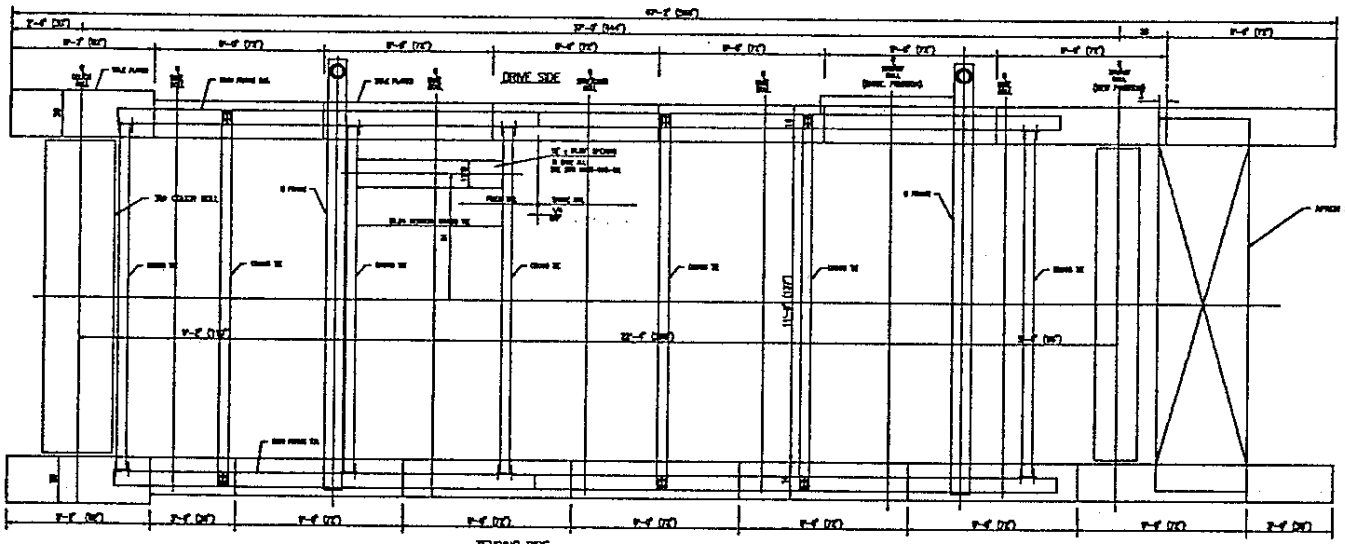
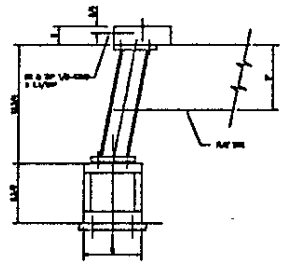
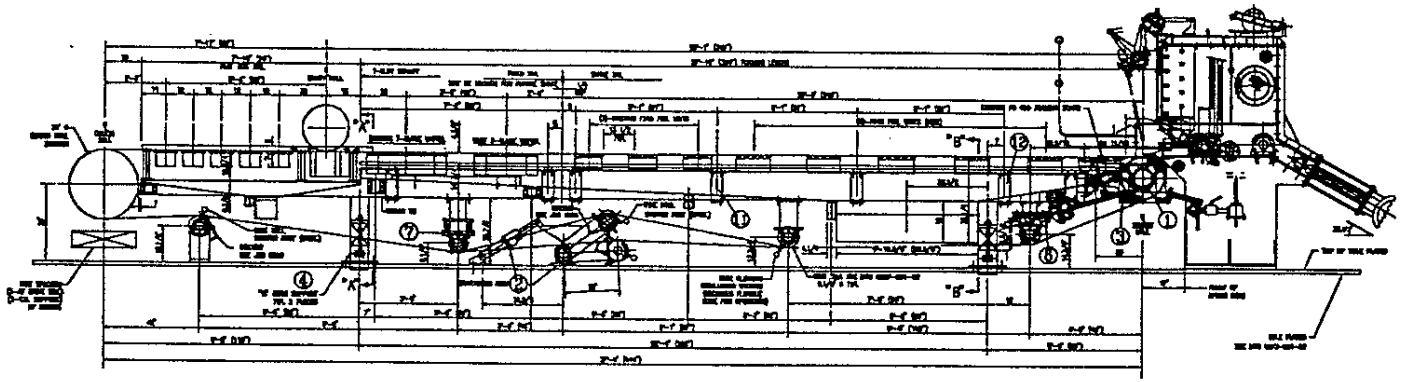


PLAN VIEW

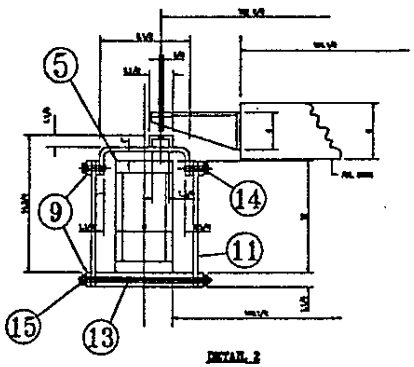
ITEM	QTY	DESCRIPTION	REF	REMARKS
1	2	BRIGHT ROLL BEARING HOUSING ASSY	6553-002-02	
2	2	STRIPPER ASSY	6553-011-02	
3	X	BRIGHT ROLL BRNG ARM ASSY	6553-013-02	
4	2	C FRAME	6553-012-02	
5	1	MAIN FRAME & SHAE ALL ASSY	6553-014-02	
6	1	HAND CLOTH	6553-004-02	
7	1	AIR CLOTH	6553-007-03	
8	2	CHANEL, T SLOT	6553-002-03	
9	28	CLAMP	6553-001-03	
10	1	FOIL WIRE ROLL	6553-001-03	
11	36	SCOTCH FLY	6553-009-03	
12	1	SCOTCH FLY	6553-001-03	
13	24	ROD THREADED 3/8	6553-005-03	
14	88	HEX CAP SCR 3/4-10NC/LG	3/5	
15	48	HEX NUT 3/4-10NC	3/5	
16				
17				
18				



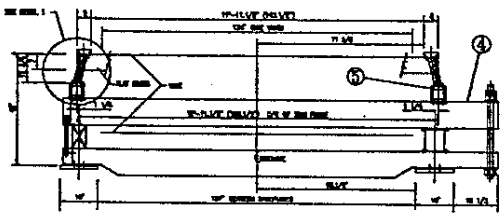
DETAIL 1



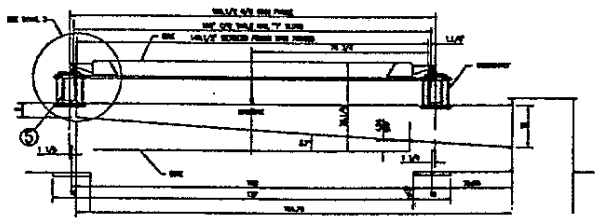
T.S ELEVATION



DETAIL 2



SECTION "A-A"



SECTION "B-B"

NOTES:

- ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
- THIS DRAWING MUST BE READING CONJUNCTION TOUCHER DWG NUMB 6555-000-10, 6573-001-02

MEC-FAB inc.

1401 GRAHAM BELL
BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

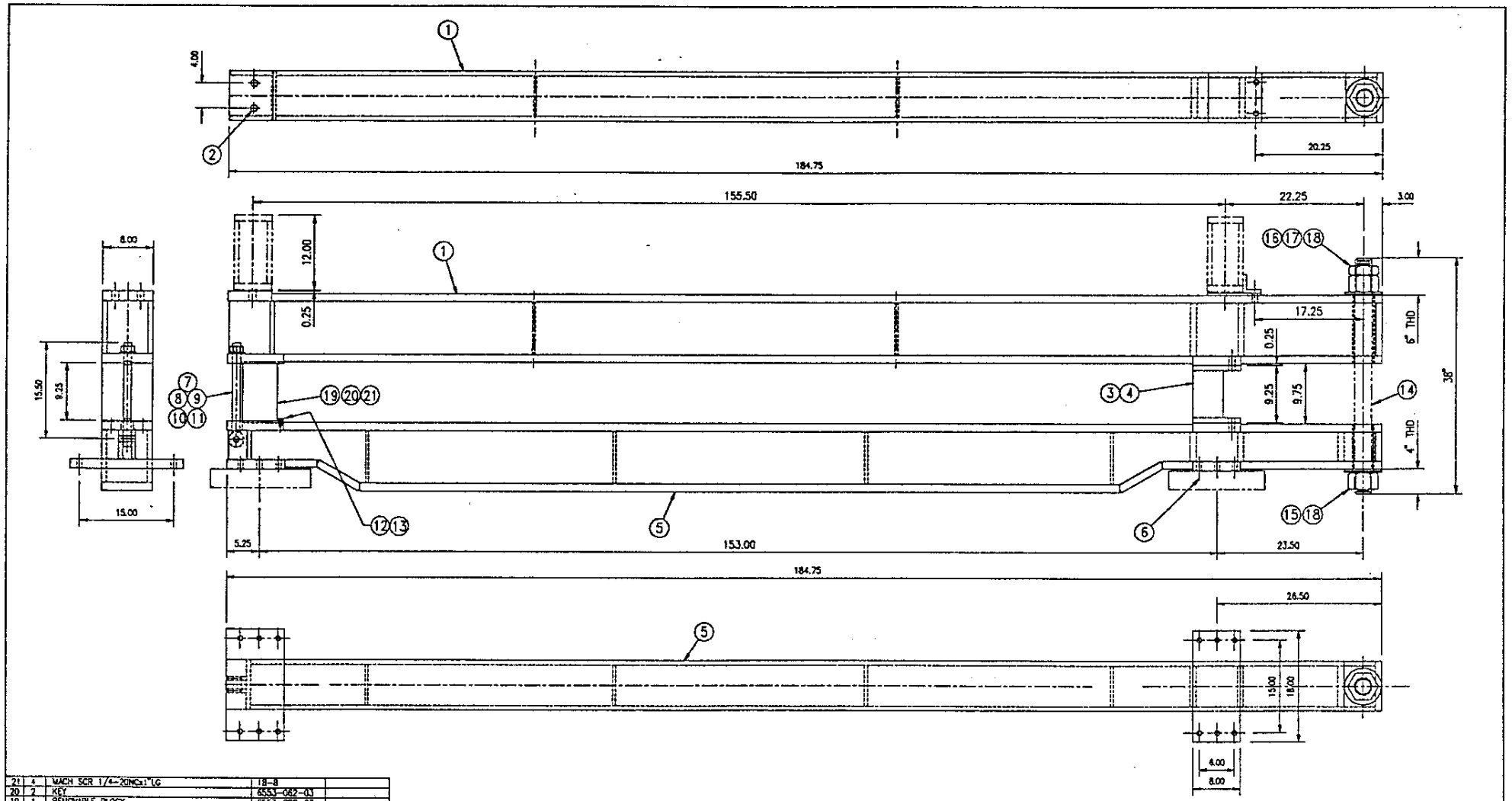
X.	± .040	DRAWN BY T.N.	DATE 92/09/18
X.X	± .000	DESIGNED BY J.P.H.	DATE 92/09/30
X.XX	± .010	APPROVED BY	DATE
X.XXX	± .005		
FRACTIONS	± 1/64		

SCALE 1/2"=1'-0"

TITLE: #2 FOURDRINIER ASSY FOR CROSS POINT, FLAMBEAU MILL

DRAWING NO. 6553-001-02

REV 4



ITEM	QTY	DESCRIPTION	MAT'L	REMARKS
21	4	MACH SCR 1/4-20NC×1"LG	18-8	
20	2	KEY	6553-062-03	
19	1	REMOVABLE BLOCK	6553-020-03	
18	2	WASHER 2.3/4	18-8	
17	1	JAM HEX NUT 2.3/4-4NC	SI BRONZE	
16	1	HVY HEX NUT 2.3/4-4NC	SI BRONZE	
15	1	HVY HEX NUT 2.3/4-4NC	18-8	
14	1	CANTILEVER ROD	6553-061-03	
13	2	MACH SCR 3/8-16NC×3/4LG FL HD	18-8	
12	1	STOP BAR	6553-060-03	
11	2	COTTER PIN 1/8"	18-8	
10	1	PIN	6553-059-03	
9	1	WASHER 1.1/4 HVY	18-8	
8	1	HVY HEX NUT 1.1/4-7NC	SI BRONZE	
7	1	EYE BOLT 1.1/4	6553-058-03	
6	8	HEX CAP SCR 3/4-10NC×3"LG	18-8	
5	1	C FRAME BOTTOM BEAM	6553-060-02	
4	4	HEX CAP SCR 1-8NC×2"LG	18-8	
3	1	SUPPORT BLOCK	6553-019-03	
2	2	HEX CAP SCR 1-8NC×2.75"LG	18-8	
1	1	C FRAME "CP" BEAM	6553-013-02	

MEC-FAB inc.

