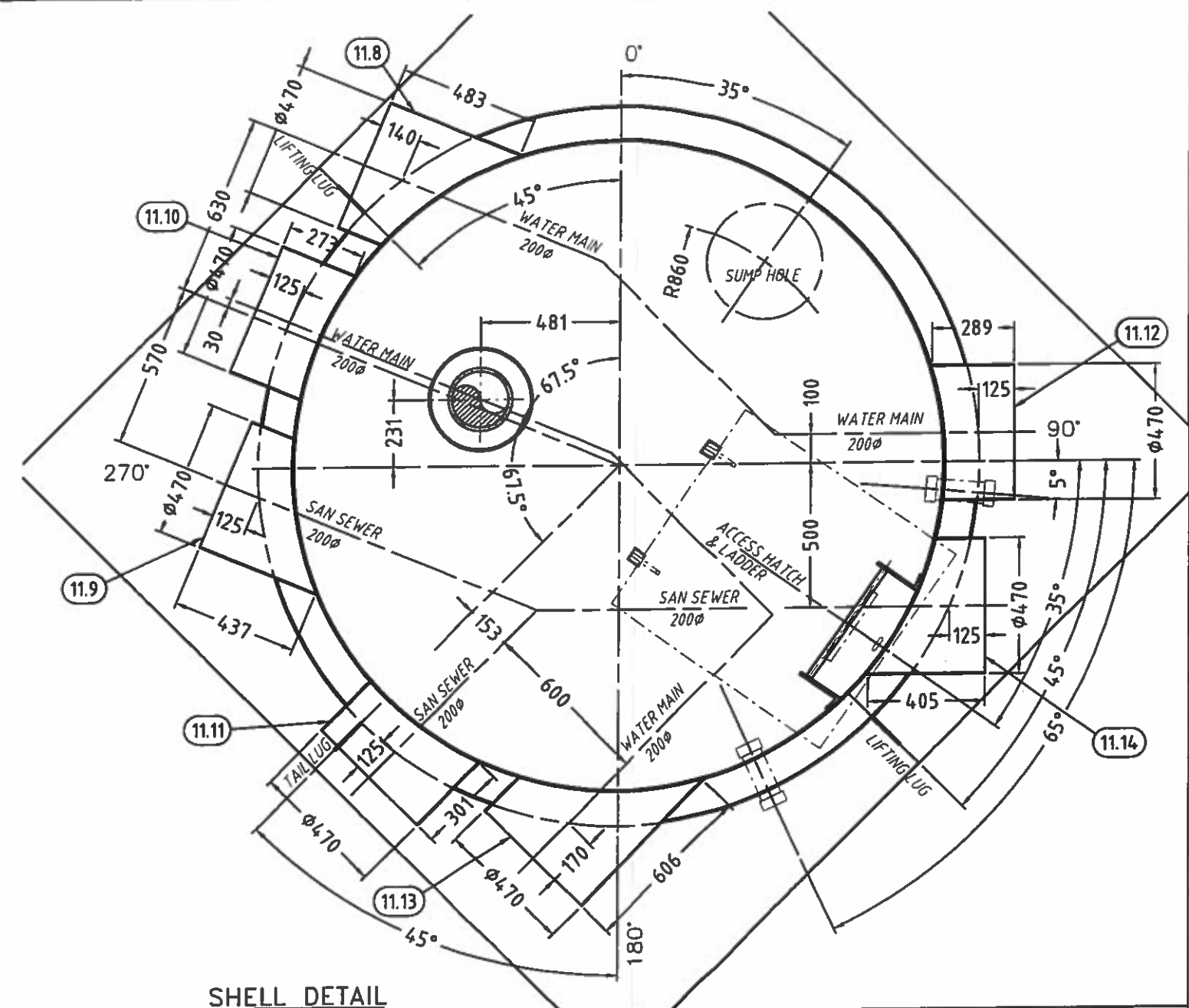
8mm for 4" pipe  
10mm for 6" pipe  
12mm for 8" pipe  
12mm for 10" pipe



A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>BERLIE-FALCO</b> Falco Technologies Inc., a company of 1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com		CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC. THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.	
CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV10	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No:		DESS. PAR:	
DRAWING No: 6400-F-AV10		DRAW BY: G.L.	
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	1	01-04-14	3 / 3
			REV:
			A




SECTION "A-A"



## SHELL DETAIL

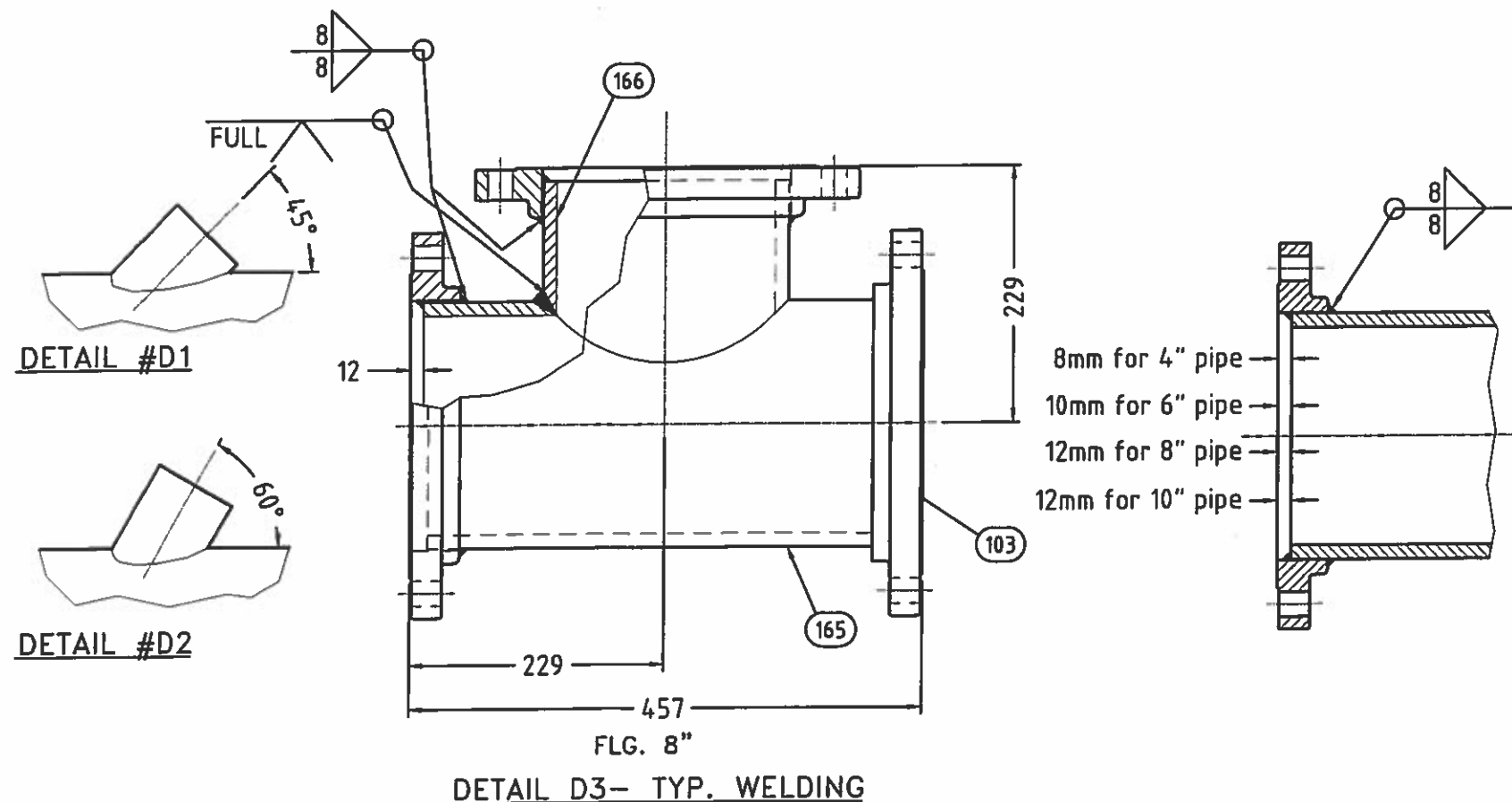
**GENERAL NOTES:**

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL ,CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b></p>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel.: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
<p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA  RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT  PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICIABLE AUX INTERETS  DE FALCO TECHNOLOGIES INC.  THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED  OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS  OF FALCO TECHNOLOGIES INC.</p>			
CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT	
TITRE: TITLE:		ACCESS VAULT AV11 NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:	
6400-F-AV11		G.L.	
.....	QTE: QTY:	DATE:	FEUILLE: SHEET:
SCALE: X/X" = X"	1	01-04-14	1 / 3
			A

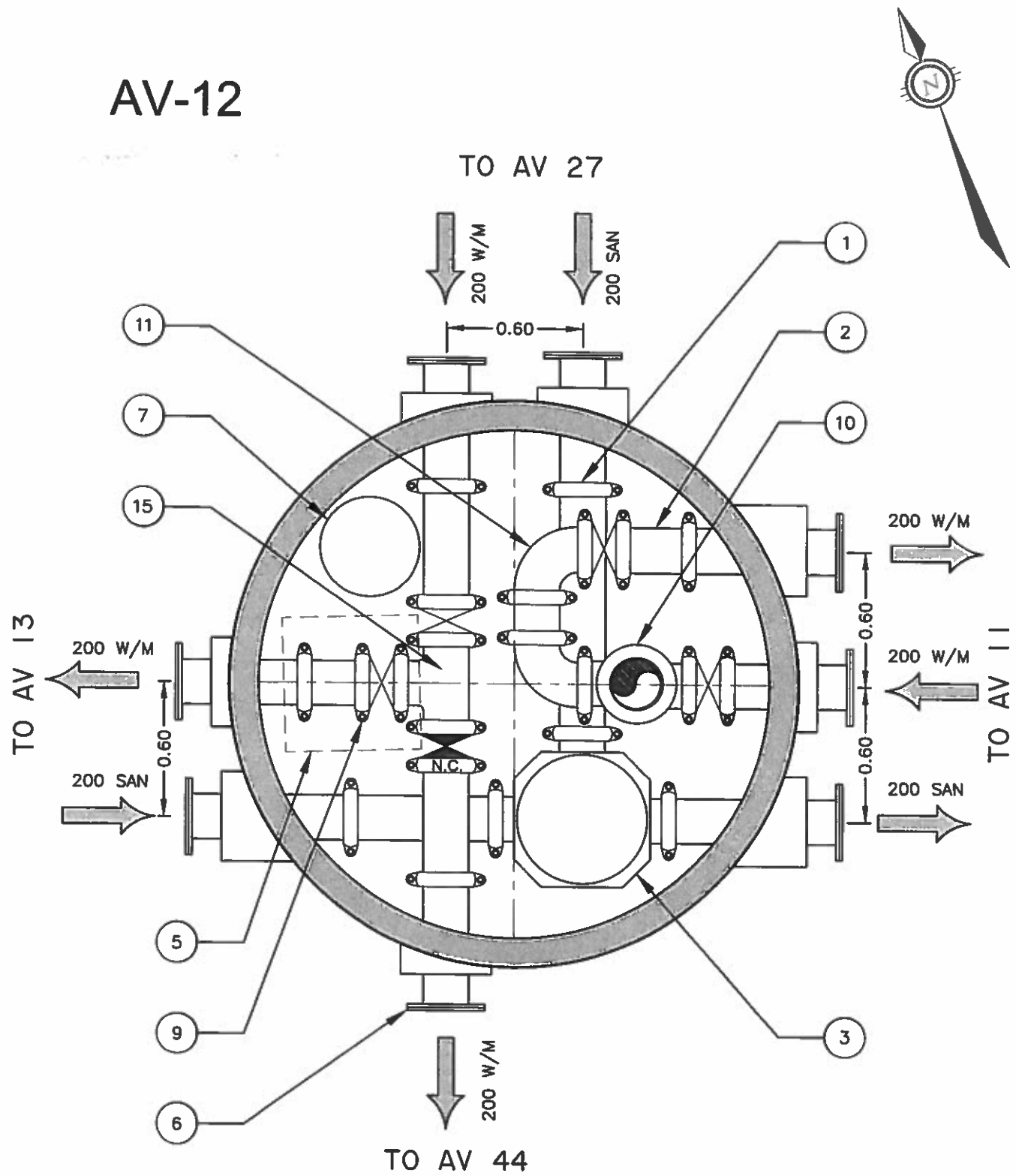


Item	Qty	Description	Material	Item	Qty	Description	Material
103	11	FLANGE SORF 8" - 150#	SA 105	11.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
105	2	FLANGE WN 8" 150#, BORE	SA-105	11.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
112	12	8" VICTAULIC COUPLING STYLE 77	GALV C.S.	11.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
122	2	8" VICTAULIC ELBOW 22 1/2°, #12	GALV C.S.	11.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
127	1	8" VICTAULIC ELBOW 45°, #11	GALV C.S.	11.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 3280mm LG.	A36
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.	11.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7048mm x 3668mm LG.	A36
137	3	8" VICTAULIC FLANGE STYLE 741	GALV C.S.	11.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER	11.8	1	PL. 1/4" THK. x 483 x 1456mm LG.	A36
157	4	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)		11.9	1	PL. 1/4" THK. x 437 x 1456mm LG.	A36
				11.10	1	PL. 1/4" THK. x 273 x 1456mm LG.	A36
				11.11	1	PL. 1/4" THK. x 301 x 1456mm LG.	A36
160	64	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.	11.12	1	PL. 1/4" THK. x 289 x 1456mm LG.	A36
161	8	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.	11.13	1	PL. 1/4" THK. x 606 x 1456mm LG.	A36
162	8	3/4-10 HEX. NUT	PLATED C.S.	11.14	1	PL. 1/4" THK. x 405 x 1456mm LG.	A36
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B	11.15	1	PIPE 8" SCH.80 x 758mm LG.	A-53-B
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B	11.16	1	PIPE 8" SCH.80 x 746mm LG. vic groove 2 end	A-53-B
				11.17	1	PIPE 8" SCH.80 x 642mm LG. vic groove 1 end	A-53-B
				11.18	1	PIPE 8" SCH.80 x 601mm LG. vic groove 1 end	A-53-B
				11.19	1	PIPE 8" SCH.80 x 560mm LG. vic groove 1 end	A-53-B
				11.20	1	PIPE 8" SCH.80 x 606mm LG. vic groove 1 end	A-53-B
				11.21	1	PIPE 8" SCH.80 x 688mm LG. vic groove 1 end	A-53-B
				11.22	1	PIPE 8" SCH.80 x 770mm LG. vic groove 1 end	A-53-B
				11.23	1	PIPE 8" SCH.80 x 210mm LG. vic groove 2 end	A-53-B
				11.24	1	PIPE 8" SCH.80 x 699mm LG. vic groove 2 end	A-53-B
				11.25	1	PIPE 8" SCH.80 x 604mm LG. vic groove 2 end	A-53-B
				11.26	1	PIPE 8" SCH.80 x 346mm LG. vic groove 2 end	A-53-B
				11.27	1	PIPE 8" SCH.80 x 307mm LG. vic groove 2 end	A-53-B



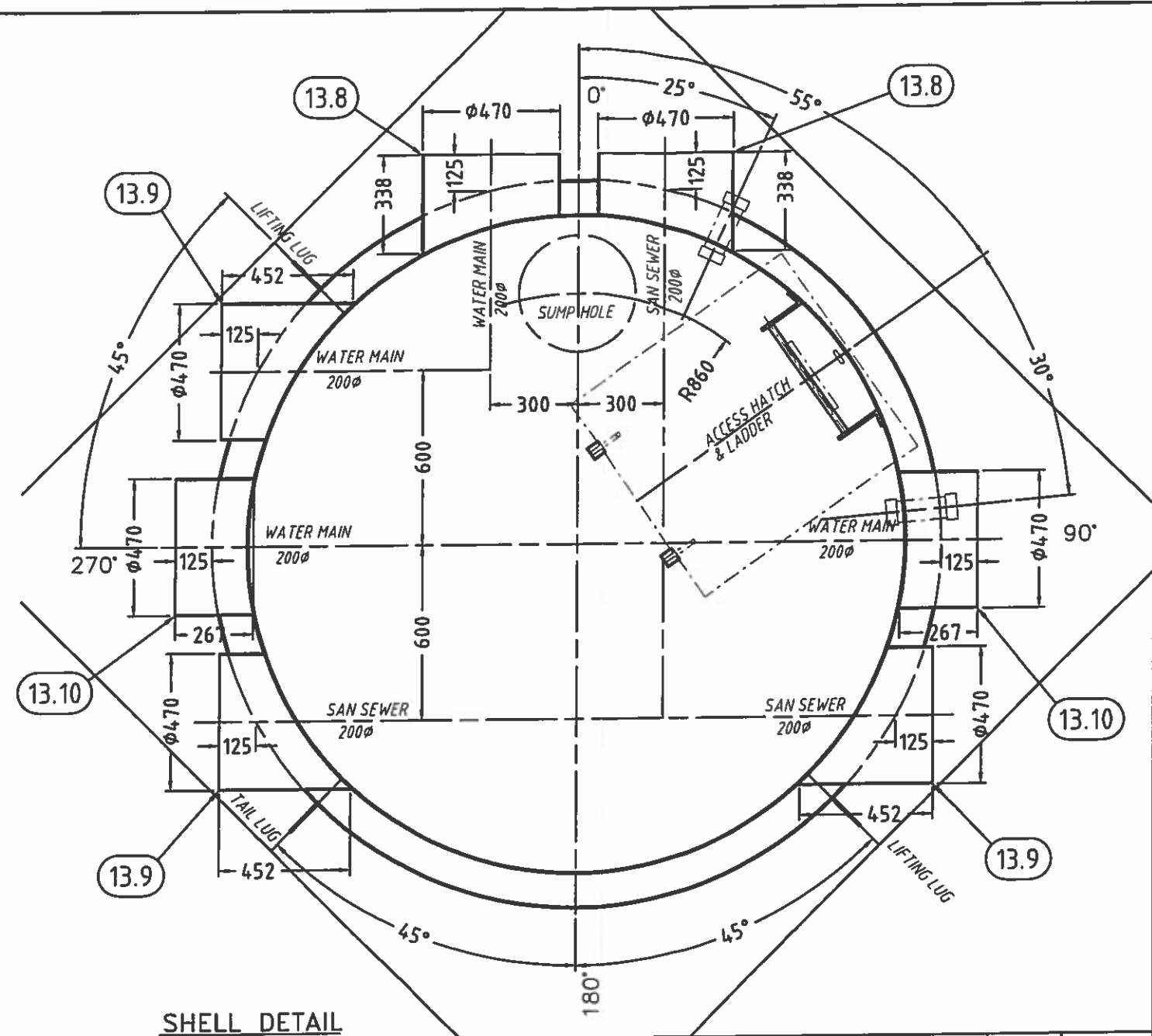
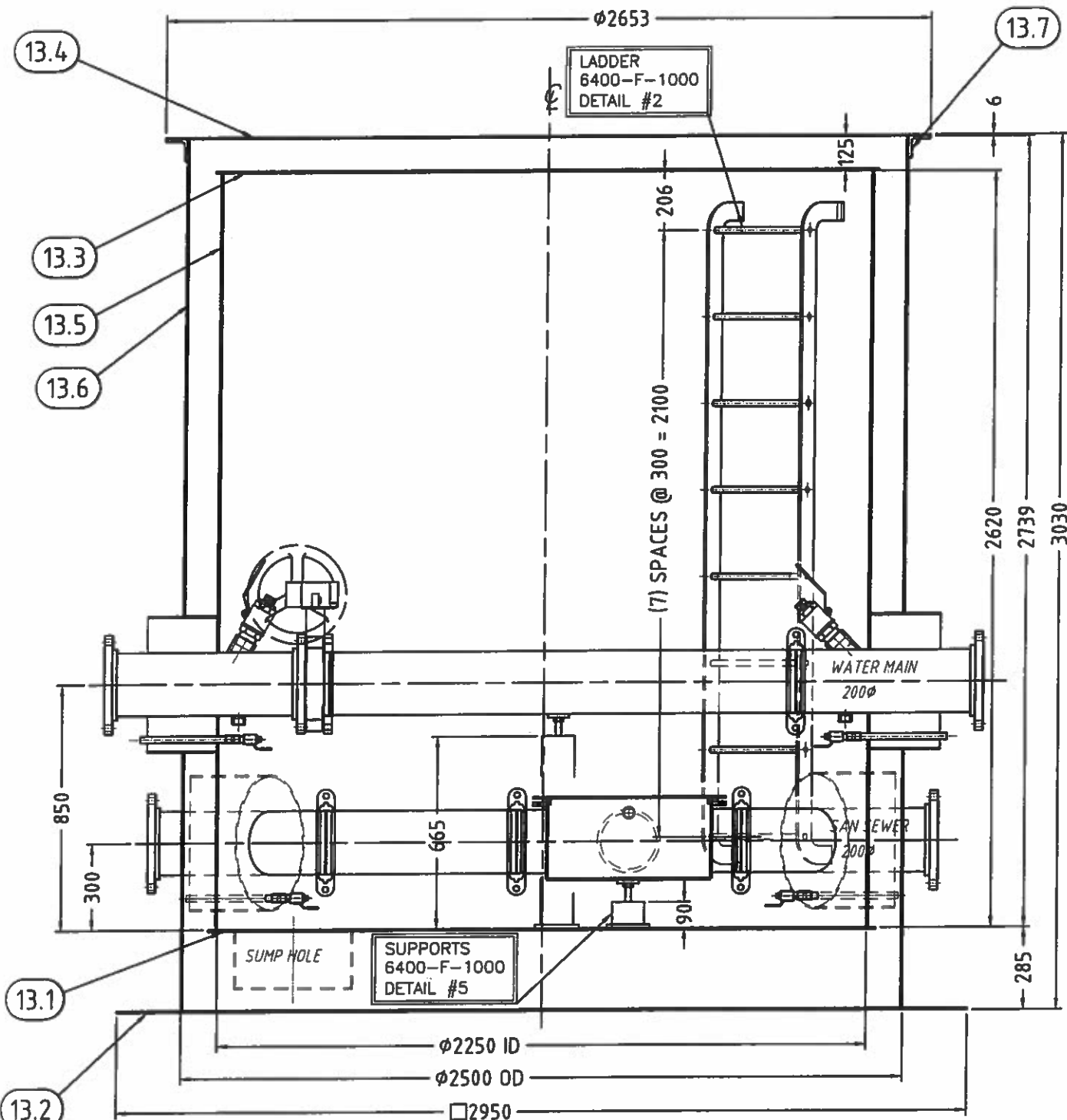
A ISSUED FOR COMMENTS		01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
<b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV11	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY, NU	
DESSIN No.:		DESS. PAR:	
DRAWING No. 6400-F-AV11		DRAWBY: G.L.	
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	1	01-04-14	SHEET: 3 / 3
			REV: A

AV-12



AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				NE	SE	E	NW	
AV-12	2.25m	15.01m	3.35m	12.16	12.16		12.16	12.91



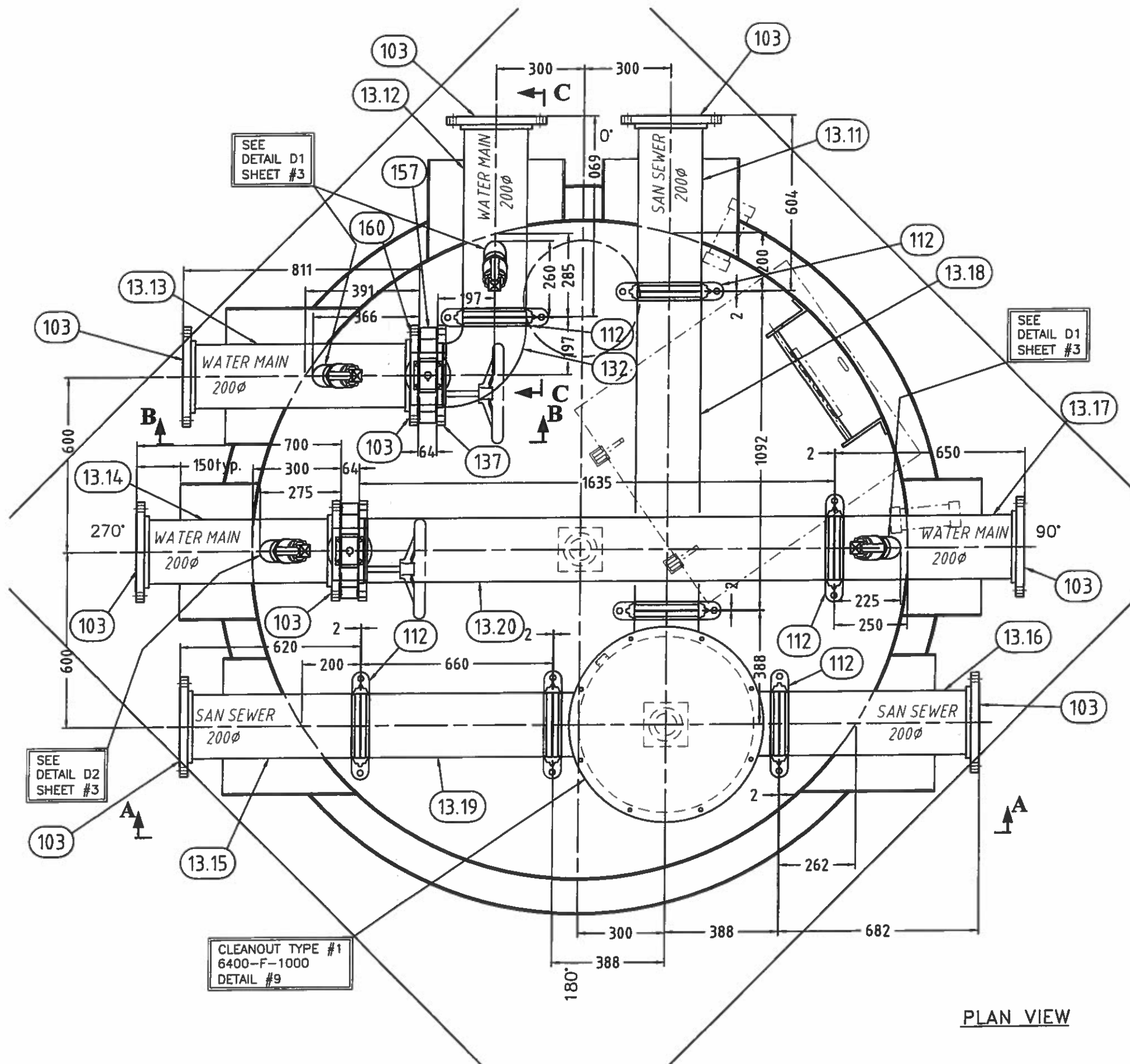


#### GENERAL NOTES:

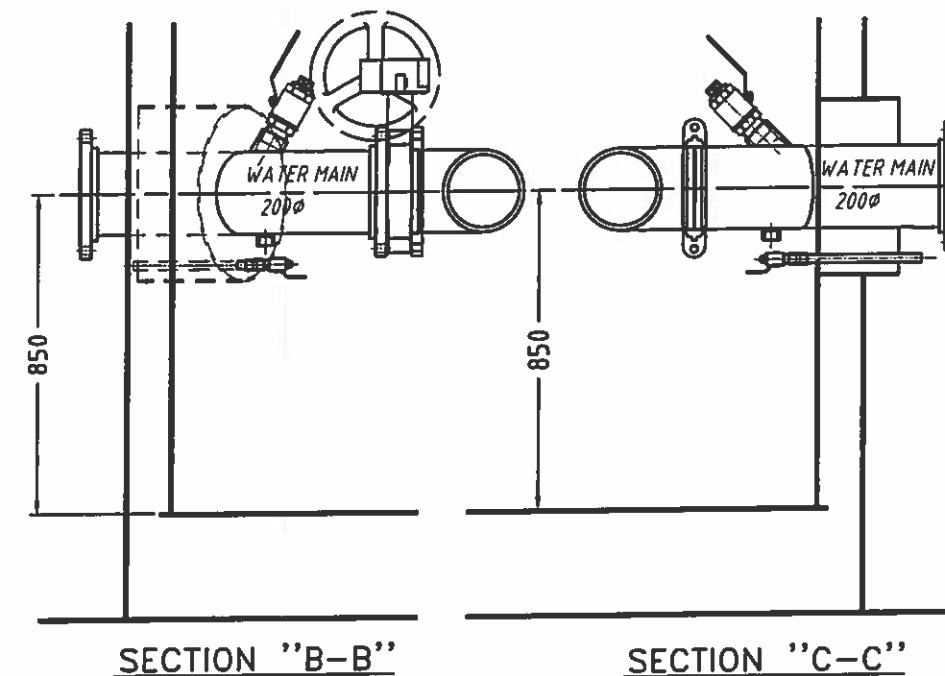
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- 4 - VALVE: BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS


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REV	DESCRIPTION	DATE	DESS/DRAWN
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CLIENT: CUSTOMER: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV13 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.: 6400-F-AV13		DESS. PAR: G.L.	
DRAWING No:		DRAW BY:	
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 1 / 3
			REV: A

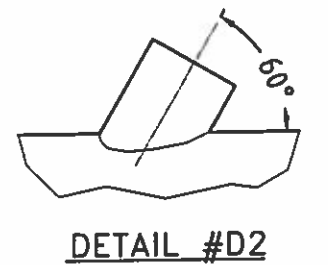
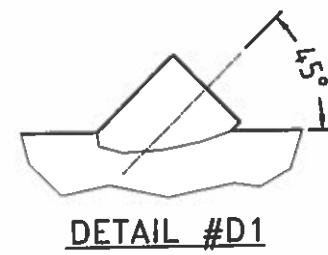
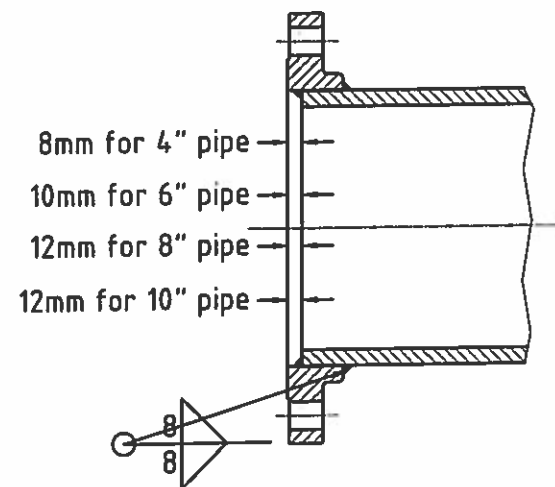





PLAN VIEW



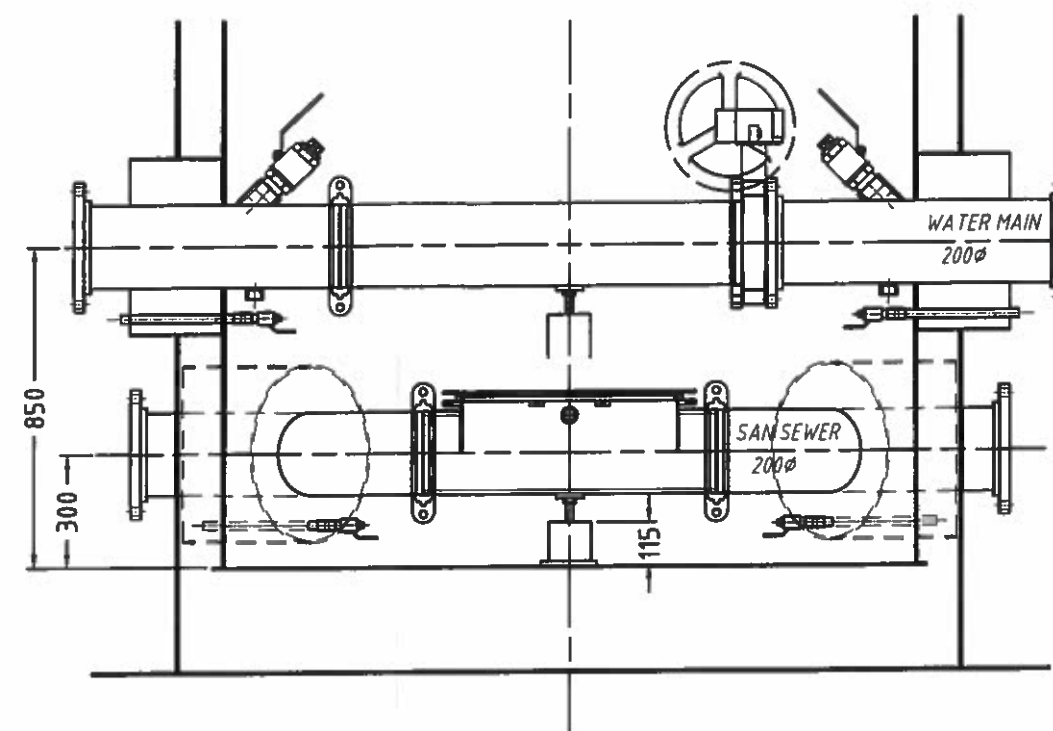
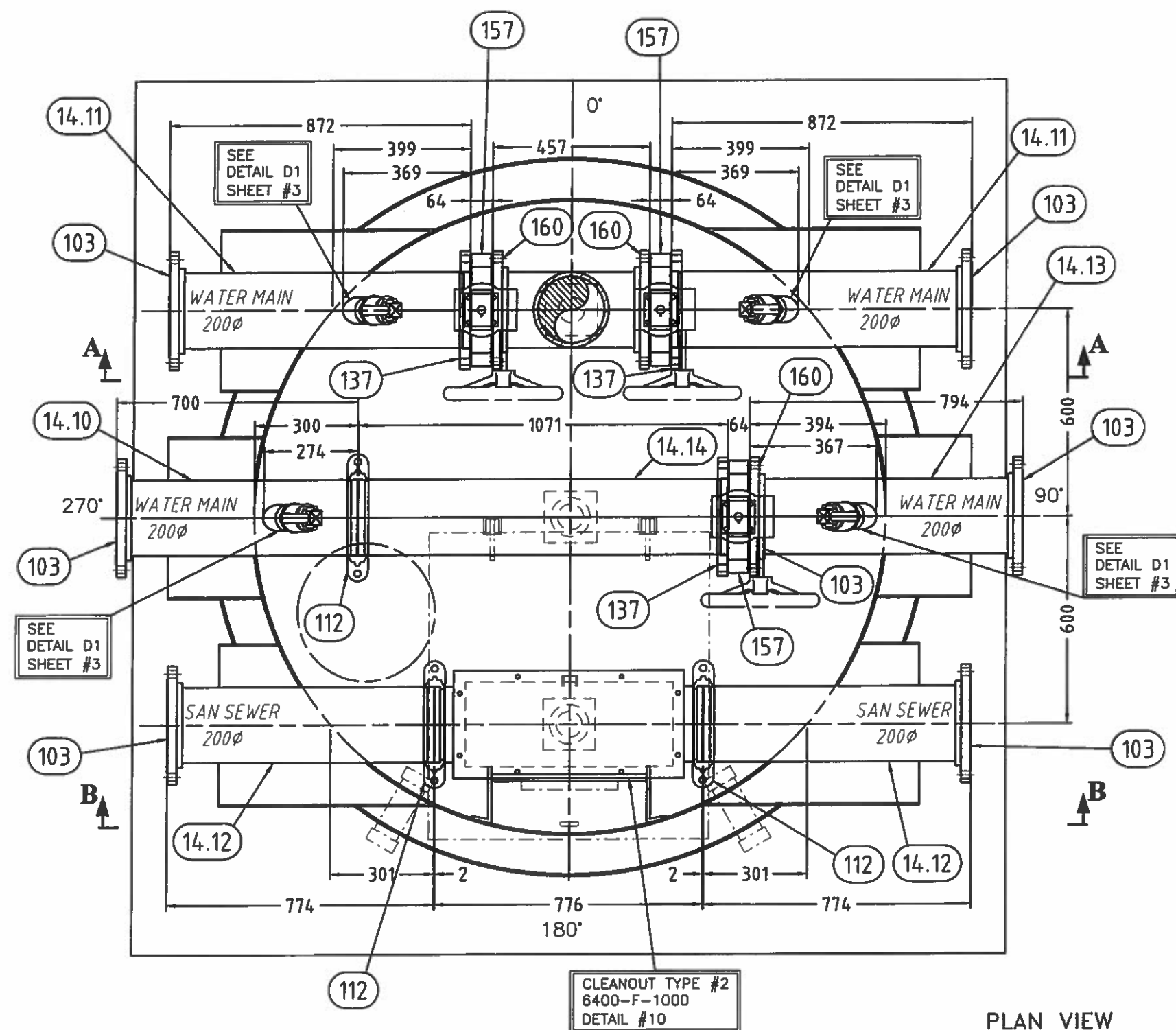
A ISSUED FOR COMMENTS		01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAW
 Falco Technologies Inc., a company of <b>BERLIE-FALCO</b>		1245 rue Industriel La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT:		CUSTOMER:	
		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV13	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV13		DRAWBY: G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE: X/X" = X"	QTY: 1	01-04-14	SHEET: 2 / 3
			REV: A




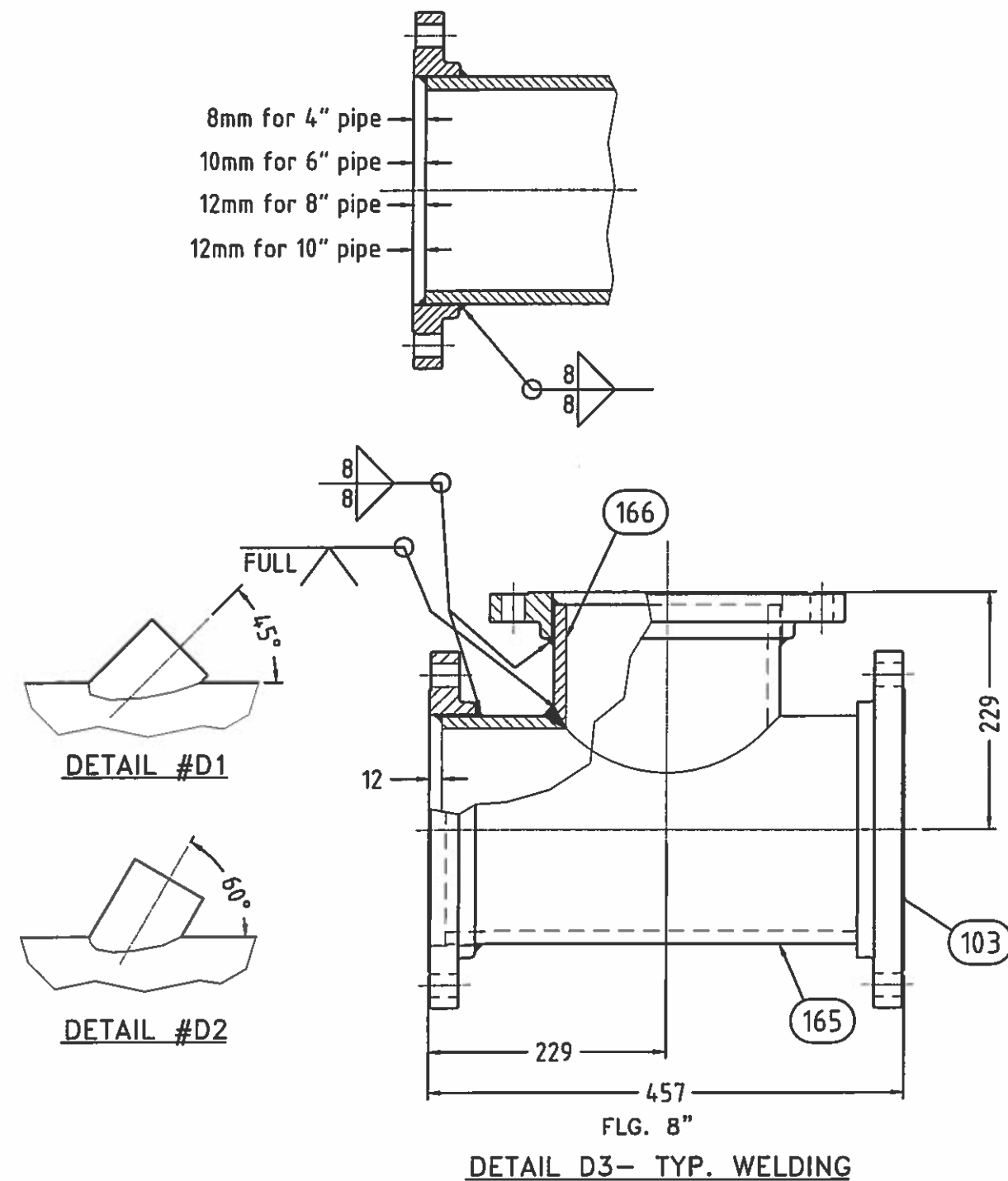
Item	Qty	Description	Material
13.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
13.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
13.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
13.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
13.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 2620mm LG.	A36
13.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7843mm x 3008mm LG.	A36
13.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
13.8	2	PL. 1/4" THK. x 338 x 1456mm LG.	A36
13.9	3	PL. 1/4" THK. x 452 x 1456mm LG.	A36
13.10	2	PL. 1/4" THK. x 267 x 1456mm LG.	A36
13.11	1	PIPE 8" SCH.80 x 592mm LG. vic groove 1 end	A-53-B
13.12	1	PIPE 8" SCH.80 x 678mm LG. vic groove 1 end	A-53-B
13.13	1	PIPE 8" SCH.80 x 787mm LG.	A-53-B
13.14	1	PIPE 8" SCH.80 x 676mm LG.	A-53-B
13.15	1	PIPE 8" SCH.80 x 608mm LG. vic groove 1 end	A-53-B
13.16	1	PIPE 8" SCH.80 x 670mm LG. vic groove 1 end	A-53-B
13.17	1	PIPE 8" SCH.80 x 638mm LG. vic groove 1 end	A-53-B
13.18	1	PIPE 8" SCH.80 x 1092mm LG. vic groove 2 end	A-53-B
13.19	1	PIPE 8" SCH.80 x 660mm LG. vic groove 2 end	A-53-B
13.20	1	PIPE 8" SCH.80 x 1635mm LG. vic groove 2 end	A-53-B
103	9	FLANGE SORF 8" - 150#	SA 105
112	7	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	2	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
157	2	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	32	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com	
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CLIENT:		CUSTOMER:	
		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV13	
TITLE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV13		DRAW BY: G.L.	
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SCALE: X/X" = X"	QTY: 1	01-04-14	SHEET: 3 / 3
			REV: A




