3195 Regional Parkway
Santa Rosa CA. 95403

Empire Castings, Inc

Fax

To:	Darryl Brackney	**From:**	James Allen
Fax:	419-394-4776	**Pages:**	two
Phone:	419-394-7840	**Date:**	03/01/99
Re:	Die base problem	**CC:**	

☐ **Urgent** ☐ **For Review** ☑ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

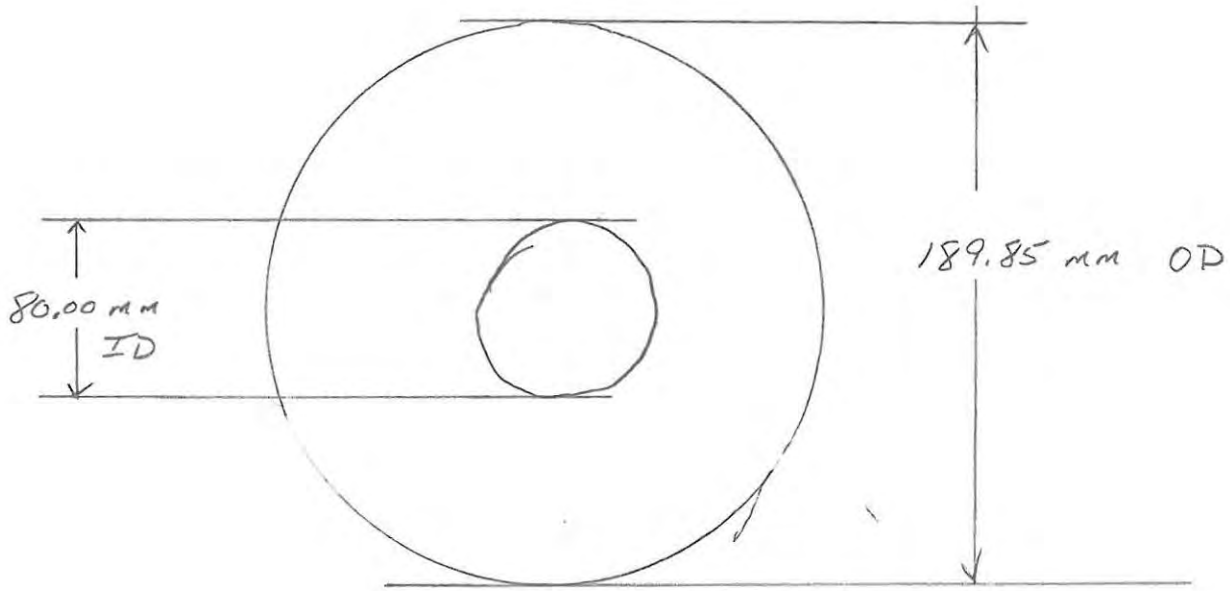
Darryl sorry about the error attached is a drawing to relocate the bottom die base in the machine. We are in the process of making new key blocks for the top die base also a new plate for the retriever carriage to allow you to move the arm up or down. In my mind your machine already did this. Again I apologize for any inconvenience this may have caused you!

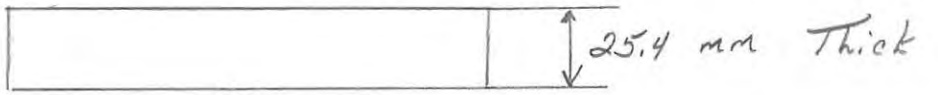
Best regards,

James Allen

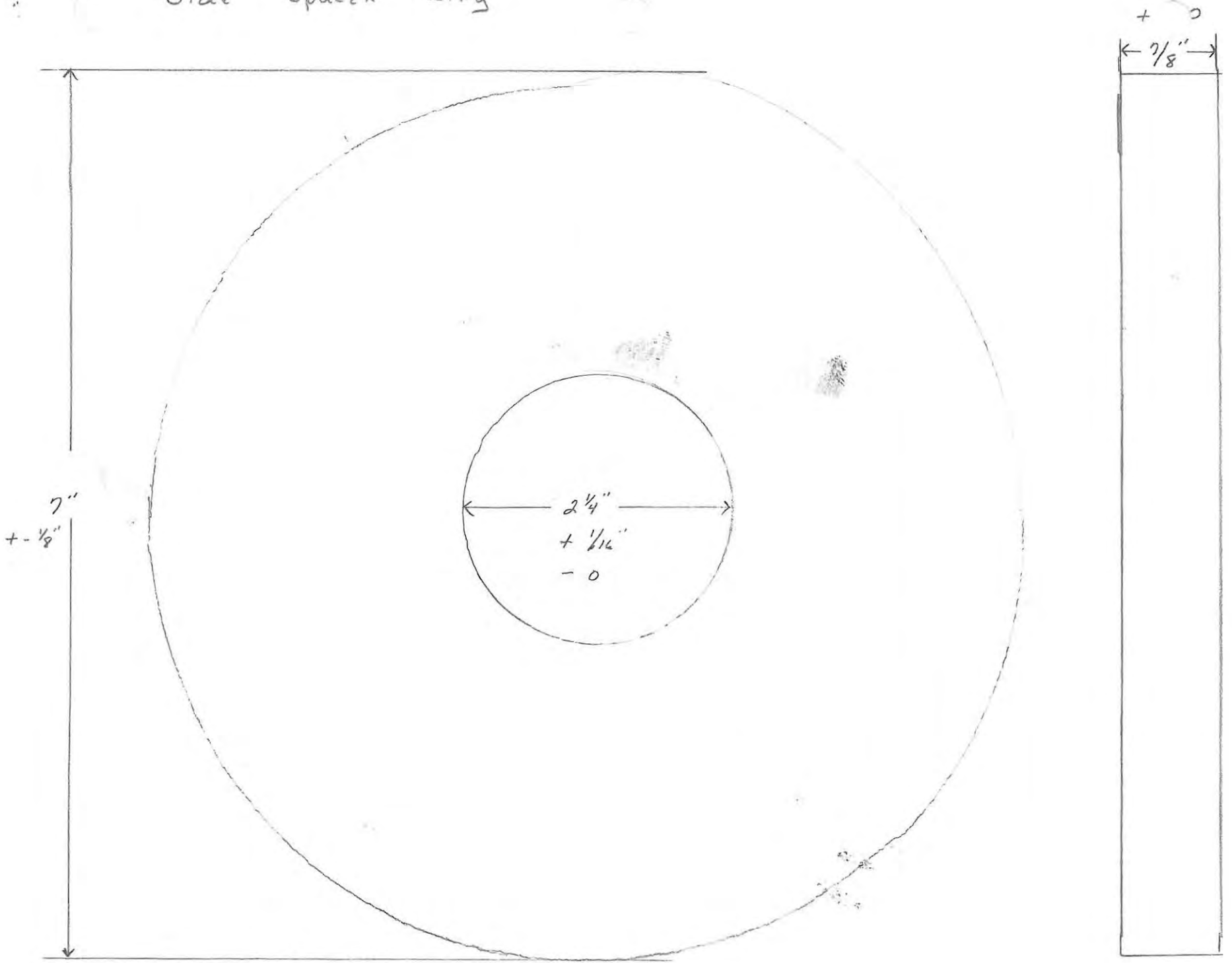
03/02/1999 10:48 7075239829 EMPIRE CASTINGS INC. PAGE 01

Retro Fit X-Member System - Top Mermit.





Side spacer ring



5-23-9829

ST. MARYS CORP.

FAX FORM

Voice 419-394-7840 FAX 419-394-4776

TO: Jim Waters	CC:	Date: 2/25/99
		No. of Pages: 1/2
		From: Daryl Brackney

Subject: Cyl. Limit Switch Wiring

Here is the information you asked for yesterday, the cord information & what wire# is on each pin on the machine plug.

DL Brackney

Cord Infromation

BRAD HARRISON® 600V 10 AMPS
QUICK-DISCONNECT SYSTEMS

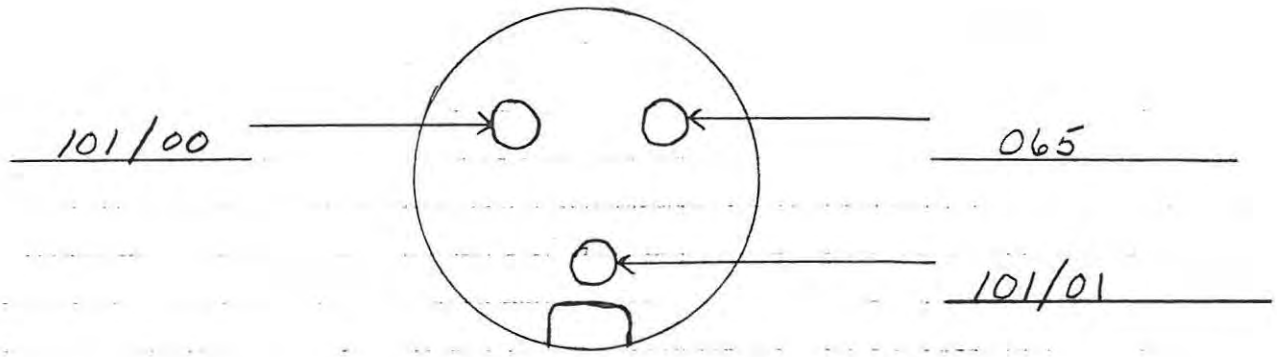
MINI-CHANGE®
MOLDED CONNECTORS

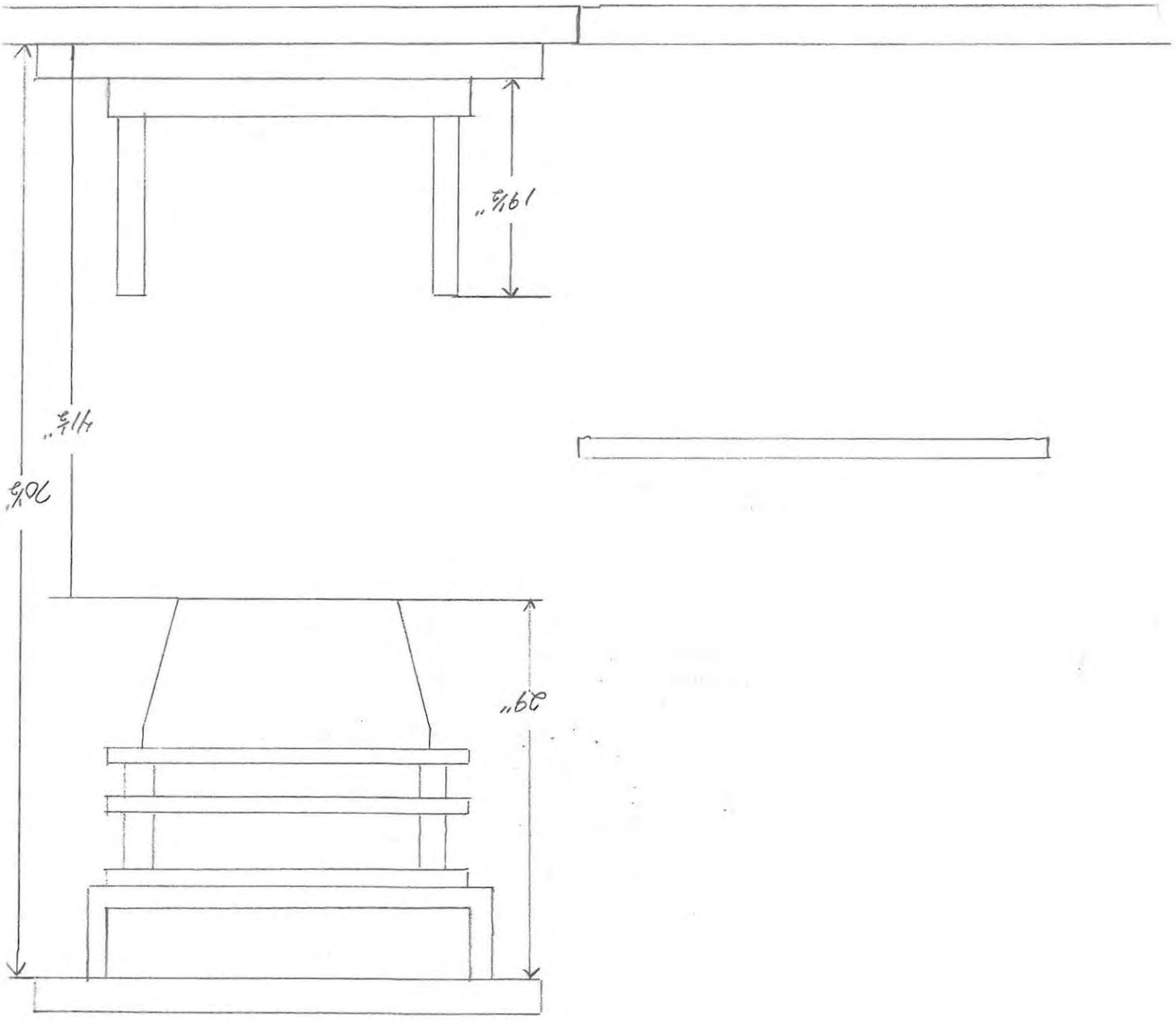
CATALOG NO. 40906
Assembled in Mexico

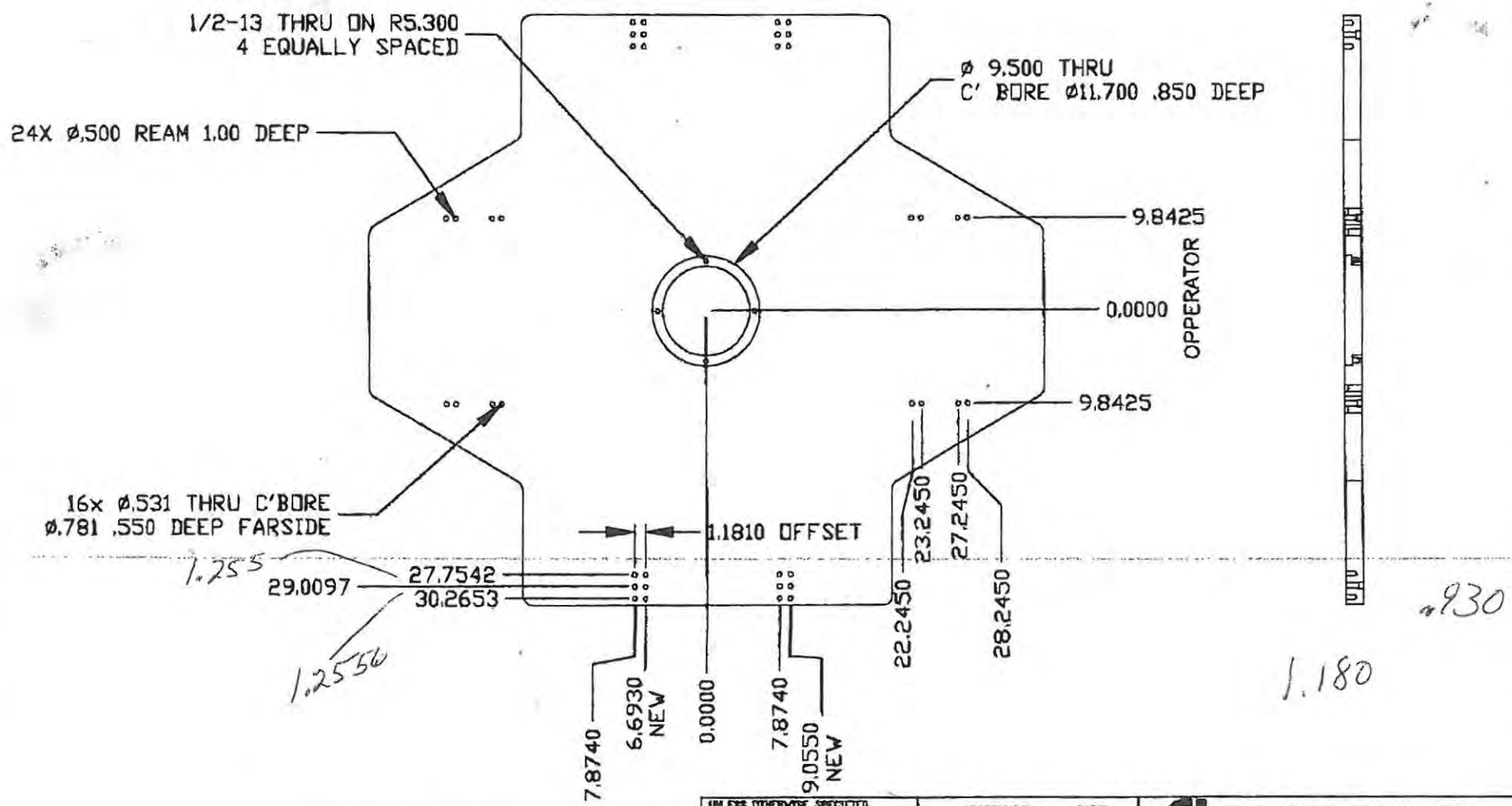
BRAD HARRISON®
From Daniel Woodhead Company

31-0204

m/c plug - wire # at each pin




19½"
41½"
70½"
29"



REV	DESCRIPTION	DATE	APP'D
–	ENGINEERING RELEASE	22JAN99	

REVISIONS

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THIS DOCUMENT CONTAINS INFORMATION THAT IS THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF EMPIRE CASTINGS, INC. AND MAY NOT BE COPIED, PUBLISHED, OR DISCLOSED TO OTHERS, OR USED FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF AN AUTHORIZED OFFICER OF THIS COMPANY. THIS DOCUMENT MUST BE KEPT ONLY BY EMPIRE CASTINGS, INC. CONFIDENTIAL FILES WHEN NOT IN USE.
UNPUBLISHED WORK © 1999 EMPIRE CASTINGS, INC.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE INCHES
TOLERANCES ARE:
FRACTIONS ±1/16 DECIMALS .XX ± .01 .XXX ± .005 ANGLES ±1/2°

MATERIAL: 0400103–

FINISH: MACHINED

APPROVALS	DATE
DRAWN BY: J ALLEN	22JAN99
CHECKED BY:	
APPROVED BY:	
ENGINEERING:	
MANUFACTURING:	
CUSTOMER: AAP ST, MARYS	

DO NOT SCALE DRAWING

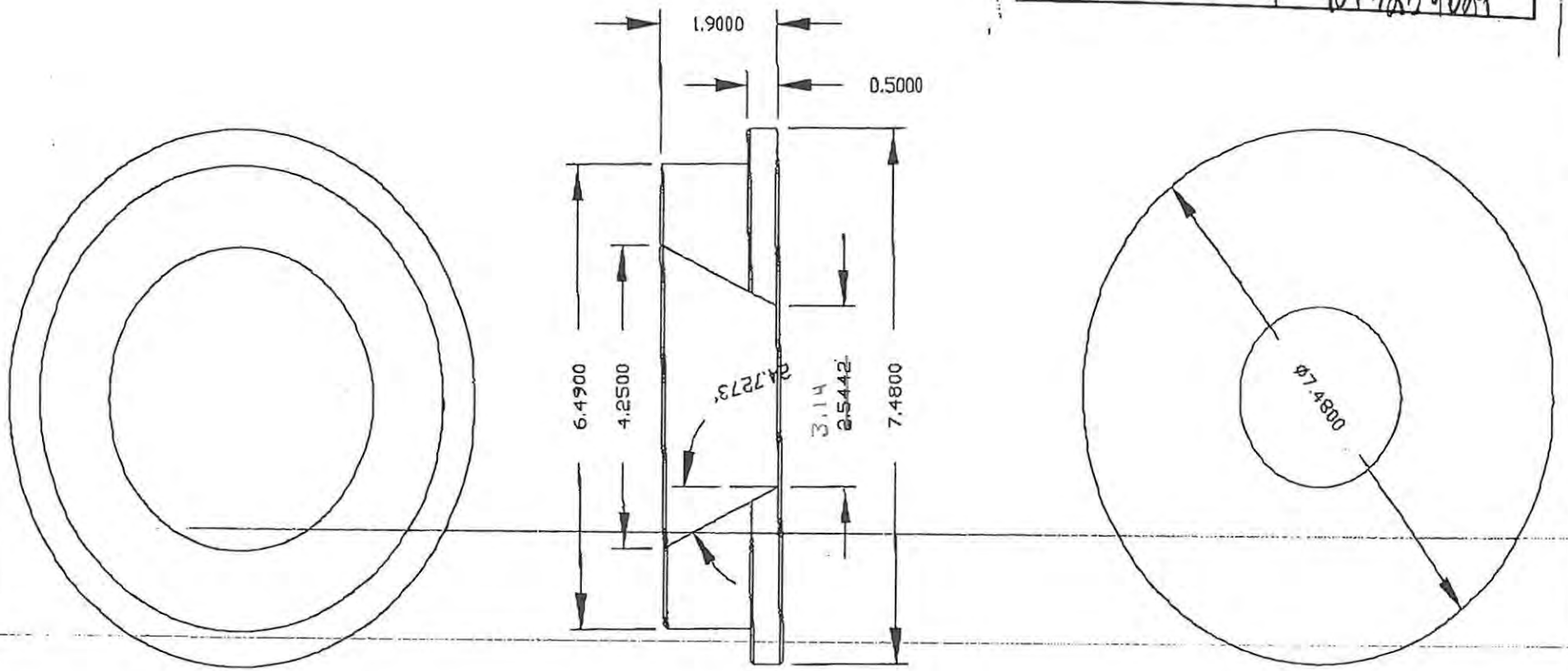
EMPIRE CASTINGS INC.
3195 REGIONAL PARKWAY SANTA ROSA, CA 95403

DIE BASE ADPTER BOTTOM VIEW

EMPIRE WORK ORDER NO.	EMPIRE DRAWING NO.	
AAP9201	0400104	
NEXT ASSEMBLY NO.	CUSTOMER PART NO.	REV
		–

QTY: ONE | SCALE: TO FIT | SHEET 1 OF 1

Post-it® Fax Note 7671	Date 4/13/99 # pages
To Doug Cano	From
Co./Dept.	Co. Empire Castings
Phone #	Phone #
Fax #	Fax # 707 525 9629



REV	DESCRIPTION	DATE	APP'D
–	ENGINEERING RELEASE	11FEB99	

REVISIONS

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UNPUBLISHED WORK © 1993 EMPIRE CASTINGS, INC.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE INCHES
TOLERANCES ARE:
FRACTIONS ±1/16 DECIMALS .XX ± .01 .XXX ± .005 ANGLES ±1/2°

MATERIAL: N-17 CERAMIC BOARD

FINISH: MACHINED

APPROVALS	DATE
DRAWN BY JALLEN	11FEB99
CHECKED BY	
APPROVED BY	
ENGINEERING	
MANUFACTURING	

CUSTOMER AAP ST, MARYS

DO NOT SCALE DRAWING

EMPIRE CASTINGS INC.
3795 REGIONAL PARKWAY SANTA ROAST, CA 95400

SPRUE INSERT

EMPIRE WORK ORDER NO	EMPIRE DRAWING NO.
AAP9201	0400401
NEXT ASSEMBLY NO.	CUSTOMER PART NO. / REV
	–

DIM: FOUR/MACH | SCALE: TO FIT | SHEET 1 OF 1

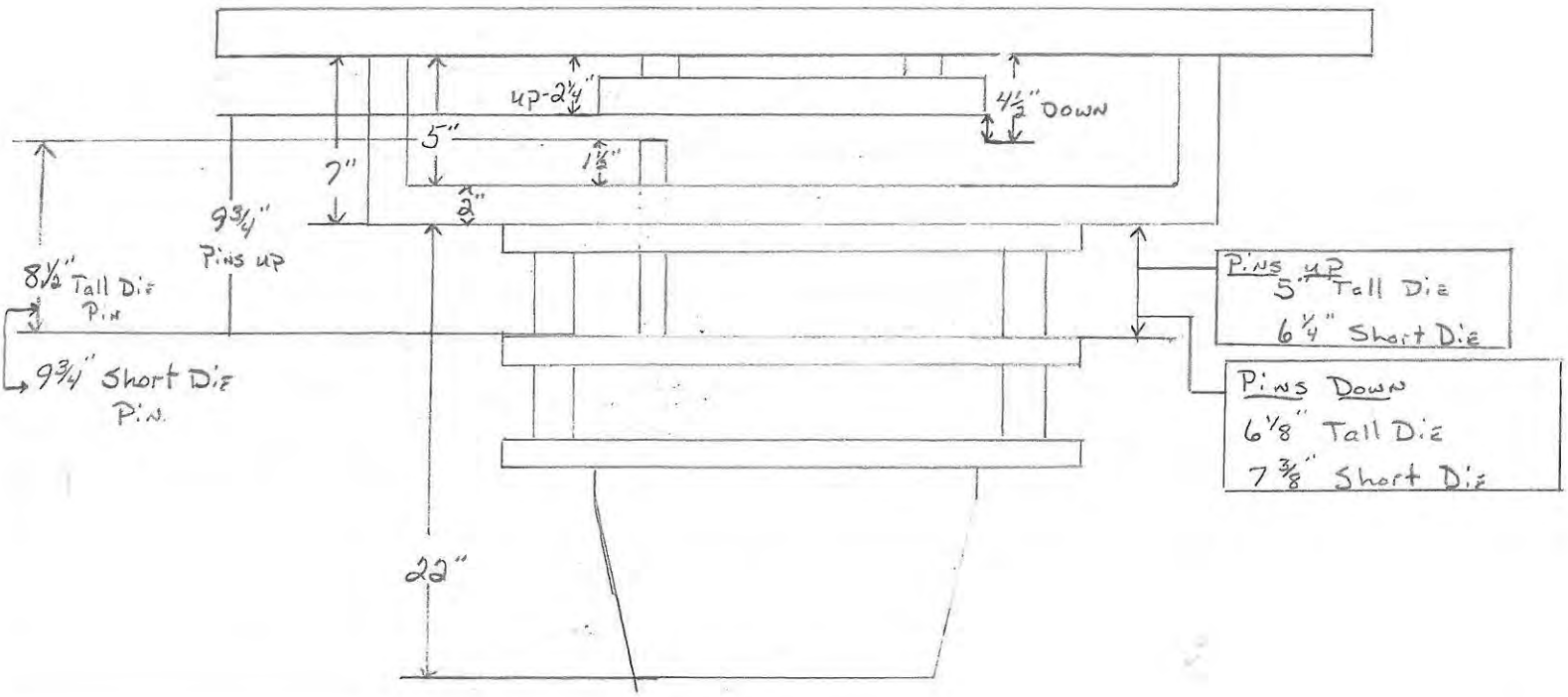
04/13/1999 09:48 7075239829 EMPIRE CASTINGS INC. PAGE 01

2/25/99

Ejector Bars

Tall Die Pin Bars: $5" + 2" + 2\frac{3}{4}" = 9\frac{3}{4}"$ - top of die E. plate to bottom of E syste plate.

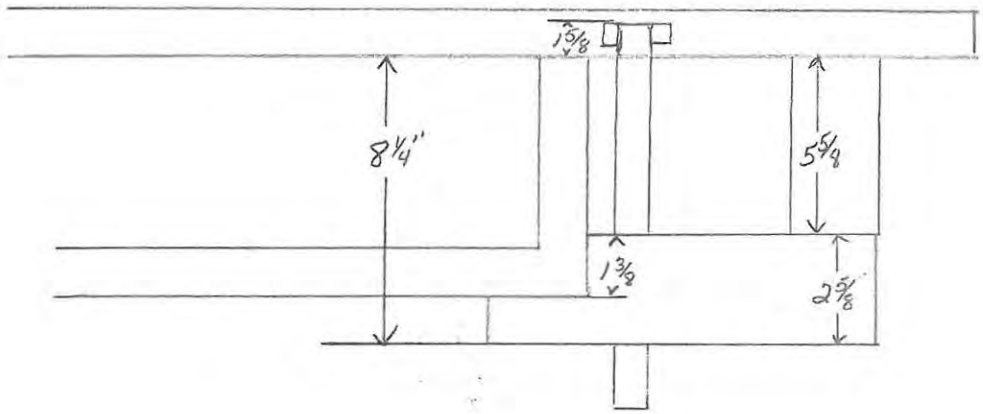
$9\frac{3}{4}" - 3\frac{1}{2}"$ = E. system plate stroke with



Tall Dies - 8½" Bars
Short Dies - 9¾" Bars

2/25/99

Top Die Clamping Space Bolting Assembly



8 1/4
2 5/8
5 5/8
1 1/2
5 1/2

T-Slot 1 5/8" + Spacer 5 3/4" + Clamp Block 2 5/8" + Nut end 1 1/2"

Setup Stud - 11 1/2"

McMaster

- Set-up Stud - #90281A818
  3/4" x 10 x 12"
- T-Slot Nut - #90526A624
  3/4" x 10 13/16" Table Slot
- Flange Nut - #91030A036
  3/4" x 10

Omni

- Cold Rolled Drawn Steel
  2" OD .876" ID with 9/16" wall

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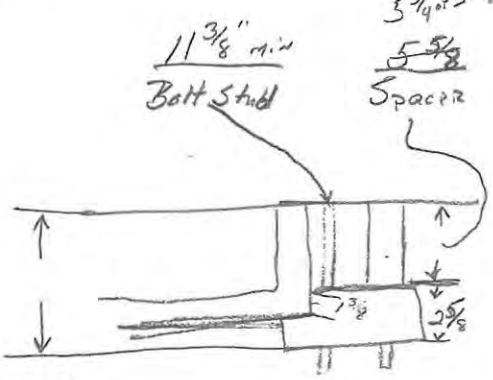
ú±■■½ÞÁ' ±ú■½ÞÞÁâ

2 OD
7/4 ID 9/16

2¼ - E stroke on m/c

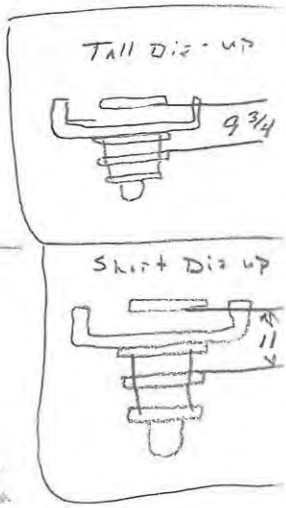
Clamp bolts ≠ Spacer

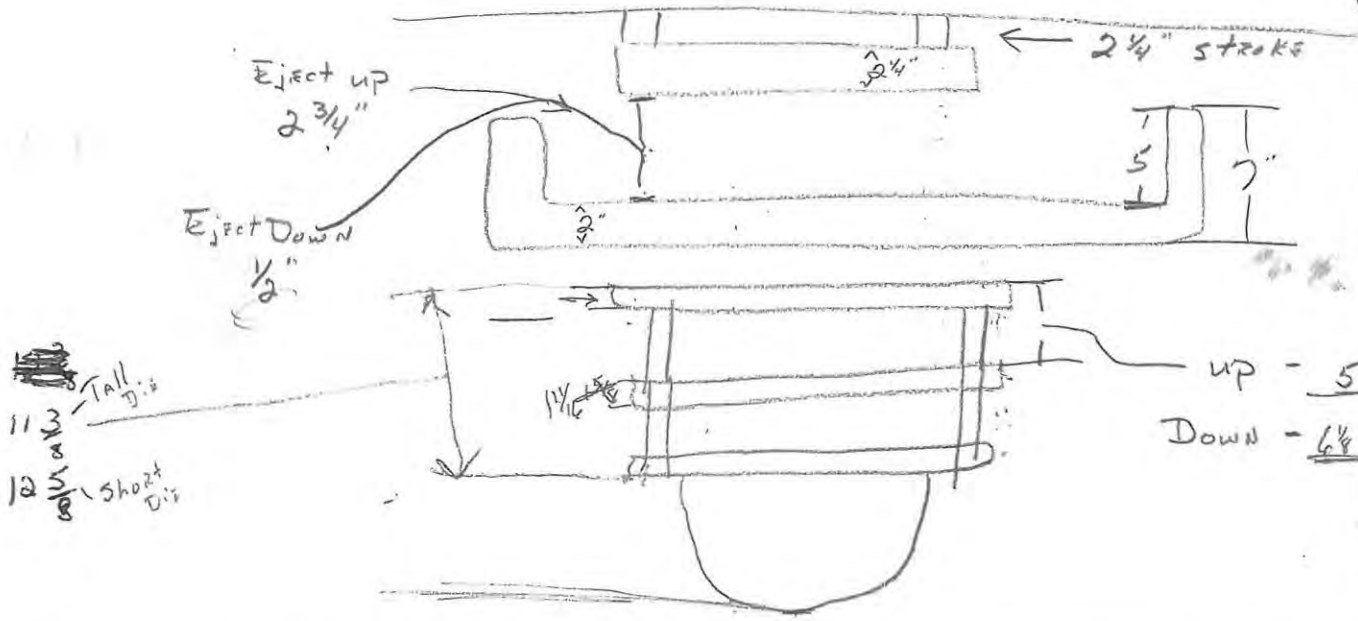
1⅝
1⅜ Nut



$\frac{T}{1\frac{5}{8}} \times \frac{N}{1\frac{3}{8}} \times \frac{A}{7} \times \frac{C}{1\frac{1}{4}} =$

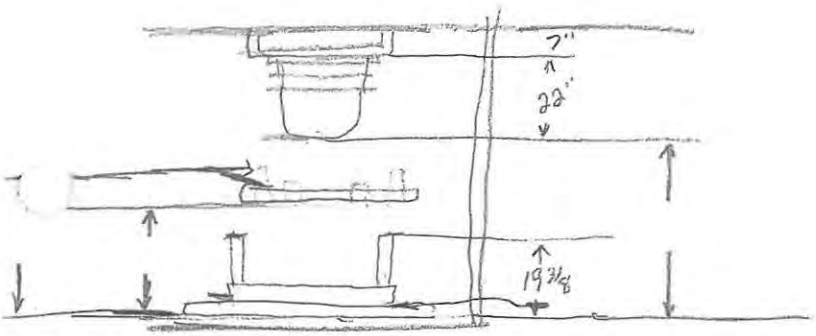
E. pin Bars





Retriver Clearance.

5 4/64 - .875



Avg. Widest wheel

FAX FRUCHEY

5608 Old Maumee Road , Fort Wayne, In. 46803
PH 219/749-8502 FAX 219/749-6337

To:	**Daryl Brackney**	**From:**	Mike Howard
Co:	AAP St. Marys Corp.	**Date:**	February 4, 2000
Fax:	419-394-4776	**Pages:**	3
Phone:	419-394-7840	**Re:**	**Empire Cast Machine & Platform**

Daryl -

Following is the quotation that you requested for the installation of the Empire Cast Machine and work platform. Please review and call me if you have any questions.

Thank you for the opportunity to quote on this project.

Sincerely,

Mike Howard

Mike Howard

mike.howard@donfruchey.com

FRUCHEY
DON R. FRUCHEY, INC.

February 4, 2000

AAP St. Marys Corp.
1100 McKinley Road
P.O. Box 419
St. Marys, OH 45885

Re: Empire Cast Machine and Platform

Attn: Mr. Daryl Brackney

Dear Mr. Brackney:

The following is our firm price quotation to provide labor and equipment to install one (1) Empire cast machine and fabricate and install one (1) 25' x 37' work platform per your instructions, our site visit and conditions listed below:

One (1) Lump Sum Price . . . . . $ 45,490.00

1. Our work would include:
   a. Fabricate one (1) work platform 25' x 37', landing 5' x 10' with stairs and removable handrail.
   b. Unload cast machine from other's trucks and move into building.
   c. Assemble cast machine, including the furnace pod, catwalk, ladder and retriever.
   d. Connect piping on cast machine.
   e. Modify existing work platform as required to mate with new platform.
   f. Install new work platform including landing, stairs and handrails.
   g. Relocate robot approximately 1'-6" north.

2. We have based our bid upon the following conditions:
   a. Free and easy access to work areas.
   b. Working straight time only.
   c. All drives, parking lots and floors capable of concentrated weights of trucks and equipment.
   d. Our proposal is valid for 30 days.
   e. Standard terms of payment are Net 30 Days. Progress billings are made on projects that have a duration of over 30 days.

3. We have specifically included:
   a. Gray primer paint on platform and Safety Yellow paint on handrails.
   b. Unloading and setting of electrical panels and hydraulic units.

Continued . . .

5609 Old Maumee Road ▪ Fort Wayne, Indiana 46803 ▪ 219/749-8502 ▪ Fax: 219/749-6337

4. We have specifically excluded:
   a. Furnishing any materials not listed above.
   b. Electrical connections.
   c. Piping connections except for connections on press.
   d. Sales tax (will be added if applicable).

Thank you for reviewing our quotation. We are looking forward to performing this job for you.

Sincerely,

DON R. FRUCHEY, INC.

Michael A. Howard

Michael A. Howard
Estimator

MAH:bk

1 OF 4

FRUCHEY
DON R. FRUCHEY, INC.

5608 Old Maumee Road ▪ Fort Wayne, Indiana 46803 ▪ 219/749-8502 ▪ FAX 219/749-6337

CONTRACTORS TO INDUSTRY
Equipment Installation - Heavy Hauling - Millwright Work - Warehousing - Steel & Precast Erection - Shop Fabrication - Equipment Rentals

AAP - ST. MARYS
ST. MARYS, OH.

1. FABRICATE (5) PLATFORM PANELS & (1) STAIR WITH LANDING PANEL.
2. PANEL SECTIONS TO BOLT TOGETHER.
3. COLUMNS WILL BOLT TO BOTTOM OF PANELS.
4. FURNISH EXPANSION ANCHORS FOR COLUMNS.
5. STAIR TREADS TO BE GRIP-STRUT.
6. REMOVABLE HANDRAIL. PAINT SAFETY YELLOW.
7. PLATFORM & STAIRS - GRAY PRIMER.
8. DELIVERY TO ST. MARYS, OH.
9. QUOTE DUE: FRI 2-4-00
10. MATERIAL DELIVERY: 3-1-00

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

No. 2690

Date 2/8/00

Your No. _____

Your Due Date _____

Terms NET 30 DAYS

Prices quoted are
F.O.B. _____

Delivery Date _____

To

AAP ST MARYS CORP
ATTN: DARREL BRACKNEY
PO BOX 408
ST MARYS OH 45885

We are pleased to quote as follows:

1	LABOR AND MATERIALS TO CONSTRUCT PLATFORM FOR NEW CROSSMEMBER CASTING MACHINE AS PER OUR DISCUSSION.	$13,875.00	EA	$13,875.00

1125 Sherman Road
Russia, OH 45363
Phone: 1-937-295-5228
Fax: 1-937-295-5228

Enviro-Tech Industries

Fax

To: Daryl Brackney **From:** James D. Pleiman

Fax: 419-394-4776 **Date:** 2-1-00

Phone: 419-394=7840 **Pages:**

Re: Quote **CC:**

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

•Comments:

Transfer Dolly

Resize to A.A.P. Specs. will need unit for two days $ 475.00 **ea.**

Die Cart

$ 1550.00 **ea.**

Age Carrier

$ 1000.00 ea.

Ladle Table

$ 1900.00 ea.

Age Furnace Cart

$ 850.00 ea.

Work Bench $ 450.00 ea.

Main Work Platform
Daryl, this quote does not include Installation of platform . We feel we could not do a good job of installation at this time. $14500.00 ea.

Thank You for the consideration

James D. Pleiman

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538 Grinding

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date:8/24/99	Proposal No.:3403	F.O.B.	Terms

Qty.	Description	Price	Amount
1	4'X6' INSPECTION TABLE WITH BOTTOM SHELF		
	* NO BACK		
	* 2 LIGHT BRACKETS		
	(FABRICATE, DELIVER)		$915.00

REQUOTED TO AAP 1/14/00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: STEVE EMERICK ACCEPTED: DATE:

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: DARREL BRACKNEY
PO BOX 408
ST MARYS OH 45885

No. 2693

Date 2/9/00

Your No. _____

Your Due Date _____

Terms NET 30 DAYS

Prices quoted are
F.O.B. _____

Delivery Date _____

We are pleased to quote as follows:

1	LABOR AND MATERIALS TO CONSTRUCT A NEW TRIM TABLE 48" X 72" WITH 1/4" PLATE ON TOP AND BOTTOM SHELF AND WITH A LIGHT HANGING BRACKET AS PER OUR DISCUSSION.	$875.00	EA	$875.00

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date: 1/26/00	Proposal No.:4947	F.O.B.	Terms

Qty.	Description	Price	Amount
	37' x 25' PLATFORM 60" HIGH • WITH REMOVEABLE HANDRAIL ON 3 SIDES • 1 SET OF STAIRS 60" WIDE WITH 72" PLATFORM • AS PER CONVERSATION WITH BUTCH DELAP • ALL MATERIAL, EQUIPMENT AND LABOR TO ENSURE PROPER INSTALLATION. FABRICATE, PAINT (AS NEEDED) DELIVER, INSTALL (TOTAL SITE TIME IS TWO (2) WEEKS.)		$37690.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: Steve Emerick ACCEPTED: DATE:
STEVE EMERICK

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer

Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer

Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date: 1/26/00	Proposal No.:4947	F.O.B.	Terms

Qty.	Description	Price	Amount
	37' x 25' PLATFORM 60" HIGH • WITH REMOVEABLE HANDRAIL ON 3 SIDES • 1 SET OF STAIRS 60" WIDE WITH 72" PLATFORM • AS PER CONVERSATION WITH BUTCH DELAP • ALL MATERIAL, EQUIPMENT AND LABOR TO ENSURE PROPER INSTALLATION. FABRICATE, PAINT (AS NEEDED) DELIVER, INSTALL (TOTAL SITE TIME IS TWO (2) WEEKS.)		$37690.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: Steve Emerick ACCEPTED: DATE:
STEVE EMERICK

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date:2/14/00	Proposal No.:4951	F.O.B.	Terms

Qty.	Description	Price	Amount
	INSTALLATION OF MACHINE BASE FOR EMPIRE CASTING MACHINE AS PER CUSTOMER DRAWING.		
	INCLUDES:		
	• CONCRETE SAWING		
	• EXCAVATION AND DISPOSAL OF MATERIALS		
	• 2 - 10"x5" BEAMS 35 lbs. / FT.		
	• 2 - 12" CHANNELS - STANDARD		
	• 5/8" REBAR REINFORCEMENT		
	• CONCRETE WORK COMPLETE		
	• CONCRETE BASE TO BE 20" DEEP		$6911.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: Butch Delap ACCEPTED: DATE: 2-14-2K
BUTCH DELAP

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

Spurling Electric Company, Inc. 8323 North Dixie Drive, Dayton, OH 45414

FAX

Date: 02-10-00

Number of pages including cover sheet: 2

To:

Darrel Brackney

AAP St. Marys Corporation

Phone: 419-394-7840

Fax phone: 419-394-4776

CC:

From:

Keith Hunter

Phone: 937-890-7149

Fax phone: 937-890-7164

REMARKS: ☐ Urgent ☒ For your review ☐ Reply ASAP ☐ Please comment

Attached find our proposal for:

Empire Casting Machine Foundation

Any questions, please call.

SPURLING ELECTRIC COMPANY, INC.
8623 North Dixie Drive
Dayton, Ohio 45414
Phone 937-890-7149
Fax 937-890-7164

Proposal Number: 00-017

PROPOSAL

TO:
AAP St. Marys Corporation
Attn: Darrel Brackney
1100 McKinley Road
St. Marys, OH 45885

PHONE 419-394-7840 #225 FAX 419-394-4776	DATE 02-10-00
JOB NAME / LOCATION	
Empire Casting Machine Foundation Same	
JOB NUMBER	JOB PHONE

We hereby submit specifications and estimates for:

1 - To furnish and install I-Beams and foundation for one new Cross Member Empire Casting Machine.

2 - To be done on a straight time basis.

3 - No taxes, permits, and/or fees included.

WE PROPOSE hereby to furnish materials and labor - complete and in accordance with above specifications, for the sum of $ 5,480.00

Payments to be made as follows: Net fifteen days

All material is guaranteed to be specified. All work to be completed in a professional manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado, and other necessary insurance. Our workers are fully covered by Worker's Compensation Insurance.

Authorized Signature

Note This proposal may be withdrawn by us if not accepted within 10 days

ACCEPTANCE OF PROPOSAL - The above prices, specifications, and satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Signature _____

Date of Acceptance: _____

Signature _____

CONSOLIDATED MACHINERY MOVERS, INC.
15 HEID AVENUE, DAYTON, OHIO 45404 TEL. (937) 233-0926 FAX: (937) 233-1162

Mr. Daryl Brackney
AAP ST Marys
1100 McKinley Rd.
ST Marys, Ohio 45885

January 29, 2000

SUBJECT: QUOTATION INFORMATION FOR THE INSTALLATION OF EMPIRE CASTING CROSS MEMBER MACHINE AT AAP ST. MARYS, AS SPECIFIED.

Dear Daryl,

In regard to the above mentioned subject, we offer the following quotation information:

1. To unload load new equipment.
2. To move to location.
3. To set in place and level.
4. To weld to beams in floor- beams to be installed by others.
5. To set electric panels.
6. To set hyd tank in place.
7. Truck with must be there by 8:00am on workday, wait time on truck will by at a premium rate.
8. This work is figured to be completed on a straight time basis.

Lump Sum Quotation Price $ 8400.00

Thank you for the opportunity to quote on this work. If we can be of further help or if you have any questions, do not hesitate to call.

Very truly yours,

CONSOLIDATED MACHINERY MOVERS, INC.

Paul Daugherty
General Manager

200015

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: DARREL BRACKNEY
PO BOX 408
ST MARYS OH 45885

No. 2753

Date 3/16/00

Your No. _____

Your Due Date _____

Terms NET 30 DAYS

Prices quoted are
F.O.B. _____

Delivery Date _____

We are pleased to quote as follows:

1	LABOR AND MATERIALS TO MAKE MODIFICATIONS TO NEW CROSSMEMBER CASTING MACHINE AS PER OUR DISCUSSION. THIS IS FOR HANDRAIL RETRIEVER SPILL SHIELDS CONDUIT COVER (DOG HOUSE) AND EVERYTHING ON YOUR LIST AS OF 3/6/00.	$1,440.00	EA	$1,440.00

C.O. WELDING & FAB. 419-394-3293

03/15/00

To: DARREL BRACKNEY
From: C.O. Welding & Fabrication Inc.
Re: Completed Work--Need PO's and/or ATI's for the following:

P O #	Date Complet	Ordered by	Quote #	Price Ea	Quanti	Total Price	Task Name	ATI	IN
T64719	3/8/00	Darrell Brackney	2691	$385.00	1	$385.00	Lab/mat to modify die changing cart.		

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARYL BRACKNEY

PROPOSAL

Proposal Date:3/9/00	Proposal No.:5325	F.O.B.	Terms

Qty.	Description	Price	Amount
	RE: PUNCH LIST FOR CROSS MEMBER		
	MODIFICATIONS INCLUDE:		
	1. MODIFY HANDRAIL INTO SWING GATE		
	2. CUT AND SHAPE HANDRAIL TO FORM CORNER		
	3. SHORTEN HANDRAILING APPROXIMATELY 90" AT NORTH END OF PLATFORM		
	4. 24"X48" PLATFORM AT WEST SIDE OF PLATFORM, CONSTRUCTED FROM 3/16" DIAMOND PLATE AND 3" CHANNEL.		
	5. SPILL GUARDS - QUANITY OF 3		
	6. 48"x33.5" SCREEN GUARD AT RETRIEVER		
	7. 1/8" SHIELD 9"x20"		
	8. APPROXIMATELY 60"x60"X48" COVER WITH ACCESS DOOR "DOGHOUSE" TYPE PIPE RACK COVER FROM 1/8" MATERIAL.		
	TOTAL		$2775.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: Butch Delap ACCEPTED: DATE:
BUTCH DELAP

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

FRUCHEY
DON R. FRUCHEY, INC.

March 3, 2000

Mr. Daryl Brackney
AAP St. Marys Corporation
1100 McKinley Road
P.O. Box 419
St. Marys, OH 45885

Dear Mr. Brackney:

Subject: Grout Furnace Rails and Fill In Checker Plate

The following is our firm price quotation to provide labor, equipment, and materials to grout two (2) furnace rails and fill in checker plate per your instructions, our site visit and conditions listed below:

One (1) Lump Sum Price . . . . . $ 2,290.00

1. Our work would include:
   a. Grout two (2) furnace rails.
   b. Fill in deck area approximately 1' x 8'.

2. We have based our bid upon the following conditions:
   a. Free and easy access to work areas.
   b. Working straight time only.
   c. Our proposal is valid for 30 days.
   d. Standard terms of payment are Net 30 Days.

3. We have specifically included:
   a. Furnishing of grout.
   b. Furnishing of deck plate.

4. We have specifically excluded:
   a. Sales tax (will be added if applicable).

Thank you for reviewing our quotation. We are looking forward to performing this job for you.

Sincerely,

DON R. FRUCHEY, INC.

Michael A. Howard

Michael A. Howard
Estimator
MAH:bk

5608 Old Maumee Road ▪ Fort Wayne, Indiana 46803 ▪ 219/749-8502 ▪ Fax: 219/749-6337

SC&RA
Specialized Carriers & Rigging Association

EMPIRE CASTINGS, INC.
3195 REGIONAL PARKWAY • SANTA ROSA, CA 95403 • (707) 545-2232 • FAX (707) 523-9829

DRAWING TRANSMITTAL

TO:	AAP St. Marys Corporation	2/10/00
	1100 McKinley Road	
	St. Marys, OH 45885	
ATTN:	Daryl Brackney	AAPM08

NO. OF COPIES	DRAWING NO.	REV. LTR	TITLE
1	0100101	A	Furnace Track Mounting

Destroy all previous copies of these prints and substitute the above copies in your files.

Please acknowledge receipt and approval of the above by sending a copy of this transmittal to the above address.

RECEIVED BY: _____ **DATE:** 2-11-00

Empire Castings, Inc.

3195 Regional Parkway
Santa Rosa, CA 95403
Tel. 707.545.2232
Fax. 707.523.9829

February 8, 2000

Daryl Brackney
AAP St. Marys
1100 McKINLEY ROAD
St. MARYS, OHIO 45885
Tel. 419.394.7840
Fax 419.394.4776

Dear Mr. Brackney,

This is an update per our conversation today concerning the casting machine AAPM008. The thermocouple cabinets will be lowered so that the bottom of the box is at approximately 15 inches to the top of the bottom platen. This is done to mount the infrared eyes to the bottom of the thermocouple boxes. The infrared eyes will then be 30 inches to the top of the deck.

We will be adding a lighted push button to the furnace MMI for furnace needs filling reset.

These two items have been approved by you and will be incorporated in AAPM008. If you have any questions, don't hesitate to call.

Sincerely,

James Waters

James Waters
Senior Controls Engineer
jwaters@empirecastings.com

Cc: **Ken Clark**
David Carey
Graham Broad
Edwin Wickham
Robert Betschart
John MacMaster
James Allen
Bruce Gandt
Chris Buettner

02/08/2000 14:36 7075239829 EMPIRE CASTINGS INC. PAGE 01

EMPIRE CASTINGS, INC.
3195 REGIONAL PARKWAY • SANTA ROSA, CA 95403 • (707) 545-2232 • FAX (707) 523-9829

REQUEST FOR DRAWING TRANSMITTAL

Requestor Information:

Company Name: AAP St. Marys.

Address: 1100 McKinley Road
St. Marys, OHIO
45885

Ship to: _____

Contact Name: Harold Farley

Drawing(s) are requested for the following purpose: _____

Describe Drawing(s): Cross Member Machine (AAPM08)
Electrical Schematics
"Preliminary Drawings"

I understand that there may be a fee charged for supplying requested drawing(s). If a fee is charged, payment in advance or a valid purchase order will be required.

Requestors' Signature: _____ Date: 2/9/00

Office Use:

Chargeable ☐ **Non-chargeable** ☐ **Amount $** _____

Drawing No.	**Rev #**	**Drawing Title**

Supplied drawing(s) are for reference only and will NOT be updated.

Please acknowledge receipt of the drawing(s) by returning a signed copy of this document by mail or facsimile.

Received by:

Signature _____ Date: _____

02/08/2000 09:35 7075239829 EMPIRE CASTINGS INC. PAGE 02

EMPIRE CASTINGS, INC.

3195 REGIONAL PARKWAY, SANTA ROSA, CA 95403
TEL:(707) 545-2232•FAX(707)523-9829

FACSIMILE TRANSMITTAL SHEET

TO: Harold Farley	FROM: David F. Carey
COMPANY: AAP St. Marys	DATE: 02/08/2000
FAX NUMBER: (419) 394-5450 (419) 394-4776	TOTAL NO. OF PAGES INCLUDING COVER: 2
PHONE NUMBER: (419) 394-7840	SENDER'S REFERENCE NUMBER:
RE: Electrical Schematics – Preliminary Drawing	YOUR REFERENCE NUMBER:

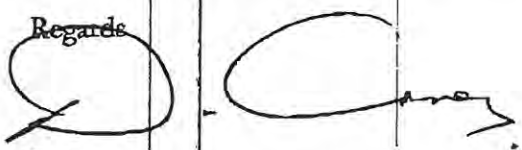
☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Harold:

Please sign and return the attached form. I will overnight the CD to you for delivery tomorrow.

Regards



Dave

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FRUCHEY
DON R. FRUCHEY, INC.

February 4, 2000

AAP St. Marys Corp.
1100 McKinley Road
P.O. Box 419
St. Marys, OH 45885

Re: Empire Cast Machine and Platform

Attn: Mr. Daryl Brackney

Dear Mr. Brackney:

The following is our firm price quotation to provide labor and equipment to install one (1) Empire cast machine and fabricate and install one (1) 25' x 37' work platform per your instructions, our site visit and conditions listed below:

One (1) Lump Sum Price . . . . . $ 45,490.00

1. Our work would include:
   a. Fabricate one (1) work platform 25' x 37', landing 5' x 10' with stairs and removable handrail.
   b. Unload cast machine from other's trucks and move into building.
   c. Assemble cast machine, including the furnace pod, catwalk, ladder and retriever.
   d. Connect piping on cast machine.
   e. Modify existing work platform as required to mate with new platform.
   f. Install new work platform including landing, stairs and handrails.
   g. Relocate robot approximately 1'-6" north.

2. We have based our bid upon the following conditions:
   a. Free and easy access to work areas.
   b. Working straight time only.
   c. All drives, parking lots and floors capable of concentrated weights of trucks and equipment.
   d. Our proposal is valid for 30 days.
   e. Standard terms of payment are Net 30 Days. Progress billings are made on projects that have a duration of over 30 days.

3. We have specifically included:
   a. Gray primer paint on platform and Safety Yellow paint on handrails.
   b. Unloading and setting of electrical panels and hydraulic units.

Continued . . .

5608 Old Maumee Road ▪ Fort Wayne, Indiana 46803 ▪ 219/749-8502 ▪ Fax: 219/749-6337

SC&RA
Specialized Carriers & Rigging Association

EMPIRE CASTINGS, INC.
3195 REGIONAL PARKWAY • SANTA ROSA, CA 95403 • (707) 545-2232 • FAX (707) 523-9829

DRAWING TRANSMITTAL

TO:	AAP St. Marys Corporation	1/26/00
	1100 McKinley Road	
	St. Marys, OH 45885	
ATTN:	Daryl Brackney	AAPM08

NO. OF COPIES	DRAWING NO.	REV. LTR	TITLE
1	PLAN001	----	Basic Foot Print – EC02A

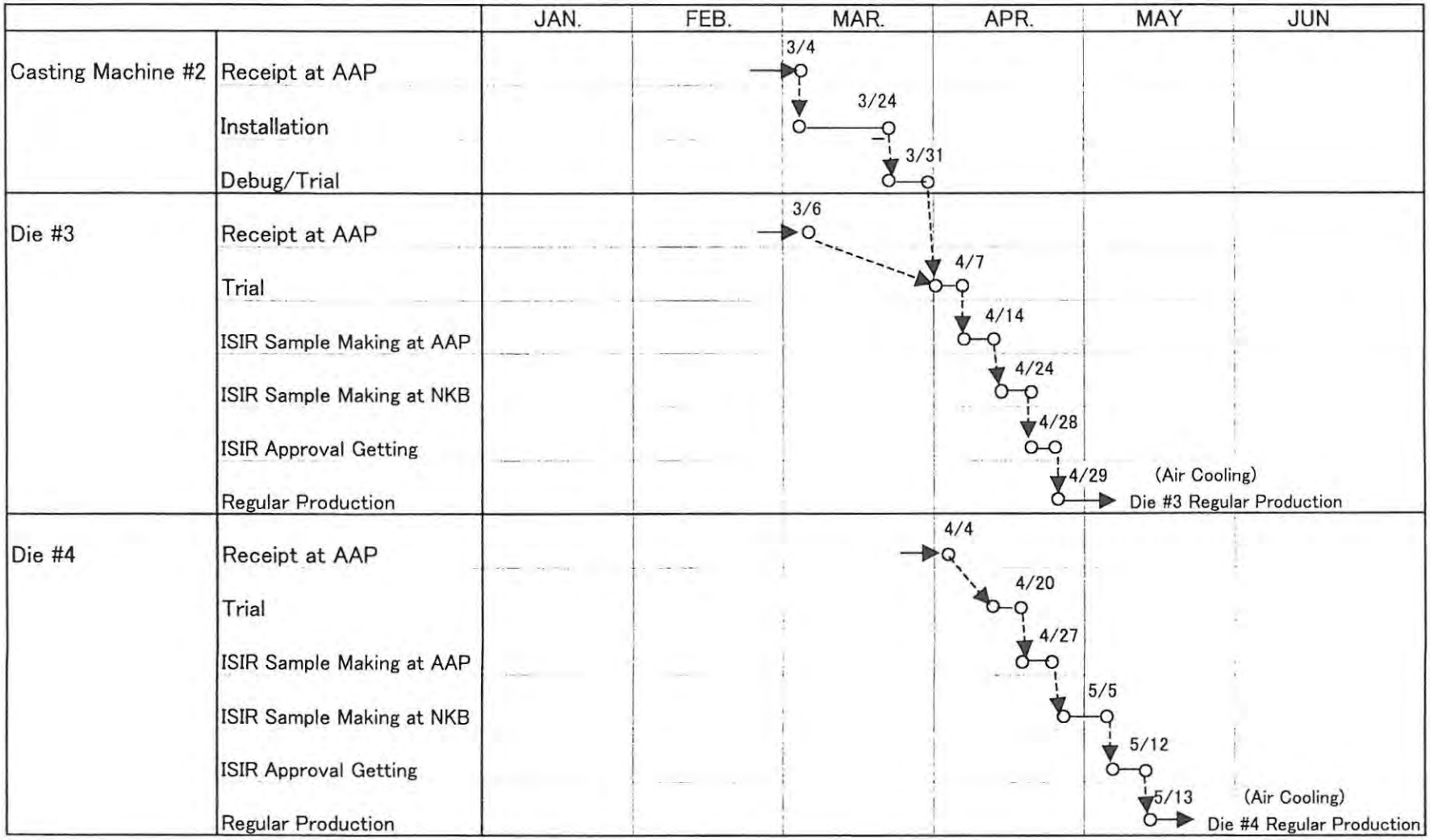
Destroy all previous copies of these prints and substitute the above copies in your files.