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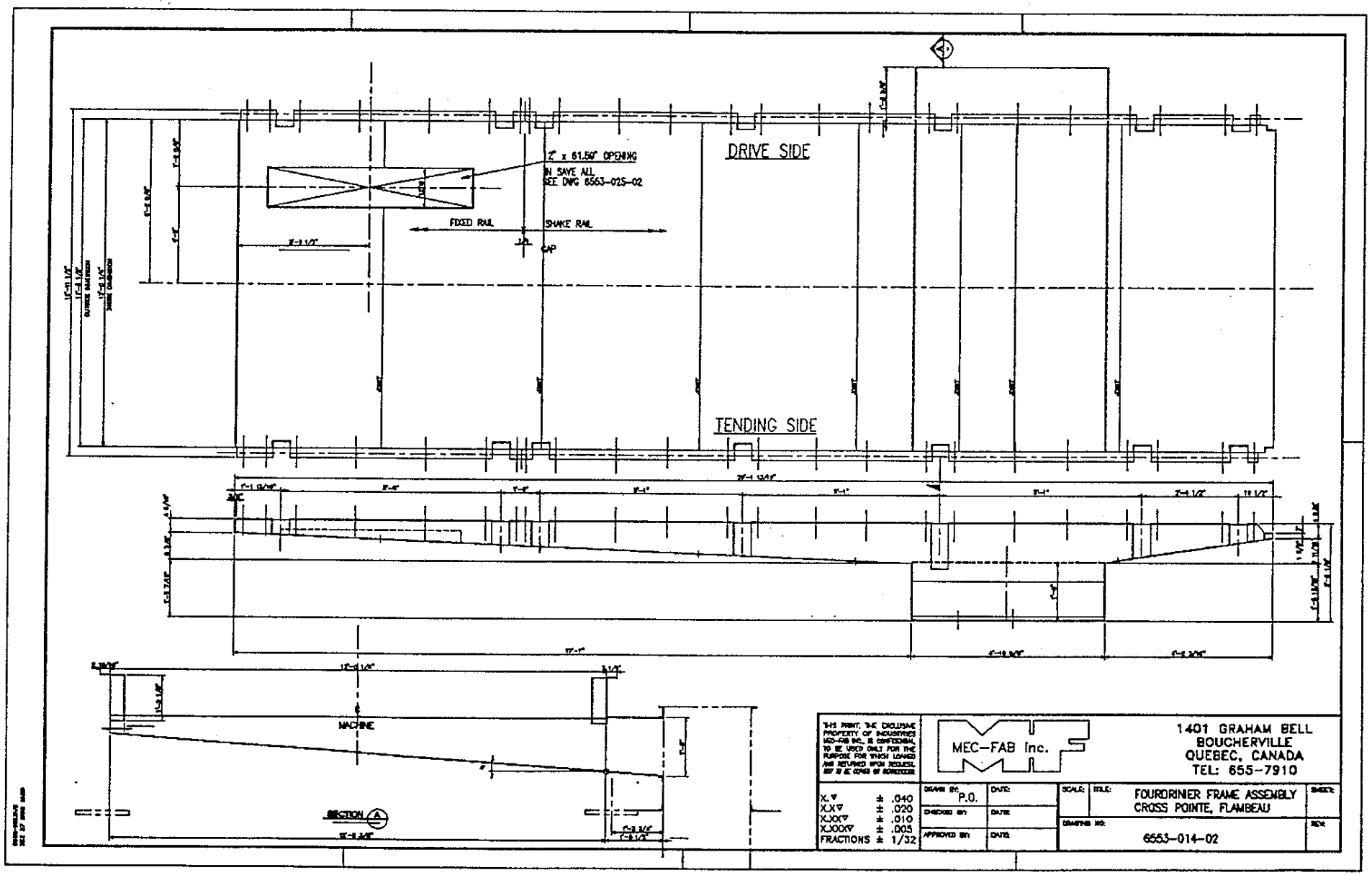
BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

X.	± .040
X.X	± .020
X.XX	± .010
X.XXX	± .005
FRACTIONS	± 1/32

DRAWN BY: T.N. DATE: 92/11/09
CHECKED BY: DATE:
APPROVED BY: DATE:
SCALE:
TITLE: "C" FRAME ASSY
CROSS POINTE, FLAMBEAU
DRAWING NO: 6553-039-02
SHEET:
REV:



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MEC-FAB Inc.

1401 GRAHAM BELL
BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

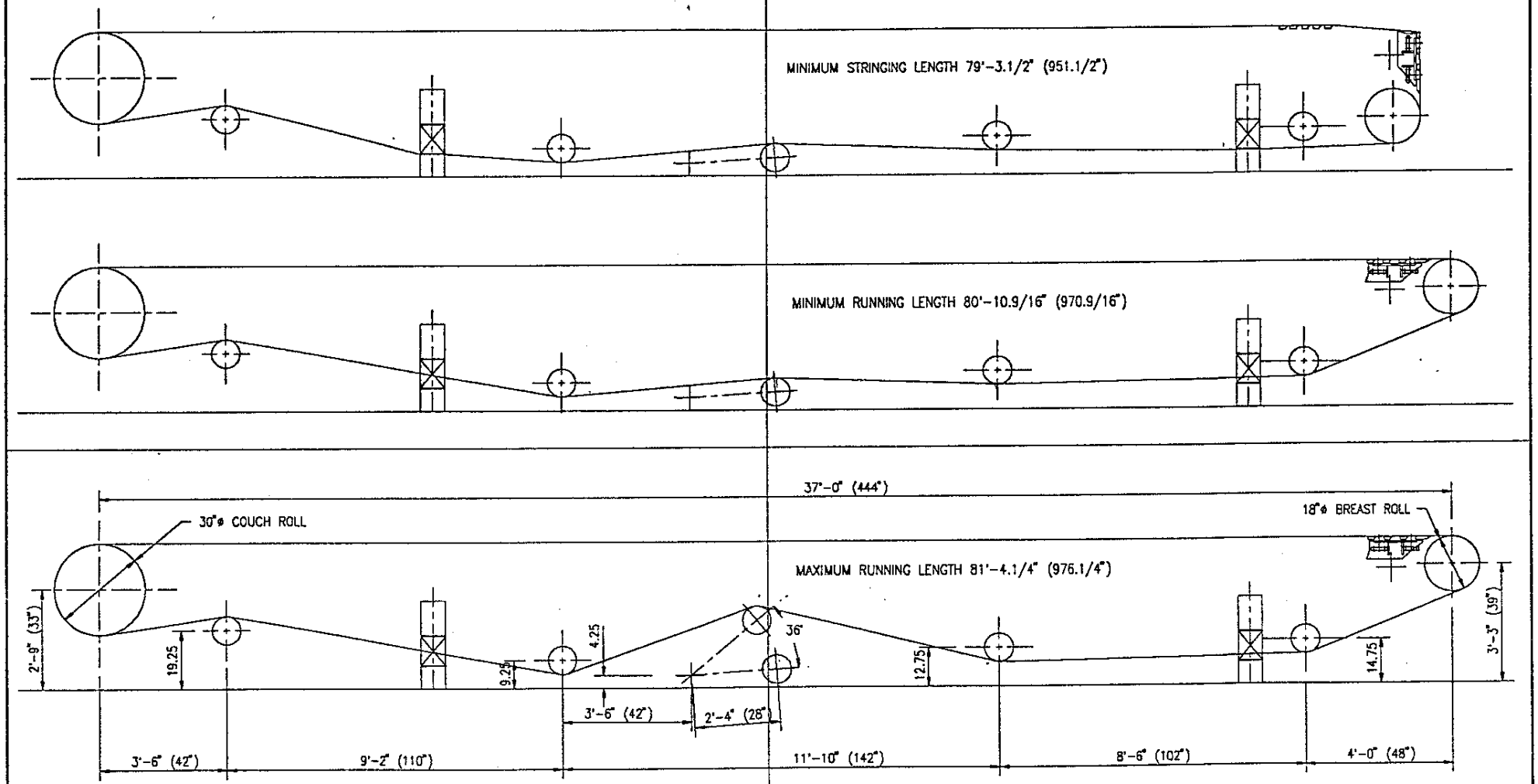
X.Y	± .040
X.XY	± .020
X.XXY	± .010
X.XXXY	± .005
FRACTIONS	± 1/32

DRAWN BY: P.O. DATE:
CHECKED BY: DATE:
APPROVED BY: DATE:

SCALE: TITLE: FOURDRINIER FRAME ASSEMBLY
CROSS POINTE, FLAMBEAU

DRAWING NO: 6563-014-02

SHEET:
REV:



REV	DESCRIPTION	DATE	BY
1	ROLLS AND C-BEAM RELOCATED	92/10/30	P.G.

MEC-FAB inc.

1401 GRAHAM BELL
BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

X.	± .040
X.X	± .020
X.XX	± .010
X.XXX	± .005
FRACTIONS	± 1/64

DRAWN BY: P.O. DATE: 2/10/92
CHECKED BY: T.N. DATE: 2/10/92
APPROVED BY: DATE:

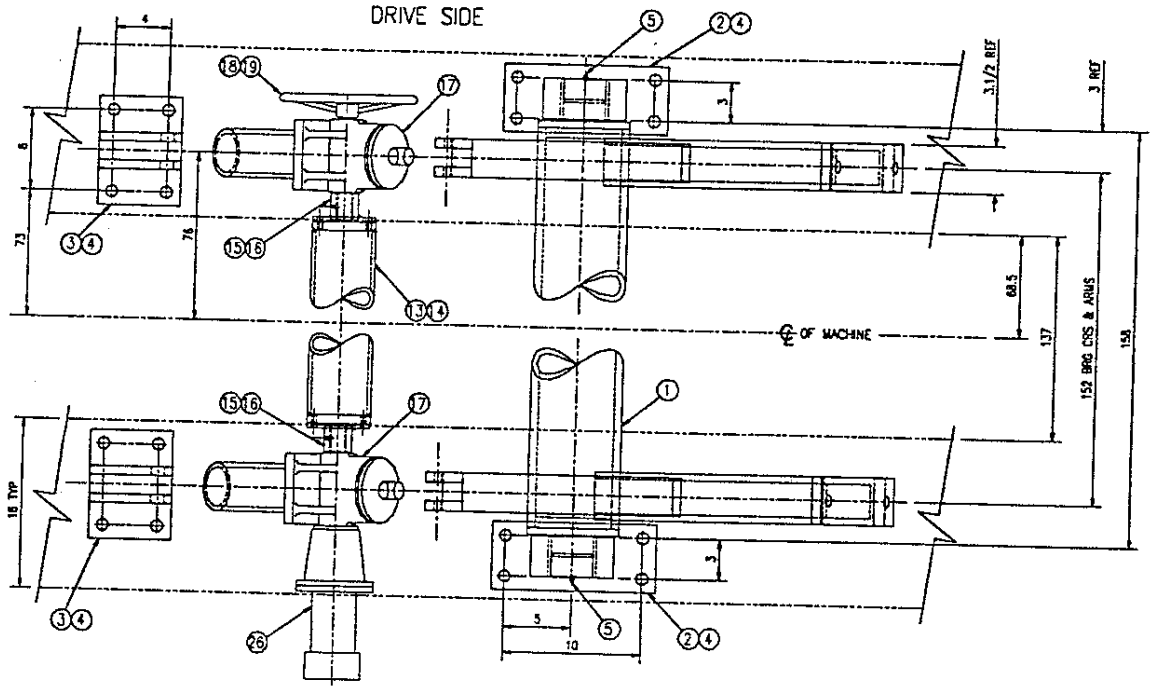
SCALE:

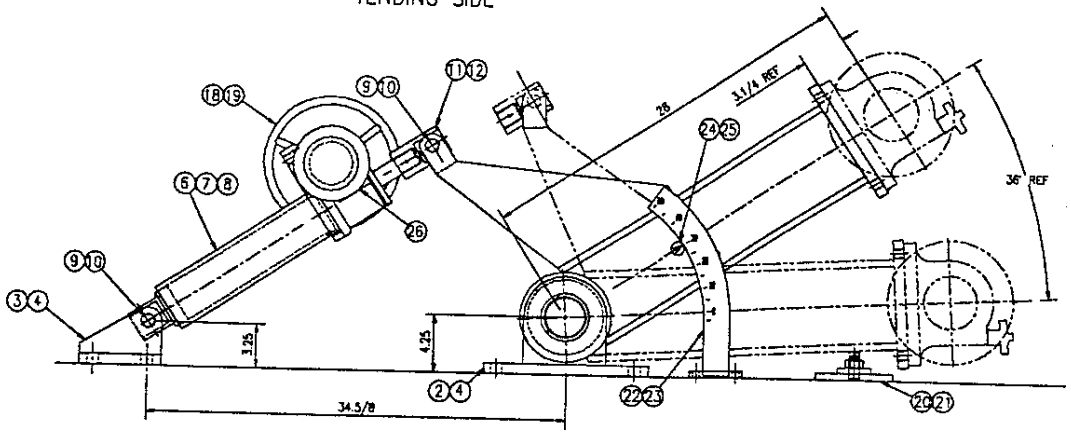
TITLE: WIRE RUN
CROSS POINTE, FLAMBEAU

DRAWING NO: 6553-049-20

SHEET:

