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

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PREPARED BY:

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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.

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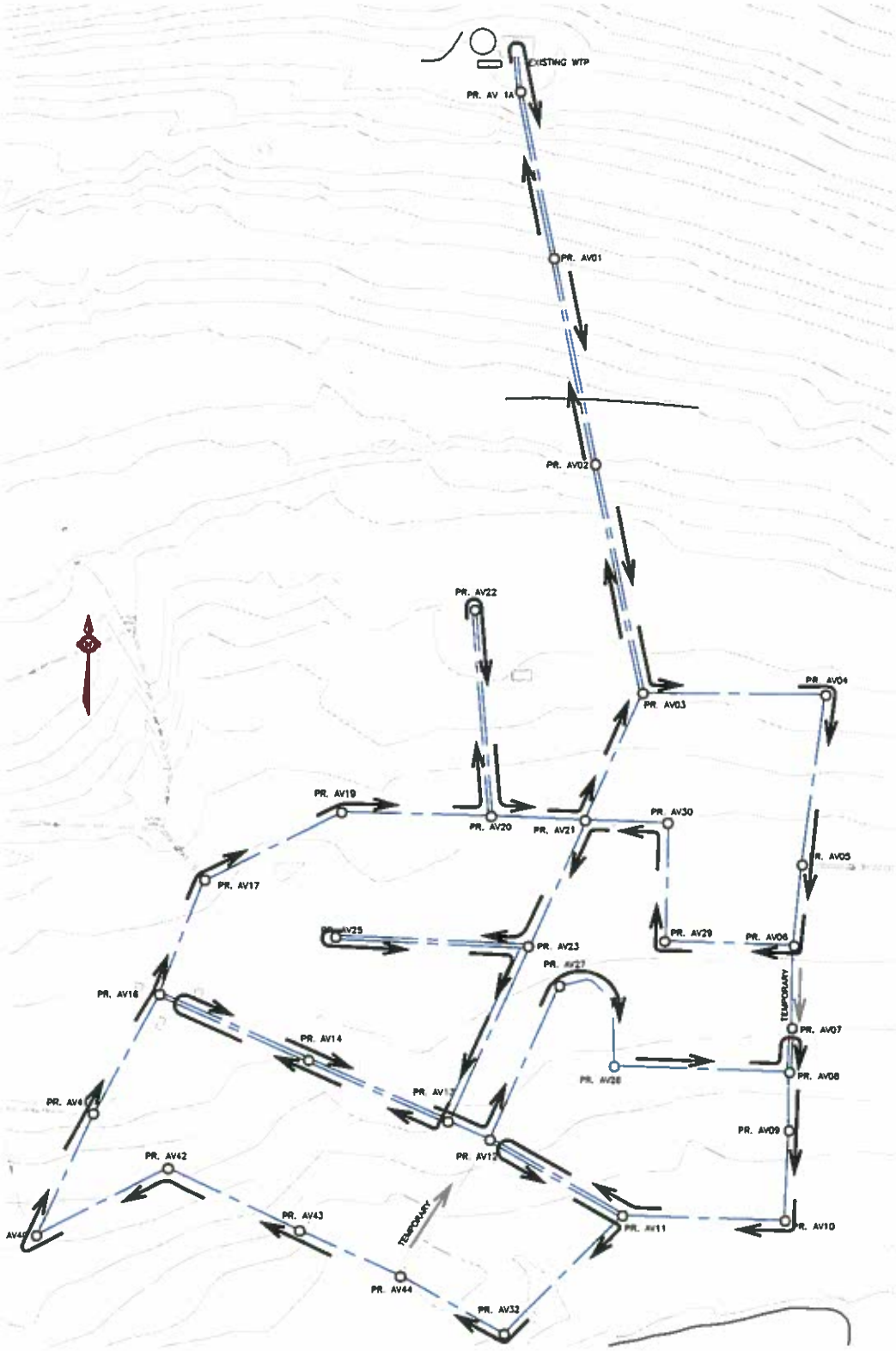
Maintenance of Water and Sewer Systems



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scale: N.T.S	CLIENT: RESOLUTE BAY NEW UTILIDOR DESIGN	project no: 206333
date: 03/12/2013	TITLE: PROPOSED WATER CIRCULATION	FIG1
drawn by: IPC		

Filename: p:\projects\civil engineering services\206000\tot-00206333-a0 - new utilidor design, resolute bay - gn\d - drawings\sketches and figures\water circulation-proposed.dwg
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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	**AV's**
	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.
	Watermain
	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	**Sewer Mains**
	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.
	AV's
	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.
	Hydrants
	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	**Sewer Mains**
	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.
	AV's
	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.
	Water Main
	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 watermains.
	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.
	Hydrants
	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.

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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 ¼ 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.

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

Ryfan Kitikmeot Ltd.
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WATER SERVICE RECIRCULATION PUMP

OPERATING AND EMERGENCY CONDITIONS

UNDER NORMAL CONDITIONS GREEN FLOW LAMP IS ON WHEN RED LAMP TURNS ON AND/OR ALARM SOUNDS FOLLOW STEPS 1 TO 4

1. TURN A KITCHEN TAP 1/2 OPEN.
2. CALL THE PLUMBER.
3. PUSH THE "ALARM SILENCE" BUTTON
4. TURN OFF TAP WHEN THE PLUMBER SAYS IT'S OK.

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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. 616SHQ-12012

By Abdul Ahmad

Date 2024-Aug-22

exp.

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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

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

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.

Alarm Silence Push Button

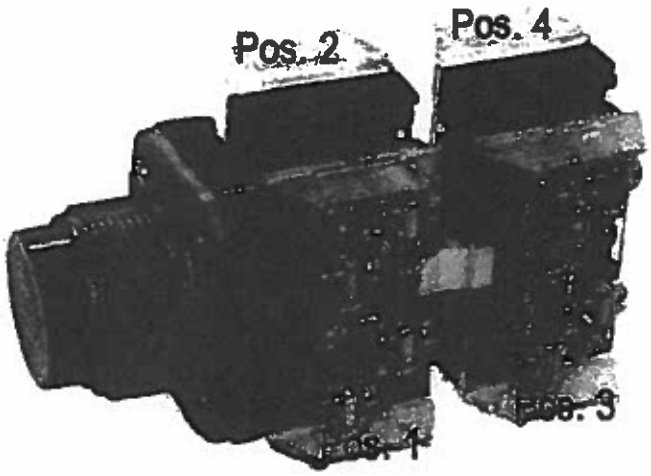
REVIEWED
By Darren Fraser at 3:18 pm, Apr 10, 2014

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 #NKCR, NOIV
CSA	LR1234, LR11924, 22.2 #14



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PUSH BUTTON DEVICES

MOMENTARY CONTACT PUSHBUTTONS, NON-ILLUMINATED

CONTACT CONFIGURATION	COLOR	TYPE 800T (METAL) FLUSH HEAD	TYPE 800T (METAL) EXTENDED HEAD	TYPE 800H (PLASTIC) BOOTLESS FLUSH HEAD	TYPE 800H (PLASTIC) 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 PUSHBUTTONS, NON-ILLUMINATED WITH 2 COLOR MOLDED LEGEND CAP

CONTACT CONFIGURATION	BUTTON COLOR	LEGEND COLOR	LEGEND	HEAD TYPE	TYPE 800T (METAL)	TYPE 800H (PLASTIC)
						
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 PUSHBUTTONS, ILLUMINATED

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

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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

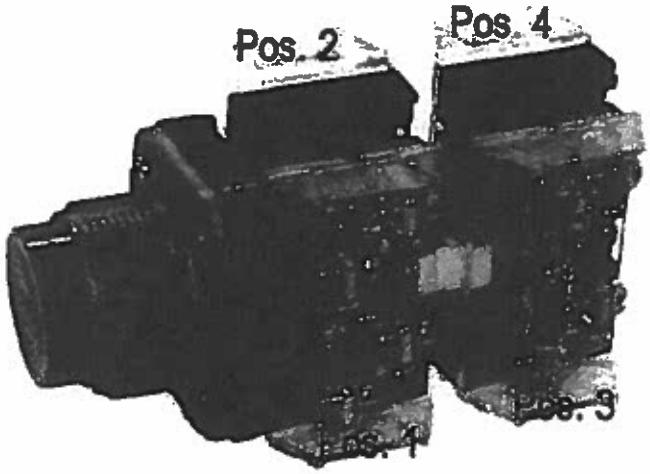
Product: 800T-A2D2

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



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Reviewed	Reviewed with Comments	Resubmit See Comments
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PUSH BUTTON DEVICES

MOMENTARY CONTACT PUSH BUTTONS, NON-ILLUMINATED

CONTACT CONFIGURATION	COLOR	TYPE 4/4X METAL (800T) FLUSH HEAD	TYPE 4/4X METAL (800T) EXTENDED HEAD	TYPE 4/4X/13 PLASTIC (800H) BOOTLESS FLUSH HEAD	TYPE 4/4X/13 PLASTIC (800H) 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 4/4X METAL (800T) 	TYPE 4/4X/13 PLASTIC (800H) 
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 4/4X METAL (800T) EXTENDED HEAD WITHOUT GUARD	TYPE 4/4X METAL (800T) EXTENDED HEAD WITH GUARD	TYPE 4/4X/13 PLASTIC (800H) EXTENDED HEAD WITHOUT GUARD	TYPE 4/4X/13 PLASTIC (800H) 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.

BOUTHILLETTE PARIZEAU INC. (BPA)

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

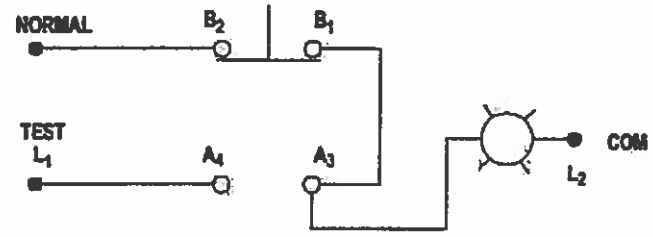
Product: 800T-QT10G
Description: 800T Standard, Push-To-Test, Dual Input

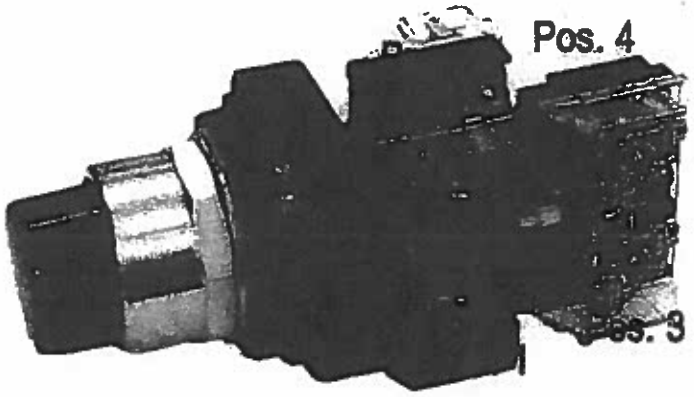
ASSEMBLY	
Factory or User Assembled?	Factory Assembled

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 — PROVIDE LED LAMP
Voltage	~~120V AC~~
Lens Color	Green
Block Type	Standard
Contact Blocks	1 N.O. - 1 N.C. (Standard with Push-to-Test)

CERTIFICATIONS AND APPROVALS	
UL	Listed E14840, E10314; Guide #NKCR, NOIV
CSA	LR1234, LR11924, 22.2 #14

Push-to-Test Pilot Light Device Schematic





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Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	

MAY 4 2014

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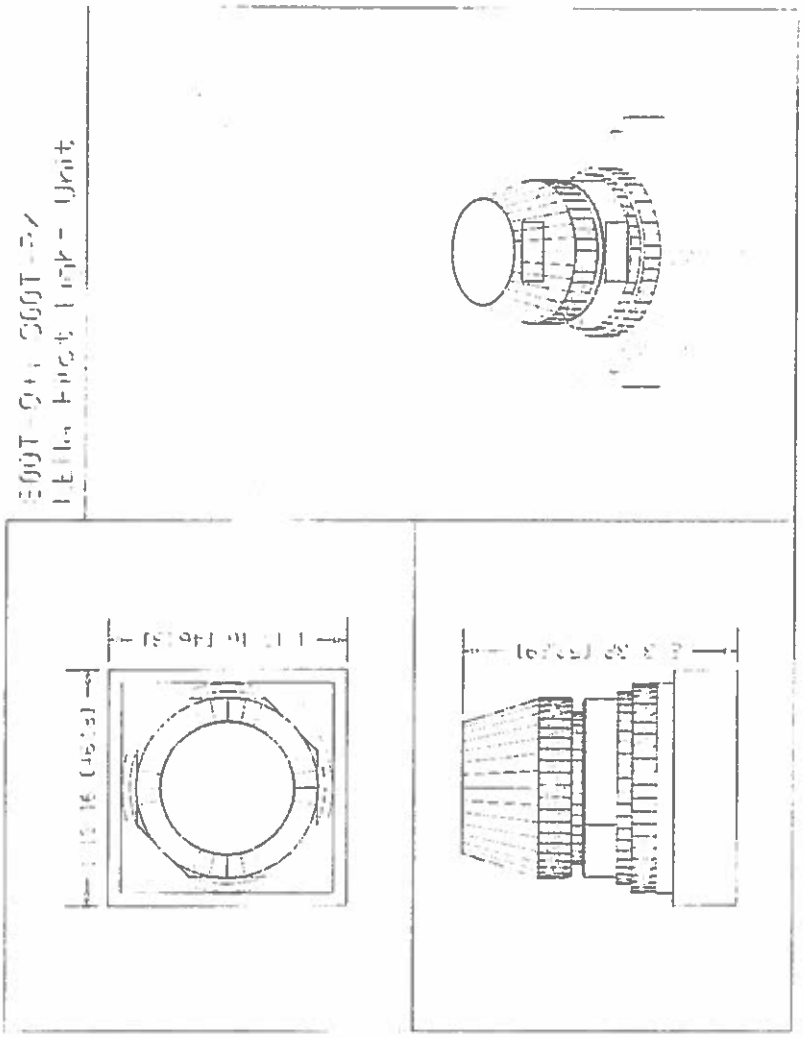

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Reviewed	Reviewed with Comments	Resubmit See Comments
✓		

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.

No Flow "Push to Test" Red Pilot Light

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

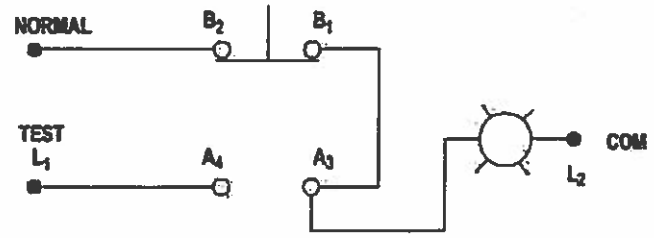
Product: 800T-QT10R
Description: 800T Standard, Push-To-Test, Dual Input

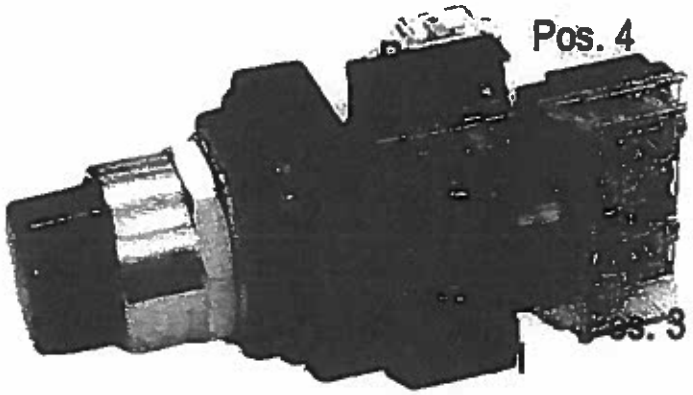
ASSEMBLY	
Factory or User Assembled?	Factory Assembled

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 — PROVIDE LED TYPE LAMP
Voltage	120V AC
Lens Color	Red
Block Type	Standard
Contact Blocks	1 N.O. - 1 N.C. (Standard with Push-to-Test)

CERTIFICATIONS AND APPROVALS	
UL	Listed E14840, E10314; Guide #NKCR, NOIV
CSA	LR1234, LR11924, 22.2 #14

Push-to-Test Pilot Light Device Schematic





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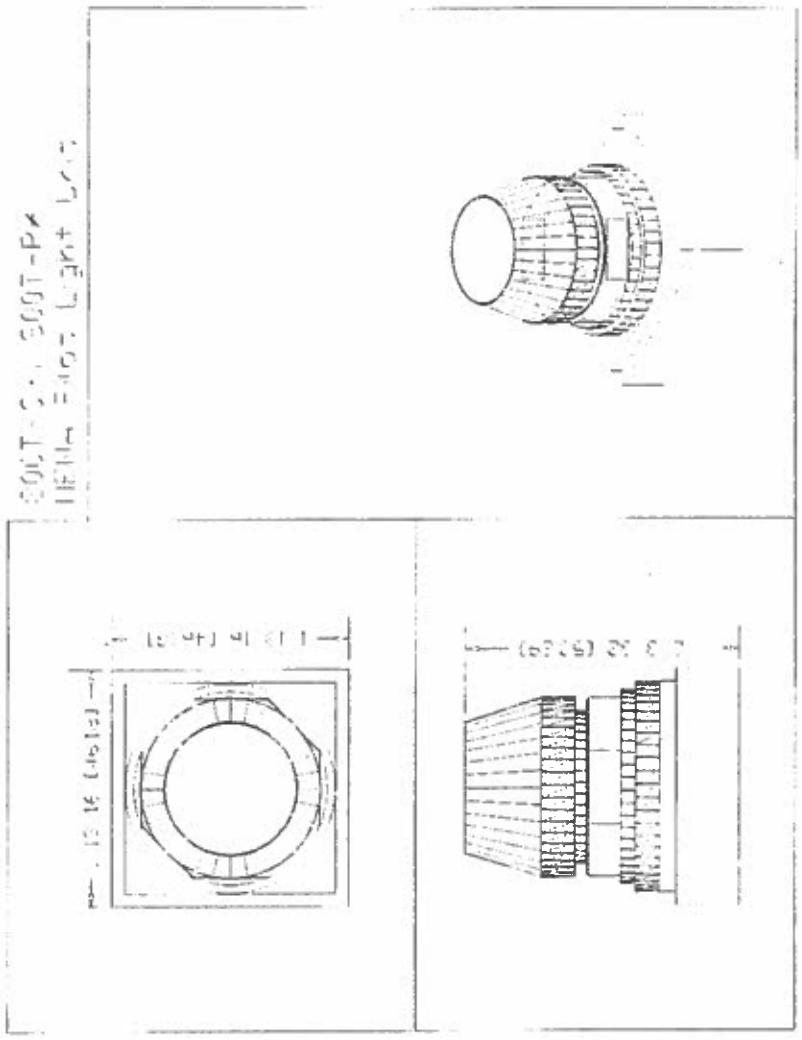

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Reviewed	Reviewed with Comments	Resubmit See Comments
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CHRIS MARCON, CET.

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 10.5 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 VAC 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 (Erectrical)	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)	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 Material Safety Law
Terminal structure	Plug-in
Weight	Approx. 40 g

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CHRIS MARCON, CET

BOUTHILLETTE PARIZEAU INC. (BPA)

Reviewed	Reviewed with Comments	Resubmit See Comments

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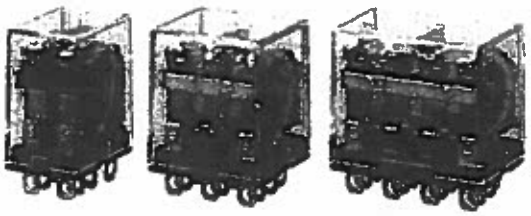
Bi-power Relays

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 *Common Relay Precautions*.



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

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 Bifurcated	**LY2Z	**LY2ZN	**LY2Z-0	**LY2ZF
	3	*LY3	**LY3N	*LY3-0	*LY3F
	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 Bifurcated	**LY2Z-D	**LY2ZN-D2	—	—
	3	**LY3-D	**LY3N-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 Bifurcated	**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 (TÜV).
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 110/120 VOLT AC RATED RELAY.

BOUTHILLETTE PARIZEAU INC. (BPA)

Reviewed	Reviewed with Comments	Resubmit See Comments
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Ordering Information

Models with Plug-in Terminals

Classification \ Number of poles		1 pole		2 poles		3 poles		4 poles	
		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
	Models with built-in CR circuits	—	—	LY2-CR	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—
	Models with built-in CR circuits and operation indicators	—	—	LY2N-CR	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—
Bifurcated contacts	Standard models	—	—	LY2Z	100/110 or200/220 VAC	—	—	—	—
		—	—		12, 24, 48, or 100/110 VDC	—	—	—	—
	Models with built-in operation indicators	—	—	LY2ZN	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—
		—	—		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, 110/1 20, or 200/220 VAC	—	—	—	—

Relays with PCB Terminals

Classification \ Number of poles	1 pole		2 poles		3 poles		4 poles	
	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		12, 24, 48, or 100/110 VDC
Bifurcated contacts	—	—	LY2Z-0	100/110 VAC	—	—	—	—
				24, 48, or 100/110 VDC				—

Case-surface Mounting

Classification \ Number of poles	1 pole		2 poles		3 poles		4 poles	
	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	—	—	LY2F	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.

Classification \ Number of poles	2 poles		4 poles		Minimum order (No. of Relays)
	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	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	

PROVIDE 110/120 VOLT AC RELAY

ORIGINAL SIGNED BY CHRIS MARCON, CET

BOUTHILLETTE PARIZEAU INC. (BPA)

Reviewed	Reviewed with Comments	Resubmit See Comments
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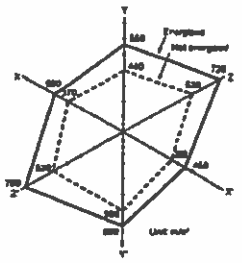
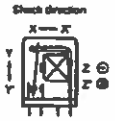
Malfunctioning Shock

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/s², Energized: 200 m/s²

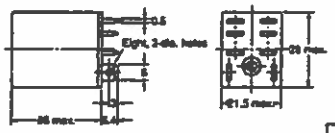


Dimensions

(Unit: mm)

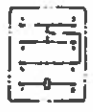
Solder terminals

LY1
LY1N
LY1-D
LY1N-D2



Terminal Arrangement/Internal Connections (Bottom View)

LY1

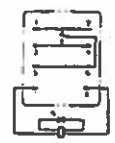


(The coil has no polarity.)

LY1N-D

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

LY1N

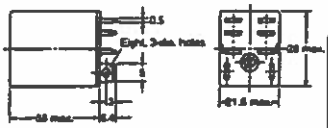
DC Models	AC Models
	
Check the coil polarity when wiring and wire all connections correctly.	(The coil has no polarity.)

LY1N-D2

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

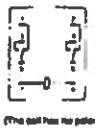
Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.
2. The indicator is red for AC and green for DC.
3. The operation indicator indicates the energization of the coil and does not represent contact operation.

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



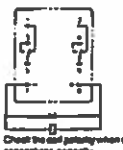
Terminal Arrangement/Internal Connections (Bottom View)

LY2(Z)



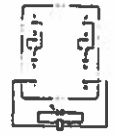
(The coil has no polarity.)

LY2(Z)-D

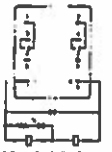


Check the coil polarity when wiring and wire all connections correctly.

LY2(ZN)

DC Models	AC Models
	
Check the coil polarity when wiring and wire all connections correctly.	(The coil has no polarity.)

LY2(ZN)-D2



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.

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VERIFY COIL VOLTAGE

PROVIDE 110/120VAC TYPE UNIT

Part # PTF08A-E

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

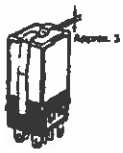
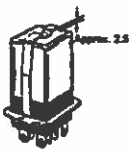
Item	Front-mounting Sockets	Back-mounting Sockets		
Number of poles	Track or screw mounting	Solder terminals	Wrapping terminals	Relays with PCB Terminals
1 or 2	PTF08A(-E)	PT08	PT08QN	PT08-0
3	PTF11A	PT11	PT11QN	PT11-0
4	PTF14A(-E) 	PT14 	PT14QN 	PT14-0 

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

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

Model	Standards	No.
PTF08A PTF11A PTF14A	UL	File No. E87929
	CSA	File No. LR31928

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

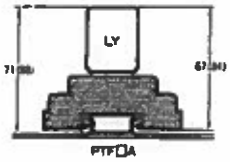
Used with Socket		Used with Socket mounting plate	For models with built-in CR circuits	
PYC-A1 	PYC-P 	PYC-S 	Y92H-3 	PYC-1 

Connection Socket and Hold-down Clip Application Table

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

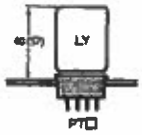
Mounting Height with Sockets

Front-mounting Sockets



PTF□A

Back-mounting Sockets



PT□

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

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BASE TO MATCH
120 VOLT AC TYPE
RELAY

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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PROVIDE 110/120VAC
TYPE UNIT

BOUTHILLETTE PARIZEAU INC. (BPA)

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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 (Erectrical)	1800 opn./h
Insulation resistance	Between coil and contacts: 100 MOhm Min. (at 500 VDC) Between contacts of different polarity: 100 MOhm Min. (a; 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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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 *Common Relay Precautions*.

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

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 Bifurcated	**LY2Z	**LY2ZN	**LY2Z-0	**LY2ZF
	3	*LY3	**LY3N	*LY3-0	*LY3F
	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 Bifurcated	**LY2Z-D	**LY2ZN-D2	—	—
	3	**LY3-D	**LY3N-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 Bifurcated	**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 (TÜV).
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)

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Ordering Information

Models with Plug-in Terminals

Classification	Number of poles	1 pole		2 poles		3 poles		4 poles	
		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, or220/240 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
	Models with built-in CR circuits	—	—	LY2-CR	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—
	Models with built-in CR circuits and operation indicators	—	—	LY2N-CR	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—
Bifurcated contacts	Standard models	—	—	LY2Z	100/110 or200/220 VAC	—	—	—	—
		—	—		12, 24, 48, or 100/110 VDC	—	—	—	—
	Models with built-in operation indicators	—	—	LY2ZN	100/110, 110/120, 200/220, or 220/240 VAC	—	—	—	—
		—	—		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, 110/1 20, or 200/220 VAC	—	—	—	—

Relays with PCB Terminals

Classification	Number of poles	1 pole		2 poles		3 poles		4 poles	
		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		12, 24, 48, or 100/110 VDC
Bifurcated contacts		—	—	LY2Z-0	100/110 VAC	—	—	—	—
					24, 48, or 100/110 VDC				—

Case-surface Mounting

Classification	Number of poles	1 pole		2 poles		3 poles		4 poles	
		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.

Classification	Number of poles	2 poles		4 poles		Minimum order (No. of Relays)
		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		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	

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

ORIGINAL SIGNED BY
CHRIS MARCON, CET.

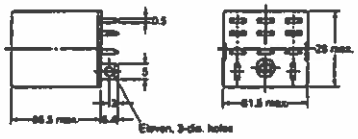
SOUTHILLETTE PARIZEAU INC. (SPA)

Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	✓

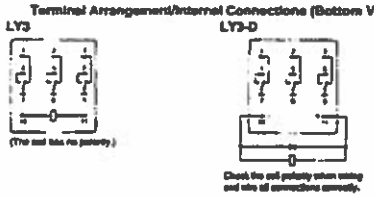
MAY 4 . 2014

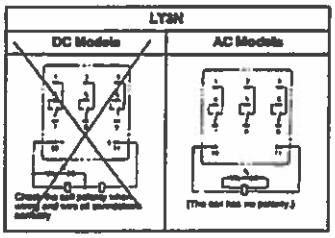
This review of this drawing does not in any way relieve the contractor of responsibility for its accuracy or for compliance with the contract documents.

LY3
LY3N
LY3-D



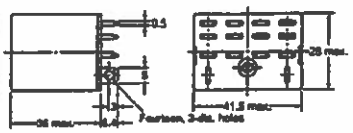
Terminal Arrangement/Internal Connections (Bottom View)



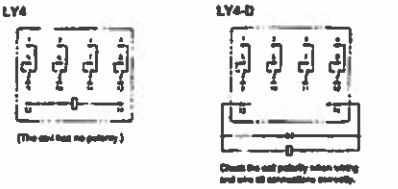


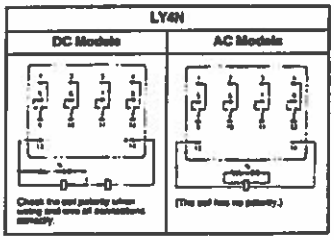
Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.
2. The indicator is red for AC and green for DC.
3. The operation indicator indicates the energization of the coil and does not represent contact operation.

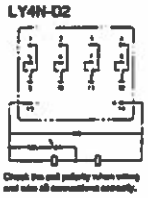
LY4
LY4N
LY4-D
LY4N-D2



Terminal Arrangement/Internal Connections (Bottom View)

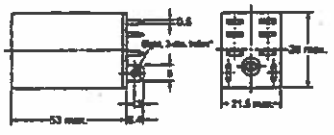






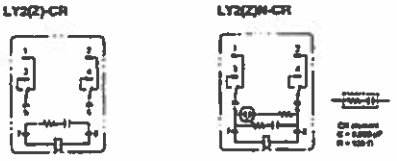
Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.
2. The indicator is red for AC and green for DC.
3. The operation indicator indicates the energization of the coil and does not represent contact operation.

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



*These dimensions are for the LY2N-CR.

Terminal Arrangement/Internal Connections (Bottom View)



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 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 # PTF11A

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

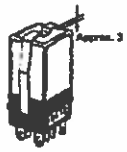
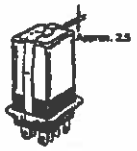
Item	Front-mounting Sockets	Back-mounting Sockets		
Number of poles	Track or screw mounting	Solder terminals	Wrapping terminals	Relays with PCB Terminals
1 or 2	PTF08A(-E)	PT08	PT08QN	PT08-0
3	PTF11A	PT11	PT11QN	PT11-0
4	PTF14A(-E) 	PT14 	PT14QN 	PT14-0 

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

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

Model	Standards	No.
PTF08A PTF11A PTF14A	UL	File No. E87929
	CSA	File No. LR31928

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

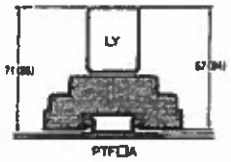
Used with Socket		Used with Socket mounting plate	For models with built-in CR circuits	
PYC-A1 	PYC-P 	PYC-S 	Y92H-3 	PYC-1 

Connection Socket and Hold-down Clip Application Table

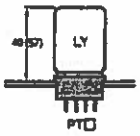
Applicable Relay	Number of poles	Front-mounting Sockets: Track or screw mounting				Back-mounting Sockets: Solder terminals, wrapping terminals, or PCB terminals			
		PTF08A	PTF11A	PTF14A	Applicable Hold-down Clips	PT08(QN) PT08-0	PT11(QN) PT11-0	PT14(QN) PT14-0	Applicable Hold-down Clips
• Standard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

Mounting Height with Sockets

Front-mounting Sockets



Back-mounting Sockets



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

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

BOUTHILLETTE PARIZEAU INC. (BPA)

Reviewed	Reviewed with Comments	Resubmit See Comments
	✓	

ORIGINAL SIGNED BY CHRIS MARCON, CET.

MAY 4 . 2014

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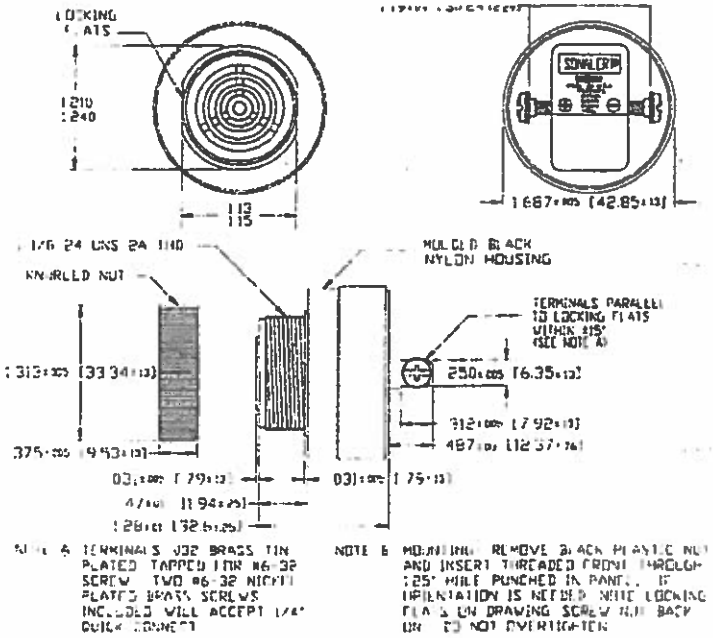
120v Buzzer

MALLORY Mallory Sonalert Products, Inc.	Part #:	SC110N
Sales Outline Drawing	Revision:	H

Specifications:

Sound Level Category	Loud
Mode of Operation	Continuous
Voltage Rating	30 to 120 VAC/DC
Frequency	2900 ± 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	6/6 Nylon, Color: Black
Storage Temperature	-40° to +85° C
Operating Temperature	-30° to +65° 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.

SOUTHILLETTE PARIZEAU INC. (SPA)

Reviewed	Reviewed with Comments	Resubmit See Comments
✓		

MAY 4, 2014

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Part # VWHC 12126

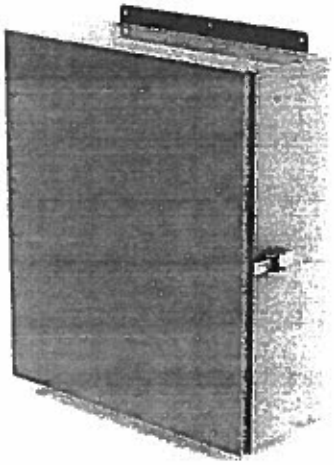
MANUFACTURING Ltd.
Advanced technology... Simple solutions.

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.



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	16	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

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

Toll Free Phone 888-632-6477
Phone 250-832-6477
Fax 250-832-7746
E-mail: sales@validmanufacturing.com
www.validmanufacturing.com

SOUTHILLETTE PARIZEAU INC. (SPA)

Reviewed	Reviewed with Comments	Resubmit See Comments
✓		

ORIGINAL SIGNED BY
CHRIS MARCON, CET. MAY 4 2014

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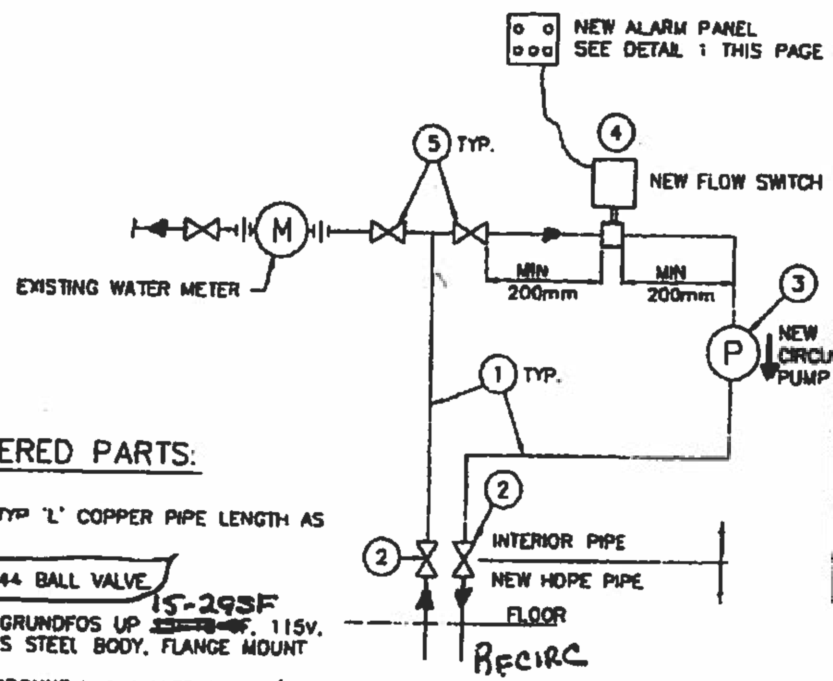
REVIEWED BY TOWER ARCTIC LTD.
DATED 3/12/14



KEY TO NUMBERED PARTS:

1. 25mm TYP 'L' COPPER PIPE LENGTH AS REQUIRED.
2. 25mm FORD B44-444 BALL VALVE
3. CIRCULATION PUMP, GRUNDFOS UP ~~15-18SF~~ 15-29SF, 115V, 2050 RPM, STAINLESS STEEL BODY, FLANGE MOUNT
4. FLOW SWITCH, ITT MCDONNELL & MILLER FS5-1
5. 25MM KITZ BALL VALVE Fig NO 58

Note: 15-18SF is no longer made.

1 TYPICAL WATER SERVICE RECIRCULATION SCHEMATIC

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.

X	NO EXCEPTIONS TAKEN	Submission No. 1
	EXCEPTIONS NOTED - RESUBMIT	Project No. CGSGHQ-12012
		By ABDAL ZAKAD
		Date 19 MAR 2014

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

scale N.T.S.	CLIENT: RESOLUTE BAY NEW BUILDING DESIGN	project no. 206333
date 10/12/2013	TITLE: WATER SERVICE CIRCULATION	FIG2
drawn by A.SURNAME		

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

GRUNDFOS

Submittal Data

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

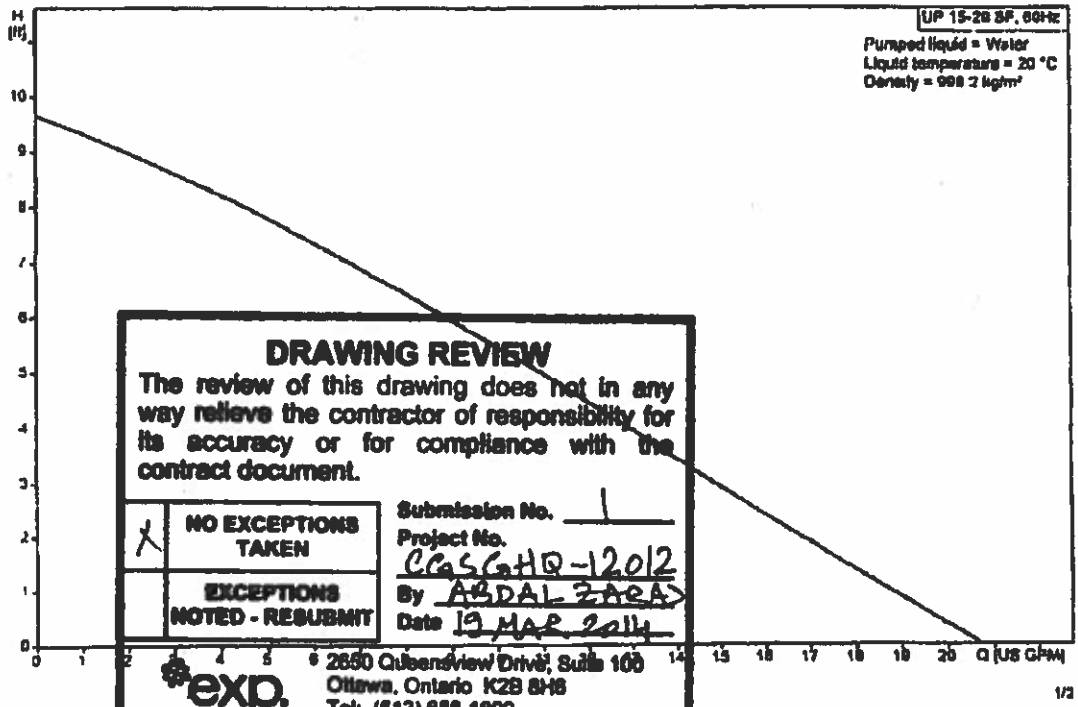
UP 15-29 SF

Circulator pumps

Conditions of Service	
Flow	
Head	
Efficiency:	
Liquid:	Water
Temperature	20 °C
NPSH required:	
Viscosity:	1 mm2/s
Specific Gravity:	1.000

Pump Data	
Maximum operating pressure:	145 psi
Liquid temperature range:	2 .. 110 °C
Maximum ambient temperature:	40 °C
Approvals:	UL, CSA
Type of connection:	S.S. Flange
Flange standard:	USA Oval
Pipe connection:	2 - Bolt Flange
Product number:	59696771

Motor Data	
Max. power input:	87 W
Rated power - P2:	0.121 HP
Rated voltage:	115 V
Mains frequency:	60 Hz
Insulation class:	F
Motor protection:	CONTACT
Thermal protection:	internal



DRAWING REVIEW

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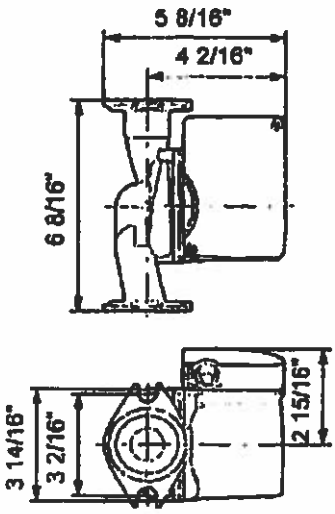
X	NO EXCEPTIONS TAKEN
	EXCEPTIONS NOTED - RESUBMIT

Submission No. 1
Project No. CGSCHQ-12012
By ABDAL ZAREA
Date 19 MAR 2014

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

GRUNDFOS

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.

X	NO EXCEPTIONS TAKEN
	EXCEPTIONS NOTED - RESUBMIT

Submission No. 1
Project No. CAS CAHQ
By ABDM_ABD 14/03/13
Date 13 MAR 2014

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

2/2

ITT

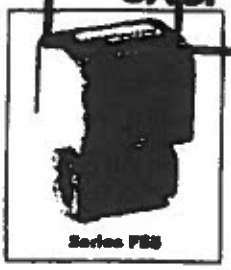
Flow Switches – Liquid

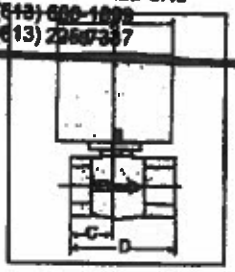
Series FS5

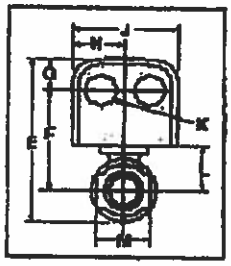
(UL) (CE) (for specified models)

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
  - ¾" 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/cm²)







Electrical Ratings

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

Dimensions, in. (mm)

A	B	C	D
3⁷⁄₁₆ (87)	1⁹⁄₁₆ (40)	1⁵⁄₁₆ (33)	3¹⁄₁₆ (56)

E	F	G	H
5¹⁄₁₆ (129)	3¼ (83)	⅛ (22)	1¹³⁄₃₂ (40.5)

J	K	L	M
3³⁄₁₆ (81)	⅞ (22)	1⅜ (35)	1¹¹⁄₁₆ (43)

Ordering Information

Model Number	Part Number	Description	Weight lbs. (kg)
FS5-¾	114760	General purpose flow switch ¾" NPT	2.5 (1.1)
FS5-D-¾A	114763	FS5-¾ w/2 SPDT switches	2.5 (1.1)
FS5-J-¾A	114765	FS5-¾ w/BSPT connections	2.5 (1.1)
FS5-1	114760	General purpose flow switch 1" NPT	2.5 (1.1)
FS5-D-1	114763	FS5-1 w/2 SPDT switches	2.5 (1.1)
FS5-J-1	114765	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-¾-E	114766	FS5-J-¾ - CE conformance rated	2.5 (1.1)
FS5-J-1-E	114767	FS5-J-1 - CE conformance rated	2.5 (1.1)

See page 132 for CE Conformance information

Flow Rates

Pipe Size NPT	Setting	Mode of Operation: Flow	Mode of Operation: No Flow	Max. Flow Rate (gpm) w/o Bypass
¾	Factory	[illegible]	[illegible]	[illegible]

(2) RESUBMIT

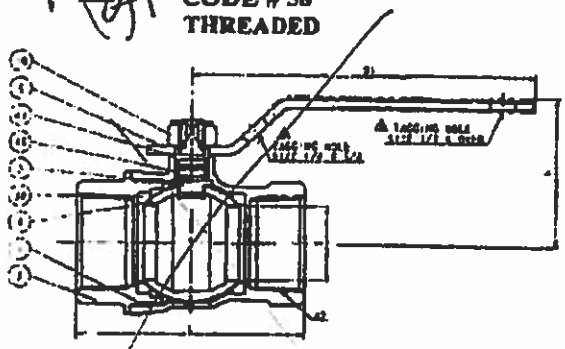
Abdul Jamil 19 MAR 2014

FORGED BRASS BALL VALVE

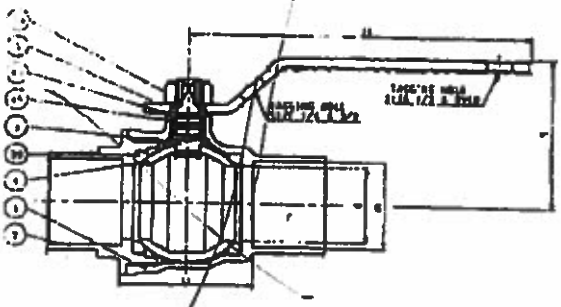
MAINTENANCE FREE DOUBLE O-RING STEM SEALS

Two Piece Body • Full Port • Chrome Plated Ball
Blowout Proof Stem (Ni Plated) • PTFE Seats
CSA (US/C) • UL • FM

CODE # 58
THREADED



CODE # 59
SOLDER*



*REFERENCE VALVE INSTALLATION TIPS FOR [illegible] INSTALLATION SHEET PACKAGED WITH VALVE

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

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

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.
Project No.
Spec. No.
Class
Material 20.1
ANSI B16.18
SOLDER JOINT ENDS
WALL THICKNESS
CONFORMS MSS-SP 110, ASME B16.34, FED. SPEC. WW-V-35B, TYPE I, CLASS 2, TYPE 3

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

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.	d1 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	.506	.502	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	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1 1/4	1.26	2.16	4.33	3.31	2.00	1.382	1.378	68	24
1 1/2	1.57	2.52	5.90	3.62	2.25	1.633	1.629	90	16
2	1.97	2.83	5.90	4.13	2.63	2.133	2.129	[illegible]	[illegible]

**CSA (US/C)
ASME B16.33 – 1250
AGA 3-88 – 2/50
COA 9.1 N97/ANSI Z21.15/CSA 9.1 – 50
COA 3.16 – 125G
COA CR 9.1-00/Z – 20
COA 9.2 N[illegible] – 5G
UL-258 – 175 WWP (Fire Protection Systems)
FM-1140 – 175 WWP (Fire Protection Systems)

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. C&S-Refit-2012
By ABDUL FARAD
Date 19 MAR 2014

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

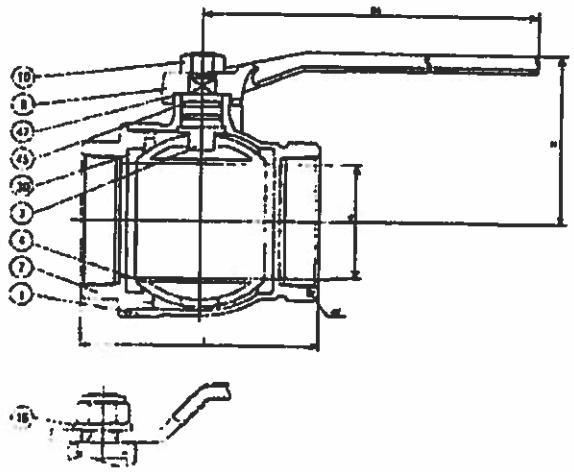
KITZ

CAST BRONZE BALL VALVE

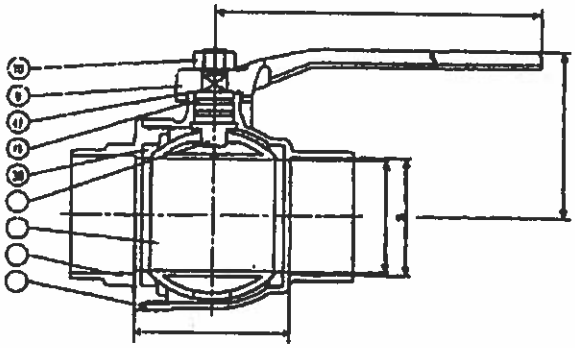
MAINTENANCE FREE DOUBLE O-RING STEM SEALS

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

→ **CODE # 58**
THREADED



CODE # 59
SOLDER*



*REFERENCE VALVE INSTALLATION TIPS FOR SOUND SOLDER JOINTS (PAGE BV-60) 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 US. FED. SPEC. WWV-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 (2½")	(3) FORGED BRASS
	(3"&4")	(2) CAST BRASS
		STRAIGHT OR HOLLOW BALL
9	HANDLE (2½")	(3) CARBON STEEL
	(3"&4")	DUCTILE IRON
10	HANDLE NUT	CARBON STEEL
16	WASHER (2½")	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
2½	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	34

REVIEWED BY TOWER ARCTIC LTD.
DATE 3/04/14

X NO EXCEPTIONS TAKEN
EXCEPTIONS NOTED - RESUBMIT

Submission No. 1
Project No. CG-SCIHQ-12012
By ABDALLAH
Date 19 MAR 2014

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.

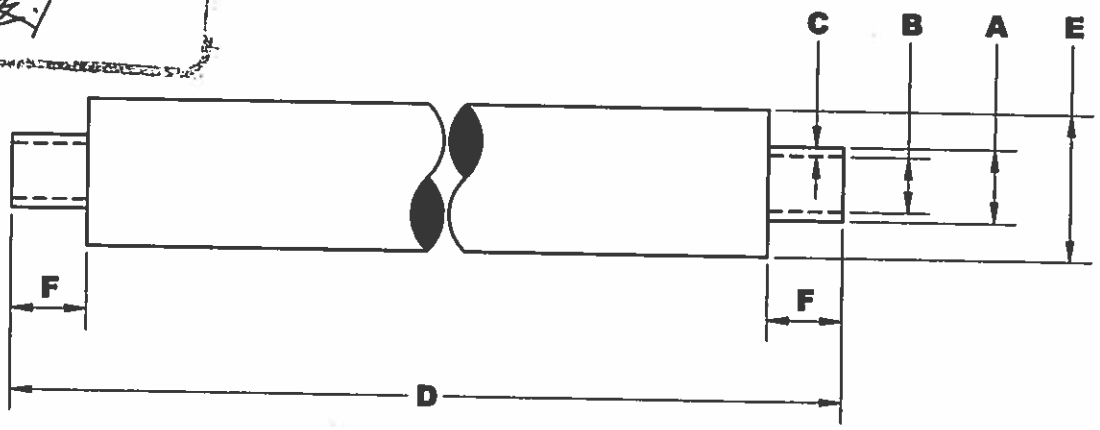
exp.
2650 Queensview Drive, Suite 100
Ottawa, Ontario K2B 8H6
Tel: (613) 688-1899
Fax: (613) 225-7337

2009-10-15 BV-9

PIPE

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

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



PIPE

Nominal Diameter :	2"
Series/Class :	DR-13.5
Pipe service :	----------
Joint type :	Butt Fused
Outside diameter "A" :	2.375"
Inside diameter "B" :	1.920"
Wall thickness "C" :	0.216"
Overall length "D" :	40'

INSULATION

Thickness :	3"
Outside diameter "E" :	8.63"
Cutback "F" :	9"
Mastic on ends :	No

TRACING

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

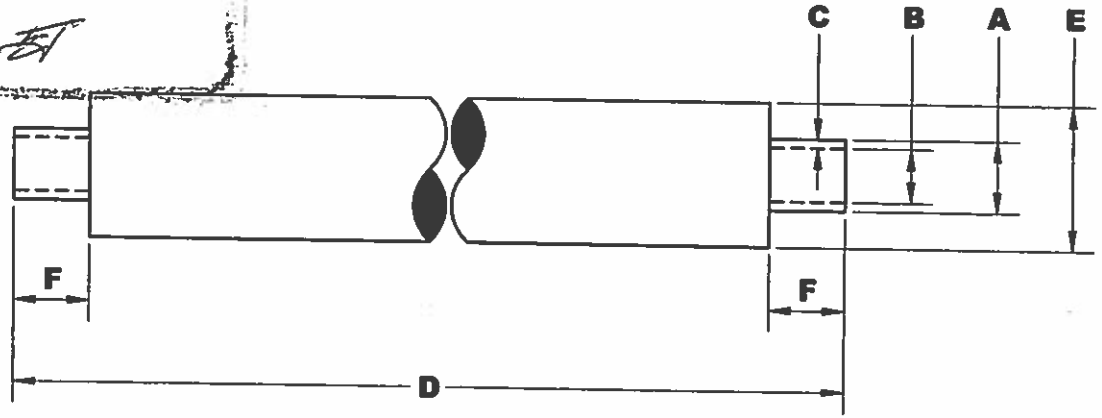
JACKET

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 :	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 :	-----

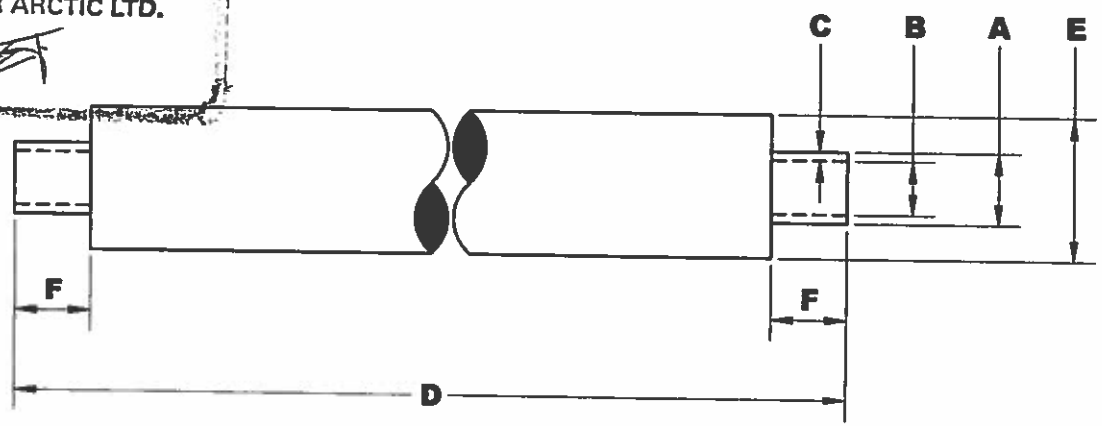
JACKET

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 :	-----

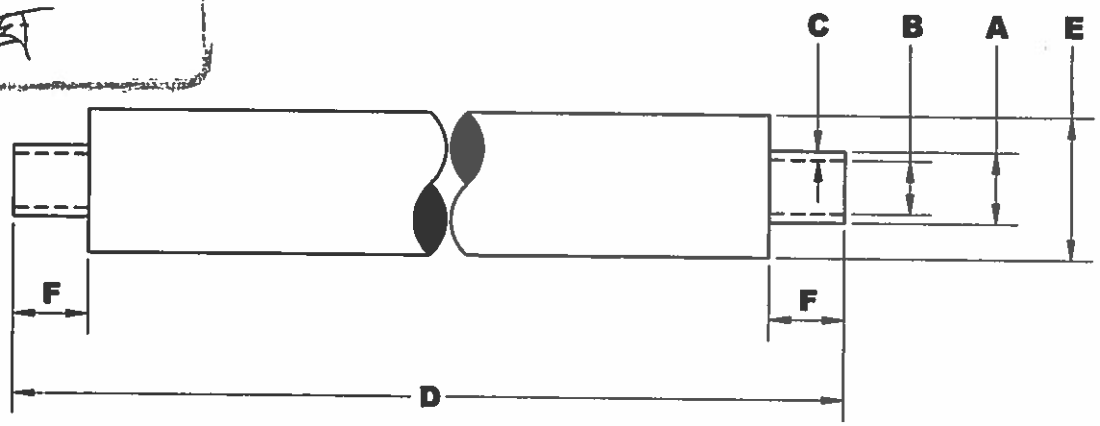
JACKET

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



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" 12
Mastic on ends :	No

TRACING

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

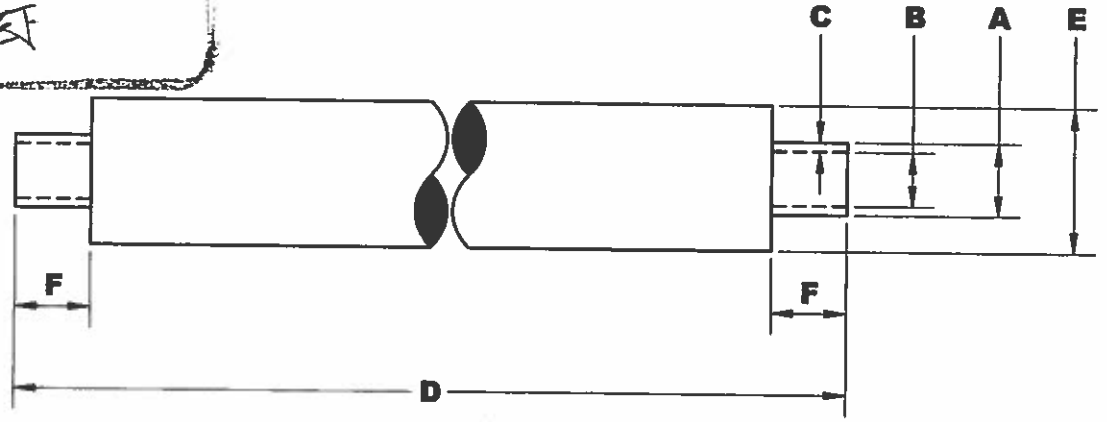
JACKET

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 :	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" :	9" 22
Mastic on ends :	No

TRACING

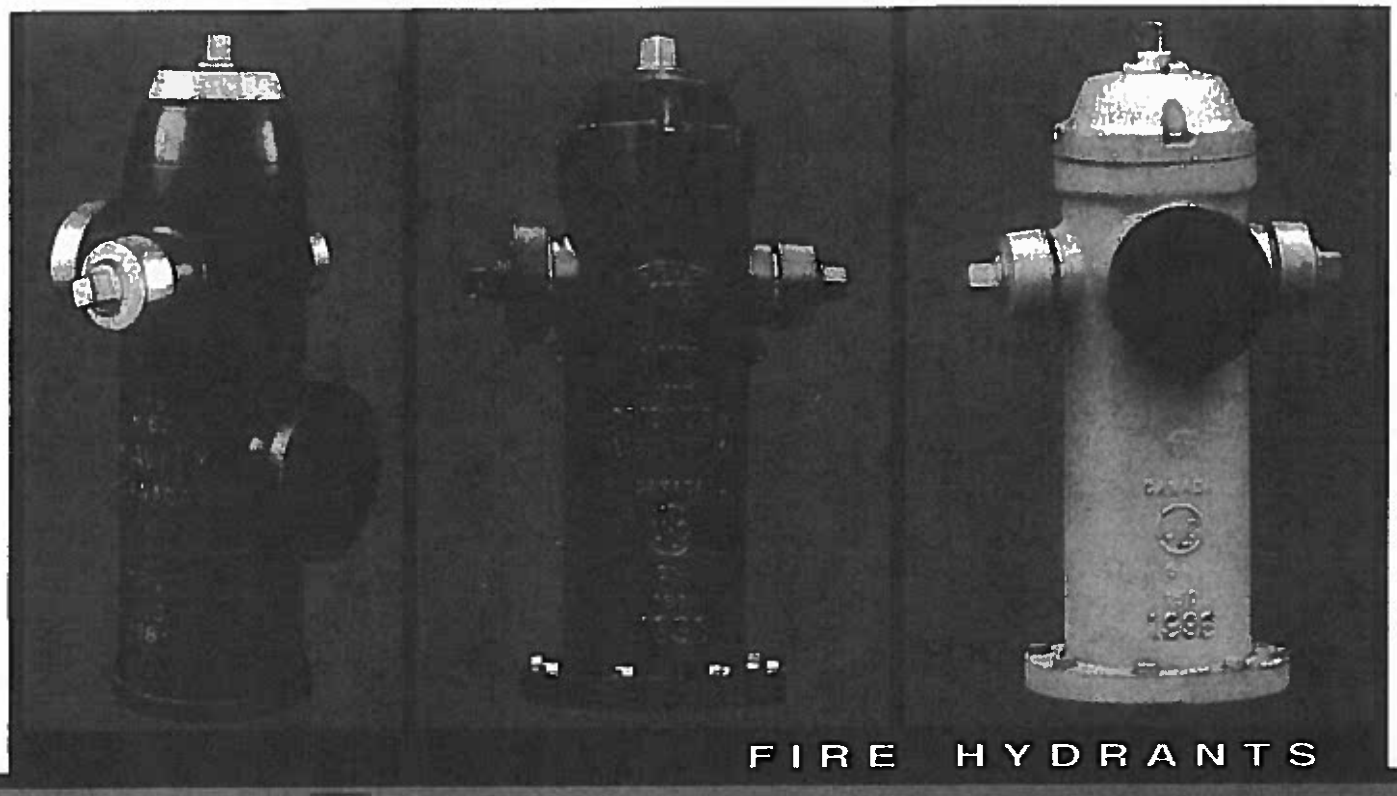
Number of trace conduit :	-----
Size of trace conduit :	-----
Location :	-----
Cable type :	-----

JACKET

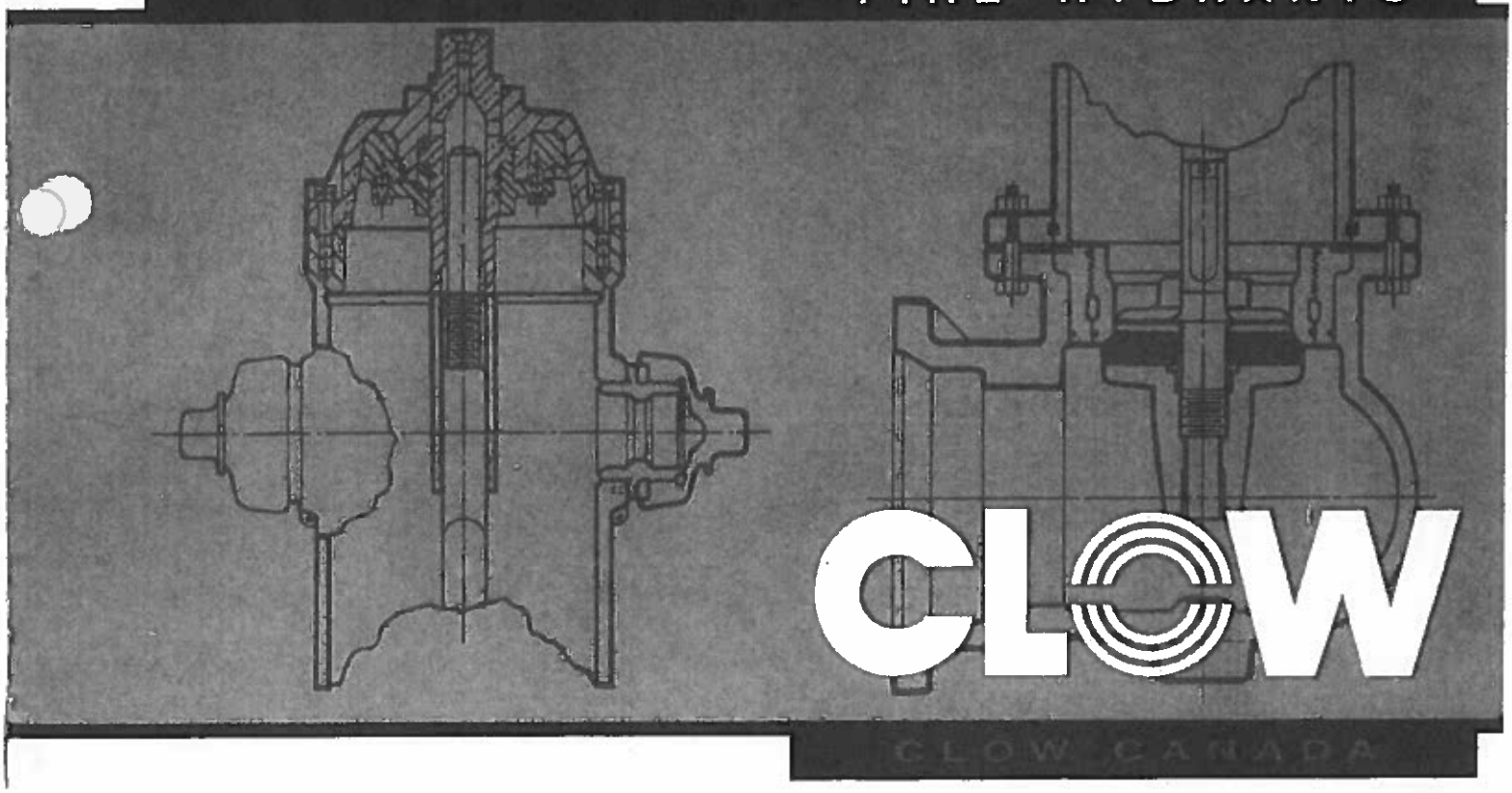
Thickness :	1.27mm
Color :	Black
UV inhibited :	No

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

FIRE HYDRANTS



FIRE HYDRANTS



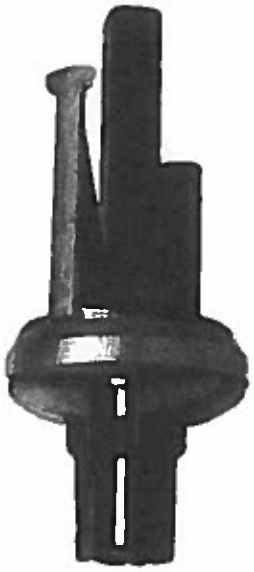
CLOW

CLOW CANADA

www.clowcanada.com

BRIGADIER

SERIES M



Lower valve assembly

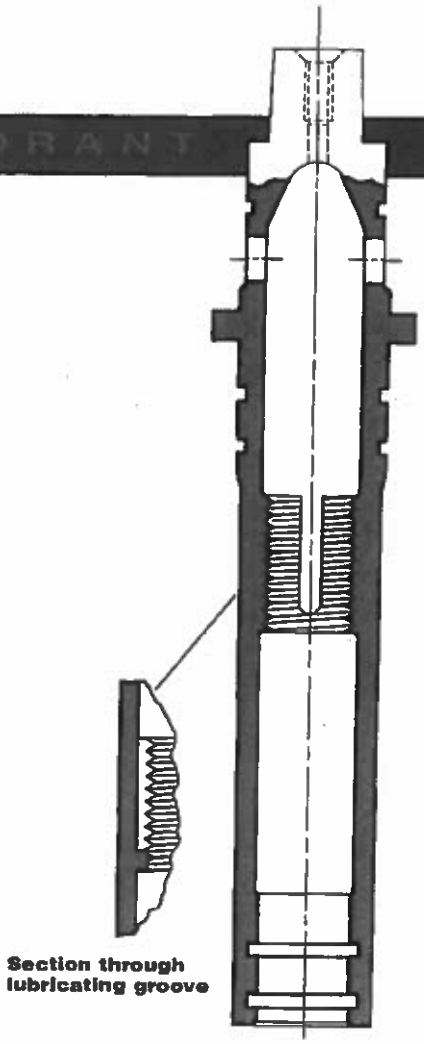
Clow Canada is committed to the manufacture and delivery of superior products, supported by superior services. Strict quality control measures govern every step of the manufacturing process, to ensure precision and consistency. We provide the knowledge, the technology and the products to serve industry's 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

BRIGADIER FIRE HYDRANT

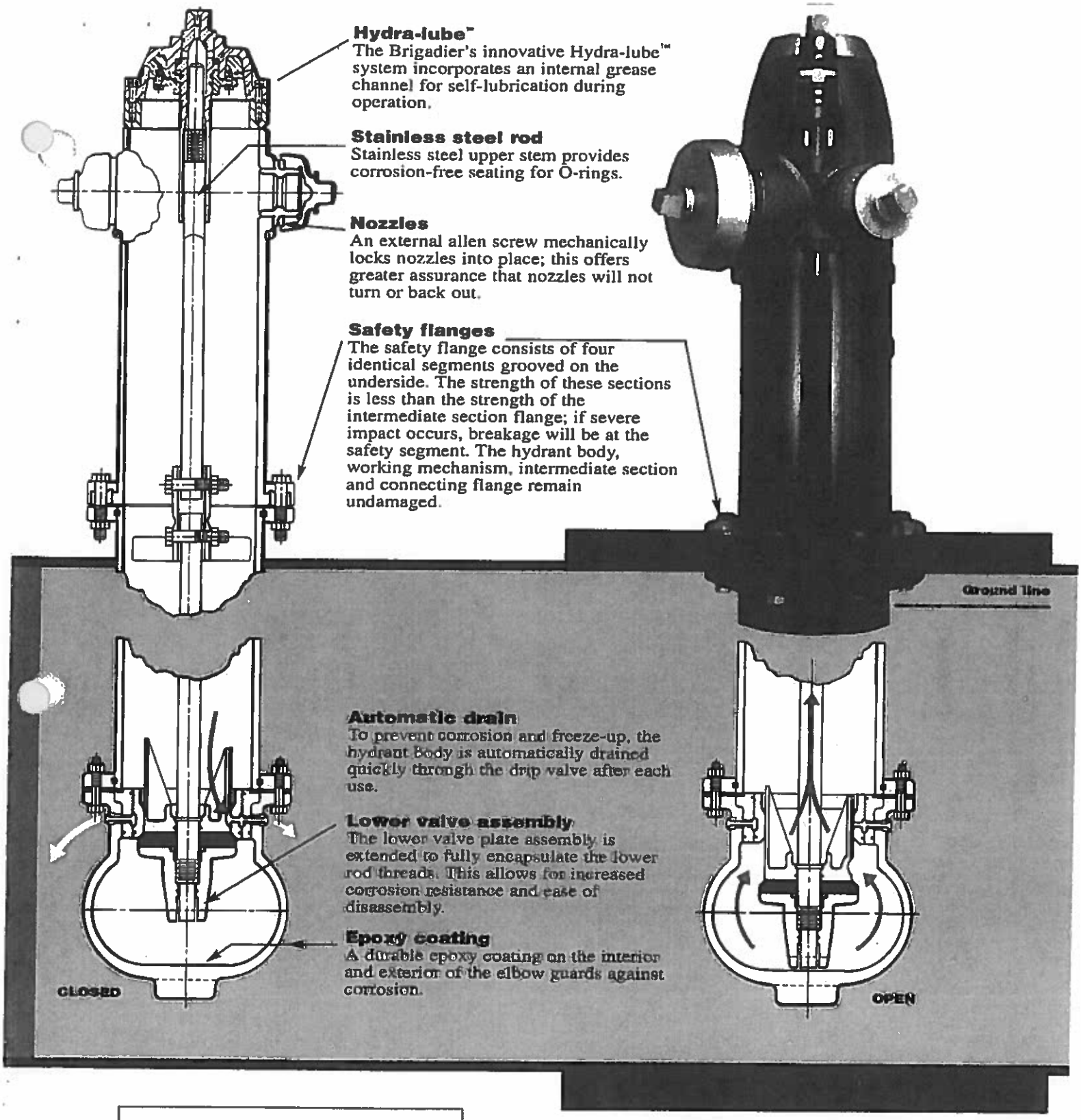
Clow Canada's Brigadier SERIES M incorporates several new design features and improved components for increased performance in firefighting, along with greater durability, economy and convenience. These hydrants are manufactured in Canada to the highest standards of quality — every unit is thoroughly 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



Listed by Underwriters' Laboratories of Canada.

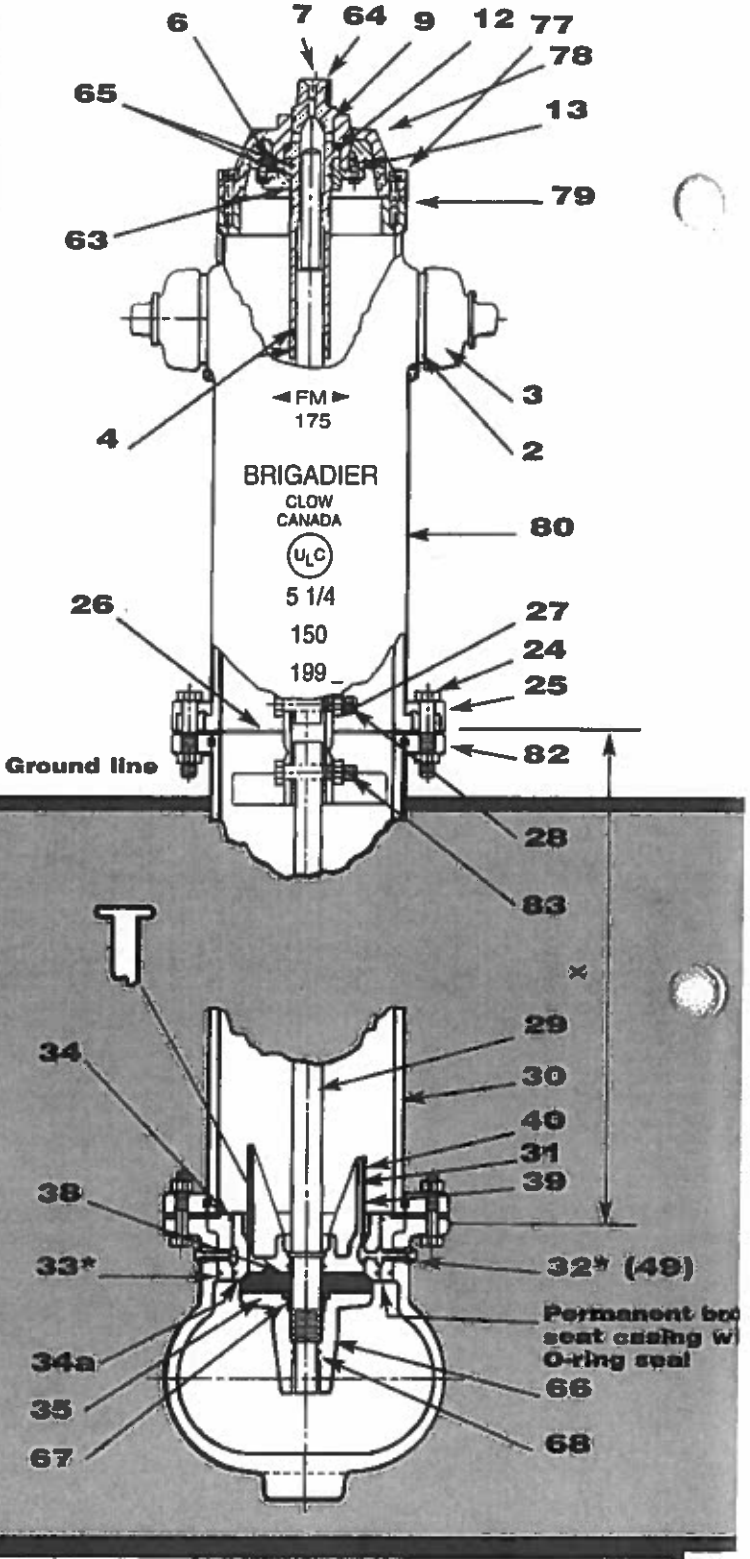
FM

Factory Mutual Approved

CLOW

CLOW CANADA

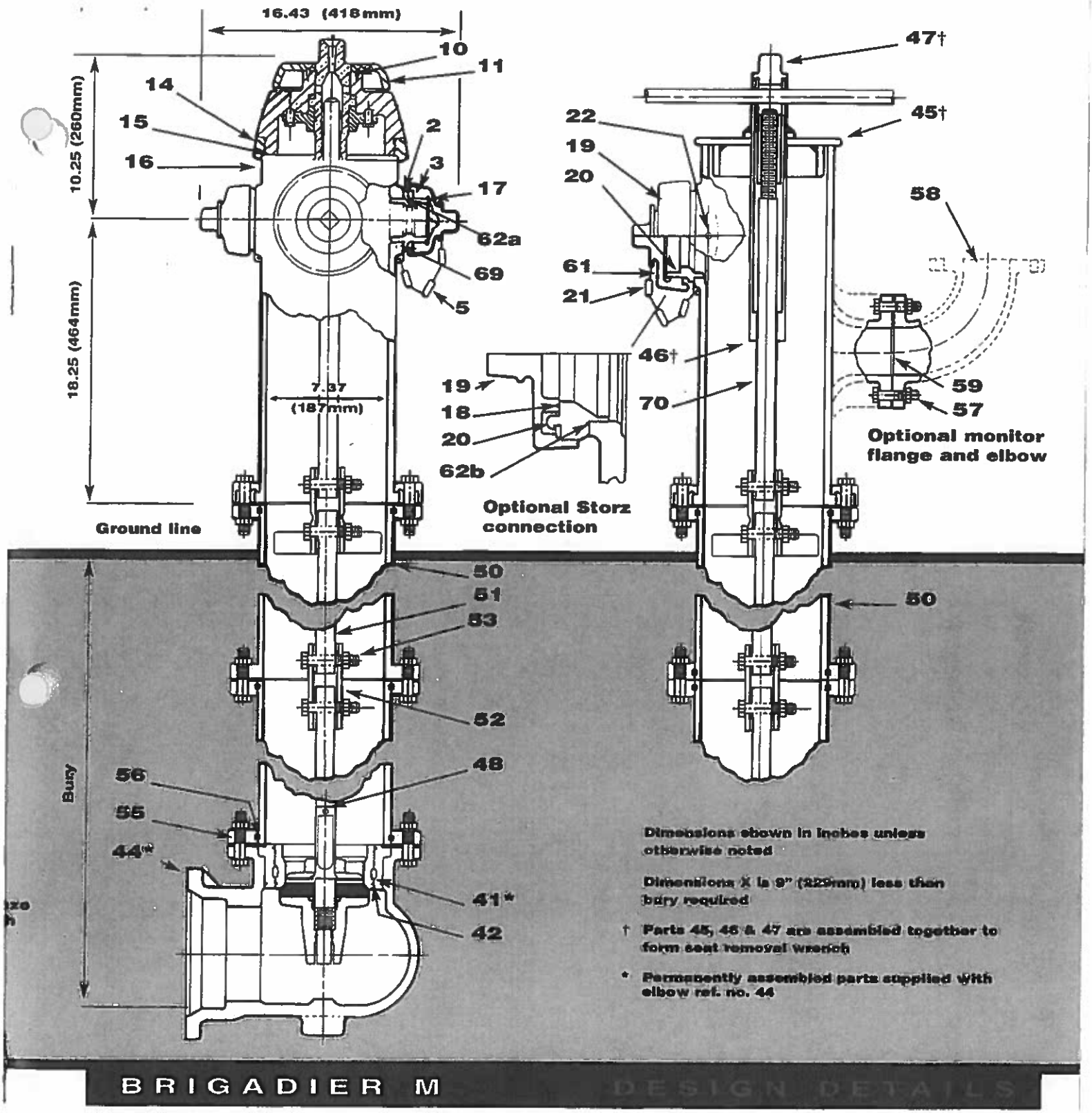
NO.	DESCRIPTION	MATERIAL
2	HOSE NOZZLE	COPPER ALLOY
3	HOSE NOZZLE CAP	CAST IRON
4	HOUSING STEM "O" RING	BUNA N
5	HOSE CAP CHAIN & "S" HOOK	STEEL ZINC PLATED
6	HOUSING JOINT GASKET	COMPRESSED NON ASBESTOS
7	OIL HOLE SCREW	BRASS
9	OPERATING NUT "O" RING	BUNA N
12	OPERATING NUT BEARING	DELRIN
13	CAP SCREW (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.

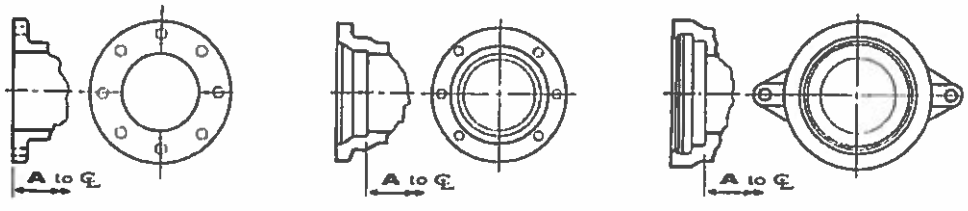
PARTS LIST

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



BRIGADIER M DESIGN DETAILS

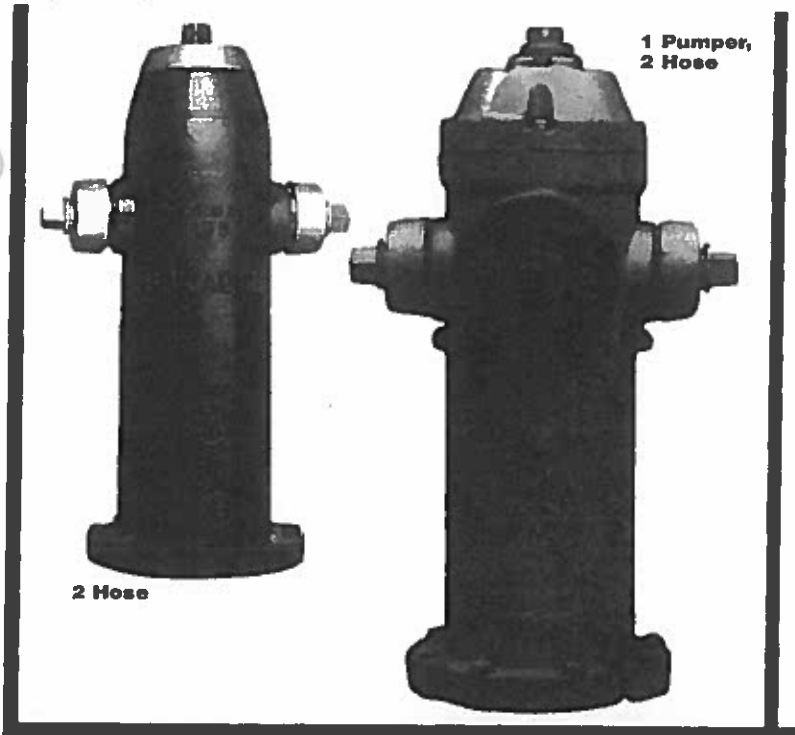
Hydrant end joints



Flanged | Mechanical | Join-tite

	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

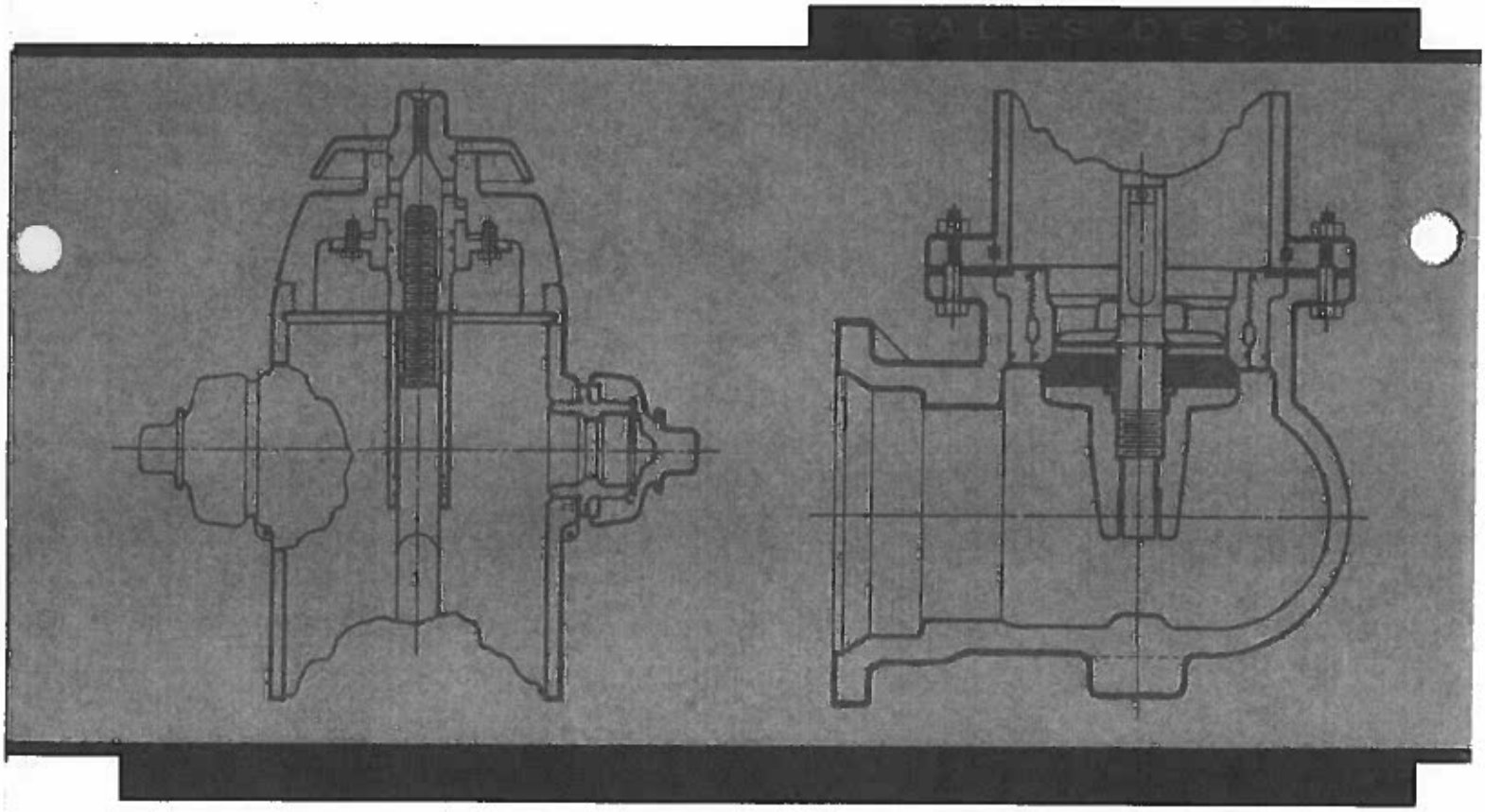
CLOW CANADA

HAMILTON, ONTARIO
TOLL FREE NUMBER

1-800-561-9931

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

www.clowcanada.com



CLOW

CLOW CANADA

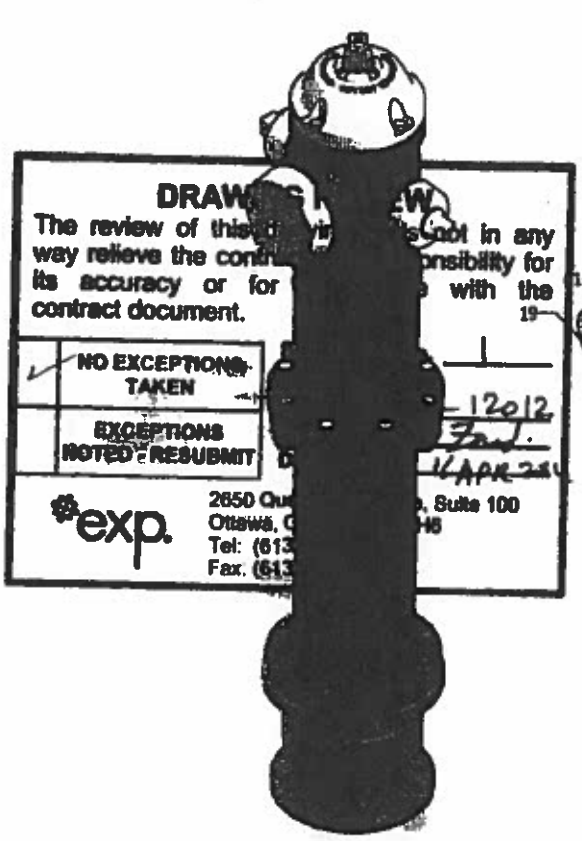
EASTERN CANADA
P.O. Box 700
Saint John, N.B. E2L 4B3
Tel. (506) 633-2541
Fax (506) 634-8936

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

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



DRAWINGS REVIEW

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

- NO EXCEPTIONS TAKEN
- EXCEPTIONS NOTED - RESUBMIT

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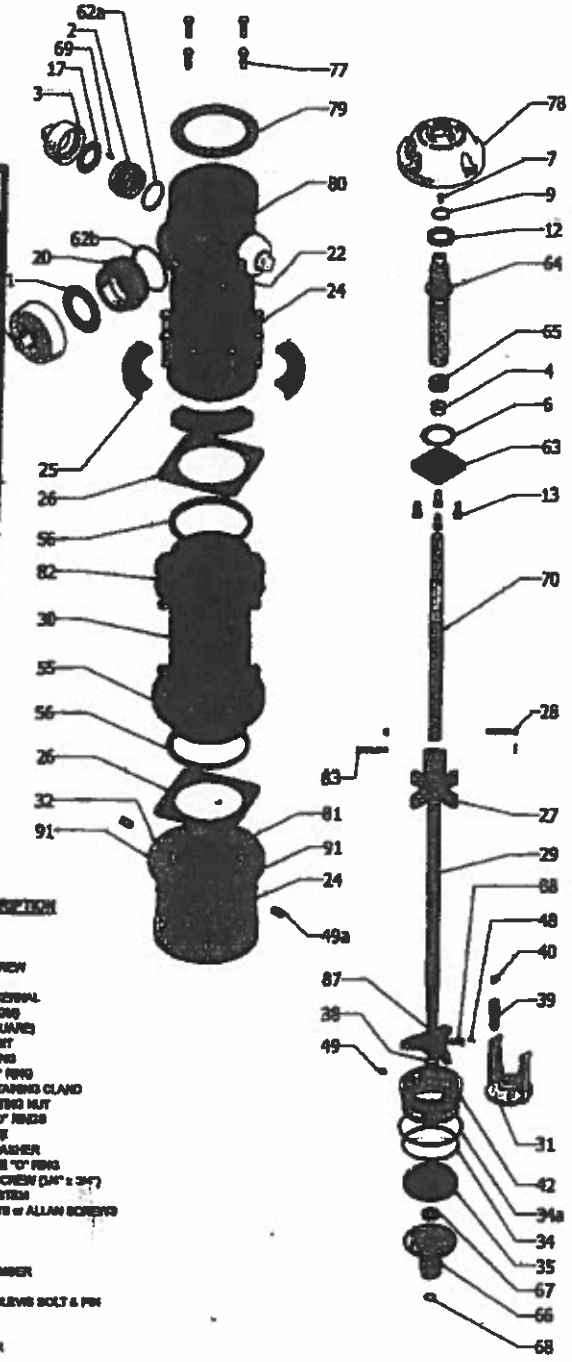
2650 Queensview Dr., Suite 100
Ottawa, ON
Tel: (613) 748
Fax. (613)

12 2012
Brad.
16 APR 2012



MSTB 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	48	HOLDING CLAMP SCREW
5	HOSE CAP CHAIN & "S" HOOK	49	DRAIN HOLE PLUG
6	HOLDING JOINT GASKET	49a	3/8" PIPE PLUG (optional)
7	OIL HOLE SCREW	53	PIPE FLANGE (BOTTOM)
9	OPERATING NUT "O" RING	55	RETAINING RING (SQUARE)
12	OPERATING NUT BEARING	59	PUMPER CAP GASKET
13	CAP SCREW (2" X 1 1/4")	62a	HOSE NOZZLE "O" RING
17	HOSE CAP GASKET	62b	PUMPER NOZZLE "O" RING
19	PUMPER NOZZLE CAP	63	OPERATING NUT RETAINING CLAMP
20	PUMPER NOZZLE	64	HYDRALUBE OPERATING NUT
21	PUMPER CAP CHAIN & "S" HOOK	65	RETAINING CLAMP "O" RINGS
22	PUMPER NOZZLE PIN	66	LOWER VALVE PLATE
24	INTERMEDIATE BOLTS & NUTS	67	MAIN VALVE LOCKWASHER
25	SAFETY FLANGE (SEGMENTS)	68	LOWER VALVE PLATE "O" RING
26	INTERMEDIATE GASKET	69	HOSE NOZZLE SET SCREW (3/4" x 3/4")
27	SAFETY COUPLING	70	UPPER OPERATING STEM
28	SAFETY COUPLING BOLT & NUT (3/4" X3")	77	BODY CAP HEX BOLTS or ALLAN SCREWS
29	OPERATING STEM LOWER	78	BODY CAP
30	INTERMEDIATE SECTION	79	BODY CAP GASKET
31	DRIP VALVE	80	BODY
32	DRAIN HOLE LINING CW CHAMBER	81	SEAT RING CW CHAMBER
34a	SEAT "O" RING (TOP)	82	PIPE FLANGE TOP
34	SEAT "O" RING (BOTTOM)	83	SAFETY COUPLING CLEVIS BOLT & PIN
35	MAIN VALVE DISC	87	ON-LINE SPIDER
38	MAIN VALVE "O" RING	88	3/8" x 1 1/4" BOLT
39	DRIP VALVE FACING	91	6" ON-LINE CHAMBER

MADE IN CANADA

www.clowcanada.com

Link-Seal® Modular Seal Model Properties

with EPDM Seal Elements

Model "O" or "L" Link-Seal Modular Seal
Suitable for use in water, direct ground burial and atmospheric conditions. Provides electrical isolation. System 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 "OS" or "LS" 316 Link-Seal Modular Seal
For chemical processing & waste water treatment. EPDM rubber is resistant to most inorganic chemicals, weak acids, some caustic chemicals, alcohols, glycol based coolants, skydrol hydraulic fluid, ketones, esters and many other chemicals. Not recommended for petroleum oils, fuels or solvents.
Type: Chemical Resistant
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 +89°C)*

Model "OS" 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 +89°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: -67 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	860 psi
Elongation	D-412	400%	300%	250%
Compression Set	S-395	15% 22 hrs. @ 158°F (70°C)	45% 22 hrs. @ 212°F (100°C)	40% 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	2.25 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%

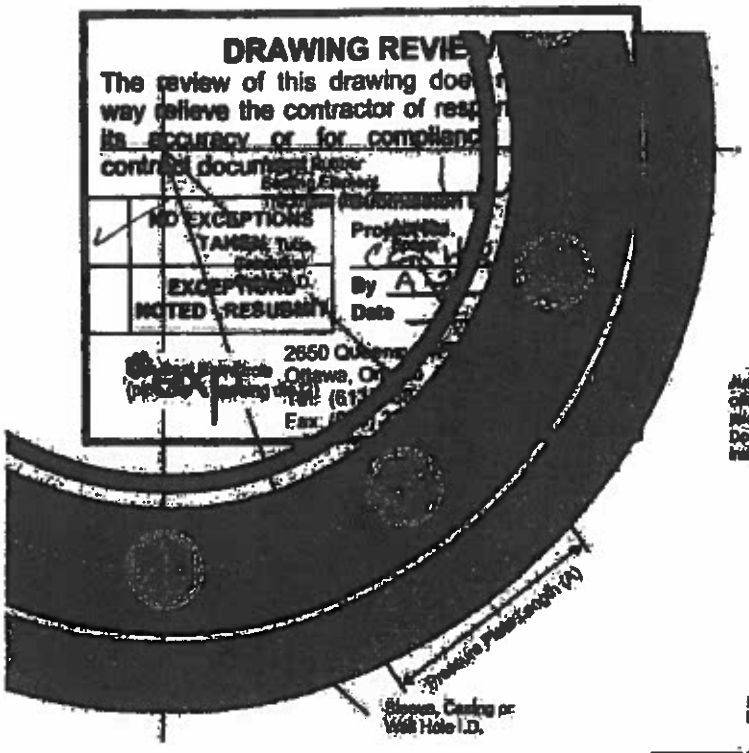
Bolt & Nut Specifications

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 = 80,000 psi, minimum.

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

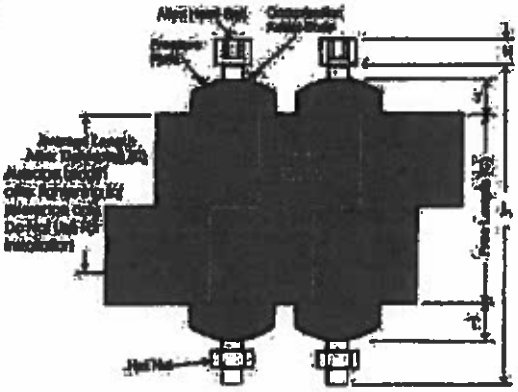
PSI-Thunderline/Link-Seal®
6525 Goforth Street, Houston TX 77021 U.S.A.
Tel: 713-747-6948, Fax: 713-747-6029, Toll Free: 800-423-2410
www.linkseal.com, e-mail: info@psipsl.com

LSTECH-9/27/ 10

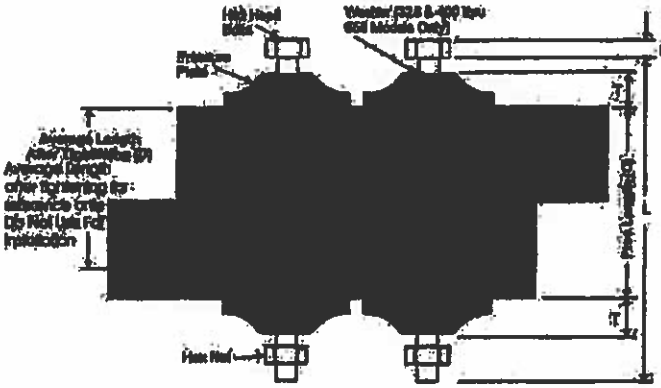


Drawings for Reference Only

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**

	RUBBER SEALING ELEMENT			PRESSURE PLATE		BOLT				WEIGHT FOR 10 LINK SECTION (LBS)	MIN. REQUIRED SEATING WIDTH
LINK-SEAL® MODEL NO.	ACTUAL THICKNESS (B)	FREE LENGTH (C)	AVG. LENGTH AFTER TIGHTENING (D)	(A)	(T)	ALLEN HEAD HEX ACROSS FLATS	(H)	THREAD SIZE	(L)		
LS-200-*	0.45"	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-*	0.61"	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-*	0.69"	2.37"	1.87"	1.56"	0.44"	6mm Allen (0.236")	7.87mm (0.310")	M8-1.25	90mm (3.543")	2.15	3.00"
LS-316-*	0.61"	2.37"	1.87"	1.44"	0.44"	6mm Allen (0.236")	7.87mm (0.310")	M8-1.25	90mm (3.543")	2.30	3.00"
LS-325-*	0.69"	2.83"	2.00"	3.13"	1.00"	13mm (0.511")	5.30mm (0.215")	M8-1.25	90mm (3.543")	5.50	4.00"
LS-340-*	1.00"	2.70"	2.25"	1.45"	0.66"	13mm (0.511")	5.30mm (0.215")	M8-1.25	120mm (4.720")	3.30	4.00"
LS-360-*	1.24"	2.70"	2.25"	2.05"	0.77"	13mm (0.511")	5.30mm (0.215")	M8-1.25	120mm (4.725")	5.10	4.00"
LS-400-*	1.36"	3.50"	2.75"	3.50"	1.06"	17mm (0.669")	6.40mm (0.250")	M10-1.5	130mm (5.118")	12.00	5.00"
LS-410-*	1.43"	3.37"	2.67"	2.52"	0.86"	17mm (0.669")	6.40mm (0.250")	M10-1.5	130mm (5.118")	8.20	5.00"
LS-425-*	1.06"	3.00"	2.25"	3.50"	1.19"	17mm (0.669")	6.40mm (0.250")	M10-1.5	130mm (5.118")	10.00	5.00"
LS-475-*	1.56"	3.36"	2.63"	2.63"	0.86"	17mm (0.669")	6.40mm (0.250")	M10-1.5	130mm (5.118")	10.00	5.00"
LS-500-*	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	5.00"
LS-525-*	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	5.00"
LS-575-*	1.61"	3.75"	3.00"	3.00"	1.00"	19mm (0.748")	7.50mm (0.300")	M12-1.75	140mm (5.511")	16.50	5.00"
LS-600-*	3.09"	4.00"	3.00"	6.00"	1.90"	30mm (0.748")	12.50mm (0.490")	M20-2.5	180mm (7.086")	60.80	6.00"
LS-650-*	2.71"	3.86"	3.00"	3.96"	1.19"	19mm (0.748")	7.50mm (0.300")	M12-1.75	140mm (5.511")	28.10	6.00"

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.

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.

✓	NO EXCEPTIONS TAKEN
	EXCEPTIONS NOTED - RESUBMIT

Submission No. 1
Project No. CGSHR-12012
By Abdul Zaved
Date 16 APR 2014

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

Standard Flexible Coupling

STYLE 77

DIMENSIONS

	8.625 219.1	800 5500	46,740 207995	0 – 0.13 0 – 3.2	0° – 50'	0.14 14	2 – 8 x 2.5	13.88 279	16.25 375	2.50 63	20.8 9.4
	10.750 273.0	800 5500	73,280 326100	0 – 0.13 0 – 3.2	0° – 40'	0.14 12	2 – 1 x 6	13.63 348	17.13 435	2.69 67	31.1 14.1
	12.750 323.9	800 5500	102,000 453900	0 – 0.13 0 – 3.2	0° – 34'	0.12 9	2 – 1 x 6½	15.63 397	19.25 489	2.63 67	27.8 12.6
	14.000 355.6	300 2065	46,180 205500	0 – 0.13 0 – 3.2	0° – 31'	0.11 9	2 – 1 x 3½	16.75 425	20.25 514	3.00 76	39.2 17.8
	14.842 377.0	300 2065	51,875 230,845	0 – 0.13 0 – 3.2	0° – 31'	0.11 9	2 – 1 x 3½	17.39 442	20.96 531	2.8 71	48.8 22.1
	16.000 406.4	300 2065	60,320 268425	0 – 0.13 0 – 3.2	0° – 27'	0.10 9	2 – 1 x 3½	18.75 476	22.25 565	3.00 76	45.8 20.4
	16.772 426	300 2065	66,245 294,795	0 – 0.13 0 – 3.2	0° – 27'	0.10 9	2 – 1 x 3½	19.69 500	22.92 581	2.92 74	55.7 25.7
	18.000 457.2	300 2065	76,340 339710	0 – 0.13 0 – 3.2	0° – 24'	0.08 7	2 – 1¼ x 4	21.56 548	25.00 635	3.13 80	64.1 29.1
	18.898 48	300 2065	84,105 374,265	0 – 0.13 0 – 3.2	0° – 24'	0.08 7	2 – 1¼ x 4	22.38 569	25.86 655	3.04 77	77.2 35
	20.000 508.0	300 2065	94,000 418300	0 – 0.13 0 – 3.2	0° – 22'	0.08 7	2 – 1¼ x 4	23.63 600	27.00 686	3.13 80	74.8 34.0
	22.00 559.0	300 2065	114,000 507300	0 – 0.13 0 – 3.2	0° – 19'	0.07 6	2 – 1¼ x 4	25.63 651	29.13 740	3.13 80	82.6 37.5
	20.866 530	300 2065	102,535 456,280	0 – 0.13 0 – 3.2	0° – 22'	0.08 7	2 – 1¼ x 4	24.29 617	27.8 704	3.07 77	91.7 41.6
	22.835 580	300 2065	102,380 455,591	0 – 0.13 0 – 3.2	0° – 19'	0.07 6	2 – 1¼ x 4	26.76 680	30.01 762	3.12 79	92.8 42.2
	24.000 609.6	250 1725	113,000 502850	0 – 0.13 0 – 3.2	0° – 18'	0.07 6	2 – 1¼ x 4	27.75 705	31.00 787	3.19 81	89.6 40.7
	24.803 630	250 1725	102,790 457,416	0 – 0.13 0 – 3.2	0° – 18'	0.07 6	2 – 1¼ x 4	28.42 722	32.16 817	3.12 79	96.8 44

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 cut 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 1½ times the figures shown.

