

October 23, 2023

Mr. Josh Arneson  
Town Manager  
Town of Richmond  
203 Bridge Street  
P.O. Box 285  
Richmond, VT 05477

**Re: Recommendation to Purchase Replacement Equipment for Dewatering Facilities at the Richmond WWTF**

Dear Mr. Arneson:

The Richmond WWTF utilizes a Fournier Rotary Press for dewatering waste sludge and septage. The equipment was installed as part of the 2003 WWTF upgrade and has been a reliable means of dewatering sludge at the facility. The equipment has an estimated 45,000 hours of operation since installation, has not had significant maintenance or replacement parts since installation, and is effectively at the end of its useful life. The WWTF has recently been experiencing significant operational issues with the existing dewatering equipment that jeopardizes the WWTF's ability to dewater sludge and accept septage.

Fournier Industries Inc., the manufacturer of Richmond's rotary press dewatering equipment, conducted a site visit to the Richmond WWTF on September 30, 2023, to inspect the condition of the existing two-channel Rotary Press and provide operational assistance to the plant operators. A copy of Fournier's site inspection report is attached to this letter. Based on the assessment of the condition of the existing rotary press, Fournier prepared a proposal for refurbishment of the existing dewatering system. A copy of Fournier's proposal is attached. The proposal identifies several levels of recommended repairs with Level "A" as most urgent, Level "B" as less urgent, but required for optimal results, and Level "C" as replacement of the rotary press. Associated costs are included in Fournier's proposal.

Hoyle, Tanner has reviewed the Fournier's proposal (and costs) and held a conference call with Fournier and Russell Resources, the Fournier local representative. The purpose of the call was for Hoyle Tanner to better understand the ability to reuse components purchased now in a future dewatering upgrade, the ability to expand the equipment to meet future solids handling demands, i.e., accepting and processing more septage, and identify lead times for delivery of purchased equipment.

It is Hoyle Tanner's recommendation to continue dewatering operations at the Richmond WWTF with a Fournier Rotary Press. A rotary press is the best suited dewatering technology for the pressing of combined sludge and septage. Fournier has installations of rotary presses in Canada that dewater 100% septage and achieve a 40-50% cake solid. Richmond's sludge feed is a combination of waste activated sludge and septage and historically the rotary press has achieved a 25% cake solid when operating well. It is both Hoyle Tanner's and Fournier's opinion that with the replacement of failing components and equipment, the portion of septage in the sludge feed could be increased without deterioration of cake solids.

It is Hoyle, Tanner's further recommendation that the entire dewatering facilities be overhauled in the future. The future upgrade would include replacement dewatering equipment sized for future dewatering needs and a building expansion/refurbishment to address space constraints, NFPA 820 code requirements, HVAC requirements, safety issues, and operational functionality. Through our discussions with Fournier Industries, it is our understanding that the purchase of replacement equipment under Level "A" could be reused and incorporated into a future dewatering facility upgrade design. The purchase of equipment under Level "A" would allow the WWTF to continue current dewatering operations while a comprehensive upgrade is designed and constructed.

Fournier Industries has indicated that replacement channels and equipment in the Level "A" budget proposal can be delivered in 6-8 weeks from execution of a purchase order, whereas the lead time for a control panel replacement in Level "B" is approximately 6 months and full replacement equipment in Level "C" would be approximately 9 months.

Based on the urgency of the repair needs of Richmond's existing rotary press, lead times and the ability to reuse purchased equipment in the future upgrade, it is Hoyle, Tanner's recommendation to purchase the replacement equipment for \$108,920.00 and the electrical and mechanical installation service for \$9,870.00 as outlined in Level "A" in the budget proposal for a total of \$118,790. The 20-Year Evaluation Report will identify recommended upgrades to the Richmond WWTF, which will include the dewatering process. It is also Hoyle Tanner's recommendation to advance design phase engineering services for a comprehensive dewatering upgrade at the time of a facility-wide upgrade.

Should you require additional information or have any questions, please contact me at (802) 489-7362 or via email at [kworden@hoyletanner.com](mailto:kworden@hoyletanner.com).

Sincerely,  
Hoyle, Tanner & Associates, Inc.



Kirstin DiPietro Worden, P.E.  
Associate -Senior Environmental Engineer

Enclosure(s)

## Richmond Vermont

### Visit Summary

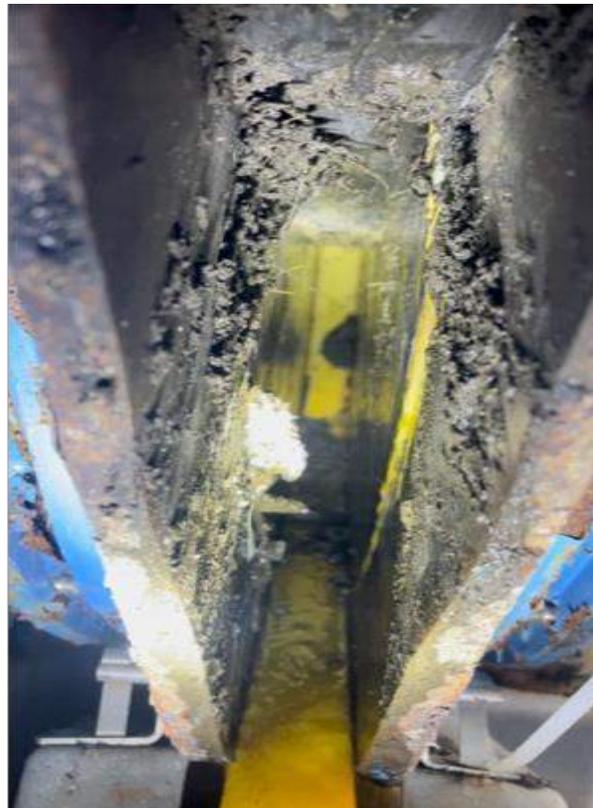
#### Introduction

The purpose of this visit was to inspect the condition of the two channel Rotary Press located in Richmond Vermont and provide operational assistance to the personnel. The press has an estimated 45,000hrs on it. This is a two 36” channel press, model number 2-900/2000, and serial number PR-09-0/99.

#### Inspection

**Screens:** The facility only runs sludge through one channel and has recently complained about the filtrate quality. They do not run on the other channel due to damaged screens. Opening the restrictor arms on both channels and cleaning the channels out to inspect, I discovered that all four screens were very worn.

**Frames:** The frames on the channels were rusting and worn were the restrictor arms moved. You could see the yellow cover seal between the wheel and the frame starting to come through with trash.



September 30<sup>th</sup>, 2023

**Shaft:** The shaft of the press was in ok condition. The shaft only supports one channel on each side, so there was limited exposure to the atmosphere. There is some rust around on the end, however that should not effect the removal.



**Three-way valve:** The existing three-way valve does not work. It has been stuck in the dewatering position and does not turn. This causes problems with a proper startup. Sludge also leaks out of the supply tank, through the sludge pump and, because the valve is stuck in the dewatering position, into the channels.



**Flocculator:** The flocculator seal shaft has been leaking for some time. It's hard to tell the extent of the damage.



September 30<sup>th</sup>, 2023

**Panel:** The panel is the old style with speed dials for the flocculator speed and rotary press speed. The outlet pressure is controlled directly at the channel. If you adjust it on the panel, it doesn't do anything.



**Channel Wash Manifold:** The Festo valves on the channel wash manifold do not seem to work. The piping and spray bars are not in good condition.



**Sludge Pump:** The facility has a double disc sludge pump and is in good condition. However, the sludge tank gravity feeds past the pump when it is in the off position.



September 30<sup>th</sup>, 2023

**Polymer System:** The polymer system does not have an indication of concentration. A batch of diluted polymer is sent to a 50-gallon tank. From there it is pumped to the floccuator at a ratio of the sludge flow.



**Conveyor System:** The conveyor seems to be in good condition apart from a couple rusted out holes in the lower one. Also, on the inclined conveyor it is open at the top. The employees said this was from cake building up due to an unopened slide gate that has since been fixed.



## Operation

The operators at the facility are operating the press as best as possible for the condition it is in. During a normal startup the three-way valve sends sludge down the drain, in recirculation, this gives the operator time to determine that they have a good flocculation. Because the valve does not work it sends it directly to the rotary press. If the sludge tank is full and the sludge supply valve is open to the pump, it passes the pump and goes into the rotary press without it even on or running. So, when they start instead of recirculating, they hit dewatering and it goes right to the rotary press. The first sludge the press receives is not flocculated. Once it starts to flocculate, the one operating channel begins to produce cake. However, a lot of solids are going through

September 30<sup>th</sup>, 2023

the worn screens and down the filtrate. Because they are running a blend of digested and septic sludge the press is still able to produce some cake. I believe if they were just running digested sludge, they would have a hard time getting anything to come out of the channel. The only way to keep sludge producing cake is to treat it gently. If they produce high pressure inside the channel sludge comes out the screens instead of out the front as cake. The key is low outlet pressure 5psi, low inlet pressure 1.2psi, and moderate rotary press speed 30%. This minimizes the sludge in the filtrate being sent to the head of the plant. The press still produces 25-30% cake dryness with a flow of 20-30gpm through the channel. Sludge total solids was 1.45% Polymer consumption was 26 active lbs/dry ton.