REV: 1





ITEM	QUAN	DESCRIPTION	DWG.	REMARKS
1	1	STRETCHER FRAME ASSEMBLY	6553-011-02	
2	2	BEARING	6553-011-03	
3	2	CLEVIS	6553-011-04	
4	16	HHCS 3/4-10NC x 1.3/4 Lg	PURCHASING	18-8 ST.ST.
5	2	1/4 NPT GREASE FITTING	PURCHASING	18-8 ST.ST.
6	2	DOUBLE CLEVIS MOUNTING	6553-011-05	
7	4	HHCS 5/8-11NC x 1.1/2 Lg	PURCHASING	18-8 ST.ST.
8	4	5/8 LOCK WASHER	PURCHASING	18-8 ST.ST.
9	4	PIN	6553-011-06	
10	8	1/8 COTTER PIN x 2 Lg	PURCHASING	18-8 ST.ST.
11	2	ROD EYE	6553-011-07	
12	2	3/16 x 1 Lg PIN	PURCHASING	304L ST.ST.
13	2	CROSS SHAFT	6553-011-08	
14	8	HHCS 1/4-10NC x 1.1/2 Lg	PURCHASING	18-8 ST.ST.
15	2	CROSS SHAFT FLANGE	6553-011-09	
16	2	SOC SET SCR 1/4-20NC x 1/2 Lg	PURCHASING	18-8 ST.ST.
17	2	SCISSOR JACK BU-58-H-U-I-300mm	PURCHASING	
18	2	PLASTIC HANDWHEEL	PURCHASING	
19	2	SOC SET SCR 1/4-20NC x 3/4 Lg	PURCHASING	18-8 ST.ST.
20	2	STRETCHER STOP	6553-011-10	
21	4	HHCS 1/2-13NC x 1.1/2 Lg	PURCHASING	18-8 ST.ST.
22	4	INDICATOR	6553-011-11	
23	4	HHCS 3/8-16NC x 1.1/2 Lg	PURCHASING	18-8 ST.ST.
24	4	POINTER	6553-011-12	
25	4	SOC CAP SCR #6-32NC x 1 Lg	PURCHASING	18-8 ST.ST.
26	1	AIR MOTOR	PURCHASING	

MEC-FAB inc.
1401 GRAHAM BELL
BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

X	± .040
X.X	± .020
X.XX	± .010
X.XXX	± .005
FRACTIONS	± 1/32

DRAWN BY	P.O	DATE	92/09/29
CHECKED BY		DATE	
APPROVED BY		DATE	

SCALE: N.T.S.
TITLE: STRETCHER ASSEMBLY
CROSS POINTE, FLAMBEAU
SHEET
DRAWING NO: 6553-011-02
REV

GUIDE DATA SHEET

(* = PLEASE INDICATE)

DATE 11-9-92
11-18-92

CUSTOMER & LOCATION MEC-FAB, BOUCHERVILLE, QUEBEC

CUSTOMER REF. NO. JOB 6553 CUSTOMER P.O. NO. 29082

G&N QUOTE NO. N-11391-1 G&N ORDER NO. GN-55976

TYPE OF BELT: METAL _____ FELT _____ SYN. ✓ OTHER _____

BELT SPECS. 134" WIDE

MACHINE LOCATION (WIRE-PRESS-FELT-OTHER) WIRE

APPLICATION (WET-DRY) _____ MAX. TEMP. _____

GUIDE MODEL 430-A AIR GUIDE

GUIDE MOUNTING "S" PALM LOCATION "A" ("A" Preferred)

PALM BLADE STYLE W (Determined by type of belt) COATING ROXIDE IF OVER 800 FPM (Recommended over 800 FPM)

PALM BRACKET STYLE: PENDULUM _____ UPRIGHT ✓ OTHER _____

GUIDE ROLL DIAMETER 9 1/8" (Preferred) FACE WIDTH = BELT WIDTH + 4" (138")

MAX. MACHINE SPEED 1500 FPM. MIN. MACHINE SPEED _____

GUIDE ROLL WEIGHT _____ BELT TENSION _____ (20 PLI Wires and 15 PLI Felts)

DOCTOR WEIGHT _____ TOTAL LOAD _____

FRONT GUIDE ROLL BEARING BY CUSTOMER (GUIDE SIDE)

REAR GUIDE ROLL BEARING BY CUSTOMER

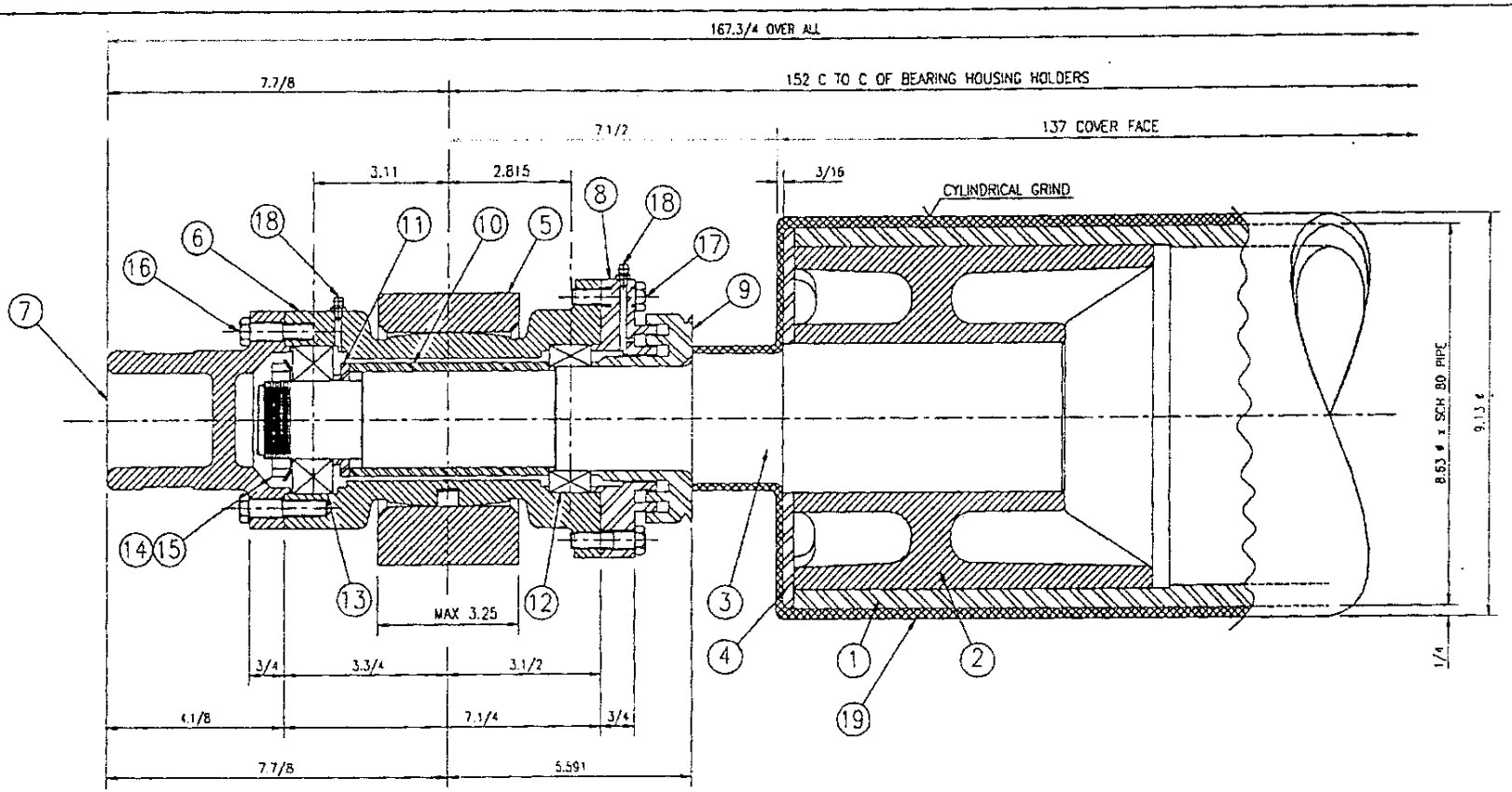
BACKSTAND BY CUSTOMER

LUBRO-CONTROL UNIT (REQUIRED FOR AIR GUIDES ONLY) 33BB-A2S

MAXIMUM AIR PRESSURE AVAILABLE _____ INSTRUMENT AIR _____

SPECIAL REQUIREMENTS MODEL 830 HO. & BACKSTAND MOUNTED WITH SEPERATE GUIDE ROLL.

REVISED 4-91



19	1	ROLL COVER (HARDNESS 0-5 P&J)	RUBBER	PURCHASING	SUB CONTRACT
18	4	GREASE FITTING 1/8 NPT	ST.ST.	PURCHASING	
17	8	H.H.C.S. 3/8-16NC X 2 Lg	ST.ST.	PURCHASING	
16	8	H.H.C.S. 3/8-16NC X 2 Lg	ST.ST.	PURCHASING	
15	2	LOCK WASHER W-09	S.K.F.	PURCHASING	
14	2	LOCK NUT N-09	S.K.F.	PURCHASING	
13	2	SPHERICAL ROLLER BEARING 22209 CC	S.K.F.	PURCHASING	
12	2	NEEDLE ROLLER BEARING NA 4912	S.K.F.	PURCHASING	
11	2	SPACER RING	M.S.	6557-009-03	
10	2	SPACER SLEEVE	M.S.	6557-008-03	SA-106-B SMLS
9	2	FLINGER SPACER	M.S.	6557-007-03	
8	2	INNER END CAP	M.S.	6557-006-03	
7	2	OUTER END CAP	~~G1.130~~	6557-005-03	S/S 316L
6	2	BEARING HOUSING	~~G1.130~~	6557-004-03	S/S 316L
5	2	BEARING HOUSING SADDLE	~~G1.130~~	6557-003-03	S/S 316L
4	2	END PLATE	ST.ST.	6557-011-03	
3	2	ROLL JOURNAL	4140 H.T.	6557-002-03	
2	2	[illegible]EAD	C1.130	6557-010-03	
1	1	SCH 80 PIPE	M.S.	6557-002-03	E.R.W./SMLS

NOTES:
1- QUANTITIES SHOWN IN B.O.M., ARE FOR ONE (1) ROLL ONLY. SIX (6) ROLLS ARE REQUIRED FOR THIS PROJECT.

MEC-FAB inc.

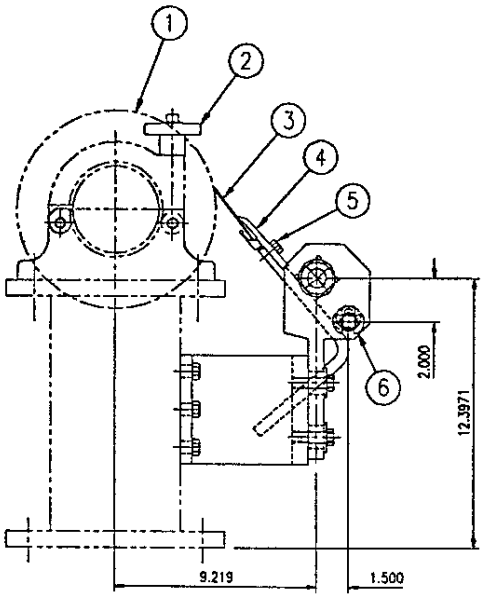
1401 GRAHAM BELL
BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