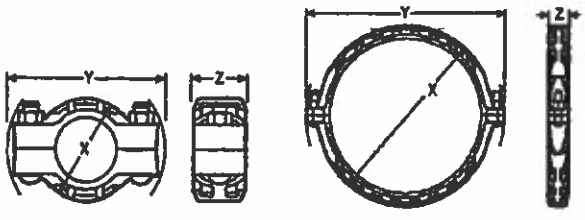
† Allowable Pipe End Separation and Deflection figures show the maximum nominal range of movement available at each joint for standard roll grooved pipe. Figures for standard cut grooved pipe may be doubled. These figures are maximums; for design and installation purposes these figures should be reduced by: 50% for ¼ – 3½"/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.

µ CIS size product is designed with two housings and requires two bolts.



¼ – 12"/20 – 300 MM SIZES 14 – 24"/350 – 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 Gasket: (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.

✓ NO EXCEPTIONS TAKEN	Submission No. 1
EXCEPTIONS NOTED - RESUBMIT	Project No. CGSHQ-12012
	By Abdul Zayood
	Date 16 APR 2013

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

Standard Flexible Coupling

STYLE 77

SEE VICTAULIC PUBLICATION 10.01 FOR DETAILS

¼ – 12"/20 – 300MM SIZES

14 – 24"/350 – 600 MM SIZES

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 ¼ – 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 earthquake 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.

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
EXCEPTIONS NOTED - RESUBMIT	Project No. Abdel Fawed.
	By 16 APR 2014
	Date

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

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

DRN. L.G. McA

DATE: OCT. 6 / 2005

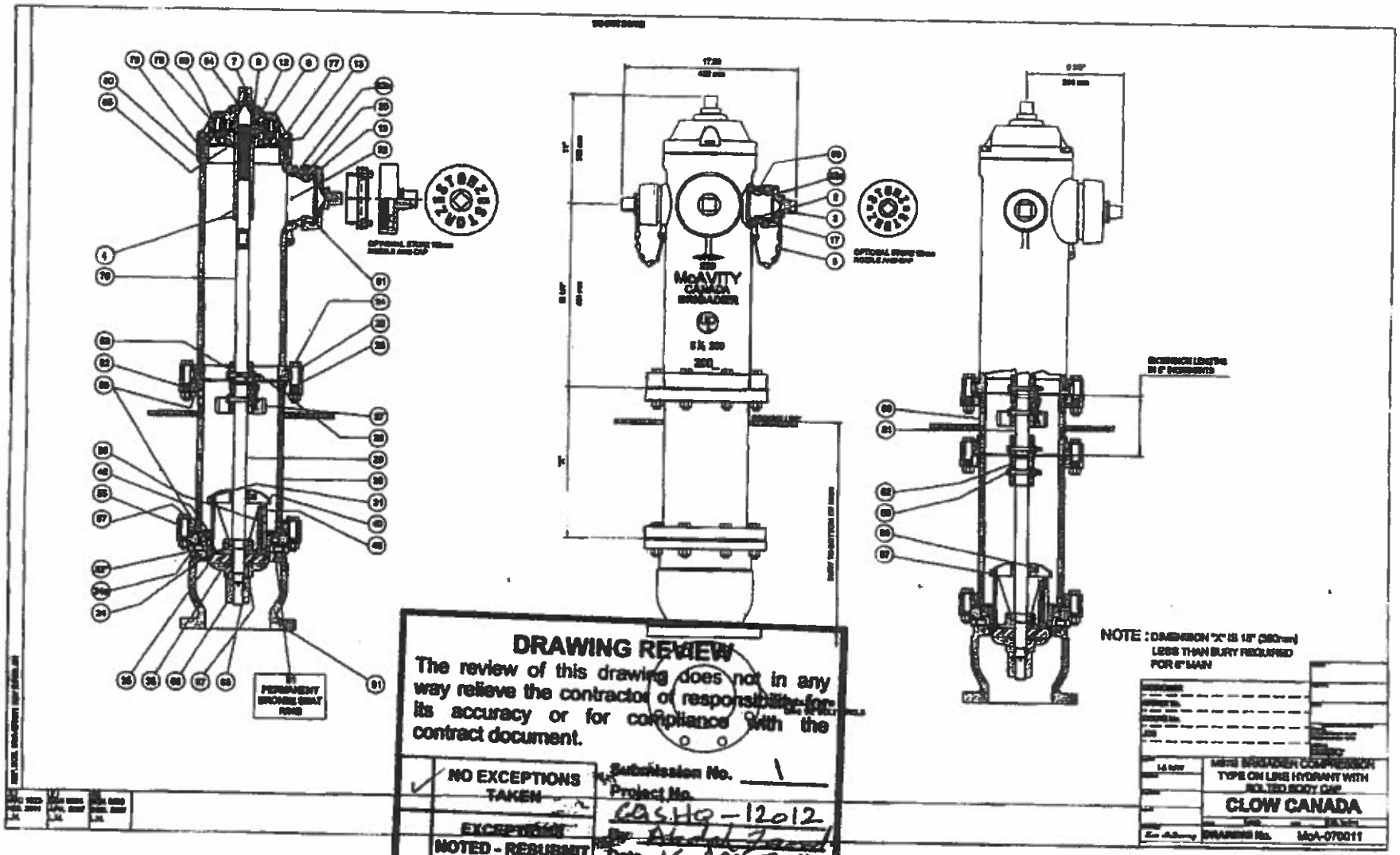
ELBOW CANADA

DWG. No. McA-067076 | 2 of 3 | REV.

M67 BRIGADIER HYD. WITH BOLTED BODY CAP MATERIAL LIST

[AF] MVC 1316 OCT. 2000 L.M.

REF No	DESCRIPTION	MATERIAL
2	HOSE NOZZLE	COPPER ALLOY
3	HOSE [illegible] GAP	CAST IRON
4	HOUSING STEM "O" RING	BUNA - N
5	HOSE CAP CHAIN	STEEL ZINC PLATED
6	HOUSING JOINT GASKET	COMPRESSED FIBRE ASBESTOS
7	OIL HOSE SCREW	
8	OPERATING NUT	BUNA - N
12	OPERATING NUT BEARING	DELRIN
13	CAP SCREW (5/16")	STEEL ZINC PLATED
17	HOSE CAP GASKET	RED RUBBER
18	STORZ 100 PUMPER CAP "O" RING	BUNA - N
19	PUMPER NOZZLE CAP	CAST IRON
20	PUMPER NOZZLE	COPPER ALLOY
21	PUMPER CAP CHAIN & "S" HOOK	STEEL ZINC PLATED
22	PUMPER NOZZLE PIN	BRASS
24	INTERSECTION BOLTS & NUTS	STEEL ZINC PLATED
25	SAFETY FLANGE (SEGMENTS)	CAST IRON
26	INTERSECTION GASKET	RED RUBBER
27	SAFETY COUPLING	CAST IRON
28	SAFETY COUPLING BOLT & NUT (3/8"x 3")	STEEL ZINC PLATED
29	OPERATING STEM LOWER	STEEL
30	INTERMEDIATE SECTION	DUCTILE IRON
31	DRIP VALVE	COPPER ALLOY
32 *	DRAIN HOLE LINING	BRASS
34a	SEAT "O" RING (TOP)	BUNA - N
34	SEAT "O" RING (BOTTOM)	BUNA - N
35	MAIN VALVE DISC	RUBBER OR POLYURETHANE
36	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	EXTENSION STEM	STEEL
52	ALIGNMENT COUPLING	CAST IRON
53	EXTENSION STEM BOLTS & NUTS (3/8" x 3")	STEEL ZINC PLATED
55	PIPE FLANGE (BOTTOM)	CAST IRON
56	RETAINING RING (SQUARE)	STEEL ZINC PLATED
57	MONITOR BOLT & NUT (5/8" x 2 1/4")	STEEL ZINC PLATED
58	MONITOR ELBOW	CAST IRON
59	MONITOR GASKET	RED RUBBER
61	PUMPER CAP GASKET	RED RUBBER
62a	HOSE NOZZLE "O" RING	BUNA - N
62b	PUMPER NOZZLE "O" RING	BUNA - N
63	OPERATING NUT RETAINING GLAND	CAST IRON
64	HYDRALUBE OPERATING NUT	COPPER ALLOY
65	OPERATING NUT "O" RINGS (RETAINING GLAND)	BUNA - N
66	LOWER VALVE PLATE	CAST IRON
67	LOCKWASHER (1 1/8")	18-8 STAINLESS STEEL
68	LOWER VALVE PLATE "O" RING	BUNA - N
69	HOSE NOZZLE SET SCREW (1/4" x 1/4")	18-8 STAINLESS STEEL
70	OPERATING STEM UPPER	[illegible]
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
76	STORZ 100 PUMPER NOZZLE	COPPER ALLOY
76	STORZ 100 PUMPER CAP	CAST IRON
77	BODY CAP ALLEN SCREWS OR HEX BOLTS	18-8 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 ZINC PLATED
87	PIPE TO ELBOW BOLTS& NUTS	18-8 STAINLESS STEEL



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
EXCEPTIONS NOTED - RESUBMIT	Project No. 605Hq-12012
	By Alexandra Jarrell
	Date 16 APR 2014

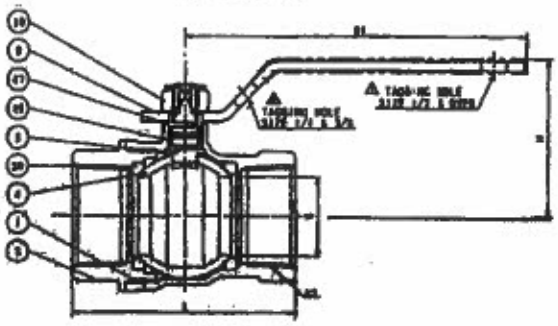
exp.
2650 Queensview Drive, Suite 100
Ottawa, Ontario K2B 8H6
Tel: (613) 688-1899
Fax: (613) 225-7337

FORGED BRASS BALL VALVE

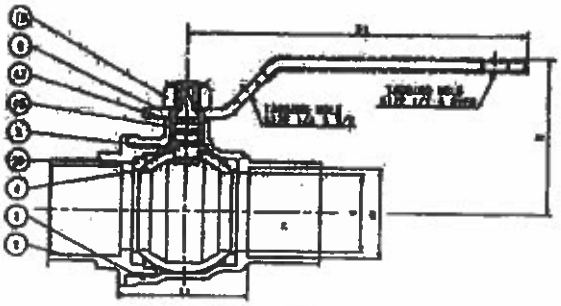
MAINTENANCE FREE DOUBLE O-RING STEM SEALS

Two Piece Body • Full Port • Chrome Plated Ball
Blowout Proof Stem (Ni Plated) • PTFE Seats
CSA (US/C) • UL • FM

CODE # 58
THREADED



CODE # 59
SOLDER*



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

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 US 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	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
36	BALL SEATS	PTFE
45	O-RINGS	FPM
47	THRUST WASHER	PET

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

DIMENSIONS / WEIGHT / QUANTITIES

d2 SIZE	d	H	D1	L	L1	d1 Min. Min.	APPROX. NET WT.	CARTON QTY
¼	.39	1.46	2.76	1.65	1.11	.381 .377	29	120
⅜	.39	1.46	2.76	1.65	1.05	.508 .502	29	120
½	.59	1.69	3.15	2.09	1.19	.631 .627	39	80
¾	.79	1.69	3.15	2.09	1.19	.756 .752	45	60
1	1.00	2.13	3.94	2.56	1.50	1.000 .996	71	40
1¼	1.25	2.52	4.72	3.03	1.81	1.252 1.248	71	16
1½	1.50	2.52	4.72	3.03	1.81	1.502 1.498	71	16
2	1.99	2.52	4.72	3.03	2.03	2.003 2.000	71	16

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

CSA (US/C):
ASME B16.33 - 1990
AGA 3-93 - 2000
CGA 9.1-M97/ANSI Z21.15-1997-SG
CGA 5.1-M88 - 1993
CGA CR91-089-M95
CGA 9.2-M-88 - 1993
UL-258 - 75 WSP (Fire Protection Valves)
FM-1140 - (Fire Protection Systems)

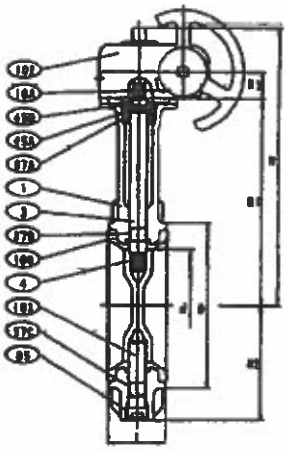
DRAWING REVIEW

The review of this drawing does not in any way relieve the contractor of responsibility for its accuracy nor for compliance with the contract document.

✓ NO EXCEPTIONS TAKEN	Submission No.
EXCEPTIONS NOTED - RESUBMIT	Project No. CGSHQ-12012
	By Abdel Zaoui
	Date 16 APR 2014

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

KITZ®



NO.	NAME OF PART	SPECIFICATION
1	BODY	DUCTILE IRON (A536 Gr. 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	G/F PTFE
85	PLUG	ZINC DIE-CAST (2)
99	SET BOLTS	CARBON STEEL
102	GEAR UNIT	ALUMINUM DIE-CAST
103	BOTTOM STEM*	STAINLESS STEEL (A276, TYPE 410 or 316)
106	SEAT RUBBER (3)	NBR/EPDM
145	SPRING WASHER	CARBON STEEL

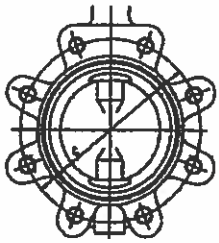
(1) Line scribed on top of the stem indicates the disc direction.
(2) Chromate Coating
(3) Vulcanized to the Body

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

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

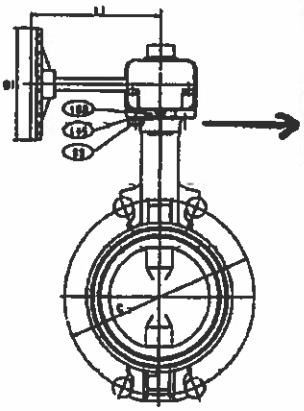
*Code # 5141 (B/E)G
Disc: 316 SS
(A351 Gr. CF8M)

*316 stem rated for
150 PSI max.



SIZE		d	D	C	H	H1	H2	L	D1	L1	Wafer Lbs.	Lug Lbs.
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	6.10	2.95	1.81	3.15	4.78	5.7	8.4
in	3	3.15	4.88	6.00	9.29	6.81	3.58	1.81	4.33	5.31	8.6	13.0
in	4	3.94	5.75	7.50	9.69	7.20	3.98	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	5.91	14.0	26.0
in	6	5.91	8.11	9.50	11.26	8.78	5.47	2.19	4.33	5.91	19.0	32.0
in	8	7.76	10.12	11.75	12.80	9.76	6.65	2.38	6.69	7.09	30.0	49.0

For gear operator details, refer to page 20.



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

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

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

NOTE:
KITZ lug style butterfly valves are rated 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.

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
EXCEPTIONS NOTED - RESUBMIT

Submission No. 1
Project No. CGSHQ-12012
By Andal Fawcett
Date 16 APR 2014

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

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: -67 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	860 psi
Elongation	D-412	400%	300%	250%
Compression Set	S-395	15% 22 hrs. @ 158°F (70°C)	45% 22 hrs. @ 212°F (100°C)	40% 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: 713-747-6948, Fax: 713-747-6029, Toll Free: 800-423-2410
www.linkseal.com, e-mail: info@psipsi.com

LSTECH-9/27/ 10

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[1], per inch, ASTM C518, C177, @ 75°F mean temp., ft²•h•°F/Btu, R-value, min.	5.0	5.0	5.0
Compressive Strength[2], ASTM D1621, psi, min.	40	60	100
Water Absorption, ASTM D2842, % by volume, max.	0.1	0.1	0.1
Water Vapor Permeance[3], 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	3.5×10^{-5}	3.5×10^{-5}	3.5×10^{-5}
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

*R means resistance to heat flow. The higher the R-value or RSI, the greater the insulating power.

STYROFOAM Highload 40, 60 and 100 Extruded Polystyrene Insulation

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[1], per inch (25 mm), ASTM C518, C177, @ 75°F (24°C) mean temp., ft²•h•°F/Btu (m²•°C/W), R-value (RSI), min.	5.0 (.88)	5.0 (.88)	5.0 (.88)
Compressive Strength[2], 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[3], ASTM E96, perms (ng/Pa•s•m²)	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^{-5} (6.3×10^{-5})	3.5×10^{-5} (6.3×10^{-5})	3.5×10^{-5} (6.3×10^{-5})
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 S701, 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 or www.dowstyrofoam.ca/4architects for more specific instructions.

6 Availability

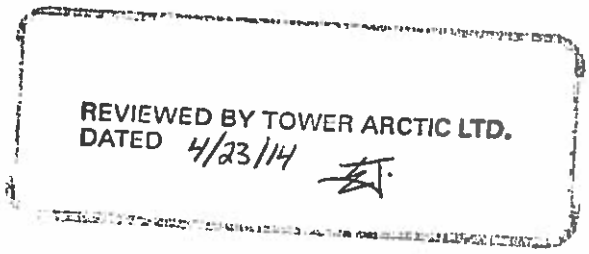
STYROFOAM™ Highload 40, 60 and 100 insulation products are distributed through an extensive network. For more information, call:
1-800-232-2436 (English)
1-800-565-1255 (French)

7 Warranty

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

8 Maintenance

Not applicable.

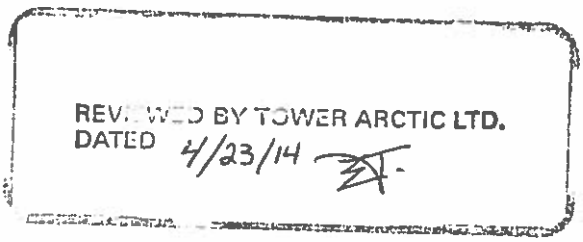


9 Technical Services

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
- www.dowstyrofoam.ca/4architects
- www.sweets.com



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

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

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

SEWER SERVICE

URECON
PRE-INSULATED PIPE

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

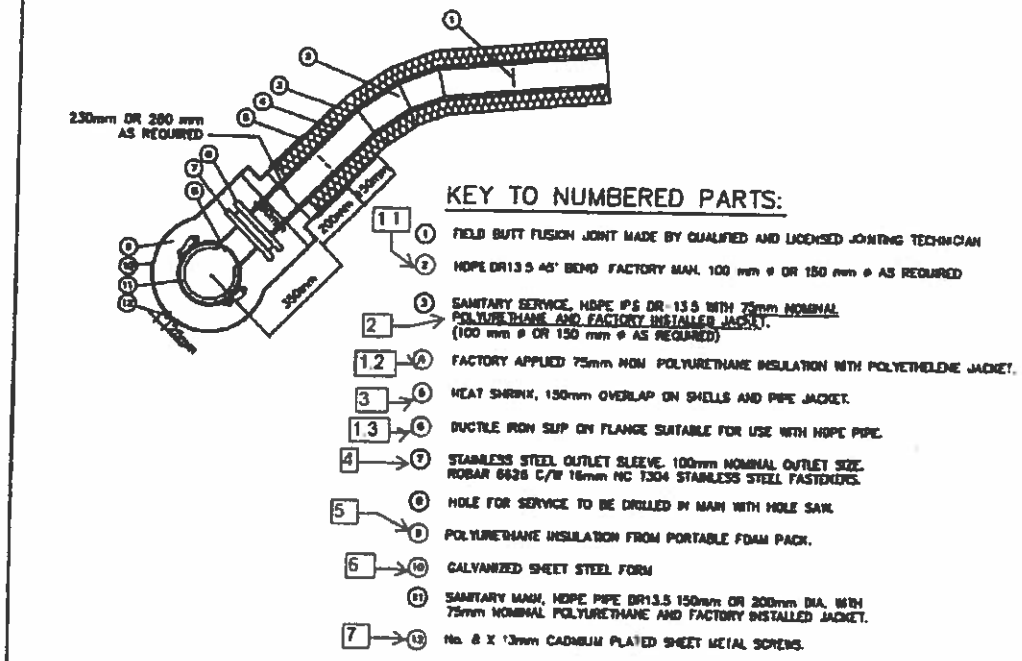


Figure 1 : Detail 2 - from Drawing C-332 - Sewer service connection Kit at main

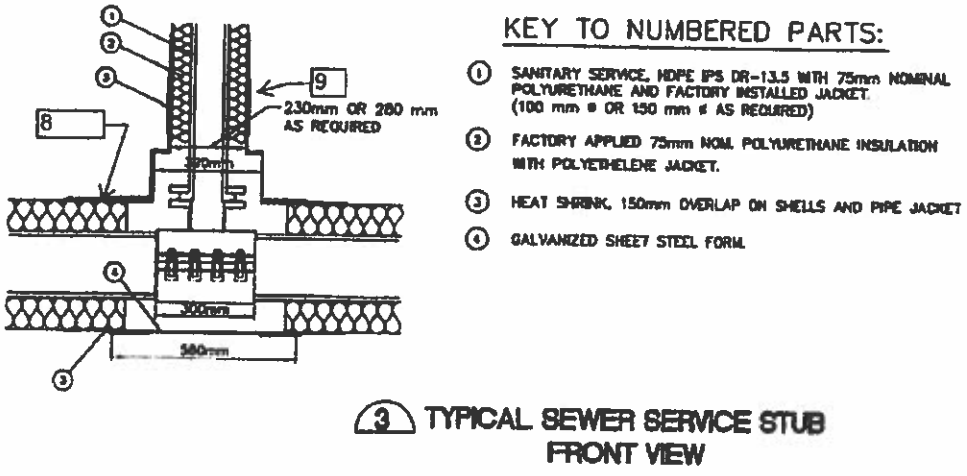


Figure 2: Detail 3 - from drawing C-332 - Sewer service connection kit at main - Front view

Figure 2 – removed as per Engineer's note on June 3rd, 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 ø (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.

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. CAS HQ12 01

By Abdul Jaami

Date 6 June 2014

exp.

2650 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 - without polymer coating

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. 2
EXCEPTIONS NOTED - RESUBMIT	Project No. 2655HQ-12012
	By Abdul Fani
	Date 6 June 2014

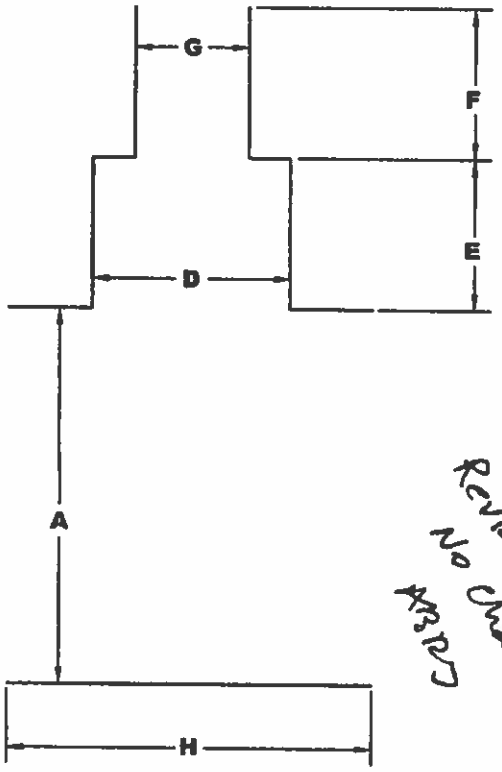
exp.
2650 Queensview Drive, Suite 100
Ottawa, Ontario K2B 8H6
Tel: (613) 688-1899
Fax: (613) 225-7337

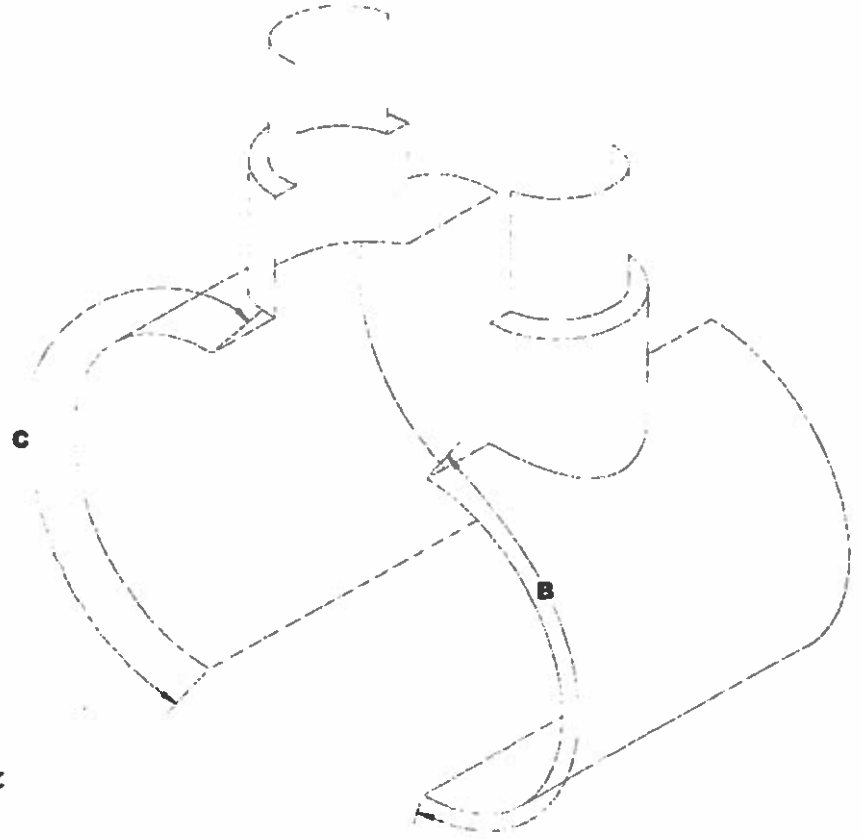
URECON
TUYAUTERIE PRÉISOLÉE

Pièce/Part No: P-MFORM-SSK-RESOLUTE-GALV-22G-0800-0400-R

8" x 4" - 22 ga. Galvanized metal mold Resolute bay Style for sewer connection

	A	B	C	D	E	F	G	H
DIMENSIONS	15 ½"	30"	25"	13 ½"	6"	4"	11 ¼"	28"





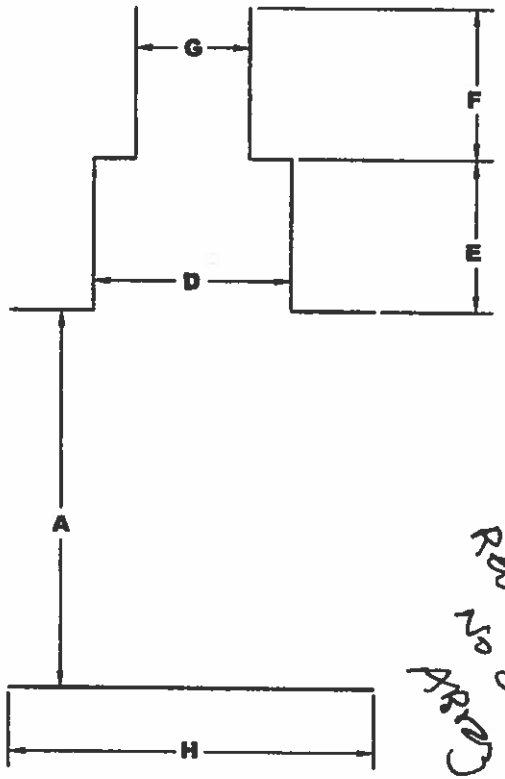
Reviewed 3 June 2014
No Changes
KB RD

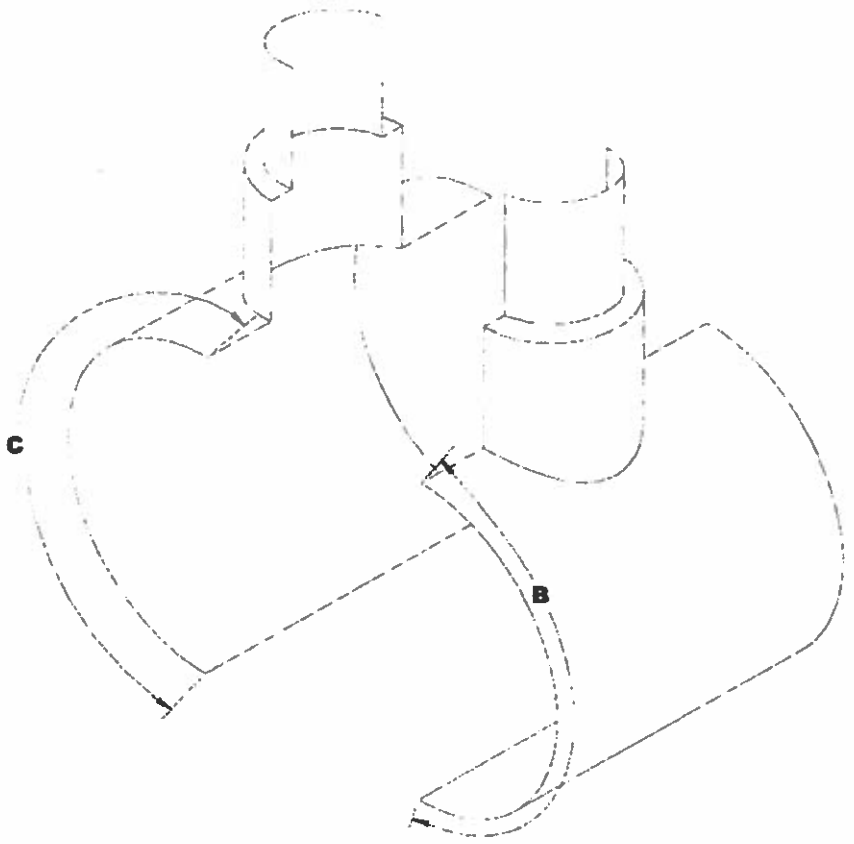
URECON
TUYAUTERIE PRÉISOLÉE

Pièce/Part No: P-MFORM-SSK-RESOLUTE-GALV-22G-0800-0600-R

8" x 6" - 22 ga. Galvanized metal mold Resolute bay Style for sewer connection

	A	B	C	D	E	F	G	H
DIMENSIONS	15 ½"	30"	25"	15 ½"	6"	4"	13 ¼"	28"





Reviewed 9 June 2014
No changes.
ARD

Removed as per note on June 3rd, 2014

Removed as per note on June 3rd, 2014

6626

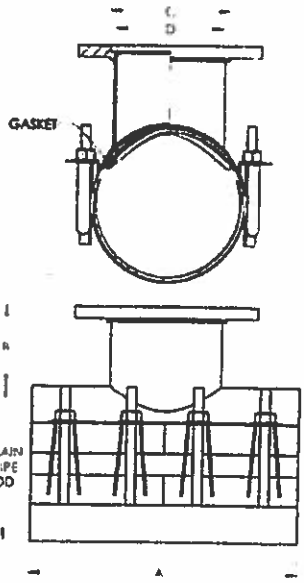
STAINLESS STEEL OUTLET SLEEVE

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 ATB/CJ

All dimensions are in inches.

NOMINAL PIPE SIZE	BY X	OUTLET SIZE	FITTING LENGTH	NUMBER OF BOLTS	APPROXIMATE SHIPPING WEIGHT LBS.	APPROXIMATE SHIPPING WEIGHT KG.	WORKING RANGE LOW	WORKING RANGE HIGH
4	X	3	12	8	33	15.0	4.70	4.95
		4*			36	16.4	4.95	5.20
6	X	3	12	8	36	16.4	6.40	6.80
		4			39	17.7	6.60 7.20	7.20 7.60
		6*	16	10	43	19.6	6.75 6.85 7.00 7.25	7.00 7.10 7.25 7.50
8	X	3	12	8	40	18.2	8.40	8.80
		(4)			43	19.6	8.80	9.20
		(6)	16	10	47	21.4	9.20	9.60
		8*	20	14	64	29.1	8.95 9.25	9.20 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: 1-800-663-6553

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

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

Website: www.robarindustries.com / E-mail: waterworks@robarindustries.com

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	10.90	11.30
		6	16	10	50	22.7	11.30	11.70
		8	20	14	68	30.9	11.90	12.30
		10*			73	33.2		
12	x	3	12	8	46	20.9	12.15	12.55
		4			49	22.3	12.55	12.95
		6	16	10	53	24.1	13.00	13.40
		8	20	14	72	32.7	13.40	13.80
		10			77	35.0	13.80	14.20
		12*	24	16	111	50.5		
14	x	3	12	8	67	30.5	15.10	15.50
		4			70	31.8	15.50	15.90
		6	16	10	74	33.6	15.90	16.20
		8	20	14	93	42.3	16.20	16.60
		10			98	44.6		
		12	24	16	132	60.0		
16	x	3	12	8	71	32.3	17.20	17.60
		4			75	34.1	17.40	17.80
		6	16	10	79	35.9	17.80	18.20
		8	20	14	100	45.5	18.40	18.80
		10			105	47.7	18.80	19.20
		12	24	16	141	64.1		
18	x	3	12	12	74	33.6	19.30	19.70
		4			77	35	19.80	20.20
		6	16	15	81	36.8	20.20	20.60
		8	20	21	103	46.8		
		10			108	49.1		
		12	24	24	144	65.5		
20	x	3	12	12	84	38.2	21.40	21.80
		4			87	39.6	22.00	22.40
		6	16	15	91	41.4	22.60	23.00
		8	20	21	115	52.3		
		10			120	54.6		
		12	24	24	158	71.8		
24	x	3	12	12	90	40.9	23.20	23.60
		4			93	42.3	23.80	24.20
		6	16	15	97	44.1	25.60	26.00
		8	20	21	121	55.0		
		10			127	57.7		
		12	24	24	167	75.9		

All dimensions are in inches.

HOW TO ORDER:

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 number		nom. main size		nom. outlet size		high end of range	

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

Reviewed 3 June 2014 ABES

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 / E-mail: waterworks@robarindustries.com

WATER SERVICE

URECON
PRE-INSULATED PIPE

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)

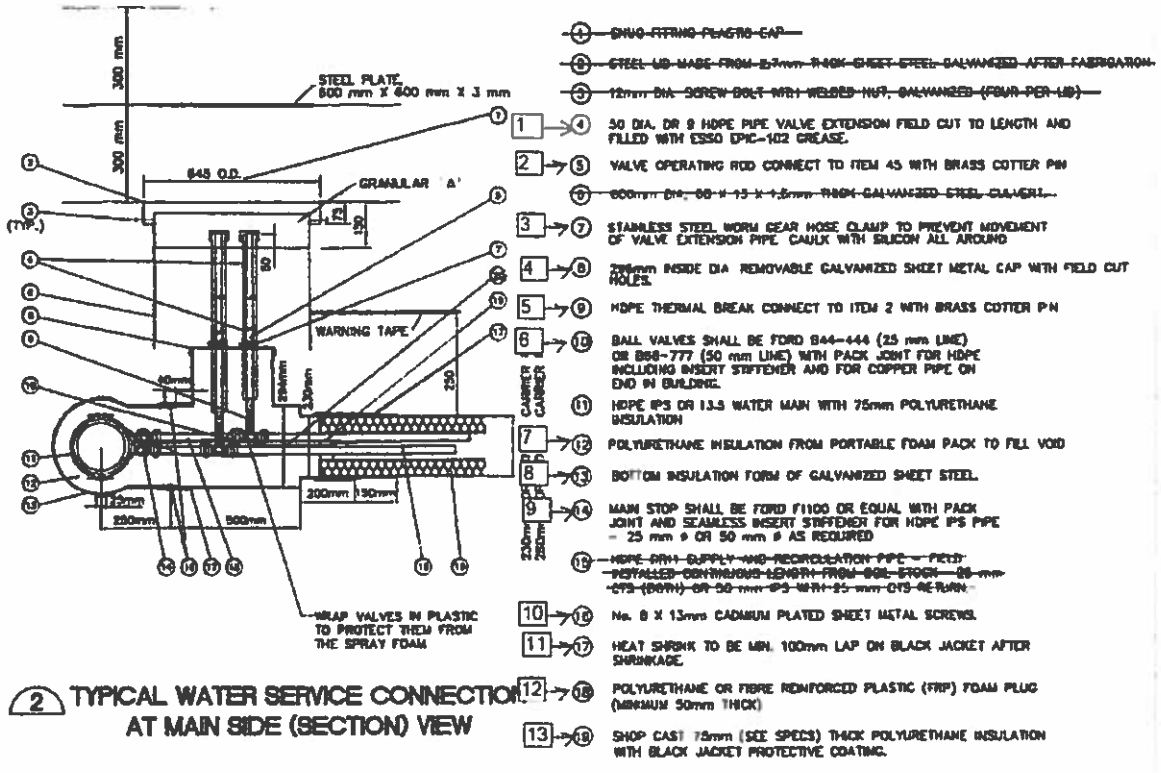


Figure 4 : Detail 2 - from Drawing C-330 - Water service connection Kit at main

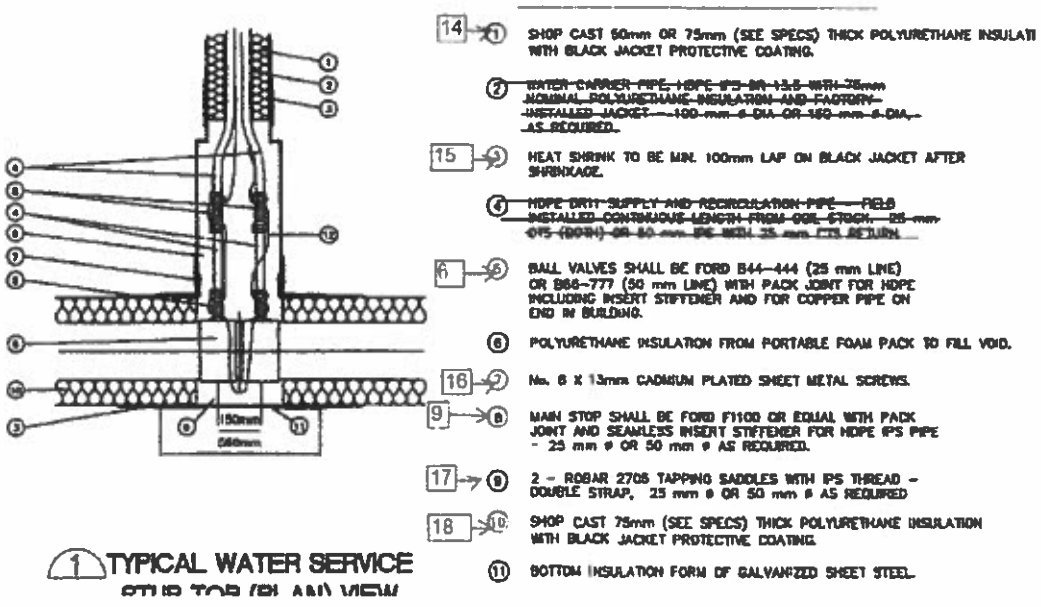
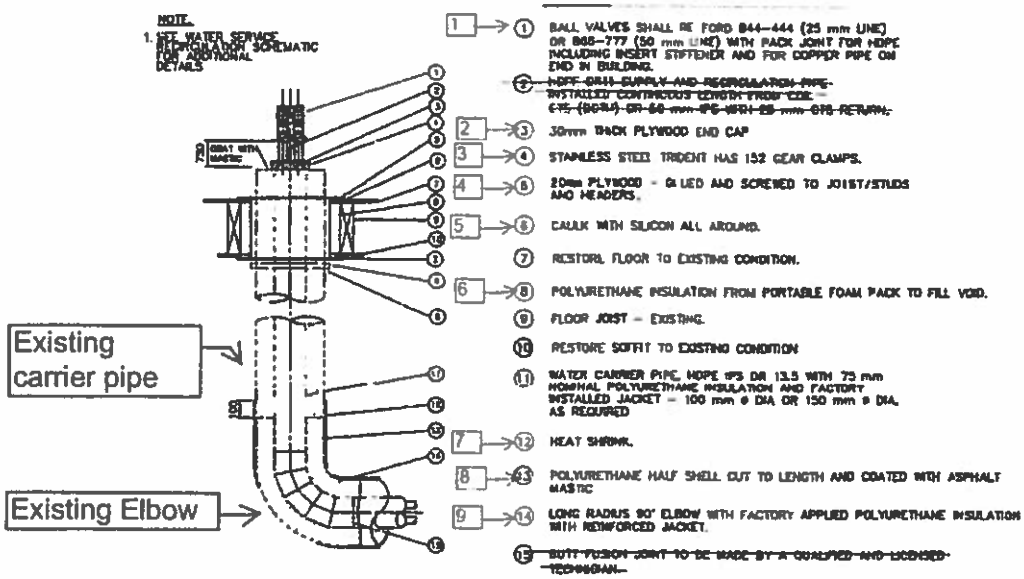


Figure 5 : Detail 1 - from drawing C-330- Water service connection kit at main – Plan view

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	1in 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)

Reviewed
3 June 2014
ABRJ



7 TYPICAL WATER SERVICE RISER

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. CGS HQ-12012
By Abdel Fraal
Date 6 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	1in 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

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3 June 2014
ABRS

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

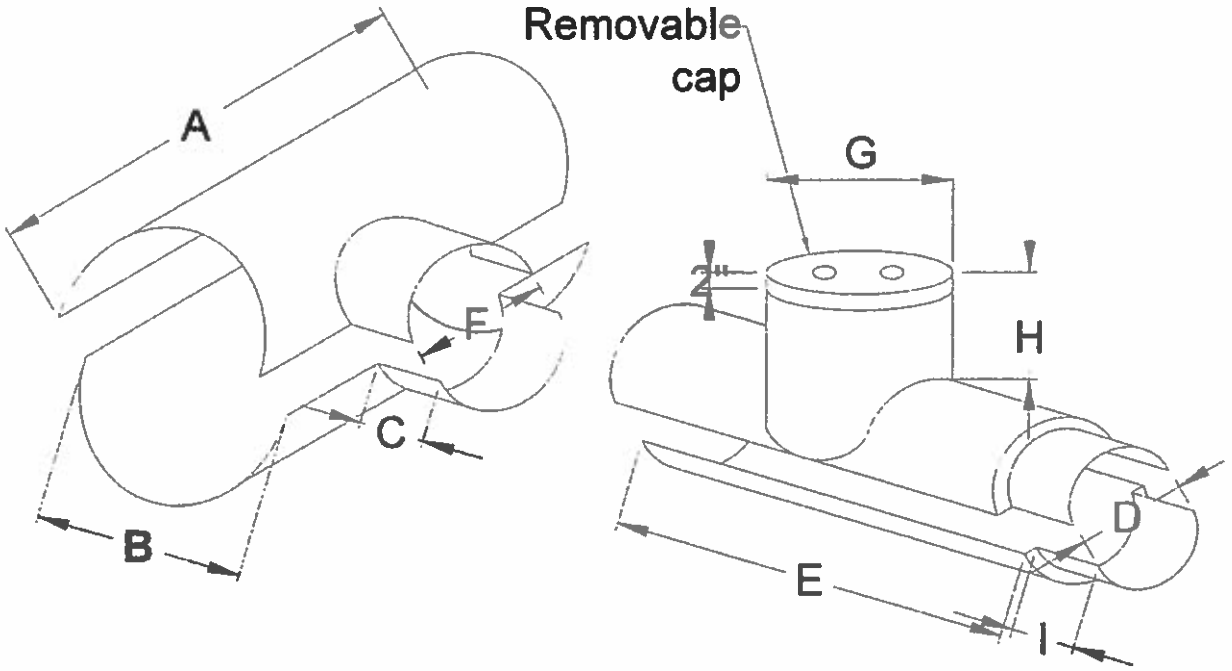
Reviewed
3 June 2014
ABR3

URECON
TUYAUTERIE PRÉISOLÉE

Pièce/Part No: P-MFORM-WSK-RESOLUTE-GALV-22G-0800-0600-R

8" x 6" - 22 ga. Galvanized metal mold Resolute bay Style for Water connection

	A	B	C	D	E	F	G	H	I
DIMENSIONS	22"	15 ¼"	3"	13 ¼"	20"	15 ¼"	11"	10"	8"



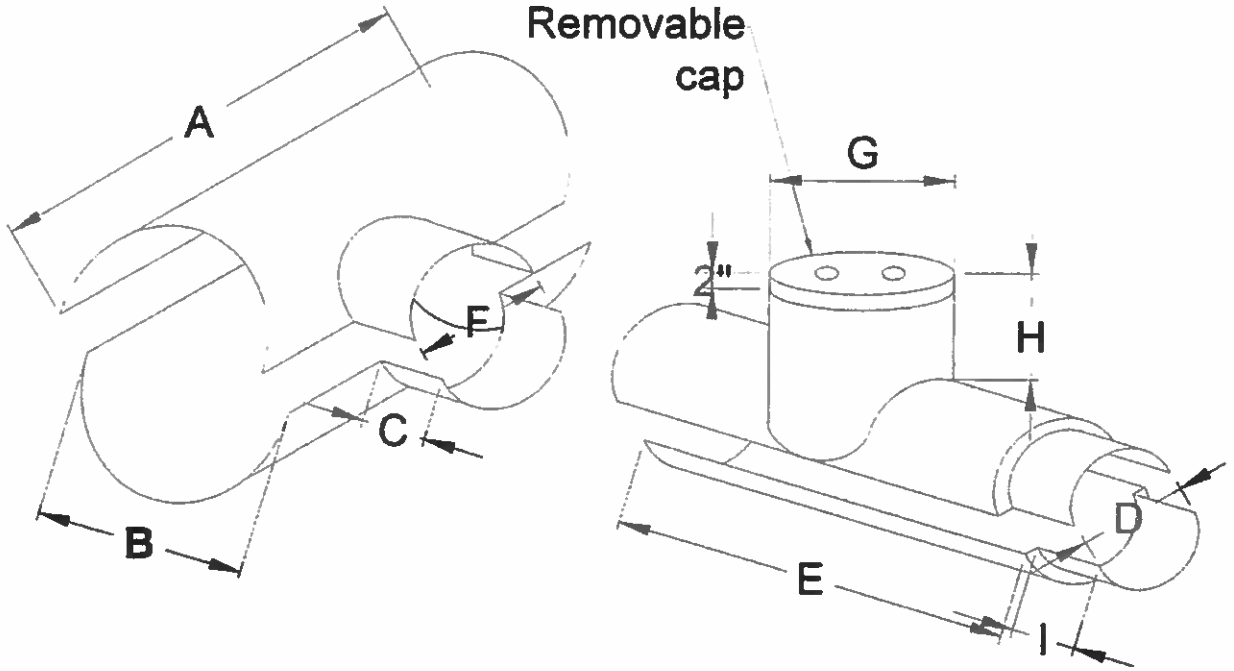
Reviewed
3 June 2014
ABP

URECON
TUYAUTERIE PRÉISOLÉE

Pièce/Part No: **P-MFORM-WSK-RESOLUTE-GALV-22G-0800-0400-R**

8" x 4" - 22 ga. Galvanized metal mold Resolute bay Style for Water connection

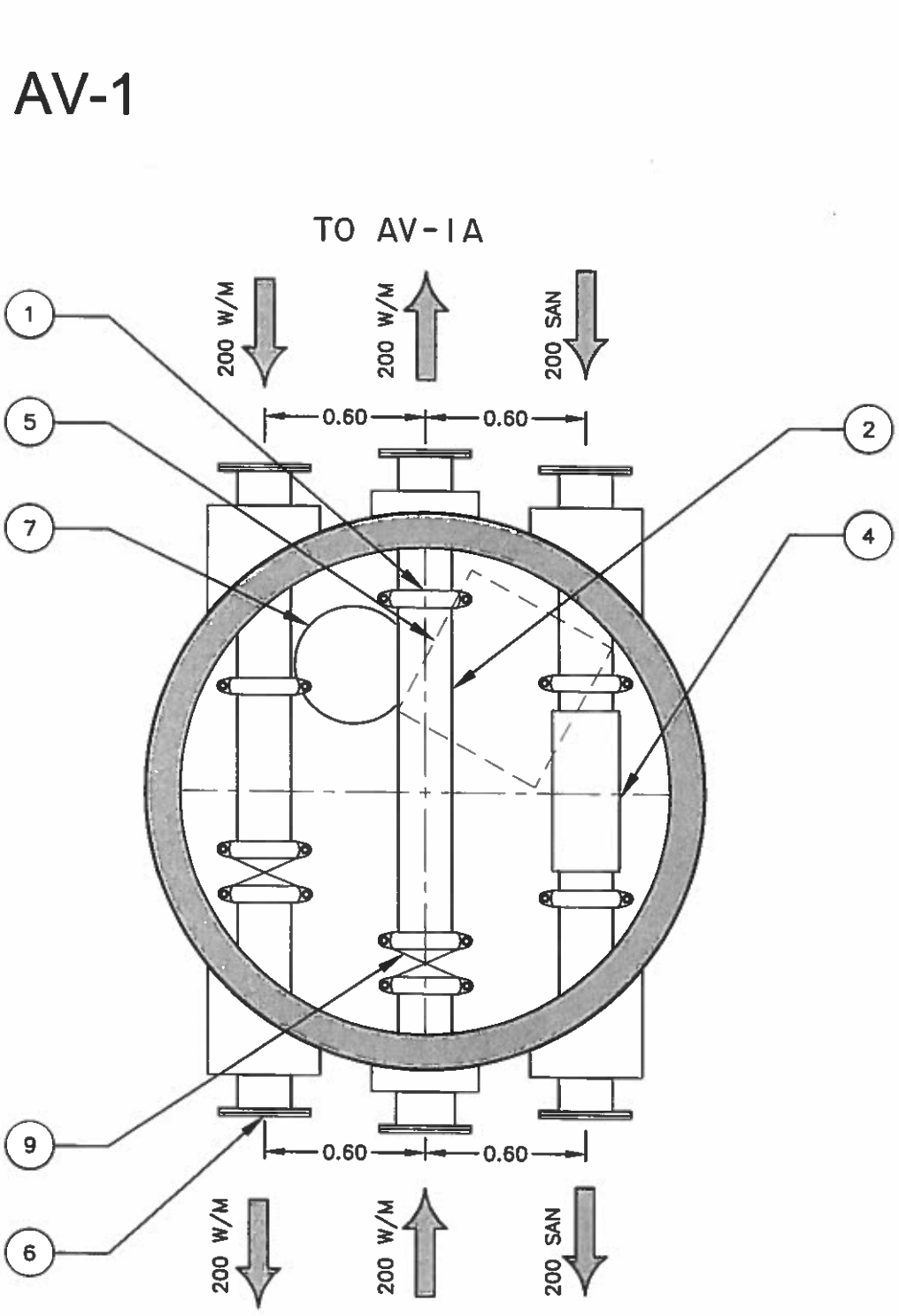
	A	B	C	D	E	F	G	H	I
DIMENSIONS	22"	15 ¼"	3"	11 ¼"	20"	15 ¼"	11"	10"	8"



Reviewed
3 June 2014
ASAR3

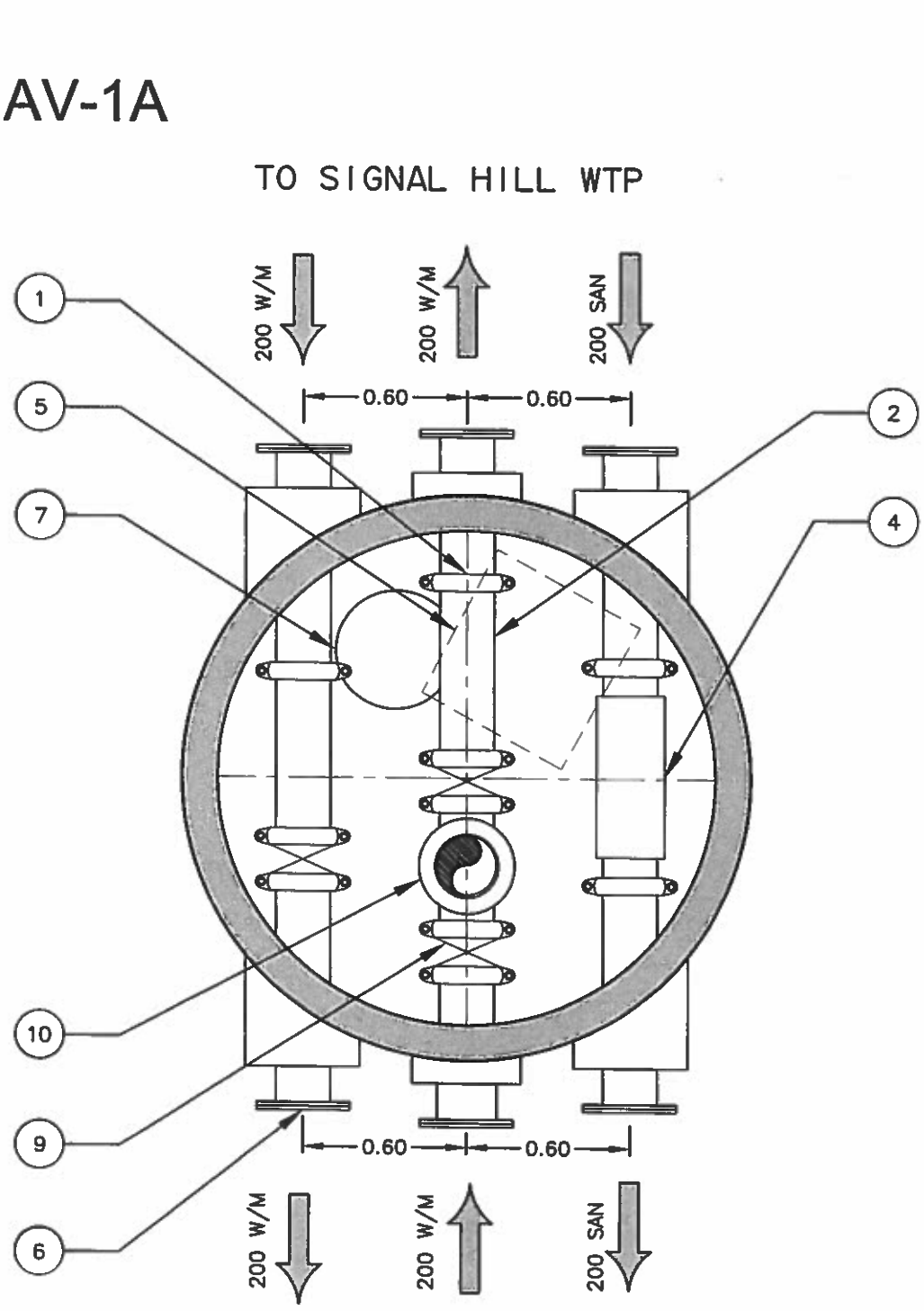
ACCESS VAULTS

AV-1



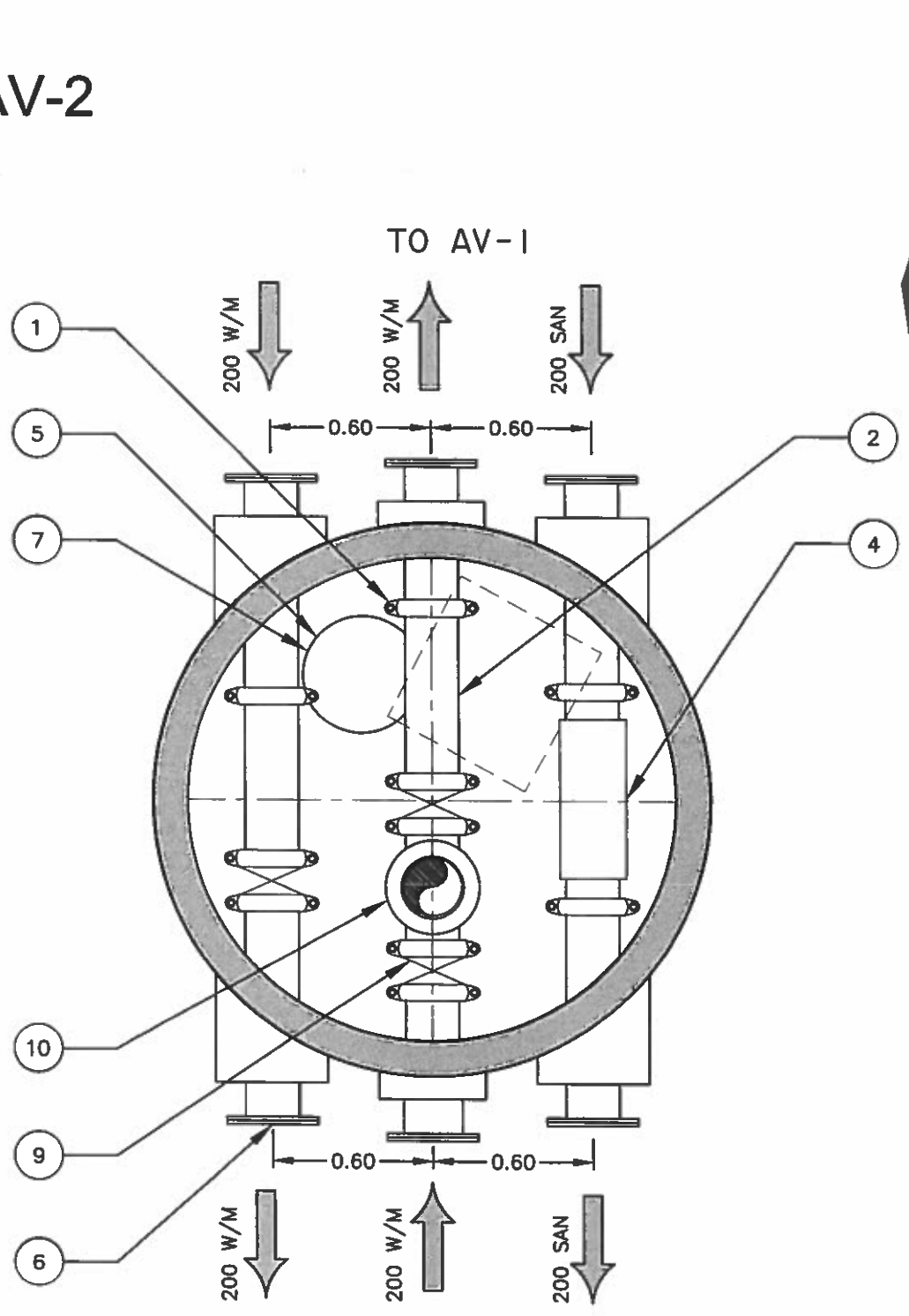
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-1	1.83m	53.79m	4.29m	50.00	50.00			50.75

AV-1A



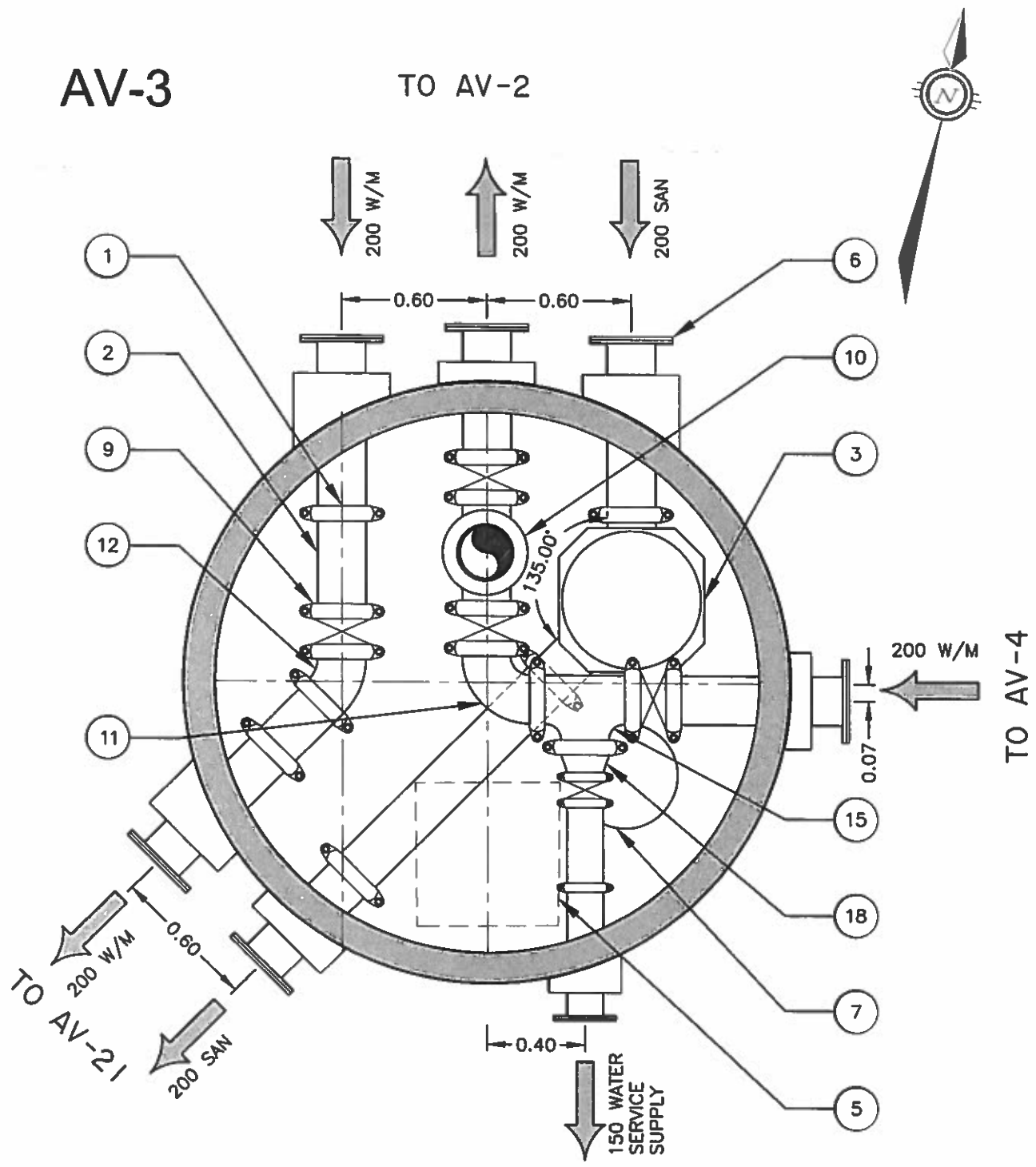
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-1A	1.83m	73.09m	4.09m	69.50	69.50			70.25

AV-2



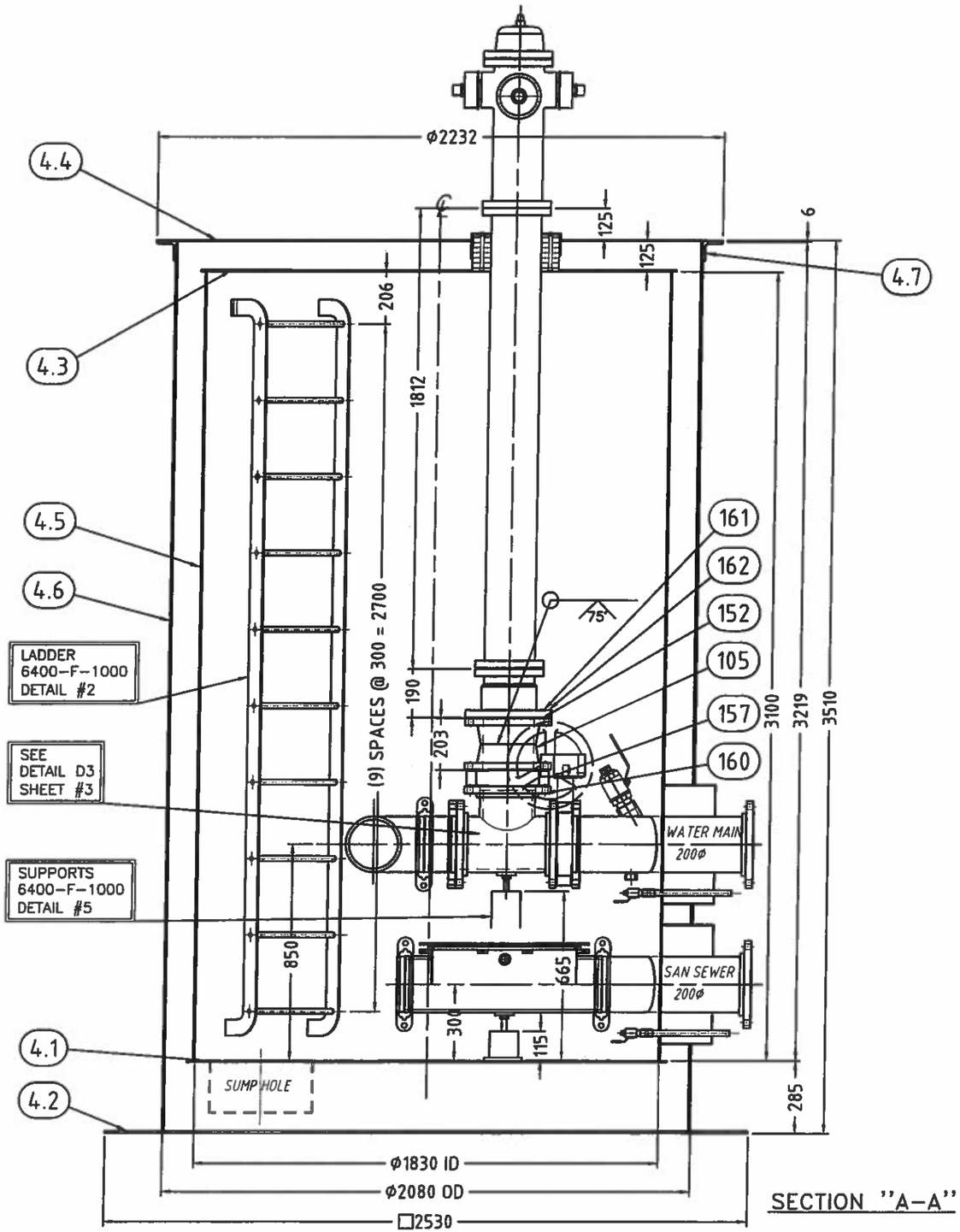
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-2	1.83m	38.87m	3.97m	35.40	35.40			36.15

AV-3



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	2.25m	27.95m	4.45m	24.00	24.00			24.75



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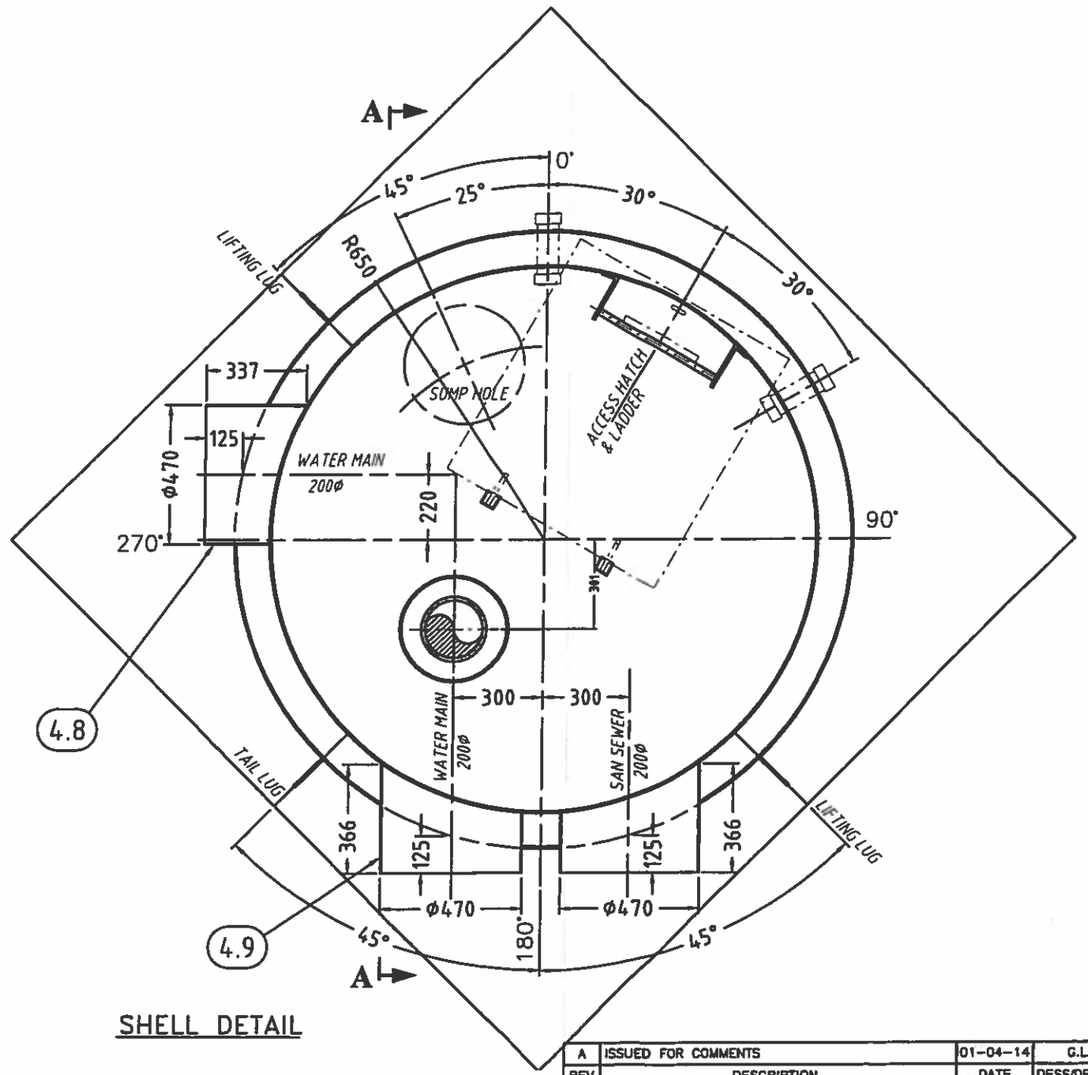

SHELL DETAIL

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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel : (450) 444-0566
Fax : (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV4
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV4	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
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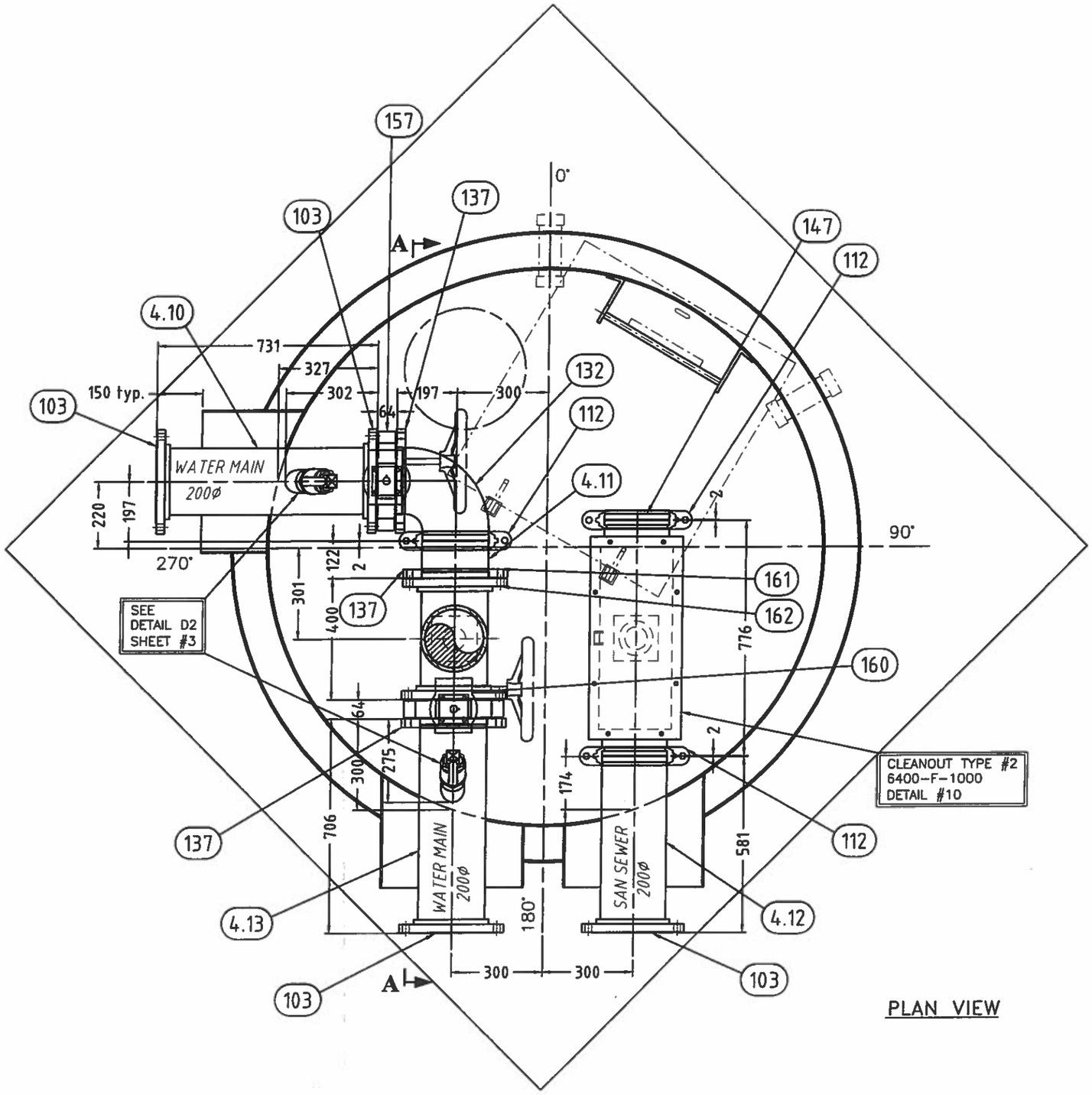

PLAN VIEW

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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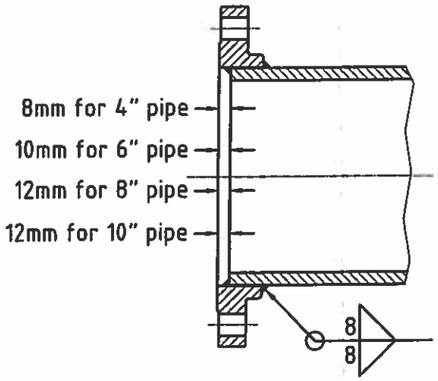
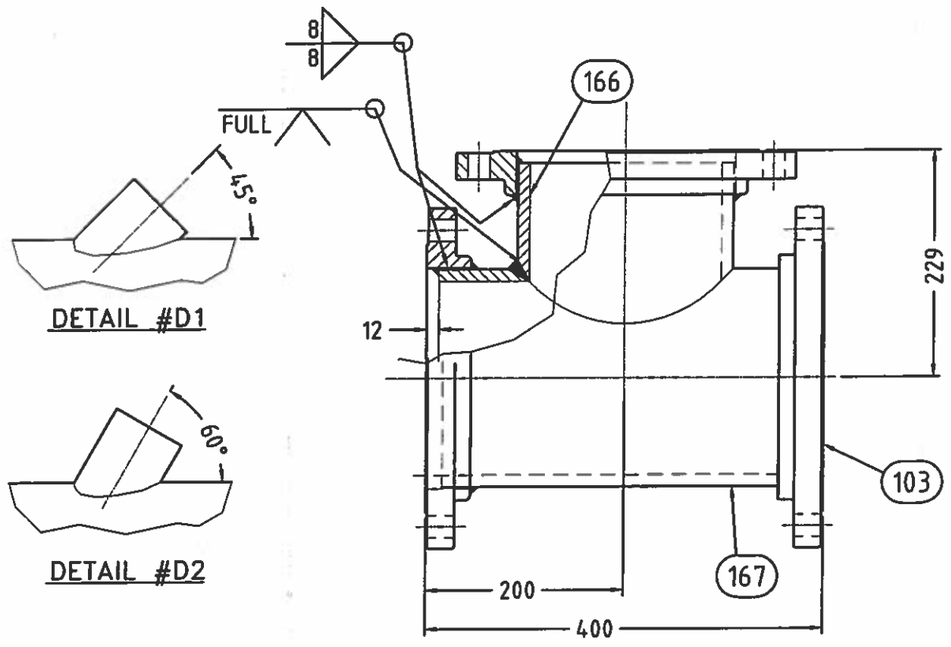
	6400-F-AV4	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	2 / 3	A





DETAIL #D1

DETAIL #D2

FLG. 8"

DETAIL D3– TYP. WELDING

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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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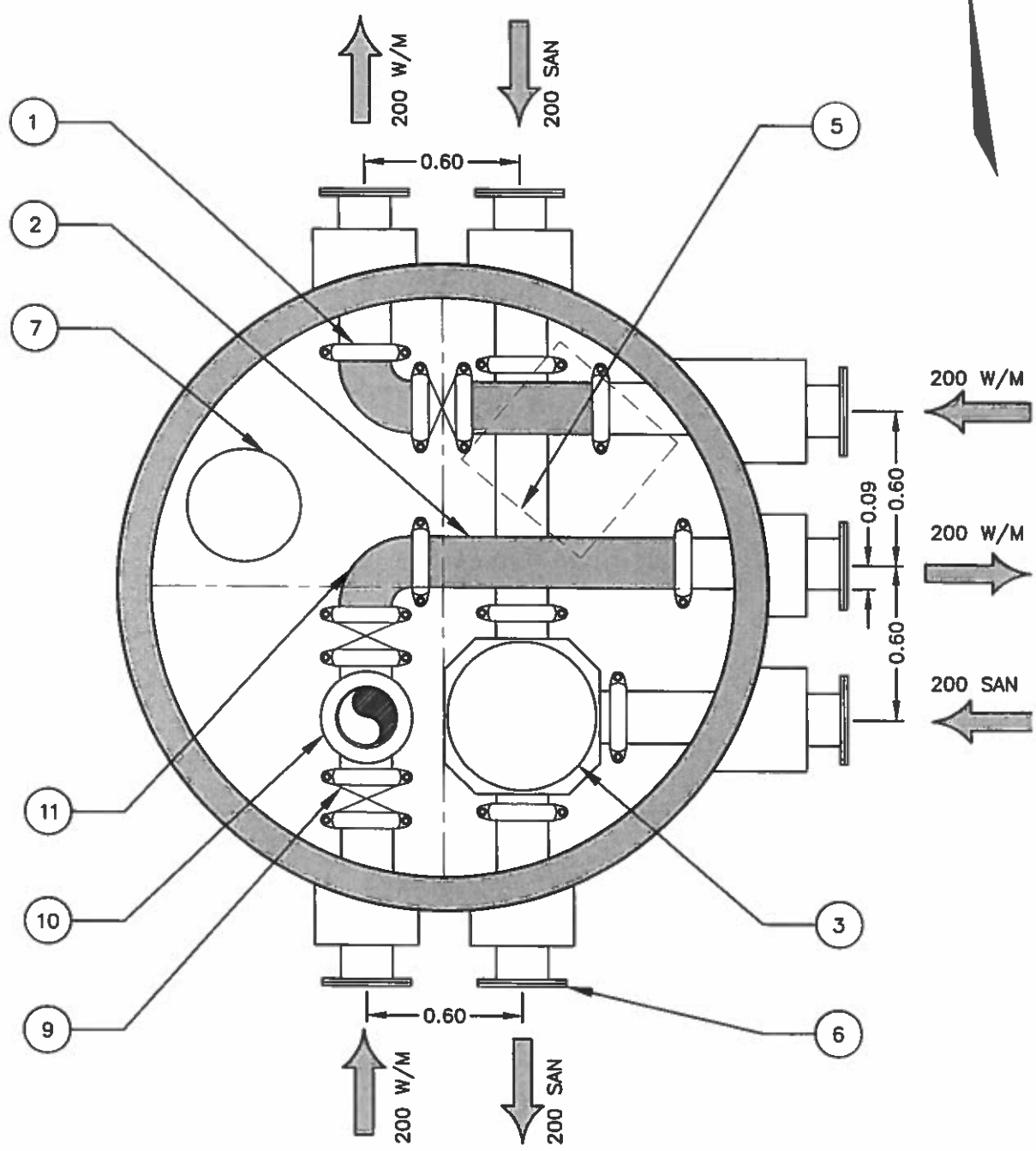
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV4
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No. / DRAWING No:	DESS. PAR: / DRAW BY:
6400-F-AV4	G.L.

SCALE:	QTE: / QTY:	DATE:	FEUILLE: / SHEET:	REV:
X/X" = X"	1	01-04-14	3 / 3	A

FUTURE AV-5

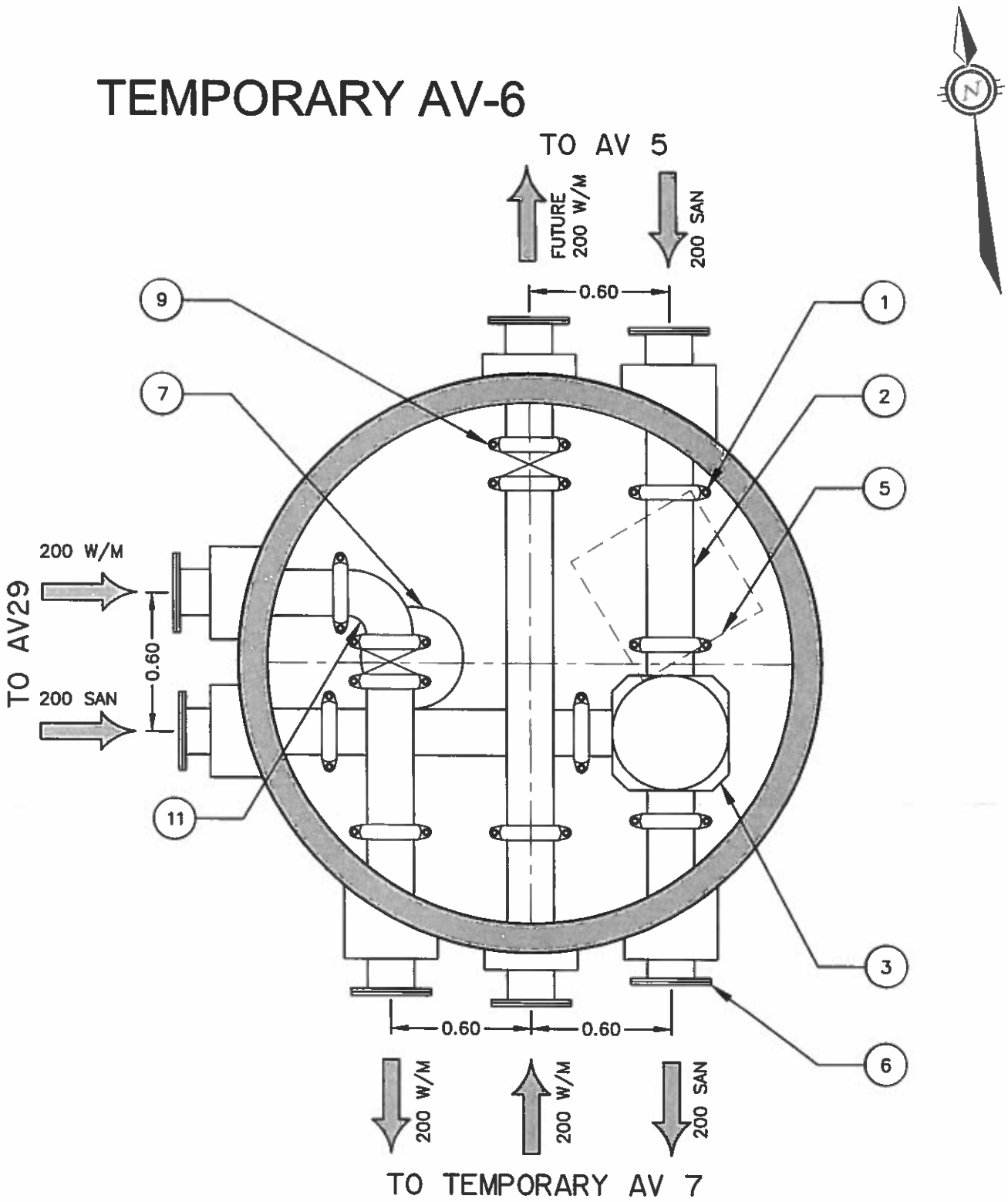


TO AV-6

DENOTES FITTING TO BE PROVIDED FOR FUTURE CONFIGURATION

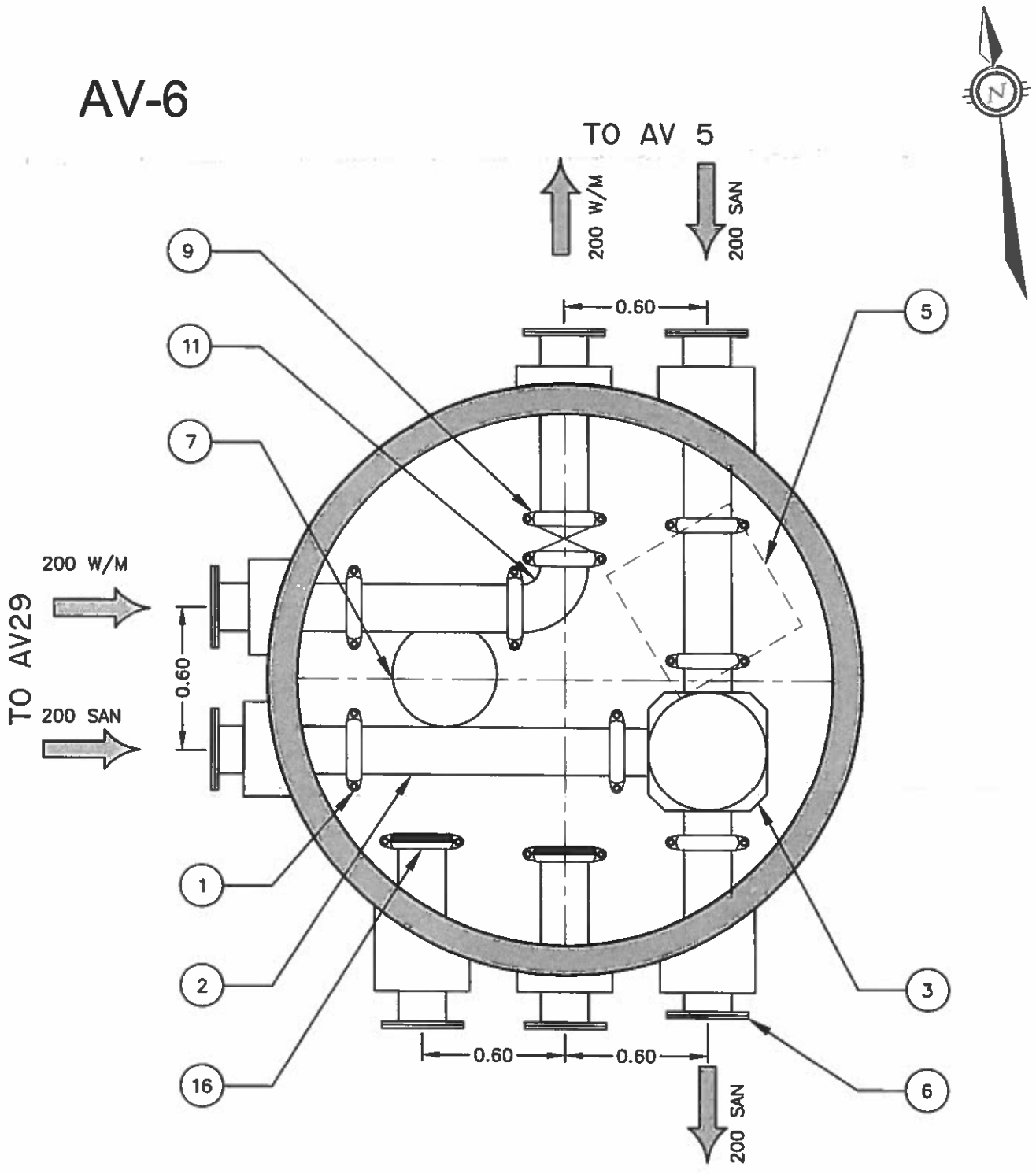
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-05	2.25m	21.64m	4.13m	18.01	18.01	18.01		18.76

TEMPORARY AV-6

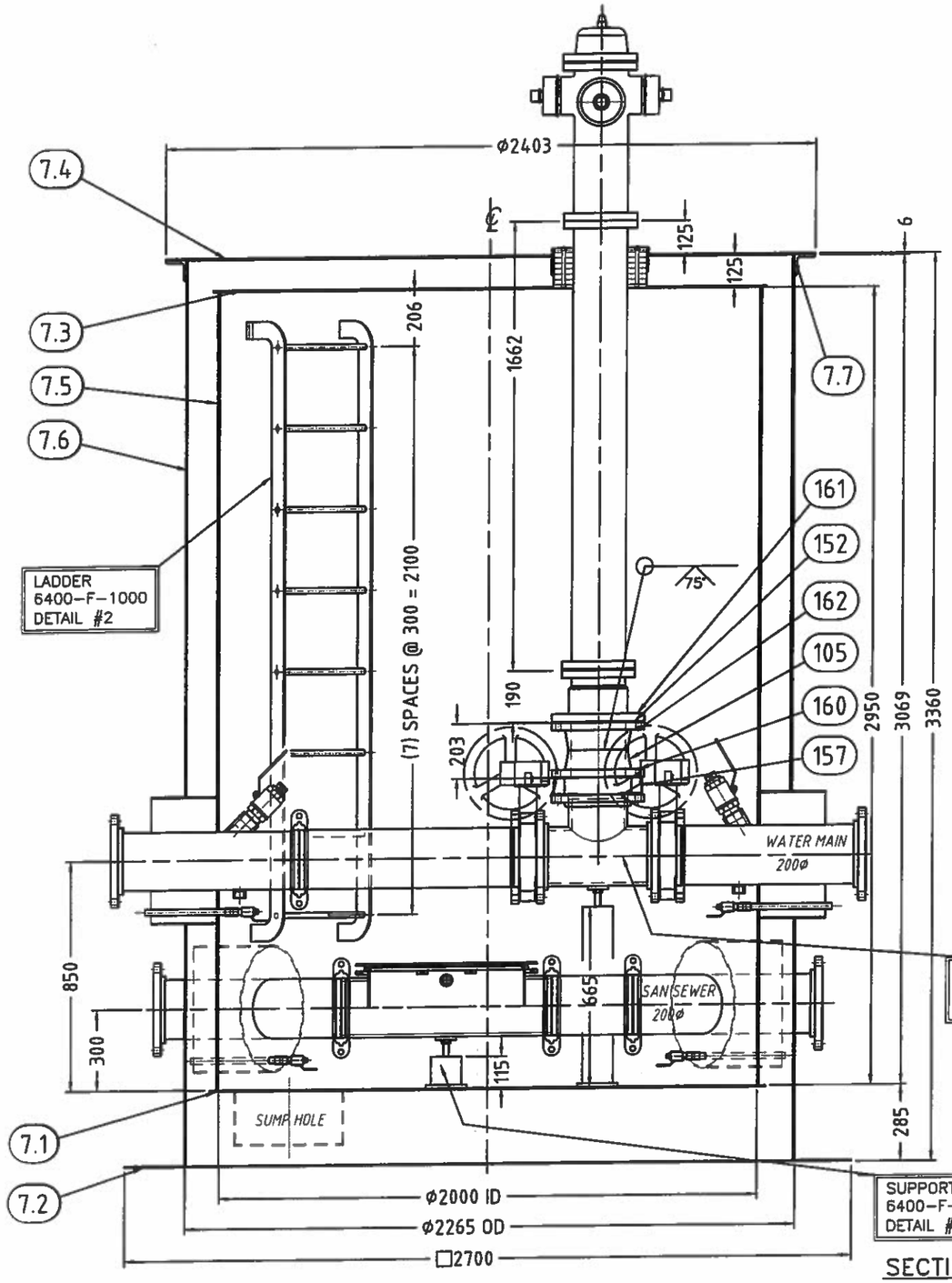


AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-6	2.25m	18.64m	3.42m	15.72	15.72		15.72	16.47

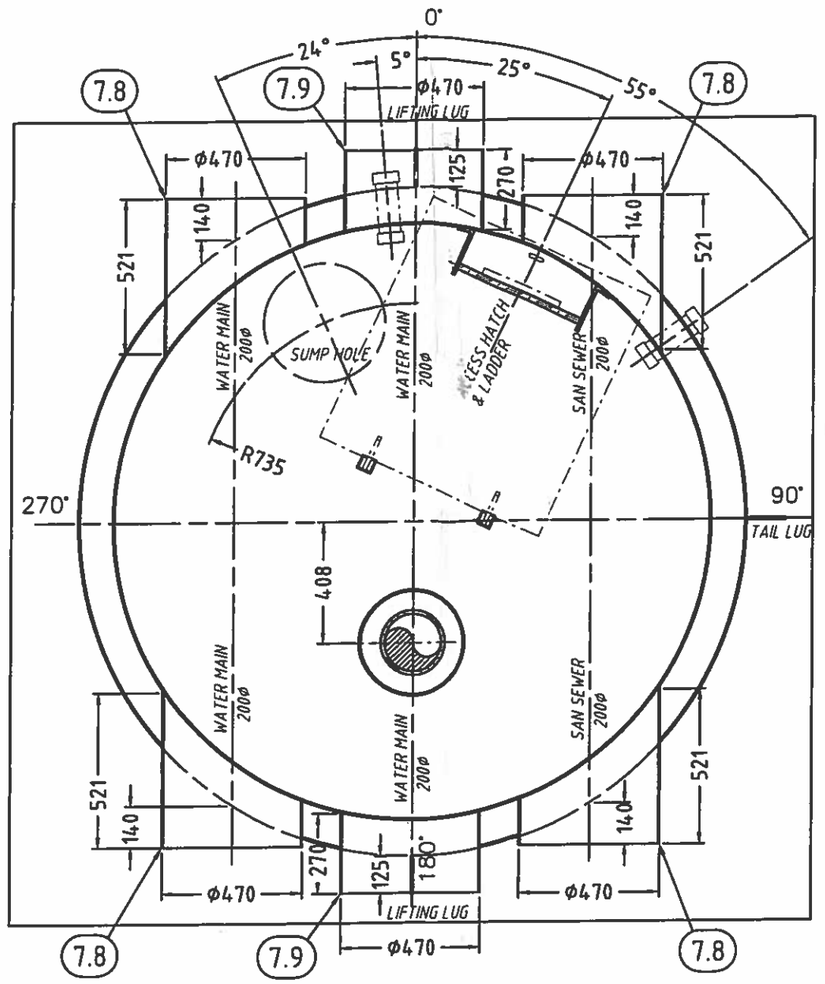
AV-6



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	16.47



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
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.

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J5R 2E4
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www.berliefalco.com

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.

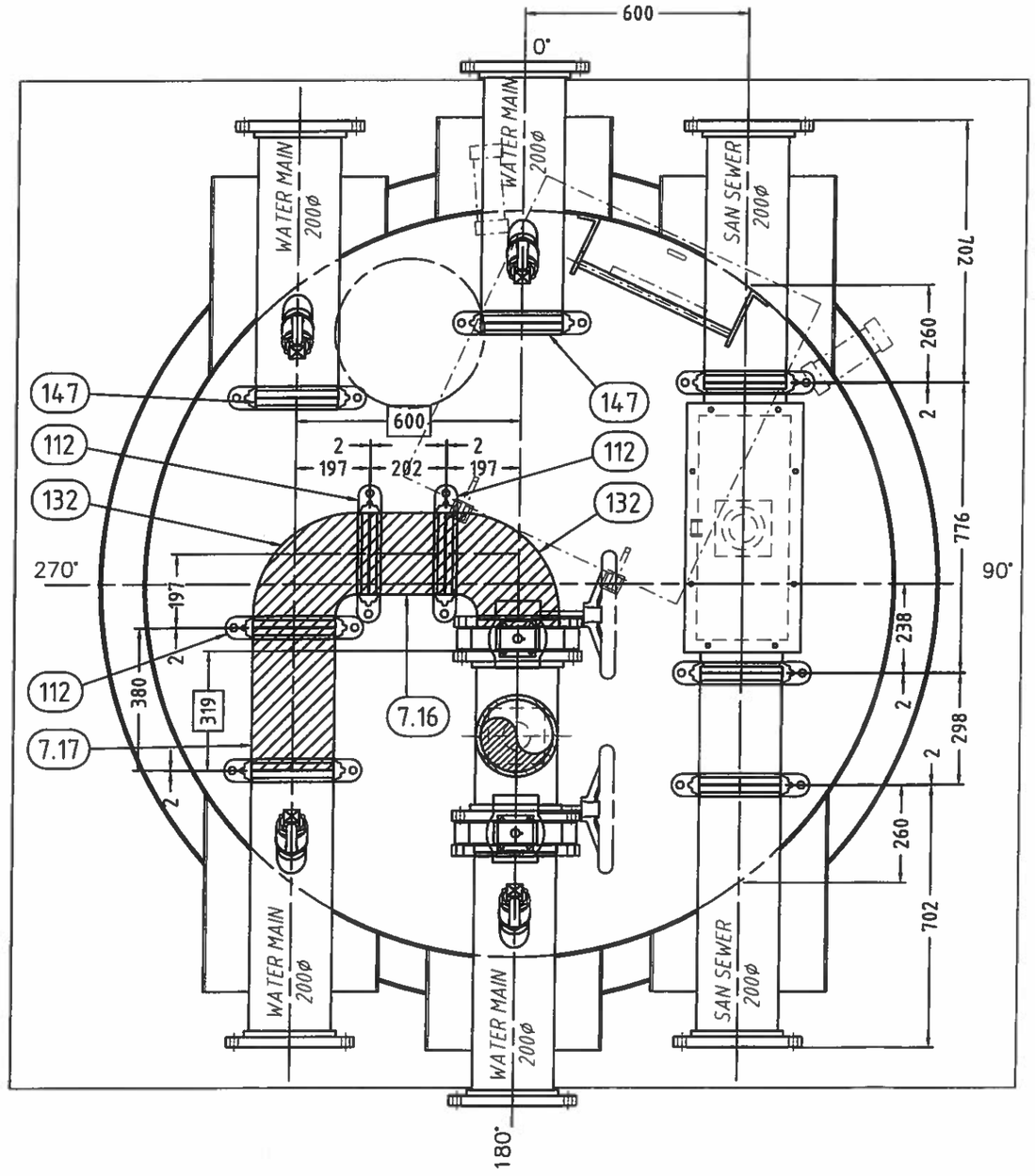
SCALE: X/X" = X"

QTE:
QTY: 1

DATE: 01-04-14

FEUILLE:
SHEET: 1 / 4

REV: A



PLAN VIEW
(FUTURE)

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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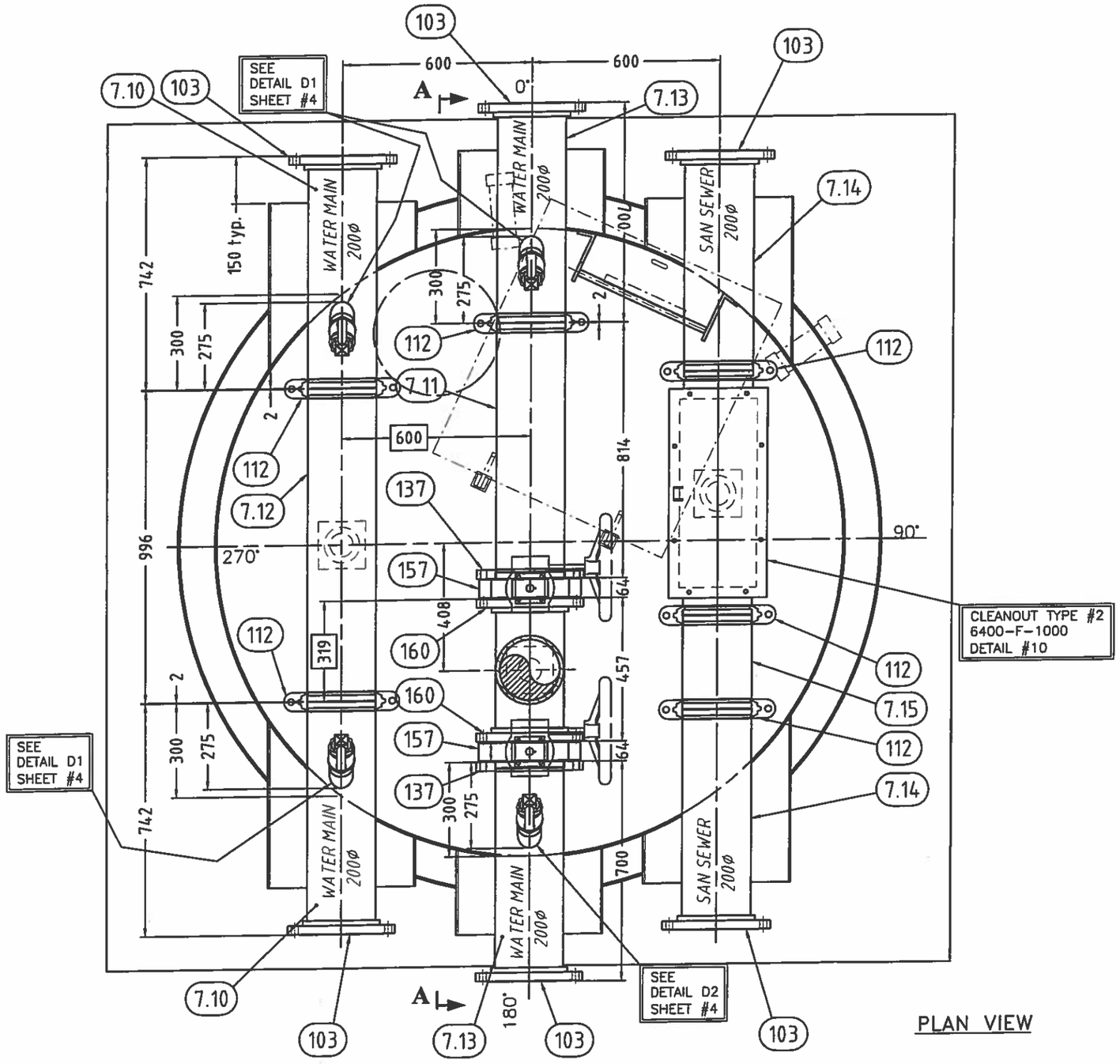
CLIENT / CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE / TITLE: ACCESS VAULT AV7
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No. / DRAWING No:	DESS. PAR / DRAW BY:
6400-F-AV7	G.L.