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RECEIVED BY: _____ **DATE:** 1-27-00

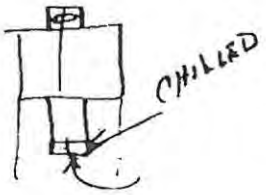
X-Member Casting Machine #2, &Die #3,#4の立上げSchedule (Air Cooling)

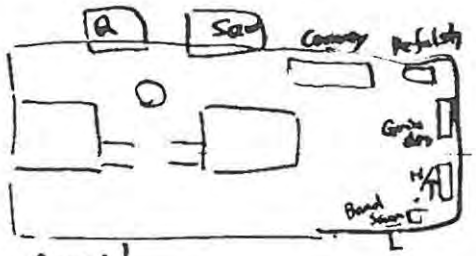
1/21/00
(AAP)



1/26. Mike. Tom. Daryl. Frank. Gene Seto.

NEW EQUIPMENT ON CROSSMEMBER.





1. Schedule.

	March. 1W	2W	3W	4W	April. 1W	2W	3W	4W
(1) Casting M/c.	3/3 Setup 3/6 Piping E.W. 3/18 Piping Bypass 3/18. 3/19 or 3/20 ⇒ Start casting.							
(2) Equipment for water cooling	Order 3/25 Install 3/27							
(3) Quench (Air or Mist)								
(4) Aging furnace. Arrival Jan. 29 → Install Feb/E.								
(5) Others. chemical pump. (10^{KB})								

Relocate electric panel. (2days)

※ Move manupilator & saw. (Feb. someday?)

Need to study handing during casting. (2days)

※ Casting M/c

Runoff. Feb/22. Ship Feb/25. Arrival. Mar/2.

Water cooling pump system. Mar/25. ($25000.)

※ 4 stations (air quench) $7.5^{min} \times 3^{S} = 22.5^{min}$.

80^{kg} (12 wks) ① 8 stations (air quench) $3^{min} \times 7^{S} = 21^{min}$.

47^{kg} (?) ② 4 stations. $3^{min} \times 3^{S} = 9^{min}$

(2 wks) ③ 4 station → 8 stations X

④ 4 station (mist or shower)

Next meeting.

① Feb. schedule & layout
② Cooling pump system.
③ Quench.

Feb/1. 1:30pm ~.

Empire Castings, Inc.
3195 Regional Parkway
Santa Rosa, CA 95403
Tel. 707.545.2232
Fax. 707.523.9829

January 7, 2000

Daryl Brackney
AAP St. Marys
1100 McKINLEY ROAD
St. MARYS, OHIO 45885
Tel. 419.394.7840
Fax 419.394.4776

Dear Mr. Brackney,

This is to follow up on our telephone conversation today. For your P.O. FT48001 (AMC008), the following was discussed.

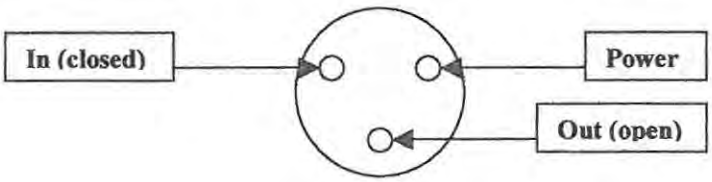
a) **The disconnect cabinet, transformer, and furnace MMI cabinet will be the same arrangement as your wheel machines.**
   1) **Dimensions for the disconnect cabinet are 48"H X 37.38"W X 12"D.**
   2) **Dimensions for the furnace MMI are 24"H X 20"W X 10"D.**
   3) **Dimensions for the transformer are 42"H X 32"W X 22"D.**

b) **The furnace will be set to the new style track system. See attached drawing.**
c) **The furnace will be set up to use your cast iron stalk tube.**
d) **As viewed from the operator side of the machine, the MMI cabinet, mold cooling rack, and hydraulic valves will be on the left side of the machine, and the retriever on the right side of the machine. The furnace MMI will be on the superstructure on the same side of the machine as the retriever.**
e) **It has been confirmed that the holes are no longer drilled in the edge of the bottom platen. This can be done upon request.**
f) **AAP St. Marys will be submitting a P.O. to upgrade the mold cooling to air and water.**
g) **AAP St. Marys will be submitting a P.O. to add Allen Bradley 1492-CB3G200 circuit breakers to the disconnect cabinet for a transfer ladle.**
h) **AAP St. Marys will be submitting a P.O. to Add the Red Lion APLTC400 thermocouple readout to the furnace MMI cabinet.**

   This entails the follows parts;
   1 ea. Red Lion APLTC400 t/c readout
   1 ea. AB 1492-H4 fuse holder
   1 ea. Little fuse 312 series 3AG fast acting 1/10 amp fuse
   2 ea. AB 800T-A2D1 pushbutton
   2 ea. AB 800T-X559 standard legend.

i) **There will be two thermocouple boxes on the machine. One in front on the support post, and one in back on the support post. Both the same side as the retriever.**

j) **Each side core will only have one limit switch connection per side core. The connector will be wired as follows;**



k) **AAP St. Marys will send to Empire Castings the thermocouple adapter and tube. The furnace is to accommodate the thermocouple adapter and protection tube.**

l) **AAP St. Marys will send to Empire Castings the "Staubli" plate that is specific to the cross member machine.**

m) **Ed Wickham will send, as soon as he returns, a quote for a die-loading cart. Daryl will send specifications to Ed.**

n) **Drawings for the machine layout and elevation will be sent from Empire Castings to AAP St. Marys. A note, the height for the operator machine has not changed.**

Sincerely,

James J Waters

James Waters
Senior Controls Engineer
jwaters@empirecastings.com

Enclosure: 1801202-.dwg 1801303-.dwg 0100101-.dwg

Cc: **Ken Clark**
David Carey
Graham Broad
Edwin Wickham
Robert Betschart
John MacMaster
James Allen
Bruce Gandt
Chris Buettner

EMPIRE CASTINGS, INC.
3195 REGIONAL PARKWAY • SANTA ROSA, CA 95403 • (707) 545-2232 • FAX (707) 523-9829

DRAWING TRANSMITTAL			
TO:	AAP St. Marys Corporation		1/07/00
	1100 McKinley Road		
	St. Marys, OH 45885-0419		
ATTN:	Daryl Brackney		AAPM08

NO. OF COPIES	DRAWING NO.	REV. LTR	TITLE
1	0100101	—	Furnace Track Mounting

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RECEIVED BY: _____ **DATE:** 1-11-00

Empire Castings, Inc.

3195 Regional Parkway
Santa Rosa, CA 95403
Tel. 707.545.2232
Fax. 707.523.9829

January 6, 2000

Greg Cass
AAP St. Marys
1100 McKINLEY ROAD
St. MARYS, OHIO 45885
Tel. 419.394.7840
Fax 419.394.4776

Dear Mr. Cass,

In reviewing the LPC cross member machines that is on order. On the previous wheel machine order, AAP St. Marys purchased a Furnace temperature read out on the furnace MMI cabinet as well as the circuit breakers for the transfer ladles. The question is, does AAP St. Marys want these items incorporated into the cross member machine?

It was not in the original quote, but can easily be added to the machine. The circuit breakers are a $292.00 adder and the thermocouple readout is a $550.00 adder. If these two items are to be ordered, please let us know as soon as possible.

A second note, we are to modify the furnace thermocouple mounting plate. Please send to us a thermocouple protection tube so that we can make the necessary modifications. Also it has not been indicated if the furnace will use a ceramic or cast iron stalk tube. Please indicate which one to use.

If you have any questions, don't hesitate to call.

Sincerely,

James Waters

James Waters
Senior Controls Engineer
jwaters@empirecastings.com

Cc: Ken Clark
David Carey
Edwin Wickham

01/06/2000 14:25 7075239829 EMPIRE CASTINGS INC. PAGE 01

d) Hydraulic Power Unit
   1. 25 HP 480 VAC TEFC electric motor
   2. 35 GPM hydraulic pump
   3. 1800 psi operating pressure
   4. Off-line filtering and cooling loop
   5. Thermostat controlled water/oil heat exchanger
   6. 200 gallon steel reservoir
   7. Sight gauge for fluid level/temp/contamination.
   8. Pump unloading circuit
   9. Motor starter and fusing on HPU (hydraulic power unit).
   10. 1-1/4" Pressure, 1-1/2" Return pipe size.

Cost: $81,690.00

005: Bottom Platen

a) 100" x 66"
b) Distance between tie bars 66" from side to side and 48" front to back
c) T-slot plate provided for bottom core mounting

Cost: $39,308.00

006: Moving Platen

a) 82" x 64"
b) "Quick Change" main tie rod bushings
c) T-slot plate provided for top core mounting
d) 4" tie rods to guide moving platen
e) Scotch safety
f) Open height 72" , closed height 24"

Cost: $45,575.00

007: Casting Ejection

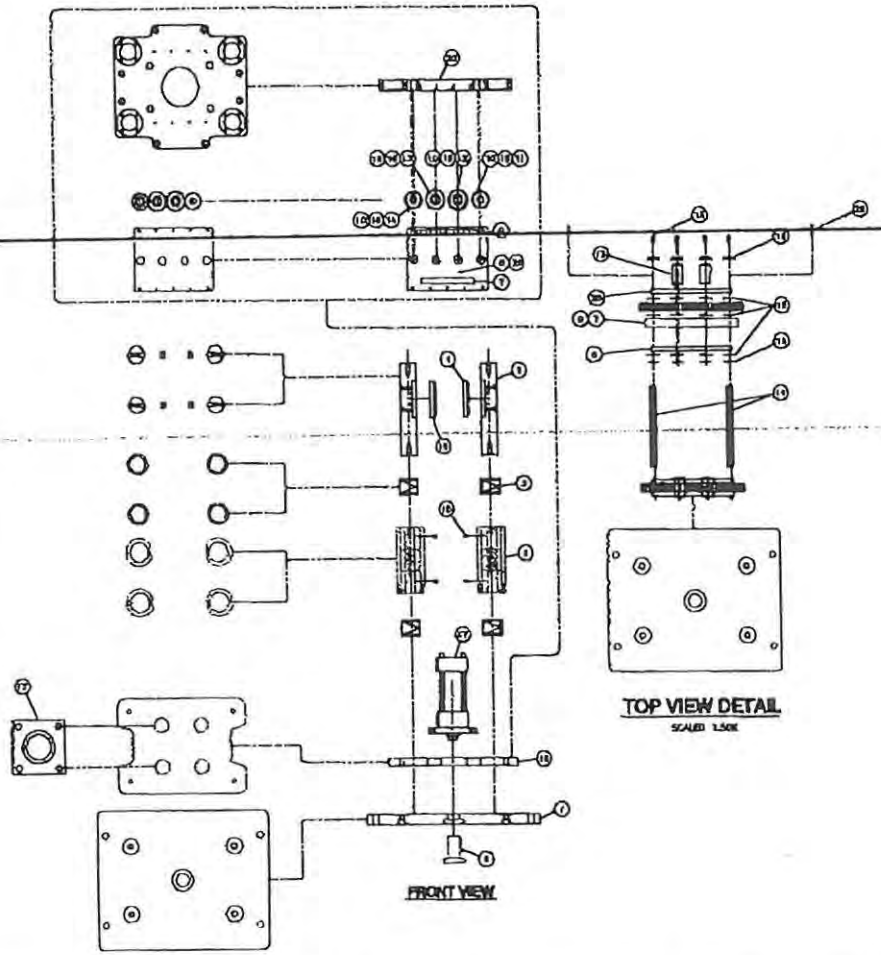
a) Bumper pin emergency system
b) Ejection force 90,000 lbs. 8" bore ejection cylinder

Cost: $47,813.00

008: Casting Extractor

a) Cantilever shuttle type design
b) Hydraulic motor actuates shuttle
c) Capable of supporting 100 lbs. of castings

Cost: $49,064.00



ITEM	DESCRIPTION	QTY.	REF. DWG.
27	DOWEL PINS, ø.250 X 1.000 LG.	8	BUY ITEM
26	DOWEL PINS, ø.250 X 2.000 LG.	8	BUY ITEM
25	SANDWICH PLATES, OUTER	2	1000061
24	1/8-27 NPT PIPE PLUGS	8	BUY ITEM
23	3/8-16 NC HEX HD. CAPSCREW X 1.50 LG.	32	BUY ITEM
22	1/2-13 NC SOC. HD. CAPSCREW X 2.25 LG.	10	BUY ITEM
21	5/8-16 NC SOC. HD. CAPSCREW X 1.75 LG.	36	BUY ITEM
20	EJECTION MOUNT PLATE	1	1000041
19	EJECTION TOP PLATE	1	1000011
18	LEFT RACK GEAR, LINN GEAR P/N SR10Fx4	2	1000141
17	HYDRAULIC CYLINDER	1	BUY ITEM
16	ø1.250 EXTERNAL RETAINING RING	16	BUY ITEM
15	1/8-27 NPT ZERK FITTING	24	BUY ITEM
14	SPLINED TIMING SHAFT	2	1000101
13	IDLER GEAR SHAFT	4	1000151
12	IDLER GEARS, LINN GEAR P/N 10CG35 (5/16 W KEYWAY KEYED TO ONE TOOTH)	4	1000191
11	DRIVEN GEARS, LINN GEAR P/N 10CG30 (5/16 W KEYWAY KEYED TO ONE TOOTH)	4	1000191
10	THRUST WASHER, INA P/N TWA2031	32	BUY ITEM
9	UPPER GEAR SPACER	2	1000081
8	SANDWICH PLATES, INNER	2	1000071
7	LOWER GEAR SPACER	2	1000091
6	CYLINDER CONNECTOR	1	1000161
5	EJECTION GUIDE SHAFTS	4	1000051
4	RIGHT RACK GEAR, LINN GEAR P/N SR10Fx4	2	1000131
3	BUSHINGS	8	1000181
2	GUIDE SHAFT BUSHING HOUSINGS	4	1000031
1	EJECTOR CONNECTION PLATE	1	1000021

PARTS LIST

NOTES: UNLESS OTHERWISE SPECIFIED

1. REMOVE ALL BURRS AND SHARP EDGES
2. APPLY ANTI-SEIZE LUBRICANT TO ALL THREADED FASTENERS AT ASSEMBLY
3. REDRAWN FROM AMC006 3410501

REV	DESCRIPTION	DATE	APP'D
–	ENGINEERING RELEASE	16JUN94	

REVISIONS

THIRD ANGLE PROJECTION

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE INCHES
TOLERANCES ARE
DECIMALS FRACTIONS ANGLES
.XX ± .005 ±1/16 ±1/2°
.XX ± .01
BREAK SHARP EDGES PER DRAWING PER ANSI Y14.5

MATERIAL
ASTM A36 STEEL
BRONZE

FINISH
X

APPROVALS	DATE
DRAWN BY RON PERRY	16JUN94
CHECKED BY	
APPROVED BY	
ENGINEERING DAVID LLOYD	16JUN94
MANUFACTURING	
QUALITY AAP	

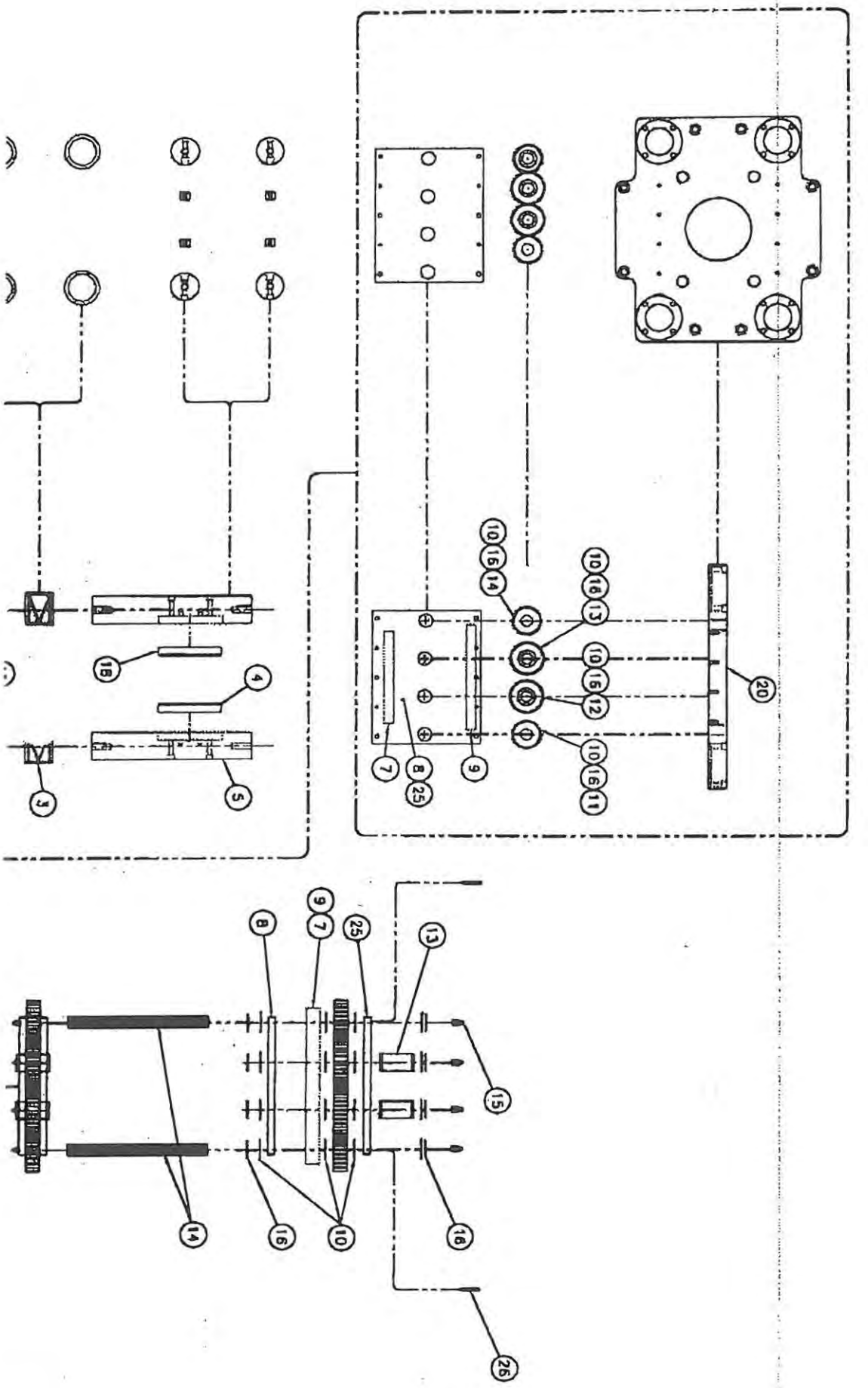
DO NOT SCALE DRAWING

EMPIRE CASTINGS INC.
3195 REGIONAL PARKWAY, SANTA ROSA, CA 95403

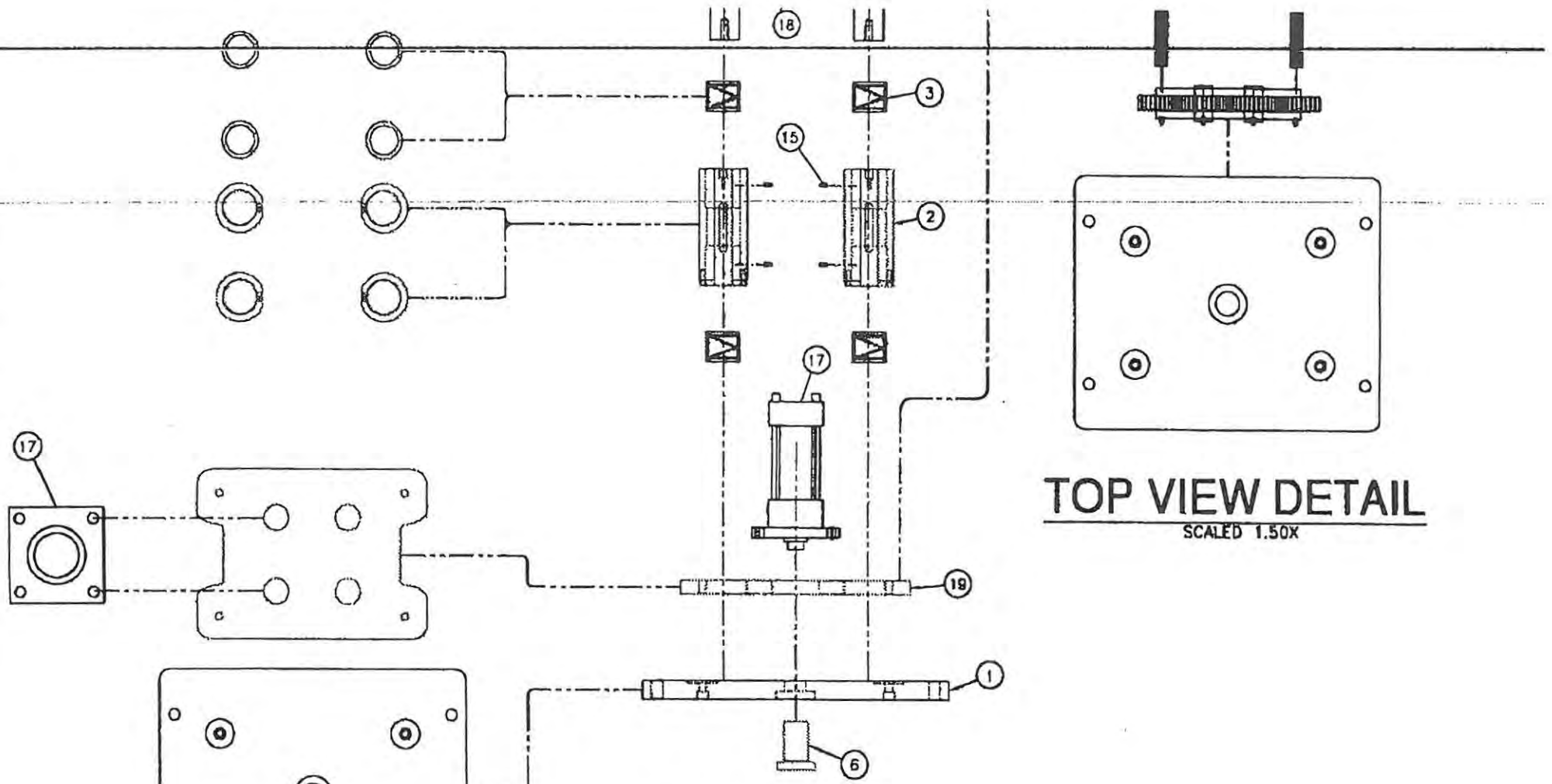
EJECTION SYSTEM ASSEMBLY

EMPIRE WORK ORDER NO.	EMPIRE DRAWING NO.	REV
AAPM01	1000171	–

QTY 1/MACH | SCALE TO FIT | SHEET 1


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EMPIRE CASTINGS INC.



FRONT VIEW

TOP VIEW DETAIL

SCALED 1.50X

TOP VIEW

ITEM	DESCRIPTION	QTY.	REF.
27	DOWEL PINS, ø.250 X 1.000 LG.	8	BUY ITEM
26	DOWEL PINS, ø.250 X 2.000 LG.	8	BUY ITEM
25	SANDWICH PLATES, OUTER	2	1000061
24	1/8-27 NPT PIPE PLUGS	8	BUY ITEM
23	3/8-16 NC HEX HD. CAPSCREW X 1.50 LG.	32	BUY ITEM
22	1/2-13 NC SOC. HD. CAPSCREW X 2.25 LG.	10	BUY ITEM
21	5/8-16 NC SOC. HD. CAPSCREW X 1.75 LG.	36	BUY ITEM
20	EJECTION MOUNT PLATE	1	1000041
19	EJECTION TOP PLATE	1	1000011
18	LEFT RACK GEAR, LINN GEAR P/N SR10Fx4	2	1000141
17	HYDRAULIC CYLINDER	1	BUY ITEM
16	ø1.250 EXTERNAL RETAINING RING	16	BUY ITEM
15	1/8-27 NPT ZERK FITTING	24	BUY ITEM
14	SPLINED TIMNG SHAFT	2	1000101
13	IDLER GEAR SHAFT	4	1000151
12	IDLER GEARS, LINN GEAR P/N 10CG35 (5/16 W KEYWAY KEYED TO ONE TOOTH)	4	1000191
11	DRIVEN GEARS, LINN GEAR P/N 10CG30 (5/16 W KEYWAY KEYED TO ONE TOOTH)	4	1000191
10	THRUST WASHER, INA P/N TWA2031	32	BUY ITEM
9	UPPER GEAR SPACER	2	1000081
8	SANDWICH PLATES, INNER	2	1000071
7	LOWER GEAR SPACER	2	1000091
6	CYLINDER CONNECTOR	1	1000161
5	EJECTION GUIDE SHAFTS	4	1000051
4	RIGHT RACK GEAR, LINN GEAR P/N SR10Fx4	2	1000131
3	BUSHINGS	8	1000181
2	GUIDE SHAFT BUSHING HOUSINGS	4	1000031
1	EJECTOR CONNECTION PLATE	1	1000021

EMPIRE CASTINGS INC.

EMPIRE CASTINGS, INC.

3195 REGIONAL PARKWAY, SANTA ROSA, CA 95403
TEL:(707) 545-2232•FAX(707)523-9829

FACSIMILE TRANSMITTAL SHEET

TO: Bob Waterman
Aaron Suchland

FROM: David E. Carey

FAXED 11/12/99

COMPANY: AAP St. Marys

FAX NUMBER: (419) 394-4776

TOTAL NO. OF PAGES INCLUDING COVER: 19

PHONE NUMBER: (419) 394-7840

SENDER'S REFERENCE NUMBER:

RE: RFQ

YOUR REFERENCE NUMBER:

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Greg/Jim:

This is the information you requested for the following;

1. Furnace pop-off valve P/N 118C 25 PSI $ 67.98 ea.
   Delivery: Two(2) weeks after receipt of order..

The other items that you have requested are all detailed in our quote # 011924-AMC (attached). I will extend the expiration date of the quotation to November 19, 1999.

The relevant items are;

Line item # 007	Casting Ejection,	$ 47,813.00
Option # 003	Mold Water Cooling, 24 channels	$ 30,480.00
Option # 007	Furnace stainless steel protection plate,	$ 1,007.00

On site technical assistance (page 10) Paragraph 3.

$ 1,000.00 per person per day plus travel and living expenses. Three(3) weeks advance notice is required for scheduling factory technician.

Delivery: on all of the above items will be agreed and confirmed after receipt of order.

Regards

Dave

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MMI

MACHINE CENTERLINE

107.678

107.678

Empire Castings, Inc.
3195 Regional Parkway
Santa Rosa, CA 95403
(707)545-2232
(707)523-9829 Fax

facsimile transmittal

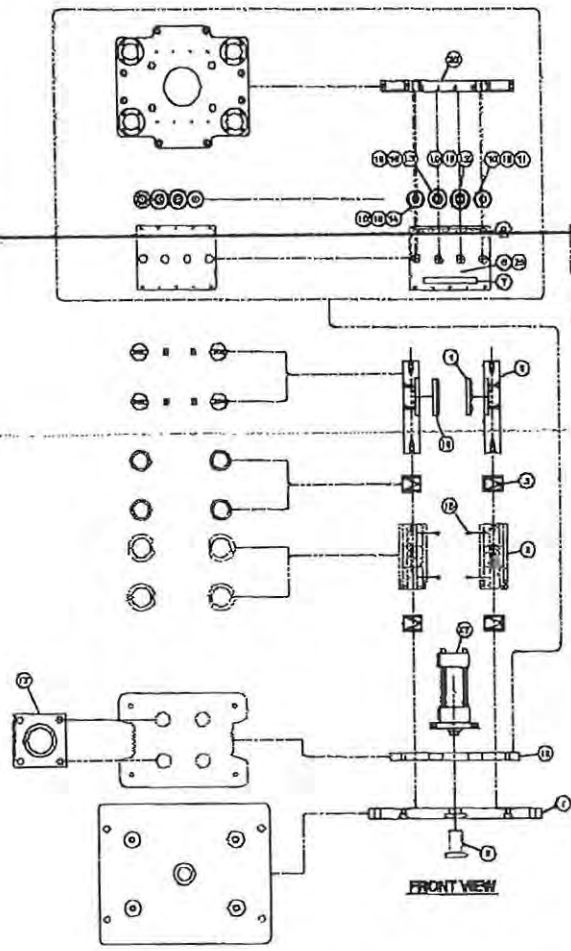
To:	AAP St. Marys Corporation	Fax:	419-394-4776
From:	Jim Allen	Date:	11/08/99
Re:	Drawing Per Request	Pages:	2
CC:	Daryl Brackney		

☐ Urgent X☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

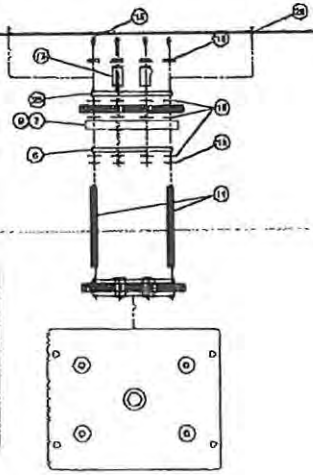
CONFIDENTIAL

11/08/1999 10:48 7075239829 EMPIRE CASTINGS INC. PAGE 01

PAGE 02
EMPIRE CASTINGS INC.
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TOP VIEW



TOP VIEW DETAIL
SCALE 1.50X

FRONT VIEW

NOTES: UNLESS OTHERWISE SPECIFIED
1. REMOVE ALL BURRS AND SHARP EDGES
2. APPLY ANTI-SEIZE LUBRICANT TO ALL THREADED FASTENERS AT ASSEMBLY
3. REDRAWN FROM AMC006 3410501

ITEM	DESCRIPTION	QTY.	REF. DWG.
27	DOWEL PINS, ø.250 X 1.000 LG.	8	BUY ITEM
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17	HYDRAULIC CYLINDER	1	BUY ITEM
16	ø1.25D EXTERNAL RETAINING RING	16	BUY ITEM
15	1/8-27 NPT ZERK FITTING	24	BUY ITEM
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3	BUSHINGS	8	1000181
2	GUIDE SHAFT BUSHING HOUSINGS	4	1000031
1	EJECTOR CONNECTION PLATE	1	1000021

PARTS LIST

REV	DESCRIPTION	DATE	APP'D
–	ENGINEERING RELEASE	16JUN94	

REVISIONS

THIRD ANGLE PROJECTION

CONFIDENTIAL
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UNPUBLISHED WORK © 1994 EMPIRE CASTINGS, INC.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE INCHES
TOLERANCES ARE:
DECIMALS .XXX ± .005 .XX ± .01
FRACTIONS ±1/16
ANGLES ±1/2°
BREAK SHARP EDGES .01R
DRAWING PER ANSI Y14.5

MATERIAL
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BRONZE

FINISH
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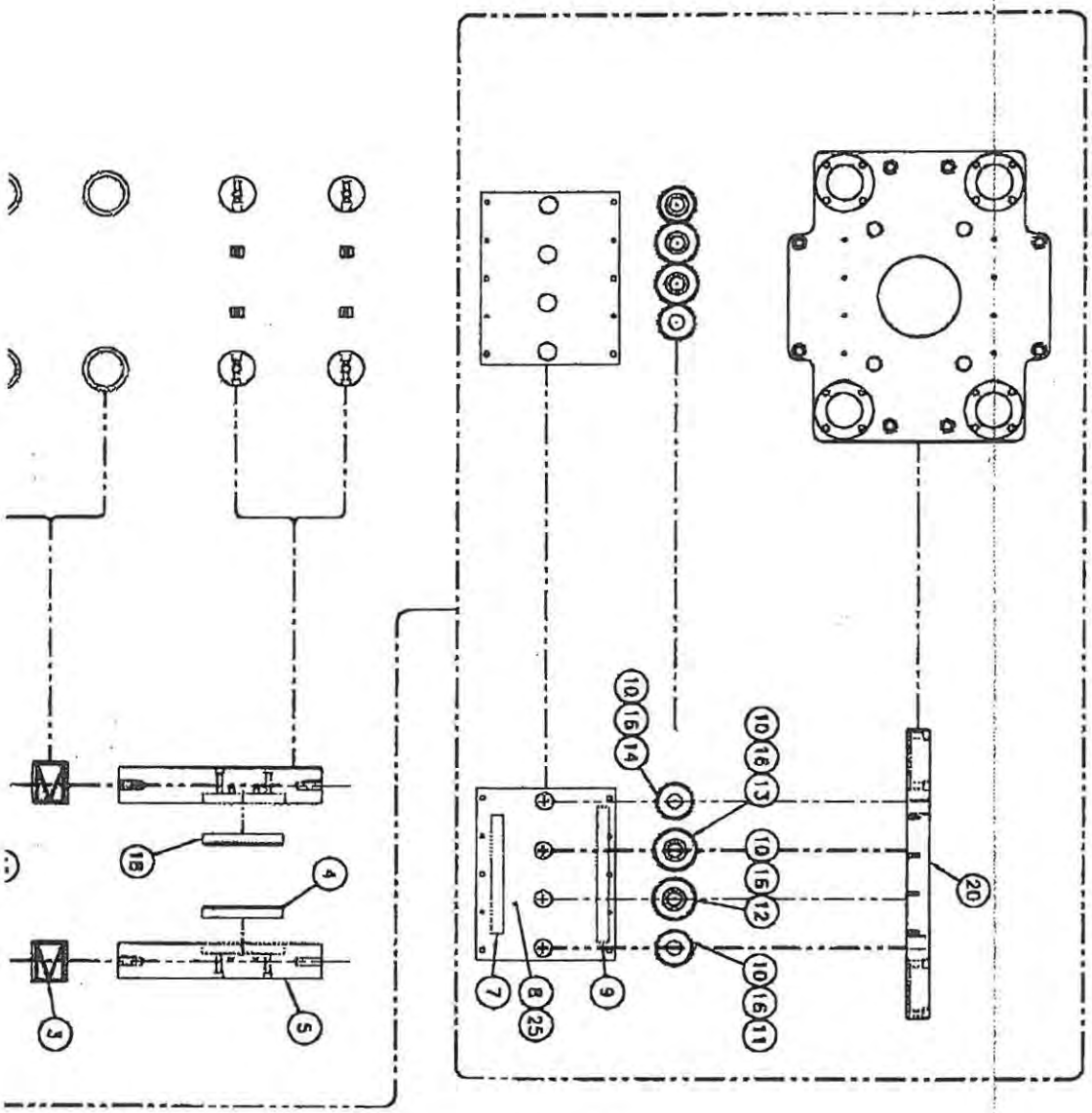
APPROVALS	DATE
DRAWN BY RON PERRY	16JUN94
CHECKED BY	
APPROVED BY	
ENGINEERING DAVID LLOYD	16JUN94
MANUFACTURING	
CUSTOMER AAP	

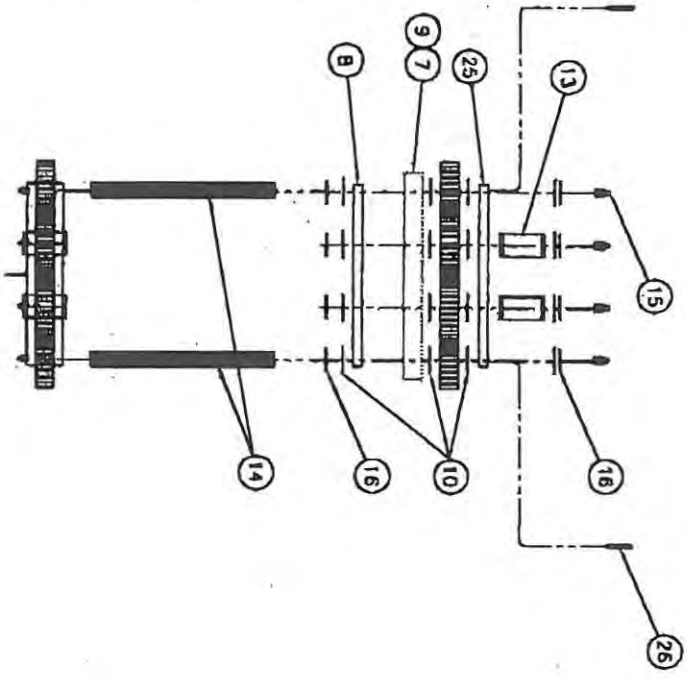
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EMPIRE CASTINGS INC.
3193 REGIONAL PARKWAY, SANTA ROSA, CA 95403

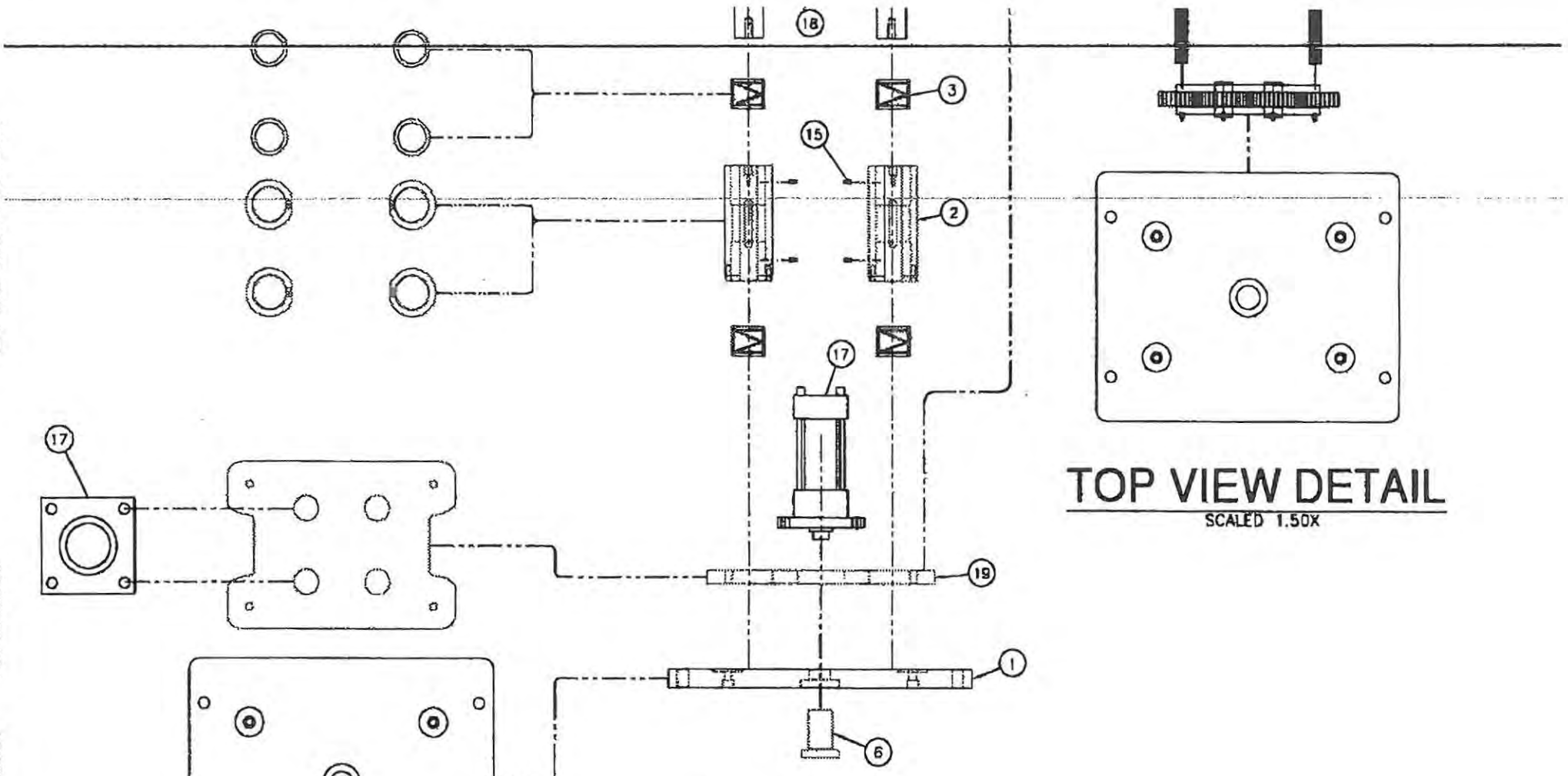
EJECTION SYSTEM ASSEMBLY

EMPIRE WORK ORDER NO.	EMPIRE DRAWING NO.	REV
AAPM01	1000171	–
QTY 1/MACH	SCALE TO FIT	SHEET 1


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EMPIRE CASTINGS INC.



FRONT VIEW

TOP VIEW DETAIL

SCALED 1.50X

TOP VIEW

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11/08/1999 11:17 6261/80/11 EMPIRE CASTINGS INC. PAGE 04

GOKOH CORPORATION

PO written 11/2

1280 Archer Drive
Troy, Ohio 45373

Tel: 937-339-4977
Fax: 937-339-5146

October 20, 1999

Quotation # 99102002

Mr. Darryl Brackney
AAP St. Mary's Corporation
1100 McKinley Road
St. Mary's, OH 45885

Dear Mr. Brackney:

Gokoh Corporation wishes to submit firm pricing for complete installation of an automatic coolant filling system for AAP St. Mary's Corporation frame saw. This unit would consist of:

- A 5 gallon master tank with it's own support stand and integral pump. This unit would be fillable from platform deck level.

-A 1 gallon distributor mounted clear tank with a high / low level sensing switch.

-Installation of a panel mounted warning light and description tag.

-Connecting fluid line with check valve and fitting.

We will install the assembly to the frame saw. We estimate around 4 hours installation time. Unit would operate on 110 vac control and be powered exclusively by the PLC.

The operator must keep the large tank full and the upper distributor mounted tank will feed the spray system. As the upper tank gets low, the level switch will engage the large tank pump, refilling the distributor tank. When the upper tank fluid level reaches the level switch it would shut off the transfer pump. An inline check valve would keep fluid from siphoning back to the master tank.

A panel mounted flashing light would indicate when the distributor tank is calling for fluid. If the master tank is empty and cannot refill the distributor tank the light continues flashing. Refilling of the master tank will shut off the flashing signal. No other interlocks are provided.

CONTROLS

No pushbutton control of this unit is to be supplied. All level switches for sensing and pump to be 120 vac. Wire numbers to be per existing sequence.

DELIVERY

Delivery will be 3 weeks pending receipt of purchase order.

EQUIPMENT GUARANTEE

We guarantee that the materials and workmanship entering into the construction of equipment covered by the proposal will be first class of their kind, in every respect, for the purpose stated herein. If, at any time within one year from starting operation with this equipment, it is established to our satisfaction that any part or parts of our manufacturer were defective at the time they were furnished, we will repair such part or parts if delivered F.O.B. our factory, replacement parts for such defective parts, and it is mutually agreed that we make no other guarantee. We are not to be held liable for loss, damage, or expense of any nature arising from defective material, workmanship, or parts. We will make no allowance for repairs, alterations, or work done unless specifically agreed to in writing.

TERMS

Terms to be 50% to in initiate order, 50% upon installation.

Gokoh Corporation will supply the above job scope for:

- System and installed complete $3,722.40

F.O.B. Fremont, Ohio

We hope this proposal meets your approval. We appreciate this opportunity to quote on your needs and if there should be any questions please do not hesitate to give me a call.

Respectfully,

Jeff Case
Sales

JC/erm

1280 Archer Drive • Troy, Ohio 45373 • Telephone 937-339-4977 • Fax 937-339-5146

GOKOH CORPORATION

1280 Archer Drive
Troy, Ohio 45373

Tel: 937-339-4977
Fax: 937-339-5146

January 18, 2000

Post-it® Fax Note 7671	Date 1-18-00	# of pages ▶ 1
To Daryl Brackney	From Parker	
Co./Dept.	Co. Gokon	
Phone #	Phone #	
Fax #	Fax #	

Subject: Revised Pricing & Delivery for 8 Position Cooling Station for Cross-Member Casting

Dear Mr. Cass and Mr. Brackney:

Per your request Gokoh Corporation is pleased to provide revised lower pricing options for the 8 Position Cooling Station for Cross-Member Casting as described in our quotation# 99080201R2.

These options are as follows:

1.	8 Position Cooling Station for Cross-Member Casting as described in quote# 99080201R2	$77,499.54 (with 9 week delivery)
2.	8 Position Cooling Station for Cross-Member Casting as described in quote# 99080201R2	$75,901.61 (with 12 week delivery)

We hope this revised pricing meets your requirements. If you need further information or have any questions please feel free to contact me at your earliest convenience.

Respectfully,

P. K. McFarland

for Parker Bailey
Senior Sales Manager

1/6

GOKOH CORPORATION

1280 Archer Drive
Troy, Ohio 45373

Tel: 937-339-4977
Fax: 937-339-5146

PO Written 1-11-00

January 11, 2000

Quotation # 99080201R2

Post-it™ Fax Note 7671	Date 1-11-00	# of pages ▶ 1/6
To Mr. Daryl Brackney	From Parker	
Co./Dept. AAP	Co. Gokoh	
Phone #	Phone #	
Fax # 419-394-4776	Fax #	

Mr. Daryl Brackney
AAP St. Mary's Corporation
1100 McKinley Road
St. Mary's, OH 45885

Subject: Cooling Station for Crossmember (Machine #2)

Dear Mr. Brackney:

Per our discussions, Gokoh Corporation submits pricing for a 2nd casting cool down booth for subframe castings. This unit is to air cool castings, coming direct from molding, at a temperature in excess of 350 degree C, to a more tolerable range around 50 degree C. We propose two different methods, one unit is to handle 4 castings at any time and will give up to 16 minutes of cool time. Optional unit is to handle 8 parts at any time and basically double the through put. Cooling is to be by high velocity air drawn over the parts and exhausted into the manufacturing area. Machine is to be manually loaded and unloaded. Air flow is to be by draft and negative pressure in a plenum using an exhaust fan.

Our feelings are that the most cost effective unit would be a duplicate unit to your existing. A double capacity unit will have to be completely re-engineered and several items up sized. A second drive wheel arrangement would have to be installed. In the end you would have roughly 3 times your normal capacity as the existing unit will still be operational.

As for redoing the existing unit, There would be considerable down time along with freight costs. Hardly any of the existing unit could be reused excepting maybe the power panel and 4 shelves. We can explore this but the cost effectiveness does not appear to be worth considering.

DUPLICATE UNIT

A duplicate to your existing unit is to be of 3" square tubing construction with 12 gauge sheet steel covering. Sheet is to be reinforced to withstand up to 1/2" of water column draft pressure. Outside dimensions to be roughly 7 ft. wide by 6.5 ft. deep and 7 ft. high excluding fan and ductwork. Fan height is in excess of 3 ft. Unit is to set on elevated platform with other equipment and under side of unit will transition down to a 24" inlet flange. This flange will allow a 24' diameter duct to extend on down to within 12" of facility floor. This will be the inlet source of air. This inlet will be baffled

and screened for blockage of object ingestion. Ductwork from fan outlet to discharge point in facility is to be by customer.

The top of booth will have a transition down to 18" diameter and will be flanged. Attached will be a 1 HP 18" tube axial fan arrangement of in excess of 3500 CFM static capacity. Draft of air through this arrangement will give 1400 fpm velocity through the 18" section and 1100 fpm through the 24" section. The inlet transition will also have directors and turbulators to stir the air around the parts. Fan decibles is rated at 88 in this configuration.

Castings will set on four individual resting "seats" that will be arranged in a Ferris Wheel pattern. The most recently loaded casting will be at 90 degrees and, as castings are loaded and unloaded, will cycle to 0 degrees, 270 degrees, and 180 degrees. This will eventually put the coldest casting to the inlet which is the coolest incoming air. The heat transfer rate will decrease as the temperature difference between part and air decreases. The casting seats will be on high temperature bearings to allow the castings to stay in a horizontal plane as they travel the Ferris Wheel circle.

At the 90 degree stops a brake or lock will engage to eliminate any tendency for the Ferris Wheel to rotate due to unbalance when a casting is removed. Indexing will perform when ever a casting is finally loaded and the operator door closes. Operator will open and close the door by foot switch. Upon closing the Ferris wheel will index 90 degrees and lock. Operator will reopen the door and remove a casting and replace with a hot one from mold, Then closing the door. Cycle time is molding period driven.

Wheel will rotate on 2" diameter shafting with external mounted flange bearings. Rotation of the Ferris Wheel will be by external ring and pinion gear with DC gear drive power. This will allow for speed adjustment, acceleration, and deceleration as the castings approach the 90 degree indexes. Door opening will be by pneumatic cylinder and solenoid as will the rotation lock. Door to travel on bushed slides or flange wheels and will be designed to seal against frame. All functions will be monitored by limit switch. All functions can be performed by manual pushbuttons.

OPTIONAL 8 STATION

An 8 Station unit will have the same floorspace footprint but would be approximately 6"-0" higher. The parts travel would be on individual shelves but traveling a vertical racetrack pattern instead of circular. Fan size is to be increased to 8000 CFM with 24" ductwork. All controls to be the same as your existing unit. All construction to also be the same except for vertical height.

Operation would have a part shelf available upon every 90 degrees rotation of the main drive wheel. Spacing between shelves will also be the same as the current unit but unit can be cycled every two minutes versus the existing four.

Power on either unit to be 480/240 3ph with 110 vac on control circuits. Machine control to be by Allen Bradley PLC. Electrical components to be Allen Bradley. All electric including motor starter and DC controller to be in a Nema enclosure with fused flanged disconnect. All outputs to be fused.

3/6

ENGINEERING

We will supply all engineering. We reserve the right to change the above concepts in light of future calculations as they develop. Three sets of utility drawings will be supplied at time of machine completion and a copy of CAD disc. All purchased components literature and maintenance information to be provided with machine.

DELIVERY

Delivery is determined by the best information we are able to obtain at the time. We estimate 12 weeks delivery for a duplicate unit and 16 weeks after receipt of purchase order for an 8 station. There will be a construction meeting after engineering completion prior to actual fabrication start to confirm machine design.

PAINTING

This system will be primed and painted to your standard colors with one coat of industrial enamel to all structural and plate work.

EQUIPMENT GUARANTEE

We guarantee that the materials and workmanship entering into the construction of equipment covered by this proposal will be first class of their kind, in every respect, for the purpose stated herein. If, at any time within one year from starting operation with this equipment, it is established to our satisfaction that any part or parts of our manufacturer were defective at the time they were furnished, we will repair such part or parts if delivered F.O.B. our factory: or at our option, we will supply F.O.B. our factory, replacement parts for such defective parts, and it is mutually agreed that we make no other guarantee,. We are not to be held liable for loss, damage, or expense of any nature arising from defective material, workmanship, or parts. We will make no allowance for repairs, alterations, or work done unless specifically agreed to in writing.

PURCHASE PRICE & PAYMENT

The purchase price for the equipment covered by this proposal shall be payable in current funds of the United States at per indicated on the signed page of this proposal. The price indicated will be valid for a period of 30 days from the date of this proposal.

CHANGES AND DELAYS

If you cause changes to be made, or delays, or interrupt the progress of the work, you are to reimburse us for any additional expense, or we are to credit you for any reduced cost which can be established as resulting from such causes. Also delivery date may be affected.

THE FOLLOWING ITEMS
OF WORK, MATERIALS, OR SERVICES ARE NOT INCLUDED
IN THIS PROPOSAL:

1. Field painting

2. Foundations, pits, pit covers, railings, anchor bolts, machine steel, pit steel, curb steel, or any other steel that is part of foundations.

3. Electrical wiring other than for control panel, piping of compressed air, hydraulics, gas, or water unless otherwise specified.

4. Wiring and wiring supplies, pipe fittings for field installation. However, we will pre-wire to convenient terminal boxes and plump to valves or manifolds from hydraulic components on the line.

5. Buildings

6. Federal, State, or local taxes of any kind.

7. Insurance against fire or other risks on any equipment after delivery by the carrier at your plant.

8. Grouting

9. Removal of existing equipment on the job site.

10. Supports and Foundations

11. Motors, Starters, or Pushbuttons other than listed as furnished.

12. Cutting or patching of holes in buildings or enclosures where equipment extend through buildings.

13. Platforms, walkways, ladder and railings except as specified.

14. No special provisions have been incorporated in pour proposal for noise abatement on equipment manufactured by suppliers other than Gokoh Corporation.

5/6

15. No other equipment not specified as furnished by Gokoh Corporation.

16. Service man charges on equipment not of our manufacture.

17. Installation of any sort.

LIABILITY

We are not to be held liable for any loss, damage, or delay due to transportation, accident, fire, strike, civil or military authority, insurrection or any causes beyond our control.

CLAIMS

We will consider no claims for shortages or errors unless such claim is made immediately after receipt of shipment.

CANCELLATION CLAUSE

This order cannot be countermanded or delivery date changed except by written consent of Gokoh Corporation on terms to indemnify said company against all losses from such changes can be estimated at costs incurred to date plus 15%.

TITLE AND OWNERSHIP

The title and right of possession of the equipment covered by this proposal shall remain with us until full and final payment therefor in cash shall have been made in accordance with there terms agreed upon, and all notes, if any, shall have been paid in full in cash.

We shall not be liable for any loss occurring after receipt of any shipment at your plant from fire, explosion, wind, water, exposure to the elements, or any other hazard outside of our control,. You are to provide proper insurance coverage of these risks to protect us against loss up to the time you have made final payment to us. In the absence of such insurance, you are liable for such loss.

MISCELLANEOUS CONDITIONS

As a manufacturer we have no means of determining definitely that our products meet OSHA specifications since the interpretation of a violation rests with the compliance officer, the OSHA Review Commission and ultimately the courts. The OSHA Act places the burden of compliance on the employer.

We attempt to, whenever possible. To incorporate OSHA recommendations and common sense items for safety features on our equipment. We will also be more that willing to incorporate specific safety features into the equipment covered by your purchase order providing such features can be

reevaluated with respect to the effect on the final price and it is understood that by doing so that the equipment may still not meet OSHA specifications.

TESTING AND TRIAL

This system will be wired and operating in our plant for your inspection and approval. Upon approval and providing financial terms are met, the equipment will then be disassembled, tagged, and loaded on the shipping carrier.

TERMS

Terms to 40% with order, 50% due at time of machine approval prior to shipment, and final 10% upon approval at customer's plant.

Gokoh Corporation will supply the above job scope for:

- Duplicate unit	$47,749.38 ea.
- 8 station unit	$79,896.43 ea.

F.O.B. Fremont, Ohio

We hope that this proposal meets your approval. We appreciate this opportunity to quote on your needs and if there should be any questions please do not hesitate to give me a call. A concept drawing of the 8 station can be made available if desired.

Respectfully,

Parker Bailey
Senior Sales Manager

PB/erm

This quote is valid for 30 days.

1/6

GOKOH CORPORATION

1280 Archer Drive
Troy, Ohio 45373

Tel: 937-339-4977
Fax: 937-339-5146

November 29, 1999

Quotation # 99080201R1

Mr. Daryl Brackney
AAP St. Mary's Corporation
1100 McKinley Road
St. Mary's, OH 45885

Subject: Cooling Station for Crossmember (Machine #2)

Dear Mr. Brachney:

Per our discussions, Gokoh Corporation submits pricing for a 2nd casting cool down booth for subframe castings. This unit is to air cool castings, coming direct from molding, at a temperature in excess of 350 degree C, to a more tolerable range around 50 degree C. We propose two different methods, one unit is to handle 4 castings at any time and will give up to 16 minutes of cool time. Optional unit is to handle 8 parts at any time and basically double the through put. Cooling is to be by high velocity air drawn over the parts and exhausted into the manufacturing area. Machine is to be manually loaded and unloaded. Air flow is to be by draft and negative pressure in a plenum using an exhaust fan.

Our feelings are that the most cost effective unit would be a duplicate unit to your existing. A double capacity unit will have to be completely re-engineered and several items up sized. A second drive wheel arrangement would have to be installed. In the end you would have roughly 3 times your normal capacity as the existing unit will still be operational.

As for redoing the existing unit, There would be considerable down time along with freight costs. Hardly any of the existing unit could be reused excepting maybe the power panel and 4 shelves. We can explore this but the cost effectiveness does not appear to be worth considering.