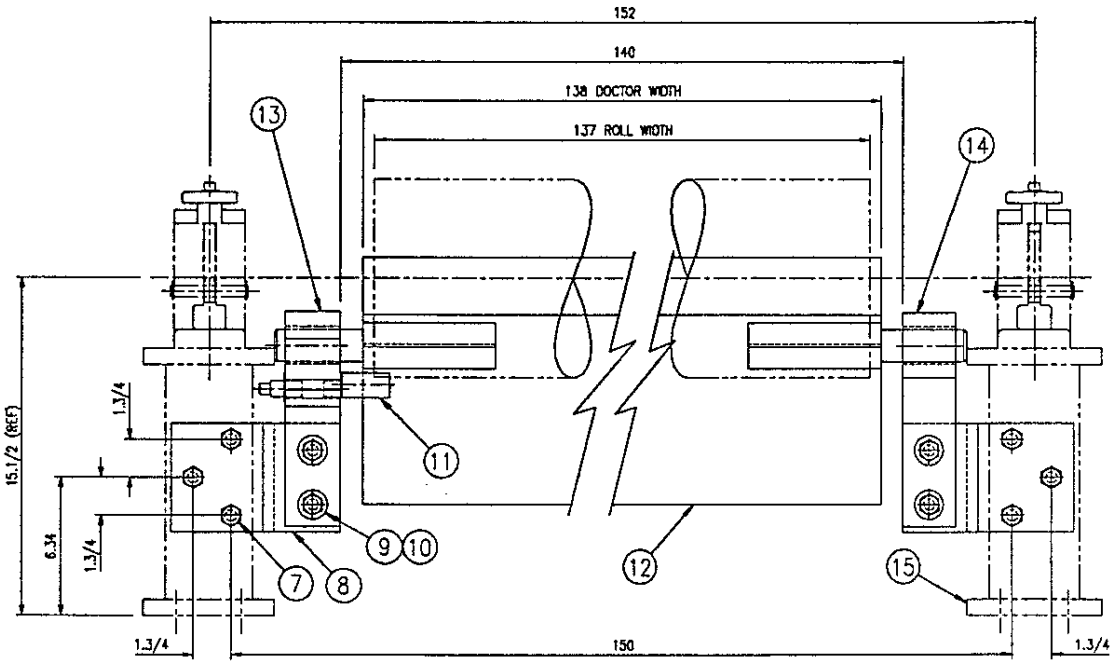
X.	±	.040
XX	±	.020
XXX	±	.010
XXXX	±	.005
FRACTIONS	±	1/32

DRAWN BY: P.O. DATE: 29/09/92
CHECKED BY: DATE:
APPROVED BY: DATE:

SCALE: 1 = 4
TITLE: WIRE ROLL ASSEMBLY
CROSS POINTE, TEAMRAU
DRAWING NO. 6557-001

ITEM	QTY	DESCRIPTION	DWG No.	REMARKS
1	1	WIRE ROLL 9.1/8 DIA	6557-001-02	REF
2	2	SADDLE, BEARING HOUSING	6557-003-02	REF
3	1	COMPO BLADE .090 x 3 x 138	PURCHASING	KanEng Inc.
4	1	VICKMATE BLADE HOLDER x 138	PURCHASING	KanEng Inc.
5	46	3/8-16NC x 3/4 Lg HEX.HD.CAP SCR	PURCHASING	18-8
6	1	KUPRING No. 5304-75	PURCHASING	TRUARC
7	6	1/2-13NC x 1.1/2 Lg HEX.HD.CAP SCR.	PURCHASING	18-8
8	2	BRACKET, DOCTOR, L.W.R.	6558-005-03	
9	4	1/2-13NC x 1.1/2 Lg HEX.HD.CAP SCR.	PURCHASING	18-8
10	4	PLAIN WASHER 1/2	PURCHASING	18-8
11	1	CAM BAR, DOCTOR	6558-008-03	
12	1	DOCTOR BACK, LAST WIRE ROLL	6558-005-03	
13	1	BRACKET, BEARING, T.S., L.W.R.	6558-006-03	
14	1	BRACKET, BEARING, O.S., L.W.R.	6558-007-03	
15	2	WIRE ROLL POST	6553-069-03	REF





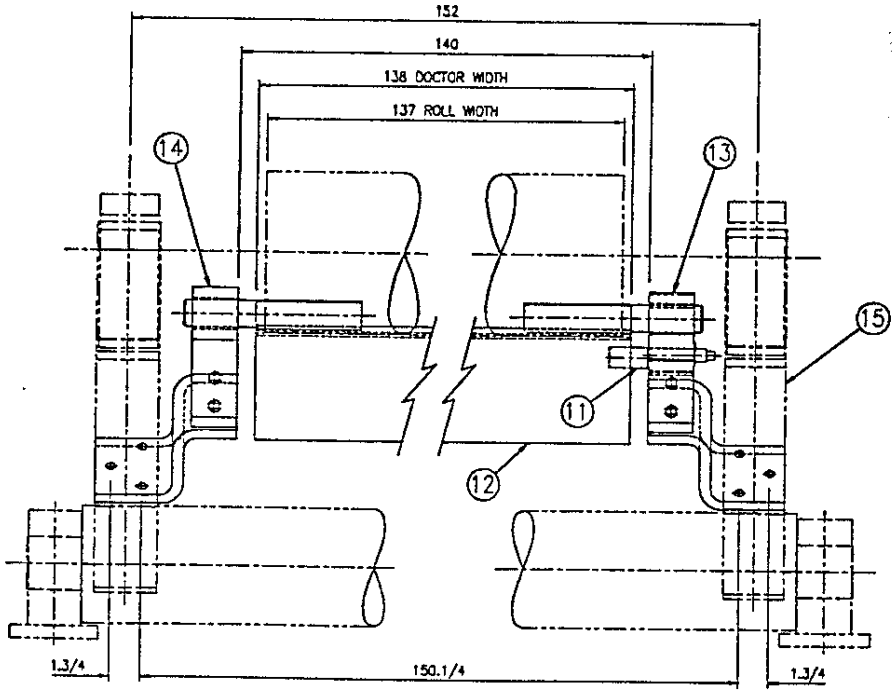
MEC-FAB inc.

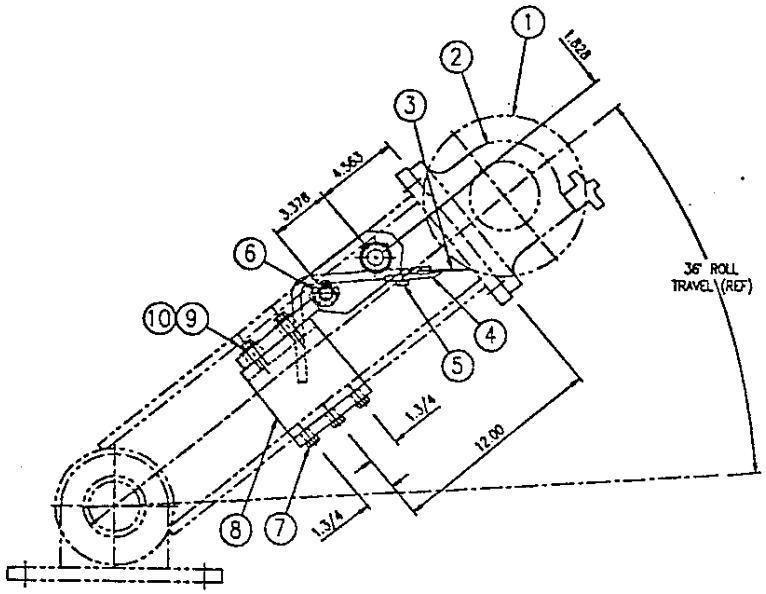
1401 GRAHAM BELL
BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

X.	± .040
X.X	± .020
X.XX	± .010
X.XXX	.005
FRACTIONS	± 1/32

DRAWN BY: P.D. DATE: 93/02/10
CHECKED BY: DATE:
APPROVED BY: DATE:
SCALE:
TITLE: LAST W.ROLL DOCTOR ASS'Y CROSS POINTE, FLAMBEAU
SHEET:
DRAWING NO: 6558-001-02
REV:

ITEM	QTY	DESCRIPTION	DWG No.	REMARKS
1	1	WIRE ROLL 9.1/8 DIA	6557-001-02	REF
2	2	SADDLE, BEARING HOUSING	6557-003-02	REF
3	1	COMPO BLADE .090 x 3 x 138	PURCHASING	KanEng Inc.
4	1	VICKMATE BLADE HOLDER x 138	PURCHASING	KanEng Inc.
5	46	3/8-16NC x 3/4 Lg HEX.HD.CAP SCR	PURCHASING	18-8
6	1	KLIPRING No. 5304-75	PURCHASING	TRUARC
7	6	1/2-13NC x 1.1/2 Lg HEX.HD.CAP SCR.	PURCHASING	18-8
8	2	BRACKET, DOCTOR, S.W.R.	6558-010-03	
9	4	1/2-13NC x 1.1/2 Lg HEX.HD.CAP SCR.	PURCHASING	18-8
10	4	PLAIN WASHER 1/2	PURCHASING	18-8
11	1	CAM BAR, DOCTOR	6558-008-03	
12	1	DOCTOR BACK, STRETCHER W.R.	6558-009-03	
13	1	BRACKET, BEARING, T.S., S.W.R.	6558-011-03	
14	1	BRACKET, BEARING, D.S., S.W.R.	6558-012-03	
15	2	STRETCHER ASSEMBLY	6553-011-02	REF



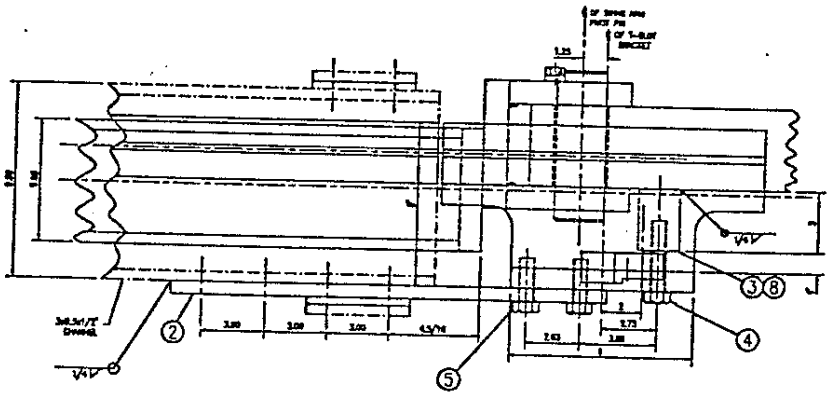


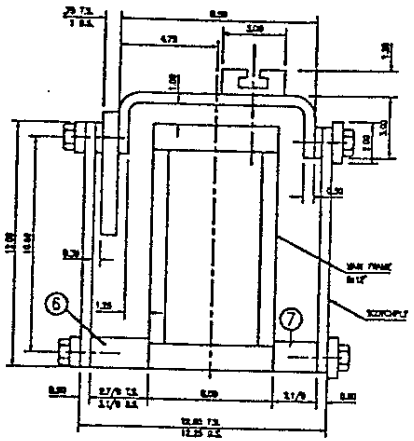
MEC-FAB inc.

1401 GRAHAM BELL
BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

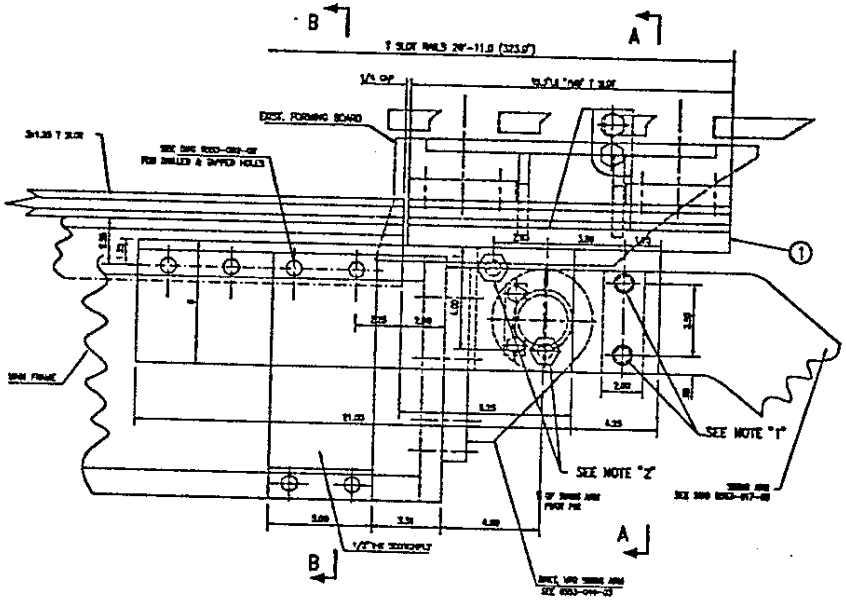
X.	± .040
XX	± .020
XXX	± .010
XXXX	± .005
FRACTIONS	± 1/32

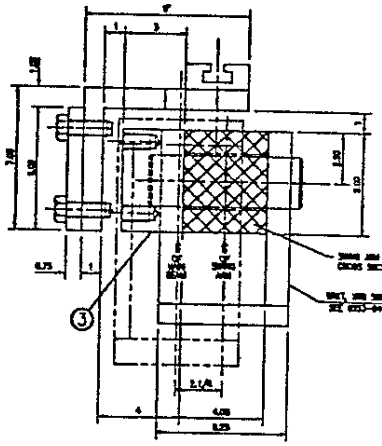
DRAWN BY: P.O. DATE: 93/02/11
CHECKED BY: DATE:
APPROVED BY: DATE:
SCALE:
TITLE: STRETCHER W.R. DOCTOR ASSY
CROSS POINTE, FLAMBEAU
SHEET:
DRAWING NO. 6558-002-02
REV.