SCALE:	QTE / QTY:	DATE:	FEUILLE / SHEET:	REV:
X/X" = X"	1	01-04-14	3 / 4	A



PLAN VIEW

REV.	DESCRIPTION	DATE	DESS/DRWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

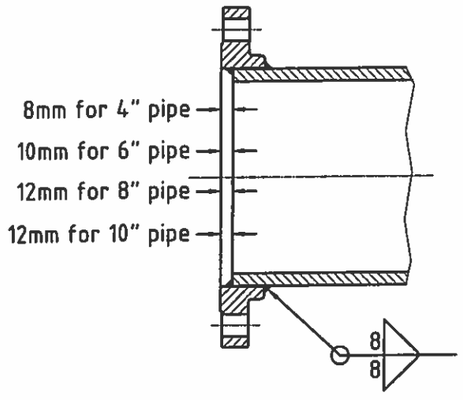
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

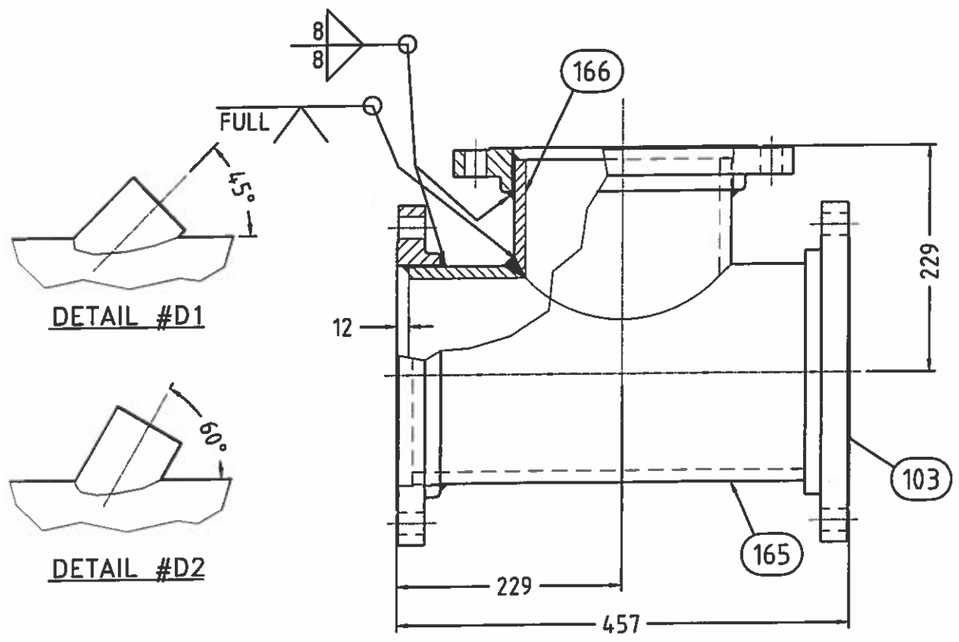
TITRE:
TITLE: ACCESS VAULT AV7
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:	
6400-F-AV7		G.L.	
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 2 / 4 — REV: A

Item	Qty	Description	Material
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

Item	Qty	Description	Material
7.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2062mm	A36
7.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2700mm x 2700mm	A36
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.





DETAIL #D1

DETAIL #D2

DETAIL D3- TYP. WELDING

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of BERLIE-FALCO
1245 rue Industrielle
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Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

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.

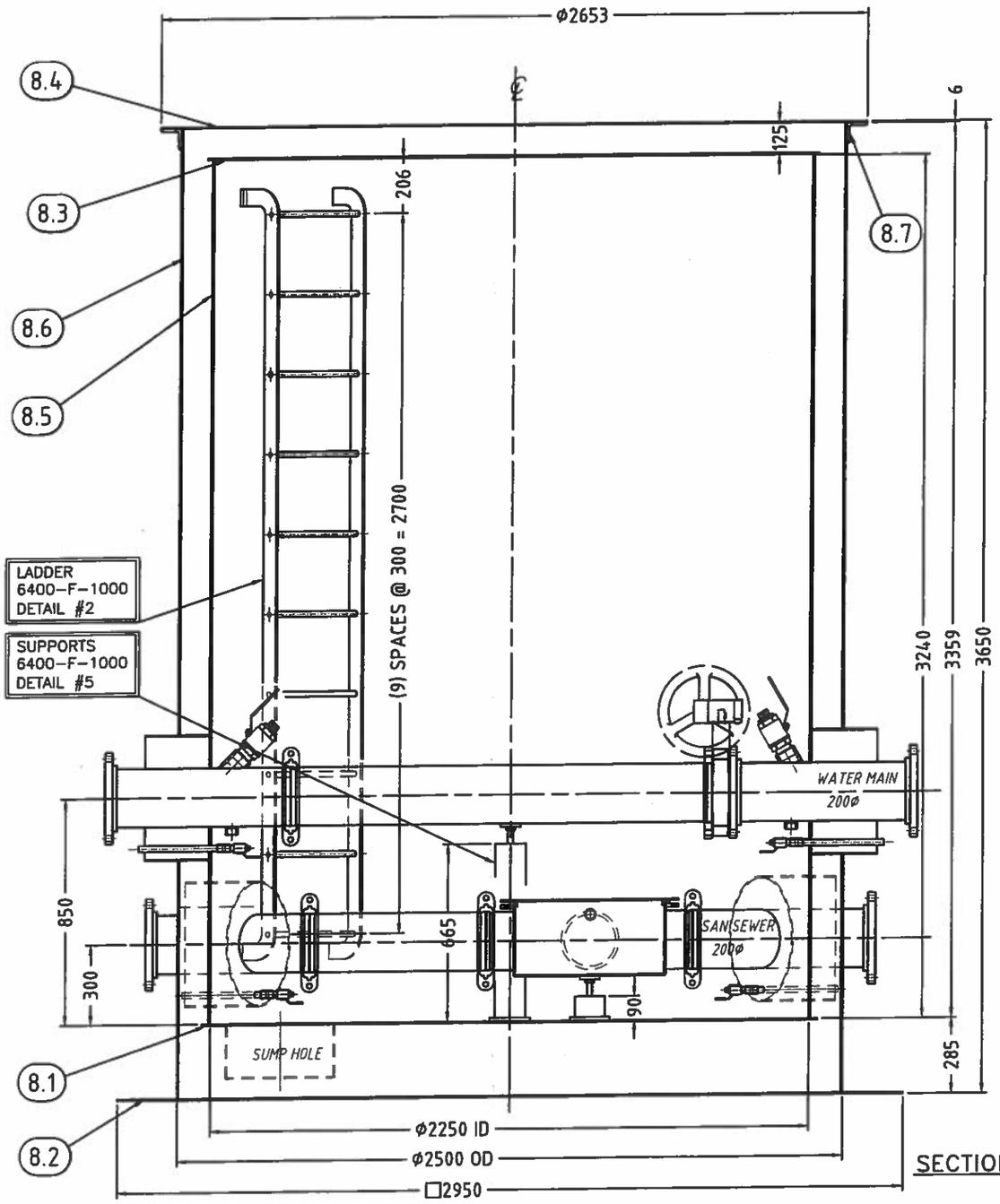
SCALE: X/X" = X"

QTE:
QTY: 1

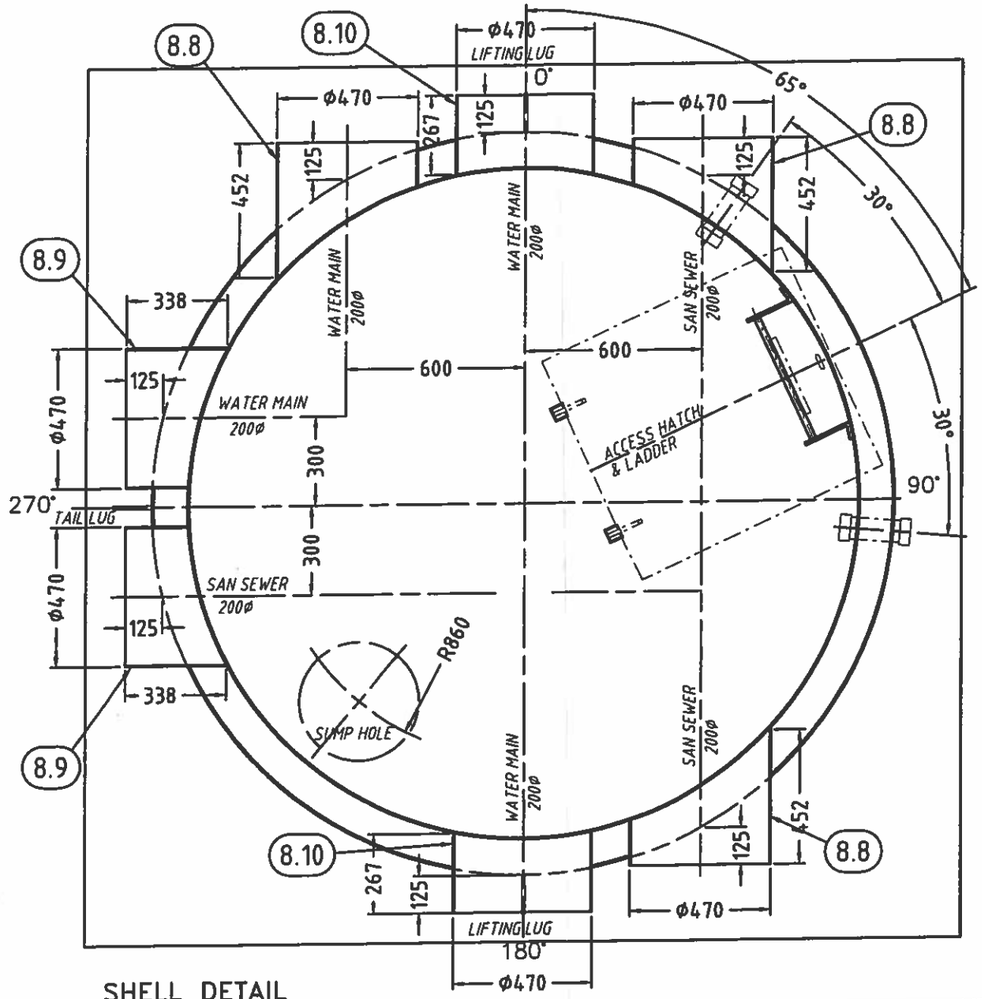
DATE: 01-04-14

FEUILLE:
SHEET: 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

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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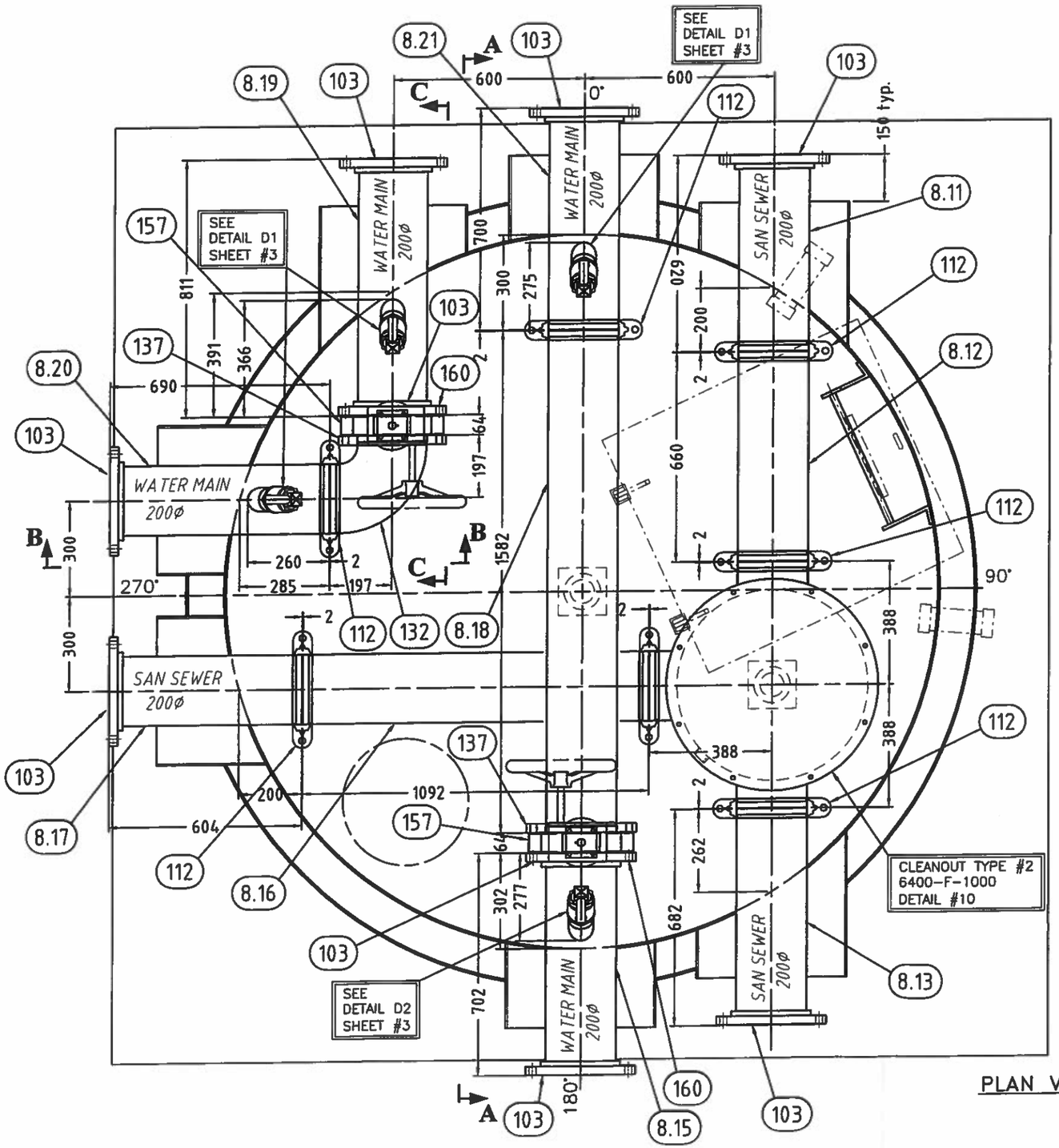
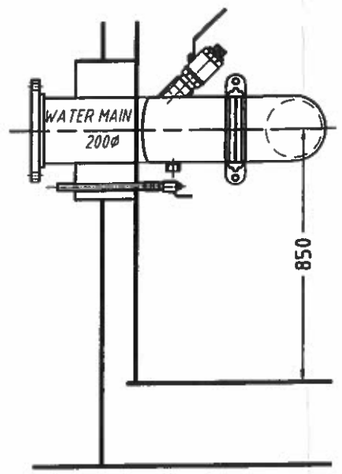
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV8
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

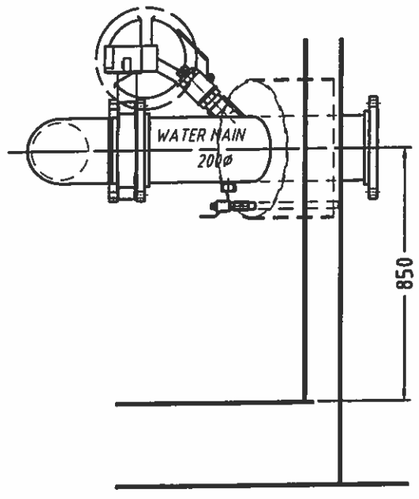
DESSIN No.: DRAWING No: 6400-F-AV8			DESS. PAR: DRAW BY: G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 1 / 3 — REV: A



PLAN VIEW



SECTION ''B-B''



SECTION ''C-C''

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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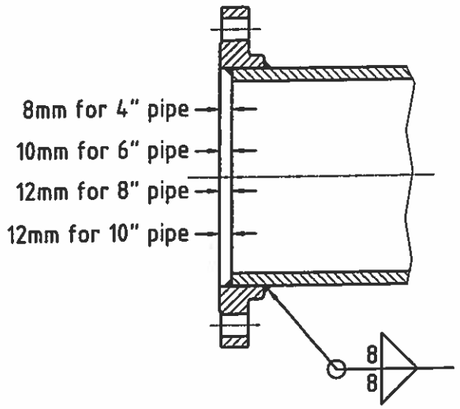
www.berliefalco.com

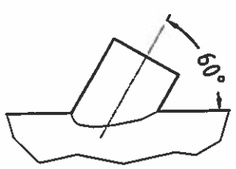
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV8
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:	
6400-F-AV8		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
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.

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV8
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV8

DESS. PAR:
DRAW BY: G.L.

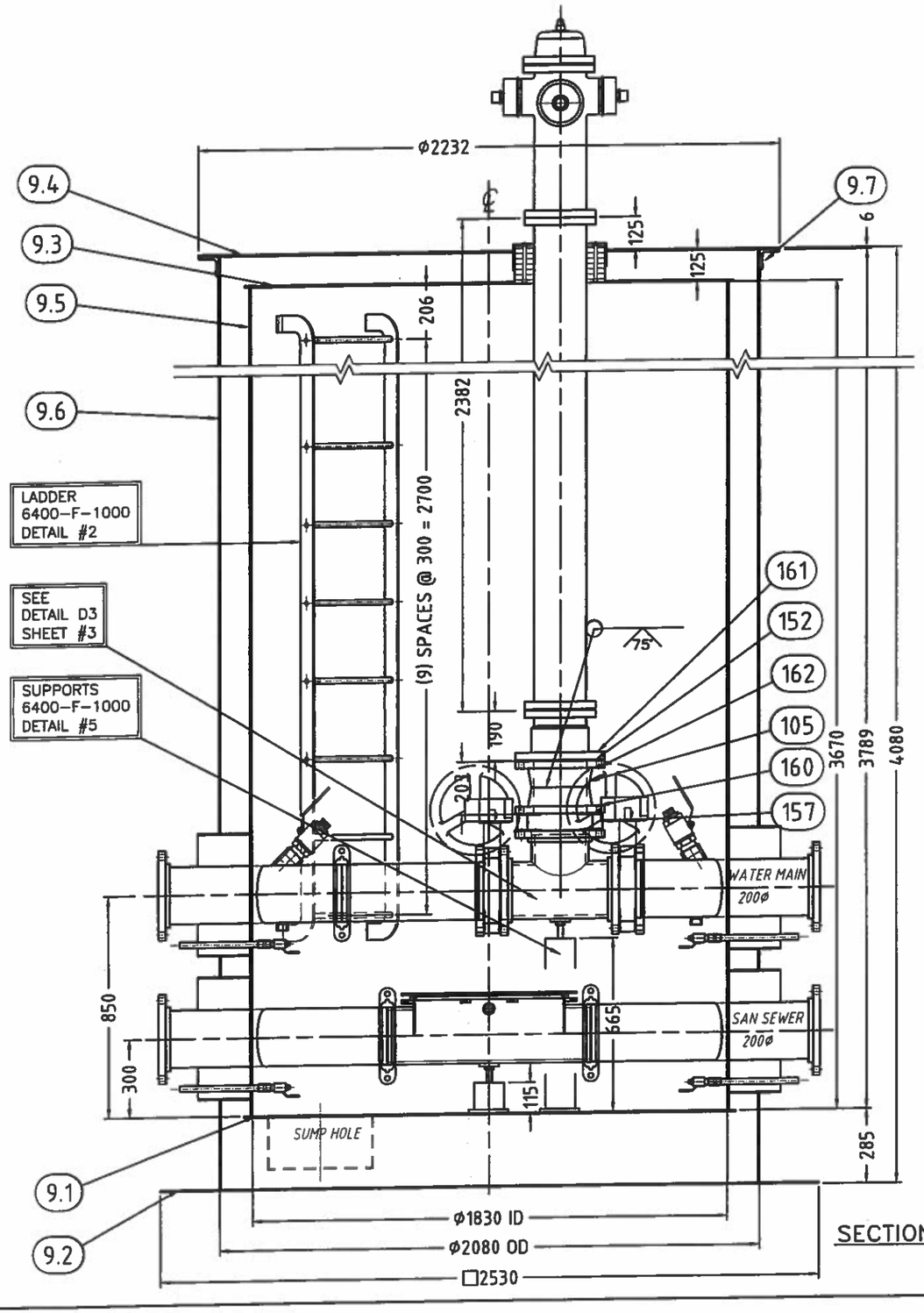
SCALE: X/X" = X"

QTE:
QTY: 1

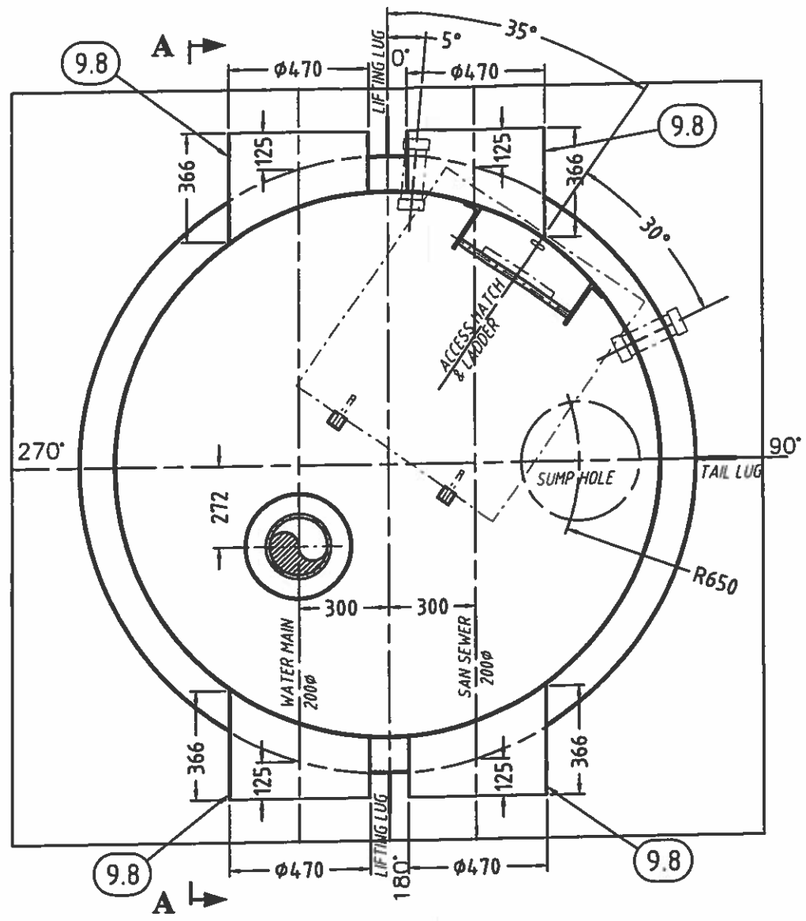
DATE:
01-04-14

FEUILLE:
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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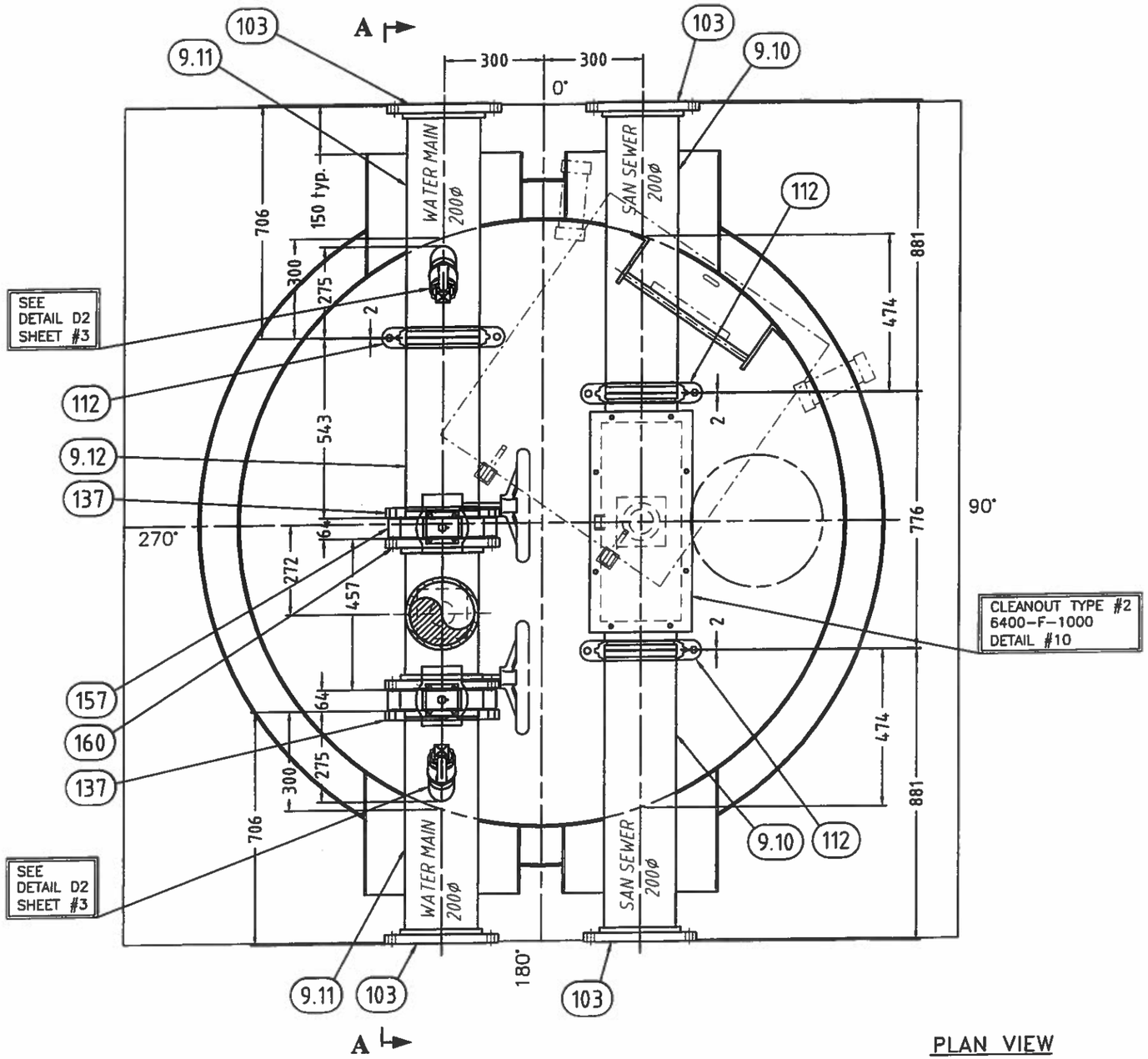
Fax.:(450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV9
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV9	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	A



PLAN VIEW

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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BERLIE-FALCO
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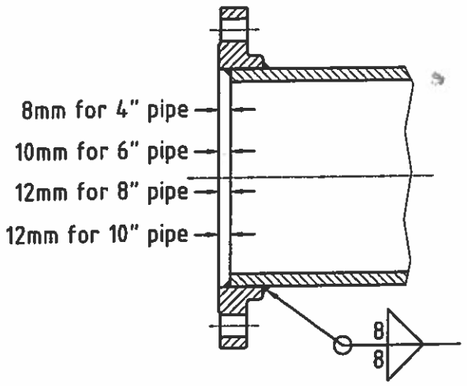
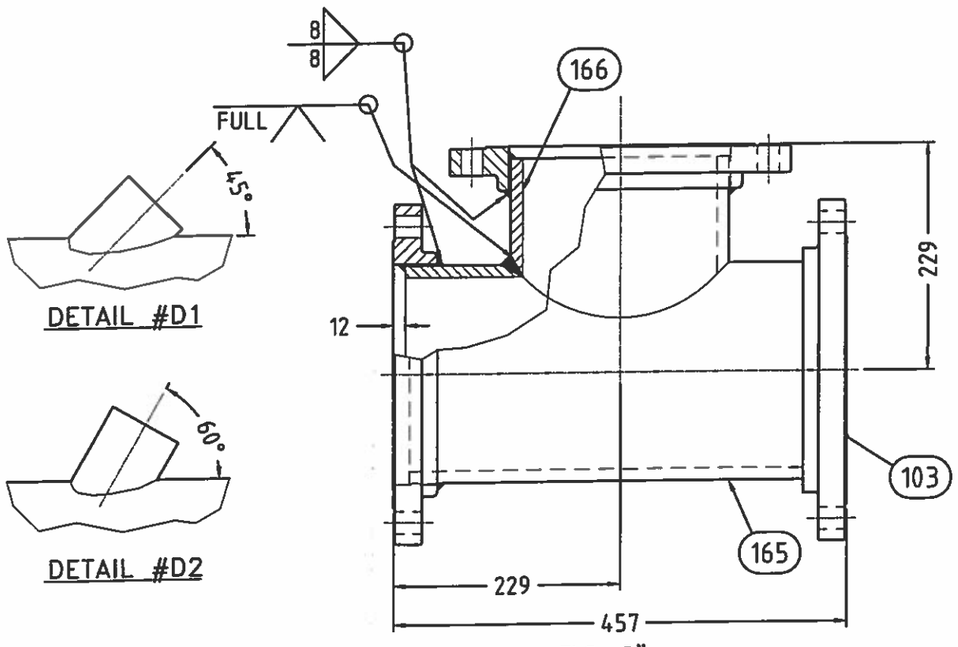
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV9
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV9	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	2 / 3	A





DETAIL #D1

DETAIL #D2

DETAIL D3– TYP. WELDING

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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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CLIENT:
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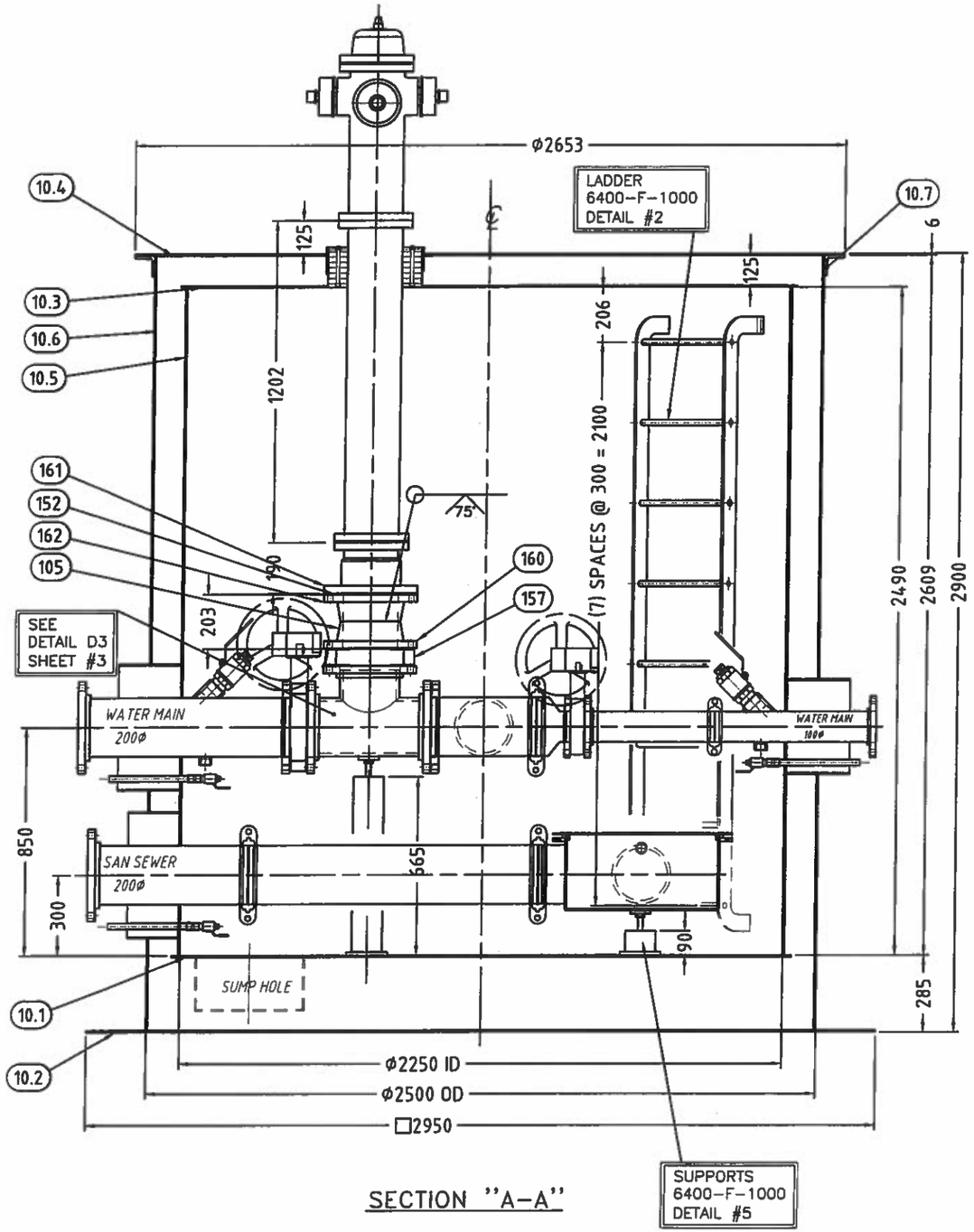
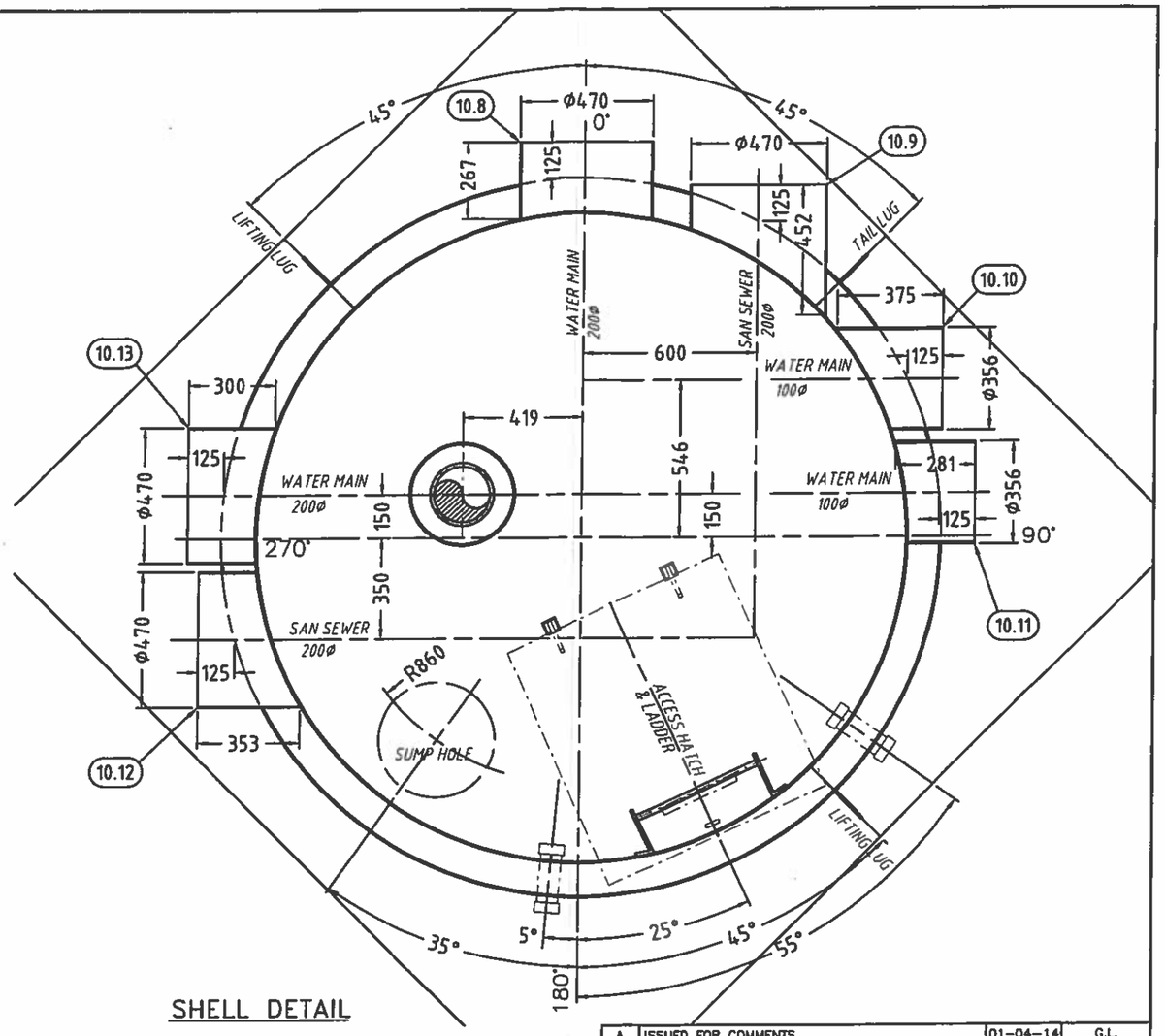
TITRE:
TITLE: ACCESS VAULT AV9
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV9	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	3 / 3	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
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REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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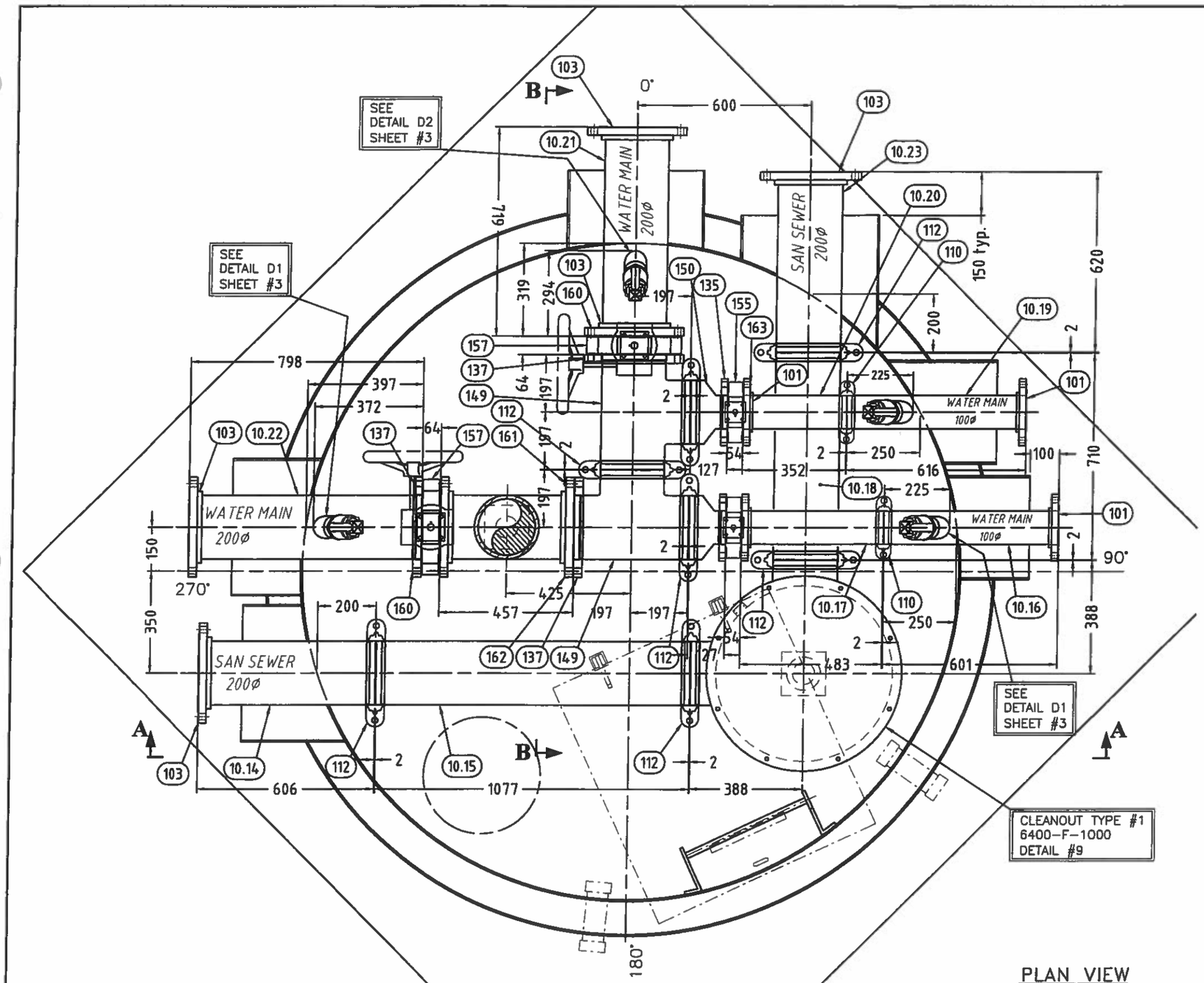
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

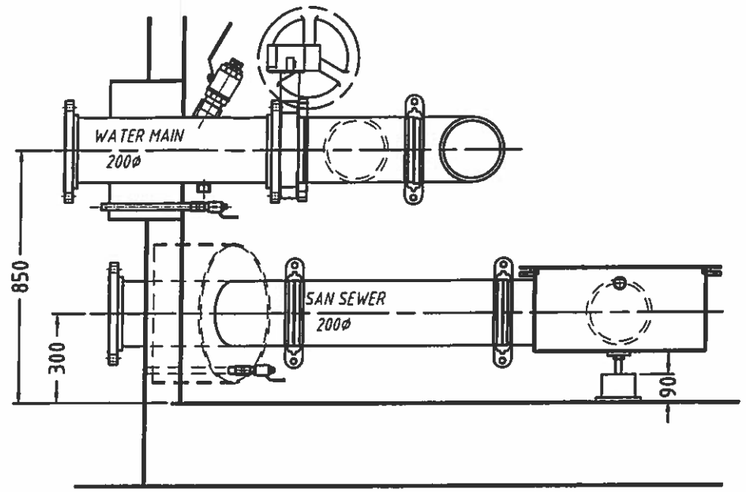
TITRE:
TITLE: ACCESS VAULT AV10
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
	6400-F-AV10	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	A



PLAN VIEW



SECTION ''B-B''

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
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CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

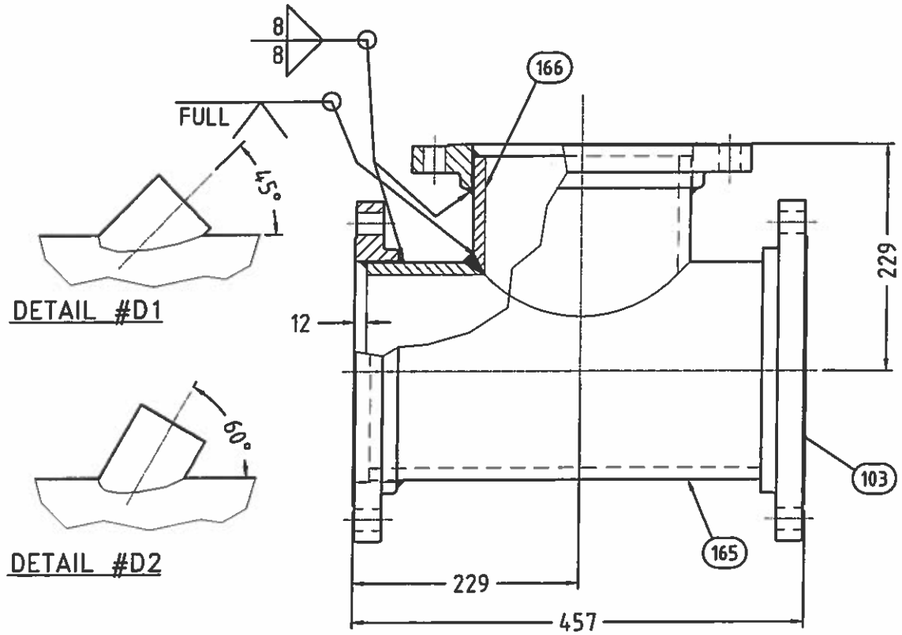
TITRE:
TITLE: ACCESS VAULT AV10
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV10	G.L.

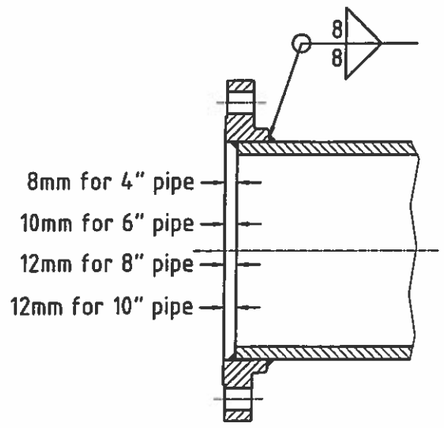
SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	2 / 3	A

Item	Qty	Description	Material
112	7	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
135	2	4" VICTAULIC FLANGE STYLE 741	GALV C.S.
137	3	8" VICTAULIC FLANGE STYLE 741	GALV C.S.
149	2	8" VICTAULIC TEE, #20	GALV.
150	2	8" @ 4" VICTAULIC CONCENTRIC REDUCER , #50	GALV C.S.
152	1	1/8" THK. GASKET FOR 8"FLG. #150	SOFT RUBBER
155	2	4" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
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.
163	32	BOLT 5/8-11UNC x 1 3/4"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

Item	Qty	Description	Material
10.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
10.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
10.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
10.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
10.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 2490mm LG.	A36
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
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
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
10.12	1	PL. 1/4" THK. x 353 x 1456mm LG.	A36
10.13	1	PL. 1/4" THK. x 300 x 1456mm LG.	A36
10.14	1	PIPE 8" SCH.80 x 594mm LG. vic groove 1 end	A-53-B
10.15	1	PIPE 8" SCH.80 x 1077mm LG. vic groove 2 end	A-53-B
10.16	1	PIPE 4" SCH.80 x 593mm LG. vic groove 1 end	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



REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

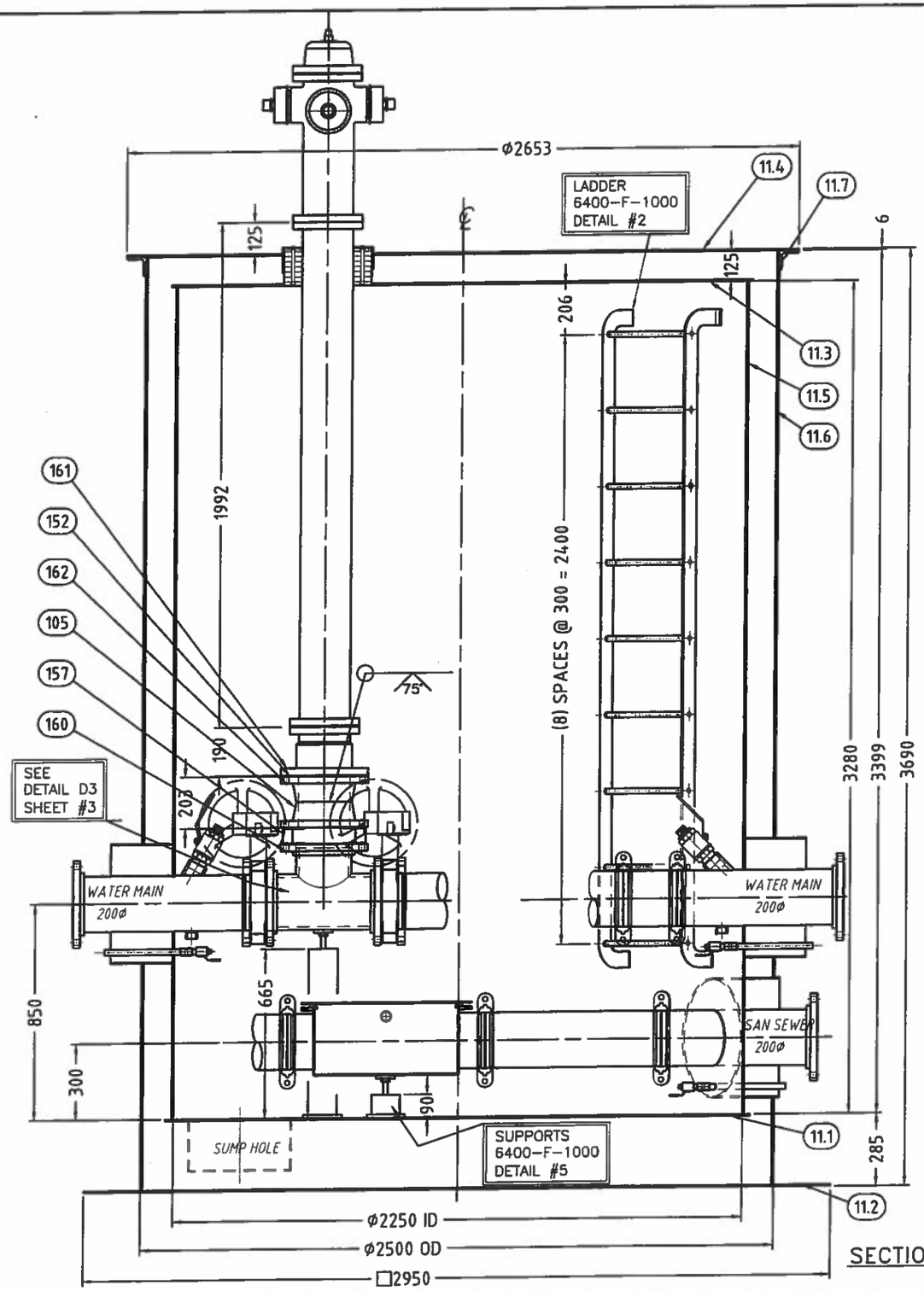
Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

CLIENT/CUSTOMER: GOVERNEMENT OF NUNAVUT

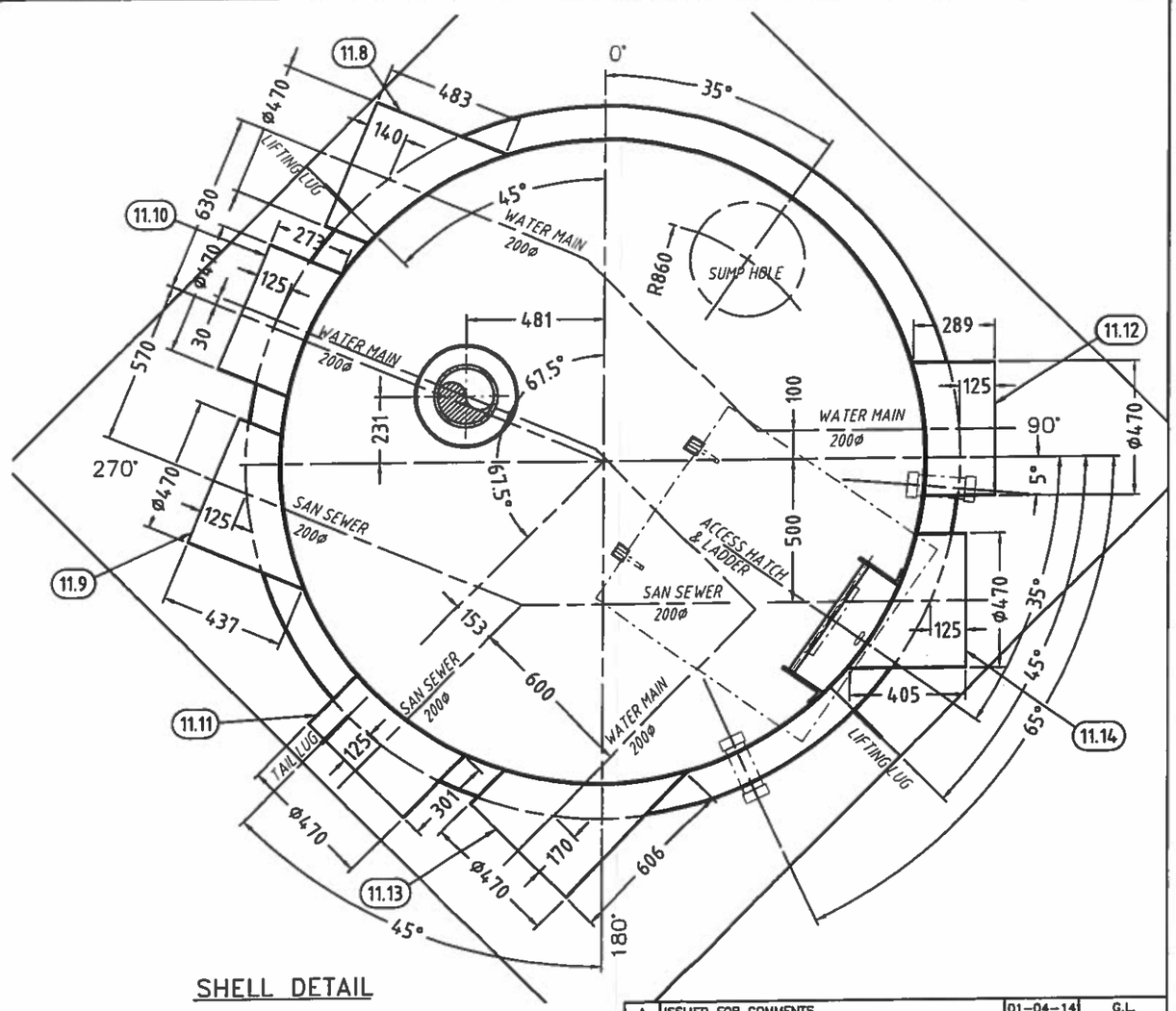
TITRE/TITLE: ACCESS VAULT AV10
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No./DRAWING No:	DESS. PAR:/DRAW BY:
6400-F-AV10	G.L.

SCALE:	QTE:/QTY:	DATE:	FEUILLE/SHEET:	REV:
X/X" = X"	1	01-04-14	3 / 3	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

REV.	DESCRIPTION	DATE	DESS/DRAWN
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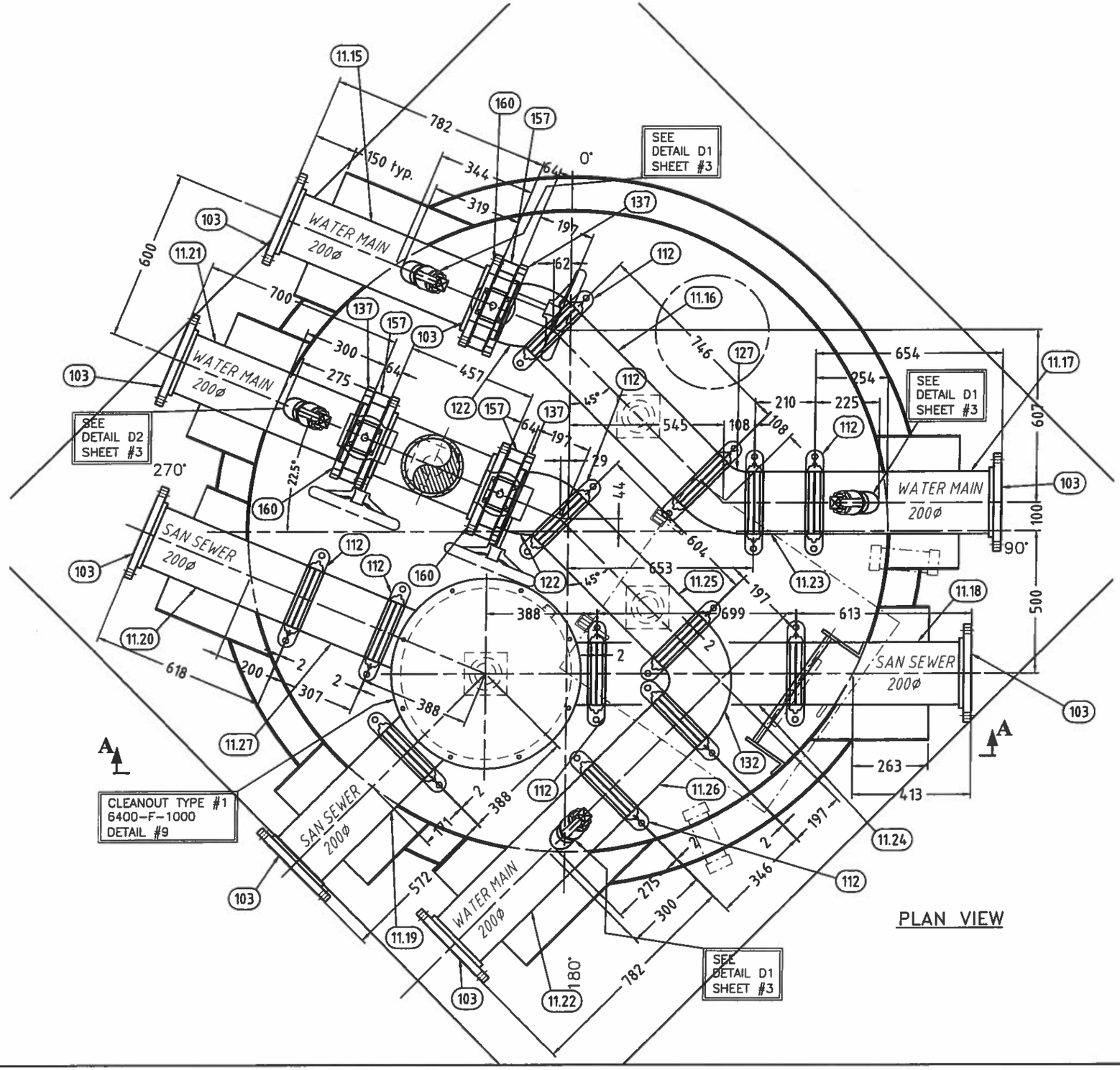
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV11
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: / DRAWING No:	DESS. PAR: / DRAW BY:
6400-F-AV11	G.L.

SCALE:	QTE: / QTY:	DATE:	FEUILLE: / SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	A



PLAN VIEW

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

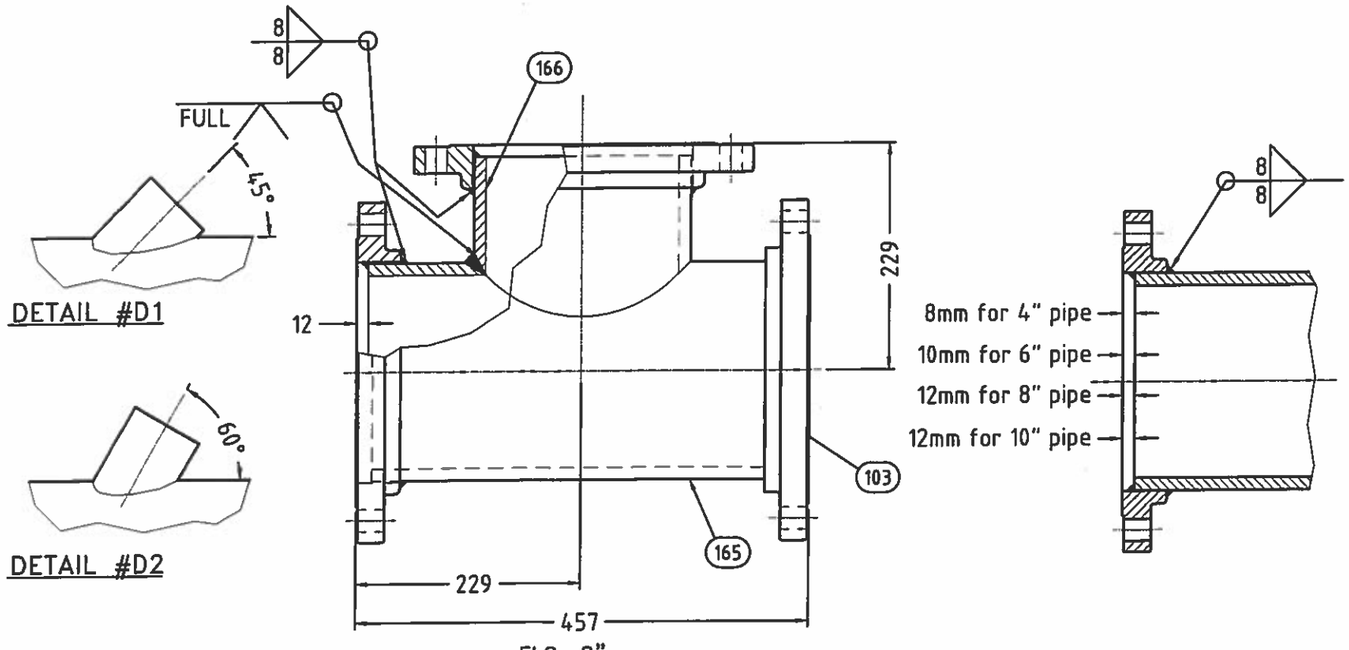
TITRE:
TITLE: ACCESS VAULT AV11
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV11	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	2 / 3	A

Item	Qty	Description	Material
103	11	FLANGE SORF 8" - 150#	SA 105
105	2	FLANGE WN 8" 150#, BORE	SA-105
112	12	8" VICTAULIC COUPLING STYLE 77	GALV C.S.
122	2	8" VICTAULIC ELBOW 22 1/2°, #12	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.
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

Item	Qty	Description	Material
11.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
11.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
11.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
11.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
11.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 3280mm LG.	A36
11.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7048mm x 3668mm LG.	A36
11.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
11.8	1	PL. 1/4" THK. x 483 x 1456mm LG.	A36
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
11.12	1	PL. 1/4" THK. x 289 x 1456mm LG.	A36
11.13	1	PL. 1/4" THK. x 606 x 1456mm LG.	A36
11.14	1	PL. 1/4" THK. x 405 x 1456mm LG.	A36
11.15	1	PIPE 8" SCH.80 x 758mm 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



DETAIL D3- TYP. WELDING

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV11
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV11

DESS. PAR:
DRAW BY: G.L.

SCALE: X/X" = X"

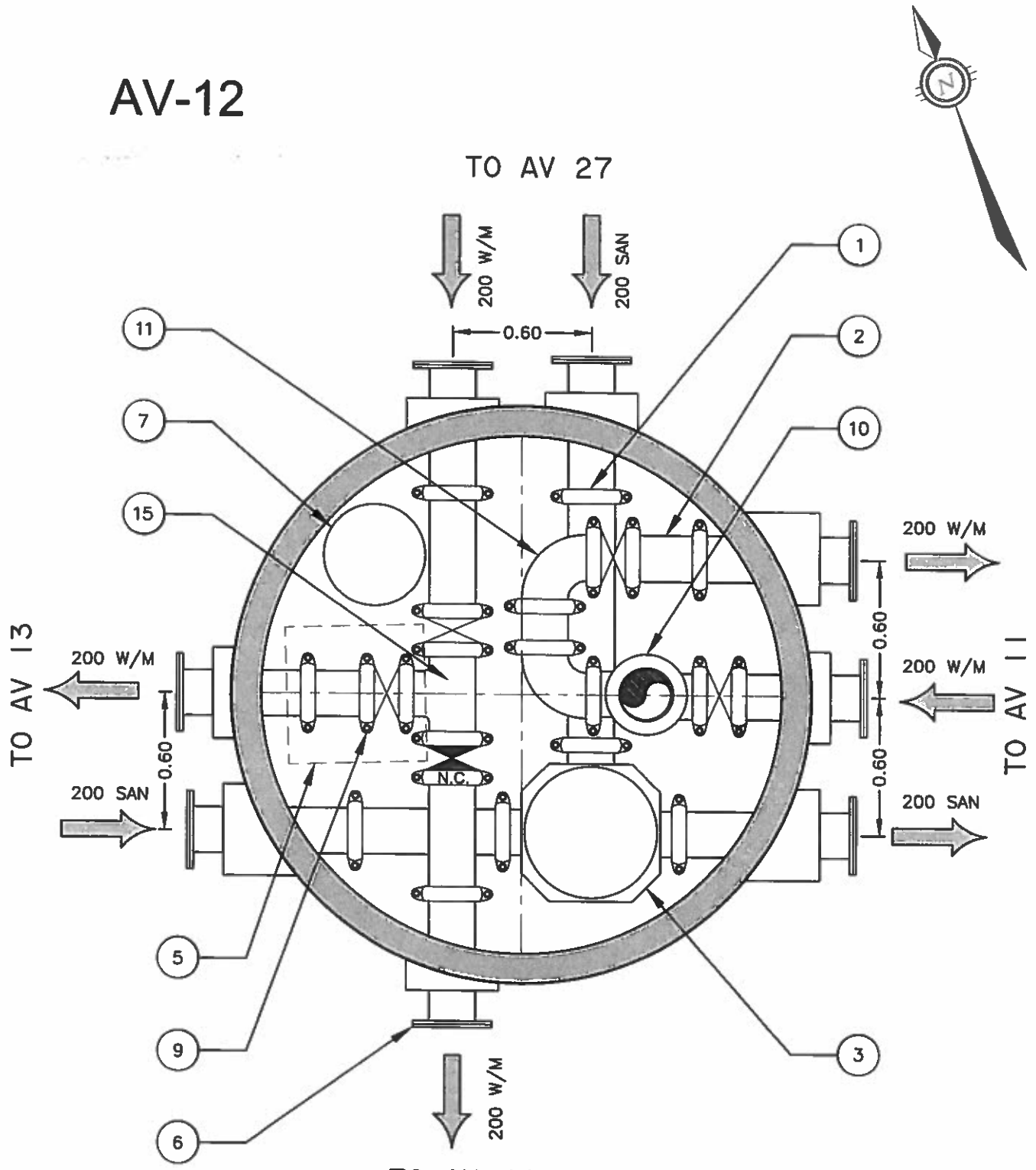
QTE:
QTY: 1

DATE: 01-04-14

FEUILLE:
SHEET: 3 / 3

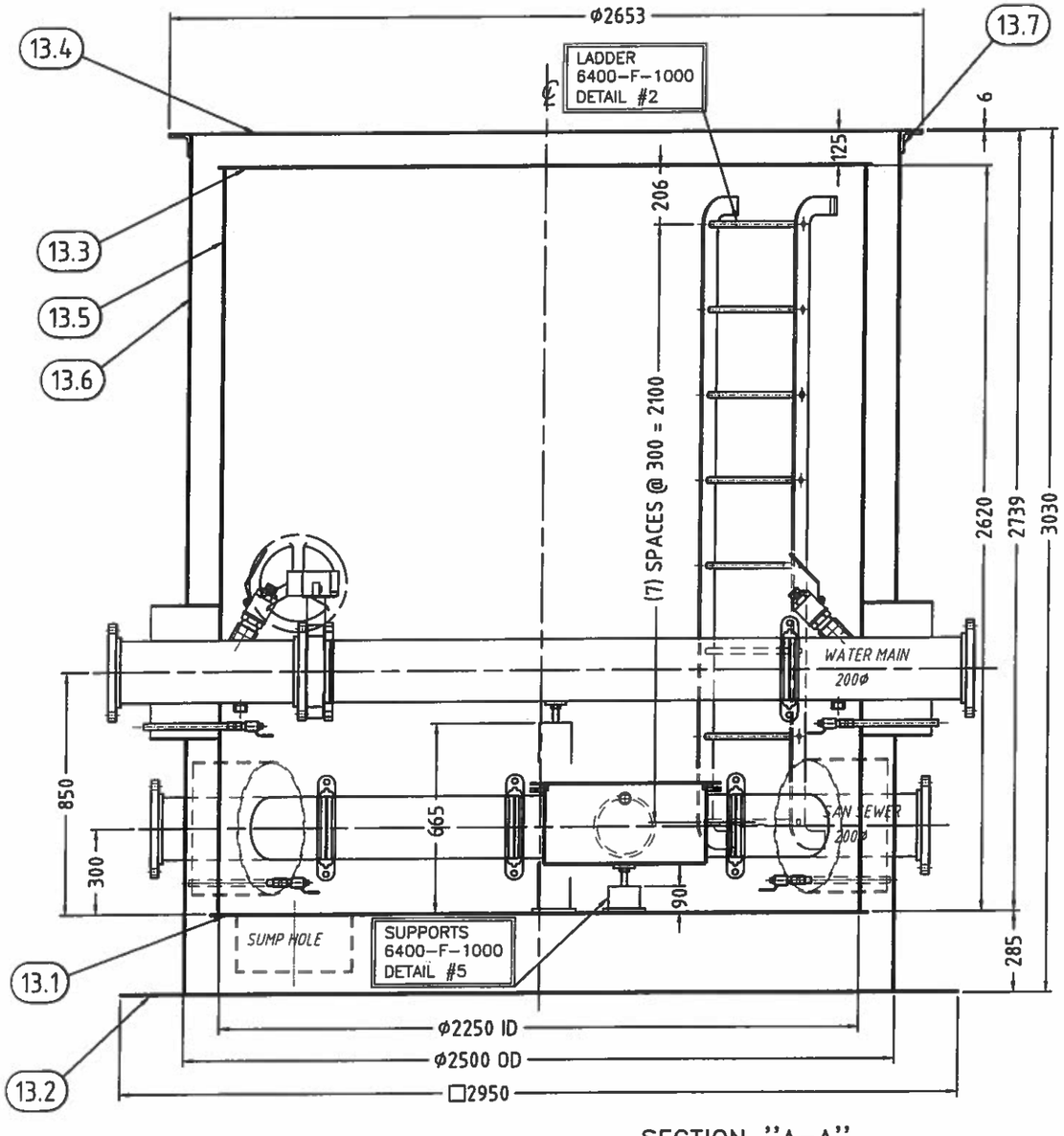
REV: A

AV-12

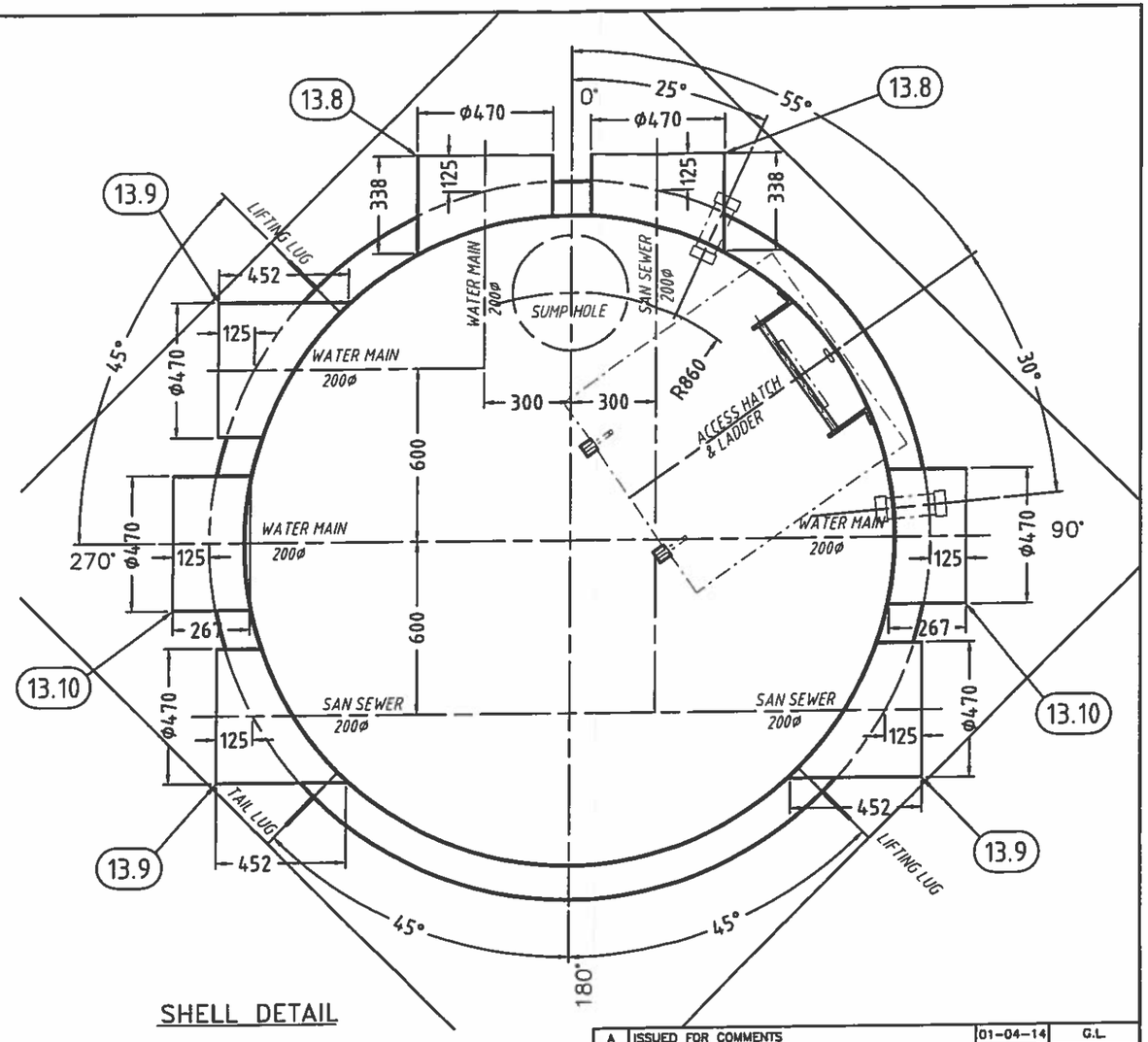


TO AV 44

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



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

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L

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www.berliefalco.com

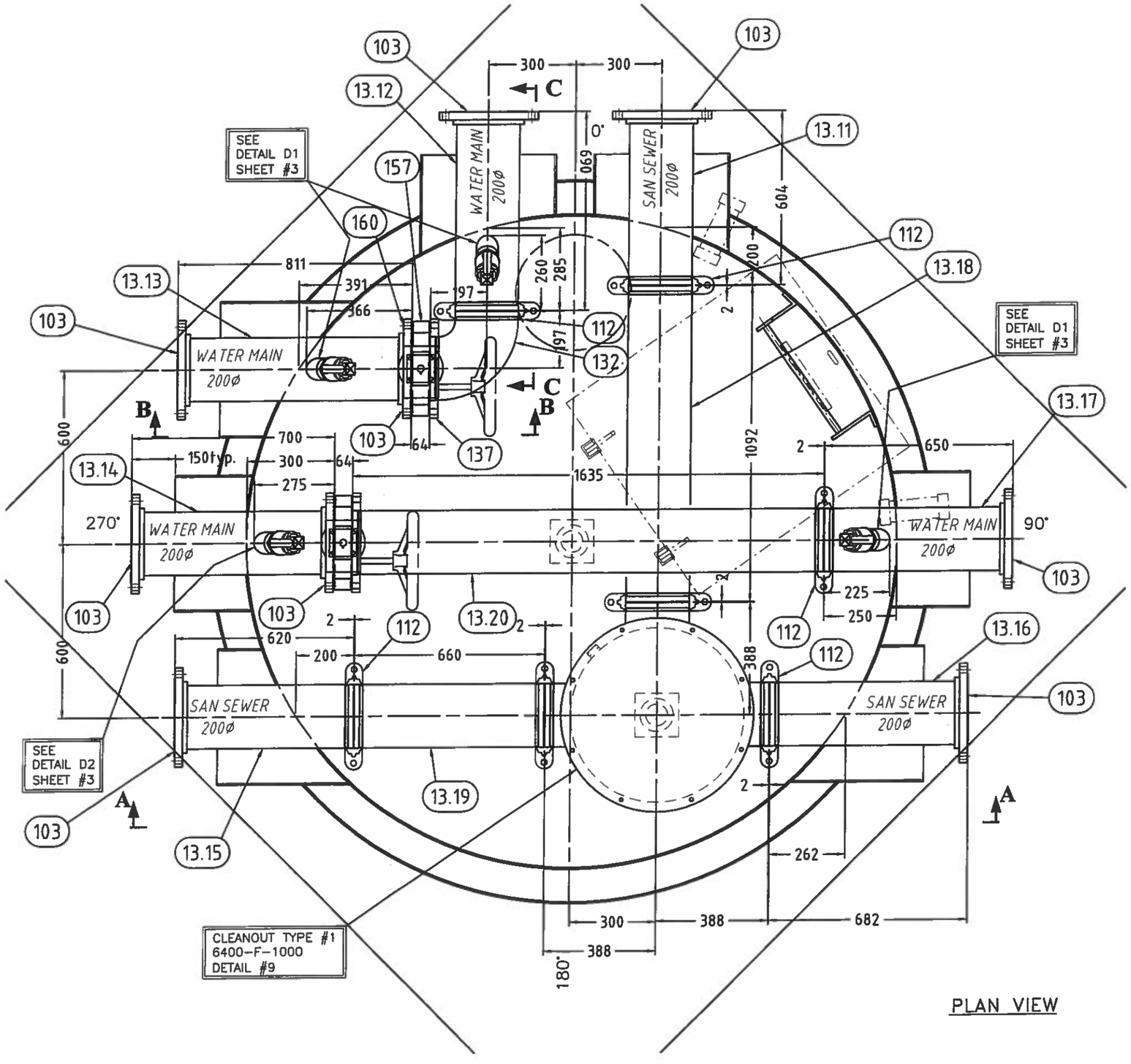
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV13
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

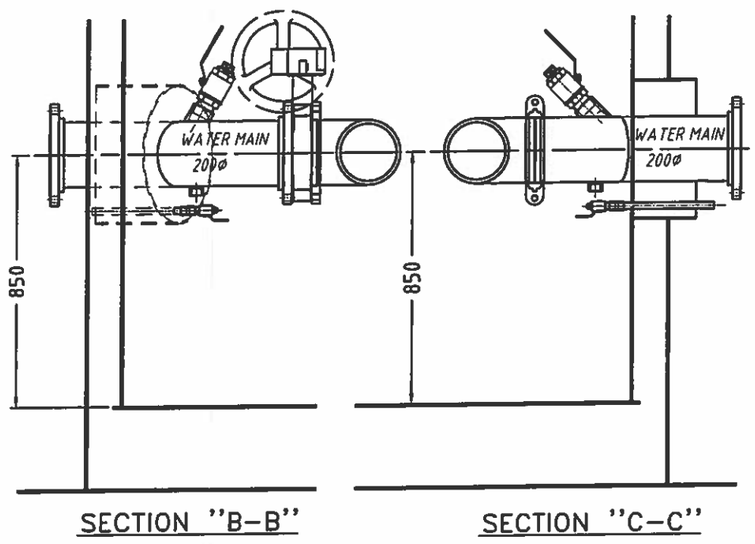
DESSIN No.:
DRAWING No: 6400-F-AV13

DESS. PAR:
DRAW BY: G.L.

SCALE: X/X" = X"
QTE:
QTY: 1
DATE: 01-04-14
FEUILLE:
SHEET: 1 / 3
REV: A



PLAN VIEW



SECTION ''B-B''

SECTION ''C-C''

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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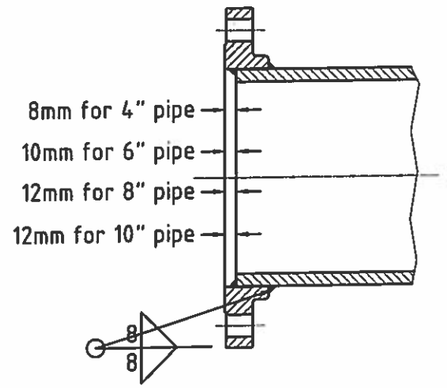
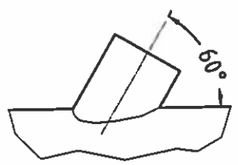
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV13
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV13		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
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.

REV	DESCRIPTION	DATE	DESS/DRAWN
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CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV13
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV13

DESS. PAR:
DRAW BY: G.L.

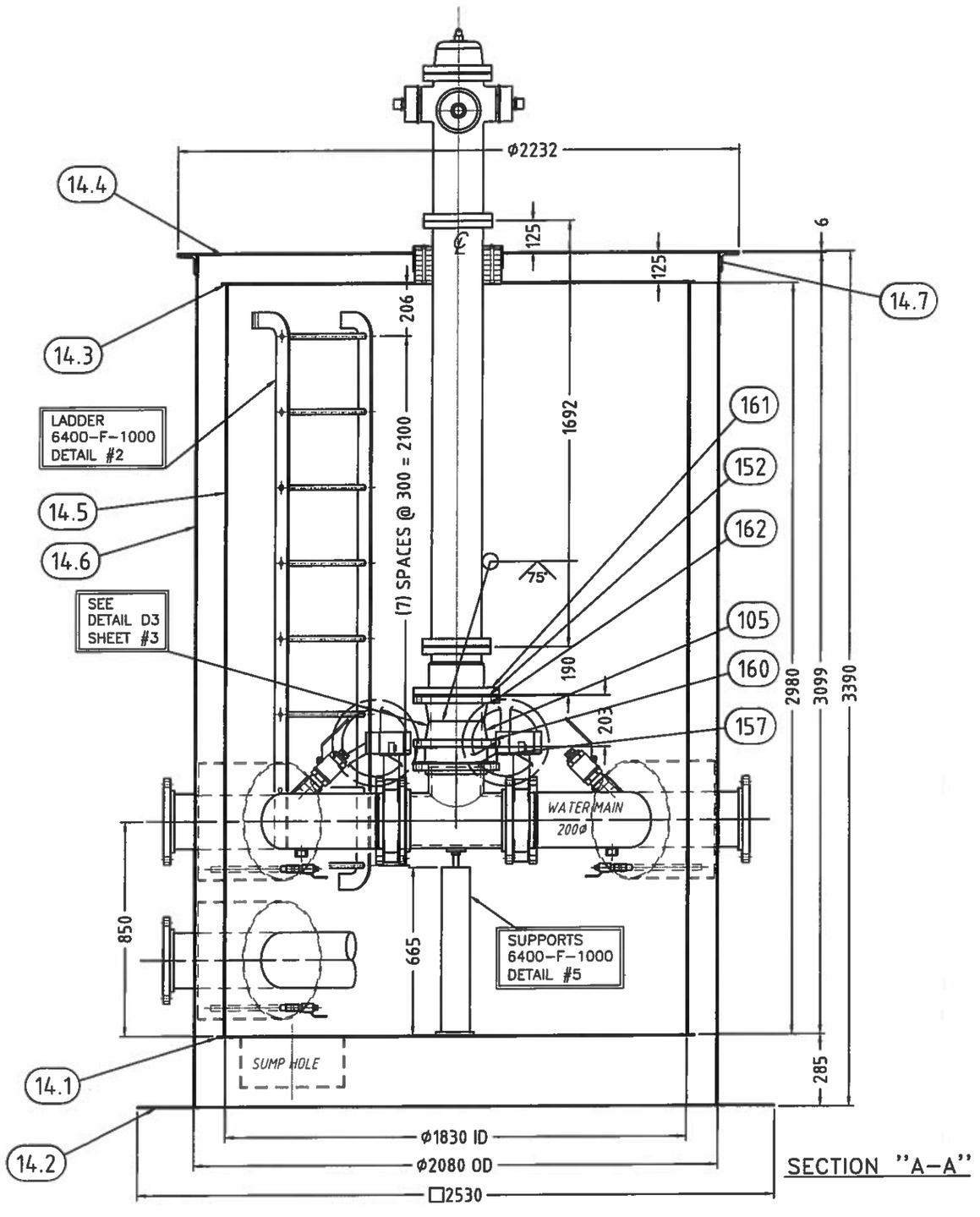
SCALE: X/X" = X"

QTE:
QTY: 1

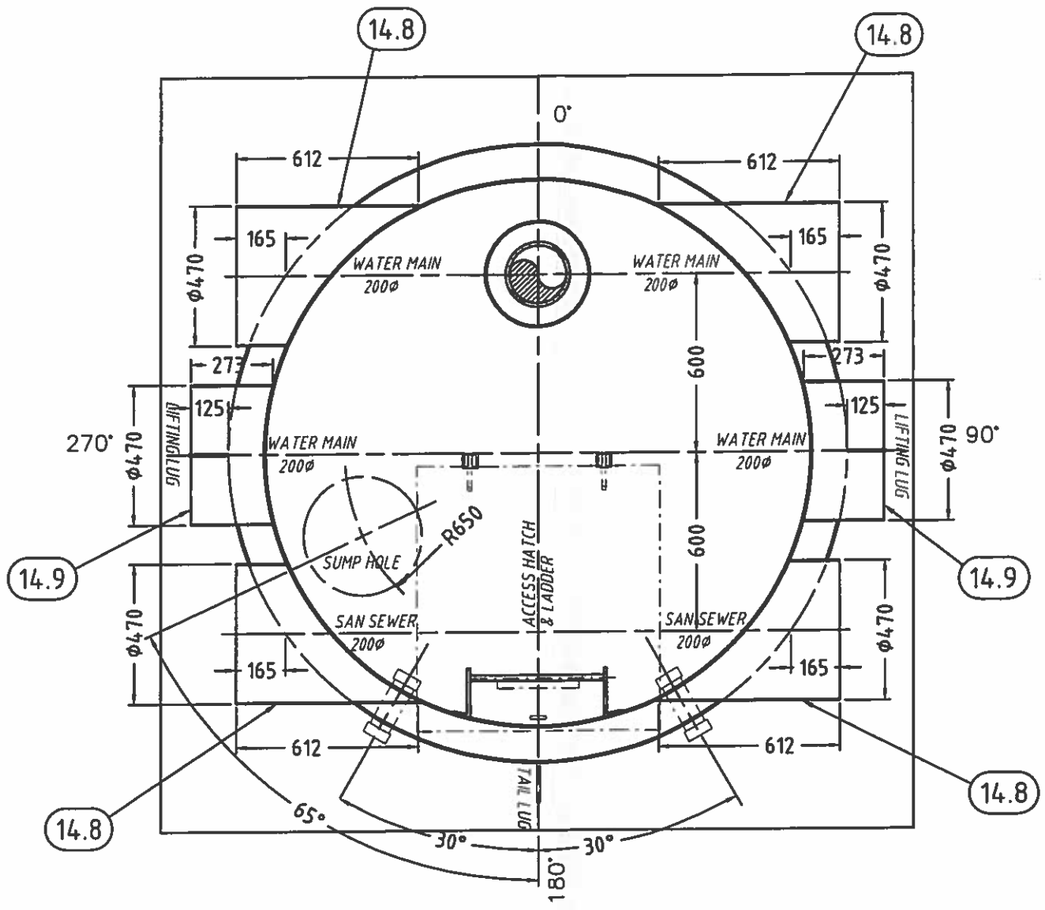
DATE: 01-04-14

FEUILLE:
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

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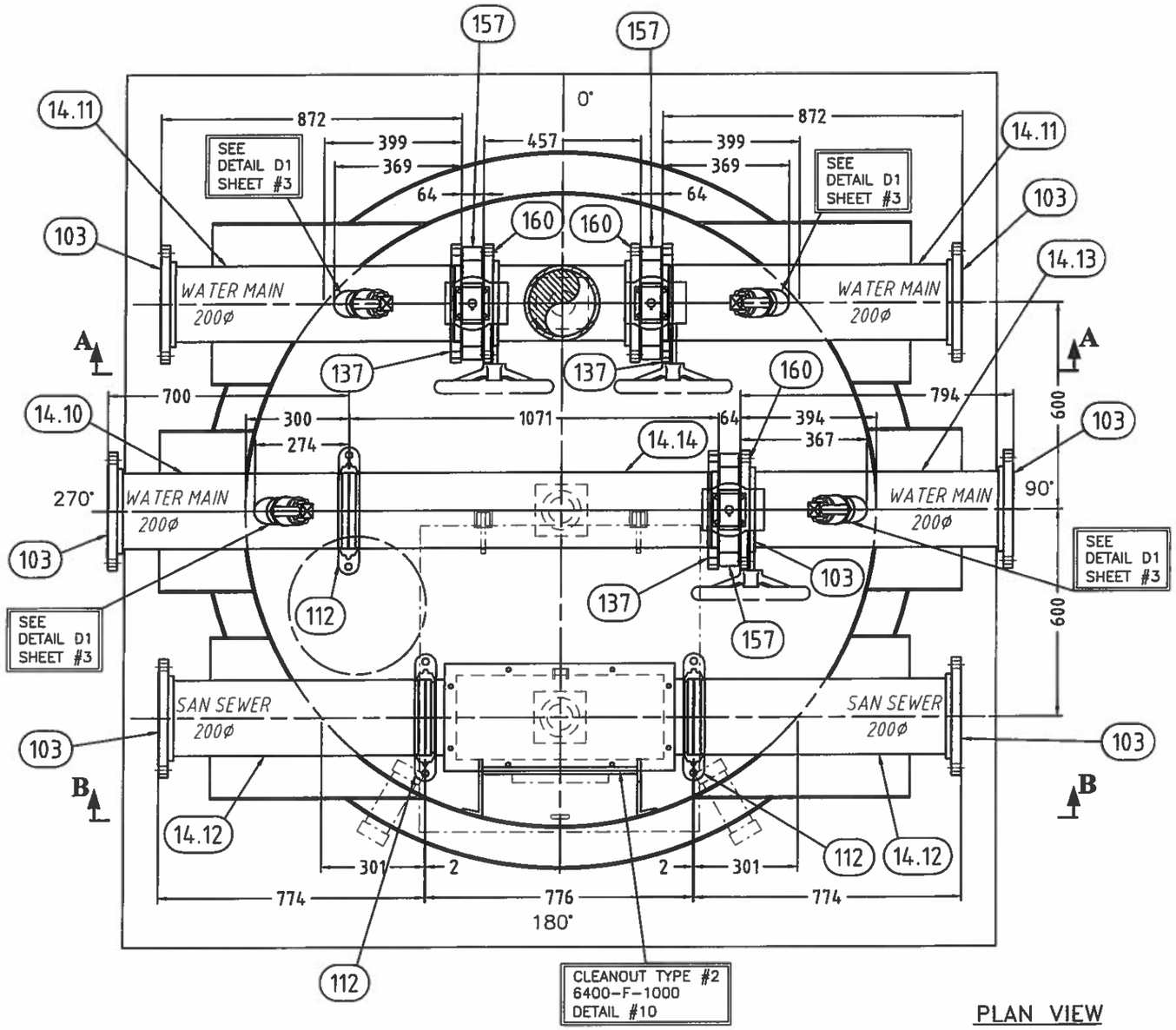
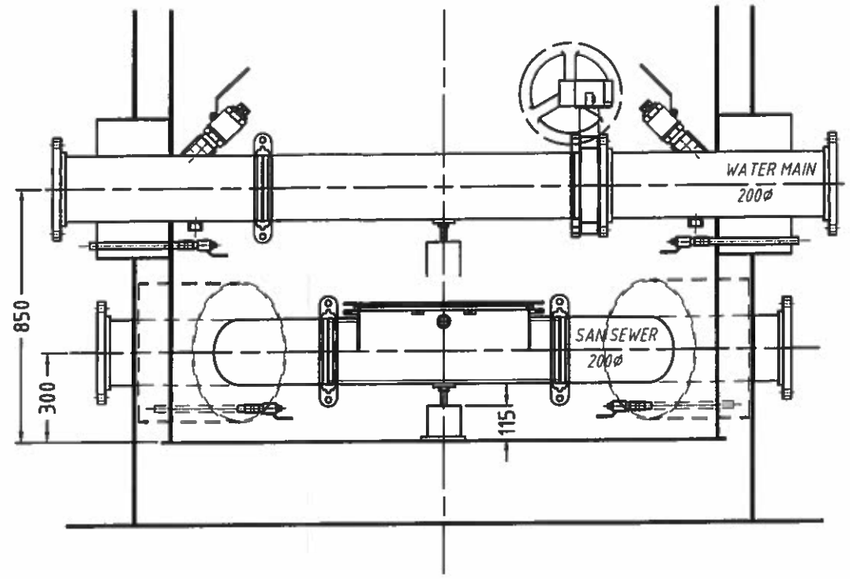
CUSTOMER: GOVERNEMENT OF NUNAVUT

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: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
	FEUILLE: SHEET: 1 / 3	REV: A



PLAN VIEW



SECTION "B-B"

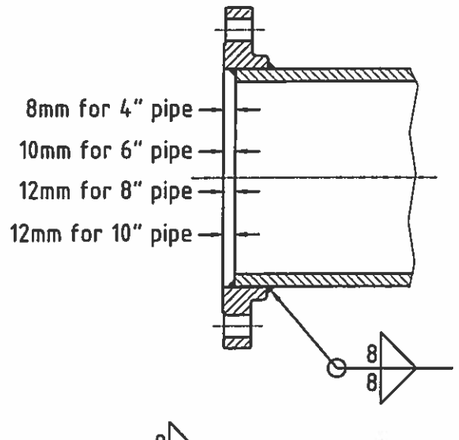
REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

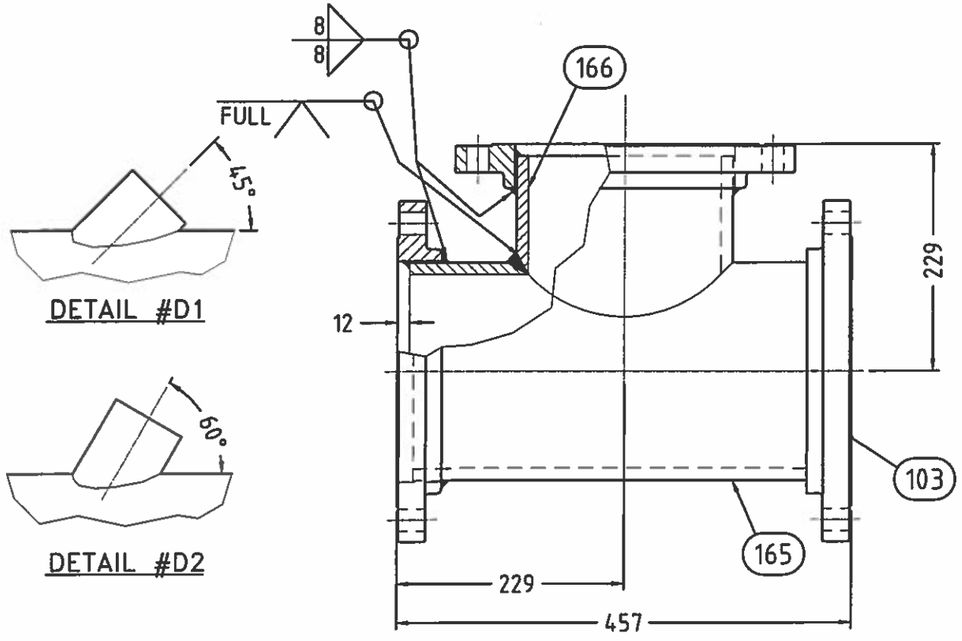
Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel.: (450) 444-0566
Fax: (450) 444-2227
www.berliefalco.com

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: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
	FEUILLE: SHEET: 2 / 3	REV: A





DETAIL #D1

DETAIL #D2

FLG. 8"

DETAIL D3– TYP. WELDING

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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV14
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV14

DESS. PAR:
DRAW BY: G.L.

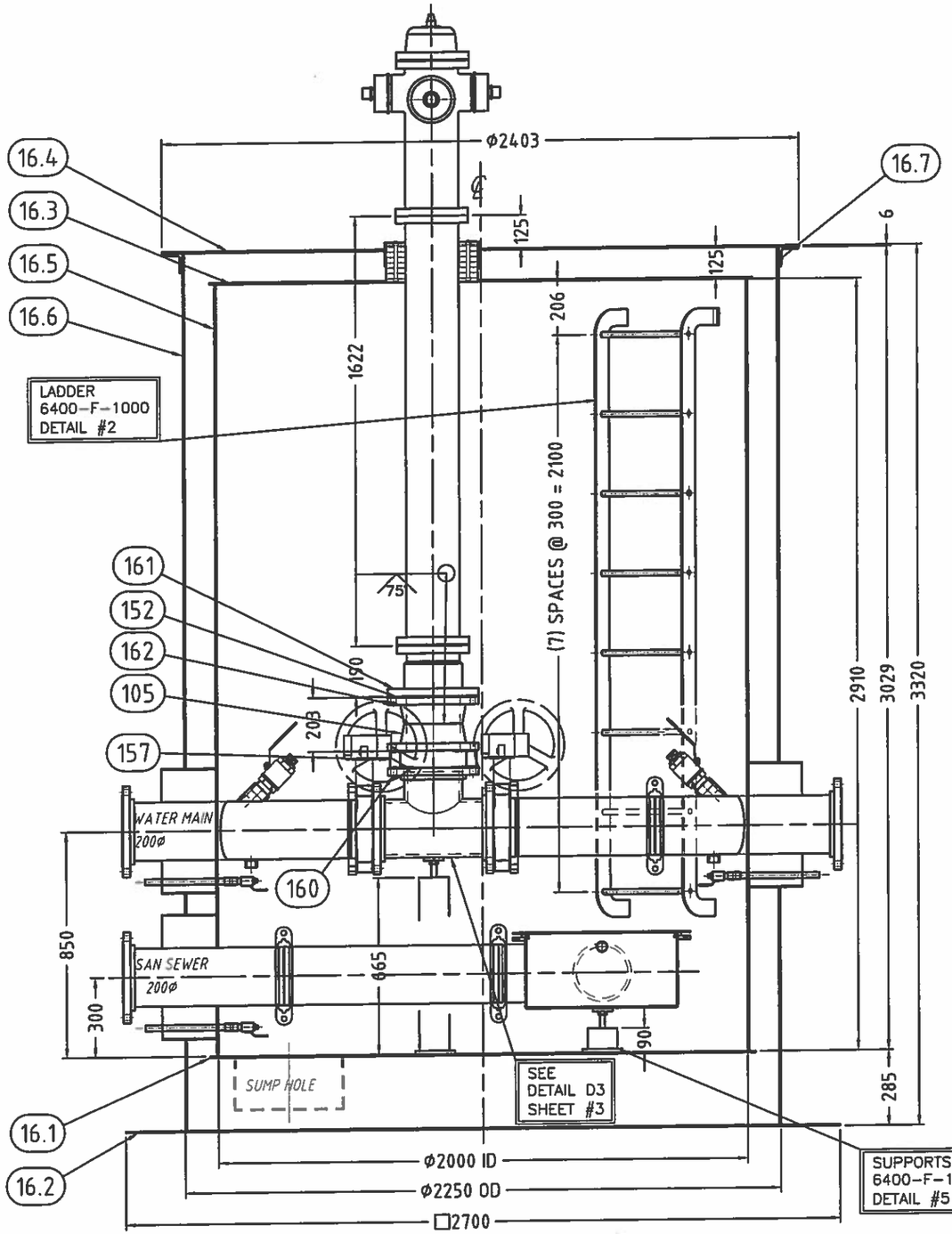
SCALE: X/X" = X"

QTE:
QTY: 1

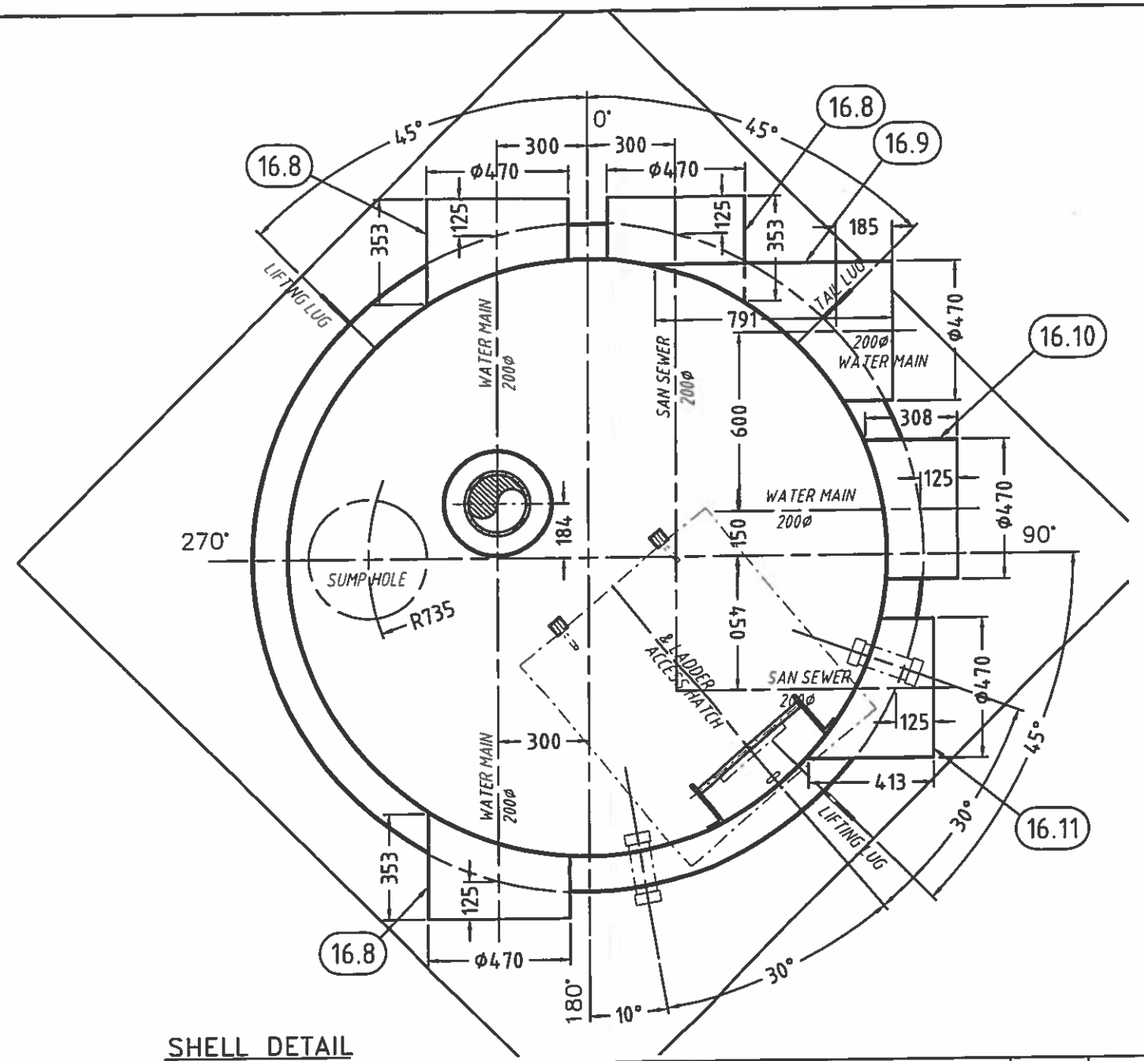
DATE: 01-04-14

FEUILLE:
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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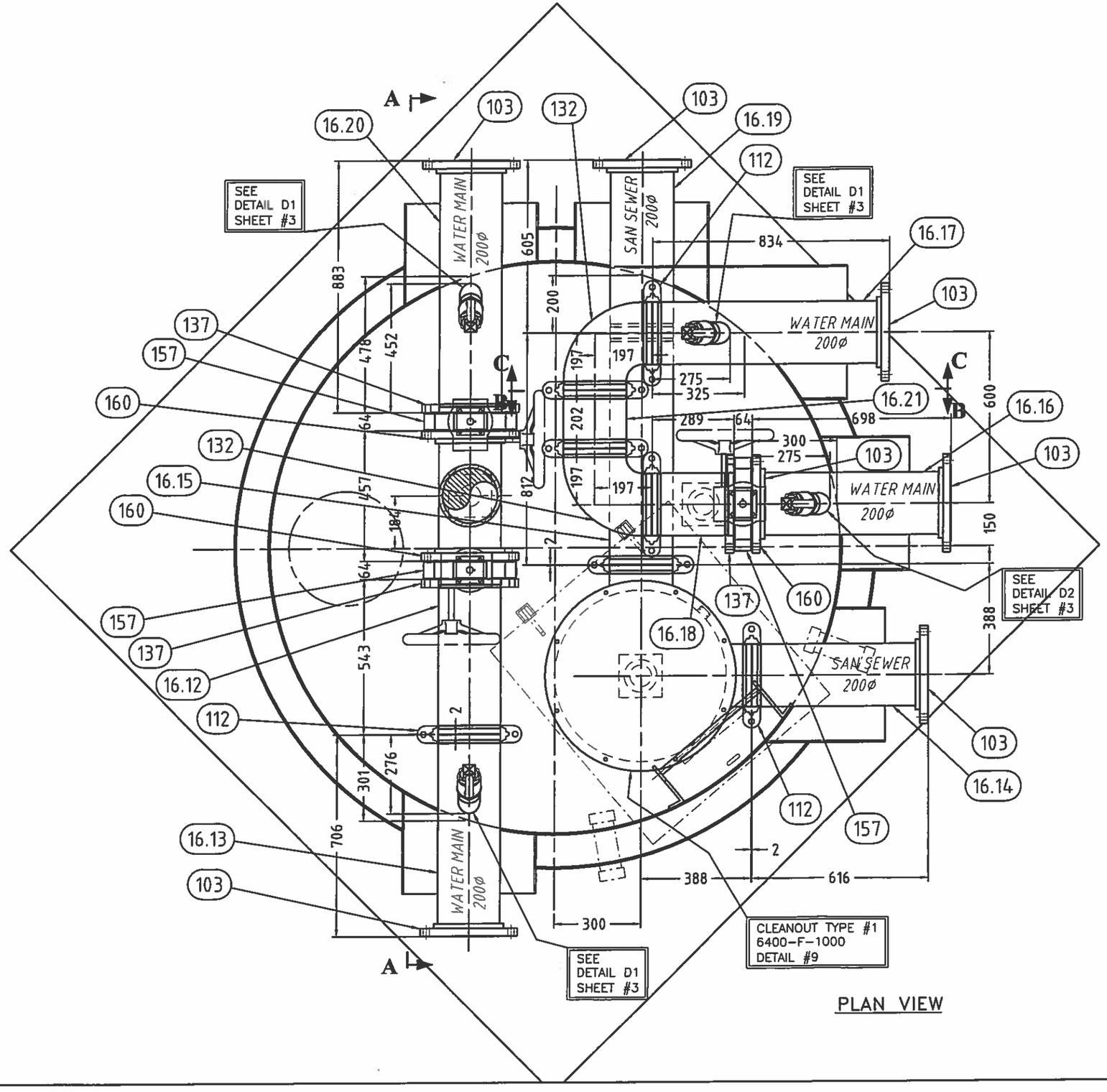
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV16
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

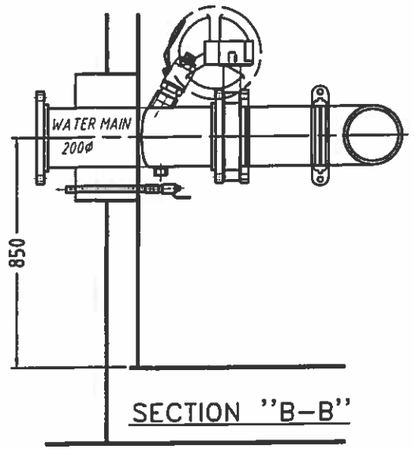
DESSIN No.:
DRAWING No: 6400-F-AV16

DESS. PAR:
DRAW BY: G.L.