DUPLICATE UNIT

A duplicate to your existing unit is to be of 3" square tubing construction with 12 gauge sheet steel covering. Sheet is to be reinforced to withstand up to 1/2" of water column draft pressure. Outside dimensions to be roughly 7 ft. wide by 6.5 ft. deep and 7 ft. high excluding fan and ductwork. Fan height is in excess of 3 ft. Unit is to set on elevated platform with other equipment and under side of unit will transition down to a 24" inlet flange. This flange will allow a 24' diameter duct to extend on down to within 12" of facility floor. This will be the inlet source of air. This inlet will be baffled

The top of booth will have a transition down to 18" diameter and will be flanged. Attached will be a 1 HP 18" tube axial fan arrangement of in excess of 3500 CFM static capacity. Draft of air through this arrangement will give 1400 fpm velocity through the 18" section and 1100 fpm through the 24" section. The inlet transition will also have directors and turbulators to stir the air around the parts. Fan decibles is rated at 88 in this configuration.

Castings will set on four individual resting "seats" that will be arranged in a Ferris Wheel pattern. The most recently loaded casting will be at 90 degrees and, as castings are loaded and unloaded, will cycle to 0 degrees, 270 degrees, and 180 degrees. This will eventually put the coldest casting to the inlet which is the coolest incoming air. The heat transfer rate will decrease as the temperature difference between part and air decreases. The casting seats will be on high temperature bearings to allow the castings to stay in a horizontal plane as they travel the Ferris Wheel circle.

At the 90 degree stops a brake or lock will engage to eliminate any tendency for the Ferris Wheel to rotate due to unbalance when a casting is removed. Indexing will perform when ever a casting is finally loaded and the operator door closes. Operator will open and close the door by foot switch. Upon closing the Ferris wheel will index 90 degrees and lock. Operator will reopen the door and remove a casting and replace with a hot one from mold, Then closing the door. Cycle time is molding period driven.

Wheel will rotate on 2" diameter shafting with external mounted flange bearings. Rotation of the Ferris Wheel will be by external ring and pinion gear with DC gear drive power. This will allow for speed adjustment, acceleration, and deceleration as the castings approach the 90 degree indexes. Door opening will be by pneumatic cylinder and solenoid as will the rotation lock. Door to travel on bushed slides or flange wheels and will be designed to seal against frame. All functions will be monitored by limit switch. All functions can be performed by manual pushbuttons.

OPTIONAL 8 STATION

An 8 Station unit will have the same floorspace footprint but would be approximately 6"-0" higher. The parts travel would be on individual shelves but traveling a vertical racetrack pattern instead of circular. Fan size is to be increased to 8000 CFM with 24" ductwork. All controls to be the same as your existing unit. All construction to also be the same except for vertical height.

Operation would have a part shelf available upon every 90 degrees rotation of the main drive wheel. Spacing between shelves will also be the same as the current unit but unit can be cycled every two minutes versus the existing four.

Power on either unit to be 480/240 3ph with 110 vac on control circuits. Machine control to be by Allen Bradley PLC. Electrical components to be Allen Bradley. All electric including motor starter and DC controller to be in a Nema enclosure with fused flanged disconnect. All outputs to be fused.

ENGINEERING

We will supply all engineering. We reserve the right to change the above concepts in light of future calculations as they develop. Three sets of utility drawings will be supplied at time of machine completion and a copy of CAD disc. All purchased components literature and maintenance information to be provided with machine.

DELIVERY

Delivery is determined by the best information we are able to obtain at the time. We estimate 12 weeks delivery for a duplicate unit and 16 weeks after receipt of purchase order for an 8 station. There will be a construction meeting after engineering completion prior to actual fabrication start to confirm machine design.

PAINTING

This system will be primed and painted to your standard colors with one coat of industrial enamel to all structural and plate work.

EQUIPMENT GUARANTEE

We guarantee that the materials and workmanship entering into the construction of equipment covered by this proposal will be first class of their kind, in every respect, for the purpose stated herein. If, at any time within one year from starting operation with this equipment, it is established to our satisfaction that any part or parts of our manufacturer were defective at the time they were furnished, we will repair such part or parts if delivered F.O.B. our factory: or at our option, we will supply F.O.B. our factory, replacement parts for such defective parts, and it is mutually agreed that we make no other guarantee,. We are not to be held liable for loss, damage, or expense of any nature arising from defective material, workmanship, or parts. We will make no allowance for repairs, alterations, or work done unless specifically agreed to in writing.

PURCHASE PRICE & PAYMENT

The purchase price for the equipment covered by this proposal shall be payable in current funds of the United States at per indicated on the signed page of this proposal. The price indicated will be valid for a period of 30 days from the date of this proposal.

CHANGES AND DELAYS

If you cause changes to be made, or delays, or interrupt the progress of the work, you are to reimburse us for any additional expense, or we are to credit you for any reduced cost which can be established as resulting from such causes. Also delivery date may be affected.

4/6

THE FOLLOWING ITEMS OF WORK, MATERIALS, OR SERVICES ARE NOT INCLUDED IN THIS PROPOSAL:

1. Field painting
2. Foundations, pits, pit covers, railings, anchor bolts, machine steel, pit steel, curb steel, or any other steel that is part of foundations.
3. Electrical wiring other than for control panel, piping of compressed air, hydraulics, gas, or water unless otherwise specified.
4. Wiring and wiring supplies, pipe fittings for field installation. However, we will pre-wire to convenient terminal boxes and plump to valves or manifolds from hydraulic components on the line.
5. Buildings
6. Federal, State, or local taxes of any kind.
7. Insurance against fire or other risks on any equipment after delivery by the carrier at your plant.
8. Grouting
9. Removal of existing equipment on the job site.
10. Supports and Foundations
11. Motors, Starters, or Pushbuttons other than listed as furnished.
12. Cutting or patching of holes in buildings or enclosures where equipment extend through buildings.
13. Platforms, walkways, ladder and railings except as specified.
14. No special provisions have been incorporated in pour proposal for noise abatement on equipment manufactured by suppliers other than Gokoh Corporation.
15. No other equipment not specified as furnished by Gokoh Corporation.
16. Service man charges on equipment not of our manufacture.
17. Installation of any sort.

LIABILITY

We are not to be held liable for any loss, damage, or delay due to transportation, accident, fire, strike, civil or military authority, insurrection or any causes beyond our control.

CLAIMS

We will consider no claims for shortages or errors unless such claim is made immediately after receipt of shipment.

CANCELLATION CLAUSE

This order cannot be countermanded or delivery date changed except by written consent of Gokoh Corporation on terms to indemnify said company against all losses from such changes can be estimated at costs incurred to date plus 15%.

TITLE AND OWNERSHIP

The title and right of possession of the equipment covered by this proposal shall remain with us until full and final payment therefor in cash shall have been made in accordance with there terms agreed upon, and all notes, if any, shall have been paid in full in cash.

We shall not be liable for any loss occurring after receipt of any shipment at your plant from fire, explosion, wind, water, exposure to the elements, or any other hazard outside of our control,. You are to provide proper insurance coverage of these risks to protect us against loss up to the time you have made final payment to us. In the absence of such insurance, you are liable for such loss.

MISCELLANEOUS CONDITIONS

As a manufacturer we have no means of determining definitely that our products meet OSHA specifications since the interpretation of a violation rests with the compliance officer, the OSHA Review Commission and ultimately the courts. The OSHA Act places the burden of compliance on the employer.

We attempt to, whenever possible. To incorporate OSHA recommendations and common sense items for safety features on our equipment. We will also be more that willing to incorporate specific safety features into the equipment covered by your purchase order providing such features can be reevaluated with respect to the effect on the final price and it is understood that by doing so that the equipment may still not meet OSHA specifications.

TESTING AND TRIAL

This system will be wired and operating in our plant for your inspection and approval. Upon approval and providing financial terms are met, the equipment will then be disassembled, tagged, and loaded on the shipping carrier.

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F.O.B. Fremont, Ohio	

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Respectfully,

Jeff Case
Sales

JC/erm

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1/6

GOKOH CORPORATION

1280 Archer Drive
Troy, Ohio 45373

Tel: 937-339-4977
Fax: 937-339-5146

February 8, 1999

Quotation # 99080201

Post-it® Fax Note 7671	Date 2/9/99	# of pages ▶ 1/6
To Daryl Brackney	From Parker	
Co./Dept. AAP-St.Mary's	Co. Gokoh	
Phone #	Phone #	
Fax # 419-394-4776	Fax #	

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The top of booth will have a transition down to 18" diameter and will be flanged. Attached will be a 1 HP 18" tube axial fan arrangement of in excess of 3500 CFM static capacity. Draft of air through this arrangement will give 1400 fpm velocity through the 18" section and 1100 fpm through the 24" section. The inlet transition will also have directors and turbulators to stir the air around the parts. Fan decibles is rated at 88 in this configuration.

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6/6

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Respectfully,

Parker Bailey
Senior Sales Manager

PB/dlm

This quote is valid for 30 days.

LIMA SHEET METAL

FABRICATION & WELDING
WE MAKE MOST ANYTHING STEEL, STAINLESS, ALUMINUM
1001 BOWMAN RD. • LIMA, OHIO 45804
PHONE 419-229-1161 • FAX 419-229-8538

February 23, 1999

Daryl Brackney,

Lima Sheet Metal respectfully request additional funds for the three (3) AGE FURNACE PART CARRIERS (PO# P-57310). The first request is for design, engineering and improvement. For this we are requesting and additional $288.00 which is for eight (8) hours at $36.00/hr. The second request is for an additional $75.00 per unit for the second and third units due to the changes in the first. Please review this and contact Butch Delap if there are any questions concerning this matter.

Again we are requesting the following:

Design/Engineering/Improvement (Carrier 1 of 3)	
8 labor hours @ $36.00/hr.	$288.00
Changes for Carriers #2 & #3	
$75.00 each	$150.00
Total Request	**$438.00**

Thank you for your cooperation.

Sincerely,

Steven M. Emerick, B.S.M.E.
Eng. Coor., Lima Sheet Metal, Inc.

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

PO written 2/10/99

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARYL BRACKNEY

PROPOSAL

Proposal Date:2/8/99	Proposal No.:1532	F.O.B.	Terms

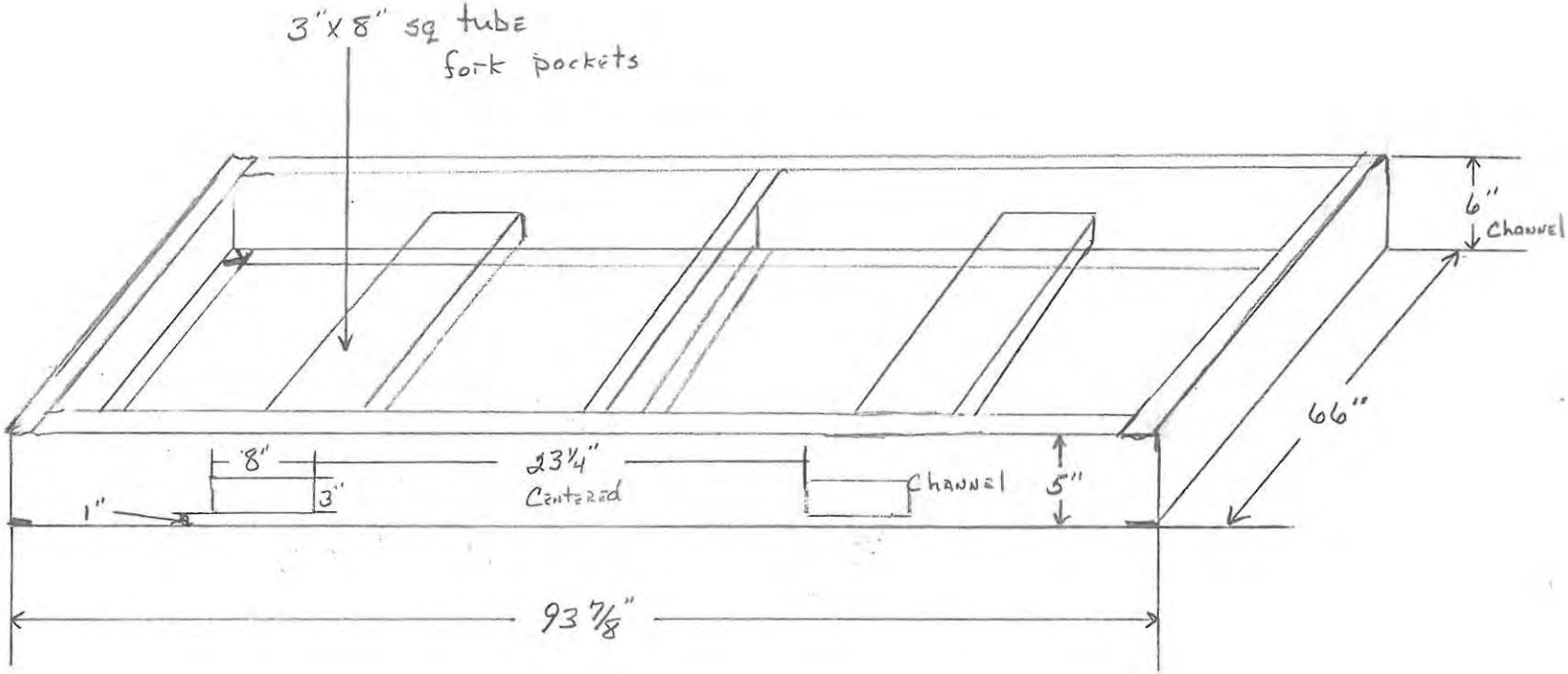
Qty.	Description	Price	Amount
3	AGE FURNACE PART CARRIERS AS PER FAX DRAWING.	$1425.00 EA	$4275.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY:BUTCH DELAP Butch Delap ACCEPTED: DATE:

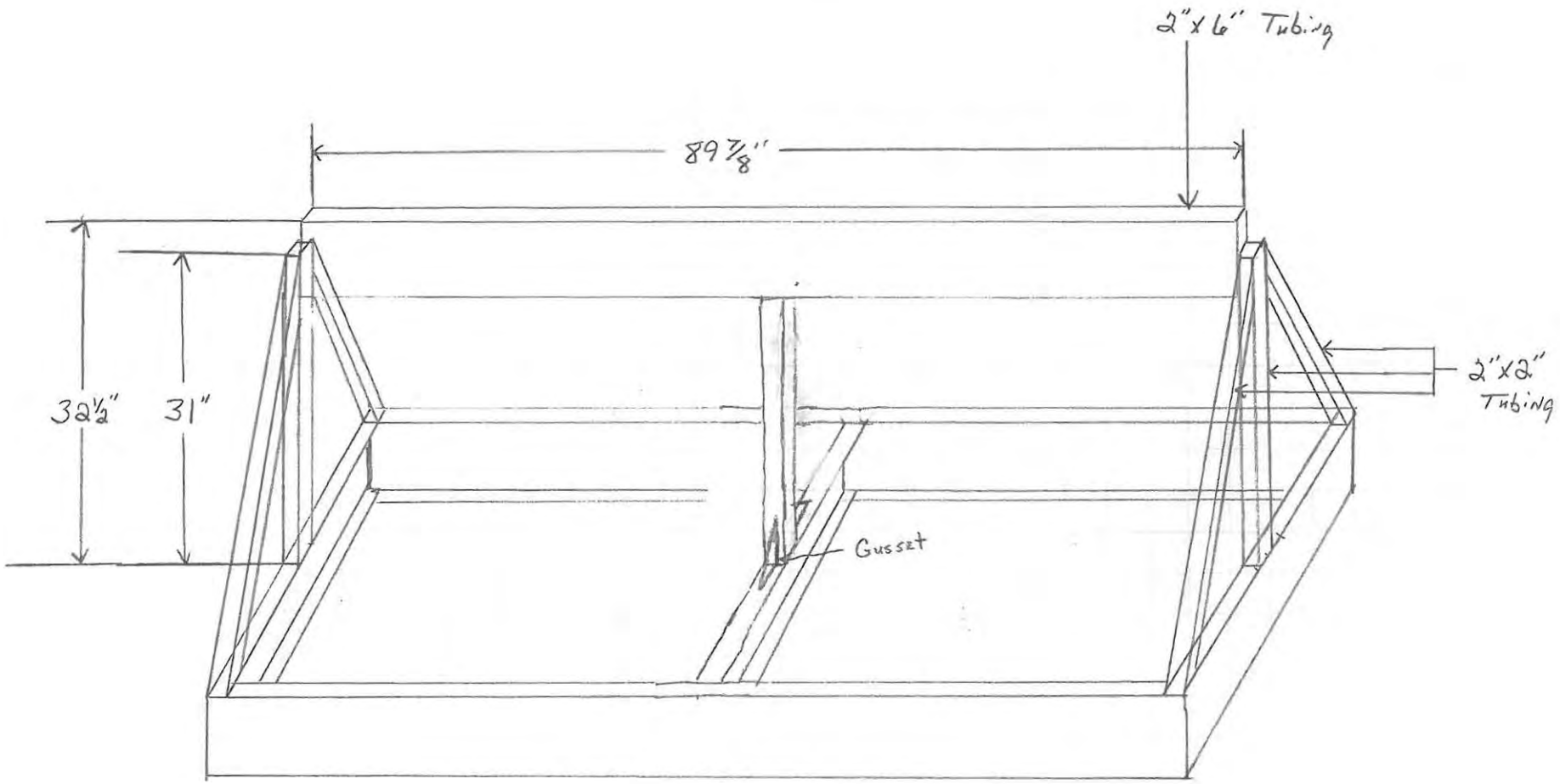
Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

Base


3"x8" sq tube
fork pockets
6"
Channel
66"
8"
3"
1"
23¼"
Centered
Channel
5"
93 7/8"

3/6

Base & Main Frame



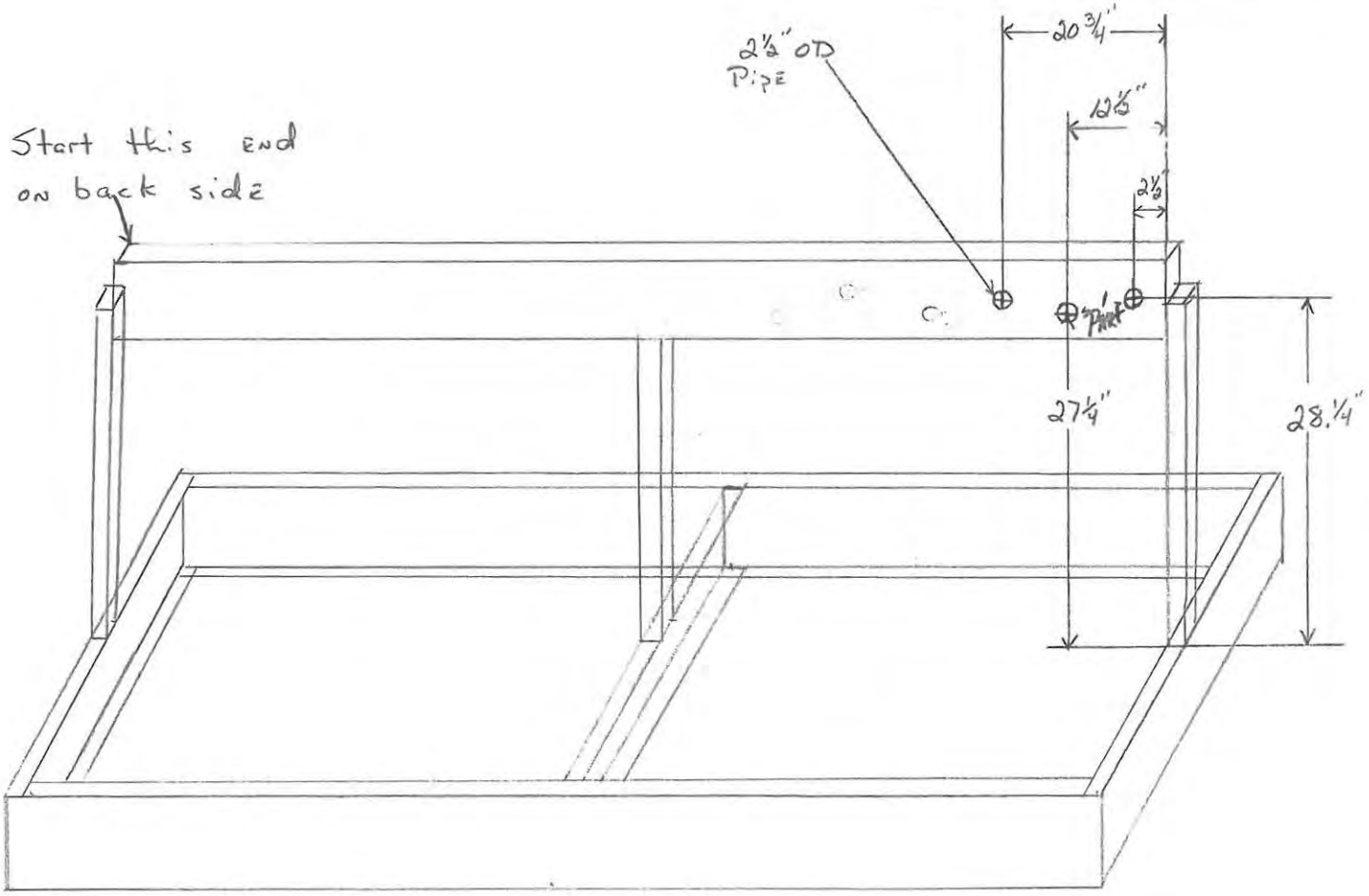
4/2

Hanger Pipe Alignment

10 L
8¼ H

Need 5 part positions per each side of carrier.

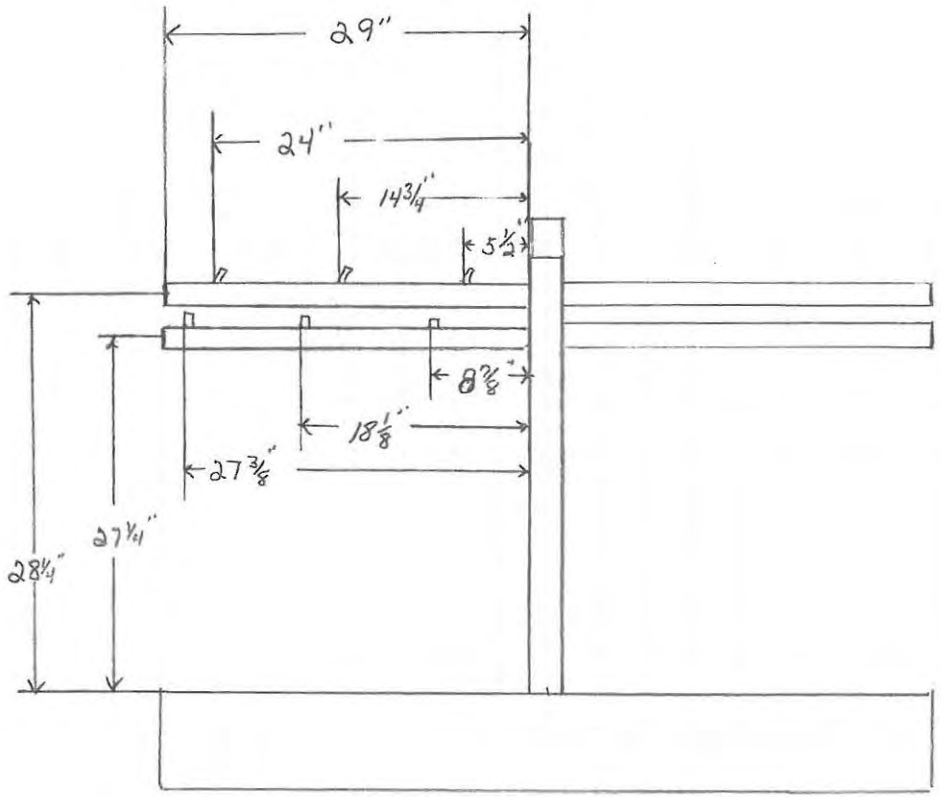
Continue Spacing at this measurment than turn carrier around & use same measurement but start at opposite end.



5/4

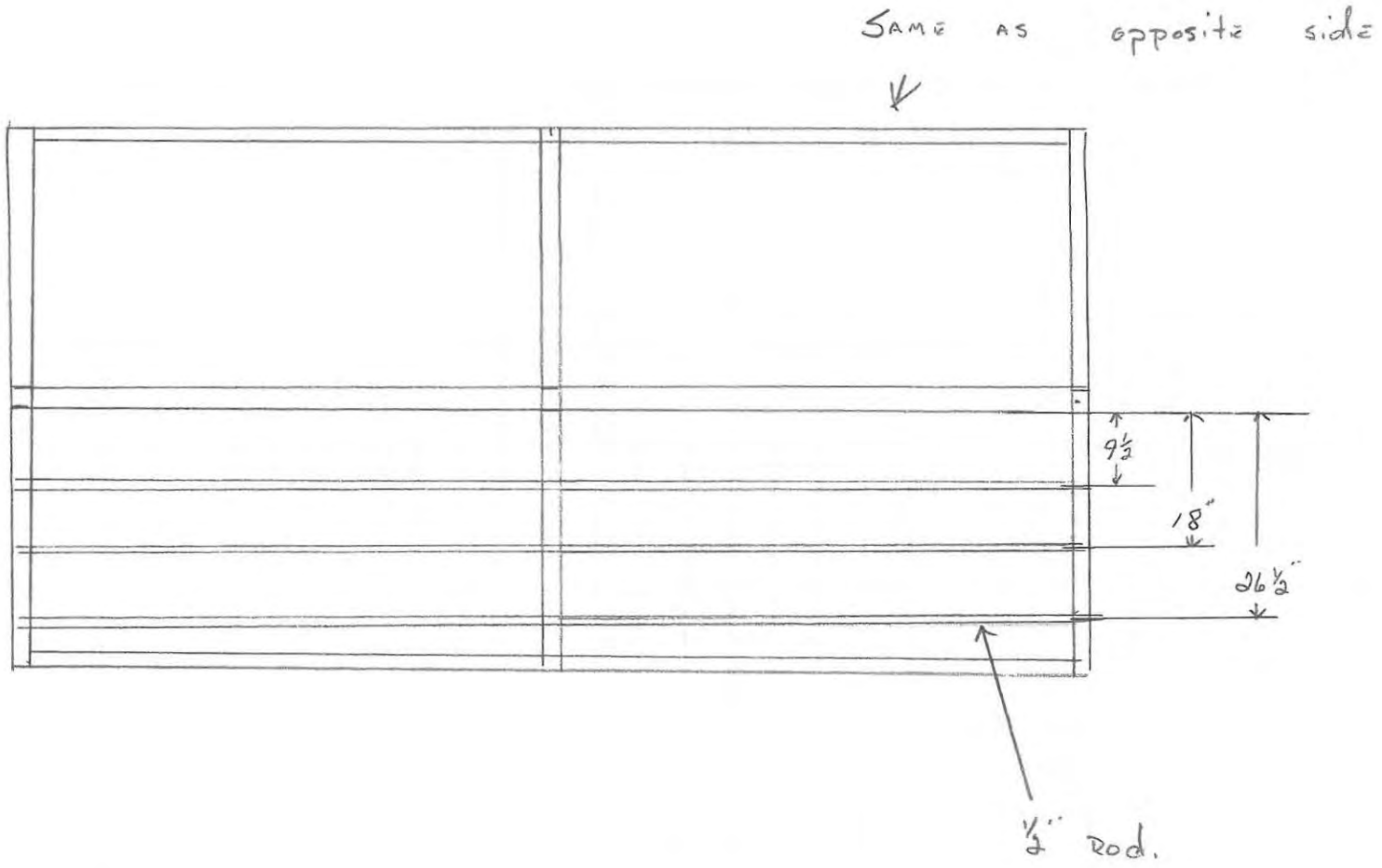
Nubs on Hanger Pipes
(End view)

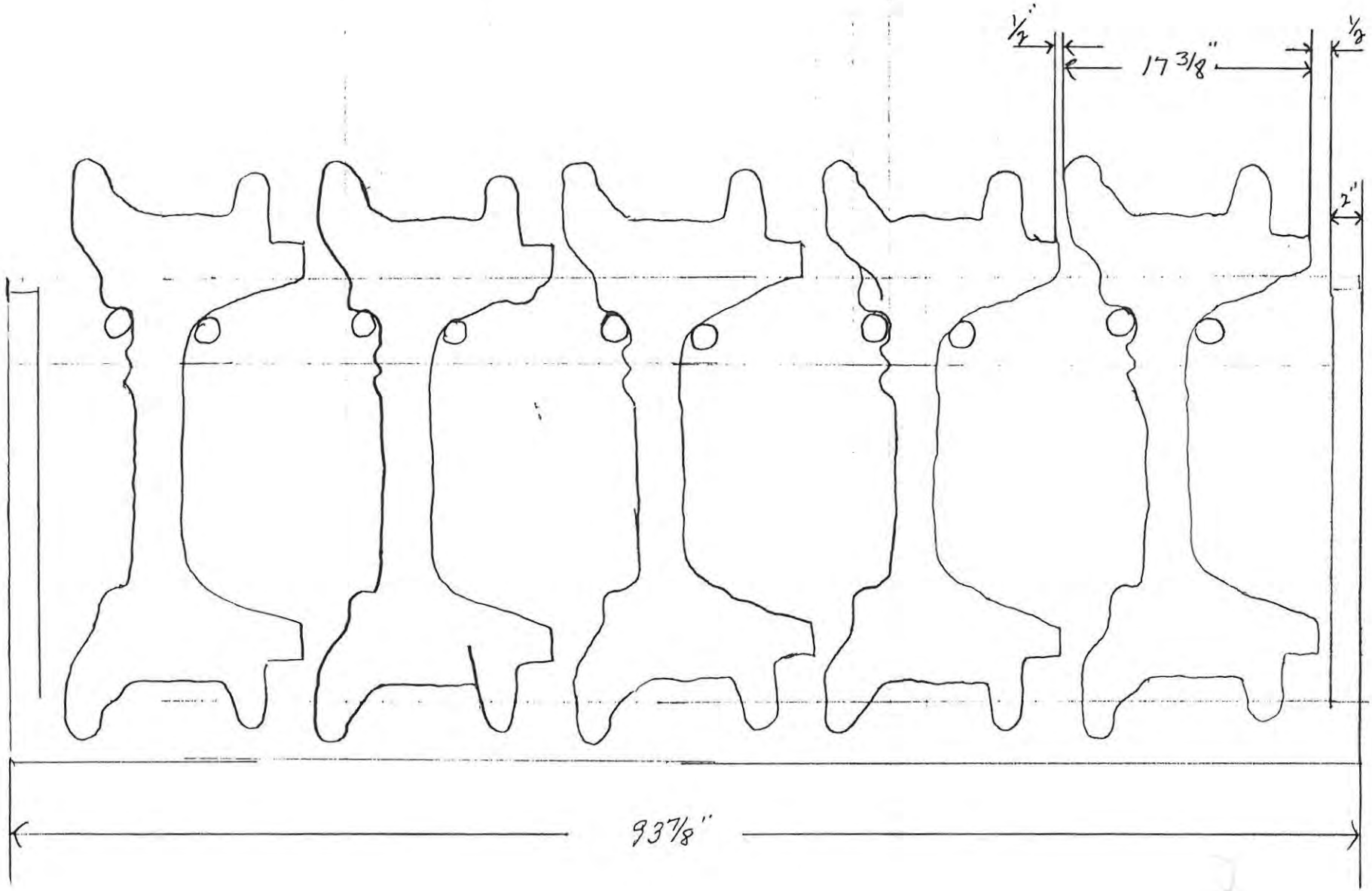
Same on opposite side.

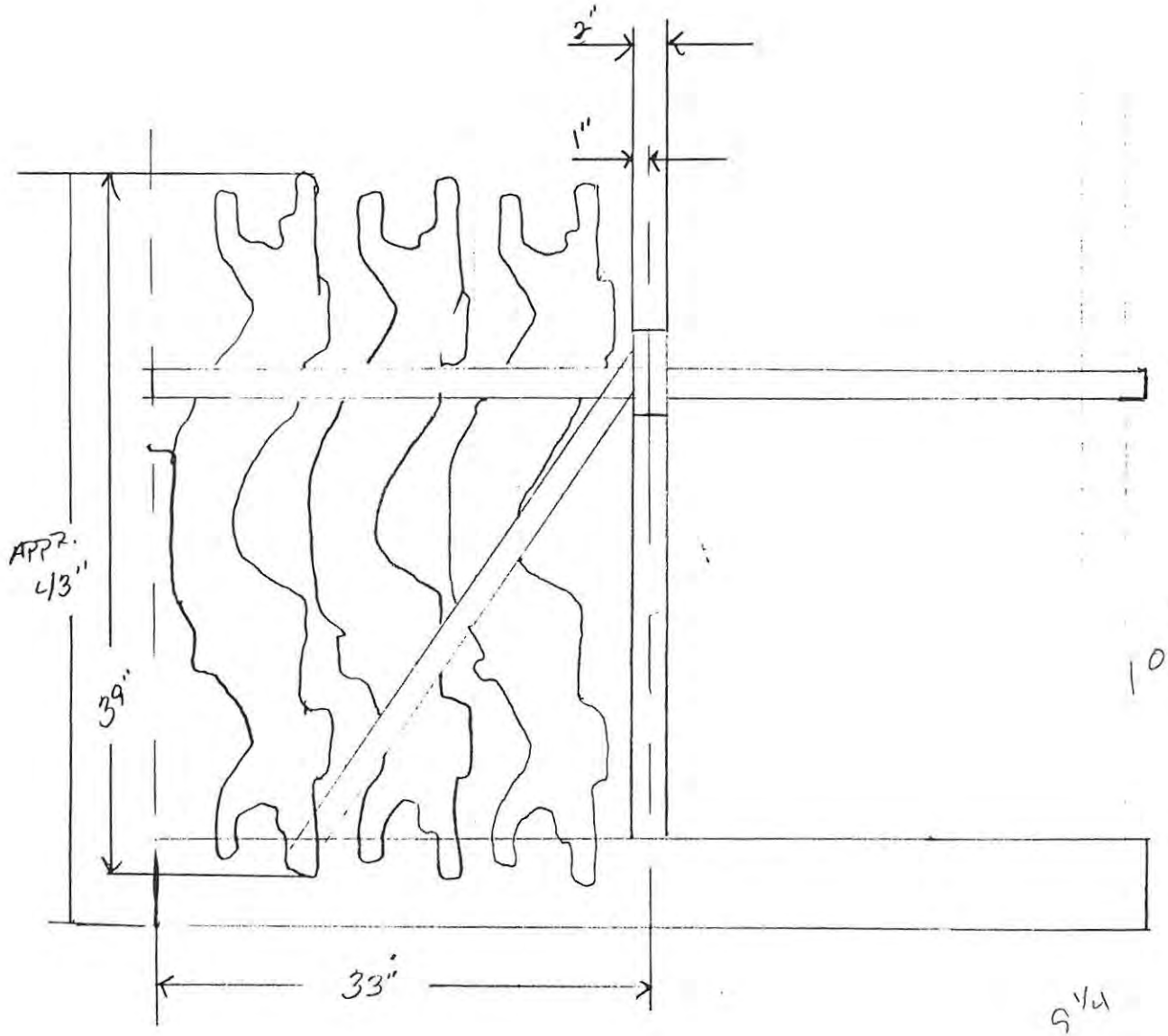


6/6

Base Part Bottom Bars
(Top View)




1/2"
17 3/8"
1/8
2"
93 7/8"



3/4

6/8

10 3/8

2 1/2 OD
PIPE

19 1/4 - 19 1/2

29 1/8 29 1/2

9 1/4

FROST & CO
- INC -

9 Broadway Street
Wapakoneta. Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

A merit shop
Contractor
serving all of
Western Ohio

September 9, 1998

AAP - St. Marys
1100 Mckinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: AGING OVEN CARRIERS

Dear Daryl,

As per our meeting and discussion about 2 - 3 new carriers, for the aging oven, with the modifications you requested, please find our estimate listed bleow.

Cost for 1 $ 1,511.00

QTY - 2 (Ea) Cariers for aging oven
(As per customers specifications)

Cost for 2 $ 3,022.00

Cost for 3 $ 4,457.00

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

If you have any questions, please feel free to call.

Sincerely,

Butch Delap
Millwright Superintendent

ACCEPTED BY_____DATE_____

AN EQUAL OPPORTUNITY EMPLOYER

ROSE

ROSE METAL INDUSTRIES, Inc.

FABRICATING & FORGING SPECIALISTS

1536 EAST 43RD STREET • CLEVELAND, OHIO 44103
PHONE: 216/881-3355 • FAX: 216/881-3689

BillTo
AAP ST. MARYS CORPORATION
P. O. BOX 408

ST. MARYS OH 45885

ShipTo
AAP ST. MARYS CORPORATION
1100 MCKINLEY AVENUE

ST. MARYS OH 45885

Job No:64097

CustNo AAPSMO

Job Date	Cust. P.O. No	Ordered By	Projected Ship Date
10/25/96	F-24601	GREG CASS	
Terms	**Via**	**Contact**	**Weight**
NET 30	BEST WAY	ALAN KOHLRIESER	

Qty Ord	Back Order	Description	Each	Total
15		**PartNo1** 64097-1	1750.00	26250.00
		DwgNo:		
		CustPartNo:		
		BASKET, HEAT TREAT		
		FOR ALUMINUM CROSS MEMBERS, LOW CARBON STEEL		
		1 PROTOTYPE W/ ROUND & REC TUBING BY 11/30/96		
		BALANCE BY 2/28/97		

[ ] HT TR_____ [ ] REWORK_____ [ ] 100%VIS/SPOT DIM__ [ ] WELDS MG FLX._____
[ ] MGFLX._____ _____ [ ] SPOT VIS/DIM_____ [ ] 100%MGFLX._____
[ ] WELD_____ [ ] SHIP_____ [ ] 100%VIS/DIM_____ [ ] CUT SIZES_____
[ ]_____ _____ [ ] DYE PENZ/SC_____ [ ] STOCK CHECK_____
[ ] BUY_____

Job No: 64097

Quotation

KELLY INDUSTRIAL SERVICES, INC.
P.O. BOX 237
975 BEAVER ROAD
ST. CHARLES, MI 48655

Quote Number: 97-209

Quote Date: Feb 14, 2000

Quoted to:
AAP ST. MARYS CORPORATION
1100 MCKINLEY ROAD
ST. MARYS, OH 45885

Customer ID	Good Thru	Payment Terms	Sales Rep
AAP ST. MARYS	3/15/00	Net 30 Days	

Quantity	Description	Unit Price	Extension
1.00	LABOR AND MATERIAL TO MODIFY BLUE SURF OVEN FOR AUTOMATIC LOAD AND UNLOAD SYSTEM TO BE SIMILAR TO PIFCO FURNACE. INCLUDED IN PRICE ALL MECHANIC AND NEUMATIC PIPING FABRICATION OF NEW CAR, NEW DOOR AND CHAIN RETURN. ALL ELECTRICAL MATERIAL AND LABOR.		21,500.00
		Subtotal	21,500.00
		Sales Tax	
		Total	21,500.00

OUR GANG WELDING, INC.
05030 VOGEL RD.
ST. MARYS, OH 45885
PHONE (419) 394-2969
FAX (419) 394-1724

DATE
2/10/2000 Quote

BILL TO:

AAP St.Marys Corp.
1100 McKinley Rd.
St.Marys, OH 45885

Attn: Daryl Brackney

P.O. NUMBER	TERMS	PROJECT
	Net 30	

QUANTITY	DESCRIPTION	RATE	AMOUNT
1	Oven Cart- approximately 10' x 7', 6" channel construction similar to existing cart with 6" steel casters w/ V grooves Delivery included	1,490.00	1,490.00
1	Oven Door - approximately 10' x 8' x 4" thick - 4 x 1/2 tube framework covered with 18 gauge CR sheeting filled with 8 lb mineral wool. This price is for drop off of door only, seals, hardware and installation not included. Note: Installation of above or additional parts will be billed time & mat'l	2,130.00	2,130.00

This proposal may be withdrawn by us If not accepted within 30 days.

TOTAL

CONSOLIDATED MACHINERY MOVERS, INC.
15 HEID AVENUE, DAYTON, OHIO 45404 TEL. (937) 233-0926 FAX: (937) 233-1162

Mr. Daryl Brackney January 29, 2000
AAP ST Marys
1100 McKinley Rd.
ST Marys, Ohio 45885

SUBJECT: QUOTATION INFORMATION FOR THE INSTALLATION OF USED OVEN AT AAP ST. MARYS, AS SPECIFIED.

Dear Daryl,

In regard to the above mentioned subject, we offer the following quotation information:

SCOPE OF WORK:

This work is to be completed working on a straight time basis.

1. To unload oven from truck.
2. To set on floor in location.
3. Truck must be on job site by 8:00 AM day of work.
4. Waiting on truck will be at premium rate.

Quotation Price $1800.00

Very truly yours,

CONSOLIDATED MACHINERY MOVERS, INC.

Paul Daugherty
Project Manager

200016

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

CARRIER
36pc

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date:1/14/00	Proposal No.:4878	F.O.B.	Terms

Qty.	Description	Price	Amount
1	AGE FURNACE CARRIER.		$2300.00
	DELIVERY 10 WORKING DAYS FROM RECEIPT OF P.O.		

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: ACCEPTED: DATE:

ERIC VORE

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date: 1/26/00	Proposal No.:4950	F.O.B.	Terms

Qty.	Description	Price	Amount
	AGE OVEN CART AS PER CONVERSATION WITH BUTCH DELAP.		
	FABRICATE, PAINT (HIGH TEMP. SILVER) DELIVER		$1200.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: Steve Emerick /gd ACCEPTED: DATE:

STEVE EMERICK

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer

Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer

Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

Cart

EMPIRE CASTINGS, INC.

3195 REGIONAL PARKWAY, SANTA ROSA, CA 95403
TEL:(707) 545-2232•FAX(707)523-9829

FACSIMILE TRANSMITTAL SHEET

Daryl Brackney	FROM: Ed Wickham
COMPANY: AAP St Mary's Corp	DATE: 01/25/00
FAX NUMBER: 419-394-4776	TOTAL NO. OF PAGES INCLUDING COVER: 1
PHONE NUMBER: 419-394-7840	SENDER'S REFERENCE NUMBER:
RE: Mold shuttle cart	YOUR REFERENCE NUMBER:

☐ URGENT ☒ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Item#	Qty	Description	Price
001	1 ea	Manually operated mold shuttle cart. Two way pallet design via forklift. Heavy duty casters with locking mechanism. One set of removable rails to be located on bottom platen T-slot plate. Swivel jig type mold plate to assist in indicating Mold to movable platen. Shuttle load capacity 10,000 lbs. Paint: AAP Green	$5,000.00

Delivery: 6 weeks ARO
FOB: Our plant

Best regards,

Ed Wickham

QUOTATION

From



C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: DARREL BRACKNEY
PO BOX 408
ST MARYS OH 45885

No. 2691

Date 2/9/00

Your No. _____

Your Due Date _____

Terms NET 30 DAYS

Prices quoted are
F.O.B. _____

Delivery Date _____

We are pleased to quote as follows:

1	LABOR AND MATERIALS TO MODIFY DIE CHANGING CART AS PER OUR DISCUSSION.	$385.00	EA	$385.00

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date: 1/26/00	Proposal No.:4949	F.O.B.	Terms

Qty.	Description	Price	Amount
	REVAMP DIE INSTALLATION TABLE AS PER CONVERSATION WITH BUTCH DELAP.		$950.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: Steve Emerick /jk ACCEPTED: DATE:

STEVE EMERICK

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

EMPIRE CASTINGS, INC.
3195 REGIONAL PARKWAY • SANTA ROSA, CA 95403 • (707) 545-2282 • FAX (707) 523-9829

Fax

(2) PAGES

To: AAP ST. MARYS CORP. From: ED WICKHAM

Attention: DARYL BRACKNEY

Phone: Date: 10/30/98

Fax: 419-394-4776

Re: CC:

☐ Urgent XX For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments

RE: EMPIRE CASTINGS, INC.
QUOTATION NO: 011864.aap REVISION A
MOLD LOADING SHUTTLE

Best Regards

Empire Castings Inc. Quotation No.: 011864.aap Revision A
Mold Loading Shuttle

Date: 10/30/98

Requestor:

AAP St. Marys Corp.
1100 McKinley Road
St. Mary's, OH, USA, 45885

Item#	*Qty*	*Description*
001	*1 each*	*Manually operated mold shuttle* *Includes:* *Shuttle cart to be lifted via fork lift.* *Four way pallet design for lifting in any direction.* *Four Heavy Duty Casters with bearings two with locking mechanism.* *Swivel type mold plate to assist in indicating mold to moveable platen.* *Cost: $4,200.00*

Terms:
50% down payment, balance due upon delivery.

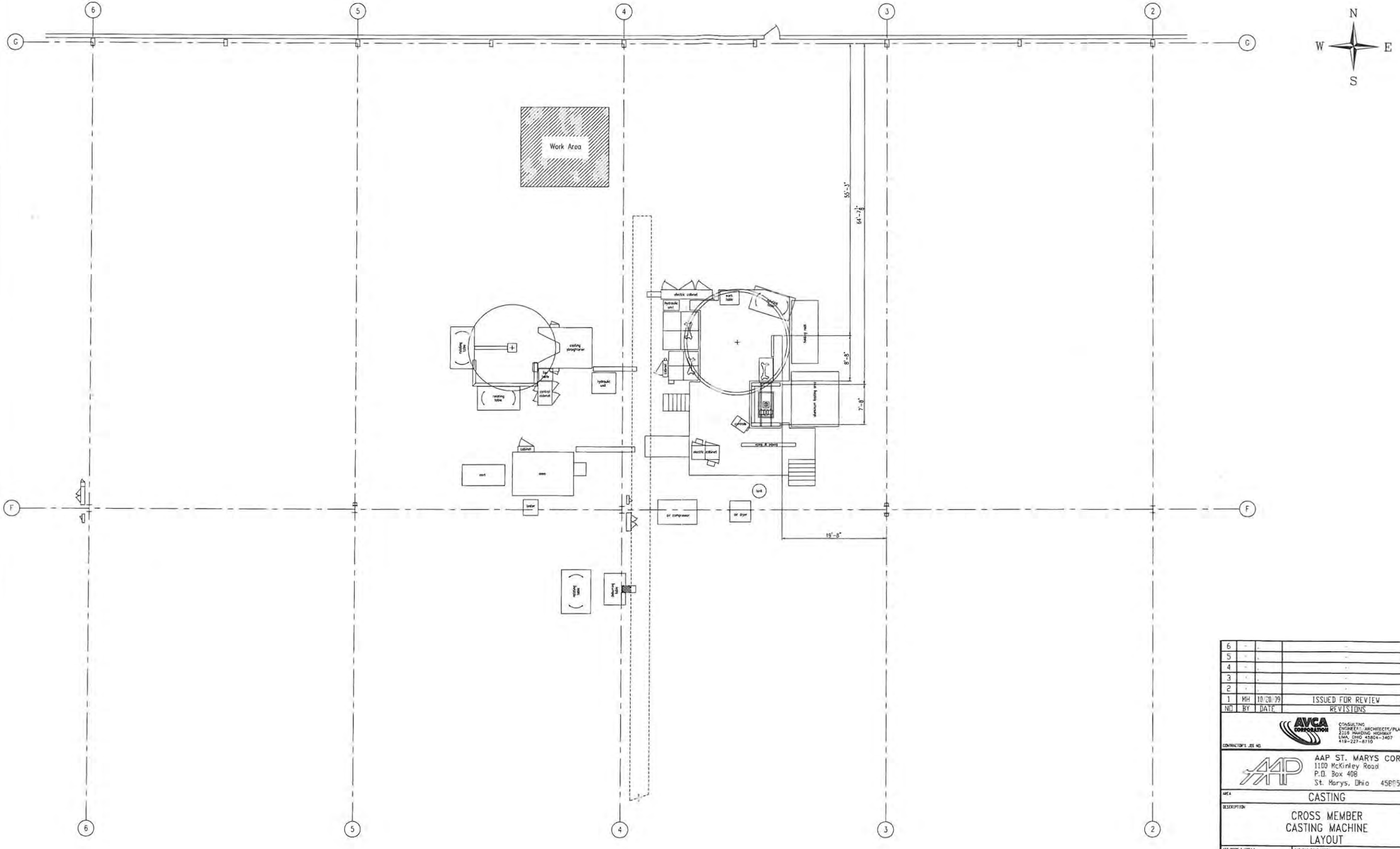
Delivery: 8 weeks ARO.

Thank you for the opportunity to quote your requirements.

Best regards,



Ed Wickham
Plant Manager



NO	BY	DATE	REVISIONS	PROG. #
6	-	-	-	-
5	-	-	-	-
4	-	-	-	-
3	-	-	-	-
2	-	-	-	-
1	MH	10/20/99	ISSUED FOR REVIEW	-

AVCA CORPORATION
CONSULTING ENGINEERS / ARCHITECTS / PLANNERS
2258 HANDING HIGHWAY
LIMA, OHIO 45804-3407
419-227-8710

CONTRACTOR'S JOB NO.

AAP ST. MARYS CORP.
1100 McKinley Road
P.O. Box 408
St. Marys, Ohio 45885

AREA: CASTING

DESCRIPTION: CROSS MEMBER CASTING MACHINE LAYOUT

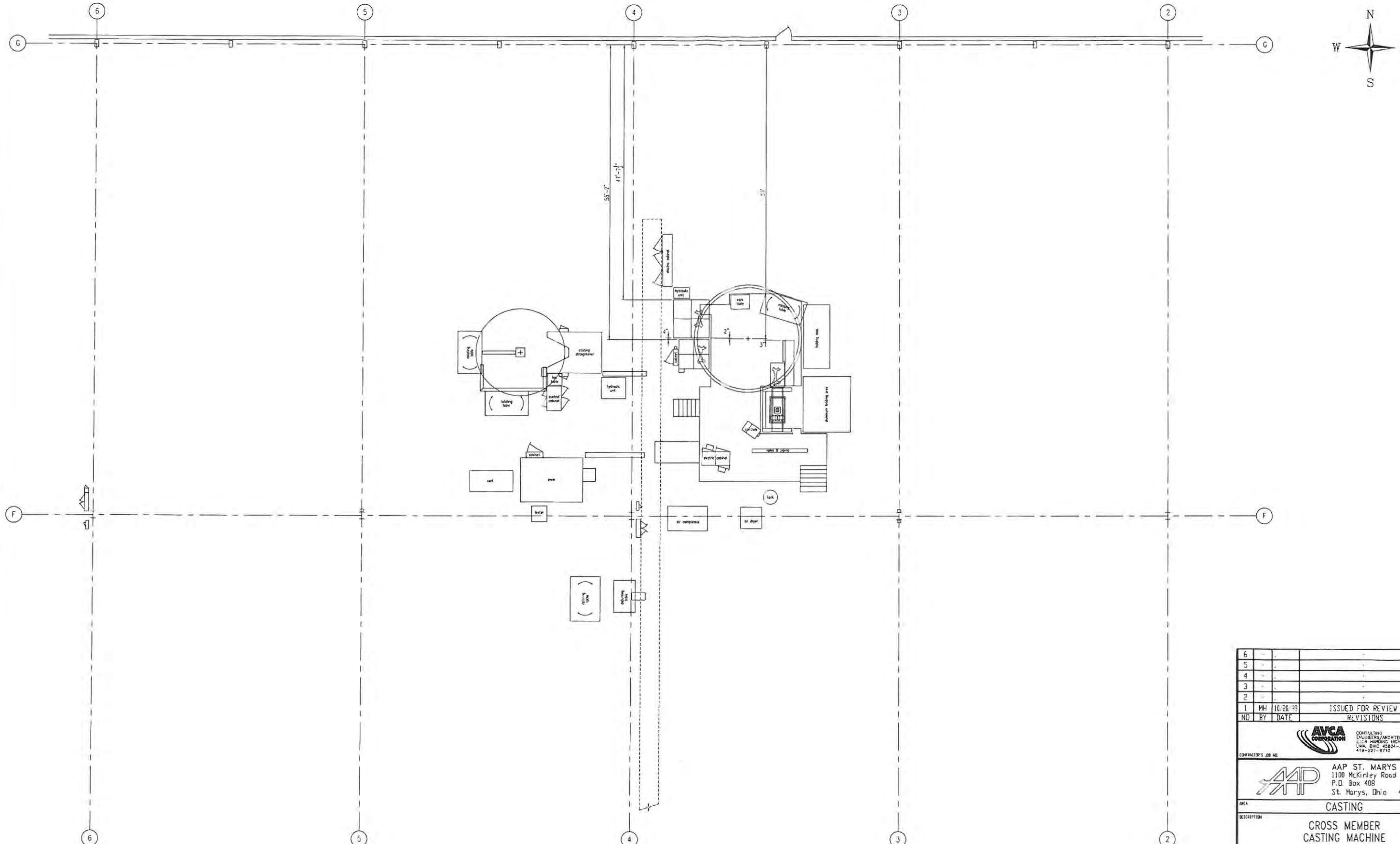
AAP CAD FILE NAME: 04005-27

DRAWN	DATE DRAWN	CHECKED	DATE CHKD.	APPROVED	DATE APPR.
M.H.	10/8/99	-	-	-	-

SCALE: 1/8"=1'-0" | DRAWING NO: 4005-27A | REV: 0

JAN 1 1 2000

PLOT DATE: 1-11-00 11:05 a.m.



NO	BY	DATE	REVISIONS	PROG. #
6	-	.	-	-
5	-	.	-	-
4	-	.	-	-
3	-	.	-	-
2	-	.	-	-
1	MH	10/20/99	ISSUED FOR REVIEW	-

AVCA CORPORATION
CONSULTING ENGINEERS/ARCHITECTS/PLANNERS
2306 HARDING HIGHWAY
LIMA, OHIO 45804-3407
419-227-8710

CONTRACTOR'S JOB NO.

AAP ST. MARYS CORP.
1100 McKinley Road
P.O. Box 408
St. Marys, Ohio 45885

AREA: CASTING

DESCRIPTION: CROSS MEMBER CASTING MACHINE LAYOUT

AFE/PROG.#/PROJ.#	AAP CAD FILE NAME				
-	04005-27				
DRAWN	DATE DRAWN	CHECKED	DATE CHKD.	APPROVED	DATE APPR.
M.H.	10/8/99	-	.	-	.
SCALE	DRAWING NO.				REV.
1/8"=1'-0"	4005-27B				0

JAN 1 1 2000

PLOT DATE: 1-11-00 10:50 a.m.

1-11-00

To: Tim Waters

From: Daryl Brackney

MUSIC AIR QUENCH current 16 min → min

1/30 DARE (2) PLATFORM / CEMENT WORK

1/30 MH (3) RELOCATION OF EQUIPMENT SAW, QUENCH MANIPULATO

1/30 MH (5) PLATFORMS CEMENT / BEAMS

" (5) AGING LOCATION

" (6) UTILITYS.

MAT'L (1) MAN POWER. (NOW 3 → 5 people/shift

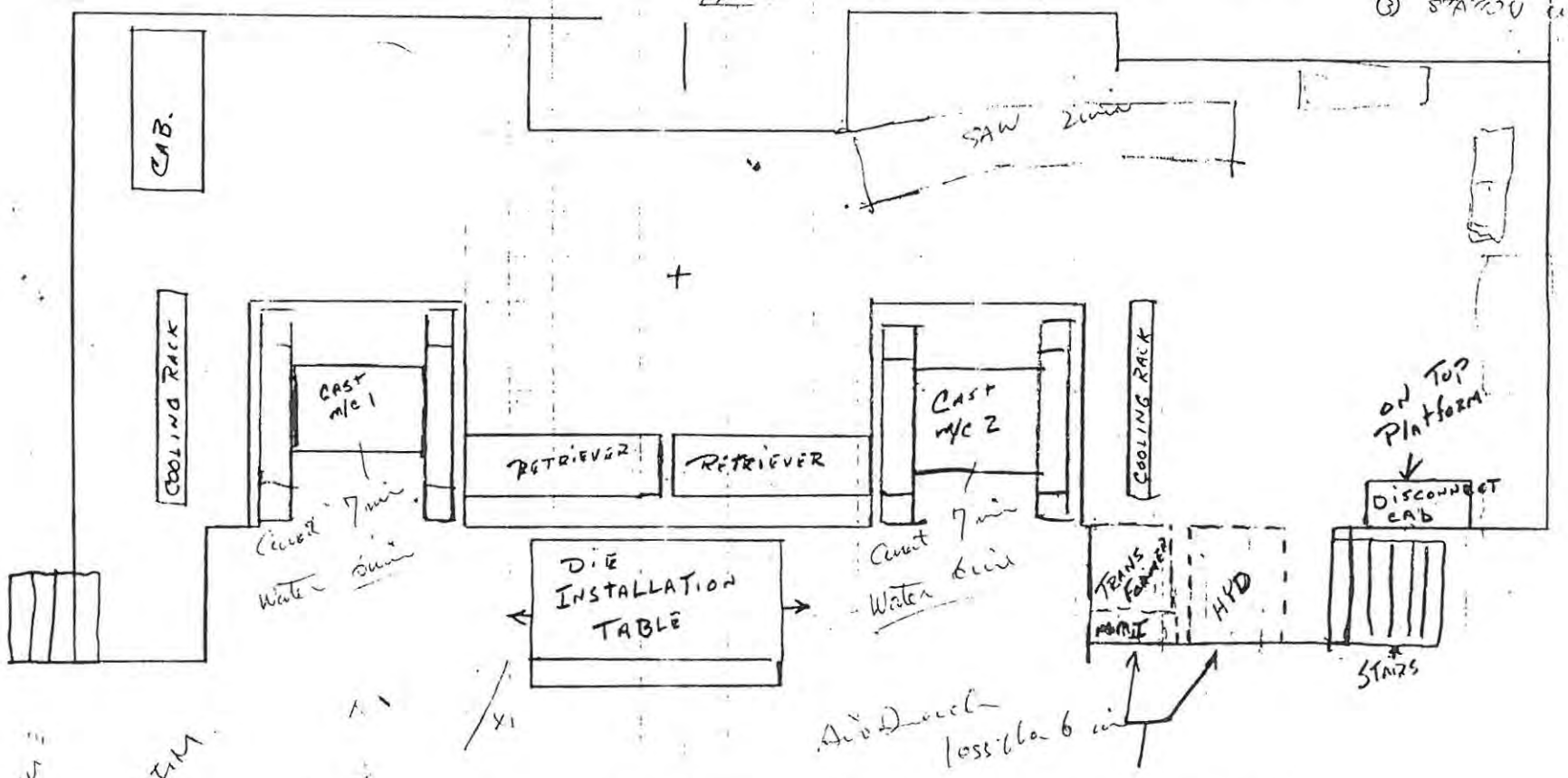
1/30 MH 8 WATER CHILLER.