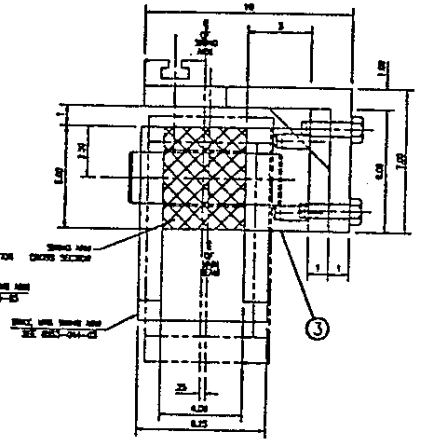


SECTION "B-B"





SECTION "A-A"
TENDING SIDE



SECTION "A-A"
DRIVE SIDE

ITEM	QTY	DESCRIPTION	REF.	REMARKS
9	2	SPACER 3"x1"x8"		
7	2	BLOCK 2-1/8x1-1/2"x8"		
6	2	1 BLOCK 3-7/8x1-1/2"x8" (T.S.) AND 1 BLOCK 3-1/8x1-1/2"x8"		
5	4	BOLT 3/4-10UNC-2 LG 5/8		
4	4	BOLT 3/4-10UNC-2 LG 3-1/2 LG 3/8		
3	2	BLOCK 3"x3"x8"		
2	2	1 PLATE 3/16x8x11 (T.S.) AND 1 PLATE 1/4x8x11 (D.S.)		
1	2	BRACKET SLOT	6553-091-02	

PROCEDURE PRIOR TO LOWER BREAST ROLL:

NOTE 1: INSTALL (2)-3/4 3/8 BOLTS

NOTE 2: REMOVE (2)-DIRST 3/4 BOLTS

SEE ALSO DWG 6553-012-02 TO UNLOCK T-BOLTS ITEM 17

NOTE 3: WHEN RAISING BREAST ROLL REVERSE PROCEDURE

REV	DESCRIPTION	DATE	BY	CHK
2	PARTS 1, 2, 3, 8 & 9 ADDED, SECTION A-A (D.S.) ADDED	97/08/01	P.A.	
1	PART LIST ADDED	93/01/11	T.N.	

MEC-FAB Inc.

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BOUCHERVILLE
QUEBEC, CANADA
TEL: 655-7910

X.	± .040
XX	± .020
XXX	± .010
XXXX	± .005
FRACTIONS	± 1/32

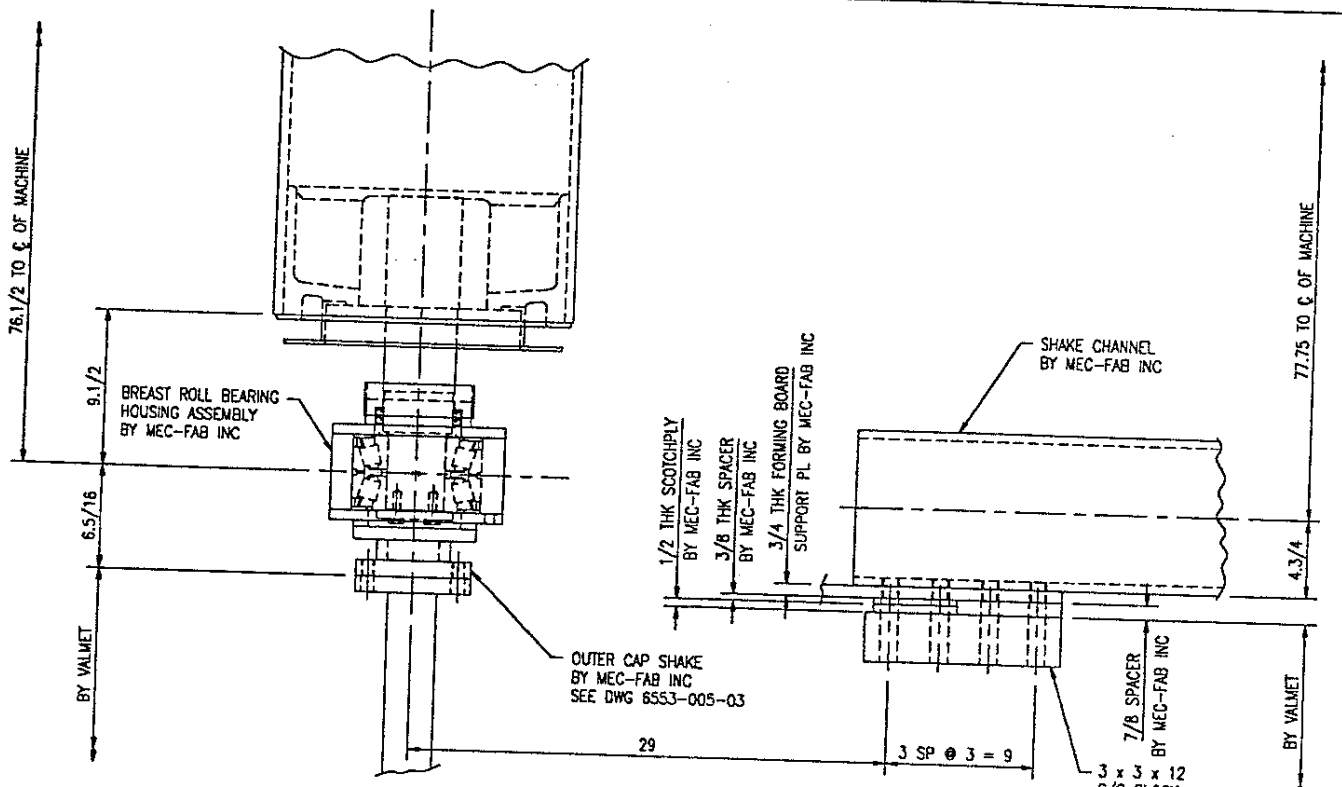
DRAWN BY: T.N. — DATE: 92/12/08

SCALE: 1/8-1

TITLE: FORMING BOARD SUPPORT CROSS POINT, FLAMBEAU

DRAWING NO: 6553-074-02

REV: 2



X. ± .040
X.X ± .020
X.XX ± .010
X.XXX .005
FRACTIONS ± 1/32

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DRAWN BY: P.O. DATE: 92/12/18
CHECKED BY: DATE:
APPROVED BY: DATE:
SCALE:
TITLE: SHAKE ARRANGEMENT FIT CROSS POINTE, FLAMBEAU
SHEET:
DRAWING NO: 6553-083-02
REV:

HEADBOX DESIGN DATA

Headbox Type	MF-1003
Deckle	129.0 inches
Minimum Speed	350 FPM
Maximum Speed	1500 FPM
Grades	40 to 150 lbs / 3,300 sq. ft. Bond, cover, offset

MF-1003 DESCRIPTION

The stock flow coming from the approach piping enters the headbox manifold through a circular to rectangular transition which directs the stock flow into the tapered header of rectangular cross section. The stock flows across the machine through a tapered header designed to create a constant pressure at all points across the width of the machine. At the small end of the tapered header there is a recirculation outlet for control of the header pressure balance.

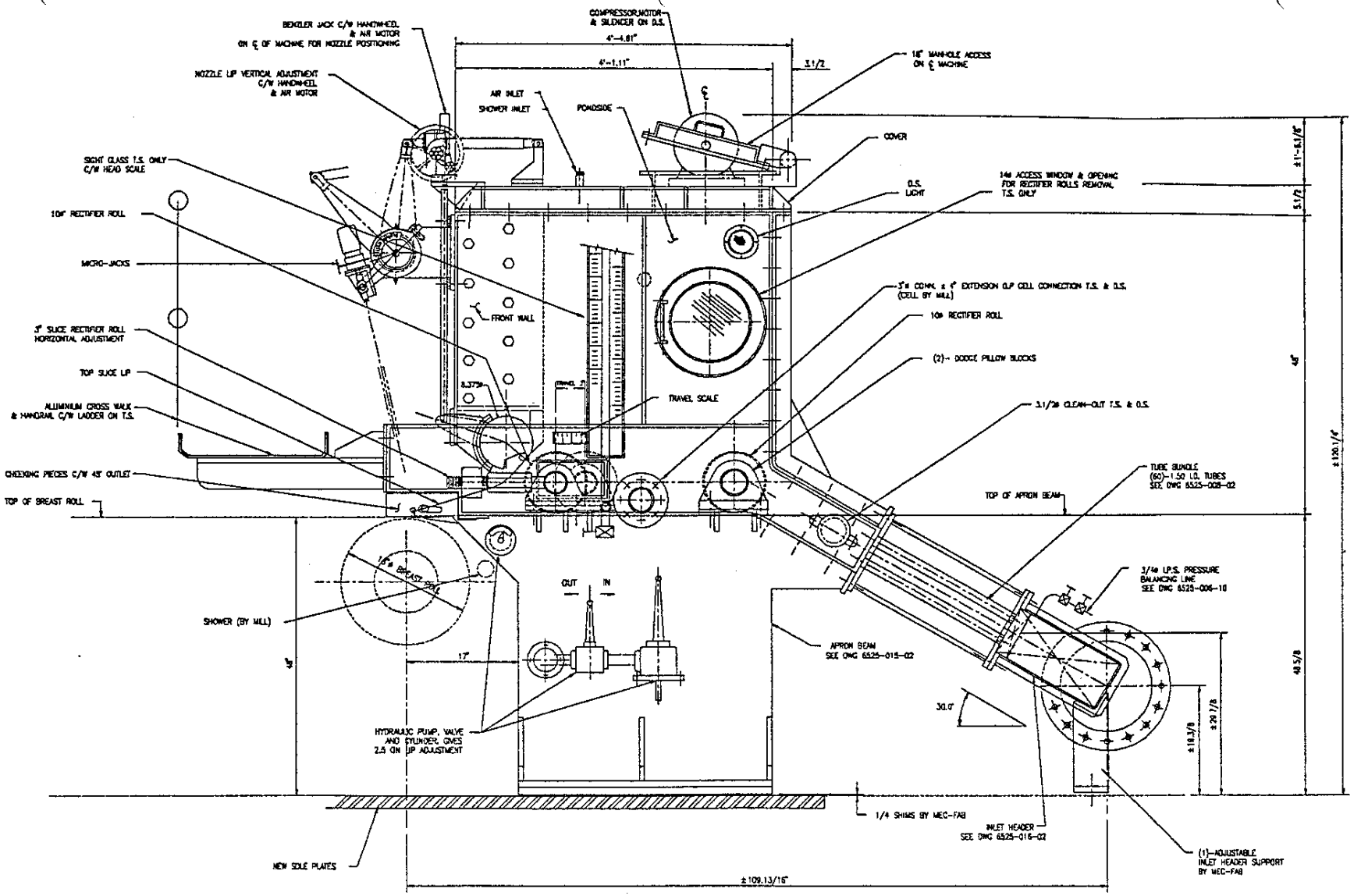
From the tapered header, the stock enters a tube bank distributor where the flow is directed into the machine direction. The multiple tube distributor is a plurality of tubes of specific diameter, length, and number to give proper stock velocity and pressure drop through the manifold system.

The discharge from the tube distributor flows into a mixing chamber where the individual stock streams are blended.

The flow out of the mixing chamber and into the headbox vat portion takes place at the throat distributing roll. Here the stock flowing out of the sloped mixing chamber is turned to the horizontal and directed into the vat. The throat distributing roll is designed with proper hole size and percent open area to provide uniform stock distribution and stability as the flow changes direction.

From the vat section, the stock flows through a slice distributing roll designed with proper hole size and percent open area to provide the desired fiber distribution and flow evening just prior to discharge onto the wire.

Immediately downstream of the slice distributing roll, the flow enters the fully adjustable slice. This includes a rotating beam, an upper nozzle blade, and bottom apron blade. These are all adjustable during operation to create optimum flow conditions to the wire for a superior quality end product.