## **Observations and Conclusion**

The Richmond, Vermont facility needs:

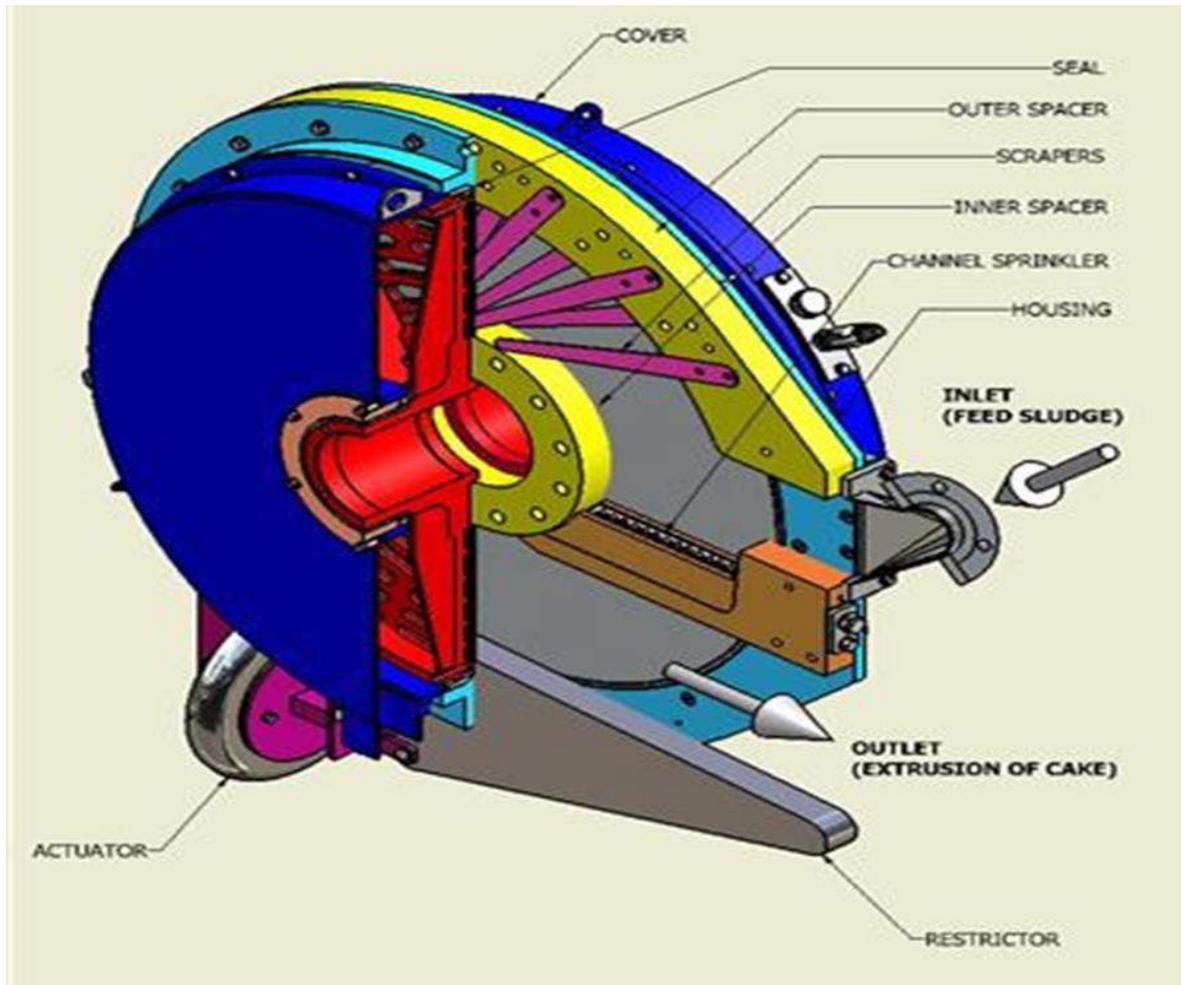
1. New Channels – Everything on the channels needs replacement so I would recommend whole new channels. Even if you could spare some parts, we might need to cut the wheels from the shaft.
2. New Flocculator Assembly – The top of the floccuator need to be dismantled and probably everything needs to be replaced below the gearbox.
3. Three-way Valve – I would suggest they replace them with two two-way valves.
4. Channel Wash Valves – If it doesn't already come with the new channels.
5. Air supply – A new air regulator needs to be installed. As of right now I do not believe they have air going to the three-way valve and they only have it to the bellows.

Possible upgrades needed:

1. Sludge pump - The sludge supply tank feeding the pump is gravity feeding through it. The pump may just need new interior parts. Or the sludge valve needs to be closed off when the press is not running.
2. Polymer system – We determined the polymer was making down a batch of 0.25% concentration, with a polymer to sludge ratio of 8% and a consumption of 26 active lbs/dry ton. An upgrade of the polymer system could produce lower consumption.

September 30<sup>th</sup>, 2023

3. Panel HMI – The installation of a new panel would make it easier for the operators to use the press. The current old program is outdated and not optimal.
4. Conveyor system – There are a couple holes that need to be patched or sections replaced.





Theftord Mines (Quebec) Canada  
October 16, 2023



**Attention: Mr. Steve Cote**  
**Water & Wastewater Superintendent**  
Telephone: 802) 434-2178  
Email: [scote@richmondvt.gov](mailto:scote@richmondvt.gov)

**Subject: Dewatering Equipment – Budget Proposal**

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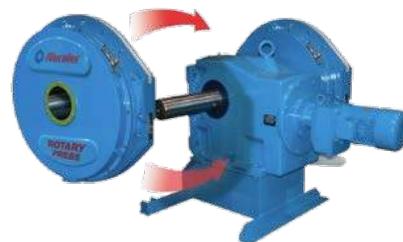
Dear Mr. Cote,

Following the request from our local representative, Russell Resources, along with our site visit conducted at the end of September, we are pleased to submit our budget proposal base on our observations and considering three (3) level of repair urgency. The following equipment and service are suggested:

### **A. Most Urgent**

#### **Equipment:**

- Two (2) Dewatering Channel, 36" Dia., New generation with fiber glass cover and full stainless-steel housing.
- One (1) flocculator
- Two (2) Two-way air-actuated valves for automatic sludge recirculation and dewatering
- Two (2) Wash wastewater valve pneumatically actuated.
- One (1) Air regulator
- Two (2) lots of manifold piping.
- Two (2) 3Ø feed valve.
- Two (2) Filtrate collector and cake chute, equipped with flush sensor.
- Two (2) lots of hardware, bolts, supports needed for the installation of the channel.



**Price for this option: US\$ 108,920.00**

#### **Service:**

- On-site electrical and mechanical team, for equipment installation assistance and coordination, for a minimum of 40 man-hours, five (5) days at site, including one (1) trip to the job site. **Price: US\$ 9, 870.00**

\*If additional assistance or maintenance (electrical & mechanical) needs to be added, at the client's demand a US\$ 150.00 / hour will be charged, excluding equipment or pieces not listed above.

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**Subject: Dewatering Equipment  
Budget Proposal (Cont'd)**

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## **B. Less Urgent, Required for Optimal Results**

### **Option 1 - Control Panel**

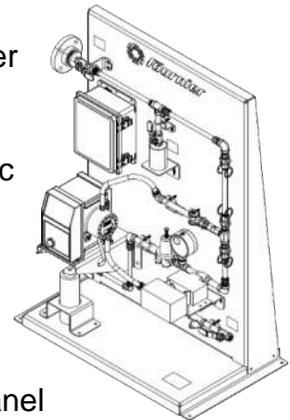
- One (1) Control Panel, Nema 12, including:
  - One (1) PLC, Allen-Bradley CompactLogix 5069 SERIES, or equivalent
  - One (1) HMI, Allen-Bradley, PanelView, 9" (225 mm) Allen-Bradley Panelview 5310 - 9" (230mm), or equivalent
  - One (1) VFD, Allen-Bradley PowerFlex 525, or equivalent, for Rotary Press
  - One (1) VFD, Allen-Bradley PowerFlex 525, or equivalent, for flocculator

**Price for above option: US\$ 71,165.00**

\* System final selection and pricing to be in accordance with the final system location layout and customer request.

### **Option 2 - Inline emulsion polymer system**

- One (1) Inline emulsion polymer system with the following specifications:
  - Compact construction on a SS304 skid frame
  - One (1) Water pressure regulator, needing a continuous water supply of 4.1 bar (60 psi)
  - One (1) Proportional valve, 24Vdc (4-20mA)
  - One (1) Peristaltic dosing pump, Watson Marlow, 120V or 24Vdc (4-20mA)
  - One (1) Static mixing chamber
  - One (1) Strainer
  - One (1) Junction box
  - Programming integrated in the PLC & HMI of the Rotary Press
  - Additional control items located in the Rotary Press Control Panel
- On-site start-up, commissioning and training assistance during the Rotary Press start-up.
- One (1) Submittal package and O&M manual



Press

**Price for above option: US\$ 23,920.00**

\* System final selection and pricing to be in accordance with the final system location layout and customer request.

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**Subject: Dewatering Equipment  
Budget Proposal (Cont'd)**

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### **Option 3 - Sludge pump system**

- One (1) Sludge pump with the following specifications:
  - Rotary lobe type
  - Flooded
  - Pressure head max 10,6 m (35')
- One (1) Sludge pump VFD and additional control items located the Rotary Press Control Panel
- On-site additional start-up, commissioning, and training assistance during start-up.
- One (1) Submittal package and O&M manual



in

**Price for above option: US\$ 13,400.00**

\* Pump final selection and pricing to be in accordance with the final pump location layout and customer request.