OPTION

① MONITI EXISTING

② 8 STATION.

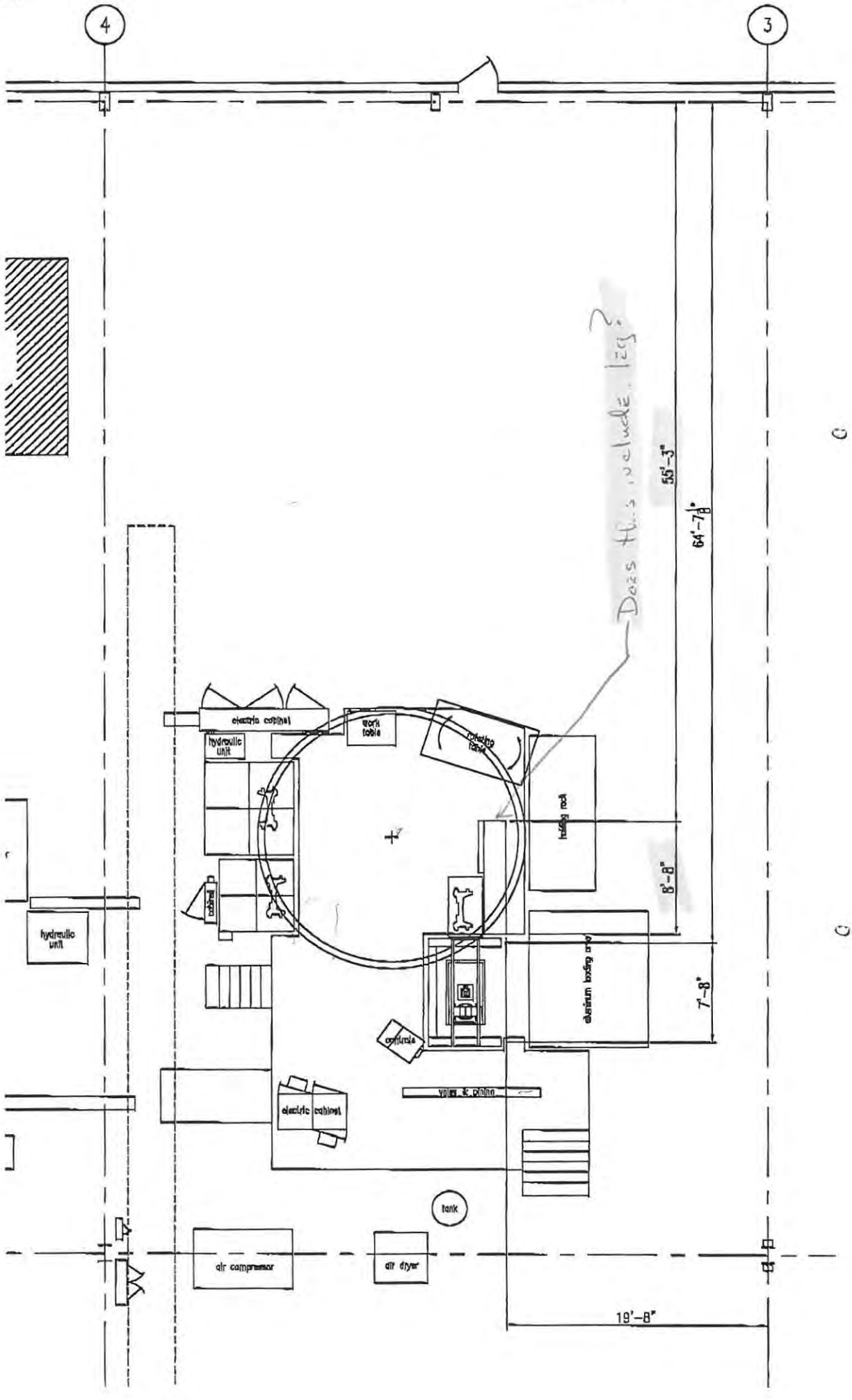
③ STATION QUENCH MANIP



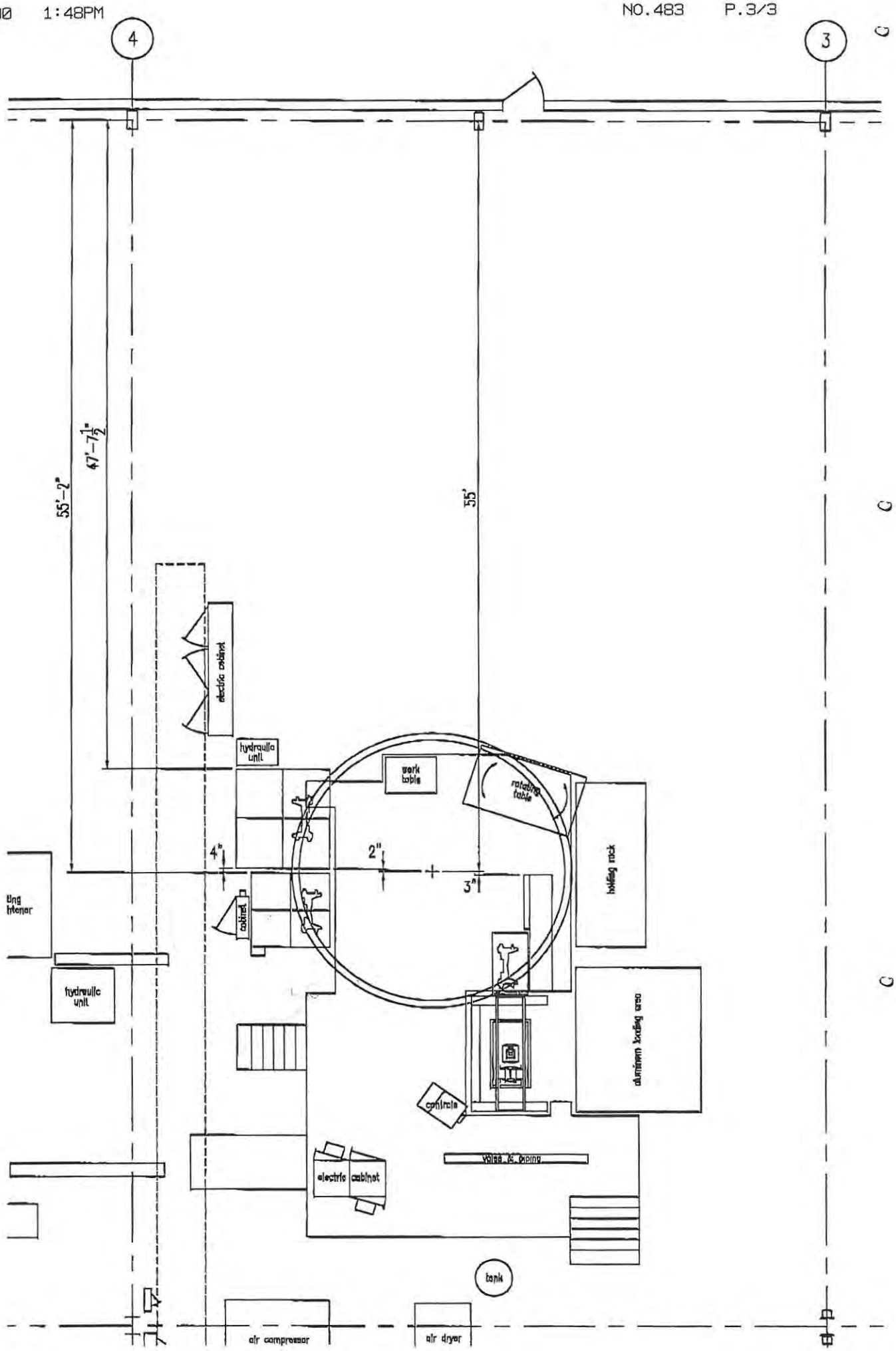
3500 CFM

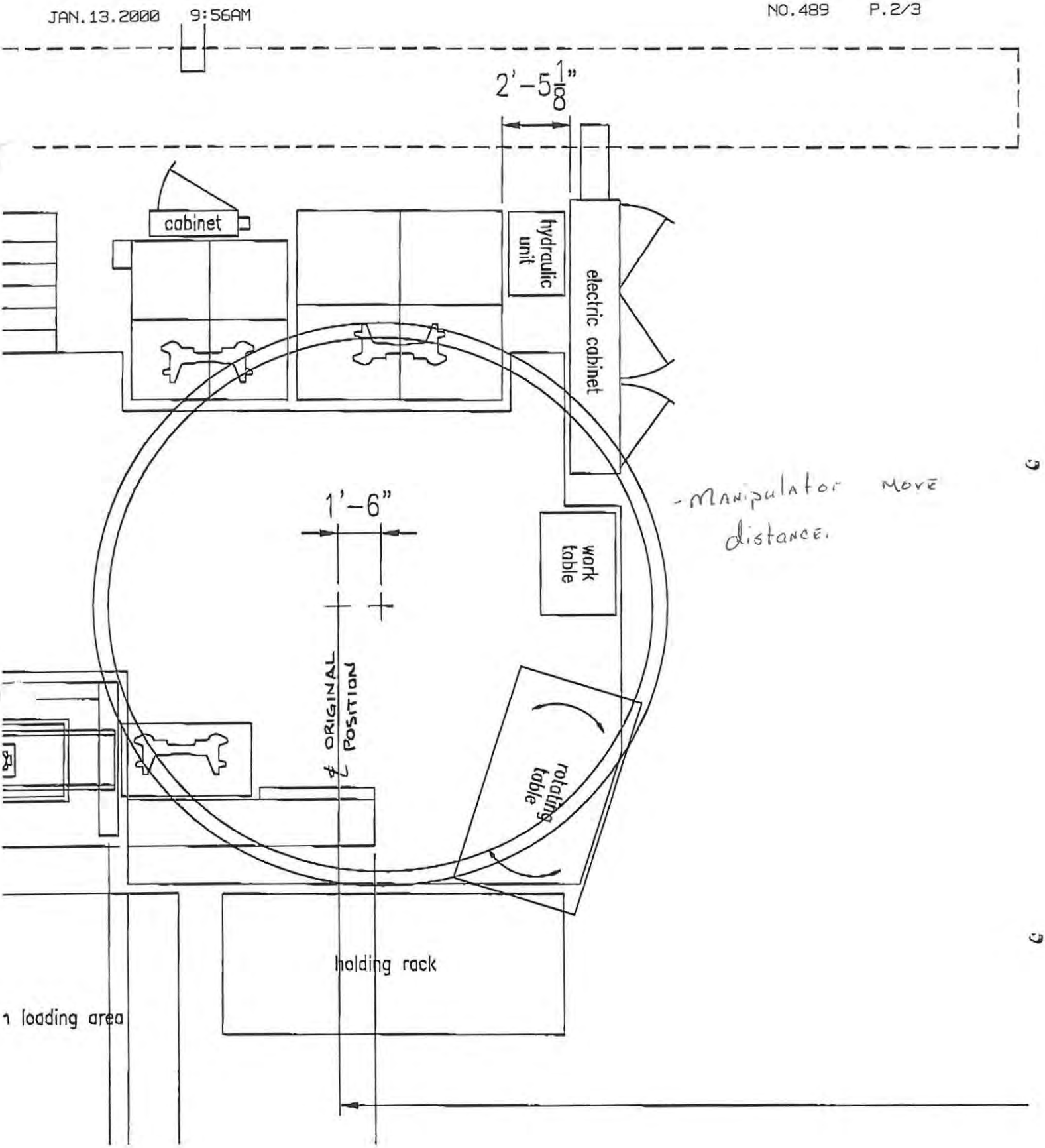
8000 CFM

OPTION 1

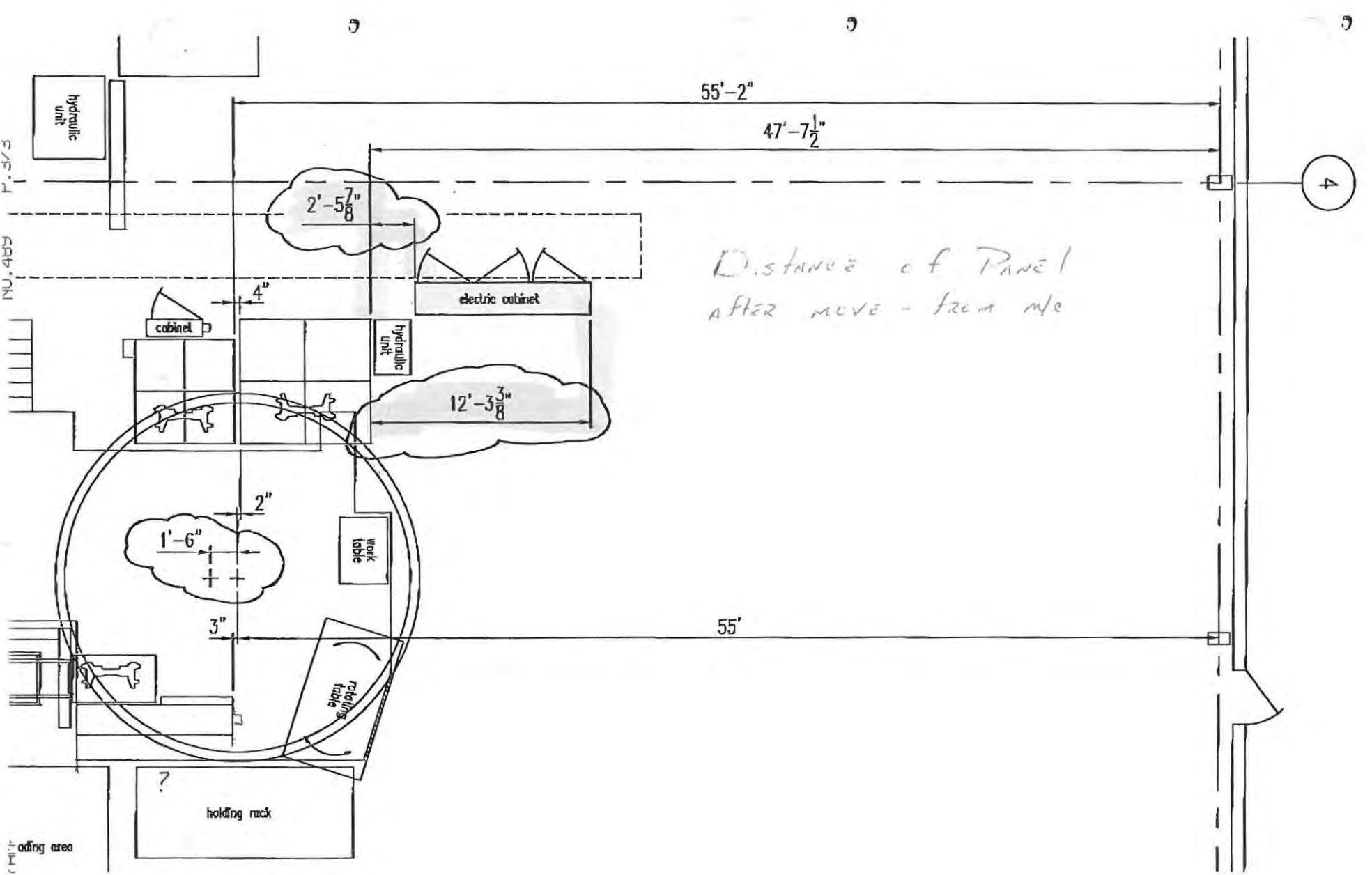

4
3
Does this include leg?
55'-3"
64'-7 1/8"
8'-8"
7'-8"
19'-8"
electric cabinet
work table
rotating table
hydraulic unit
hydraulic unit
cabinet
hoisting rack
electrum loading area
controls
valve & piping
electric cabinet
tank
air compressor
air dryer

OPTION 2


4
3
55'-2"
47'-7½"
55'
electric cabinet
hydraulic unit
work table
rotating table
4"
2"
3"
holding rack
ting interior
cabinet
hydraulic unit
aluminum loading area
controls
electric cabinet
tank
air compressor
air dryer



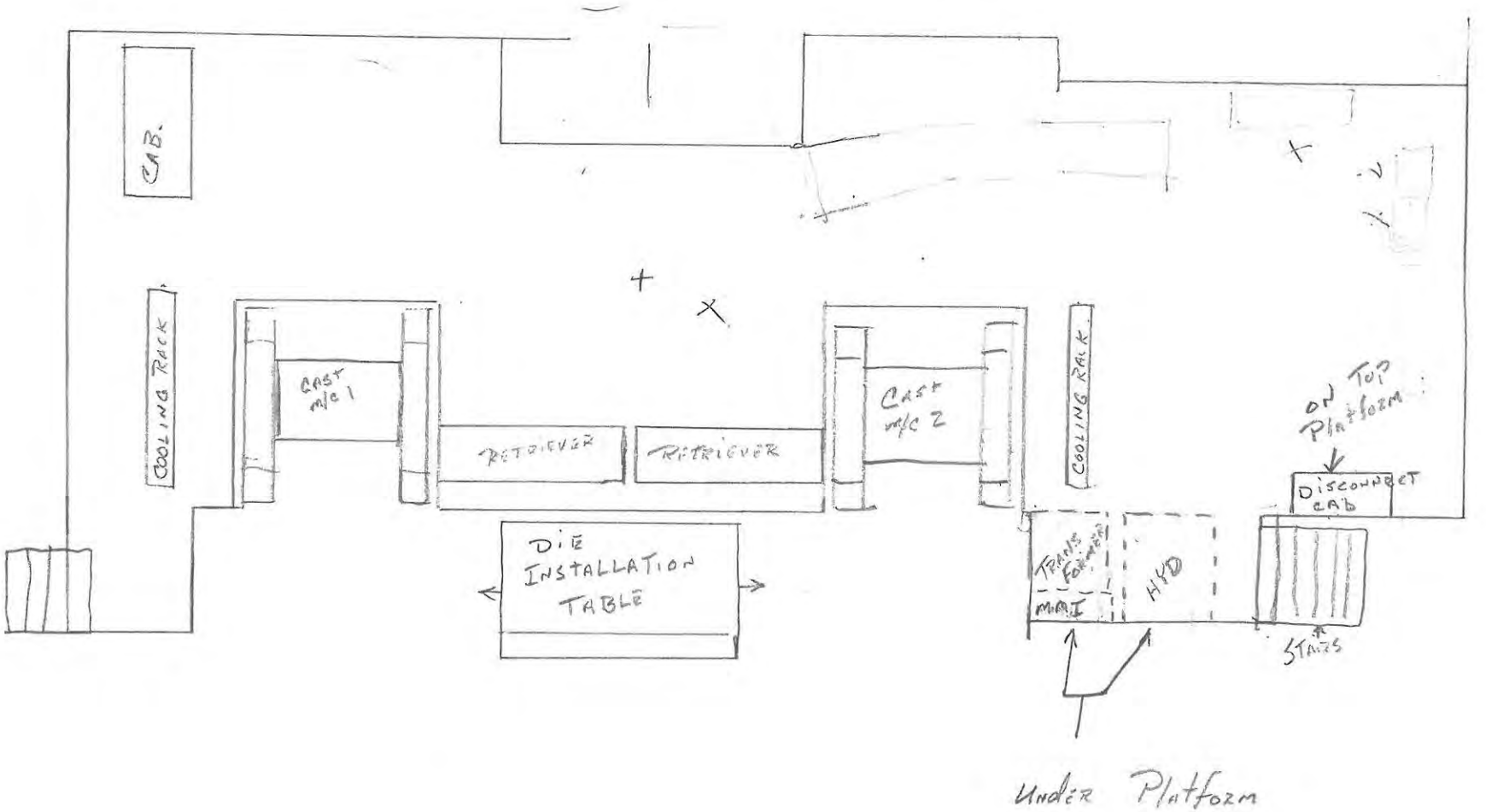
- Manipulator move distance.

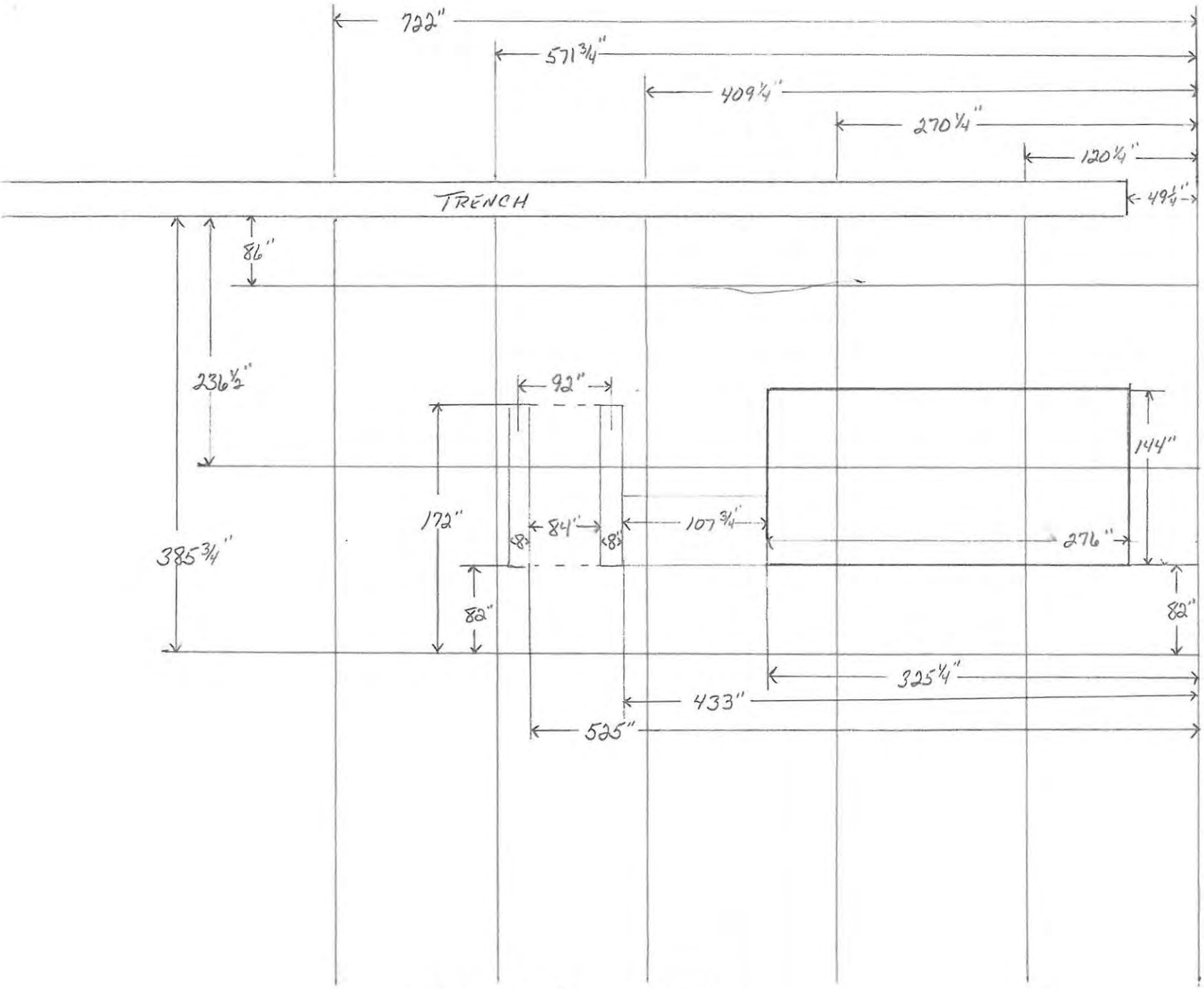

hydraulic unit
55'-2"
47'-7½"
4
2'-5⅞"
Distance of Panel after move - from m/c
electric cabinet
4"
cabinet
hydraulic unit
12'-3⅜"
2"
1'-6"
work table
3"
55'
rotating table
?
holding rack
oading area

1-11-00

To: Tim Waters

From: Daryl Brackney





X-Member #1 Relocation

6691

North Unit

Cast m/c: - Leg to Leg (N-S) - 100 1/4 - Post 12 1/2 

- Leg to Leg (E-W) - 82 3/4
- Platform to Top of Bottom Platters -
- m/c Width (N-S) - 100"
- m/c Width (E-W) - 66"
- Air Controls - m/c E-W width to outside air control - approx. ~~45-43~~ 45 1/2
- Air Control length - (Start Point Find) - 126 1/2
- Part Shuttle Length - ~~106"~~ 107 3/4
- Part Shuttle Width (Start Point Find) - 47" - 7 1/2 Behind m/c
- Distance between back of furnace to back of m/c - 26"
- Distance between furnace and m/c with furnace up - 5-5 1/8
- Hyd. Tank Dimensions - 48 1/2 x 56 x 49 1/4
- Distance Hyd. Tank can be from m/c. - Right - rear corner
- Electric Panel Dimensions - 32" x 63
- Distance Elect Panel can be from m/c -
- Length of Furnace Track - 185" in → out
- Width of Furnace Track - 27 center
- Distance needed for Track movement - approx ~~94"~~ 185" in → out
- Furnace Length (E-W) - 82 1/2
- Furnace Width (N-S) - ~~82~~ 86
- Furnace Height - 61"
- Operator tunnel from m/c post - 48"
- Ladle Track - 33"

Air Quench: Box Dimensions -
Distance of any part outside box list part & location -

Saw: Box Dimension -
Distance of any part outside box list part & location -

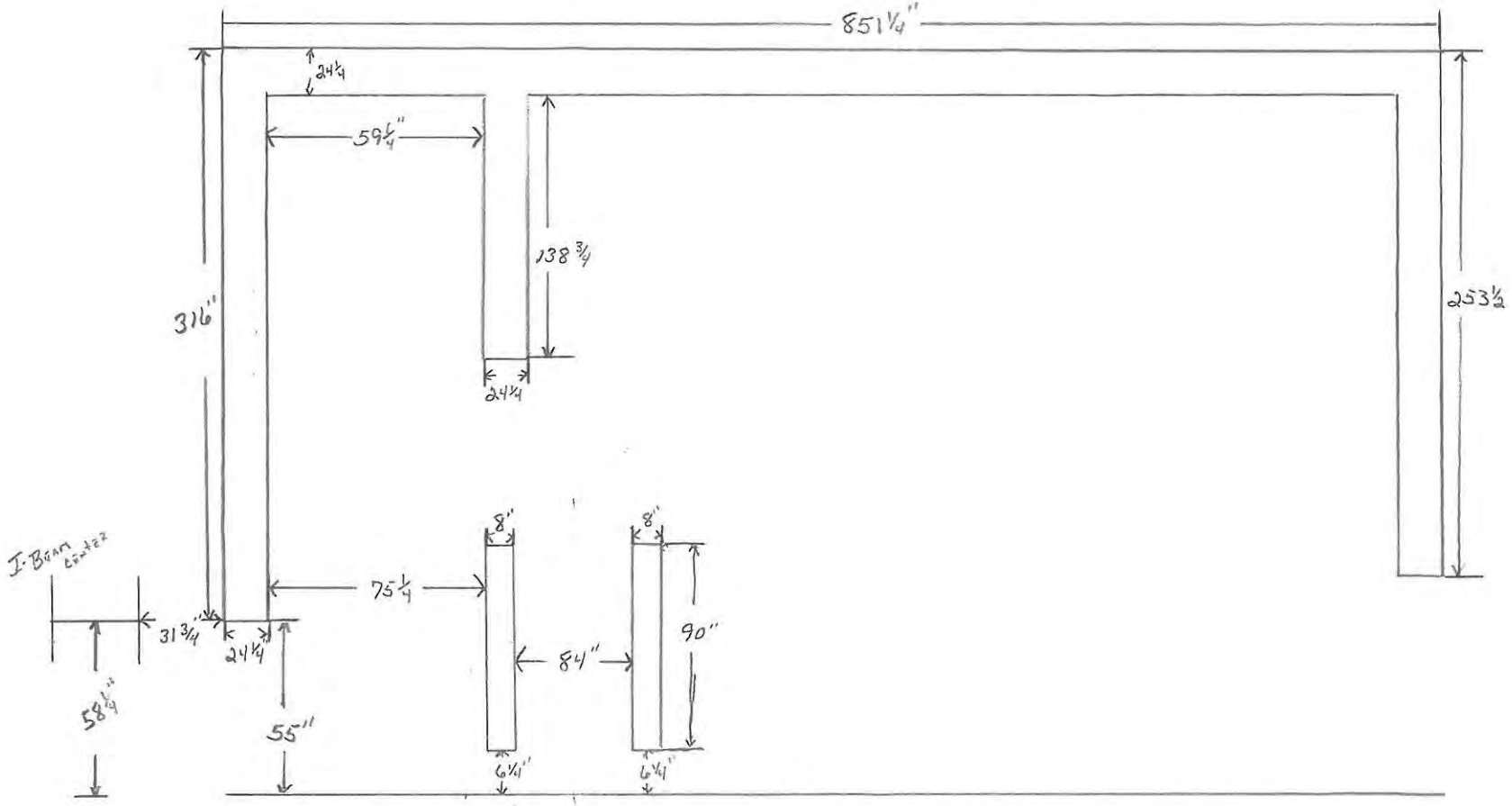
Manipulator: Height -
- Longest Radius - 84"
- Shortest Radius - 42"
- Length from joint to joint - 42"

H.T. Basket Table: Dimensions -
Weight Capacity -

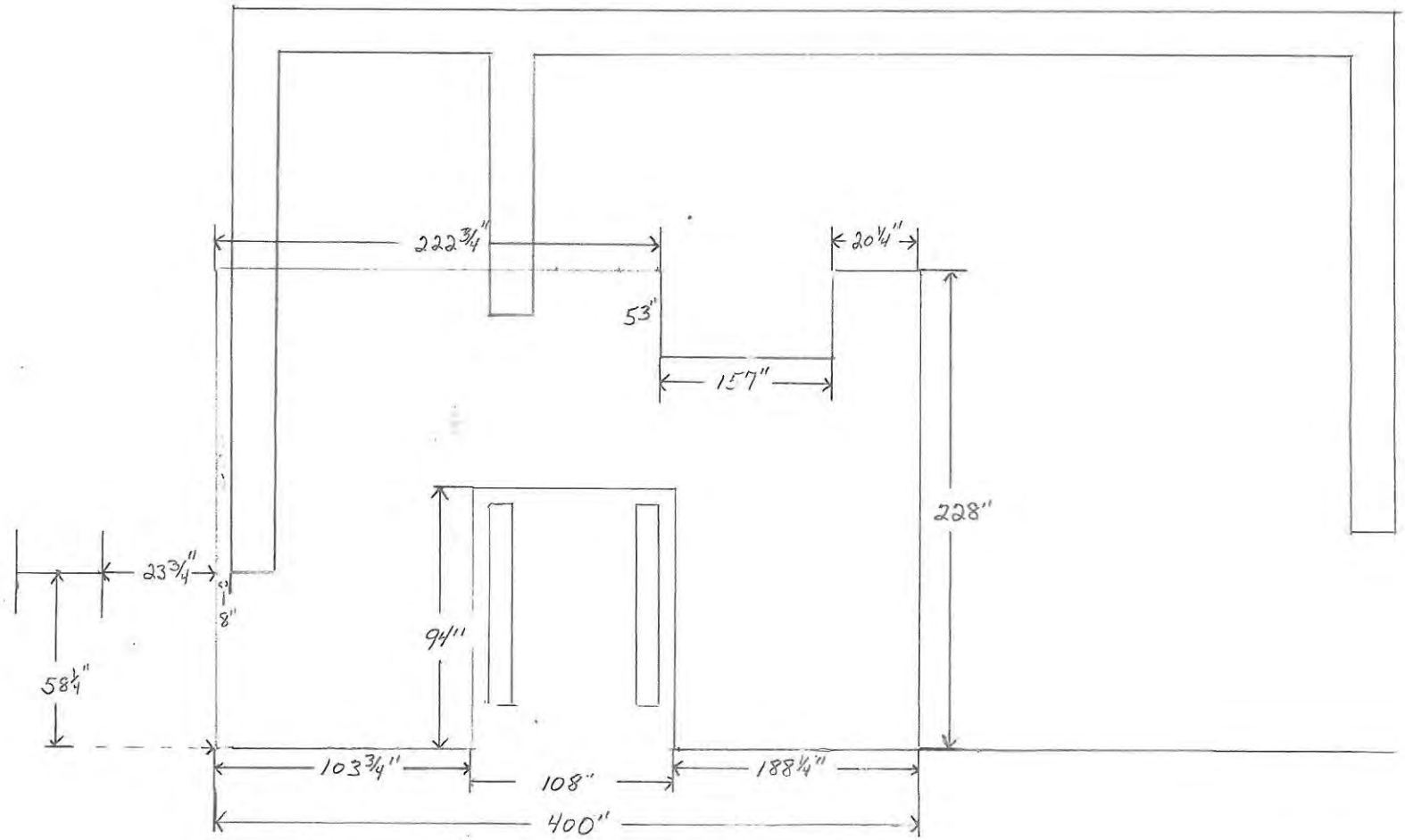
Tower Dryer: Dimension of space required -

Accumulator: Dimension of space required -

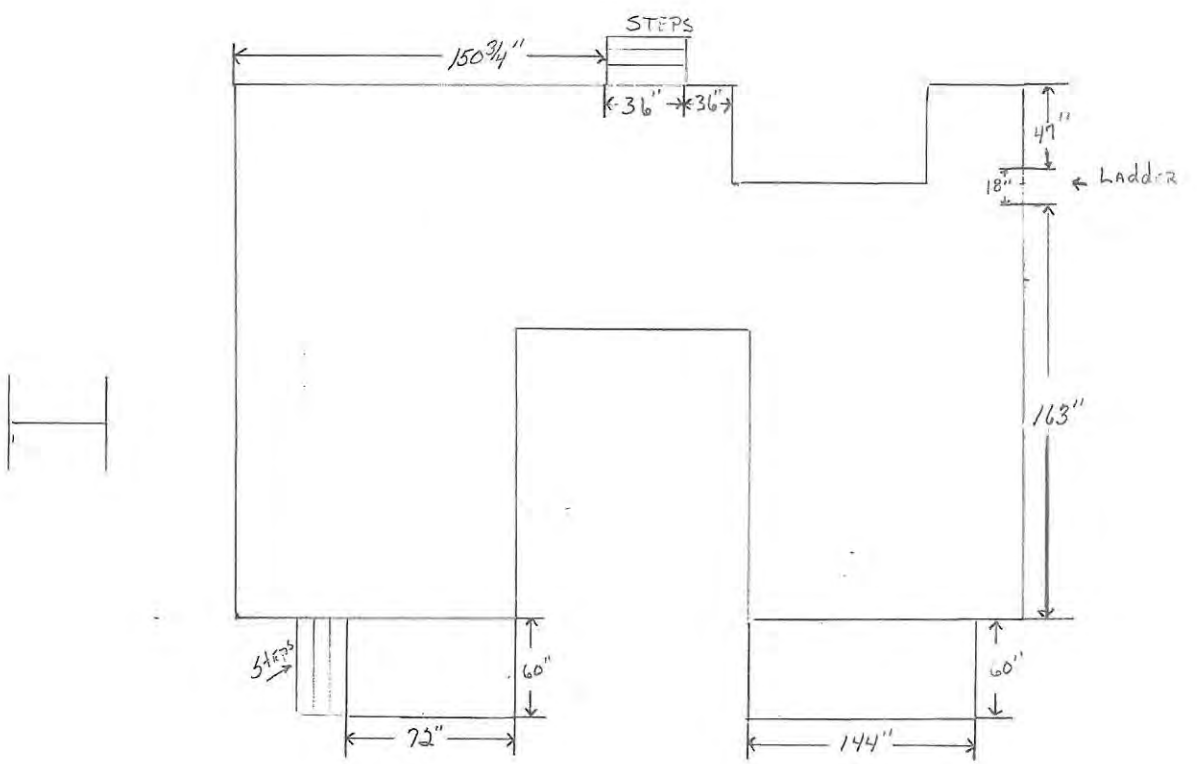
- Electric & Plumbing Trenches
- Crs[illegible] w/c Pads



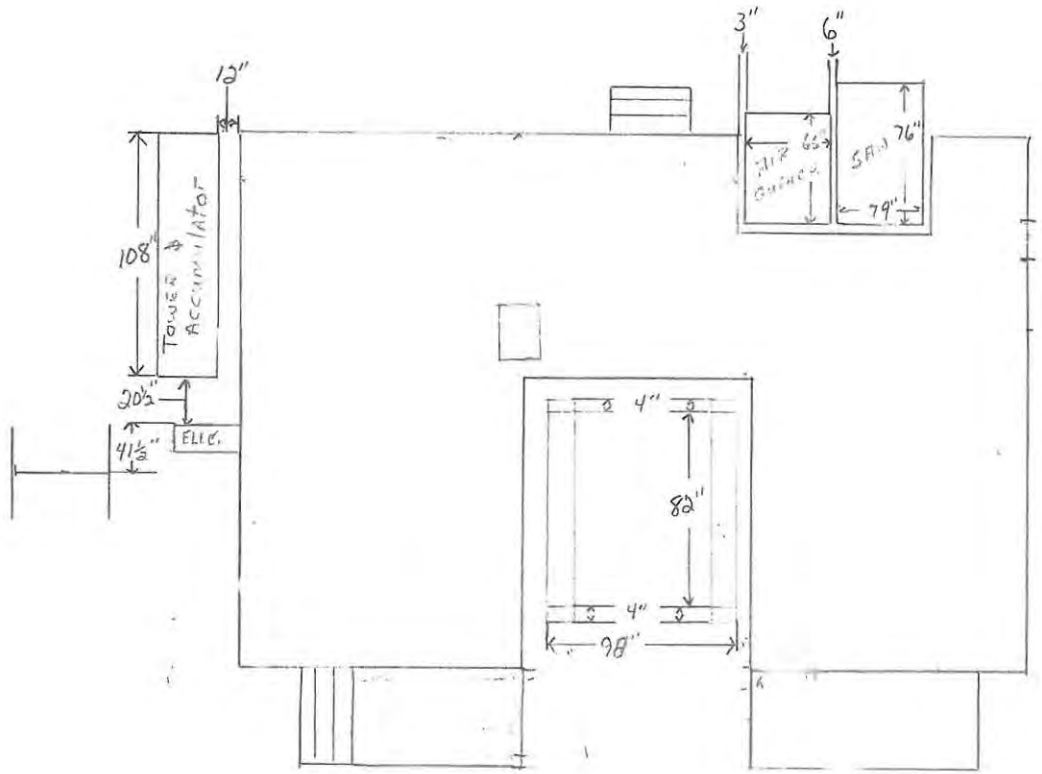
- Platform



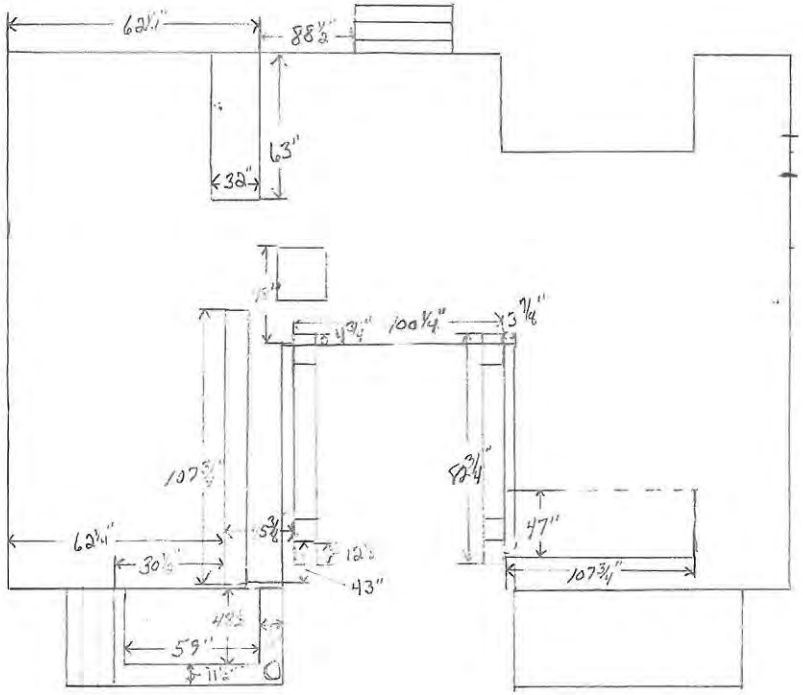
- West Steps
- East Steps & Platform
- Movable Platform
- North Ladder



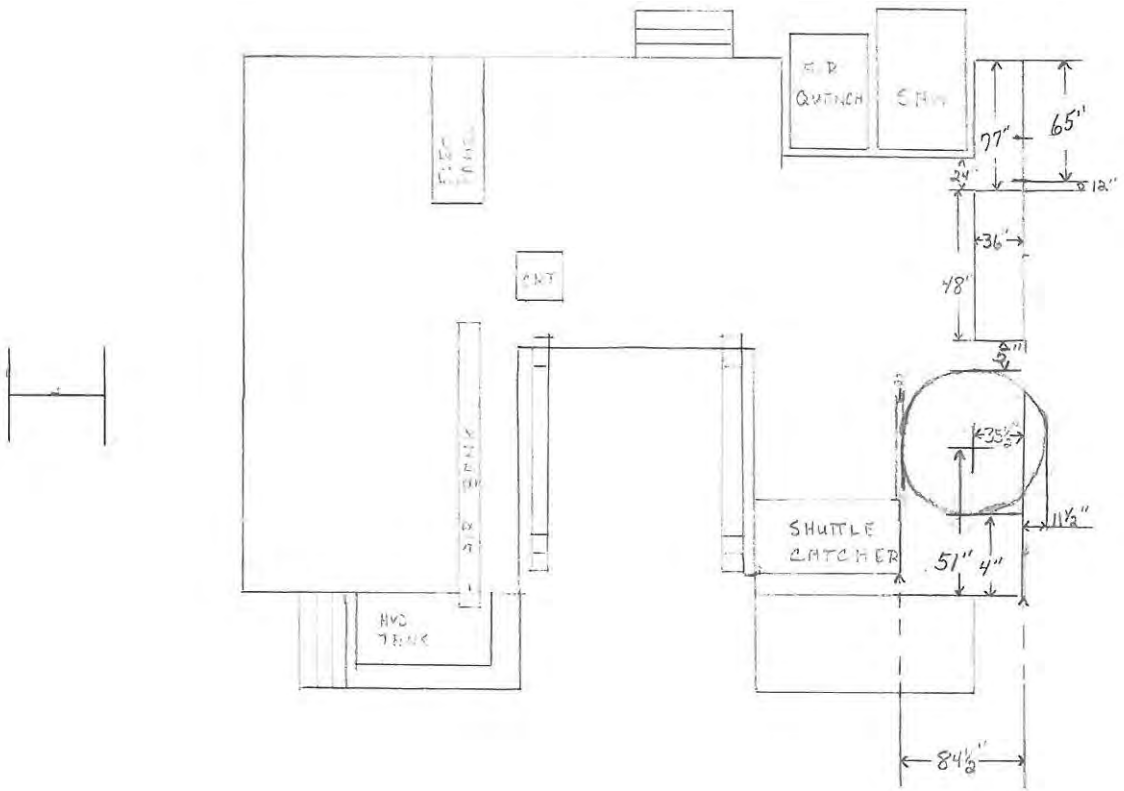
- Tranformer
- Dr[illegible] Viz System
- Quench & Saw Placement
  - Saw - 76" x 79"
  - Quench - 66" x 66"



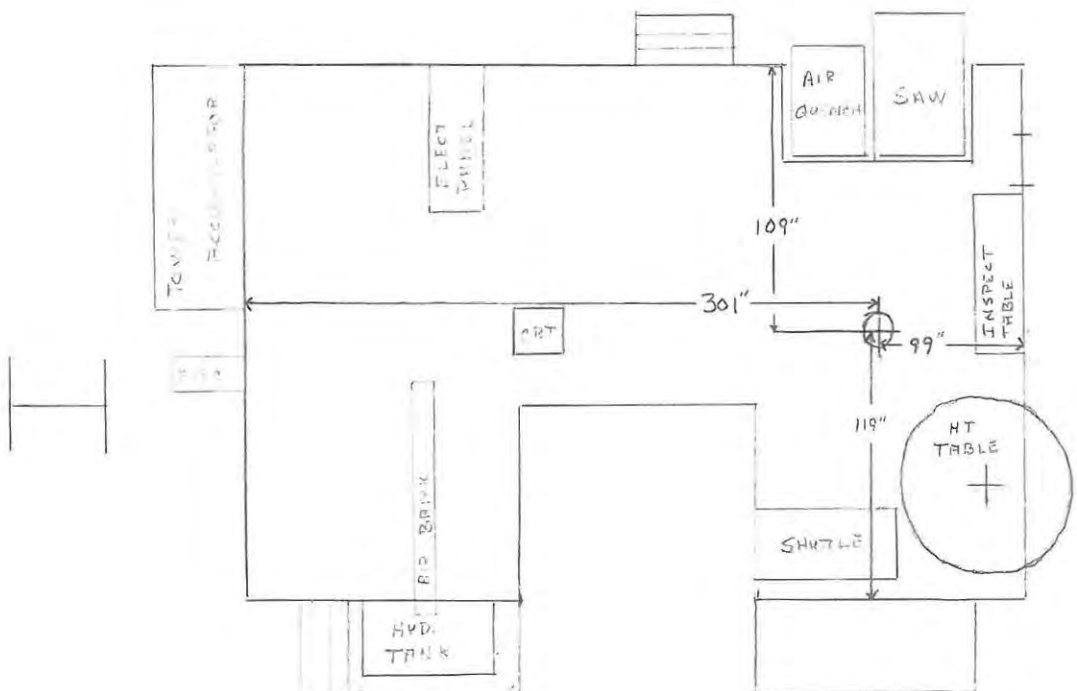
- Cast mic
- Electric Panel
- CRT
- Cooling Bank
- Hyd Pump
- Part Shuttle



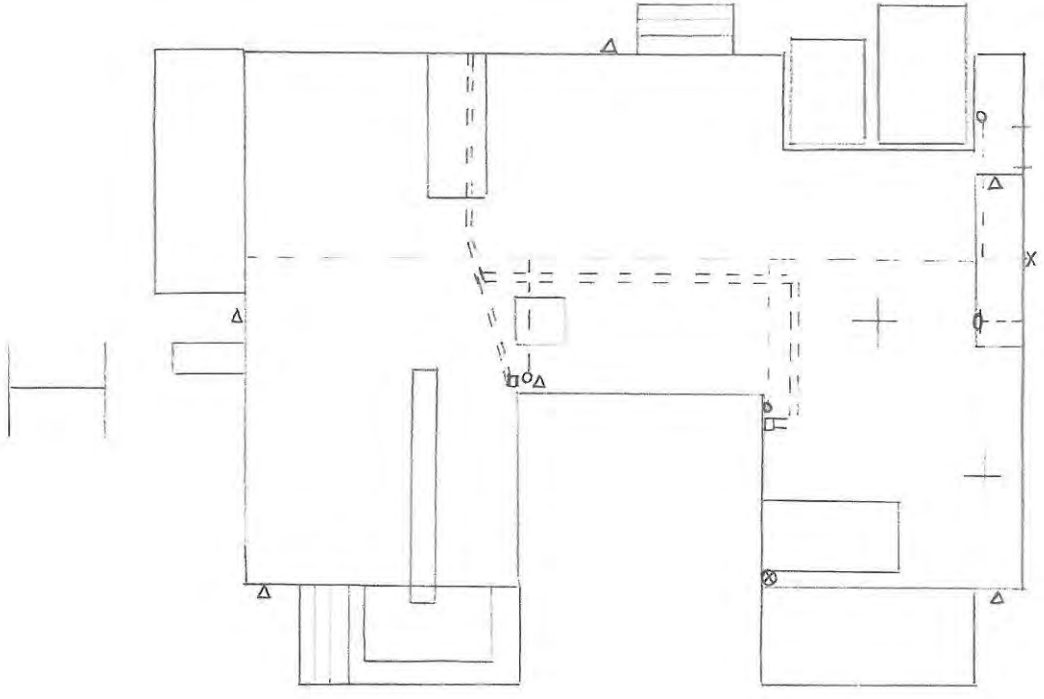
- Inspection Table
- Eat Treat Carrier Table 94" R



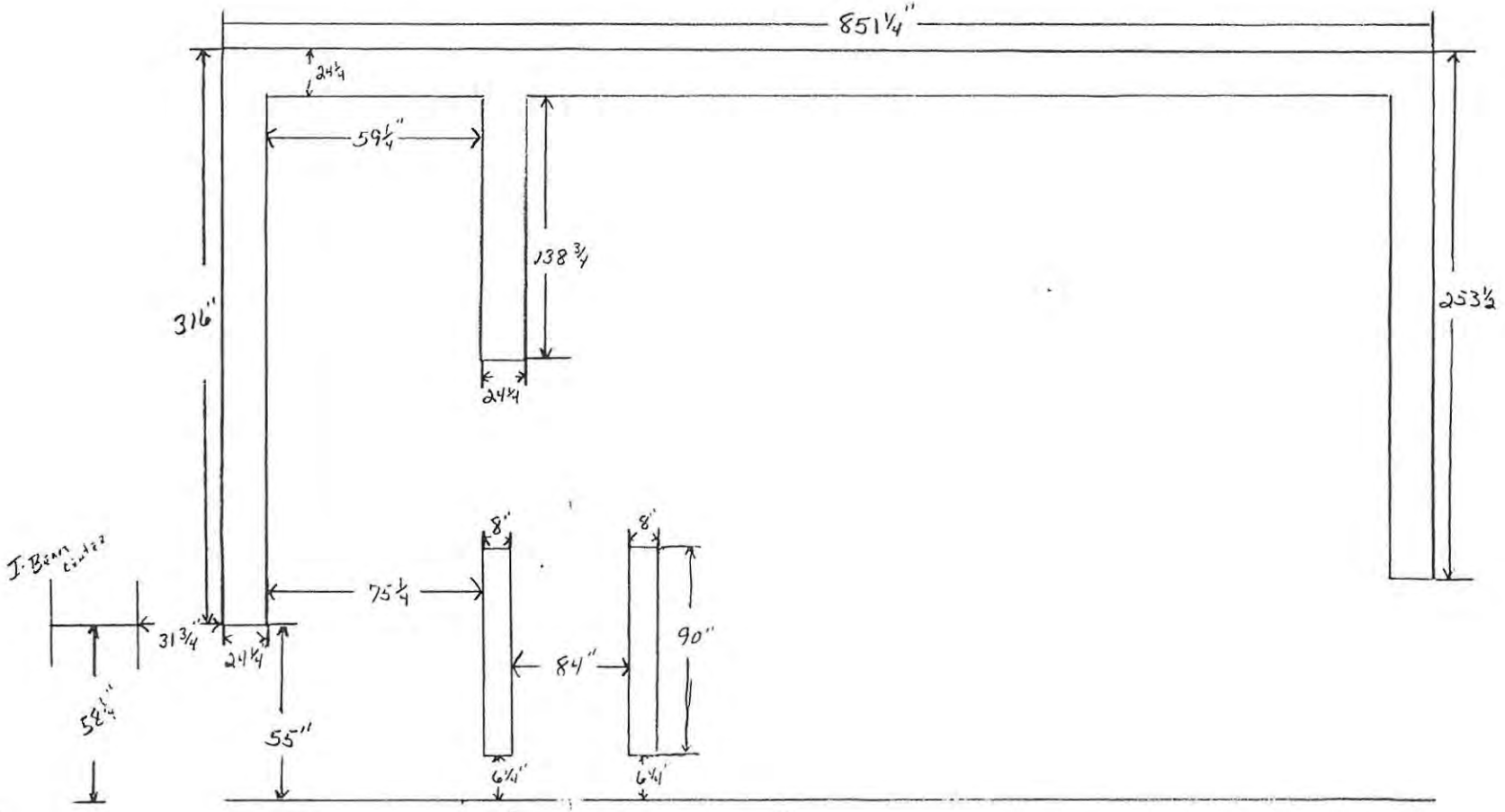
Manipulator



- Air — — —o
- Gas = = =□
- 110 △
- Ladle ⊗

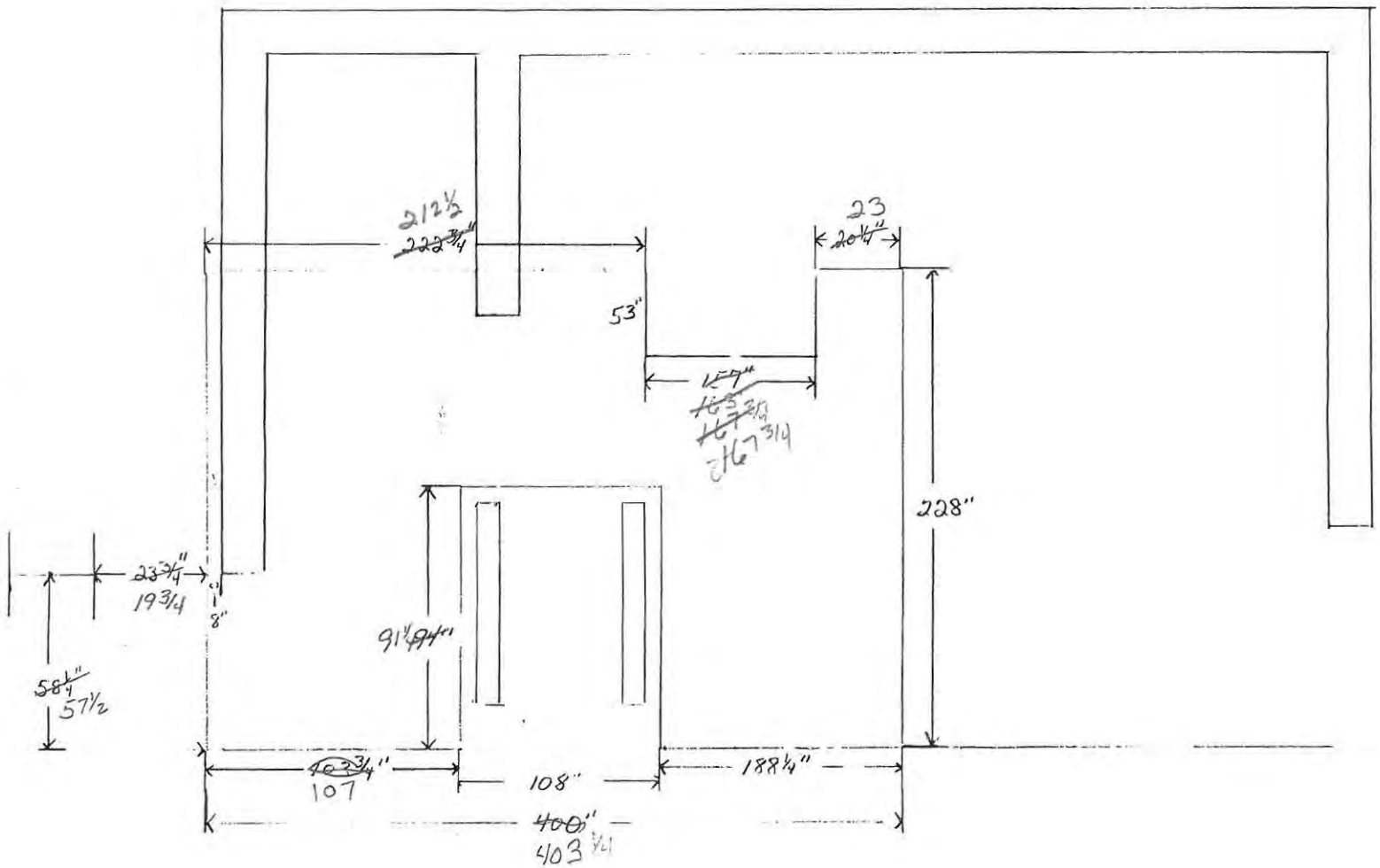


- Cast w/c Pads

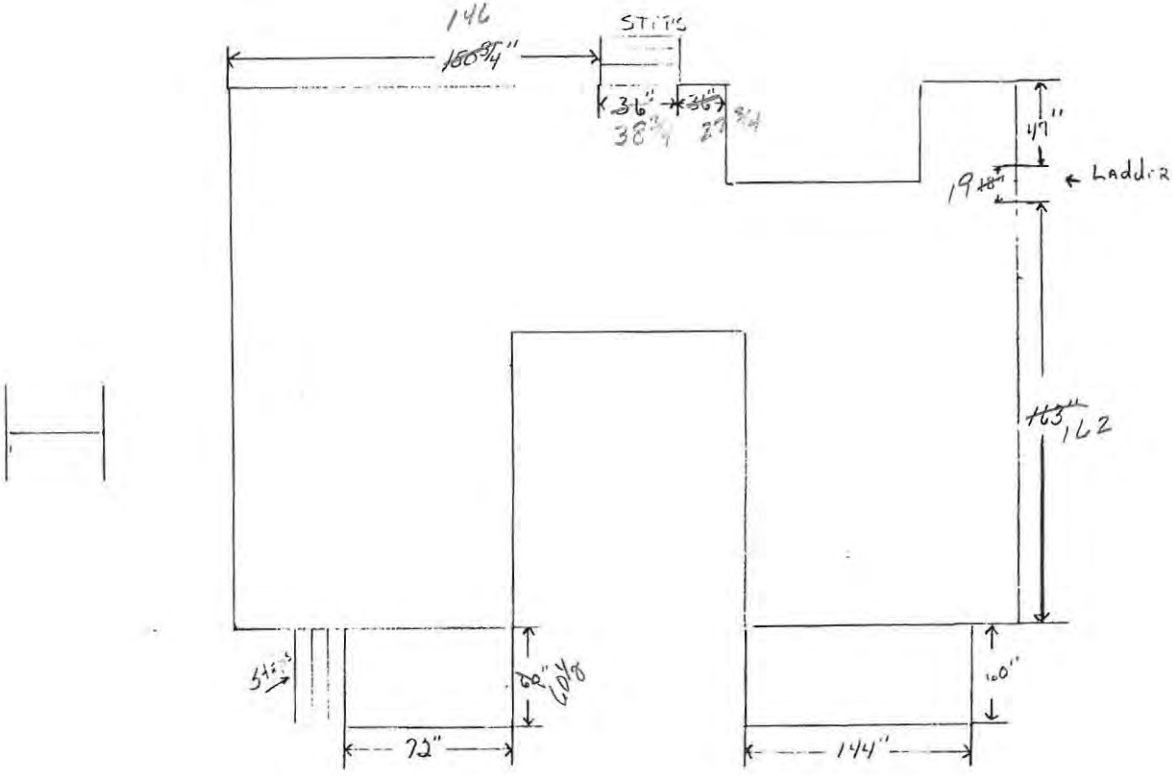

851 1/4"
24 1/4
59 1/4"
138 3/4
316"
253 1/2
24 1/4
I-Beam Center
31 3/4"
24 1/4
58 1/4"
55"
75 1/4
8"
84"
8"
90"
6 1/4"
6 1/4"
Concrete Pad