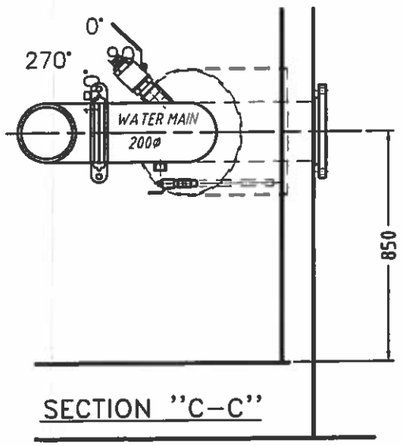
SCALE: X/X" = X"
QTE: QTY: 1
DATE: 01-04-14
FEUILLE: SHEET: 1 / 3
REV: A



PLAN VIEW



SECTION ''B–B''



SECTION ''C–C''

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
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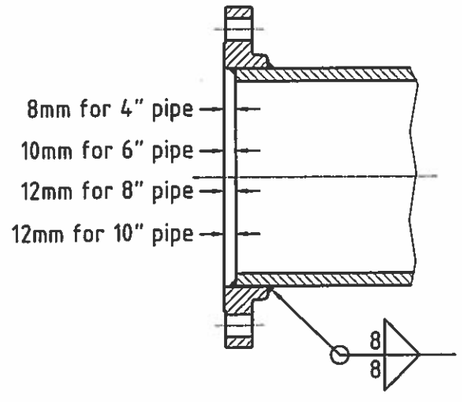
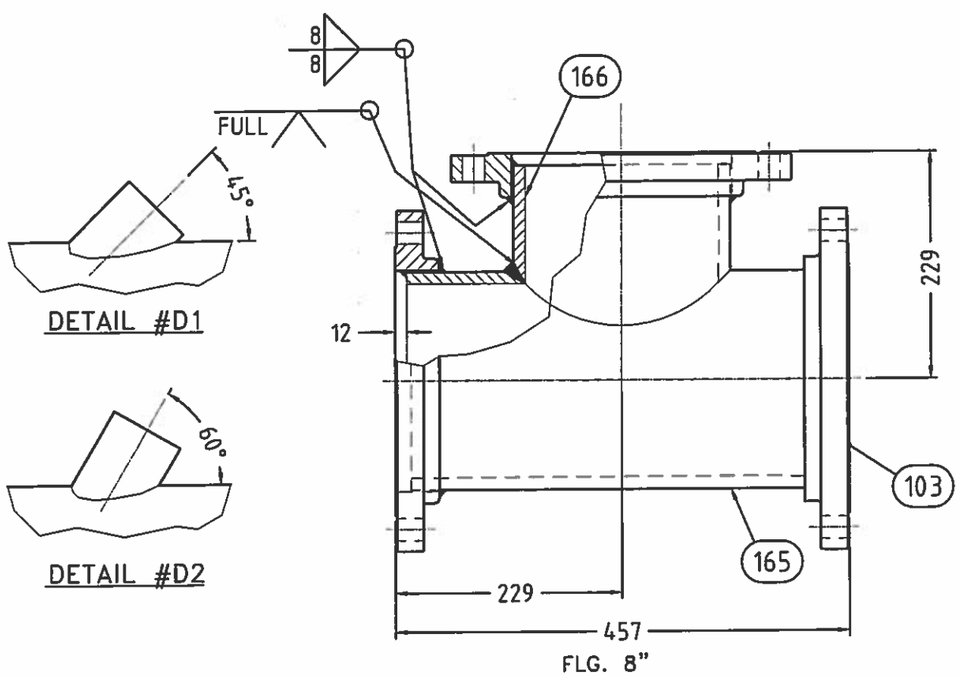
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV16
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS PAR: DRAW BY:
6400-F-AV16		G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
	FEUILLE: SHEET: 2 / 3	REV: A

Item	Qty	Description	Material
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





DETAIL #D1

DETAIL #D2

DETAIL D3– TYP. WELDING

Item	Qty	Description	Material
16.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2062mm	A36
16.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2700mm x 2700mm	A36
16.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2048mm	A36
16.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2403mm	A36
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.)	

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV16
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV16

DESS. PAR:
DRAW BY: G.L.

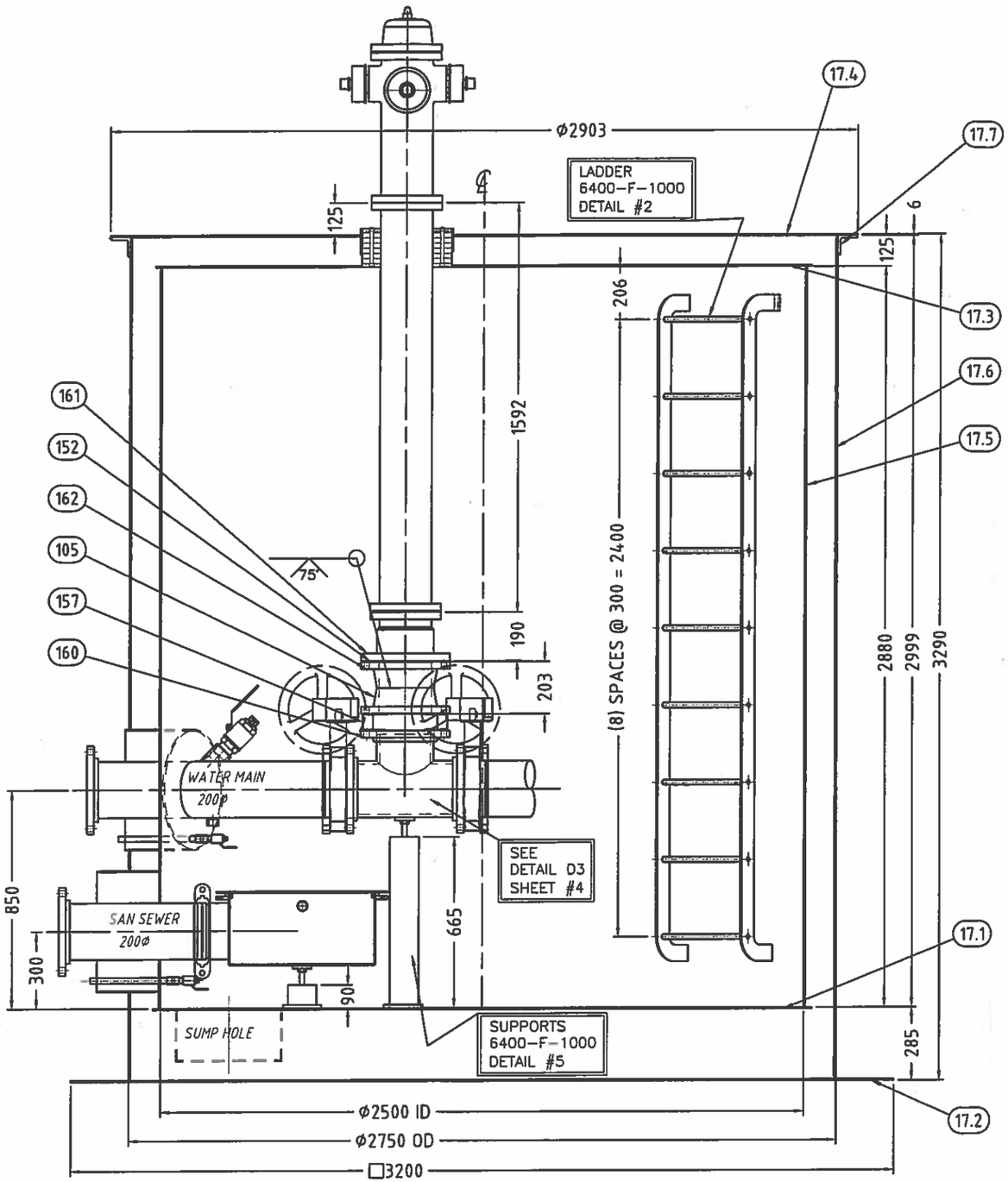
SCALE: X/X" = X"

QTE:
QTY: 1

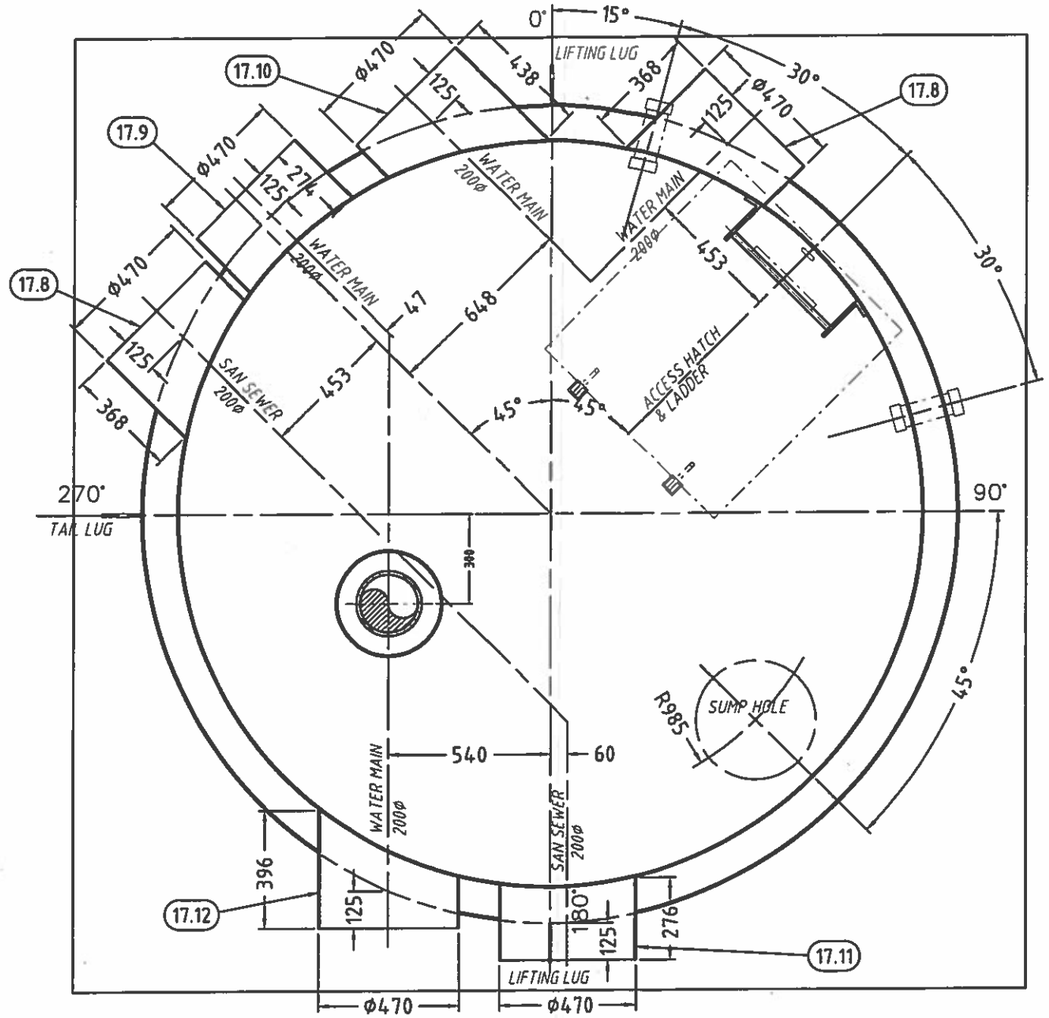
DATE: 01-04-14

FEUILLE:
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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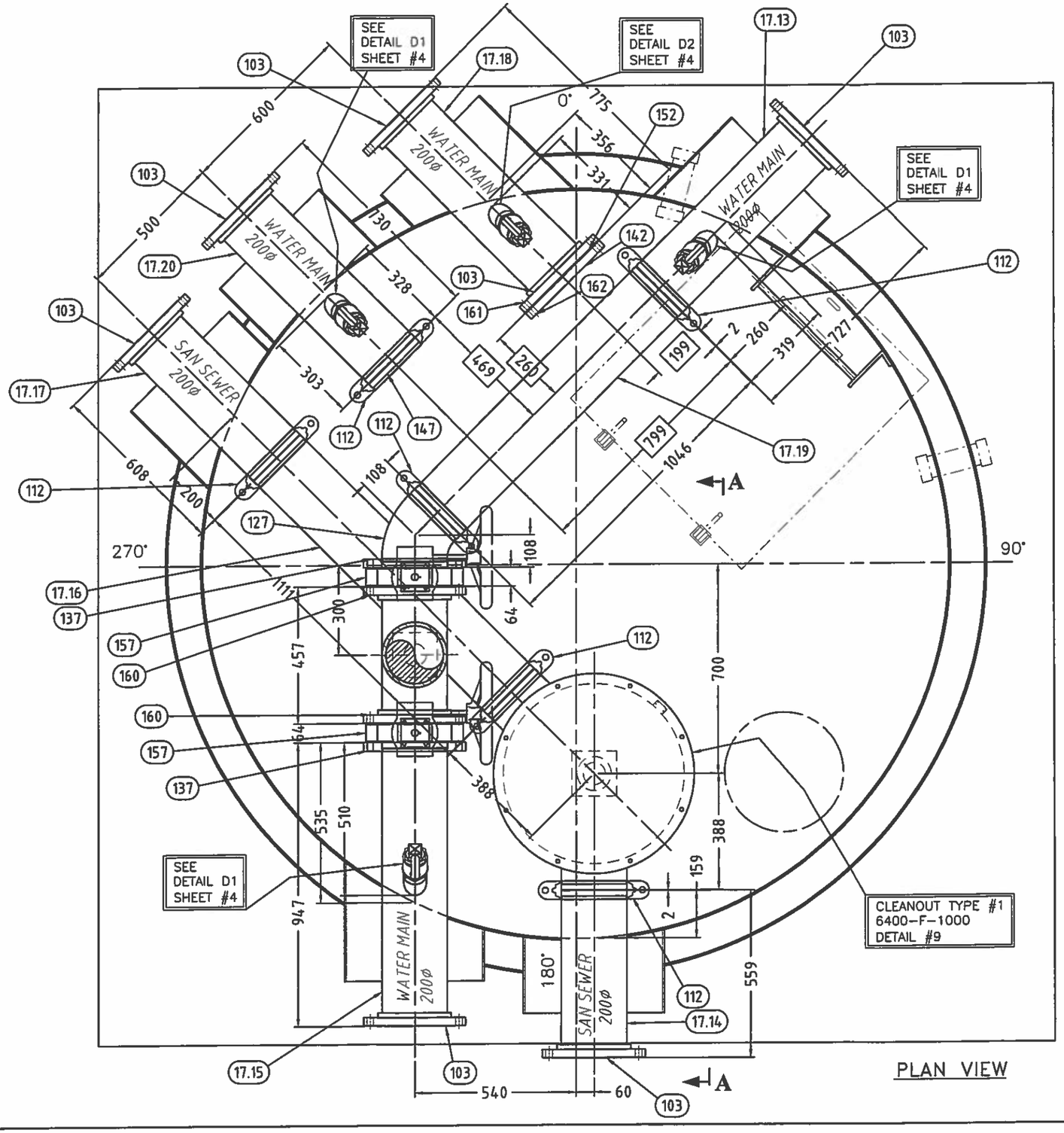
www.berliefalco.com

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



REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
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J5R 2E4
Tel. (450) 444-0566
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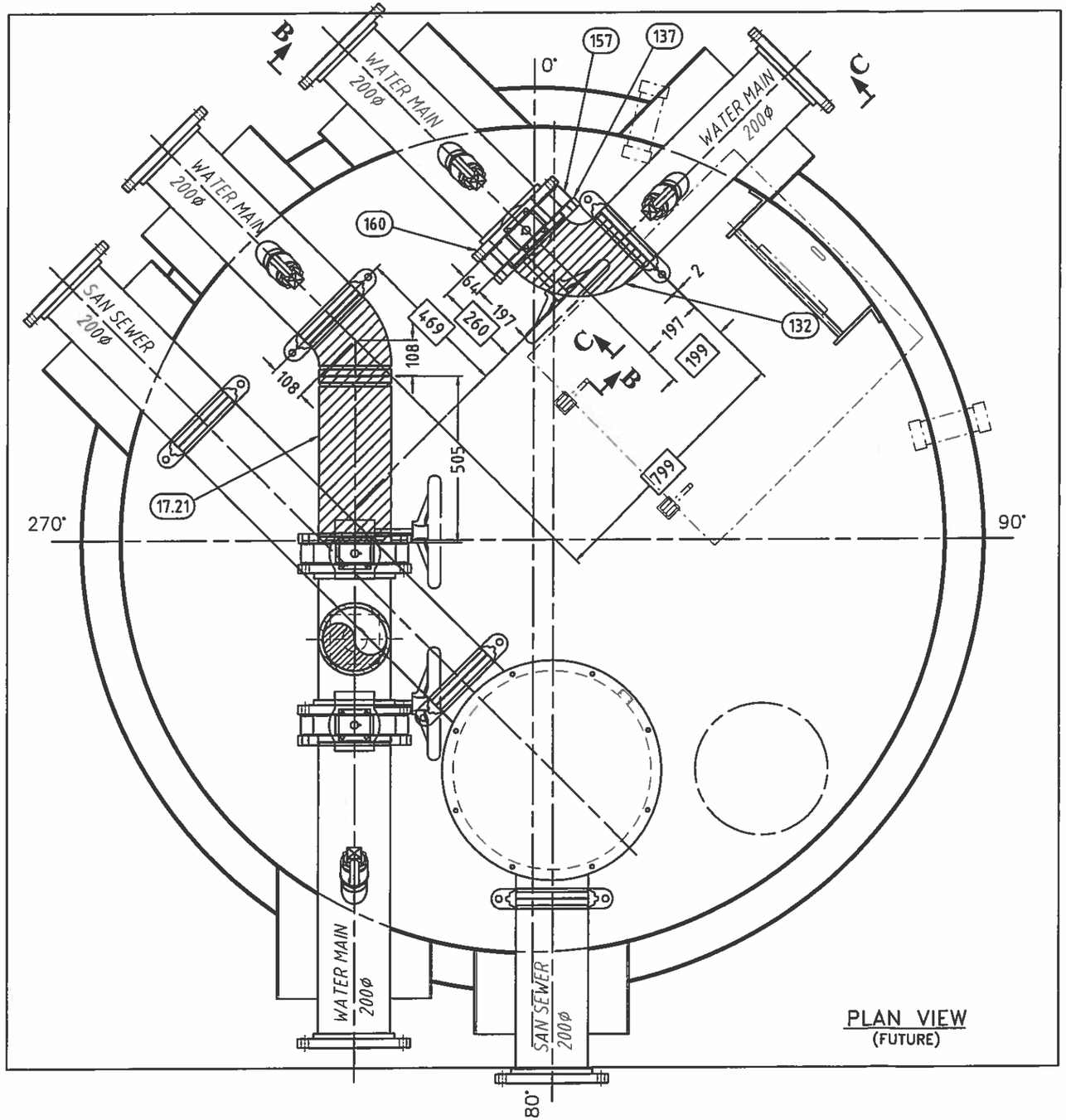
www.berliefalco.com

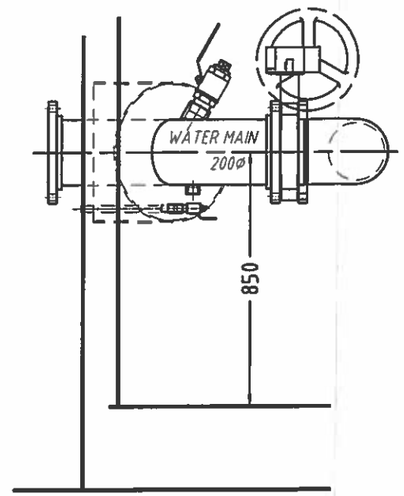
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV17
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

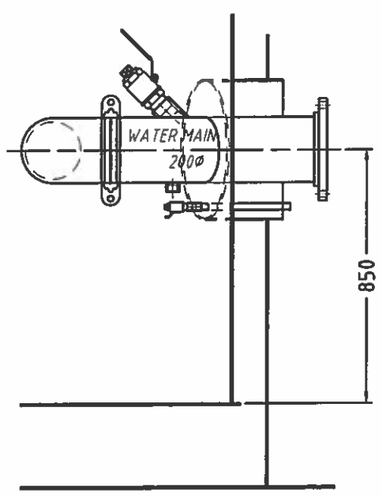
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:	
	6400-F-AV17		G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 2 / 4 — REV: A



PLAN VIEW
(FUTURE)



SECTION "B–B"



SECTION "C–C"

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01–04–14	G.L.

Falco Technologies Inc., a company of
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www.berliefalco.com

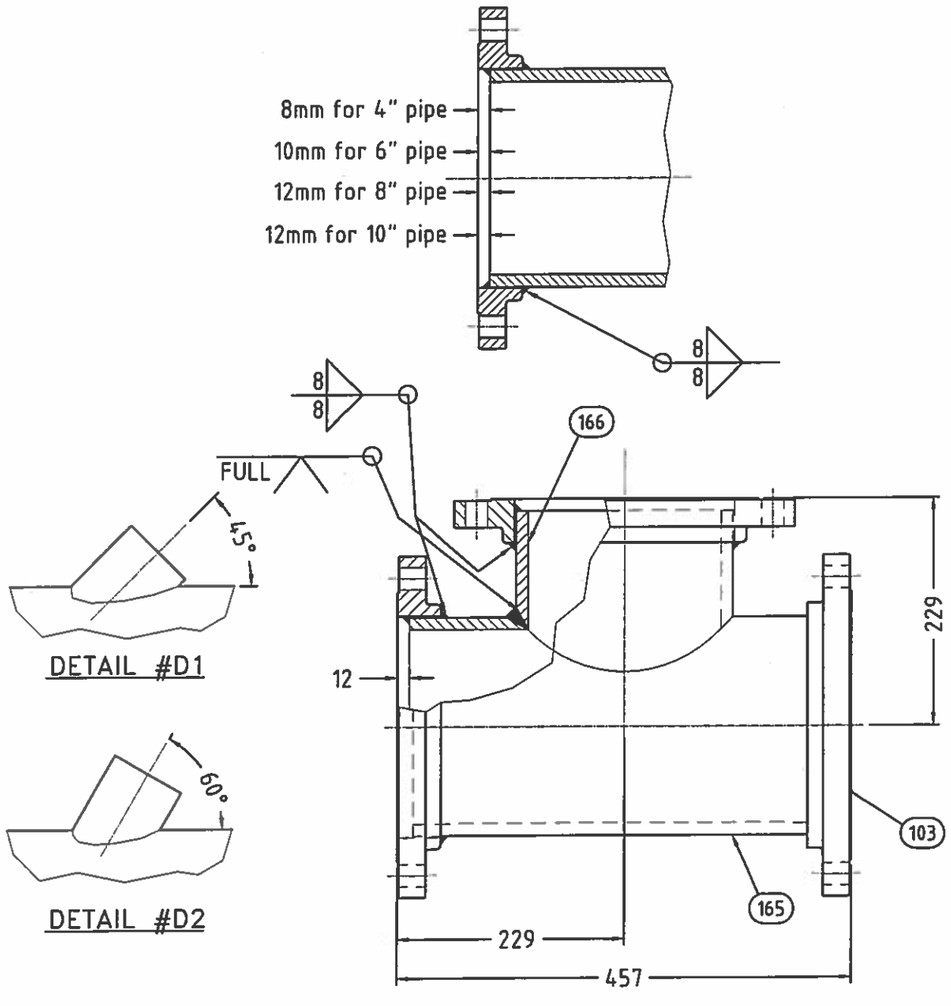
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

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: X/X" = X"	QTE: QTY: 1	DATE: 01–04–14
	FEUILLE: SHEET: 3 / 4	REV: A

Item	Qty	Description	Material
152	2	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	16	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.
162	16	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

Item	Qty	Description	Material
17.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2562mm	A36
17.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 3200mm x 3200mm	A36
17.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2548mm	A36
17.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2903mm	A36
17.5	1	INTERNAL SHELL PL. 1/4" THK. x 7833mm x 2880mm LG.	A36
17.6	1	EXTERNAL SHELL PL. 1/4" THK. x 8619mm x 3268mm LG.	A36
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.



DETAIL #D1

DETAIL #D2

DETAIL D3- TYP. WELDING

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
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Tel: (450) 444-0566
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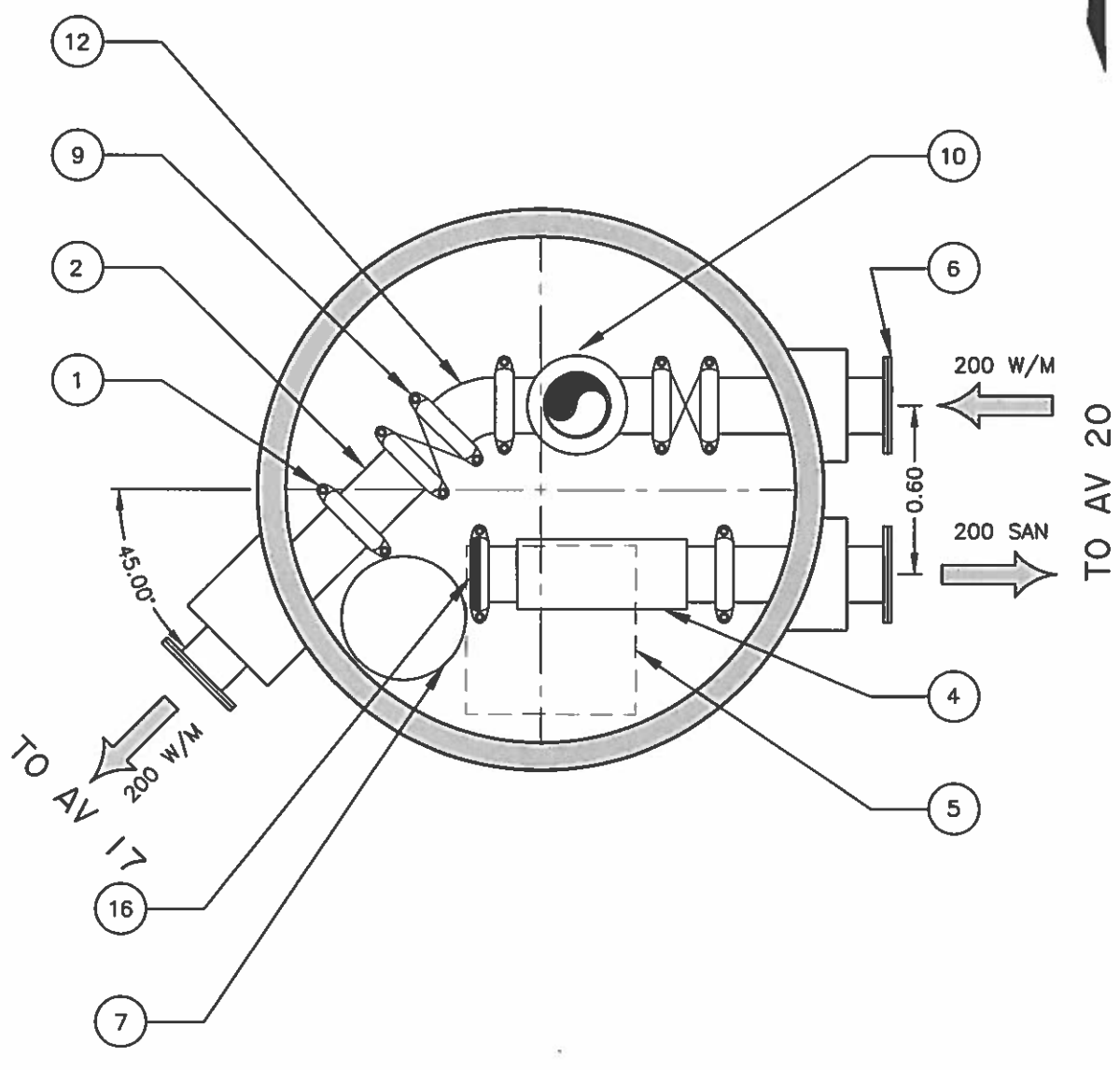
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

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: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
	FEUILLE: SHEET: 4 / 4	REV: A

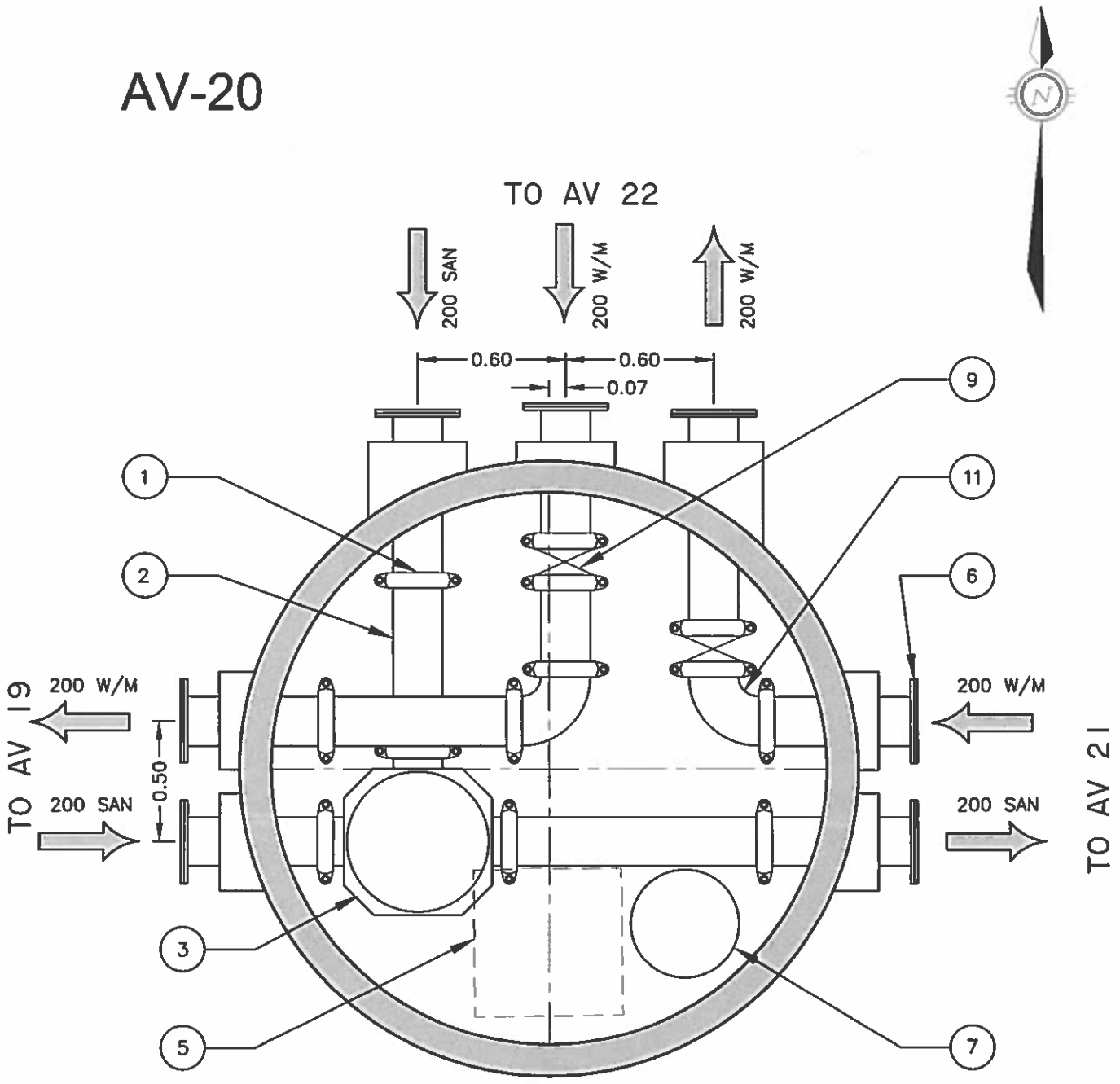
AV-19



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)

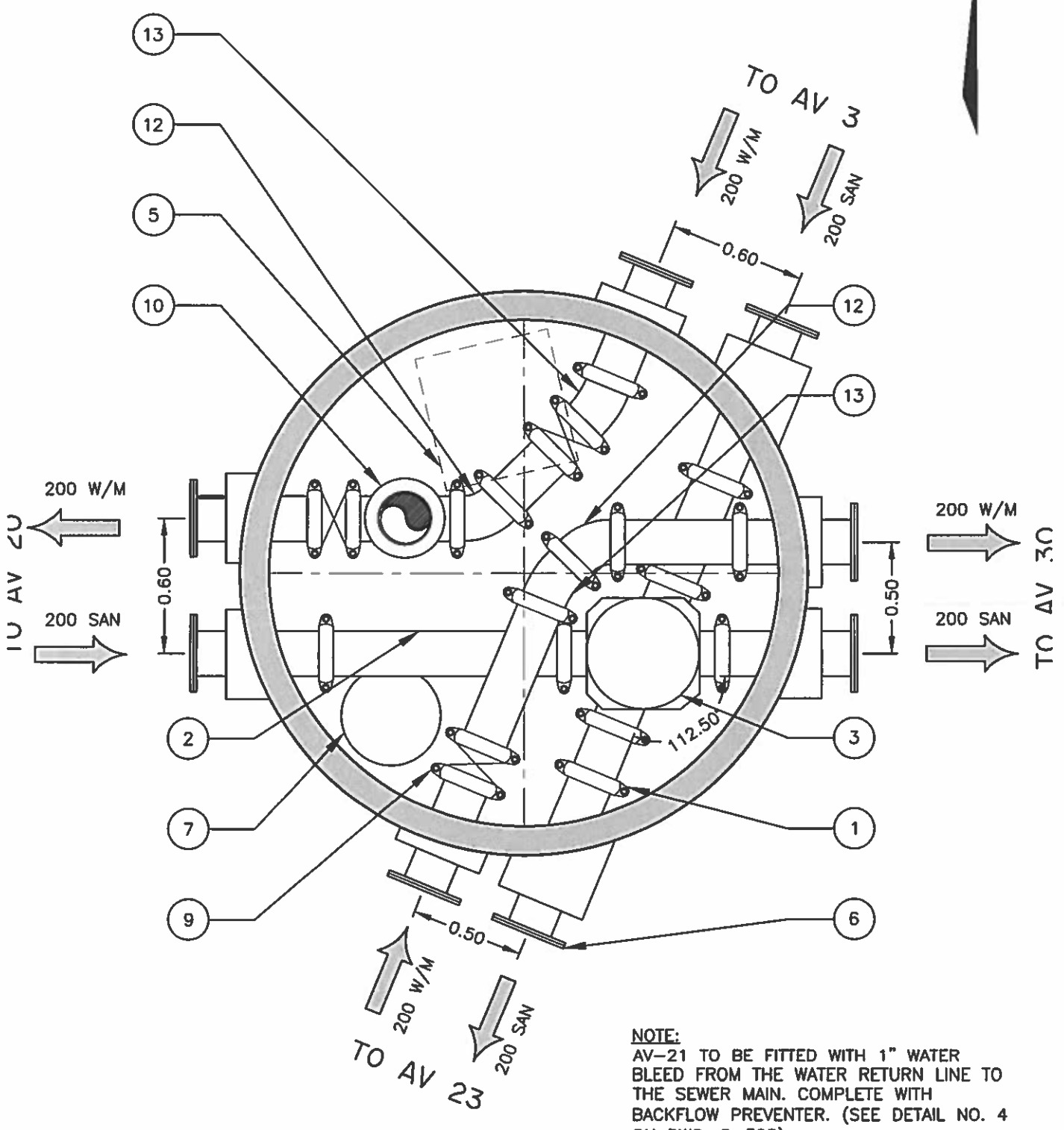
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-19	1.83m	25.10m	3.20m			22.40		23.15

AV-20



AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-20	2.25m	23.49	2.90	21.09		21.09	21.09	21.84

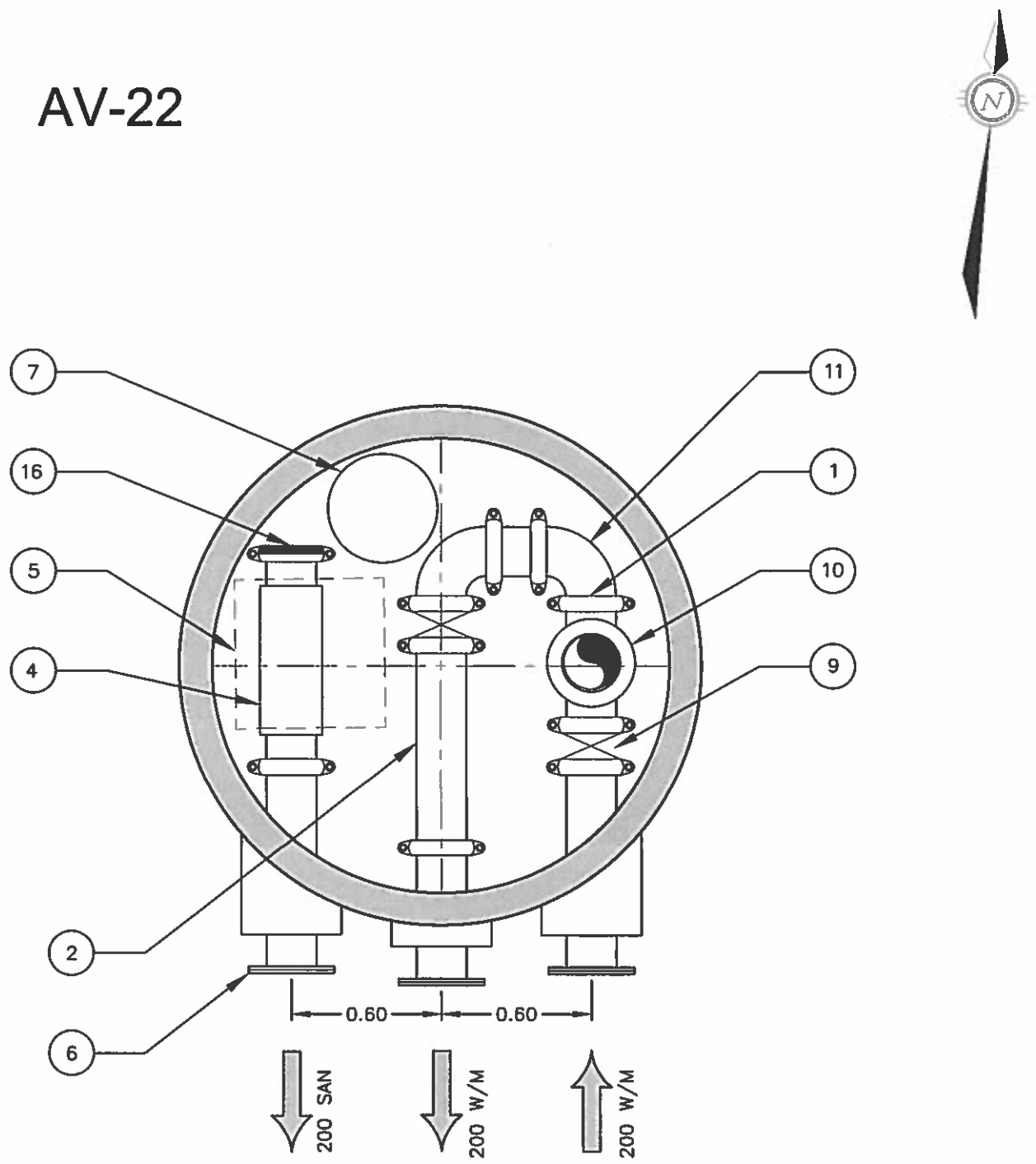
AV-21



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	2.25m	22.85m	3.36m	19.99	19.99	19.99	19.99	20.74

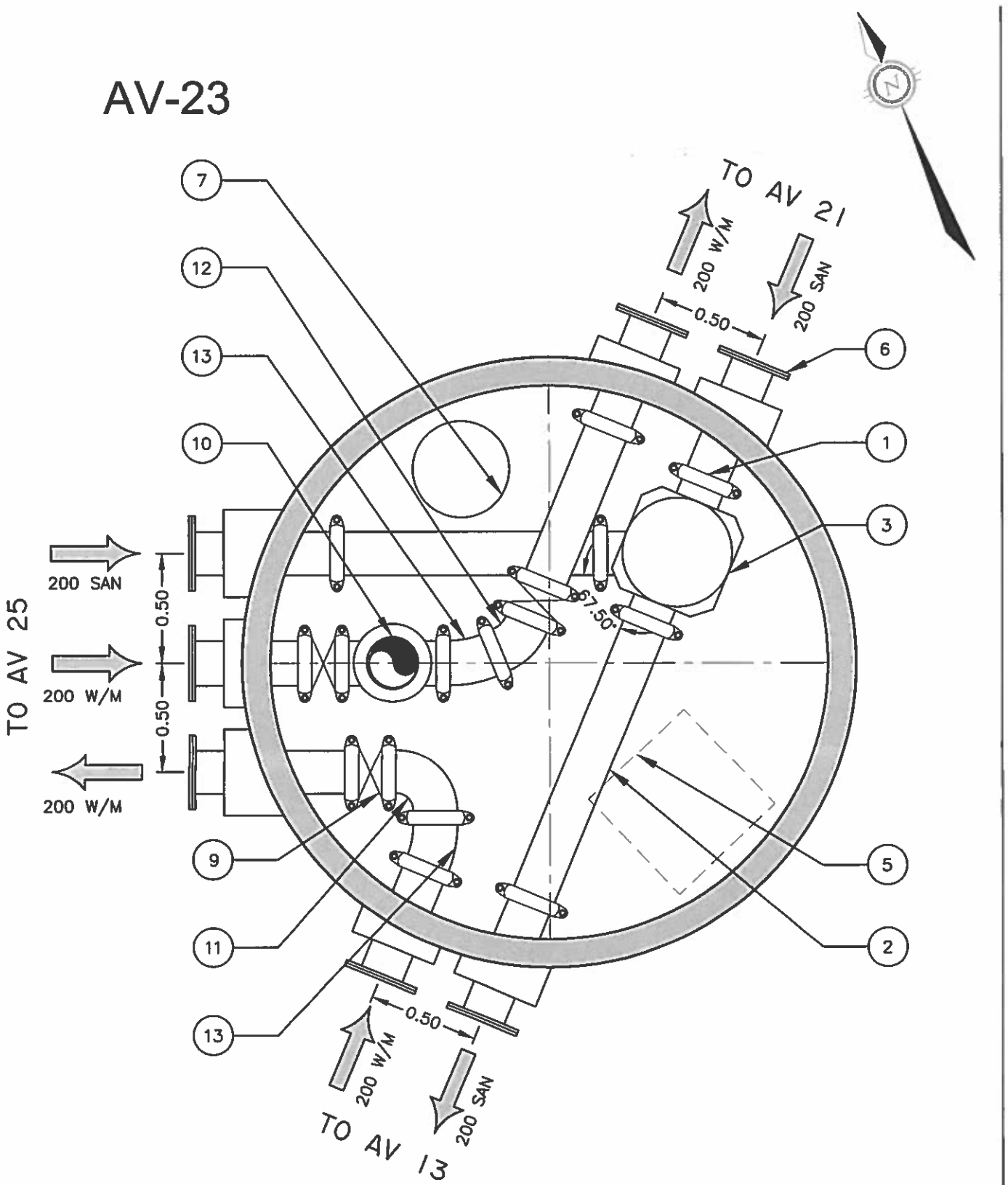
AV-22



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)

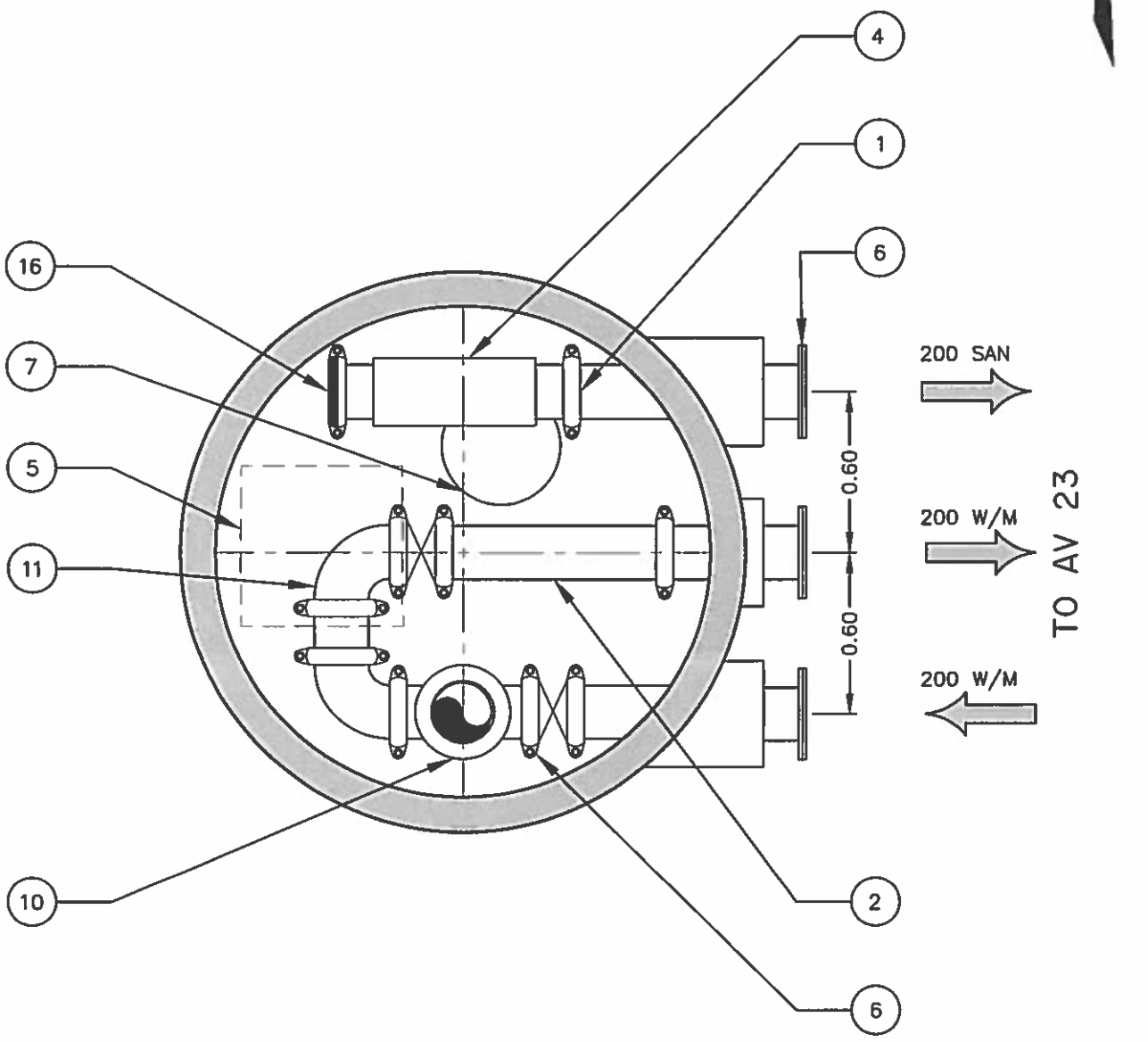
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-22	1.83m	30.96m	3.32m		28.14			28.89

AV-23



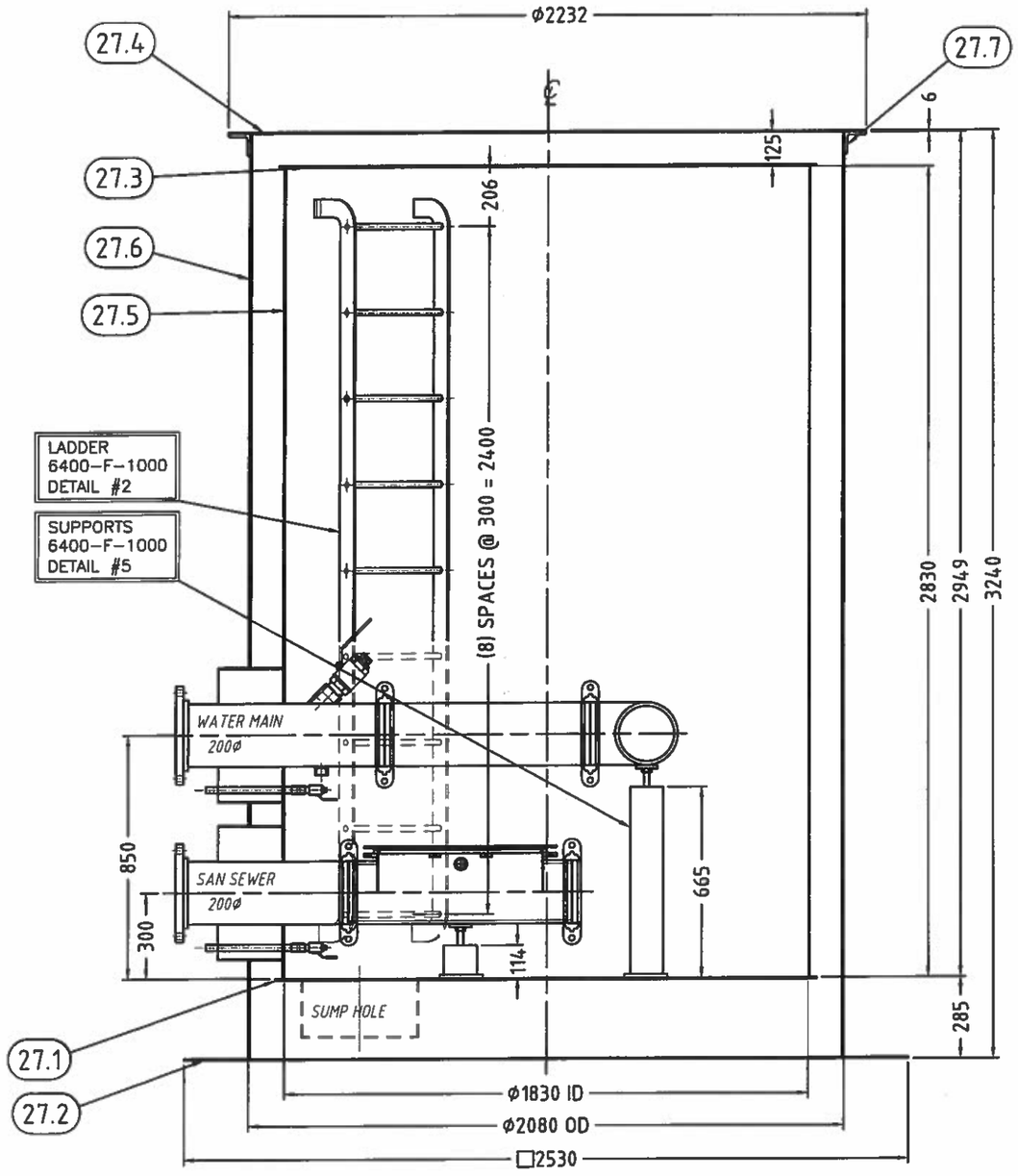
AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-23	2.53m	20.11m	3.71m	16.90	16.90		16.90	17.65

AV-25

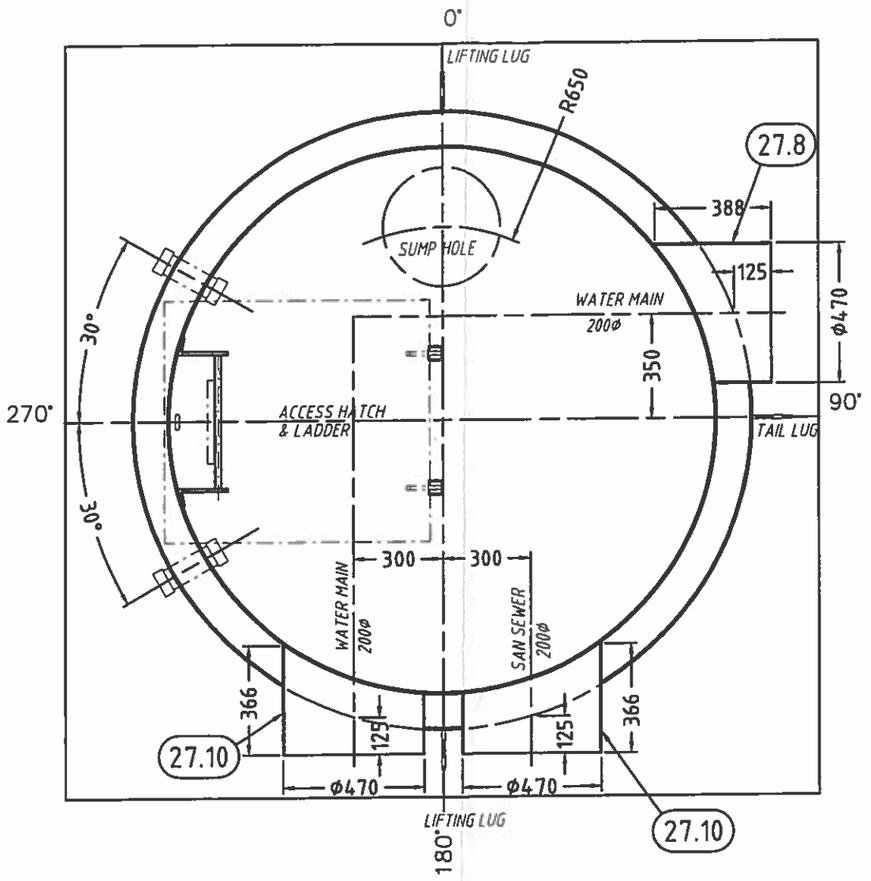


NOTE:
AV-25 TO BE FITTED WITH 1" WATER BLEED FROM THE WATER RETURN LINE TO THE SEWER MAIN. COMPLETE WITH BACKFLOW PREVENTER. (SEE DETAIL NO. 4 ON DWG. C-328)

AV No.	INSIDE DIAMETER	AV TOP	HEIGHT	SANITARY INVERT				WATERMAIN TOP
				N	S	E	W	
AV-25	1.83m	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

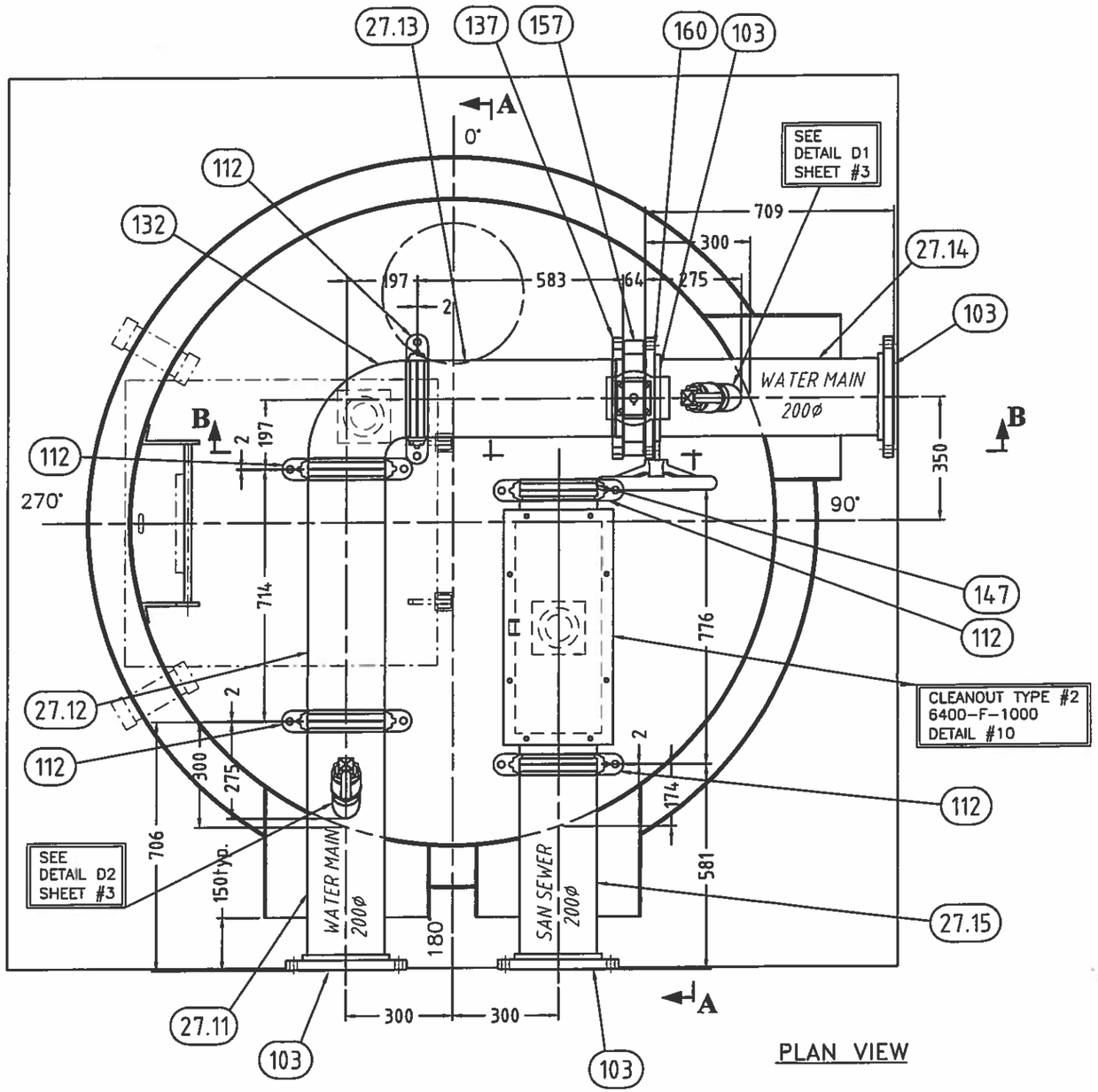
REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

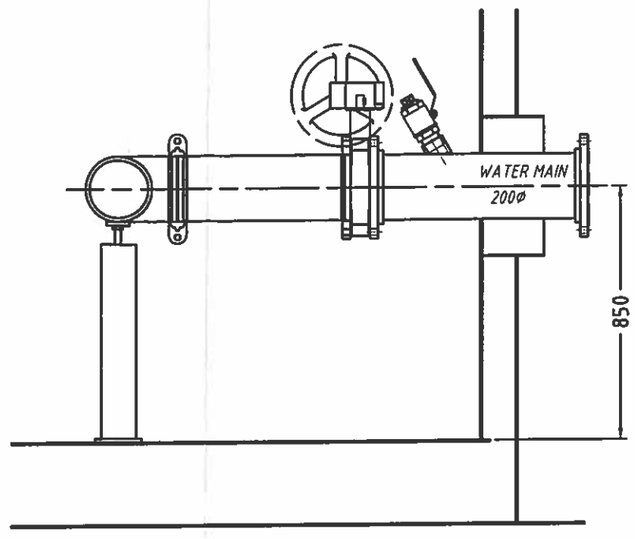
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV27
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No: 6400-F-AV27			DESS. PAR: DRAW BY: G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 1 / 3 — REV: A



PLAN VIEW



SECTION ''B–B''

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01–04–14	G.L.

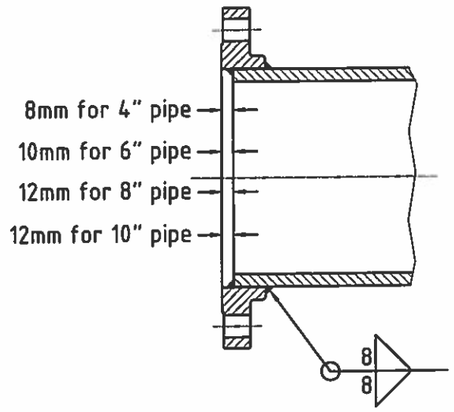
Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel.: (450) 444-0566
Fax.: (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

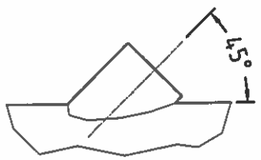
TITRE:
TITLE: ACCESS VAULT AV27
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: / DRAWING No:	DESS. PAR: / DRAW BY:
6400–F–AV27	G.L.

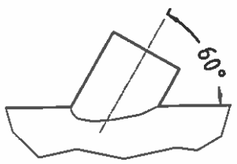
SCALE:	QTE: / QTY:	DATE:	FEUILLE: / SHEET:	REV:
X/X" = X"	1	01–04–14	2 / 3	A



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.



DETAIL #D1



DETAIL #D2

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV27
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV27

DESS. PAR:
DRAW BY: G.L.

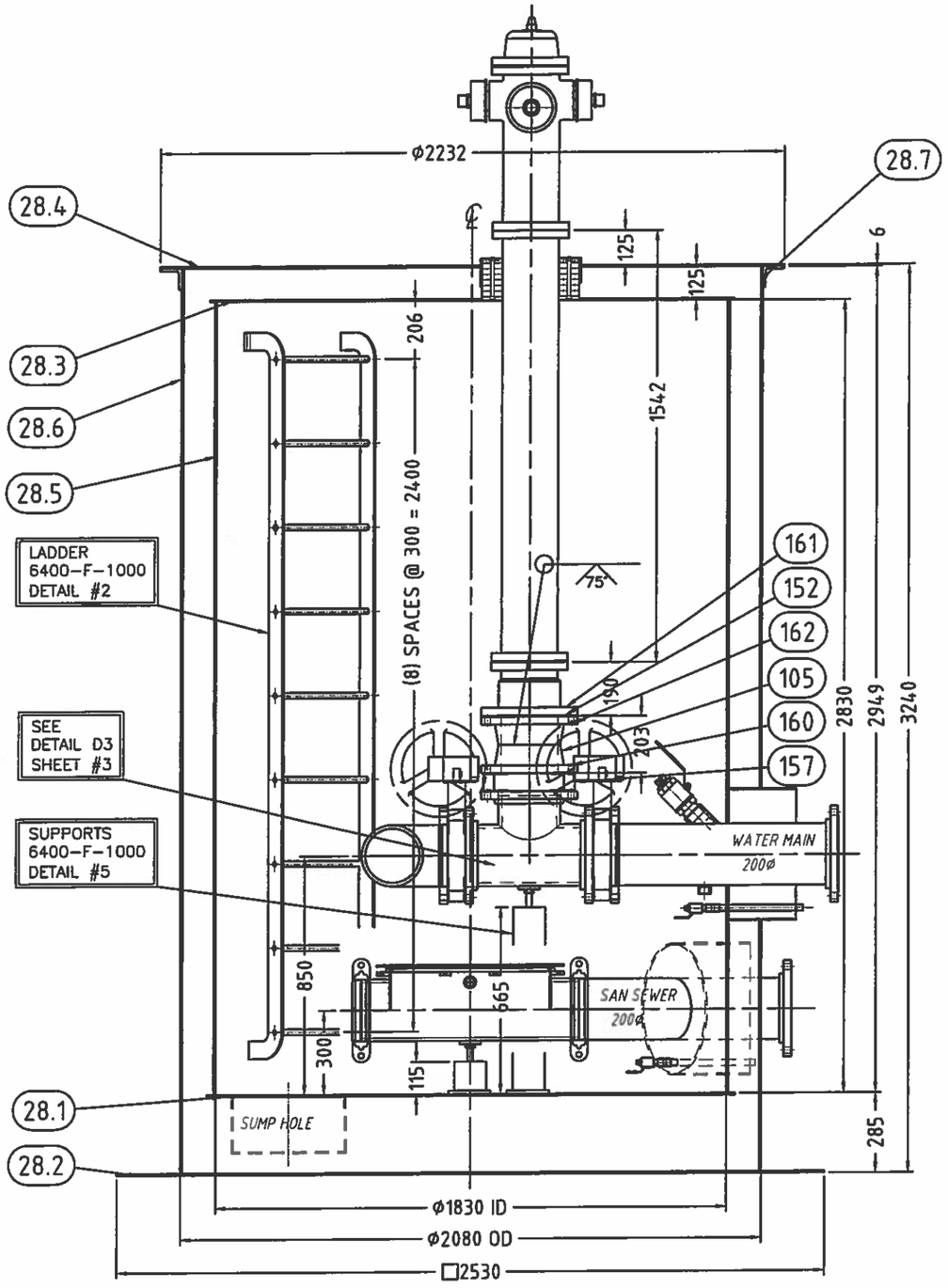
SCALE: X/X" = X"

QTE:
QTY: 1

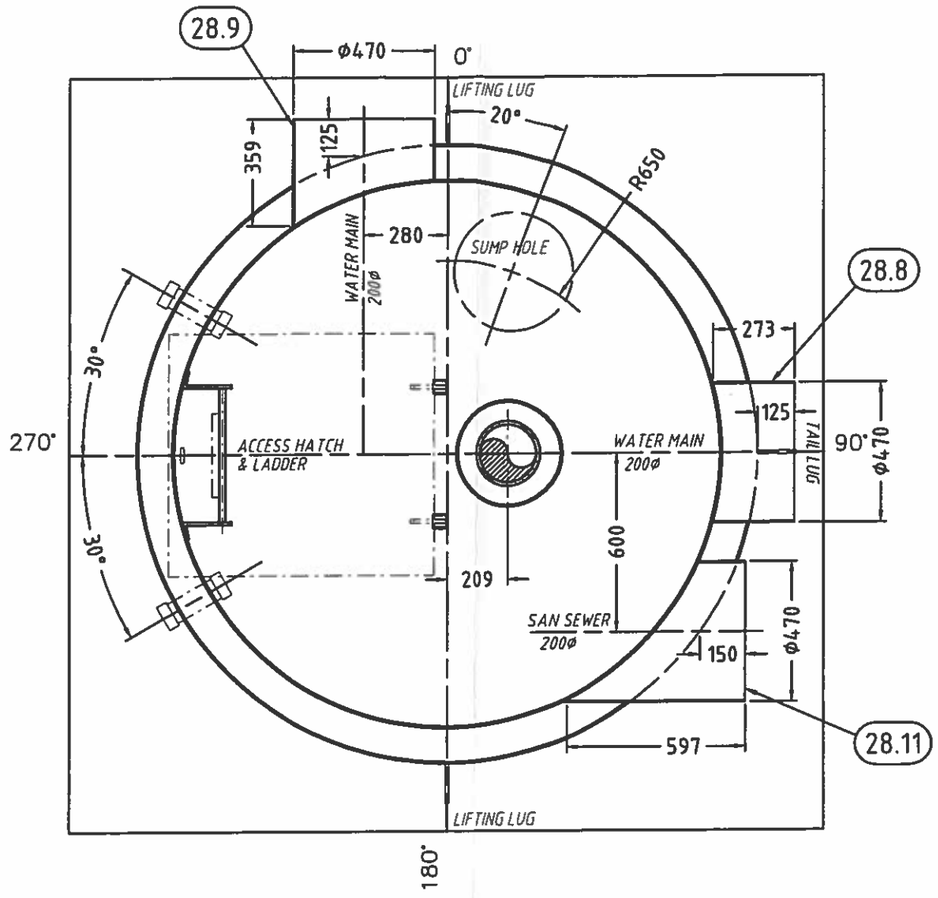
DATE: 01-04-14

FEUILLE:
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L

Falco Technologies Inc., a company of
BERLIE-FALCO
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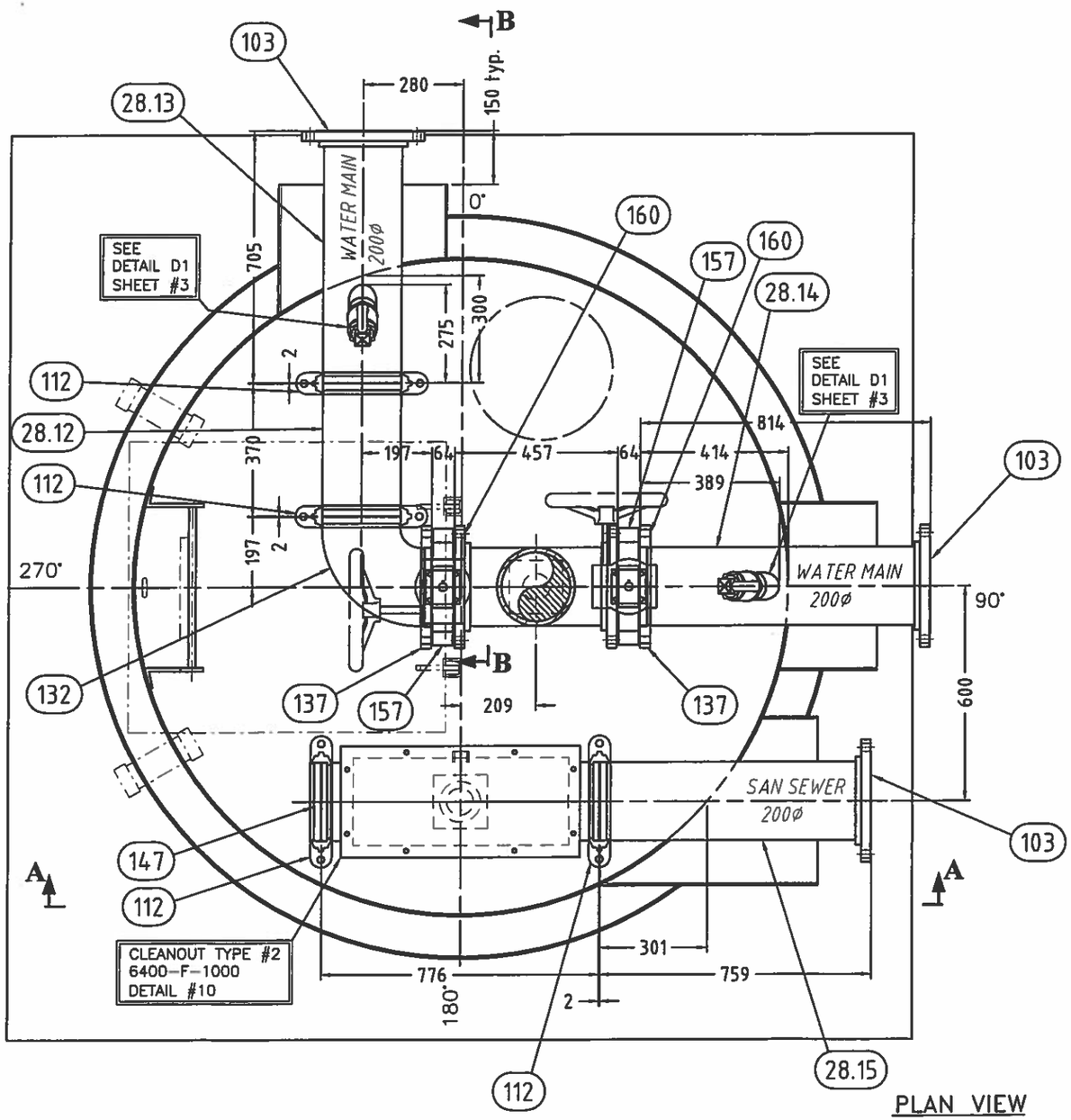
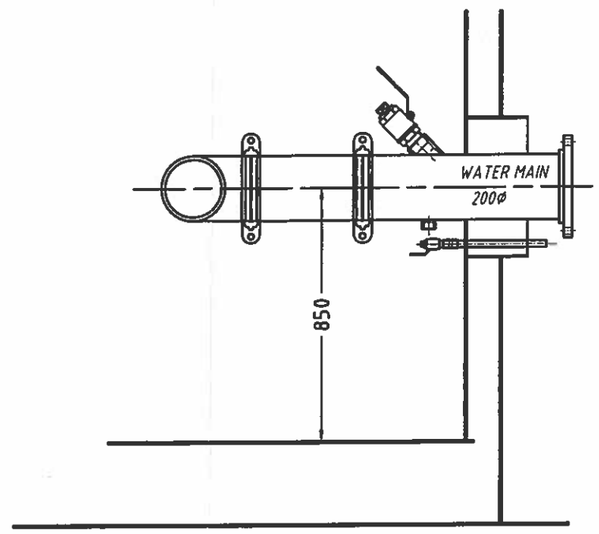
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV28
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV28		G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
FEUILLE: SHEET: 1 / 3	REV: A	



PLAN VIEW



SECTION "B-B"

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
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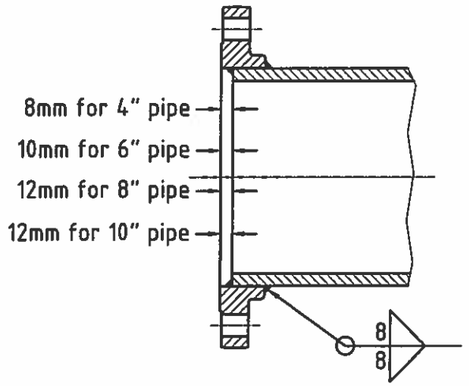
www.berliefalco.com

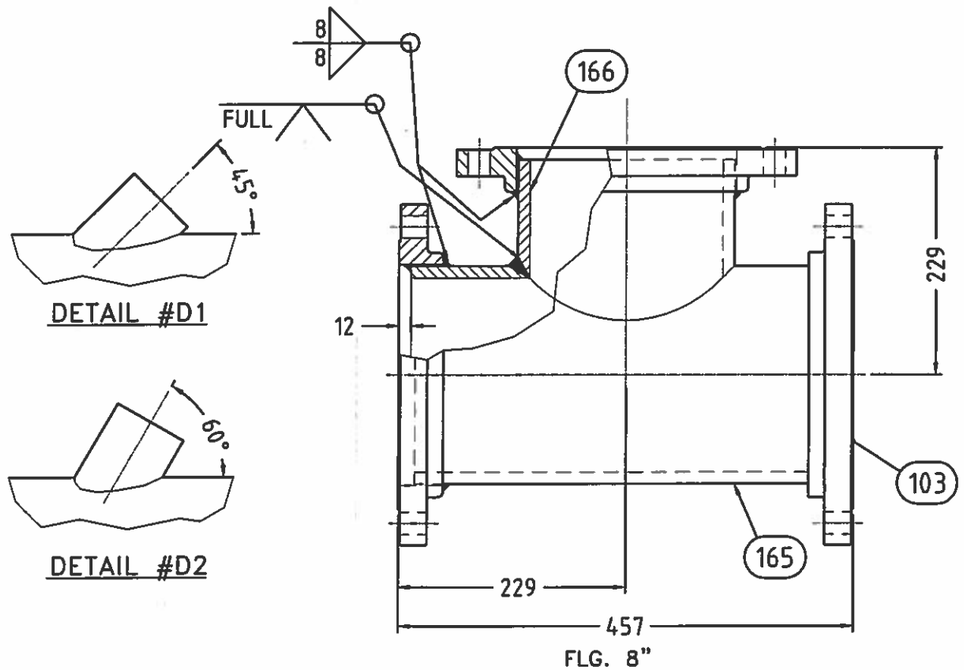
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV28
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV28		G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	2 / 3	A





DETAIL D3– TYP. WELDING

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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV28
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV28

DESS. PAR:
DRAW BY: G.L.

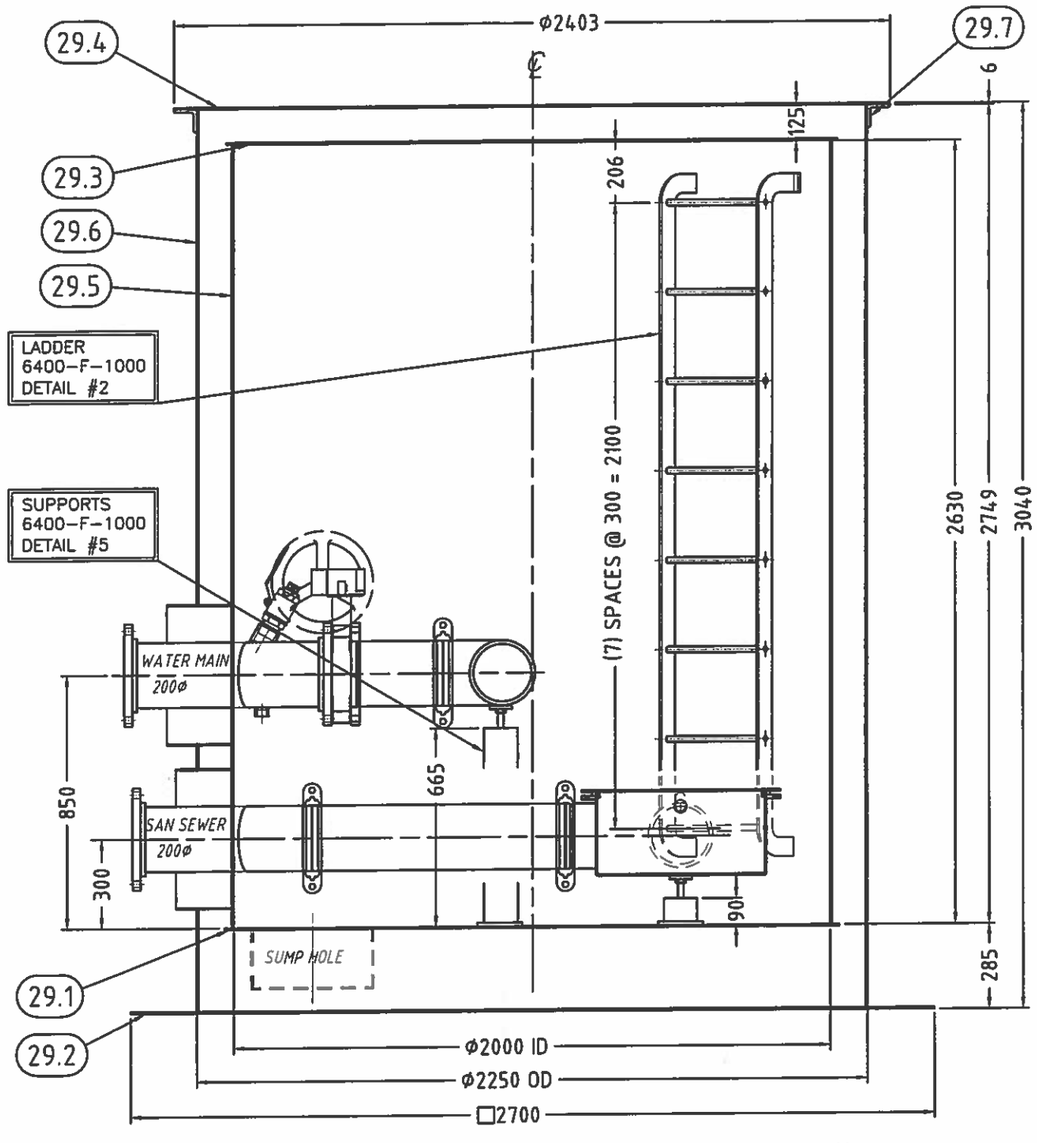
SCALE: X/X" = X"

QTE:
QTY: 1

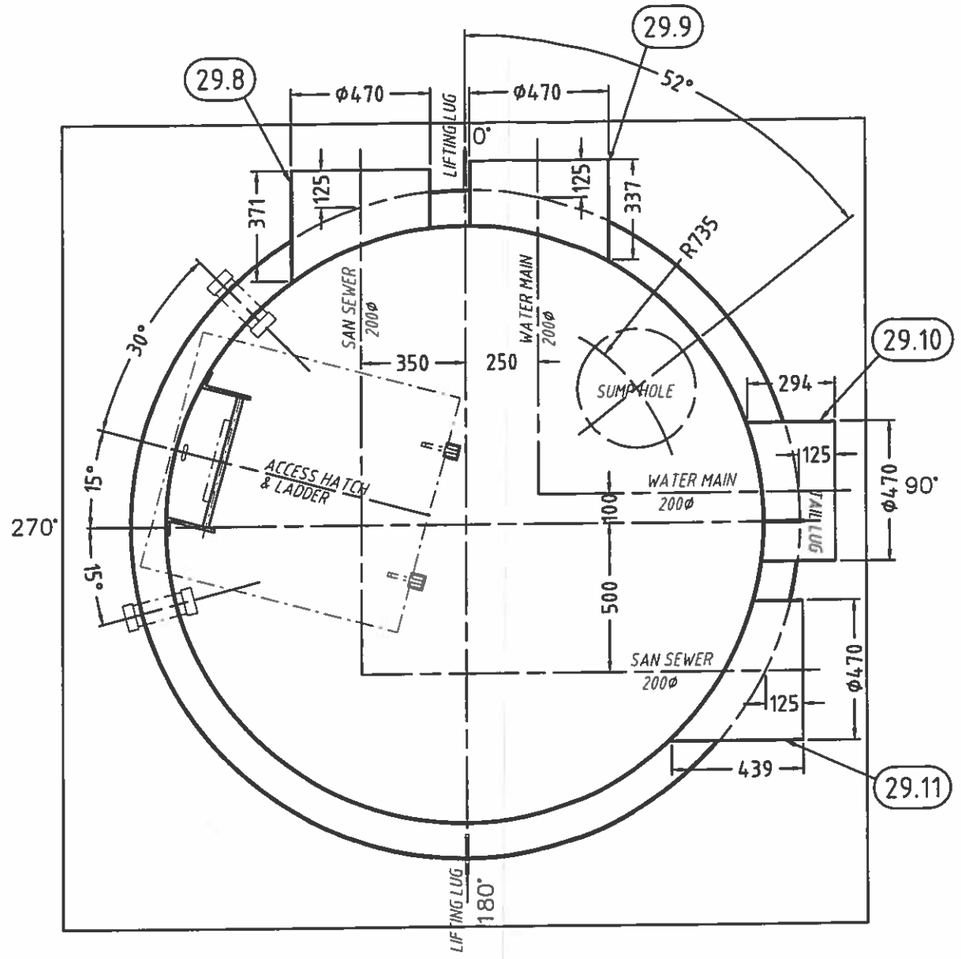
DATE:
01-04-14

FEUILLE:
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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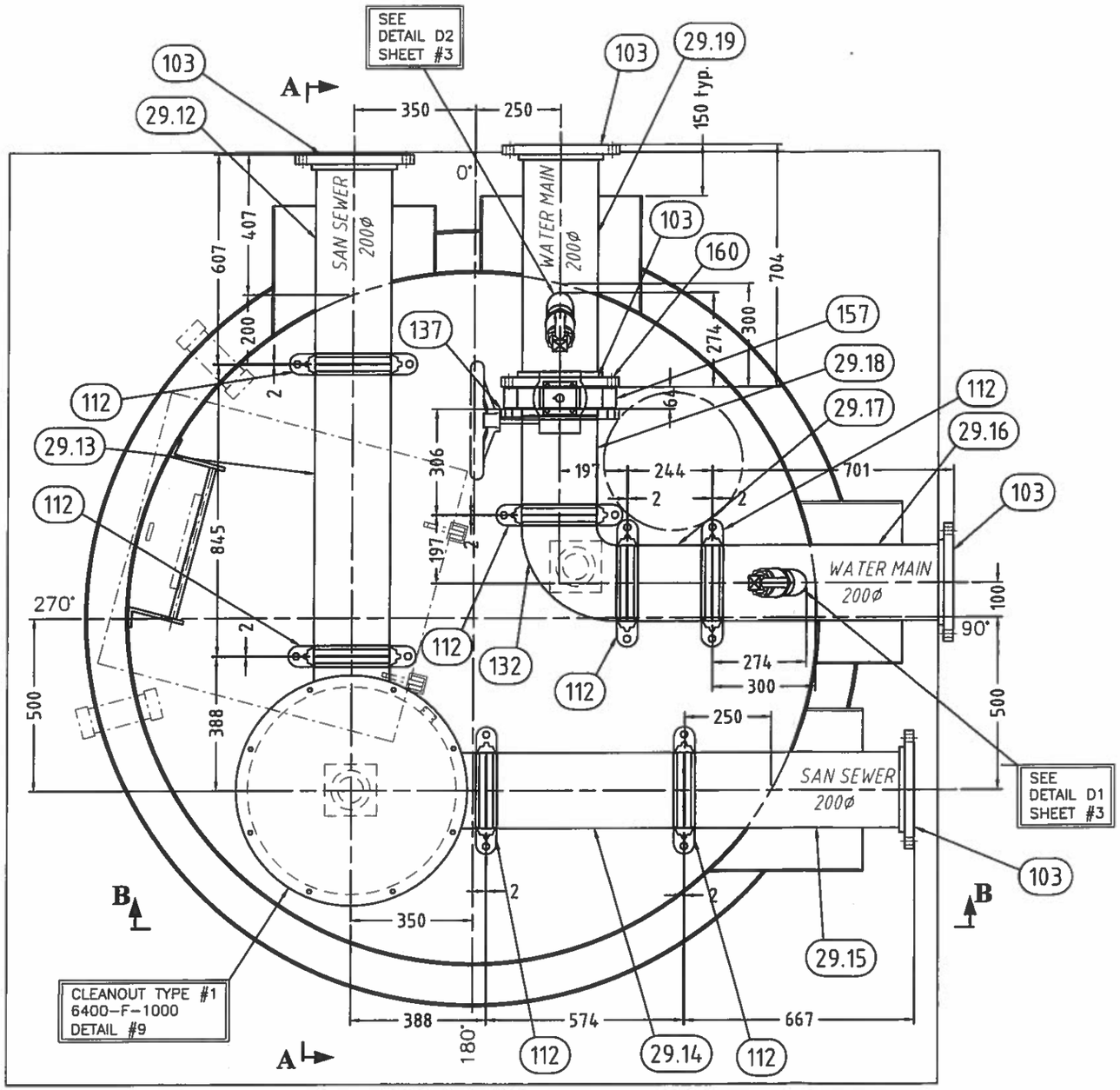
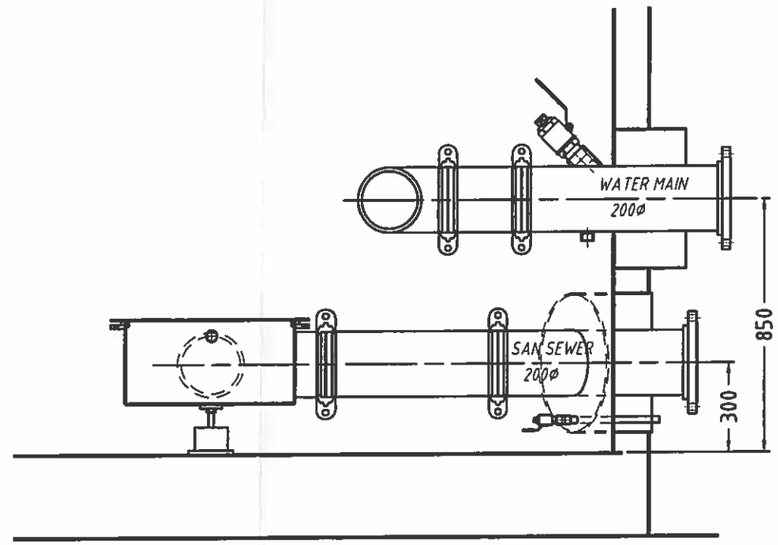
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV29
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV29		G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
	FEUILLE: SHEET: 1 / 3	REV: A



PLAN VIEW



SECTION ''B-B''

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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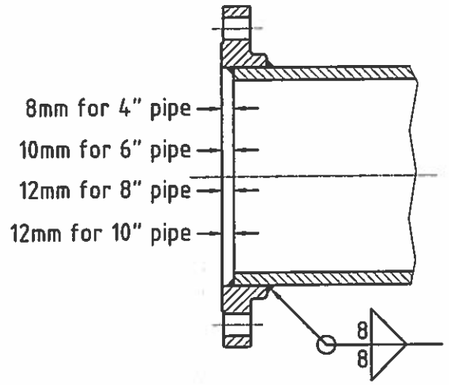
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV29
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

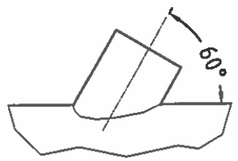
DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV29	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	2 / 3	A



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.

DETAIL #D1



DETAIL #D2

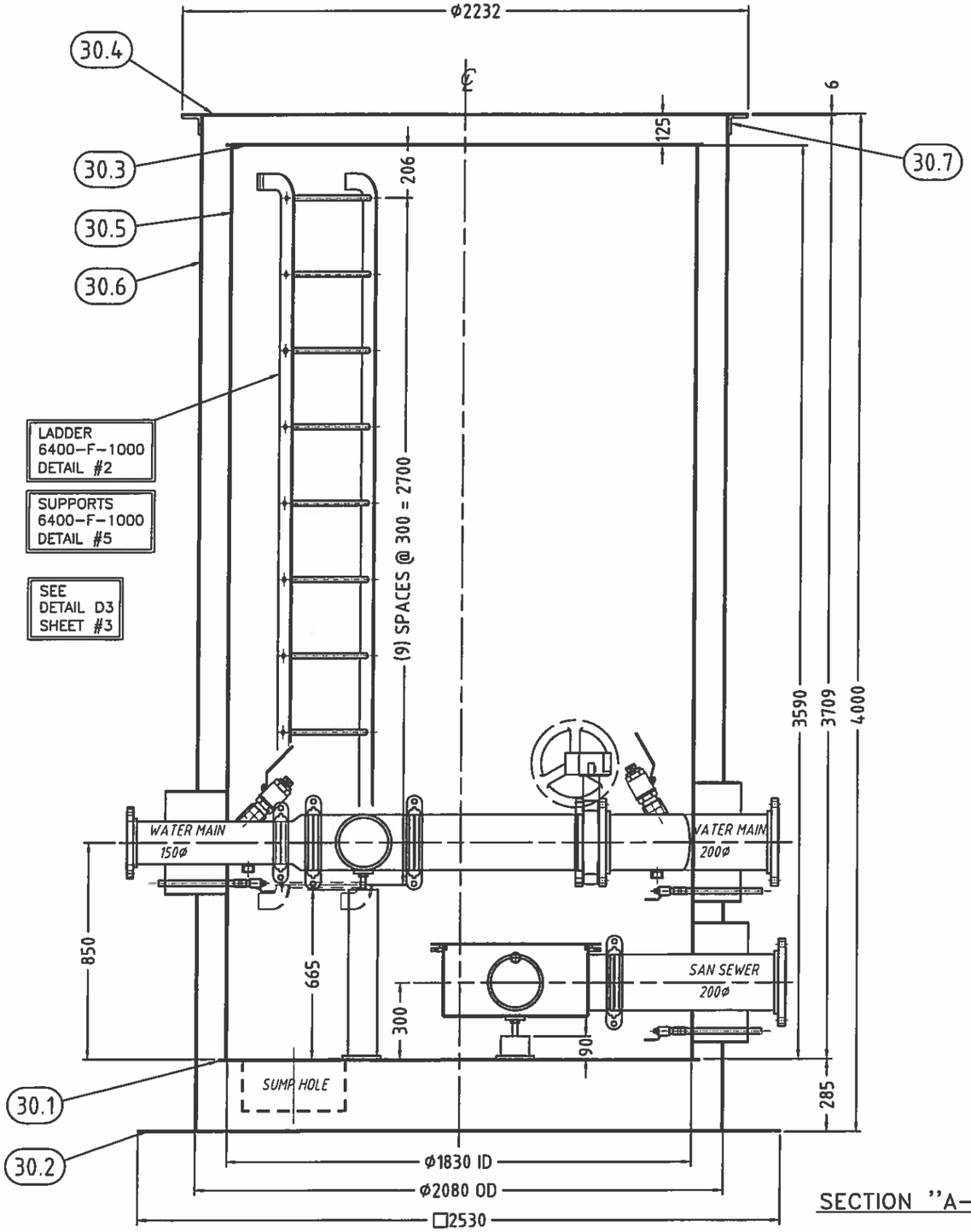
REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

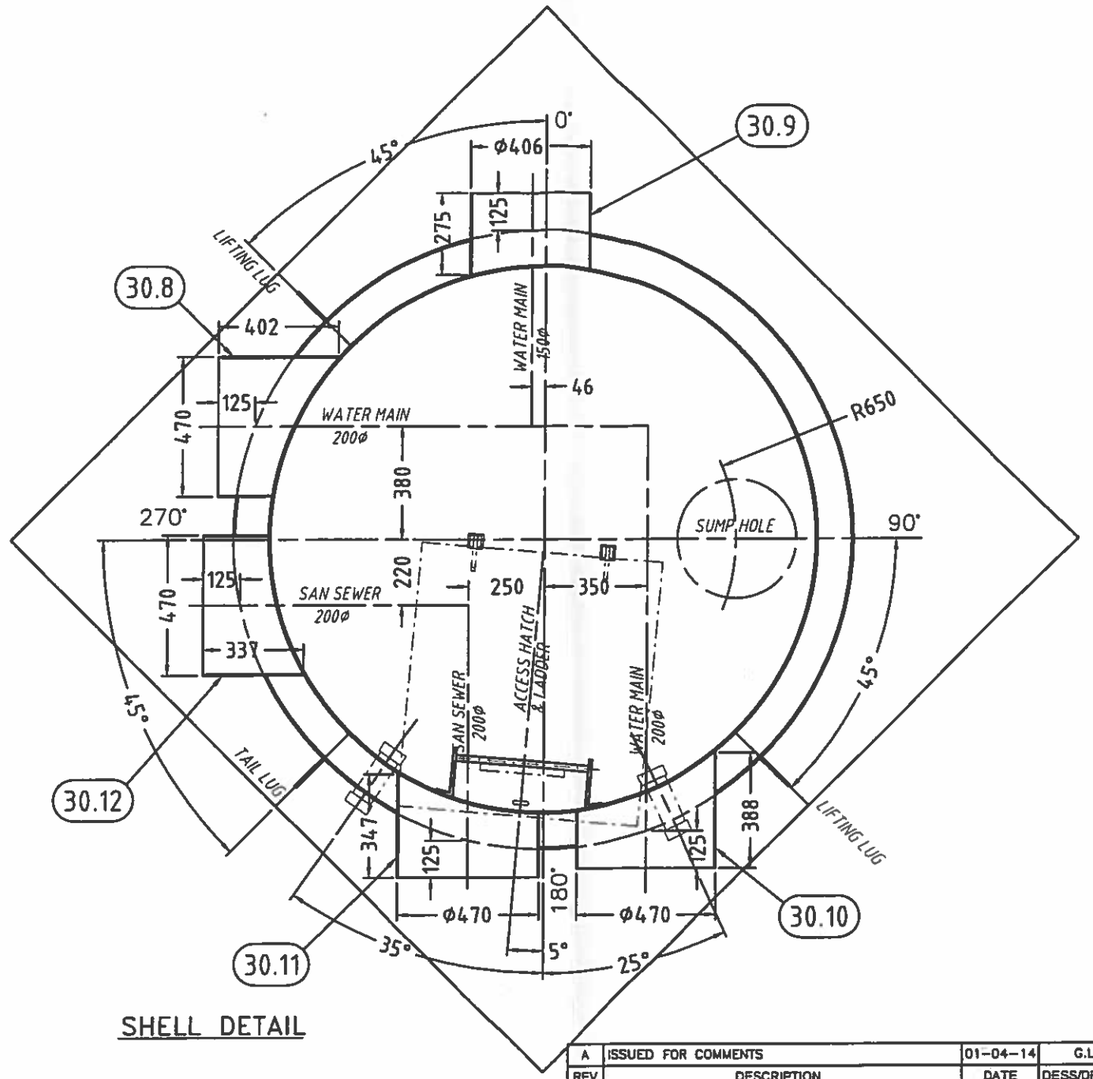
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV29
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV29		G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
FEUILLE: 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

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

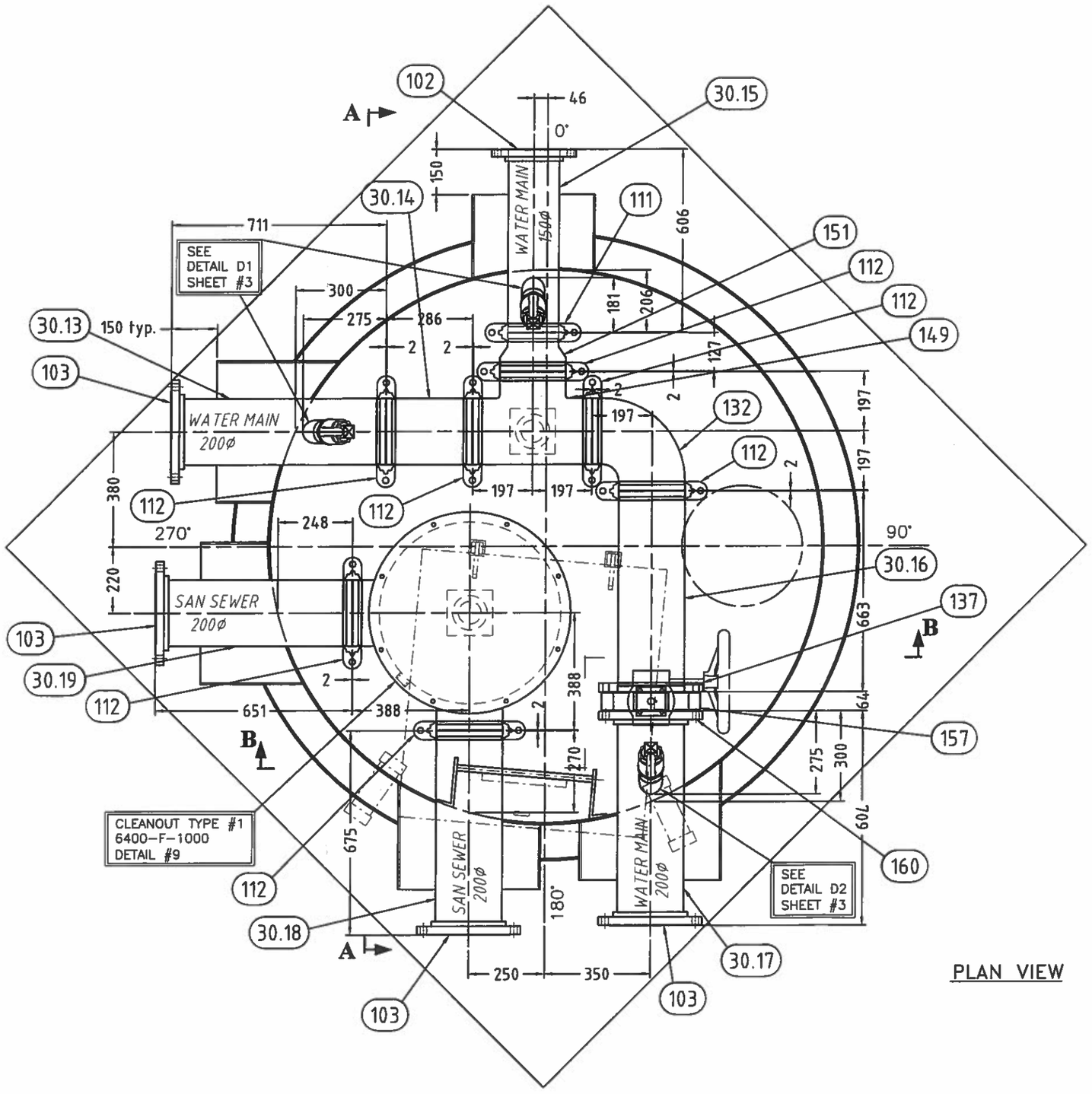
Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

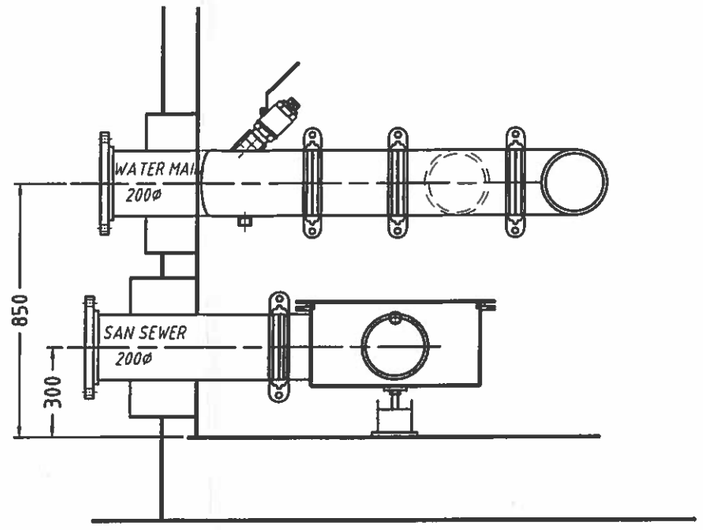
TITRE:
TITLE: ACCESS VAULT AV30
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

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	1 / 3	A



PLAN VIEW



SECTION ''B-B''

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV30
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV30

DESS. PAR:
DRAW BY: G.L.

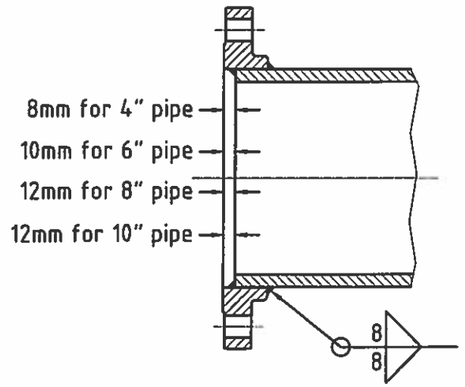
SCALE: X/X" = X"

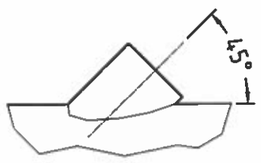
QTE:
QTY: 1

DATE: 01-04-14

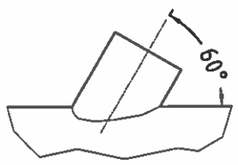
FEUILLE:
SHEET: 2 / 3

REV: A





DETAIL #D1



DETAIL #D2

Item	Qty	Description	Material
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.

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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La Prairie (Quebec)
J5R 2E4
Tel. (450) 444-0566
Fax. (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV30
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV30

DESS. PAR:
DRAW BY: G.L.