TENDING SIDE ELEVATION

FOR SOLE PLATES & PLAN VIEW SEE DWG 6525-001-20
FOR CROSS SECTION SEE DWG 6525-003-20

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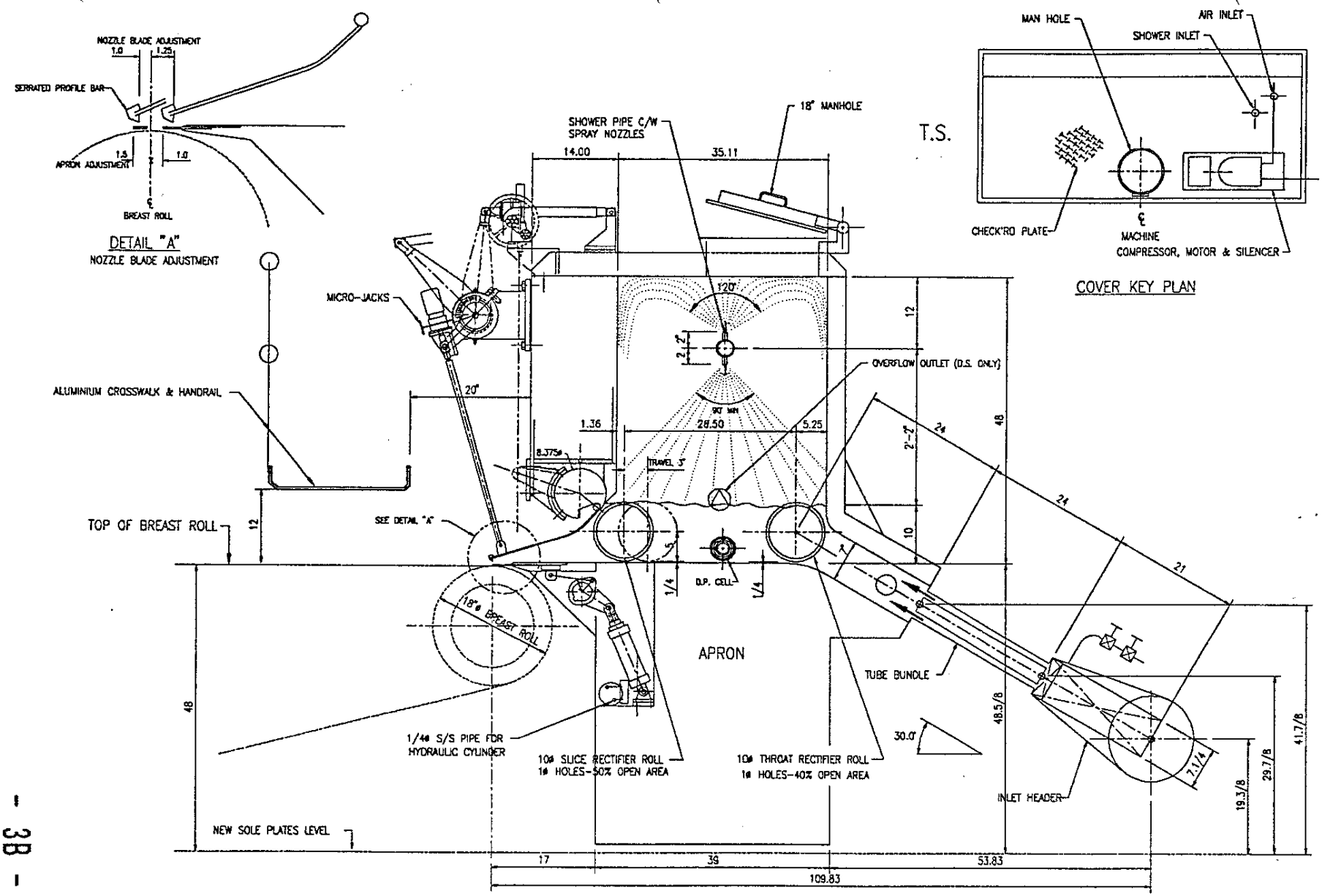
X.▽ ± .040 X.X▽ ± .020 X.XX▽ ± .010 X.XXX▽ ± .005 FRACTIONS ± 1/64	DRAWN BY: T.N.	DATE: 92/07/07	SCALE: NTS	TITLE: HEADBOX T.S. ELEVATION FOR CROSS POINT, FLAMBEAU MILL	SHEET:
	CHECKED BY:	DATE:			
	APPROVED BY:	DATE:	DRAWING NO: 6525-002-10		REV: 1



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X.▽ ± .040
X.X▽ ± .020
X.XX▽ ± .010
X.XXX▽ ± .005
FRACTIONS ± 1/64

DRAWN BY: T.N. | DATE: 92/07/07
CHECKED BY: | DATE:
APPROVED BY: | DATE:

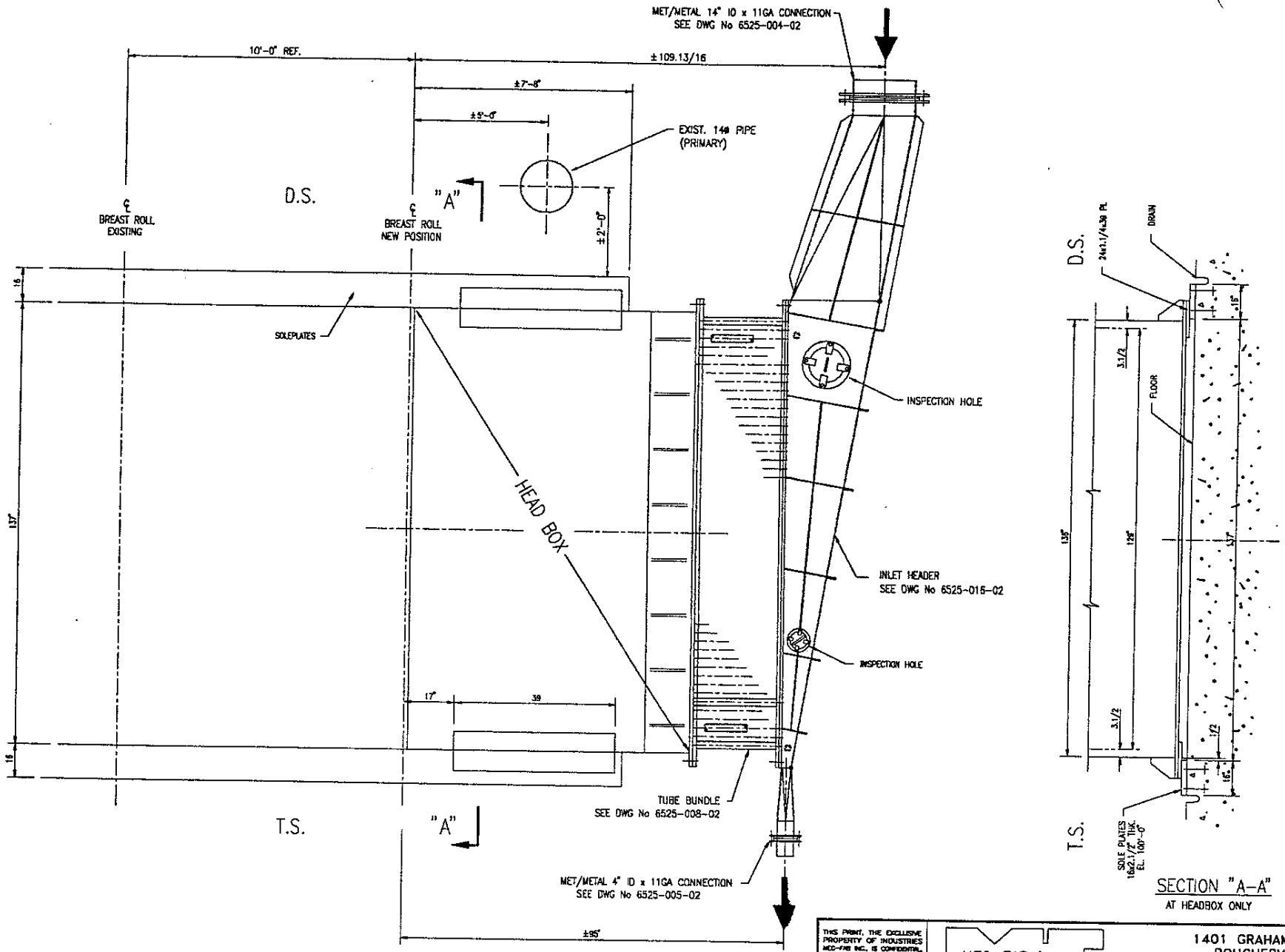
SCALE: NTS

TITLE: HEADBOX CROSS SECTION FOR CROSSPOINT, FLAMBEAU MILL

DRAWING NO: 6525-003-10

SHEET:

REV: 1



PLAN VIEW

SECTION "A-A"
AT HEADBOX ONLY

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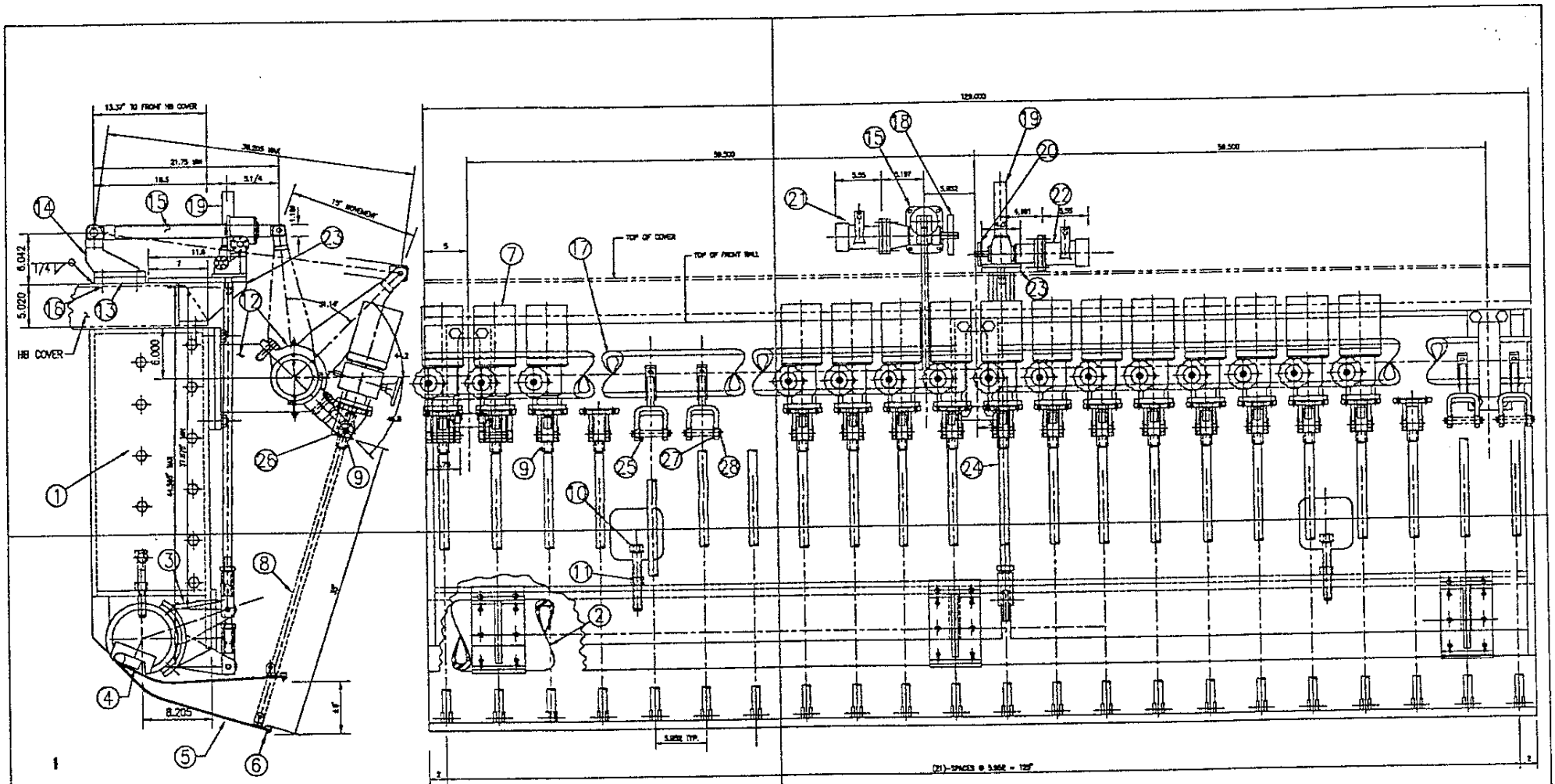
X.▽	± .040
X.X▽	± .020
X.XX▽	± .010
X.XXX▽	± .005
FRACTIONS	± 1/64

DRAWN BY: T.N.	DATE: 92/08/08	SCALE: NTS	TITLE: SOLE PLATES & PLAN VIEW FOR CROSS POINT, FLAMBEAU MILL
CHECKED BY:	DATE:		SHEET:
APPROVED BY:	DATE:	DRAWING NO: 6525-001-10	REV: 2



QTY	DESCRIPTIONS	REF.	MATERIAL
1			
1			
3			
3		15-5	
3		15-5	
16		15-5	
16		15-5	
1		PURCHASED	
1			
1			
1			
1			
1			
1			
1			

QTY	DESCRIPTIONS	REF.	MATERIAL
44			
44			
36			
36			
1			
1			
1			
1			
1			
1			
1			
1			
1			
1			
1			

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X.Y	± .040
X.XY	± .020
X.XXY	± .010
X.XXXY	± .005
FRACTIONS	± 1/64

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DRAWN BY: T.N.	DATE: 92/07/10	SCALE: NTS	TITLE: FRONT WALL COMPLETE ASSY FOR CROSS POINT FLAMBEAU MILL	SHEET:
CHECKED BY:	DATE:	DRAWING NO: 6525-017-02		REV:
APPROVED BY:	DATE:			

- 14A -

SECTION 100

DESIGN DATA

GRADE	:	Fine Paper
DESIGN PRODUCTION	:	120 Tons/Day
BASIS WEIGHT	:	40 - 146 lbs./3,300 ft^2
DESIGN SPEED	:	350 FPM
HEADBOX PONDSIDES	:	129"
WIRE WIDTH	:	134"
CENTER OF BREAST ROLL TO CENTER OF COUCH ROLL	:	440"
CENTER TO CENTER OF FOURDRINIER FRAMES	:	156"
SHAKE SECTION	:	258 from center of breast roll
VERTICAL DIMENSION FROM SOLEPLATE TO WIRE	:	48"
HAND OF MACHINE	:	Right Hand (When standing at the wet end and looking towards the dry end, the drives are located on the right side).