- Platform

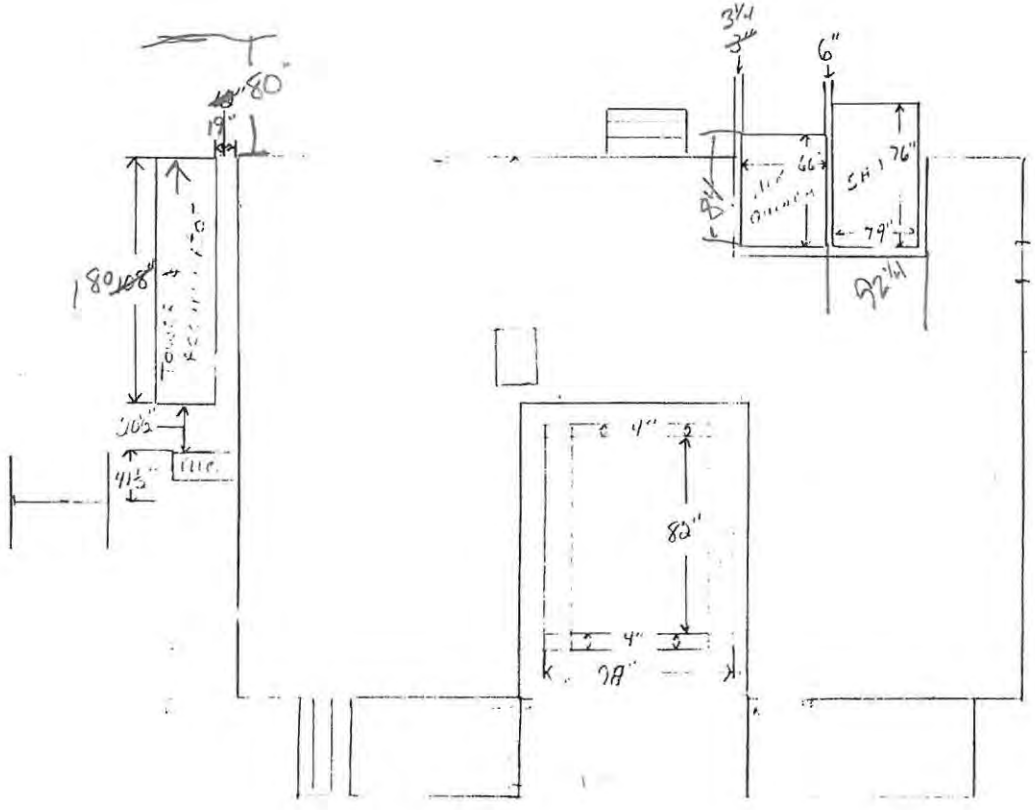
235.5



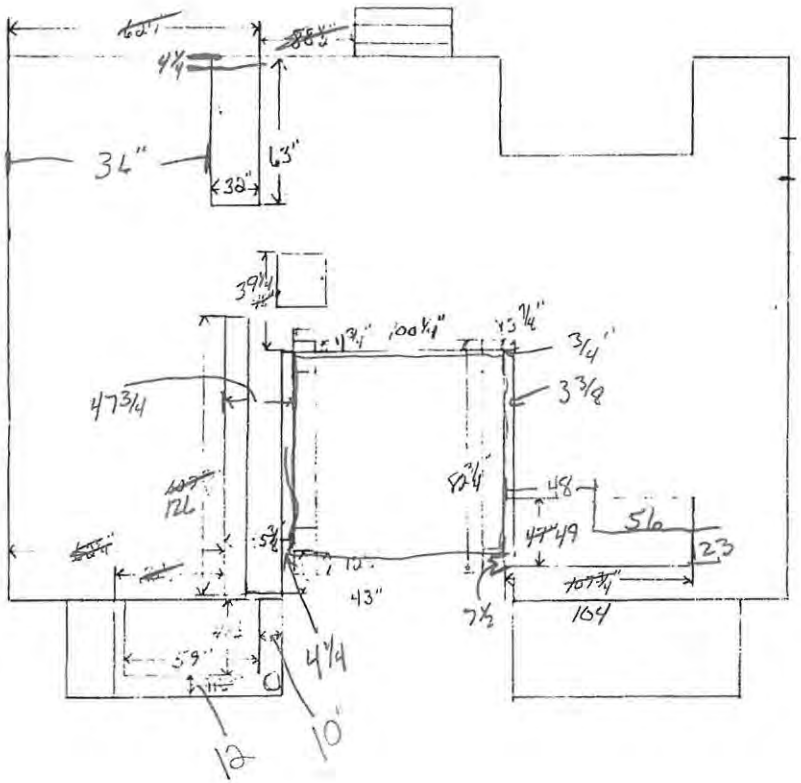
- [illegible] Steps
- East Steps to Platform
- Landing Platform
- North Ladder



- Dry Air System
- Qu... & Saw Placement
  - Saw - 76" x 79"
  - Q... - 66" x 66"

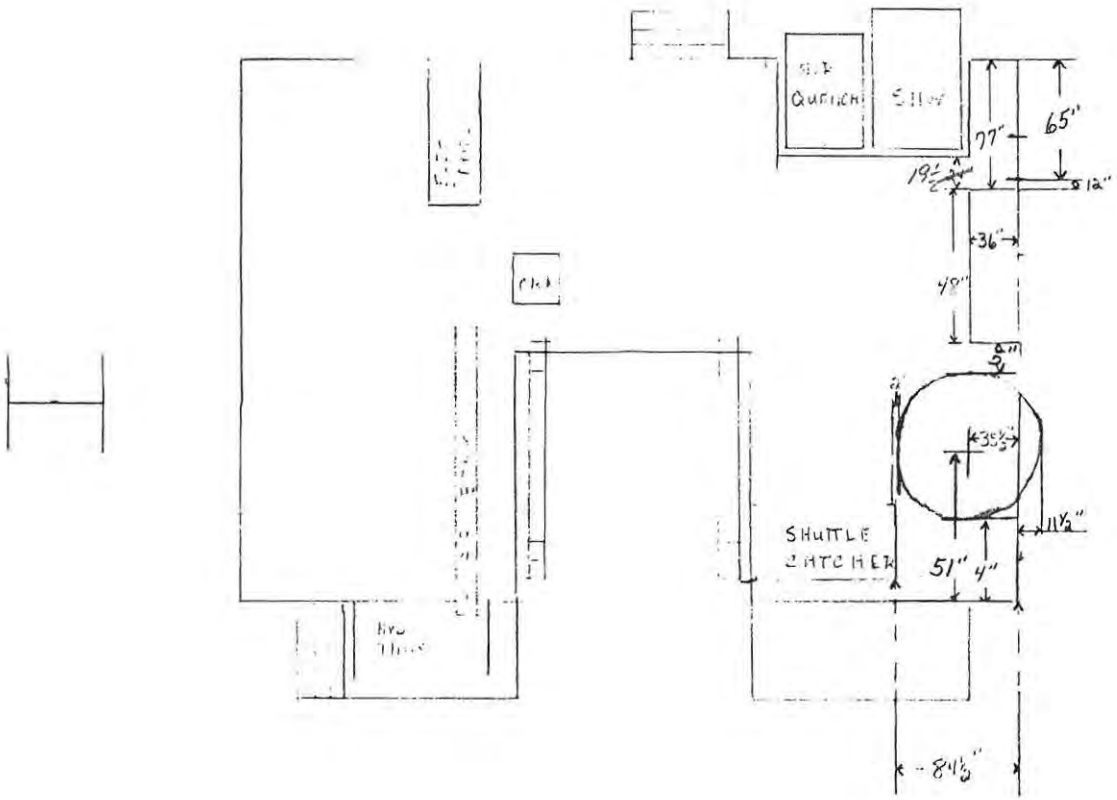


- [illegible] Pump
- [illegible] Panel
- CRT
- Cooling Unit
- Hyd Pump
- Part Shuttle

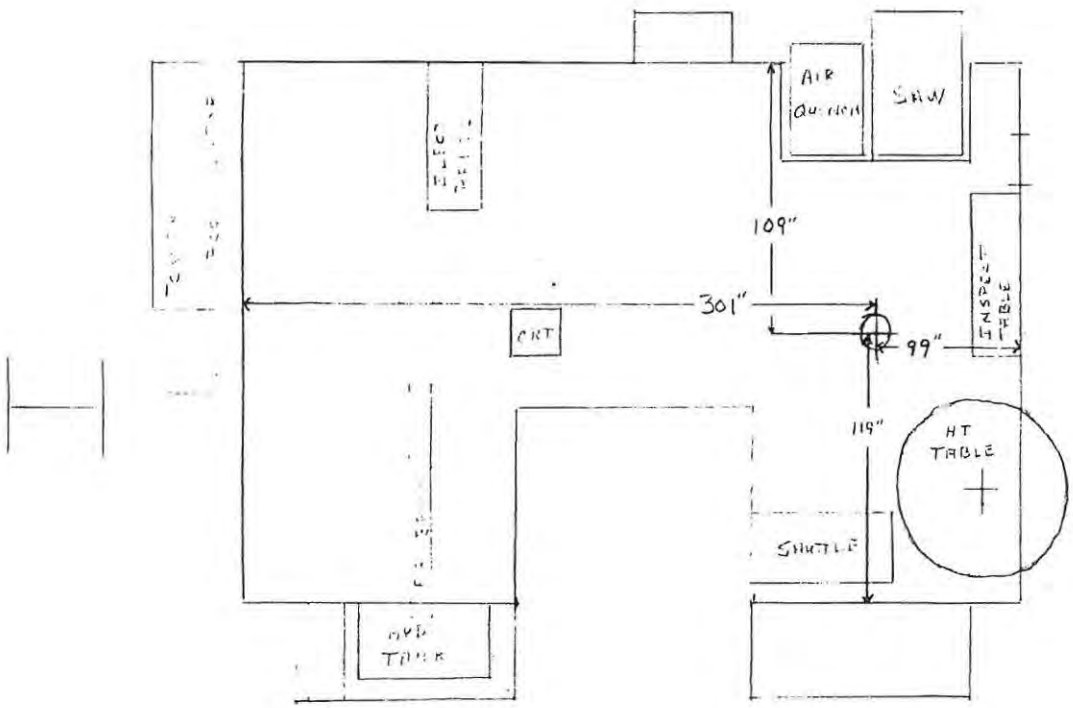


Inspection Table

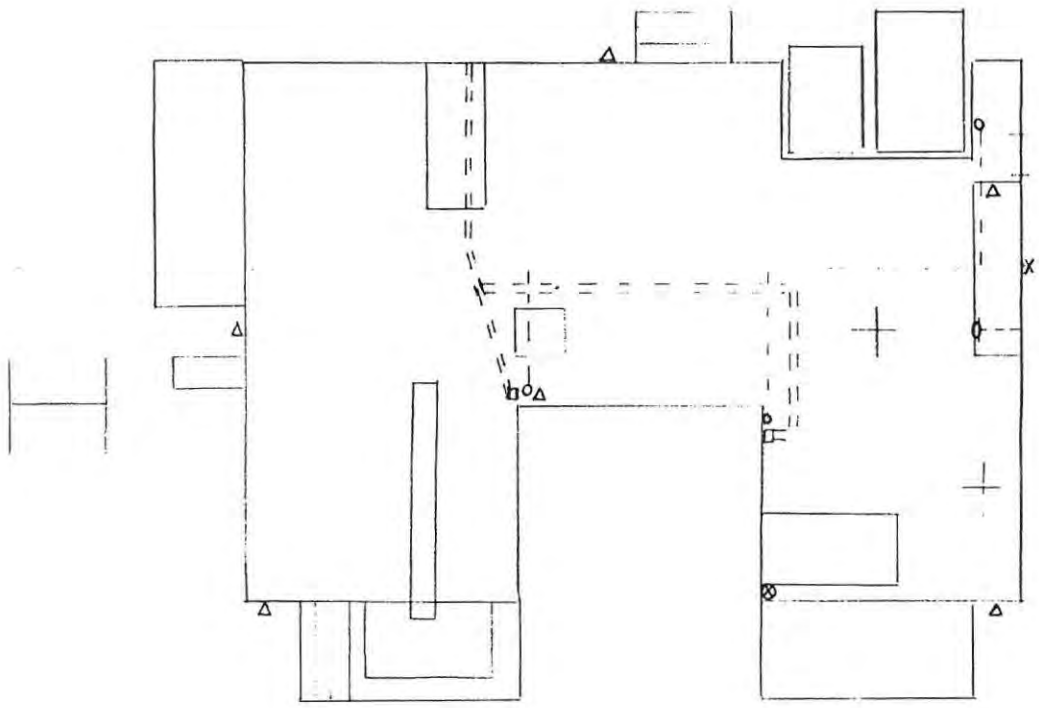
- Heat Treat carrier Table 94" R



- Manipulator



- Gas = = =□
- 110 △
- Ladle ⊗



E. P. Enterprises
21777 Gutman Rd.
Wapakoneta, Ohio 45895
Tel. 937-596-6098 -Fax 937-596-0561

July 7 1997

A.P.P.St. Marys Corp.
1500 Mc Kinly Rd.
St. Marys, Ohio

Attn. Daryl Brackney

Reference: Parts Fixture For Inspection Table
Under E. P. Enterprise Estimate No. 502

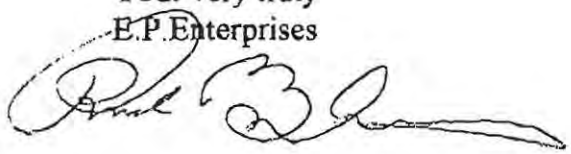
As requested we are pleased to sumit our lump sum prise for the above mentioned project as follows.

FIRM LUMP SUM PRICE. $360.00
(Three Hundred Sixty Dollers.)

Our price based on the following.
1. On drawing submited by fax.
.2.Labor and materal to be furnished by E. P. Enterprise
3. Price brake down $240.00 to fab fixture and $120.00 to install on inspection table
4. price good for 30 days

Trusting the above meets your approvel. If any questions please contect the undersigned at (937-596-6098)

Your very truly
E.P.Enterprises



FROST & CO - INC -

9 Broadway Street
Wapakoneta, Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

A merit shop
Contractor
serving all of
Western Ohio

August 1, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: SADDLE FIXTURE FOR
CROSS MEMBER

Dear Daryl:

As per our conversation and drawings provided, please find enclosed our estimate to fabricate the saddle fixture.

- 1 saddle fixture as per customer's drawing

TOTAL COST: $491.00

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

If you have any questions, please feel free to call.

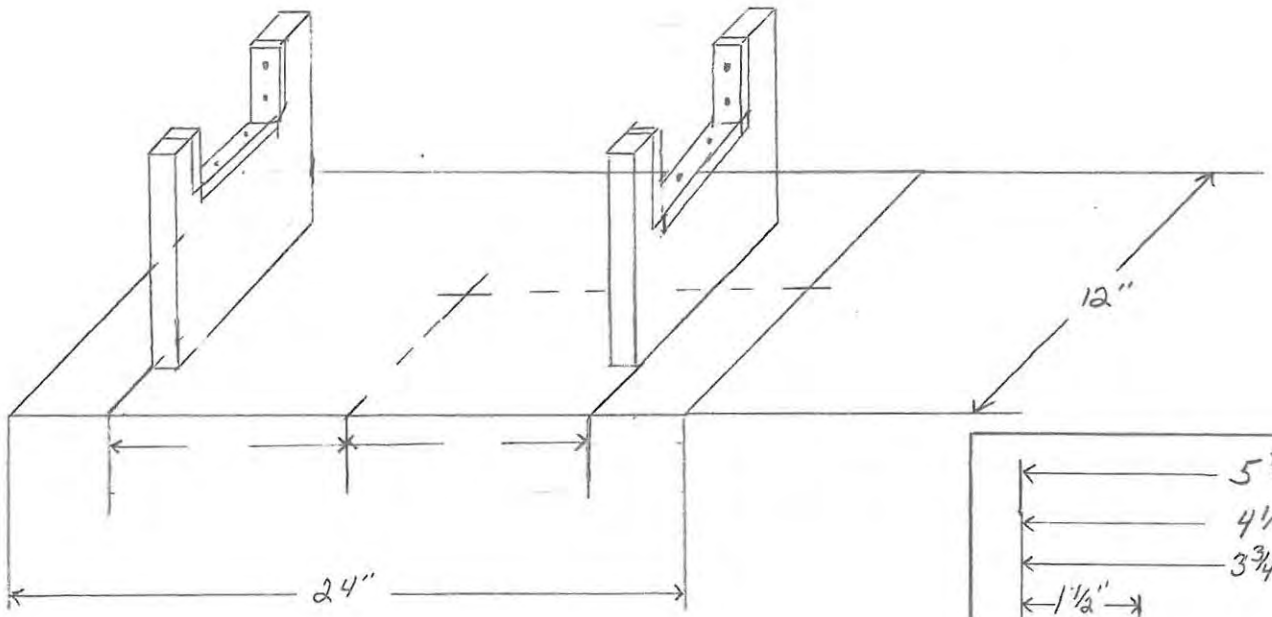
Sincerely,

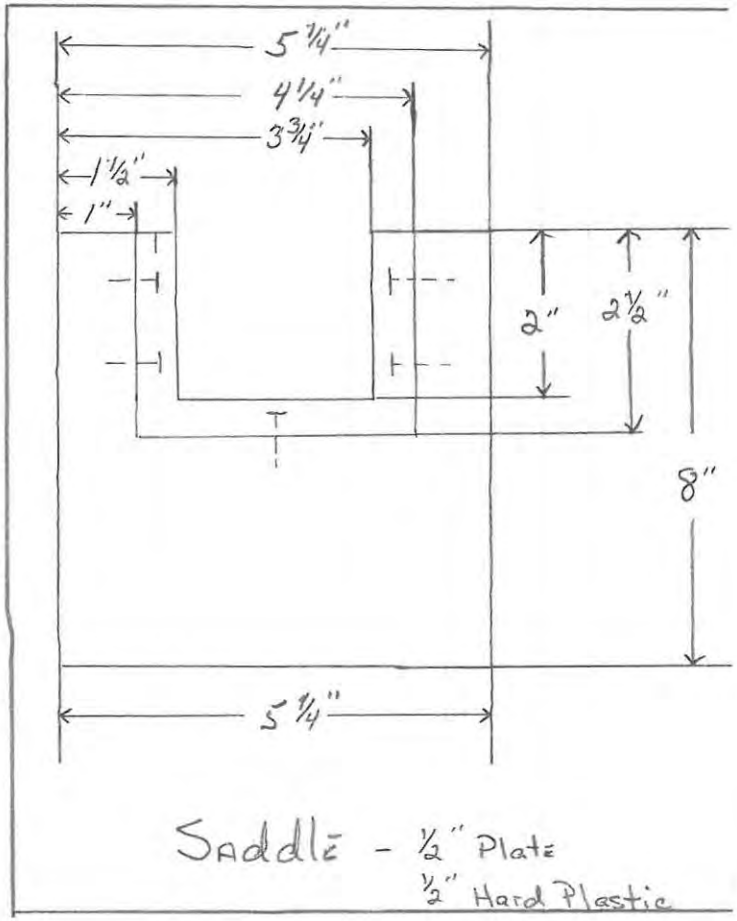
Butch Delap

Butch Delap
Millwright Superintendent

ACCEPTED BY_____DATE_____

Insp. Table
Part Fixture





Saddle - 1/2" Plate
1/2" Hard Plastic

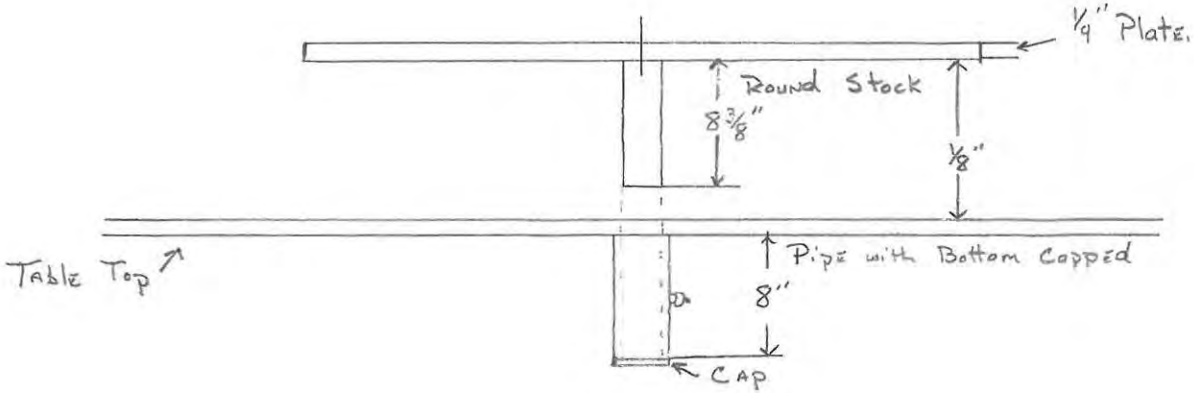
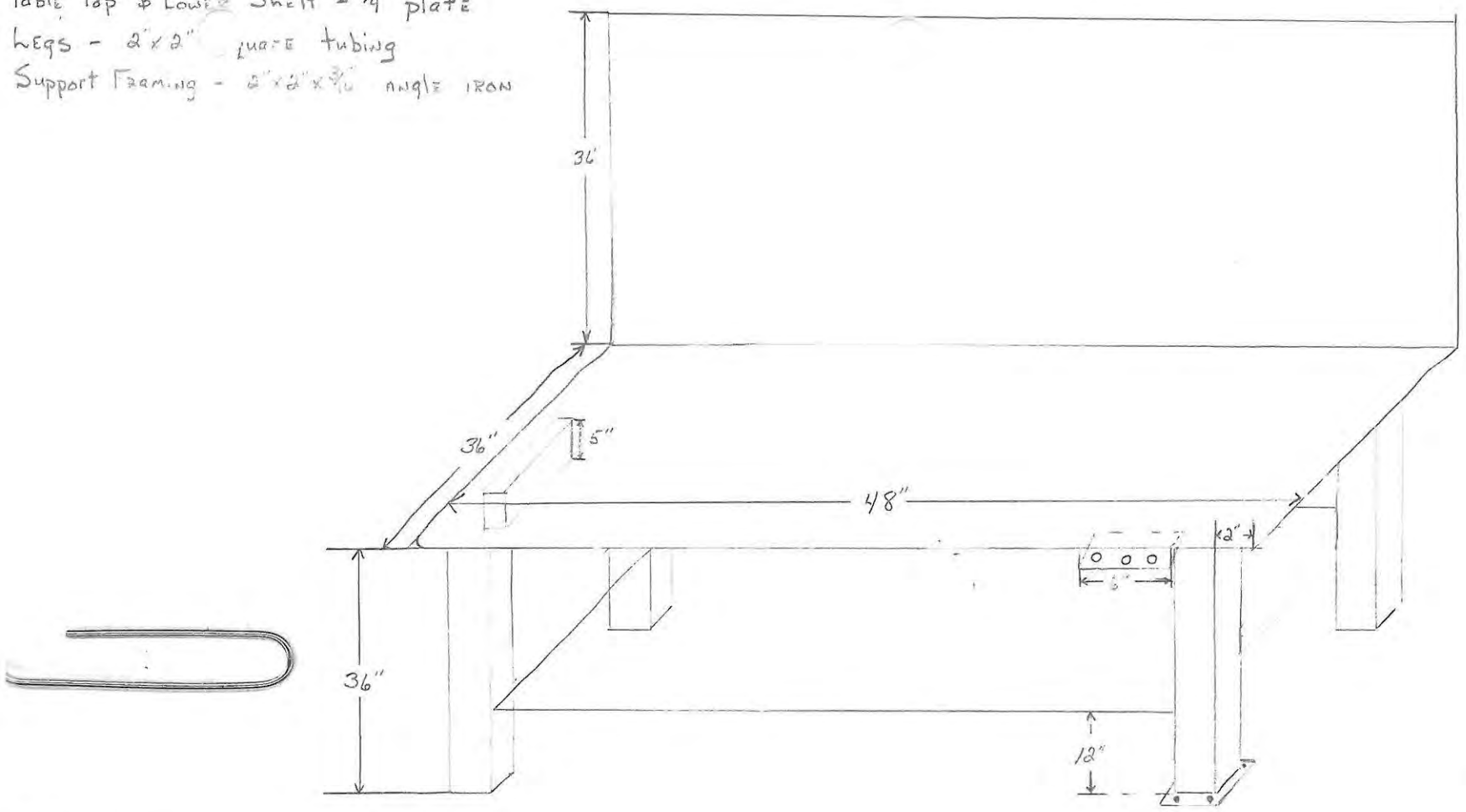
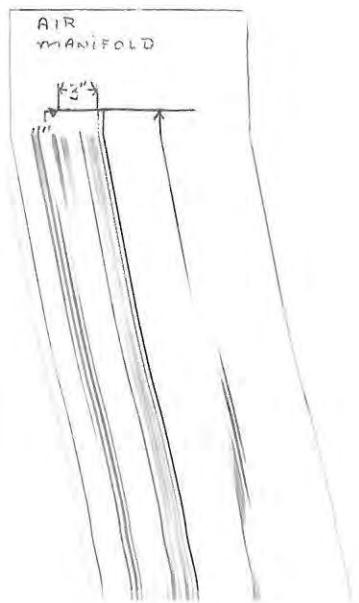
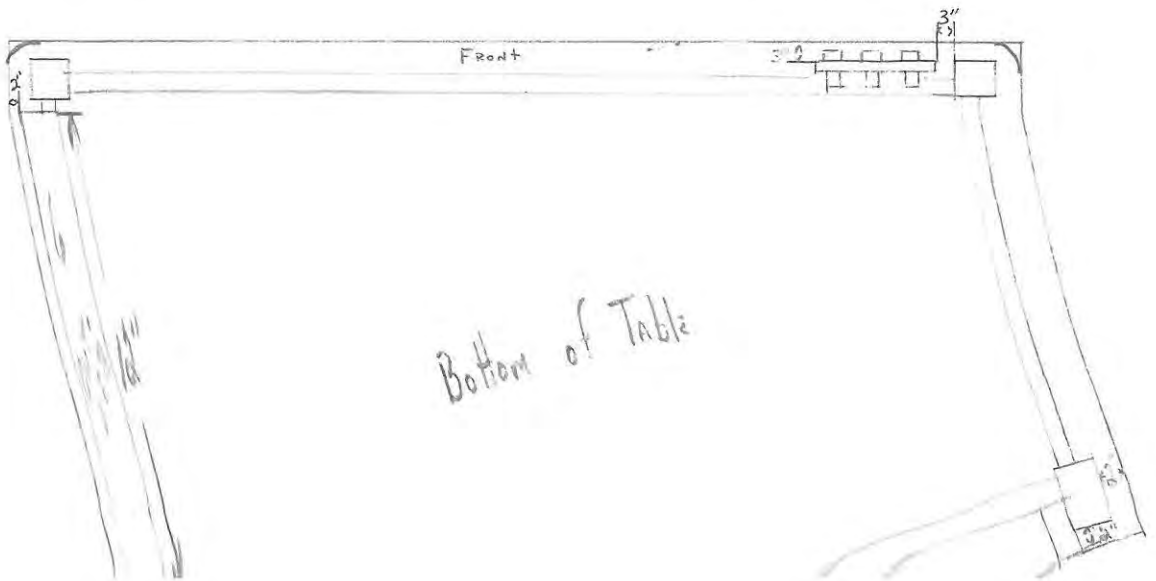


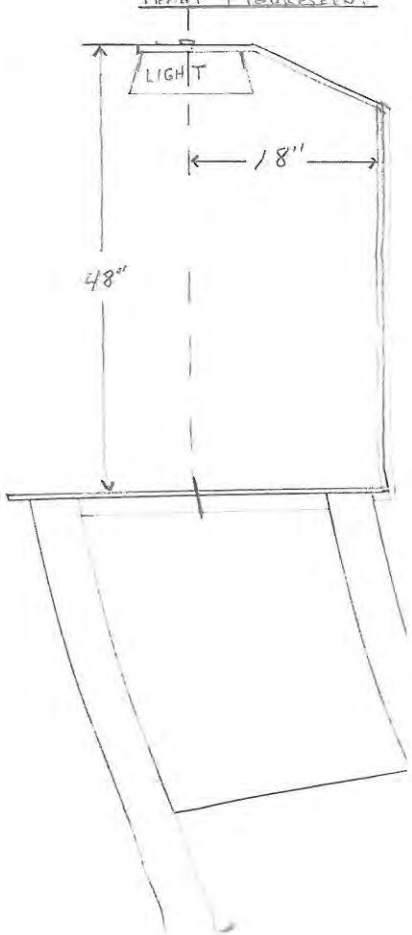
Table Top & Lower Shelf - 1/4" plate
Legs - 2"x2" square tubing
Support Framing - 2"x2"x3/16 angle iron







4ft. Explosion Proof Flourescent



FROST & CO
- INC -

9 Broadway Street
Japakoneta. Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

February 17, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: TABLES FOR CASTING DECK
REVISED QUOTE

Dear Daryl:

As per our conversation and drawings provided, we propose the following

1 H-D table

- 40" x 60" with 18" work height
- 1/2" plt. table top
- 4" x 4" x 3/16" sq. tube legs and frame structure with footpads

TOTAL COST: $600.00

1 - Medium duty table

- 36" x 48" with 36" work height
- 1/4" plt. table top
- 2" x 2" x 3/16" sq. tube legs with footpads
- 10 ga. back and hood

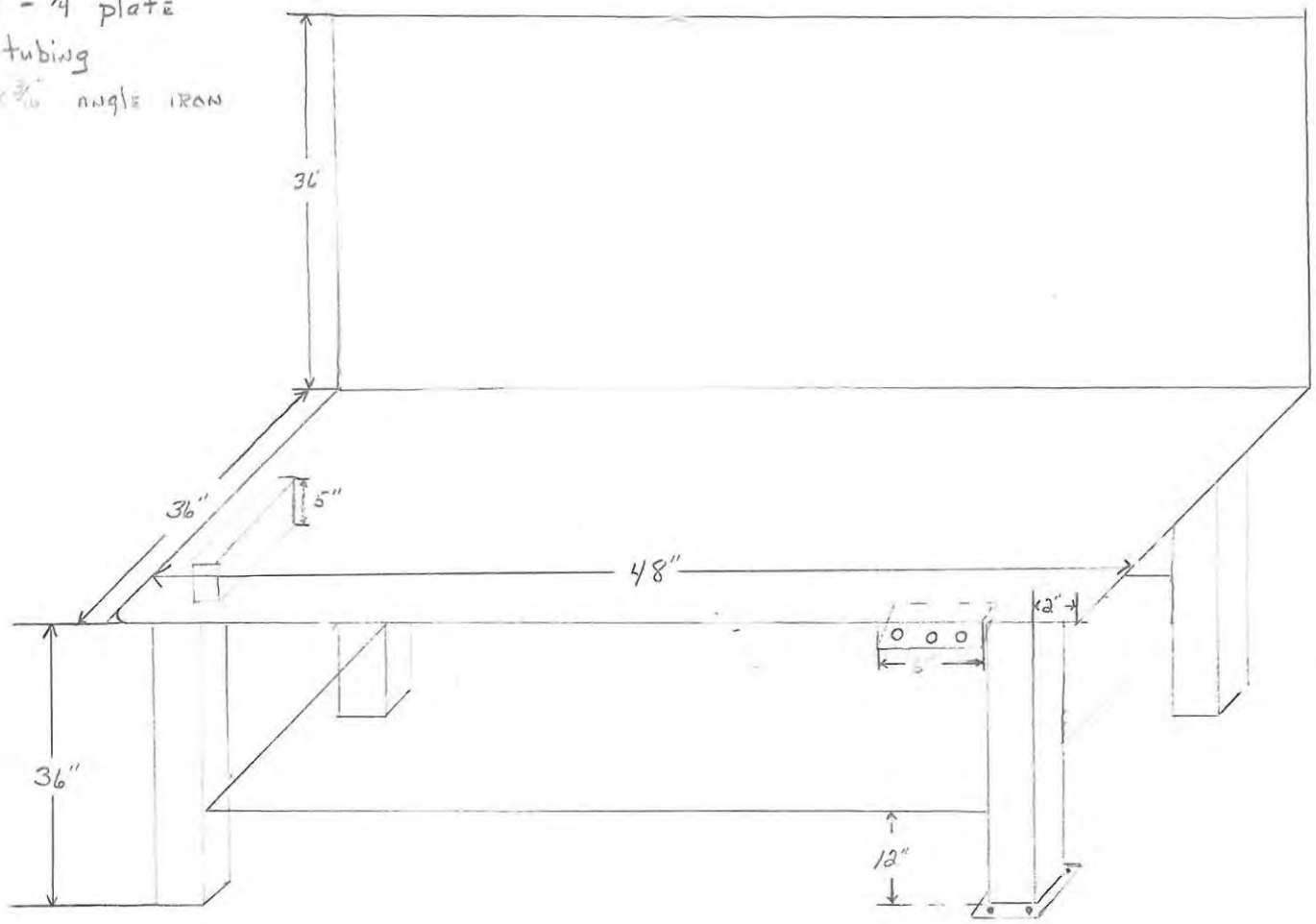
Butch Delap

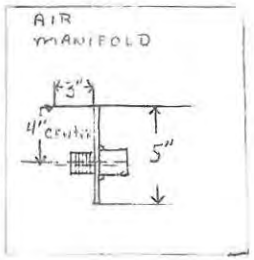
Butch Delap
Millwright Superintendent

ACCEPTED BY _____

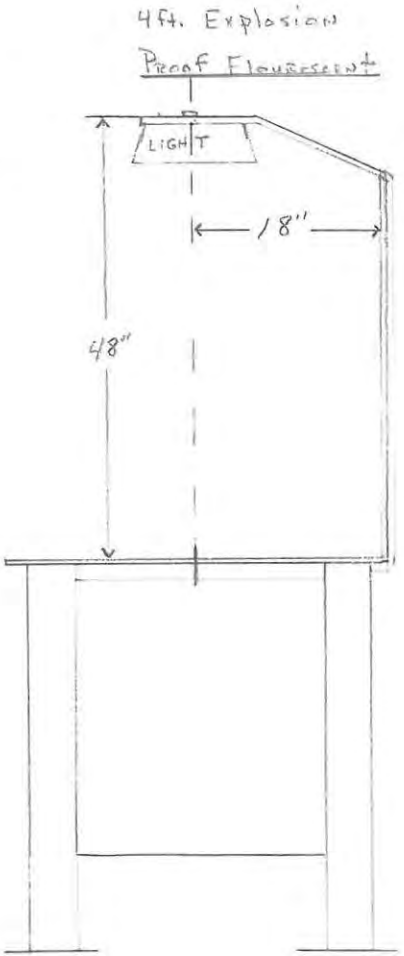
AN EQUAL OPPORTUNITY EMPLOYER

Table Top & Lower Shelf - 1/4" plate
Legs - 2"x2" square tubing
Support Framing - 2"x2"x3/16" angle iron

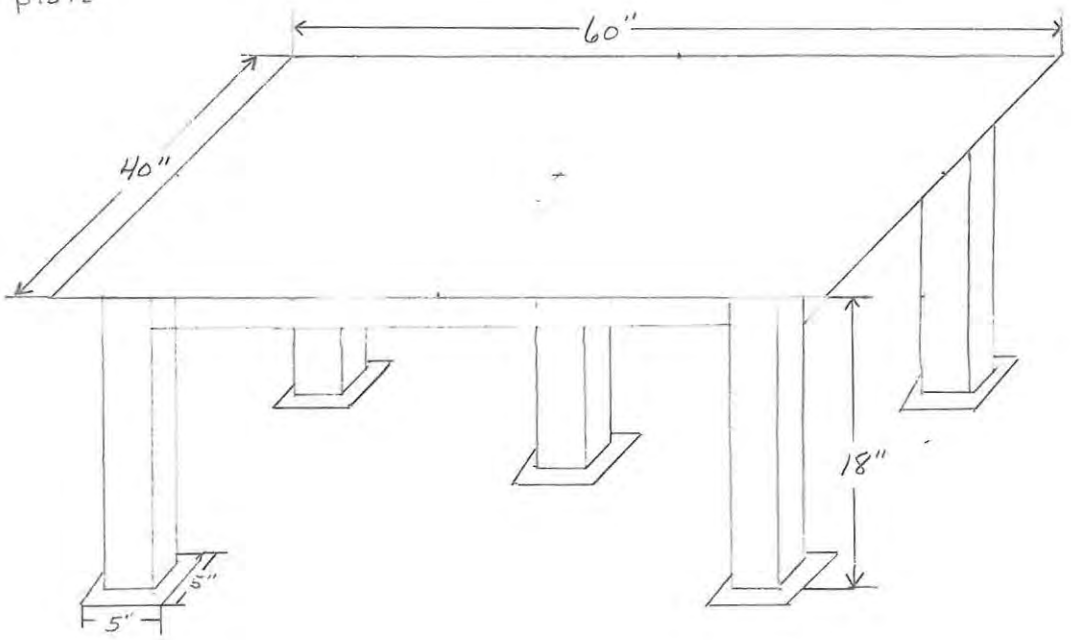


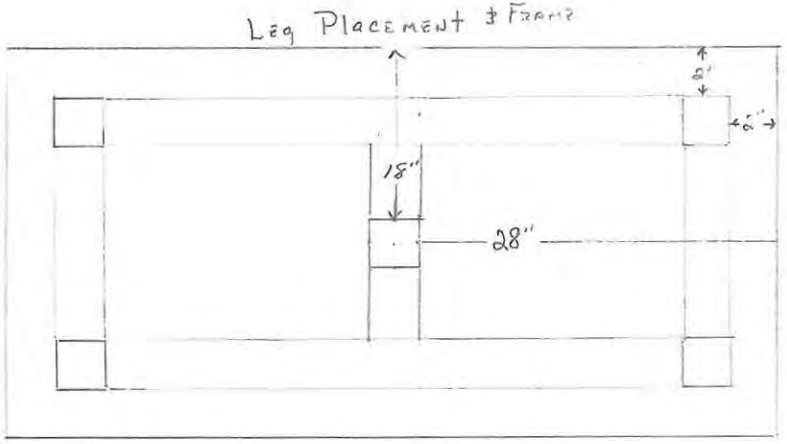






Legs 4x4 square tubing
Table Support ~~me~~ 4x4 sq tubing
Table Top ½" plate





FROST & CO - INC -

9 Broadway Street
Wapakoneta, Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
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A merit shop
Contractor
serving all of
Western Ohio

February 17, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: TABLES FOR CASTING DECK
REVISED QUOTE

Dear Daryl:

As per our conversation and drawings provided, we propose the following:

1 H-D table

- 40" x 60" with 18" work height
- 1/2" plt. table top
- 4" x 4" x 3/16" sq. tube legs and frame structure with footpads

TOTAL COST: $600.00

1 - Medium duty table

- 36" x 48" with 36" work height
- 1/4" plt. table top
- 2" x 2" x 3/16" sq. tube legs with footpads
- 10 ga. back and hood
- 10 ga. shelf

TOTAL COST: $599.00

TOTAL COST FOR BOTH TABLES: $1,199.00

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS. If you have any questions, please feel free to call.

Sincerely,

Butch Delap

Butch Delap
Millwright Superintendent

ACCEPTED BY _____ DATE _____

AN EQUAL OPPORTUNITY EMPLOYER

FROST & CO - INC -

9 Broadway Street
Lakeneta, Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
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Contractor
serving all of
Western Ohio

March 28, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: FINAL INSPECTION TABLE
QUANTITY: ONE

Dear Daryl:

As per your request and drawing provided, the final inspection table is listed below:

- Final inspection table as per customer's specs.
- Paint complete

TOTAL COST: ***$786.82***

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

If you have any questions, please feel free to call.

Sincerely,

Butch Delap

Butch Delap
Millwright Superintendent

ACCEPTED BY_____ DATE_____

E & P Enterprise
21777 Gutman Rd.
Wapakoneta, Ohio, 45895

A.A.P. Corp.
McKinley Rd.
St. Marys, Ohio

Attention
DARYL Brackney

We are pleased to submit lump sum price of $1012..00 even for material , labor , fabrication and delivery of one final inspection table in accordance to your faxed drawing

Any questions please call or fax phone number 1-937-596-6098 fax # 1-937-596-0561

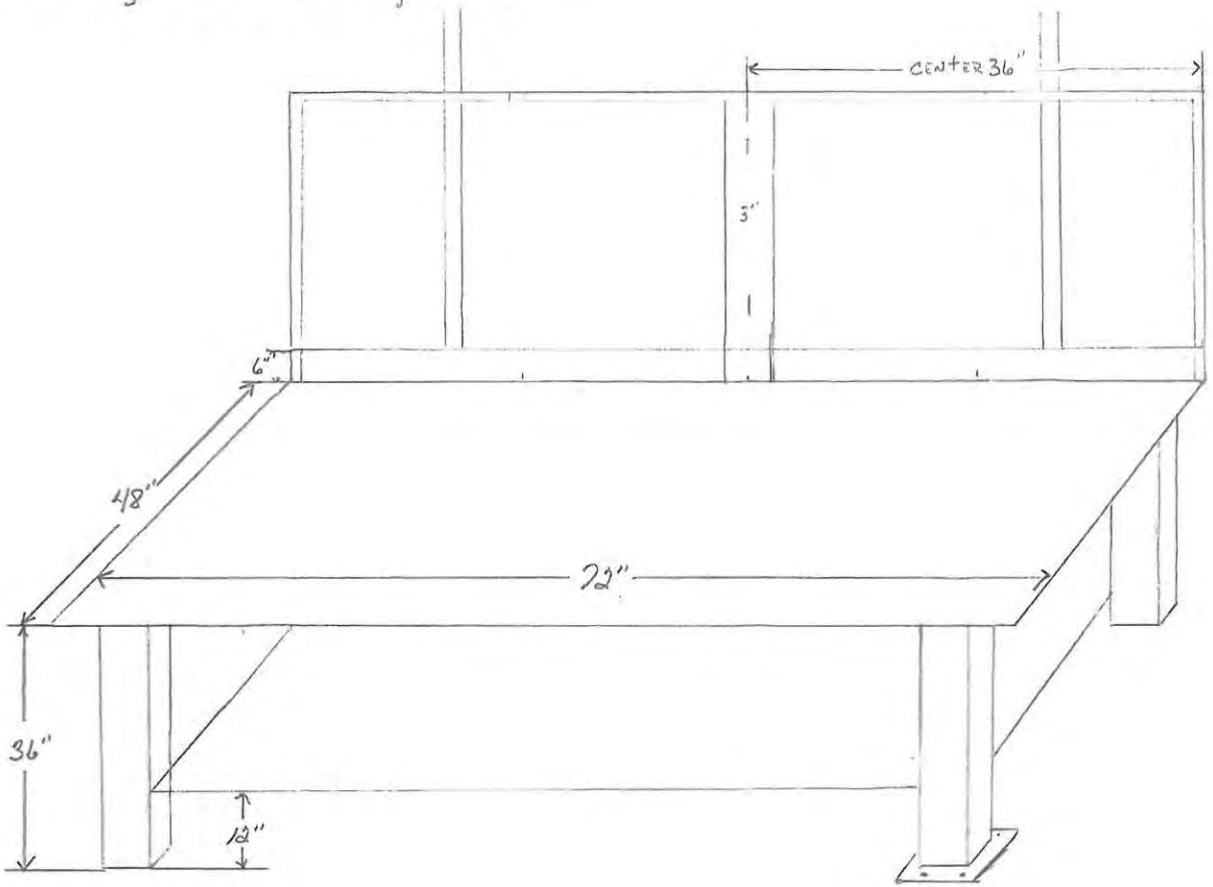
26 March 1997

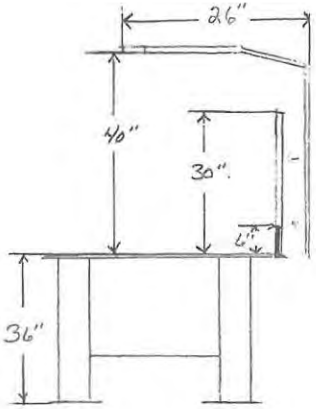
Thank you

Paul Jerry Brackney

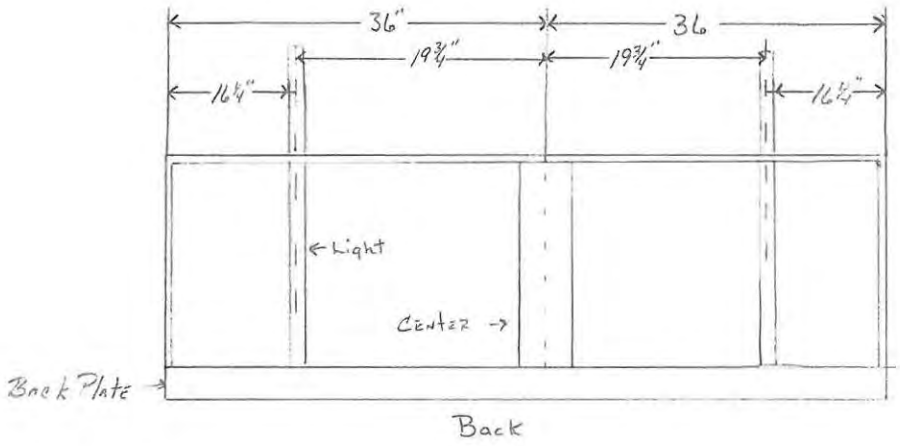
Table Top & Shelf 1/4" plate
Legs 2x2 " sure tubing
Support Framing - 2"x2"x 3/16 Angle iron

Back - 1" angle iron frame
Light Hanger "





Need to fit 2 - 36x24" boards
in back



Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

Ladel

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date: 1/26/00	Proposal No.:4948	F.O.B.	Terms

Qty.	Description	Price	Amount
1	LADEL TABLE (126" x 108") AS PER CONVERSATION WITH BUTCH DELAP. FABRICATE, PAINT (HIGH TEMP. SILVER) DELIVER		$3608.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: Steve Emerick ACCEPTED: DATE:
STEVE EMERICK

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer

Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer

Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

Grinding

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARRYL BRACKNEY

PROPOSAL

Proposal Date:8/24/99	Proposal No.:3403	F.O.B.	Terms

Qty.	Description	Price	Amount
1	4'X6' INSPECTION TABLE WITH BOTTOM SHELF * NO BACK * 2 LIGHT BRACKETS (FABRICATE, DELIVER)		$915.00

REQUOTED TO AAP 1/14/00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY: STEVE EMERICK ACCEPTED: DATE:

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

FROST & CO INC

) Broadway Street
Wapakoneta. Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
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Contractor
serving all of
Western Ohio

TELEFAX COVER SHEET

DATE: 8-12-98

COMPANY: AAP St. Mary's Corp.

ATTENTION: Daryl Brackney FAX NO. 419-394-4776

REFERENCE: X Member spill trough

NUMBER OF PAGES (INCLUDING COVER SHEET): ONE

MESSAGE:

Daryl,
this is my estimate to build and install the spill trough we looked at.

- 4" x 12" x 13 3/4 trough made from 1/4" plf.

total $561.56

FRC Butch Delap

AN EQUAL OPPORTUNITY EMPLOYER

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: DARRELL BRACKNEY
PO BOX 408
ST MARYS OH 45885

No. 1024

Date 9/24/97

Your No. _____

Your Due Date _____

Terms NET 30 DAYS

Prices quoted are
F.O.B. _____

Delivery DATE _____

We are pleased to quote as follows:

QUANTITY	DESCRIPTION	Price	Unit	Amount
1	LABOR AND MATERIALS TO CONSTRUCT LADLE PLATFORM FOR CROSS MEMBER CASTING MACHINE AS PER YOUR SKETCH.	$1,285.00	EA	$1,285.00

ORIGINAL

BY _____

FROST & CO - INC -

7 Broadway Street
Wapakoneta, Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

A merit shop
Contractor
serving all of
Western Ohio

September 17, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: LADLE TABLE

Dear Daryl:

As per our discussion on 9/16/97 and drawing provided, please find enclosed our estimate to fabricate table, install, and modify existing die installation table tracks and lock to accommodate. Specs. listed below.

- 4" x 4" x 1/4" tubing legs and frame
- 10'6" x 9' - 1/2" plate table top
- 1/4" formed fork pockets
- "Fireman's" ladder
- 2" x 2" x 3/8" angle iron v-rails for ladle
- Track extension at installation table
- Lock hardware for ladle table
- Modify lock mechanism at installation table

TOTAL COST: $4,086.00

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

If you have any questions, please feel free to call.

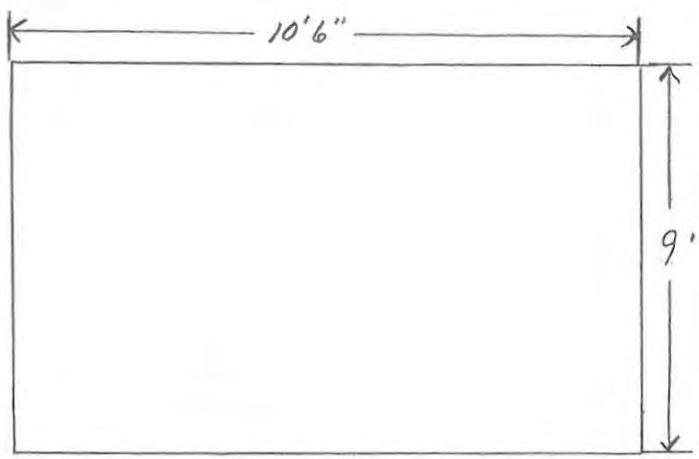
Sincerely,

Butch Delap

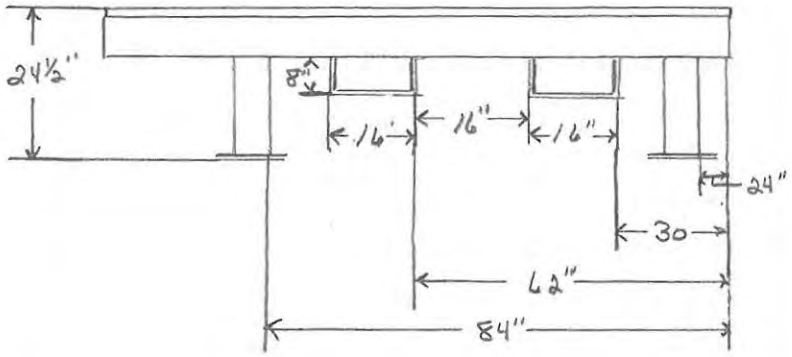
Butch Delap
Millwright Superintendent

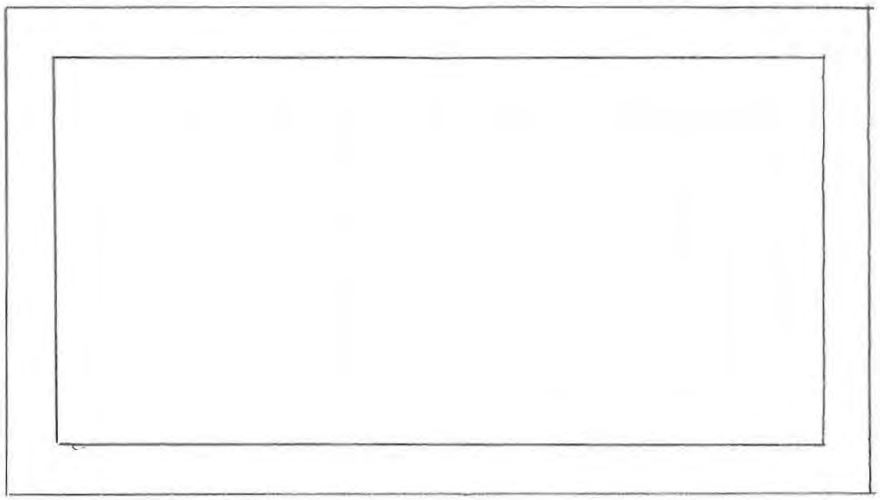
ACCEPTED BY_____ DATE_____

Table Top

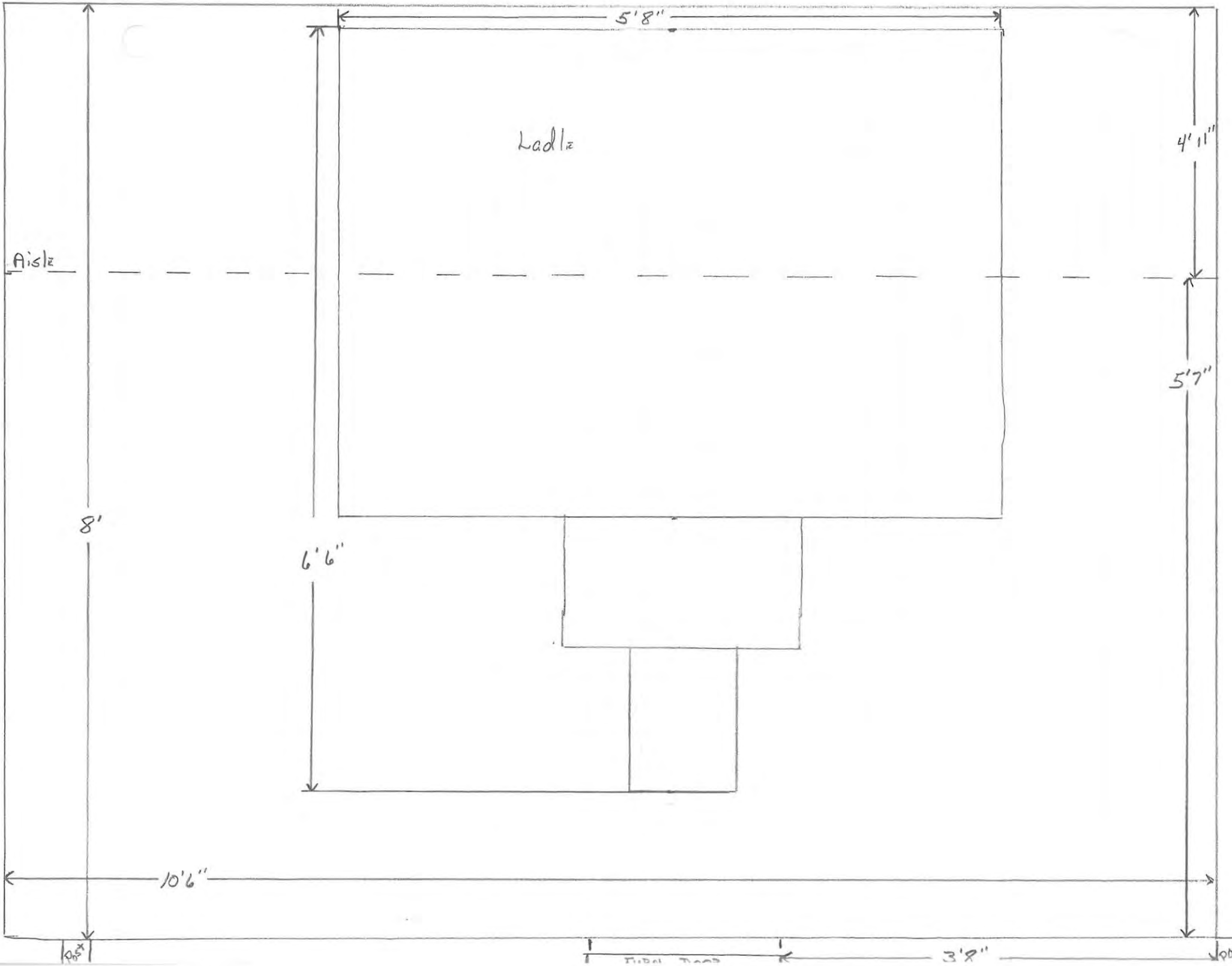


Side View - Legs & Fork Pockets





- Wieght Capacity: 7000 lbs.
- Ladder on right side when facing back
- Angle iron tracks to be located.
- Fork lift pockets
- Lock in method to the platform
- Length track for installation cart table
- New lock position for installation table.