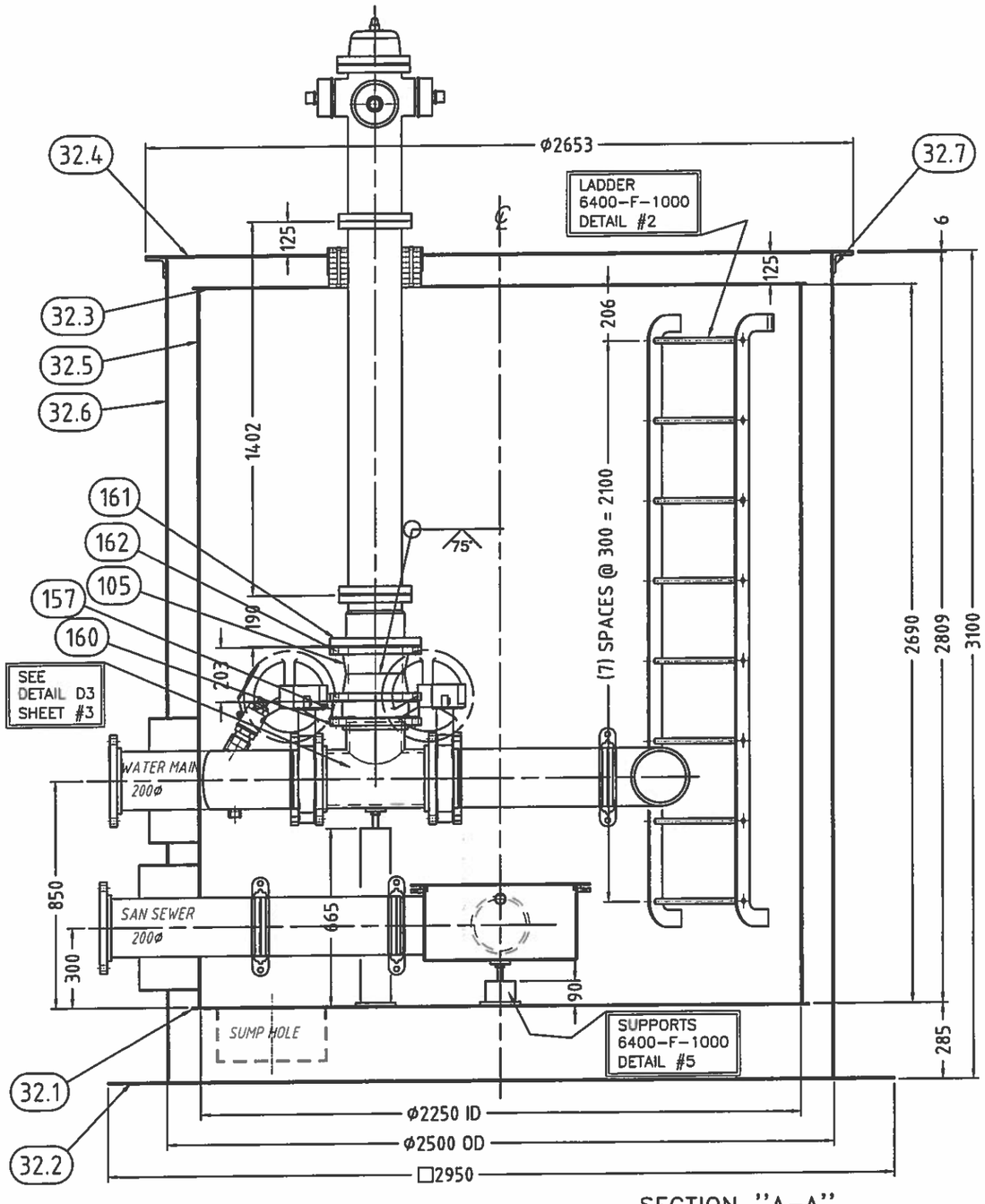
SCALE: X/X" = X"

QTE:
QTY: 1

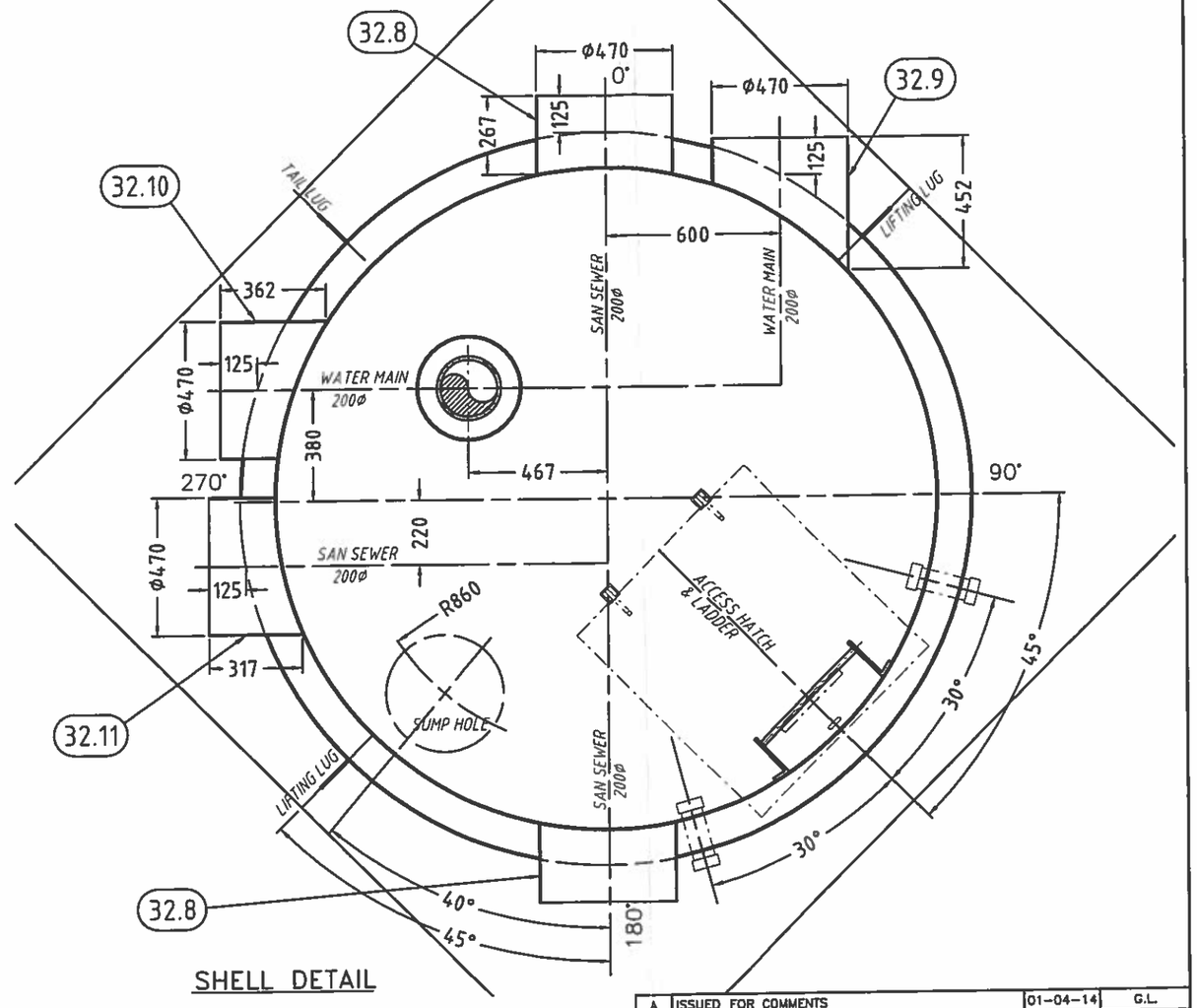
DATE: 01-04-14

FEUILLE:
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
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Fax. (450) 444-2227
www.berliefalco.com

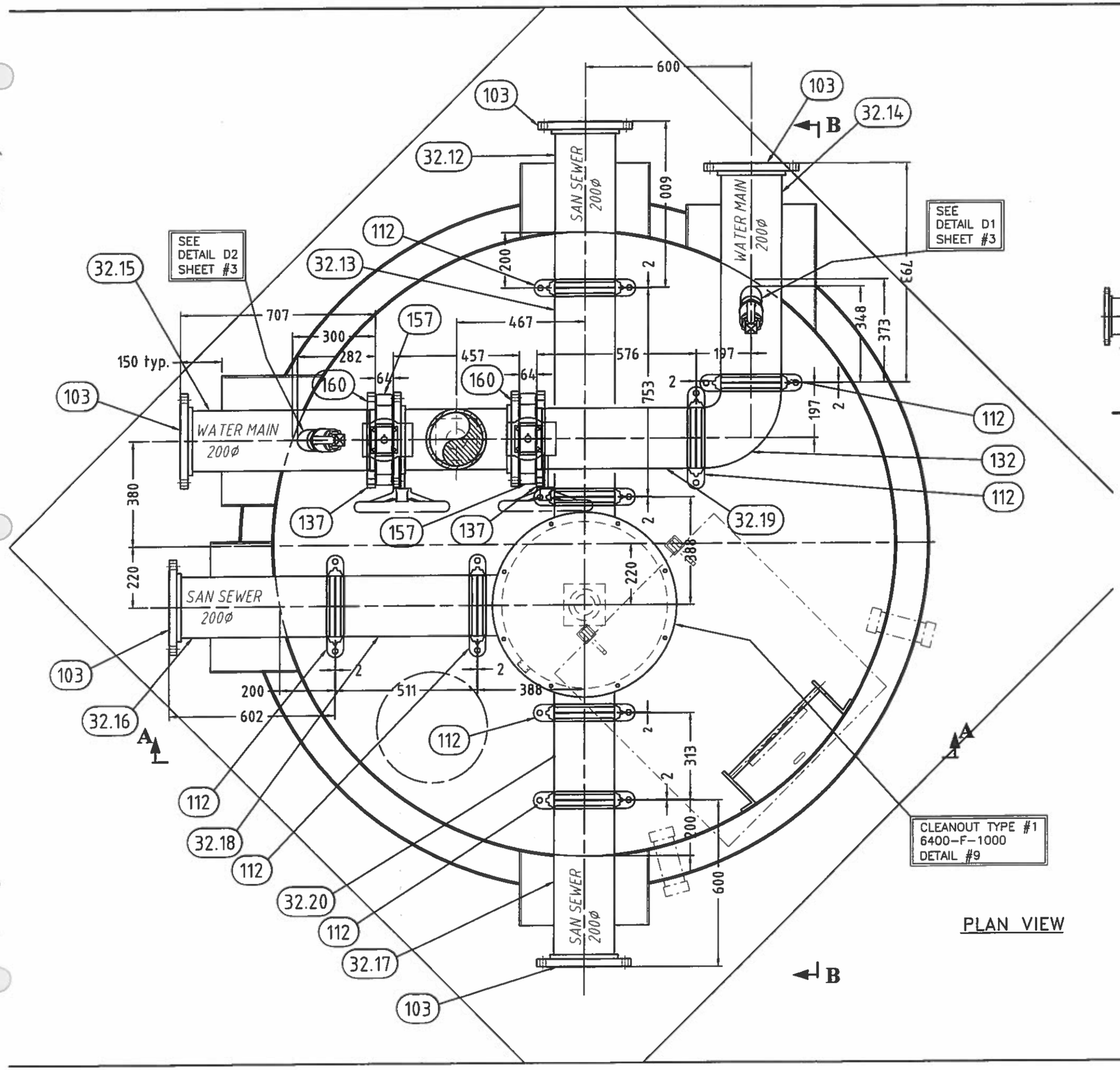
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV32
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

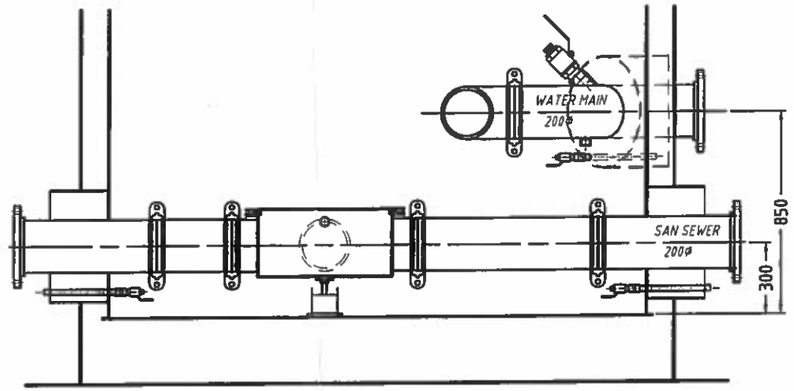
DESSIN No.:
DRAWING No: 6400-F-AV32

DESS. PAR:
DRAW BY: G.L.

SCALE:	QTE:	DATE:	FEUILLE:	REV:
X/X" = X"	QTY: 1	01-04-14	SHEET: 1 / 3	A



PLAN VIEW



SECTION ''C-C''

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel.:(450) 444-0566
Fax.:(450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

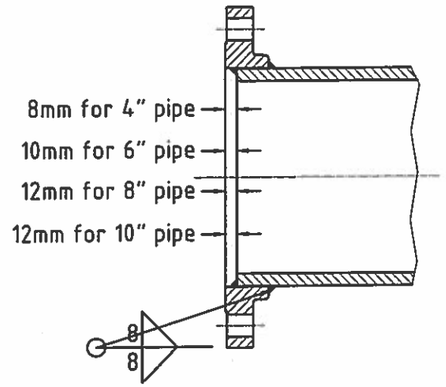
TITRE:
TITLE: ACCESS VAULT AV32
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

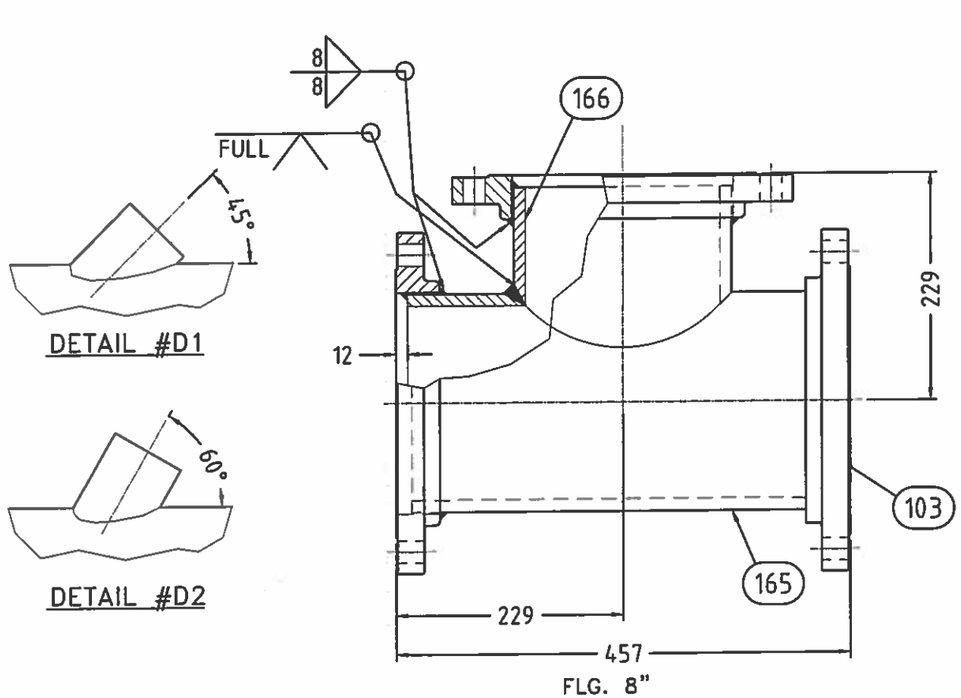
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
	6400-F-AV32	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	2 / 3	A

Item	Qty	Description	Material
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

Item	Qty	Description	Material
32.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
32.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
32.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
32.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
32.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 2690mm LG.	A36
32.6	1	EXTERNAL SHELL PL. 1/4" THK. x 7843mm x 3078mm LG.	A36
32.7	1	ANGLE 3" x 3" x 1/4"	G40.21-44W
32.8	2	PL. 1/4" THK. x 267 x 1456mm LG.	A36
32.9	1	PL. 1/4" THK. x 452 x 1456mm LG.	A36
32.10	1	PL. 1/4" THK. x 362 x 1456mm LG.	A36
32.11	1	PL. 1/4" THK. x 317 x 1456mm LG.	A36
32.12	1	PIPE 8" SCH.80 x 588mm LG. vic groove 1 end	A-53-B
32.13	1	PIPE 8" SCH.80 x 753mm LG. vic groove 2 end	A-53-B
32.14	1	PIPE 8" SCH.80 x 781mm LG. vic groove 1 end	A-53-B
32.15	1	PIPE 8" SCH.80 x 695mm LG. vic groove 1 end	A-53-B
32.16	1	PIPE 8" SCH.80 x 590mm LG. vic groove 1 end	A-53-B
32.17	1	PIPE 8" SCH.80 x 588mm LG. vic groove 1 end	A-53-B
32.18	1	PIPE 8" SCH.80 x 511mm LG. vic groove 2 end	A-53-B
32.19	1	PIPE 8" SCH.80 x 576mm LG. vic groove 2 end	A-53-B
32.20	1	PIPE 8" SCH.80 x 313mm LG. vic groove 2 end	A-53-B
103	8	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	1	8" VICTAULIC ELBOW 90°, #10	GALV C.S.
137	2	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.





DETAIL #D1

DETAIL #D2

DETAIL D3– TYP. WELDING

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV32
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV32

DESS. PAR:
DRAW BY: G.L.

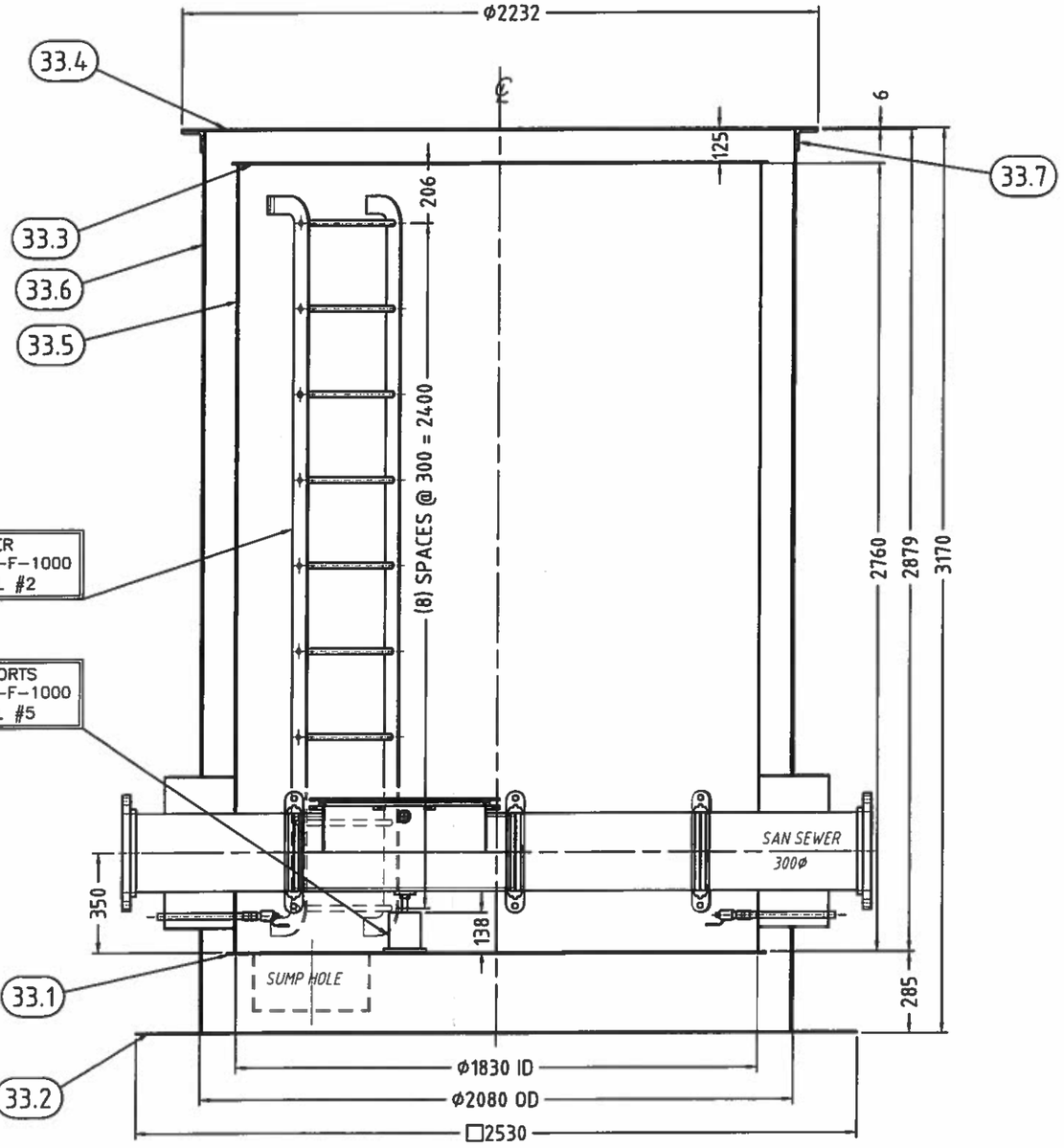
SCALE: X/X" = X"

QTE:
QTY: 1

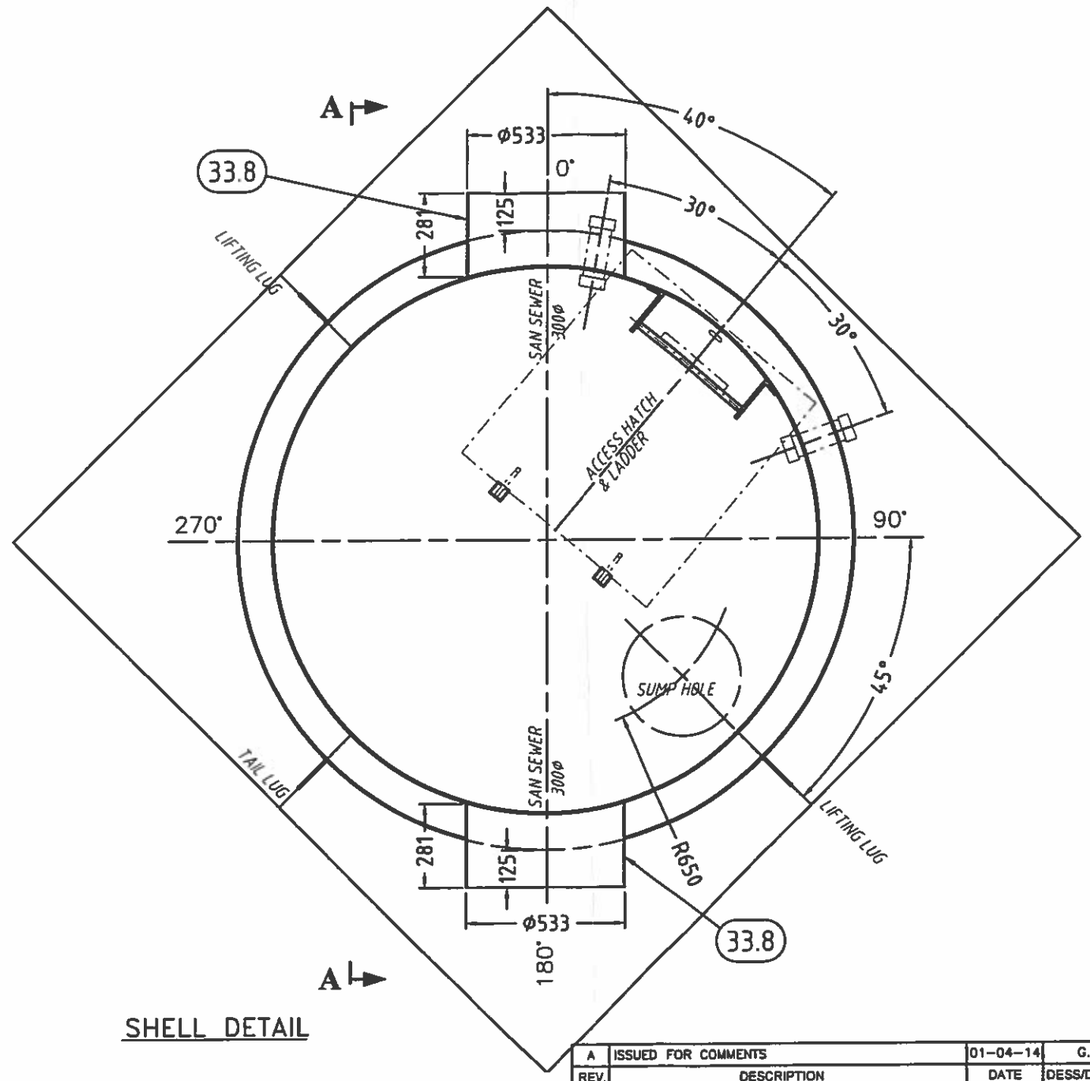
DATE: 01-04-14

FEUILLE:
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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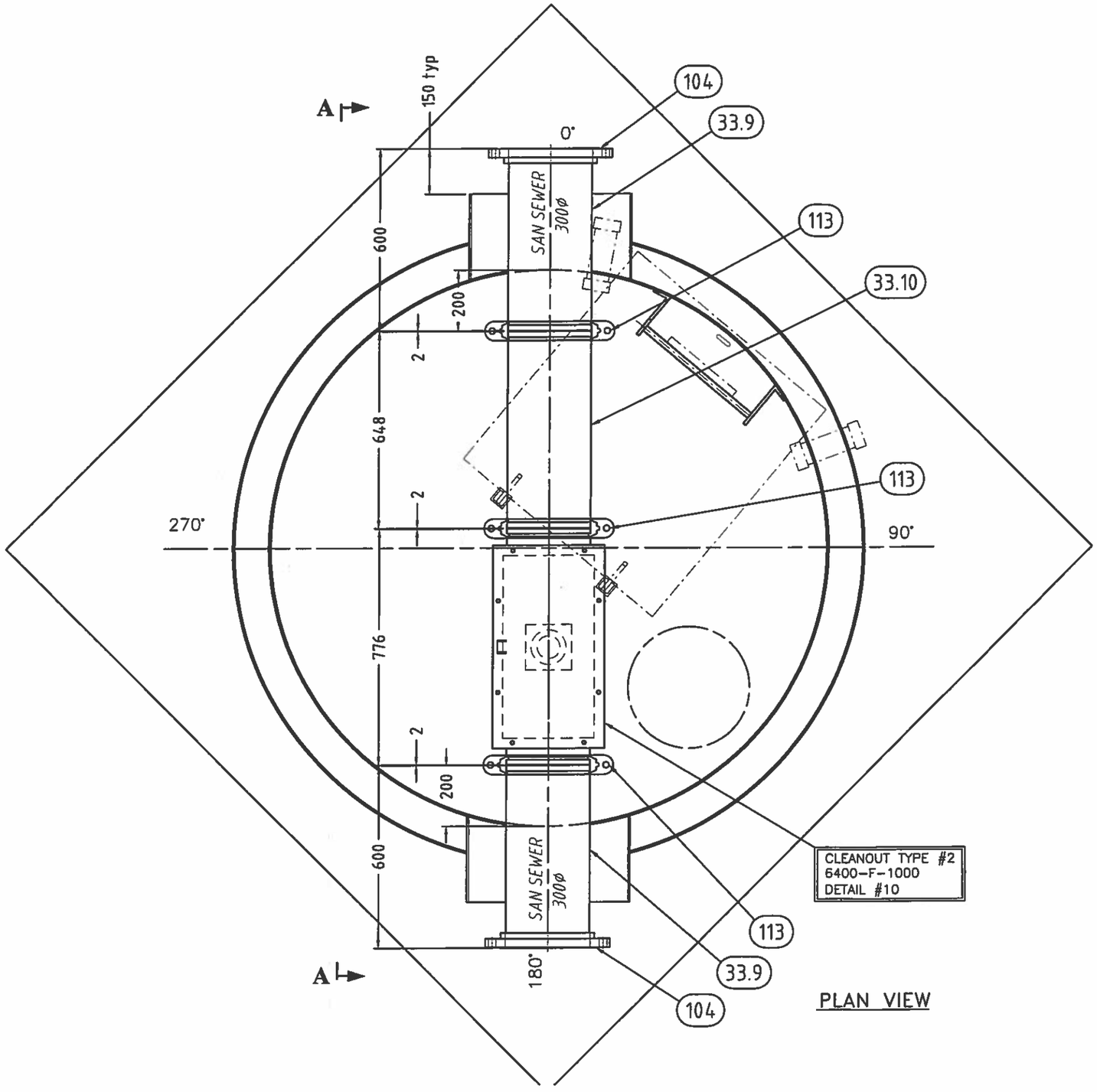
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel: (450) 444-0566
Fax: (450) 444-2227
www.berliefalco.com

CLIENT/CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE/TITLE: ACCESS VAULT AV33
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No./DRAWING No:	DESS. PAR/DRAW BY:
6400-F-AV33	G.L.

SCALE:	QTE/QTY:	DATE:	FEUILLE/SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	A



PLAN VIEW

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
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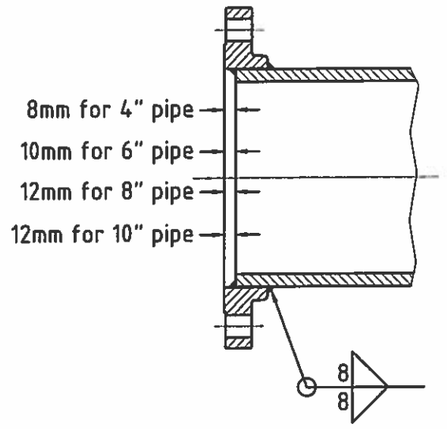
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV33
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No. / DRAWING No:	DESS. PAR: / DRAW BY:
6400-F-AV33	G.L.

SCALE:	QTE: / QTY:	DATE:	FEUILLE: / SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	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.

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT 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.

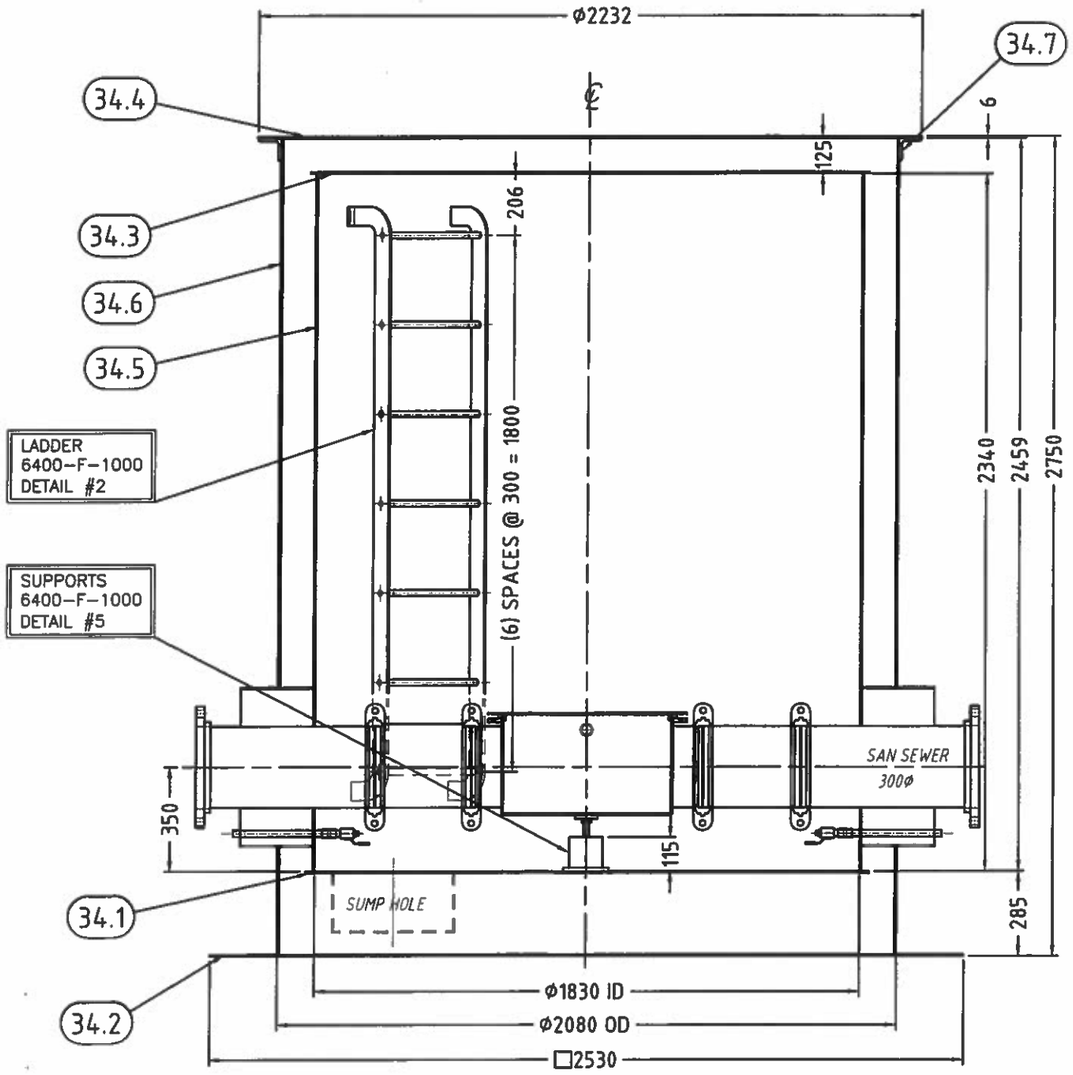
SCALE: X/X" = X"

QTE:
QTY: 1

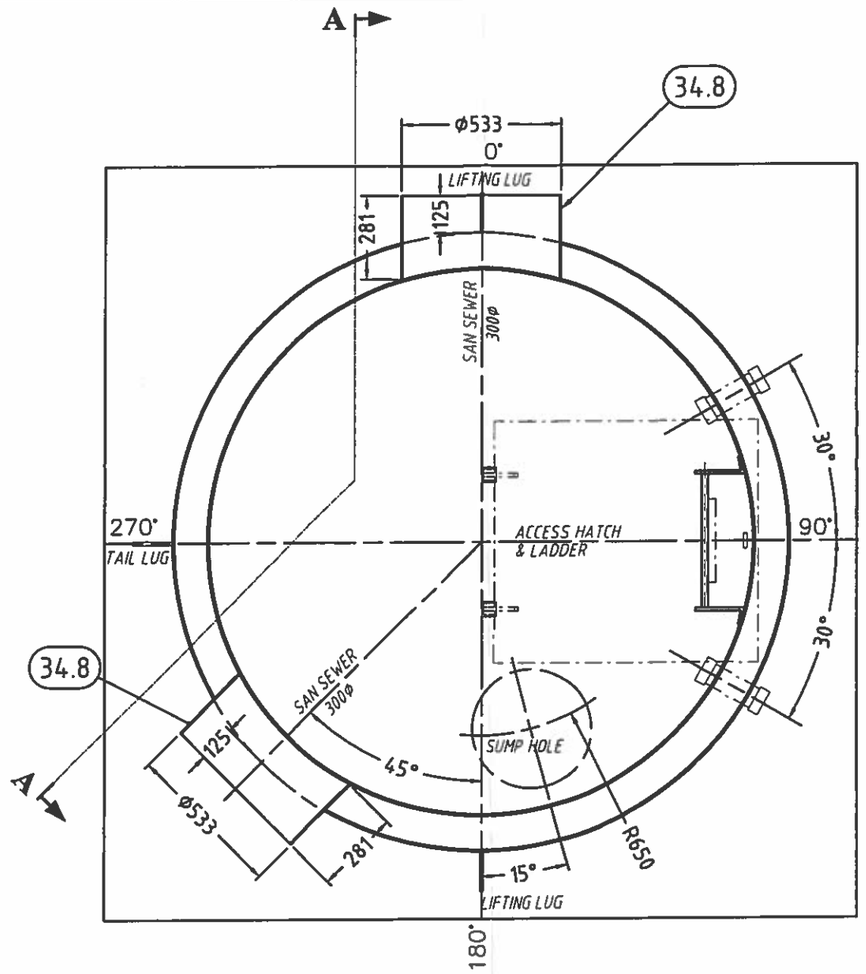
DATE: 01-04-14

FEUILLE:
SHEET: 3 / 3

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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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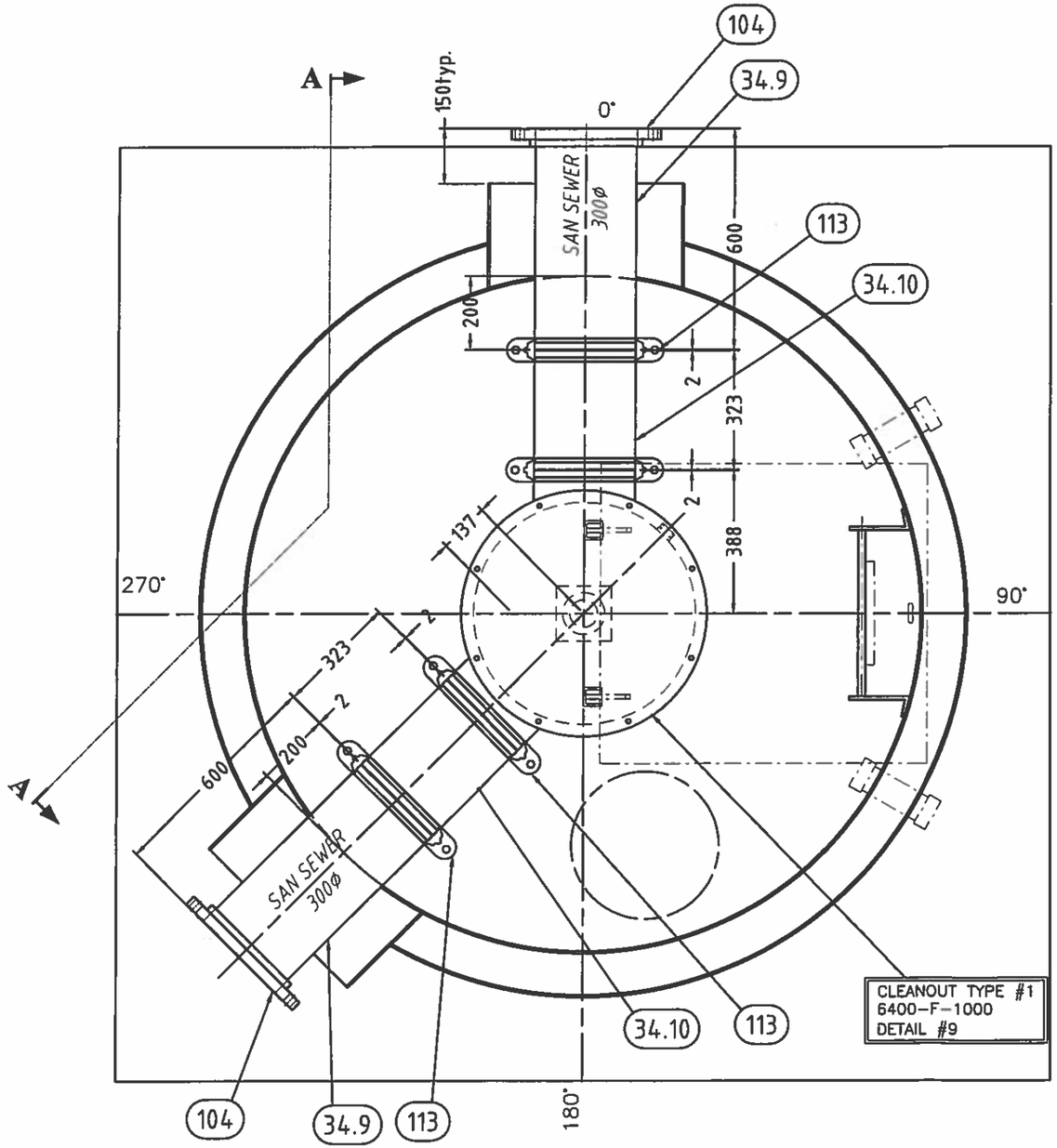
www.berliefalco.com

CLIENT/CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE/TITLE: ACCESS VAULT AV34
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No./DRAWING No:	DESS. PAR/DRAW BY:
6400-F-AV34	G.L.

SCALE:	QTE/QTY:	DATE:	FEUILLE/SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	A



PLAN VIEW

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
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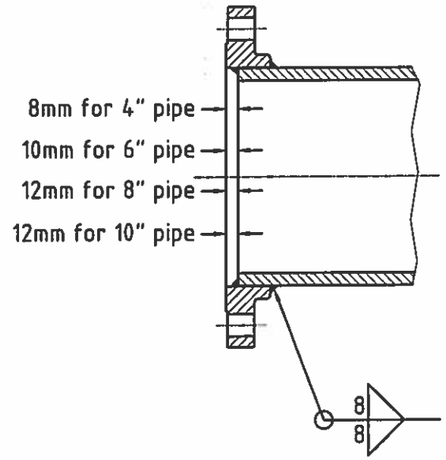
J5R 2E4
Tel.: (450) 444-0566
Fax.: (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV34
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV34		G.L.
SCALE: X/X" = X"	QTÉ: QTY: 1	DATE: 01-04-14
	FEUILLE: SHEET: 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.

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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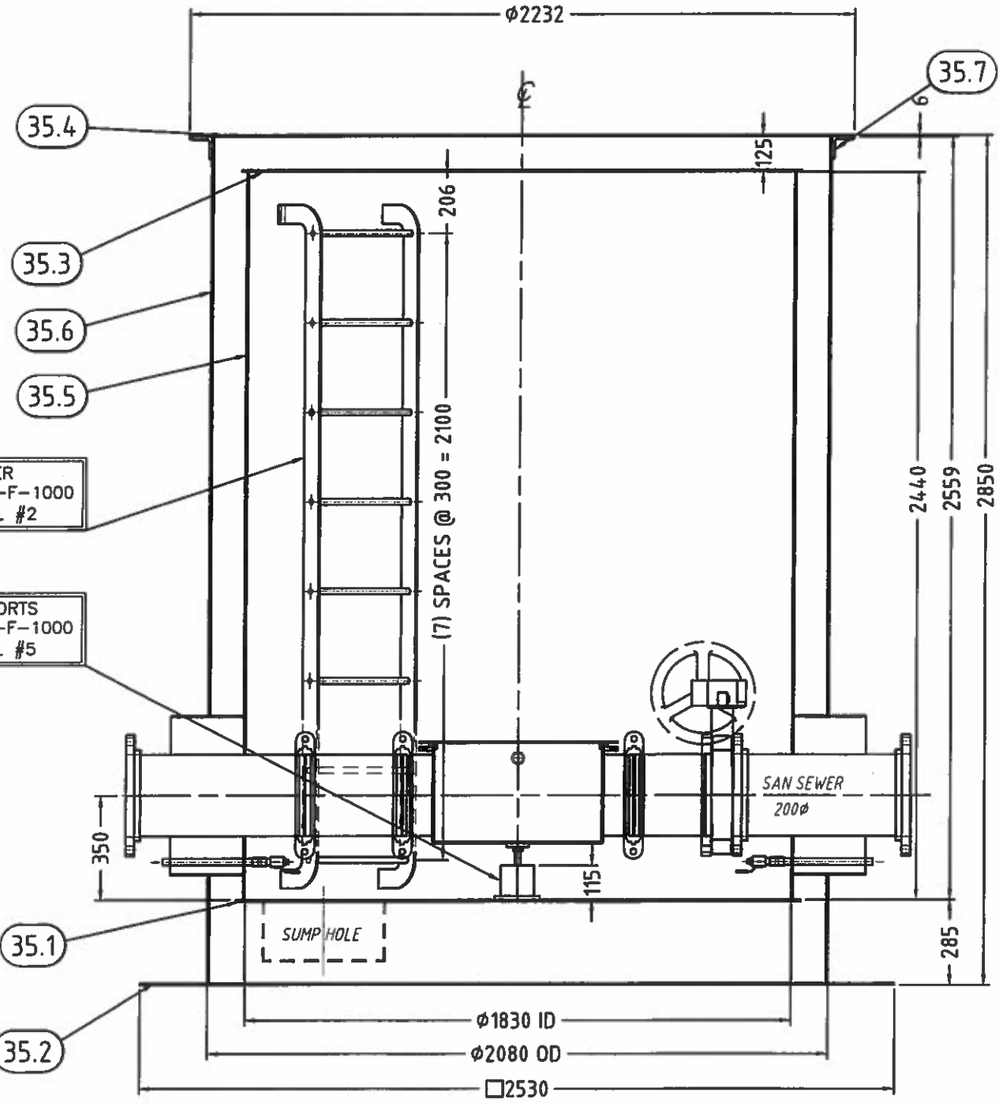
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

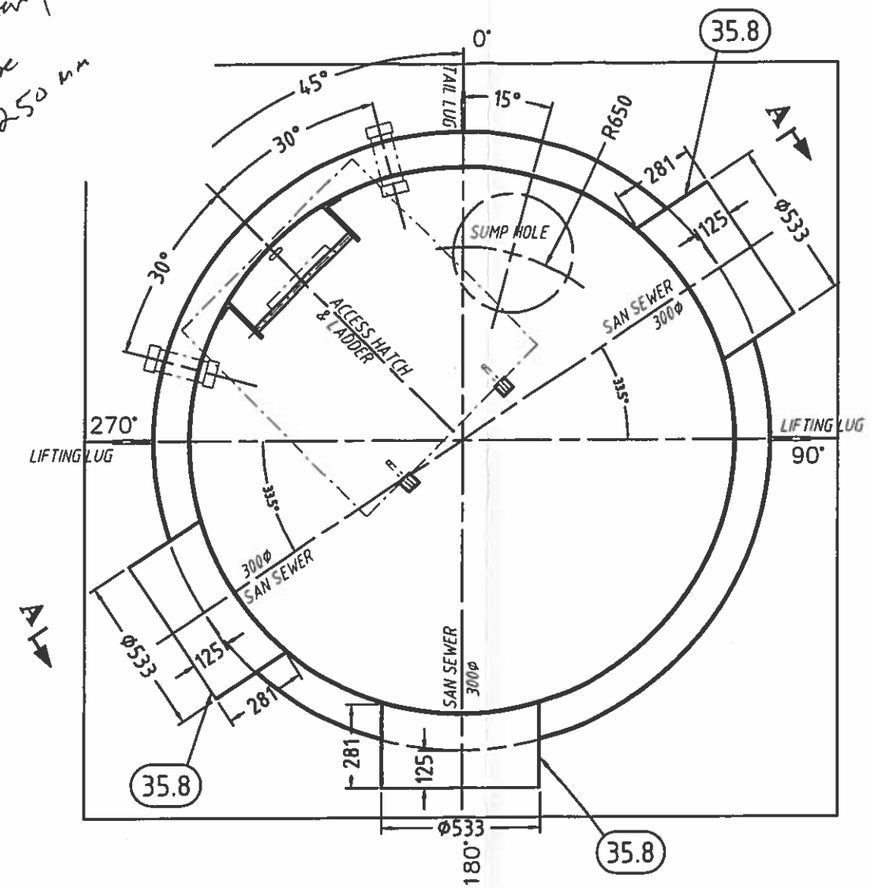
TITRE:
TITLE: ACCESS VAULT AV34
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:	
6400-F-AV34		G.L.	
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 3 / 3 — REV: A



SECTION "A-A"

Sentury to be 250 mm



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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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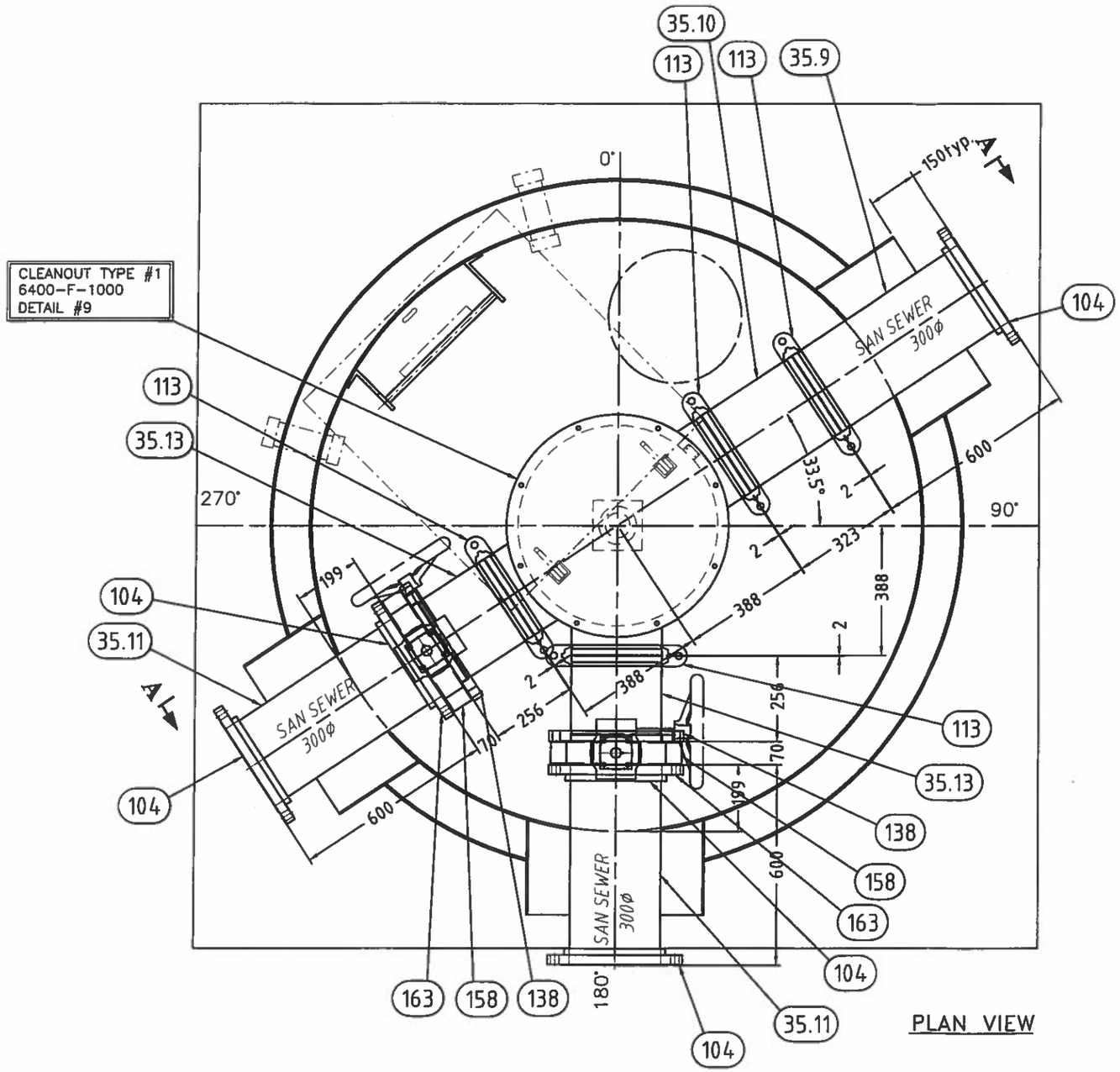
www.berliefalco.com

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: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
FEUILLE: SHEET: 1 / 3	REV: A	



PLAN VIEW

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
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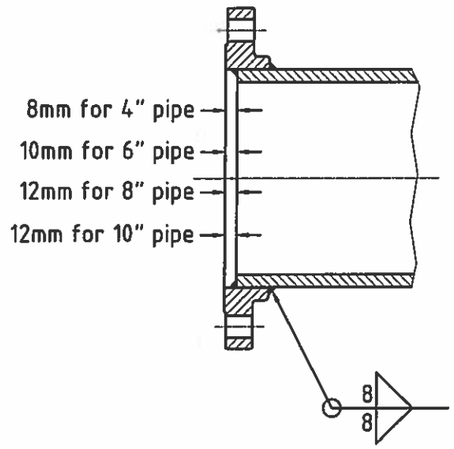
Fax.: (450) 444-2227
www.berliefalco.com

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: X/X" = X"	QTE: QTY: 1 / DATE: 01-04-14	FEUILLE: SHEET: 2 / 3 — REV: A



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.

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV35
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV35

DESS. PAR:
DRAW BY: G.L.

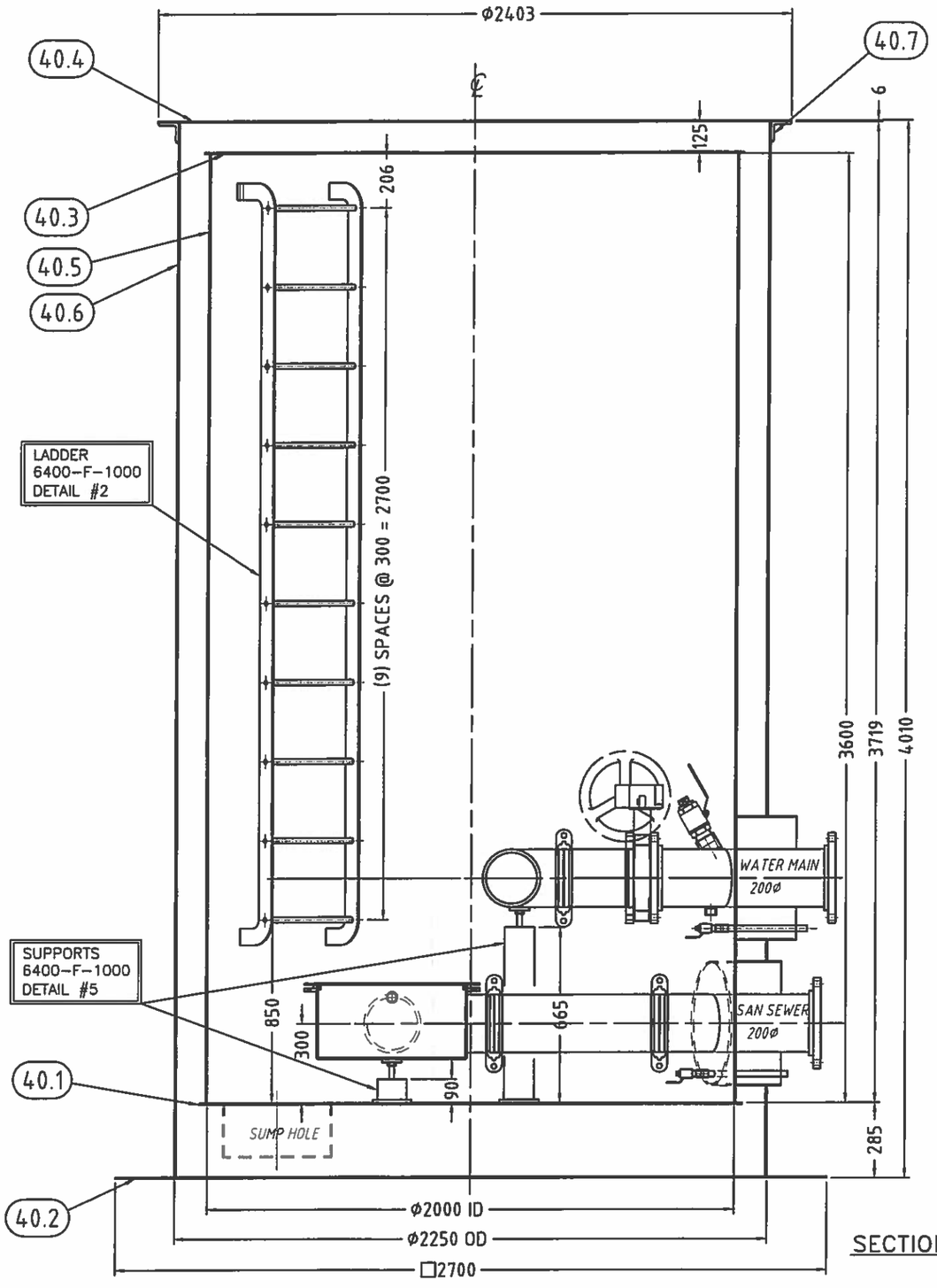
SCALE: X/X" = X"

QTE:
QTY: 1

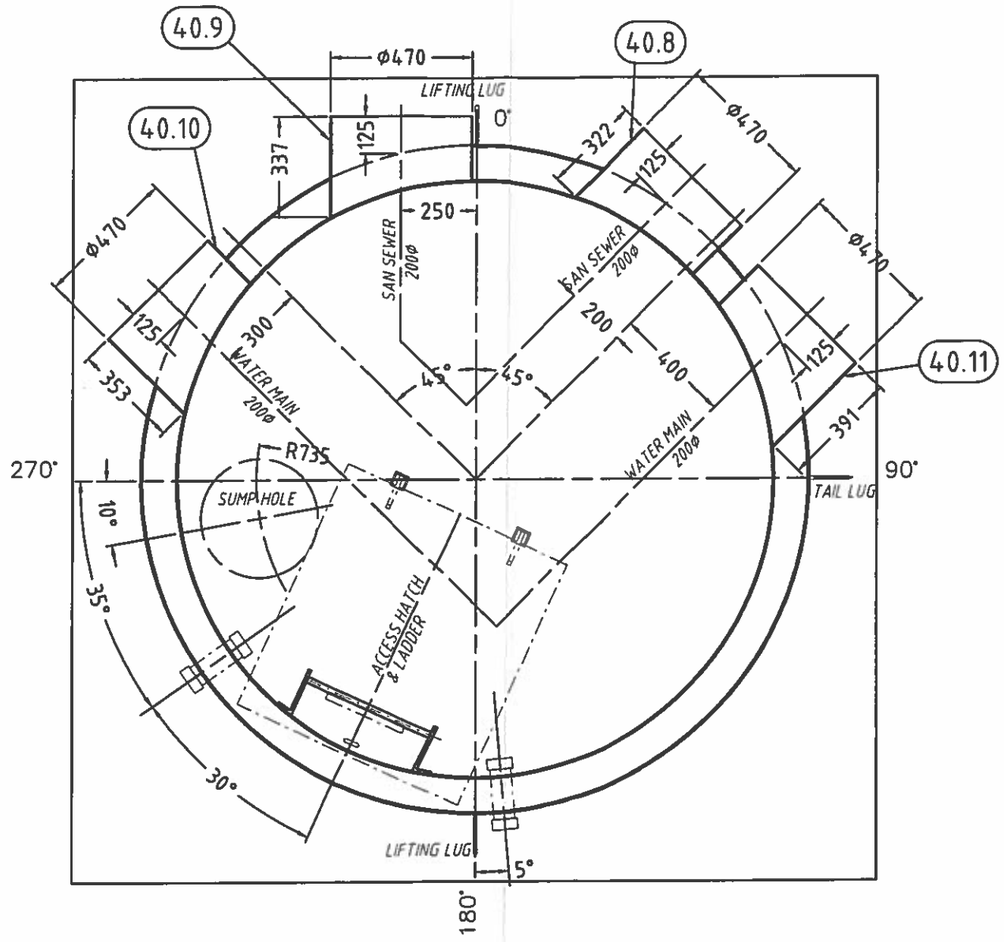
DATE: 01-04-14

FEUILLE:
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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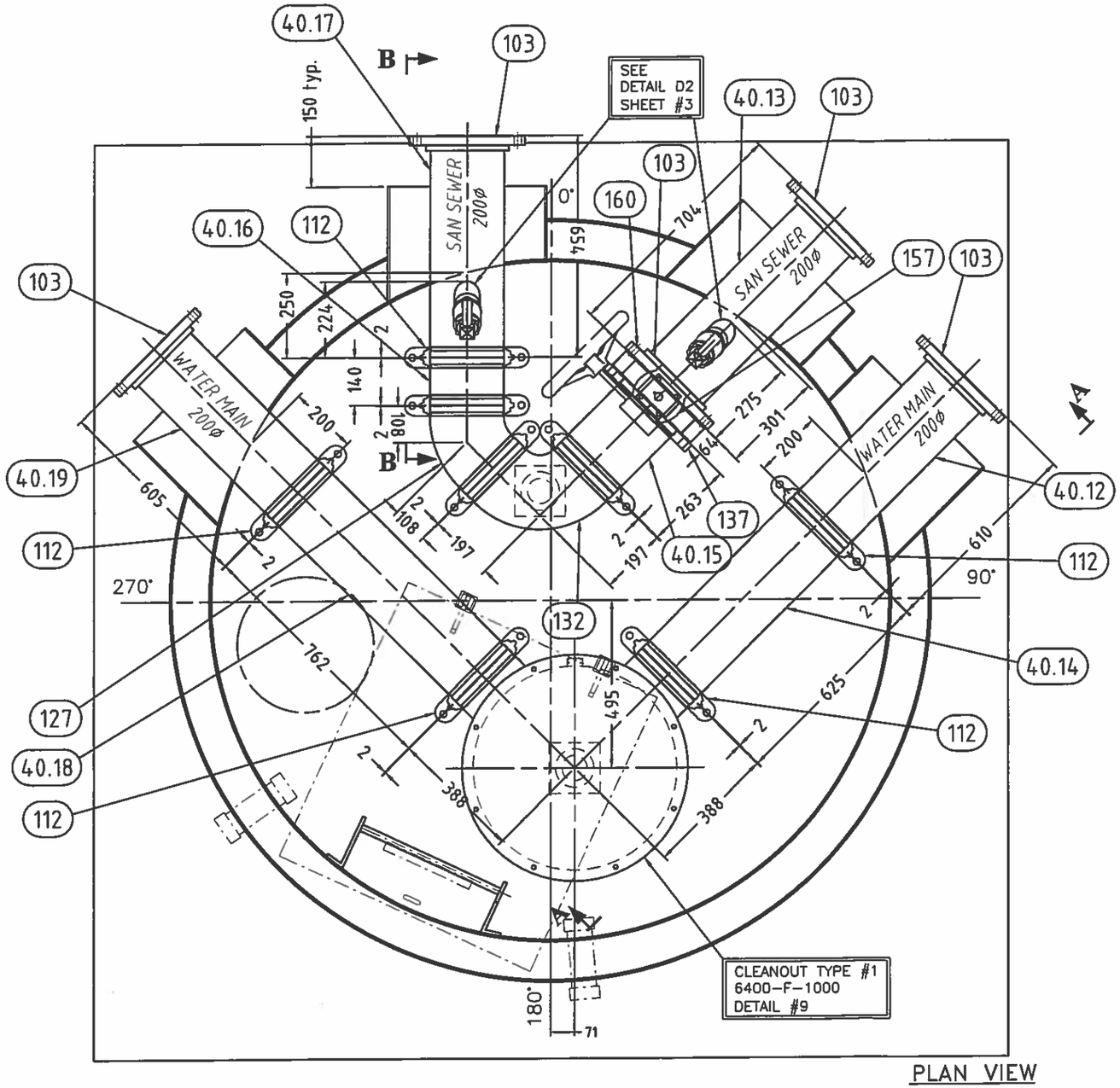
Fax (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

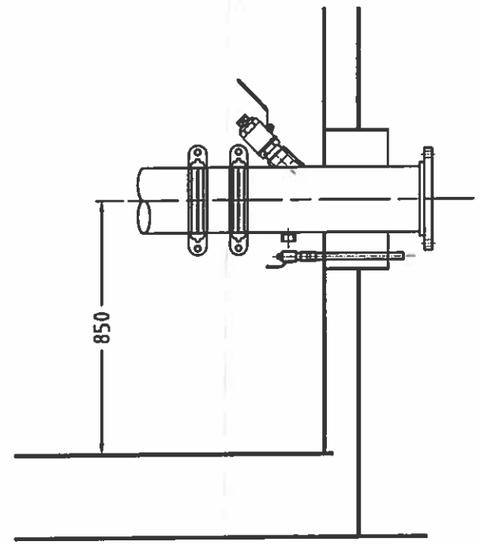
TITRE:
TITLE: ACCESS VAULT AV40
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: / DRAWING No:	6400-F-AV40	DESS. PAR: / DRAW BY:	G.L.

SCALE:	QTE: / QTY:	DATE:	FEUILLE: / SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	A



PLAN VIEW



SECTION "B-B"

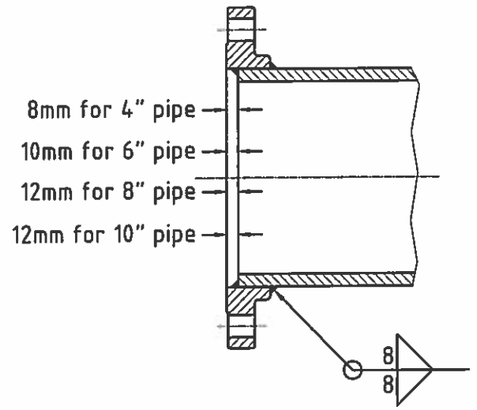
REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

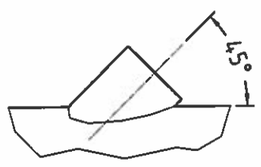
Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel (450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

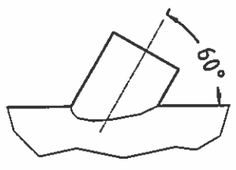
TITRE:
TITLE: ACCESS VAULT AV40
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV40		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
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.

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
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www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV40
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV40

DESS. PAR:
DRAW BY: G.L.

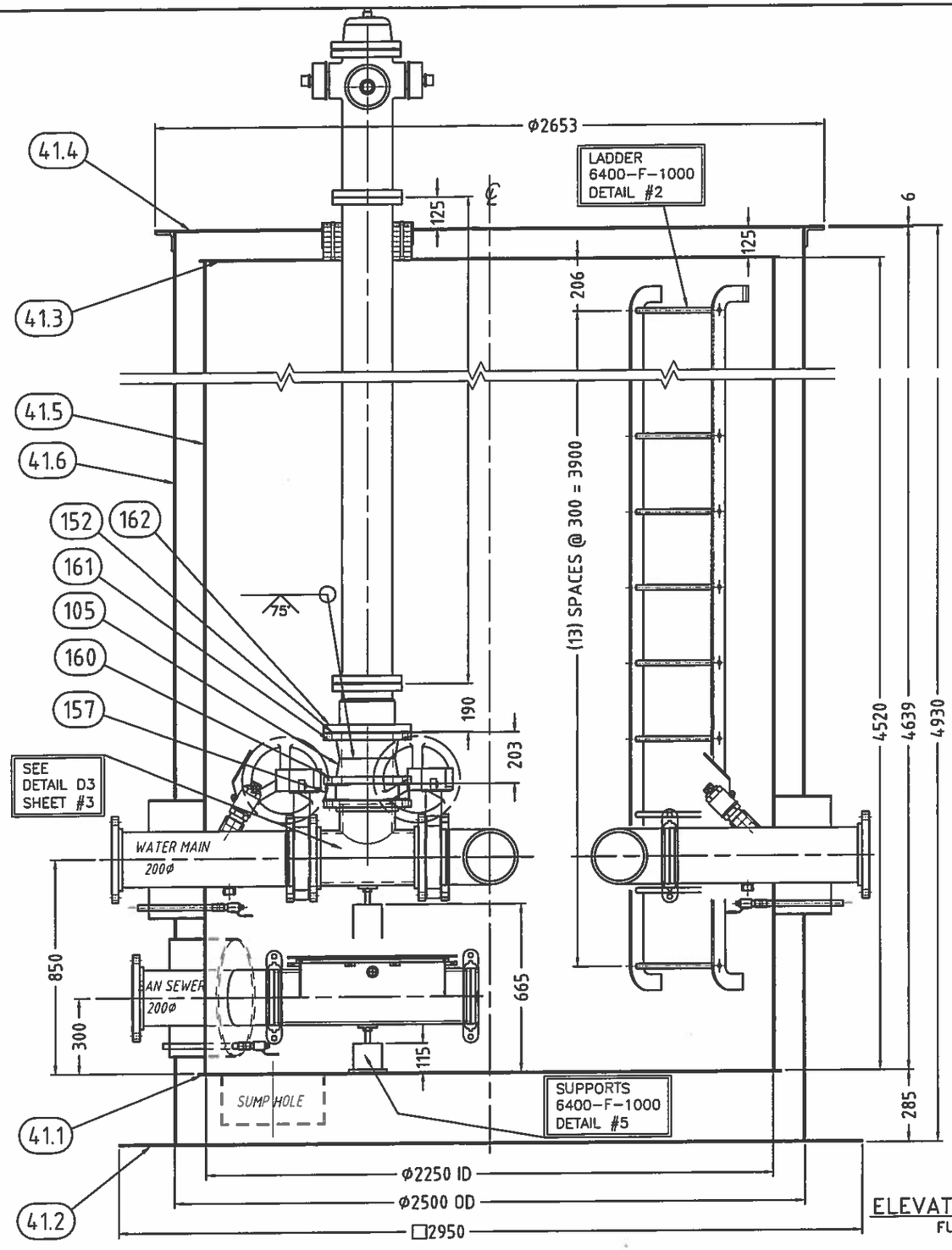
SCALE: X/X" = X"

QTE:
QTY: 1

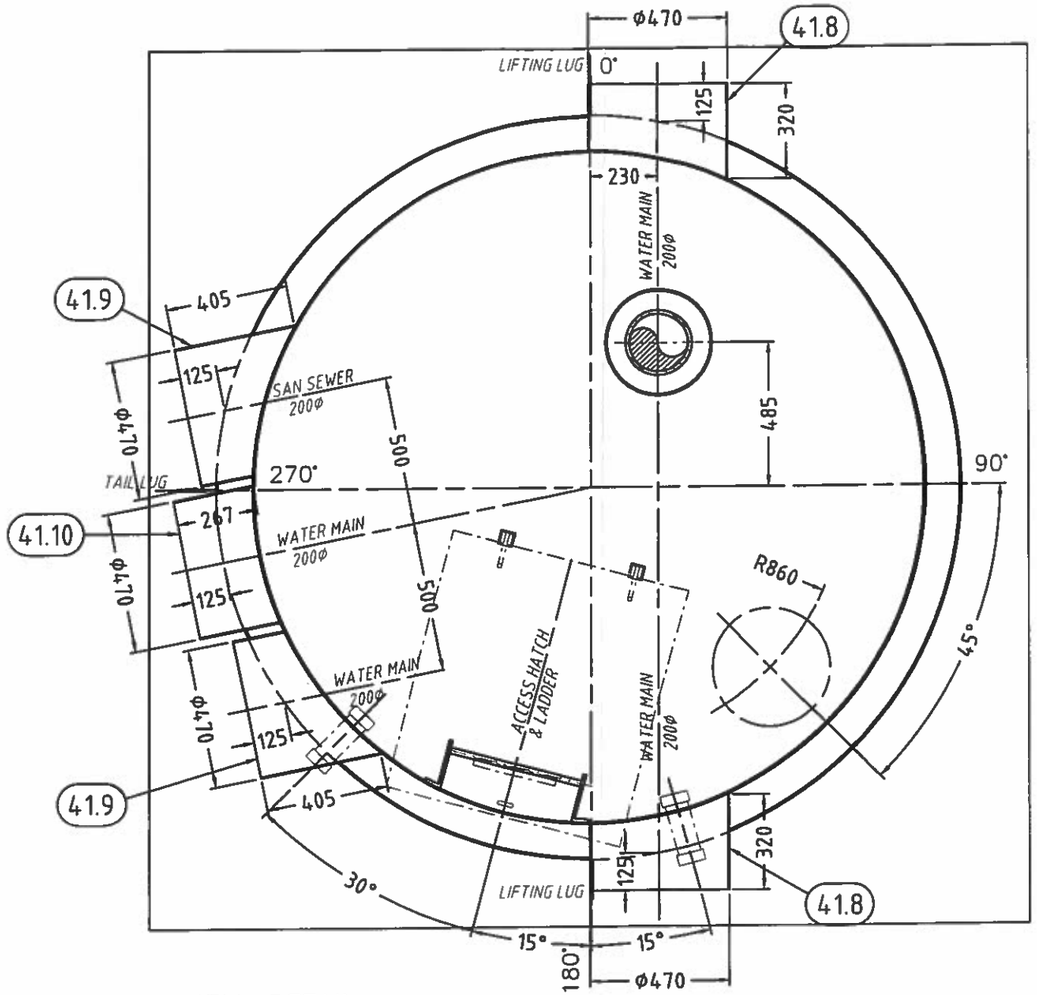
DATE: 01-04-14

FEUILLE:
SHEET: 3 / 3

REV: A



ELEVATION VIEW
FUTURE



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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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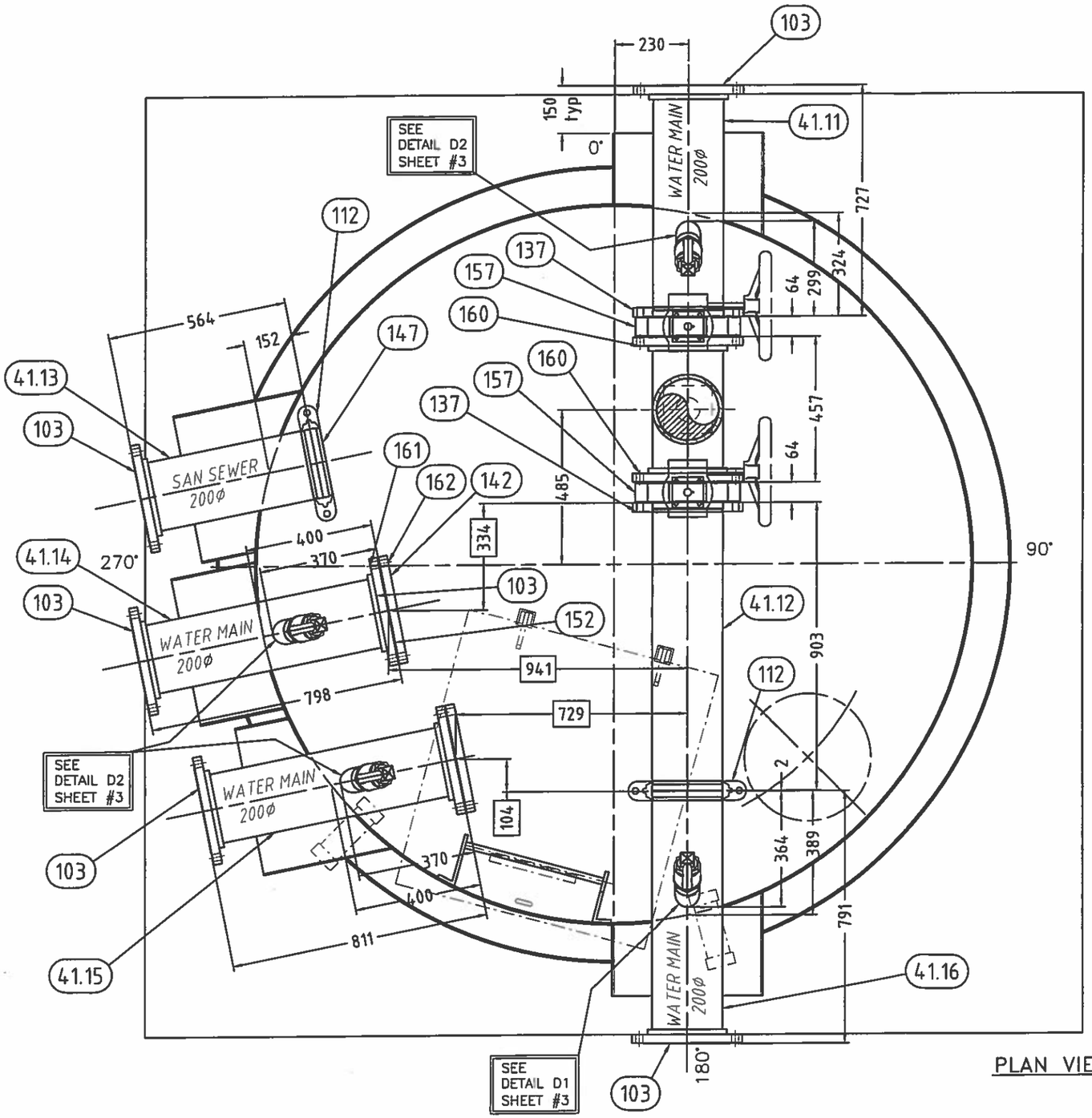
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV41
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: / DRAWING No:		DESS. PAR: / DRAW BY:	
6400-F-AV41		G.L.	
SCALE: X/X" = X"	QTE: / QTY: 1	DATE: 01-04-14	FEUILLE: / SHEET: 1 / 4 — REV: A



PLAN VIEW

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel.: (450) 444-0566
Fax: (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV41
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.:
DRAWING No: 6400-F-AV41

DESS. PAR:
DRAW BY: G.L.

SCALE: X/X" = X"

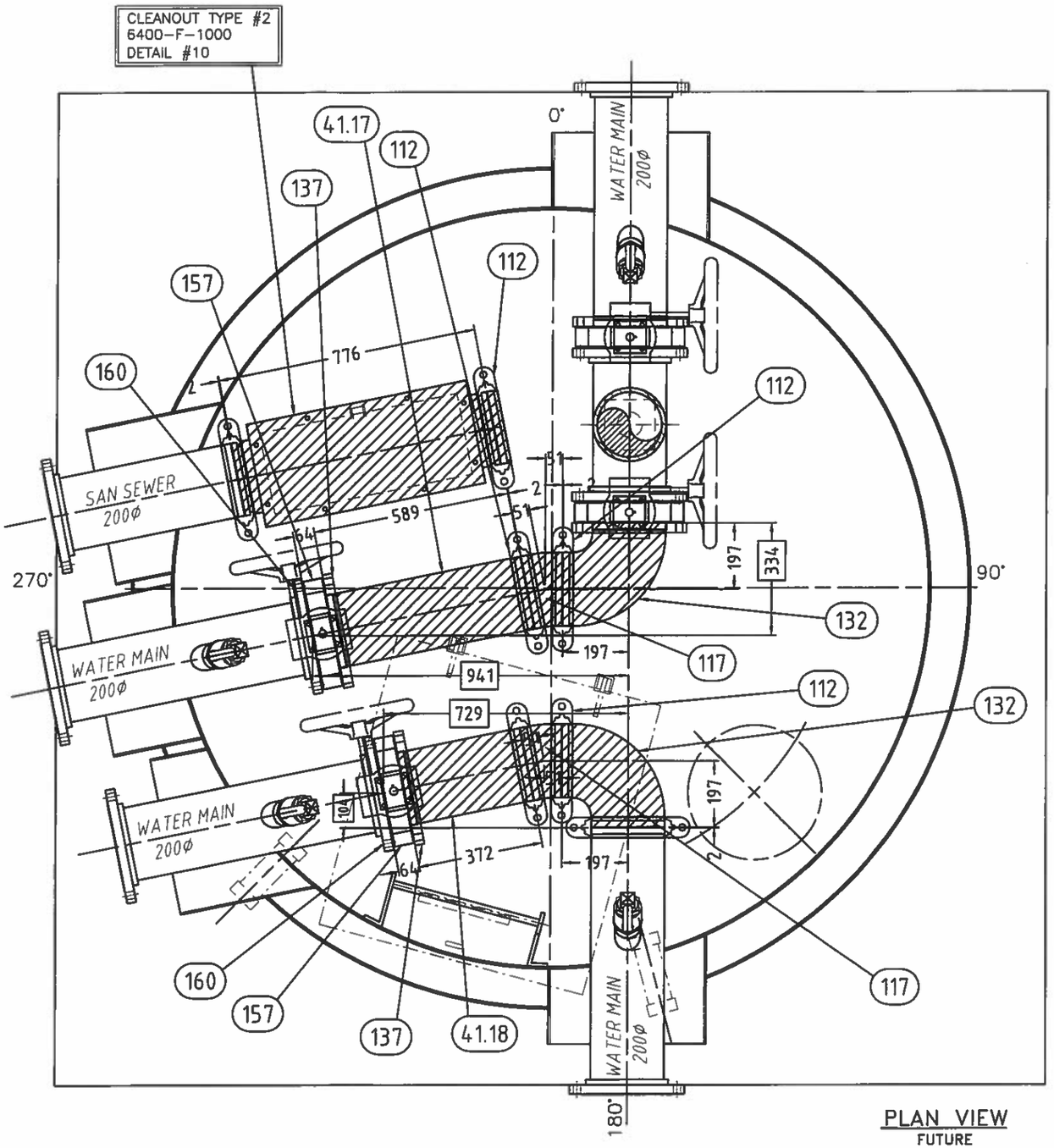
QTE:
QTY: 1

DATE: 01-04-14

FEUILLE:
SHEET: 2 / 4

REV: A

CLEANOUT TYPE #2
6400–F–1000
DETAIL #10



PLAN VIEW
FUTURE

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01–04–14	G.L.

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TITRE:
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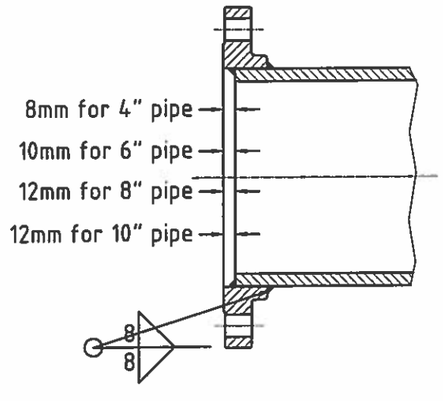
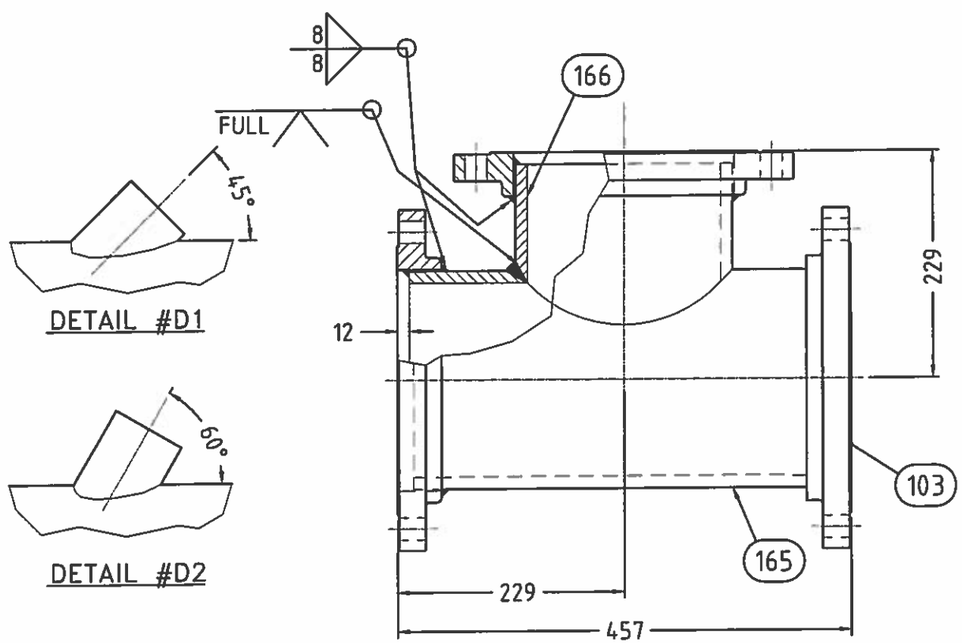
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400–F–AV41	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01–04–14	3 / 4	A

Item	Qty	Description	Material
157	5	8" BUTTERFLY VALVE - CRANE MODEL 44BXZ-GD FULL LUG WITH ROTARY ACTUATOR AND HANDWHEEL (OR EQUIV.)	
160	80	BOLT 3/4-10UNC x 2 1/4"LG + FLAT WASHER	PLATED C.S.
161	24	3/4-10 HEX.-BOLT, 3 1/2"LG	PLATED C.S.
162	24	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





DETAIL #D1

DETAIL #D2

FLG. 8"

DETAIL D3– TYP. WELDING

Item	Qty	Description	Material
41.1	1	BOTTOM INTERNAL PL. 1/4" THK. x Ø2312mm	A36
41.2	1	BOTTOM EXTERNAL PL. 3/8" THK. x 2950mm x 2950mm	A36
41.3	1	TOP INTERNAL PL. 1/4" THK. x Ø2298mm	A36
41.4	1	TOP EXTERNAL PL. 1/4" THK. x Ø2653mm	A36
41.5	1	INTERNAL SHELL PL. 1/4" THK. x 7088mm x 4520mm LG.	A36
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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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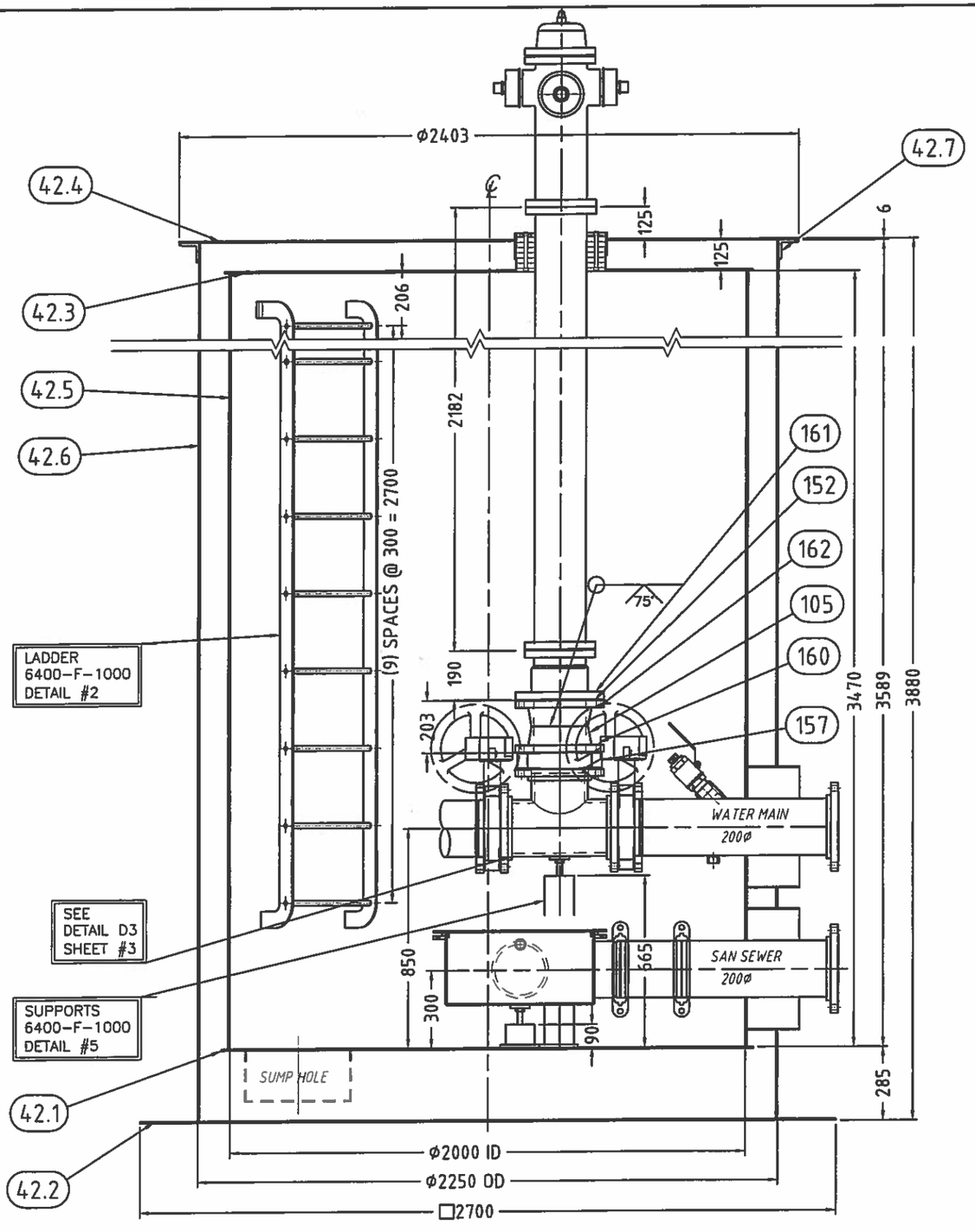
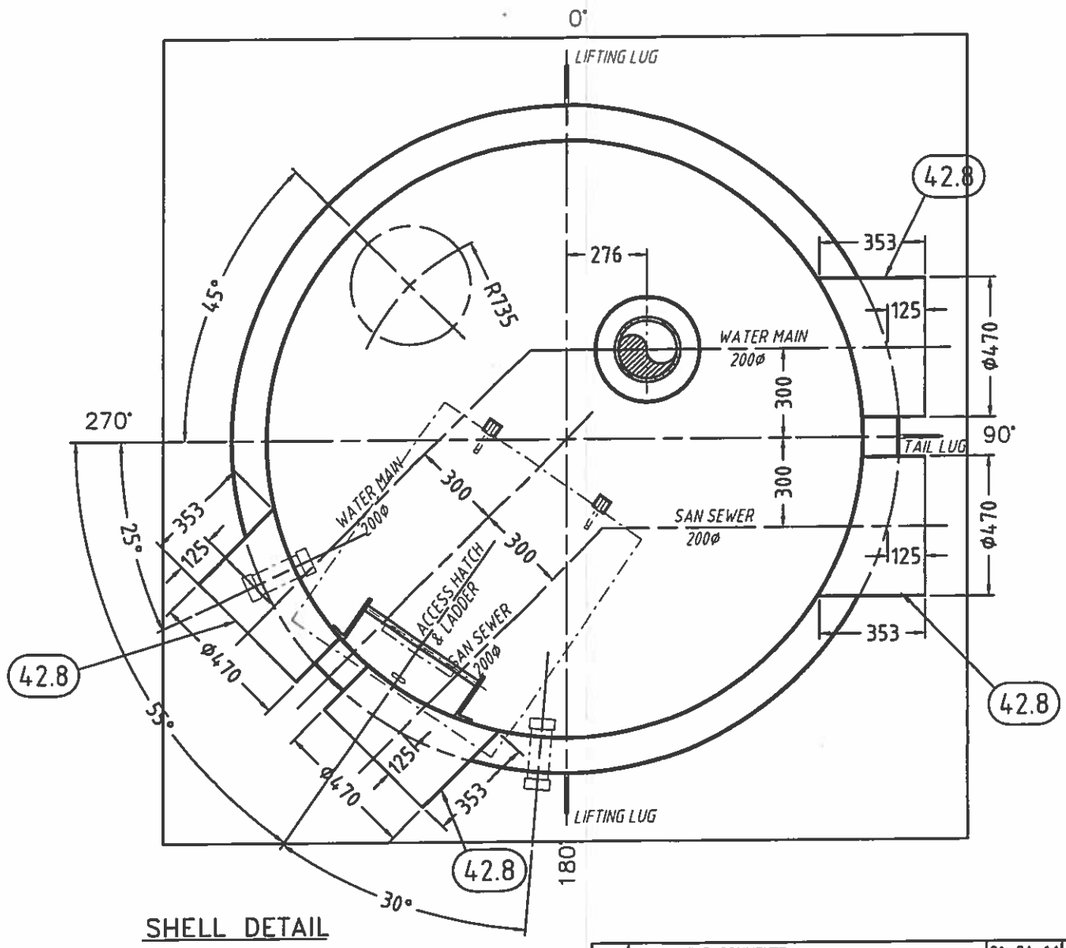
TITRE:
TITLE: ACCESS VAULT AV41
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV41	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	4 / 4	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

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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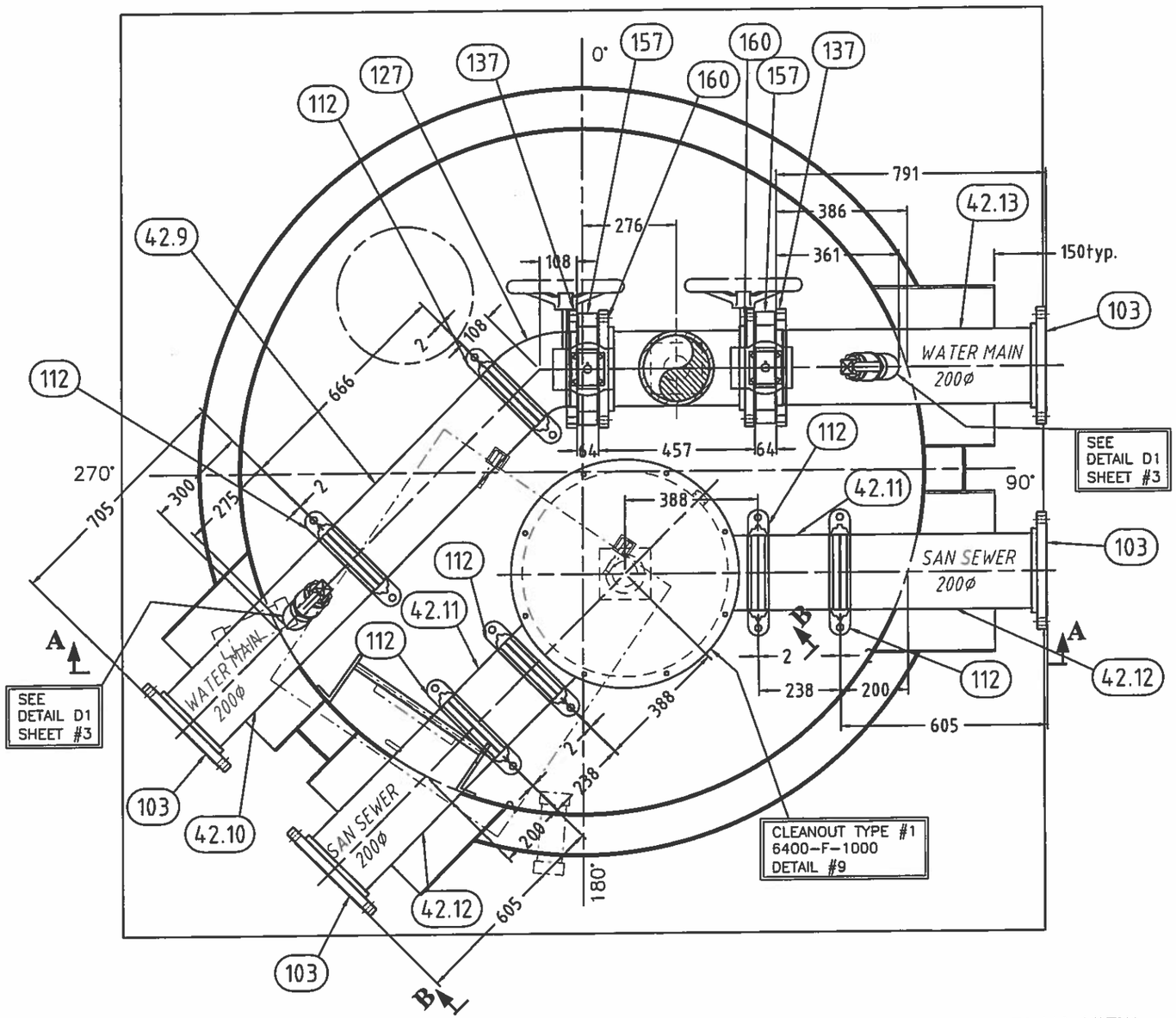
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV42
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

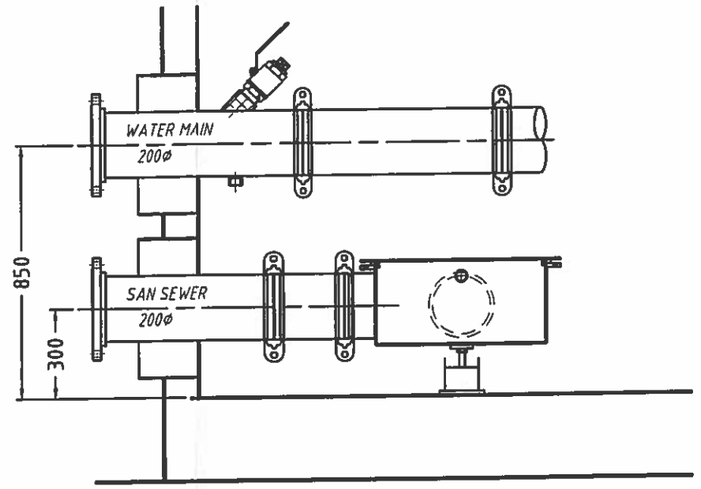
DESSIN No.:
DRAWING No: 6400-F-AV42

DESS. PAR:
DRAW BY: G.L.

SCALE	QTE. QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	A



PLAN VIEW



SECTION ''B-B''

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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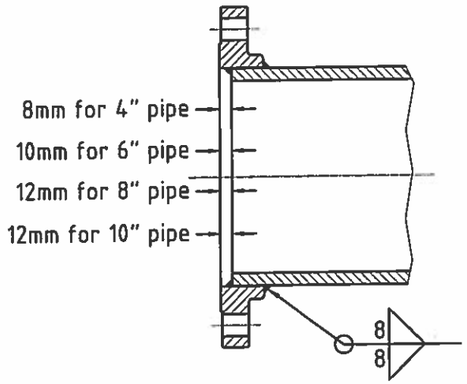
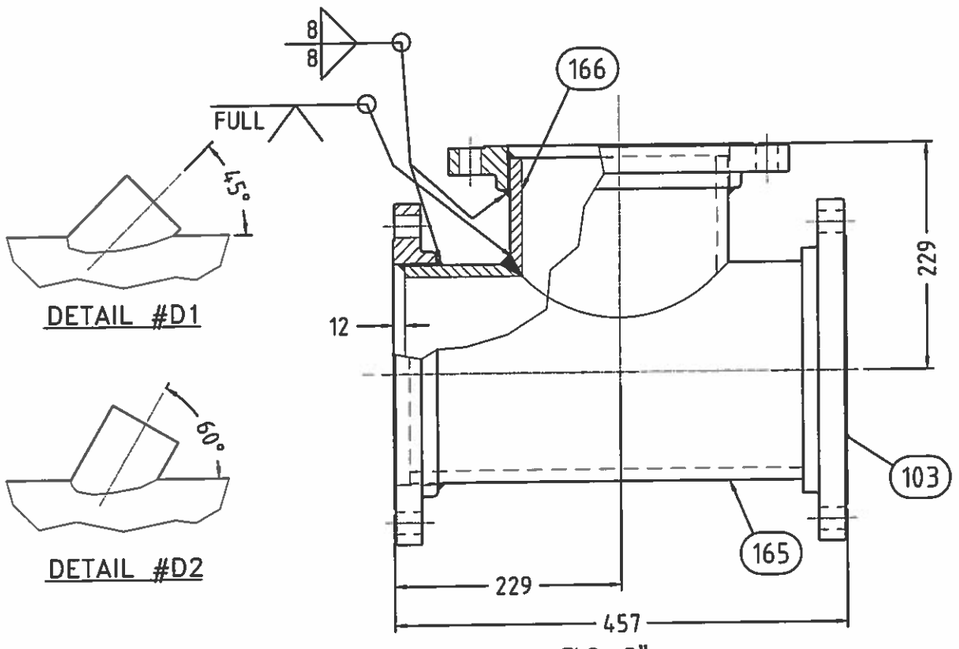
TITRE:
TITLE: ACCESS VAULT AV42
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No: 6400-F-AV42			DESS. PAR: DRAW BY: G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 2 / 3 — REV: A





DETAIL D3– TYP. WELDING

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

REV	DESCRIPTION	DATE	DESS/DRAWN
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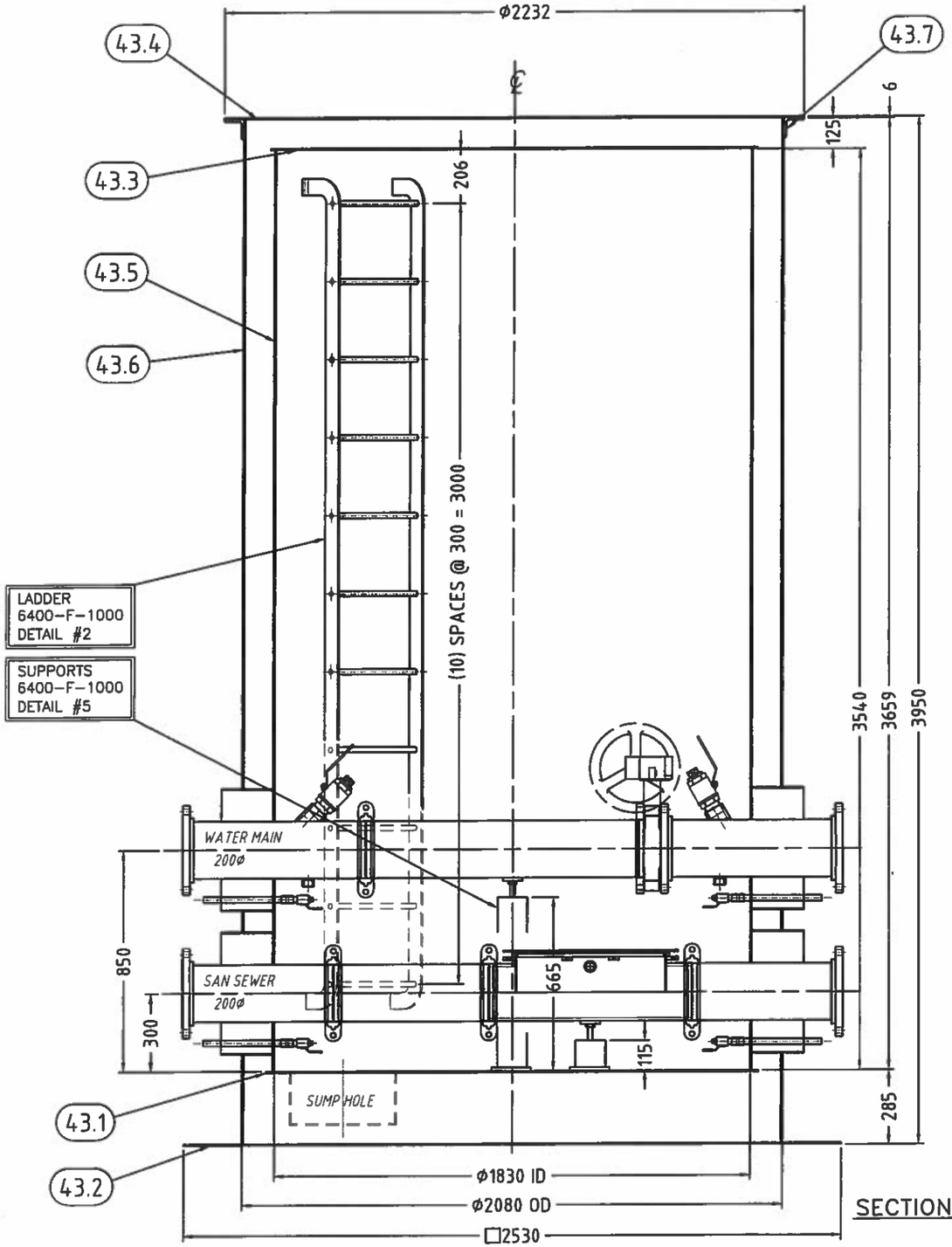
CLIENT / CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE / TITLE: ACCESS VAULT AV42
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No. / DRAWING No	DESS. PAR / DRAW BY	
6400-F-AV42	G.L.	