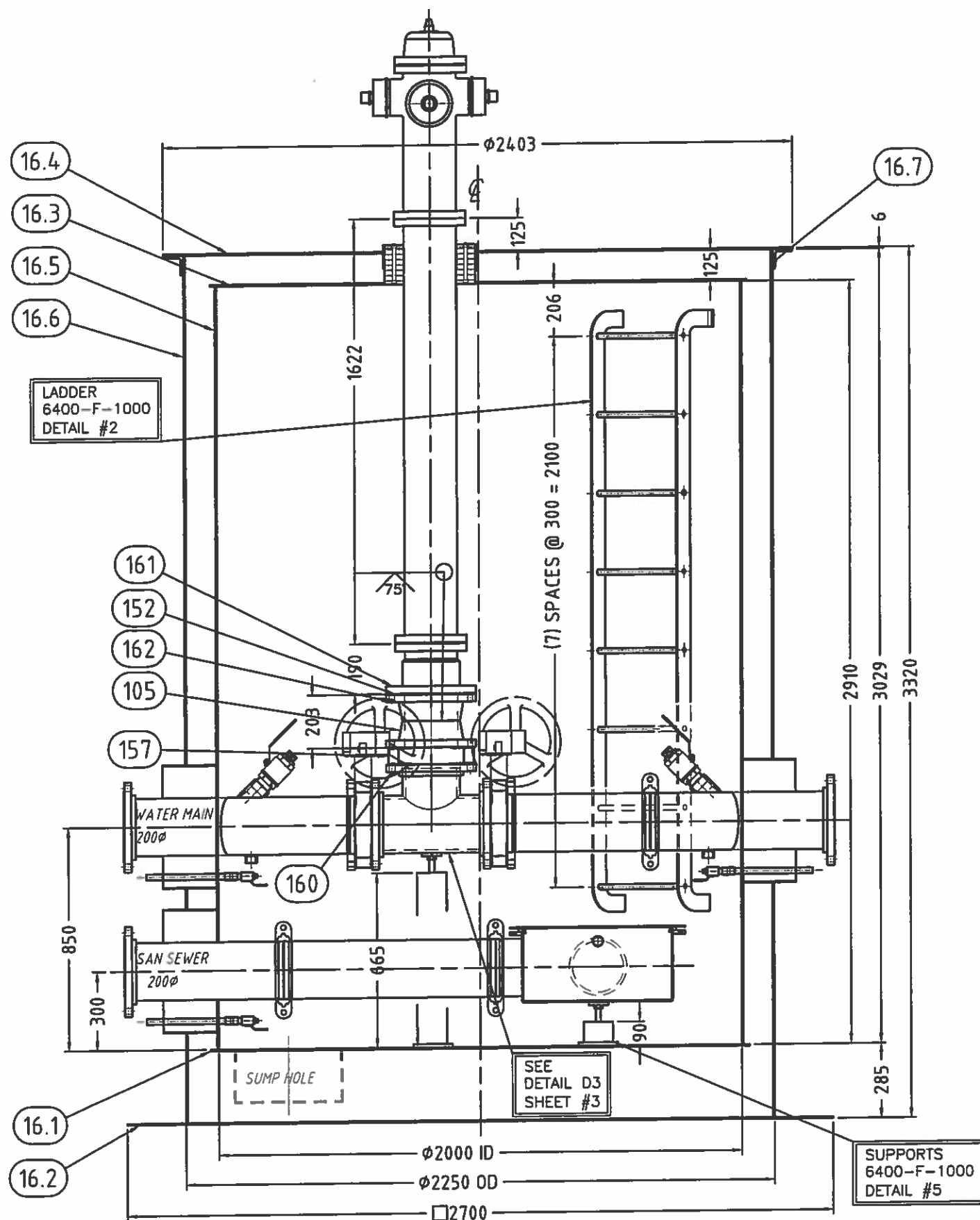


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CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT		
TITRE: TITLE:		ACCESS VAULT AV14 NEW UTILIDOR DESIGN RESOLUTE BAY , NU		
DESSIN No. DRAWING No:		DESS. PAR: DRAW BY:		
6400-F-AV14		G.L.		
..... SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	2 / 3	A

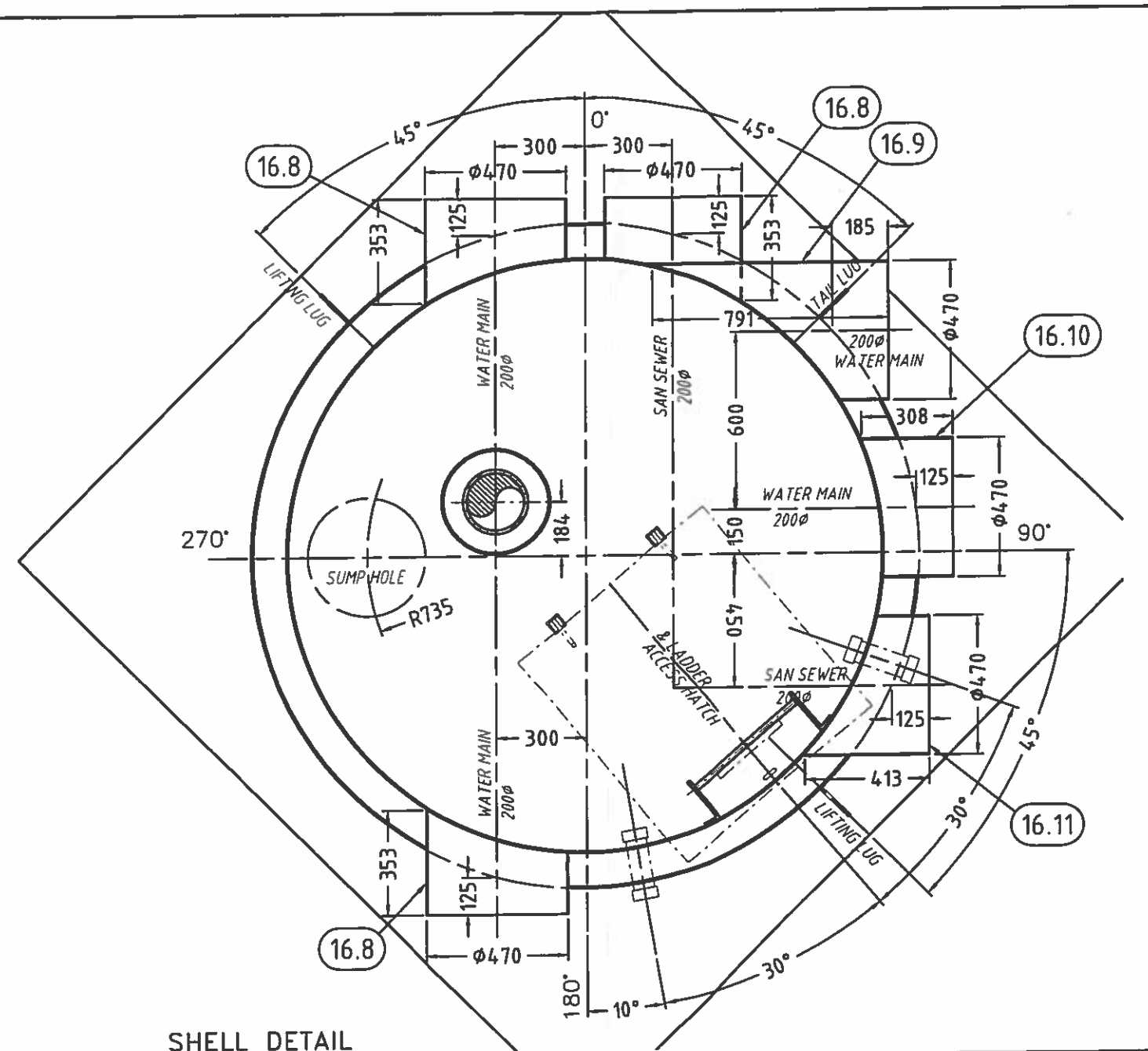


Item	Qty	Description	Material
14.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
14.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
14.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
14.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
14.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 2980mm LG.	A36
14.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 3368mm LG.	A36
14.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
14.8	4	PL. 1/4" THK. x 612 x 1456mm LG.	A36
14.9	2	PL. 1/4" THK. x 273 x 1456mm LG.	A36
14.10	1	PIPE 8" SCH.80 x 688mm LG. vic groove 1 end	A-53-B
14.11	2	PIPE 8" SCH.80 x 860mm LG. vic groove 1 end	A-53-B
14.12	2	PIPE 8" SCH.80 x 762mm LG. vic groove 1 end	A-53-B
14.13	1	PIPE 8" SCH.80 x 770mm LG.	A-53-B
14.14	1	PIPE 8" SCH.80 x 1071mm LG. vic groove 2 end	A-53-B
103	10	FLANGE SORF 8" - 150#	SA 105
105	2	FLANGE WN 8" 150#, BORE	SA-105
112	3	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
137	3	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER
157	4	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	64	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.
161	8	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.
162	8	3/4-10 HEX. NUT	PLATED C.S.
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B

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CLIENT: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV14 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No: 6400-F-AV14		DESS. PAR: G.L.	
SCALE: X/X" = X"	QTE: 1	DATE: 01-04-14	FEUILLE: 3 / 3 REV: A




SECTION "A-A"

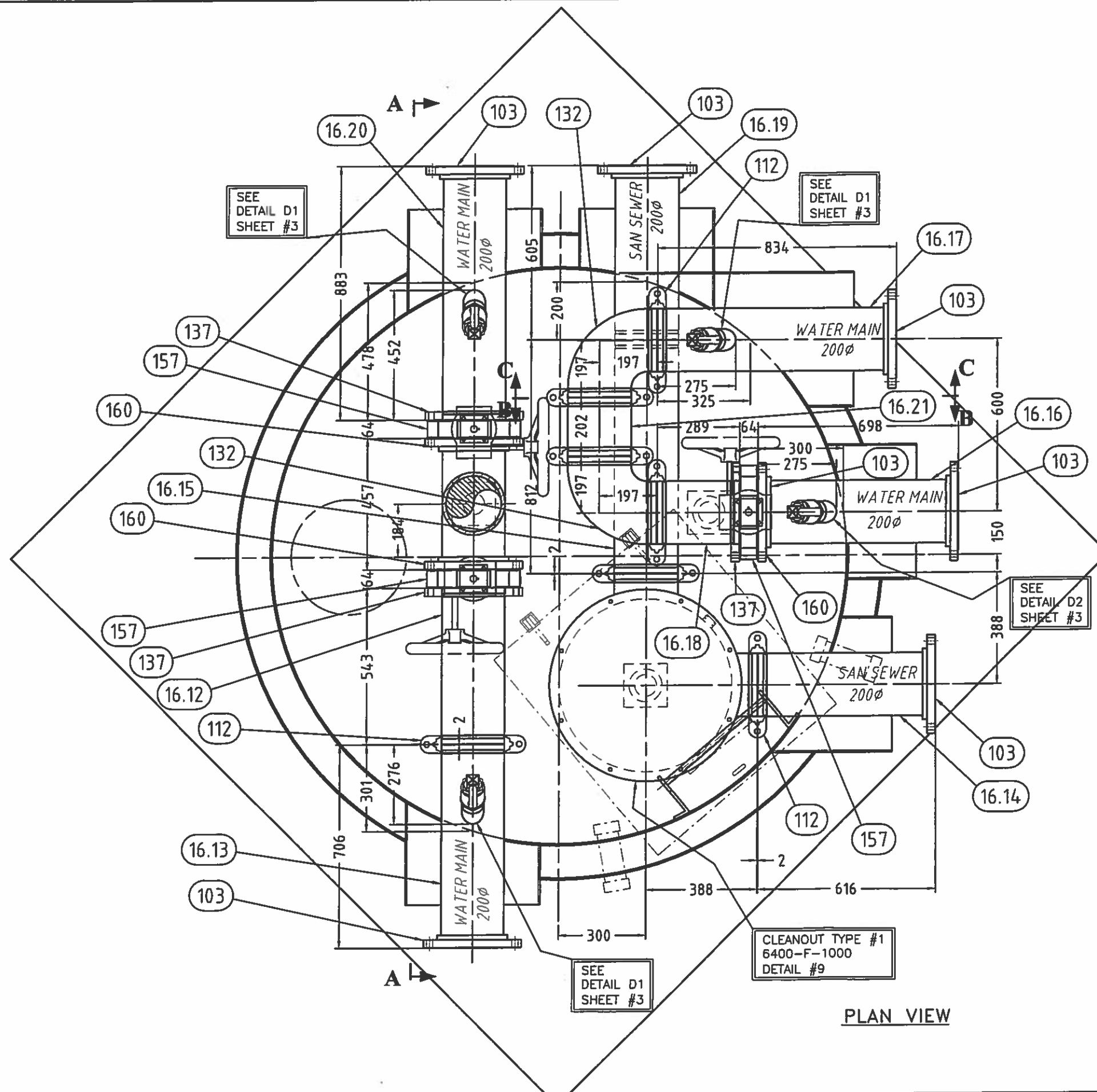


SHELL DETAIL

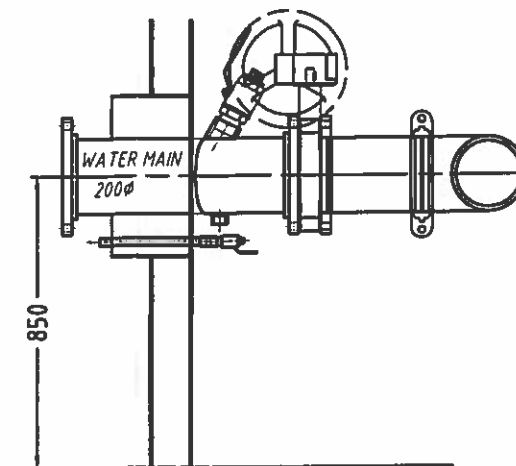
GENERAL NOTES:

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- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

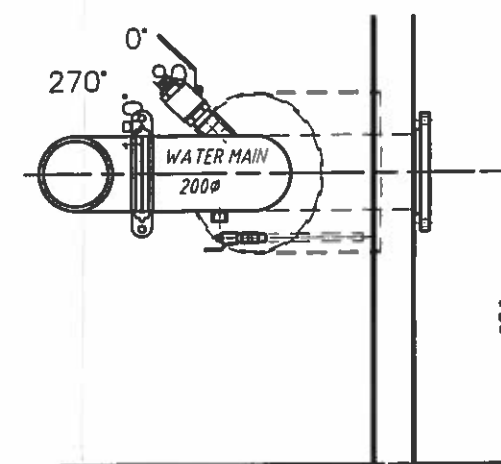
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 <p>Falco Technologies Inc., a company of</p> <h1>BERLIE-FALCO</h1>		1245 rue industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT	
TITLE:		ACCESS VAULT AV16 NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:	
6400-F-AV16		G.L.	
..... SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:
X/X" = X"	1	01-04-14	1 / 3
			REV: A



PLAN VIEW



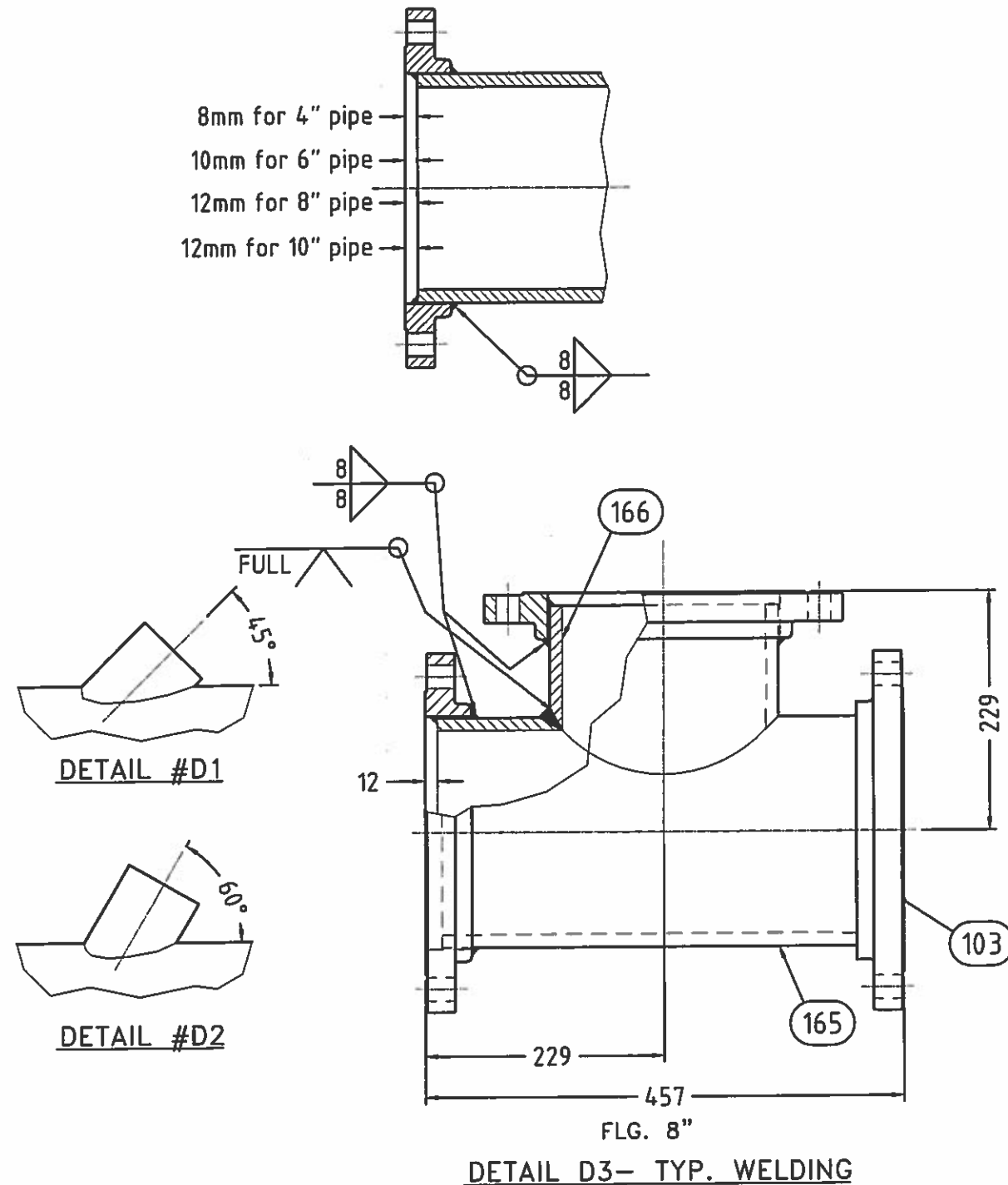
SECTION "B-B"




SECTION "C-C"

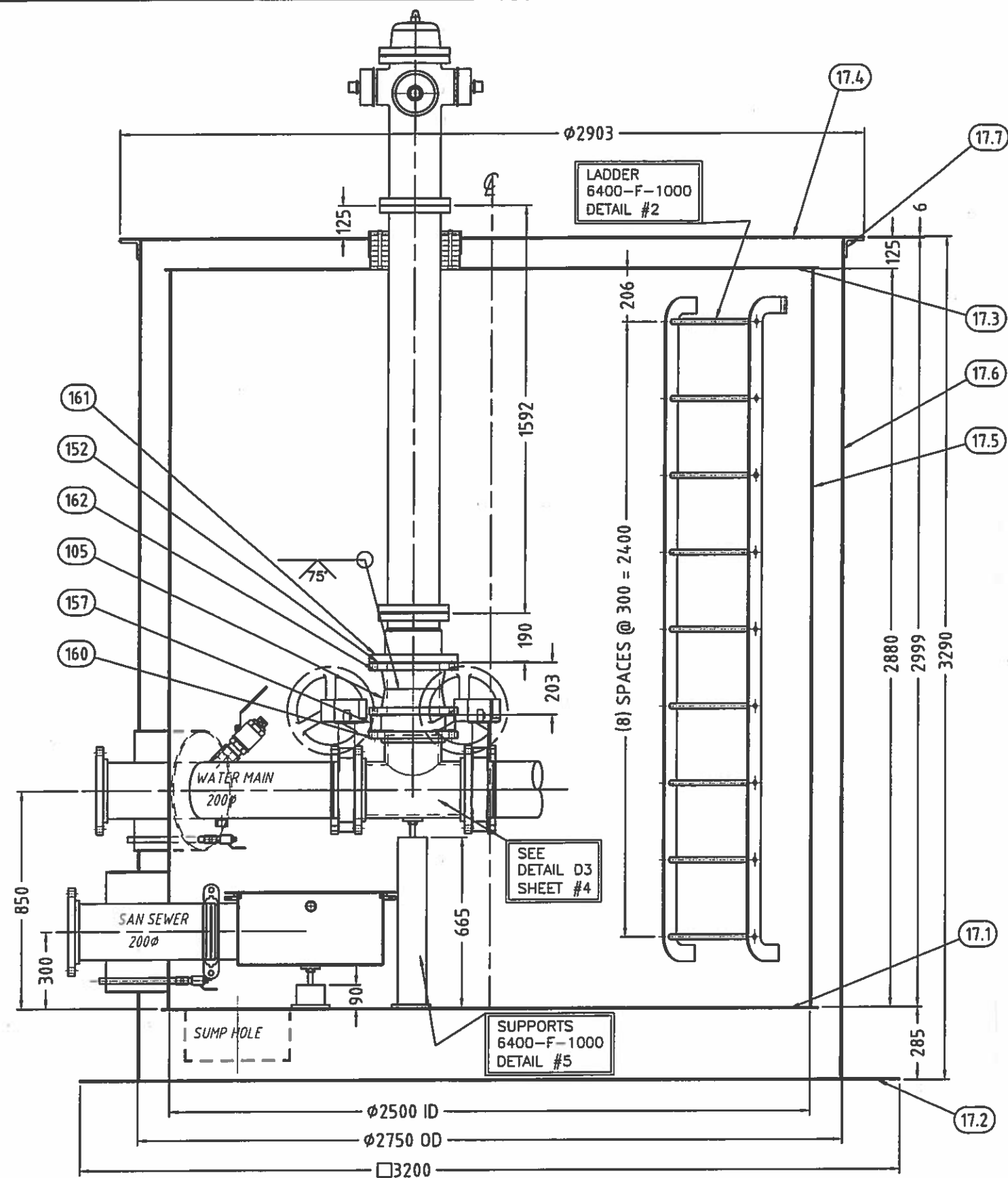
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com</p>			
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CLIENT:		GOVERNEMENT OF NUNAVUT	
CUSTOMER:			
TITRE:		ACCESS VAULT AV16	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY, NU	
DESSIN No.:		DESS PAR:	
DRAWING No.:		DRAW BY:	
6400-F-AV16		G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE:	QTY:		SHEET:
X/X" = X"	1	01-04-14	2 / 3
			REV:
			A

Item	Qty	Description	Material	Item	Qty	Description	Material
160	64	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.	16.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2062mm	A36
161	8	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.	16.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2700mm x 2700mm	A36
162	8	3/4-10 HEX. NUT	PLATED C.S.	16.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2048mm	A36
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B	16.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2403mm	A36
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B	16.5	1	INTERNAL SHELL PL. 1/4" THK. x 6303mm x 2910mm LG.	A36
				16.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7048mm x 3298mm LG.	A36
				16.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
				16.8	3	PL. 1/4" THK. x 353 x 1456mm LG.	A36
				16.9	1	PL. 1/4" THK. x 791 x 1456mm LG.	A36
				16.10	1	PL. 1/4" THK. x 308 x 1456mm LG.	A36
				16.11	1	PL. 1/4" THK. x 413 x 1456mm LG.	A36
				16.12	1	PIPE 8" SCH.80 x 543mm LG. vic groove 2 end	A-53-B
				16.13	1	PIPE 8" SCH.80 x 694mm LG. vic groove 1 end	A-53-B
				16.14	1	PIPE 8" SCH.80 x 604mm LG. vic groove 1 end	A-53-B
				16.15	1	PIPE 8" SCH.80 x 812mm LG. vic groove 2 end	A-53-B
				16.16	1	PIPE 8" SCH.80 x 674mm LG.	A-53-B
				16.17	1	PIPE 8" SCH.80 x 822mm LG. vic groove 1 end	A-53-B
				16.18	1	PIPE 8" SCH.80 x 289mm LG. vic groove 2 end	A-53-B
				16.19	1	PIPE 8" SCH.80 x 593mm LG. vic groove 1 end	A-53-B
				16.20	1	PIPE 8" SCH.80 x 871mm LG. vic groove 1 end	A-53-B
				16.21	1	PIPE 8" SCH.80 x 202mm LG. vic groove 2 end	A-53-B
				103	10	FLANGE SORF 8" - 150#	SA 105
				105	2	FLANGE WN 8" 150#, BORE	SA-105
				112	8	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
				132	2	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
				137	3	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
				152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER
				157	4	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	

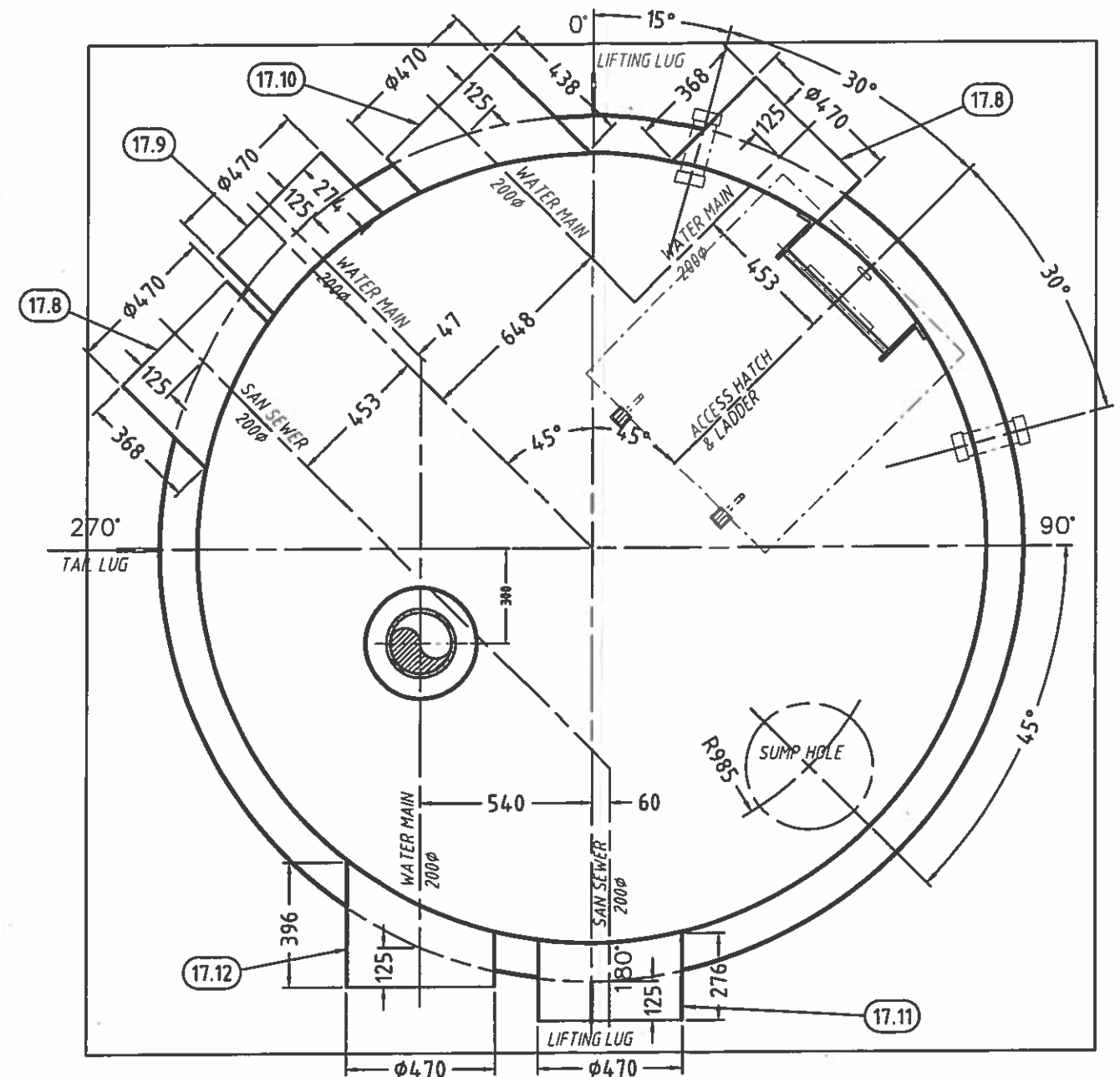


A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>BERLIE-FALCO</b> Falco Technologies Inc., a company of 1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com		CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC. THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.	
CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV16	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY, NU	
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV16		DRAW BY: G.L.	
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	1	01-04-14	3 / 3
			REV: A






SECTION "A-A"



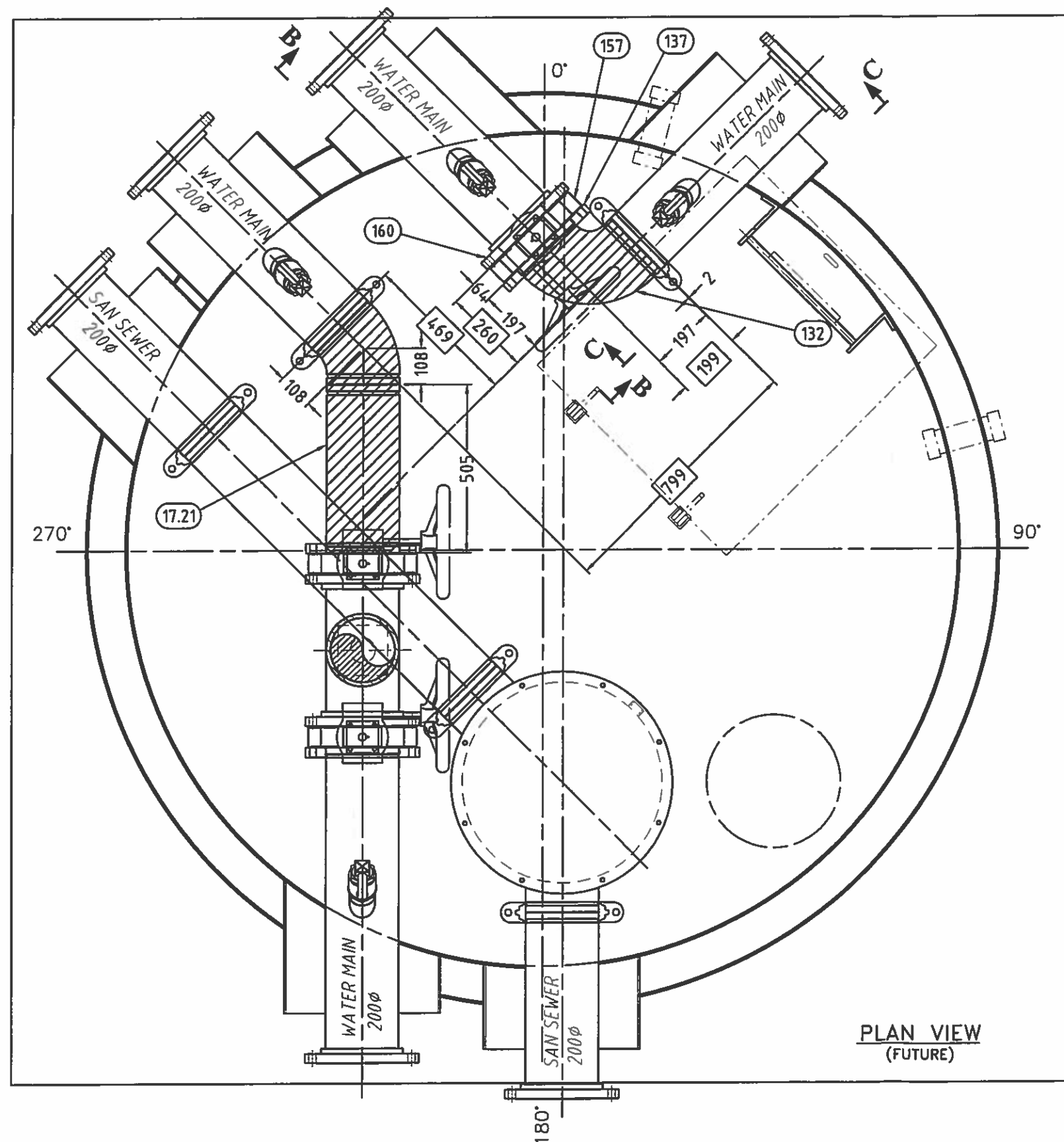
SHELL DETAIL

GENERAL NOTES:

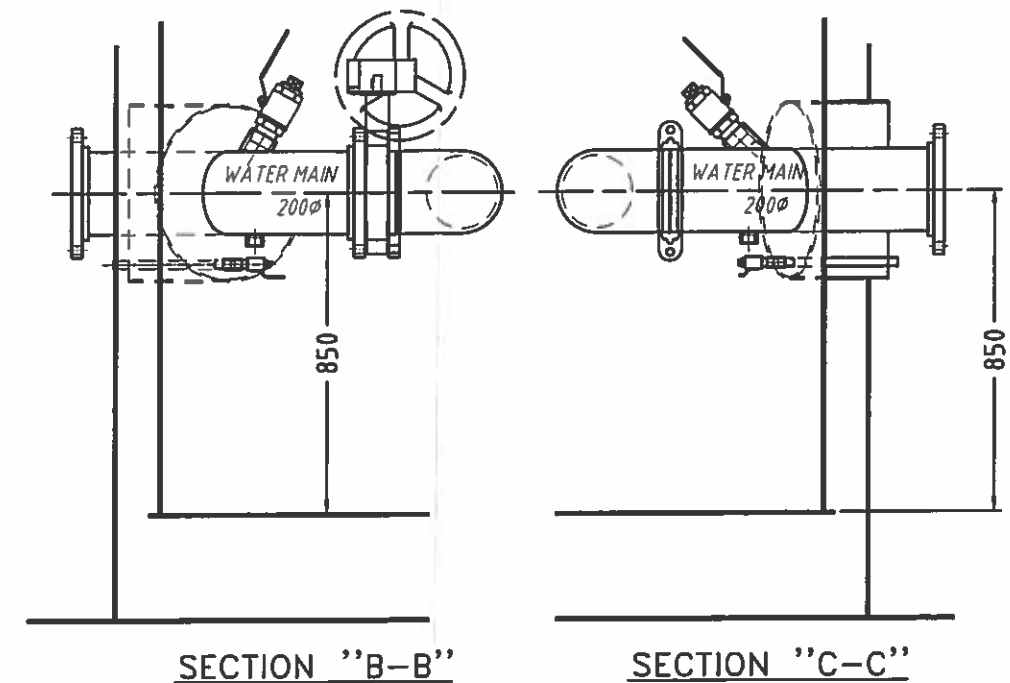
- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL ,CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

A	ISSUED FOR COMMENTS	D1-04-14	G.L.	
REV	DESCRIPTION	DATE	DESS/DRAWN	
 Falco Technologies Inc., a company of <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) JSR 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com		
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CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT		
TITRE: TITLE:		ACCESS VAULT AV17 NEW UTILIDOR DESIGN RESOLUTE BAY , NU		
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:		
6400-F-AV17		G.L.		
..... SCALE	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 4	A





PLAN VIEW  
(FUTURE)

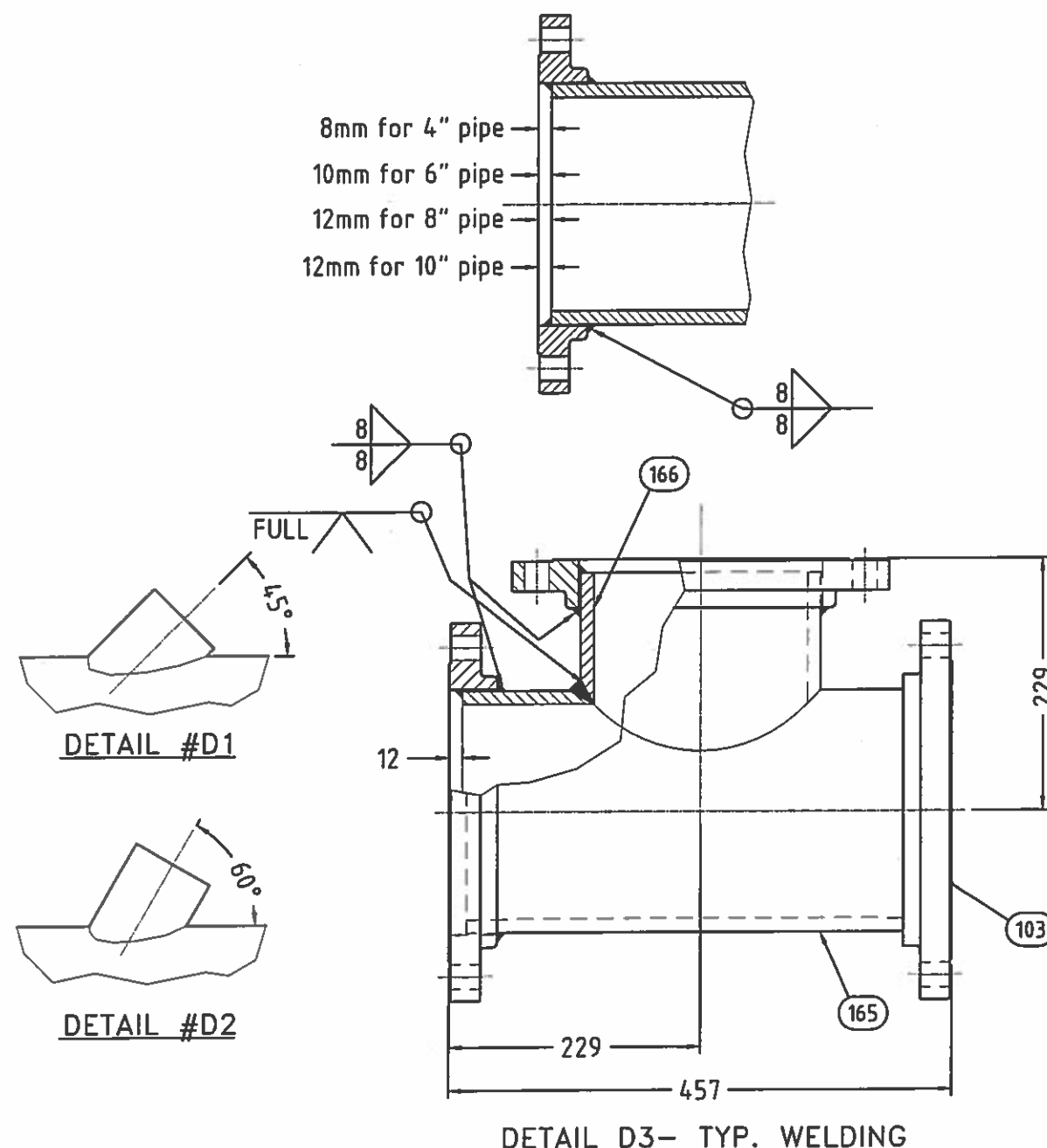


SECTION "B-B"

SECTION "C-C"

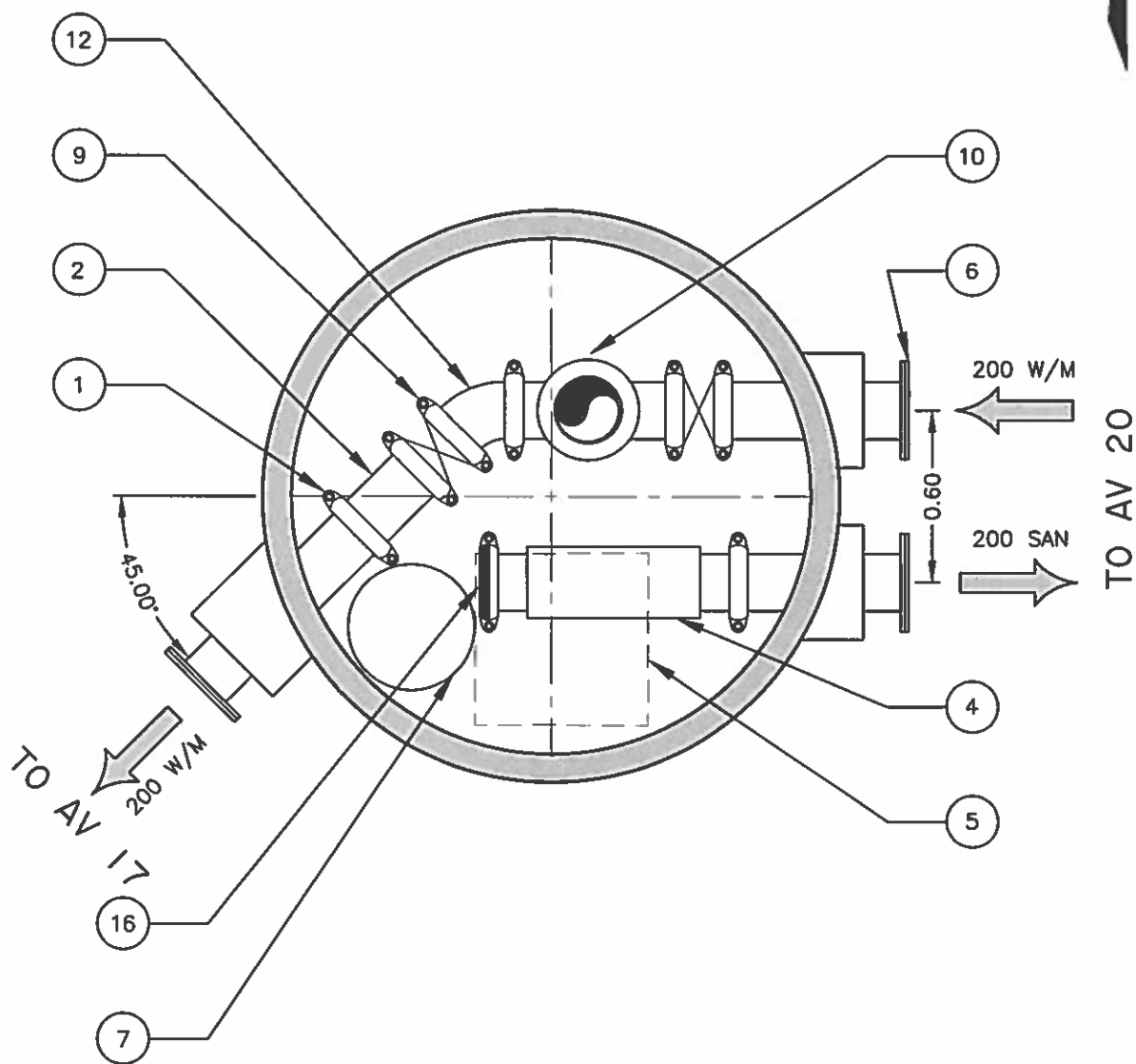
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>CE DOCUMENT EST LA PROPRIÉTÉ DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNÉ SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ÊTRE UTILISÉ, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PRÉJUDICABLE AUX INTÉRÊTS DE FALCO TECHNOLOGIES INC.</p> <p>THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p> <p>CLIENT: <b>GOVERNEMENT OF NUNAVUT</b></p> <p>TITRE: <b>ACCESS VAULT AV17</b></p> <p>TITLE: <b>NEW UTILIDOR DESIGN RESOLUTE BAY, NU</b></p> <p>DESSIN No.: <b>6400-F-AV17</b></p> <p>DRAWING No.: <b>6400-F-AV17</b></p> <p>DESS. PAR: <b>G.L.</b></p> <p>DRAW BY: <b>G.L.</b></p> <p>SCALE: <b>X/X" = X"</b></p> <p>QTE: <b>1</b></p> <p>DATE: <b>01-04-14</b></p> <p>FEUILLE: <b>3 / 4</b></p> <p>REV: <b>A</b></p>			

Item	Qty	Description	Material	Item	Qty	Description	Material
152	2	1/8" THK. GASKET FOR 8" FLG. #150	SOFT RUBBER	17.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2562mm	A36
157	4	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)		17.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 3200mm x 3200mm	A36
160	64	BOLT 3/4-10UNC x 2 1/4" LG + FLAT WASHER	PLATED C.S.	17.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2548mm	A36
161	16	3/4-10 HEX.-BOLT, 3 1/2" LG	PLATED C.S.	17.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2903mm	A36
162	16	3/4-10 HEX. NUT	PLATED C.S.	17.5	1	INTERNAL SHELL PL. 1/4" THK. x 7833mm x 2880mm LG.	A36
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B	17.6	1	EXTERNAL SHELL PL. 1/4" THK. x 8619mm x 3268mm LG.	A36
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B	17.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
				17.8	2	PL. 1/4" THK. x 368 x 1456mm LG.	A36
				17.9	1	PL. 1/4" THK. x 274 x 1456mm LG.	A36
				17.10	1	PL. 1/4" THK. x 438 x 1456mm LG.	A36
				17.11	1	PL. 1/4" THK. x 276 x 1456mm LG.	A36
				17.12	1	PL. 1/4" THK. x 396 x 1456mm LG.	A36
				17.13	1	PIPE 8" SCH.80 x 715mm LG. vic groove 1 end	A-53-B
				17.14	1	PIPE 8" SCH.80 x 547mm LG. vic groove 1 end	A-53-B
				17.15	1	PIPE 8" SCH.80 x 935mm LG. vic groove 1 end	A-53-B
				17.16	1	PIPE 8" SCH.80 x 1111mm LG. vic groove 2 end	A-53-B
				17.17	1	PIPE 8" SCH.80 x 596mm LG. vic groove 1 end	A-53-B
				17.18	1	PIPE 8" SCH.80 x 751mm LG.	A-53-B
				17.19	1	PIPE 8" SCH.80 x 1046mm LG. vic groove 2 end	A-53-B
				17.20	1	PIPE 8" SCH.80 x 718mm LG. vic groove 1 end	A-53-B
				17.21	1	PIPE 8" SCH.80 x 505mm LG. vic groove 2 end	A-53-B
				103	10	FLANGE SORF 8" - 150#	SA 105
				105	2	FLANGE WN 8" 150#, BORE	SA-105
				112	6	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
				127	1	8" VICTAULIC ELBOW 45°, #11	GALV C.S.
				132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
				137	3	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
				142	1	BLIND FLANGE 8" - 150#	SA 105
				147	1	8" VICTAULIC CAP, #60	GALV C.S.