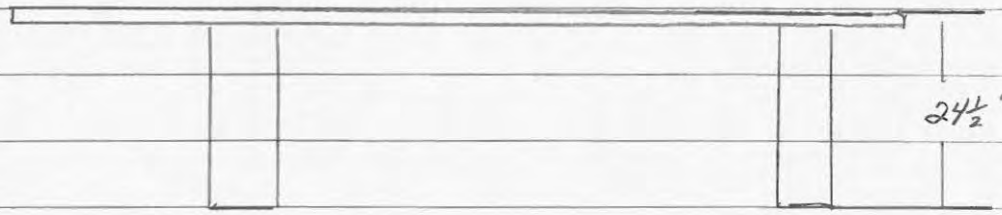

5'8"
Ladle
4'11"
Aisle
5'7"
8'
6'6"
10'6"
POST
3'8"
POST

Trough Ladle

Floor to Bottom of Trough - Ladle on Angle Iron Rails
23½"

Floor to Bottom of LPF opening - Furnace up.
48"

48" - 23½" = 24.5



10'6" x 8'~~6~~"

5'7" - Front to Aisle

S. Post to LPF Open
3'8" - 5'5"

Ladle Width
5'8"

Trough
2'5"

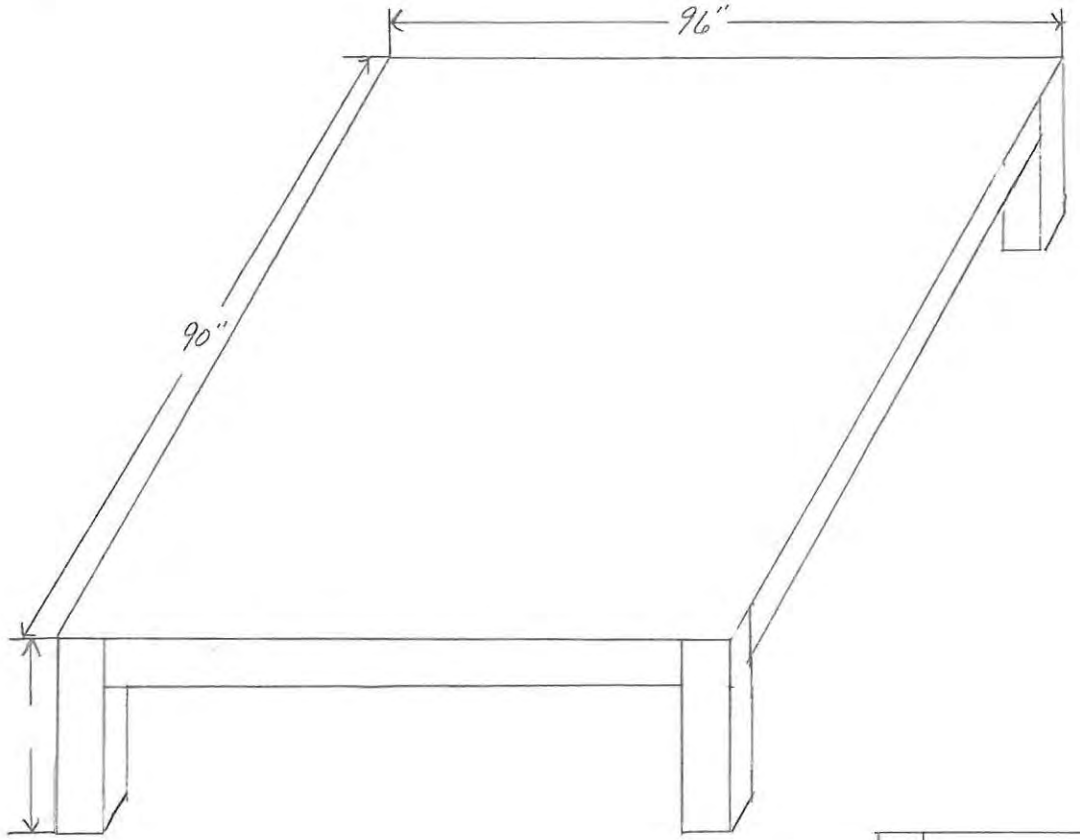
Post to Post
10'?

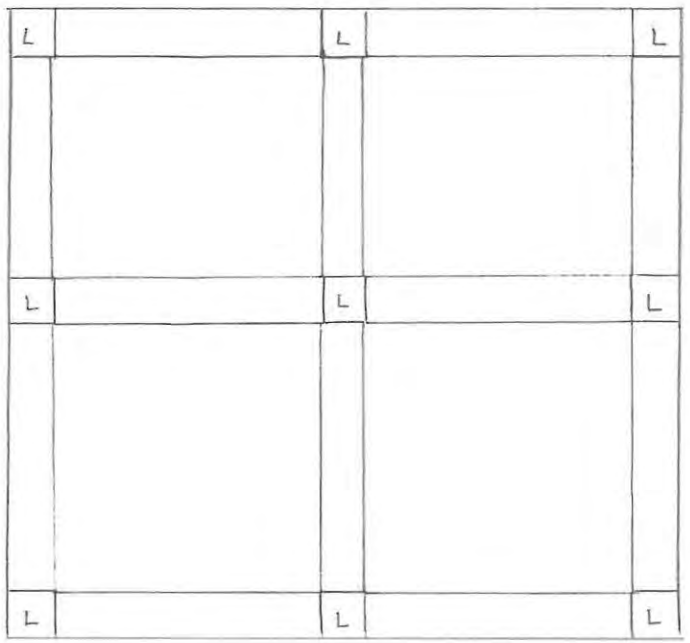
67

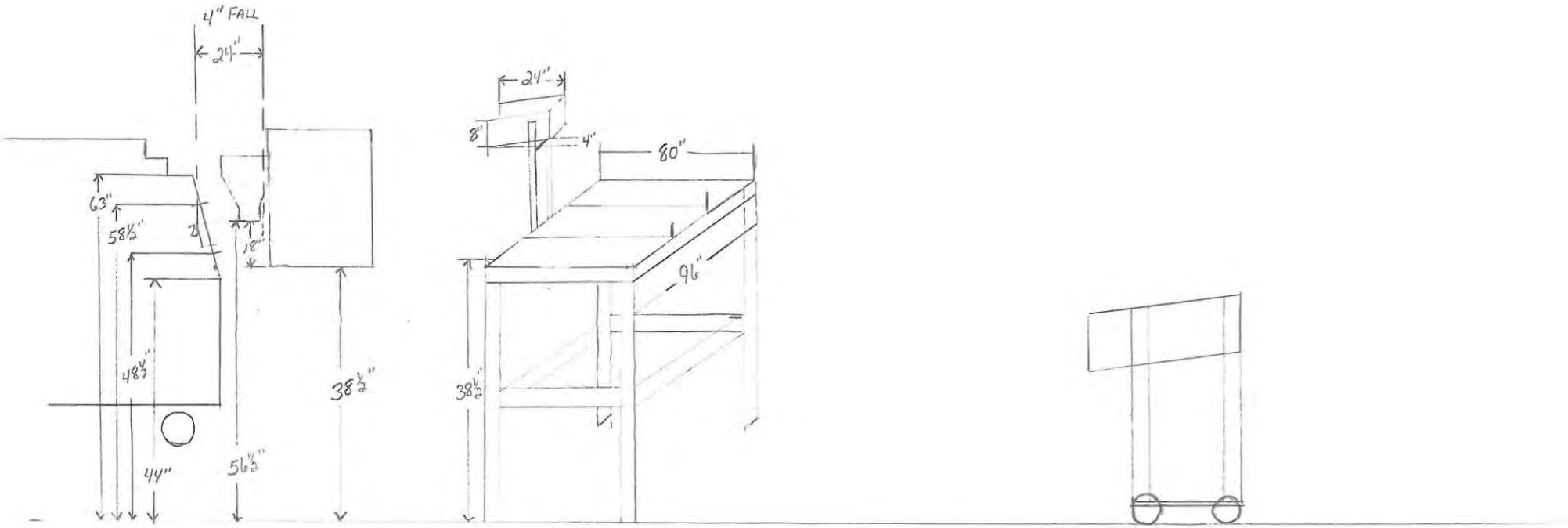
9

Ladle Table

½" plate
4x4 sq. tubing .Rame & legs






4" FALL
24"
63"
58½"
18"
48½"
44"
56½"
38½"
24"
8"
4"
80"
96"
38½"

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: JAY MCGUE
PO BOX 408
ST MARYS OH 45885

No. 855

Date 3/12/97

Your No.

Your Due Date

Terms NET 30 DAYS

Prices quoted are F.O.B.

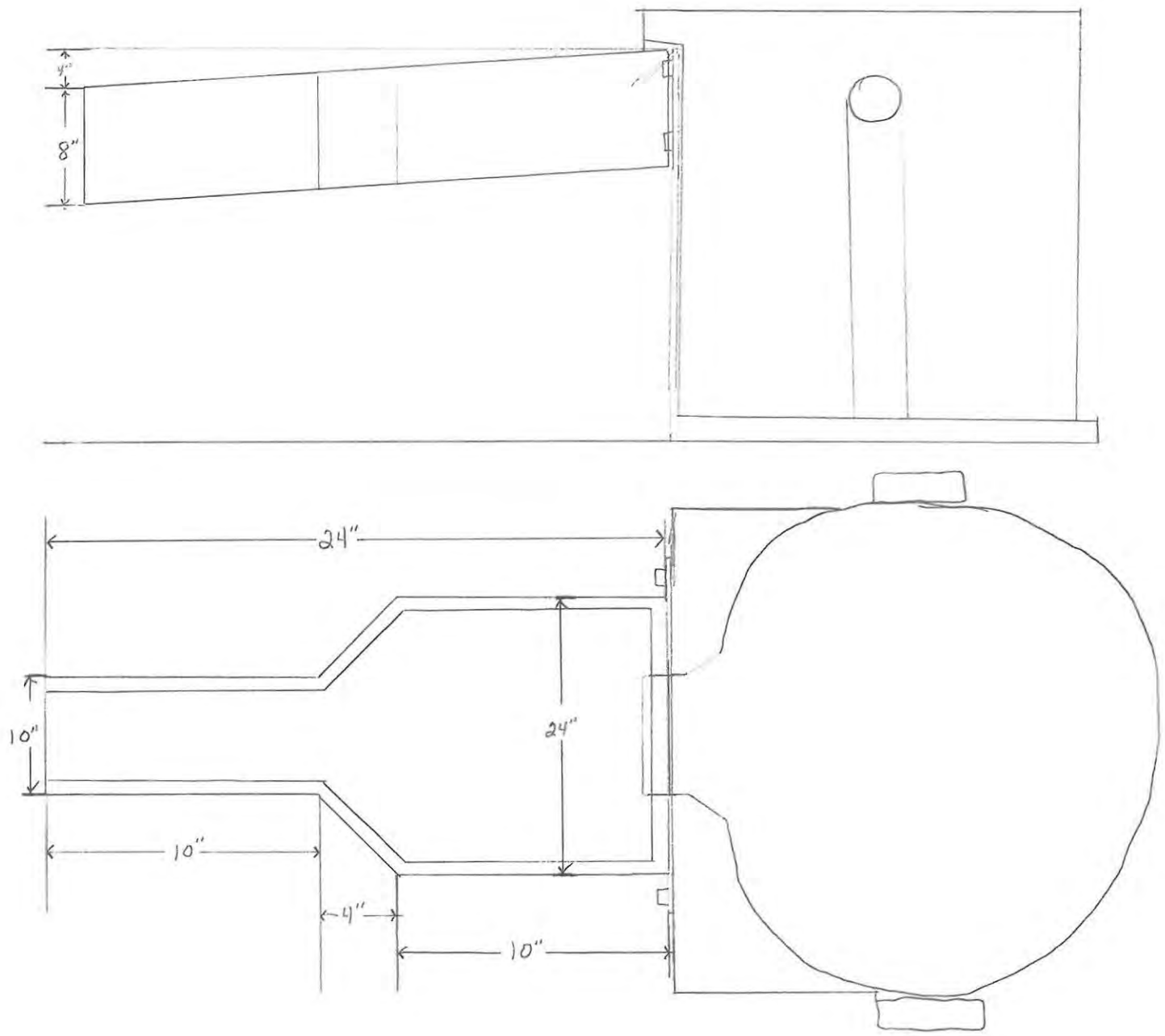
Delivery DATE

We are pleased to quote as follows:

Quantity	Description	Price	Unit	Amount
1	LABOR AND MATERIALS TO CONSTRUCT NEW POURING TROUGH AS PER SKETCH AND OUR DISCUSSION.	$175.85	EA	$175.85

ORIGINAL

BY


4"
8"
24"
10"
24"
10"
4"
10"

FROST & CO - INC -

9 Broadway Street
Wapakoneta, Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
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A merit shop
Contractor
serving all of
Western Ohio

March 17, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

Re: Pouring Trough

Dear Daryl:

As per our conversation and drawing provided the cost for fabricating a custom our trough is as follows:

- Fab per drawing custom pour trough.

Total Cost: $488.00

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

Thank you for the opportunity in submitting this quote to you. If you have any questions, please feel free to call.

Sincerely,

Butch Delap

Butch Delap
Millwright Superintendent

ACCEPTED BY: _____ DATE: _____

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: ALAN KOHLRIESER
PO BOX 408
ST MARYS OH 45885

No. 854

Date 3/12/97

Your No. _____

Your Due Date _____

Terms NET 30 DAYS

Prices quoted are F.O.B. _____

Delivery DATE _____

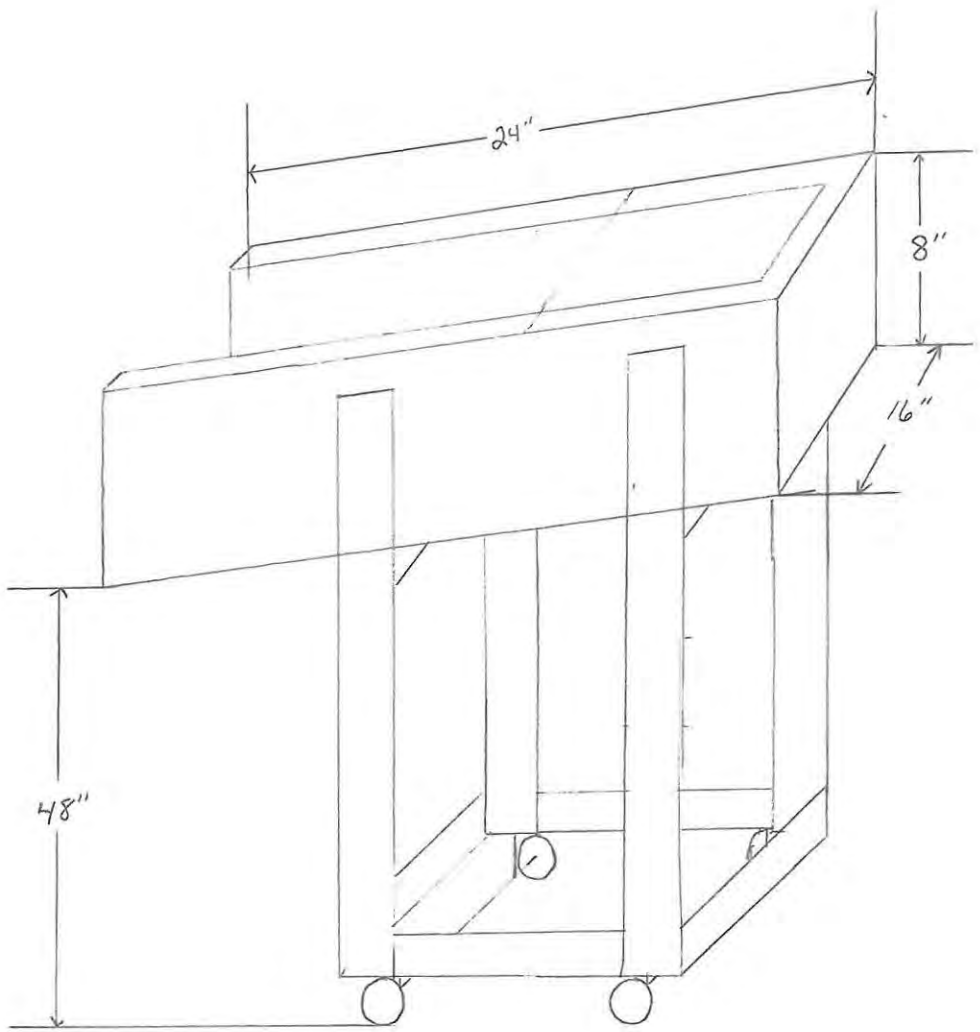
We are pleased to quote as follows:

Quantity	Description	Price	Unit	Amount
1	LABOR AND MATERIALS TO CONSTRUCT POURING TROUGH ON WHEELS AS PER SKETCH.	$265.89	EA	$265.89

ORIGINAL

BY _____

Pouring Trough



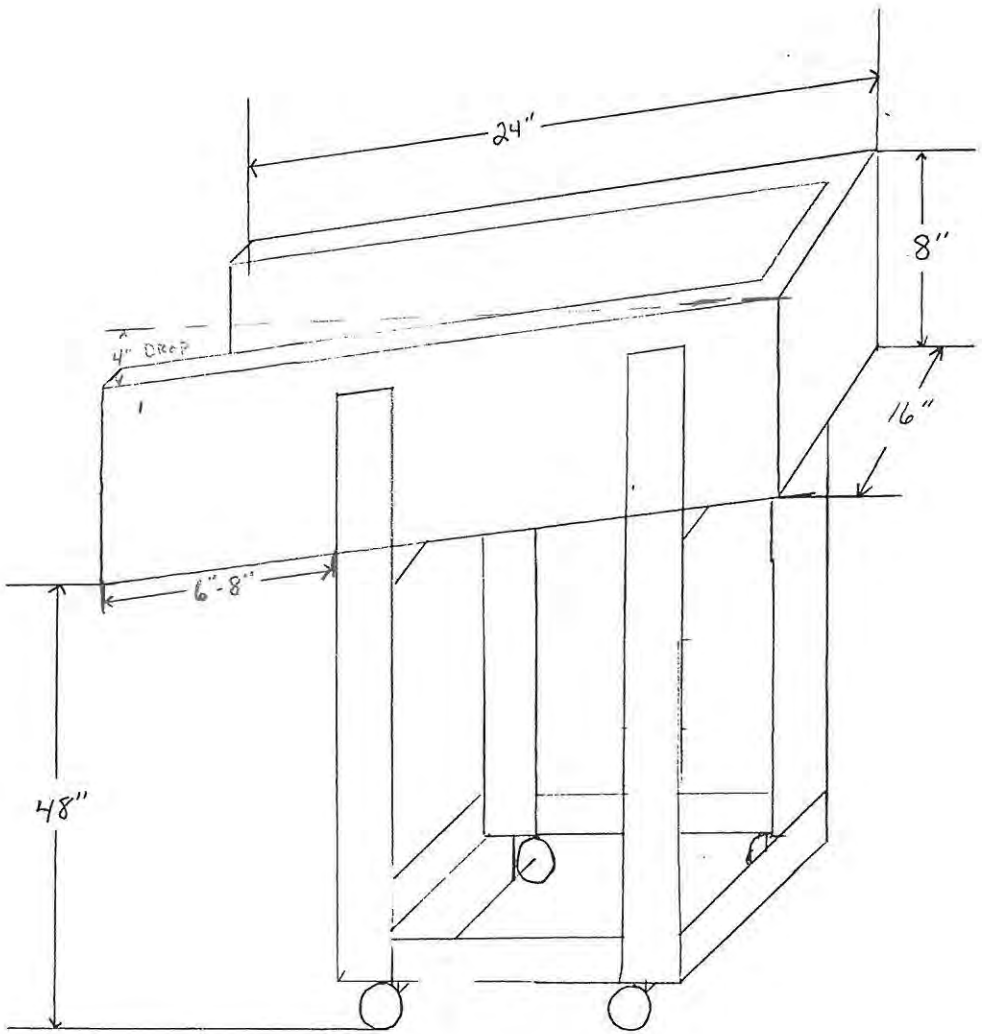
Pouring Trough

1/4" Plate.

To: Butch Delop 419-938-8881

From: Daryl Brackney

AHD St Marys



QUOTATION

From
C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To
AAP ST MARYS CORP
ATTN: ALAN KOHLRIESER
PO BOX 408
ST MARYS OH 45885

No. 851
Date 3/7/97
Your No.
Your Due Date
Terms NET 30 DAYS
Prices quoted are F.O.B.
Delivery DATE

We are pleased to quote as follows:

Quantity	Description	Price	Unit	Amount
1	LABOR AND MATERIALS TO CONSTRUCT 3 PIECE SPILL GUARD AS PER DARREL'S SKETCH.	$145.75	EA	$145.75

ORIGINAL

BY _____

FROST & CO - INC -

9 Broadway Street
Tapakoneta, Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

A merit shop
Contractor
serving all of
Western Ohio

March 5, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: SAFETY GUARDS & FLOOR PLATES

Dear Daryl:

As per our conversation and drawings provided, each item is quoted individually as you requested. We propose:

• Retriever guard	$ 396.00
• Spill guard front	$ 298.00
• Spill guard North	$ 298.00
• Spill guard South	$ 298.00
• 64" x 104" x 1/2" dia. plt. floor plt.	$1,012.00
• 64" x 84" x 1/2" dia. plt. floor plt.	$ 908.00
• 95" x 79" x 1/2" dia. plt. floor plt.	$1,279.00
• 48" x 96" x 1/4" dia. plt. elevated platform	$ 782.00
TOTAL COST:	**$5,271.00**

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

If you have any questions, please feel free to call.

Sincerely,

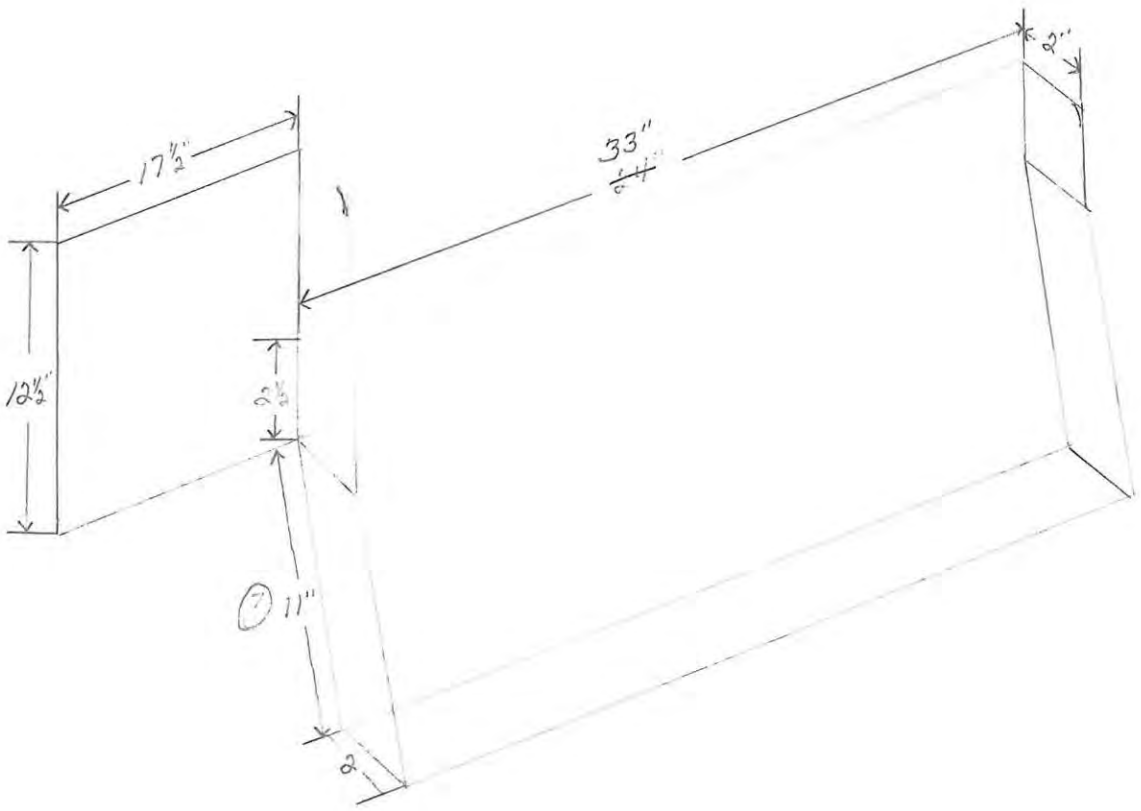
Butch Delap

Butch Delap
Millwright Superintendent

ACCEPTED BY_____ DATE_____

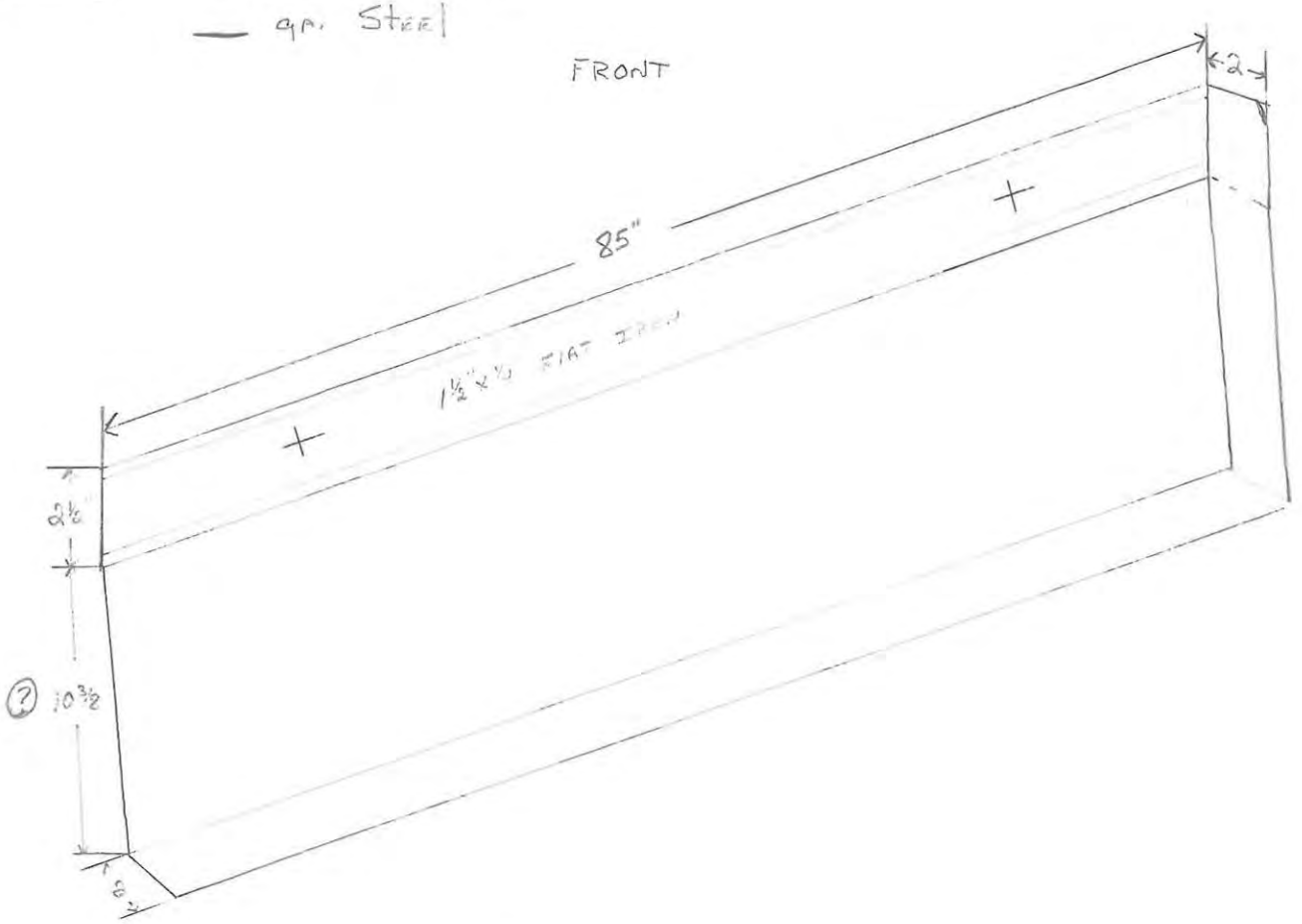
Spill Gaurd
South

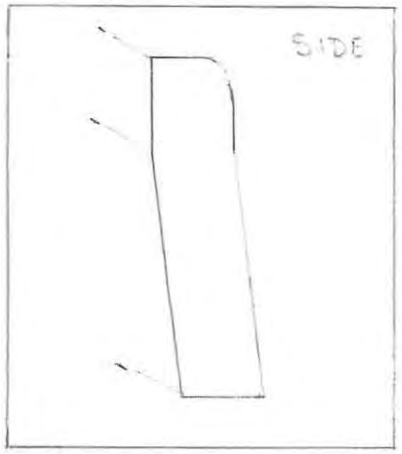
On 1½ x 12½ section Possibly
put a Angle piece on inside
even with platten tube.



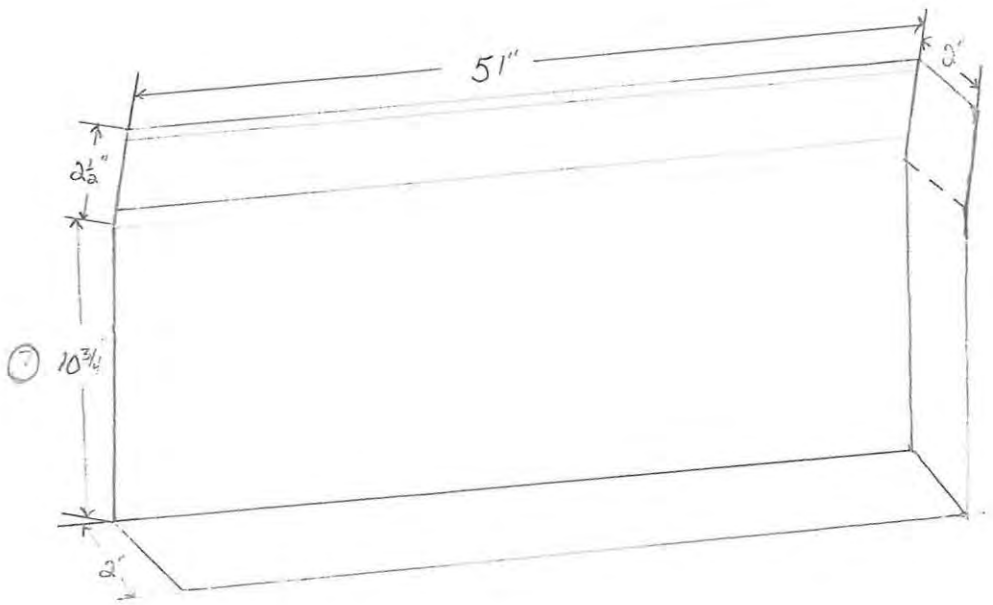
Spill Guard
cont

Bolt top to bottom flatten.
Use 1/4" x 1 1/2" flat Iron for ⊢ ALL 3 pieces
Support. à' Sides
— 9ga. Steel





North Side



ATTENTION:

ALAN - FYI

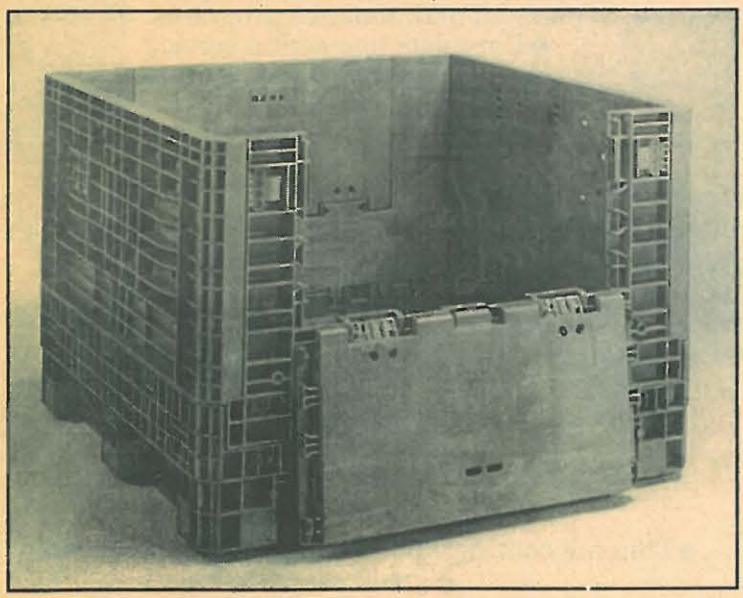
YOU KNOW AMERICAN WIRE PRODUCTS, INC. AS ONE OF THE NATION'S LEADING MANUFACTURERS OF WIRE MESH MATERIAL HANDLING STORAGE PRODUCTS.

NOW, OUR PRODUCT OFFERINGS TO YOU ARE EVEN GREATER !

awp

INTRODUCES:

PLASTIC BULK CONTAINERS



FIVE IN-STOCK STANDARD MODELS

32 X 30	2 ACCESS DOORS
48 X 40	2 ACCESS DOORS
48 X 40	1 ACCESS DOOR
48 X 45	2 ACCESS DOORS
48 X 45	1 ACCESS DOOR

STYLE: COLLAPSIBLE PALLET BASE
COLOR: BLACK
HEIGHT: 34"

MANUFACTURED BY:
PERSTORP XYTEC, INC.

STRUCTURAL FOAM MOLDED HIGH DENSITY POLYETHYLENE

SOLD AND DISTRIBUTED BY:
awp industries inc.

NEXT DAY SHIPMENT

(F.O.B.) KENTUCKY

FOR DETAILS ON PRICING CALL awp'S CUSTOMER SERVICE AT:
1-800-666-9938

awp

awp industries inc.
616 Industrial Road
Frankfort, Kentucky 40601

SEE PAGE 17, FOR

INNOVATIVE HANDLING and METALFAB, INC.
7765 Sylvania Ave. Sylvania, Ohio 43560
(419) 882-7480 Fax (419) 885-1624

Conveying Systems, Cranes, and Custom Fabrication, Stainless Steel and Aluminum

FAX TRANSMITTAL SHEET

TO: Greg Cass
AAP - St. Marys
FAX NO.: (419) 394-~~3~~4776
FROM: Rich Peterson
REF: Wire Mesh Container
DATE: 7/25/96
NUMBER OF PAGES: 1

QUOTE 166620	X
PURCHASE ORDER NUMBER	
PLEASE QUOTE PRICE AND DELIVERY ON THE FOLLOWING	
PLEASE PLACE MY ORDER FOR THE FOLLOWING	
PLEASE CHECK STATUS ON PURCHASE ORDER NUMBER	
FOR YOUR INFORMATION	
OTHER	

MESSAGE: Standard unit has ½ Drop Side.
50 pcs } 40"W x 48"L x 42"OAH — $125.00 ea.
100 pcs } 2000 Lb Capacity — 123.00 ea.
150 pcs } — 123.00 ea.
Ship: 2-3 Days
Wt.: 165 lbs ea.

Full Drop would be a special + would be 10-12 wks Delivery: It will take 2-3 Days to get pricing

Regards

IF YOU DO NOT RECEIVE ALL THE PAGES, OR HAVE ANY QUESTIONS OR COMMENTS, PLEASE CALL.

SIGNED Rich Peterson

INNOVATIVE HANDLING and METALFAB, INC.
7755 Sylvania Ave. Sylvania, Ohio 43560
(419) 882-7480 Fax (419) 885-1624

Conveying Systems, Cranes, and Custom Fabrication, Stainless Steel and Aluminum

FAX TRANSMITTAL SHEET

TO: Greg Cass
AAP - St. Marys Corp
FAX NO.: (419) 394-4776
FROM: Rich Peterson
REF: Full Drop Containers
DATE: 7/26/96

NUMBER OF PAGES: 1

QUOTE 660676	X
PURCHASE ORDER NUMBER	
PLEASE QUOTE PRICE AND DELIVERY ON THE FOLLOWING	
PLEASE PLACE MY ORDER FOR THE FOLLOWING	
PLEASE CHECK STATUS ON PURCHASE ORDER NUMBER	
FOR YOUR INFORMATION	
OTHER	

MESSAGE: 40"W x 48"L x 42" OAH (36" usable)
Capacity: 2000 Lbs
* 1/2 Drop &/or Full Drop Side on 48" Section
Containers will stack 4 high
wt.: 166 #/unit
* Special Construction
50 pcs - $153.00/each
100 pcs - 129.00/"
150 pcs - 128.00/"

Ship 10-12 wks ARO

Regards

IF YOU DO NOT RECEIVE ALL THE PAGES, OR HAVE ANY QUESTIONS OR COMMENTS, PLEASE CALL.

SIGNED Rich Peterson

GREG CASS
AAP
ST. MARYS OHIO

STAHLER RITMS SUN INDEPENDENT

SUBJECT: RATE QUOTATION

FROM: ST. MARYS OHIO
  TO: MATTOON IL
    : $400.00 560 175.85 NEG

FROM: ST. MARYS OHIO
  TO: MATTOON IL
  TO: ST. MARYS OHIO
    : $750.00 948 700 NEG

GREG THANK YOU FOR ALLOWING ME TO QUOTE THIS BUSINESS.

CAREY PAINTER
513-322-6230

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: ALAN KOHLRIESER
PO BOX 408
ST MARYS OH 45886

No. 652
Date 3/7/97
Your No.
Your Due Date
Terms NET 30 DAYS
Prices quoted are F.O.B.
Delivery DATE

We are pleased to quote as follows:

Quantity	Description	Price	Unit	Amount
1	LABOR AND MATERIALS TO CONSTRUCT EXPANDED METAL GUARD FOR RETRIEVER.	$175.45	EA	$175.45

ORIGINAL

BY _____

FROST & CO - INC -

9 Broadway Street
Spakoneta, Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

A merit shop
Contractor
serving all of
Western Ohio

March 5, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: SAFETY GUARDS & FLOOR PLATES

Dear Daryl:

As per our conversation and drawings provided, each item is quoted individually as you requested. We propose:

• Retriever guard	$ 396.00
• Spill guard front	$ 298.00
• Spill guard North	$ 298.00
• Spill guard South	$ 298.00
• 64" x 104" x 1/2" dia. plt. floor plt.	$1,012.00
• 64" x 84" x 1/2" dia. plt. floor plt.	$ 908.00
• 95" x 79" x 1/2" dia. plt. floor plt.	$1,279.00
• 48" x 96" x 1/4" dia. plt. elevated platform	$ 782.00
TOTAL COST:	**$5,271.00**

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

If you have any questions, please feel free to call.

Sincerely,

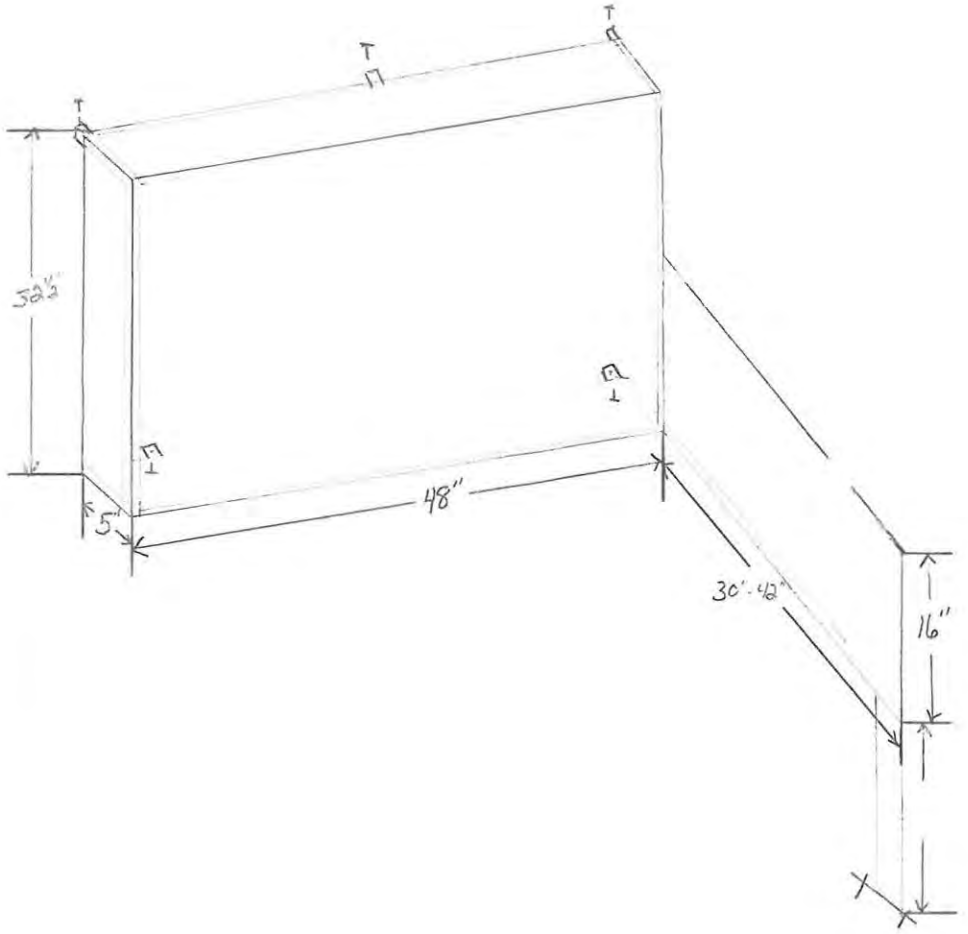
Butch Delap

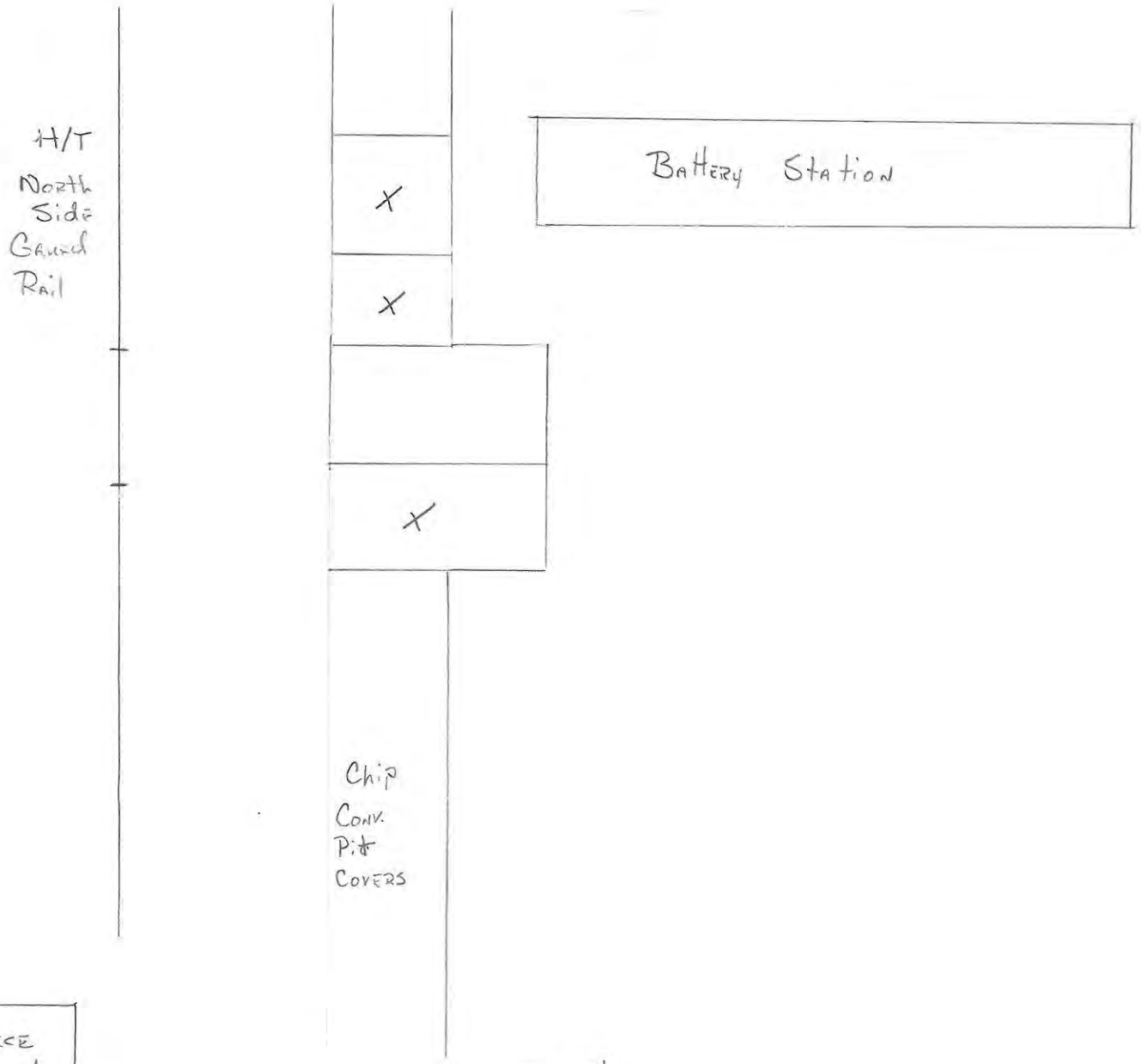
Butch Delap
Millwright Superintendent

ACCEPTED BY_____DATE_____

Retriever Guard

Expanded Metal
Angle Iron
Flat Iron





Replace & Reinforce Deck Plate Behind H/T.
X- Changer.

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: ALAN KOHLRIESER
PO BOX 408
ST MARYS OH 45885

No. 645
Date 3/7/97
Your No.
Your Due Date
Terms NET 30 DAYS
Prices quoted are F.O.B.
Delivery DATE

We are pleased to quote as follows:

Quantity	Description	Price	Unit	Amount
1	LABOR AND MATERIALS TO INSTALL 1 1/2" DIAMOND TREAD PLATE WITH 4" WIDE FLANGE BEAM BRACES OVER #9 CHIP CONVEYOR AT HEAT TREAT AS PER OUR DISCUSSION.	$4450.00	EA	$4450.00

ORIGINAL

BY _____

FROST & CO - INC -

9 Broadway Street
Spakoneta, Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

A merit shop
Contractor
serving all of
Western Ohio

March 5, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: SAFETY GUARDS & FLOOR PLATES

Dear Daryl:

As per our conversation and drawings provided, each item is quoted individually as you requested. We propose:

• Retriever guard	$ 396.00
• Spill guard front	$ 298.00
• Spill guard North	$ 298.00
• Spill guard South	$ 298.00
• 64" x 104" x 1/2" dia. plt. floor plt.	$1,012.00
• 64" x 84" x 1/2" dia. plt. floor plt.	$ 908.00
• 95" x 79" x 1/2" dia. plt. floor plt.	$1,279.00
• 48" x 96" x 1/4" dia. plt. elevated platform	$ 782.00
TOTAL COST:	**$5,271.00**

3199.00

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

If you have any questions, please feel free to call.

Sincerely,

Butch Delap

Butch Delap
Millwright Superintendent

ACCEPTED BY_____ DATE_____

Step Cover

AAP
ST. MARYS CORP.
1100 McKinley Road • St. Marys, Ohio 45885
Telephone: (419) 394-7840
Fax: (419) 394-4776

- Plumbing Cover
- Hand rail - Removable section.
  ? Heavy end post.

¼" plate Cover (1)
4 x 8

Handrail
25' Total
9' ? to opening (2)
7' opening

Lima Sheet Metal 1001 Bowman Rd. Lima, Ohio 45804
Phone: (419)-229-1161 Fax: (419)-229-8538

Plumbing Covers
P.O. Written
2/10/99

To:

AAP ST. MARY'S CORPORATION
1100 McKINLEY RD.
ST.MARY'S, OHIO 45885
ATTN: DARYL BRACKNEY

PROPOSAL

Proposal Date:2/8/99	Proposal No.:1536	F.O.B.	Terms

Qty.	Description	Price	Amount
	FABRICATE, PAINT (SAFETY YELLOW) DELIVER AND INSTALL :		
	6.5" CHANNEL COVERS WITH 3" OF CLEARANCE:		
	1 - 6' LONG		
	1 - 12' LONG		
	1 - 5' LONG		
	1 - 4' LONG		
	16" CHANNEL COVER WITH 5" OF CLEARANCE:		
	1 - 12' LONG		
	10" CHANNEL COVER WITH 6" OF CLEARANCE:		
	1 - 8' LONG		
	12" CHANNEL COVER WITH 6" OF CLEARANCE:		
	1 - 30" LONG		
	DECKING 2" CHANNEL FRAME WITH 1/8" TREADPLATE:		
	1 - 16"x30"		
	1 - 48"x96"		$2625.00

WE ARE PLEASED TO SUBMIT THE ABOVE PROPOSAL FOR YOUR CONSIDERATION. SHOULD YOU PLACE AN ORDER, BE ASSURED IT WILL RECIEVE OUR PROMPT ATTENTION.
THIS PROPOSAL IS VALID FOR (60) DAYS. THEREAFTER IT IS SUBJECT TO CHANGE WITHOUT NOTICE.

BY:STEVE EMERICK Steve M Emerick ACCEPTED: DATE:

Mike Emerick - President
Tom Emerick - Vice President
Anne Emerick - Secretary/Treasurer
Janet Dotson - Office Secretary
Steve Emerick - Mech. Engineer
Eric Vore - Mech. Engineer
Chuck Weekly - Field Supervisor
Butch Delap - Field Supervisor
Mark Kahle - Shop Supervisor

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

No. 847

Date 3/7/97

Your No. _____

Your Due Date _____

Terms NET 30 DAYS

Prices quoted are
F.O.B. _____

Delivery DATE _____

To

AAP ST MARYS CORP
ATTN: ALAN KOHLRIESER
PO BOX 408
ST MARYS OH 45885

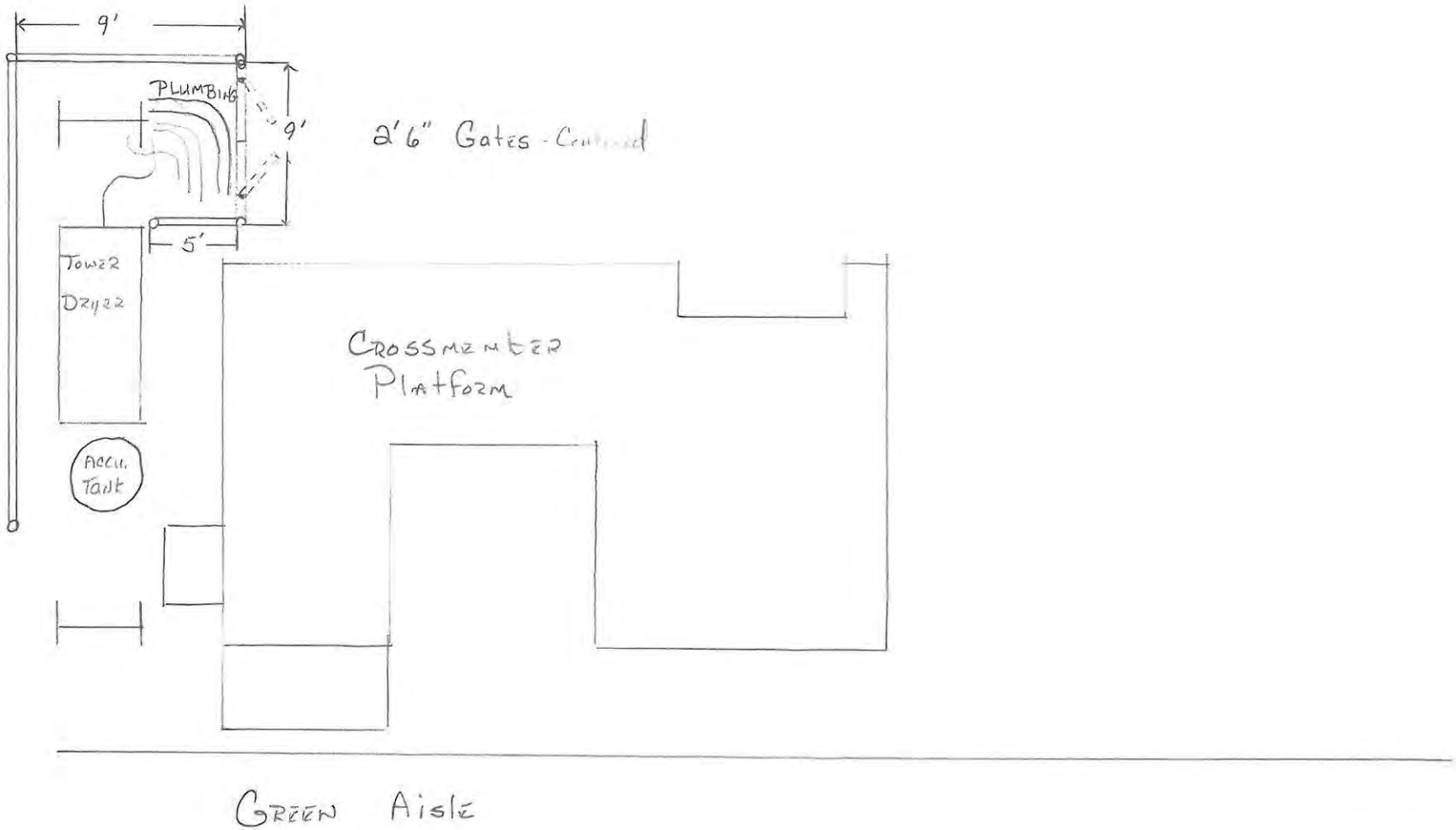
We are pleased to quote as follows:

Quantity	Description	Price	Unit	Amount
1	LABOR AND MATERIALS TO INSTALL PIPE HAND RAIL WITH 2 GATES AROUND PIPING AT NEW CASTING MACHINE.	$365.00	EA	$365.00

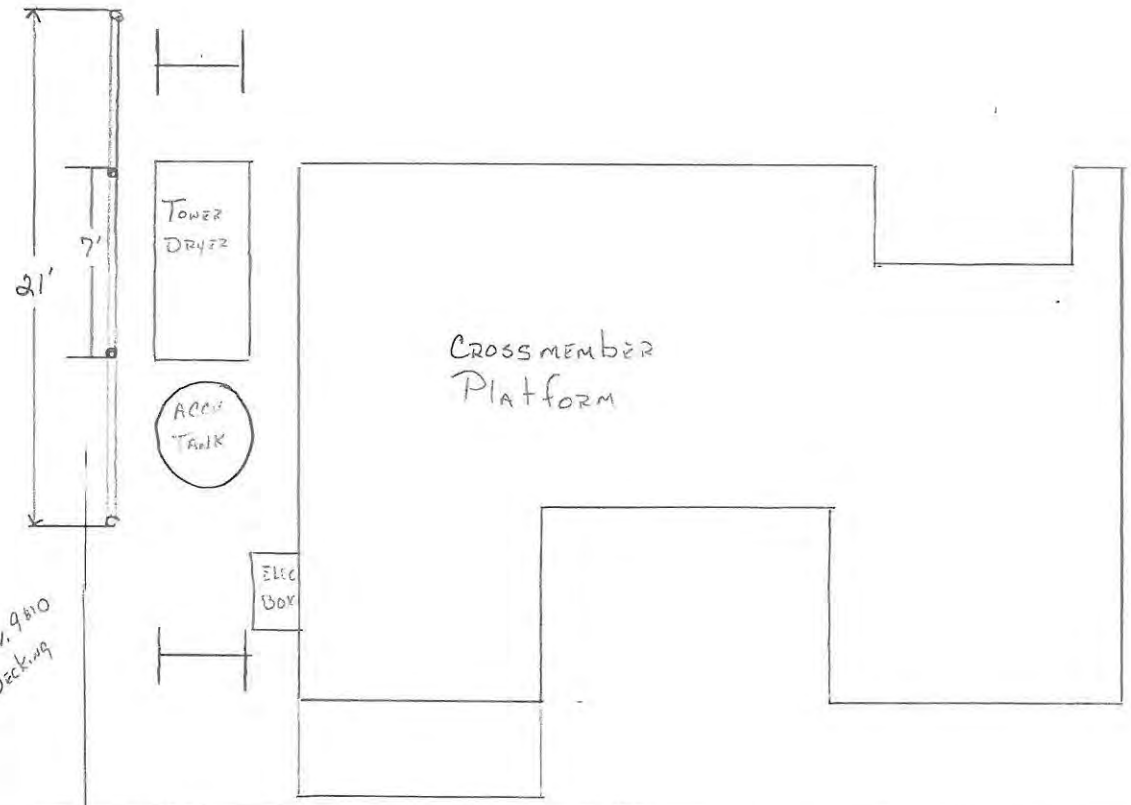
ORIGINAL

BY _____

Hand Rail around
Casting plumbing



-Hc 'zail South of Tower Dryer



QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

No. 548

Date 3/7/97

Your No.

Your Due Date

Terms NET 30 DAYS

Prices quoted are F.O.B.