SCALE	QTE / QTY	DATE	FEUILLE / SHEET	REV
X/X" = X"	1	01-04-14	3 / 3	A



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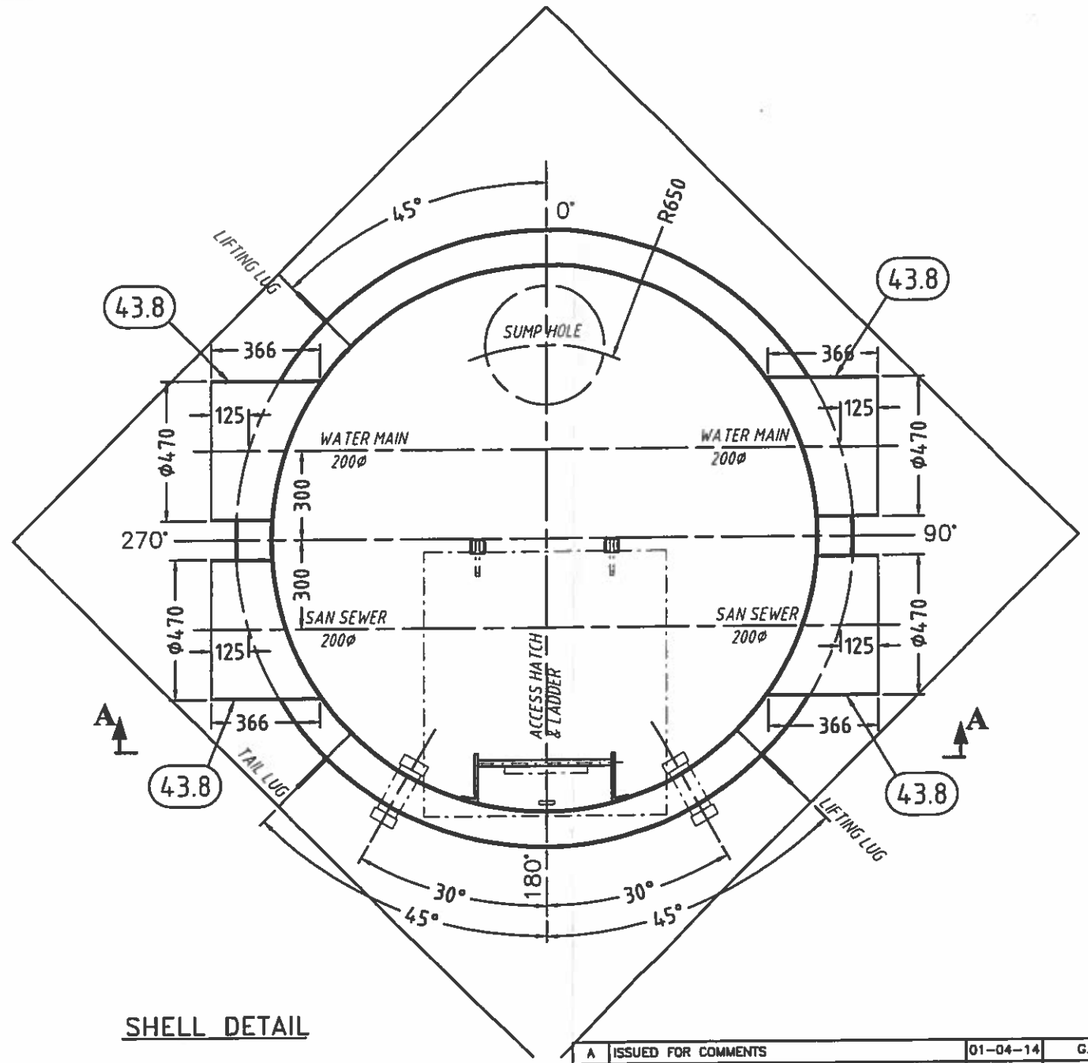

SHELL DETAIL

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

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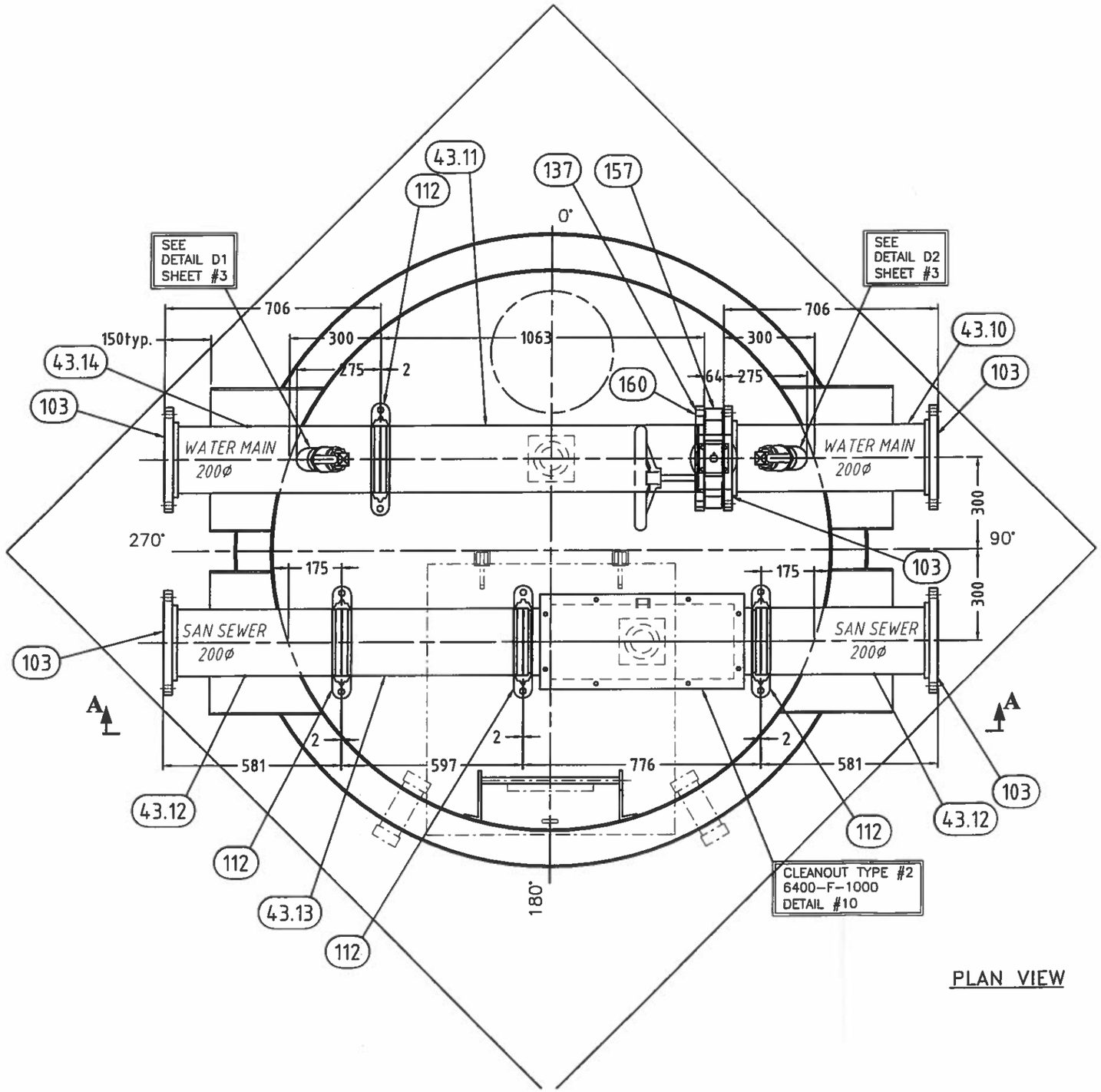
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV43
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No: 6400-F-AV43			DESS. PAR: DRAW BY: G.L.	
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: SHEET: 1 / 3	REV: A



PLAN VIEW

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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TITRE:
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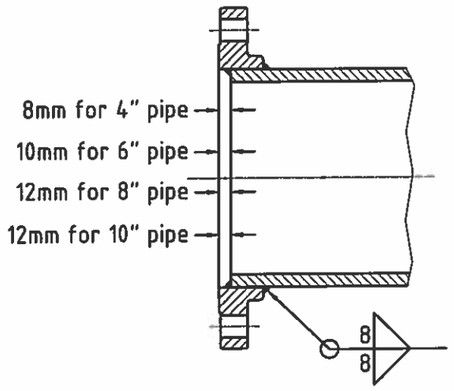
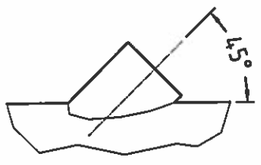
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

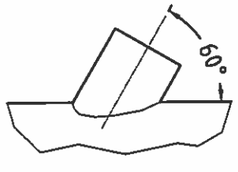
DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV43		G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14
	FEUILLE: SHEET: 2 / 3	REV: A



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.



DETAIL #D1



DETAIL #D2

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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BERLIE-FALCO
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CLIENT:
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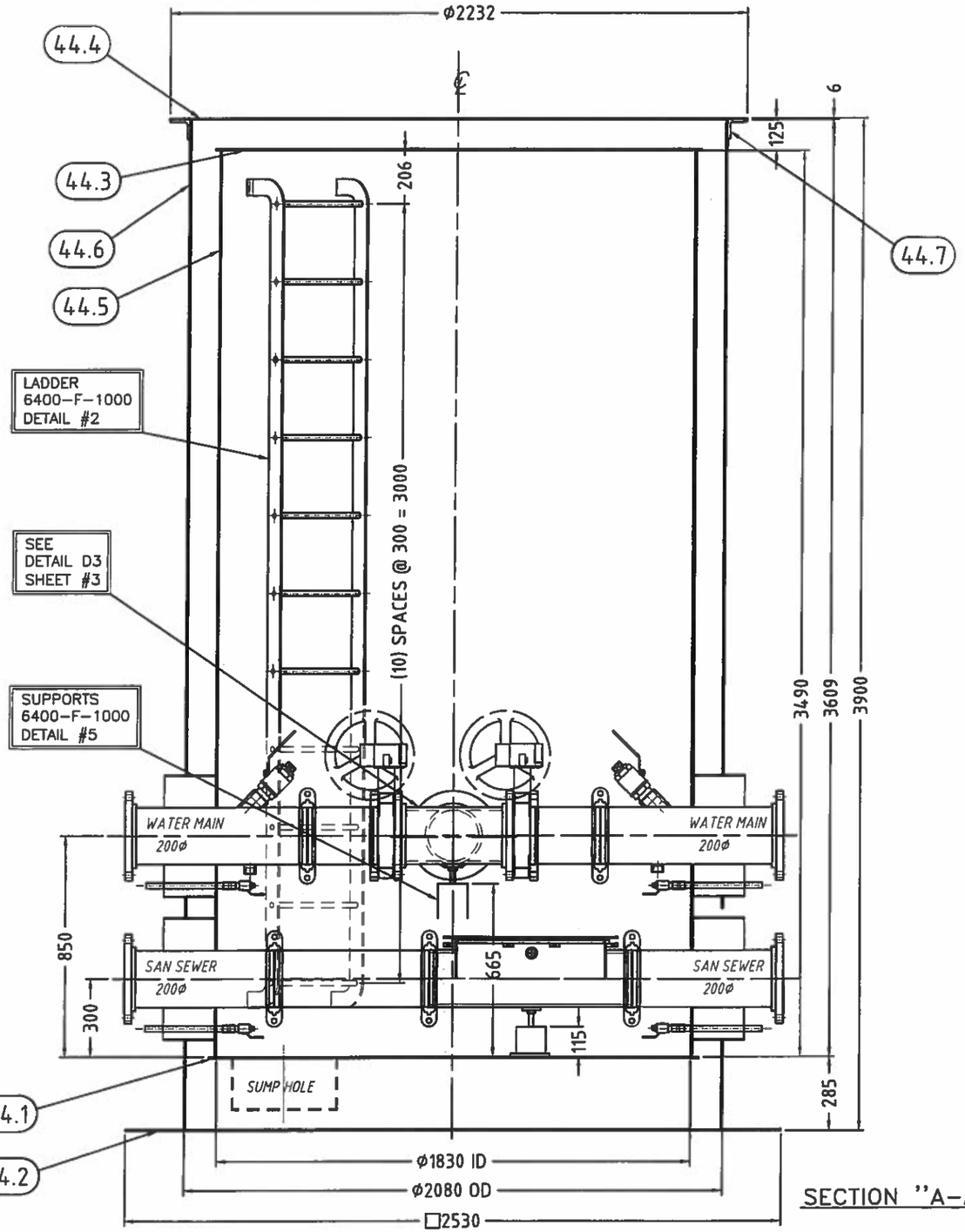
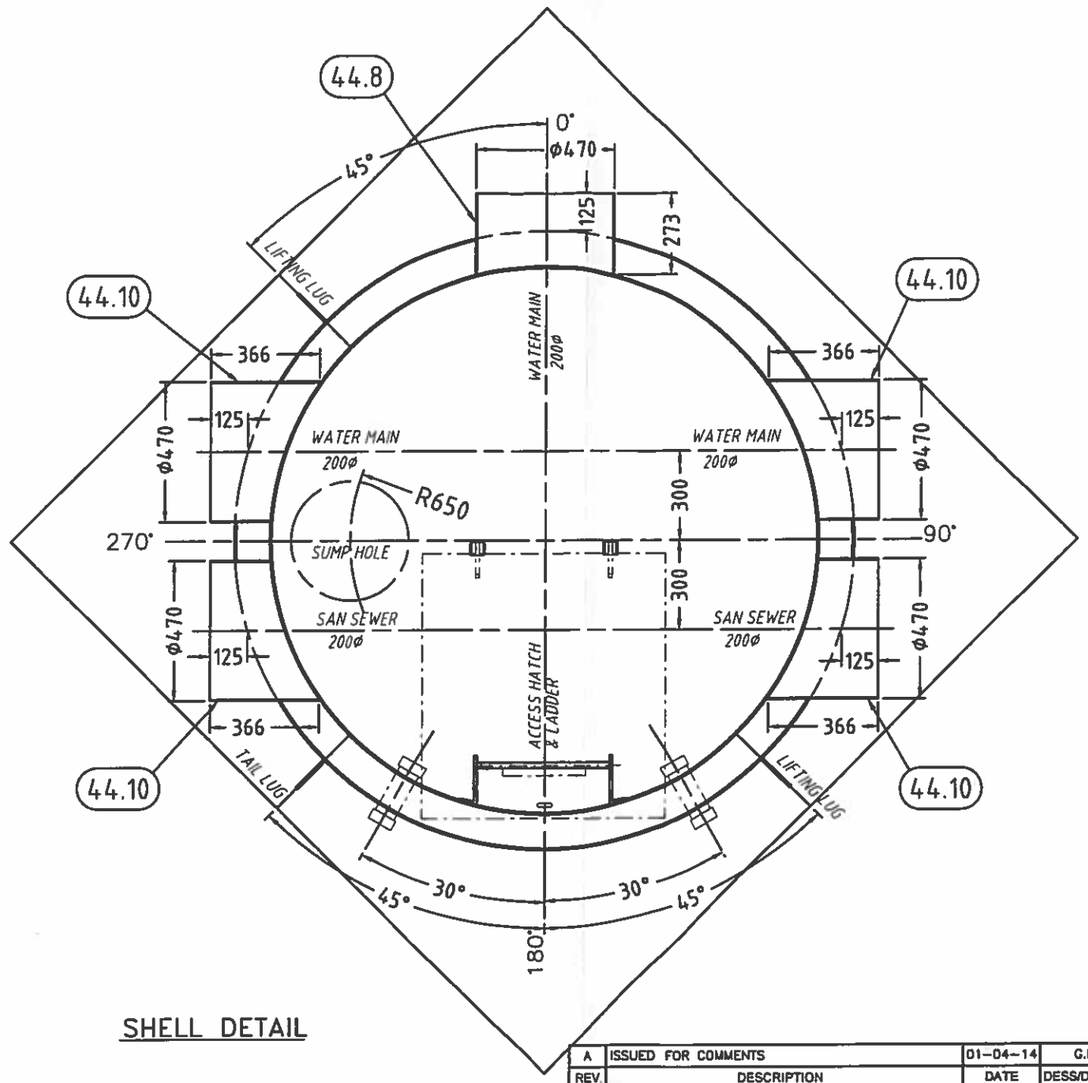
TITRE:
TITLE: ACCESS VAULT AV43
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:			DESS. PAR: DRAW BY:
6400-F-AV43			G.L.
SCALE: X/X" = X"	QTE: QTY: 1	DATE: 01-04-14	FEUILLE: 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

REV.	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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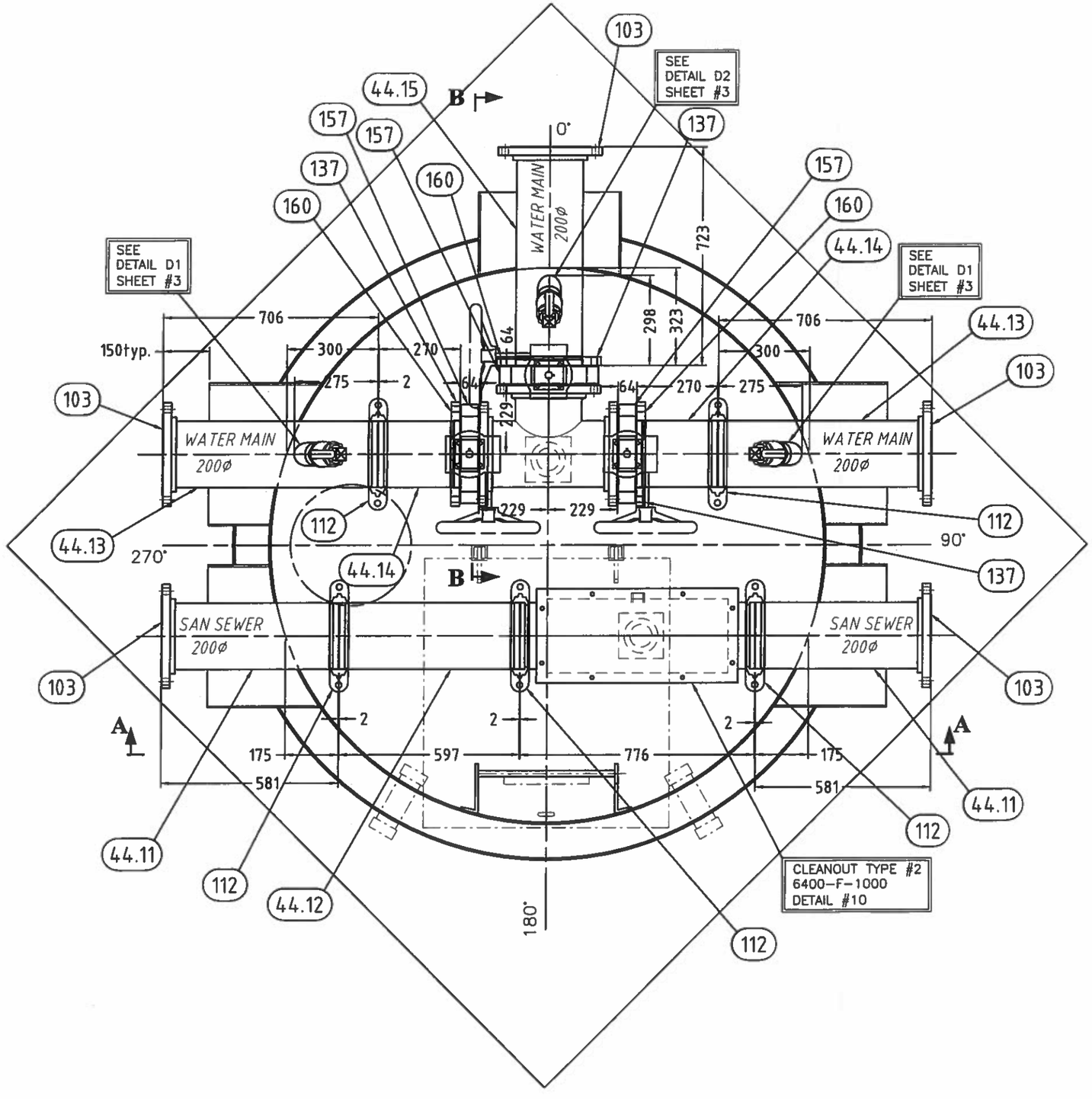
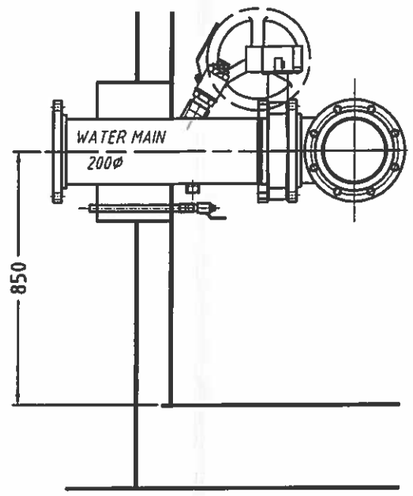
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV44
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:	DESS. PAR: DRAW BY:
6400-F-AV44	G.L.

SCALE:	QTE: QTY:	DATE:	FEUILLE: SHEET:	REV:
X/X" = X"	1	01-04-14	1 / 3	A





SECTION "B-B"

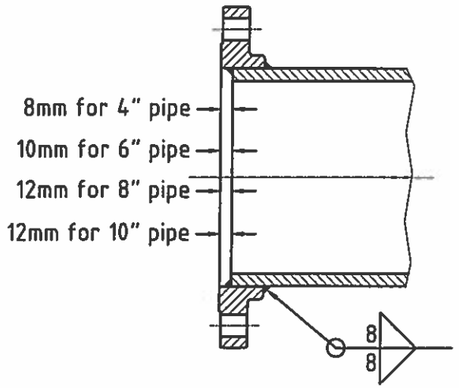
REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

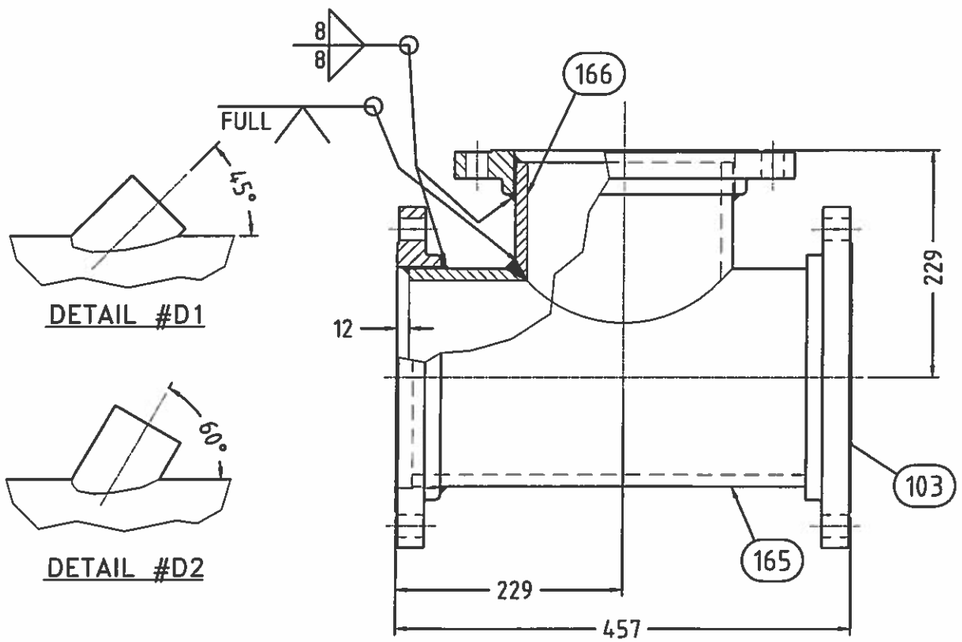
Falco Technologies Inc., a company of
BERLIE-FALCO
1245 rue Industrielle
La Prairie (Quebec)
J5R 2E4
Tel.(450) 444-0566
Fax (450) 444-2227
www.berliefalco.com

CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV44
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: DRAWING No:		DESS. PAR: DRAW BY:
6400-F-AV44		G.L.
SCALE: X/X" = X"	QTE: QTY: 1 / DATE: 01-04-14	FEUILLE: SHEET: 2 / 3 — REV: A





FLG. 8"

DETAIL D3– TYP. WELDING

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

REV	DESCRIPTION	DATE	DESS/DRAWN
A	ISSUED FOR COMMENTS	01-04-14	G.L.

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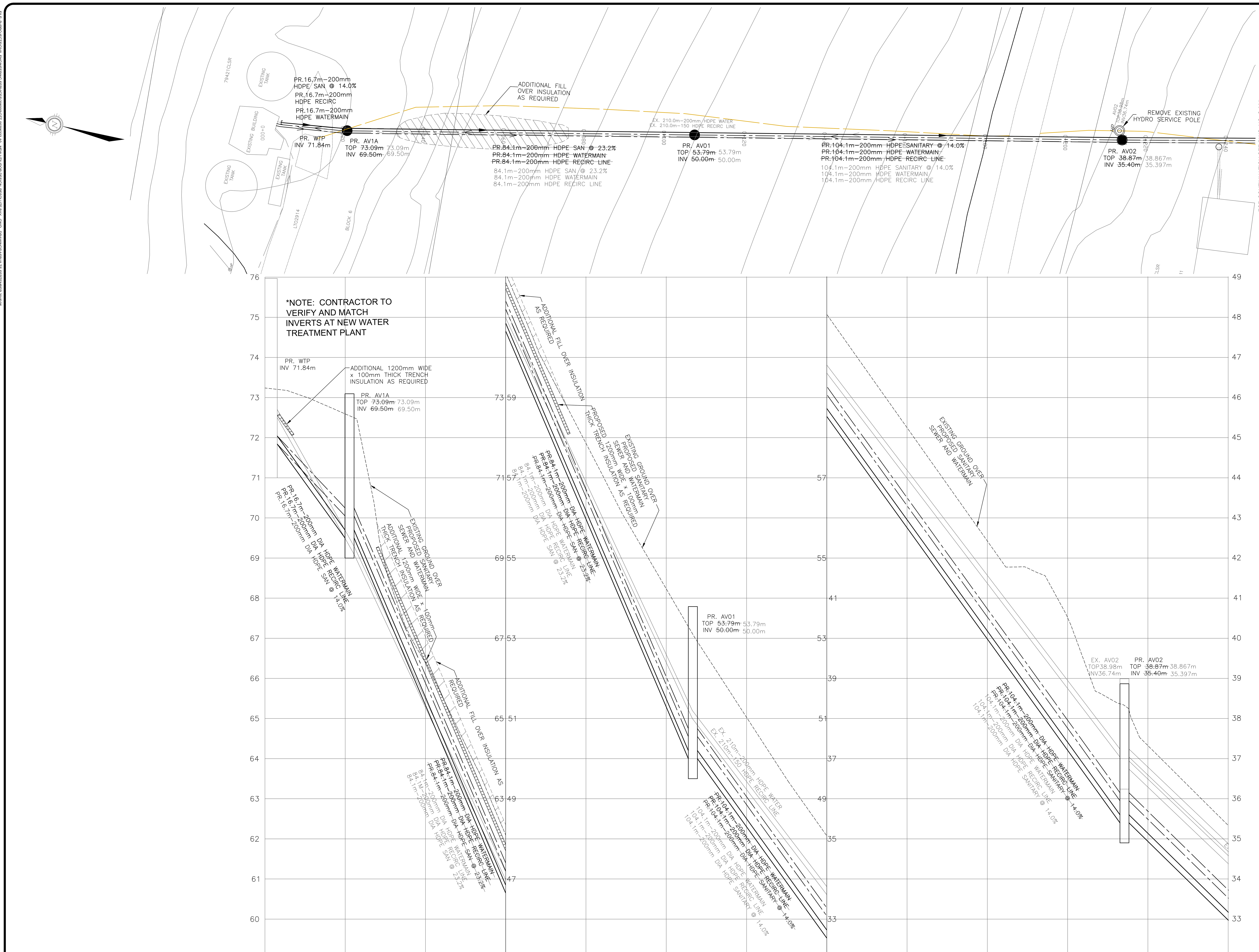
CLIENT:
CUSTOMER: GOVERNEMENT OF NUNAVUT

TITRE:
TITLE: ACCESS VAULT AV44
NEW UTILIDOR DESIGN RESOLUTE BAY , NU

DESSIN No.: / DRAWING No:	DESS. PAR: / DRAW BY:
6400-F-AV44	G.L.

SCALE:	QTE: / QTY:	DATE:	FEUILLE: / SHEET:	REV:
X/X" = X"	1	01-04-14	3 / 3	A

AS BUILTS – RESOLUTE



	0+000	0+020	0+021.74	0+040	0+060	0+080	0+100	0+106.62	0+120	0+140	0+160	0+180	0+200	0+214.17	0+220
PROPOSED ELEVATION	73.24	72.59		66.40	62.09	57.86	54.23		51.03	47.52	43.76	41.50	40.51		37.05
TOP OF WATERMAIN ELEVATION	72.70 16.7m–200mmø SERIES 128 HDPE WATERMAIN 70.25		70.25		~~84.1m–200mmø SERIES 128 HDPE WATERMAIN~~ 84.1m–200mmø SERIES 128 HDPE WATERMAIN			50.75 | 50.75			~~104.1m–200mmø SERIES 128 HDPE WATERMAIN~~ 104.1m–200mmø SERIES 128 HDPE WATERMAIN			36.15 | 36.15	
TOP OF WATER RECIRC ELEVATION	72.70 16.7m–200mmø SERIES 128 HDPE RECIRC 70.25		70.25		~~84.1m–200mmø SERIES 128 HDPE RECIRCULATION~~ 84.1m–200mmø SERIES 128 HDPE RECIRCULATION			50.75 | 50.75			~~104.1m–200mmø SERIES 128 HDPE RECIRCULATION~~ 104.1m–200mmø SERIES 128 HDPE RECIRCULATION			36.15 | 36.15	
SANITARY SEWER INVERT	72.50 16.7m–200mmø SERIES 128 HDPE SAN @ 18.0% ~~69.50~~		~~69.50~~ 69.50		~~84.1m–200mmø SERIES 128 HDPE SAN @ 23.2%~~ 84.1m–200mmø SERIES 128 HDPE SAN @ 23.2%			~~50.00~~ | ~~50.00~~ 50.00			~~104.1m–200mmø SERIES 128 HDPE SAN @ 14.0%~~ 104.1m–200mmø SERIES 128 HDPE SAN @ 14.0%			~~35.40~~ | ~~35.40~~ 35.397	
EXISTING ELEVATION	73.24	72.59		66.40	62.09	57.86	54.23		51.03	47.52	43.76	41.50	40.51		37.05

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

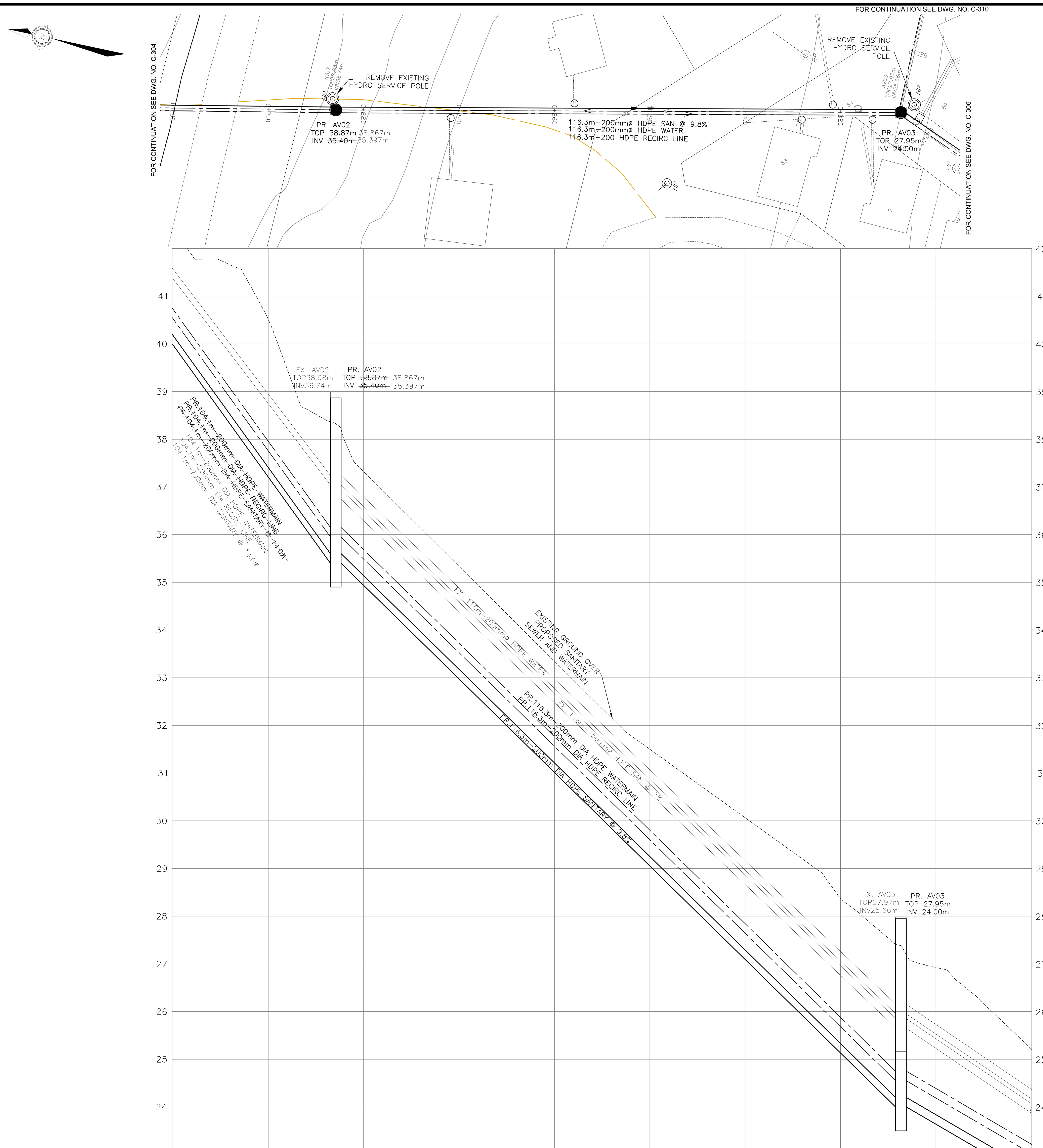
Dwg. Title

PLAN AND PROFILE
SIGNAL HILL TO AV02

Project No. OTT-00206333-A0

Dwg. No. **C-304** Rev. No. 03

Scale 1:500
This drawing is not to be scaled



PROPOSED ELEVATION	40.51		37.05	34.25	32.54	30.89	29.16	28.36		26.92		
TOP OF WATERMAIN ELEVATION		36.15 | 36.15	116.3m–200mmø SERIES 128 HDPE WATERMAIN						NW24.75 | SW24.75 E 24.75			
TOP OF WATER RECIRC ELEVATION		36.15 | 36.15	116.3m–200mmø SERIES 128 HDPE RECIRCULATION						NW24.75			
SANITARY SEWER INVERT		~~35.40~~ | ~~35.40~~ 35.397	116.3m–200mmø SERIES 128 HDPE SAN @ 9.8%						24.00 | 24.00			
EXISTING ELEVATION	40.51		37.05	34.25	32.54	30.89	29.16	28.36		27.47		
CHAINAGE	0+200	214.17	0+220	0+240	0+260	0+280	0+300	0+320	332.66	0+340		

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

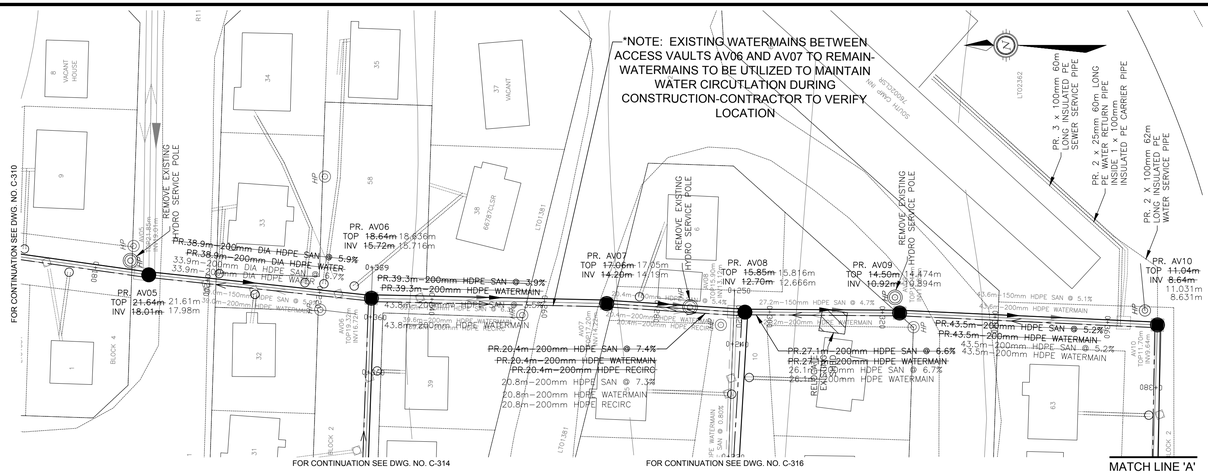
Dwg. Title

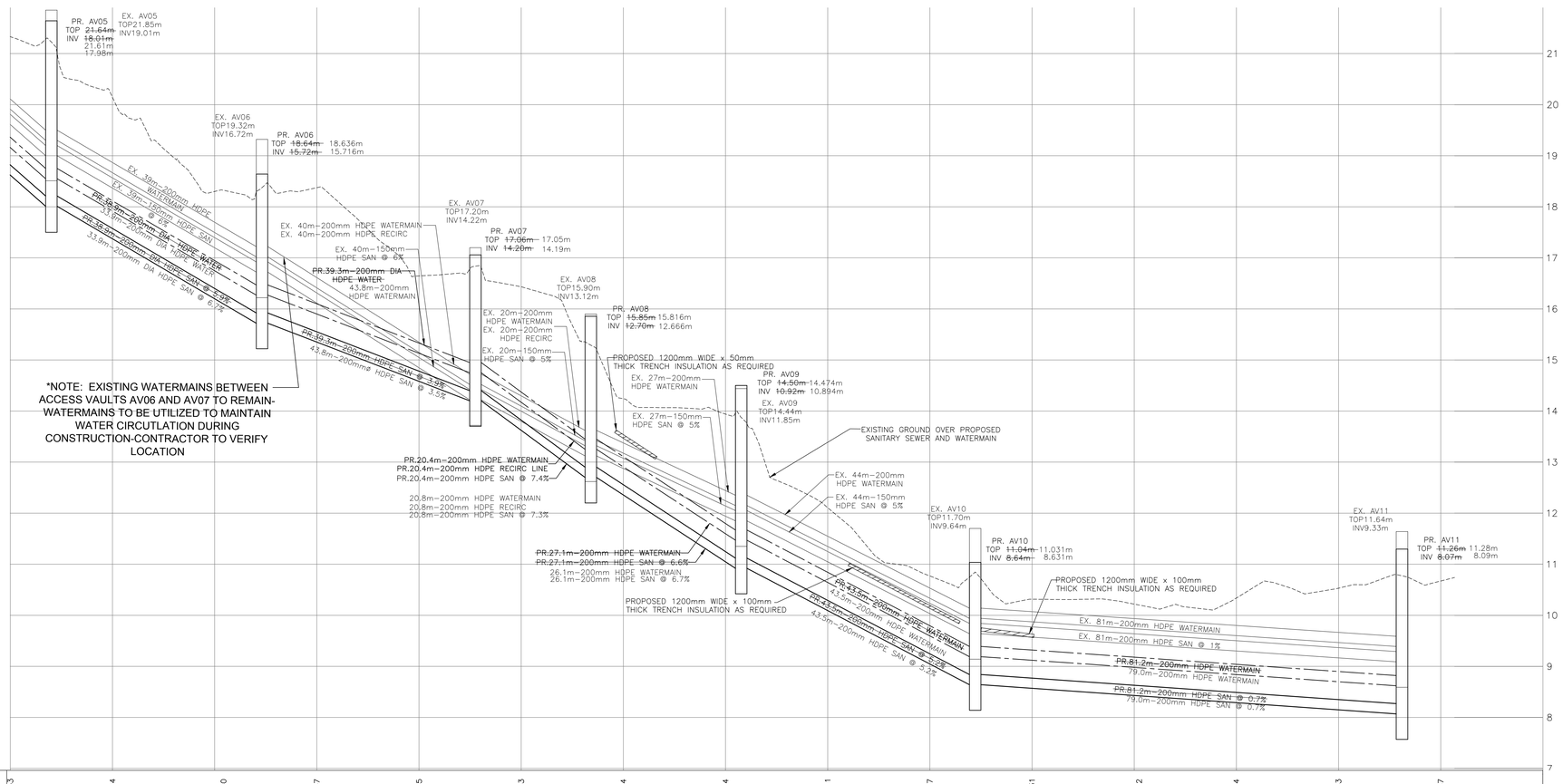
PLAN AND PROFILE AV02 TO AV03

Project No. OTT-00206333-A0

Dwg. No. **C-305** Rev. No. 03

Scale 1:500
This drawing is not to be scaled





No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
00	100% SUBMISSION	SLB 2013-MAR-04
No.	Revision	Ckd. By Date

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

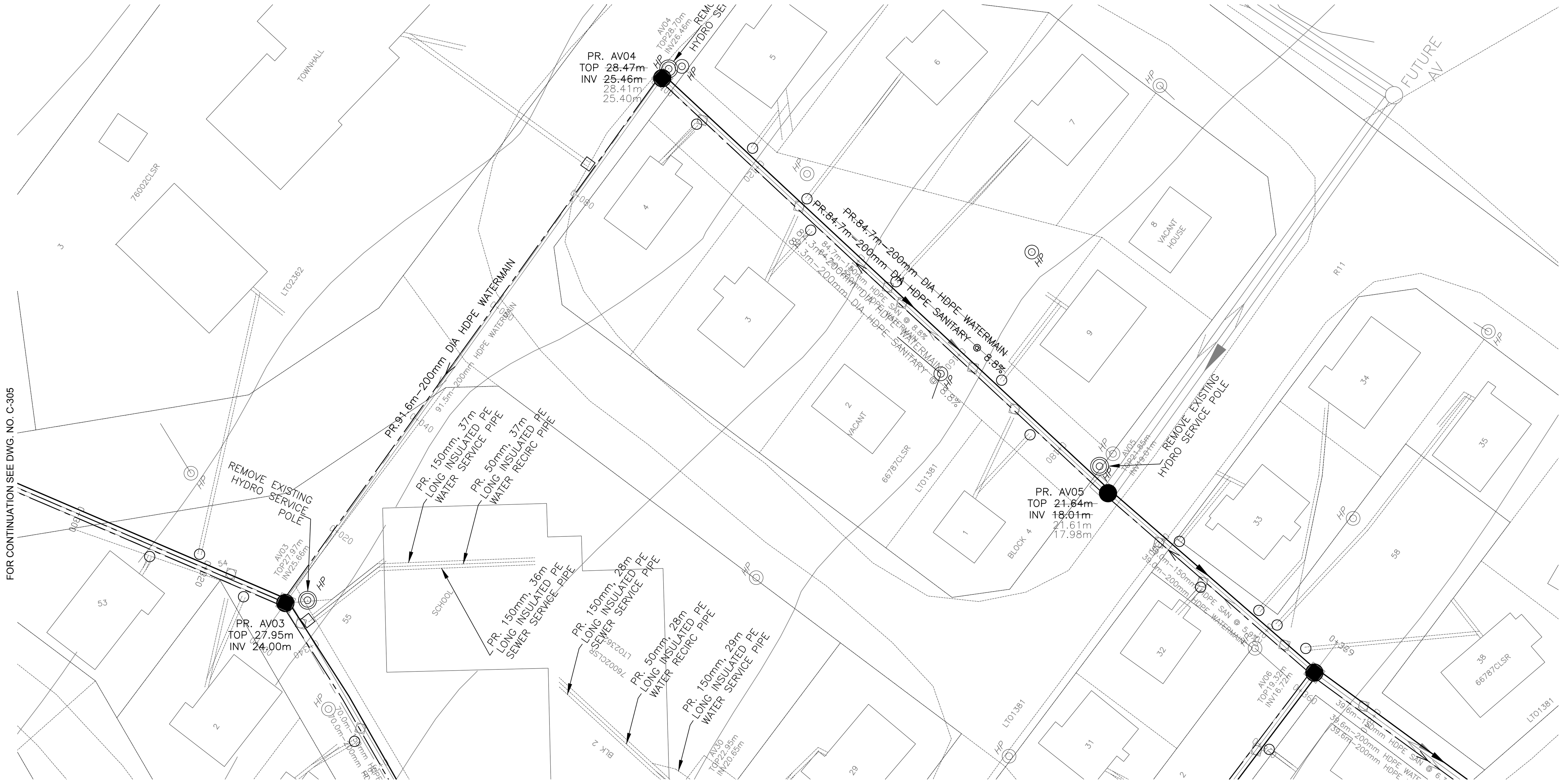
Dwg. Title

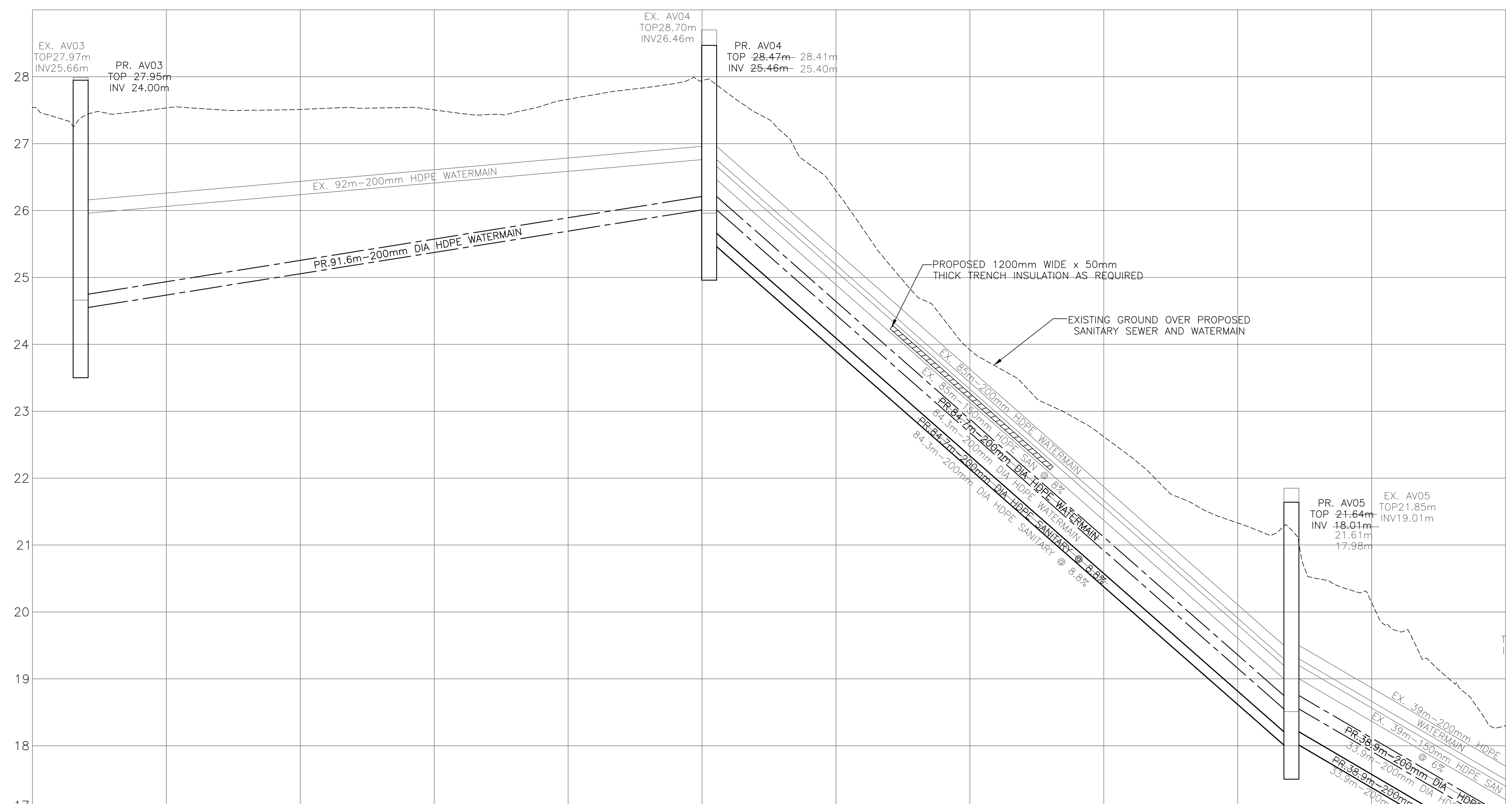
PLAN AND PROFILE AV05 TO AV11

Project No. OTT-00206333-A0

Dwg. No. **C-311** Rev. No. 03

Scale 1:500
This drawing is not to be scaled





PROPOSED ELEVATION	27.54	27.53	27.51	27.50	27.66	27.94	26.30	23.92	22.62	21.33	20.14
TOP OF WATERMAIN ELEVATION	NW24.75 / SW24.75 E 24.75	91.6m-200mmø SERIES 128 HDPE WATERMAIN				26.21	84.7m-200mmø SERIES 128 HDPE WATERMAIN / 84.3m-200mmø SERIES 128 HDPE WATERMAIN			18.76 / 18.76	38.9m-200mmø SERIES 12 HDPE WATERMAIN / 33.9m-200mmø SERIES 128 HDPE WATERMAIN
TOP OF WATER RECIRC ELEVATION	NW24.75 / SW24.75 E 24.75										
SANITARY SEWER INVERT	24.00 / 24.00					25.46 25.40	84.7m-200mmø SERIES 128 HDPE SAN @ 8.8% / 84.3m-200mmø SERIES 128 HDPE SAN @ 8.8%			18.01 / 18.01 17.98	38.9m-200mmø SERIES 12 HDPE SAN @ 5.9% / 33.9m-200mmø SERIES 128 HDPE SAN @ 6.7%
EXISTING ELEVATION	27.54	27.53	27.51	27.50	27.66	27.94	26.30	23.92	22.62	21.33	20.14
CHAINAGE	0+000 / 0+007.20	0+020	0+040	0+060	0+080	0+100 / 0+101.06	0+120	0+140	0+160	0+180 / 0+188.03	0+200

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

ISSUED FOR CONSTRUCTION

Const. North

Date Printed

Drawn By: I.CRAWFORD
Dwg. Standards Ckd. By:
Designed By: A. ZARAD
Dwg. Design Ckd. By: S. BURDEN

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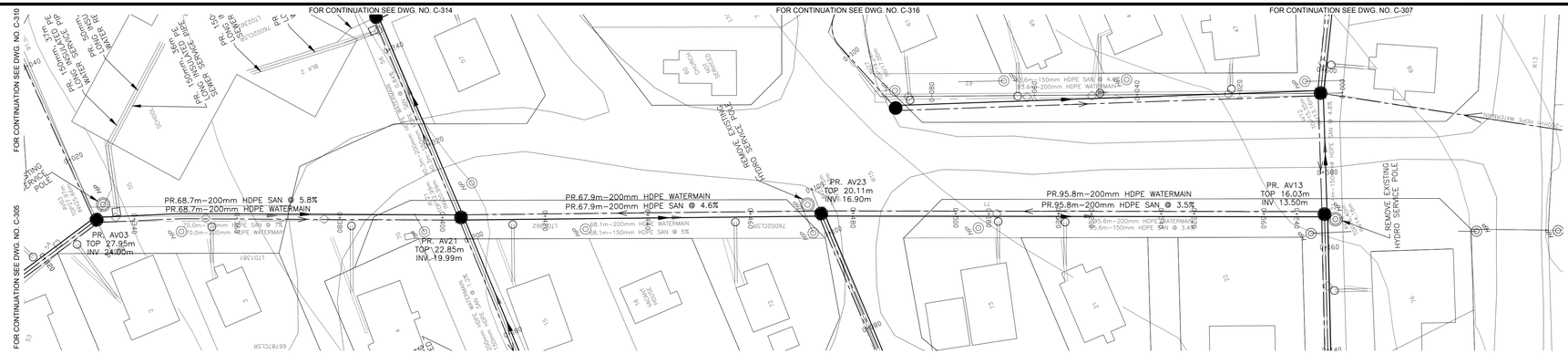
Project Title
NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title
PLAN AND PROFILE AV03 TO AV05

Project No. OTT-00206333-A0
Dwg. No. **C-310** Rev. No. 03
Scale 1:500
This drawing is not to be scaled



No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
00	100% SUBMISSION	SLB 2013-MAR-04
No.	Revision	Ckd. By / Date

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

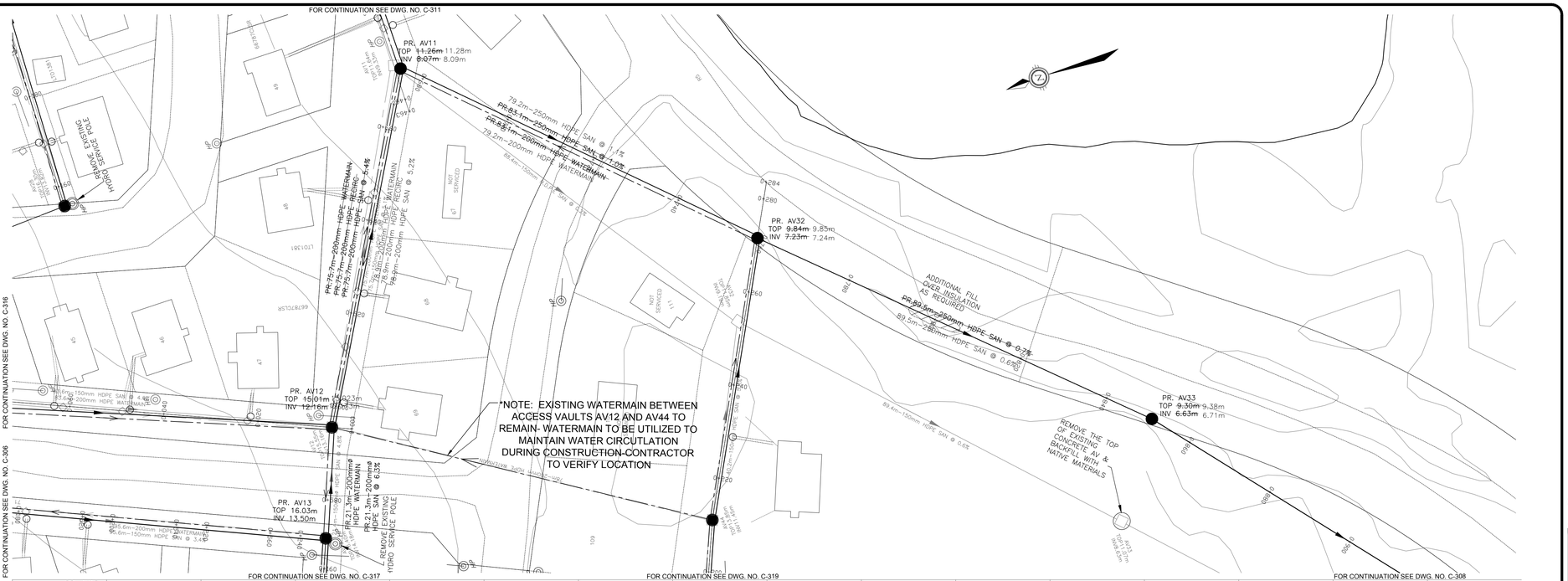
Dwg. Title

PLAN AND PROFILE AV03 TO AV13

Project No. OTT-00206333-A0

Dwg. No. **C-306** Rev. No. 03

Scale 1:500
This drawing is not to be scaled



No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
00	100% SUBMISSION	SLB 2013-MAR-04
No.	Revision	Ckd. By / Date

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

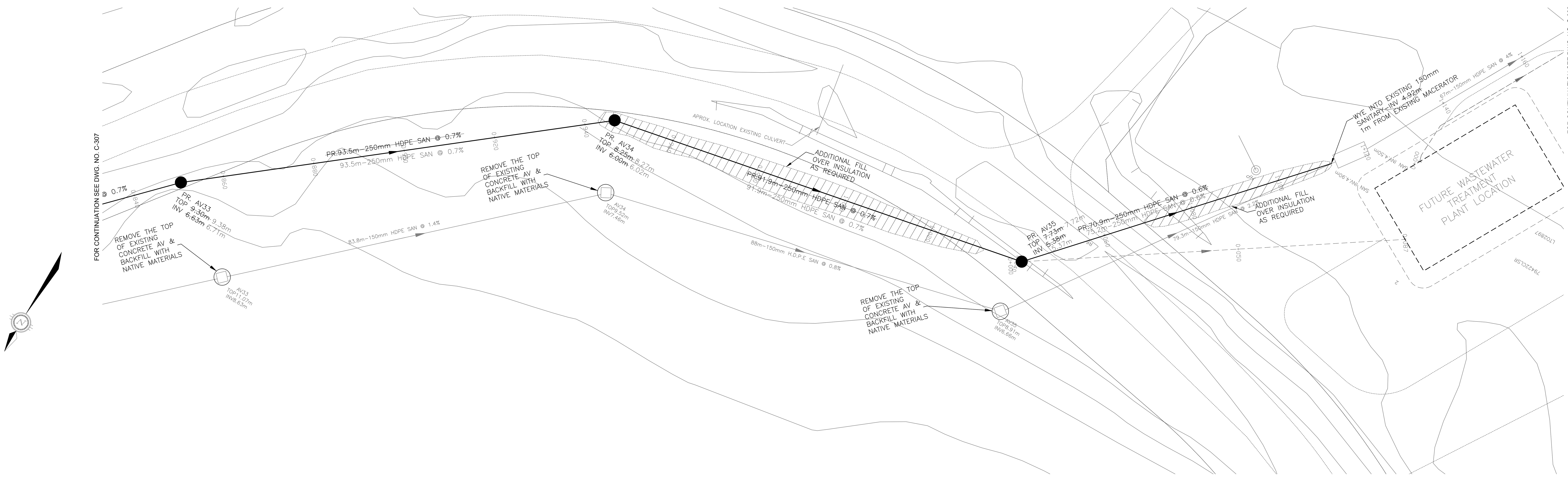
PLAN AND PROFILE AV13 TO AV33

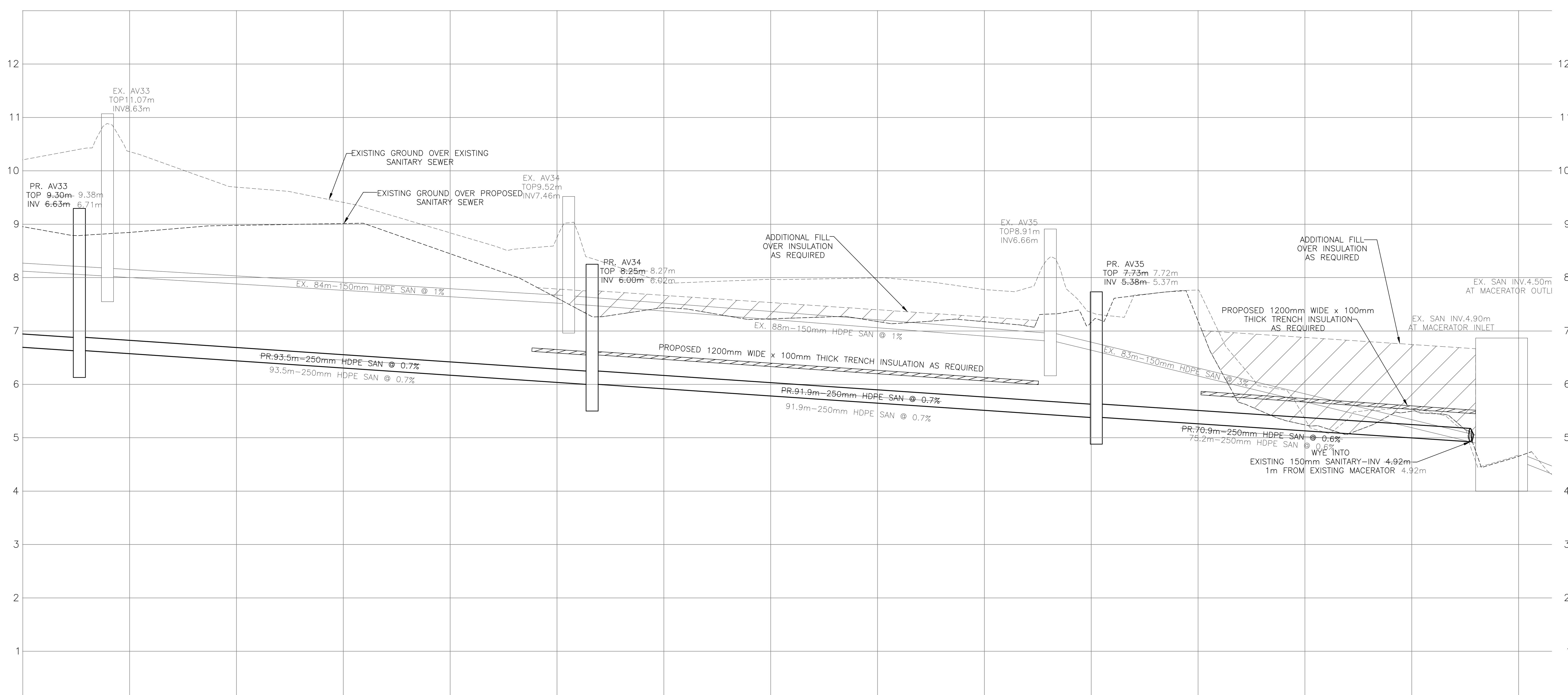
Project No. OTT-00206333-A0

Dwg. No. **C-307** Rev. No. 03

Scale 1:500

This drawing is not to be scaled





CHAINAGE	0+850.60	0+860	0+880	0+900	0+920	0+940	0+946.58	0+960	0+980	1+000	1+020	1+040	1+040.96	1+060	1+080	1+100	1+111.97	1+120	1+121.67
PROPOSED ELEVATION		8.85	8.98	9.01	8.45	7.62		7.44	7.23	7.18	7.17	7.16		7.19	5.24	5.50		4.65	
TOP OF WATERMAIN ELEVATION																			
TOP OF WATER RECIRC ELEVATION																			
SANITARY SEWER INVERT	6.63 / 6.63 6.71			~~93.5m–250mmø SERIES 128 HDPE SAN @ 0.7%~~ 93.5m–250mmø SERIES 128 HDPE SAN @ 0.7%			6.00 / 6.00 6.02			~~91.9m–250mmø SERIES 128 HDPE SAN @ 0.7%~~ 91.9m–250mmø SERIES 128 HDPE SAN @ 0.7%			5.38 / 5.38 5.37		~~70.9m–250mmø SERIES 128 HDPE SAN @ 0.6%~~ 75.2m–250mmø SERIES 128 HDPE SAN @ 0.6%		4.92 / 4.92 EX.4.90		EX.4.50
EXISTING ELEVATION		8.04	8.73	6.07	6.13	6.07		6.10	6.08	6.04	6.08	6.06		6.72	6.41	6.08		6.94	

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
02	ISSUED FOR CONSTRUCTION	2014-APR-21

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

ISSUED FOR CONSTRUCTION

Const. North

Date Printed

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

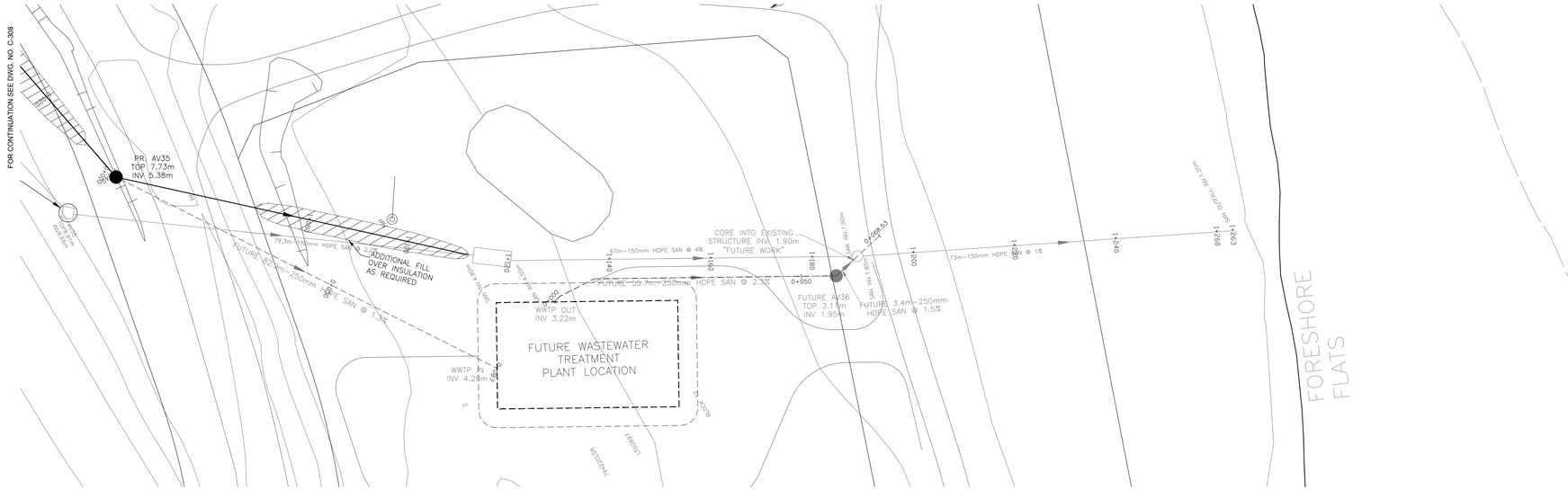
PLAN AND PROFILE
AV33 TO EXIST. SAN

Project No. OTT-00206333-A0

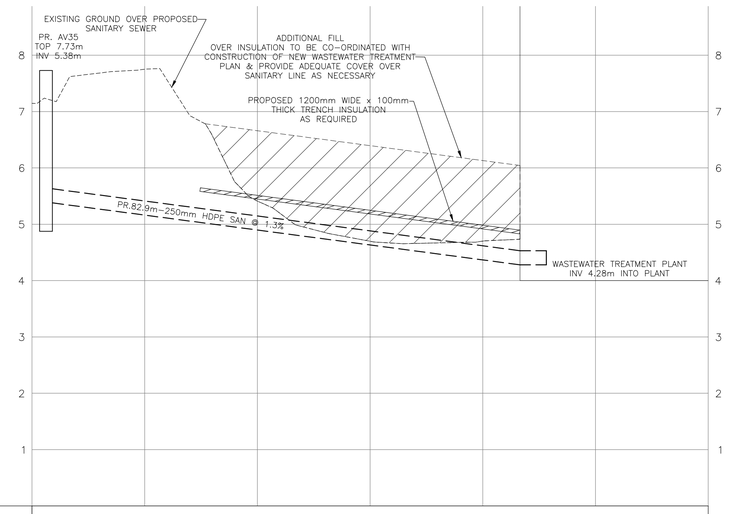
Dwg. No. **C-308** Rev. No. 03

Scale 1:500
This drawing is not to be scaled

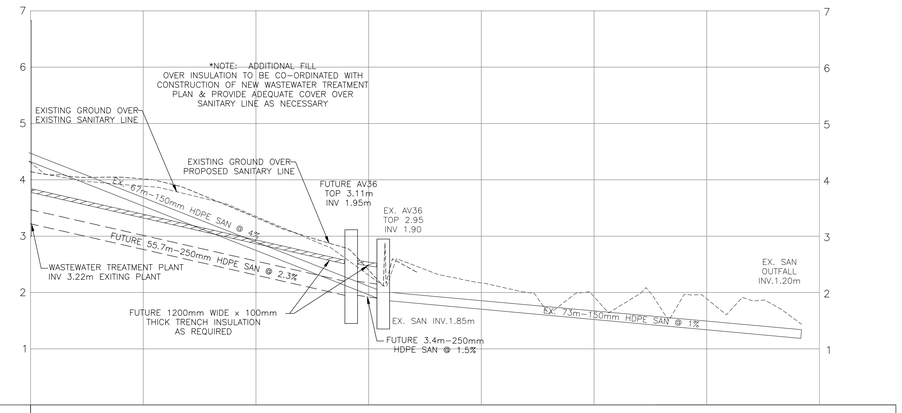
FILE: P:\PROJECTS\CIVIL ENGINEERING SERVICES\206000\OTT-00206333-A0 - NEW UTILIDOR DESIGN, RESOLUTE BAY - GND - DRAWINGS\ASBUILTS-SEPTEMBER 2015\06-206333-PLAN & PROFILES.DWG
PLOTTED BY: IAN CRAWFORD DATE: 2016/Apr/26 8:15:05 AM



FUTURE WORK FOR INFORMATION PURPOSE ONLY



PROPOSED ELEVATION	7.15		7.75		5.41	4.70	4.70	
TOP OF WATERMAIN ELEVATION								
TOP OF WATER RECIRC ELEVATION								
SANITARY SEWER INVERT	5.38	5.38	82.9m–200mmø SERIES 128 HDPE SAN @ 1.3%				4.28	
EXISTING ELEVATION	7.15		7.75		5.41	4.70	4.70	
CHAINAGE	0+000	0+002.49	0+020	0+040	0+060	0+080	0+086.61	0+100	0+120



PROPOSED ELEVATION	4.15	4.02	3.33	2.40			1.57	1.67
TOP OF WATERMAIN ELEVATION								
TOP OF WATER RECIRC ELEVATION								
SANITARY SEWER INVERT	3.22	55.7m–250mmø SERIES 128 HDPE SAN @ 2.3%			1.95	EX. 1.90	EX. 1.85	EX. 1.20
EXISTING ELEVATION	4.15	4.02	3.33	2.40			1.57	1.67
CHAINAGE	0+000	0+020	0+040	0+056.91 0+060	0+080	0+100		

No.	Issue	Date

Nunavut

No.	Revision	Ckd. By	Date

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV35 TO AV36

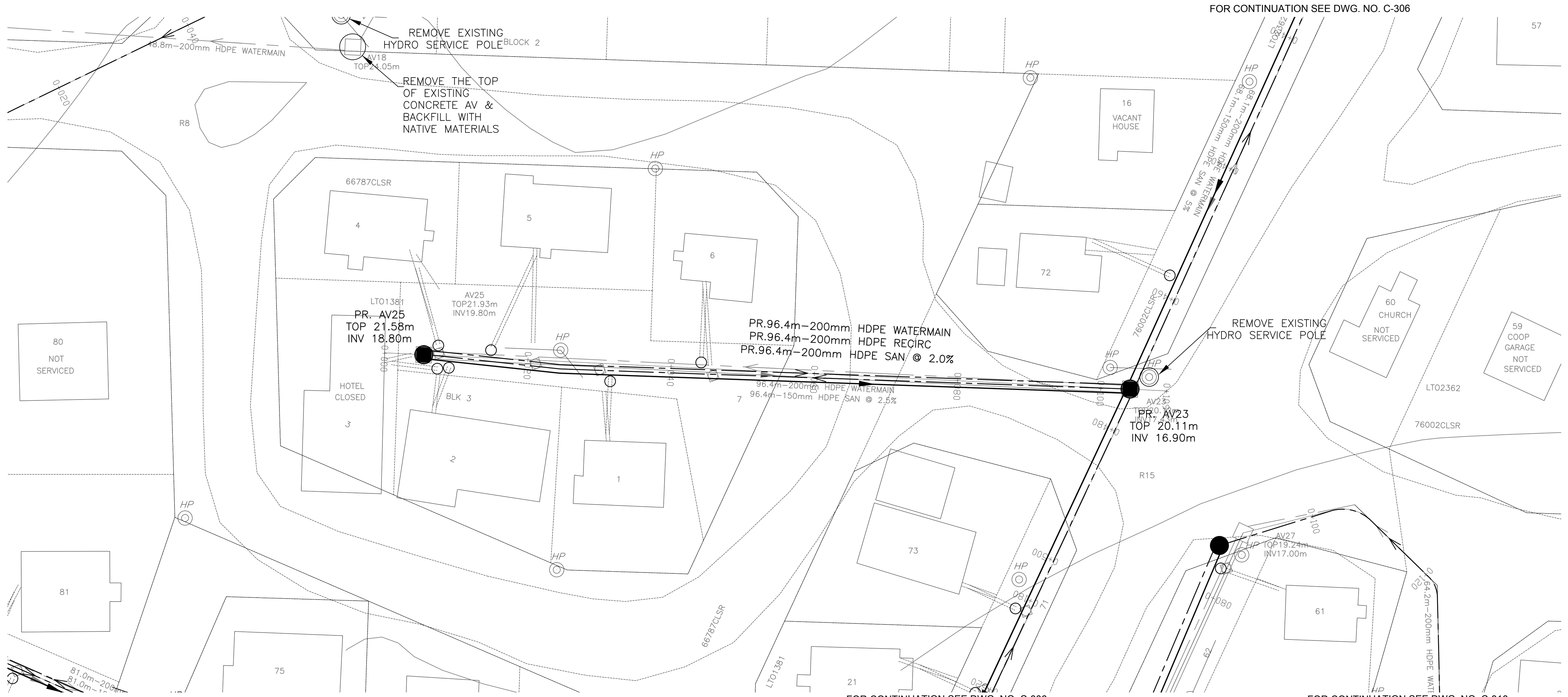
Project No. OTT-00206333-A0

Dwg. No. **C-309** Rev. No. 00

Scale 1:500

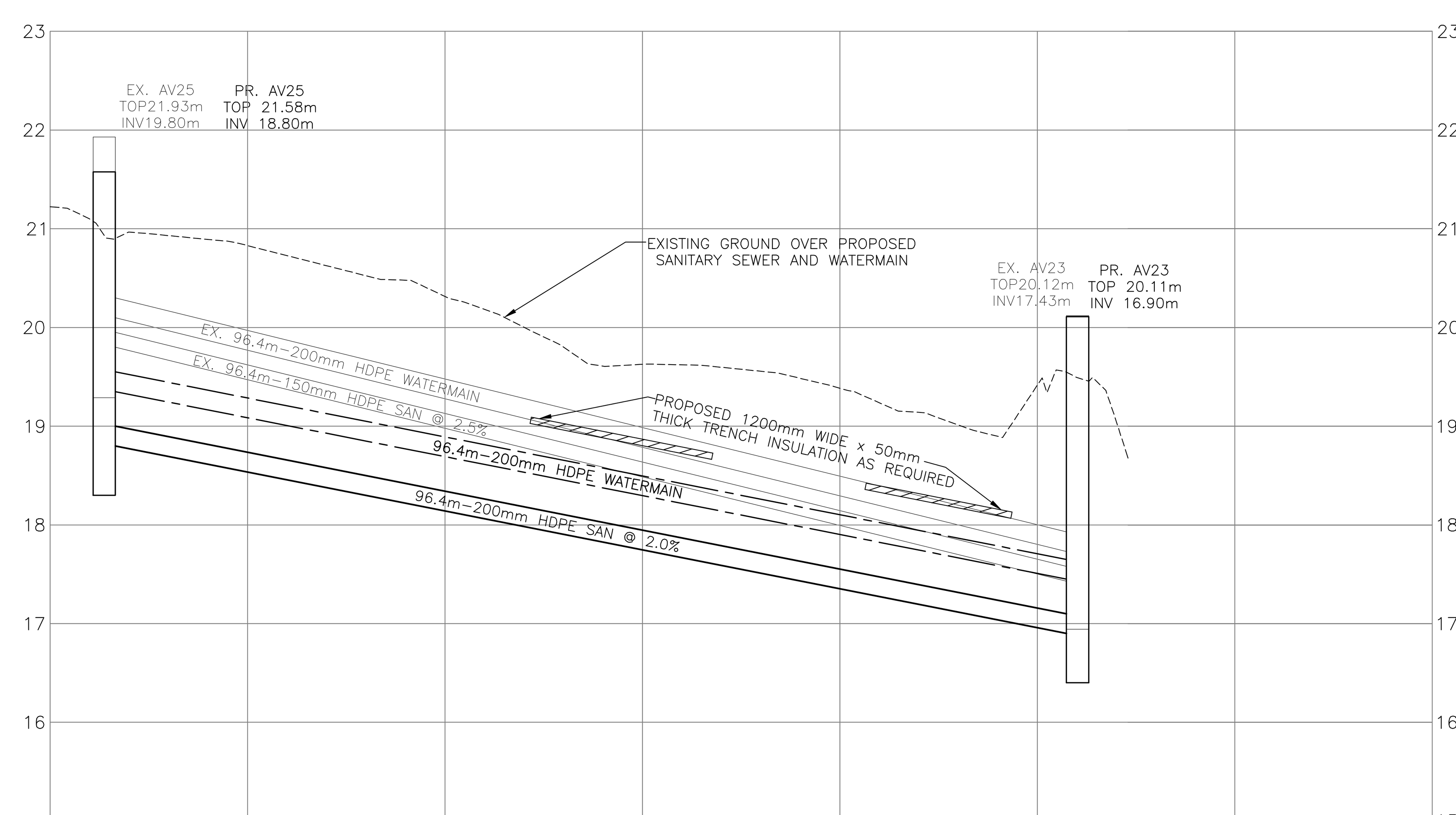
This drawing is not to be scaled

FOR CONTINUATION SEE DWG. NO. C-306



FOR CONTINUATION SEE DWG. NO. C-306

FOR CONTINUATION SEE DWG. NO. C-316



PROPOSED ELEVATION	21.22		20.83	20.32	19.63	19.38	19.41			
TOP OF WATERMAIN ELEVATION		19.55			96.4m–200mmø SERIES 128 HDPE WATERMAIN		W 17.65	NE17.65 SW17.65		
TOP OF WATER RECIRC ELEVATION		19.55			96.4m–200mmø SERIES 128 HDPE RECIRCULATION		17.65			
SANITARY SEWER INVERT		18.80			96.4m–200mmø SERIES 128 HDPE SAN @ 2.0%		W 16.90	NE16.90 SW16.90		
EXISTING ELEVATION	21.22		20.83	20.32	19.63	19.38	19.41			
CHAINAGE	0+000	0+005.48	0+020	0+040	0+060	0+080	0+100	0+104.08	0+120	0+140

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

ISSUED FOR CONSTRUCTION

Const. North

Date Printed

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

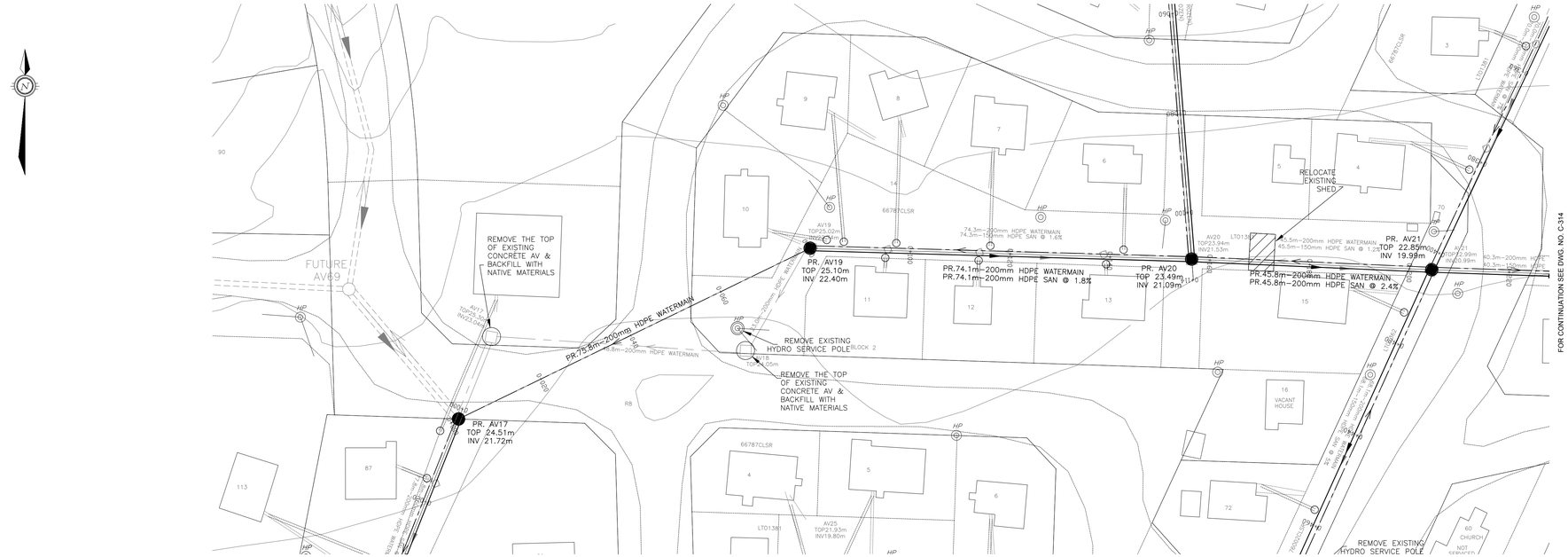
Dwg. Title

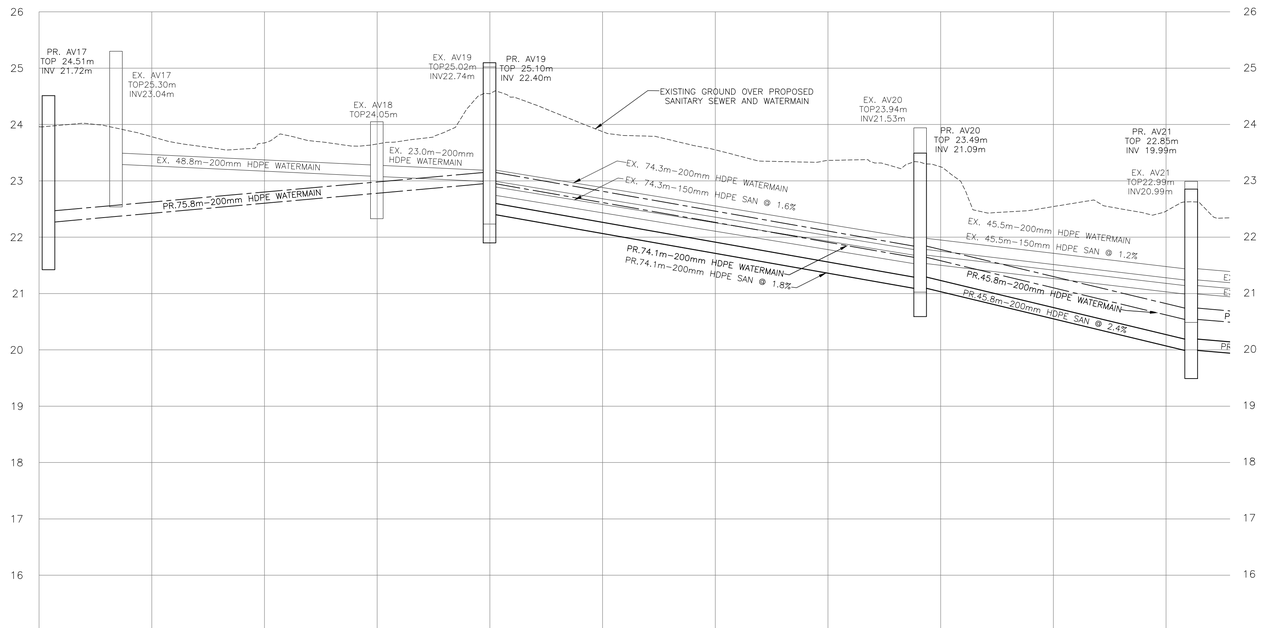
PLAN AND PROFILE
AV25 TO AV23

Project No. OTT-00206333-A0

Dwg. No. **C-312** Rev. No. 03

Scale 1:500
This drawing is not to be scaled





PROPOSED ELEVATION	23.96	23.78	23.67	23.66	24.55	23.87	23.55	23.36	23.25	22.54	22.46	
TOP OF WATERMAIN ELEVATION	22.47	75.8m–200mmø SERIES 128 HDPE WATERMAIN			23.15	74.1m–200mmø SERIES 128 HDPE WATERMAIN			W 21.84 E 21.84 N 21.84	45.8m–200mmø SERIES 128 HDPE WATERMAIN		W 20.74 E 20.74 SW20.74 NE20.74
TOP OF WATER RECIRC ELEVATION												
SANITARY SEWER INVERT	21.72				22.40	74.1m–200mmø SERIES 128 HDPE SAN @ 1.8%			W 21.09 E 21.09 N 21.09	45.8m–200mmø SERIES 128 HDPE SAN @ 2.4%		W 19.99 E 19.99 SW19.99 NE19.99
EXISTING ELEVATION	*23.96*	*23.78*	*23.67*	*24.66*	*24.55*	*23.87*	*23.35*	*23.36*	*23.25*	*22.54*	*22.46*	
CHAINAGE	0+000	0+001.67	0+020	0+040	0+060	0+080	0+079.93	0+100	0+120	0+140	0+156.35 0+160	0+180	0+200	0+204.46

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
00	100% SUBMISSION	SLB 2013-MAR-04
No.	Revision	Ckd. By / Date

Nunavut

ISSUED FOR CONSTRUCTION

	Const. North
	Drawn By: I.CRAWFORD
	Dwg. Standards Ckd. By:
	Designed By: A. ZARAD
Date Printed	Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

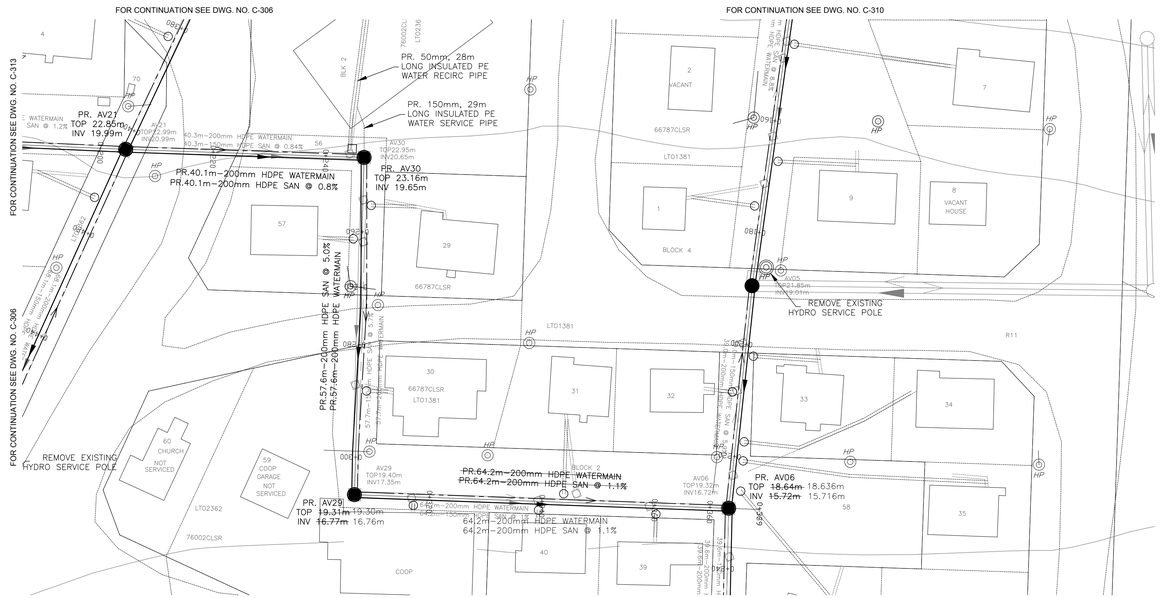
Dwg. Title

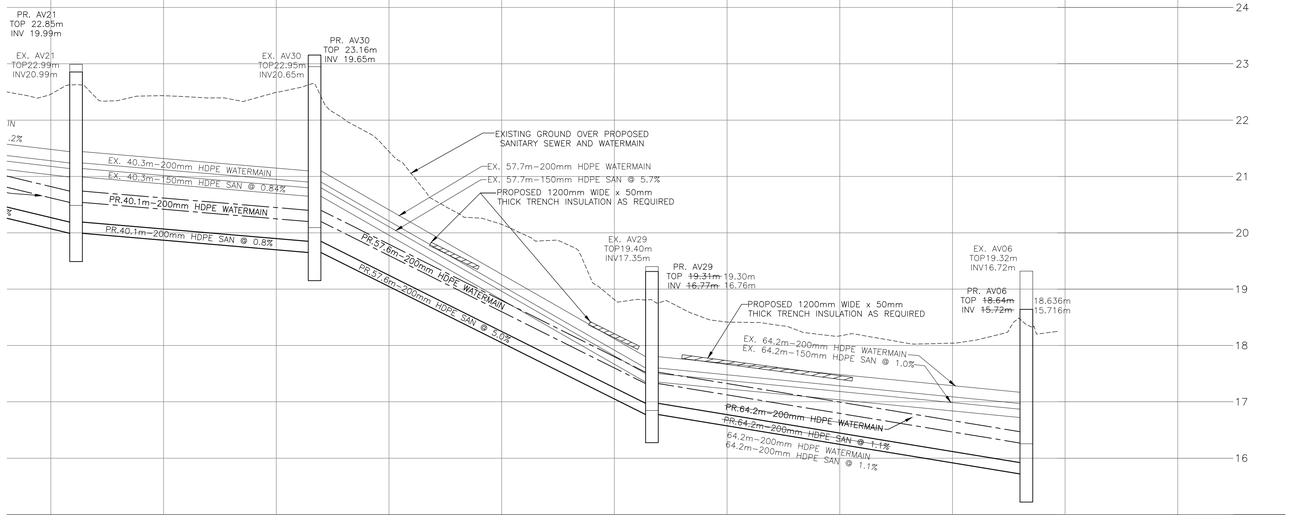
PLAN AND PROFILE AV17 TO AV21

Project No. OTT-00206333-A0

Dwg. No. **C-313** Rev. No. 03

Scale 1:500
This drawing is not to be scaled





22.46	22.43	22.50	21.44	20.15	18.81	18.41	18.17	18.04		PROPOSED ELEVATION
W 20.74 E 20.74 NE20.74	40.1m–200mmø SERIES 128 HDPE WATERMAIN	20.40 20.40	57.6m–200mmø SERIES 128 HDPE WATERMAIN	17.52 17.52	~~64.2m–200mmø SERIES 128 HDPE WATERMAIN~~ 64.2m–200mmø SERIES 128 HDPE WATERMAIN			W 16.47 N 16.47 S 16.47		TOP OF WATERMAIN ELEVATION
										TOP OF WATER RECIRC ELEVATION
W 19.99 E 19.99 SW19.99 NE19.99	40.1m–200mmø SERIES 128 HDPE SAN @ 0.8%	19.65 19.65	57.6m–200mmø SERIES 128 HDPE SAN @ 5.0%	~~16.77~~ ~~16.77~~ 16.76	~~64.2m–200mmø SERIES 128 HDPE SAN @ 1.1%~~ 64.2m–200mmø SERIES 128 HDPE SAN @ 1.1%			~~15.72~~ N ~~15.72~~ S 15.716		SANITARY SEWER INVERT
22.46	22.43	22.50	21.44	20.15	18.81	18.41	18.17	18.04		EXISTING ELEVATION
0+200	0+204.46	0+220	0+240	0+246.80	0+260	0+280	0+300	0+306.68	0+320	0+340	0+360	0+373.12	0+380	0+400	CHAINAGE

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
00	100% SUBMISSION	SLB 2013-MAR-04
No.	Revision	Ckd. By / Date

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

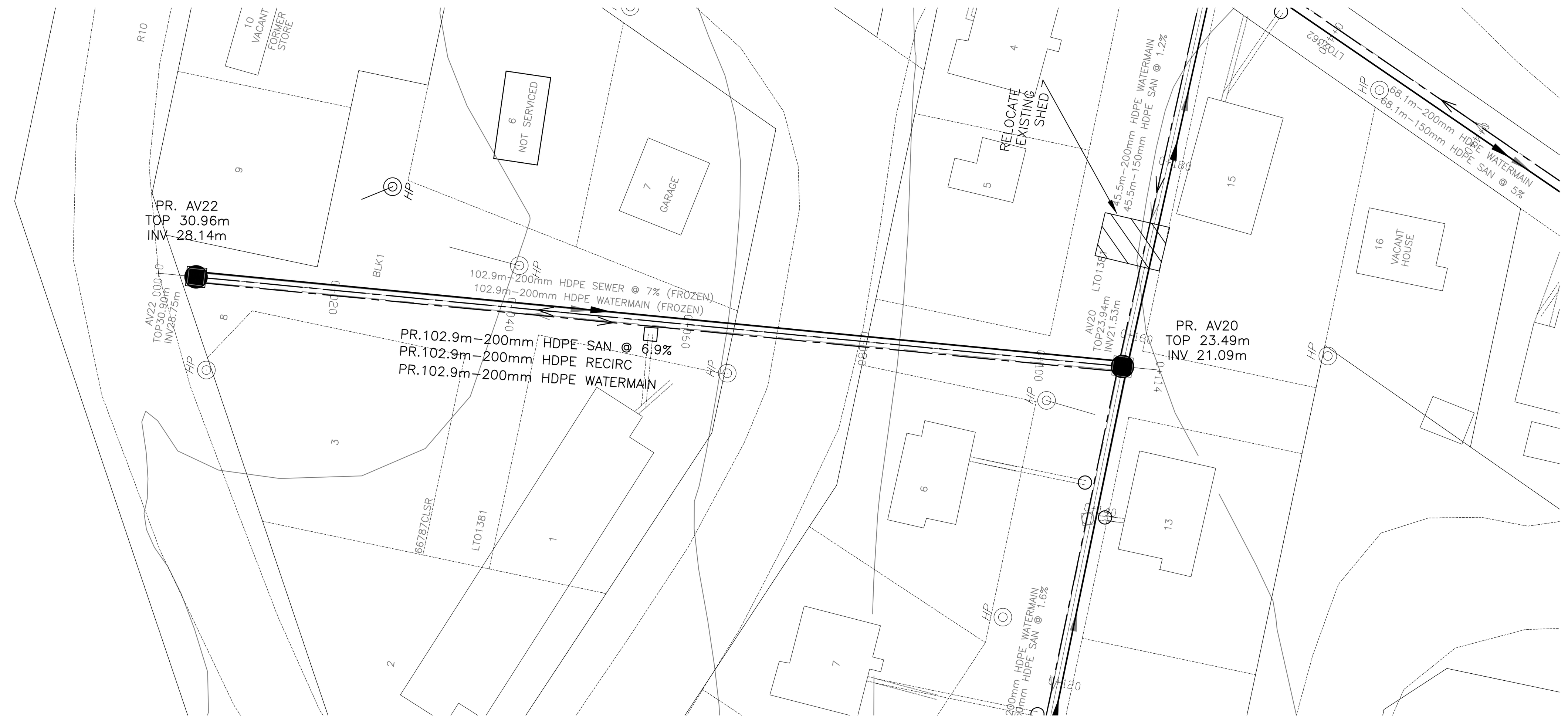
PLAN AND PROFILE AV21 TO AV06

Project No. OTT-00206333-A0

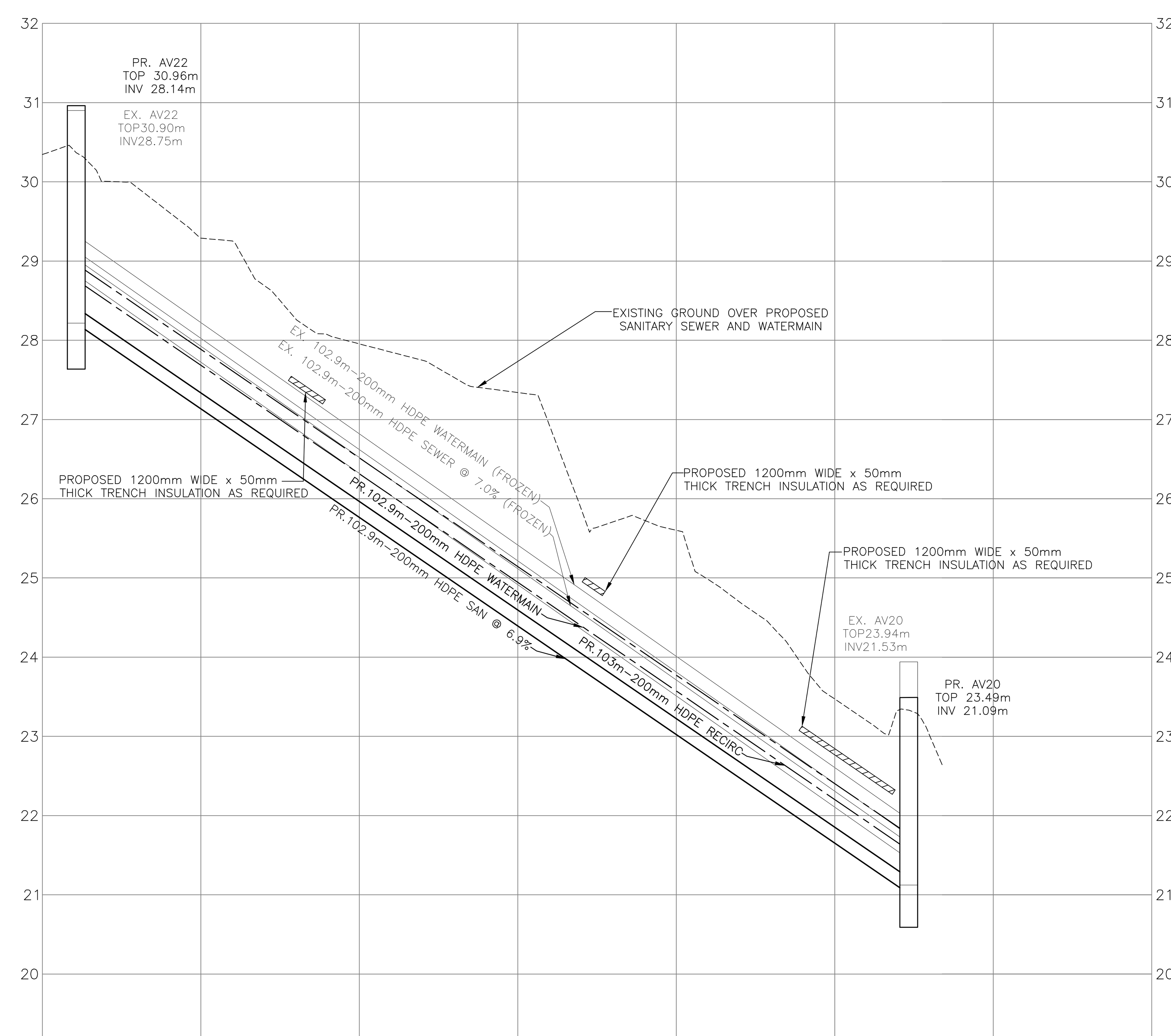
Dwg. No. **C-314** Rev. No. 03

Scale 1:500
This drawing is not to be scaled

FOR CONTINUATION SEE DWG. NO. C-313



FOR CONTINUATION SEE DWG. NO. C-313



PROPOSED ELEVATION	30.34		29.29	27.95	27.34	25.60	23.47	
TOP OF WATERMAIN ELEVATION		28.89	102.9m-200mmø SERIES 128 HDPE WATERMAIN					21.84 W 21.84 E 21.84
TOP OF WATER RECIRC ELEVATION		28.89	102.9m-200mmø SERIES 128 HDPE RECIRCULATION					21.84
SANITARY SEWER INVERT		28.14	102.9m-200mmø SERIES 128 HDPE SAN @ 6.9%					21.09 W 21.09 E 21.09
EXISTING ELEVATION	30.34		29.29	27.95	27.34	25.60	23.47	
CHAINAGE	0+000	0+004.26	0+020	0+040	0+060	0+080	0+100	0+109.32

CHAINAGE (continued): 0+120, 0+140

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

ISSUED FOR CONSTRUCTION

Const. North

Date Printed

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE
AV22 TO AV20

Project No. OTT-00206333-A0

Dwg. No. **C-315**

Rev. No. 03

Scale 1:500

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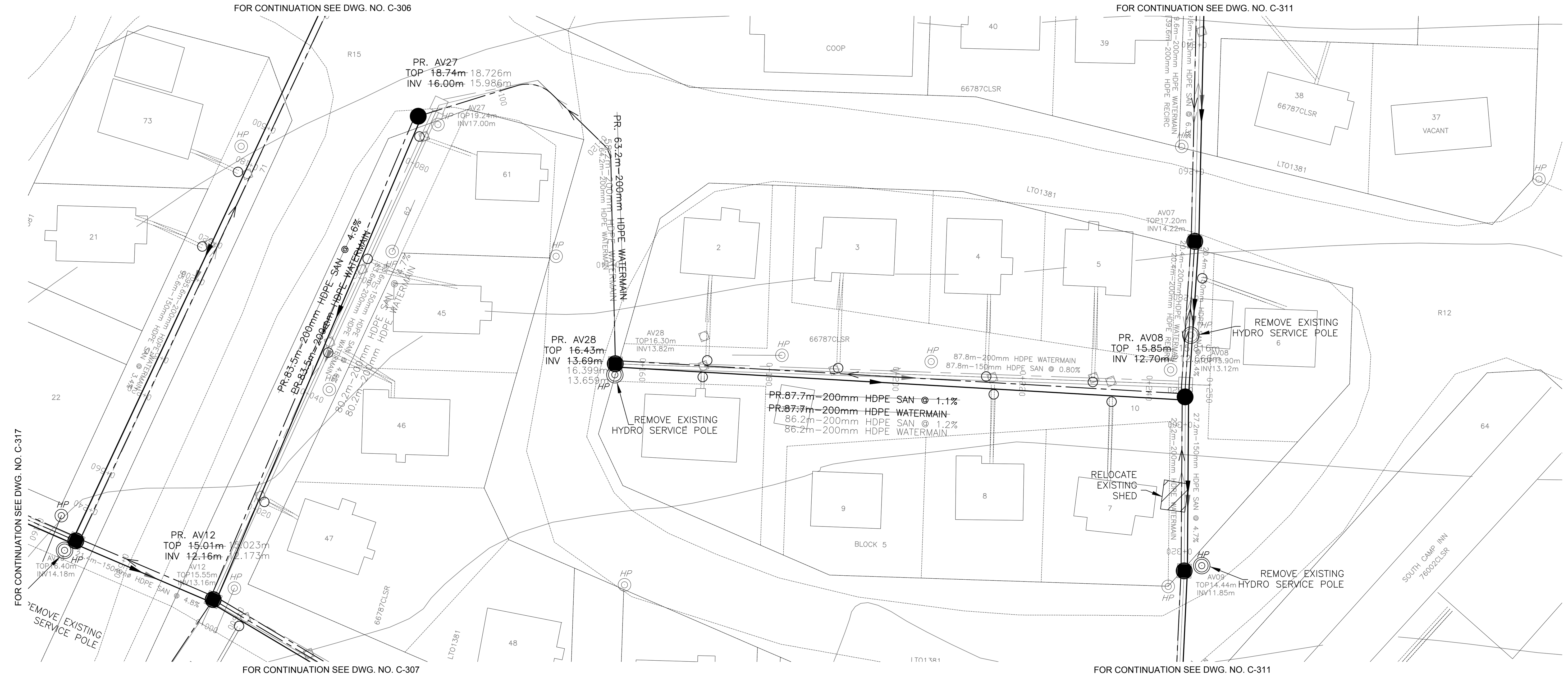

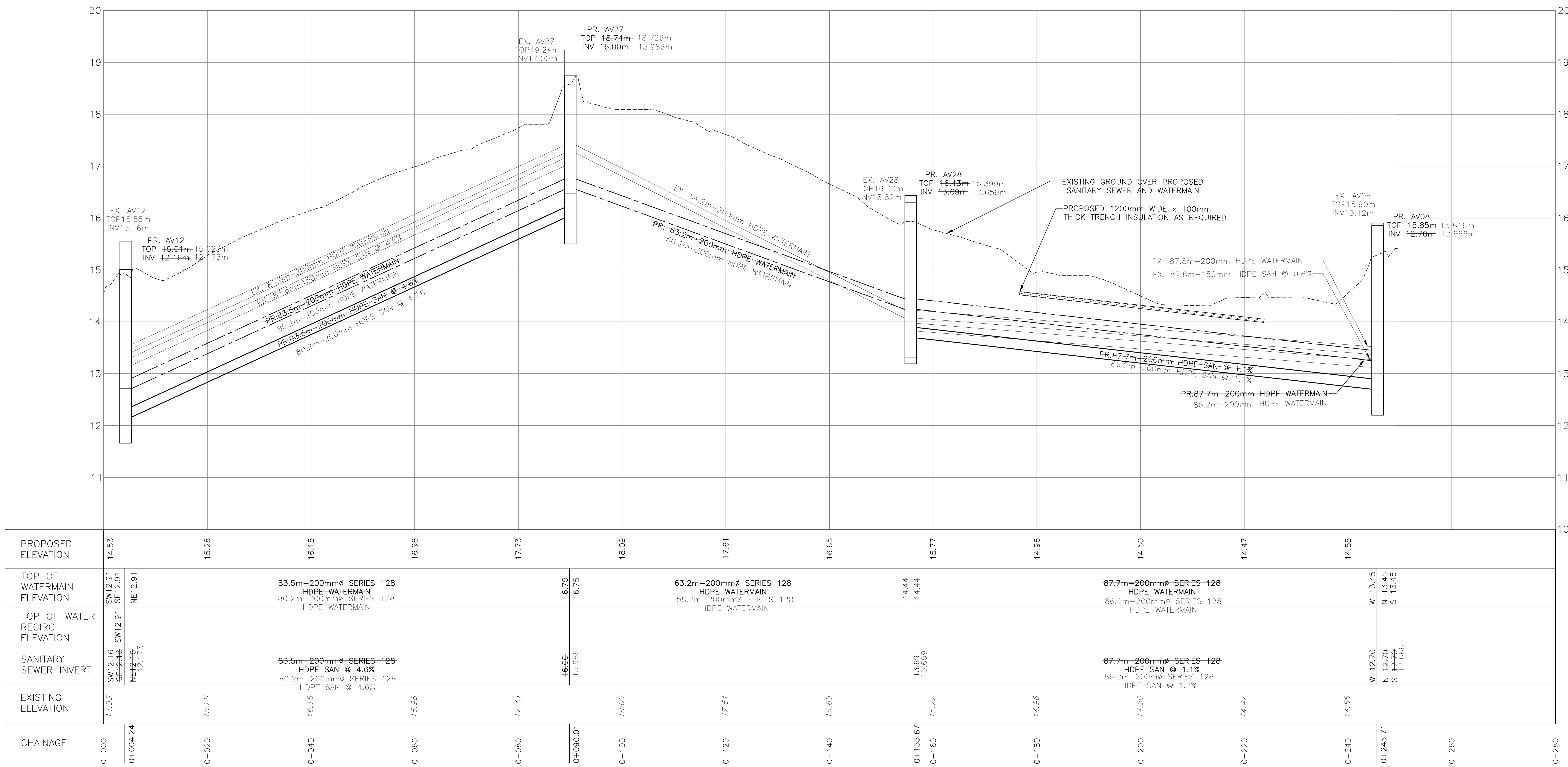

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No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE
AV12 TO AV08