### **Option 4 - Shaftless Conveyor System**

- One (1) Receiving conveyor with the following specifications:
  - 9' length
  - Shaftless, U-shaped trough, SS304 construction
  - High strength carbon steel spring flight (minimal Brinell hardness of 200)
  - Non-contact zero speed detection mechanism controlled by the PLC
- One (1) Inclined conveyor with the following specifications:
  - 21'-8" length
  - Shafted Screw, Tubular O-shape trough, SS304 construction
  - High strength carbon steel spring flight (minimal Brinell hardness of 200)
  - Non-contact zero speed detection mechanism controlled by the PLC
- One (1) Distribution conveyor with the following specifications:
  - 30'-3" length
  - Shaftless, U-shape trough, SS304 construction
  - High strength carbon steel spring flight (minimal Brinell hardness of 200)
  - Non-contact zero speed detection mechanism controlled by the PLC
  - Two (2) Pneumatic sliding gates
  - Two (2) Standard chute outlets
- Additional control items located in the Rotary Press Control Panel
- On-site start-up, commissioning, and training assistance during the Rotary Press start-up.
- One (1) Submittal package and O&M manual

**Price for above option: US\$ 69,500.00**

\* System final selection and pricing to be in accordance with final system location layout.

**Subject: Dewatering Equipment  
Budget Proposal (Cont'd)**

### **C. Rotary Press Replacement**

**One (1) Rotary Press Model 2-900/2000CVH, Two-channel unit**

#### **Equipment**

- One (1) Rotary Press model 2-900/2000CVH
- One (1) Flocculator
- One (1) Lot of piping between the flocculator and Rotary Press, c/w a sludge sampler
- One (1) Sludge flowmeter, Endress & Hauser
- One (1) Polymer flowmeter, Endress & Hauser
- One (1) Filtrate collector pipe
- Two (2) Cake chutes
- Two (2) Wash water solenoids for the automatic wash sequence
- Two (2) Two-way air-actuated valves for automatic sludge recirculation and dewatering
- One (1) Control Panel, Nema 12, including:
  - One (1) PLC, Allen-Bradley CompactLogix 5069 SERIES, or equivalent
  - One (1) HMI, Allen-Bradley, PanelView, 9" (225 mm) Allen-Bradley Panelview 5310 - 9" (230mm), or equivalent
  - One (1) VFD, Allen-Bradley PowerFlex 525, or equivalent, for Rotary Press
  - One (1) VFD, Allen-Bradley PowerFlex 525, or equivalent, for flocculator



#### **Service**

- On-site start-up, commissioning, and training assistance for a total of 64 man-hours, including 2 trips to the job site.
- One (1) Submittal package and O&M manual

**Price: US\$ 238,385.00**

The above equipment is illustrated in the following:

- General arrangement ..... : B-C-24107 Rev12
- Layout arrangement..... : B-C-2110 Rev03

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**Subject: Dewatering Equipment  
Budget Proposal (Cont'd)**

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**GENERAL NOTES:**

1. Our price does not include the following items:
  - a. Unloading and installation of the equipment on site
  - b. Dilution polymer system (Option 2)
  - c. Sludge pump and its VFD (Option 3)
  - d. Conveyor (if required) (Option 4)
  - e. Air compressor
2. Price is valid for a period of (60) days.
3. Price is valid for an equipment delivery on site not later than December 2024.
4. Price is Ex-works, Thetford mines, Qc, Canada.
5. Standard Terms of Payment:
  - 15% of the total contract price: net 30 days after P.O. acceptance;
  - 25% of the total contract price: net 30 days after shop drawing submittal;
  - 55% of the total contract price: net 30 days upon delivery;
  - 5% of the total contract price: net 30 days upon successful start-up
  - No retainage on the above
6. Equipment delivery:
  - Shop drawings: (4) to (6) weeks after Purchase Order acceptance.
  - Equipment: (25) to (30) weeks after drawings approval.

Should you need any specific arrangement or more detailed drawings, we will be pleased to provide them upon request.

Please do not hesitate to contact us for any additional information you may require. Hoping that everything is to your entire satisfaction, please accept our best regards.

**FOURNIER INDUSTRIES INC.**



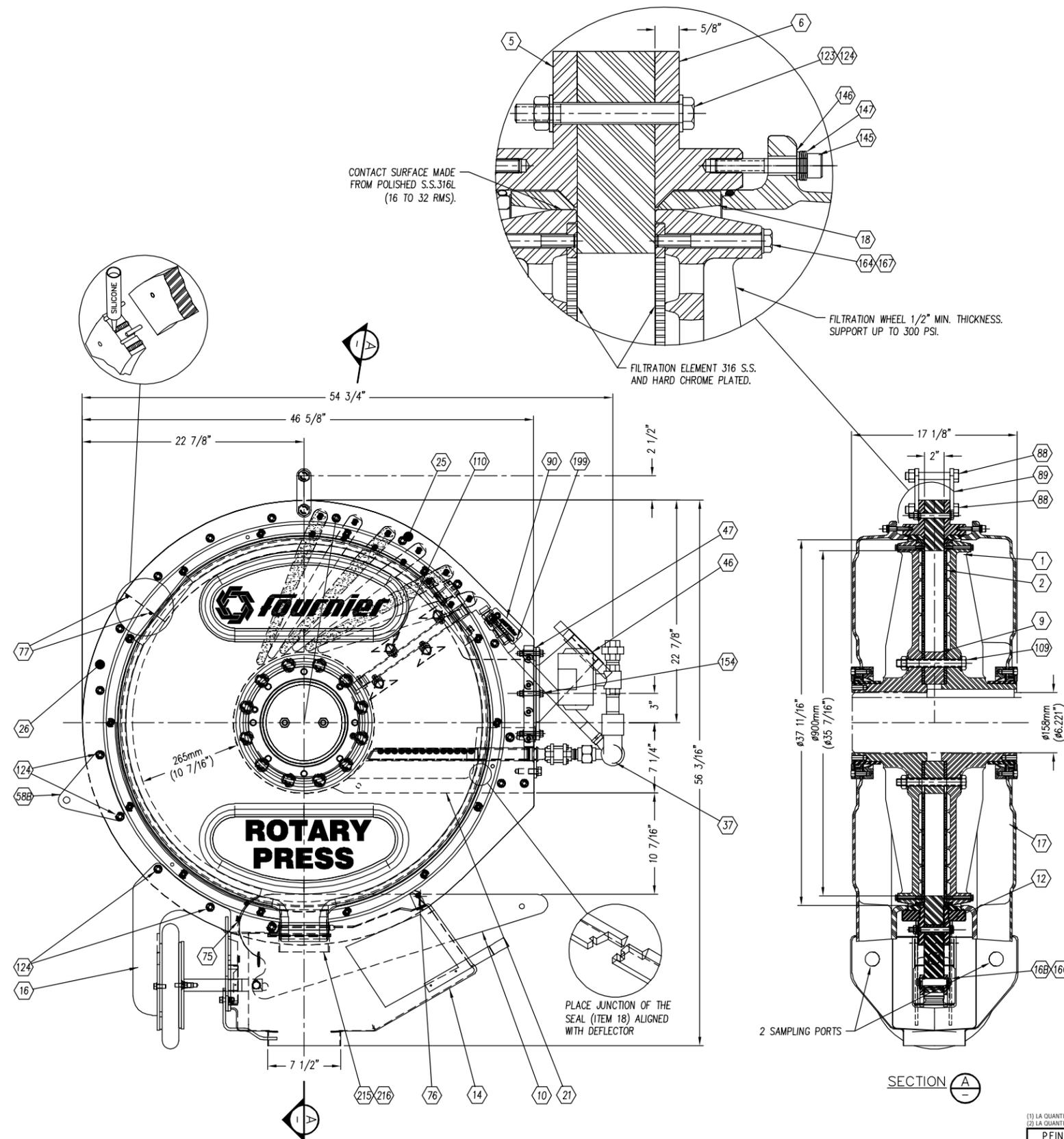
Zaineb Haouas  
Technician, Estimator  
Dewatering Equipment

ZH/

Encl.: Channel, Rotary Press and Conveyors Drawings  
C.c.: Paul Russell, Russell Resources Inc.  
Scott McKay, Fournier Industries Inc.  
Francis Caouette, Fournier Industries Inc.,  
Mathieu Ouellette, Fournier Industries Inc.