A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV17	
Dessin No:		DESS. PAR:	
DRAWING No: 6400-F-AV17		DRAW BY: G.L.	
.....	OTE:	DATE:	FEUILLE:
SCALE	QTY:	01-04-14	SHEET:
X/X" = X"	1		4 / 4
			REV:
			A

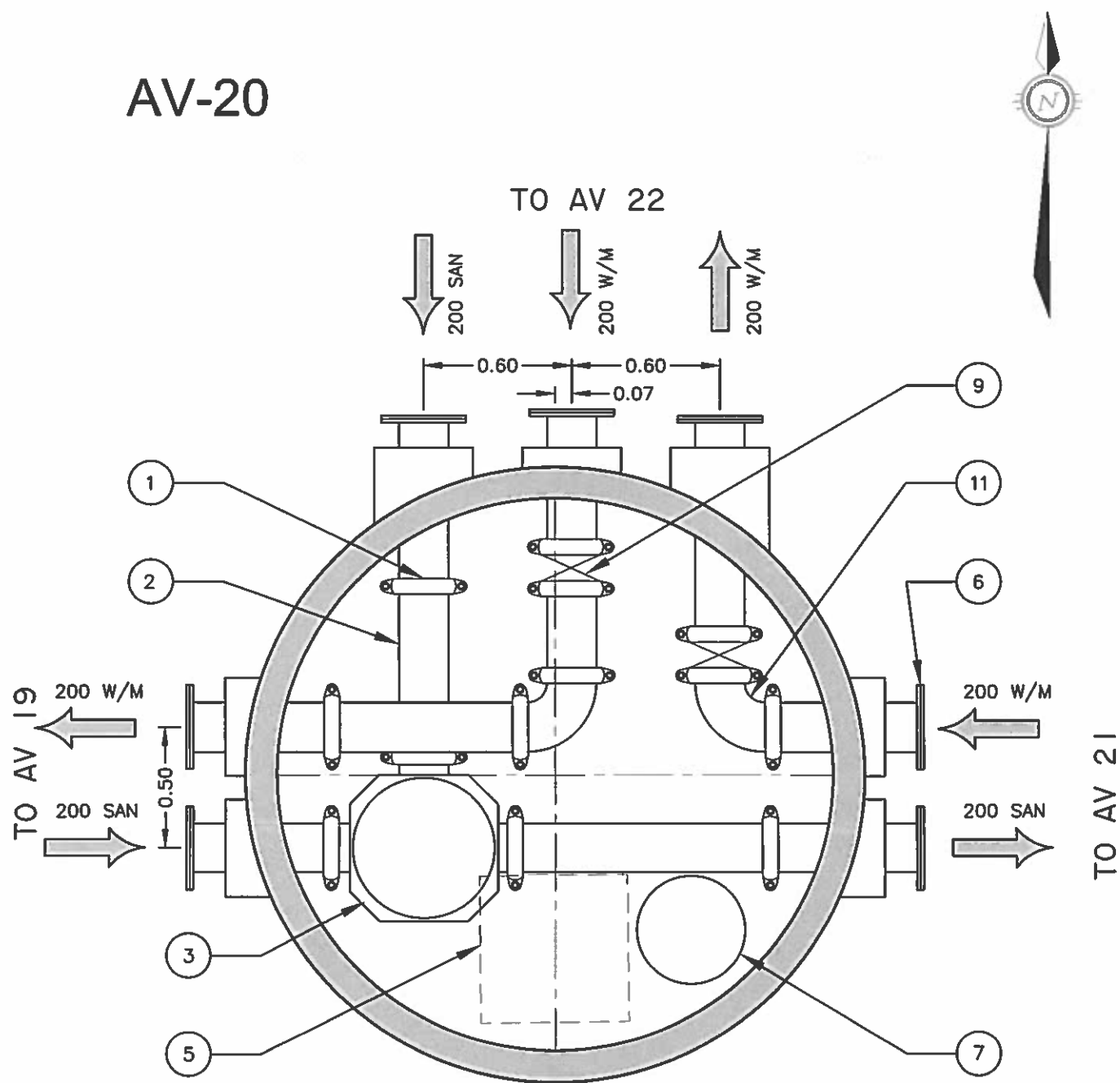
AV-19



NOTE:  
AV-19 TO BE FITTED WITH 1" WATER BLEED FROM THE WATER RETURN LINE TO THE SEWER MAIN. COMPLETE WITH BACKFLOW PREVENTER. (SEE DETAIL NO. 4 ON DWG. C-328)

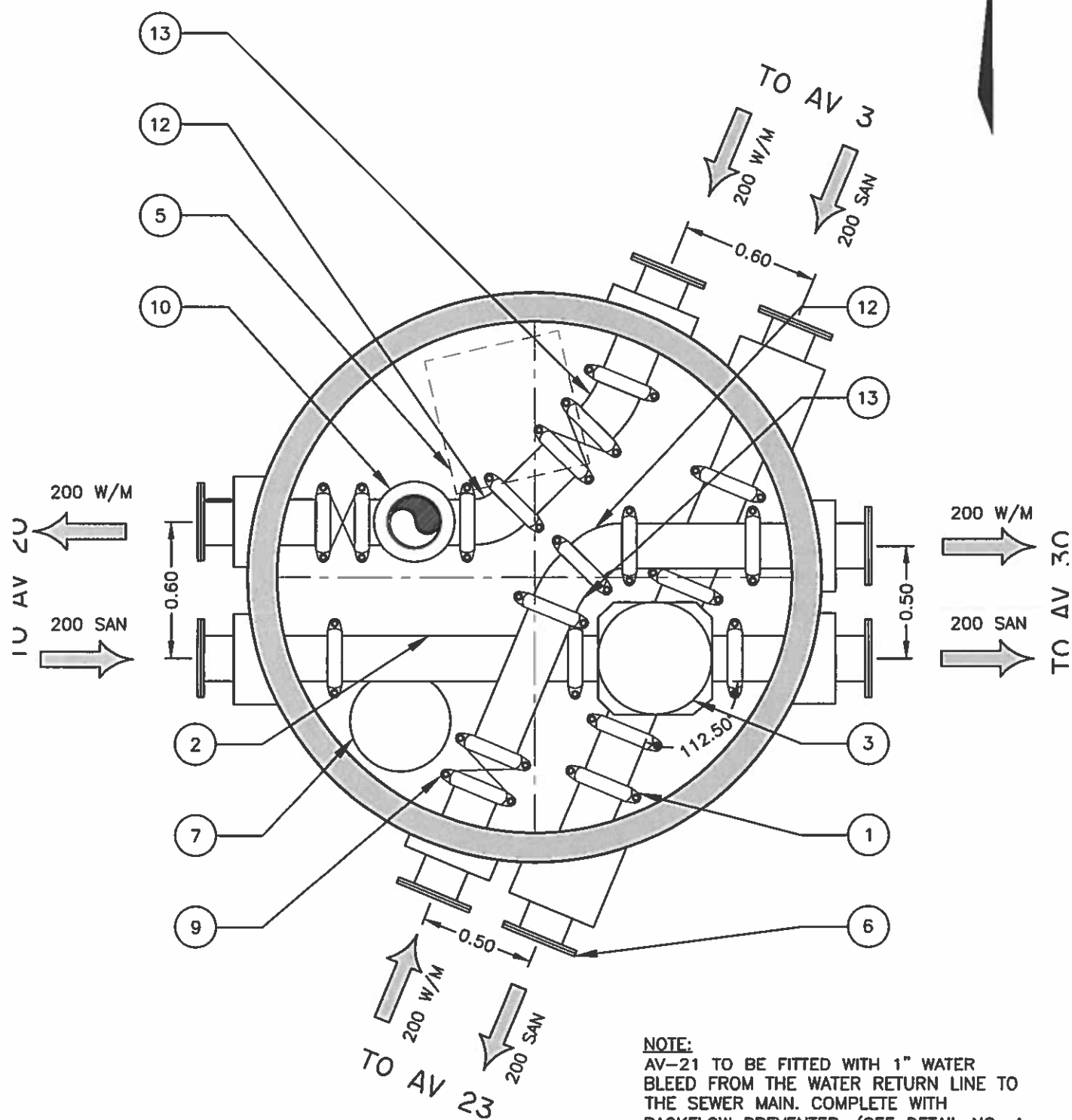
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-19	1.83m	25.10m	3.20m			22.40		23.15

AV-20



AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-20	225m	23.49	2.90	21.09		21.09	21.09	21.84

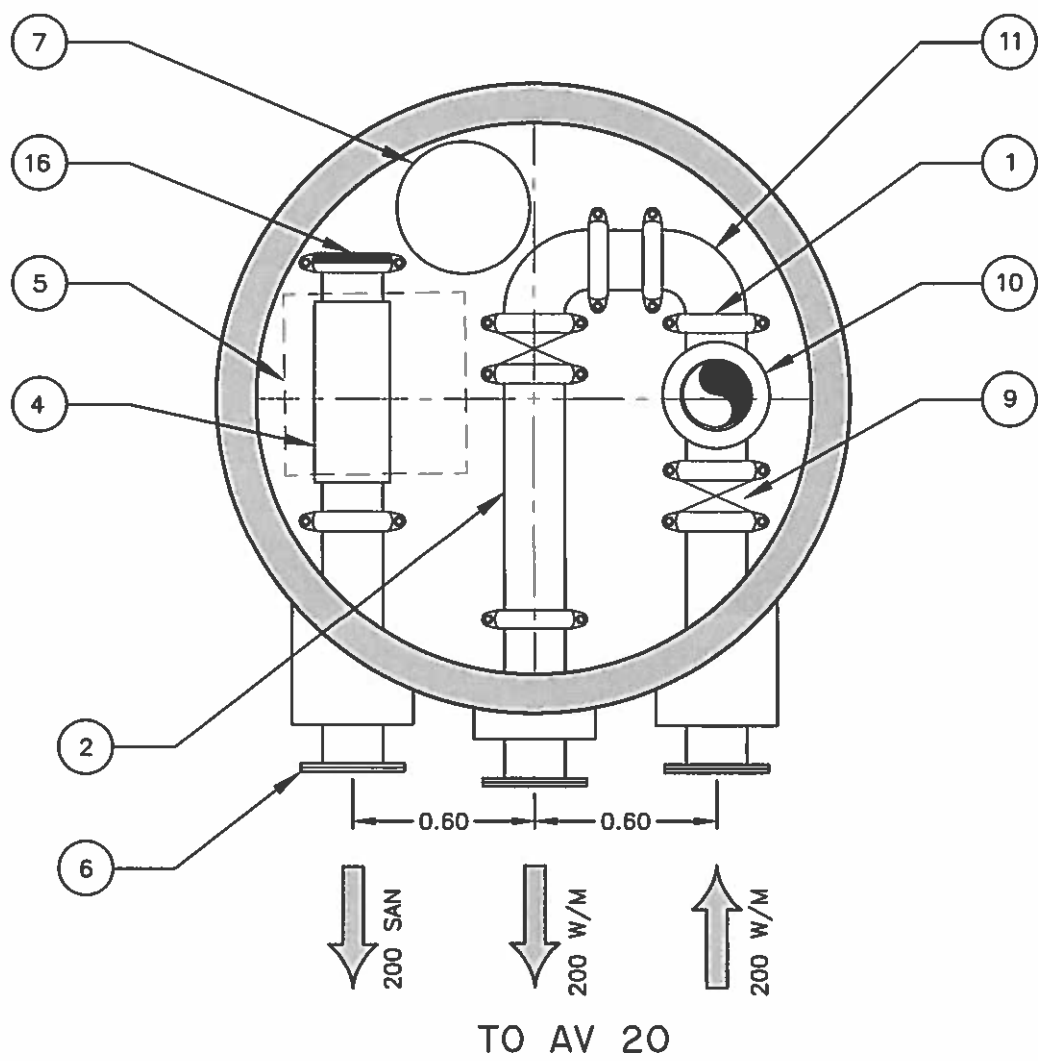
AV-21



NOTE:  
AV-21 TO BE FITTED WITH 1" WATER BLEED FROM THE WATER RETURN LINE TO THE SEWER MAIN. COMPLETE WITH BACKFLOW PREVENTER. (SEE DETAIL NO. 4 ON DWG. C-328)

AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-21	225m	22.85m	3.36m	19.99	19.99	19.99	19.99	20.74

AV-22

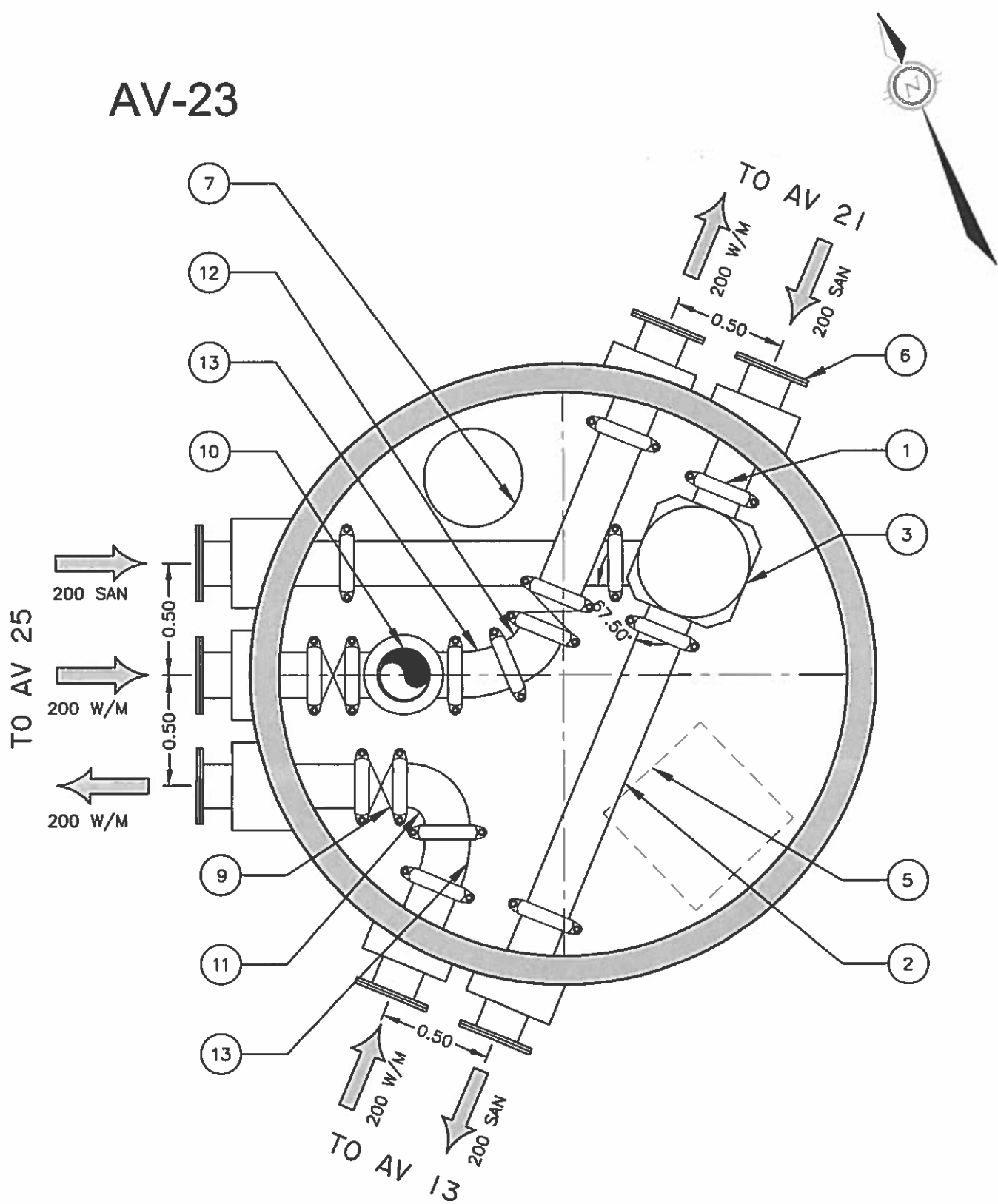


NOTE:  
AV-22 TO BE FITTED WITH 1" WATER BLEED FROM THE WATER RETURN LINE TO THE SEWER MAIN. COMPLETE WITH BACKFLOW PREVENTER. (SEE DETAIL NO. 4 ON DWG. C-328)

AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-22	183m	30.96m	3.32m		28.14			28.89

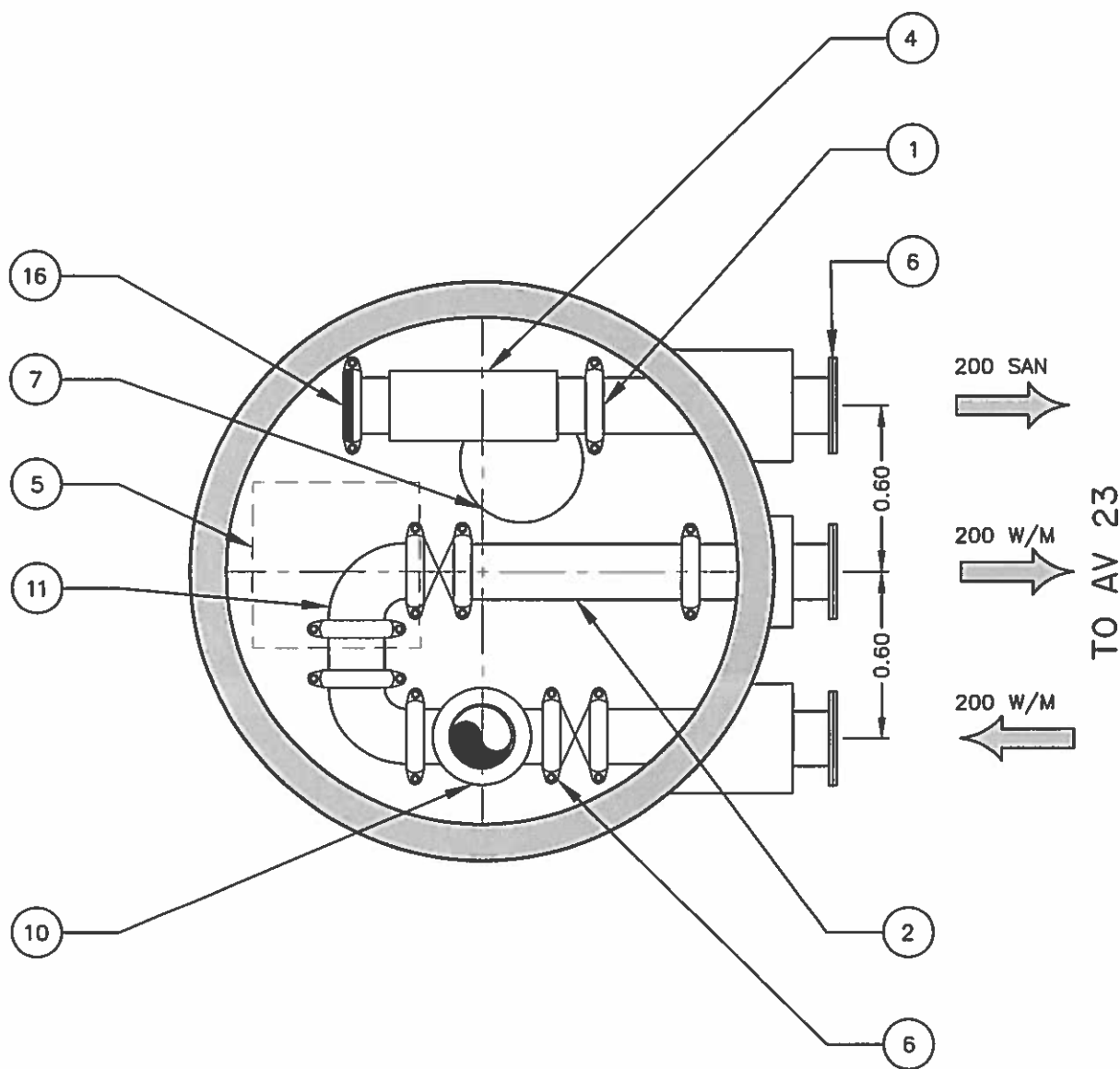


AV-23



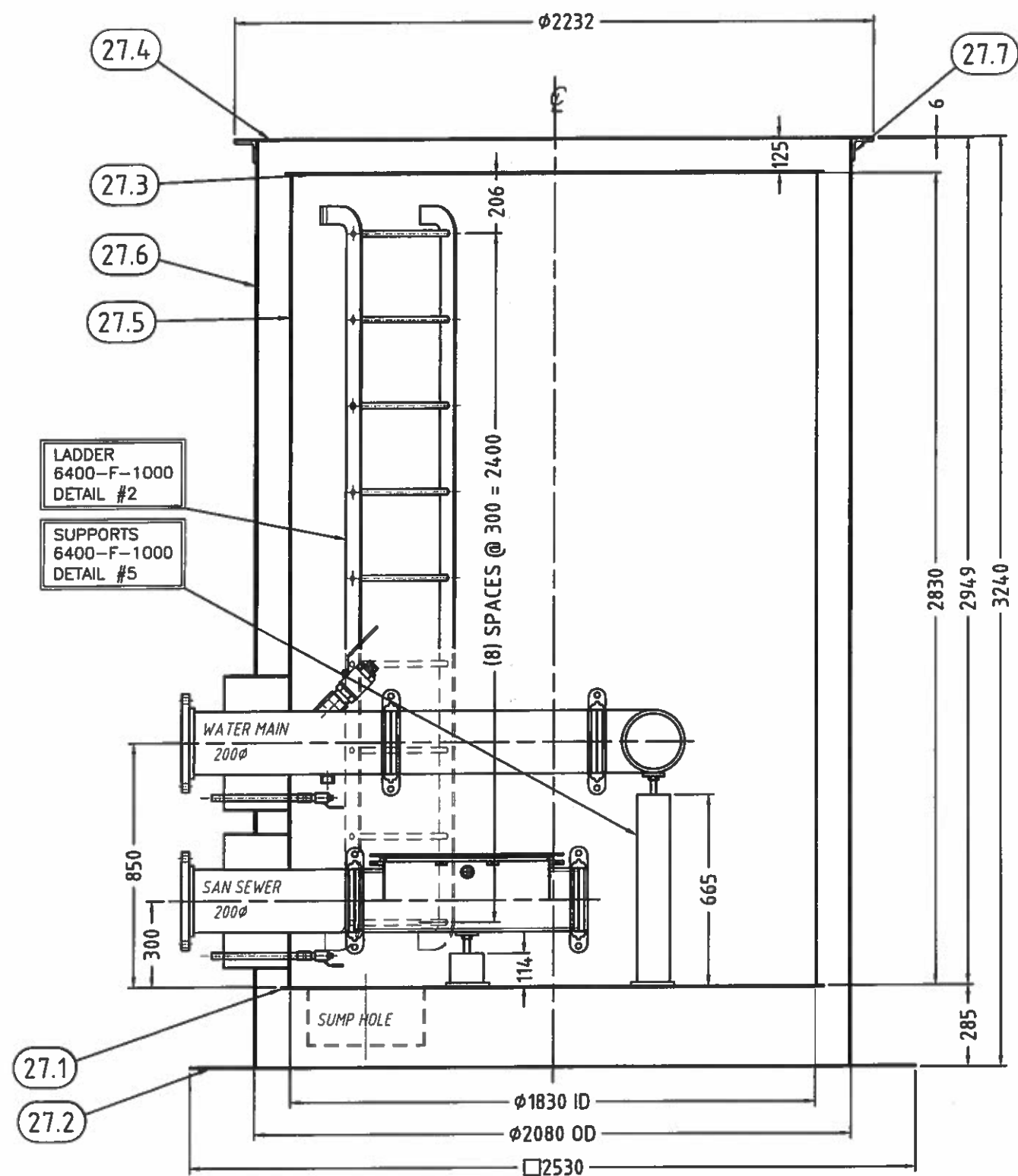
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-23	2.53m	20.1m	3.71m	16.90	16.90		16.90	17.65

AV-25

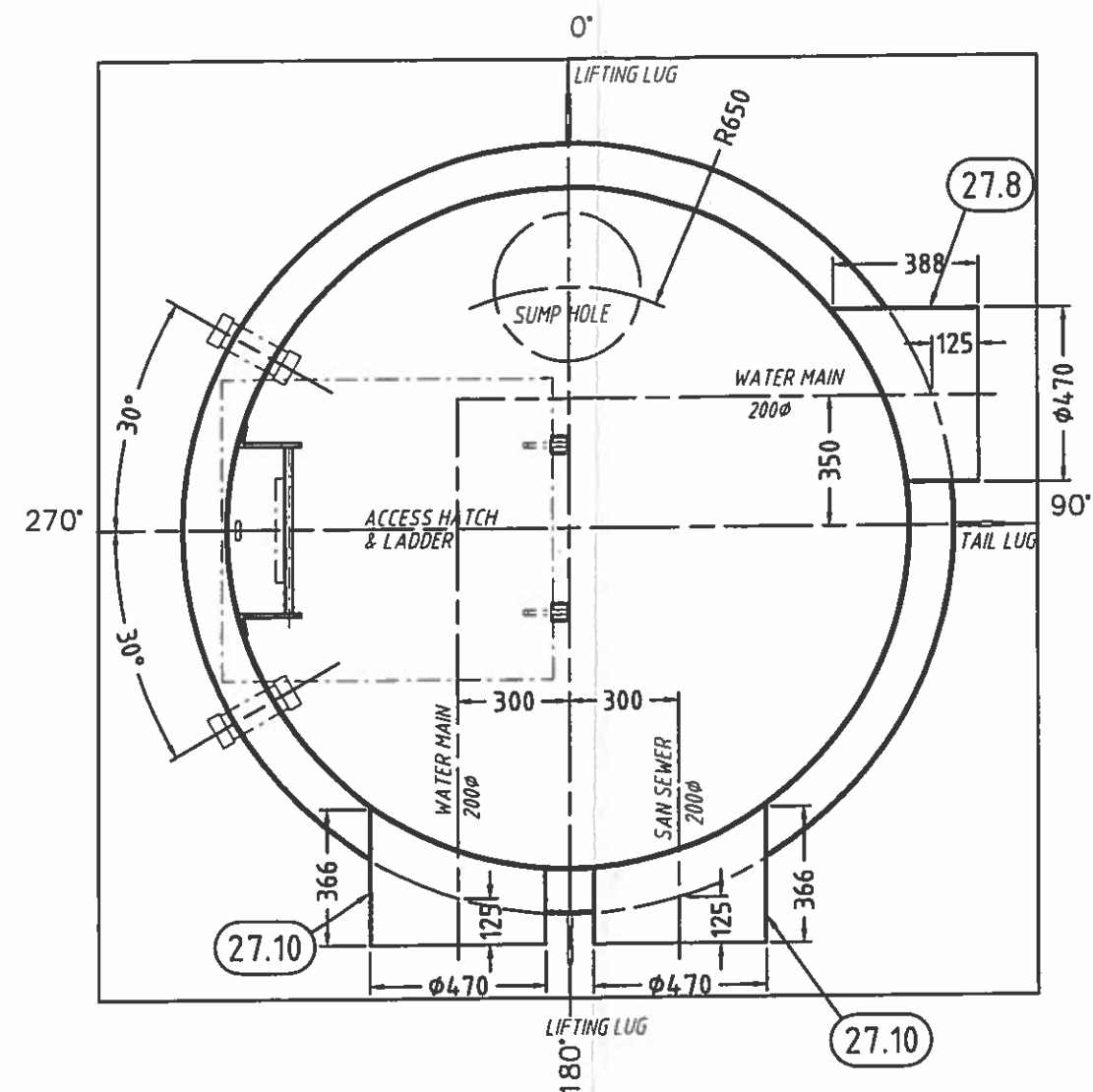


NOTE:  
AV-25 TO BE FITTED WITH 1" WATER BLEED FROM THE WATER RETURN LINE TO THE SEWER MAIN. COMPLETE WITH BACKFLOW PREVENTER. (SEE DETAIL NO. 4 ON DWG. C-328)

AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-25	183m	21.58m	3.28m			18.80		19.55



SECTION "A-A"

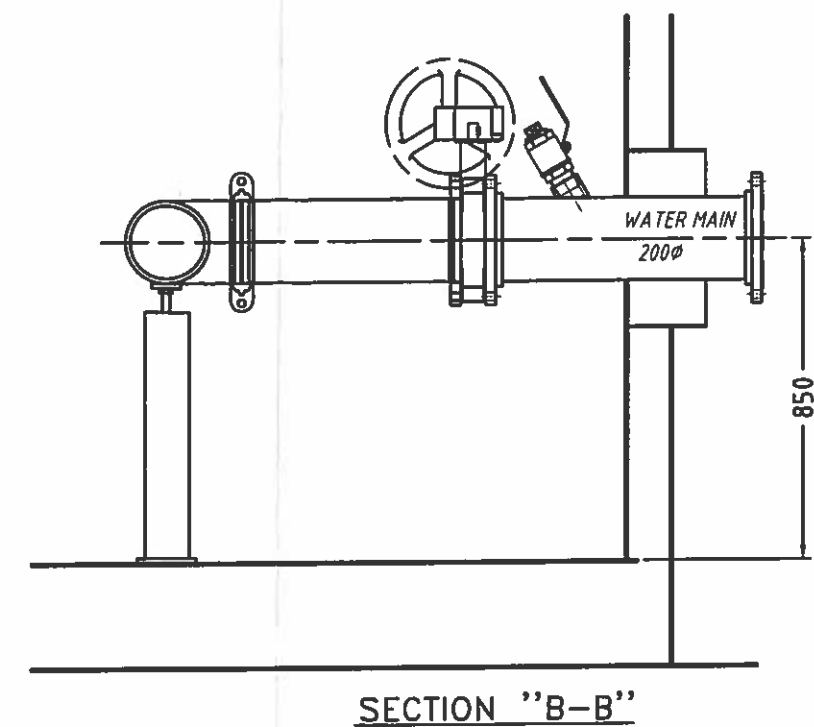
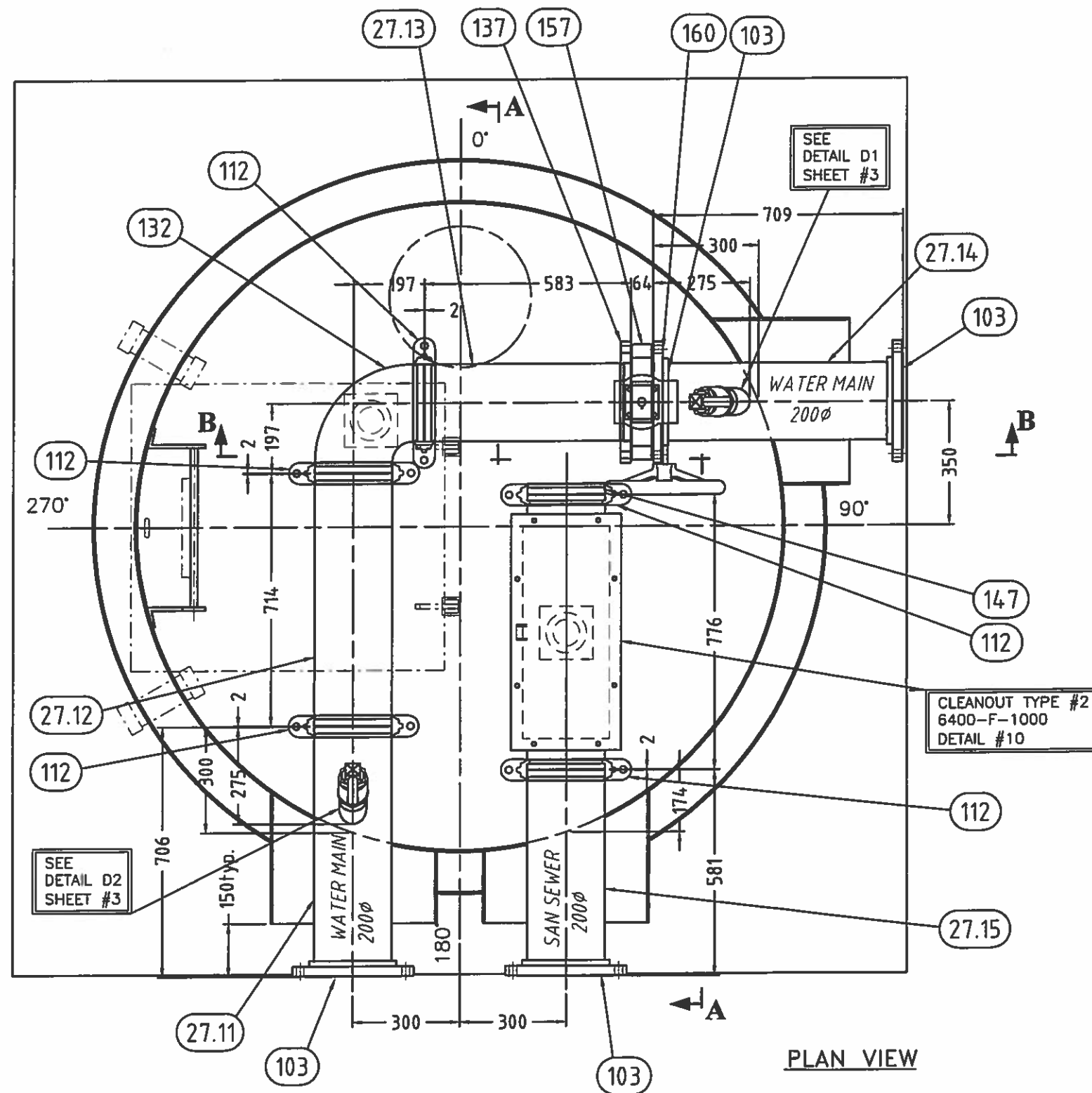



SHELL DETAIL

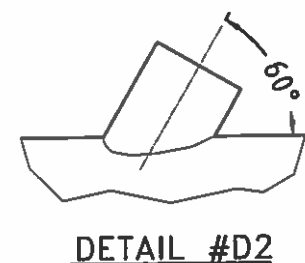
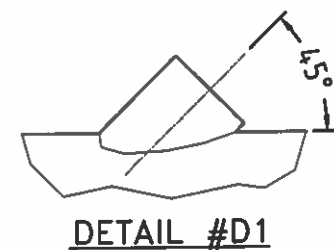
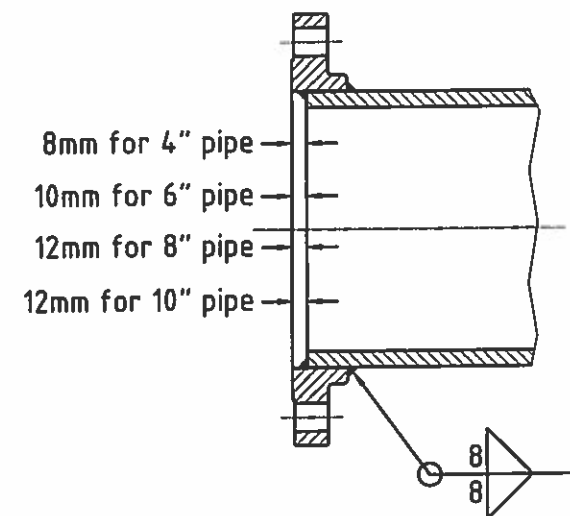
GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS


A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel (450) 444-0566  Fax (450) 444-2227  www.berliefalco.com</p> <p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC.  THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p>			
CLIENT: CUSTOMER: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV27 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.: 6400-F-AV27		DESS. PAR: G.L.	
DRAWING No.: 6400-F-AV27		DRAW BY:	
SCALE: X/X" = X"	QTE: 1	DATE: 01-04-14	FEUILLE: 1 / 3
			REV: A

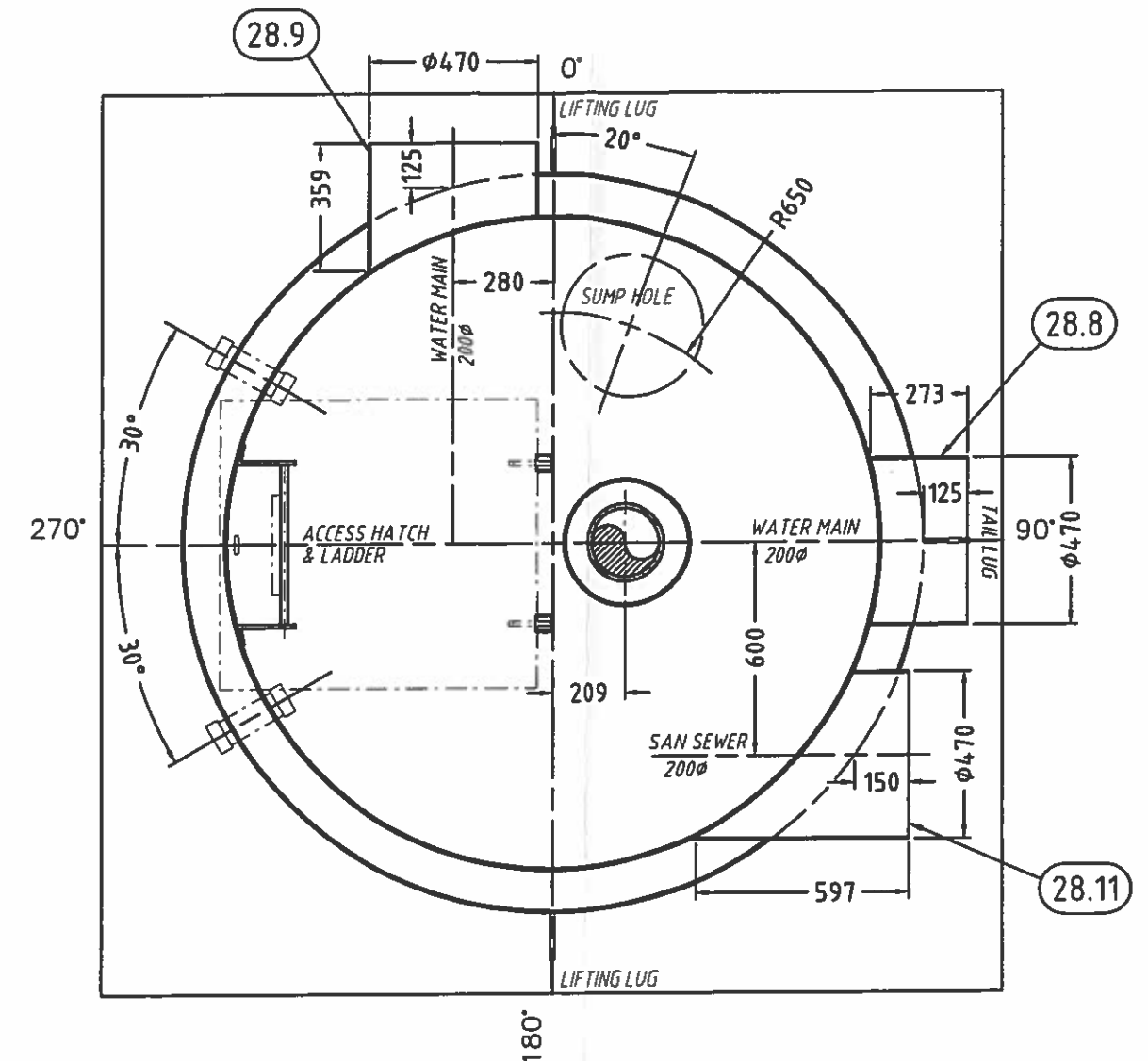
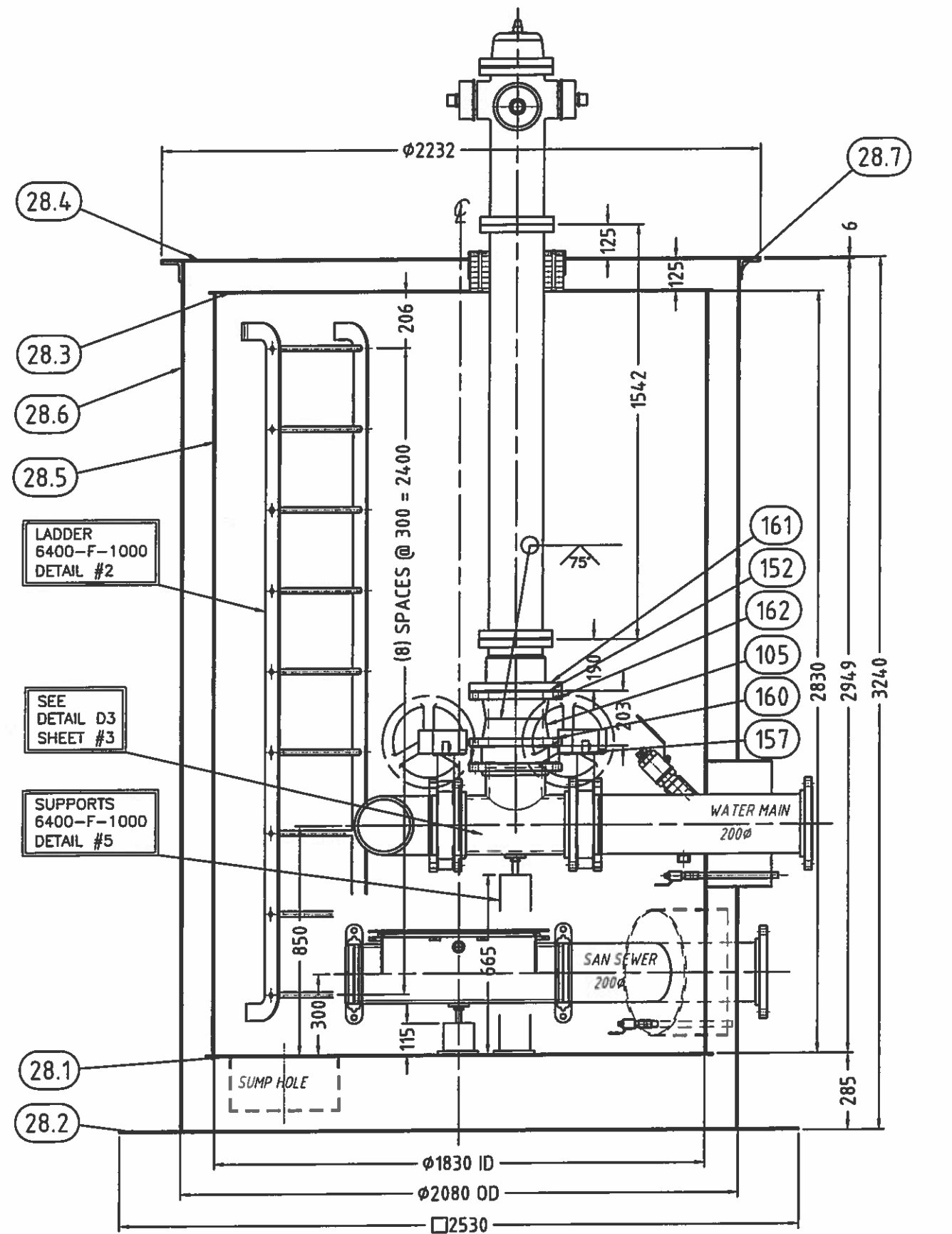


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REV	DESCRIPTION	DATE	DESS/DRAWN
 Falco Technologies Inc., a company of <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel. (450) 444-0566 Fax. (450) 444-2227 www.berliefalco.com	
CE DOCUMENT EST LA PROPRIÉTÉ DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNÉ SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ÊTRE UTILISÉ, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PRÉJUDICABLE AUX INTÉRÊTS DE FALCO TECHNOLOGIES INC. THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.			
CLIENT:		GOVERNEMENT OF NUNAVUT	
CUSTOMER:			
TITRE:		ACCESS VAULT AV27	
TITLE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No. DRAWING No:		DESS. PAR DRAW BY:	
6400-F-AV27		G.L.	
..... SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:
X/X" = X"	1	01-04-14	2 / 3
			A



Item	Qty	Description	Material
27.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
27.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
27.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
27.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
27.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 2830mm LG.	A36
27.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 3218mm LG.	A36
27.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
27.8	1	PL. 1/4" THK. x 388 x 1456mm LG.	A36
27.10	2	PL. 1/4" THK. x 366 x 1456mm LG.	A36
27.11	1	PIPE 8" SCH.80 x 694mm LG. vic groove 1 end	A-53-B
27.12	1	PIPE 8" SCH.80 x 714mm LG. vic groove 2 end	A-53-B
27.13	1	PIPE 8" SCH.80 x 583mm LG. vic groove 2 end	A-53-B
27.14	1	PIPE 8" SCH.80 x 685mm LG.	A-53-B
27.15	1	PIPE 8" SCH.80 x 569mm LG. vic groove 1 end	A-53-B
103	4	FLANGE SORF 8" - 150#	SA 105
112	5	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	1	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
147	1	8" VICTAULIC CAP , #60	GALV C.S.
157	1	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	16	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.

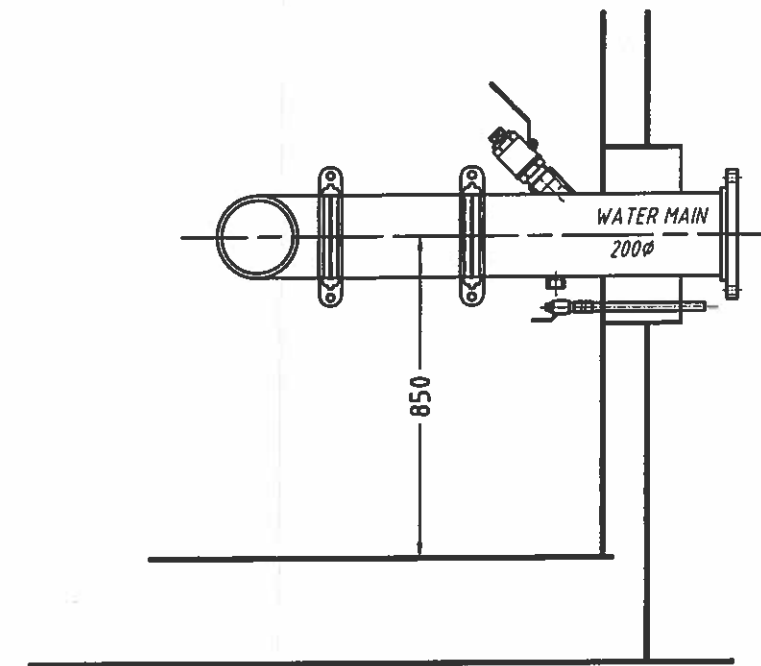
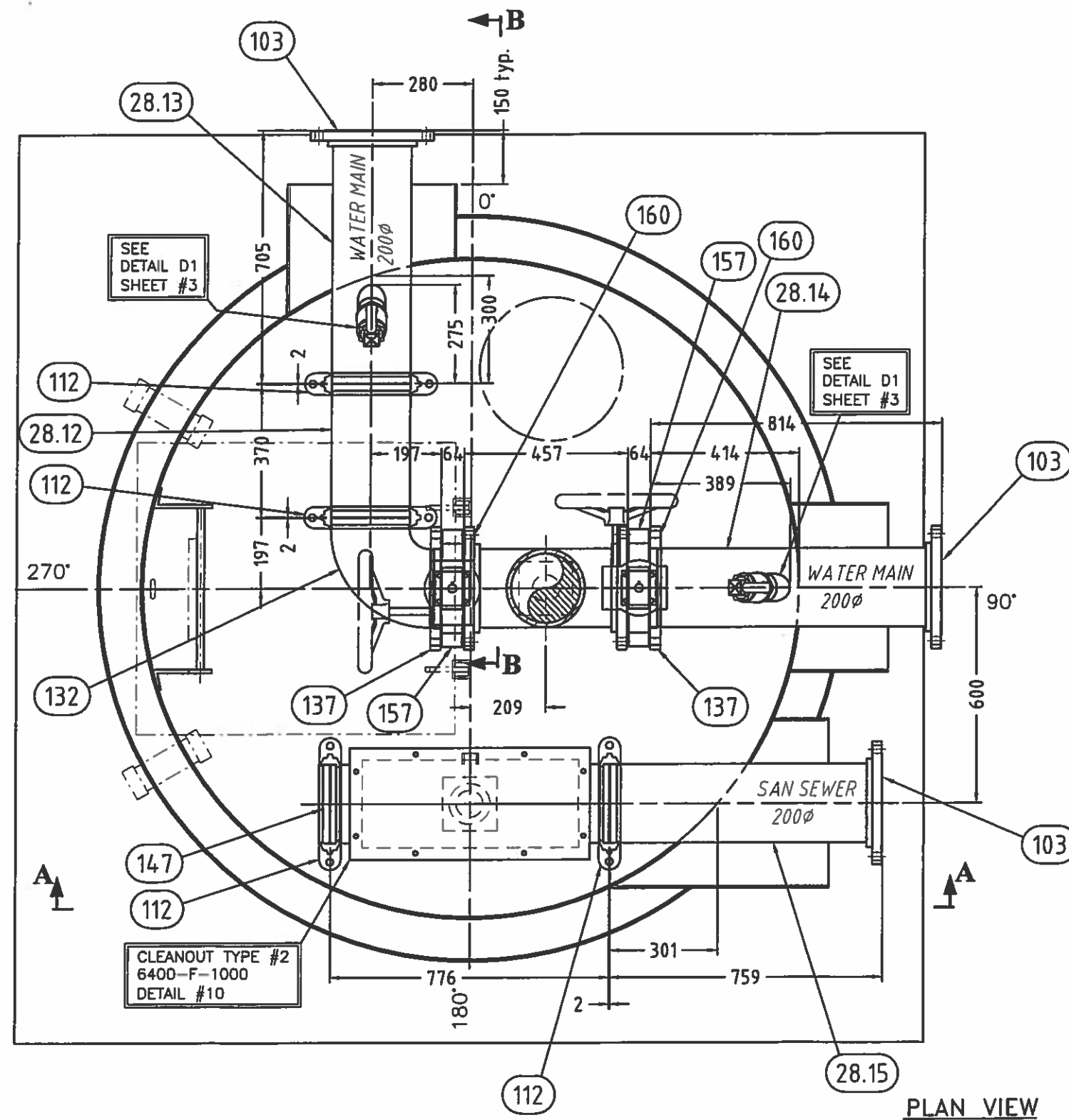
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT:			
CUSTOMER: GOUVERNEMENT OF NUNAVUT			
TITRE:			
TITLE: ACCESS VAULT AV27 NEW UTILIDOR DESIGN RESOLUTE BAY , NU			
DESSIN No. DRAWING No:		DESS. PAR: DRAW BY:	
6400-F-AV27		G.L.	
..... SCALE X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 3 / 3
			REV: A




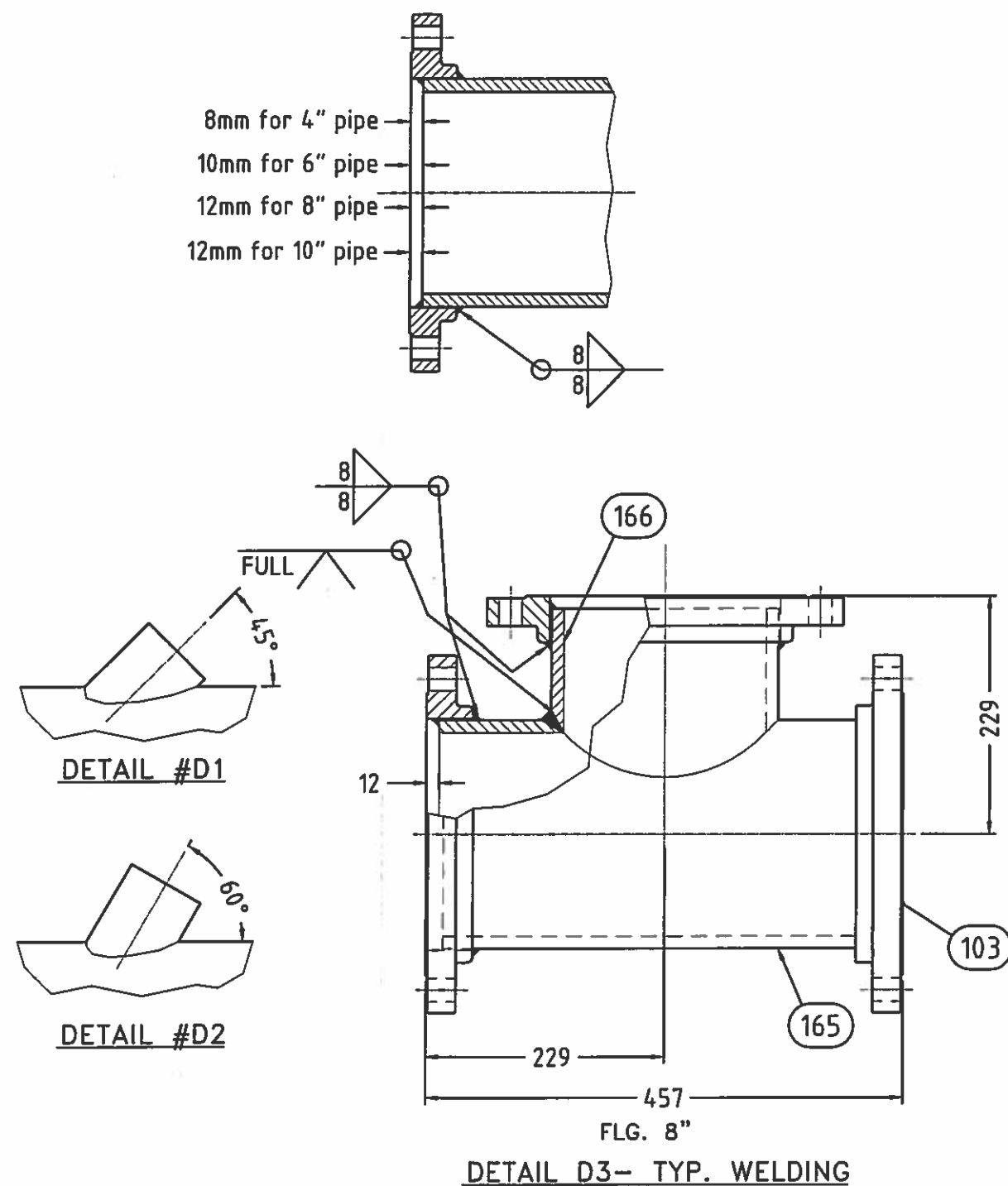
#### GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS


A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
			1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com
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CLIENT: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV28 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.: 6400-F-AV28		DESS. PAR: G.L.	
SCALE: X/X" = X"	QTE: 1	DATE: 01-04-14	FEUILLE: 1 / 3
			REV: A



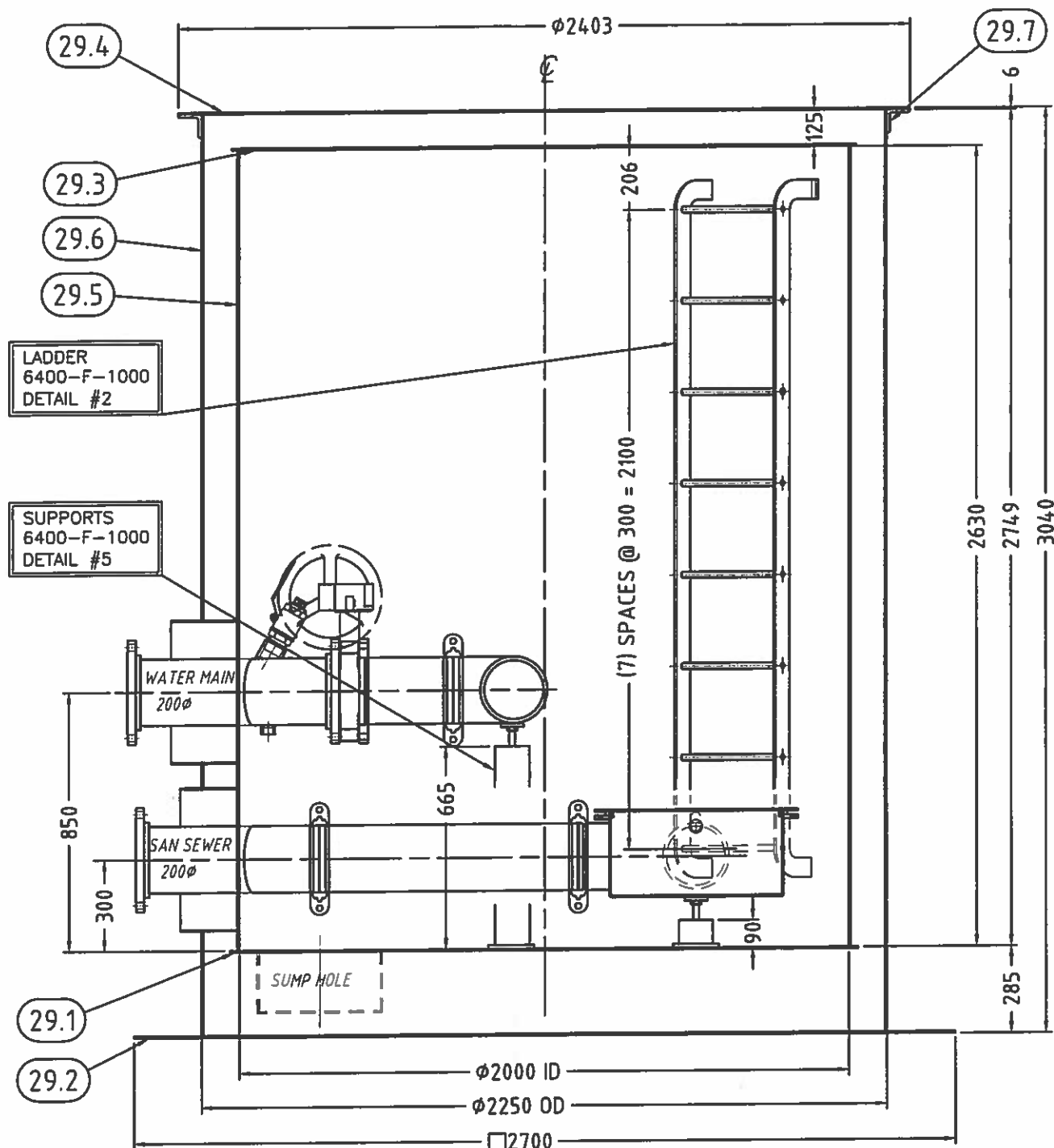
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b></p>		<p>1245 rue Industrielle          La Prairie (Quebec)          J5R 2E4          Tel. (450) 444-0566          Fax (450) 444-2227          www.berliefalco.com</p>	
<p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA          RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT          PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS          DE FALCO TECHNOLOGIES INC.          THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED          OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS          OF FALCO TECHNOLOGIES INC.</p>			
<p>CUSTOMER:          GOVERNEMENT OF NUNAVUT</p>			
<p>TITLE:          ACCESS VAULT AV28          NEW UTILIDOR DESIGN RESOLUTE BAY, NU</p>			
<p>DESSIN No.:          DRAWING No: 6400-F-AV28</p>		<p>DESS. PAR:          DRAW BY: G.L.</p>	
<p>SCALE:  <math>X/X'' = X''</math></p>	<p>QTE:          QTY: 1</p>	<p>DATE:          01-04-14</p>	<p>FEUILLE:          SHEET: 2 / 3</p>
			<p>REV:          A</p>



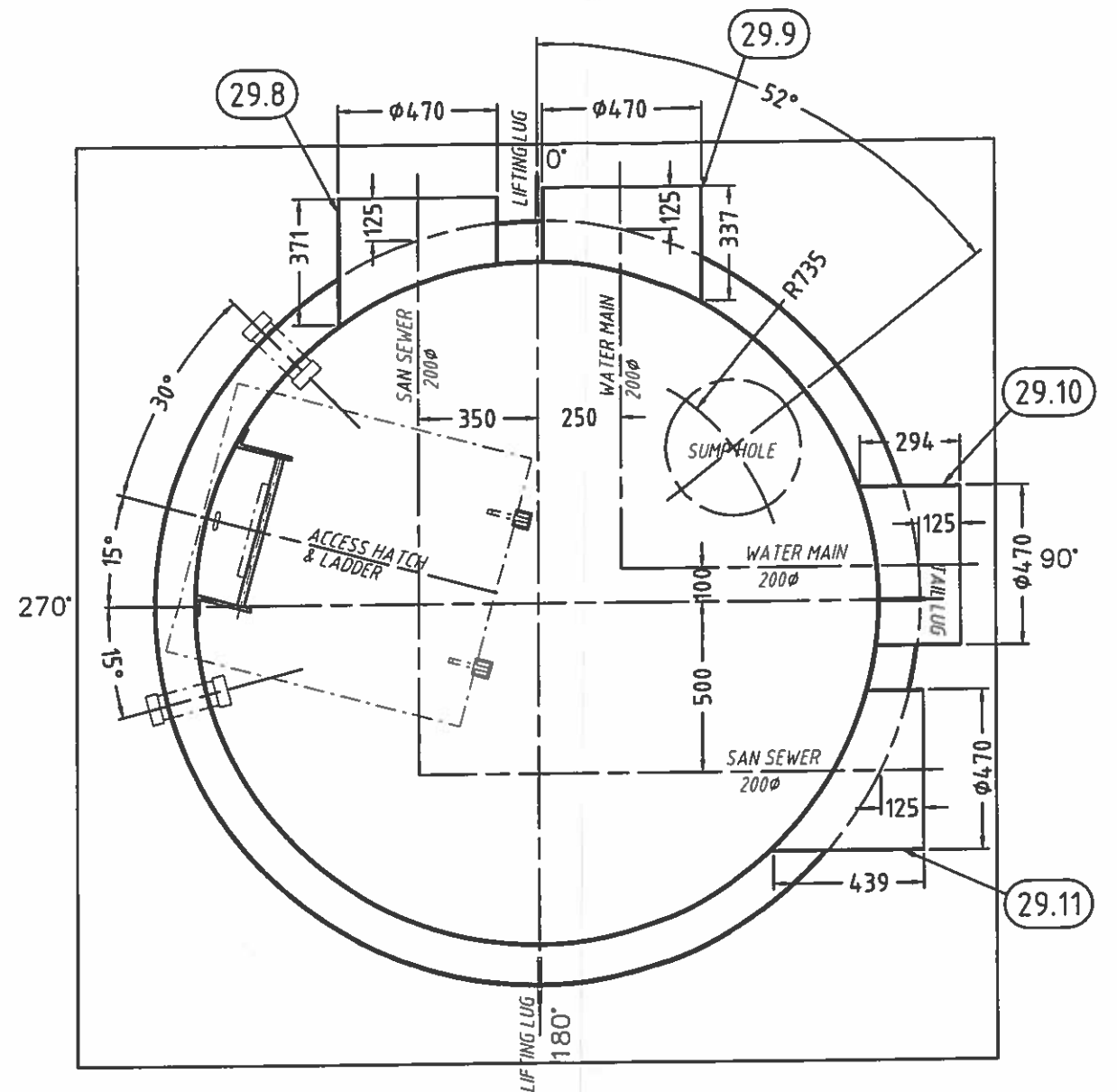
Item	Qty	Description	Material
28.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
28.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
28.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
28.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
28.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 2830mm LG.	A36
28.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 3218mm LG.	A36
28.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
28.8	1	PL. 1/4" THK. x 273 x 1456mm LG.	A36
28.9	1	PL. 1/4" THK. x 359 x 1456mm LG.	A36
28.11	1	PL. 1/4" THK. x 597 x 1456mm LG.	A36
28.12	1	PIPE 8" SCH.80 x 370mm LG. vic groove 2 end	A-53-B
28.13	1	PIPE 8" SCH.80 x 693mm LG. vic groove 1 end	A-53-B
28.14	1	PIPE 8" SCH.80 x 802mm LG. vic groove 1 end	A-53-B
28.15	1	PIPE 8" SCH.80 x 759mm LG. vic groove 1 end	A-53-B
103	6	FLANGE SORF 8" - 150#	SA 105
105	2	FLANGE WN 8" 150#, BORE	SA-105
112	4	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	2	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
147	1	8" VICTAULIC CAP , #60	GALV C.S.
152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER
157	3	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	48	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.
161	8	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.
162	8	3/4-10 HEX. NUT	PLATED C.S.
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b> 1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com			
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CLIENT: CUSTOMER: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV28 TITLE: NEW UTILIDOR DESIGN RESOLUTE BAY , NU			
DESSIN No.: 6400-F-AV28		DESS PAR: G.L.	
DRAWING No.:		DRAW BY:	
SCALE: X/X" = X"	QTE: 1	DATE: 01-04-14	FEUILLE: 3 / 3
		REV: A	





SECTION "A-A"

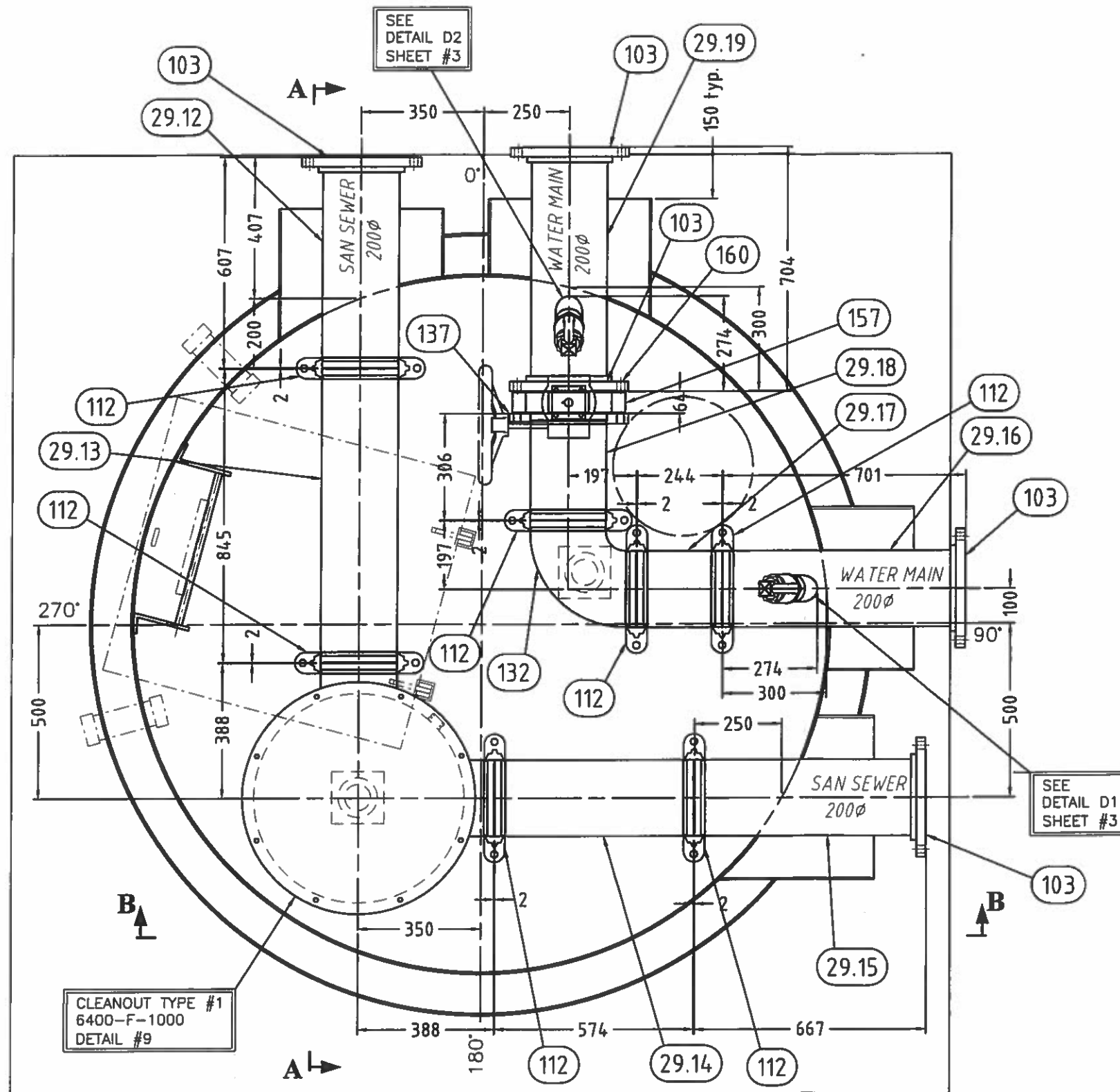


SHELL DETAIL

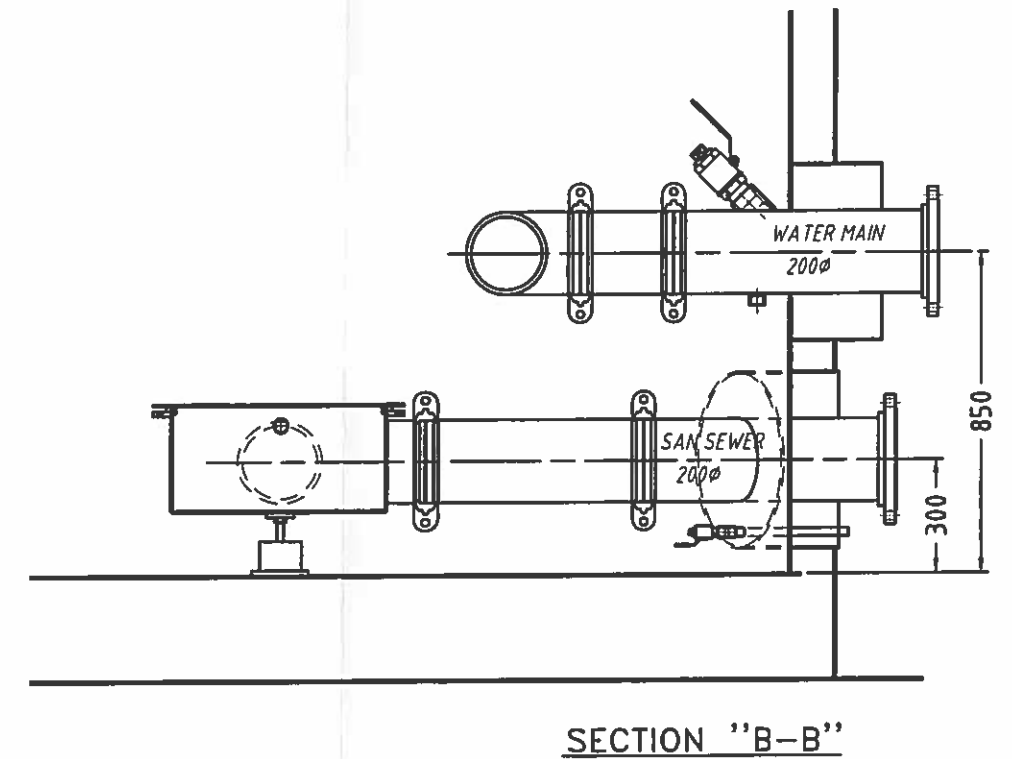
GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

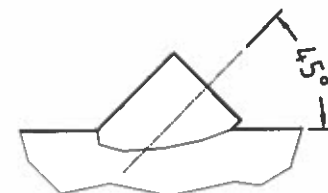
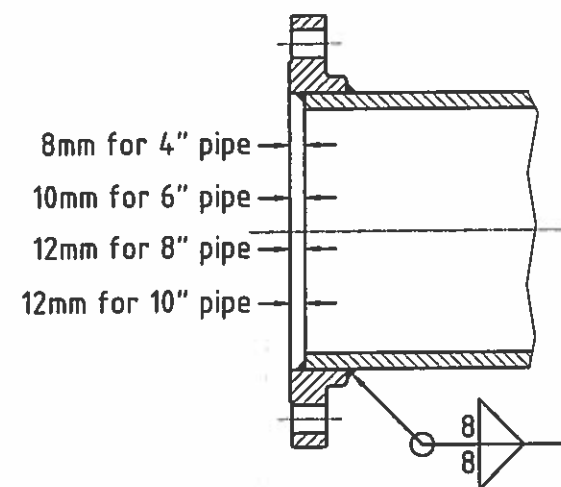
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com</p> <p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC.  THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p>			
CLIENT:	GOVERNEMENT OF NUNAVUT		
CUSTOMER:			
TITRE:	ACCESS VAULT AV29		
TITLE:	NEW UTILIDOR DESIGN RESOLUTE BAY, NU		
DESSIN No.:	6400-F-AV29		DESS. PAR:
DRAWING No.:			DRAW BY: G.L.
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	QTY: 1	01-04-14	SHEET: 1 / 3
			REV: A



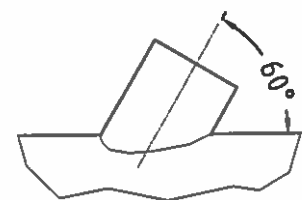
PLAN VIEW



A	ISSUED FOR COMMENTS	01-04-14	G.L.
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CLIENT:			
CUSTOMER: GOVERNEMENT OF NUNAVUT			
TITRE:			
TITLE: ACCESS VAULT AV29 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.: DRAWING No: 6400-F-AV29		DESS. PAR: DRAW BY: G.L.	
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 2 / 3
			REV: A




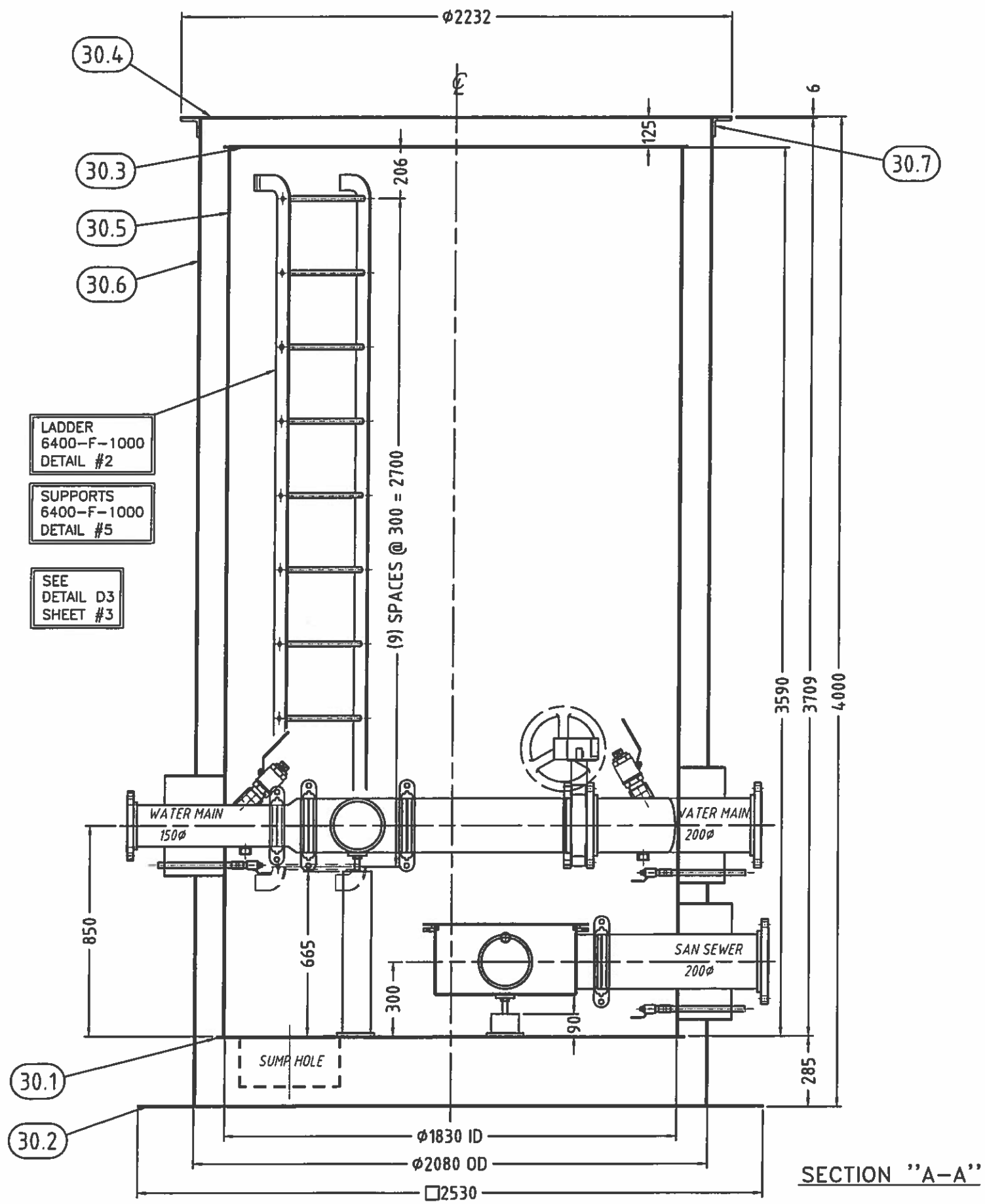
DETAIL #D1



DETAIL #D2

Item	Qty	Description	Material
29.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2062mm	A36
29.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2700mm x 2700mm	A36
29.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2048mm	A36
29.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2403mm	A36
29.5	1	INTERNAL SHELL PL. 1/4" THK. x 6303mm x 2630mm LG.	A36
29.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7048mm x 3018mm LG.	A36
29.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
29.8	1	PL. 1/4" THK. x 371 x 1456mm LG.	A36
29.9	1	PL. 1/4" THK. x 337 x 1456mm LG.	A36
29.10	1	PL. 1/4" THK. x 294 x 1456mm LG.	A36
29.11	1	PL. 1/4" THK. x 439 x 1456mm LG.	A36
29.12	1	PIPE 8" SCH.80 x 595mm LG. vic groove 1 end	A-53-B
29.13	1	PIPE 8" SCH.80 x 845mm LG. vic groove 2 end	A-53-B
29.14	1	PIPE 8" SCH.80 x 574mm LG. vic groove 2 end	A-53-B
29.15	1	PIPE 8" SCH.80 x 655mm LG. vic groove 1 end	A-53-B
29.16	1	PIPE 8" SCH.80 x 689mm LG. vic groove 1 end	A-53-B
29.17	1	PIPE 8" SCH.80 x 244mm LG. vic groove 2 end	A-53-B
29.18	1	PIPE 8" SCH.80 x 306mm LG. vic groove 2 end	A-53-B
29.19	1	PIPE 8" SCH.80 x 680mm LG.	A-53-B
103	5	FLANGE SORF 8" - 150#	SA 105
112	7	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	1	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
157	1	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	16	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.