Delivery DATE

To

AAP ST MARYS CORP
ATTN: ALAN KOHLRIESER
PO BOX 408
ST MARYS OH 45885

We are pleased to quote as follows:

Quantity	Description	Price	Unit	Amount
1	LABOR AND MATERIALS TO INSTALL PIPE HAND RAIL ON SOUTH SIDE OF AIR DRIER AT NEW CASTING MACHINE.	$297.50	EA	$297.50

ORIGINAL

BY

FROST & CO - INC -

9 Broadway Street
Ipakoneta. Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

A mexit shop
Contractor
serving all of
Western Ohio

March 5, 1997

AAP, St. Marys
1100 McKinley Road
St. Marys, OH 45885
Attn: Daryl Brackney

REFERENCE: SAFETY GUARDS & FLOOR PLATES

Dear Daryl:

As per our conversation and drawings provided, each item is quoted individually as you requested. We propose:

• Retriever guard	$ 396.00
• Spill guard front	$ 298.00
• Spill guard North	$ 298.00
• Spill guard South	$ 298.00
• 64" x 104" x 1/2" dia. plt. floor plt.	$1,012.00
• 64" x 84" x 1/2" dia. plt. floor plt.	$ 908.00
• 95" x 79" x 1/2" dia. plt. floor plt.	$1,279.00
• 48" x 96" x 1/4" dia. plt. elevated platform	$ 782.00
TOTAL COST:	**$5,271.00**

NOTE: THIS ESTIMATE IS VALID FOR 30 DAYS.

If you have any questions, please feel free to call.

Sincerely,

Butch Delap

Butch Delap
Millwright Superintendent

ACCEPTED BY_____ DATE_____

QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: ALAN KOHLRIESER
PO BOX 408
ST MARYS OH 45885

No. 846

Date 3/7/97

Your No.

Your Due Date

Terms NET 30 DAYS

Prices quoted are F.O.B.

Delivery DATE

We are pleased to quote as follows:

Quantity	Description	Price	Unit	Amount
1	LABOR AND MATERIALS TO INSTALL STEP DECK OVER PIPING AT NEW CASTING MACHINE.	$425.00	EA	$425.00

ORIGINAL

BY _____

Richard Leis

AAP
ST. MARYS CORP.

1100 McKinley Road • P.O. Box 408 • St. Marys, Ohio 45885

Telephone:
(419) 394-7840

Fax No.
(419) 394-4776

February 14, 1997

Dear A4S Originator,

Enclosed is the acknowledgement copy of the suggestion you recently submitted. Your idea is being evaluated, and you will be notified when a decision is final.

Thank you for your participation in this program.

Alan K.

The A4S Committee

AAP ST. MARYS CORP.

A4S: ASSOCIATES SUGGESTIONS

1. Safety
2. Quality
3. Productivity
4. Cost Savings

(Please read instructions on back before completing form and Please Print)

A4S #	DATE RECEIVED
244	2-14-97

ORIGINATOR	SIGNATURE	DEPT.	TEAM	AFFECTED DEPARTMENT, EQUIPMENT, etc.
RICHARD LEE	Richard Lee	MAINT	5-DAY	CAST.
ORIGINATOR	SIGNATURE	DEPT.	TEAM	
ORIGINATOR	SIGNATURE	DEPT.	TEAM	

Problem Description (Current Situation)

NEW PUMP TO ACCOMODATE MC. IS A TRIP HAZARD

Suggested Solution (Please Describe in Detail)

Build a shelter to go over the pump so no one trips over the pipes

Please make a sketch to show your idea.

IF ADOPTED, would you assist in implementing this A4S Project?

Yes ☑ No ☐

This form must be fully completed and legible - Please use sharp pencil or pen.

It is understood and agreed that all suggestions shall become the property of AAP St. Marys Corp.

A4S PROGRAM

(Please read carefully before completing form)

WHAT IS THE A4S PROGRAM?

A4S is a program that encourages associates to turn in recommendations which could help our safety, productivity or quality, resulting in a cost savings. However, in order for an idea to be accepted it must meet two (2) criteria:

1. It must be originated by a non-exempt associate or group of associates (please limit to three or less).
2. It must potentially result in a savings in cost or time.

WHEN WRITING YOUR SUGGESTION ...

1. DEFINE THE PROBLEM .... CURRENT SITUATION.
2. EXPLAIN THE SOLUTION .... SUGGESTED IMPROVEMENT.
3. PLEASE MAKE SKETCH IF POSSIBLE.

EXAMPLES OF ACCEPTABLE A4S IDEAS:

1. IMPROVING SAFETY: Modifying equipment, layout, tools, or processes to improve working conditions; Modifying standard operating procedures or work methods to reduce or eliminate risk of injury.
2. CONSERVING MATERIAL AND OTHER RESOURCES: Reducing the number of different types of materials through standardization. Substituting less expensive materials that function equally well; Substituting standard parts for special parts, and Energy conservation improvement.
3. INCREASING PRODUCTIVITY: Changing the sequence of an operation to obtain the best results; Eliminating or simplifying operations; Performing part of an operation more effectively as a separate operation; and, Performing an operation more efficiently in another department.
4. IMPROVING MANUFACTURING METHODS: Reducing handling of parts and/or materials; Reducing maintenance in manufacturing areas; Improving machines and equipment (processes); and Making in-house versus buying from outside vendor source.

EXAMPLES OF UNACCEPTABLE A4S IDEAS:

1. Duplicate suggestions (the earliest documented suggestion will take precedence)
2. Reductions in cost due to an increase or decrease in volume
3. Choosing the lower cost quote at time of initial decision; a one-time savings in one year will not be acceptable in the following year
4. Transferring operations from one department to another without greater efficiency
5. Vague generalizations lacking in clarity
6. Conditions which are routine supervision or maintenance responsibility
7. Reporting deviations from safety and operation procedures and policies which can be reported on a safety concern report or quality concern report

A4S FLOW PROCEDURE

ORIGINATION PHASE:

1. Associate gets A4S form in cafeteria.
2. Associate fills out form as described on back of A4S form.
3. Associate puts completed form in A4S box in cafeteria.
4. A4S administrator will collect suggestions daily from the A4S box.
5. A number will be assigned to each suggestion, and copies of the completed A4S will be distributed.

DECISION/IMPLEMENTATION PHASE:

6. The department engineer, with supporting members, will evaluate the suggestion and return it to the A4S administrator within two (2) weeks. The engineer will respond in one of three ways:
   A. *Adopt the idea* - The engineer will estimate cost, assign responsibility for implementation, and set a time schedule.
   B. *Idea not adopted* - The engineer will provide an explanation as to why the idea cannot be adopted.
   C. *Ask for more information* - The engineer will request more information or involvement from associates, supervisors, managers, engineers, contractors, etc. The two-way communication between the engineer and support members will continue until resolved.

COMMUNICATION PHASE:

7. The A4S administrator will then record that a response was given and then give the response to the group leader.
8. The group leader will then give the response to the originator.
9. The department engineer is responsible for follow-up on projects to be implemented. He will notify the administrator and originator when approved projects are implemented.
10. The A4S Committee will meet monthly to follow-up on all suggestions, to make sure they are evaluated and implemented on a timely basis.

THE APPEAL PROCESS: If your suggestion is not adopted and you wish to have it reconsidered, you must return your rejection copy with a note explaining why you feel it should be reviewed. This appeal should be made in writing within one month of the rejection date.

The right to accept or reject any idea is reserved by this Company. It is understood and agreed that all suggestions submitted shall become the property of AAP ST. MARYS Corporation.

THIS COMPANY WILL HAVE THE RIGHT TO CHANGE OR REVISE THE A4S PROGRAM WHEN CONDITIONS WARRANT. ALL CHANGES WILL BE PUBLISHED IN ADVANCE. PLEASE FORWARD ANY QUESTIONS TO THE PERSONNEL DEPARTMENT VIA PHONE OR IN WRITING.

EMPIRE CASTINGS, INC.
3195 REGIONAL PARKWAY • SANTA ROSA, CA 95403 • (707) 545-2232 • FAX (707) 523-9829

March 25, 1997

Mr. Alan Kohlrieser
AAP St. Mary's Corp.
1100 McKinley Road
St. Mary's OH, 45885

The following quotation is in response to your request.

EMPIRE CASTINGS INC. QUOTATION NO. 011797.aap 03/25/97

Item#	Qty	Description	Net each
001	2 each	Staubli Tube Assembly w/guide rods and bushings	980.00 1960.00
002	2 each	Staubli Adapter Plate Per AAP drawing	280.00 560.00
003	1 each	Non Recurring Engineering Charge: Convert sketch to A/cad NC programming	260.00
			2780.00

Note: AAP to use existing hose assemblies or fabricate on site.

Delivery approx. 2 weeks ARO.
1 week material procurement
1 week manufacturing and packaging.

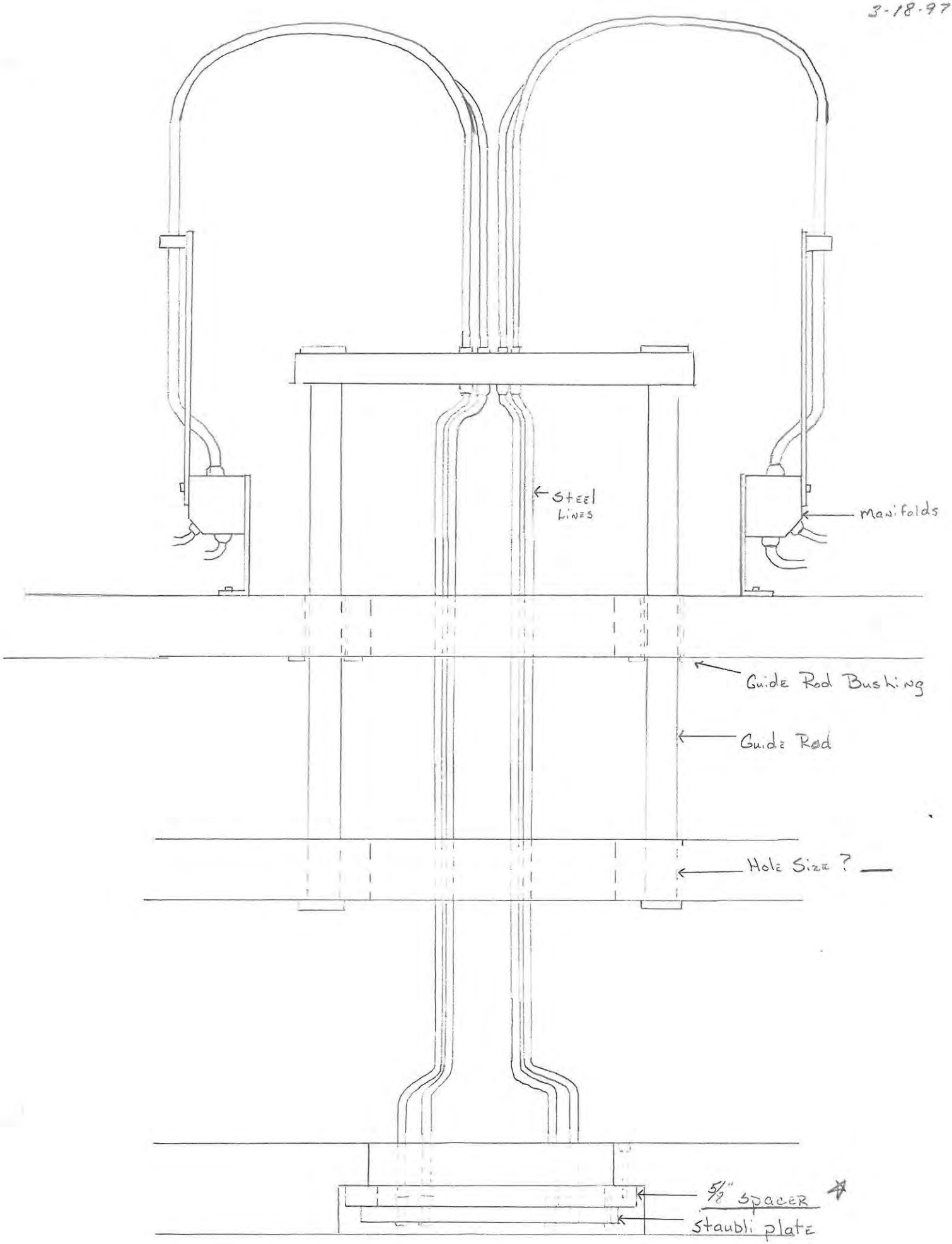
Quotation does not include any freight and/or expediting charges
Quotation does not include any taxes and/or duties.
Quotation does not include any installation or retrofit charges.

Best regards,

Ed

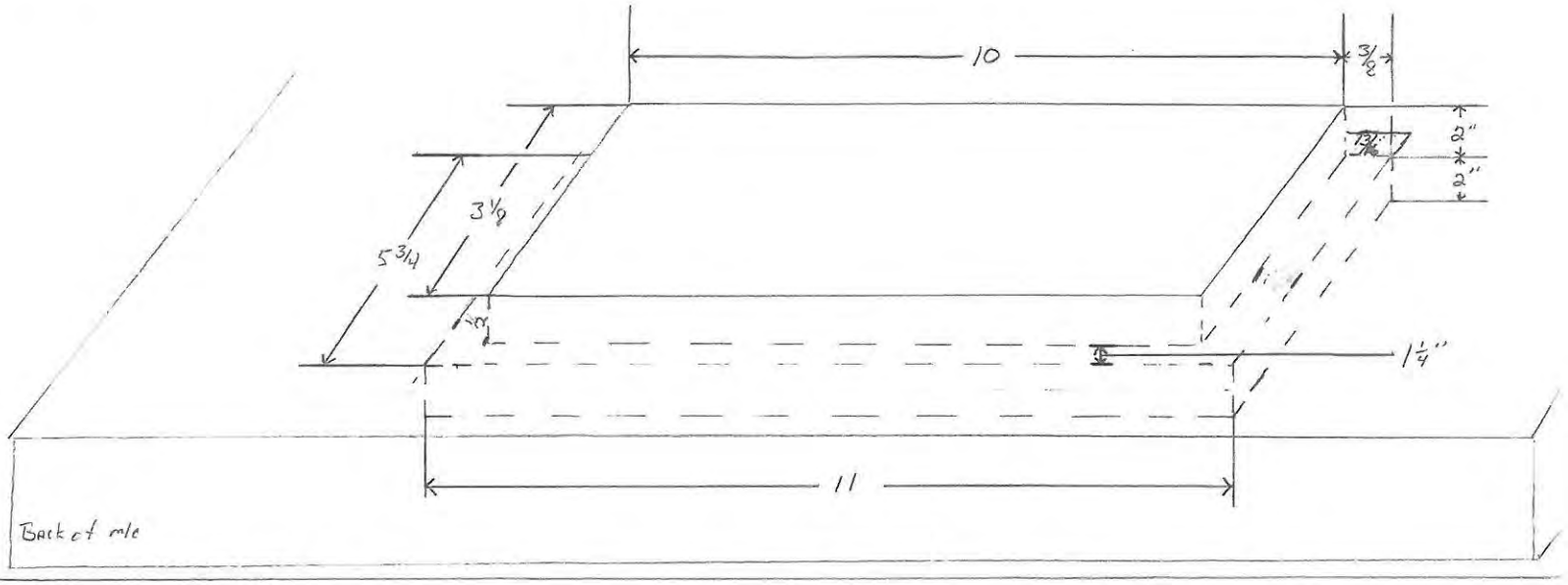
Ed Wickham

3-18-97

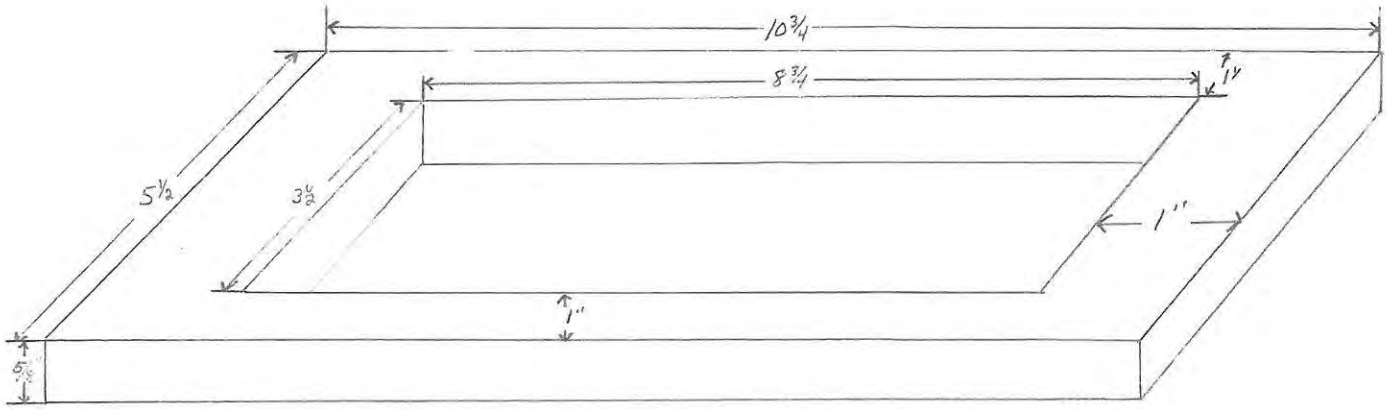

Steel Lines
Manifolds
Guide Rod Bushing
Guide Rod
Hole Size ?
5/8" spacer
staubli plate

3-18-97

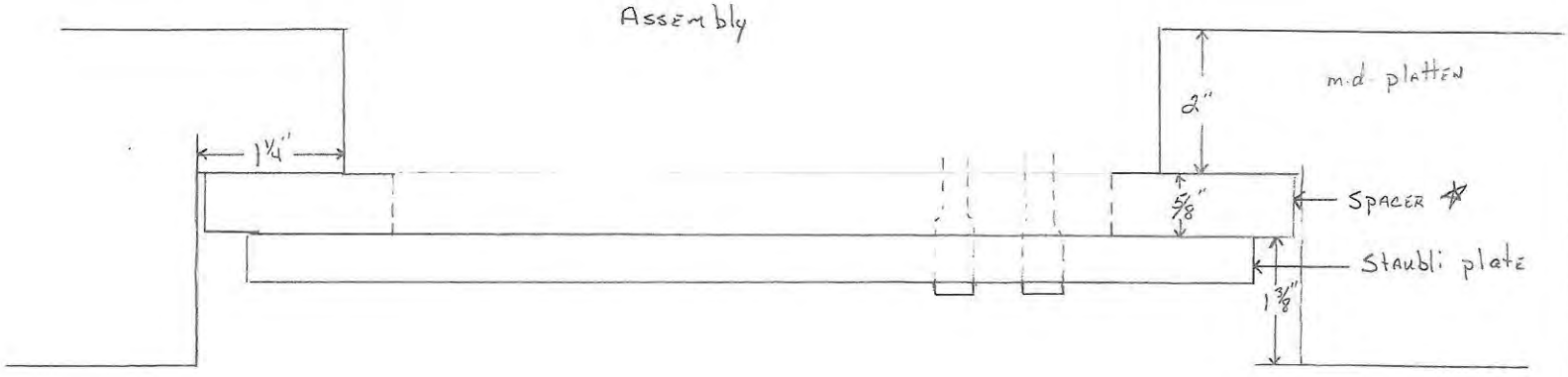
Platten Hole



Spacer



Assembly



MAZZER NYLON 11 TUBING

The most universal of all thermoplastic tubing

This formulation for flexible premium tubing is the standard for both general industrial and automotive applications. Its broad temperature range (-60° F., +250° F. continuous) combined with light weight, dimensional stability, chemical resistance and flexibility make it the most universal of all thermoplastic tubing.

- Light weight
- Long fatigue life
- Excellent abrasion resistance
- Broad range of corrosion resistance and chemical compatibility
- Low moisture absorbtion

APPLICATIONS:

- Pneumatics
- Hydraulic
- Vacuum
- Gases
- Lubricants
- Oils
- General Chemicals
- Fluidics
- Machine Tool
- Coolant
- Fuel
- Petrochemicals
- Fresh & salt water

REF. SIZE	O.D. NOM.IN.	I.D. NOM.IN.	WALL THICKNESS NOM.IN.	MIN. BEND RADIUS IN.	O.D. TOL. IN.	I.D. TOL. IN.	MIN BURST PRESSURE PSI @ 75° F.	MAZZER PAC COIL LENGTH
2	1/8	.080	.023	.70	+.002 -.0045	±.004	1000	250 ft.
2.5	5/32	.106	.025	.94	+.002 -.0045	±.004	1000	250 ft.
3	3/16	.118	.035	1.1	+.002 -.0055	±.004	1000	250 ft.
4	1/4	.180	.035	1.5	+.002 -.0055	±.004	1000	250 ft.
4	1/4	.126	.062	1.5	+.002 -.0055	±.004	1000	250 ft.
5	5/16	.233	.040	1.85	+.002 -.0055	±.004	1000	200 ft.
6	3/8	.275	.050	2.25	+.002 -.0055	±.004	1000	150 ft.
8	1/2	.375	.062	3	+.002 -.0055	±.004	1000	100 ft.
10	5/8	.500	.062	3.75	±.004	±.004	600	*100 ft.
12	3/4	.560	.095	4.5	±.004	±.004	790	*100 ft.
16	1	.750	.125	6	±.006	±.006	790	*100 ft.

Note: Specified minimum bend radius is for minimal tube flattening
*Conventional Boxes Only
In addition to Mazzer Pac Boxes:
Reels available up to 5000 ft.
Tubing size 2 to 8 available in 100 ft. Slit Pac Bags
Colors: Natural, Black, Red, Blue, Green, Yellow, Orange, Gray
Call for availability of DOT and FDA approved tubing
See Price List for regular in-stock inventory

METRIC

REF. SIZE	O.D. NOM. MM.	I.D. NOM MM.	WALL THICKNESS NOM.MM.	MIN. BEND RADIUS MM.	O.D. TOL. MM.	I.D. TOL. MM.	MIN. BURST PRESSURE 24° C. 75° F.	MAZZER PAC COIL LENGTH
0427	4	2.7	.65	24	+.05 -.1	±.1	75 BARS 1086psi	25 meters
0402	4	2	1	24	+.05 -.1	±.1	134 BARS 1956psi	25 meters
0533	5	3.3	.85	30	+.05 -.1	±.1	70 BARS 1015psi	25 meters
0604	6	4	1	36	+.05 -.1	±.1	85 BARS 1233psi	25 meters
0806	8	6	1	48	+.05 -.1	±.1	58 BARS 841psi	25 meters
0855	8	5.5	1.25	50	+.05 -.1	±.1	74 BARS 1074psi	25 meters
1008	10	8	1	60	+.05 -.1	±.1	42 BARS 609psi	25 meters
1075	10	7.5	1.25	70	+.05 -.1	±.1	57 BARS 827psi	25 meters
1210	12	10	1	75	+.05 -.1	±.1	32 BARS 464psi	25 meters
1209	12	9	1.5	84	+.05 -.1	±.1	63 BARS 914psi	25 meters
1412	14	12	1	98	+.05 -.1	±.1	27 BARS 392psi	*25 meters
1411	14	11	1.5	100	+.05 -.1	±.1	52 BARS 754psi	*25 meters
1512	15	12	1.5	105	±.1	±.1	48 BARS 696psi	*25 meters
1613	16	13	1.5	112	±.1	±.1	44 BARS 638psi	*25 meters
1814	18	14	2	126	±.1	±.1	58 BARS 841psi	*25 meters
2015	20	15	2.5	140	±.15	±.15	69 BARS 1000psi	*25 meters
2216	22	16	3	154	±.15	±.15	75 BARS 1088psi	*25 meters
2519	25	19	3	175	±.15	±.15	68 BARS 986psi	*25 meters
2822	28	22	3	196	±.15	±.15	60 BARS 870psi	*25 meters

Note: Specified minimum bend radius is for minimal tube flattening.
*Conventional Boxes Only
In addition to Mazzer Pac Boxes:
Reels available up to 1500 meters
Tubing size 0427 to size 1209 available in 25 meter Slit Pac Bags
Colors: Natural, Black, Red, Blue, Green, Yellow, Orange, Gray
Call for availability of DOT and FDA approved tubing
See Price List for regular in-stock inventory

AAP
ST. MARYS CORP.

FAX FORM

Voice 419-394-7840 FAX 419-394-4776

TO: Ed Wickham	CC:	Date: 3/18/97
		No. of Pages: 1/3
		From: DL Brackney

Subject: Staubli Assembly

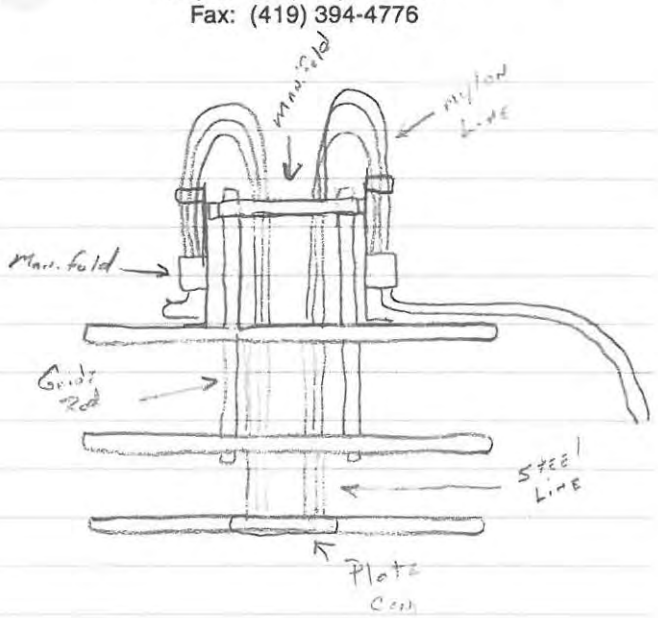
Here's the drawing Alan said I would send.

DL Brackney

Everything except nylon hose.
5 manifolds on
one track this
manifolds for on
top?

ST. MARYS CORP.
1100 McKinley Road • St. Marys, Ohio 45885
Telephone: (419) 394-7840
Fax: (419) 394-4776

- count for this.



- guide rods
- guide rod manifold
- manifold mount fixture (nylon to black hose)
- steel line
- staubli plate.

ST. MARYS CORP.
1100 McKinley Road • St. Marys, Ohio 45885
Telephone: (419) 394-7840
Fax: (419) 394-4776

Talk to Ed about routing staubli assembly. Will send something Mon or Tues

FROST & CO - INC -

Broadway Street
Wapakoneta. Ohio 45895
Phone: (419) 738-9625
Fax: (419) 738-8881

Roofing & Mechanical Contractors
Since 1946

A merit shop
Contractor
serving all of
Western Ohio

TELEFAX COVER SHEET

DATE: 7-29-98

COMPANY: AAP St. Mary's

ATTENTION: Daryl Brockway FAX NO. 419-394-4776

REFERENCE: angle frame for cast machine die

NUMBER OF PAGES (INCLUDING COVER SHEET): one

MESSAGE:

Daryl,
this is my estimate for the angle frame we looked at for the cast machine

1½" x 1½" x ¼" angle iron
½" x 1¼" flat bar

$142.00 ea.

FRC Butch Gillespie

AN EQUAL OPPORTUNITY EMPLOYER

AAP
ST. MARYS CORP.

FAX FORM

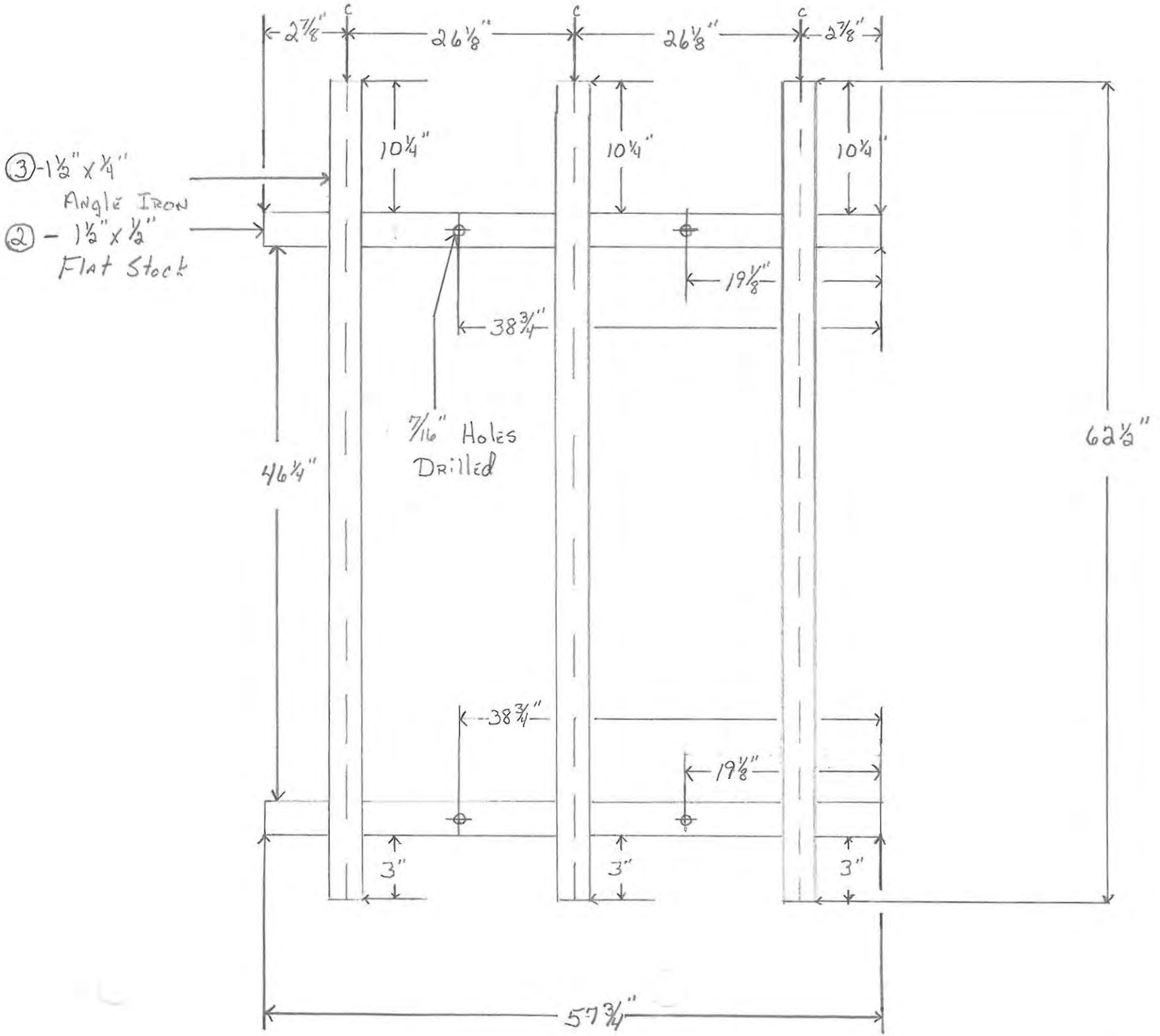
Voice 419-394-7840 FAX 419-394-4776

TO: Butch Delap	CC:	Date: 8/16/98
		No. of Pages: 1/3
		From: Daryl Brackney

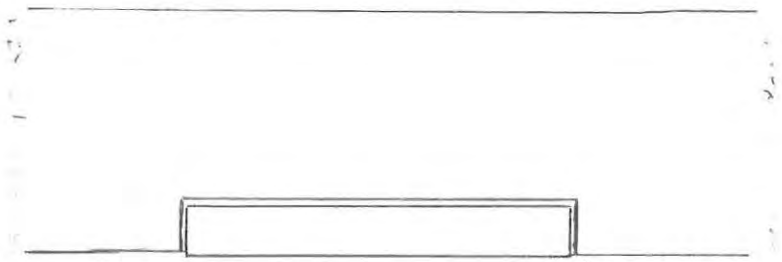
Subject: X-member Die installation Track

Here is the drawings you ask me for this morning. The 1st one has all the measurments on it. The second is to try & show that the flat stock pcs. are recessed into the angle iron tracks. This is ~~st~~ so it is all flat & evan on the bottom. If you have any questions call.

Daryl Brackney

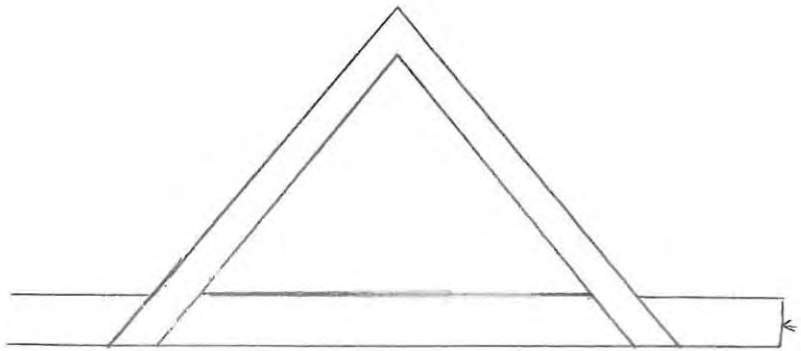

2 7/8"
C
26 1/8"
C
26 1/8"
C
2 7/8"
10 1/4"
10 1/4"
10 1/4"
(3) - 1 1/2" x 1/4" Angle Iron
(2) - 1 1/2" x 1/2" Flat Stock
19 1/8"
38 3/4"
7/16" Holes Drilled
46 1/4"
62 1/2"
38 3/4"
19 1/8"
3"
3"
3"
57 3/4"

Side View



Angle iron Notched for Flat stock

End View



Flat Stock RECESSED in to ANGLE IRON

RELIABLE PRODUCTS CO., INC.

315 S. PARK DRIVE · ST. MARYS, OHIO 45885 · (419) 394-5854

Our fax #419-394-7826

To: AAP St. Marys Corporation	Date: 11/24/97
Attn: Daryl Brackney	From: Wayne Steineman
Fax #	Page 1 of 1

Message:

Quotation per your request:

6) Limit switch arm assembly $215.00 each

ST. MARYS CORP.

FAX FORM

Voice 419-394-7840 FAX 419-394-4776

TO: Wayne Steinneman Reliable Products Co. Inc.	CC:	Date: 11/13/97 No. of Pages: 1/4 From: Daryl Brackney Project Specialist

Subject: Side cyl. limit switch arm assembly.

Here is the drawings on the arm assembly you asked for. If any question call or stop in to look at part. Will be expecting your qoute.

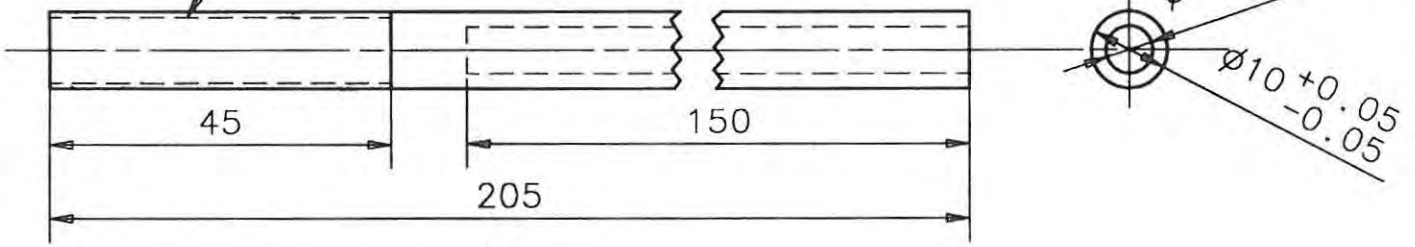
Thanks

Daryl Brackney

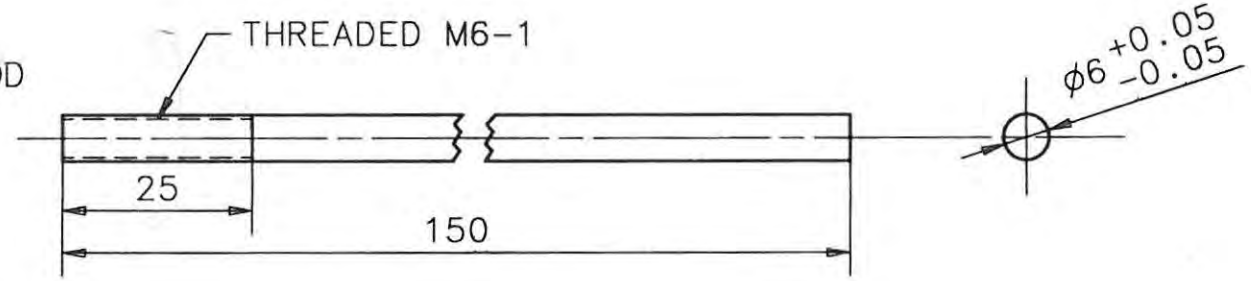
6mm Drill rod or O1 rod

DRAWING CHANGES	NAME: LIMIT SWITCH TUBE & ROD	DRAWN BY: KRH	SCALE: 1:1	AAP DWG NO:
	MAT'L: LOW CARBON STEEL	APP'D BY:	MM/IN MM	PART NO:
	ST.MARYS CORP. 1100 McKINLEY RD. ST.MARYS, OHIO 45885			DATE: 11/11/97

TUBE

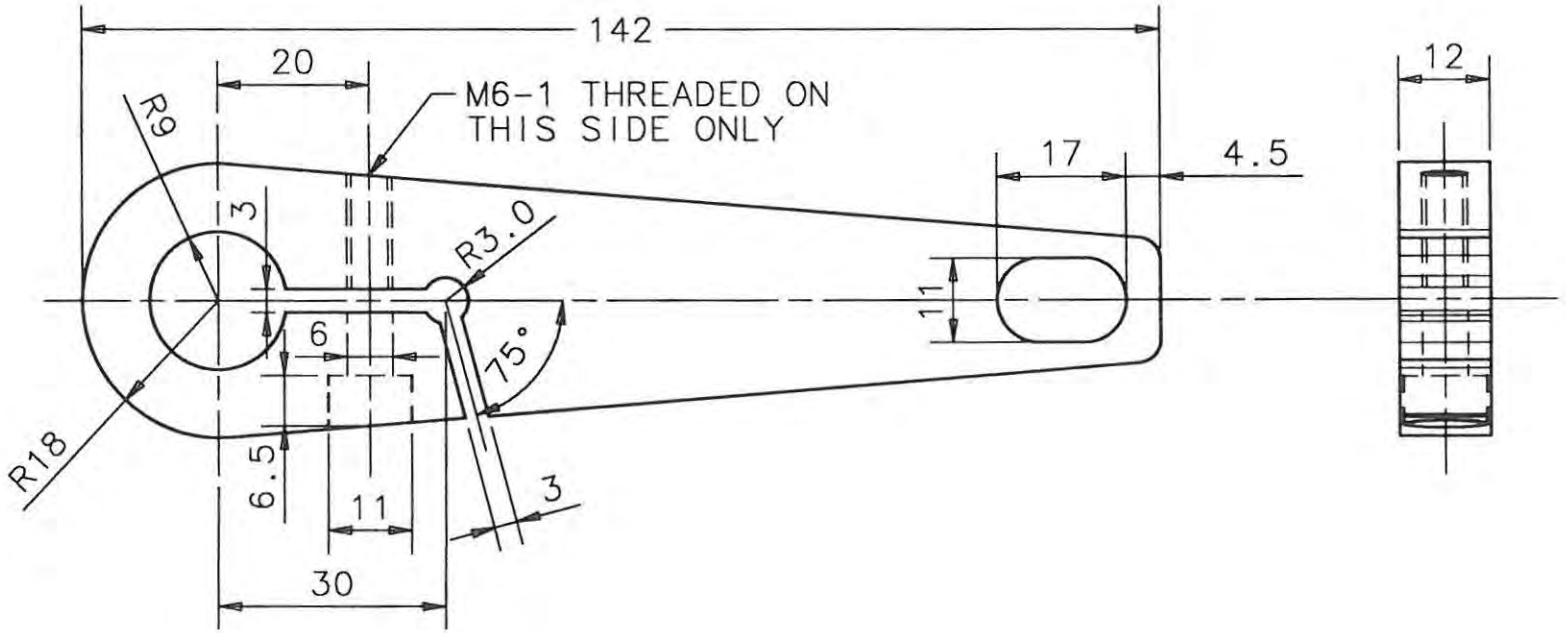


ROD



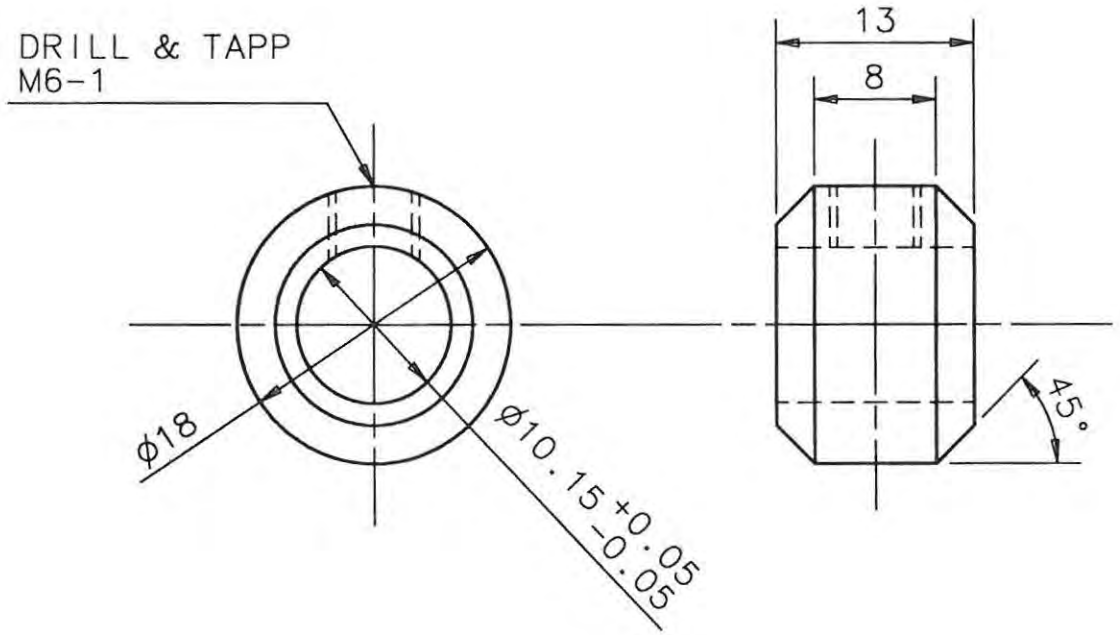
TOLERANCES UNLESS OTHERWISE NOTED
± 0.5mm

DRAWING CHANGES	NAME: LIMIT SWITCH ARM	DRAWN BY: KRH	SCALE: 1:1	AAP DWG NO:
	MAT'L: LOW CARBON STEEL	APP'D BY:	MM/IN MM	PART NO:
	ST.MARYS CORP. 1100 McKINLEY RD. ST.MARYS, OHIO 45885			DATE: 11/11/97



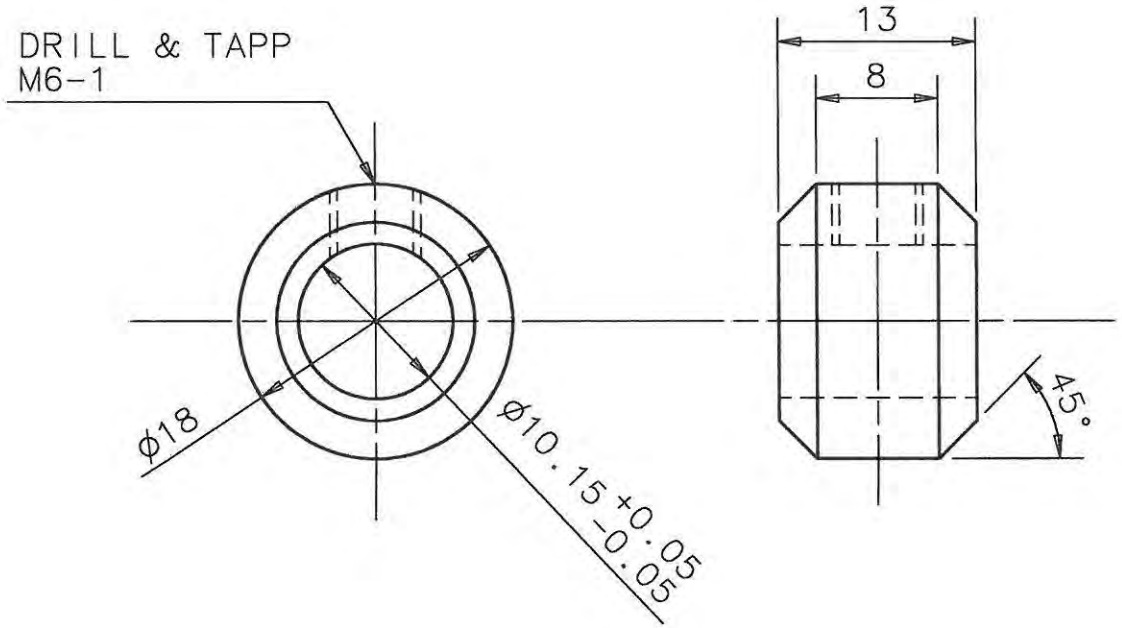
TOLERANCE UNLESS OTHERWISE NOTED
± 0.1 mm

DRAWING CHANGES	NAME: L[illegible]T SWITCH CAM	DRAWN BY: KRH	SCALE: 2:1	AAP DWG NO:
	MAT'L: LOW CARBON STEEL	APP'D BY:		PART NO:
	ST.MARYS CORP. 1100 McKINLEY RD. ST.MARYS,OHIO 45885		MM/IN MM	DATE: 11/11/97



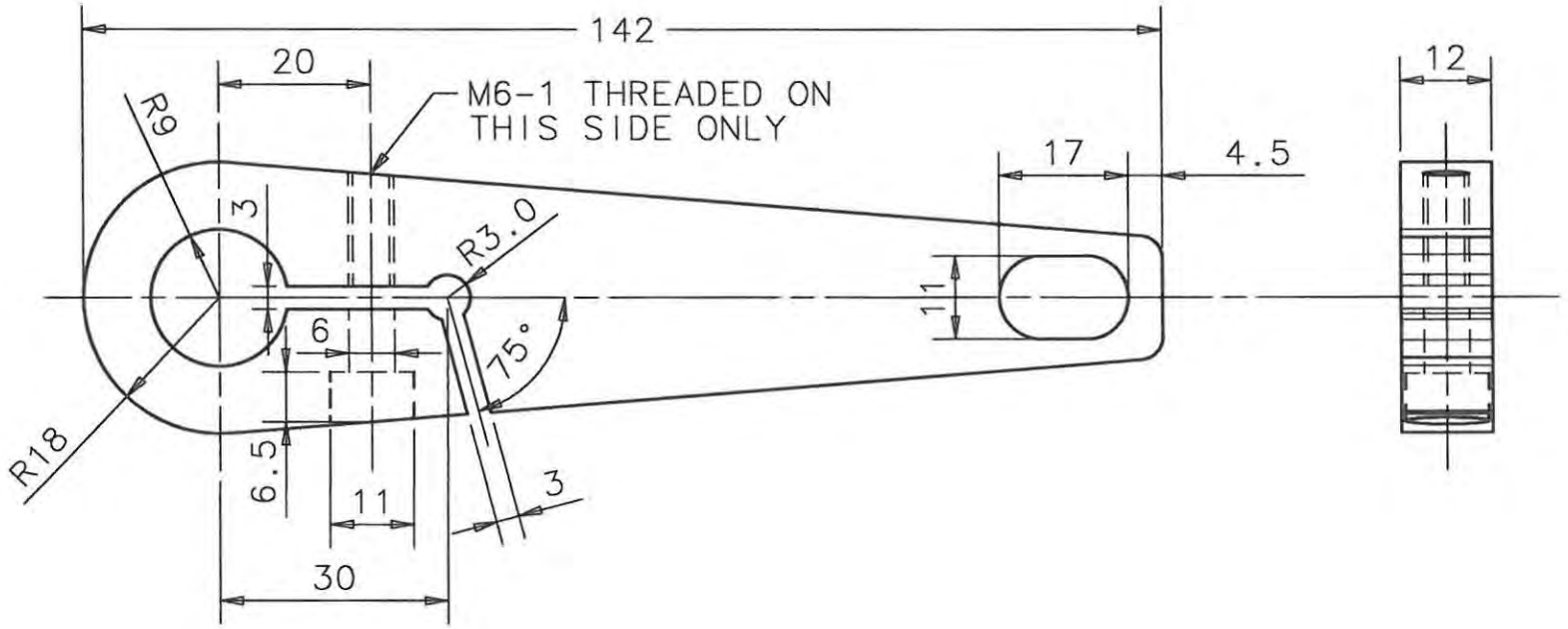
TOLERANCES UNLESS OTHERWISE NOTED
± 0.1mm

DRAWING CHANGES	NAME: LIMIT SWITCH CAM	DRAWN BY: KRH	SCALE: 2:1	AAP DWG NO:
	MAT'L: LOW CARBON STEEL	APP'D BY:	MM/IN MM	PART NO:
	ST.MARYS CORP. 1100 McKINLEY RD. ST.MARYS,OHIO 45885			DATE: 11/11/97



TOLERANCES UNLESS OTHERWISE NOTED
± 0.1mm

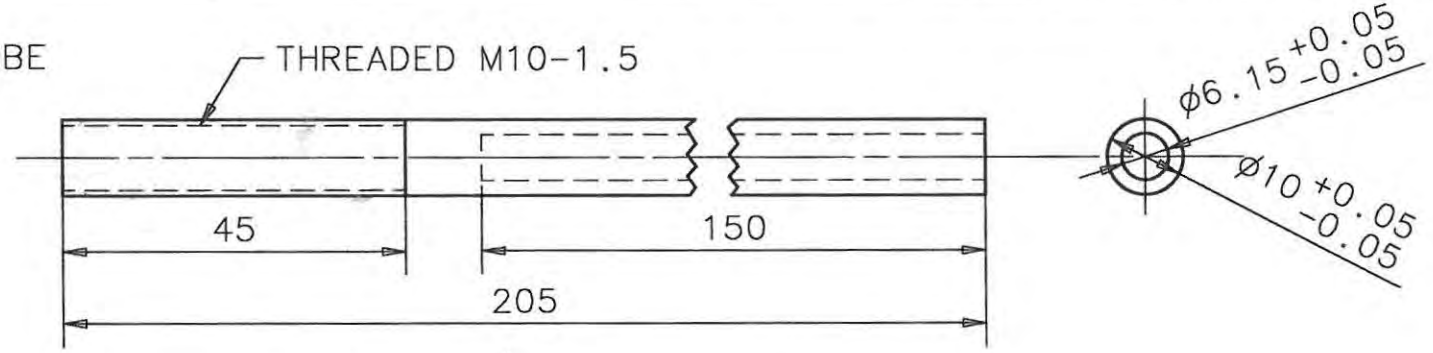
DRAWING CHANGES	NAME: LIMIT SWITCH ARM	DRAWN BY: KRH	SCALE: 1:1	AAP DWG NO:
	MAT'L: LOW CARBON STEEL	APP'D BY:	MM/IN MM	PART NO:
	ST.MARYS CORP. 1100 McKINLEY RD. ST.MARYS, OHIO 45885			DATE: 11/11/97



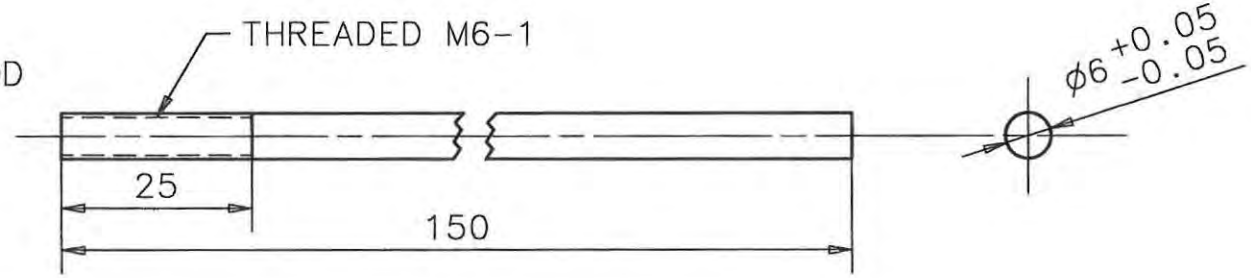
TOLERANCE UNLESS OTHERWISE NOTED
± 0.1 mm

DR ING CHANGES	NAME: LIMIT SWITCH TUBE & ROD	DRAWN BY: RH	SCALE: 1:1	AAP DWG NO:
	MAT'L: LOW CARBON STEEL	APP'D BY:	MM/IN MM	PART NO:
	ST.MARYS CORP. 1100 McKINLEY RD. ST.MARYS,OHIO 45885			DATE: 11/11/97

TUBE



ROD

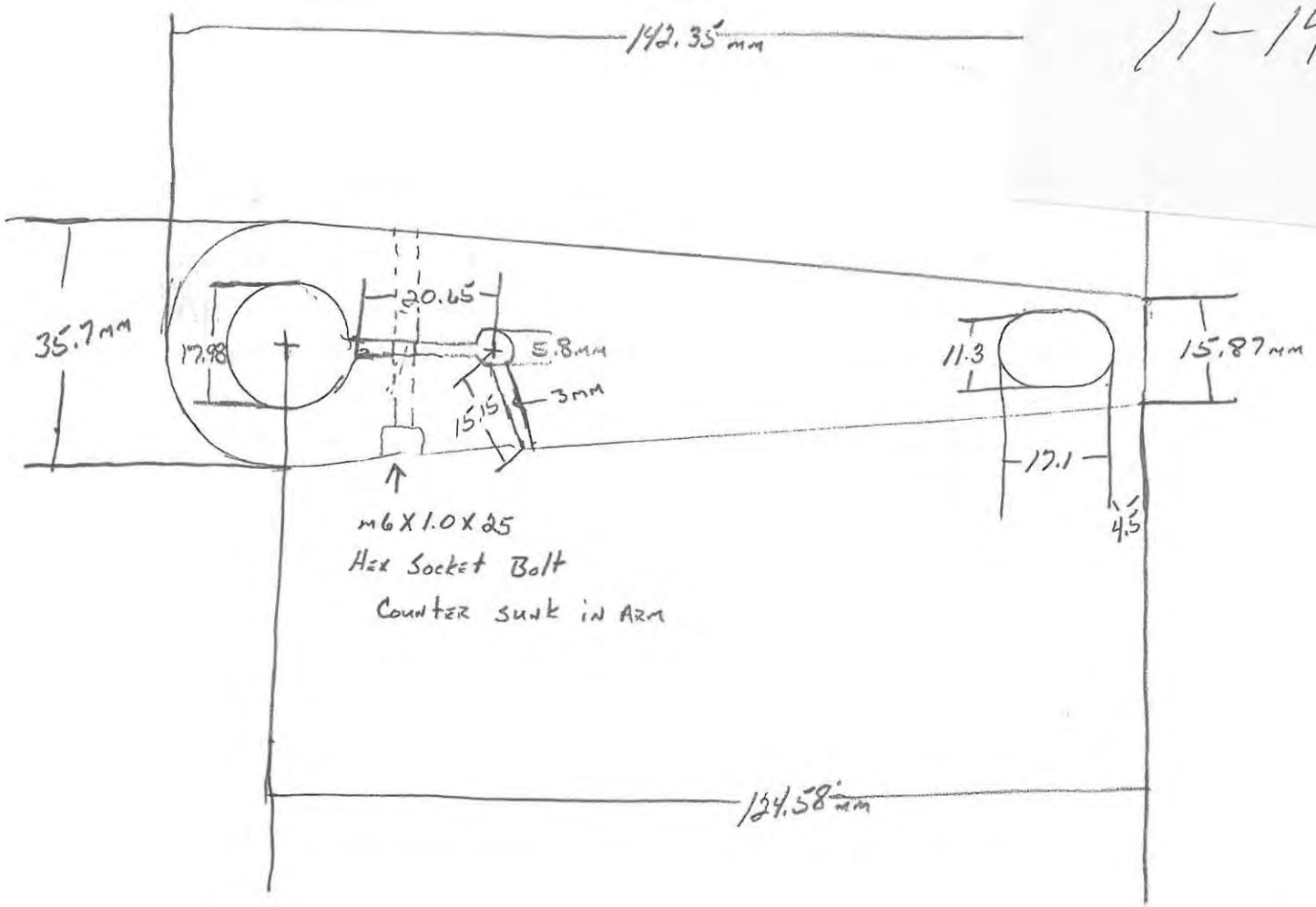


TOLERANCES UNLESS OTHERWISE NOTED
± 0.5mm

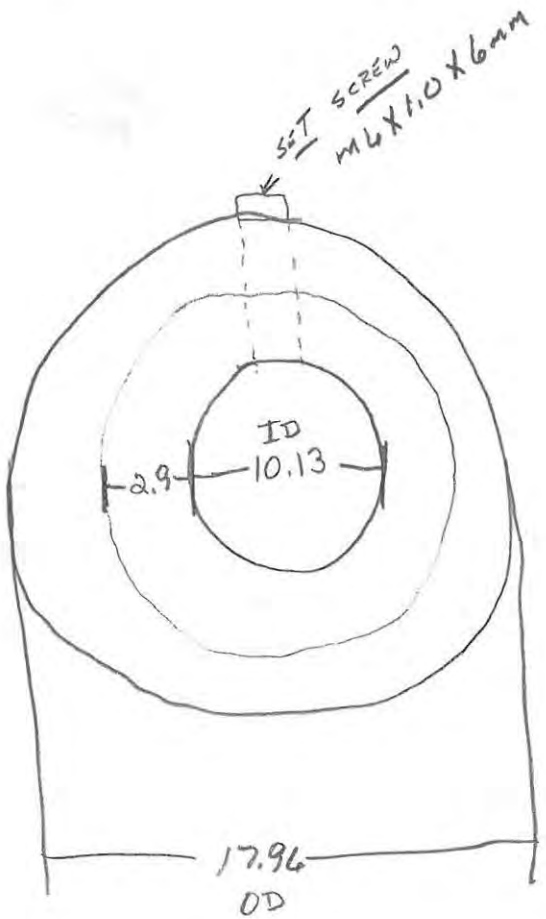
Arm

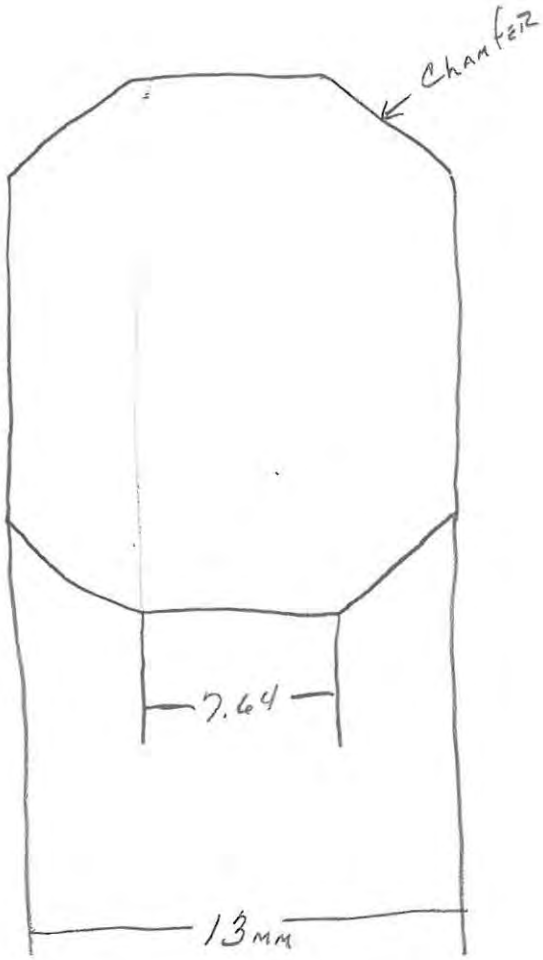
Thickness - 11.7 mm

Draw for Daryl by 11-14-97

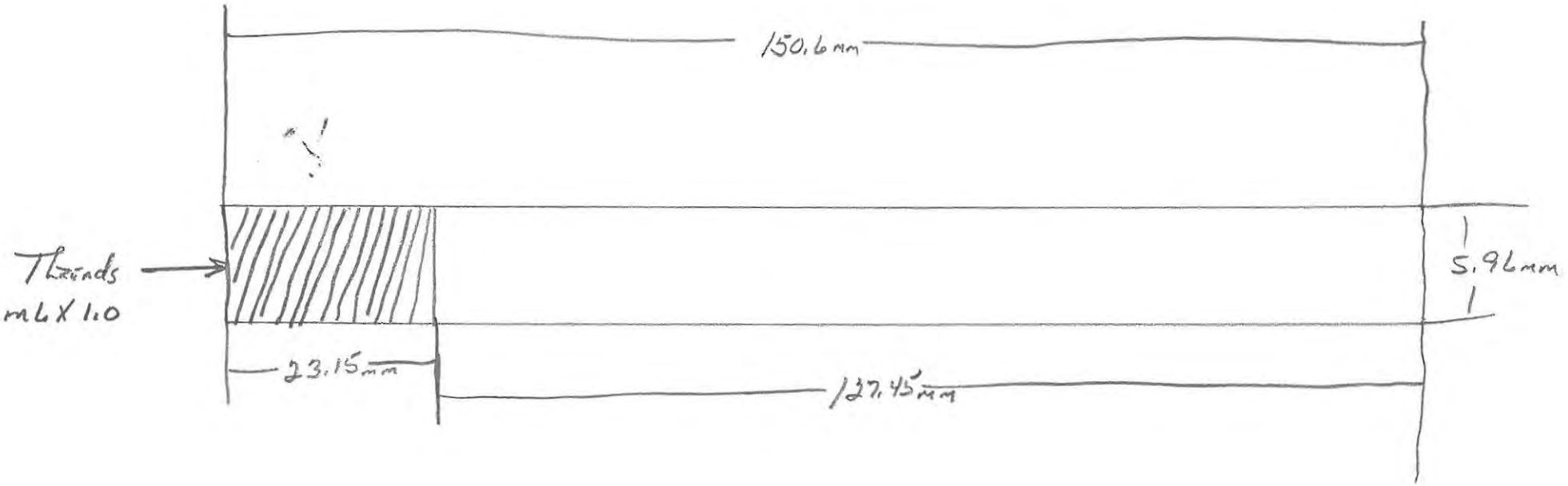


CAM



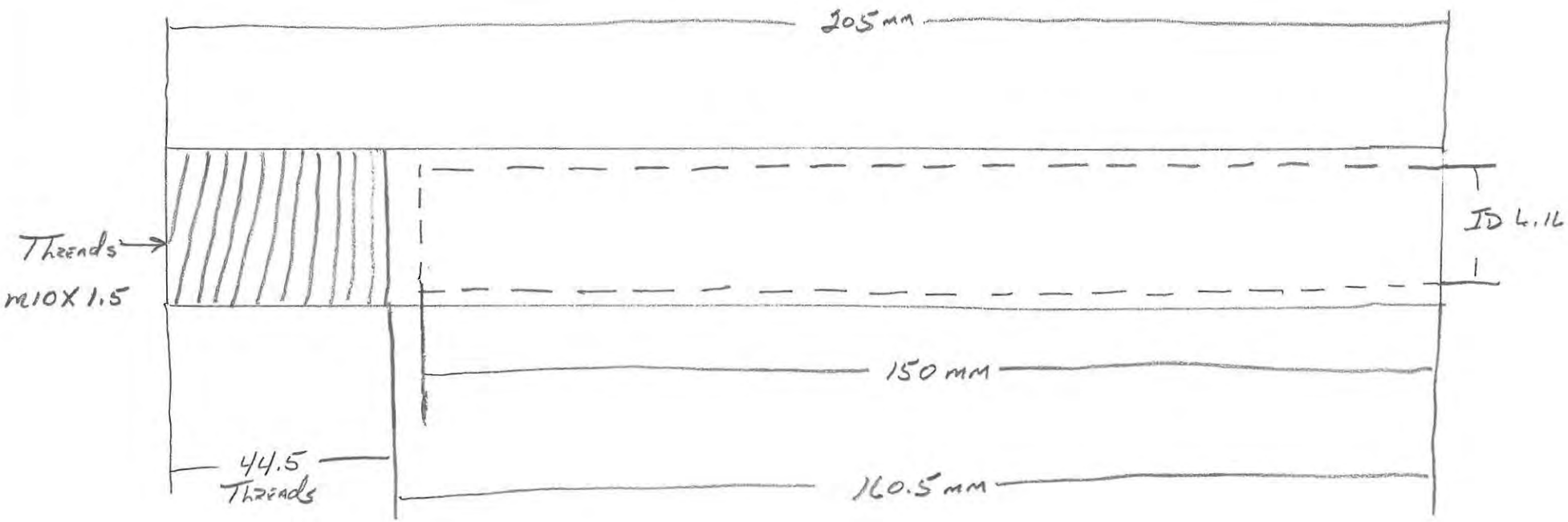


Rod



OD - 9.86 mm
ID - 6.16 mm

Tube



High Temperature Material Specialists Since 1956

Pyrotek

FAX TRANSMISSION
Ref. No.