WEIGHT OF PRINCIPAL COMPONENTS OF A ROTARY PRESS

ITEM	DESIGNATION	LBS
1	FILTRATION WHEEL	346
5-6	HOUSING (LEFT OR RIGHT)	158
9	INNER SPACER	63
17	GLAND COVER ASSEMBLY	36
	CHANNEL ASSEMBLY	1395



ARTICLE ITEM	REPÈRE REF.	NOMBRE QTY(1)	DÉSIGNATION / DESIGNATION	MATÉRIEL MATERIAL	POIDS(kg) WEIGHT UNIT.(1)	REMARQUES / NOTES
IFI-01823	1	2	FILTRATION WHEEL (CAST IRON)	ASTM A48		
IFI-01778	2	2	FILTRATION ELEMENT	S.S. 316L		
IFI-01819	5	1	LEFT HOUSING	STEEL 44W		
IFI-01826	6	1	RIGHT HOUSING	STEEL 44W		
IFI-01827	9	1	INNER SPACER (2" CHANNEL)	S.S. 316L		
IFI-01828	10	1	VERTICAL RESTRICTOR	UHMW-PE		
IFI-01830	12	1	SLEEVE	S.S. 316L		
IFI-02181	14	1	FILTRATE COLLECTOR	LLDPE		
	16	1	ACTUATOR SUPPORT ASSEMBLY	S.S. 316L		38165
	17	2	GLAND COVER ASSEMBLY	FIBERGLASS		29490
IFI-01832	18	2	SEAL	UHMW-PE		
	21	1	DEFLECTOR ASSEMBLY (2" CHANNEL)	NYLON S.S. 316L		41410
IFI-01834	25	1	INLET OUTER SPACER ASS. (2" CHANNEL)	UHMW-PE		23979
IFI-01821	26	1	OUTLET OUTER SPACER (2" CHANNEL)	UHMW-PE		
IFI-02054	37	1	WASHING WATER SYSTEM CONNECTION ASSEMBLY	S.S. 316L		30616
IFI-01836	46	1	INLET (2" CHANNEL)	S.S. 316L		
IFI-01837	47	1	INLET SEAL (2" CHANNEL)	NEOPRENE		
IFI-01859	58B	2	ANTI-ROTATION PLATE	S.S. 316L		
	75	2	KEVLAR PACKING (13mm) x 2" LG.	KEVLAR		
IFI-02018	76	2	ROD ø3/8" WITH THREAD	S.S. 316L		
	77	1	SEAL ø3/8" (NITRILE B46) x 4" LG.	BUNA N		
	88		HEX BOLT M20 x 2.5 x 120mm LG. DIN 931	PLATED		MAINTENANCE EQUIPT SEE AO-31625 C/W 1 HEX. NYLON NUT DW934
IFI-01856	89		LIFTING DEVICE (2" CHANNEL)	S.S. 316L		MAINTENANCE EQUIPMENT SEE AO-C-31625 (EXPLODED VIEW)
IFI-01915	90	1	IDENTIFICATION PL, CONCENTRIC CHANNEL TYPE	ALUMINUM		
IFI-01924	109	12	HEX BOLT M20 x 2.5 x 170mm LG. DIN 931	S.S. 316		C/W 1 HEX. NUT DIN 934 2 FLAT WASHERS DIN 125-1A
IFI-02163-DG	110	2	WHEEL WASH WATER SYSTEM ASSEMBLY	S.S. 316		D-37907
	123	13	HEX BOLT M12x1.75x110mm, CLASS 8.8 DIN 931	PLATED		C/W 1 HEX. NUT DIN 934 2 FLAT WASHERS DIN 125-1A
	124	4	HEX BOLT M12x1.75x120mm, CLASS 8.8 DIN 931	PLATED		C/W 1 HEX. NUT DIN 934 2 FLAT WASHERS DIN 125-1A
	145	28	HEX-SOCKET HEAD CAP SCREW M10x1.5x 60mm	S.S. 316		
	146	28	FLAT WASHER DIN125A	S.S. 316		
	147	112	3/8" BELLEVILLE WASHER	S.S. 17-7		BELLEVILLE K0750-C-062
	154	6	HEX BOLT M10x1.5 x 60mm, CLASS 8.8 DIN 931	PLATED		C/W 1 HEX. NUT DIN 934 1 FLAT WASHER DIN 125-1A
	164	60	HEX-CAP SCREW M8x1x70mm MET-FINE THREAD	S.S. 316		LG=70mm MAX-69mm MIN
	167	60	FLAT WASHER M8 NOM. DIN 433	S.S. 316		SPAE-NAUR #659-036
	191	6	HEX BOLT M10 x 1.5 x 20mm LG.	NYLON		SPAE-NAUR #353-071
	199	2	DRIVE SCREW #4 x 1/4" LG.	S.S. 18-8		SPAE-NAUR #376-809
	212	2	EYE BOLT M12 x 1.75 SHOULDER TYPE	STEEL		MAINTENANCE EQUIPMENT SEE AO-C-31625 (EXPLODED VIEW)
	215	2	I.D. 5 1/2" SOFT HOSE x 3/32" THICK. x 3" LG	EPDM		
	216	2	GEAR CLAMP	S.S.		HAS-104

Draw / Rev: **D 31346** Dessin No / Drawing No: **1 de 1** 09

No Prod / Project No: **20XX-XXXX** No Production / Job No: **XX-XXXX**

LÉGENDE/LEGEND  
 1 @ 259 = ASSEMBLAGES FABRIQUÉS / FABRICATED ASSEMBLY  
 300 @ 499 = COMPOSANTES MÉCANIQUES / MECHANICAL COMPONENTS  
 500 @ 699 = BOULONNERIE / BOLTS

NOTES GÉNÉRALES/GENERAL NOTES

NO.	REVISIONS	DATE	BY/PAR

THIRD ANGLE PROJECTION  
PROJECTION TROISIEME ANGLE

Tolerances sauf indications contraires/Tolerances unless otherwise stated  
 SYSTEME IMPERIAL / IMPERIAL SYSTEM SYSTEME METRIQUE / METRIC SYSTEM

FINISH	IMPERIAL	METRIC
125	0-.30" ±.10"	0-10mm ±.2mm
FRACTION	±.10"	±.2mm
1 PLACES XXX	±.010"	±.25mm
2 PLACES XXXX	±.005"	±.125mm
FINITION SURFACE	ANGLES ±.10"	3 PLACES XXXX ±.125mm

Weld Inspection according to CSA W59 / Inspection des soudures selon CSA W59  
 VT: 100% PT: As per symbol / VT: 100% PT: Selon symbole  
 UT: As per symbol / MT: As per symbol / UT: Selon symbole / MT: Selon symbole  
 Scaled welds: 100X LT (look test) / Annexes de levage: 100X MT, 100XT

Read in conjunction with the approved ITP / Lire conjointement avec PRIE approuvée / Read in conjunction with the approved ITP

ETAPES	1	2	3	4	5	6	7	8	9

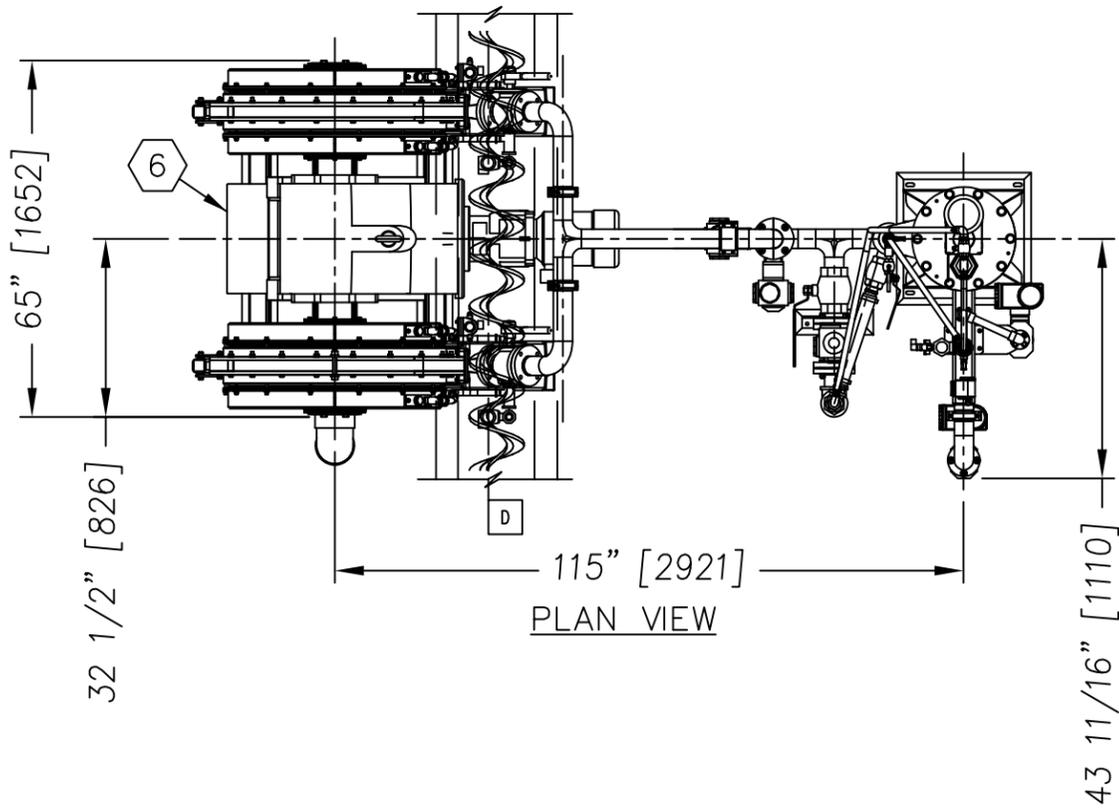
FOURNIER INDUSTRIES INC. / LES INDUSTRIES FOURNIER INC.  
 3787 BOUL. FRONTENAC, THETFORD-MINES, QUEBEC, CANADA, G4H 2B5

ROTARY PRESS ø36" CHANNEL 2" X 10" C/W FIBERGLASS COVER CHANNEL ASSEMBLY

Dessiné / Drawn: **E.GAMACHE** Vérifié / Checked: **R. ROY** Approuvé / Approved: **IFI-02068**  
 Date: **15/02/2011** Echelle / Scale: **1:6** No Equipement du Client / Customer Equipment No.