Project No. OTT-00206333-A0

Dwg. No. **C-316**   Rev. No. 03

Scale 1:500
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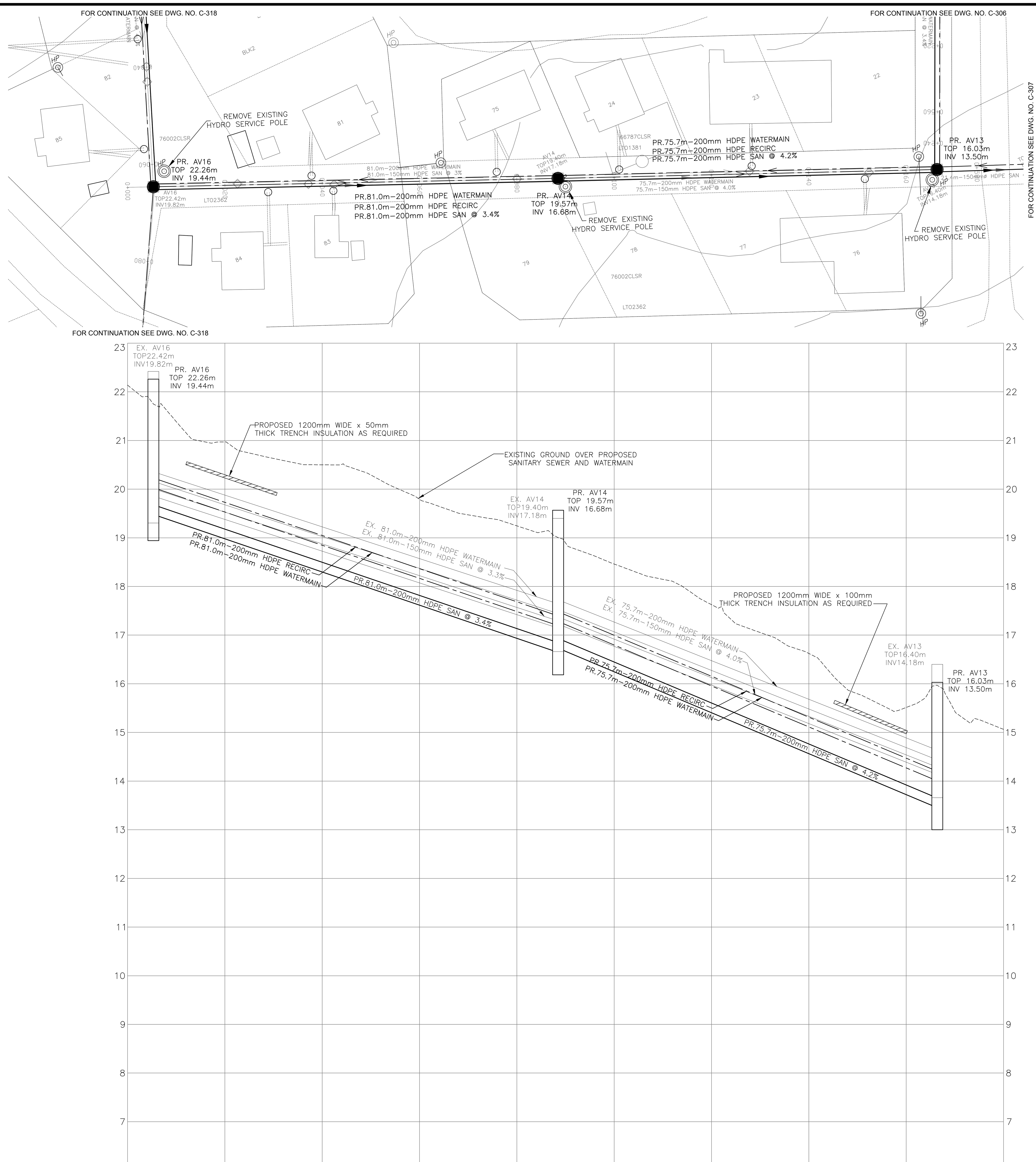

PROPOSED ELEVATION	22.14		20.97	20.50	19.79	19.25		18.46	17.63	16.62	15.51		
TOP OF WATERMAIN ELEVATION	NE20.19 NW20.19	SE20.19		81.0m–200mmø SERIES 128 HDPE WATERMAIN			17.43 17.43		75.7m–200mmø SERIES 128 HDPE WATERMAIN			NW14.25 SE14.25 NE14.25	
TOP OF WATER RECIRC ELEVATION		20.19		81.0m–200mmø SERIES 128 HDPE RECIRCULATION			17.43 17.43		75.7m–200mmø SERIES 128 HDPE RECIRCULATION			14.25	
SANITARY SEWER INVERT	19.44	19.44		81.0m–200mmø SERIES 128 HDPE SAN @ 3.4%			16.68 16.68		75.7m–200mmø SERIES 128 HDPE SAN @ 4.2%			NW13.50 SE13.50 NE13.50	
EXISTING ELEVATION	22.14		20.97	20.50	19.79	19.25		18.46	17.63	16.62	15.51		
CHAINAGE	0+000	0+005.31	0+020	0+040	0+060	0+080	0+088.48	0+100	0+120	0+140	0+160	0+166.39	0+180

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PLOTTED BY: IAN CRAWFORD DATE: 2016/Apr/26 8:19:38 AM

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

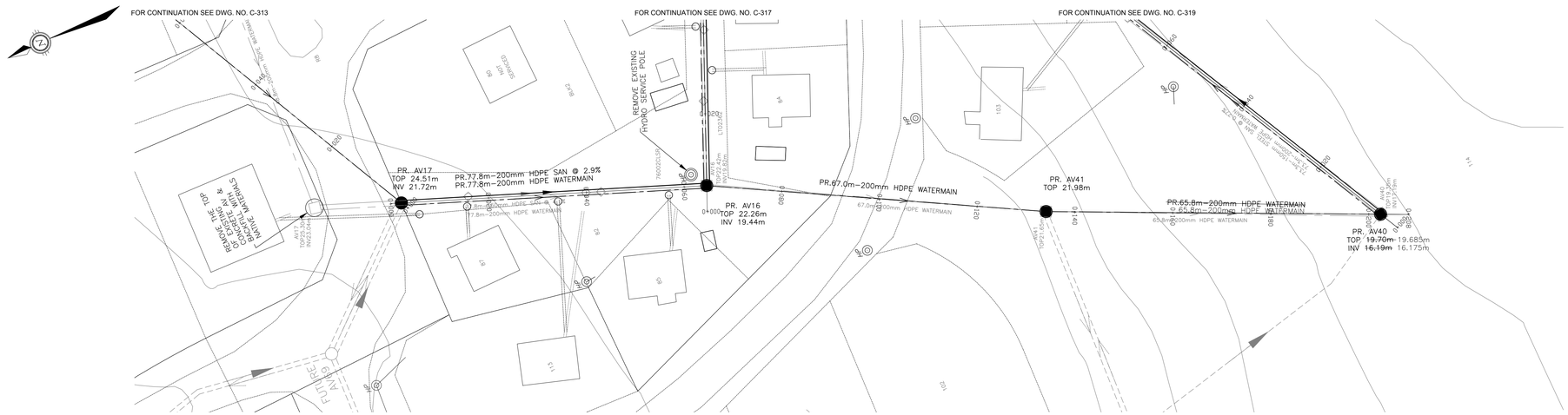
Dwg. Title

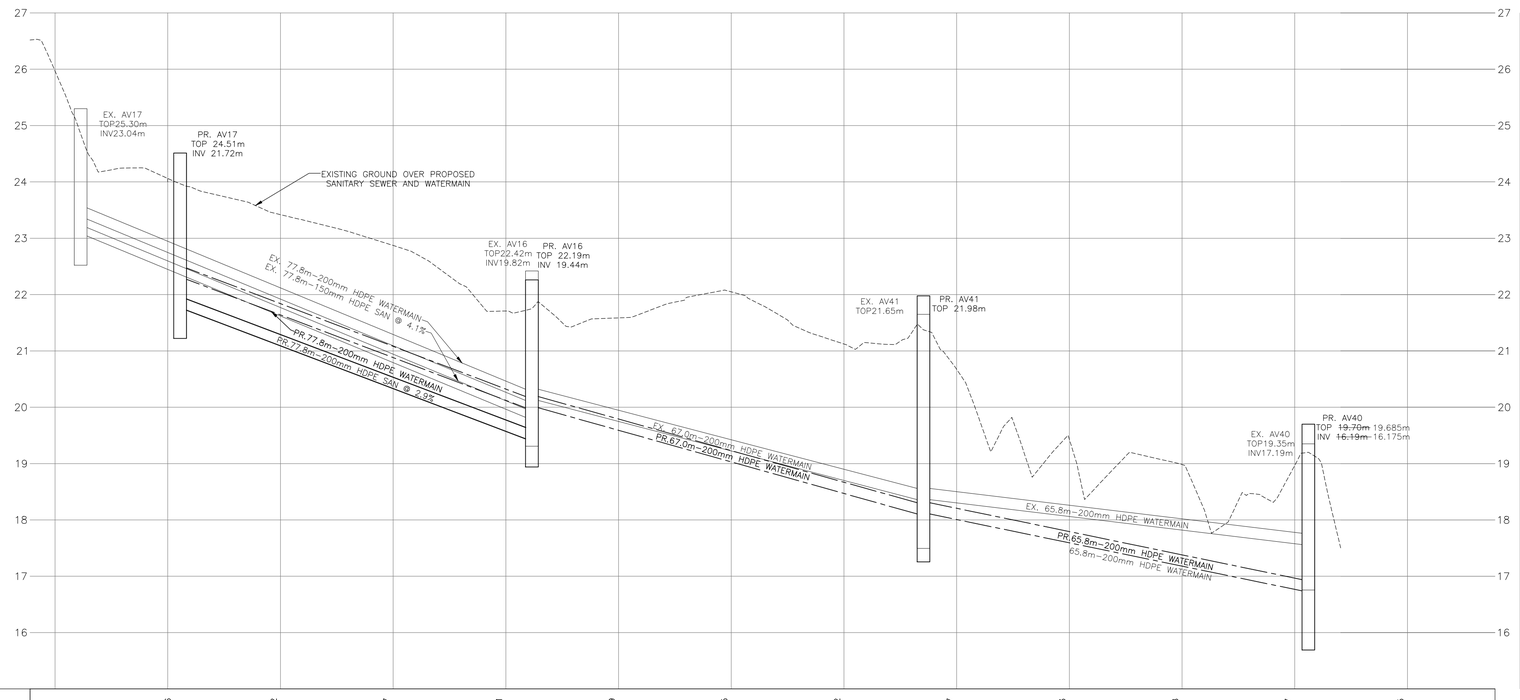
PLAN AND PROFILE
AV16 TO AV13

Project No. OTT-00206333-A0

Dwg. No. **C-317** Rev. No. 03

Scale 1:500
This drawing is not to be scaled





PROPOSED ELEVATION		24.06	23.42	22.87	21.71	21.59	22.05	21.12	20.67	19.43	18.98	18.97	18.35
TOP OF WATERMAIN ELEVATION		22.47 / 22.47	77.8m–200mmø SERIES 128 HDPE WATERMAIN		NE20.19 SE20.19 SW20.19	67.0m–200mmø SERIES 128 HDPE WATERMAIN			18.30 / 18.30	~~65.8m–200mmø SERIES 128 HDPE WATERMAIN~~ 65.8m–200mmø SERIES 128 HDPE WATERMAIN		16.94 / 16.94	
TOP OF WATER RECIRC ELEVATION													
SANITARY SEWER INVERT		21.72	77.8m–200mmø SERIES 128 HDPE SAN @ 2.9%		NE19.44 SE19.44							~~16.19~~ 16.175	
EXISTING ELEVATION	25.96	24.06	23.42	22.87	21.71	21.59	22.05	21.12	20.67	19.43	18.98	18.97	18.35
CHAINAGE		0+000 / 0+002.18	0+020	0+040	0+060	0+064.62	0+080	0+100	0+120	0+134.11 / 0+140	0+160	0+180	0+200 / 0+202.41	0+220

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
00	100% SUBMISSION	SLB 2013-MAR-04
No.	Revision	Ckd. By / Date

ISSUED FOR CONSTRUCTION

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV17 TO AV40

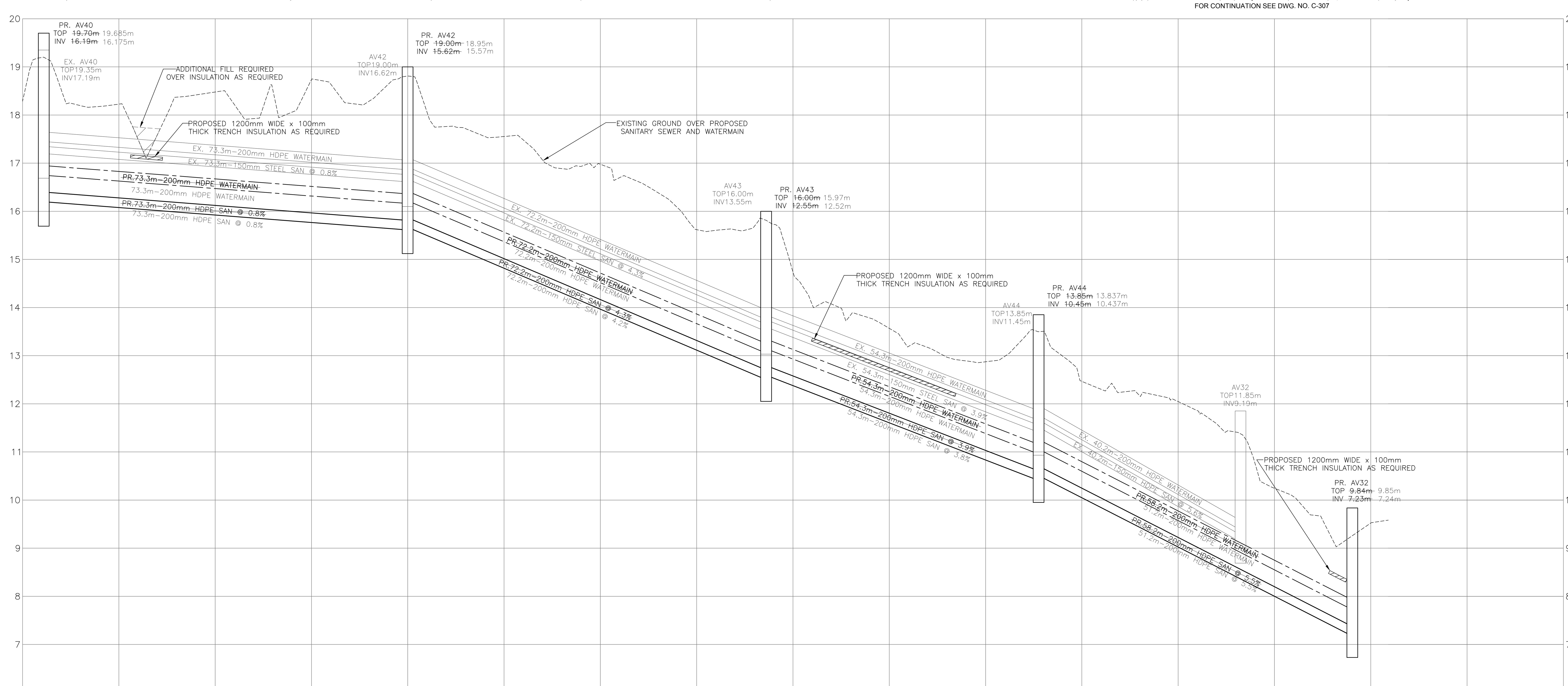
Project No. OTT-00206333-A0

Dwg. No. **C-318** Rev. No. 03

Scale 1:500
This drawing is not to be scaled

FOR CONTINUATION SEE DWG. NO. C-318

FOR CONTINUATION SEE DWG. NO. C-307



CHAINAGE	0+000	0+004.41	0+020	0+040	0+060	0+079.97	0+080	0+100	0+120	0+140	0+154.42	0+160	0+180	0+200	0+211.01	0+220	0+240	0+260	0+276.16	0+280	0+300	0+320
PROPOSED ELEVATION	18.29		18.23	18.48	18.74		18.81	17.55	16.98	15.62		14.74	13.57	12.87		12.46	12.05	10.24		8.12		
TOP OF WATERMAIN ELEVATION	16.94	16.94		~~73.3m–200mmø SERIES 128 HDPE WATERMAIN~~ 73.3m–200mmø SERIES 128 HDPE WATERMAIN		16.37	16.37		~~72.2m–200mmø SERIES 128 HDPE WATERMAIN~~ 72.2m–200mmø SERIES 128 HDPE WATERMAIN		13.30	13.30	~~54.3m–200mmø SERIES 128 HDPE WATERMAIN~~ 54.3m–200mmø SERIES 128 HDPE WATERMAIN		11.20	11.20	~~58.2m–200mmø SERIES 128 HDPE WATERMAIN~~ 51.2m–200mmø SERIES 128 HDPE WATERMAIN		7.98	7.98		
TOP OF WATER RECIRC ELEVATION																						
SANITARY SEWER INVERT		~~16.19~~ 16.175		~~73.3m–200mmø SERIES 128 HDPE SAN @ 0.8%~~ 73.3m–200mmø SERIES 128 HDPE SAN @ 0.8%		15.62	~~15.62~~ 15.57		~~72.2m–200mmø SERIES 128 HDPE SAN @ 4.3%~~ 72.2m–200mmø SERIES 128 HDPE SAN @ 4.2%		12.55	~~12.55~~ 12.52	~~54.3m–200mmø SERIES 128 HDPE SAN @ 3.9%~~ 54.3m–200mmø SERIES 128 HDPE SAN @ 3.8%		10.45	~~10.45~~ 10.437	~~58.2m–200mmø SERIES 128 HDPE SAN @ 5.5%~~ 51.2m–200mmø SERIES 128 HDPE SAN @ 5.5%		NW ~~7.23~~	NE ~~7.23~~ SW ~~7.23~~ 7.24		
EXISTING ELEVATION	*18.29*		*18.23*	*18.48*	*18.74*		*18.81*	*17.55*	*16.98*	*15.62*		*14.74*	*13.57*	*12.87*		*12.46*	*12.05*	*10.24*		*8.12*		

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21

AS-BUILT

DATE: SEPTEMBER ??, 2015

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV40 TO AV32

Project No. OTT-00206333-A0

Dwg. No. C-319

Rev. No. 03

Scale 1:500

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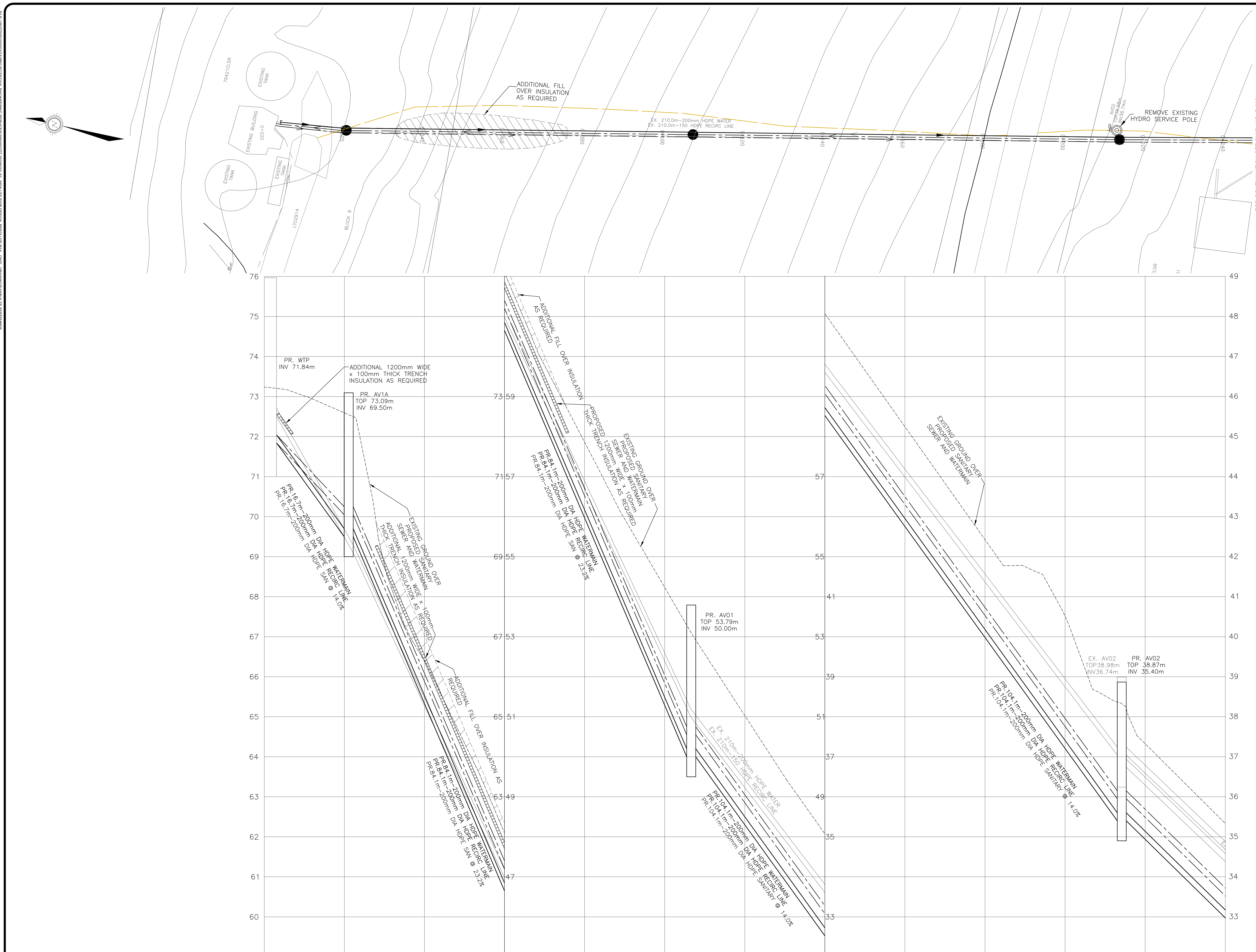
PLOTTED BY: IAN CRAWFORD DATE: 2016/Apr/26 8:20:17 AM

AS BUILTS
SERVICES WITH TIE-IN DETAIL



CHAINAGE	0+000	0+020	0+021.74	0+040	0+060	0+080	0+100	0+106.62	0+120	0+140	0+160	0+180	0+200	0+214.17	0+220
PROPOSED ELEVATION	73.24	72.59		66.40	62.09	57.86	54.23		51.03	47.52	43.76	41.50	40.51		37.05
TOP OF WATERMAIN ELEVATION	72.70 16.7m−200mmø SERIES 128 HDPE WATERMAIN 70.25		70.25		84.1m−200mmø SERIES 128 HDPE WATERMAIN		50.75	50.75		104.1m−200mmø SERIES 128 HDPE WATERMAIN			36.15	36.15	
TOP OF WATER RECIRC ELEVATION	72.70 16.7m−200mmø SERIES 128 HDPE RECIRC 70.25		70.25		84.1m−200mmø SERIES 128 HDPE RECIRCULATION		50.75	50.75		104.1m−200mmø SERIES 128 HDPE RECIRCULATION			36.15	36.15	
SANITARY SEWER INVERT	72.50 16.7m−200mmø SERIES 128 HDPE SAN @ 18.0% 69.50		69.50		84.1m−200mmø SERIES 128 HDPE SAN @ 23.2%		50.00	50.00		104.1m−200mmø SERIES 128 HDPE SAN @ 14.0%			35.40	35.40	
EXISTING ELEVATION	73.24	72.59		66.40	62.09	57.86	54.23		51.03	47.52	43.76	41.50	40.51		37.05

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

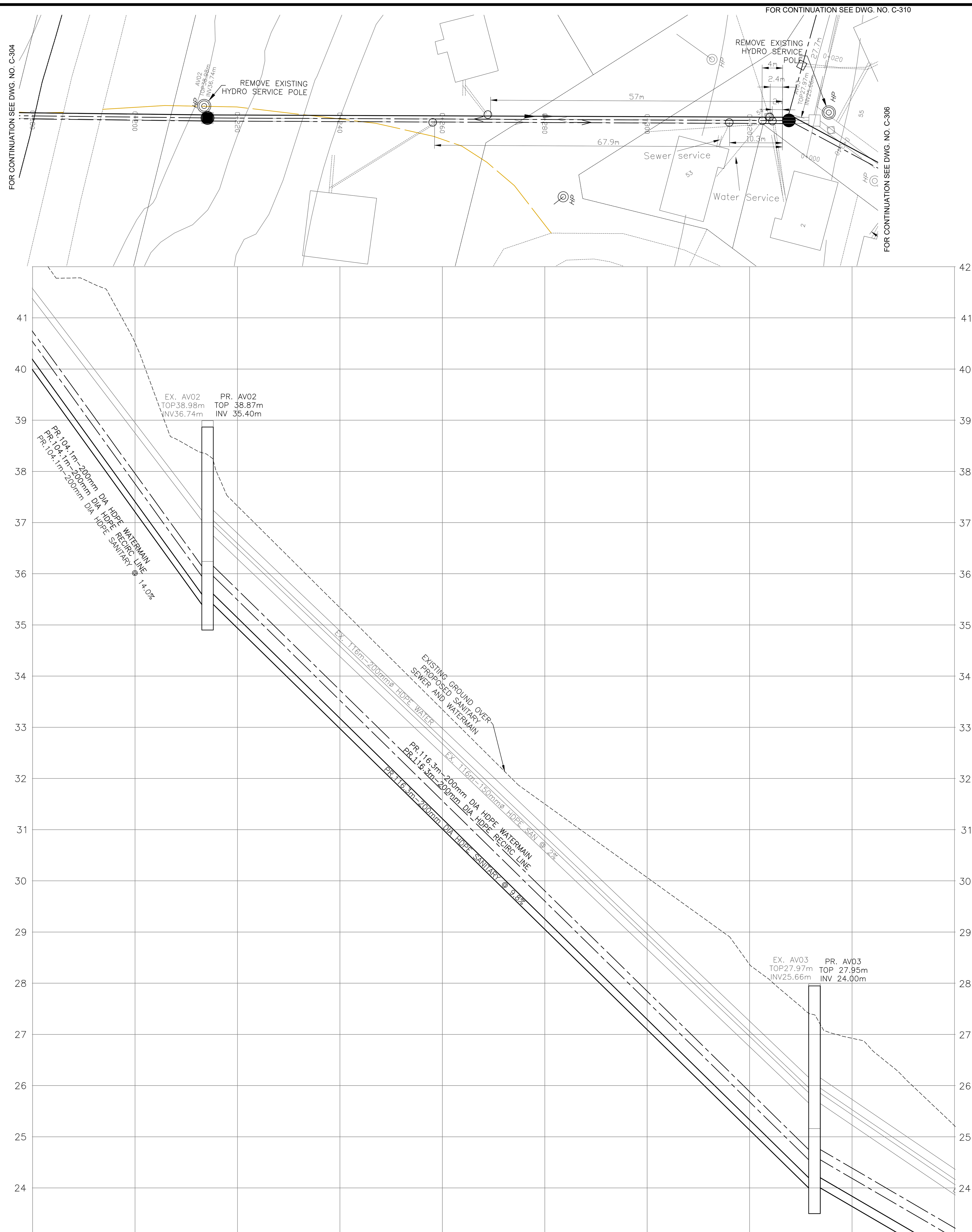
PLAN AND PROFILE SIGNAL HILL TO AV02

Project No. OTT-00206333-A0

Dwg. No. **C-304** Rev. No. 03

Scale 1:500
This drawing is not to be scaled

FILE: \\POTTFSG002\DATA\PROJECTS\CIVIL ENGINEERING SERVICES\206000\OTT-00206333-A0 - NEW UTILIDOR DESIGN, RESOLUTE BAY - GN\D - DRAWINGS\ASBUILTS-SEPTEMBER 2015\06- 206333-PLAN & PROFILES SERVICE CONNECTIONS ASBUILTS.DWG
PLOTTED BY: AYO ONI
DATE: 2017/Nov/7 2:37:03 PM



PROPOSED ELEVATION	40.51		37.05	34.25	32.54	30.89	29.16	28.36		26.92	
TOP OF WATERMAIN ELEVATION		36.15 | 36.15	116.3m–200mmø SERIES 128 HDPE WATERMAIN						NW24.75 | SW24.75 E 24.75		
TOP OF WATER RECIRC ELEVATION		36.15 | 36.15	116.3m–200mmø SERIES 128 HDPE RECIRCULATION						NW24.75		
SANITARY SEWER INVERT		35.40 | 35.40	116.3m–200mmø SERIES 128 HDPE SAN @ 9.8%						24.00 | 24.00		
EXISTING ELEVATION	40.51		37.05	34.25	32.54	30.89	29.16	28.36		27.47	
CHAINAGE	0+200	214.17	0+220	0+240	0+260	0+280	0+300	0+320	332.66	0+340	

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No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

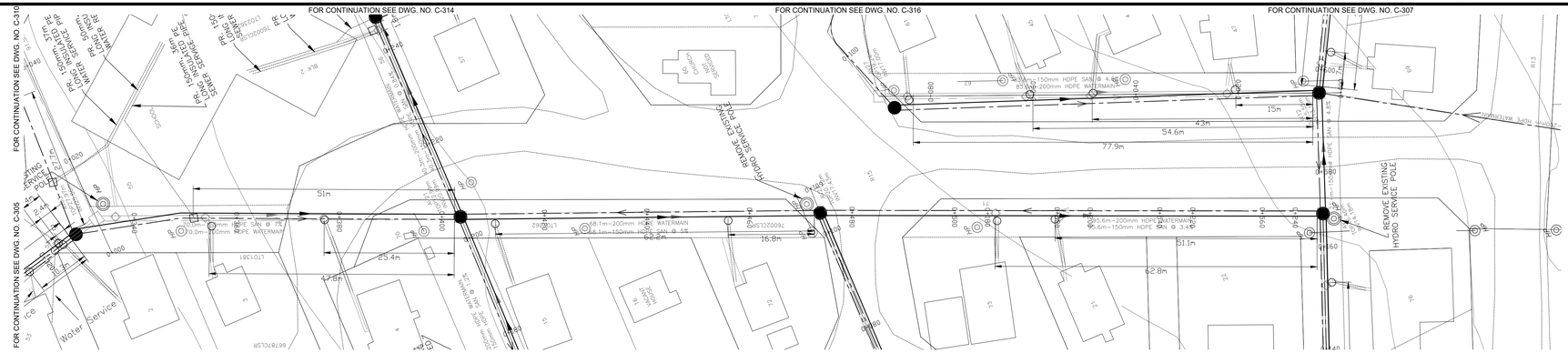
Dwg. Title

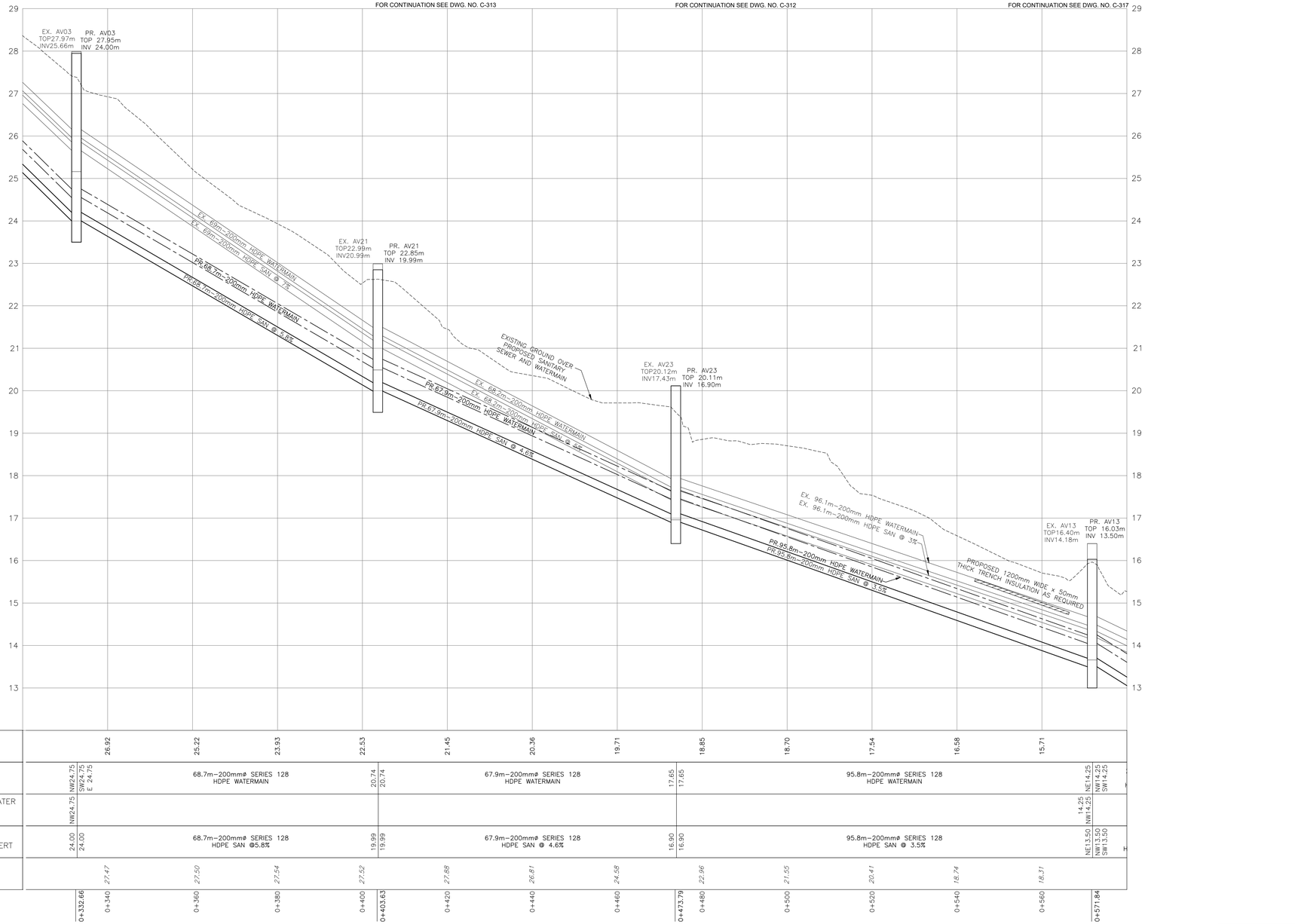
PLAN AND PROFILE AV02 TO AV03

Project No. OTT-00206333-A0

Dwg. No. **C-305** Rev. No. 03

Scale 1:500
This drawing is not to be scaled





PROPOSED ELEVATION		26.92	25.22	23.93	22.53	21.45	20.36	19.71	18.85	18.70	17.54	16.58	15.71
TOP OF WATERMAIN ELEVATION	NW24.75 SW24.75 E 24.75	68.7m–200mmø SERIES 128 HDPE WATERMAIN			20.74 20.74	67.9m–200mmø SERIES 128 HDPE WATERMAIN		17.65 17.65	95.8m–200mmø SERIES 128 HDPE WATERMAIN			NE14.25 NW14.25 SW14.25	
TOP OF WATER RECIRC ELEVATION	NW24.75											14.25 NW14.25	
SANITARY SEWER INVERT	24.00 24.00	68.7m–200mmø SERIES 128 HDPE SAN @5.8%			19.99 19.99	67.9m–200mmø SERIES 128 HDPE SAN @ 4.6%		16.90 16.90	95.8m–200mmø SERIES 128 HDPE SAN @ 3.5%			NE13.50 NW13.50 SW13.50	
EXISTING ELEVATION		*27.47*	*27.50*	*27.54*	*27.52*	*27.88*	*26.81*	*24.58*	*22.96*	*21.55*	*20.41*	*18.74*	*18.31*
CHAINAGE	0+332.66	0+340	0+360	0+380	0+400	0+403.63	0+420	0+440	0+460	0+473.79	0+480	0+500	0+520	0+540	0+560	0+571.84

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

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AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV03 TO AV13

Project No. OTT-00206333-A0

Dwg. No. **C-306**

Rev. No. 03

Scale 1:500
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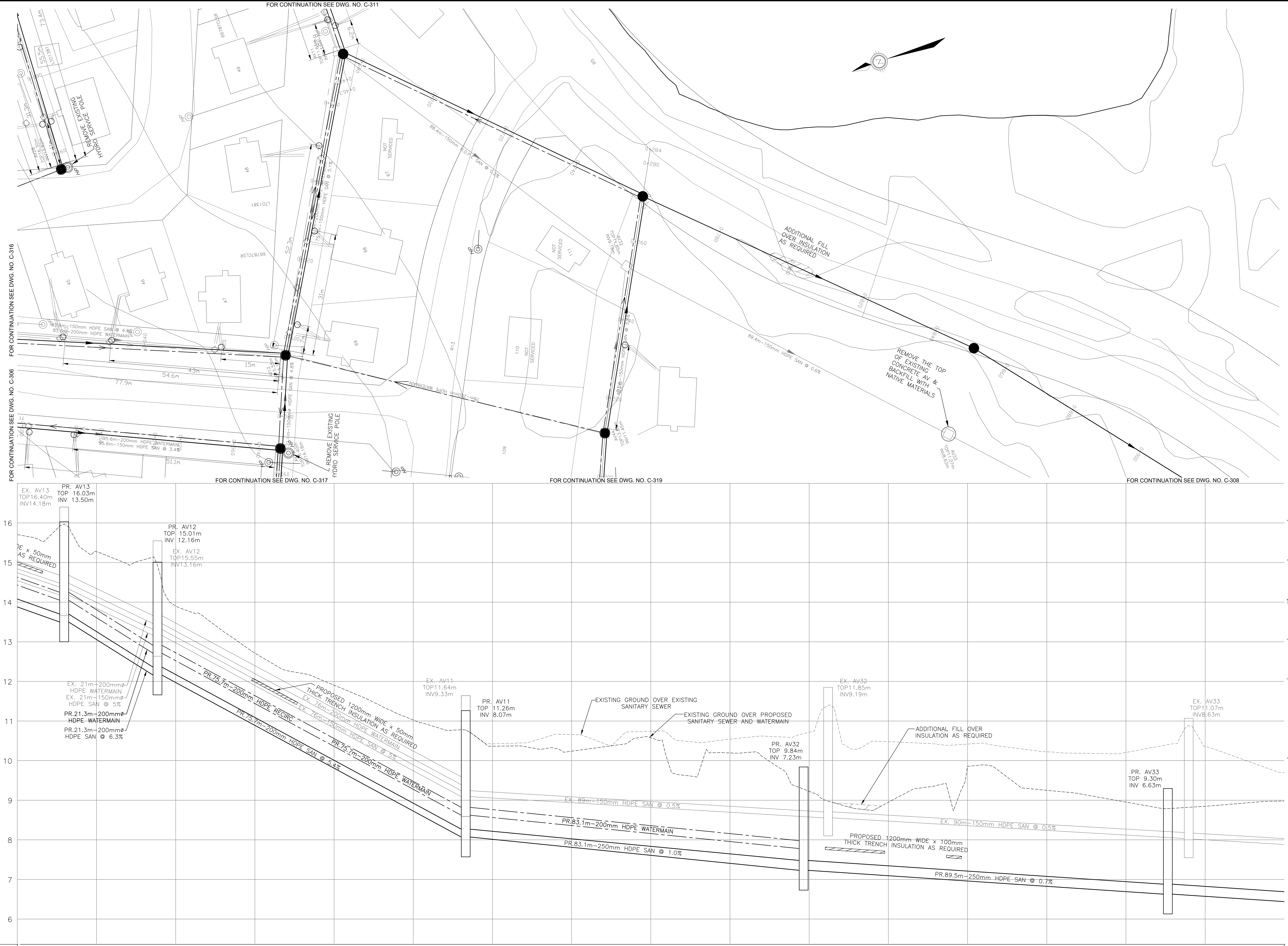
FOR CONTINUATION SEE DWG. NO. C-311



	0+571.84	0+580	0+595.41	0+600	0+620	0+640	0+660	0+673.26	0+680	0+700	0+720	0+740	0+758.60	0+760	0+780	0+800	0+820	0+840	0+850.60	0+860
PROPOSED ELEVATION		15.27		13.91	12.71	11.90	11.02		10.36	10.24	10.58	10.19		9.22	8.95	9.86	9.25	8.95		8.85
TOP OF WATERMAIN ELEVATION	NE14.25 NW14.25 SW14.25	21.3m–200mmø SERIES 128 HDPE WATERMAIN	12.91 12.91			75.7m–200mmø SERIES 128 HDPE WATERMAIN		E 8.87 SW 8.87 NW 8.87			83.1m–200mmø SERIES 128 HDPE WATERMAIN		8.03 NW7.98							
TOP OF WATER RECIRC ELEVATION	14.25 NW14.25		12.91			75.7m–200mmø SERIES 128 HDPE RECIRCULATION		E 8.82												
SANITARY SEWER INVERT	NE13.50 NW13.50 SW13.50	21.3m–200mmø SERIES 128 HDPE SAN @ 6.3%	12.16 12.16			75.7m–200mmø SERIES 128 HDPE SAN @ 5.4%		E 8.07 SW 8.07 NW 8.07			83.1m–250mmø SERIES 128 HDPE SAN @ 1.0%		NE 7.23 SW 7.23 NW 723			89.5m–250mmø SERIES 128 HDPE SAN @ 0.7%			6.63 6.63	
EXISTING ELEVATION		17.17		16.53	15.24	14.04	12.44		10.99	10.25	10.31	10.11		10.44	10.64	10.23	10.45	9.90		8.04

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE
AV13 TO AV33

Project No. OTT-00206333-A0

Dwg. No. **C-307** Rev. No. 03

Scale 1:500
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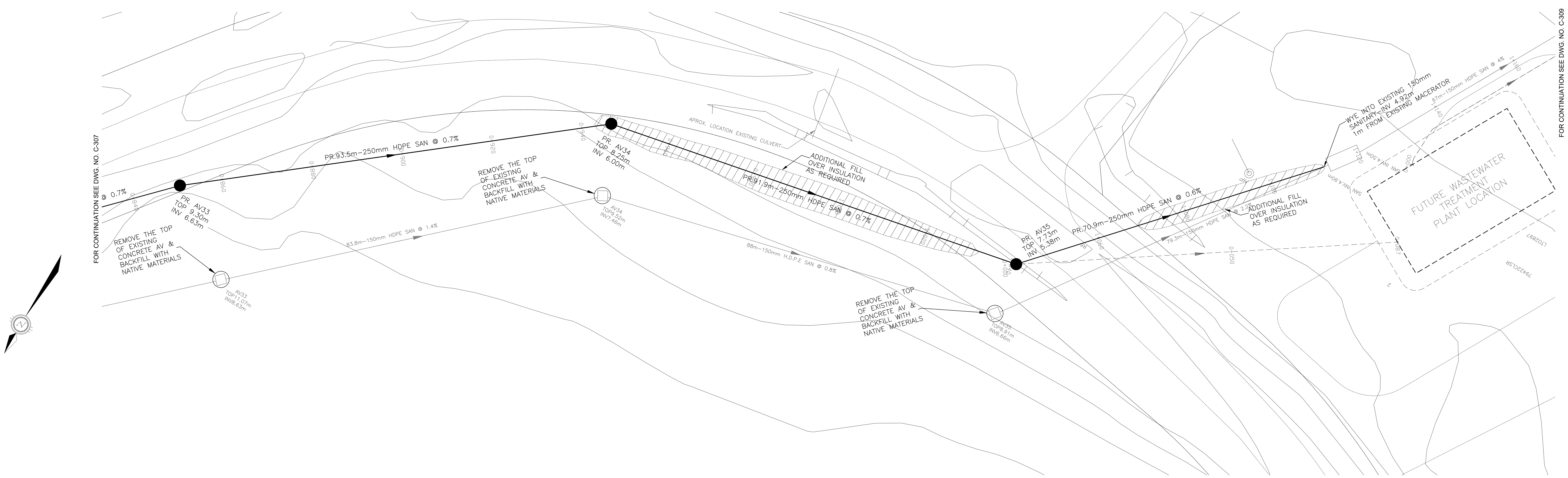
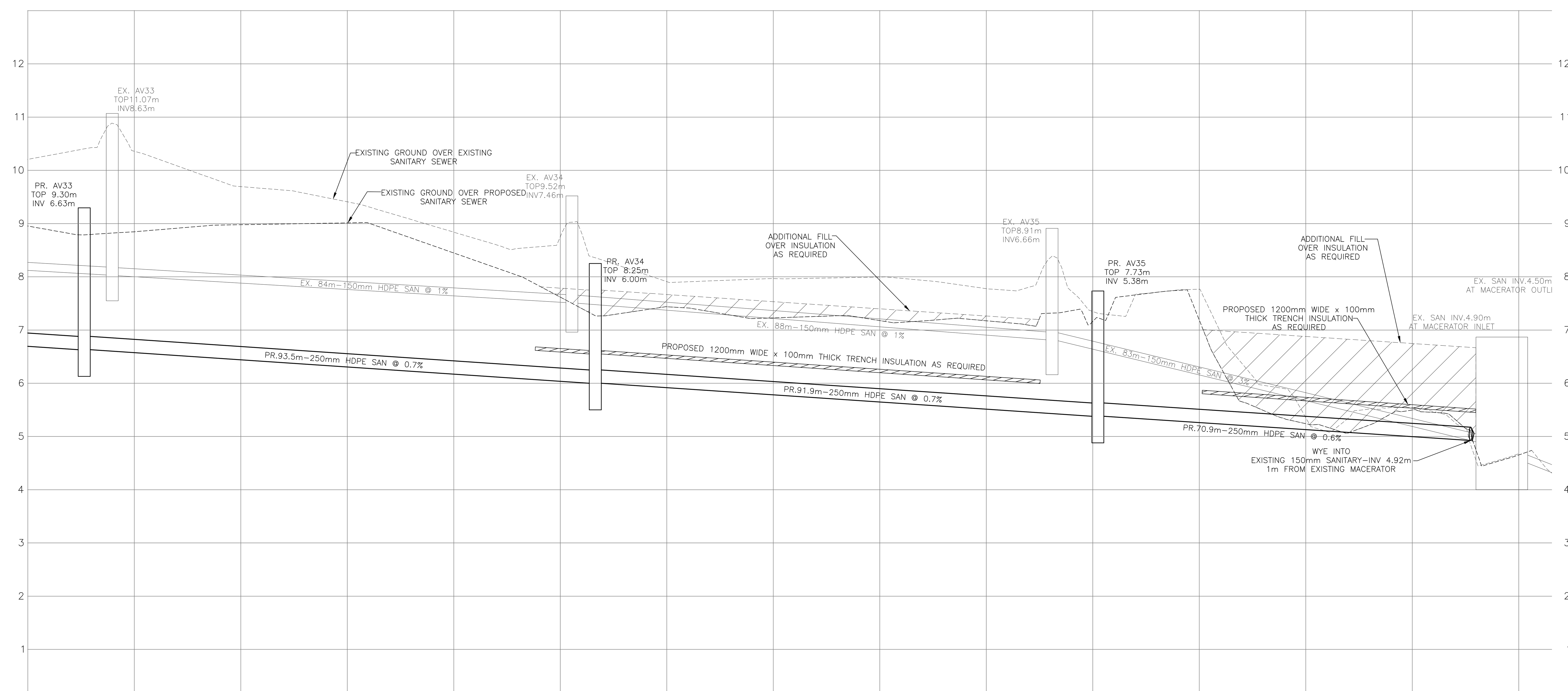
FILE: \\POTTFSG002\DATA\PROJECTS\CIVIL ENGINEERING SERVICES\206000\OTT-00206333-A0 - NEW UTILIDOR DESIGN, RESOLUTE BAY - GNID - DRAWINGS\ASBUILTS-SEPTEMBER 2015\06- 206333-PLAN & PROFILES SERVICE CONNECTIONS ASBUILTS.DWG
PLOTTED BY: AYO ONI
DATE: 2017/Nov/7 2:34:53 PM

FOR CONTINUATION SEE DWG. NO. C-307

FOR CONTINUATION SEE DWG. NO. C-309





CHAINAGE	0+850.60	0+860	0+880	0+900	0+920	0+940	0+946.58	0+960	0+980	1+000	1+020	1+040	1+040.96	1+060	1+080	1+100	1+111.97	1+120	1+121.67
PROPOSED ELEVATION		8.85	8.98	9.01	8.45	7.62		7.44	7.23	7.18	7.17	7.16		7.19	5.24	5.50		4.65	
TOP OF WATERMAIN ELEVATION																			
TOP OF WATER RECIRC ELEVATION																			
SANITARY SEWER INVERT	6.63 / 6.63			93.5m–250mmø SERIES 128 HDPE SAN @ 0.7%			6.00 / 6.00			91.9m–250mmø SERIES 128 HDPE SAN @ 0.7%			5.38 / 5.38		70.9m–250mmø SERIES 128 HDPE SAN @ 0.6%		4.92 / EX.4.90		EX.4.50
EXISTING ELEVATION		8.04	8.73	6.07	6.13	6.07		6.10	6.08	6.04	6.08	6.06		6.72	6.41	6.08		6.94	

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
02	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Dwg. Design Ckd. By: S. BURDEN

Date Printed

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE
AV33 TO EXIST. SAN

Project No. OTT-00206333-A0

Dwg. No. **C-308** Rev. No. 03

Scale 1:500
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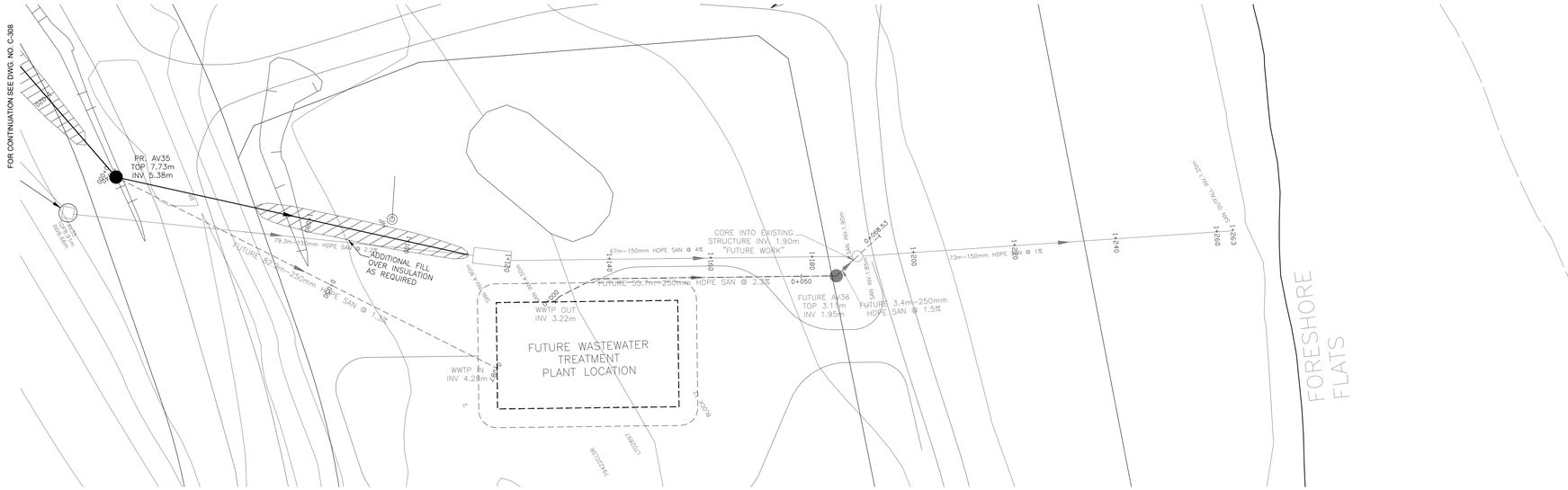
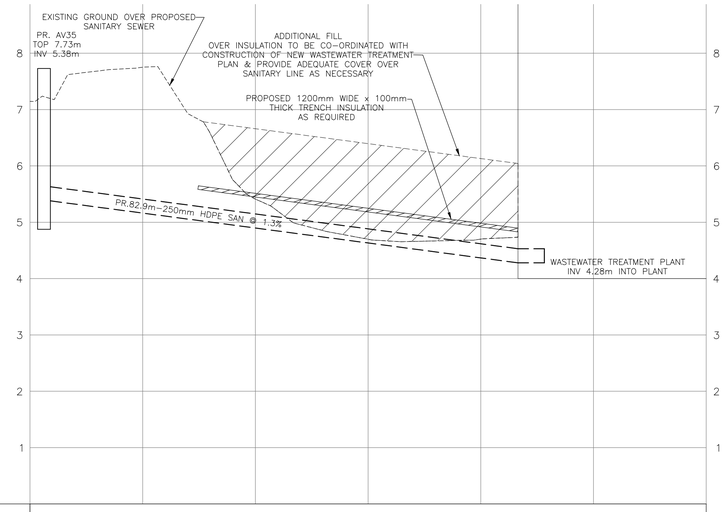
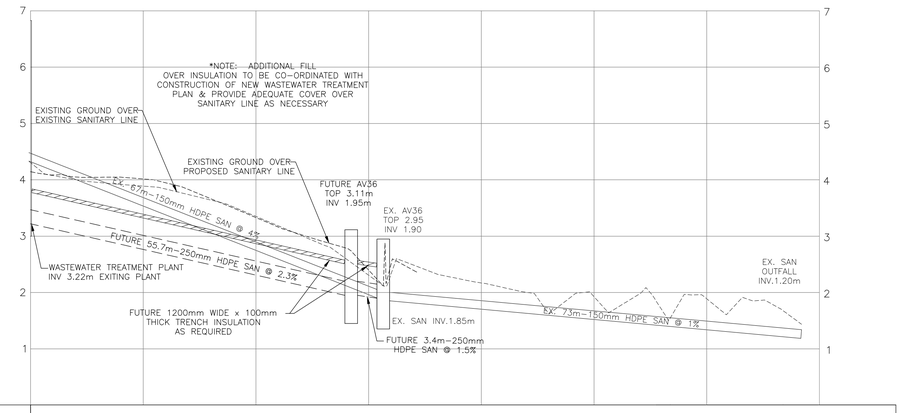
FOR CONTINUATION SEE DWG. NO. C-308



FUTURE WORK FOR INFORMATION PURPOSE ONLY



PROPOSED ELEVATION	7.15		7.75		5.41	4.70	4.70	
TOP OF WATERMAIN ELEVATION								
TOP OF WATER RECIRC ELEVATION								
SANITARY SEWER INVERT	5.38	5.38	82.9m-200mmø SERIES 128 HDPE SAN @ 1.3%				4.28	
EXISTING ELEVATION	7.15		7.75		5.41	4.70	4.70	
CHAINAGE	0+000	0+002.49	0+020	0+040	0+060	0+080	0+086.61	0+100 0+120



PROPOSED ELEVATION	4.15	4.02	3.33	2.40			1.57	1.67
TOP OF WATERMAIN ELEVATION								
TOP OF WATER RECIRC ELEVATION								
SANITARY SEWER INVERT	3.22	55.7m-250mmø SERIES 128 HDPE SAN @ 2.3%		1.95	1.95	EX. 1.90	EX. 1.85	EX. 1.20
EXISTING ELEVATION	4.15	4.02	3.33	2.40			1.57	1.67
CHAINAGE	0+000	0+020	0+040	0+056.91	0+060	0+080	0+100	

No.	Issue	Date

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV35 TO AV36

Project No. OTT-00206333-A0

Dwg. No. **C-309** Rev. No. 00

Scale 1:500

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FOR CONTINUATION SEE DWG. NO. C-305
FOR CONTINUATION SEE DWG. NO. C-306
FOR CONTINUATION SEE DWG. NO. C-311

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

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AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV03 TO AV05

Project No. OTT-00206333-A0

Dwg. No. **C-310** Rev. No. 03

Scale 1:500
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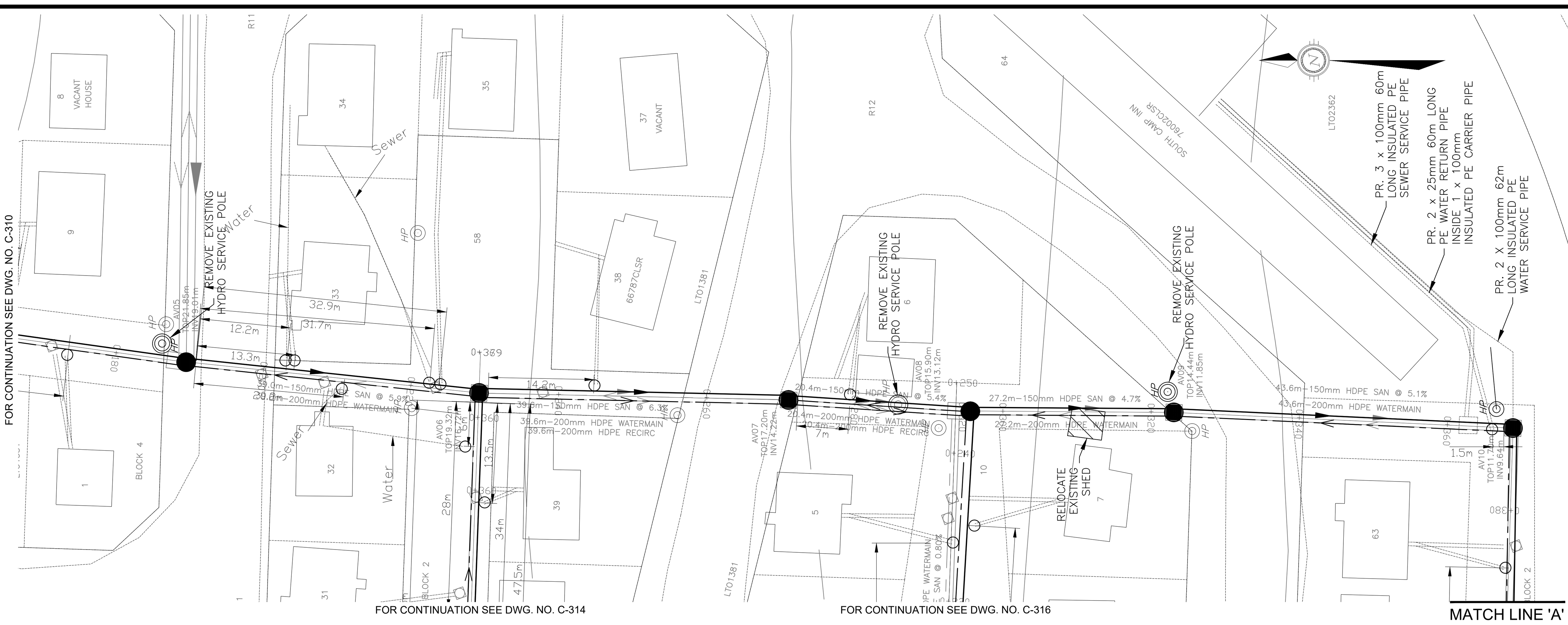

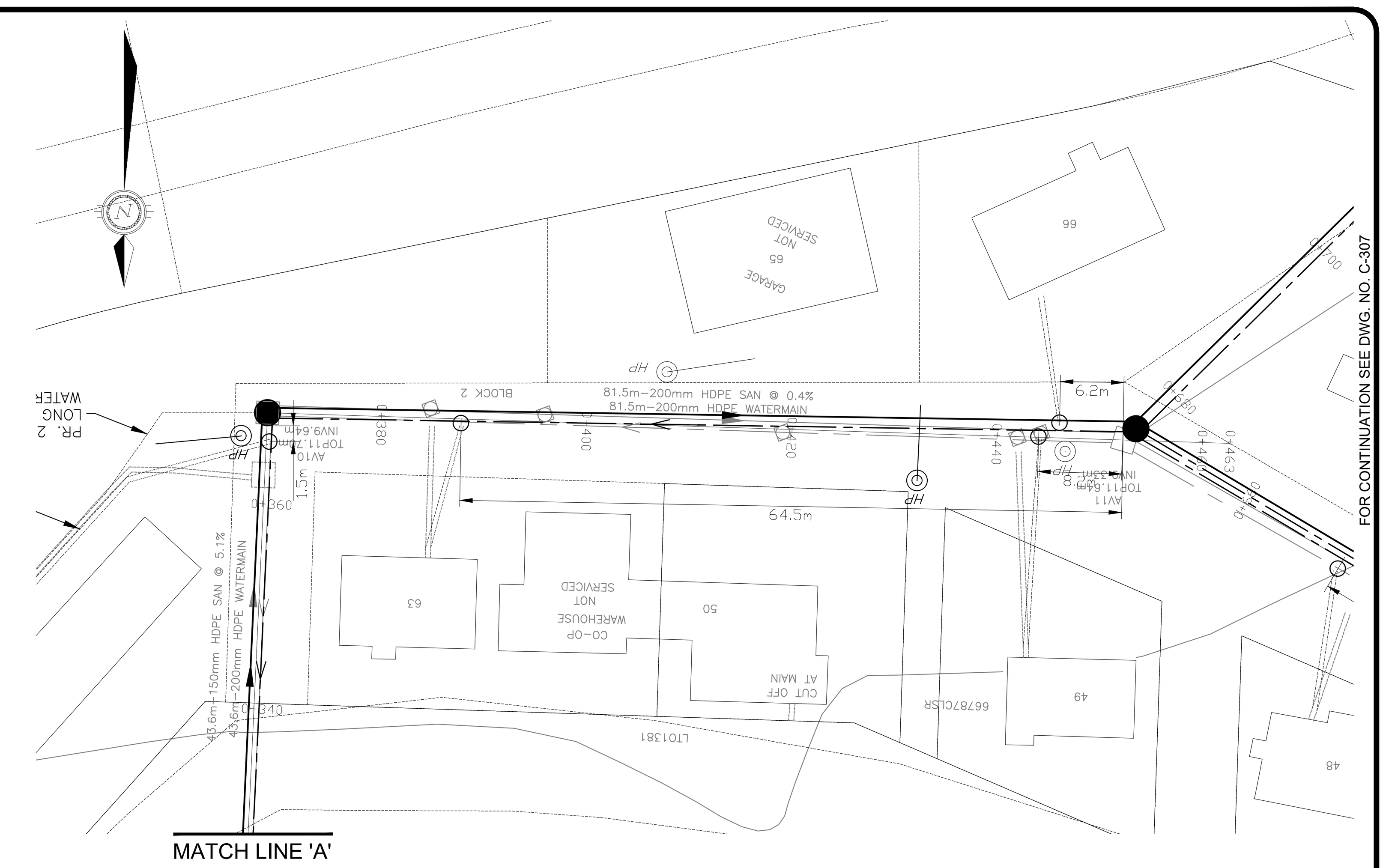

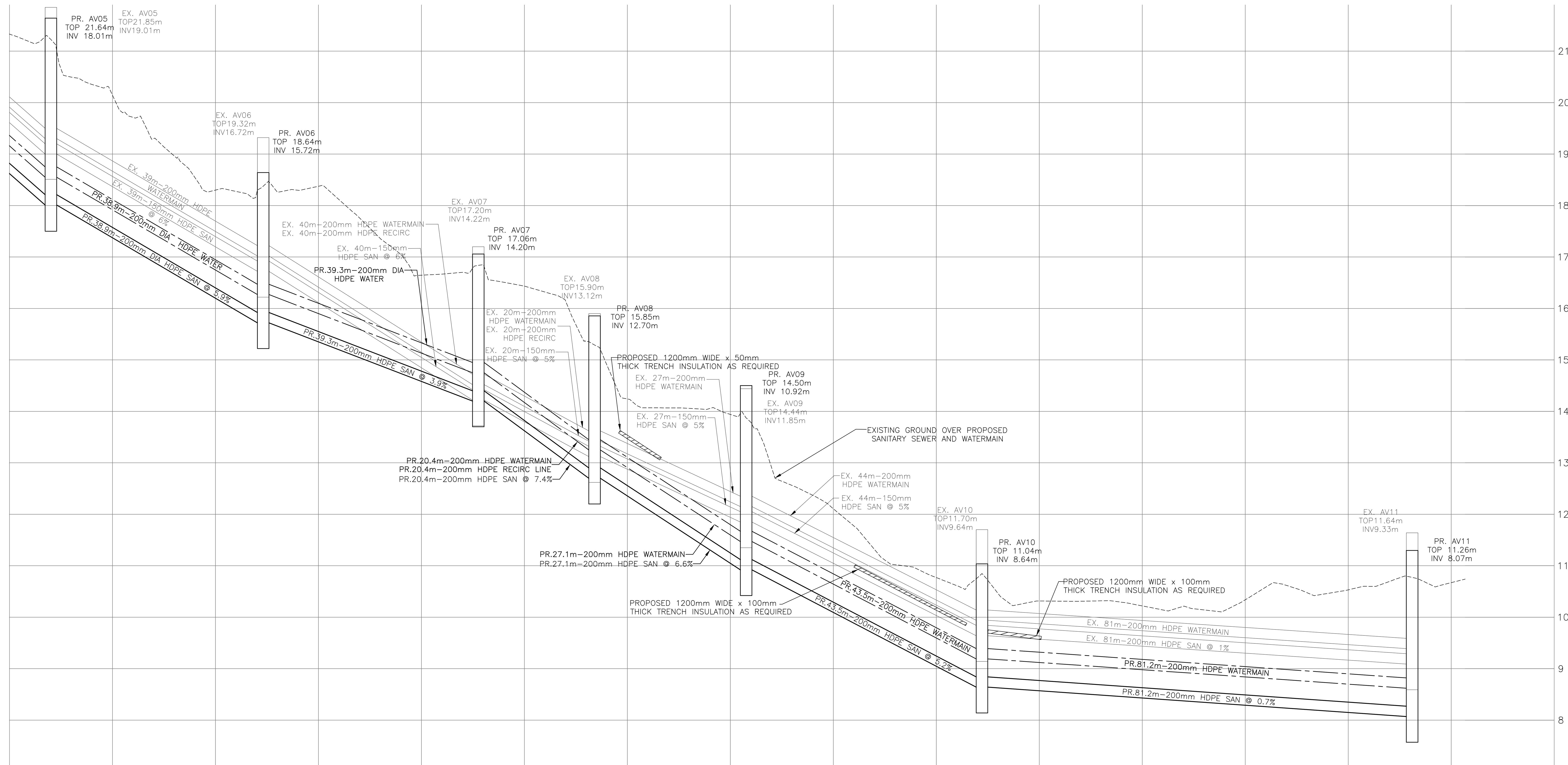

CHAINAGE	PROPOSED ELEVATION	TOP OF WATERMAIN ELEVATION	TOP OF WATER RECIRC ELEVATION	SANITARY SEWER INVERT	EXISTING ELEVATION
0+180	21.33				21.33
0+188.03		18.76 / 18.76		18.01 / 18.01	
0+188.03 – 0+229.26		38.9m–200mmø SERIES 128 HDPE WATERMAIN		38.9m–200mmø SERIES 128 HDPE SAN @ 5.9%	
0+200	20.14				20.14
0+220	18.30				18.30
0+229.26		16.47 / 16.47		N 15.72 / S 15.72 W 15.72	
0+229.26 – 0+271.04				39.3m–200mmø SERIES 128 HDPE SAN @ 3.9%	
0+240	18.37				18.37
0+260	16.65				16.65
0+271.04		14.95 / 14.95	14.95	14.20 / 14.20	
0+271.04 – 0+293.64		20.4m–200mmø SERIES 128 HDPE WATERMAIN	20.4m–200mmø SERIES 128 HDPE RECIRCULATION	20.4m–200mmø SERIES 128 HDPE SAN @ 7.4%	
0+280	16.43				16.43
0+293.64		13.45 / 13.45	13.45	N 12.70 / S 12.70 W 12.70	
0+293.64 – 0+323.07		27.1m–200mmø SERIES 128 HDPE WATERMAIN		27.1m–200mmø SERIES 128 HDPE SAN @ 6.6%	
0+300	14.24				14.24
0+320	13.94				13.94
0+323.07		11.67 / 11.67		10.92 / 10.92	
0+323.07 – 0+368.88		43.5m–200mmø SERIES 128 HDPE WATERMAIN		43.5m–200mmø SERIES 128 HDPE SAN @ 5.2%	
0+340	12.11				12.11
0+360	10.77				10.77
0+368.88		9.39 / 9.39		8.64 / 8.64	
0+368.88 – 0+452.42		81.2m–200mmø SERIES 128 HDPE WATERMAIN		81.2m–200mmø SERIES 128 HDPE SAN @ 0.7%	
0+380	10.31				10.31
0+400	10.22				10.22
0+420	10.34				10.34
0+440	10.53				10.53
0+452.42		E 8.82 / SW 8.82 NW 8.82	E 8.82	E 8.07 / SW 8.07 NW 8.07	
0+460	10.67				10.67
0+480					

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Date Printed

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV05 TO AV11

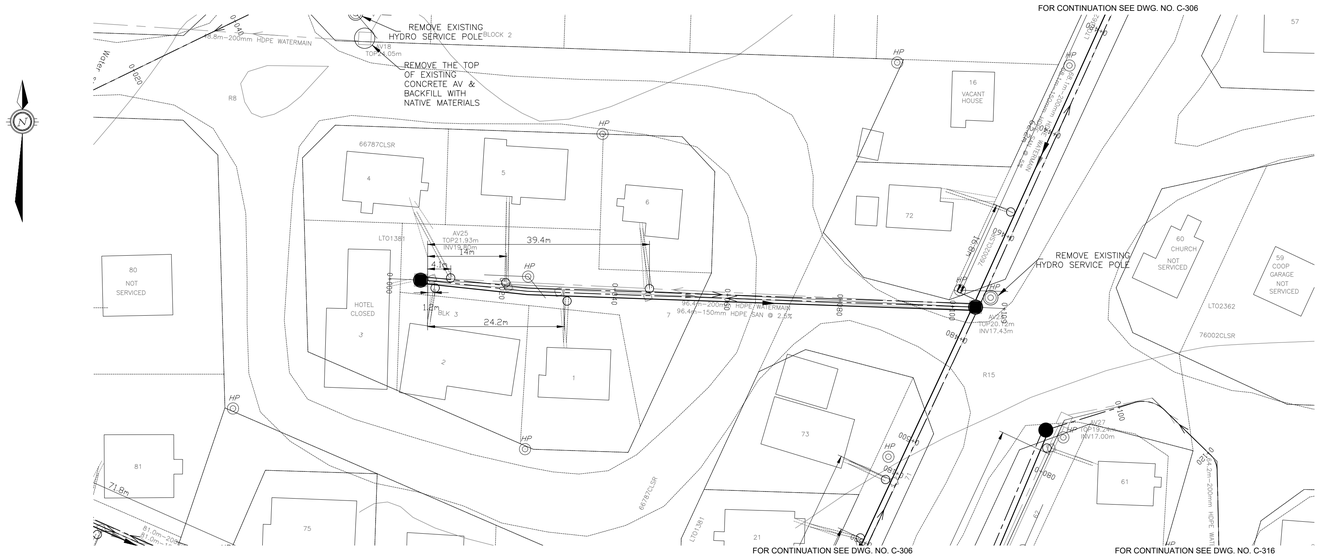
Project No. OTT-00206333-A0

Dwg. No. C-311

Rev. No. 03

Scale 1:500

This drawing is not to be scaled



No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV25 TO AV23

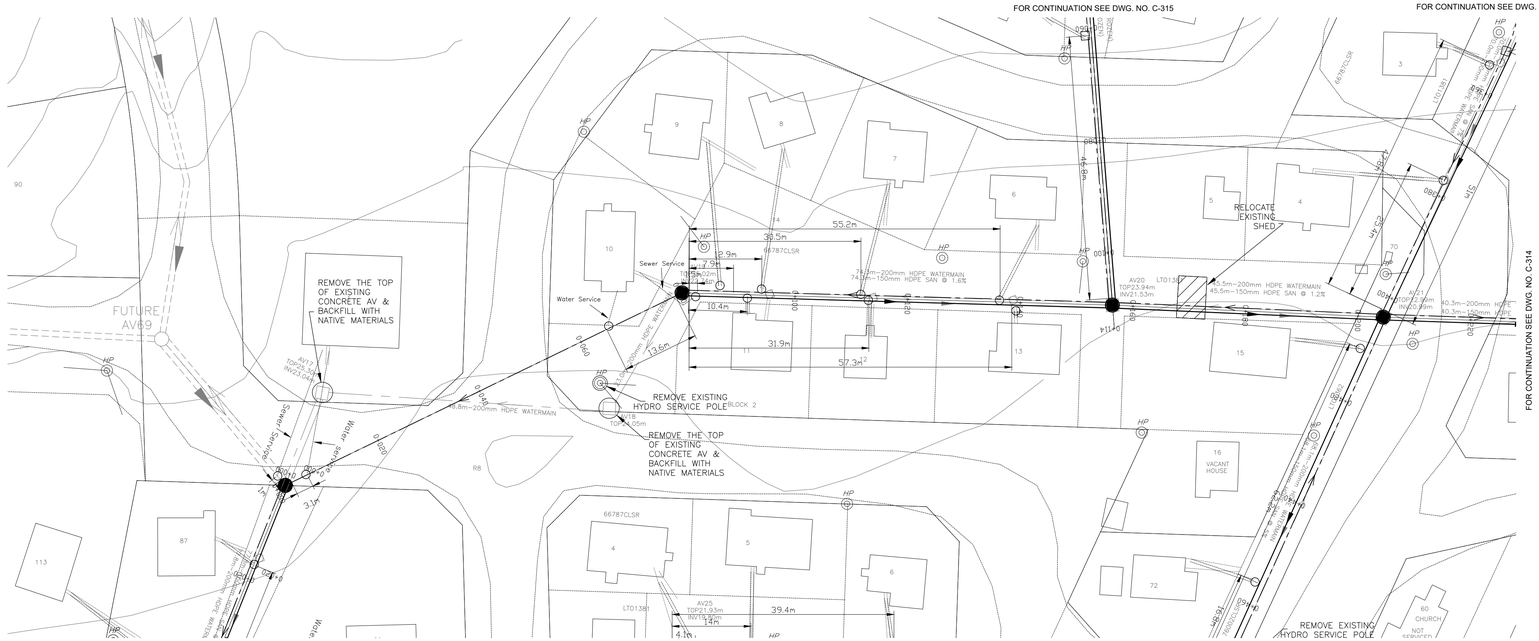
Project No. OTT-00206333-A0

Dwg. No. **C-312**

Rev. No. 03

Scale 1:500

This drawing is not to be scaled



No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

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AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

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Designed By: A. ZARAD

Date Printed

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV17 TO AV21

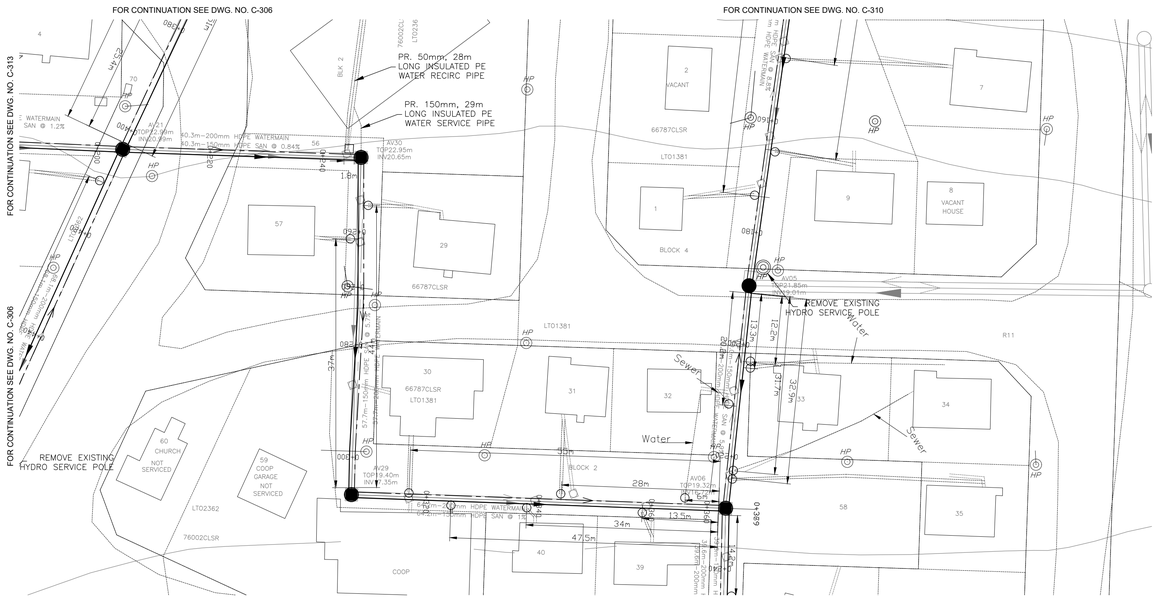
Project No. OTT-00206333-A0

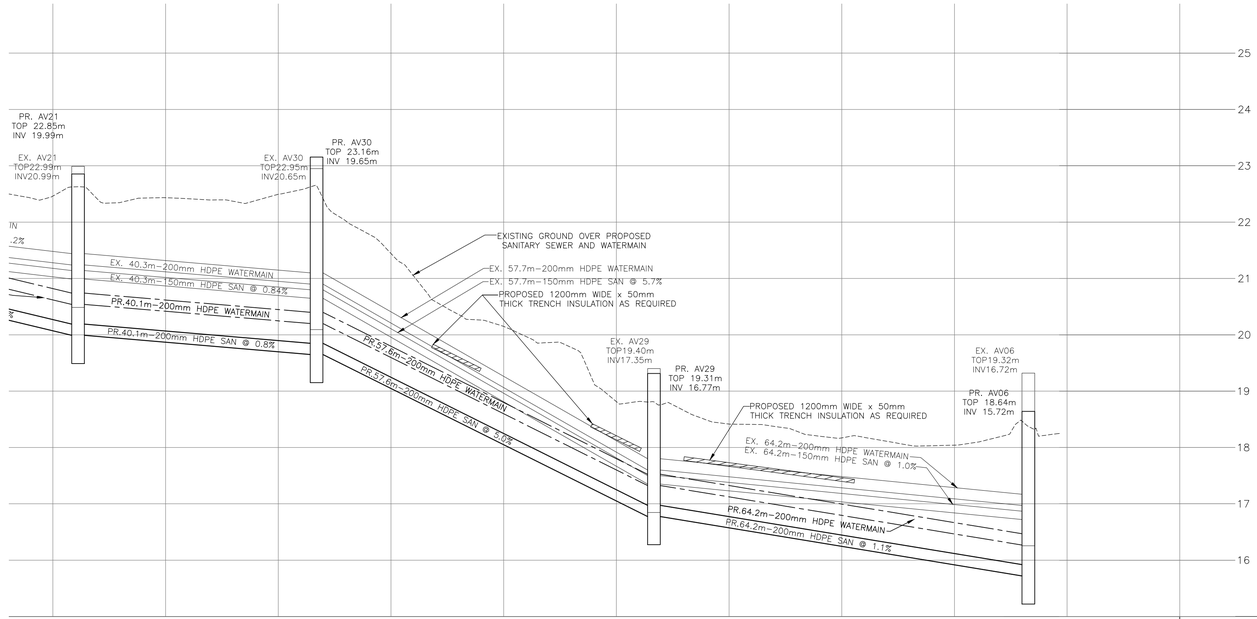
Dwg. No. **C-313**

Rev. No. 03

Scale 1:500

This drawing is not to be scaled





22.46	22.43	22.50	21.44	20.15	18.81	18.41	18.17	18.04		PROPOSED ELEVATION
W 20.74 E 20.74 SW20.74 NE20.74	40.1m-200mm⌀ SERIES 128 HDPE WATERMAIN	20.40 20.40	57.6m-200mm⌀ SERIES 128 HDPE WATERMAIN	17.52 17.52	64.2m-200mm⌀ SERIES 128 HDPE WATERMAIN			W 16.47 N 16.47 S 16.47		TOP OF WATERMAIN ELEVATION
										TOP OF WATER RECIRC ELEVATION
W 19.99 E 19.99 SW19.99 NE19.99	40.1m-200mm⌀ SERIES 128 HDPE SAN @ 0.8%	19.65 19.65	57.6m-200mm⌀ SERIES 128 HDPE SAN @ 5.0%	16.77 16.77	64.2m-200mm⌀ SERIES 128 HDPE SAN @ 1.1%			W 15.72 N 15.72 S 15.72		SANITARY SEWER INVERT
22.46	22.43	22.50	21.44	20.15	18.81	18.41	18.17	18.04		EXISTING ELEVATION
0+200	0+204.46	0+220	0+240	0+246.80	0+260	0+280	0+300	0+306.68	0+320	0+340	0+360	0+373.12	0+380	0+400	CHAINAGE

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV21 TO AV06

Project No. OTT-00206333-A0

Dwg. No. **C-314**

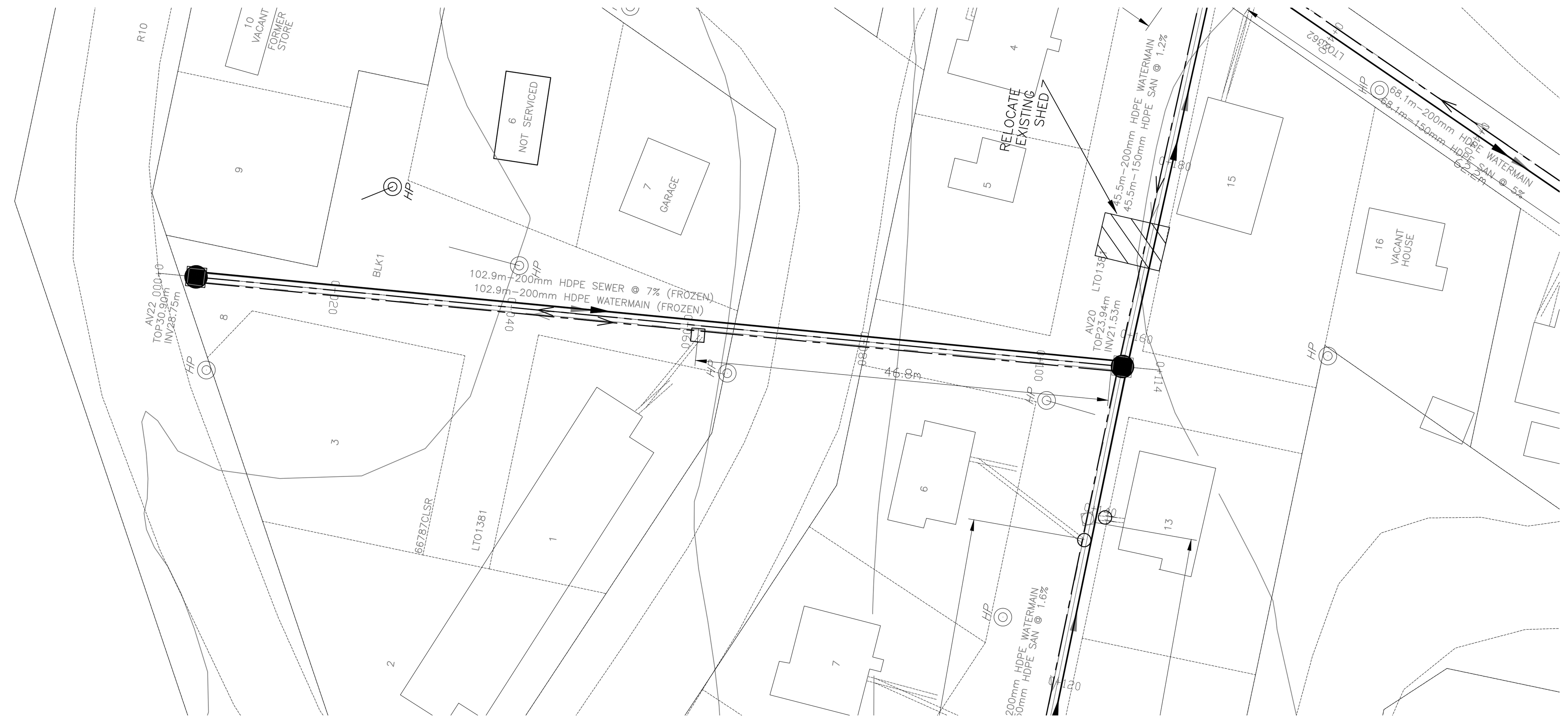
Rev. No. 03

Scale 1:500

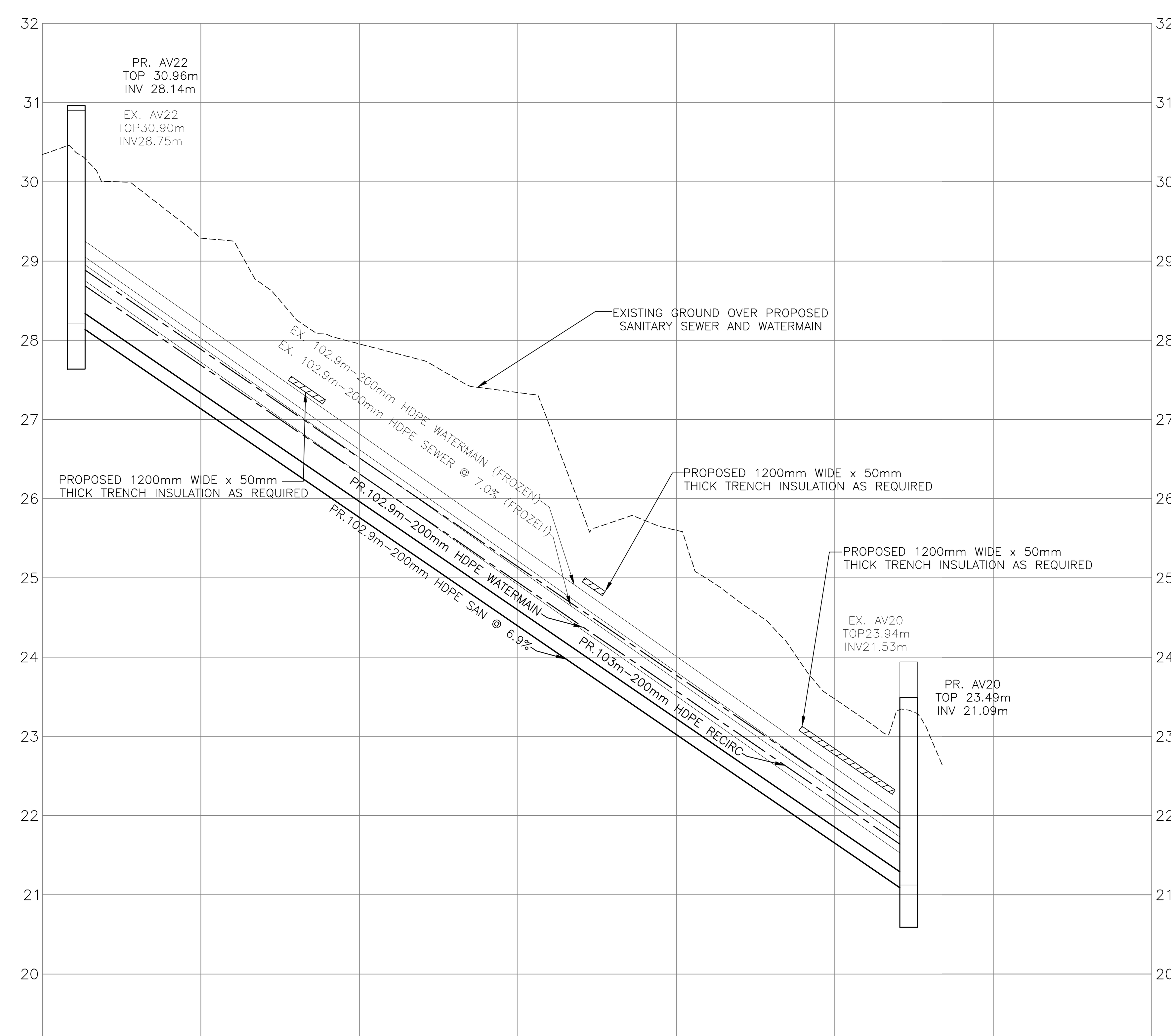
This drawing is not to be scaled

FILE: \\POTTFSG02\DATA\PROJECTS\CIVIL ENGINEERING SERVICES\206000\OTT-00206333-A0 - NEW UTILIDOR DESIGN, RESOLUTE BAY - GN\D - DRAWINGS\ASBUILTS-SEPTEMBER 2015\06- 206333-PLAN & PROFILES SERVICE CONNECTIONS ASBUILTS.DWG

FOR CONTINUATION SEE DWG. NO. C-313



FOR CONTINUATION SEE DWG. NO. C-313



PROPOSED ELEVATION	30.34		29.29	27.95	27.34	25.60	23.47			
TOP OF WATERMAIN ELEVATION		28.89	102.9m–200mmø SERIES 128 HDPE WATERMAIN					21.84 / W 21.84 E 21.84		
TOP OF WATER RECIRC ELEVATION		28.89	102.9m–200mmø SERIES 128 HDPE RECIRCULATION					21.84		
SANITARY SEWER INVERT		28.14	102.9m–200mmø SERIES 128 HDPE SAN @ 6.9%					21.09 / W 21.09 E 21.09		
EXISTING ELEVATION	30.34		29.29	27.95	27.34	25.60	23.47			
CHAINAGE	0+000	0+004.26	0+020	0+040	0+060	0+080	0+100	0+109.32	0+120	0+140

PLOTTED BY: AYO ONI

DATE: 2017/Nov/7 2:36:02 PM

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV22 TO AV20

Project No. OTT-00206333-A0

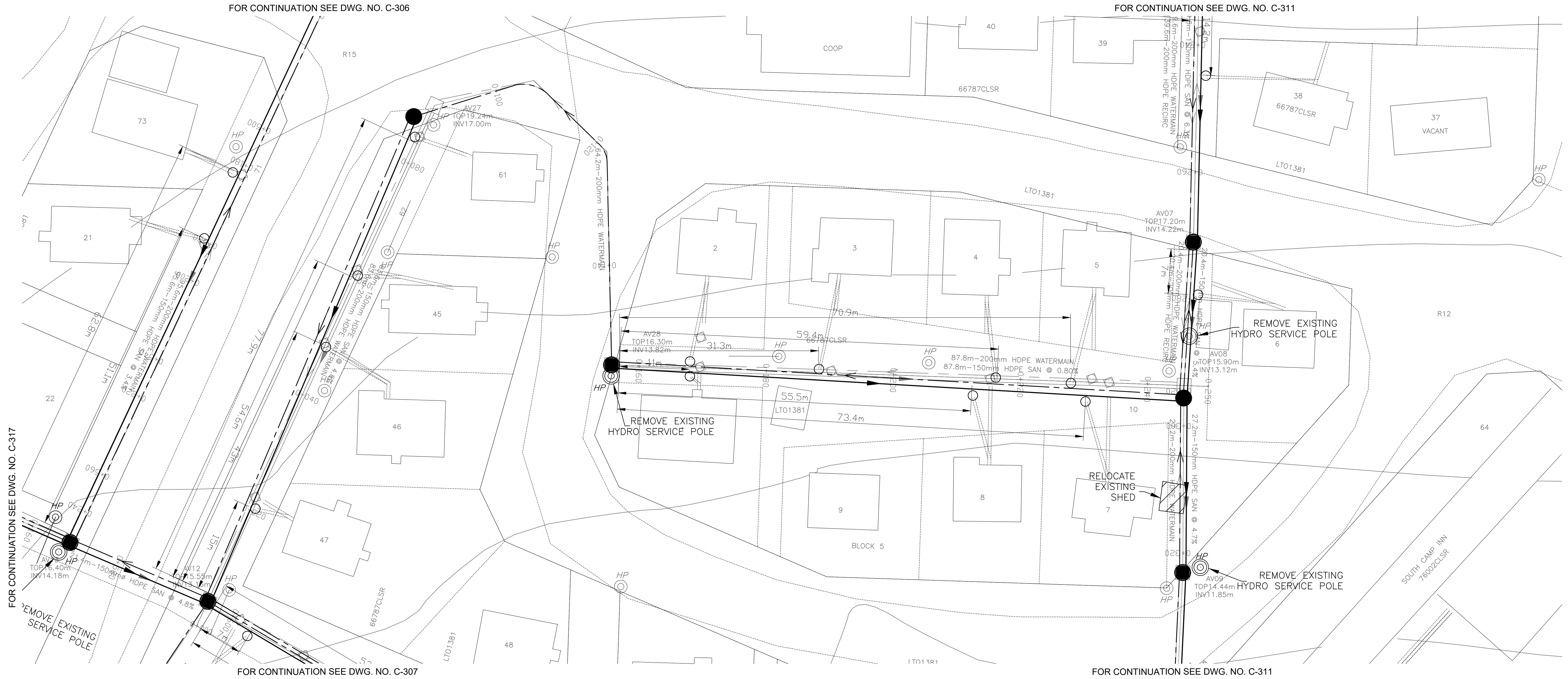
Dwg. No. **C-315**

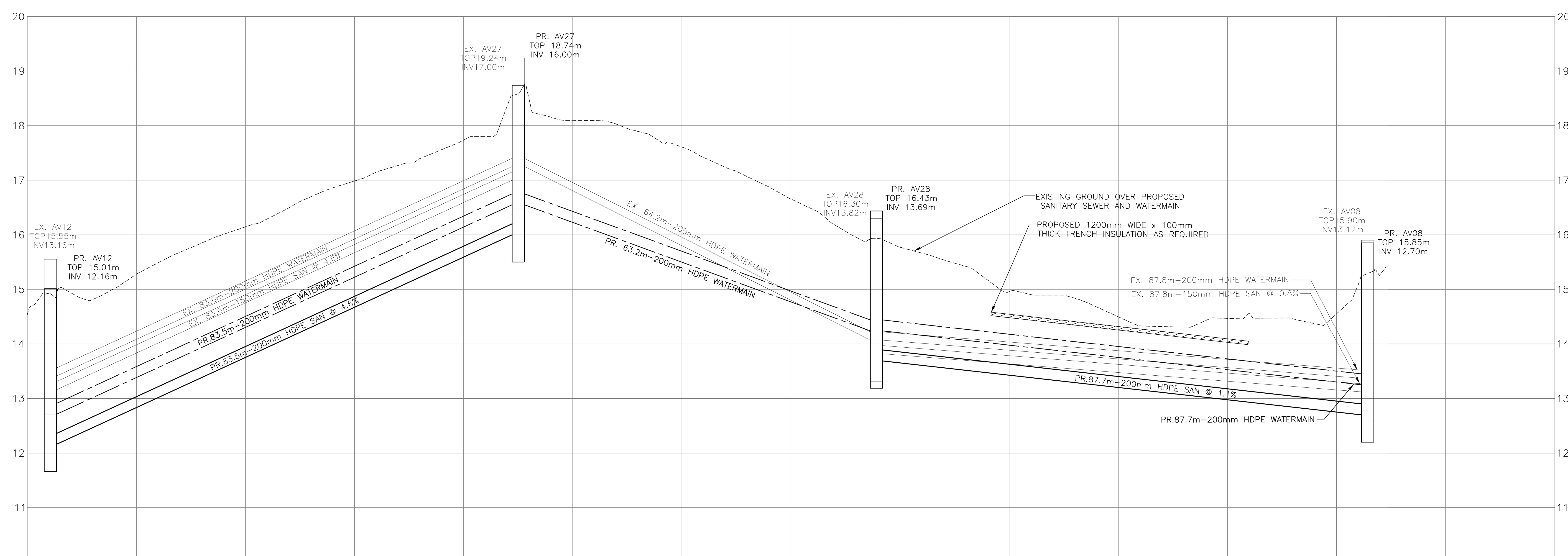
Rev. No. 03

Scale 1:500

This drawing is not to be scaled

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26





CHAINAGE	PROPOSED ELEVATION	TOP OF WATERMAIN ELEVATION	TOP OF WATER RECIRC ELEVATION	SANITARY SEWER INVERT	EXISTING ELEVATION
0+000	14.53	SW12.91 SE12.91	SW12.91	SW12.16 SE12.16	14.53
0+004.24		NE12.91		NE12.16	
0+020	15.28				15.28
0+040	16.15	83.5m-200mmø SERIES 128 HDPE WATERMAIN		83.5m-200mmø SERIES 128 HDPE SAN @ 4.6%	16.15
0+060	16.98				16.98
0+080	17.73				17.73
0+090.01		16.75 / 16.75		16.00	
0+100	18.09				18.09
0+120	17.61	63.2m-200mmø SERIES 128 HDPE WATERMAIN			17.61
0+140	16.65				16.65
0+155.67		14.44 / 14.44		13.69	
0+160	15.77				15.77
0+180	14.96				14.96
0+200	14.50	87.7m-200mmø SERIES 128 HDPE WATERMAIN		87.7m-200mmø SERIES 128 HDPE SAN @ 1.1%	14.50
0+220	14.47				14.47
0+240	14.55				14.55
0+245.71		W 13.45 / N 13.45 S 13.45		W 12.70 / N 12.70 S 12.70	
0+260					
0+280					

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AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

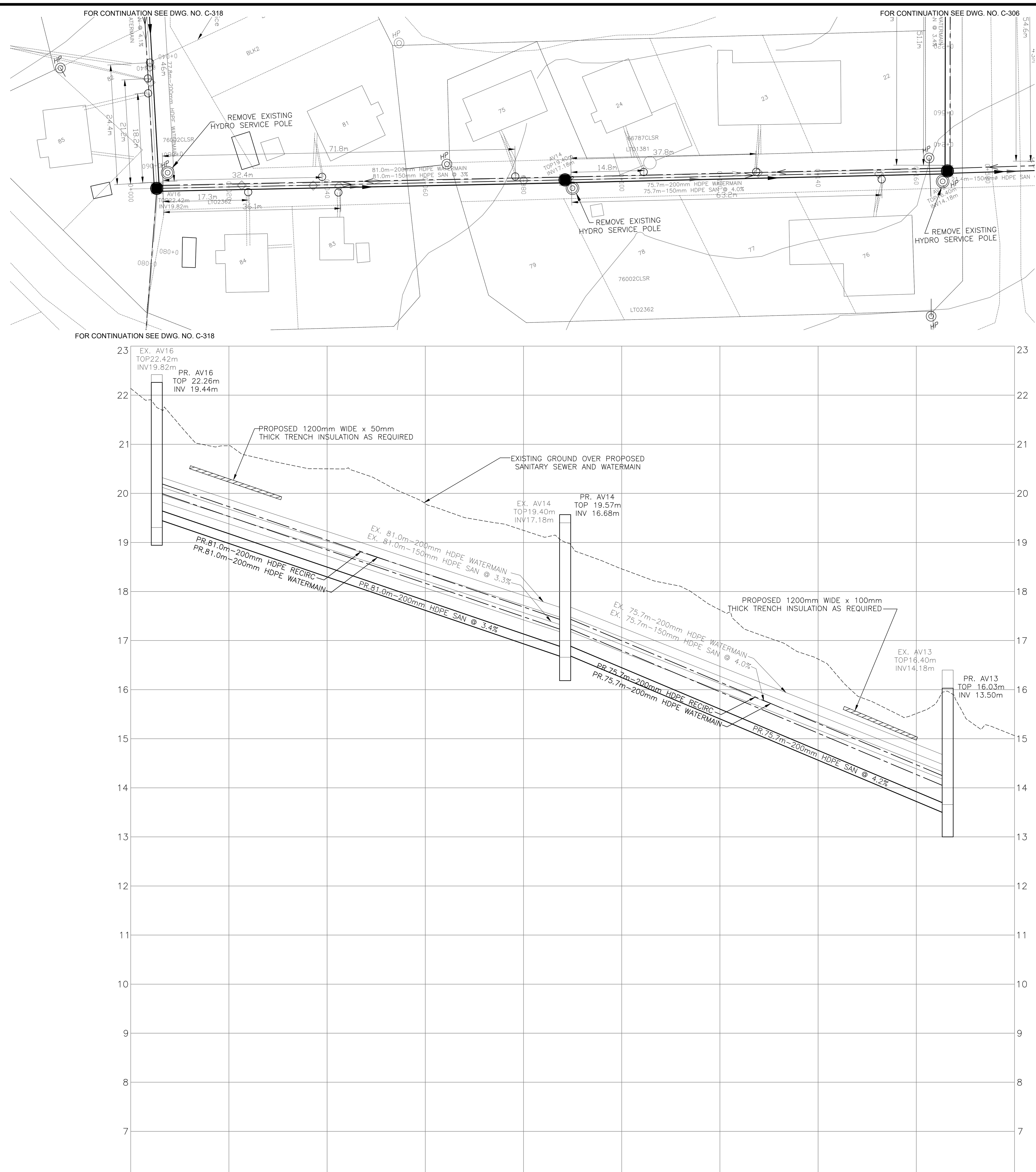
PLAN AND PROFILE AV12 TO AV08

Project No. OTT-00206333-A0

Dwg. No. **C-316** Rev. No. 03

Scale 1:500
This drawing is not to be scaled

FOR CONTINUATION SEE DWG. NO. C-318
FOR CONTINUATION SEE DWG. NO. C-306
FOR CONTINUATION SEE DWG. NO. C-307



	0+000	0+005.31	0+020	0+040	0+060	0+080	0+088.48	0+100	0+120	0+140	0+160	0+166.39	0+180
PROPOSED ELEVATION	22.14		20.97	20.50	19.79	19.25		18.46	17.63	16.62	15.51		
TOP OF WATERMAIN ELEVATION	NE20.19 NW20.19	SE20.19		81.0m–200mmø SERIES 128 HDPE WATERMAIN			17.43 17.43		75.7m–200mmø SERIES 128 HDPE WATERMAIN			NW14.25 SE14.25 NE14.25	
TOP OF WATER RECIRC ELEVATION		20.19		81.0m–200mmø SERIES 128 HDPE RECIRCULATION			17.43 17.43		75.7m–200mmø SERIES 128 HDPE RECIRCULATION			14.25	
SANITARY SEWER INVERT	19.44	19.44		81.0m–200mmø SERIES 128 HDPE SAN @ 3.4%			16.68 16.68		75.7m–200mmø SERIES 128 HDPE SAN @ 4.2%			NW13.50 SE13.50 NE13.50	
EXISTING ELEVATION	22.14		20.97	20.50	19.79	19.25		18.46	17.63	16.62	15.51		
CHAINAGE	0+000	0+005.31	0+020	0+040	0+060	0+080	0+088.48	0+100	0+120	0+140	0+160	0+166.39	0+180