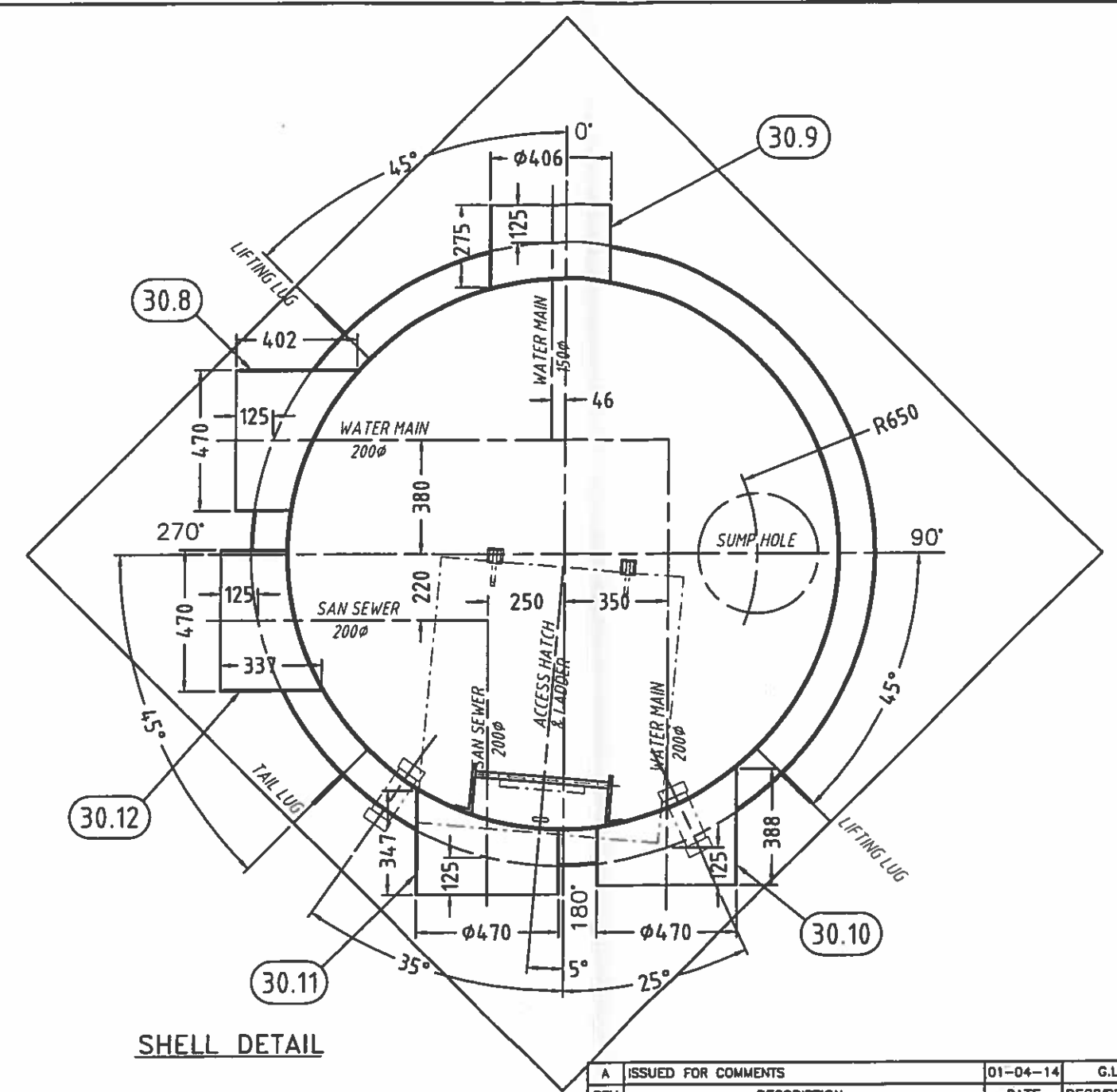
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berriefalco.com	
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CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV29	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY, NU	
DESSIN No.:		DESS PAR:	
DRAWING No. 6400-F-AV29		DRAW BY: G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE	QTY:	1	SHEET:
X/X" = X"		01-04-14	3 / 3
			REV:
			A



LADDER  
6400-F-1000  
DETAIL #2

SUPPORTS  
6400-F-1000  
DETAIL #5

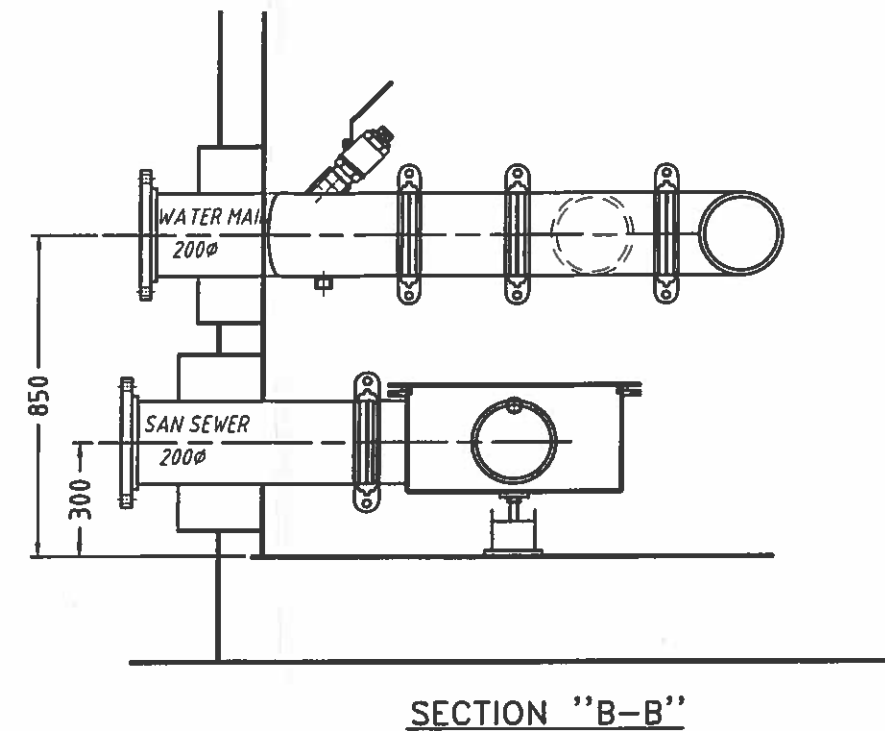
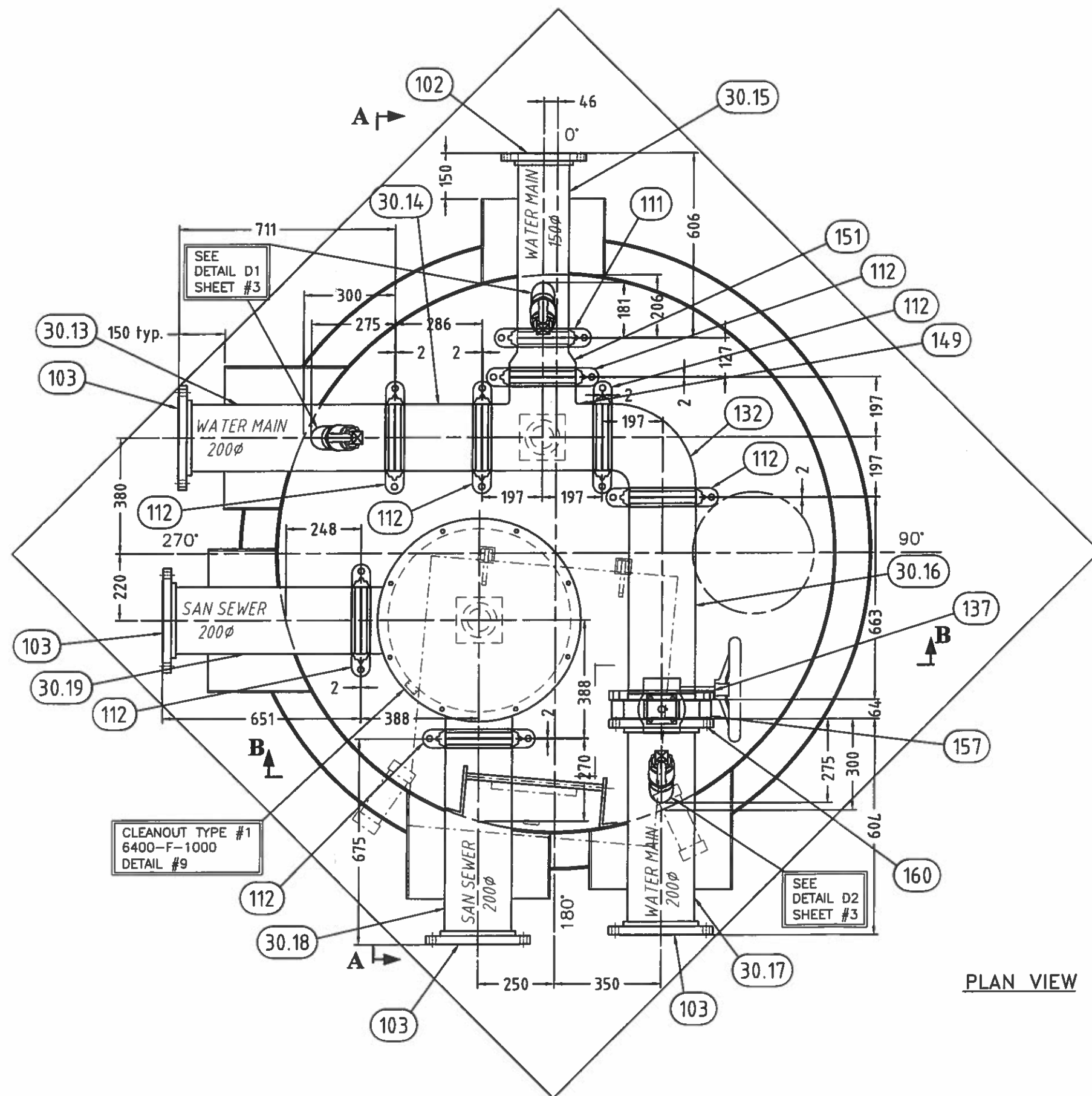
SEE  
DETAIL D3  
SHEET #3




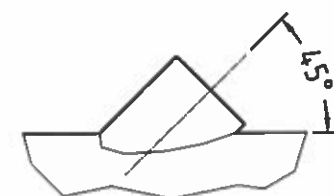
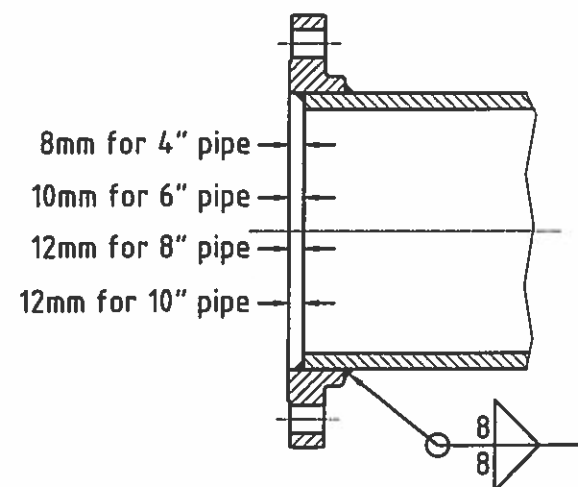
#### GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE: BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

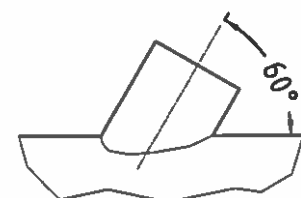
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com</p> <p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC.</p> <p>THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p> <p>CLIENT:  CUSTOMER: <b>GOVERNEMENT OF NUNAVUT</b></p> <p>TITRE:  <b>ACCESS VAULT AV30  NEW UTILIDOR DESIGN RESOLUTE BAY, NU</b></p> <p>DESSIN No.:  DRAWING No: <b>6400-F-AV30</b></p> <p>DESS. PAR:  DRAWN BY: <b>G.L.</b></p> <p>SCALE:  X/X" = X"</p> <p>QTE:  QTY: <b>1</b></p> <p>DATE:  <b>01-04-14</b></p> <p>FEUILLE:  SHEET: <b>1 / 3</b></p> <p>REV:  <b>A</b></p>			



A	ISSUED FOR COMMENTS	01-04-14	G.L.	
REV	DESCRIPTION	DATE	DESS/DRAWN	
 <p>Falco Technologies Inc., a company of</p> <h1>BERLIE-FALCO</h1>		1245 rue industrielle La Prairie (Quebec) JSR 2E4 Tel (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com		
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CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT		
TITRE: TITLE:		ACCESS VAULT AV30 NEW UTILIDOR DESIGN RESOLUTE BAY , NU		
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:		
6400-F-AV30		G.L.		
..... SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X"/X" = X"	1	01-04-14	2 / 3	A




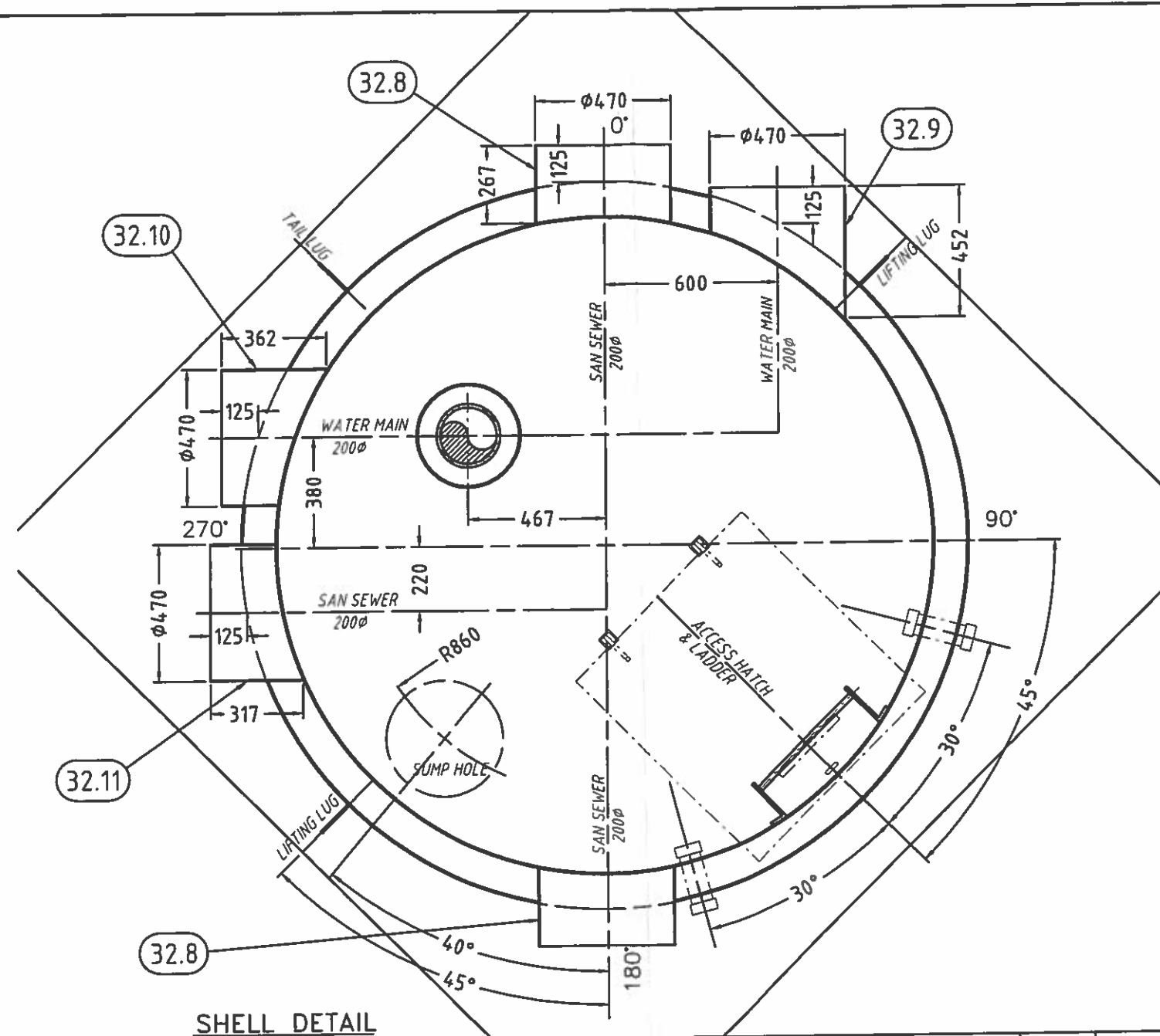
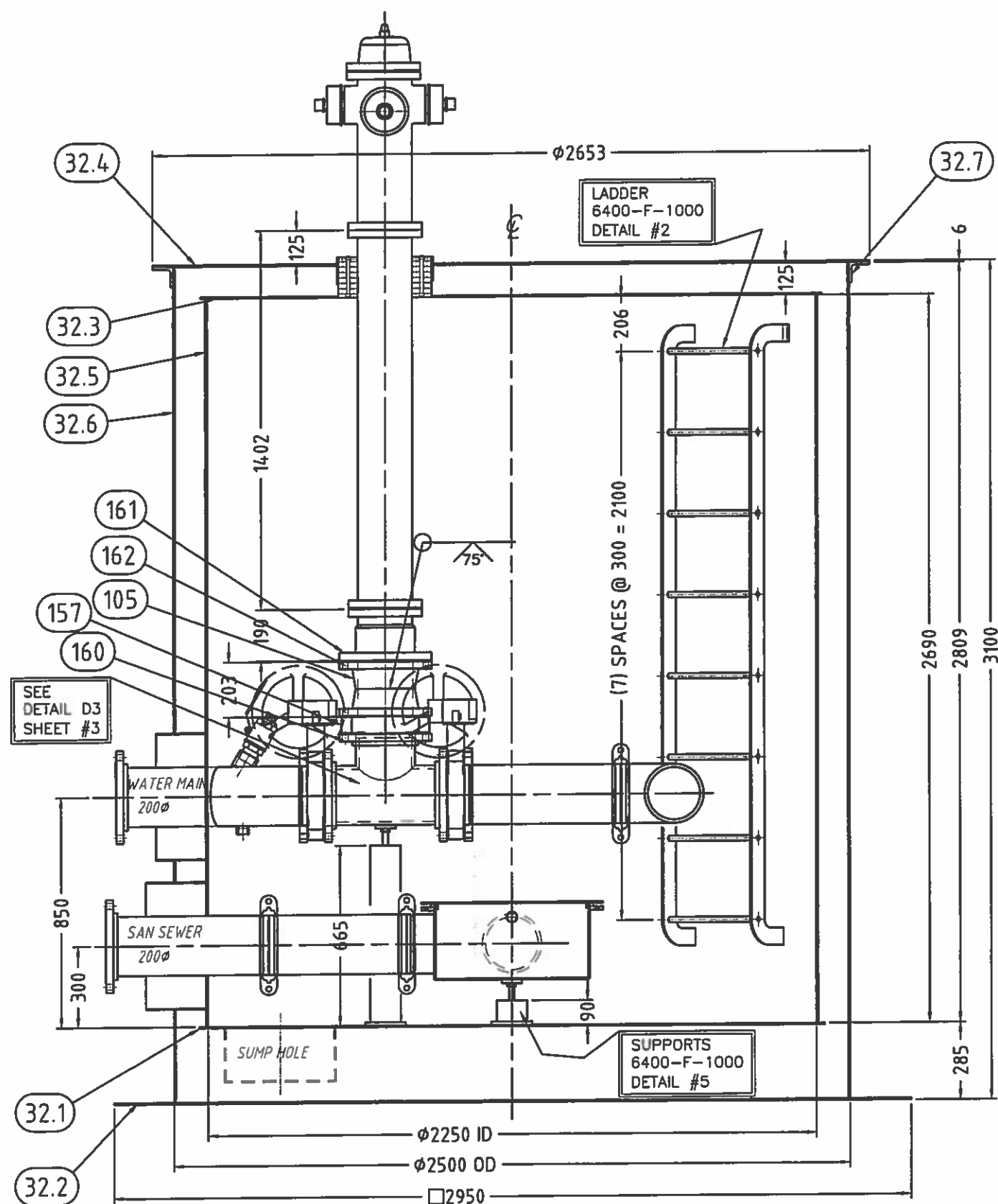
DETAIL #D1



DETAIL #D2

Item	Qty	Description	Material
30.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
30.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
30.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
30.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
30.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 3590mm LG.	A36
30.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 3978mm LG.	A36
30.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
30.8	1	PL. 1/4" THK. x 402 x 1456mm LG.	A36
30.9	1	PL. 1/4" THK. x 275 x 1255mm LG.	A36
30.10	1	PL. 1/4" THK. x 388 x 1456mm LG.	A36
30.11	1	PL. 1/4" THK. x 347 x 1456mm LG.	A36
30.12	1	PL. 1/4" THK. x 337 x 1456mm LG.	A36
30.13	1	PIPE 8" SCH.80 x 699mm LG. vic groove 1 end	A-53-B
30.14	1	PIPE 8" SCH.80 x 286mm LG. vic groove 2 end	A-53-B
30.15	1	PIPE 6" SCH.80 x 596mm LG. vic groove 1 end	A-53-B
30.16	1	PIPE 8" SCH.80 x 663m LG. vic groove 2 end	A-53-B
30.17	1	PIPE 8" SCH.80 x 685mm LG. vic groove 1 end	A-53-B
30.18	1	PIPE 8" SCH.80 x 663mm LG. vic groove 1 end	A-53-B
30.19	1	PIPE 8" SCH.80 x 639mm LG. vic groove 1 end	A-53-B
102	1	FLANGE SORF 6" - 150#	SA 105
103	4	FLANGE SORF 8" - 150#	SA 105
111	1	6" VICTAULIC COUPLING STYLE 77	GALV C.S.
112	7	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	1	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
149	1	8" VICTAULIC TEE, #20	GALV.
151	1	8" @ 6" VICTAULIC CONCENTRIC REDUCER, #50	GALV C.S.
157	1	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	16	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.

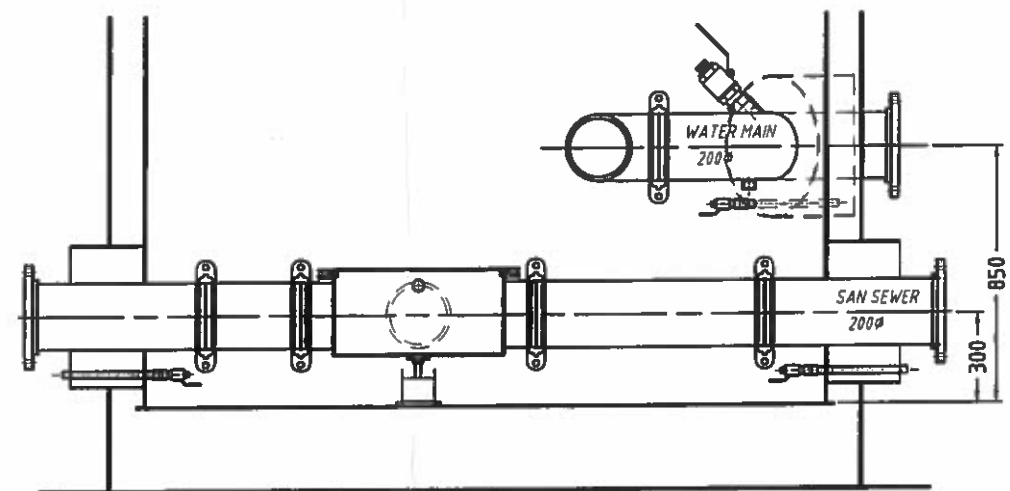
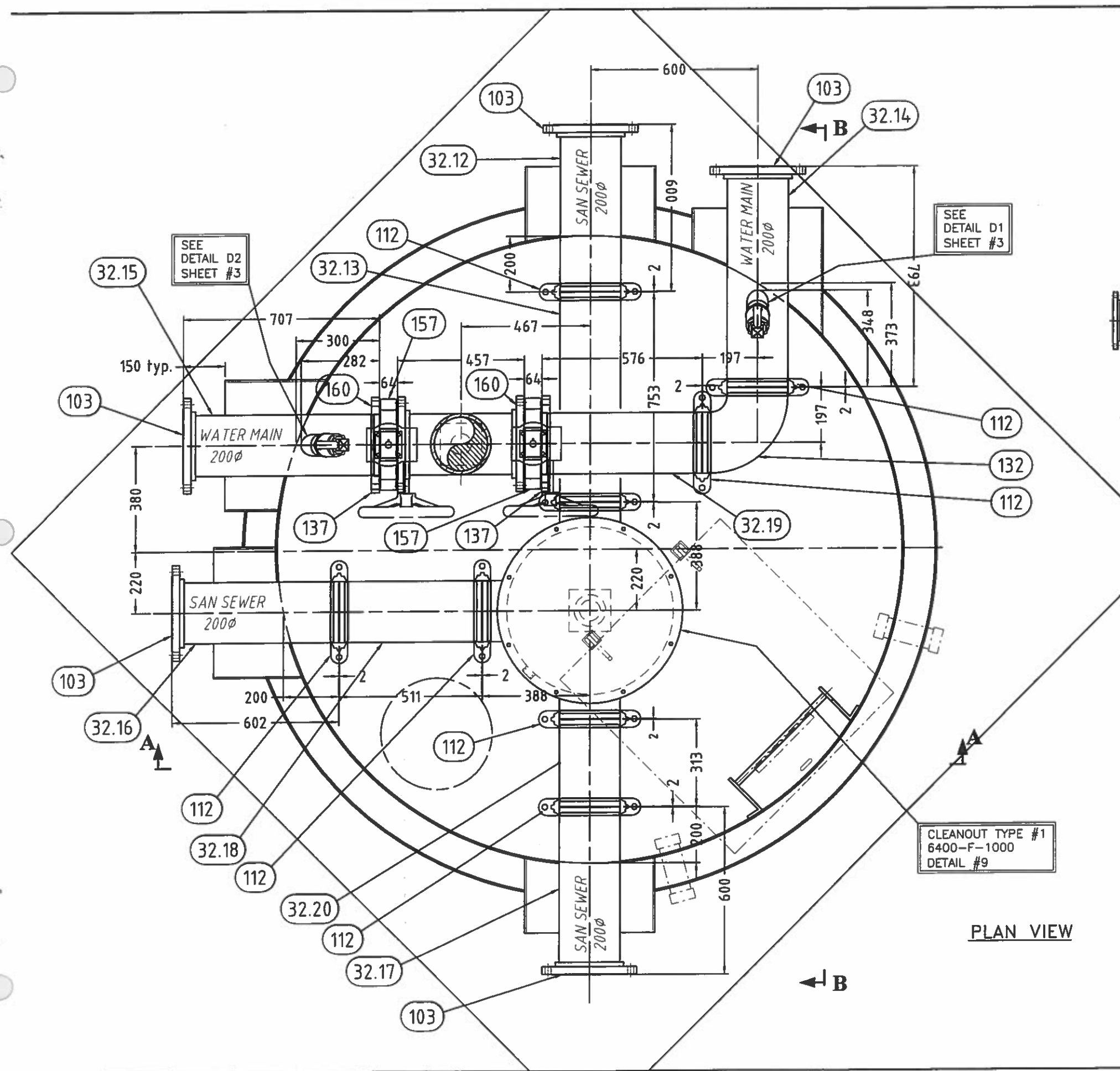
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC. THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.			
CLIENT: CUSTOMER: <b>GOVERNEMENT OF NUNAVUT</b>			
TITRE: TITLE: <b>ACCESS VAULT AV30 NEW UTILIDOR DESIGN RESOLUTE BAY, NU</b>			
DESSIN No.: DRAWING No: <b>6400-F-AV30</b>		DESS. PAR: DRAW BY: <b>G.L.</b>	
..... SCALE: <b>X/X" = X"</b>	QTE: QTY: <b>1</b>	DATE: <b>01-04-14</b>	FEUILLE: SHEET: <b>3 / 3</b>
			REV: <b>A</b>



#### GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of</p> <p><b>BERLIE-FALCO</b></p> <p>1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com</p> <p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC.</p> <p>THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p> <p>CLIENT: GOVERNEMENT OF NUNAVUT</p> <p>CUSTOMER:</p> <p>TITLE: ACCESS VAULT AV32 NEW UTILIDOR DESIGN RESOLUTE BAY, NU</p> <p>DESSIN No.: 6400-F-AV32</p> <p>DRAWING No.: 6400-F-AV32</p> <p>DESS. PAR: G.L.</p> <p>DRAWBY:</p> <p>SCALE: X/X" = X"</p> <p>QTE: 1</p> <p>DATE: 01-04-14</p> <p>FEUILLE: 1 / 3</p> <p>SHEET: 1 / 3</p> <p>REV: A</p>			



SECTION "C-C"

PLAN VIEW

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
<p><b>Falco Technologies Inc., a company of</b>  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com</p>			
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<p>CLIENT:  CUSTOMER: <b>GOVERNEMENT OF NUNAVUT</b></p>			
<p>TITRE:  <b>ACCESS VAULT AV32  NEW UTILIDOR DESIGN RESOLUTE BAY, NU</b></p>			
<p>DESSIN No.:  DRAWING No: <b>6400-F-AV32</b></p>		<p>DESS. PAR:  DRAW BY: <b>G.L.</b></p>	
<p>SCALE:  <b>X/X" = X"</b></p>	<p>QTE:  <b>1</b></p>	<p>DATE:  <b>01-04-14</b></p>	<p>FEUILLE:  SHEET: <b>2 / 3</b></p>
			<p>REV:  <b>A</b></p>



8mm for 4" pipe

10mm for 6" pipe


12mm for 8" pipe

12mm for 10" pipe

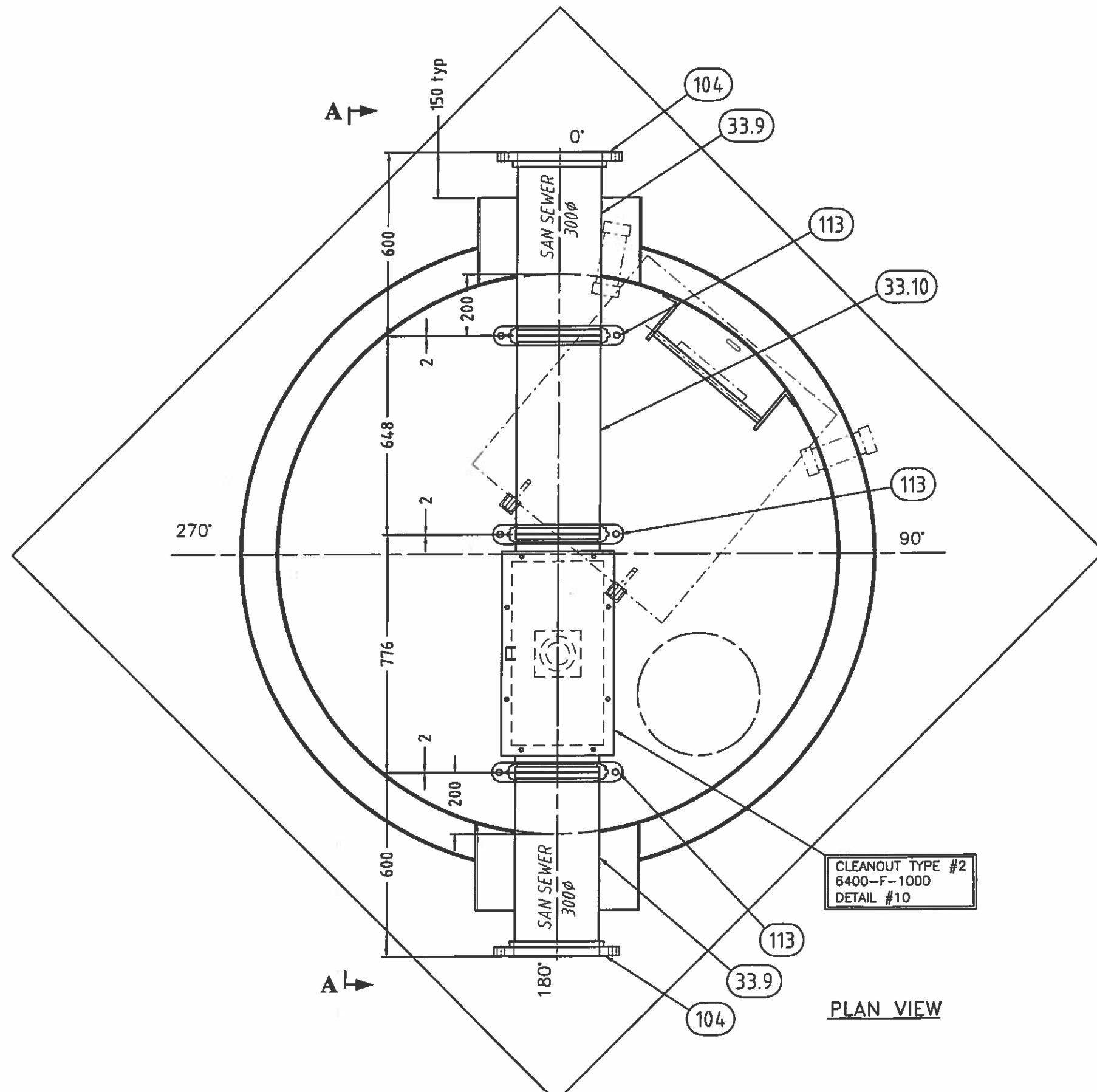
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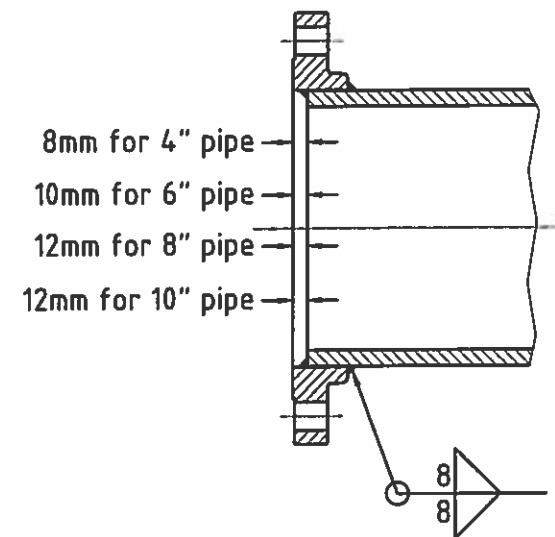
A	ISSUED FOR COMMENTS	01-04-14	G.L.		
REV	DESCRIPTION	DATE	DESS/DRAWN		
 <p>Falco Technologies Inc., a company of <b>BERLIE-FALCO</b></p>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel. (450) 444-0566 Fax (450) 444-2227 <a href="http://www.berliefalco.com">www.berliefalco.com</a>			
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CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT			
TITRE: TITLE:		ACCESS VAULT AV32 NEW UTILIDOR DESIGN RESOLUTE BAY , NU			
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:			
6400-F-AV32		G.L.			
.....		FEUILLE:		REV:	
SCALE:		QTE:		SHEET:	
X/X" = X"		QTY:		3 / 3	
1		DATE:		A	
01-04-14					






PLAN VIEW

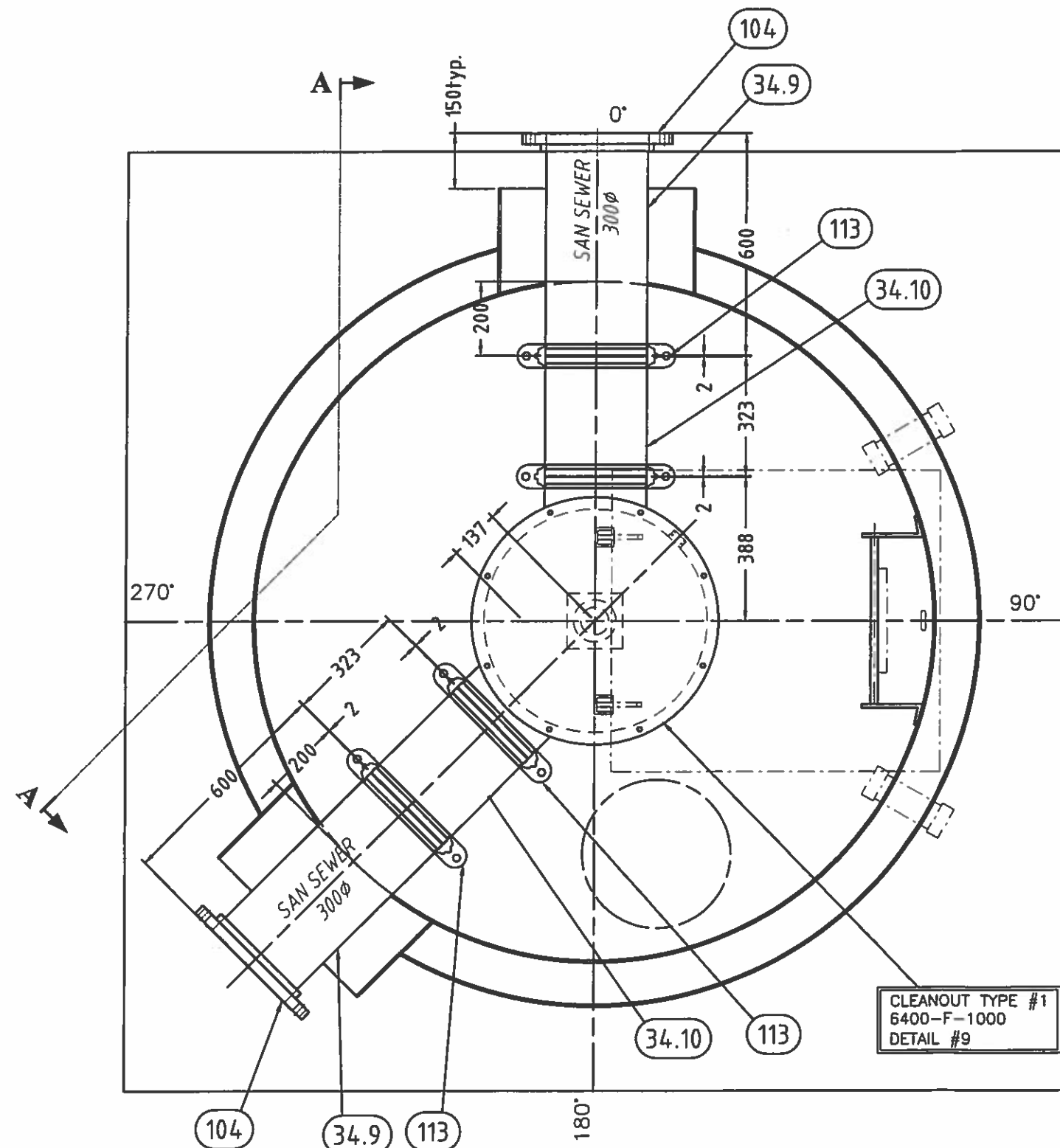
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berriefalco.com	
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CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV33	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No:		DESS. PAR:	
DRAWING No: 6400-F-AV33		DRAW BY: G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE: X/X" = X"	QTY: 1	01-04-14	SHEET: 1 / 3
			REV: A




Item	Qty	Description	Material
33.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
33.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
33.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
33.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
33.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 2760mm LG.	A36
33.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 3148mm LG.	A36
33.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
33.8	2	PL. 1/4" THK. x 281 x 1654mm LG.	A36
33.9	2	PIPE 10" SCH.80 x 588mm LG. vic groove 1 end	A-53-B
33.10	1	PIPE 10" SCH.80 x 648mm LG. vic groove 2 end	A-53-B
104	2	FLANGE SORF 10" - 150#	SA 105
113	3	10" VICTAULIC COUPLING STYLE 77	GALV C.S.