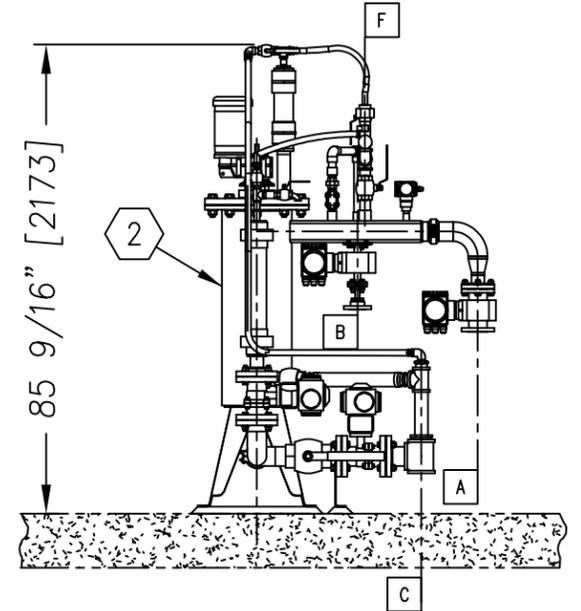
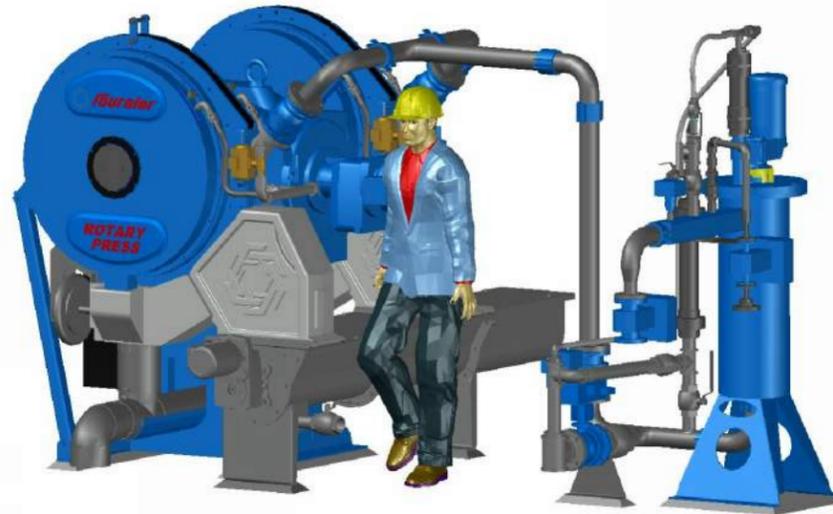
Draw / Rev: **D 31346** Dessin No / Drawing No: **1 de 1** 09

PEINTURE (m2) PAINT SURFACE (2)	CAOUTCHOUC (m2) RUBBER SURFACE (2)	PL.USURE (kg) WEIGHT OF LINERS (2)	POIDS (kg) WEIGHT (2)	REQUIS TOTAL TOTAL REQ'D
0	0	0	0	10



INTERFACE BETWEEN  
PIPING OF ROTARY PRESS  
AND CUSTOMER PIPING  
(PER ROTARY PRESS)

- A SLUDGE INLET #2" (FLANGE)
- B POLYMER INLET #1 1/2"(FLANGE)
- C SLUDGE RECIRCULATION OUTLET #3"-NPT
- D WASH WATER INLET #1"-NPT (2 PLACES) (ROTARY PRESS)
- E FILTRATE OUTLET #6" PIPE
- F WASH WATER INLET #1 1/2"-NPT (FLOCCULATOR)



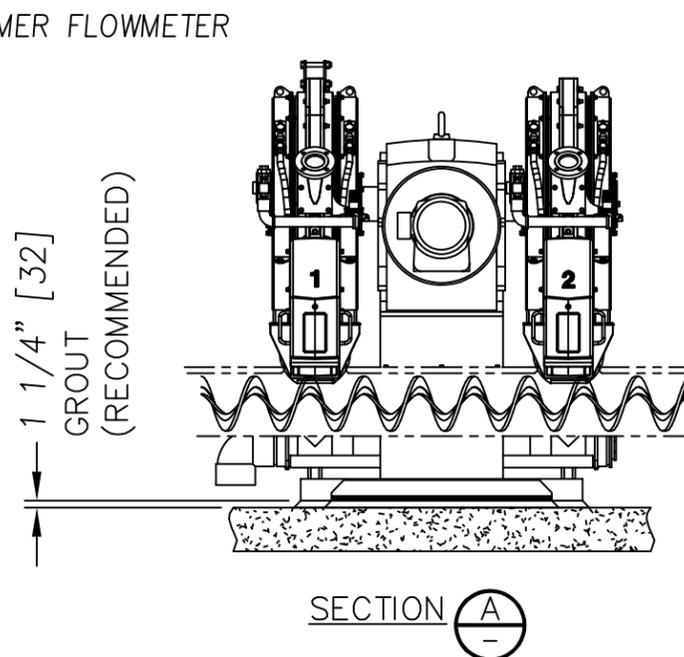
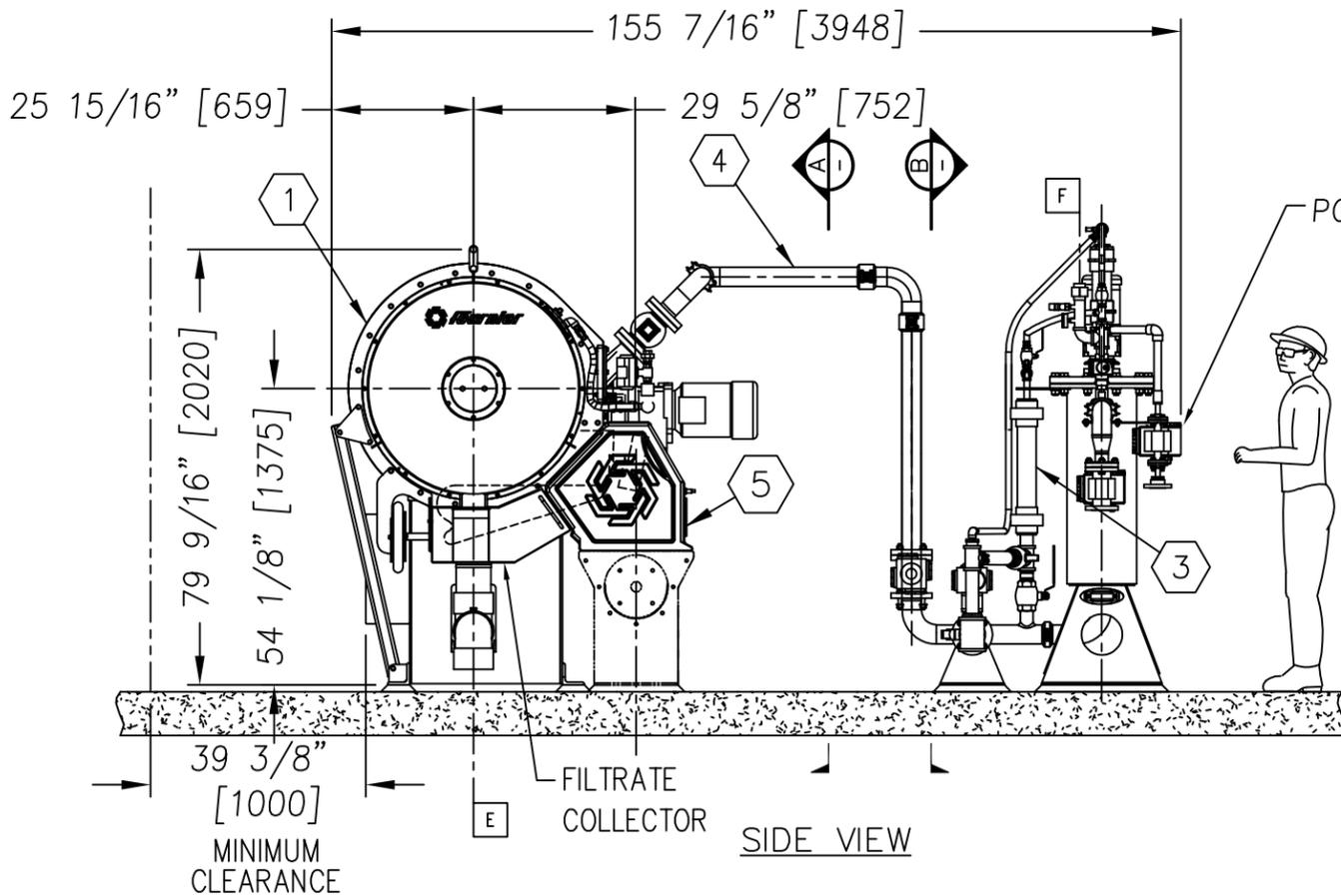
THOSE DIMENSIONS ARE GIVEN FOR INFORMATION ONLY. FINAL DIMENSIONS AND LAYOUT TO BE CONFIRMED BY CERTIFIED DRAWINGS.