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV16 TO AV13

Project No. OTT-00206333-A0

Dwg. No. **C-317**

Rev. No. 03

Scale 1:500
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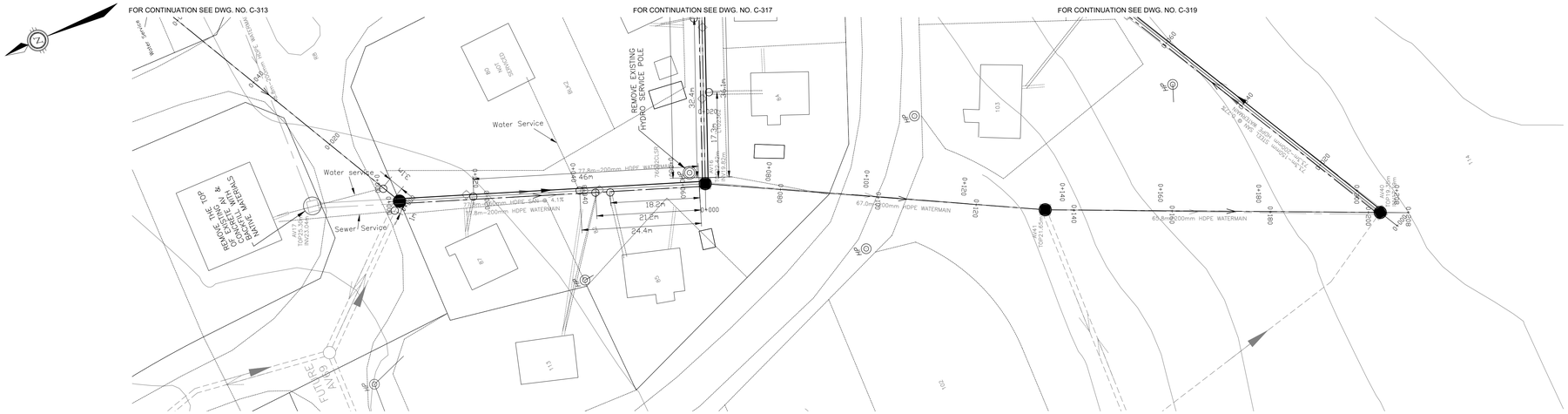

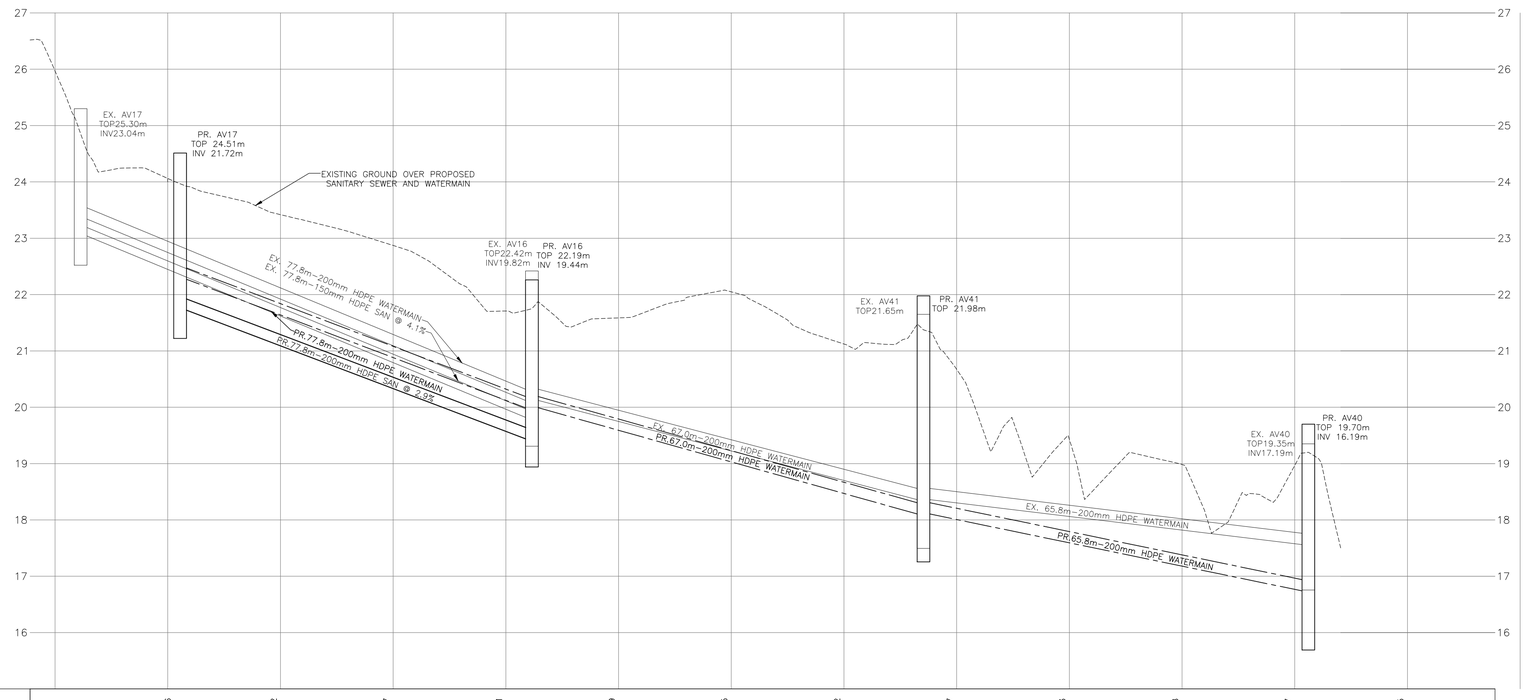

PROPOSED ELEVATION	24.06	23.42	22.87	21.71	21.59	22.05	21.12	20.67	19.43	18.98	18.97	18.35
TOP OF WATERMAIN ELEVATION	22.47	22.47	77.8m–200mmø SERIES 128 HDPE WATERMAIN	NE20.19 SE20.19 SW20.19	67.0m–200mmø SERIES 128 HDPE WATERMAIN		18.30	18.30	65.8m–200mmø SERIES 128 HDPE WATERMAIN		16.94	16.94
TOP OF WATER RECIRC ELEVATION												
SANITARY SEWER INVERT		21.72	77.8m–200mmø SERIES 128 HDPE SAN @ 2.9%	NE19.44 SE19.44							16.19	
EXISTING ELEVATION	*25.96*	*24.06*	*23.42*	*22.87*	*21.71*	*21.59*	*22.05*	*21.12*	*20.67*	*19.43*	*18.98*	*18.97*	*18.35*
CHAINAGE		0+000	0+002.18	0+020	0+040	0+060	0+064.62	0+080	0+100	0+120	0+134.11	0+140	0+160	0+180	0+200	0+202.41	0+220

No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

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AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Date Printed

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV17 TO AV40

Project No. OTT-00206333-A0

Dwg. No. **C-318**

Rev. No. 03

Scale 1:500

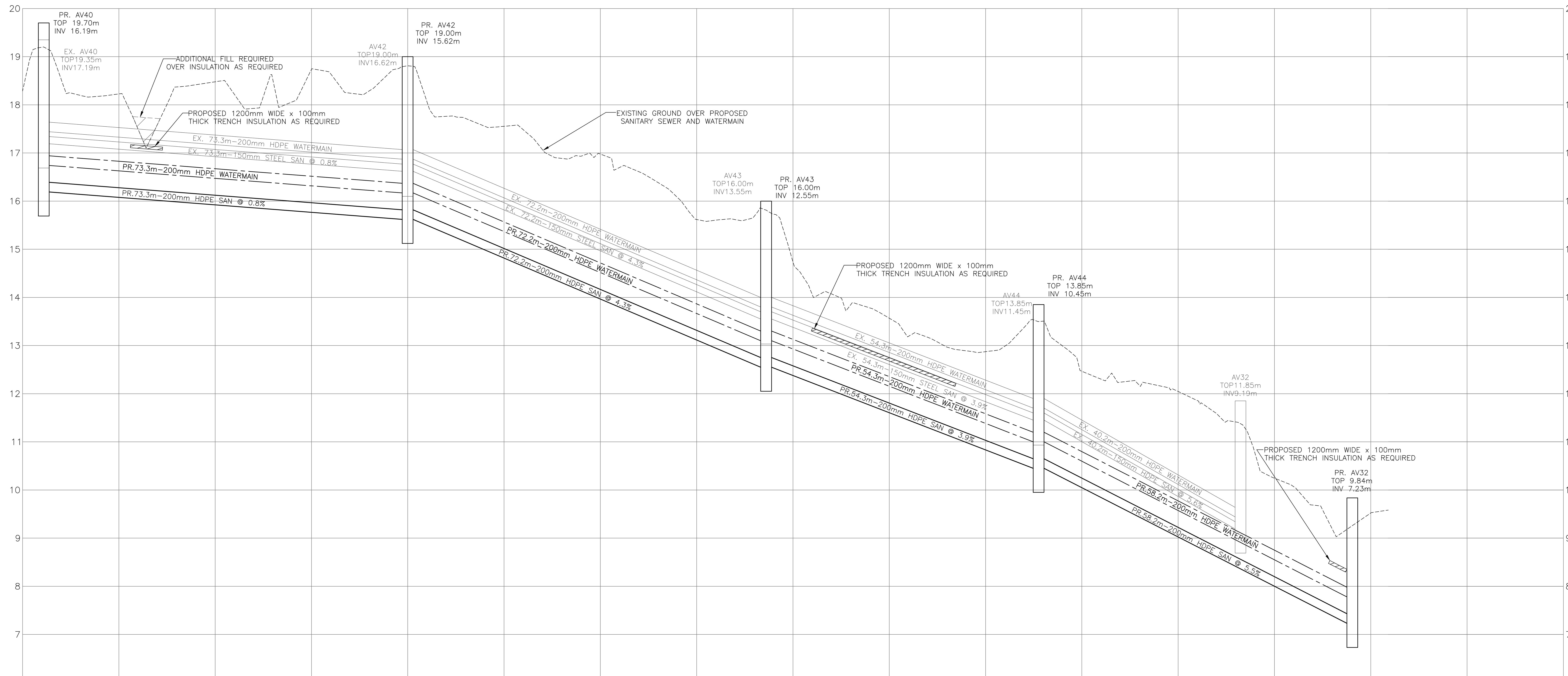
This drawing is not to be scaled

FILE: \\POTTFSG02\DATA\PROJECTS\CIVIL ENGINEERING SERVICES\206000\OTT-00206333-A0 - NEW UTILIDOR DESIGN, RESOLUTE BAY - GNID - DRAWINGS\ASBUILTS-SEPTEMBER 2015\06- 206333-PLAN & PROFILES SERVICE CONNECTIONS ASBUILTS.DWG

FOR CONTINUATION SEE DWG. NO. C-318

FOR CONTINUATION SEE DWG. NO. C-307

FOR CONTINUATION SEE DWG. NO. C-307



	0+000	0+004.41	0+020	0+040	0+060	0+079.97	0+080	0+100	0+120	0+140	0+154.42	0+160	0+180	0+200	0+211.01	0+220	0+240	0+260	0+276.16	0+280	0+300	0+320
PROPOSED ELEVATION	18.29		18.23	18.48	18.74		18.81	17.55	16.98	15.62		14.74	13.57	12.87		12.46	12.05	10.24		8.12		
TOP OF WATERMAIN ELEVATION		16.94 16.94		73.3m-200mmø SERIES 128 HDPE WATERMAIN		16.37 16.37			72.2m-200mmø SERIES 128 HDPE WATERMAIN		13.30 13.30		54.3m-200mmø SERIES 128 HDPE WATERMAIN		11.20 11.20		58.2m-200mmø SERIES 128 HDPE WATERMAIN		7.98 7.98			
TOP OF WATER RECIRC ELEVATION																						
SANITARY SEWER INVERT		16.19		73.3m-200mmø SERIES 128 HDPE SAN @ 0.8%		15.62 15.62			72.2m-200mmø SERIES 128 HDPE SAN @ 4.3%		12.55 12.55		54.3m-200mmø SERIES 128 HDPE SAN @ 3.9%		10.45 10.45		58.2m-200mmø SERIES 128 HDPE SAN @ 5.5%		NW 7.23 NE 7.23 SW 7.23			
EXISTING ELEVATION	18.29		18.23	18.48	18.74		18.81	17.55	16.98	15.62		14.74	13.57	12.87		12.46	12.05	10.24		8.12		
CHAINAGE	0+000	0+004.41	0+020	0+040	0+060	0+079.97	0+080	0+100	0+120	0+140	0+154.42	0+160	0+180	0+200	0+211.01	0+220	0+240	0+260	0+276.16	0+280	0+300	0+320

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No.	Issue	Date
01	ISSUED FOR TENDER	2013-MAR-25
02	REISSUED FOR TENDER	2013-OCT-25
03	ISSUED FOR CONSTRUCTION	2014-APR-21
04	ISSUED FOR AS-BUILT	2016-APR-26

Nunavut

AS-BUILT

DATE: APRIL 26, 2016

No.	Revision	Ckd. By	Date
00	100% SUBMISSION	SLB	2013-MAR-04

Const. North

Date Printed

Drawn By: I.CRAWFORD

Dwg. Standards Ckd. By:

Designed By: A. ZARAD

Dwg. Design Ckd. By: S. BURDEN

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Project Title

NEW UTILIDOR DESIGN
RESOLUTE BAY, NU

Dwg. Title

PLAN AND PROFILE AV40 TO AV32

Project No. OTT-00206333-A0

Dwg. No. C-319

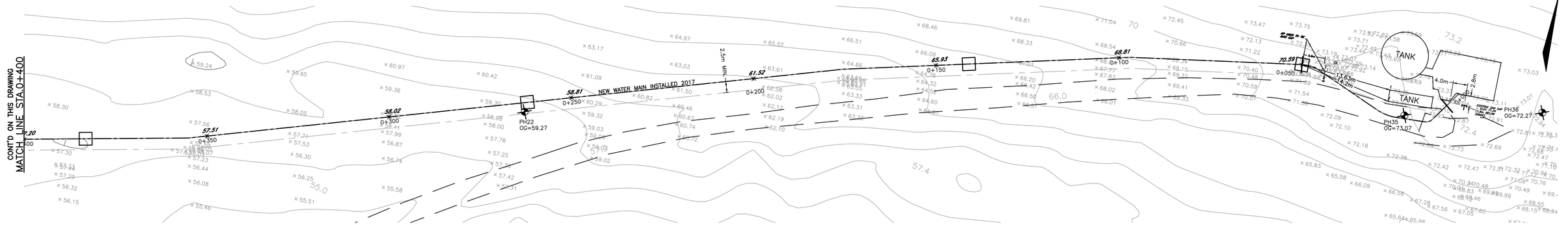
Rev. No. 03

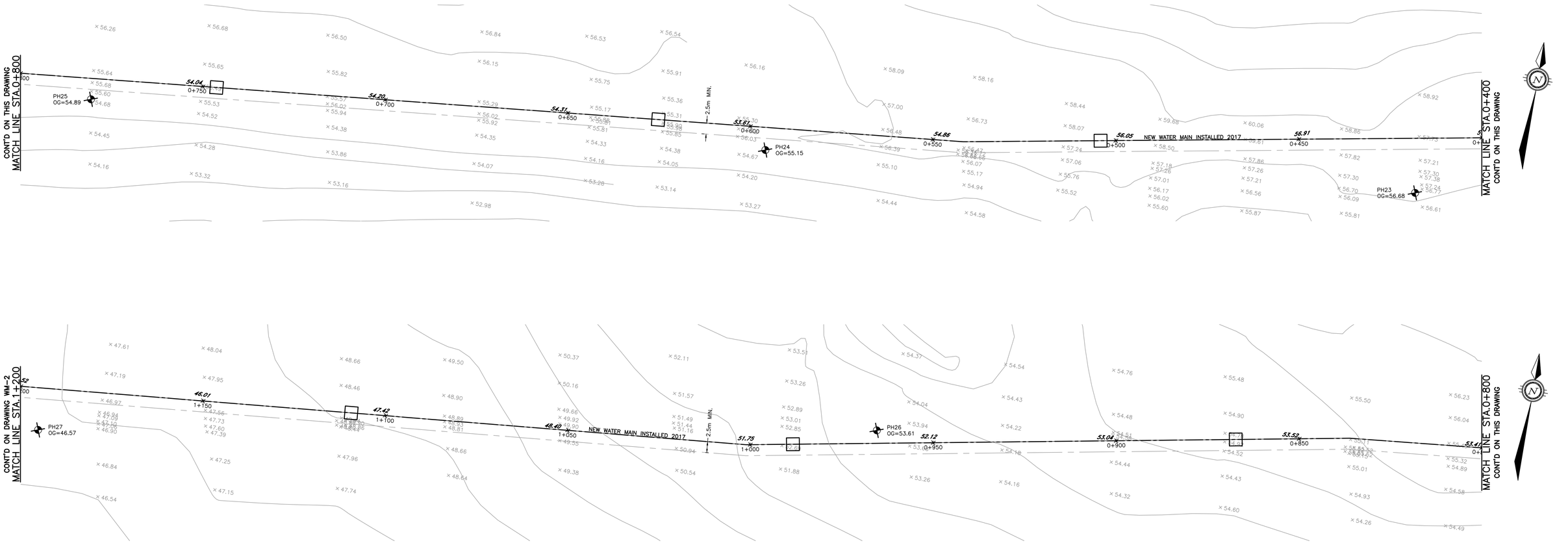
Scale 1:500

This drawing is not to be scaled

AS-BUILTS

CHAR LAKE WATERMAIN





NOTE:
NEW WATERMAIN INSTALLED IN 2017, 150mm DIA HDPE, DR 13.5 C/W 75mm INSULATION, AND HEAT TRACE CHANNEL

NOTES
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

AS-BUILT

DATE: NOVEMBER 29, 2017

REV	REVISION DESCRIPTION	DATE	BY	APPD
2	ASBUILT	29/11/17	MZG	SAD
1	ISSUED FOR CHANGE ORDER	12/05/16	SAB	SAD

SCALE: 0 5m 10m 20m — HORIZONTAL 1:500

NORTH

DESIGNED BY

REVIEWED BY

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COMMUNITY AND GOVERNMENT SERVICES

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• INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

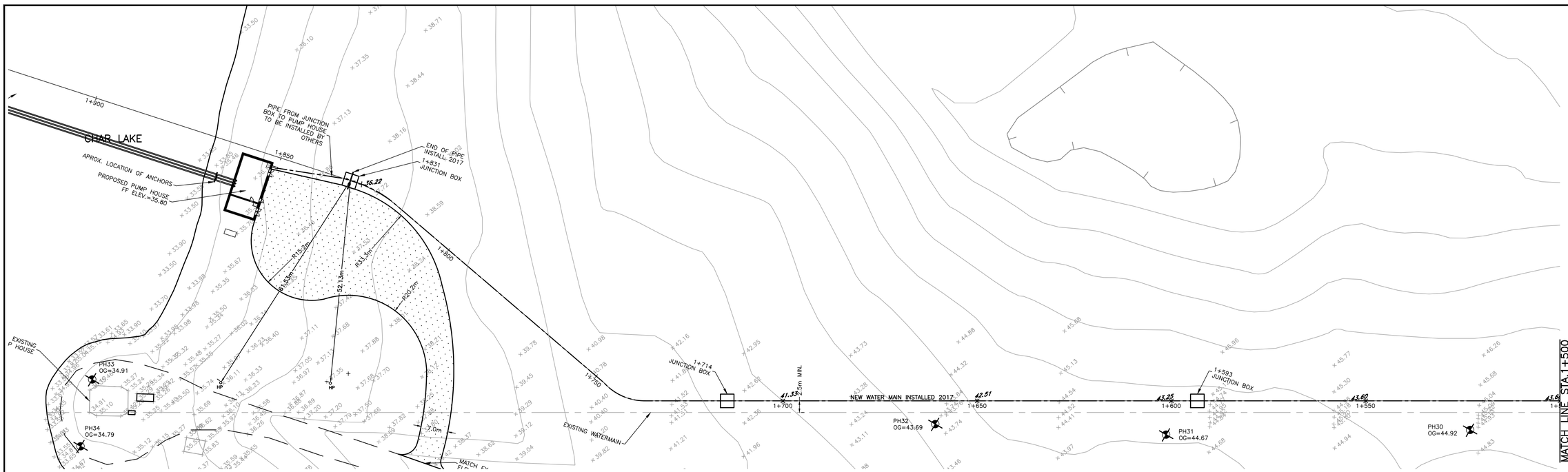
BASEPLAN: exp
DESIGN: SAD
CHECKED: SAD
CAD: SAB
PROJECT MANAGER: SLB
APPROVED: SLB

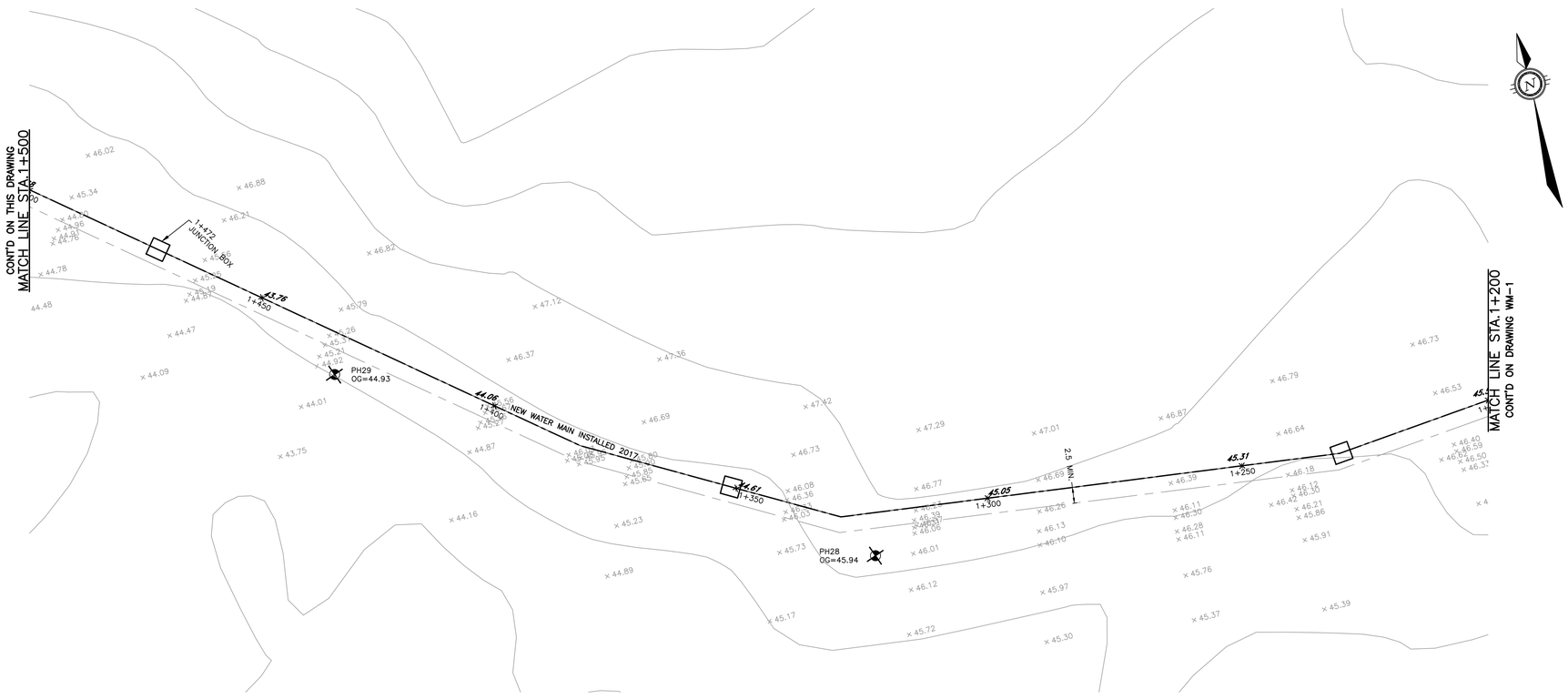
PROJECT: CHAR LAKE WATERMAIN

TITLE: WATERMAIN REPLACEMENT
STA. 0+000 TO STA. 1+200

PROJECT No.: OTT-00206333-A0
SURVEY: exp.
DATE: November 17
DRAWING No.: WM-1

File name: P:\Projects\Civil Engineering Services\206000\OTT-00206333-A0 - New Utilidor Design, Resolute Bay - GA\D - DRAWINGS\Char Lake-Sh-Transmission 2015\Asbuilt\SER-Asbuilt-2017-11-22.dwg
Last Plotted: Nov 30, 2017 8:16 AM Plotted by: ChadbornM
Last Saved: Nov 30, 2017 8:16 AM Saved by: ChadbornM
XREFs:





NOTE:
NEW WATERMAIN INSTALLED IN 2017, 150mm DIA HDPE, DR 13.5 C/W 75mm INSULATION, AND HEAT TRACE CHANNEL

NOTES
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

AS-BUILT

DATE: NOVEMBER 29, 2017

REV	REVISION DESCRIPTION	DATE	BY	APPD
2	ASBUILT	29/11/17	MZG	SAD
1	ISSUED FOR CHANGE ORDER	12/05/16	SAB	SAD

SCALE: 0 5m 10m 20m — HORIZONTAL 1:500

NORTH

DESIGNED BY

REVIEWED BY

CLIENT: GOVERNMENT OF NUNAVUT
COMMUNITY AND GOVERNMENT SERVICES

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BASEPLAN	exp
DESIGN	SAD
CHECKED	SAD
CAD	SAB
PROJECT MANAGER	SLB
APPROVED	SLB

PROJECT: CHAR LAKE WATERMAIN

TITLE: WATERMAIN REPLACEMENT
STA. 1+200 TO STA. 1+890

PROJECT No.	OTT-00206333-A0
SURVEY	exp
DATE	November 17
DRAWING No.	WM-2

Filename: P:\Projects\Civil Engineering Services\206000\OTT-00206333-A0 - New Utilidor Design, Resolute Bay - GN\D - DRAWINGS\Char Lake-Str-Transmission 2015\Rebuilt\SER-Rebuilt-2017-11-22.dwg
Last Saved By: mgoldie
Last Plotted: Nov. 30, 2017 10:33 AM Plotted by: Ghadbolal
Xrefs: None
References:

PRODUCT SPECIFICATIONS

TEK™ SERIES CONSTANT WATT HEATING CABLE

TOWER ARCTIC LTD
APPROVED
NOV 14, 2016

AVAILABLE CABLES

Catalog Number [1]		Resistance per Conductor at 68°F (20°C)		Conductor Size [2]
2 Conductor	3 Conductor	Ohms/ft	Ohms/m	
TEK 2C40	TEK 3C40	0.004548	0.01492	16 AWG
TEK 2C50	TEK 3C50	0.002880	0.009449	14 AWG
TEK 2C60	TEK 3C60	0.001812	0.005945	12 AWG
TEK 2C70	TEK 3C70	0.001060	0.003478	10 AWG

Note

1. Base cable includes nickel-plated copper braid (BN). Overjacket option is designated as a suffix to cable model number (example: TEK 2C40 BNOJ for overjacket option).
2. Consult factory for higher resistance conductor options

CIRCUIT BREAKER SIZING

Maximum circuit lengths for various circuit breaker amperages are shown below. Breaker sizing should be based on the National Electrical Code, Canadian Electrical Code or any other applicable code. The National Electrical Code and Canadian Electrical Code require ground-fault protection of equipment for each branch circuit supplying electric heating equipment. Check local codes for ground-fault protection requirements.

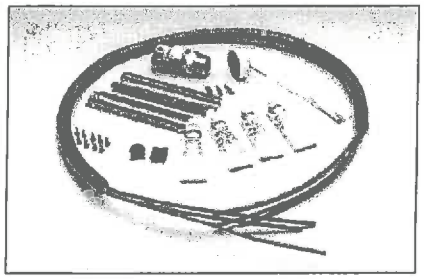
TERMINATIONS AND SPLICES

Prior to connection to power, TEK heating cables should be terminated using the Terminator DP-M, ZP-M or with an appropriate nonheating "cold lead" and a "hot-end" termination. To facilitate ease of installation and accommodate standard shipping lengths, in-line splices may also be required. These connections/terminations are available as factory fabricated assemblies or as field fabricated kits.

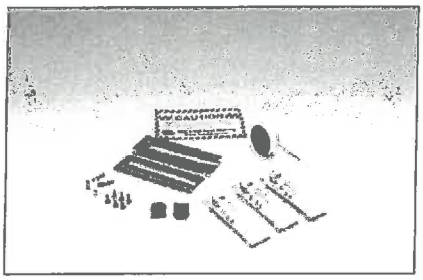
Power Connection: Provides fluoropolymer insulated nickel-plated stranded copper cold leads and ground wire extension plus required butt lug splices, insulating tape and sealant. A flexible stainless steel conduit that ends in a 3/4" fitting protects the leads. The number and size of the cold leads is based on the TEK heater type.

End Termination: The hot end (opposite end from power) utilizes an under insulation stainless steel fitting that houses the connector lug, insulating tape, sealant and grounding lug. The size and style of the termination is based on the number and size of conductors.

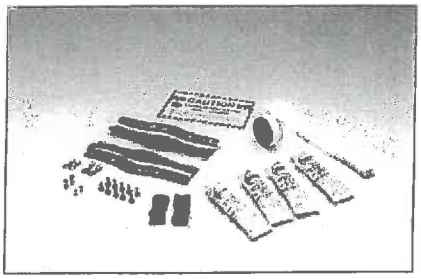
In-Line Splices: When the circuit length exceeds the practical length of a cable reel or to facilitate the installation of the cable, an under insulation splice may be required. The splice utilizes a stainless steel housing (sized for the conductor type and number), butt lug splices, grounding lugs, insulating tape and sealant.



CETK: Field fabricated cold-end termination kit.



HETK: Field fabricated hot-end termination kit.



HSTK: Field fabricated splice termination kit.

CERTIFICATIONS/APPROVALS

FM Approved

FM Approvals
Ordinary Locations
Hazardous (Classified) Locations
Class I, Division 2, Groups A, B, C and D
Class II, Division 2, Groups F and G
Class III, Divisions 1 and 2
Class I, Zones 1 and 2, AEx e II

UL LISTED

Underwriters Laboratories Inc.
Hazardous (Classified) Locations
Class I, Division 2, Groups A, B, C and D
Class II, Division 2, Groups F and G
Class III, Divisions 1 and 2

CSA

Canadian Standards Association
Ordinary Locations
Hazardous (Classified) Locations
Class I, Division 2, Groups A, B, C and D
Ex e II

Terminator DP-M and ZP-M: Designed to fabricate power connections, in-line splice connections or for making end terminations. Electrical connections are made in terminal blocks utilizing nickel-plated copper terminals to ensure corrosion-free electrical integrity. No cold leads are required.

PRODUCT SPECIFICATIONS

TEK™ SERIES CONSTANT WATT HEATING CABLE

TOWER ARCTIC LTD APPROVED NOV 14, 2016

APPLICATION

TEK series resistance constant watt heating cables are used for long line temperature maintenance or freeze protection where circuit lengths exceed the limitations of parallel resistance heating cables. Circuit lengths up to 12,000 feet (3,658 m) can be energized from a single power supply point.

The series circuitry of TEK provides consistent power output along the entire length of the cable without the voltage drop concerns associated with parallel tracer constructions.

TEK cables are approved for use in ordinary (nonclassified) and hazardous (classified) areas.

RATINGS

Rated voltage [1] .....for operation up to 600 Vac
Max. maintenance temperature [2].....215°F (101°C) [3]
Max. continuous exposure temperature
Power-off.....450°F (232°C)
Minimum installation temperature..... -60°F (-51°C)
Minimum bend radius
@ 5°F (-15°C) ..... 0.875" (22mm)
@ -76°F (-60°C) ..... 1.25" (32 mm)

Notes

1. Definition as stated in IEEE Standard 515. Specific voltage depends on circuit length and design conditions.
2. Watt density limitations are correlated to maintain temperatures.
3. Higher maintenance temperatures may be possible; contact Thermon for design assistance.

CONSTRUCTION

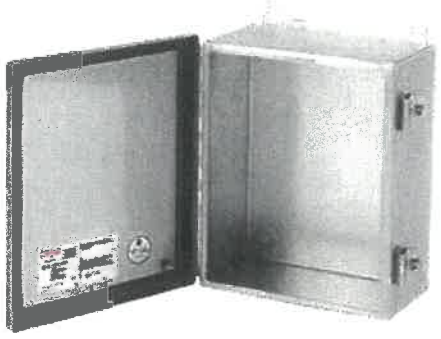
1 Heating conductors (2 or 3)
2 Fluoropolymer dielectric Insulation
3 Fluoropolymer pairing jacket
4 Nickel-plated copper braid
5 Fluoropolymer overjacket provides additional protection for cable and braid where exposure to chemicals or corrosives is expected.

BASIC ACCESSORIES

Power Connection: All TEK cables require a Terminator or cold lead transition for connection to power (available as a field fabricated kit). Refer to the back of this specification sheet for details.

End-of-Circuit Termination: An end-of-circuit termination must also be used with TEK cables. This termination, detailed on the back of this specification sheet, is available as a field fabricated kit.

CONTINUOUS-HINGE WITH CLAMPS, TYPE 4X



APPLICATION

Used in either indoor or outdoor applications, these enclo combine a rugged continuous hinge, seamless foam-in-place gasket and stainless steel screw-down clamps for a reliable seal that protects components from corrosive environments.

SPECIFICATIONS

- 16 and 14 gauge Type 304 or 316L stainless steel
- Seams continuously welded and ground smooth
- Seamless foam-in-place gasket
- Stainless steel screws and clamps
- Pull stainless steel continuous hinge pin to remove door
- Weldnuts provided for mounting optional panels and terminal block kits
- Bonding provision on door and body

FINISH

Cover and sides of body have smooth #4 brushed finish.

ACCESSORIES

Fast-Operating Clamp-Cover Junction Box Clamp
Lock Kit for Clamp Cover Junction Boxes
Panels for Junction Boxes
Terminal Block Kit Assembly for Junction Boxes Overview

MODIFICATION AND CUSTOMIZATION

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

BULLETIN: A51S

INDUSTRY STANDARDS

UL 50, 50E Listed; Type 3R, 4, 4X, 12; File No. E27567
cUL Listed per CSA C22.2 No 94; Type 3R, 4, 4X, 12; File No. E27567
UL 508A Listed; Type 3R, 4, 4X, 12; File No. E61997
cUL Listed per CSA C22.2 No 94; Type 3R, 4, 4X, 12; File No. E61997

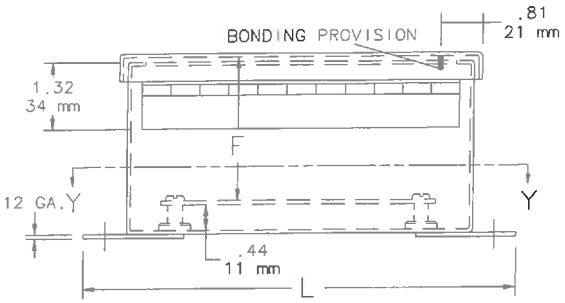
NEMA/EEMAC Type 3R, 4, 4X, 12, 13
CSA File No. 42184: Type 4, 4X, 12
IEC 60529, IP66
Meets NEMA Type 3RX requirements

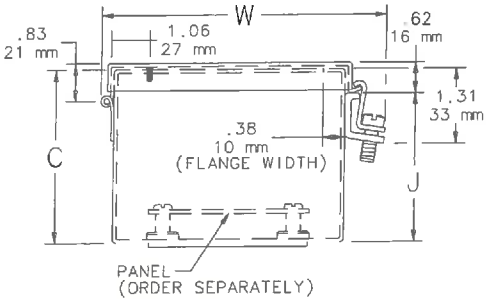
Standard Product

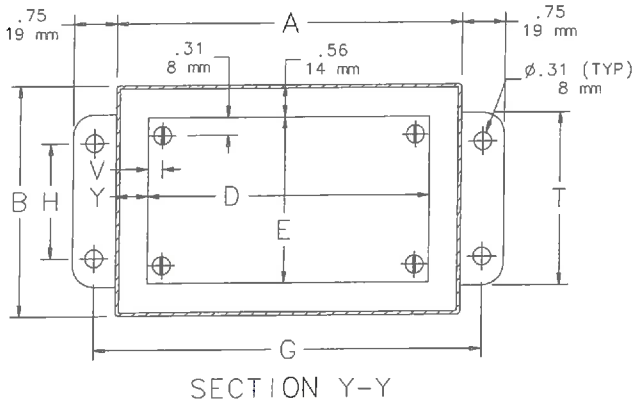
Catalog Number	AxBxC in./mm	Stainless Steel Type	UL Listed	Body Gauge	Cover Gauge	Steel Panel	Conductive Panel	Panel Size D x E in./mm	Mounting G x H in./mm	Overall L x W in./mm	F in./mm	J in./mm	N in./mm	T in./mm	V in./mm	Y in./mm
A6044CHNFSS	6.00 x 4.00 x 4.00 152 x 102 x 102	304	508A	16	16	A6P4	A6P4G	4.88 x 2.88 124 x 73	6.75 x 2.00 171 x 51	7.50 x 4.94 191 x 125	3.50 89	3.62 92	2.38 60	3.00 76	0.31 8	0.56 14
A606CHNFSS	6.00 x 6.00 x 4.00 152 x 152 x 102	304	50, 50E	16	16	A6P6	A6P6G	4.88 x 4.88 124 x 124	6.75 x 4.00 171 x 102	7.50 x 6.94 191 x 176	3.50 89	3.62 92	2.38 60	5.00 127	0.31 8	0.56 14
A8064CHNFSS	8.00 x 6.00 x 4.00 203 x 152 x 102	304	50, 50E	14	16	A8P6	A8P6G	6.75 x 4.88 171 x 124	8.75 x 4.00 222 x 102	9.50 x 6.94 241 x 176	3.50 89	3.62 92	1.38 35	5.00 127	0.25 6	0.62 16
A1008CHNFSS	10.00 x 8.00 x 4.00 254 x 203 x 102	304	50, 50E	14	16	A10P8	A10P8G	8.75 x 6.88 222 x 175	10.75 x 6.00 273 x 152	11.50 x 8.94 292 x 227	3.50 89	3.62 92	1.38 35	7.00 178	0.25 6	0.62 16
A12106CHNFSS	12.00 x 10.00 x 6.00 305 x 254 x 152	304	50, 50E	14	16	A12P10	A12P10G	10.75 x 8.88 273 x 225	12.75 x 8.00 324 x 203	13.50 x 10.94 343 x 278	5.50 140	5.62 143	2.38 60	9.00 229	0.25 6	0.62 16
A1212CHNFSS	12.00 x 12.00 x 6.00 305 x 305 x 152	304	50, 50E	14	16	A12P12	A12P12G	10.75 x 10.88 273 x 276	12.75 x 10.00 324 x 254	13.50 x 12.94 343 x 329	5.50 140	5.62 143	2.38 60	11.00 279	0.25 6	0.62 16
A1412CHNFSS	14.00 x 12.00 x 6.00 356 x 305 x 152	304	50, 50E	14	16	A14P12	A14P12G	12.75 x 10.88 324 x 276	14.75 x 10.00 375 x 254	15.50 x 12.94 394 x 329	5.50 140	5.62 143	2.38 60	11.00 279	0.25 6	0.62 16
A1614CHNFSS	16.00 x 14.00 x 6.00 406 x 356 x 152	304	508A	14	16	A16P14	A16P14G	14.75 x 12.88 375 x 327	16.75 x 12.00 425 x 305	17.50 x 14.94 445 x 379	5.50 140	5.62 143	2.38 60	13.00 330	0.25 6	0.62 16
A6044CHNFSS6	6.00 x 4.00 x 4.00 152 x 102 x 102	316L	50, 50E	16	16	A6P4	A6P4G	4.88 x 2.88 124 x 73	6.75 x 2.00 171 x 51	7.50 x 4.94 191 x 125	3.50 89	3.62 92	2.38 60	3.00 76	0.31 8	0.56 14
A606CHNFSS6	6.00 x 6.00 x 4.00 152 x 152 x 102	316L	50, 50E	16	16	A6P6	A6P6G	4.88 x 4.88 124 x 124	6.75 x 4.00 171 x 102	7.50 x 6.94 191 x 176	3.50 89	3.62 92	2.38 60	5.00 127	0.31 8	0.56 14
A8064CHNFSS6	8.00 x 6.00 x 4.00 203 x 152 x 102	316L	50, 50E	14	16	A8P6	A8P6G	6.75 x 4.88 171 x 124	8.75 x 4.00 222 x 102	9.50 x 6.94 241 x 176	3.50 89	3.62 92	1.38 35	5.00 127	0.25 6	0.62 16
A1008CHNFSS6	10.00 x 8.00 x 4.00 254 x 203 x 102	316L	50, 50E	14	16	A10P8	A10P8G	8.75 x 6.88 222 x 175	10.75 x 6.00 273 x 152	11.50 x 8.94 292 x 227	3.50 89	3.62 92	1.38 35	7.00 178	0.25 6	0.62 16
A12106CHNFSS6	12.00 x 10.00 x 6.00 305 x 254 x 152	316L	50, 50E	14	16	A12P10	A12P10G	10.75 x 8.88 273 x 225	12.75 x 8.00 324 x 203	13.50 x 10.94 343 x 278	5.50 140	5.62 143	2.38 60	9.00 229	0.25 6	0.62 16
A1212CHNFSS6	12.00 x 12.00 x 6.00 305 x 305 x 152	316L	50, 50E	14	16	A12P12	A12P12G	10.75 x 10.88 273 x 276	12.75 x 10.00 324 x 254	13.50 x 12.94 343 x 329	5.50 140	5.62 143	2.38 60	11.00 279	0.25 6	0.62 16
A1412CHNFSS6	14.00 x 12.00 x 6.00 356 x 305 x 152	316L	50, 50E	14	16	A14P12	A14P12G	12.75 x 10.88 324 x 276	14.75 x 10.00 375 x 254	15.50 x 12.94 394 x 329	5.50 140	5.62 143	2.38 60	11.00 279	0.25 6	0.62 16
A1614CHNFSS6	16.00 x 14.00 x 6.00 406 x 356 x 152	316L	50, 50E	14	16	A16P14	A16P14G	14.75 x 12.88 375 x 327	16.75 x 12.00 425 x 305	17.50 x 14.94 445 x 379	5.50 140	5.62 143	2.38 60	13.00 330	0.25 6	0.62 16

A6044CHNFSS and A6044CHNFSS6 UL 508A Listed. The remaining catalog numbers are UL 50 Listed.

Purchase panels separately. Optional stainless steel, composite and aluminum panels are available for most sizes.



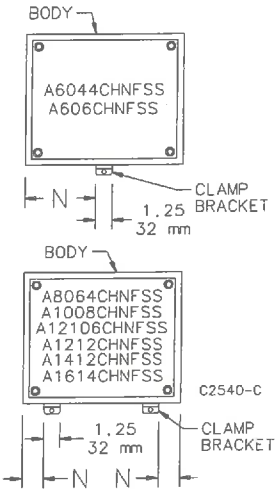




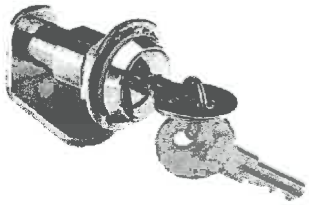
SECTION Y-Y

NOTE:
1. Optional panels are 14 gauge steel, conductive steel or stainless steel
2. Panel screws are #10-32 pan head

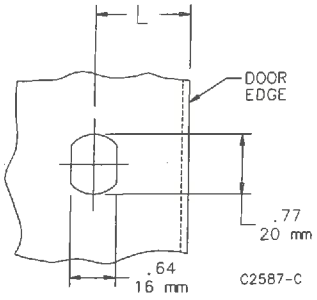
CLAMP BRACKET LOCATIONS



LOCK KIT FOR CLAMP COVER JUNCTION BOXES



Catalog Number	L in	L mm
ACLJIC	1.25	32

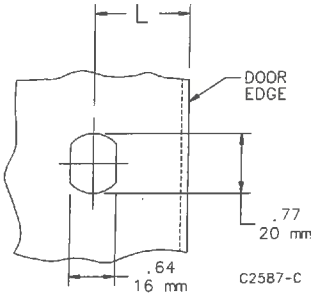


Designed for field installation in standard clamp-cover junction boxes. Includes complete installation instructions. One hole must be drilled or punched in the cover to receive the cylinder lock. Punches for Hoffman locks and latches are available from Greenlee Punches. For more information on Greenlee punches, go to **http://www.greenlee.textron.com/**

BULLETIN: A80

LOCK KIT FOR TYPE 3R AND 12 ENCLOSURES

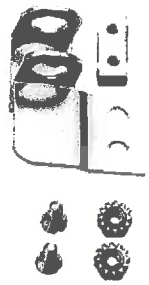
Catalog Number	L for NEMA 12 Enclosure in./mm	L for Medium 3R Hinged-Cover Enclosure in./mm
ACLSN12	1.69 43	2.25 57



Designed for field installation in standard one-door Type 3R and 12 enclosures. Includes complete installation instructions. One hole must be drilled or punched in the door to receive the cylinder lock.

BULLETIN: A80

PADLOCK KIT FOR JUNCTION BOXES



Designed for field installation on standard LP, CH and CHNF junction boxes. Maintains water-tight and dust-tight seal. To install simply drill two holes in the cover and two holes in the body. Includes complete instructions. Padlock Kit is plated steel or Type 316 stainless steel.

BULLETIN: A80

Catalog Number	Description
APLKJIC	Plated steel
APLKJIC6SS	Type 316 stainless steel

REPLACEMENT KEYS

Fits PROLINE™ Network Cabinet and Networking Wall-Mount Cabinet.

BULLETIN: DACCY

Catalog Number	Key Code	Includes	Use with
E2233KEY	2233	2 Keys	PROLINE™ , Net Series, PC Cabinet, SOHO
E333KEY	333	2 Keys	ACCESSPLUS™ II, L-BOX™ , D-BOX™

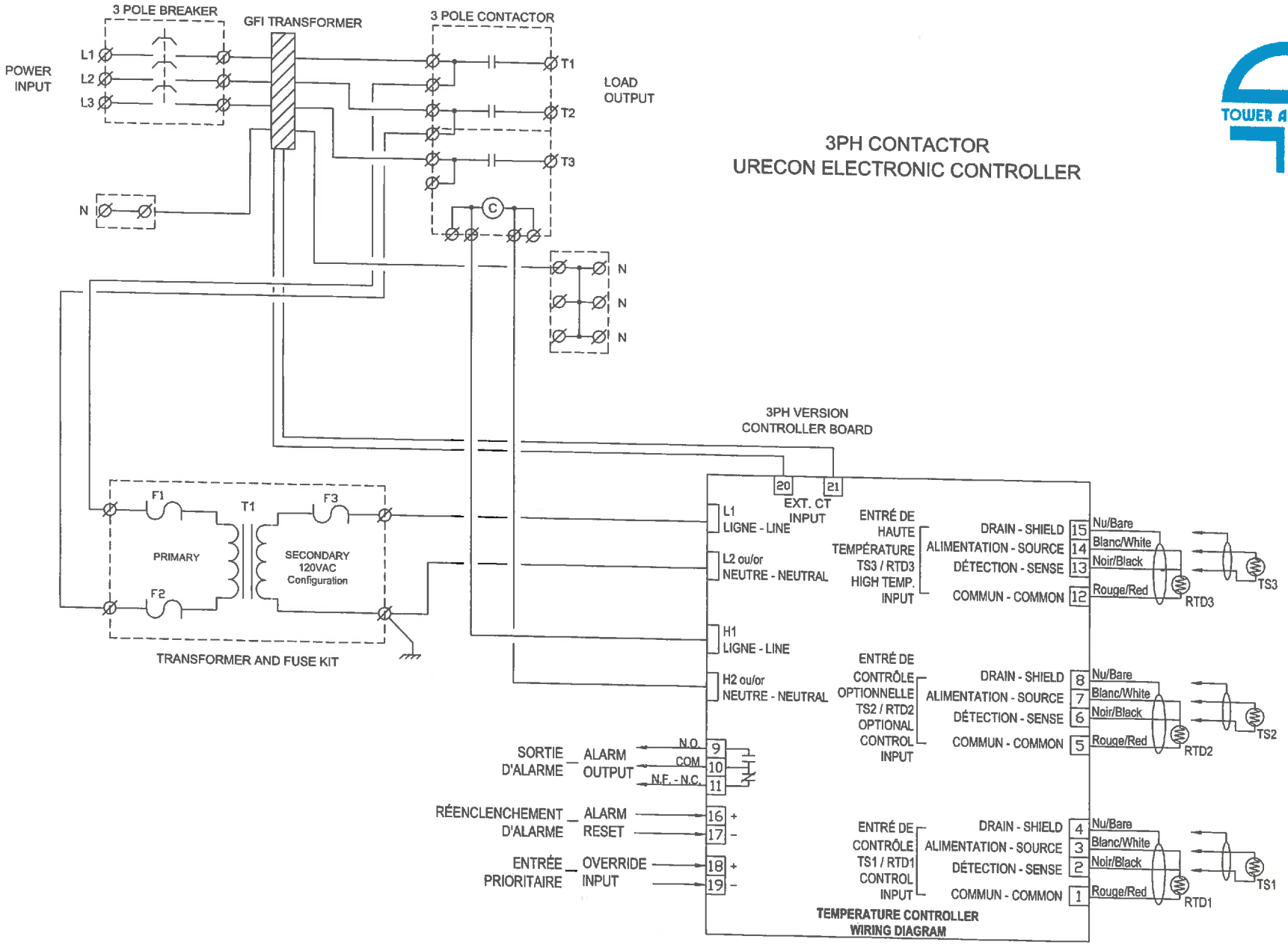
ANNEXE / ANNEX **E**

UTC-2030-xx, UTC-2230-xx, UTC-VPAA-xx

xx doit être remplacé par le code de programmation approprié

xx is to be replaced by the appropriate program code number

code de programmation pour RTD RTD program code		Capteur de contrôle TS1 (alarme en indice) Température Controlling sensor TS1 (alarm in subscript)	Capteur de contrôle TS2 (alarme en indice) Température Controlling sensor TS2 (alarm in subscript)	Capteur de haute température TS3 Température High temperature sensor TS3	code de programmation pour thermistance Thermistor program code	
POUR TUYAU DE PLASTIQUE FOR PLASTIC PIPE	01	3 °C (37.4 °F)	–	65 °C (149 °F)	51	POUR TUYAU DE PLASTIQUE FOR PLASTIC PIPE
	02	3_1 °C ($37.4_{33.8}$ °F)	–	65 °C (149 °F)	52	
	03	5 °C (41 °F)	–	65 °C (149 °F)	53	
	04	5_3 °C ($41_{37.4}$ °F)	–	65 °C (149 °F)	54	
	05	10 °C (50 °F)	–	65 °C (149 °F)	55	
	06	10_5 °C (50_{41} °F)	–	65 °C (149 °F)	56	
	07	15 °C (59 °F)	–	65 °C (149 °F)	57	
	08	15_{10} °C (59_{50} °F)	–	65 °C (149 °F)	58	
	11	3 °C (37.4 °F)	3 °C (37.4 °F)	65 °C (149 °F)	61	
	12	3_1 °C ($37.4_{33.8}$ °F)	3_1 °C ($37.4_{33.8}$ °F)	65 °C (149 °F)	62	
	13	5 °C (41 °F)	5 °C (41 °F)	65 °C (149 °F)	63	
	14	5_3 °C ($41_{37.4}$ °F)	5_3 °C ($41_{37.4}$ °F)	65 °C (149 °F)	64	
	15	10 °C (50 °F)	10 °C (50 °F)	65 °C (149 °F)	65	
	16	10_5 °C (50_{41} °F)	10_5 °C (50_{41} °F)	65 °C (149 °F)	66	
	17	15 °C (59 °F)	15 °C (59 °F)	65 °C (149 °F)	67	
	18	15_{10} °C (59_{50} °F)	15_{10} °C (59_{50} °F)	65 °C (149 °F)	68	
POUR TUYAU DE MÉTAL FOR METAL PIPE	21	3 °C (37.4 °F)	–	–	71	POUR TUYAU DE MÉTAL FOR METAL PIPE
	22	3_1 °C ($37.4_{33.8}$ °F)	–	–	72	
	23	5 °C (41 °F)	–	–	73	
	24	5_3 °C ($41_{37.4}$ °F)	–	–	74	
	25	10 °C (50 °F)	–	–	75	
	26	10_5 °C (50_{41} °F)	–	–	76	
	27	15 °C (59 °F)	–	–	77	
	28	15_{10} °C (59_{50} °F)	–	–	78	
	31	3 °C (37.4 °F)	3 °C (37.4 °F)	–	81	
	32	3_1 °C ($37.4_{33.8}$ °F)	3_1 °C ($37.4_{33.8}$ °F)	–	82	
	33	5 °C (41 °F)	5 °C (41 °F)	–	83	
	34	5_3 °C ($41_{37.4}$ °F)	5_3 °C ($41_{37.4}$ °F)	–	84	
	35	10 °C (50 °F)	10 °C (50 °F)	–	85	
	36	10_5 °C (50_{41} °F)	10_5 °C (50_{41} °F)	–	86	
	37	15 °C (59 °F)	15 °C (59 °F)	–	87	
	38	15_{10} °C (59_{50} °F)	15_{10} °C (59_{50} °F)	–	88	


3 POLE BREAKER
GFI TRANSFORMER
3 POLE CONTACTOR
POWER INPUT
L1
L2
L3
N
T1
T2
T3
LOAD OUTPUT
C
N
N
N
3PH CONTACTOR
URECON ELECTRONIC CONTROLLER
TOWER ARCTIC LTD
APPROVED
NOV 14, 2016
3PH VERSION
CONTROLLER BOARD
F1
F2
F3
T1
PRIMARY
SECONDARY
120VAC
Configuration
TRANSFORMER AND FUSE KIT
20
21
EXT. CT
INPUT
L1
LIGNE - LINE
L2 ou/or
NEUTRE - NEUTRAL
H1
LIGNE - LINE
H2 ou/or
NEUTRE - NEUTRAL
ENTRÉ DE
HAUTE
TEMPÉRATURE
TS3 / RTD3
HIGH TEMP.
INPUT
DRAIN - SHIELD
ALIMENTATION - SOURCE
DÉTECTION - SENSE
COMMUN - COMMON
15
14
13
12
Nu/Bare
Blanc/White
Noir/Black
Rouge/Red
RTD3
TS3
ENTRÉ DE
CONTRÔLE
OPTIONNELLE
TS2 / RTD2
OPTIONAL
CONTROL
INPUT
8
7
6
5
RTD2
TS2
SORTIE
D'ALARME
ALARM
OUTPUT
N.O.
COM
N.F. - N.C.
9
10
11
RÉENCLENCHEMENT
D'ALARME
ALARM
RESET
16
17
ENTRÉE
PRIORITAIRE
OVERRIDE
INPUT
18
19
ENTRÉ DE
CONTRÔLE
TS1 / RTD1
CONTROL
INPUT
4
3
2
1
RTD1
TS1
TEMPERATURE CONTROLLER
WIRING DIAGRAM

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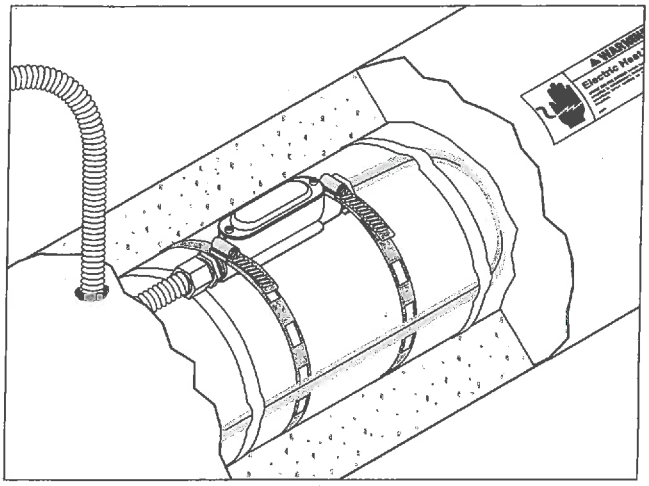
Raychem 3SC-4PT 3SC-6PT 3SC-8PT

POWER CONNECTION KIT INSTALLATION INSTRUCTIONS



APPROVALS

Hazardous Locations

-W — FM APPROVED — Class I, Div. 2, Groups A, B, C, D; Class II, Div. 2, Groups F, G; Class III

-W — Ex e II T [1]

[1] for T-Rating, see design documentation

DESCRIPTION

The 3SC-4PT, 3SC-6PT, and 3SC-8PT are NEMA 4 rated power connection kits designed for use with Raychem 3SC60, 70, 80 (-CT), 3SC/H60, 70, 80 (-CT) and 3SC/F60, 70, 80 (-CR) series heating cables in hazardous locations.

This kit may be installed at temperatures as low as -40°F (-40°C). For easier installation, store above freezing until just before installation.

For technical support, call Pentair Thermal Management at (800) 545-6358.

TOOLS REQUIRED

- Slotted screwdriver
- Diagonal cutters
- Disposable towel or rag
- Wire strippers
- Utility knife
- Adjustable wrench
- Solder tool or torch (with small tip)
- Thomas & Betts TBM5S crimp tool or equivalent (P/N P000000585)
- Thomas & Betts WT2000 crimp tool or equivalent (P/N 273435-000)

Crimp tools can be ordered from Pentair Thermal Management

ADDITIONAL MATERIALS REQUIRED

- Glass cloth tape:
  - GT-66 for installation temperature above 40°F (4°C)
  - GS-54 for installation temperature above -40°F (-40°C)
- Agency approved junction box suitable for the area classification
- Circuit identification tag (P/N P000000311)

⚠ WARNING:

This component is an electrical device that must be installed correctly to ensure proper operation and to prevent shock or fire. Read these important warnings and carefully follow all of the installation instructions.

- To minimize the danger of fire from sustained electrical arcing if the heating cable is damaged or improperly installed, and to comply with the requirements of Pentair Thermal Management, agency certifications, and national electrical codes, ground-fault equipment protection must be used. Arcing may not be stopped by conventional circuit breakers.
- Component approvals and performance are based on the use of Pentair Thermal Management-specified parts only. Do not use substitute parts or vinyl electrical tape.
- Damaged conductors can overheat or short. Do not break conductor wire strands when scoring the jacket or removing insulation.
- Keep components and heating cable ends dry before and during installation.
- Use only fire-resistant insulation materials, such as fiberglass wrap or flame-retardant foam.
- Soldering tools or torches can cause fire or explosion in hazardous areas. Be sure there are no flammable materials or vapors in the area before using these tools.
- Wrap exposed conductors with supplied tape strips to prevent shorts.

⚠ CAUTION:

HEALTH HAZARD: Hot solder can burn eyes and skin. Fumes during soldering are irritating to eyes and may cause headache and respiratory system irritation or damage. Prolonged or repeated exposure to rosin flux fumes during soldering may result in allergic reaction in a sensitive person, resulting in asthma symptoms. Consult MSDS VEN0043 for further information.

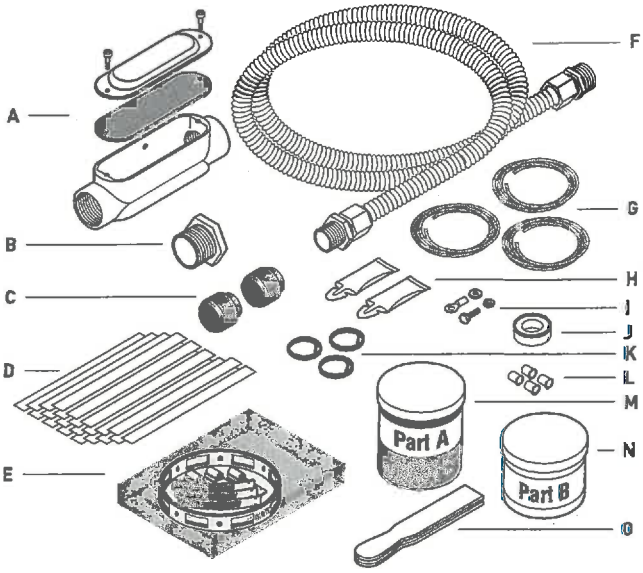
Silicone rubber compound Part A and Part B may generate flammable and explosive hydrogen gas if it comes in contact with an acidic, basic or oxidizing material. Personal contact with the silicone rubber compound may cause slight eye or skin irritation. Consult MSDS VEN0030 and VEN0031 for further information.

CHEMTREC 24-hour emergency telephone:
(800) 424-9300

Non-emergency health and safety information:
(800) 545-6258.

KIT CONTENTS:

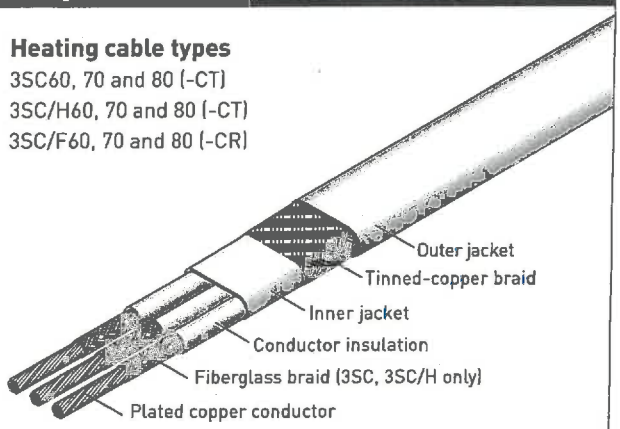
Item	Qty	Description
A	1	Box with cover, gasket, and 2 screws
B	1	Bushing
C	2	Grommets
D	22	Tape strips (19 required, 3 extra)
E	1	Pipe clamp banding kit
F	1	Armor assembly
G	3	Cold leads
H	2	Cable lubricants
I	1	Ring terminal, bolt, lock washer, and nut
J	1	Teflon® tape
K	3	Coils of Kester® 48 core LF solder for nickel
L	4	Compression joints (see table in Step 7), spare included
M	1	KE 1204 silicone rubber potting compound Part A
N	1	KE 1204 silicone rubber potting compound Part B
O	2	Stir sticks
P	2	Material Safety Data Sheets (not shown)



Heating cable construction

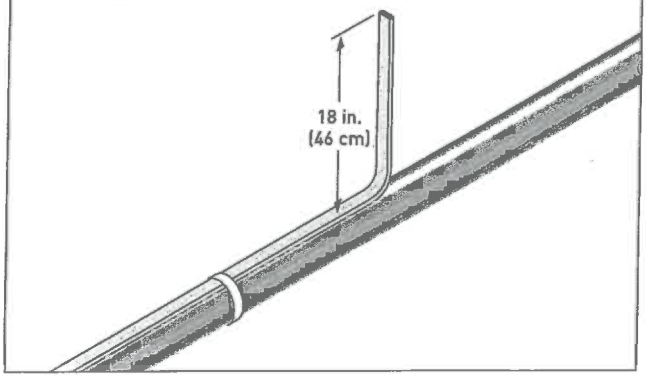
Heating cable types

3SC60, 70 and 80 (-CT)
3SC/H60, 70 and 80 (-CT)
3SC/F60, 70 and 80 (-CR)



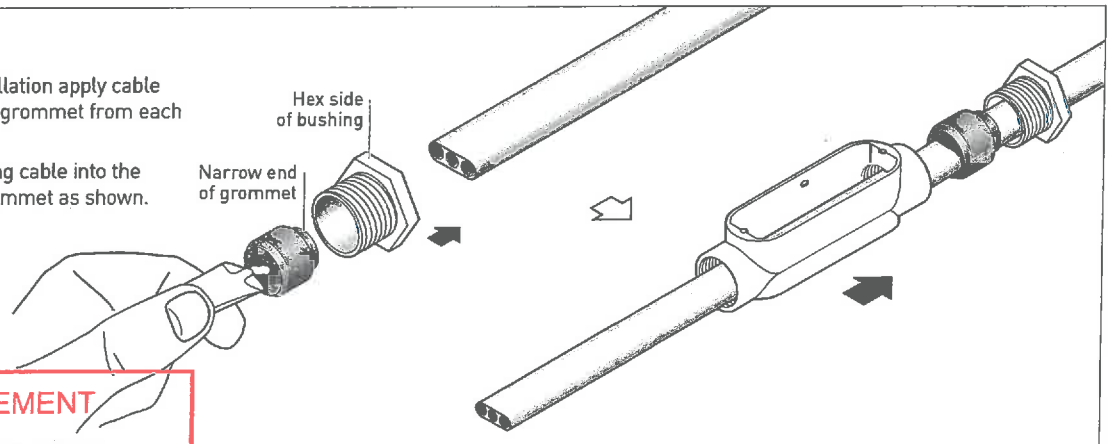
1

- Allow approximately 18 inches (46 cm) of heating cable for installation.



2

- For easier installation apply cable lubricant inside grommet from each end.
- Insert the heating cable into the bushing and grommet as shown.



- Position box on the heating cable as shown.

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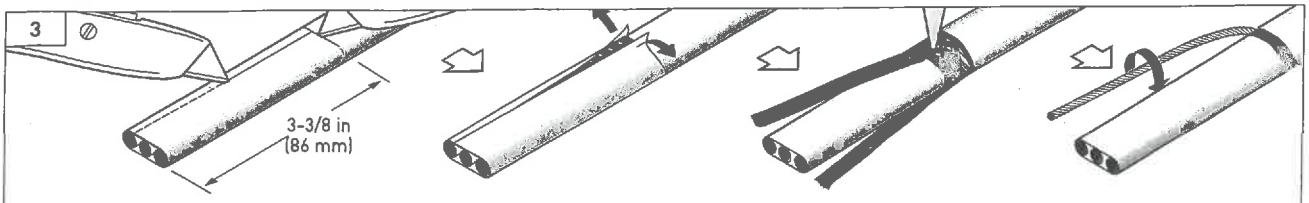
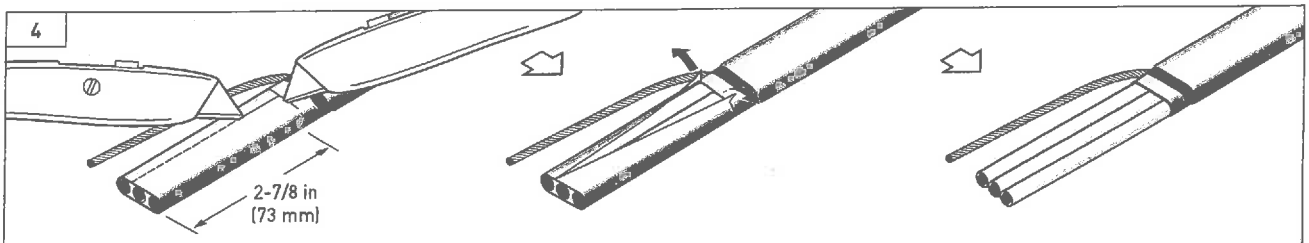


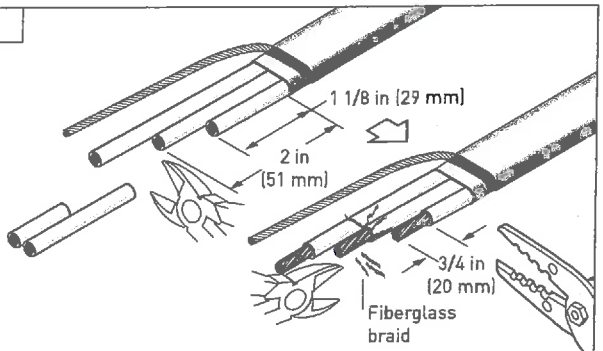
- Lightly score outer jacket around and down as shown.
- Bend heating cable to break jacket at the score, then peel off jacket.
- Use a pointed object to separate the braid from the heating cable.
- Pull braid to same side as small hole in side of box.
- Twist the braid to make a pigtail.

4



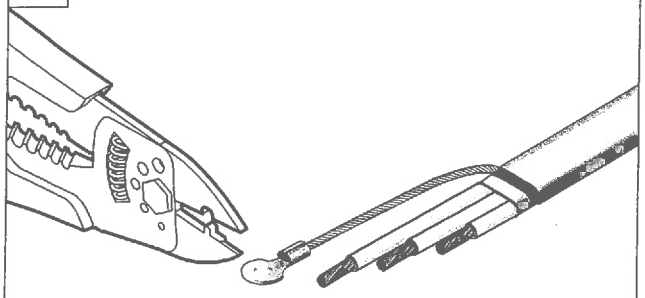
- Lightly score around and down to remove 2-7/8 inches (73 mm) of inner jacket.
- Bend heating cable to break jacket at score then peel off jacket.

5



- Cut two heating cable conductors to lengths shown.
- Remove 3/4 inch (20 mm) insulation and fiberglass braid to expose the bare conductors.

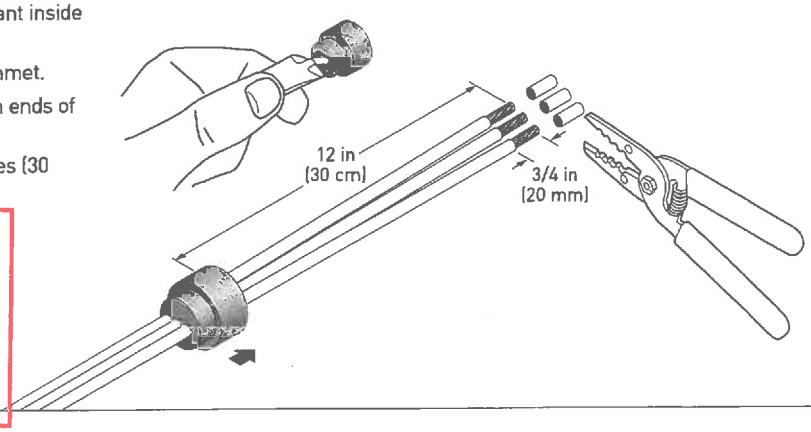
6



- Use a Thomas and Betts WT2000 crimp tool to crimp the ring terminal onto the braid.

7

- For easier installation, apply cable lubricant inside grommet from each end.
- Slide cold leads through the second grommet.
- Remove 3/4-inch (20 mm) insulation from ends of cold leads.
- Position grommet approximately 12-inches (30 cm) from end.



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8

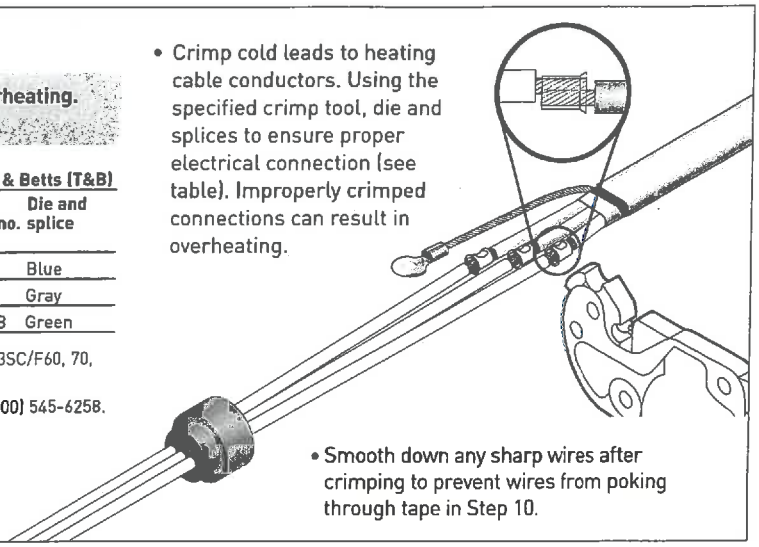
⚠ WARNING: Using the wrong splice can cause overheating. Use only the splice specified for the cable type.

Heating cable[1] color	Heating cable conductor size	Power connection kit	Power connection wire size	Thomas & Betts (T&B) Splice catalog no.	Die and splice
3SC60-CT	12 AWG	SC-8PT	8 AWG	54610	Blue
3SC70-CT	10 AWG	SC-6PT	6 AWG	54615	Gray
3SC80-CT	8 AWG	SC-4PT	4 AWG	54625-TB	Green

[1] The above table is also applicable for 3SC/H60, 70, 80 (-CT) and 3SC/F60, 70, 80 (-CR) heating cables.

For replacement crimps, call Pentair Thermal Management at (800) 545-6258.

- Overlap conductors in splice.
- Crimp cold leads to heating cable conductors. Using the specified crimp tool, die and splices to ensure proper electrical connection (see table). Improperly crimped connections can result in overheating.



- Smooth down any sharp wires after crimping to prevent wires from poking through tape in Step 10.

9

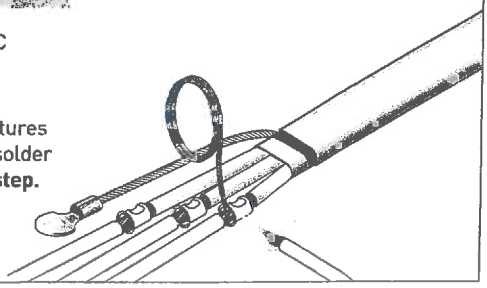
⚠ WARNING: Fire and Health Hazard

Soldering tools or minitorches can cause fire or explosion in hazardous areas. Be sure there are no flammable materials or vapors in the area before using these tools. Follow all site safety guidelines when working in hazardous areas.

Refer to solder material safety data sheet packaged with kit.

Do not overheat or char the conductor insulation. Inhalation of fumes can cause polymer fume fever, flu-like symptoms, irritation, and difficulty breathing.

- Use only solder provided with kit. Only Kester 48 core LF has been qualified with SC cables.
- Heat each splice using a soldering tool, or a propane or MAPP gas torch. **Note**: MAPP gas may be required if the connections are being soldered at temperatures below –4°F (–20°C). Heat the center of the splice until it is hot enough to melt the solder placed at both ends. **Allow the connections to cool before proceeding to the next step.**



10

IMPORTANT: To ensure proper electrical insulation, use the specified high temperature Teflon® tape provided with the kit. Do not use common vinyl tape that does not have adequate temperature rating.

- Use release liner to guide tape while wrapping the tape strips around the connection. Use five strips of tape, covering splice and 1/4-inch (6 mm) of conductor insulation (approximately three overlapped layers).
- Wrap braid with two tape strips.

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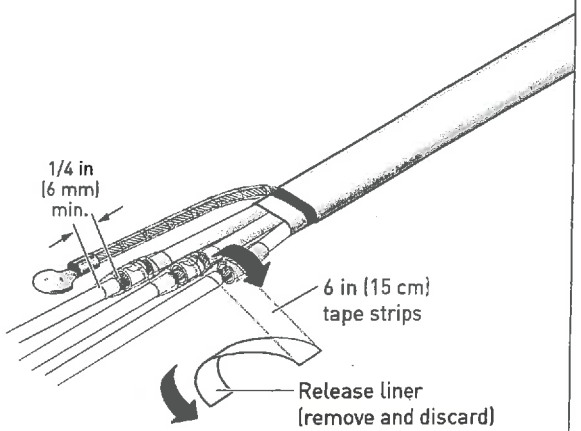
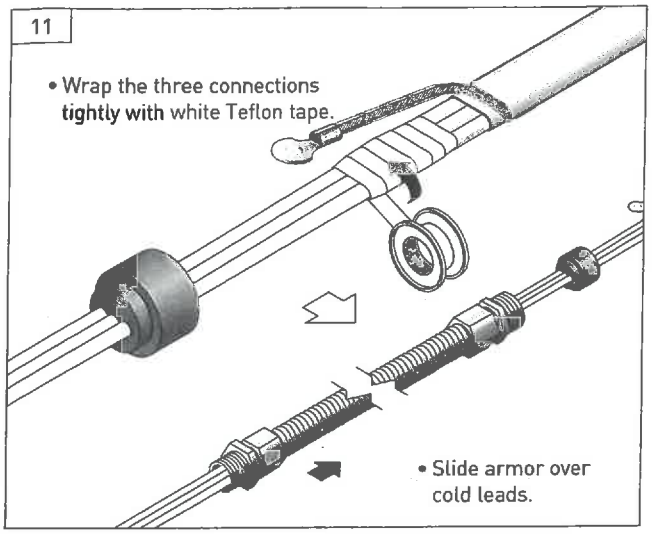
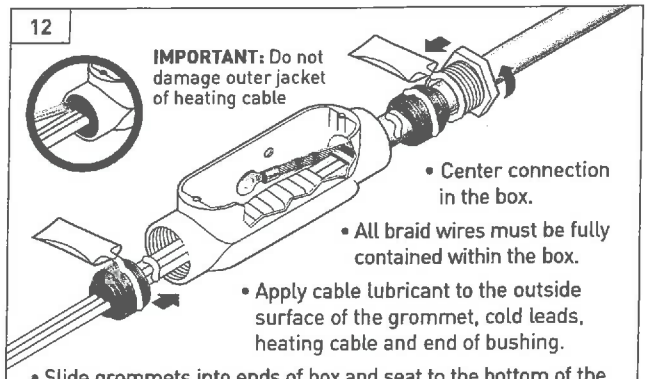


11



- Wrap the three connections **tightly with** white Teflon tape.
- Slide armor over cold leads.

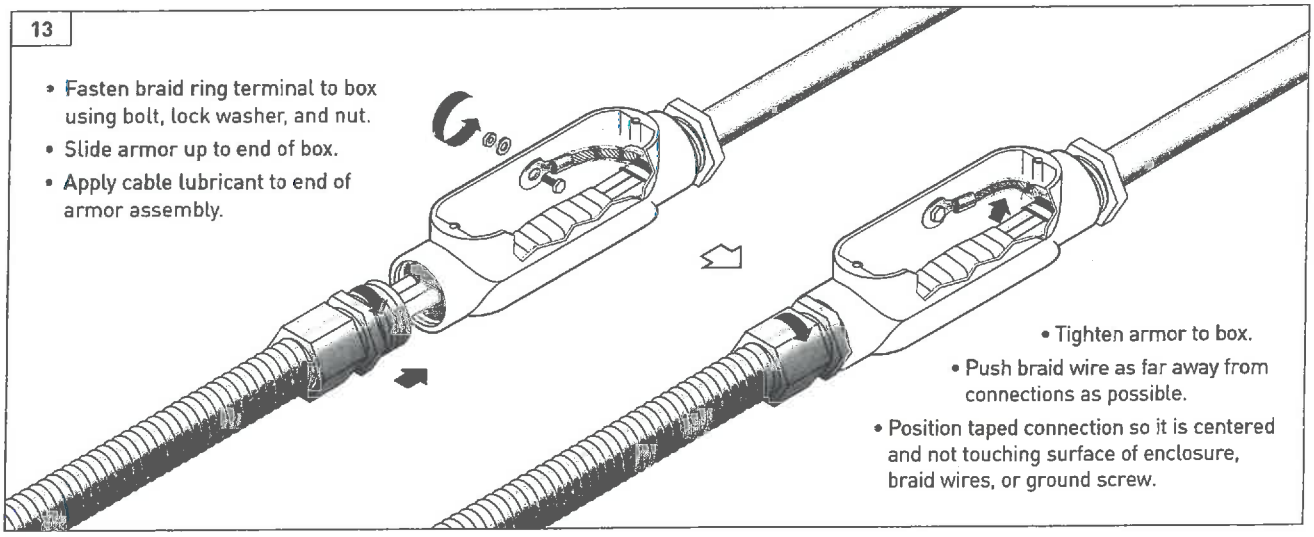
12



IMPORTANT: Do not damage outer jacket of heating cable

- Center connection in the box.
- All braid wires must be fully contained within the box.
- Apply cable lubricant to the outside surface of the grommet, cold leads, heating cable and end of bushing.
- Slide grommets into ends of box and seat to the bottom of the threaded section using a screwdriver or blunt instrument.
- Remove any slack in cable.
- Slide bushing into end of box. Screw into threaded section and tighten with a wrench.

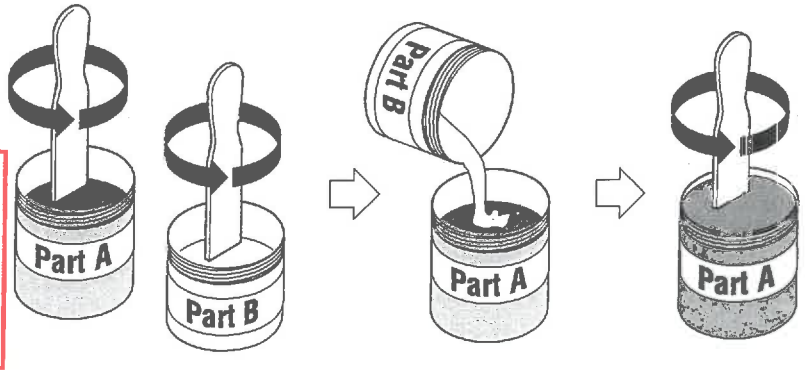
13



- Fasten braid ring terminal to box using bolt, lock washer, and nut.
- Slide armor up to end of box.
- Apply cable lubricant to end of armor assembly.
- Tighten armor to box.
- Push braid wire as far away from connections as possible.
- Position taped connection so it is centered and not touching surface of enclosure, braid wires, or ground screw.

14

⚠ WARNING: Health Hazard
Refer to silicone rubber material safety data sheet packaged with kit.



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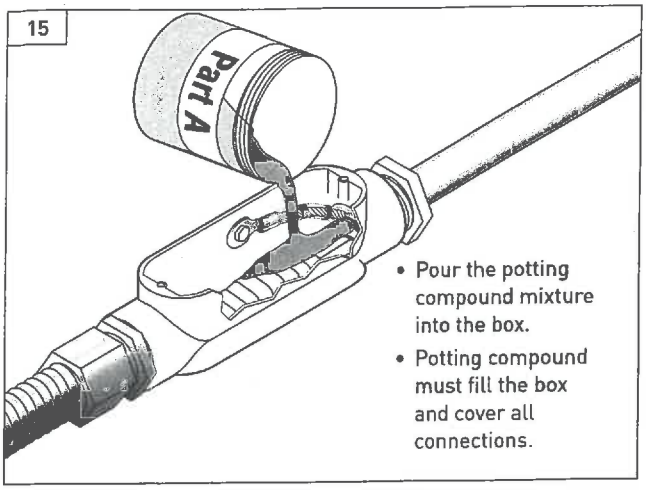
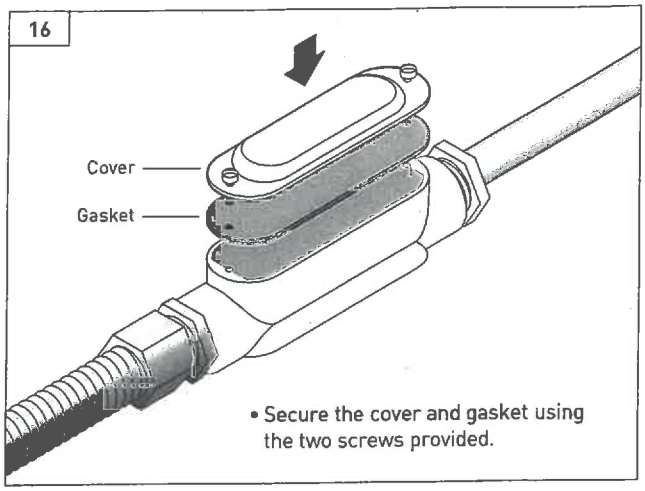
- Open the two containers: one labeled Part A, and the other Part B.
- Use separate wooden sticks to stir the contents of each container until smooth and homogeneous.
- Pour all the contents of the container labeled Part B into the container labeled Part A and mix thoroughly until the color is uniform.

15



- Pour the potting compound mixture into the box.
- Potting compound must fill the box and cover all connections.

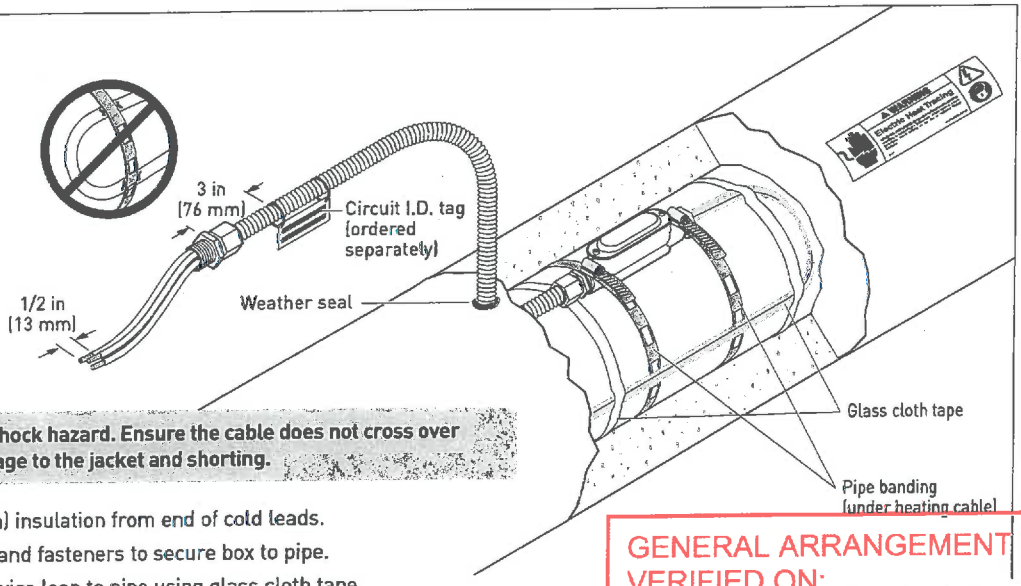
16



- Secure the cover and gasket using the two screws provided.

17

⚠ **WARNING: Fire and shock hazard. To prevent cable damage, do not position pipe banding over the heating cable.**



⚠ **WARNING: Fire and shock hazard. Ensure the cable does not cross over itself to prevent damage to the jacket and shorting.**

- Remove 1/2-inch (13 mm) insulation from end of cold leads.
- Use pipe clamp banding and fasteners to secure box to pipe.
- Secure heating cable service loop to pipe using glass cloth tape.
- Install armor fitting into a junction box that is suitable for the area classification.
- Weather-seal around armor where it exits the cladding.
- Install electric heat-tracing labels on insulation cladding.
- Attach circuit identification tag within 3 inches (76 mm) of the agency approved box, i.e. on the armor assembly.
- Leave these instructions with the end user for future reference.

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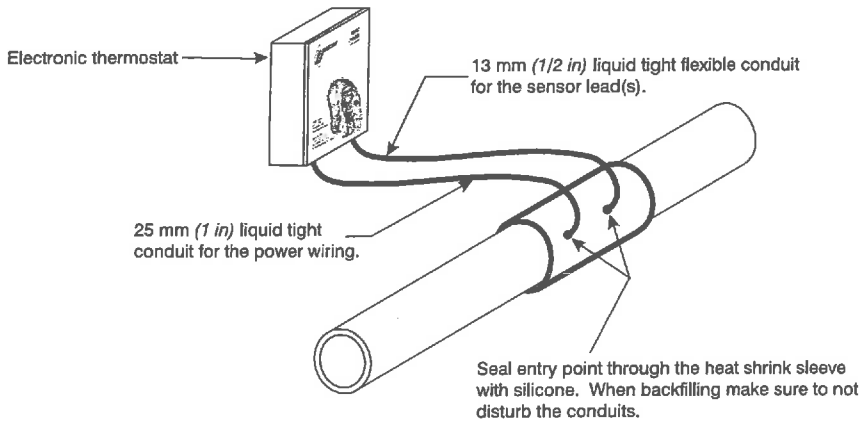
INSTALLATION INSTRUCTION #3E

PFK-1 (Power feed kit)

One PFK-1 power feed kit contains all the necessary electrical components to connect two THERMOCABLE® to an electronic thermostat of the UTC series. The thermostat may be located up to 6 m *(20 ft)* away from the pipe (PFK's for longer distances are available by special order).

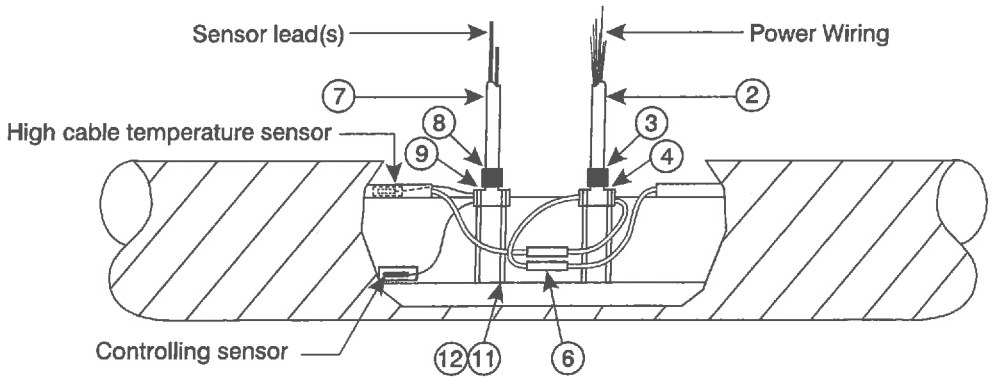


Each kit contains:

ITEM	QUANTITY	DESCRIPTION
		Components for the installation and connection of the heating cable
1	2 x 7 m	# 12 AWG, three-conductor power wiring.
2	6 m	25 mm *(1 in)* liquid tight flexible conduit (assembled to items 3 and 4).
3	2	Connector to join the 25 mm *(1 in)* flexible conduit to the thermostat and to the plastic shoe (assembled to items 2 and 4).
4	1	Plastic shoe (assembled to items 3 and 4).
5	1	Sealing ring for item 3 (at the thermostat).

6	2	PS1337-12-COJ splice kit to splice # 12 AWG bus wire THERMOCABLE® to the power wiring.
		Components for the installation of the sensor(s)
7	6 m	13 mm *(½ in)* liquid tight flexible conduit (assembled to items 8 and 9).
8	2	Connector to join the 13 mm *(½ in)* flexible conduit to the thermostat and to the plastic shoe (assembled to items 7 and 9).
9	1	Plastic shoe (assembled to items 7 and 8).
10	1	Sealing ring for item 8 (at the thermostat).
		Miscellaneous components
11	4	13 mm *(½ in)* wide x 2 m *(6 ft 6 in)* long stainless steel strap, to fasten the plastic shoes to the pipe.
12	4	Worm gear clamp to secure strap.
13	1	Silicone caulking, to seal conduit entry points through the heat shrink sleeve.
14	1	Installation instruction # 24 for heat shrink wrap.

NOTE: Item numbers are keyed to those on the diagram.



Assembly instruction:

1) Install the thermostat in an appropriate location within 6 m *(20 ft)* of the pipeline.

2) Normally the power feed kit is attached to the pipe at a pipe joint, where the insulation is removed. If it is desired to make the connection at a point other than the pipe joint, you will have to remove 450 mm *(18 in)* of jacket and insulation to expose the pipe and trace conduit. Cut and remove the jacket and insulation carefully so as not to nick or damage the pipe. Ensure that the insulation faces on the pipe are square to the axis of the pipe.

3) Cut a 300 mm *(12 in)* length of trace conduit without damaging the hidden THERMOCABLE® if it has already been installed.

4) Cut the 13 mm *(½ in)* and 25 mm *(1 in)* liquid tight flexible conduits to the appropriate length.

5) Cut two appropriate sized holes in the center of the heat shrink sleeve to permit a snug passage to the two conduits. Remove the connectors and the shoes from the conduits. Pull the conduits through the holes in the heat shrink sleeve ensuring that the mastic adhesive side of the sleeve is facing the pipe.

6) Reinstall the connectors and plastic pipe shoes.

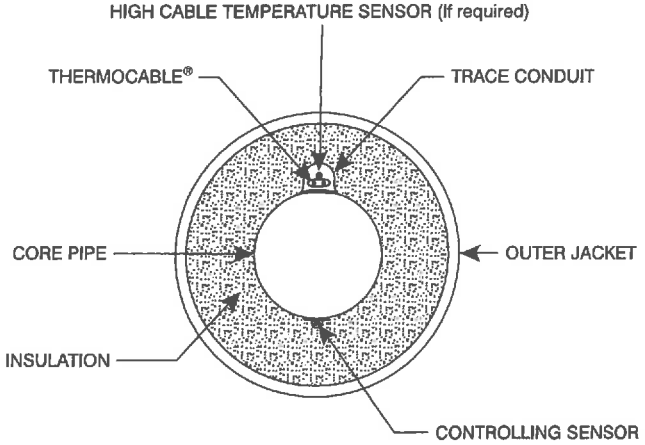
7) Using the connectors provided (ensure that the gasket is on the exterior side), connect the liquid tight flexible conduits to the bottom of the thermostat enclosure.

8) When more than one temperature sensor is used, they have to be identified according to their use i.e. : controlling sensor or high cable temperature sensor (on plastic pipe) in order to connect them to the proper terminals. As a general rule, when multiple sensors are required, they can be supplied with two different color lead wires.

9) Pull the sensor wire(s) through the 13 mm *(½ in)* conduit. Connect the sensor(s) to the proper terminals in the thermostat. Install the sensor(s) in their proper location with aluminum tape; the high cable temperature sensor is to be taped to an active zone of the THERMOCABLE® (not the cold lead) within the trace channel, the controlling sensor is to be taped directly to the pipe 180° away from the heating cable. If the thermostat is controlling a pipe which enters a heated building, the sensors must be located at least 3 m *(10 ft)* away from the outside wall to avoid inaccurate temperature sensing. **The accurate identification and positioning of the sensors is absolutely essential to the efficient and safe operation of the system.**

IMPORTANT

PLACE THE HIGH CABLE TEMPERATURE SENSOR IN CONTACT WITH AN ACTIVE ZONE OF HEATING CABLE.



IMPORTANT

TAPE THE CONTROLLING SENSOR DIRECTLY TO THE PIPE, 180° FROM THE HEATING CABLE, UNDER THE INSULATION.

10) Pull the power wiring through the 25 mm *(1 in)* flexible conduit. Splice the power wiring to the heating cable following the THERMOCABLE® installation instructions for the power splice. Connect to the appropriate terminals in the thermostat in accordance with the installation instructions supplied. **NOTE: In severe conditions, it is preferable to bring the heating cable(s) through the conduit directly to the thermostat without any splice and power wiring. In the case of heating cables with a power output of 13 watts/meter *(4 watts/foot)* or greater, a dedicated flexible conduit should be used for each cable.**

11) Attach the two plastic shoes to the pipe in the same longitudinal axis and secure with the worm gear clamps, tighten with a screwdriver. Ensure that the pipe is continuously heat traced by overlapping the power wiring and entering the shoe on the opposite side to the heat tracing circuit.

12) Trim the insulation half shells to ensure a tight fit for the uninsulated portion of the pipe. Notch out two holes to permit passage of the two flexible liquid tight conduits.

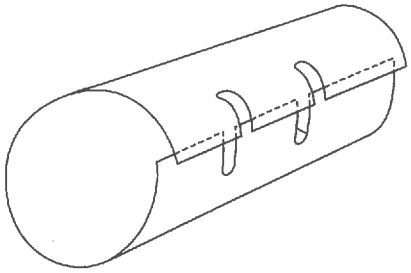
13) Before installing the insulation, test the heat tracing circuit(s) to ensure that the thermostat and THERMOCABLE® are operating properly.

14) Apply silicone caulking liberally around the neck of the plastic shoes and install the half shells.

15) Pull down the heat shrink sleeve and install as per the installation instructions supplied.

16) The flexible conduit should be positioned and protected so that it does not become damaged by passing traffic. If the pipe is to be buried, the conduit should be well protected during the backfilling operation so that it is not separated from the pipe.

17) If the piping installation has a metal jacket, a similar metal jacket should now be installed on the joint. Cut notches in the overlapping edges as shown in the following illustration. The final overlap should face down. Caulking should be used to seal all cracks.



Rolled metal cover, field cut to accomodate two PFK conduits.

CANADA

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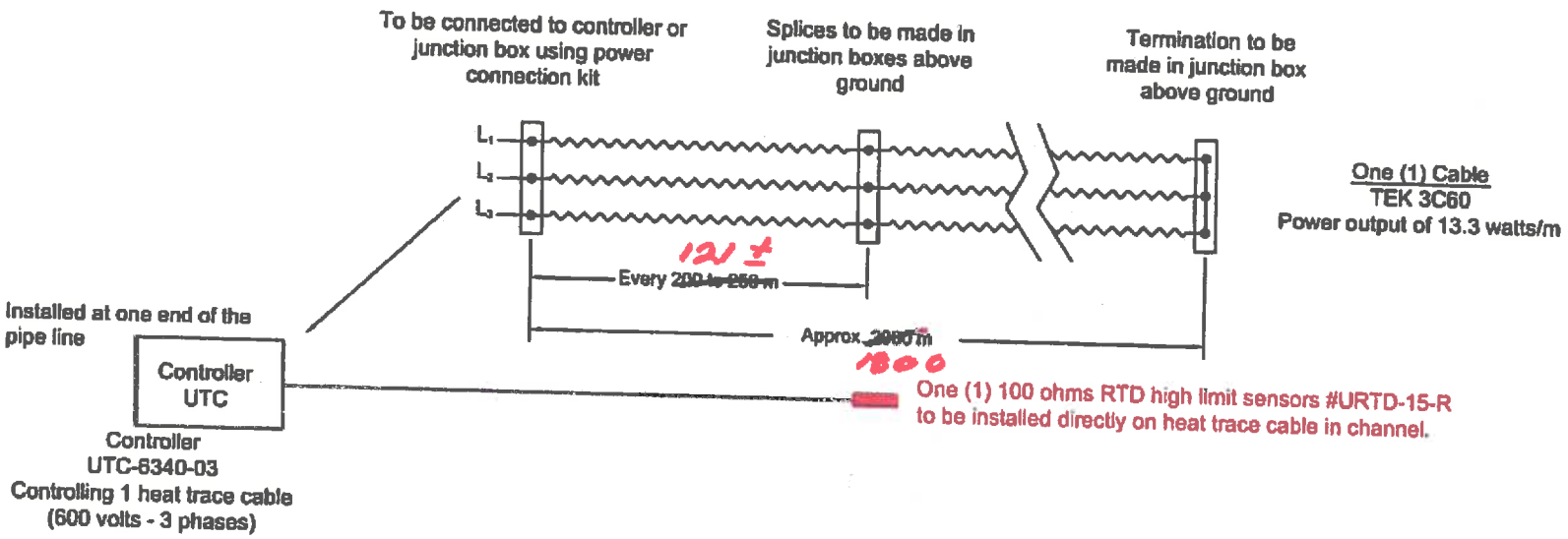
Heat tracing for ~~2,000~~ 1600 m of 150mmø HDPE piping with 75mm thick of Urecon insulation



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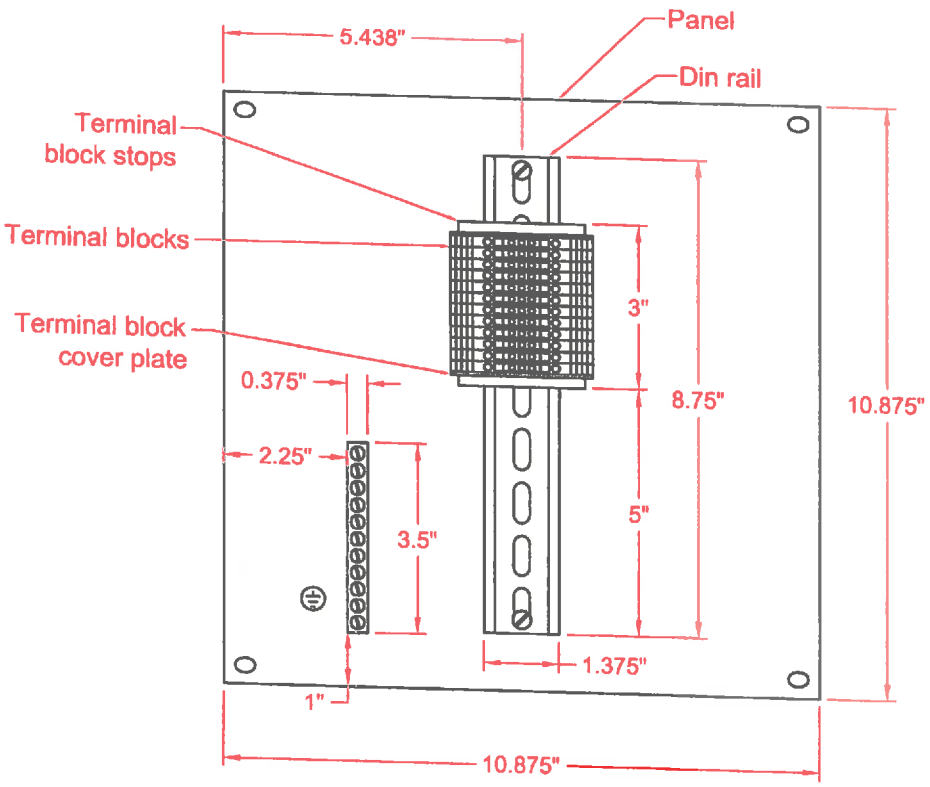
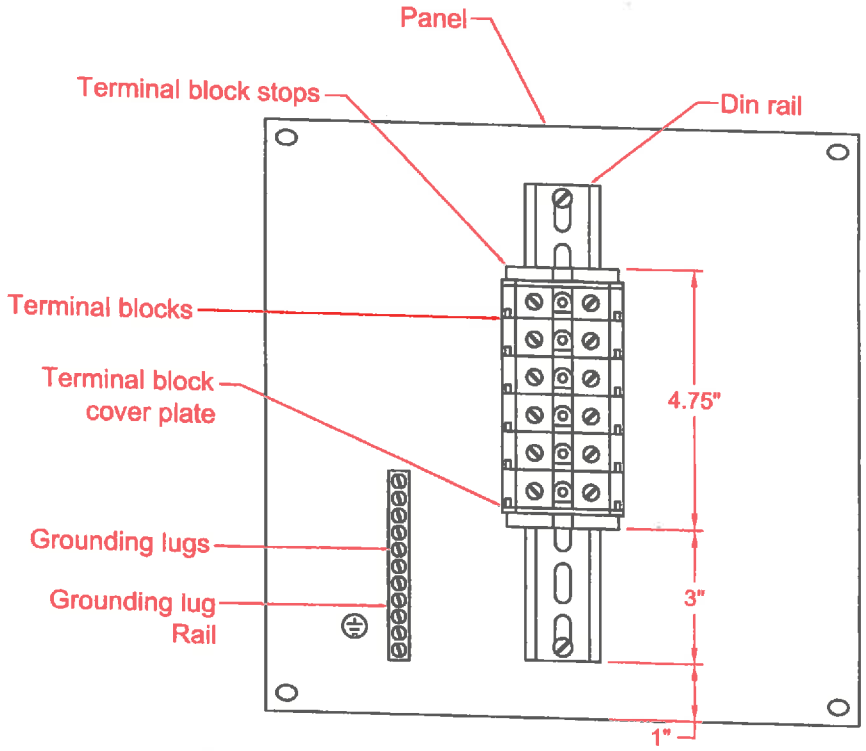
PROJECT:	Resolute Bay
DESCRIPTION:	Series heat trace cable
Format: / Contrat :	May 6, 2016 / REV
Scale: NTS	Dwg # : RBS-01



Configuration 1



Note: Same dimensions as configuration 1 excepted for the terminal blocks

Configuration 2

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Project:			
Description:	Junction box configurations		
Contract:		Supplier:	
Version:	Rev. by:	Drawn by:	E. Bates
Date:	November 25, 2015	Drawing:	TA1029-1