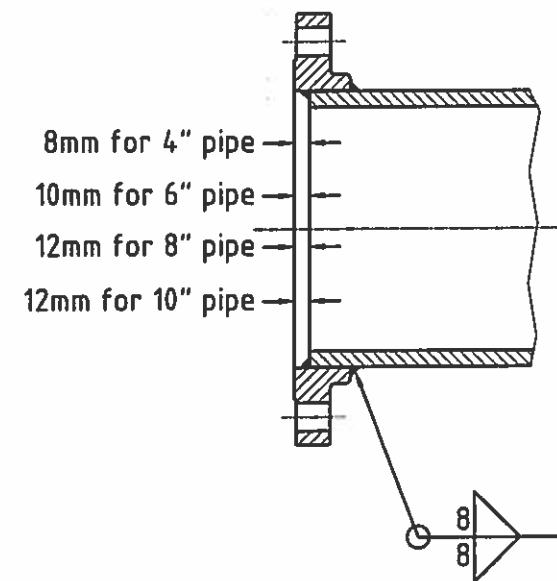
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com	
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CLIENT:			
CUSTOMER: GOUVERNEMENT OF NUNAVUT			
TITRE:			
TITLE: ACCESS VAULT AV33 NEW UTILIDOR DESIGN RESOLUTE BAY , NU			
DESSIN No. DRAWING No: 6400-F-AV33		DESS. PAR: DRAW BY: G.L.	
..... SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 3 / 3
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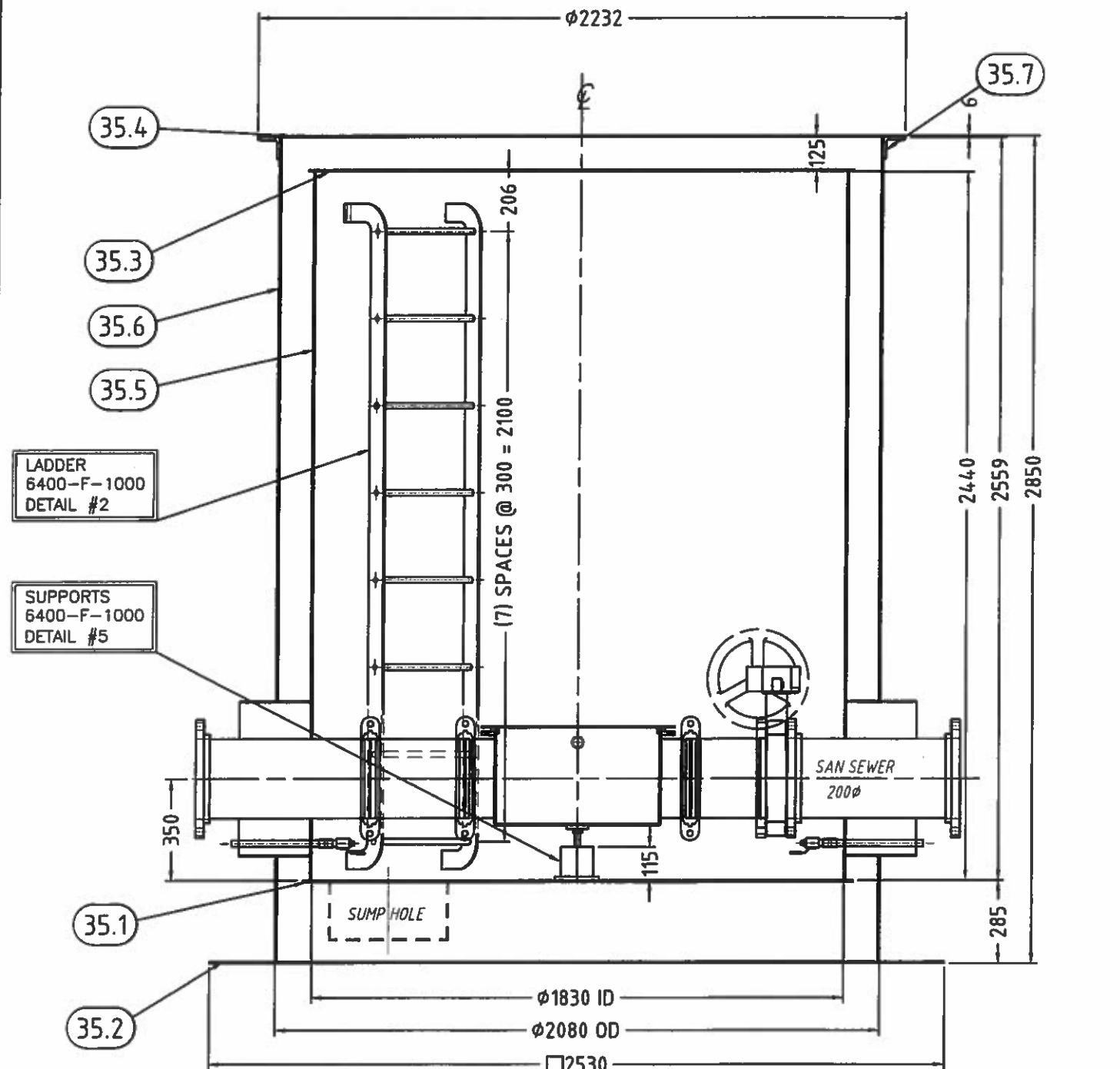
PLAN VIEW

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <p>Falco Technologies Inc., a company of</p> <h1>BERLIE-FALCO</h1>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT: CUSTOMER:			
GOVERNEMENT OF NUNAVUT			
TITRE: TITLE:			
ACCESS VAULT AV34 NEW UTILIDOR DESIGN RESOLUTE BAY , NU			
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV34		DRAW BY: G.L.	
..... SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:
X/X" = X"	1	01-04-14	2 / 3
			REV: A

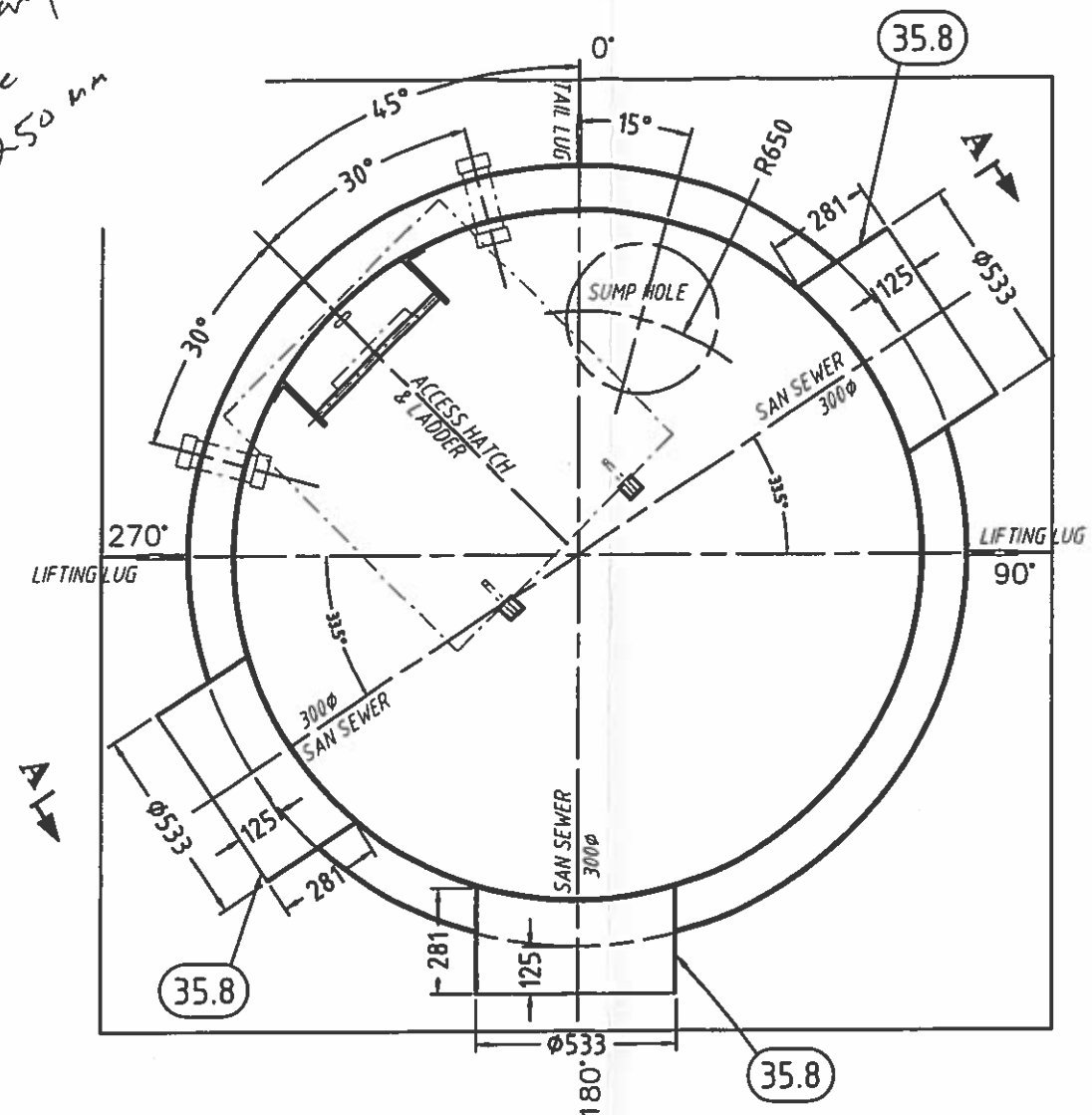


Item	Qty	Description	Material
34.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
34.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
34.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
34.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
34.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 2340mm LG.	A36
34.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 2728mm LG.	A36
34.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
34.8	2	PL. 1/4" THK. x 281 x 1654mm LG.	A36
34.9	2	PIPE 10" SCH.80 x 588mm LG. vic groove 1 end	A-53-B
34.10	2	PIPE 10" SCH.80 x 323mm LG. vic groove 2 end	A-53-B
104	2	FLANGE SORF 10" - 150#	SA 105
113	4	10" VICTAULIC COUPLING STYLE 77	GALV C.S.

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CLIENT: CUSTOMER: <b>GOVERNEMENT OF NUNAVUT</b>			
TITRE: TITLE: <b>ACCESS VAULT AV34 NEW UTILIDOR DESIGN RESOLUTE BAY , NU</b>			
DESSIN No.: DRAWING No: <b>6400-F-AV34</b>		DESS. PAR: DRAWBY: <b>G.L.</b>	
..... SCALE: <b>X/X" = X"</b>	QTE: QTY: <b>1</b>	DATE: <b>01-04-14</b>	FEUILLE: SHEET: <b>3 / 3</b>
			REV: <b>A</b>




SECTION "A-A"



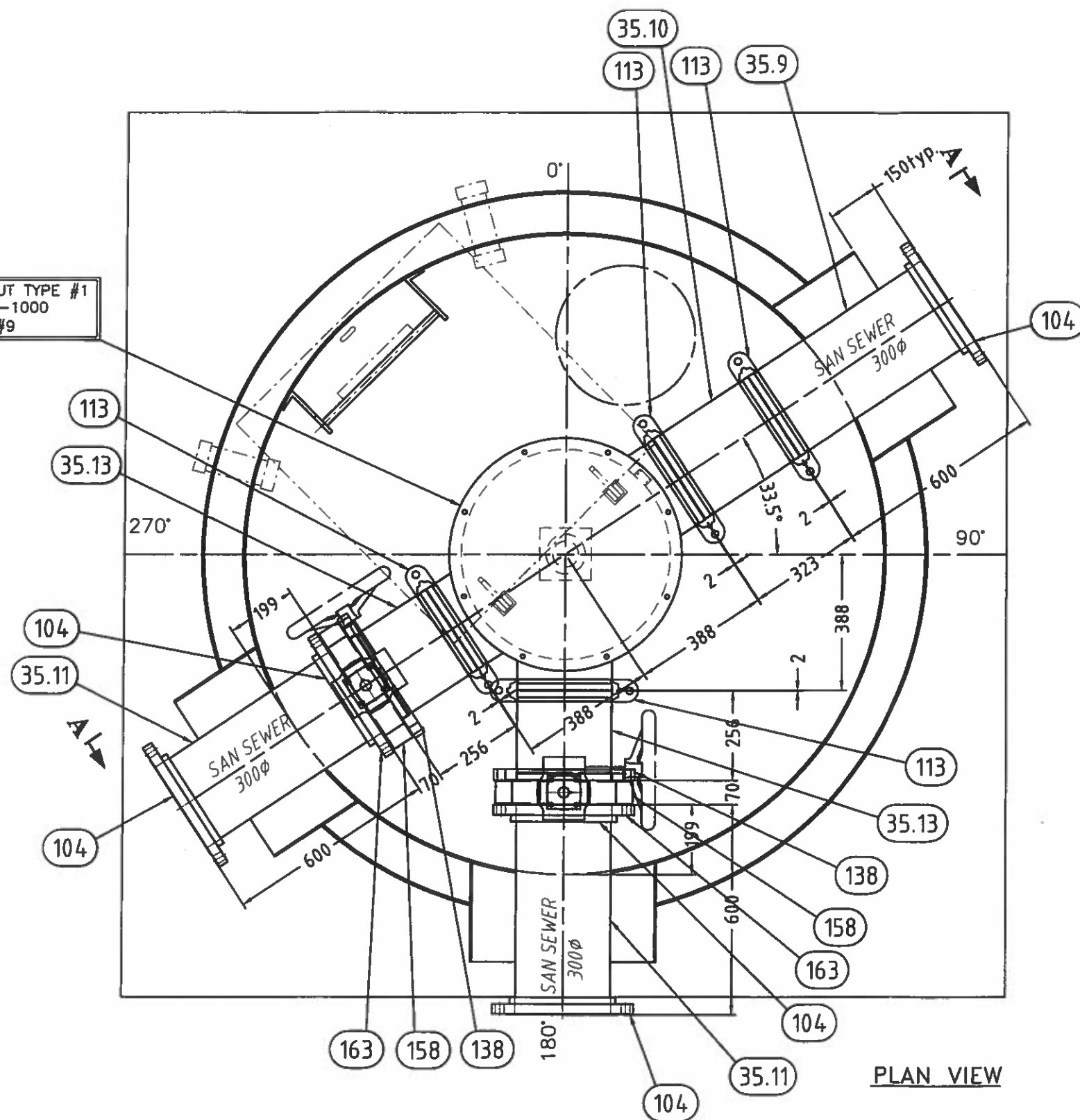
GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS


A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <p>Falco Technologies Inc., a company of <b>BERLIE-FALCO</b></p>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT	
TITRE: TITLE:		ACCESS VAULT AV35 NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:	
6400-F-AV35		G.L.	
..... SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:
X/X" = X"	1	01-04-14	1 / 3
			REV: A

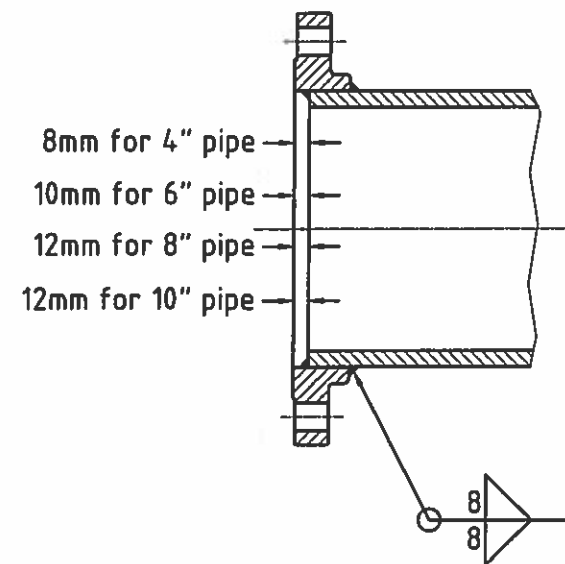


CLEANOUT TYPE #1  
6400-F-1000  
DETAIL #9




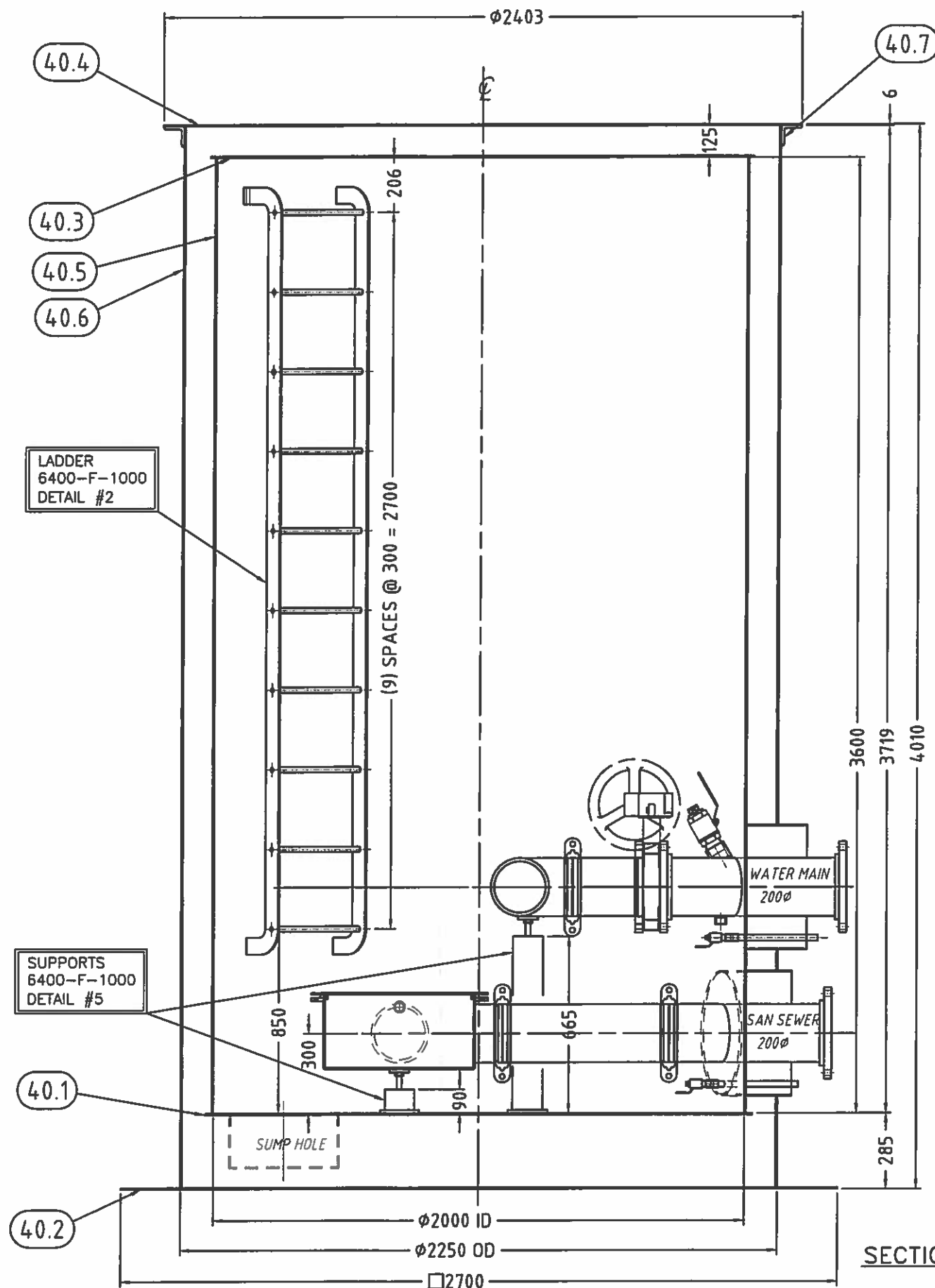
PLAN VIEW

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>  <b>Falco Technologies Inc., a company of</b>  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com </p>			
<p> CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA  RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT  PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS  DE FALCO TECHNOLOGIES INC.  THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED  OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS  OF FALCO TECHNOLOGIES INC. </p>			
<p>CLIENT: GOVERNEMENT OF NUNAVUT</p>			
<p>TITRE: ACCESS VAULT AV35 TITLE: NEW UTILIDOR DESIGN RESOLUTE BAY , NU</p>			
<p>DESSIN No.: 6400-F-AV35 DRAWING No:</p>		<p>DESS. PAR.: G.L. DRAW BY:</p>	
<p>..... SCALE: X/X" = X"</p>	<p>QTE: 1 QTY:</p>	<p>DATE: 01-04-14</p>	<p>FEUILLE: 2 / 3 SHEET: A</p>

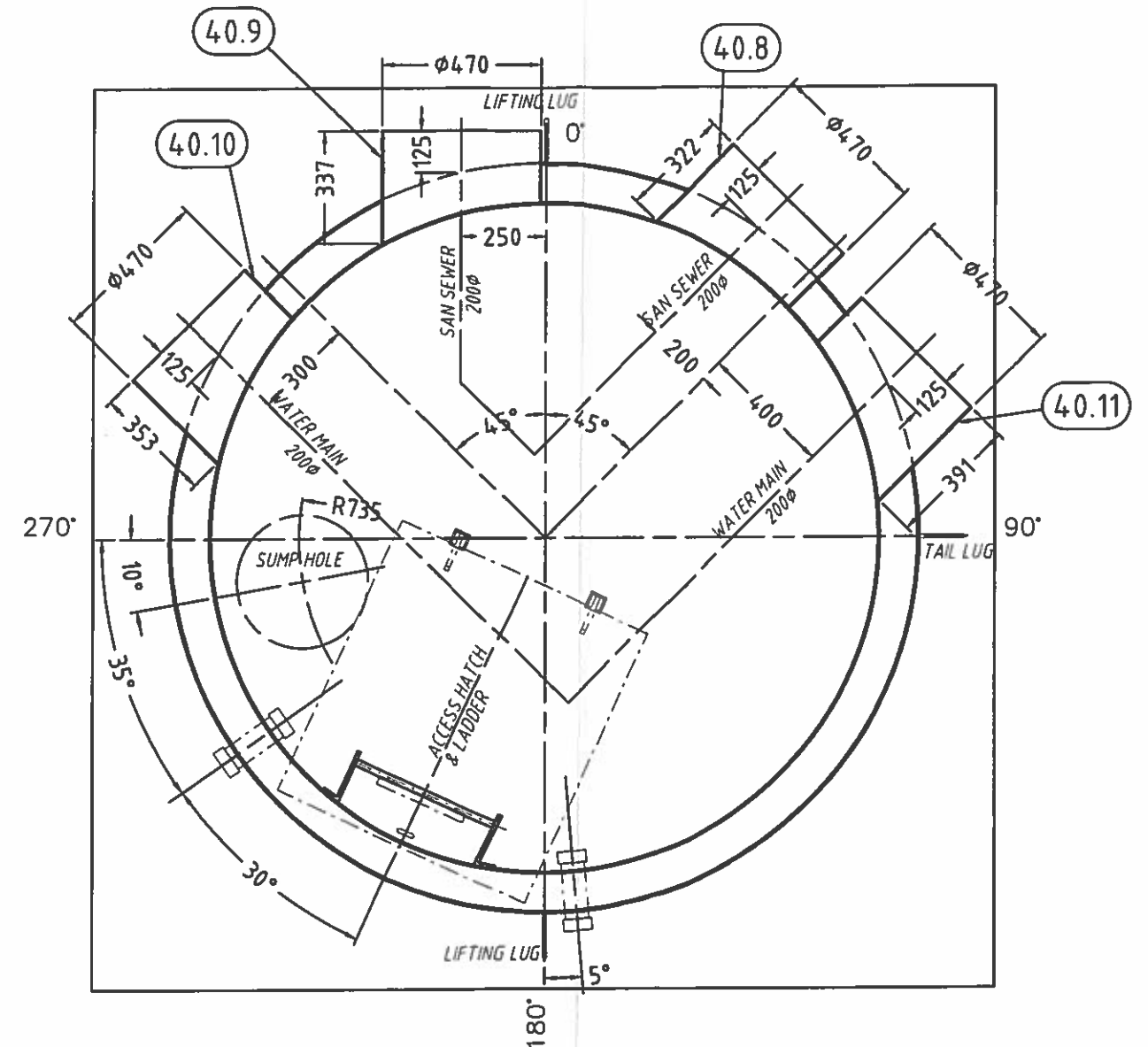


Item	Qty	Description	Material
35.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
35.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
35.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
35.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
35.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 2440mm LG.	A36
35.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 2828mm LG.	A36
35.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
35.8	3	PL. 1/4" THK. x 281 x 1654mm LG.	A36
35.9	1	PIPE 10" SCH.80 x 588mm LG. vic groove 1 end	A-53-B
35.10	1	PIPE 10" SCH.80 x 323mm LG. vic groove 2 end	A-53-B
35.11	2	PIPE 10" SCH.80 x 576mm LG.	A-53-B
35.13	2	PIPE 10" SCH.80 x 256mm LG. vic groove 2 end	A-53-B
104	5	FLANGE SORF 10" - 150#	SA 105
113	4	10" VICTAULIC COUPLING STYLE 77	GALV C.S.
138	2	10" VICTAULIC FLANGE STYLE 741	GALV C.S.
158	2	10" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
163	48	BOLT 7/8-NC x 2 1/2"LG + FLAT WASHER	PLATED C.S.

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV35	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV35		DRAW BY: G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE: X/X" = X"	QTY: 1	01-04-14	SHEET: 3 / 3
			REV: A



SECTION "A-A"

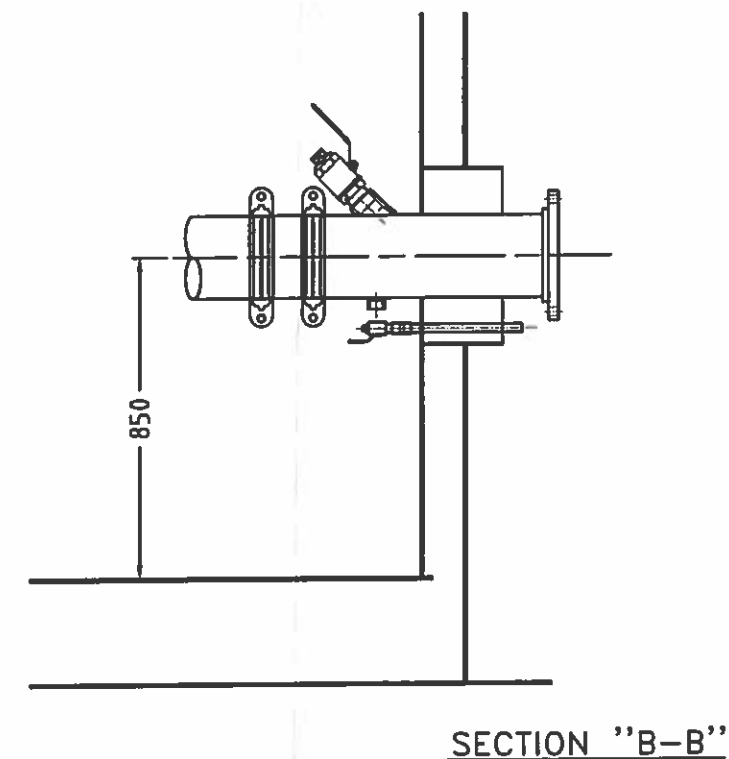
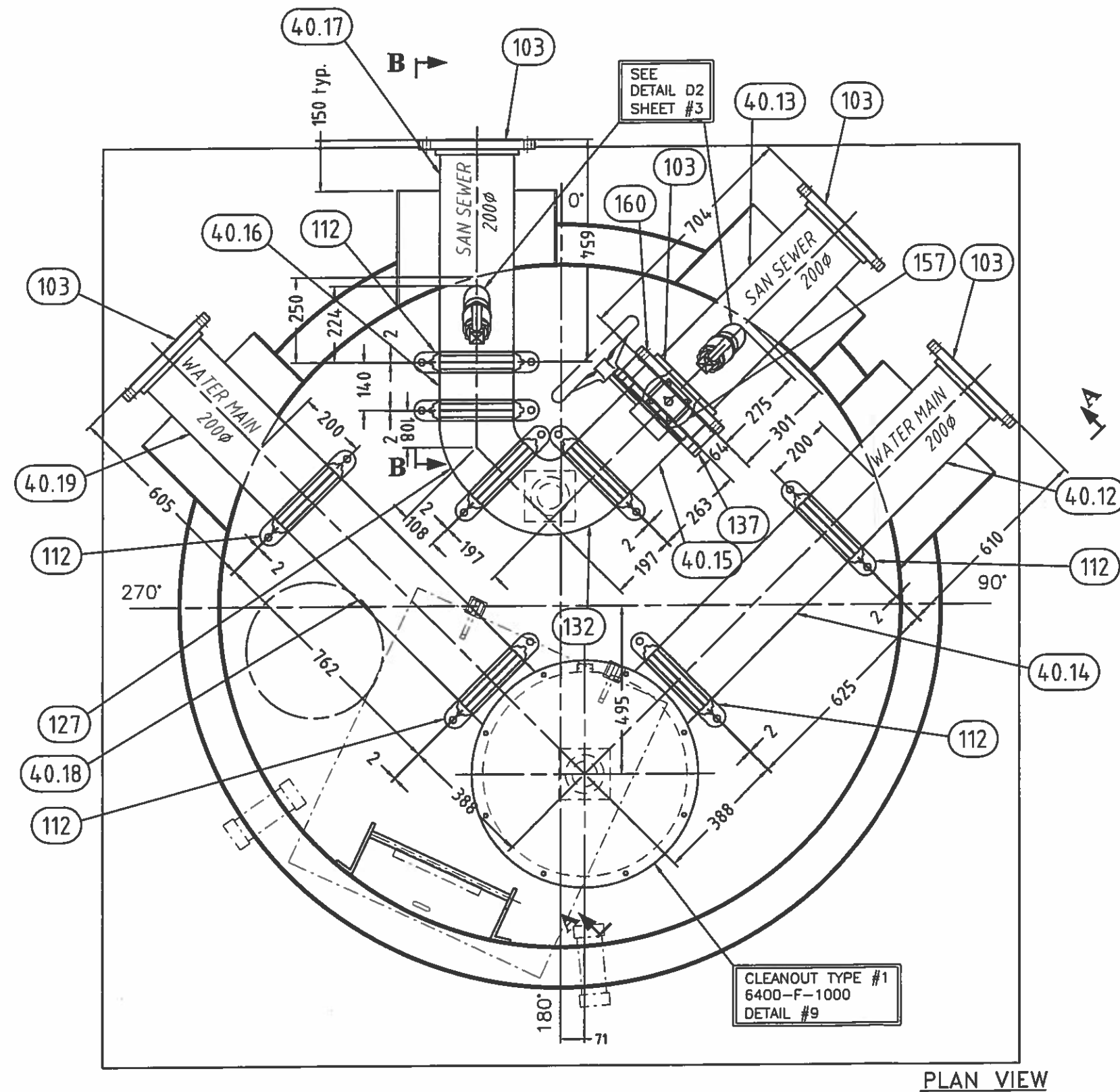



SHELL DETAIL

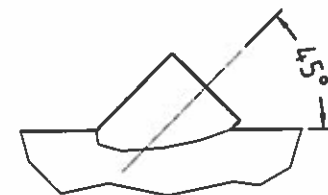
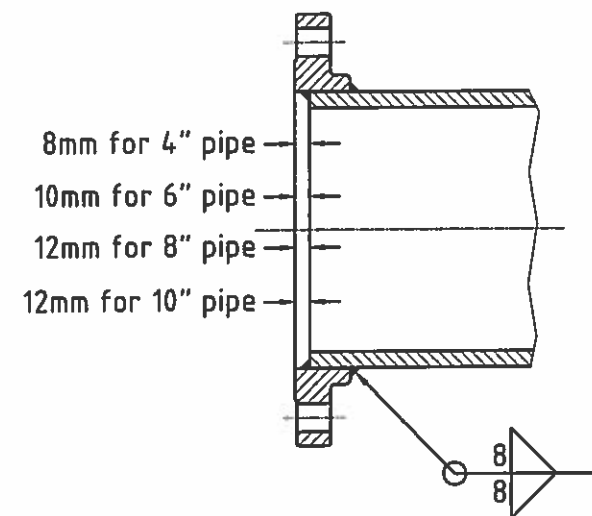
GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE: BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel (450) 444-0566  Fax (450) 444-2227  www.berliefalco.com</p>			
<p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC.  THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p>			
CLIENT:			
CUSTOMER: GOVERNEMENT OF NUNAVUT			
TITRE:			
TITLE: ACCESS VAULT AV40 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.:		DESS PAR:	
DRAWING No.:		DRAW BY:	
6400-F-AV40		G.L.	
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	QTY:	01-04-14	SHEET:
	1		1 / 3
			A



A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b></p>		<p>1245 rue Industrielle          La Prairie (Quebec)          JSR 2E4          Tel (450) 444-0566          Fax (450) 444-2227          www.berliefalco.com</p>	
<p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA          RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT          PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS          DE FALCO TECHNOLOGIES INC.          THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED          OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS          OF FALCO TECHNOLOGIES INC.</p>			
CLIENT: CUSTOMER:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV40	
TITLE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:	
6400-F-AV40		G.L.	
..... SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:
X/X" = X"	1	01-04-14	2 / 3
			REV: A




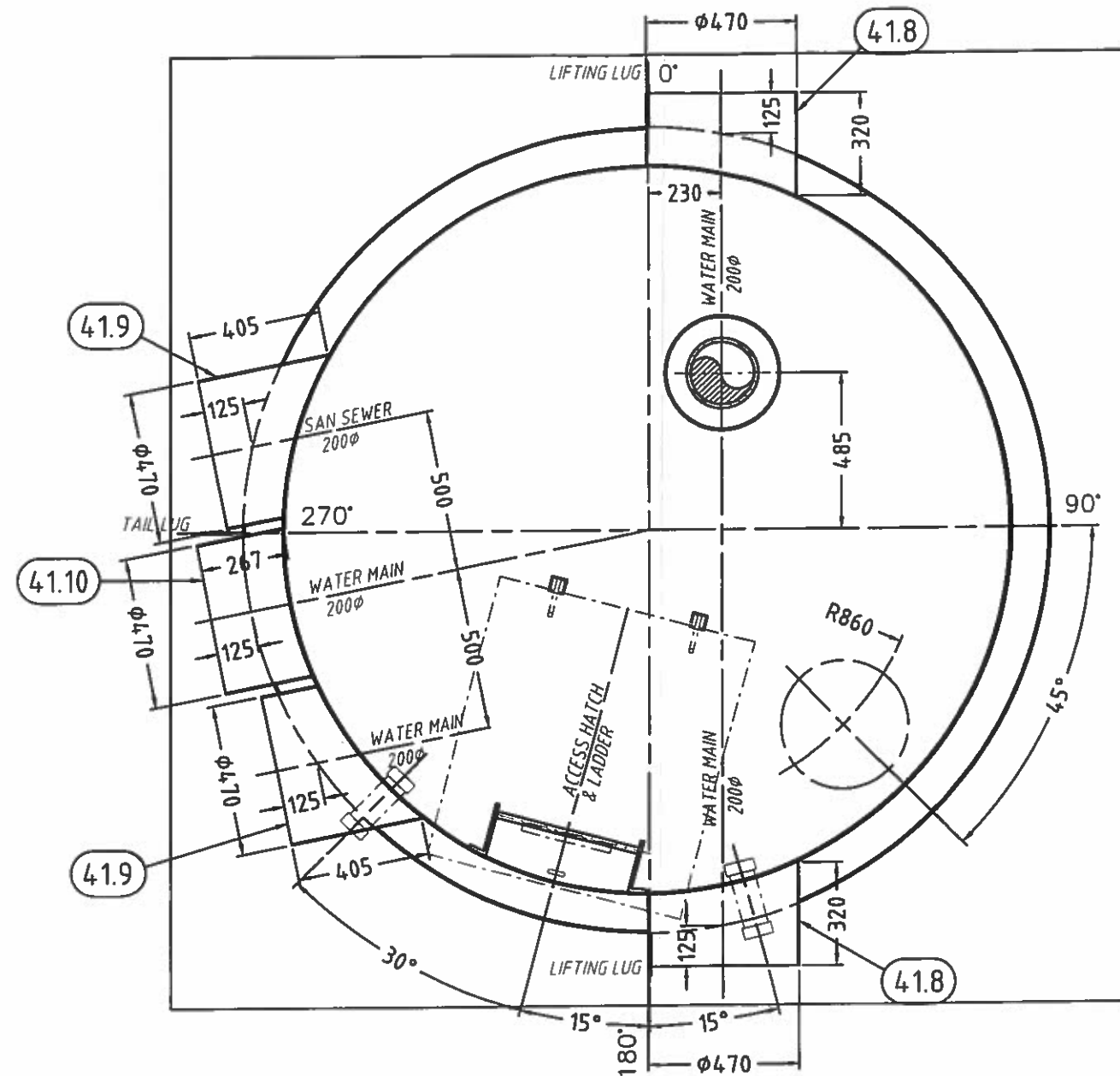
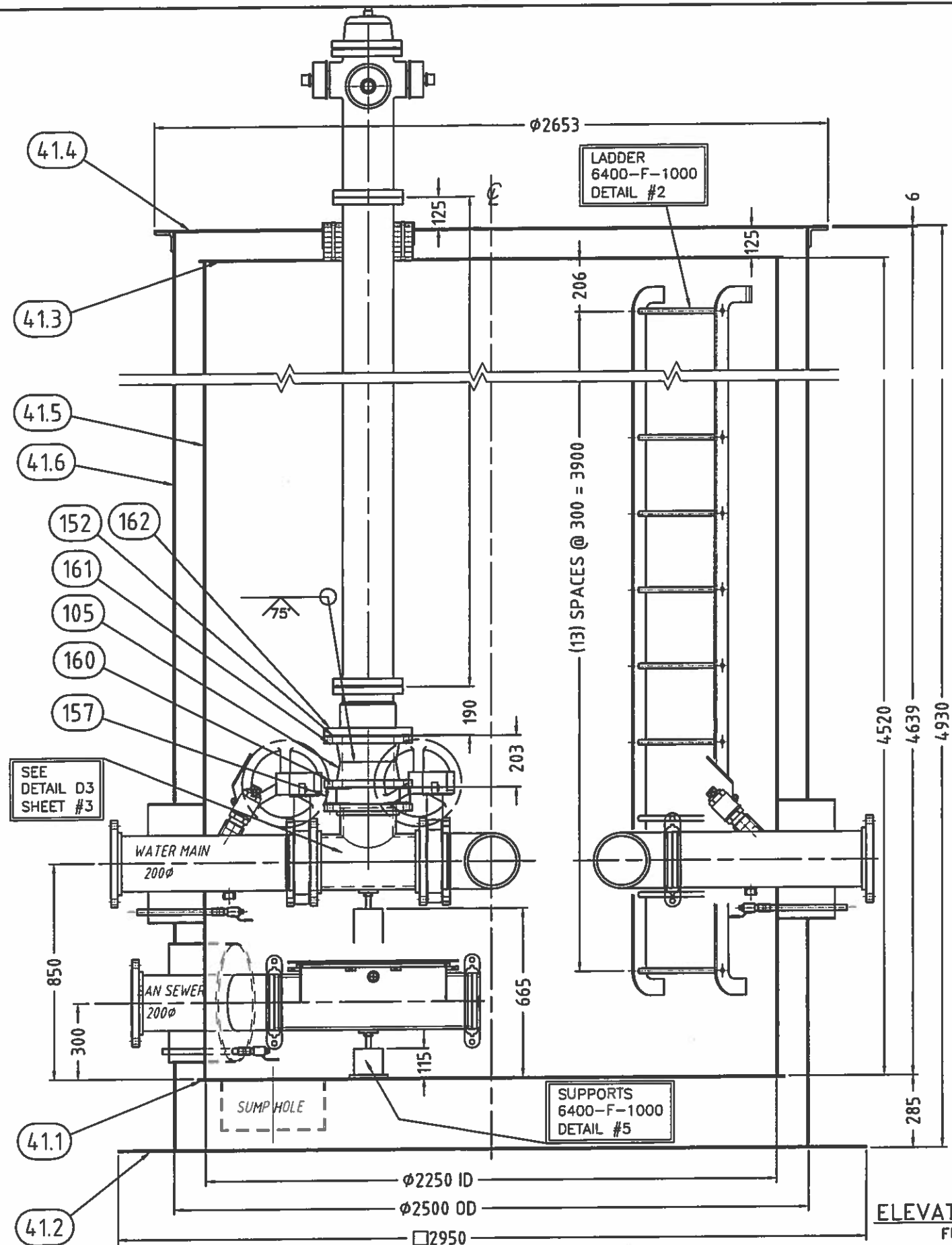
DETAIL #D1



DETAIL #D2

Item	Qty	Description	Material
40.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2062mm	A36
40.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2700mm x 2700mm	A36
40.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2048mm	A36
40.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2403mm	A36
40.5	1	INTERNAL SHELL PL. 1/4" THK. x 6303mm x 3600mm LG.	A36
40.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7048mm x 3988mm LG.	A36
40.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
40.8	1	PL. 1/4" THK. x 322 x 1456mm LG.	A36
40.9	1	PL. 1/4" THK. x 337 x 1456mm LG.	A36
40.10	1	PL. 1/4" THK. x 353 x 1456mm LG.	A36
40.11	1	PL. 1/4" THK. x 391 x 1456mm LG.	A36
40.12	1	PIPE 8" SCH.80 x 598mm LG. vic groove 1 end	A-53-B
40.13	1	PIPE 8" SCH.80 x 680mm LG.	A-53-B
40.14	1	PIPE 8" SCH.80 x 625mm LG. vic groove 2 end	A-53-B
40.15	1	PIPE 8" SCH.80 x 263mm LG. vic groove 2 end	A-53-B
40.16	1	PIPE 8" SCH.80 x 140mm LG. vic groove 2 end	A-53-B
40.17	1	PIPE 8" SCH.80 x 654mm LG. vic groove 1 end	A-53-B
40.18	1	PIPE 8" SCH.80 x 762mm LG. vic groove 2 end	A-53-B
40.19	1	PIPE 8" SCH.80 x 593mm LG. vic groove 1 end	A-53-B
103	5	FLANGE SORF 8" - 150#	SA 105
112	8	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
127	1	8" VICTAULIC ELBOW 45°, #11	GALV C.S.
132	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	1	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
157	1	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	16	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.