141 Burke Street
Nashua, NH 03060
603-882-2711

Hydrocyclone Cleaner Service Report

Company Name:	Flambeau River Papers
Location:	Park Falls, WI
Installation:	PM #2
Mill Visit:	January 19, 2009
Contact Name(s):	Adam Hoffman, Gerald Slack
Phone Number:	715.762.3231
From GL&V:	Jamie Bergeron

Purpose of Visit

Observe the operation of the #2 Paper Machine's cleaners and make recommendations where needed.

System Description

Primary:	Celleco 350HQ 2H-48
Secondary:	Celleco 350 2H-20
Tertiary:	Celleco 350 HRCC-6
Fiber Recovery:	RCC 1

Observations/Recommendations

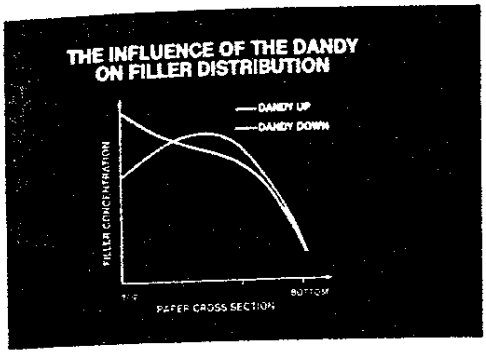
- In order to conduct accurate balances, pressure verification taps need to be in place. The following table indicates were taps need to be installed.

Pressure verification taps

	Feed	Accept	Reject
Primary	Yes	No	Yes
Secondary	Yes	Yes	Yes
Tertiary	No	Yes	Yes
RCC Acceleration	No	N/A	N/A

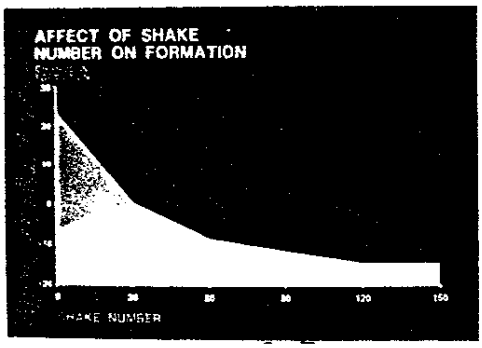
- Note that there is a PVT for the Tertiary feed but it is located after the control valve a PVT needs to be in place between the bank and the control valve.
- There also needs to be a sample tap installed in the RCC accepts stand pipe.
- Worn cleaners directly affect cleaner efficiencies as well as sewer losses GL&V would like to offer our services to help with the inspections of the GL&V Celleco cleaners.
- After the taps are installed it is recommended that GL&V perform a balance on the cleaners to insure optimal efficiency of the cleaners with minimal sewer losses

The effect of the dandy on formation is mainly in the small scale floc structure as can be seen the QNS formation curves shown in Fig.25. With the QNS Formation Meter the lower the number the better the formation. The initial work done was in the speed range of 300 to 1300 fpm and the results are shown in this figure (15). The largest effect is in improving the small scale formation. Later work extended the speed up to 1800 fpm with similar results (16). In all cases the largest improvement is in the 1/2 to 1/8 inch floc spacing portion of the QNS formation curve. It is known that there are dandy rolls running at 2500 fpm and producing good results.



26. The Influence of the Dandy on Filler Distribution

The effect of the dandy on filler distribution has also been studied. Since the action of the dandy on the ingoing side
of the nip is to squeeze water upward through the sheet, it should follow that any small particle material that was somewhat mobile would travel upward with the water. Studies done by sectioning sheets made with and without the dandy show that the filler content of the upper layers of the sheet does increase when the dandy is used (17). This is shown in Fig. 26.



27. The Effect of Shake Number on Formation

THE SHAKE

The effectiveness of the shake on formation has been the subject of many great debates about the value of the frequency, the amplitude, and at what speed the shake was no longer effective. To quickly summarize all of this, the following points are generally true. At 2000 fpm and above the shake does little or nothing for formation. There is just too little time for the shake to act on the fibers before they have passed out of the shaken zone. However, high frequency shakes at speed below 2000 fpm and especially with heavy weights at speeds of 1000 fpm can produce significant improvement in formation.

Investigations have shown that the frequency of the shake is more important than the amplitude. The higher the frequency the more beneficial is the effect on formation. The effectiveness of the shake in improving formation is roughly directly proportional to the amplitude and the square of the frequency and inversely proportional to speed of the machine. The so called shake number is the product of the amplitude times the frequency squared divided by the machine speed.

$$S = \frac{f^2 a}{m}$$

Where: S = Shake Number
f = Frequency, shakes/min.
a = Amplitude, in.
m = Machine Speed, fpm

Some trials run a number of years ago on several different paper machines making different products at different speeds supported this concept rather well (18). Fig. 27 shows a summary of the results of these trials. The formation number used in this Figure is the LIN value from the QNS formation tester; the lower the number the better the formation. All of the results were normalized so that the formation reference was zero at shake number of 30. Formation continued to improve from a shake number of 30 to about 120 and then flattened out. Below 30 the formation change is much less predictable as can be seen in the Figure. Some sheets showed constant improvement with increasing shake number, while others would deteriorate in formation with increasing shake number up to 30. Beyond 30 all sheets improved in formation by a predictable amount.

From the foregoing it seems apparent that reaching a shake number of 30 will almost always produce an improvement in formation. If we take a mechanically acceptable shake amplitude of 0.5 inch and a frequency of 300 spm, the calculated speed at which the shake number is 30 is 1500 fpm. This seems to fit with experience and indicates that it is possible to predict with some degree of confidence the improvement in formation with adjustments to the shake.

What is done with the shake regarding frequency and amplitude is usually dictated by the mechanical condition of the equipment rather than a desire to improve formation further. The easiest shake system to maintain and also one that puts the least mechanical strain on the fourdrinier is to shake the breast roll and have all other elements on the fourdrinier stationary. This system has the lowest mass to move and shakes the least amount of equipment.

SUMMARY

Making good paper formation on a machine is involved with a lot of small details; all of which contribute to good formation. This paper has examined the fundamental concerns about making good formation and discussed the operating parameters that affect it. In approximate order of importance the are:

1. Furnish
2. Refining
3. Headbox Consistency
4. Agitation on the Wire
5. Jet Speed to Wire Speed Ratio
6. L/b ratio and Forming Board Seting
7. The Dandy
8. The Shake

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Consulting Engineers
to the
Pulp & Paper Industry

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TELECOPY TRANSMITTAL

DATE 8/31/92

TIME 10:10

PROJECT TITLE No. 2 PM Wet End Rebuild

PROJECT NO. 92-0755

OWNER Cross Pointe

TO: Cross Pointe (Company)

ATTN: Brad Sturm

Telecopy No. 715-762-5299

Reference: Valmet Sandy Hill Fourdrinier Shake Operating Parameters

No. of Pages to Follow: 5

NOTE: Please make _____ copies and distribute as follows:

REMARKS:

The Shake Unit quoted by Valmet Sandy Hill will produce a Shake Intensity Factor of 30 at a machine speed of 1500 fpm

From: Randy Page

DISTRIBUTION: cc: Messrs:

IF YOU HAVE ANY PROBLEM RECEIVING THESE PAGES, PLEASE CALL 414-766-3521 IMMEDIATELY. THANK YOU.

FOURDRINIER

Shake Intensity Factor Application (SIF)

In the product of (frequency)^2 (amplitude) machine speed.

Correlation has been found between improved sheet formation and where the SIF product exceeds the value of 30.

Shake intensity factor of:

Less than 30 is unpredictable.

30 to 60 provides significant improvement in formation.

60 to 90 a lesser improvement.

Greater than 90 very little improvement.

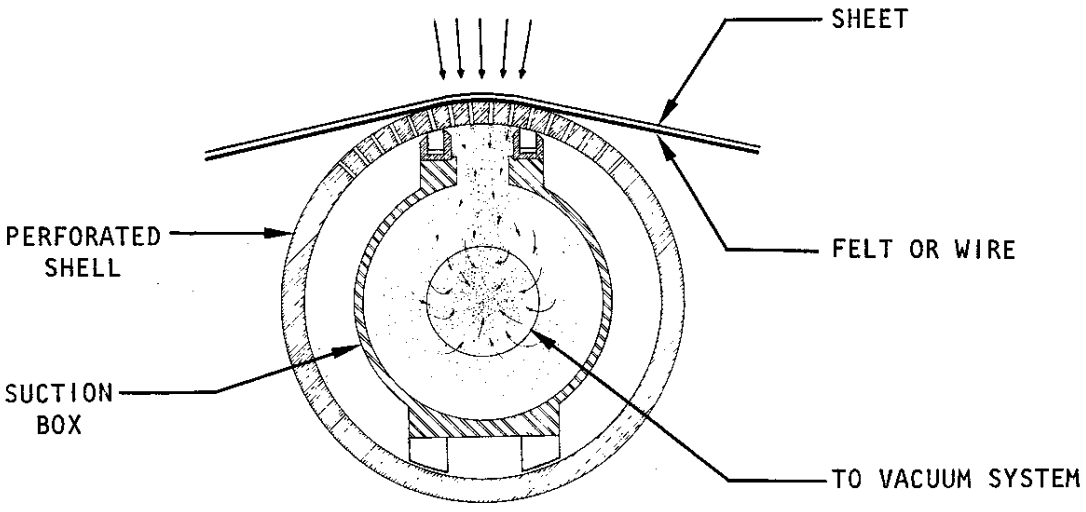
Effect of shake on formation is breaking up of flocs and producing more uniform fiber distribution.

Refer to Sandy Hill Shake Intensity Factor curves for machine speeds 200 to 1000 FPM.

SUCTION ROLL FEATURES AND OPTIONS

A suction roll's size and configuration varies significantly, it mounts different ways in different applications, and it can include a wide range of features and options. However, what it does, the way it does it, and the general design are all basic. The variations are only the ways the suction roll is adapted to the requirements of each specific application.