ESTIMATED TOTAL WEIGHT (EQUIPMENT): 3579 LBS/8957 LBS  
ESTIMATED SLUDGE WEIGHT: 140 Kg/308 LBS



DEWATERING SYSTEM  
ROTARY PRESS 2-900/2000CV  
GENERAL ARRANGEMENT

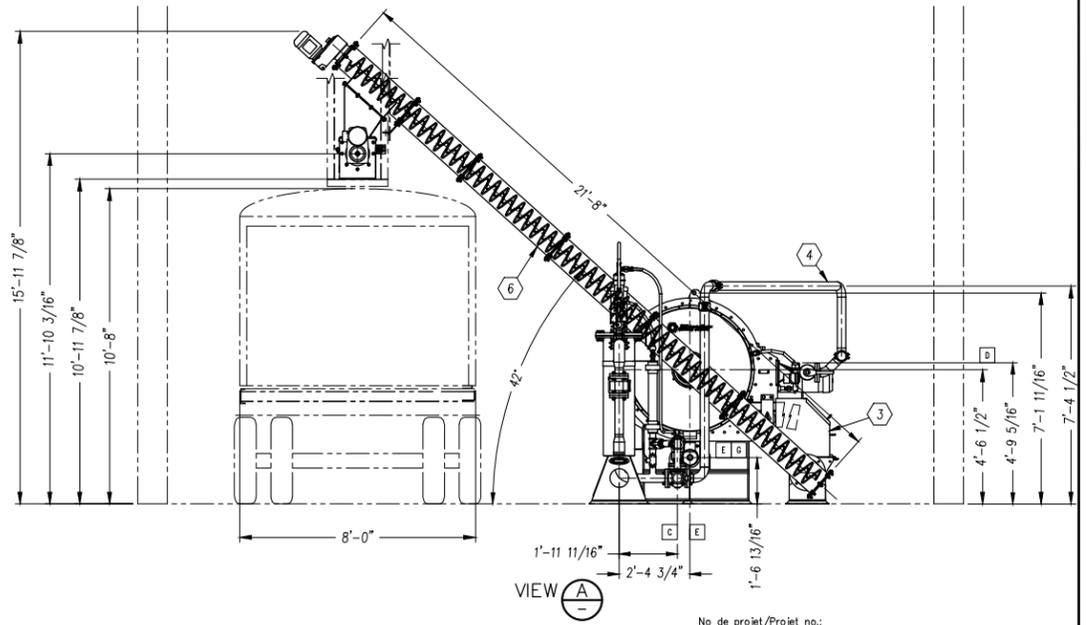
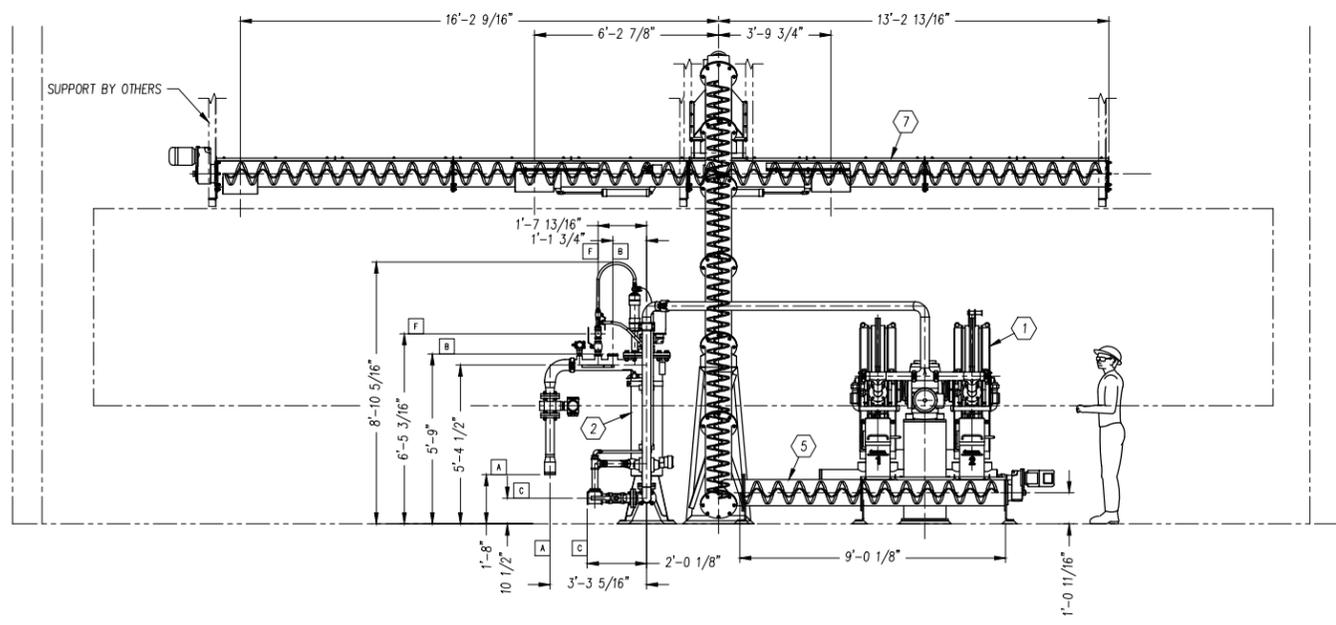
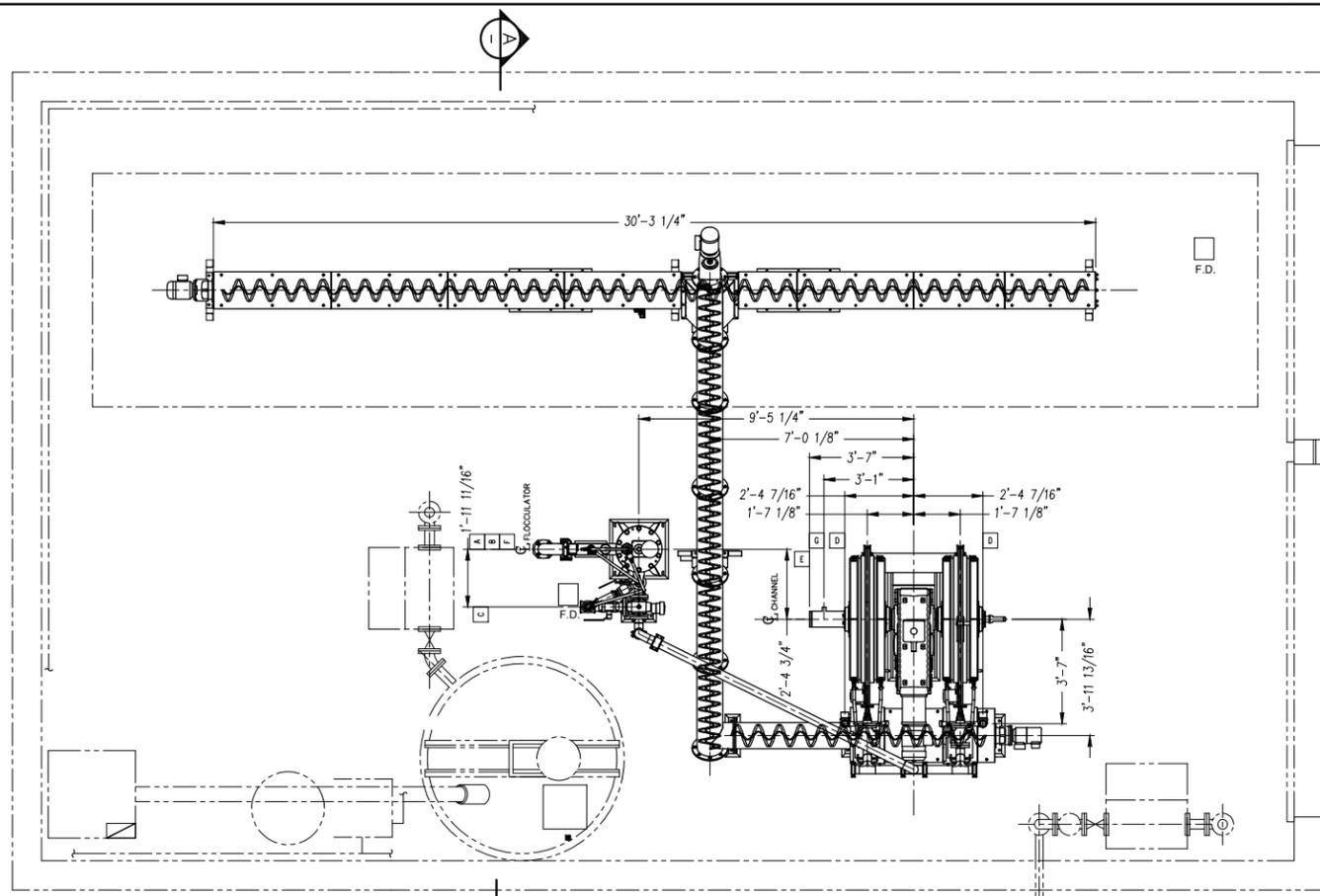
Echelle/Scale 1: 35	Des./By: E.GAMACHE	Dossier/File	Pièce no/Part no.	REV.
Date 25/04/2005	Ver.:	App.:	B-C-24107	13



LISTE DE MATÉRIEL/MATERIAL LIST						A0-21110	04
ARTICLE / ITEM	REPÈRE / REF.	QUANTITÉ / QTY.	DÉSIGNATION / DESIGNATION	MAT.	DIM.	REMARQUES / NOTES	
1		1	PRESSOR ROTATIF MODELE 2-1200/3000A	ACIER		POIDS ESTIME: 11250 LBS VOIR DESSIN # A0-22522	
		1	ARRANGEMENT DE PLANCHER			VOIR DESSIN # A0-22586	
2		1	FLOCCULATEUR	ACIER		POIDS ESTIME: 653 LBS VOIR DESSIN # A0-22524	
3		2	CHUTE A GATEAUX	INOX. 316		POIDS ESTIME: 81 LBS/Un. VOIR DESSIN # D-22676	
4		1	ARRANGEMENT DE LA TUYAUTERIE	INOX. 316		POIDS ESTIME: 660 LBS VOIR DESSIN # A0-22522	
		1	SCHEMA DE PROCEDE			VOIR DESSIN # D-22152	
5		1	CONVOYEUR A VIS DE DECHARGE 9'-0"	ACIER		POIDS ESTIME: 790 LBS VOIR DESSIN # A0-22519	
6		1	CONVOYEUR A VIS INCLINE 21'-8"	ACIER		POIDS ESTIME: 1450 LBS VOIR DESSIN # A0-22519	
7		1	CONVOYEUR A VIS DE DISTRIBUTION 30'-3"	ACIER		POIDS ESTIME: 1600 LBS VOIR DESSIN # A0-22520	
8							

AIR COMPRESS NOT SHOWN BUT SUPPLY BY FOURNIER INC.