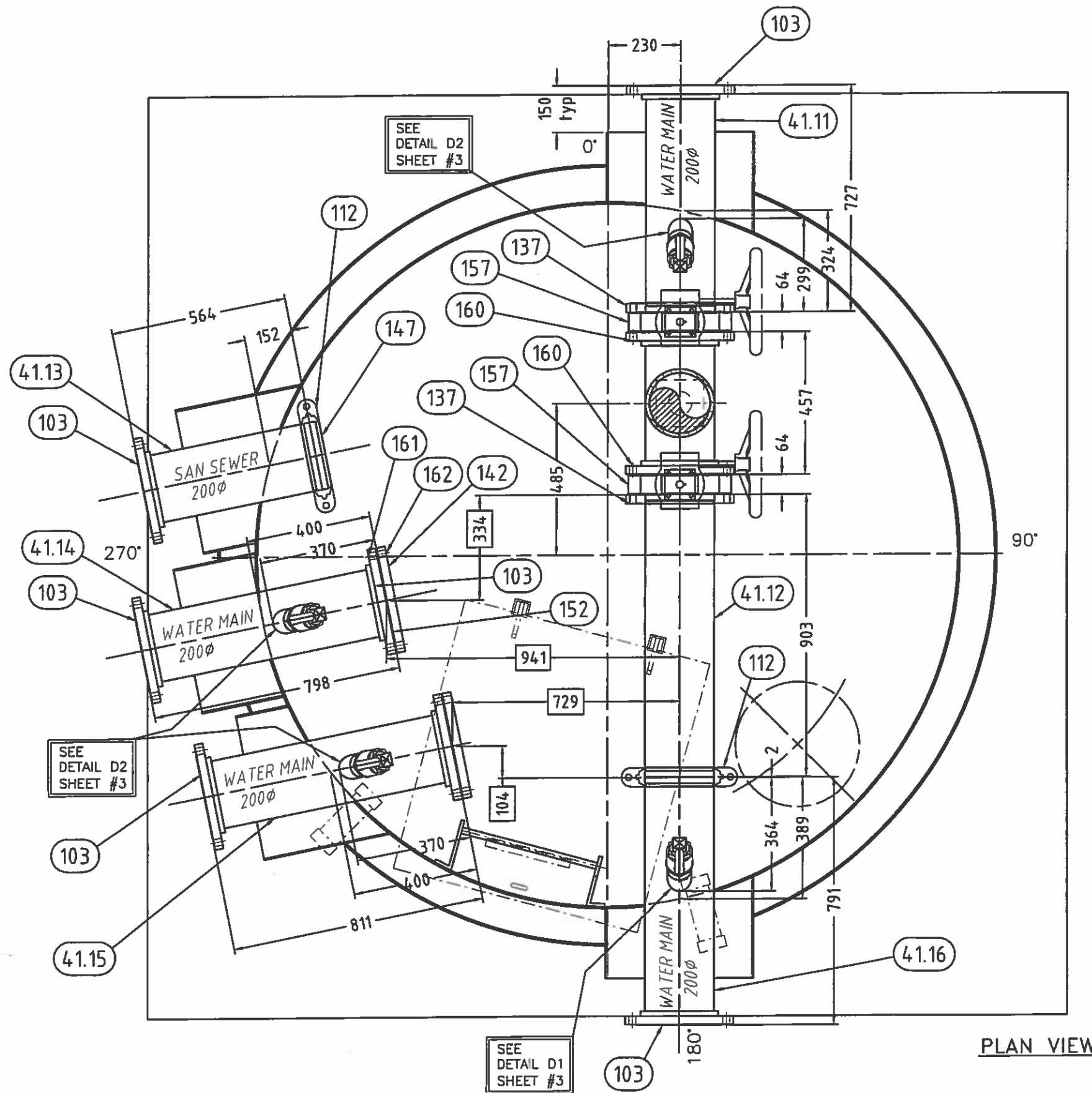
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b> 1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com			
CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC. THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.			
CLIENT: CUSTOMER: GOVERNEMENT OF NUNAVUT			
TITRE: ACCESS VAULT AV40 TITLE: NEW UTILIDOR DESIGN RESOLUTE BAY , NU			
DESSIN No.: DRAWING No: 6400-F-AV40		DESS PAR: DRAW BY: G.L.	
..... SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 3 / 3
			REV: A



#### GENERAL NOTES:

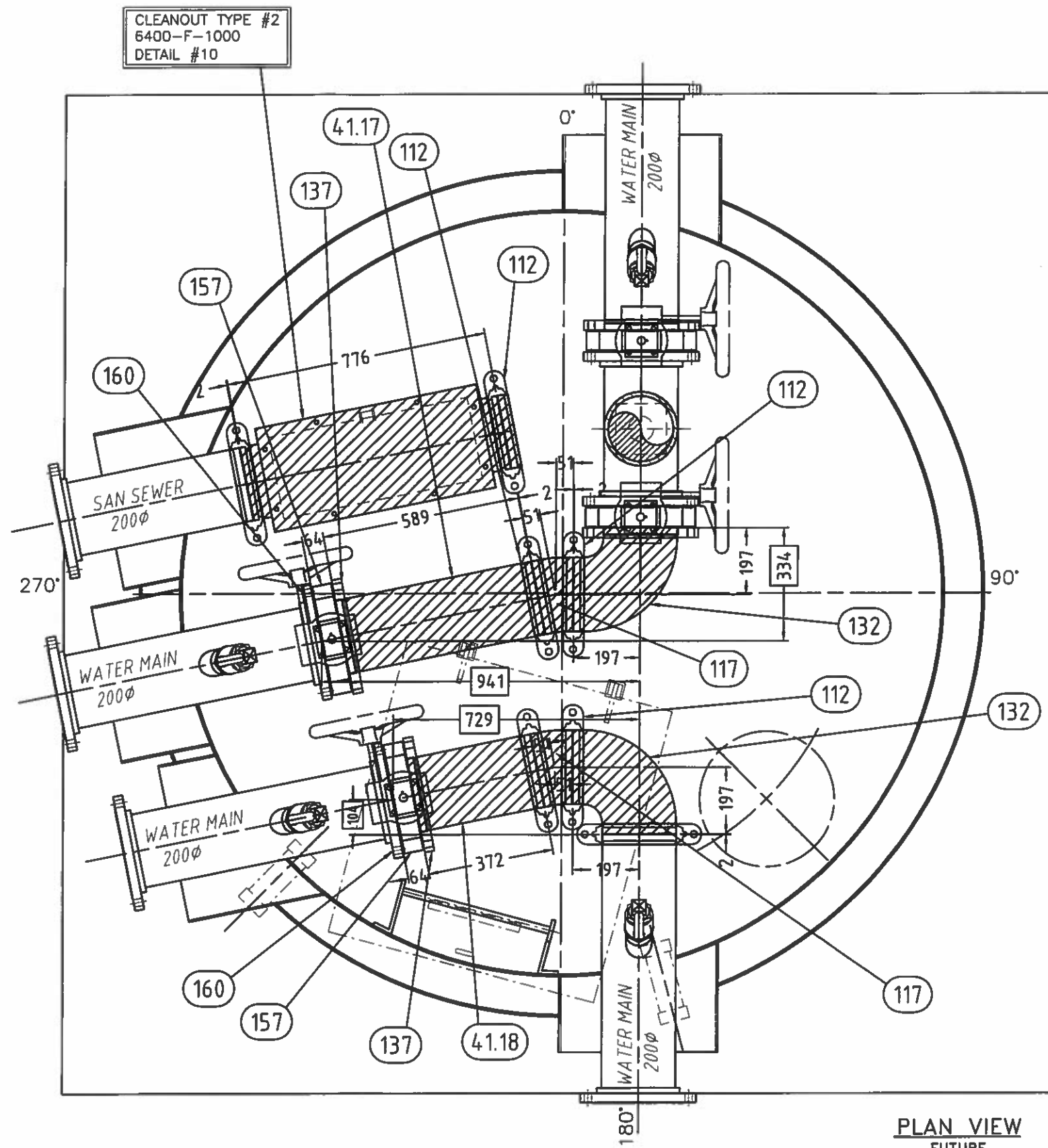
- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS


A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com</p> <p>CE DOCUMENT EST LA PROPRIÉTÉ DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNÉ SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ÊTRE UTILISÉ, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PRÉJUDICABLE AUX INTÉRÊTS DE FALCO TECHNOLOGIES INC.  THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p>			
CLIENT:	GOVERNEMENT OF NUNAVUT		
TITRE:	ACCESS VAULT AV41 NEW UTILIDOR DESIGN RESOLUTE BAY, NU		
DESSIN No.:	6400-F-AV41		DESS PAR:
DRAWING No.:			DRAW BY: G.L.
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	QTY: 1	01-04-14	SHEET: 1 / 4
			REV: A



PLAN VIEW

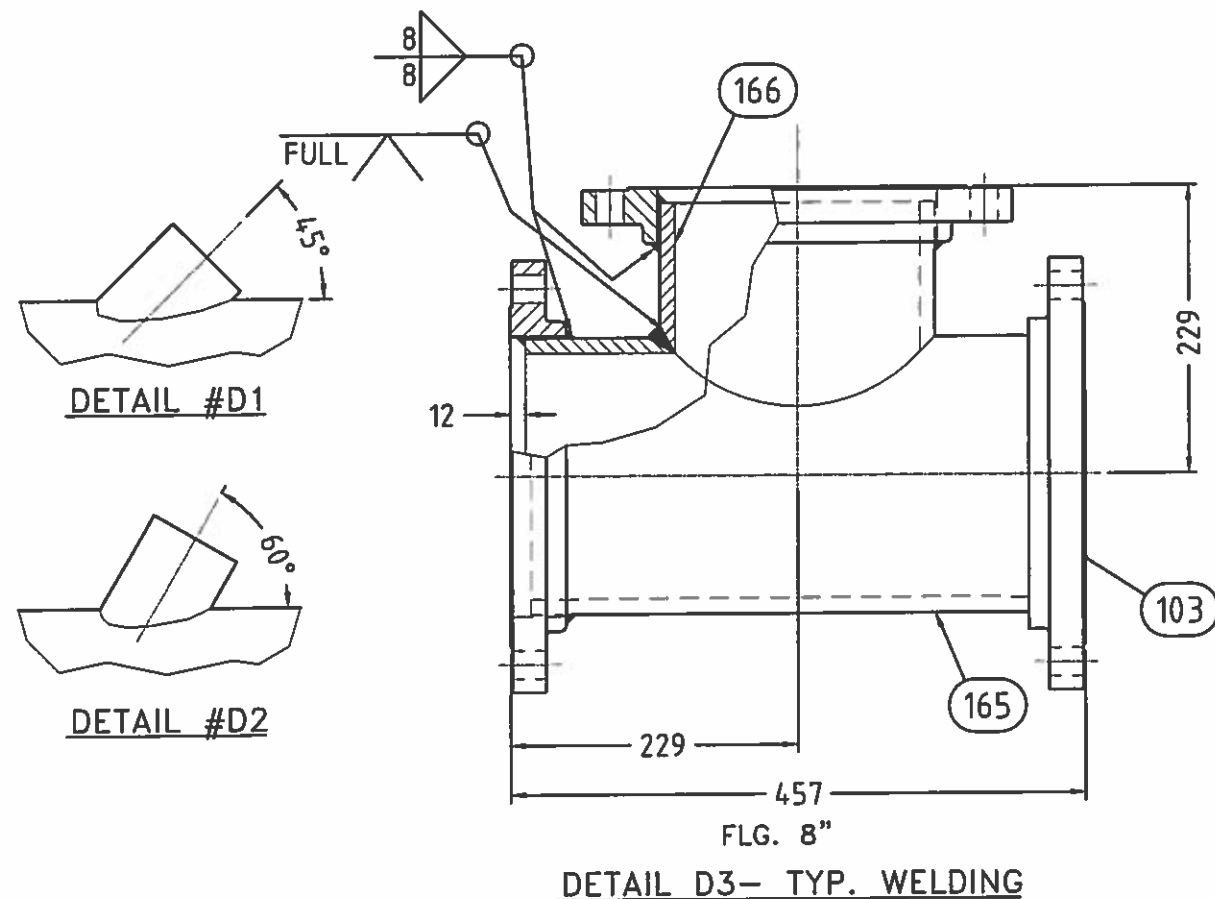
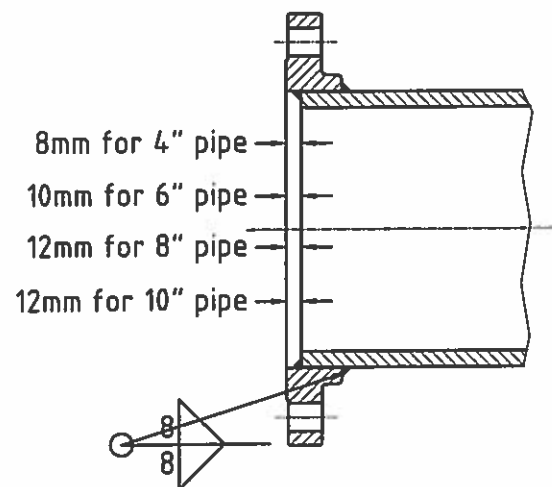
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com</p> <p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC. THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p> <p>CLIENT: CUSTOMER: GOVERNEMENT OF NUNAVUT</p> <p>TITRE: TITLE: ACCESS VAULT AV41 NEW UTILIDOR DESIGN RESOLUTE BAY, NU</p> <p>DESSIN No.: DRAWING No: 6400-F-AV41</p> <p>DESS. PAR: DRAW BY: G.L.</p> <p>SCALE: X/X" = X"</p> <p>QTE: QTY: 1</p> <p>DATE: 01-04-14</p> <p>FEUILLE: SHEET: 2 / 4</p> <p>REV: A</p>			



A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>  <b>Falco Technologies Inc., a company of</b>  <b>BERLIE-FALCO</b>            1245 rue Industrielle            La Prairie (Quebec)            J5R 2E4            Tel: (450) 444-0566            Fax: (450) 444-2227            www.berliefalco.com         </p> <p>           CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA            RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT            PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS            DE FALCO TECHNOLOGIES INC.            THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED            OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS            OF FALCO TECHNOLOGIES INC.         </p> <p>           CLIENT:            CUSTOMER: <b>GOVERNEMENT OF NUNAVUT</b> </p> <p>           TITRE:            TITLE: <b>ACCESS VAULT AV41 NEW UTILIDOR DESIGN RESOLUTE BAY , NU</b> </p> <p>           DESSIN No:            DRAWING No: <b>6400-F-AV41</b> </p> <p>           DESS. PAR:            DRAW BY: <b>G.L.</b> </p> <p>           SCALE: <b>X/X" = X"</b> </p> <p>           QTE:            QTY: <b>1</b> </p> <p>           DATE:  <b>01-04-14</b> </p> <p>           FEUILLE:            SHEET: <b>3 / 4</b> </p> <p>           REV:  <b>A</b> </p>			

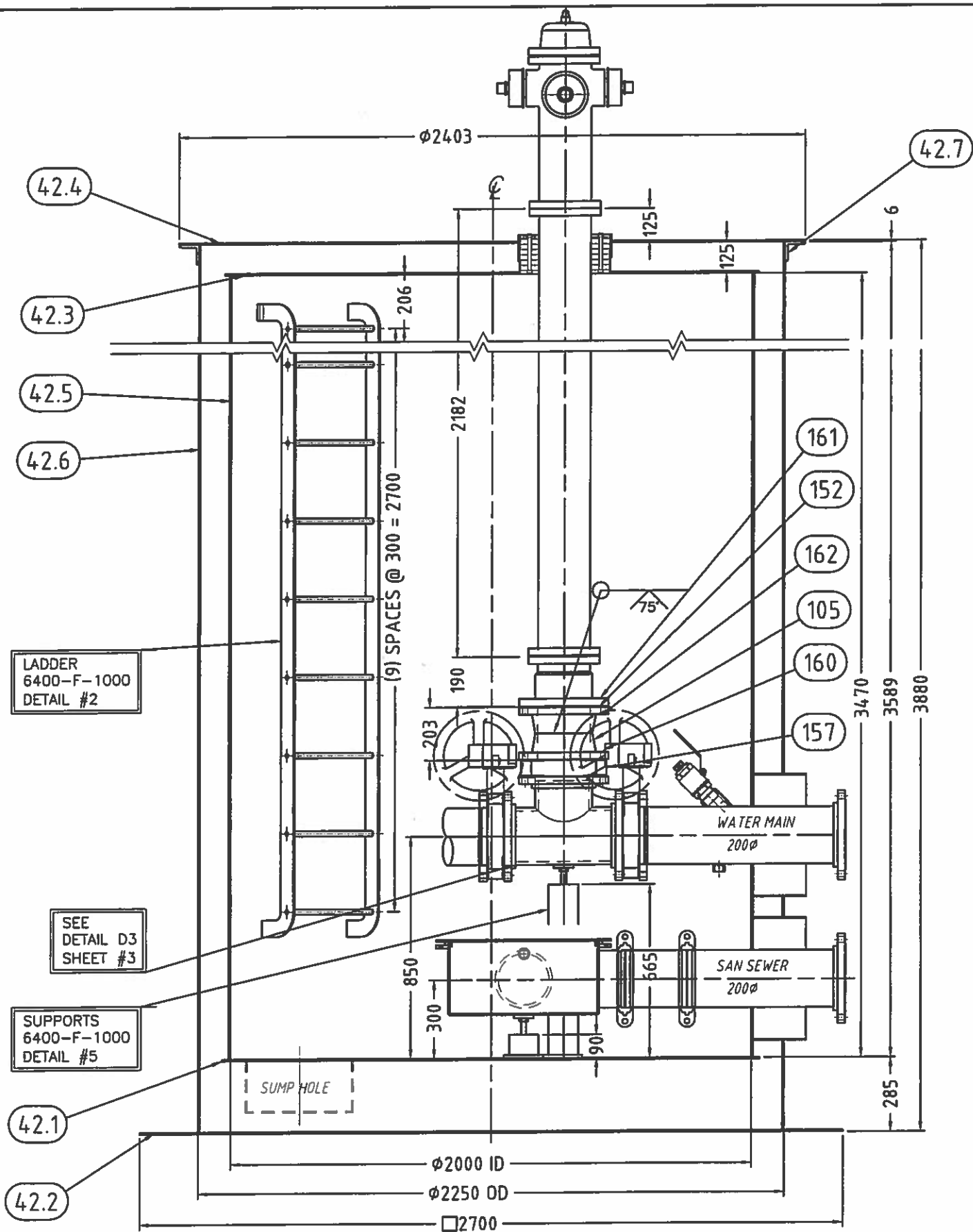


Item	Qty	Description	Material	Item	Qty	Description	Material
157	5	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)		41.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
160	80	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.	41.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
161	24	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.	41.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
162	24	3/4-10 HEX. NUT	PLATED C.S.	41.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B	41.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 4520mm LG.	A36
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B	41.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7843mm x 4908mm LG.	A36
				41.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W

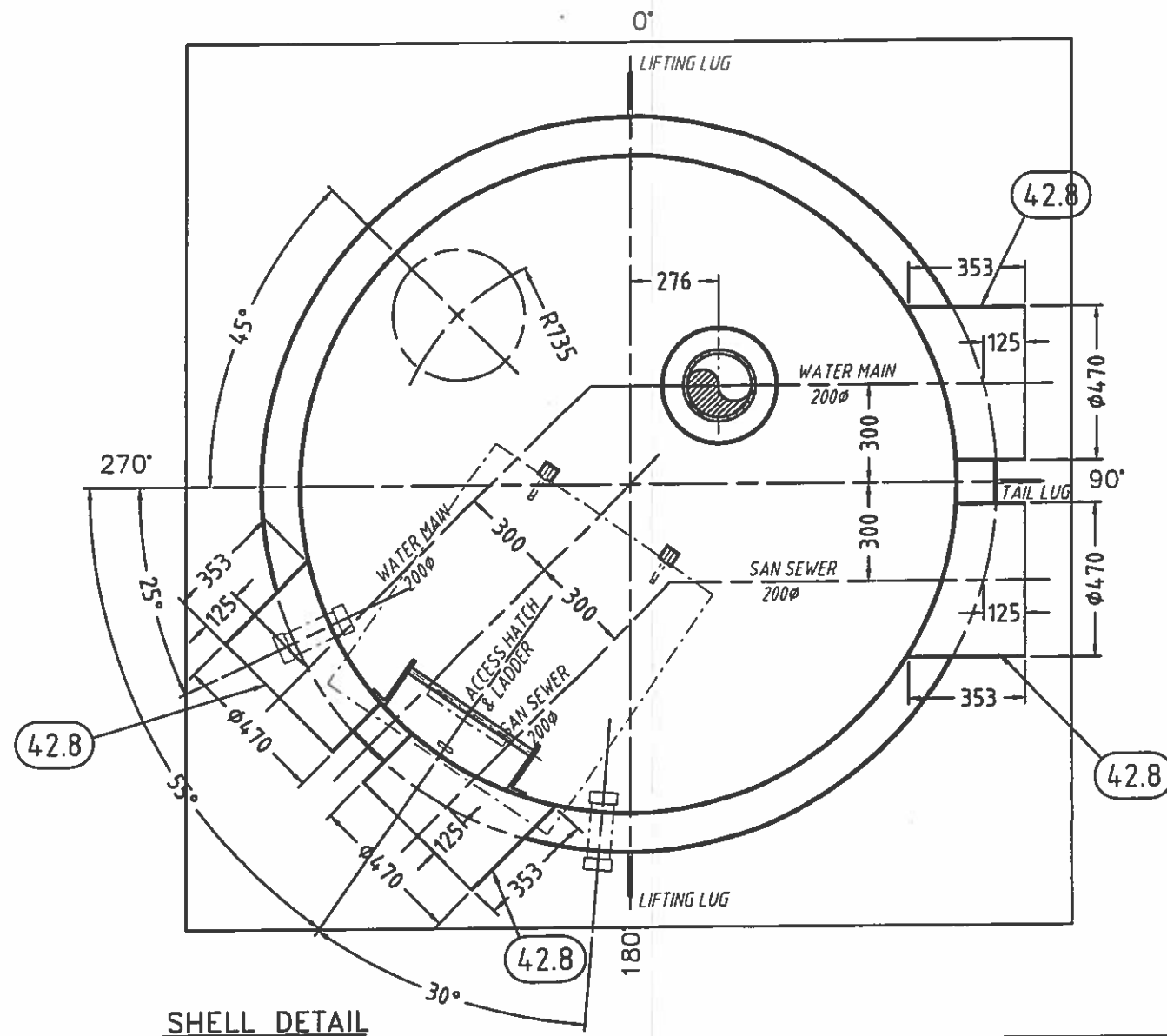


41.8	2	PL. 1/4" THK. x 320 x 1456mm LG.	A36
41.9	2	PL. 1/4" THK. x 405 x 1456mm LG.	A36
41.10	1	PL. 1/4" THK. x 267 x 1456mm LG.	A36
41.11	1	PIPE 8" SCH.80 x 715mm LG. vic groove 1 end	A-53-B
41.12	1	PIPE 8" SCH.80 x 903mm LG. vic groove 2 end	A-53-B
41.13	1	PIPE 8" SCH.80 x 564mm LG. vic groove 1 end	A-53-B
41.14	1	PIPE 8" SCH.80 x 774mm LG.	A-53-B
41.15	1	PIPE 8" SCH.80 x 777mm LG.	A-53-B
41.16	1	PIPE 8" SCH.80 x 779mm LG. vic groove 1 end	A-53-B
41.17	1	PIPE 8" SCH.80 x 589mm LG. vic groove 2 end	A-53-B
41.18	1	PIPE 8" SCH.80 x 372mm LG. vic groove 2 end	A-53-B
103	10	FLANGE SORF 8" - 150#	SA 105
105	2	FLANGE WN 8" 150#, BORE	SA-105
112	7	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
117	2	8" VICTAULIC ELBOW 11 1/4°, #13	GALV C.S.
132	2	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	4	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
142	2	BLIND FLANGE 8" - 150#	SA 105
147	1	8" VICTAULIC CAP, #60	GALV C.S.
152	3	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER

A ISSUED FOR COMMENTS		01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com	
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CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV41	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY, NU	
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV41		DRAW BY: G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE: X/X" = X"	QTY: 1	01-04-14	SHEET: 4 / 4
			REV: A



SECTION "A-A"

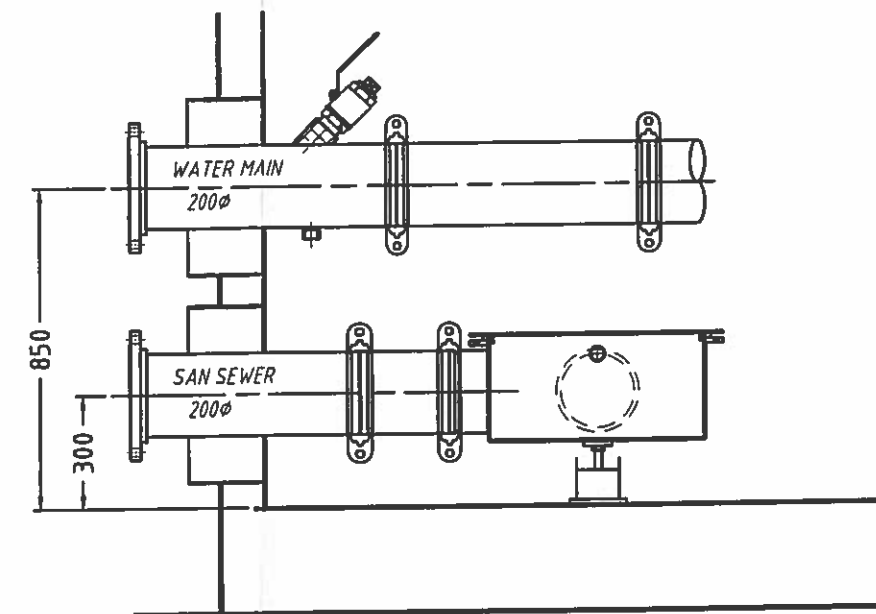


SHELL DETAIL


GENERAL NOTES:

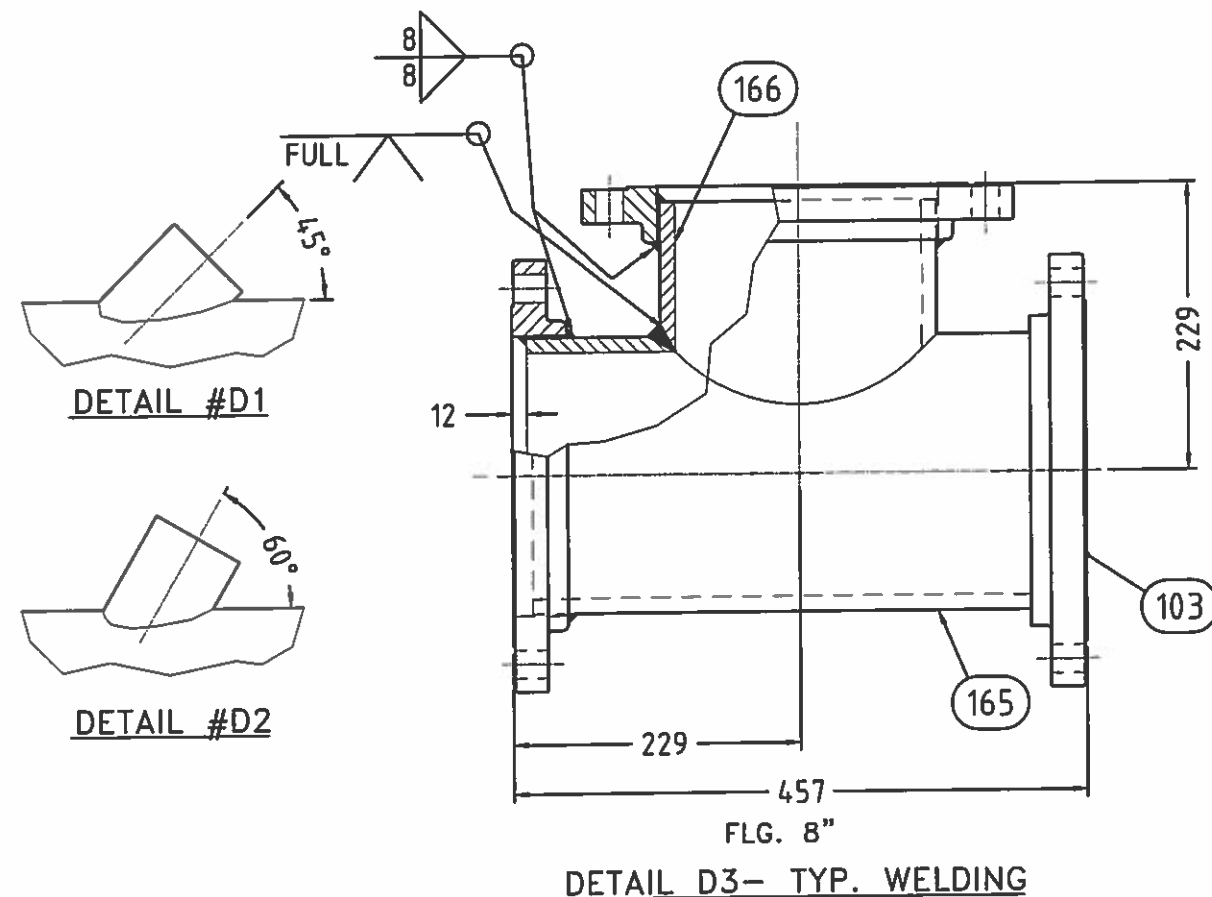
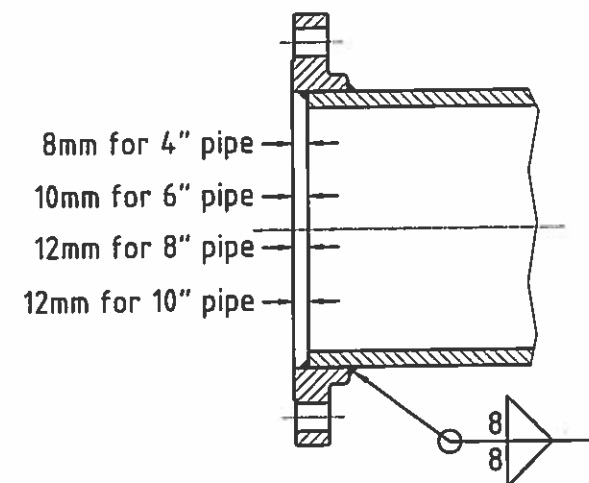
- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE:  
BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BXZ-GD  
VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com</p>			
<p>CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC.  THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.</p>			
<p>CLIENT: GOVERNEMENT OF NUNAVUT</p>			
<p>TITRE: ACCESS VAULT AV42  NEW UTILIDOR DESIGN RESOLUTE BAY, NU</p>			
<p>DESSIN No: 6400-F-AV42</p>		<p>DESS PAR: G.L.</p>	
<p>SCALE: X/X" = X"</p>	<p>QTE: 1</p>	<p>DATE: 01-04-14</p>	<p>FEUILLE: 1 / 3</p>
			<p>REV: A</p>



SECTION "B-B"

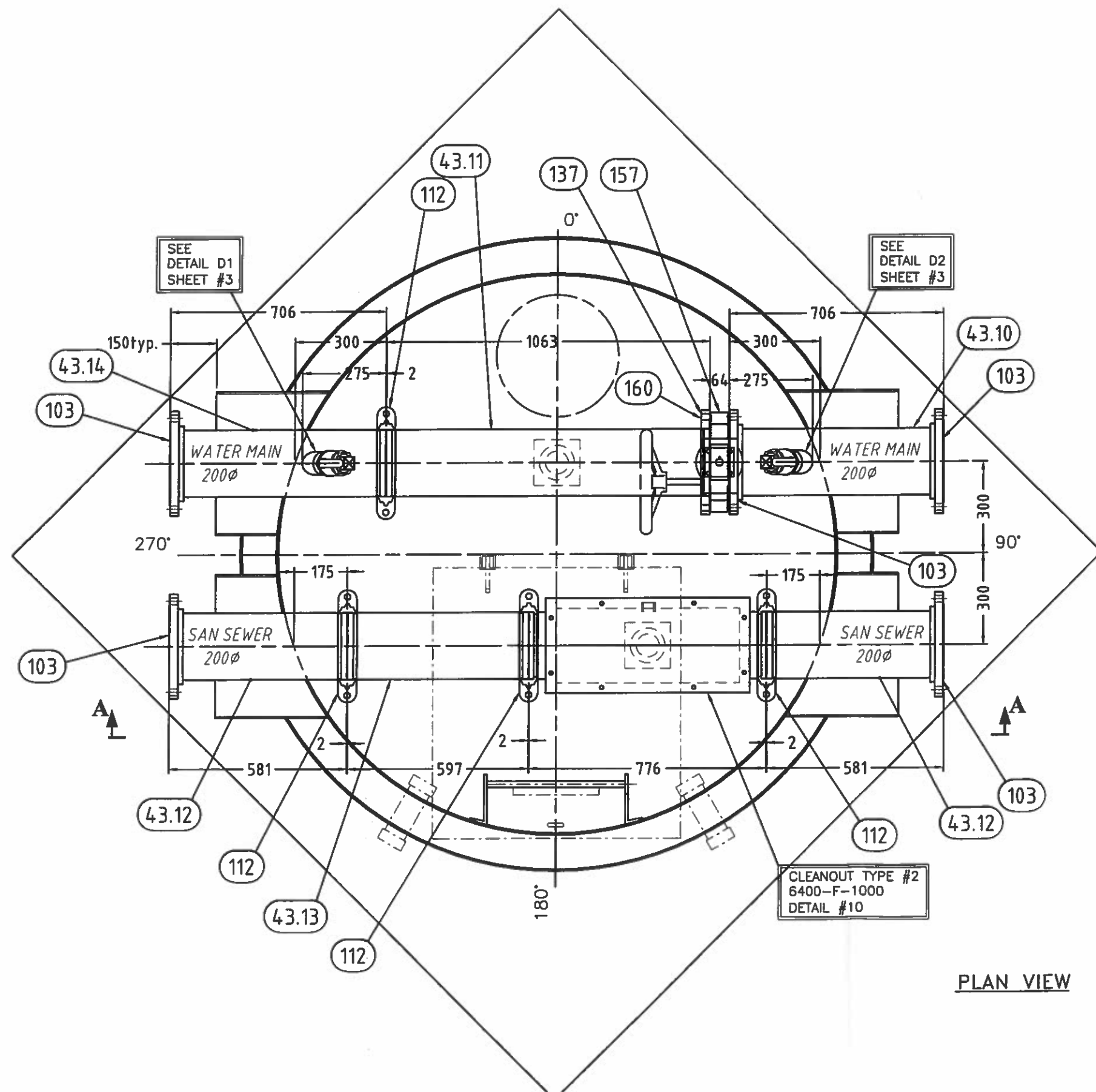
A		ISSUED FOR COMMENTS		01-04-14		G.L.	
REV		DESCRIPTION		DATE		DESS/DRAWN	
		Falco Technologies Inc., a company of <b>BERLIE-FALCO</b>		1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel (450) 444-0566 Fax: (450) 444-2227 <a href="http://www.berriefalco.com">www.berriefalco.com</a>			
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CLIENT:		GOVERNEMENT OF NUNAVUT					
CUSTOMER:							
TITRE:		ACCESS VAULT AV42 NEW UTILIDOR DESIGN RESOLUTE BAY , NU					
TITLE:							
DESSIN No.:				DESS. PAR:			
DRAWING No: 6400-F-AV42				DRAW BY: G.L.			
.....		QTE:	DATE:	FEUILLE:		REV:	
SCALE:		QTY:		SHEET:			
X/X" = X"		1	01-04-14	2 / 3		A	



Item	Qty	Description	Material
42.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2062mm	A36
42.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2700mm x 2700mm	A36
42.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2048mm	A36
42.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2403mm	A36
42.5	1	INTERNAL SHELL PL. 1/4" THK. x 6303mm x 3470mm LG.	A36
42.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7048mm x 3858mm LG.	A36
42.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
42.8	4	PL. 1/4" THK. x 353 x 1456mm LG.	A36
42.9	1	PIPE 8" SCH.80 x 666mm LG. vic groove 2 end	A-53-B
42.10	1	PIPE 8" SCH.80 x 693mm LG. vic groove 1 end	A-53-B
42.11	2	PIPE 8" SCH.80 x 238mm LG. vic groove 2 end	A-53-B
42.12	2	PIPE 8" SCH.80 x 593mm LG. vic groove 1 end	A-53-B
42.13	1	PIPE 8" SCH.80 x 779mm LG. vic groove 1 end	A-53-B
103	7	FLANGE SORF 8" - 150#	SA 105
105	2	FLANGE WN 8" 150#, BORE	SA-105
112	6	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
127	1	8" VICTAULIC ELBOW 45°, #11	GALV C.S.
137	2	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER
157	3	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	48	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.
161	8	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.
162	8	3/4-10 HEX. NUT	PLATED C.S.
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B

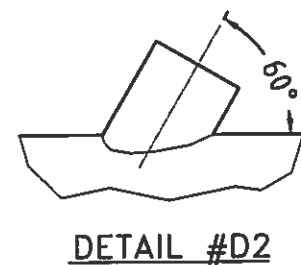
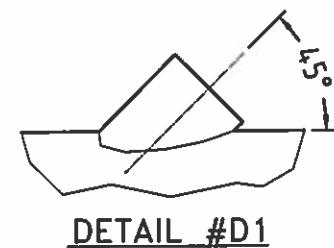
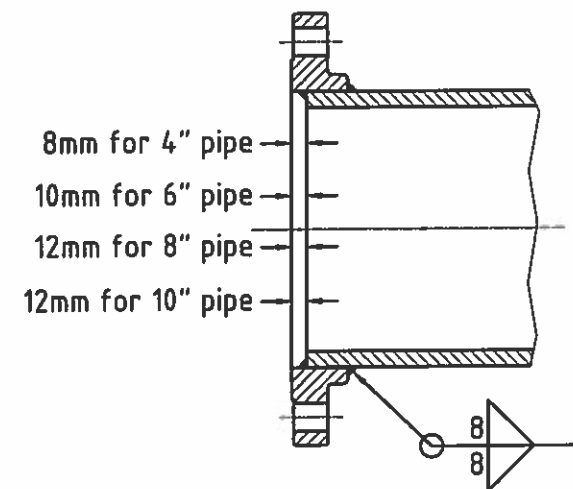
A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
<b>Falco Technologies Inc., a company of</b> <b>BERLIE-FALCO</b> 1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel. (450) 444-0566 Fax (450) 444-2227 www.berliefalco.com			
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CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV42	
TITLE:		NEW UTILIDOR DESIGN RESOLUTE BAY, NU	
DESSIN No.:		DESS. PAR:	
DRAWING No. 6400-F-AV42		DRAWBY: G.L.	
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	1	01-04-14	SHEET: 3 / 3
			REV: A