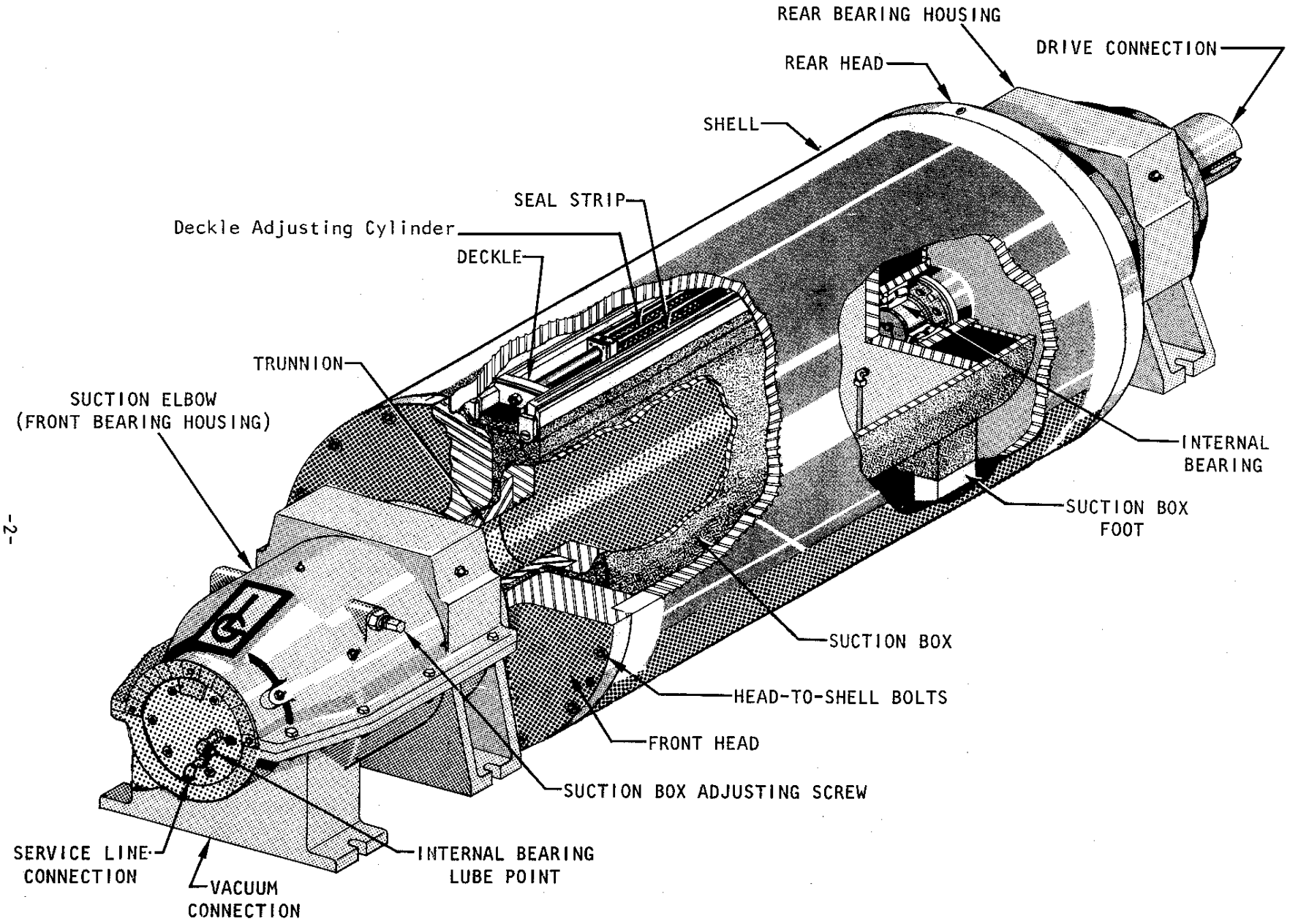
The suction roll removes water from paper by aspiration--it uses a vacuum to draw water from the sheet, through the paper machine's felt or wire, into the roll, and out through the vacuum system. The physical components essential to this function are inside a perforated roll supported between two housings.



The paragraphs which follow discuss features and options; the Suction Roll Specifications in Appendix B identify those which are incorporated in your roll along with a bill of materials, drawings, a list of spare parts, and other details. The figure which follows identifies and locates the more common components of a typical suction roll.

SHELL SURFACE AND HOLE PATTERN

The shell's surface and hole pattern are both important variables in suction roll design and both depend upon the application. The shell can have a finished metallic surface or a rubber cover of some specific thickness. The location of the perforations, their size, and the amount of open area they provide are essential features selected for the roll's intended use.



TYPICAL LG SUCTION ROLL

DESIGN SHEET

SERIAL NO. J-1146

TWO ROLL CALENDER
DESIGNED FOR

CUSTOMER: PLAINWELL PAPER COMPANY, INC.

MILL LOCATION: PLAINWELL, MICHIGAN 49080

MACHINE NO. 2 CALENDER NO. 1

MANCHESTER F.O. NO.	0602-300
CUSTOMER ORDER NO.	47442
ROLL FACE LENGTH TOP/BOTTOM	104"/106"
QUEEN ROLL DIAMETER (CUSTOMER - EXISTING - REWORKED)	20"
BOTTOM ROLL DIAMETER (FARREL NIPCO ROLL)	17"
FRAME CENTER DISTANCE	136"
BEARING CENTER DISTANCE	136"

ELECTRICAL CHARACTERISTICS:

VOLTS....MOTORS/CONTROLS	460/120
PHASE....MOTORS/CONTROLS	3/1
Hz	60

DESIGN LIMITS

MAX. NIP/MIN. NIP PRESSURE (PLI) WITH SPECIAL CROWNS GROUND ON EACH ROLL	630/50
QUEEN ROLL CROWNED .004" AND BOTTOM ROLL GROUND STRAIGHT MAX. NIP/MIN. NIP PRESSURE (PLI)	550/150
MAX. SPEED (FPM)	850

PLANT AIR CHARACTERISTICS AT MACHINE DRY END:

RUNNING - CONTINUOUS (P.S.I.)	90
SHEET BREAK - INTERMITTENT (P.S.I.)	80
PNEUMATIC EQUIPMENT - OPERATING MAX. (P.S.I.)	80

SECTION 1 – SPECIFICATION DATA – FARREL XL TYPE ROLL

Customer MANCHESTER for FLAMBEAU PAPER COMPANY

Location Park Falls, WI 54552

Purchase Order = 63754 Farrel Order = 78H4538/40

Application Information XL Type Roll for

Location: Machine 2 Roll Cal. Roll Position Bottom

Roll Dimensions: Diameter 18 Face Length 128

Over-all Length 139.25 Brg. Cent. Dist. 158

Drive Arrangement: Non - Driven

Design Speed (FPM) 1500

Design Load: 800 PLI (maximum) 70 PLI (minimum)

Roll Specifications

Shell Material Farreloy Surface Hardness 74 Min. Shore "C" Scleroscope

Roll Face Finish 8 Microinch

Internal Pressure 801 PSI, maximum. 273.1 PSI, minimum

Roll Weight 11,000 lbs.

Maximum Operating Temperature 150 °F

Control System

Operators' console

Hyd./Pneu. control system with load sensing for bottom XL roll.

Pump Unit

Consists of one 20 GPM and one 18 GPM pumps, 10 HP motor, and a 150 gal. tank, 1-1/2 HP Motor

Electrical Cabinet Not supplied

Paint Specifications

Hammertone Gray

Services Required

Electric: 230/460 volts 3 phase 60 cycles (Hertz)

Filtered Dry Air: 60 PSI minimum

Water: 20 GPM at 85 °F maximum 150 PSIG (For heat exchanger)

Chapter 1 - Introduction

1a – General Information

The purpose of this manual is to discuss the design, basic operation, and basic maintenance of *Rigid Rolls*. The objective of this manual is to:

- Cite *Safety Hazards* associated with roll unit maintenance
- Identify *Rigid Roll Components* and their functions
- Describe typical Inspection, Cleaning, and Maintenance Procedures

1b – Roll Function

Rigid Rolls are a category of rolls defined as "rolls which do not exhibit significant deflection at their center due to dynamics." The construction methods and material selections give these rolls the stiffness necessary for nipped machine positions. Shell thickness, shell material, roll head design, roll head attachment, journal size, and journal material are all critical design factors.

Rigid Rolls manufactured by Sandusky International fill the needs of many roll positions typical to a paper machine. Some examples of *Rigid Rolls* include:

- Lumpbreaker Rolls
- Plain Press Rolls
- Size Press Rolls
- Applicator Rolls
- Calender Rolls (except Spreader Rolls)
- Reel Drum Rolls

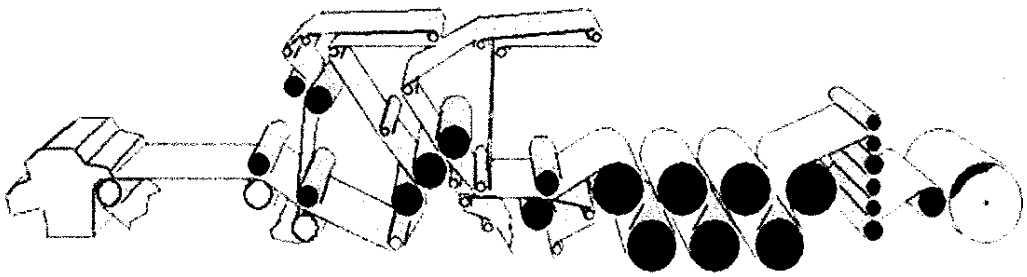


Figure 1. Typical Rigid Roll Positions

Click Here to Return to Table of Contents

Section 1.A
Design Criteria

Associated Machine Design has provided a #2 PM Winder Rebuild of the existing Langston Winder Model "304" Speedmaster Winder consisting of the following: Refurbishment of the existing Unwind and Winder equipment that is being reused, new pneumatic brake clutching system for the unwind, new hydraulic valve for the unwind sidelay/oscillation, new baseplates for the unwind stands, new lead-in roll, new stationary roll barrier, new core chucks for shaftless operation, new cradle/barrier for handling of the wound rolls, new hydraulic valving for the winder components, new pneumatic valving for the winder components, new hydraulic power unit, new control panels, new drive shafts for the winder drums and new baseplates for the winder.

Unwind Assembly

This is an existing Langston Unwind Stand. A new hydraulic valve has been installed for the operation of the sidelay and oscillation of this unit. AMD has also added a pneumatic cylinder for clutching and unclutching the brake from the reel spool. This function is activated by a selector switch located on the drive side unwind stand.

The full parent roll is transferred to the unwind stands using the house crane. Once the parent roll is in position, the saddle clamps are closed manually. The door on the brake guard must be closed before the brake can be clutched to the spool. After the door is closed, the operator turns the selector switch to clutch position. The pneumatic cylinder will then be actuated to engage the brake spline. The operator may have to slightly rotate the parent roll to have the brake spline line up with the spool to get the proper engagement.

Lead-In Roll

The new lead-in roll has been designed for the machine operating speed of 4000 fpm. It is dynamically balanced to 4500 fpm.

Stationary Roll Barrier

There is a new roll barrier located above the slitter section. With the addition of shaftless winding, this barrier is required to retain rolls being wound should they jump out of position between the rider roll and drums.

Core Chucks

New core chucks have been provided for shaftless operation of the winder. These chucks have hydraulic cylinders for raise/lower, weight relief and chuck/unchuck. The tend and drive side chucks each have 18.0" of manual adjustment. In order to eject the wound rolls from the winder, the chucks must first be unchucked and raised.

SECTION 1 – SPECIFICATION DATA – SL-ROLL

Customer Manchester Machine Div. for Plainwell Paper Co.

Location Plainwell, Michigan

Purchase Order = 70376 Farrel Order = 79H4545

Application Information

Location: Machine #2 PM Roll Position Bottom

Roll Dimensions: Diameter 17" Face Length 106"

Over-all Length: 180.9" Brg. Cent. Dist. 136"

Drive Arrangement non-driven

Design Speed (FPM) 850

Design Load 630 PLI (maximum) - PLI (minimum)

Roll Specifications

Shell Material Farreloy Surface Hardness 74 Min.

Roll Face Finish 8 RMS

Internal Pressure - PSI, maximum. - PSI, minimum

Roll Weight 8,000 lbs.

Minimum Operating Temperature 150 °F

Control System

*Operators' console

*Pump Unit

*Electrical Cabinet

*Paint Specifications

Services Required

*Electric ____ volts ____ phase ____ cycles (Hertz)

*Filtered Dry Air ____ PSI minimum

*Water ____ GPM at ____ °F maximum ____ PSIG (For heat exchanger)

*Not applicable on this order

NO. 2 PAPER MACHINE
CELLECO CLEANERS
TECHNICAL DATA

STAGE	BANK TYPE	UNITS	CAPACITY GPM/UNIT
PRIMARY	CLEANPAC 350	40	118
SECONDARY	CLEANPAC 350	20	118
TERTIARY	CLEANPAC 350	6	118

PRESSURE TARGETS (PSI)

STAGE	FEED	ACCEPT	REJECT
PRIMARY	37	16	13
SECONDARY	26	5	3
TERTIARY	32	11	3

PRESSURE DROP:	21	PSI	(FEED - ACCEPT)
PRESSURE DIFFERENCE:	3 - 5	PSI	(ACCEPT - REJECT)

CONSISTENCY TARGETS (%)

STAGE FEEDS:	0.50 - 0.90	(INDIVIDUAL STAGE)
STAGE FEED DROP:	0.05 - 0.10	(BETWEEN STAGES)

FLOW RATIO TARGETS (%)

STAGE	ACCEPT	REJECT
PRIMARY	90	10
SECONDARY	90	10
TERTIARY	90	10

FLOWS TARGETS (GPM)

STAGE	FEED	ACCEPT	REJECT
PRIMARY	4720	4248	472
SECONDARY	2360	2124	236
TERTIARY	[illegible]		

NO. 2 PAPER MACHINE
CELLECO CLEANERS
TECHNICAL DATA

FINAL STAGE TARGETS
(REJECT CONTROL UNIT)

UNITS:	1	
TYPE:	R.C.C. UNIT (1HRCC - 6)	
FEED FLOW:	71	GPM
FEED CONSISTENCY:	< 0.50	%
MAXIMUM FIBER CONTENT:	17.0	#/MIN
ACCEPT FLOW RATIO:	96	%
ACCEPT FLOW:	186	GPM
REJECT FLOW RATIO:	4	%
REJECT FLOW:	5	GPM
REJECT CONSISTENCY:	0.40 - 0.80	%
DILUTION WATER PRESSURE:	21	PSI
DILUTION WATER FLOW:	120	GPM