- INTERFACE DE RACCORDEMENT DU PRESSOR ROTATIF A LA TUYAUTERIE DU CLIENT
- A ALIMENTATION DES BOUES #4" (Ø101.6mm) (RAINURE VCTAULIC)
  - B ALIMENTATION DES POLYMERES #1 1/2" NPT/F (Ø38.1mm)
  - C RECIRCULATION DES BOUES #3" NPT/F (Ø76.2mm)
  - D ALIMENTATION EAU DE LAVAGE Ø 1 1/2"-NPT (Ø38.1mm) (2 PLACES) (PRESSOR ROTATIF)
  - E SORTIE DES FILTRATS #6" (Ø152mm) (RAINURE VCTAULIC) (1 PLACE)
  - F ALIMENTATION EAU DE LAVAGE #1 1/2"-NPT (Ø38.1mm) (FLOCCULATEUR)
  - G ENTREE ALUM #1"-NPT/F (Ø25.4mm)



No	DESCRIPTION	DATE	PAR/BY
1	AJOUTER SUPPORT DU CONVOYEUR INCLINE, ETAIT PAR AUTRE	27/10/2003	E. GAMACHE
2	REVISE POUR APPROBATION	24/09/2003	D.VALLEE
3	REVISION GENERALE	22/04/2003	A.RUEL
4	REVISION GENERALE	04/02/2002	A.RUEL

SCEAU/STAMP

PROJECTION TROISIEME ANGLE THIRD ANGLE PROJECTION

Tolerances sont indiquées contrairement Tolerances except as indicated otherwise

SYSTEME IMPERIAL/IMPERIAL SYSTEM

FRACTION 1/16" = 1.5748 mm

2 PLACES XX 1/32" = 0.762 mm

3 PLACES XXX 1/64" = 0.391 mm

SYSTEME METRIQUE/METRIC SYSTEM

UNITS/UNITS 0 = 100mm 100mm +

2 PLACES XX 0.1 mm 0.2mm

3 PLACES XXX 0.05 mm 0.125 mm

ETAT DE SURFACE/SURFACE FINISH

SURFACE 125

SOUDURE/WELD 1/2"

ANGLES 45°

No de projet/Projet no.: \_\_\_\_\_

**Fournier**

RICHMOND - SLUDGE HANDLING SYSTEME DE DESHYDRATATION PRESSOR ROTATIF MODELE 2-1200/3000A AVEC 3 CONVOYEURS A VIS

Scale: 1/2" = 1'-0"

Date: 11/01/2001

APP: \_\_\_\_\_

REV: \_\_\_\_\_

A0-21110

04

## System Description and Features

The Rotary Press sludge dewatering equipment is an innovative technology manufactured by "Fournier Industries Inc.". The technology was introduced into the municipal market in Canada in the late 1980's and has been actively implemented in the municipal waste water treatment market in the United States since 1999.

The Rotary Press technology features several distinct advantages over conventional dewatering technologies:

- High cake dryness and solids capture rate.
- Simple, fully automated operation suitable for continuous and remote operation.
- Totally enclosed which controls odours and minimizes potential for operator exposure to pathogens.
- Slow rotating (3 RPM max.) and high energy efficiency.
- Low footprint reduces capital building costs - Minimal wash water requirements.

The Rotary Press technology involves the use of modules called "dewatering channels", composed of two (2) parallel screens, separated by spacers. Sludge is fed into the rectangular channel and rotated between the two (2) revolving stainless steel chrome plated screens.



The filtrate passes through the screens as the flocculated sludge advances within the channel. The sludge continues to dewater as it travels around the channel, eventually forming a cake near the outlet side of the press. The frictional force of the slow moving screens, coupled with the controlled outlet restriction, results in the extrusion of a very dry cake.

The Rotary Press technology presents multiple outstanding features compared to conventional dewatering devices, as outlined below:

### Environmental Friendliness

- Process is totally enclosed, dramatically reducing odours, Volatile organic compounds (VOCs) and pathogen dispersion.
- Operations are quiet.
- Wash water usage is limited to 250 gallons per day, per dewatering channel. No wash water pump usually needs to be dedicated to the Rotary Press.
- Power usage is low. On normal operation on municipal biosolids, power consumption is typically 4 to 10 kW-hr/dry ton of biosolids.
- Cake dryness is high, resulting in less transportation and disposal.

### Modularity

- Machine is composed of several modular units – the dewatering channels – that are independent and interchangeable.
- Different outlet pressures can be set on the different channels, providing in time data on resulting cake dryness and throughput.
- Each channel can be washed separately.
- It is the only continuous operation dewatering device that can be made expandable. An oversized unit can be fitted with supplementary dewatering channels in order to increase its capacity.



**Safety & Health**

- Noise is well under protection thresholds.
- No exposed rotating parts.
- No operator exposure to pathogenic micro-organisms or virus in aerosols from traditional technologies.
- Low-energy dewatering removes all of the free water without cycling the cell walls; re-growth and re-activation is minimal when compared with centrifugation.
- Cleanliness prevents slippery floors.

**Low Operation Cost**

- Dewatering operations are fully automated and operator assistance is limited to start-up, mainly in order to select the optimum polymer dosage.
- Polymer mixing is external to the machine and floc quality can be easily verified by the operator, resulting in optimized polymer usage.
- Power usage is low. On normal operation on municipal biosolids, power consumption is typically 4 to 10 kW-hr/dry ton of biosolids.

**Low Maintenance Cost**

- Robust construction.
- Limited number of mechanical parts.
- Slow rotation speed.
- Results in the lowest maintenance cost of any type of dewatering equipment.
- Reduced corrosive exposure to nearby equipment.
- Automated 5 minutes/day self-cleaning cycle.



**MUNICIPAL AND INDUSTRIAL  
DEWATERING APPLICATIONS**

# **ROTARY PRESS**

## **OPTIMUM-CV**





## Advantages of operation

- Continuous process
- Equipment totally enclosed, reduced airborne contaminants & odors
- Easy start-up and shut-down procedures
- Very simple to operate
- Minimal supervision required
- Completely automated and can be remotely controlled

## Maintenance

- Robust construction
- Small number of mechanical parts
- Slow rotation speed (0.2-2 rpm)
- Reduced corrosive exposure to nearby equipment
- Automated self-cleaning cycle
- Little maintenance

## Economy

- Savings on final disposal costs (high dryness)
- Minimal space requirements (small footprint)
- Low maintenance costs
- Reduced labor costs
- Low energy consumption
- Low water usage



## ACCESSORIES & MORE

We have developed a wide variety of **customized accessories** for virtually any layout.

Custom-engineered systems for **total plant automation**, catering to every customer's individual needs.

Our engineering team will tackle any project and provide **complete package solutions** for any biosolid handling.

With a host of features tailored to your requirements, Fournier allows you to optimize your business operations.

### ■ Containerized & skid mounted units

- Complete turnkey projects
- Containerized projects

### ■ Polymer feed systems

- Liquid or dry-feed polymer
- Manual or fully automated

### ■ Shaftless screw conveyors

- Screw sizes from 9" to 18"
- Lengths from 5ft to 200ft

### ■ Sludge pumps & other accessories

- Equipment of any size can be quickly assembled and shipped to your site.





Fournier Industries Inc. has specialized in mechanical equipment manufacturing since 1960. The company's technical abilities and expertise involve product design, lab and pilot testing, commissioning and training.

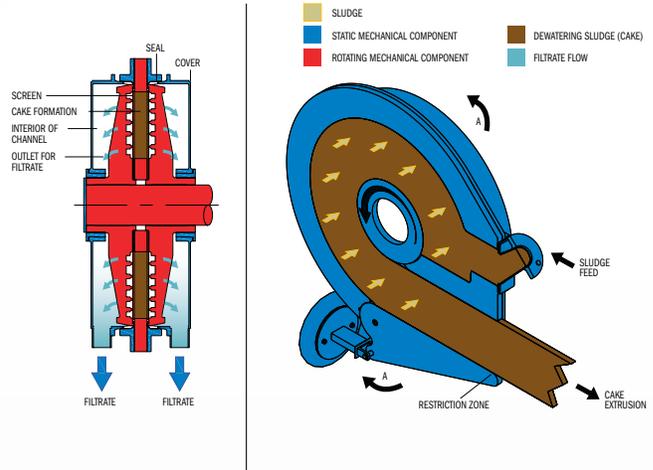
## ROTARY PRESS TECHNOLOGY

Fournier Industries Rotary Press technology is at the forefront of municipal and industrial sludge dewatering, the result of continuous improvement and R&D.

Due to its reliability and simplicity, the Fournier Rotary Press requires minimal supervision. It is the only dewatering technology that is safe for stand-alone automatic operation and can be monitored and operated by remote control.