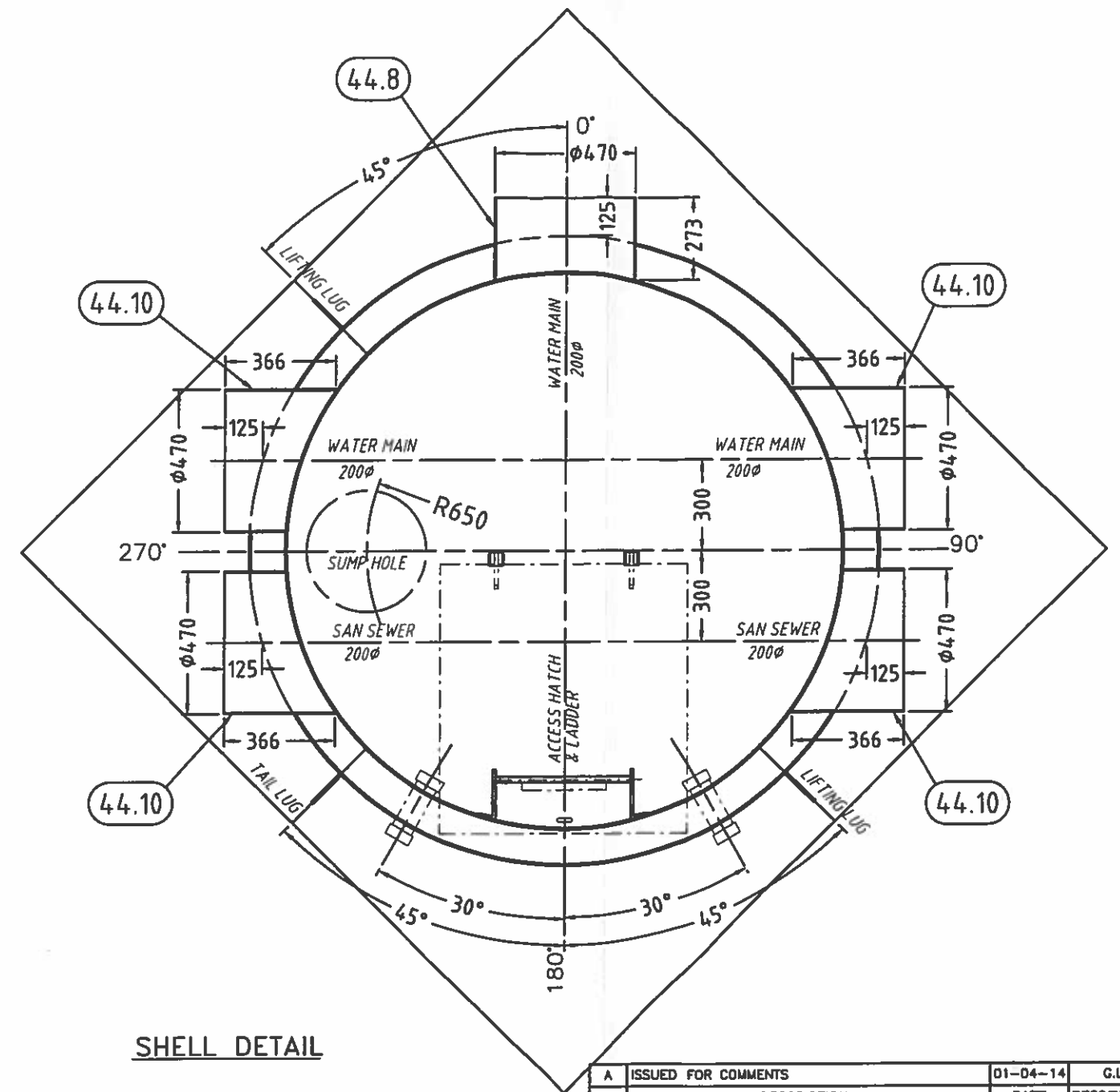
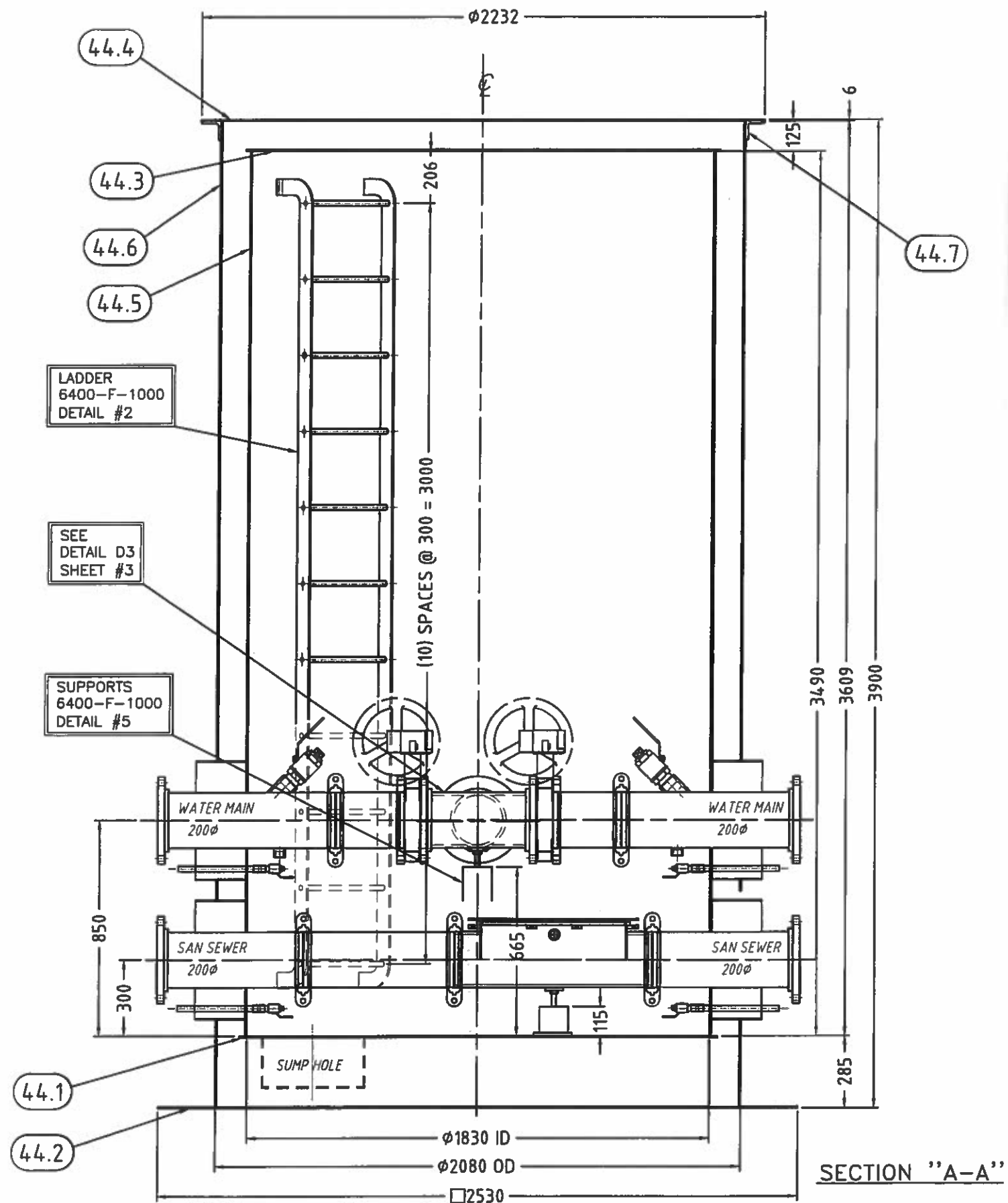
PLAN VIEW

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV.	DESCRIPTION	DATE	DESS/DRAWN
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com</p>			
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CLIENT:			
CUSTOMER: GOUVERNEMENT OF NUNAVUT			
TITRE:			
TITLE: ACCESS VAULT AV43 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.:		DESS. PAR:	
DRAWING No. 6400-F-AV43		DRAW BY: G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE: X/X" = X"	QTY: 1	01-04-14	SHEET: 2 / 3
			REV: A



Item	Qty	Description	Material
43.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
43.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
43.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
43.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
43.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 3540mm LG.	A36
43.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 3928mm LG.	A36
43.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
43.8	4	PL. 1/4" THK. x 366 x 1456mm LG.	A36
43.10	1	PIPE 8" SCH.80 x 682mm LG.	A-53-B
43.11	1	PIPE 8" SCH.80 x 1063mm LG. vic groove 2 end	A-53-B
43.12	2	PIPE 8" SCH.80 x 569mm LG. vic groove 1 end	A-53-B
43.13	1	PIPE 8" SCH.80 x 597mm LG. vic groove 2 end	A-53-B
43.14	1	PIPE 8" SCH.80 x 694mm LG. vic groove 1 end	A-53-B
103	5	FLANGE SORF 8" - 150#	SA 105
112	4	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
137	1	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
157	1	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	16	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.

A	ISSUED FOR COMMENTS	01-04-14	G.L.
REV	DESCRIPTION	DATE	DESS/DRAWN
 <b>BERLIE-FALCO</b> Falco Technologies Inc., a company of 1245 rue Industrielle La Prairie (Quebec) J5R 2E4 Tel: (450) 444-0566 Fax: (450) 444-2227 www.berliefalco.com		CE DOCUMENT EST LA PROPRIETE DE FALCO TECHNOLOGIES INC. ET LUI SERA RETOURNE SUR DEMANDE. SA REPRODUCTION EST INTERDITE SANS AUTORISATION, ET IL NE DOIT PAS ETRE UTILISE, DIRECTEMENT OU INDIRECTEMENT, DE FAÇON PREJUDICABLE AUX INTERETS DE FALCO TECHNOLOGIES INC. THIS DOCUMENT IS THE PROPERTY OF FALCO TECHNOLOGIES INC. AND SHALL NOT BE TRACED OR REPRODUCED OR USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTERESTS OF FALCO TECHNOLOGIES INC.	
CLIENT:		GOVERNEMENT OF NUNAVUT	
TITRE:		ACCESS VAULT AV43	
TITRE:		NEW UTILIDOR DESIGN RESOLUTE BAY , NU	
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV43		DRAW BY: G.L.	
.....	QTE:	DATE:	FEUILLE:
SCALE: X/X" = X"	QTY: 1	01-04-14	SHEET: 3 / 3
			REV: A

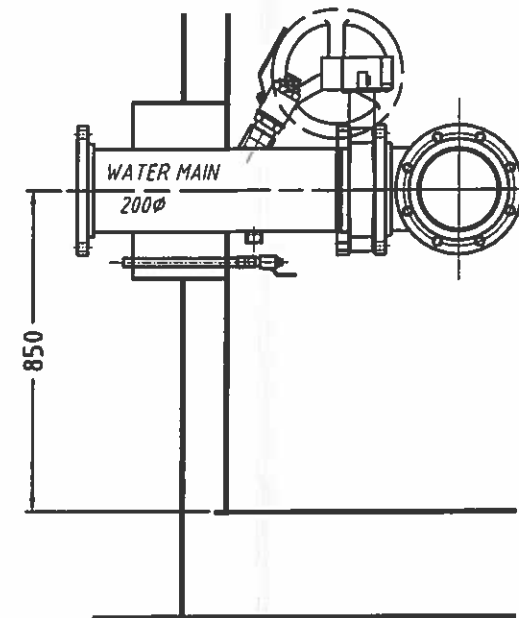
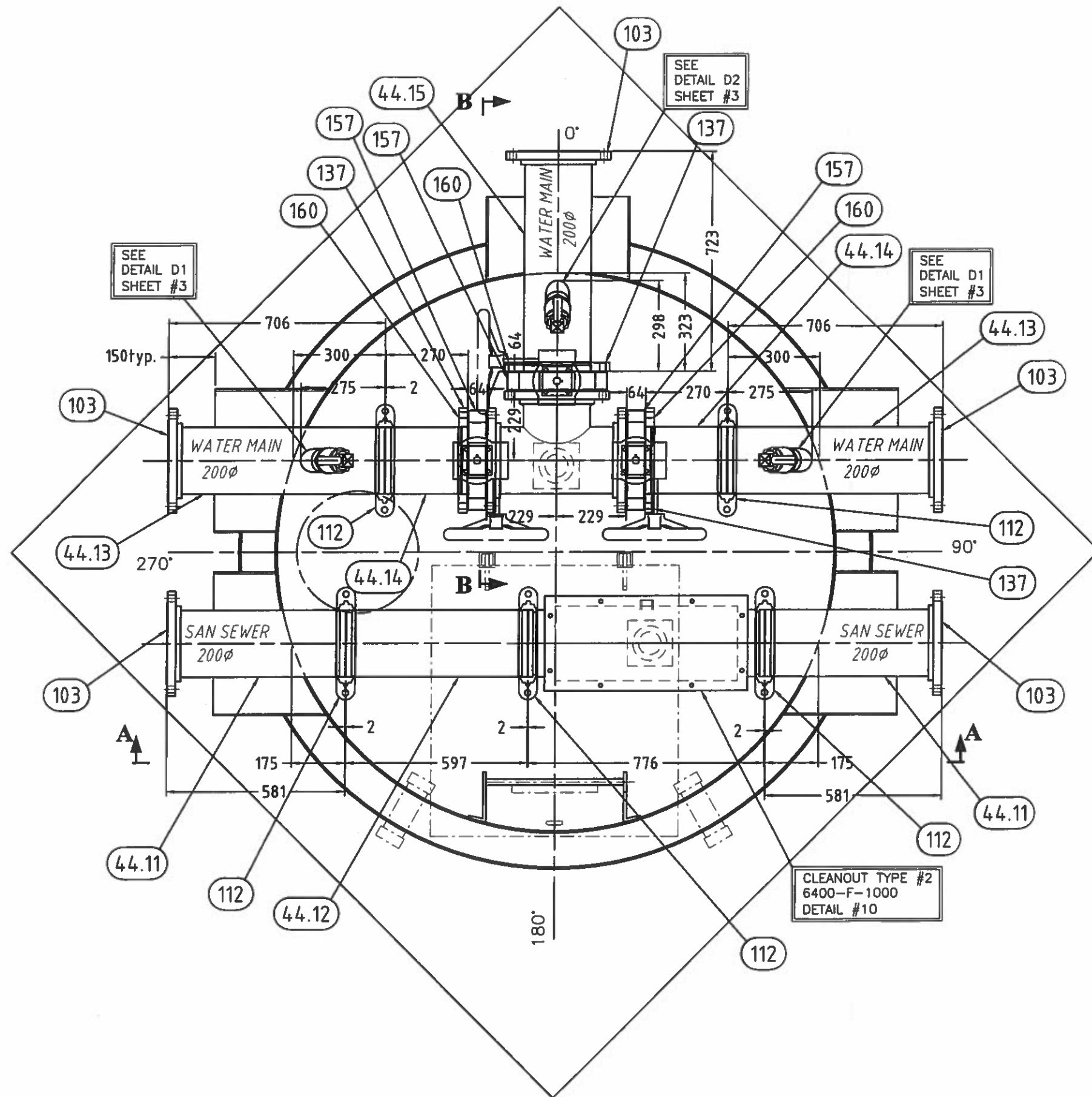


#### GENERAL NOTES:

- 1 - VICTAULIC FITTINGS SHALL BE HOT DIPPED GALVANIZED INSIDE & OUT COUPLINGS SHALL BE STYLE 77 C/W GRADE E GASKETS
- 2 - ALL NUTS, BOLTS, WASHERS, SCREW, ETC... SHALL BE HOT DIP GALVANIZED OR CADMIUM PLATED
- 3 - FLANGE ADAPTERS FOR GROOVE JOINT PIPE SHALL BE VICTAULIC STYLE 741
- 4 - VALVE: BUTTERFLY VALVES SHALL BE LUG TYPE, WITH HYCAR SHAFT SEAL AND SEAT, BRONZE DISK, 316SS SHAFT AND STAINLESS STEEL BOLTS, FITTED WITH A ROTARY MANUAL ACTUATOR AND HANDWHEEL, CRANE QUARTERMASTER 44BX2-GD VALVES SHALL BE INSTALLED WITH CADMIUM PLATED HEXAGONAL HEAD BOLTS

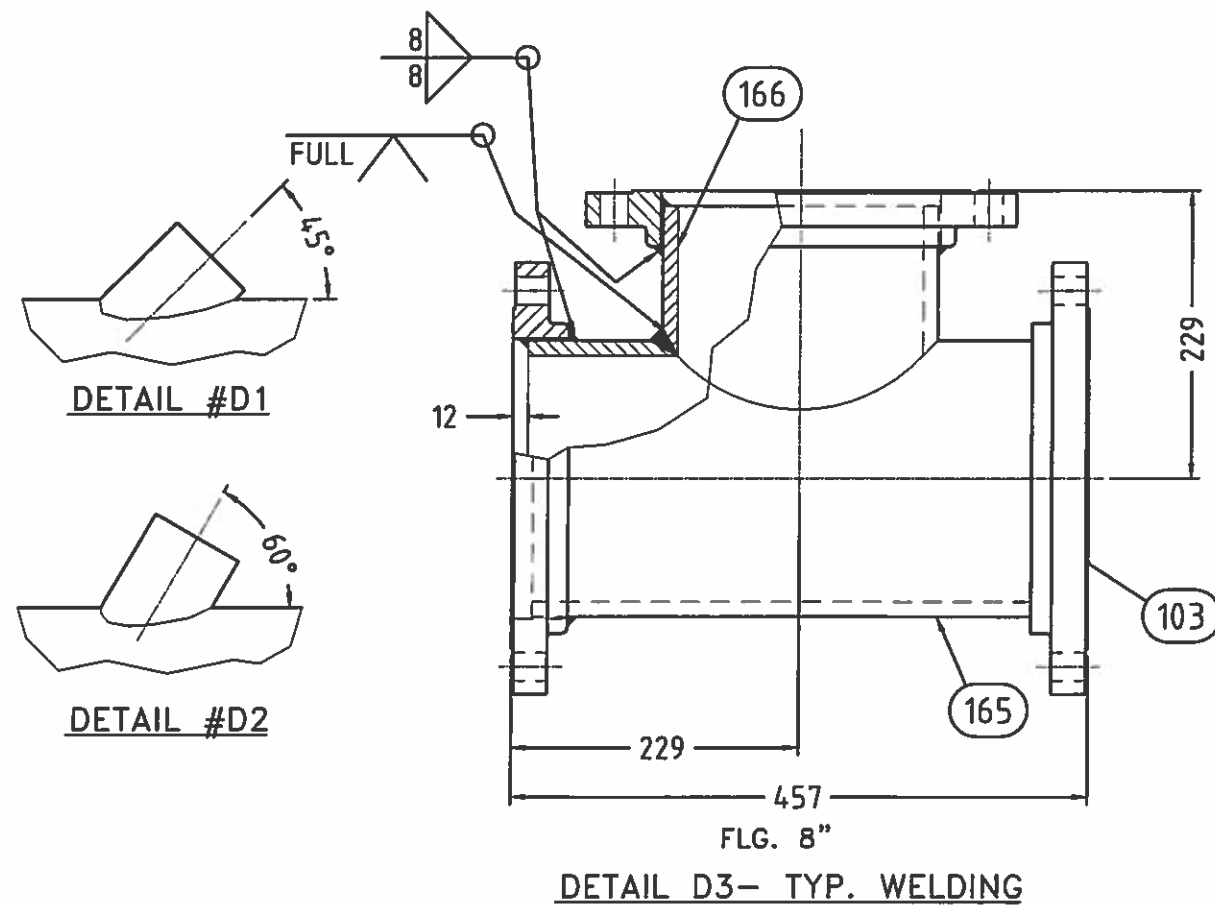
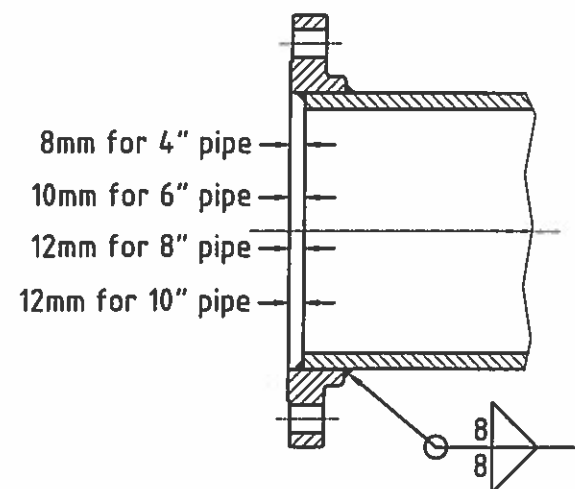
REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.
<p>Falco Technologies Inc., a company of  <b>BERLIE-FALCO</b>  1245 rue Industrielle  La Prairie (Quebec)  J5R 2E4  Tel: (450) 444-0566  Fax: (450) 444-2227  www.berliefalco.com</p>			
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<p>CLIENT: GOVERNEMENT OF NUNAVUT</p>			
<p>TITRE: ACCESS VAULT AV44  NEW UTILIDOR DESIGN RESOLUTE BAY, NU</p>			
<p>DESSIN No: 6400-F-AV44</p>		<p>DESS. PAR: G.L.</p>	
<p>SCALE: X/X" = X"</p>		<p>FEUILLE: 1 / 3</p>	
<p>QTE: 1</p>		<p>DATE: 01-04-14</p>	
<p>REV: A</p>		<p>REV: A</p>	






SECTION "B-B"

A	ISSUED FOR COMMENTS	01-04-14	G.L.
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<p>CLIENT:  CUSTOMER: <b>GOVERNEMENT OF NUNAVUT</b></p>			
<p>TITRE:  TITLE: <b>ACCESS VAULT AV44  NEW UTILIDOR DESIGN RESOLUTE BAY, NU</b></p>			
<p>DESSIN No.:  DRAWING No: <b>6400-F-AV44</b></p>		<p>DESS. PAR:  DRAWN BY: <b>G.L.</b></p>	
<p>SCALE:  X/X" = X"</p>	<p>QTE:  QTY: <b>1</b></p>	<p>DATE:  <b>01-04-14</b></p>	<p>FEUILLE:  SHEET: <b>2 / 3</b></p>
			<p>REV:  <b>A</b></p>



Item	Qty	Description	Material
44.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø1892mm	A36
44.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2530mm x 2530mm	A36
44.3	1	TOP INTERNAL PL. 1/4" THK. x Ø1878mm	A36
44.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2232mm	A36
44.5	1	INTERNAL SHELL PL. 1/4" THK. x 5767mm x 3490mm LG.	A36
44.6	1	EXTERNAL SHELL PL. 1/4" THK. x 6515mm x 3878mm LG.	A36
44.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
44.8	1	PL. 1/4" THK. x 273 x 1456mm LG.	A36
44.10	4	PL. 1/4" THK. x 366 x 1456mm LG.	A36
44.11	2	PIPE 8" SCH.80 x 569mm LG. vic groove 1 end	A-53-B
44.12	1	PIPE 8" SCH.80 x 597mm LG. vic groove 2 end	A-53-B
44.13	2	PIPE 8" SCH.80 x 694mm LG. vic groove 1 end	A-53-B
44.14	2	PIPE 8" SCH.80 x 270mm LG. vic groove 2 end	A-53-B
44.15	1	PIPE 8" SCH.80 x 711mm LG. vic groove 1 end	A-53-B
103	8	FLANGE SORF 8" - 150#	SA 105
112	5	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
137	3	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
157	3	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	48	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.
165	1	PIPE 8" SCH.80 x 433mm LG.	A-53-B
166	1	PIPE 8" SCH.80 x 217mm LG.	A-53-B

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CUSTOMER: GOVERNEMENT OF NUNAVUT			
TITRE:			
TITLE: ACCESS VAULT AV44 NEW UTILIDOR DESIGN RESOLUTE BAY, NU			
DESSIN No.:		DESS. PAR:	
DRAWING No: 6400-F-AV44		DRAW BY: G.L.	
SCALE:	QTE:	DATE:	FEUILLE:
X/X" = X"	1	01-04-14	3 / 3
			REV:
			A

# **Maintenance of Water and Sewer Systems**

The major objectives for Community Sewage System maintenance are:

1. To keep the system functioning and operating efficiently.
2. To protect the capital investment.
3. To minimize annual operations and maintenance costs.
5. To meet the sampling, operational, maintenance and ultimate sewage discharge requirements of the Water Board.
6. To maintain a healthy and safe working environment for workers and the public.
7. The operation and maintenance of the facilities and equipment shall meet all applicable codes and regulatory agencies, including:
  - a) Northwest Territories and Nunavut.
    1. safety Act, R.S.N.W.T. 1998, or latest edition.
  - b) Canada Labour Code, Part, Canada Occupational safety and Health Regulations
  - c) Health Canada/Workplace Hazardous Materials Information System Northwest (WHMIS)
    1. Material safety Data Sheets (MSDS)
  - d) Community Bylaws.

### **Sewer Service Pipe**

(Applies only to location where maintenance of the building service lines is the responsibility of the operating agency (i.e: PW&S).)

1. Service connections shall not protrude into the sewer main.
2. Adequate grade from the building to the main shall be maintained, with a minimum of irregularities in the grade along the length of the service.
3. Freeze protection shall be maintained in a good operating condition.
4. Sewer service pipe exposed to the surface shall be maintained with adequate exterior cladding, insulation and marking to prevent damage from vandalism, freezing or vehicles.

### **Sanitary Sewer Mains**

(Bold lettering denotes regulatory requirement.)

1. **Approval is required for alterations or additions to system.**
2. **There shall be no physical connection between potable water supply systems and sewer which would permit passage of sewage.**
3. **Water and sewer pipe contained in a utilidor shall have provision for drainage in order to prevent contamination of water supply during repairs and breakdowns.**
4. Sewer pipe shall be round, without any collapsed sections, and have sufficient size and grade to provide capacity for the expected flows.
5. Where collapsing pipe is known or suspected it shall be monitored and documented to determine the rate of deterioration.

6. Irregularities in the pipe grade are undesirable and shall be monitored when they exist and repaired when they create a potential risk to the integrity of the sewer system.
7. Sanitary sewer cleanouts in access vaults shall remain sealed at all times.
8. Sewer pipes shall be free of all foreign solids and flow restrictions.
9. Deposits of silt, sludge, grease and other similar deposits shall not be allowed to accumulate in the sewer.
10. Freeze protection and recovery provisions shall be kept in good physical and working condition.
11. Above ground sewer mains shall be maintained with adequate cladding, insulation and marking to prevent damage from vandalism, freezing or vehicles.

### **Water Mains**

(Bold lettering denotes regulatory requirement.)

1. **Approval is required for alterations or additions to system.**
2. **There shall be no physical connection between potable water supply systems and sewer which would permit passage of sewage.**
3. **Water and sewer pipe contained in a utilidor shall have provision for drainage in order to prevent contamination of water supply during repairs and breakdowns.**

### **Access Vaults**

Access vaults refer to shared sewer/water access points, and manholes refer to conventional concrete, sewer only, access points. (Bold lettering denotes regulatory requirement.)

1. All inspections and work shall be conducted in accordance with all safety regulations and specifically the confined work space requirements.
2. The access vault structures shall not create a hazard for access or functional operation.
3. Access vault insulation shall be maintained in good condition.
4. Access vault lid seals shall minimize the ingress of moisture or air.
5. Access vault rungs shall be in sound and safe condition.
6. Access vault walls, floors and piping within shall be clean and free of dirt, silt, slime and sludge.
7. The tops of any access vaults which lie within the driving surface of any roadway shall not protrude above the road surface more than necessary.
8. Access vault and covers shall not be broken or cracked.
9. Access vault lids shall be locked at all times where public safety is a concern and where the lids are easily opened.
10. Infiltration into any access vault shall be minimized at all times, and any infiltration shall be removed immediately upon identification.
11. Where infiltration into an access vault is unavoidable, then the total infiltration shall be limited to less than 5 litres per hour.
12. For closed pipe sewer systems, the sanitary sewer cleanouts shall remain properly

## **Materials**

The availability of a suitable stock of materials and spare parts will facilitate and expedite the responses to unusual conditions. A stock of the following materials should be continuously on-hand. Replacement materials should be acquired as the stock is consumed during the course of routine operations and in response to emergency repairs.

1. Underground piping repairs
  - 200 mm preinsulated polyethylene piping to match existing diameters and pressure classes.
  - Repair clamps (Robar style)
  - Electro-fusion couplings
  - Flange stub ends suitable for electro-fusion, back-up rings, bolts and gaskets
  - Insulation half shells
  - Polyurethane spray foam
  - Heat shrink wraps
2. AV repairs
  - Valves – butterfly to match existing
  - Fittings including tees, elbows, 45° bends, bolts, gaskets, Vic-flanges, etc
  - Fire hydrant
3. Service connections
  - Water and sewer service saddles, including corporation stops
  - 100 mm polyethylene piping (water duct and sewer service piping)
  - 25 mm water service tubing
  - Water service shut off valves (building end)
4. Excavation and backfill materials
  - Well graded 20 mm minus granular material

## **Resources**

Appropriate resources must be available to assure that unusual conditions are expeditiously dealt with. The following should be among the equipment that is continuously available:

1. Sewer cleaner (blaster)
2. Hot water thawing machine (steamer) with hose, dedicated to water thawing
3. Hot water thawing machine (steamer) with hose, dedicated to sewer thawing
4. Excavator
5. Electro-fusion equipment
6. Butt fusion equipment

7. Small backhoe
8. General earth moving equipment including loaders, dump truck and compactor
9. Small trench compactor
10. Safety equipment including fall arrest, gas detection and ventilation equipment
11. Portable generators, heaters, temporary enclosures and ventilation.

The personnel responsible for emergency responses and repairs to the water and sewer system must be appropriately trained. In addition to the training typical of trades persons there are specific training needs associated with the operation of a water and sewer system. These include:

1. Worker safety training related to fall arrest and confined space entry. There are several areas within the water and sewer system that are considered to be confined spaces. These include the AV's and any tanks that have been emptied for inspection or cleaning. Access to many locations within the water and sewer system, including AV's and tanks requires the use of ladders. Appropriate awareness of the hazards associating with climbing should form part of worker training.
2. The personnel undertaking water and sewer system operations must be trained in the safe operation of these systems. This focus of this training should be upon the assurance of the ongoing supply of uncontaminated water. This is an especially sensitive issue in view of the significant risks of cross contamination between the sewer and water system associated with work within the AV's.

Frequency	Inspection Checks
Monthly	<b>AV's</b>
	Check for water in bottom of access vaults. Remove water and fix source of leak.
	Check that locking devices are securely fastened.
	Check that water and sewer piping and fittings are tight and secure
	Check covers over sewer cleanouts are properly installed with gaskets in place.
	<b>Watermain</b>
	Check freeze protection systems for proper operation and check system failure alarms.
	Ensure that no valves within an access vault are submerged under water.



Frequency	Inspection Checks
Seasonal	<b>Sewer Mains</b>
	Inspect mains using a pipeline video camera system. Check for blockages, sediment buildup, service pipe protrusions, infiltration, exfiltration, irregularities in grade, and collapsed/ovalled pipe.
	Monitor sewage temperature in mains to determine when to activate freeze protection systems. Record temperatures on a daily basis at the start of winter and in spring, depending on the system and location.
	Where historical operation dictates the need to operate bleeders to prevent sanitary sewer mains from freezing, the bleeding should be operating as follows: 1. Starting bleeding as required by local conditions. 2. Adjust bleeders to optimize flow. 3. Discontinue bleeding as determined by local conditions.
	Check if freezing is a problem (at designated areas) during winter months.
	Inspect mains using a pipeline video camera system. Check for blockages, sediment buildup, service pipe protrusions, infiltration, exfiltration, irregularities in grade, and collapsed/ovalled pipe.
	<b>AV's</b>
	If the access vault contains a sump pump, inspect the pump and control floats, and operate the pump for a short period of time.
	Check manhole heating systems operation (where applicable).
	Check for obvious obstructions in the sewer main in the vicinity of the access vault by removing the clean out cover.

## Seasonal

Check to see that sewer pipe clean out cap is closed and sealed tight.

Check that access vault lock is in place and operational.

Inspect grading around manhole/access vault, and confirm that grading drains all surface runoff away from the access vault.

Check for groundwater or other infiltration into access vault from surcharging, permafrost or water main cross connections. Infiltration into an access vault, or debris that accumulates must be removed.

If insulation of access vault is accessible, check to see that insulation is dry.

Check that access vault interior is relatively clean.

If any odours associated with Petroleum Products or solvents are observed within the access vault, this information should be recorded for potential action associated with dumping of hazardous substances by system users. Inform senior staff for possible initiation of investigation.

## Watermain

Bleeder flows should be adjusted according to water temperatures and minimum flows required.

Note any problems and initiate corrective action as required

Check that valve position (opened or closed) is correct.

Seasonal	Service and exercise all valves, full open to full closed.
	<b>Hydrants</b>
	Check for leaks (seals, joints) and signs of damage.
	Check operating nut for wear, rounded corners and function. Lubricate threads.
	Check connection caps, threads, and chains. All caps shall be in place. Caps with rusted, damaged or worn threads that prevent easy removal shall be repaired or replaced. Ensure chains are in place and do not prevent cap removal.
	Check all valves for proper operation and exercise.
	Drain to the ground or pump out hydrant barrel. For self draining hydrants make sure they drain completely. Repair main valve or drain valve if water is present prior to draining or pumping out.
	Check glycol level and concentration (for non self-draining units). Ensure glycol is food grade. Adjust or replace as necessary.
	Check that hydrant locations are clearly identified under all conditions.

Frequency	Inspection Checks
Yearly	<b>Sewer Mains</b>
	Where sewer main is exposed to the surface, check that the exterior cladding insulation and marking is not damaged or deteriorating.
	Following inspection, clean and flush sanitary sewer mains as necessary.
	Service and exercise all valves (full open to full closed) in the sewer line. Verify correct position of each valve (open or closed). Maintain concise records (forms) for each valve and drawings for each location.
	<b>AV's</b>
	Check ladder rungs for corrosion and tightness.
	Check access vault structure for shifting, or structural damage as a result of permafrost degradation or ice formation.
	Check interior and exterior surfaces of access vaults for signs of structural damage.
	Check coatings on interior and exterior. Repair damaged coatings.
	<b>Water Main</b>
	Check intake structure, protective equipment, wet well, screen and intake valves. Clean as required.

Yearly	Check condition of intake. (May require divers).
	Check intake pump and piping removal mechanism.
	Check operation of level sensors, alarms and low level shut offs.
	Check for ground settlement over mains.
	Check for signs of leakage along line and valves.
	Check all supports and insulation on above ground piping.
	Check all freeze protection and recovery systems including heat trace and bleeder systems.
	Check all pipe corrosion protection systems and replace when necessary.
	Check condition and operation of backflow preventer valves.
	Flush watermain.
	Clean valves. Remove rust from operating parts and paint as necessary.

Yearly	Clean dirt or debris from valve box. Check elevation. Grease valve stem.
	Ensure that all protective enclosures for valves are maintained to prevent freezing and vandalism.
	Check bollards around valve operators or valve boxes are properly anchored and structurally undamaged.
	<b>Hydrants</b>
	Flush hydrant with main valve and any outlet valves fully opened until water runs clear.
	Contact the Office of the Fire Marshal to confirm required fire flow requirements for the community, fire code updates that affect hydrant maintenance, and arrange for flow testing of fire hydrants. Record test results.
	Inspect breakaway component of hydrant if possible.
	Check for access obstructions. Remove or minimize obstruction.
	Note any problems and initiate corrective action as required.

## TRANSMITTAL

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### TOWER ARCTIC LTD.

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To: Government Of Nunavut  
Chileab Yue

Tel: 867-975-5450

Date: August 25, 2017

Total no. of pages: 1

From: Doug Thompson

Project Manager

Tower Arctic Ltd.

P.O. Box 717,

Iqaluit, NU., X0A 0H0

Ph: (867) 979-6465

Fax: (867) 979-6591

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### COMMENTS

Re: New Water and Sewer System – Resolute Bay

Chileab

This is to confirm that 30 spare recirculating pumps were give to Resolute Bay Housing Corp in July 2015.

Best regards,



Doug Thompson

# NARWHAL PLUMBING & HEATING LTD.

P.O. BOX 471, IQALUIT, NU \* X0A 0H0 \* PHONE (867) 979-6350 \* FAX (867) 979-6622 \* EMAIL [narwhal@northwestel.net](mailto:narwhal@northwestel.net)

## Testing for reduced pressure Dar (DARPR)

**Five tests must be carried out :**

- **Test #1 :**  
Pressure measurement of the opening discharge valve.
- **Test #2 :**  
Verify the second check valve's sealing in counter-pressure.
- **Test #3 :**  
Pressure loss measurement for the first check valve in normal flow direction.
- **Test #4 :**  
Pressure measurement in the pipe during the tests.
- **Test #5 :**  
Pressure loss measurement for the second check valve in normal flow direction.

**\*Give special attention during the start-up.**

**IMPORTANT : DARPR TESTING MUST ONLY BE DONE BY  
CERTIFIED TECHNICIAN.**



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## Testing for reduced pressure Dar (DARPR)

**Before testing** – Requirement for installation and using of the testing material.

1. Inform the powers of regulation that the water supply will be interrupted ;
2. Open the tests valves #4 to produce a flow in the device then open valves #3 and #2 and #1 then close #1 and #2 and #3 and #4 ;
3. Place the required adaptor on the back flow preventer ;
4. Visually inspect the pressure gauge and make sure that all the valves are close ;

### **Test #1 :**

Pressure measurement of the opening discharge valve.

1. Close the main stop valve #2 ;
2. Plug the gauge's high pressure hose in the testing valve #2 ;
3. Plug the gauge's low pressure hose in the testing valve #3 ;
4. Open testing valve #3 low pressure (L) ;
5. Open testing valve #4 high pressure (H) ;
6. Open the high pressure purge valve (HP) on the gauge to let the air out of the hose and the gauge then close the valve ;
7. Open the low pressure purge valve (LP) on the gauge to let the air out of the hose and the gauge then close the valve ;
8. Open the low pressure valve on the gauge for maximum  $\frac{1}{4}$  turn.
9. Really slowly open the high pressure valve on the gauge to transfer the pressure from the opening of the device to the intermediate chamber. The pressure difference on the gauge slowly drop ;
10. Put your hand under the discharge valve's exhaust port while observing the pressure dropping again. Write down the pressure indicated on the pressure gauge when water starts to leak from the exhaust port ;
11. If the written pressure is at least 2 psi, tick the "open at" box on the report. If not then tick the "failure" box ;
12. Close all testing valves with the hoses still plug and let all the residual pressure out of the pressure gauge ;

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## Testing for reduced pressure Dar (DARPR)

### **Test #2 :**

Verify the second check valve's sealing in counter-pressure.

1. Open testing valve #3 (L) ;
2. Open testing valve #2 (H) ;
3. Open the high pressure purge valve (HP) on the gauge to let the air out of the hose and the gauge then close the valve ;
4. Open the low pressure purge valve (LP) on the gauge to let the air out of the hose and the gauge then close the valve ;
5. Partially open the low pressure valve as well as the by-pass valve just enough to see some water drops at the end of the by-pass hose ;
6. Hold up the by-pass hose's end. It will fill up with water. Plug the hose's end on the testing valve #4 and then close the gauge's low pressure valve ;
7. Open the testing valve #4 as well as the gauge's high pressure valve to transfer the between the testing valve #2 and the testing valve #4 by the pressure gauge and then close the testing valve #2. A light pressure drop will happen from the pressure gauge because of the second check valve's disc compressing ;
8. If the pressure gauge's pressure stay the same for at least 2 minutes then tick the "sealed closing" box on the report. If not then tick the "leaking" box ;
9. Close the testing valves with the high and low pressure hoses still plug and let all the residual pressure out of the pressure gauge then unplug the by-pass hose ;

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## Testing for reduced pressure Dar (DARPR)

### **Test #3 :**

Pressure loss measurement for the first check valve in normal flow direction.

1. Open testing valve #3 (L) ;
2. Open testing valve #2 (H) ;
3. Open the high pressure purge valve (HP) on the gauge to let the air out of the hose and the gauge then close the valve ;
4. Open the low pressure purge valve (LP) on the gauge to let the air out of the hose and the gauge then close the valve ;
5. Write down the pressure showed on the pressure gauge. The value showed on the pressure gauge represent the pressure drop in check valve #1 and it is written on the report. This value must remain the same for 2 minutes. If the value stayed the same then tick the "sealed closing" box on the report. If not then tick the "leaking" box. This test is successful if the value is at least 5 psi ;
6. Close the testing valves and let all the residual pressure out of the pressure gauge then unplug the hoses except the high pressure hose that need to be kept plugged ;

### **DARPR's buffer pressure or buffer zone calculation**

(First check valve's differential pressure) – (Discharge valve's opening pressure) = 3 psi

\*Those 3 psi are usually called the buffer pressure or the buffer zone.

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## Testing for reduced pressure Dar (DARPR)

### **Test #4 :**

Pressure measurement in the pipe during the tests.

1. Open testing valve #2 ;
2. Open the high pressure purge valve (HP) on the gauge to let the air out of the hose and the gauge then close the valve ;
3. The value showed on the small gauge is the pipe's pressure. Write down that pressure on the report ;
4. Close the testing valve #2 and let the gauge's pressure out and then unplug the high pressure hose from the second testing valve ;

### **Test #5 :**

Pressure loss measurement for the second check valve in normal flow direction.

1. Plug the pressure gauge's high pressure hose on testing valve #3 ;
2. Plug the pressure gauge's low pressure hose on testing valve #4 ;
3. Open the testing valve #4 (L) ;
4. Open the testing valve #3 (H) ;
5. Open the high pressure purge valve (HP) on the gauge to let the air out of the hose and the gauge then close the valve ;
6. Open the low pressure purge valve (LP) on the gauge to let the air out of the hose and the gauge then close the valve ;
7. Check the pressure showed on the pressure gauge. This value represent the pressure drop in check valve #2. It must remain the same for two minutes. If the value is stable then write it down on the report and tick the "sealed closing" box. If not then tick the "leaking" box. This test is successful if the pressure is at least 1 psi ;
8. Close the testing valves and let the gauge's pressure out and then unplug all hoses from ;

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## Testing for reduced pressure Dar (DArPR)

**After testing – DArPR start-up.**

### **Start-up procedure**

After completing all prescribed tests the DArPR must put back in service as follows :

1. Close all testing valves ;
2. Remove all testing materials ;
3. Completely open the first main valve to put the device under pressure ;
4. Check if there are leaks on the DArPR ;
5. Inform the powers of regulation that the water supply will be restored ;
6. Open the second main valve to put the DArPR back in service. Be sure to progressively and slowly open the main valves to avoid damaging the installations. Check for air in the pipes before the device and purge if needed.

**IMPORTANT : DArPR TESTING MUST ONLY BE REALISED BY CERTIFIED TECHNICIAN.**