The benefits derived from using the Rotary Press have been well documented and result in lower operating costs for the customer through its high performance, easy operation, reduced polymer usage, low power consumption and low maintenance.

## Principle of operation



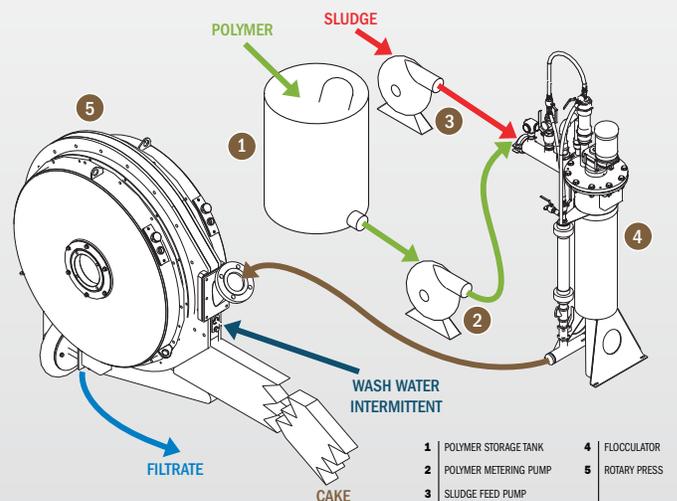
## HOW IT WORKS...

The principle of operation is simple. Sludge is fed at low pressure into the channel and rotates between two parallel revolving stainless steel chrome plated filtering elements.

As free water passes through the screens, the sludge continues to dewater as it travels around the channel. The flocculated sludge builds up solids until enough pressure is generated against the outlet restricted arm.

The frictional force of the slow-moving filtering elements, coupled with controlled outlet restriction, generates enough back pressure to dewater the remaining solids, resulting in the extrusion of a very dry cake.

## Process schematic



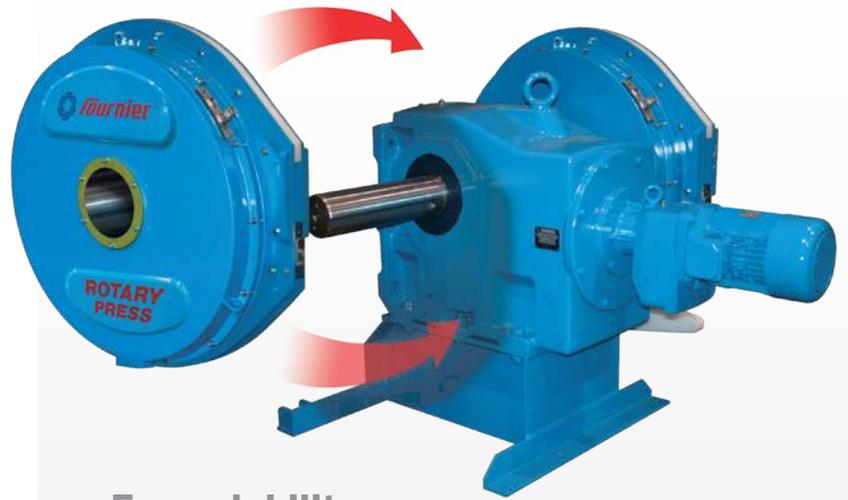
# THE ROTARY PRESS CV-OPTIMUM

The Fournier Rotary Press, CV-optimum is the latest development in dewatering technology.

Winner of the 2002 WEF Innovative Technology Award, this Canadian invention has undergone several upgrades over the years.

A single-width channel is able to dewater all varieties of sludge, allowing a single press to be used anywhere, without any physical modification.

To ensure that our customers always get the parts they need quickly & affordably, Fournier Industries maintains a large inventory of spare parts.



## Expandability

Another unique feature of the Rotary Press is the ability to order units that can be expanded at a future date. This allows customers to benefit from lower capital costs at time of purchase and expand according to need. Any combination of channels can be obtained, up to maximum of 8 channels per press.

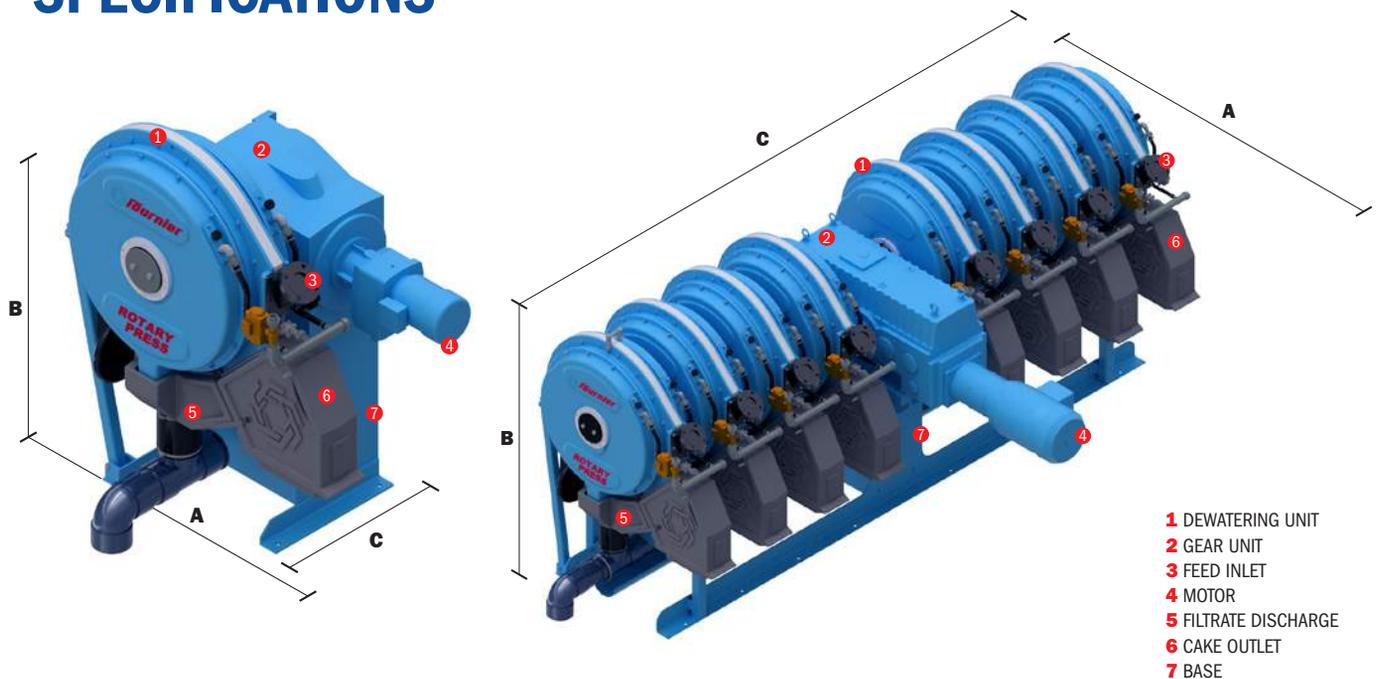


**TURNKEY SYSTEMS DELIVERED ON SKID, FOR SIMPLE,  
FAST AND ECONOMIC INSTALLATION**





## SPECIFICATIONS



- 1** DEWATERING UNIT
- 2** GEAR UNIT
- 3** FEED INLET
- 4** MOTOR
- 5** FILTRATE DISCHARGE
- 6** CAKE OUTLET
- 7** BASE

MODEL NO.	MODEL	DIMENSIONS In. (mm)			WEIGHT Lb (kg)	MOTOR HP (kW)
	CHANNEL	A	B	C		
1-900/1000CV	1	69 (1745)	72 (1830)	40 (1028)	3966 (1799)	1.5 (1.1)
2-900/2000CV	2	74 (1874)	72 (1830)	65 (1646)	6854 (3109)	3 (2.2)
3-900/3000CV	3	75 (1899)	72 (1830)	86 (2180)	8498 (3855)	5 (3.7)
4-900/4000CV	4	84 (2135)	75 (1915)	102 (2580)	10280 (4663)	5 (3.7)
5-900/5000CV	5	88 (2240)	75 (1915)	123 (3124)	12235 (5550)	7.5 (5.5)
6-900/6000CV	6	88 (2240)	75 (1915)	144 (3668)	13649 (6191)	7.5 (5.5)
7-900/7000CV	7	90 (2280)	79 (2007)	176 (4471)	17409 (7913)	10 (7.5)
8-900/8000CV	8	90 (2280)	79 (2007)	187 (4750)	18820 (8555)	10 (7.5)

\*VARIES AS PER INSTALLATION LAYOUT



## LABORATORY AND PILOT TESTING

In order to determine the size that meets your needs, we strongly recommend taking advantage of our **Free** laboratory tests.

These steps allow us to characterize sludge samples and to anticipate the performance of your Rotary Press, based on previous results in the same operation field.



FOURNIER INDUSTRIES INC.

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Quebec, Canada G6H 2B5

Phone: 418 423-4241 | [general@fournierindustries.com](mailto:general@fournierindustries.com)  
Fax: 418 423-7366 | [www.fournierdewatering.com](http://www.fournierdewatering.com)

## WHAT YOU SEE IS WHAT YOU GET!

Fournier Rotary Press performance testing can be demonstrated by means of our mobile units. Our use of a full-scale pilot unit defines the performance of the Rotary Press on your typical sludge. Using the information from the pilot gives us the exact performance data needed for any final installation design.



**OVER 500 INSTALLATIONS WORLDWIDE**



US Patent 7,166,229  
ISO-9001:2015