To: AAP St. Marys Corp.
Attn: Daryl Brackney
From: David Galus
Date: May 26, 1998
Page: 1 of 1

Pyrotek, Inc.
4020 Merchant Road
Fort Wayne, IN 46818
USA
Ph: 219/489-6460
Fax: 219/489-5096
Direct: 219/489-2334

Subject: 32" thermocouple assembly

Daryl,

Thank you for taking the time to meet with me last week. Based on our conversation, I have quoted the 32" thermocouple assembly with the flange that connects to the thermocouple and 36" of leadwire with a plug. We would like to sell this thermocouple as an assembly with the noted price breaks. If you need pricing on the holddisk/flange please let me know. Please review the following quote and contact me with any further questions or concerns. Thanks and I am looking forward to working with you.

DESCRIPTION	PRICE
AAPSTMA-3325-TCASSY-30 30" C3 assembly w/element, holddisk, 36"leadwire and plug	5 or less $246.60/each 6 or more $215.10/each

FOB - Fort Wayne, IN
Leadtime- 3-4 weeks
Net terms- 30 days

AAP
ST. MARYS CORP.

FAX FORM

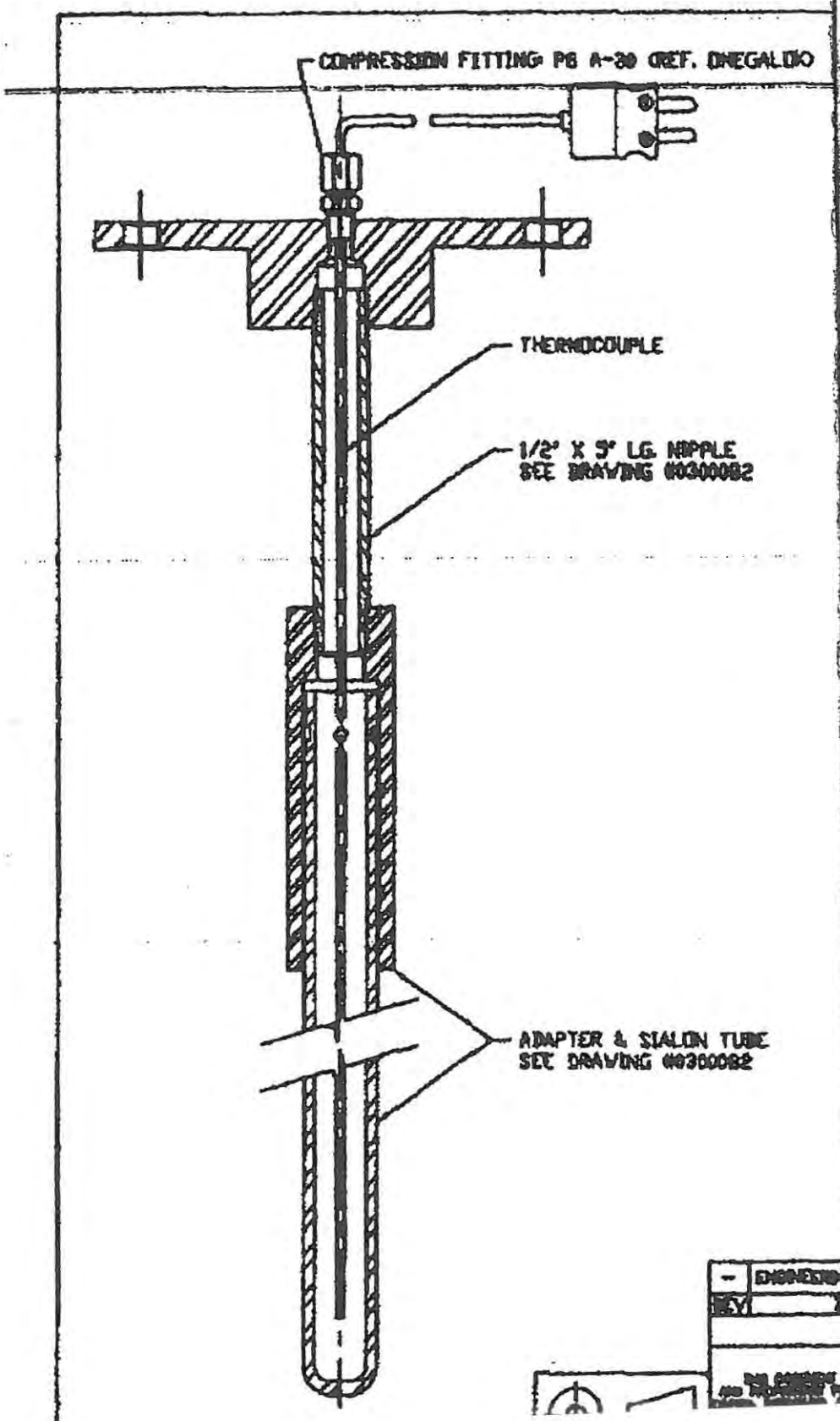
Voice 419-394-7840 FAX 419-394-4776

TO: David Galus	CC:	Date: 8/17/98
		No. of Pages: 1/3
		From: Daryl Bizackney

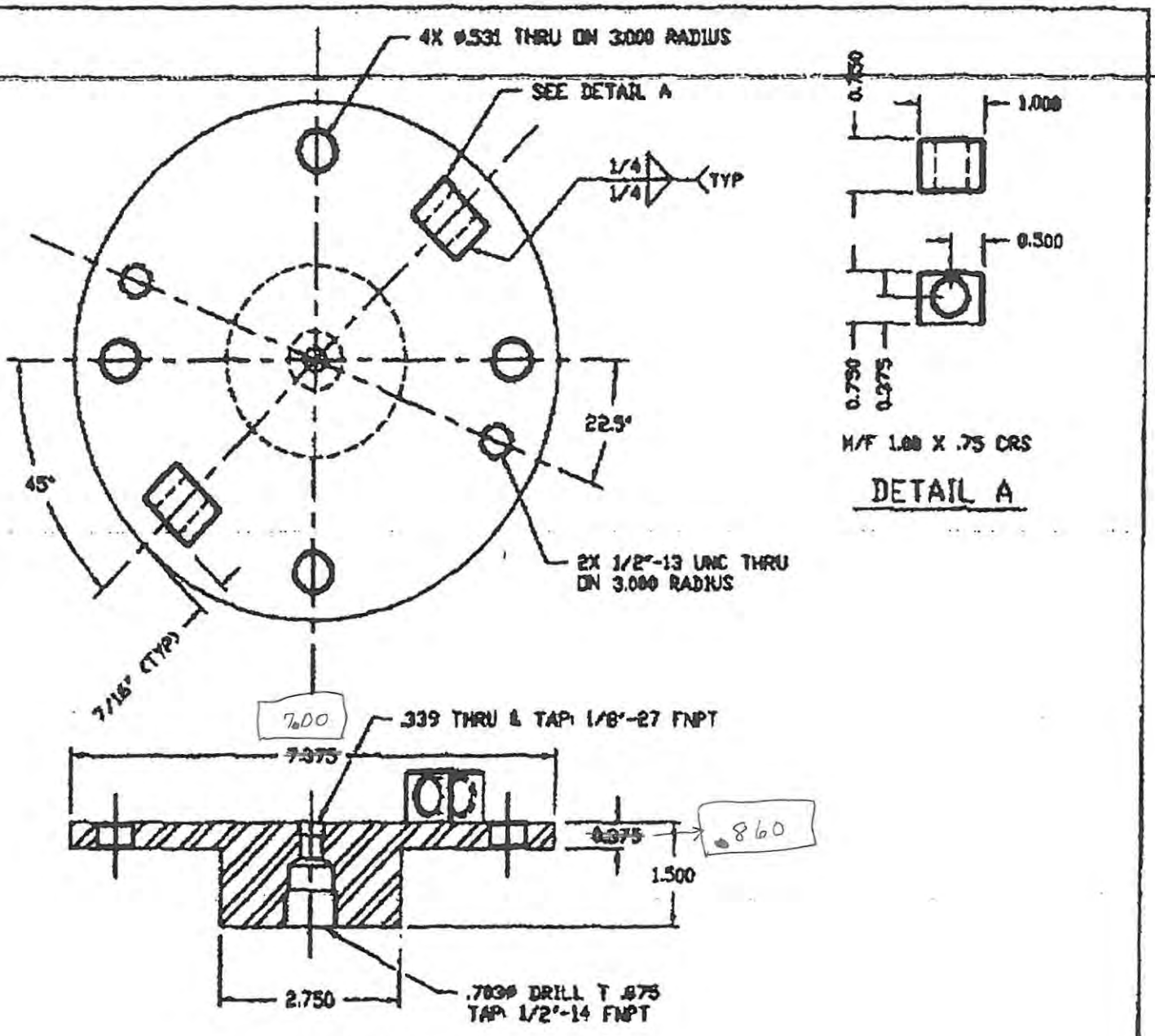
Subject:

Here is the drawing with new dimensions on O.D. & thickness of the plate.

David Galus 3/3



David Sims 2/3



DETAIL A

MOUNTING PLATE

NOTE:

1. REMOVE BURRS, SHARP EDGES AND CHAMFER HOLES.
2. REDRAWN FROM AMC004 3401701
3. DRAWING LOCATED IN M006C\34amc006\03\03000818

SE	21MAR94		APPROVALS	DATE	EMPIRE CASTINGS INC.
REVISIONS	DATE	APP'D	JON ALLEN	3/21/94	FURNACE LID THERMOCOUPLE HOUSING
CONFIDENTIAL					0300081 B
			1.5 THK A36 HRS		
			MACHINE	DO NOT SCALE DRAWING	SCALE NONE SHEET 1

APR 16 '98 09:40 EMPIRE CASTINGS 707 523 9829 P.3/5

AAP
ST. MARYS CORP.

FAX FORM

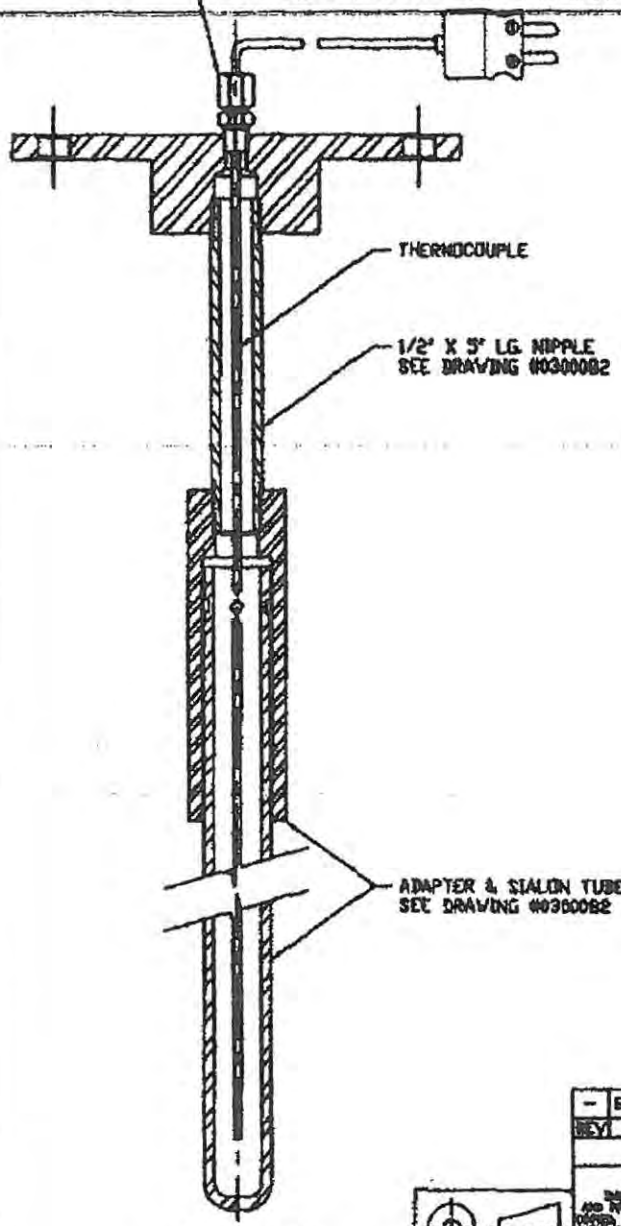
Voice 419-394-7840 FAX 419-394-4776

TO: David Galus Sales Engineer	CC:	Date: 5/12/98 No. of Pages: 1/3 From: Daryl Brackney

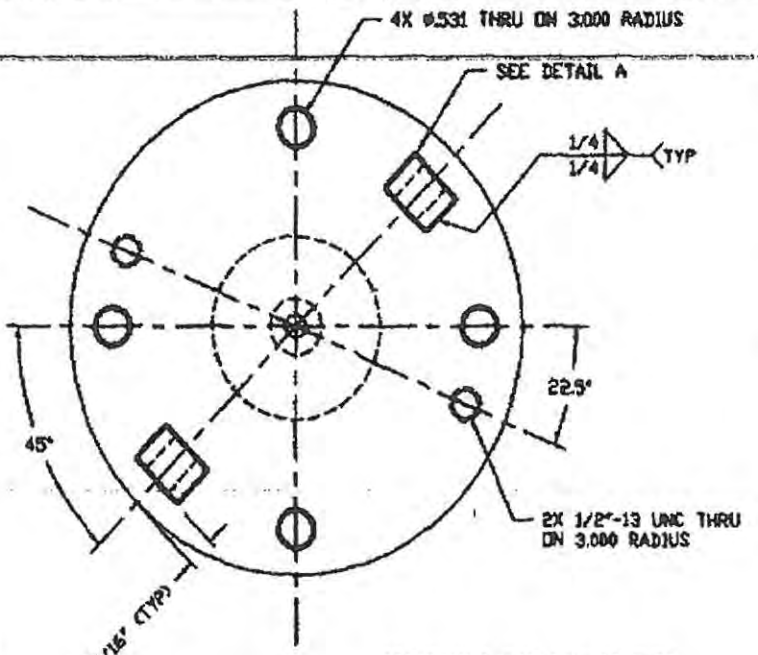
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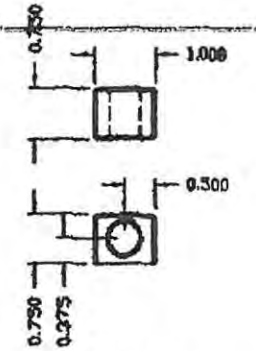
Hope these work



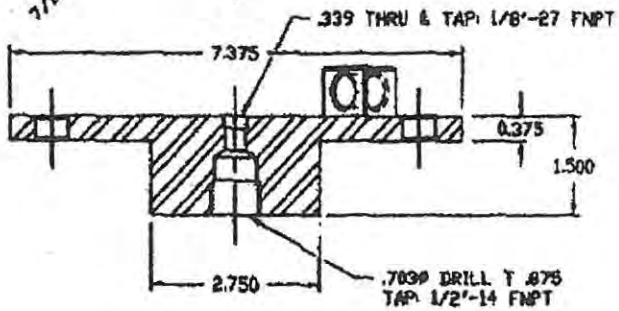


ASSEMBLY





DETAIL A



MOUNTING PLATE

NOTE:
1. REMOVE BURRS, SHARP EDGES AND CHAMFER HOLES.
2. REDRAWN FROM AMC084 3401701
3. DRAWING LOCATED IN I006C\34amc006\03\03000818

REV	DESCRIPTION	DATE	APP'D
-	ENGINEERING RELEASE	21MAR94	

REVISIONS

CONFIDENTIAL

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THIRD ANGLE PROJECTION

	APPROVALS	DATE
DRAWN BY	JIM ALLEN	3/21/94
ENGINEERING		
QUALITY		
MANUFACTURING		
PURCHASING		

MATERIAL: 1.8 THK A36 HRS

FINISH: MACHINE

DO NOT SCALE DRAWING

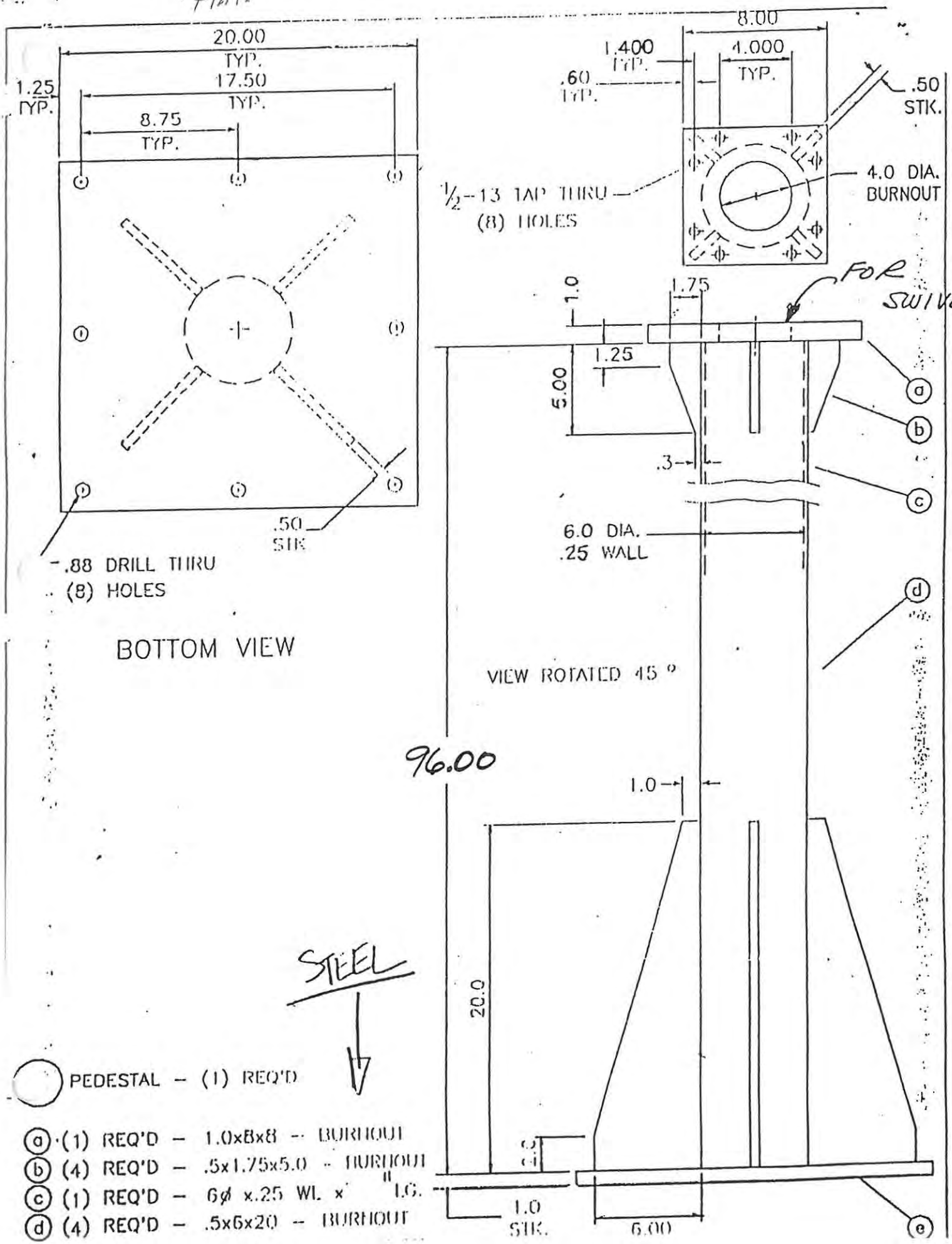
EMPIRE CASTINGS INC.
3450 FOSTORIA, PARKVALE, SANTA ROSA, CA 95403

FURNACE LID
THERMOCOUPLE HOUSING

EMPIRE PART/ASSY NO.	EMPIRE DRAWING NO.	REV
	0300	B

QTY | SCALE NONE | SHEET 1

Pedistal Plate



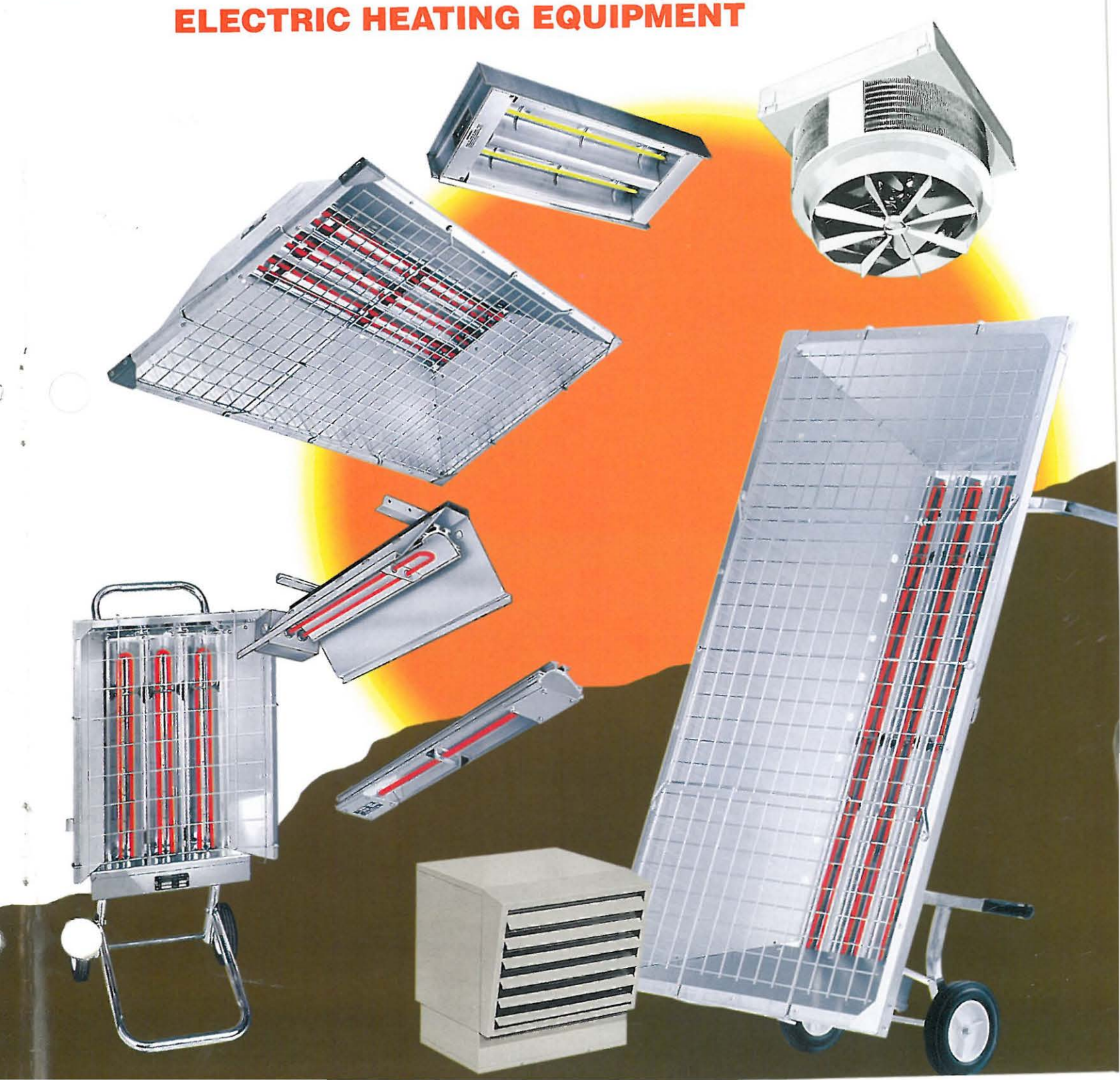
STEEL

PEDESTAL – (1) REQ'D

(a) (1) REQ'D – 1.0x8x8 – BURNOUT
(b) (4) REQ'D – .5x1.75x5.0 – BURNOUT
(c) (1) REQ'D – 6ø x.25 WL x 96.00 LG.
(d) (4) REQ'D – .5x6x20 – BURNOUT

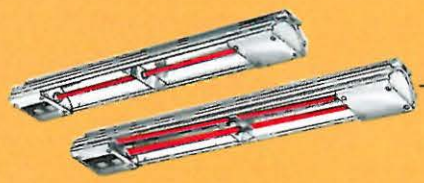
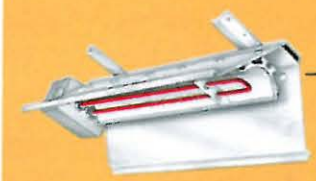
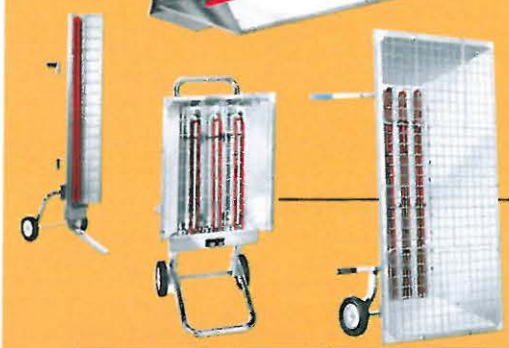
Aitken

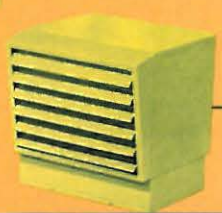
ELECTRIC HEATING EQUIPMENT



Aitken Index

Warranty Information– See Back Cover

INFRARED RADIANT ELECTRIC HEATERS	PAGES
 **Solarbeam™ Quartz Lamps** for snow melting, people heating — 1000 to 5000 watt	21-23
 **Modules** for processing, drying — 800 to 7200 watt	16 & 17
 **Overhead** 2,000 to 13,500 watt	10-13
 **Solarod®** metal sheath overhead for broad "low watt density" heating pattern — 500 to 2500 watt	14 & 15
 **Portables** 4,500 to 13,500 watt	6-9

UNIT & DOWNFLOW ELECTRIC HEATERS	PAGES
 **Downflow** Electric Unit Heaters for high bay heating in factories, garages, stores	29-31
 **Horizontal** Electric Unit Heaters for office, stores, factories	24-28

CEILING PADDLE FANS	PAGES
	20

Accessories & Controls for Radiant Heaters 18 & 19

NOTE: Heaters not approved for use in explosive atmospheres.

AITKEN PRODUCTS, INC. • P.O. Box 151 • 566 N. Eagle Street • Geneva, Ohio 44041 • (216) 466-5711 • Fax: (216) 466-5716

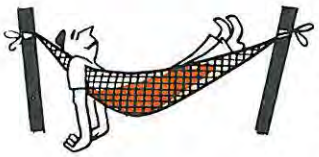
What is infrared comfort heating?

You can't heat a 92° body . . . with 70° heat.



The usual temperature for comfort heating is 70° but since the human body in a 70° room has a 92° skin temperature (84° clothing temperature) . . . you're not really "heating" the body with that 70° air.

People in a 70° Room are helping to Heat the Room with their 92° skin temperature.



so comfort heating is really . . . the control of body heat loss



Now the average person seated or resting will dissipate about 400 BTU's per hour (his metabolism) . . . exercising or doing heavy work he can dissipate up to ten times the heat (4000 BTU's per hour).

The Body must Lose Heat to be Comfortable but it must lose it at a proper, controlled level.

Heat leaves the body by . . .



1. EVAPORATION
About 25% of the loss is through perspiration or water vaporized by the lungs. Evaporation loss should stay fairly constant to provide comfort.



2. CONVECTION
In a 70° room, a person at rest will lose about 100 BTU's per hour through convection. If the room is hotter . . . he loses less; if it's cooler he loses more.

It's easy to control convection body heat loss in a small building or room . . . just by changing the air temperature. But as the size of the building gets bigger and the roof gets higher, control gets more difficult.

What is infrared comfort heating?

continued



"Spot" heating by convection doesn't work, since the heat is immediately diffused to the rest of the building.

3. RADIATION
A normally clothed person (with a surface temperature of 84°) . . . loses heat to walls, floor, machinery when they are under 84° . . . gains heat if the objects are at a higher temperature.



In our 70° room a seated human loses about 200 BTU's per hour by radiation.

Infrared heating



is like heat from the sun, the oldest type of heating known. It heats "people" and "objects" not "air" or "space."

How infrared heating "comfort heats" in large buildings



The lower the air temperature the greater the amount of "convection" heat loss from the body. This "radiation" loss can be offset by installing overhead infrared heaters. The body will lose by "radiation" to the surroundings and gain by absorbing the overhead radiation.

When you need infrared heating

In a well insulated building with a low ceiling you can probably supply heat efficiently by convection (warm air blowers etc.). But as the height of the ceiling increases . . . especially in a poorly built drafty building, convection heating becomes less and less efficient.



Radiant Infrared Heating, however, since it heats people and objects is less affected by drafts and large air movements. So it "makes up" the body loss by radiation more efficiently than warm air, blower type heating.

Full heating by infrared

When a complete building is heated by overhead infrared, direct radiation from the heaters passes through the air to heat the floor, walls and machinery. These heated objects then transfer heat to the air by convection and by secondary radiation.



So workers are comfortably located between the direct radiation from the overhead infrared and the secondary radiation from the floor and machinery.

Floors stay warm, heat is steady and even without the sharp blasts from blower heat.

Partial or "spot heating" by infrared



When "spot heating" is done in a building or plant the actual ambient temperature in the area heated will be lower than if the entire building is heated.

This, of course, means the convection loss from the workers will be greater . . . which must be made up by greater overhead radiation. The body will then absorb more heat so the net heat loss maintains the worker comfortably.



On spot heating, the radiation from the floors and machinery supplies less heat . . . the overhead primary radiation is the important element.

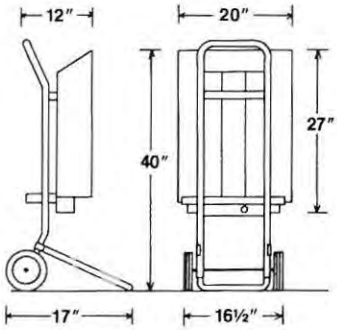
Remember, On "Spot" or Partial Heating workers should be between the overhead infrared heaters so that they are "seen" by the infrared rays and receive radiation on both sides of their bodies.

Aitken Infrared Radiant Heaters

Heavy Duty, Metal Sheath, Industrial.

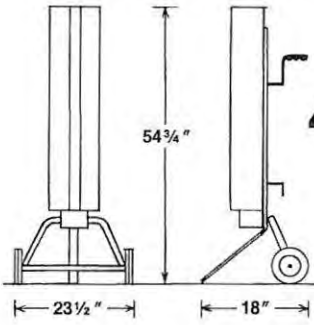
6 & 4.5 KW Portables





6 KW PPH

BOTH CAN BE SHIPPED UPS



4.5 KW PHX



Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

Versatile People Heaters

Whenever you have a heating problem that does not require a permanent installation, here is your most economical answer.

Features Are:

6 KW CAPACITY
Delivers about 20,000 BTU's of sunlike radiant heat; 4.5 KW delivers 15,300 BTU's.

PROVIDES WARMTH
Heat coverage within a 90° arc up to 12 feet away (indoor) on the 6 KW; within a 90° arc up to 10 feet on the 4.5 KW.

NEARLY INDESTRUCTIBLE
Made of heavy gauge aluminum with impact-resistant heating elements.

PORTABLE
Can be operated from welder outlets, disconnect switches or lighting distribution centers.

OPERATES IN ANY POSITION
Standing upright, on its back, side or face.

REMOVABLE HEATING UNITS
Where space requires, the heater can be removed from the cart by loosening one bolt (on 6 KW unit only).

CLEAN
No combustion by-products, no fumes, no vents required.

WEATHERPROOF
Can be operated indoors or out, or hosed off to clean, when not energized.

Cord Optional-See page 18

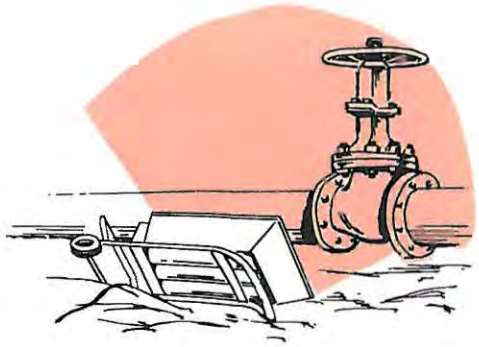
Model	Watts	Volts	Amps	Phase	Replacement Elements
PPH628	6,000	208	16.7	3	HE20208
PPH623	6,000	240	14.5	3*	HE20240
PPH643	6,000	480	7.2	3	HE20480
PPH653	6,000	550	6.3	3	HE20555
PHX4528	4,500	208	21.6	1	HE45208
PHX452	4,500	240	18.8	1	HE45240
PHX454	4,500	480	9.4	1	HE45480
PHX455	4,500	550	8.2	1	HE45550

Protective screen included.
*Can be converted to single phase.
Shipping weight 36 lbs. on the 6 KW; 30 lbs. on the 4.5 KW.
277 volt and 600 volt available as special order.

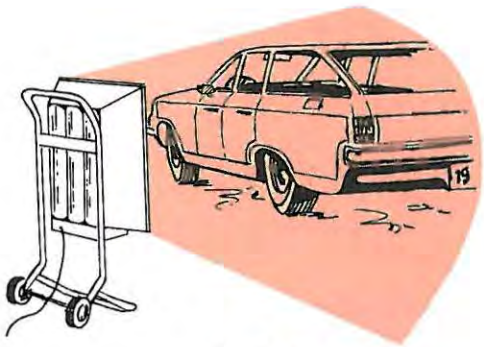
Aitken's 4.5 and 6 KW Portables do all these heating jobs



Provide heat to enable workmen to perform duties more efficiently



Help thaw frozen equipment



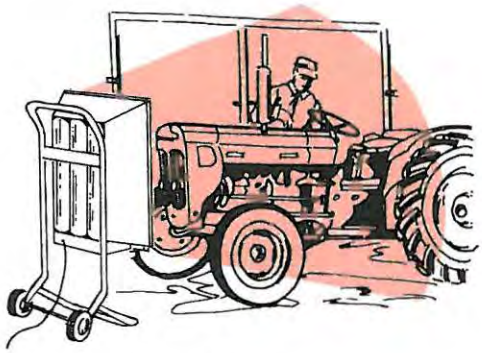
Dry paints



Heat frozen radiators, brakes or other equipment



Cure epoxy laminates



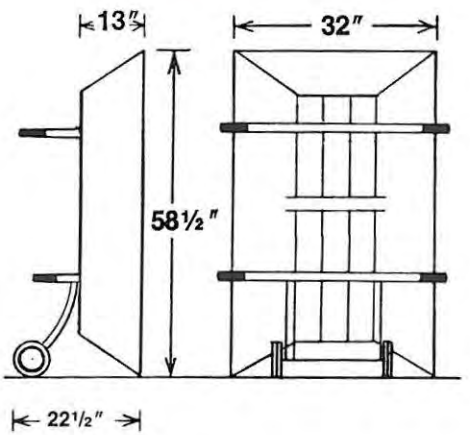
Provide heat for workmen and thawing equipment

Aitken Infrared Radiant Heaters

Heavy Duty, Metal Sheath, Industrial.

13.5 KW Portable





For Tough Heating Jobs

This is the unit for jobs where there are extremely large air movements and where portability is desirable. It was originally developed for heating workmen outside during the winter on the iron ore ranges.

The 13.5 KW Features

13.5 KW CAPACITY
Delivers about 45,000 BTU's of sunlike radiant heat.

PROVIDES WARMTH
Heat coverage within a 90° arc up to 20 feet away (indoors).

NEARLY INDESTRUCTIBLE
Made of heavy gauge aluminum with impact-resistant heating elements.

PORTABLE
Can be operated from welder outlets, disconnect switches or lighting distribution centers.

OPERATES IN ANY POSITION
Standing upright, on its back, side or face.

CLEAN
No combustion by-products, no fumes, no vents required.

WEATHERPROOF
Can be operated indoors or out, or hosed off to clean, when not energized.

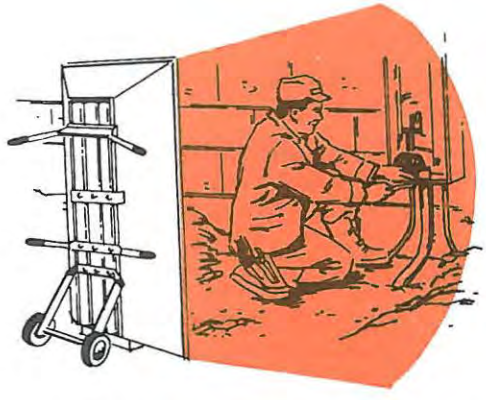
Cord Optional-See page 18

Model	Watts	Volts	Amps	Phase	Replacement Elements
SH13528	13,500	208	37.5	3	HE45208
SH135231	13,500	240	32.5	3	HE45240
SH135431	13,500	480	16.3	3	HE45480
SH13553	13,500	550	14.2	3	HE45550

Protective screen included.
Shipping weight 75 lbs.
277 volt and 600 volt available as special order.

Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

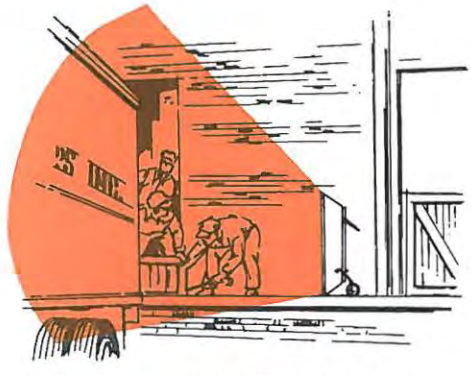
Aitken's 13.5 KW handles heavy duty heating . . . indoors or out



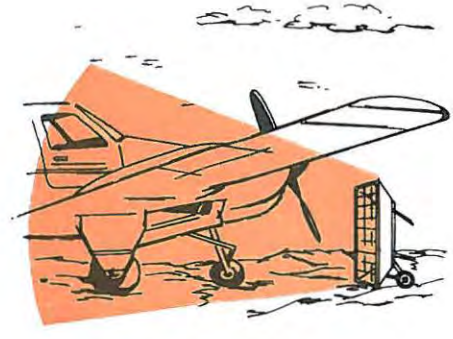
Provide heat for workmen to perform duties more efficiently indoors or out



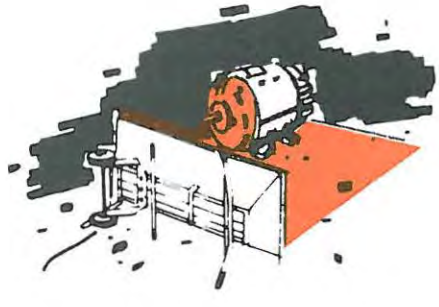
Provide heat outdoors



Heat workers on loading docks



Help thaw valuable equipment left outside



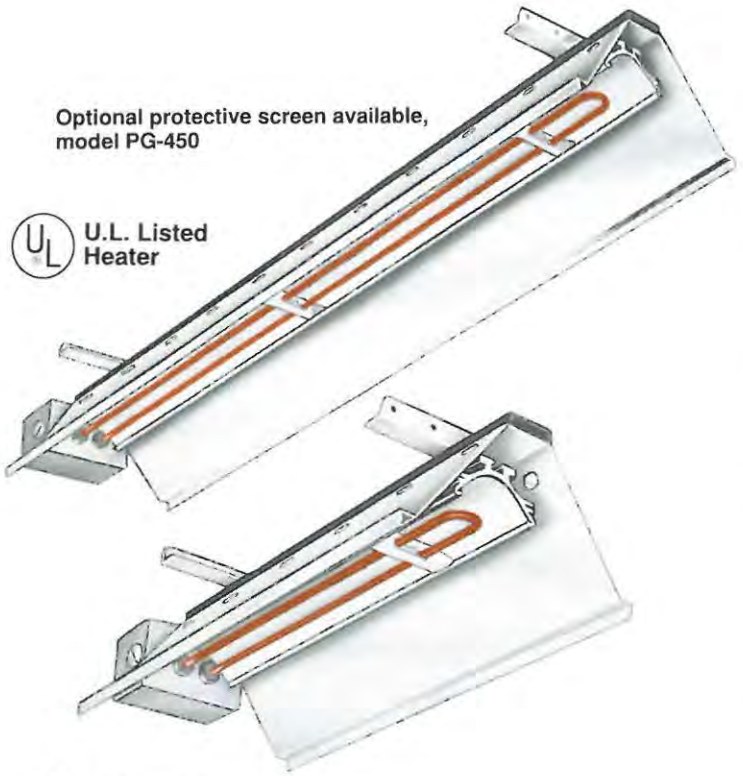
Remove moisture, preheat, dry, bake paint on parts



Aitken Infrared Radiant Heaters

Heavy Duty, Metal Sheath, Industrial.

2 & 4.5 KW Overhead Heaters



Optional protective screen available, model PG-450

U.L. Listed Heater

U.L. Listed Heater

Optional protective screen available, model PG-200

Easily Installed

Our OH series of heaters can be suspended just like fluorescent lighting fixtures to focus heat where desired. They can be used singly to heat one particular area or in a group to heat an entire building.

Features Are:

2 KW AND 4.5 KW CAPACITY
The 2000 watt model delivers about 6,000 BTU's of radiant heat. The 4500 watt model delivers about 15,000 BTU's of radiant heat.

TEMPERATURE CONTROL
It can be manually operated off a disconnect switch or automatically controlled with an Aitken control assembly. (Optional–See pages 18-20.)

NEARLY INDESTRUCTIBLE
Made of heavy gauge aluminum with impact-resistant heating elements.

OPERATES IN MANY POSITIONS
Designed for overhead installations but can be used in many positions.

EASY INSTALLATION
Mounting brackets are provided for hanging unit.

CLEAN
No combustion by-products, no fumes, no vents required.

WEATHERPROOF
Can be operated indoors or out, or hosed off to clean, when not energized.

MINIMUM MOUNTING HEIGHT
10 feet. Where ceilings are under 10 feet—or other reasons seem to dictate less than a 10-foot mounting height — consult a qualified infrared authority for advice.

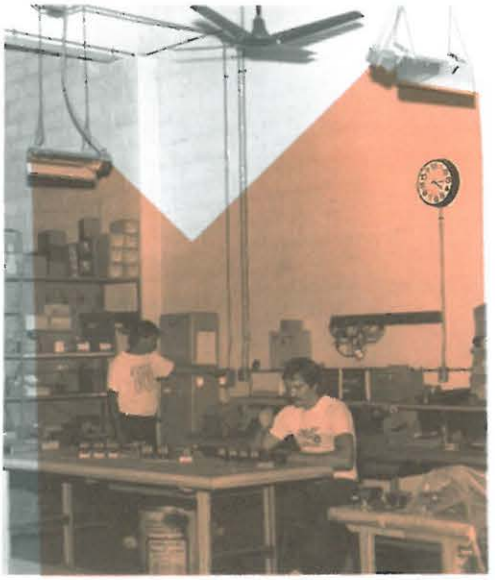
Model	Watts	Volts	Amps	Phase	Replacement Elements
OH2028	2,000	208	9.6	1	HE20208
OH202	2,000	240	8.3	1	HE20240
OH204	2,000	480	4.2	1	HE20480
OH205	2,000	550	3.6	1	HE20550
OH4528	4,500	208	21.6	1	HE45208
OH452	4,500	240	18.8	1	HE45240
OH454	4,500	480	9.4	1	HE45480
OH455	4,500	550	8.2	1	HE45550

Protective screen available for above heaters.
Shipping weight: 2 KW - 11 lbs.; 4.5 KW - 18 lbs.
277 volt and 600 volt available as special order.

Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

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Easily installed, these 2 and 4.5 KW overhead heaters will . . .



Provide heat in localized areas of large plants



Large repair facilities



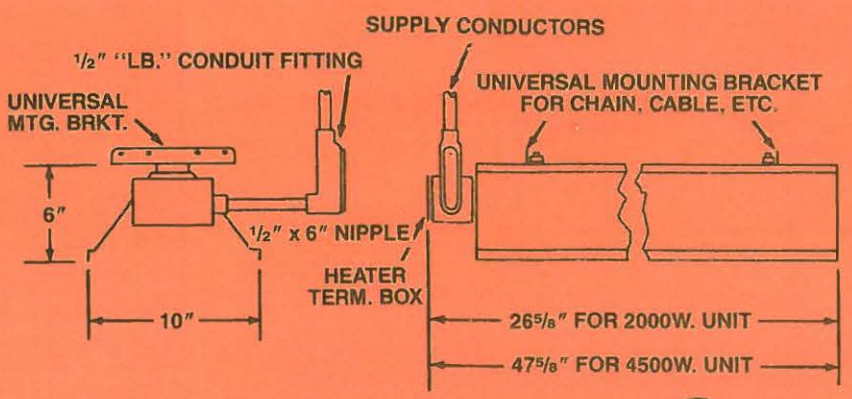
Rugged source for car wash



Narrow warehouse aisle heating

Installation Instructions

1. Minimum clearance dimensions from ceiling to top 12″ & walls to sides & ends 24″.
2. Combustible material should not be placed in the radiation path.
3. Wiring is single-end, insulated, nickelplated, stranded copper wire with 6″ of wire available for connection in conduit fitting.
4. 6″ long nipple and type "LB" conduit fitting are packed with heater, but not attached.
5. Spacing from adjacent heaters should be a minimum of 36″.

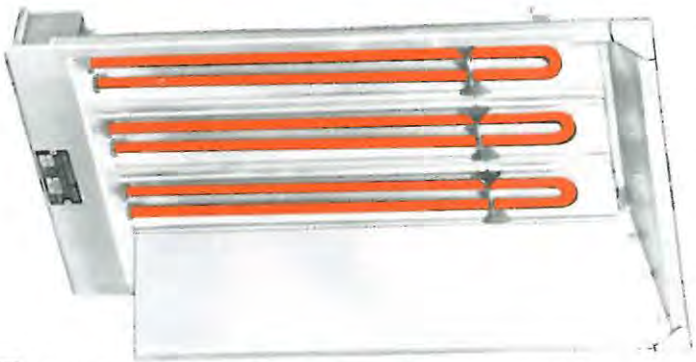


U.L. Listed Heater

Aitken Infrared Radiant Heaters

Heavy Duty, Metal Sheath, Industrial.

6 & 13.5 KW Overhead Heaters



U.L. Listed Heater

Optional protective screen available, model PG-600



U.L. Listed Heater

Shown with optional protective screen, model PG-135

These heaters handle heavy heating

Overhead heaters can be hung like fluorescents to focus heat where required and can be used singly for one area or grouped for heating an entire building.

Features Are:

6 KW AND 13.5 KW CAPACITY
The 6000 watt model delivers 20,472 BTU's of radiant heat. The 13,500 watt model delivers 46,062 BTU's of radiant heat.

TEMPERATURE CONTROL
It can be manually operated off a disconnect switch or automatically controlled with an Aitken control assembly. (Optional–See pages 18-20.)

NEARLY INDESTRUCTIBLE
Made of heavy gauge aluminum with impact-resistant heating elements.

OPERATES IN MANY POSITIONS
Designed for overhead installations but can be used in many positions.

EASY INSTALLATION
Mounting brackets are provided for hanging unit.

CLEAN
No combustion by-products, no fumes, no vents required.

WEATHERPROOF
Can be operated indoors or out, or hosed off to clean, when not energized.

Minimum mounting height for 6 KW — 12 feet.

Minimum mounting height for 13.5 KW — 14 feet.

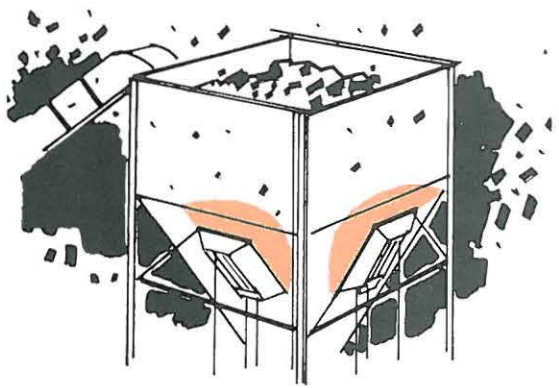
Where ceilings are under minimum mounting height — or other reasons seem to dictate less than minimum mounting height — consult a qualified infrared authority for advice.

Model	Watts	Volts	Amps	Phase	Replacement Elements
OH628	6,000	208	16.7	3	HE20208
OH623	6,000	240	14.5	3	HE20240
OH643	6,000	480	7.2	3	HE20480
OH653	6,000	550	6.3	3	HE20550
OH13528	13,500	208	37.5	3	HE45208
OH135231	13,500	240	32.5	3	HE45240
OH135431	13,500	480	16.3	3	HE45480
OH13553	13,500	550	14.2	3	HE45550

Shipping weight: 6 KW - 24 lbs.; 13.5 KW - 55 lbs.
277 volt and 600 volt available as special order.

Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

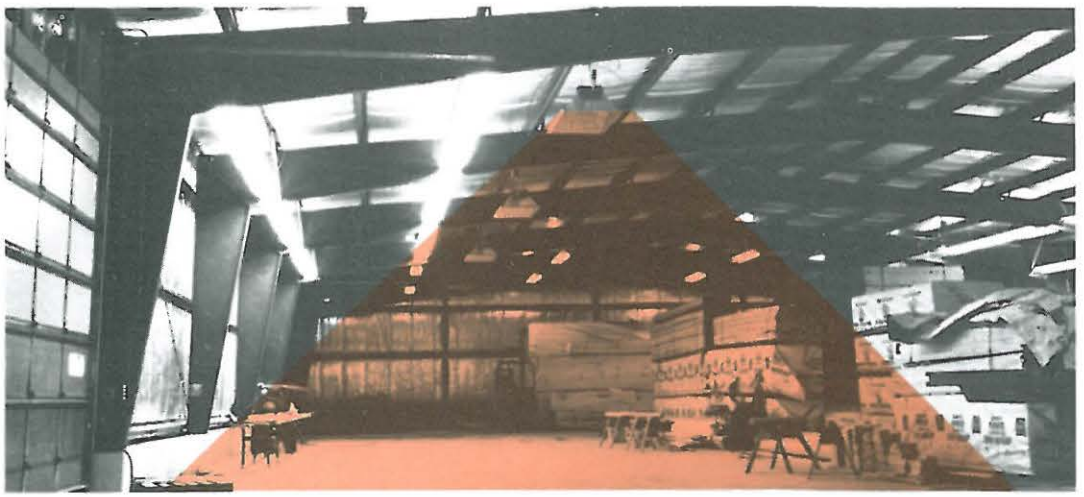
6 and 13.5 KW overhead heaters handle heavy heating



Help thaw frozen aggregate hoppers



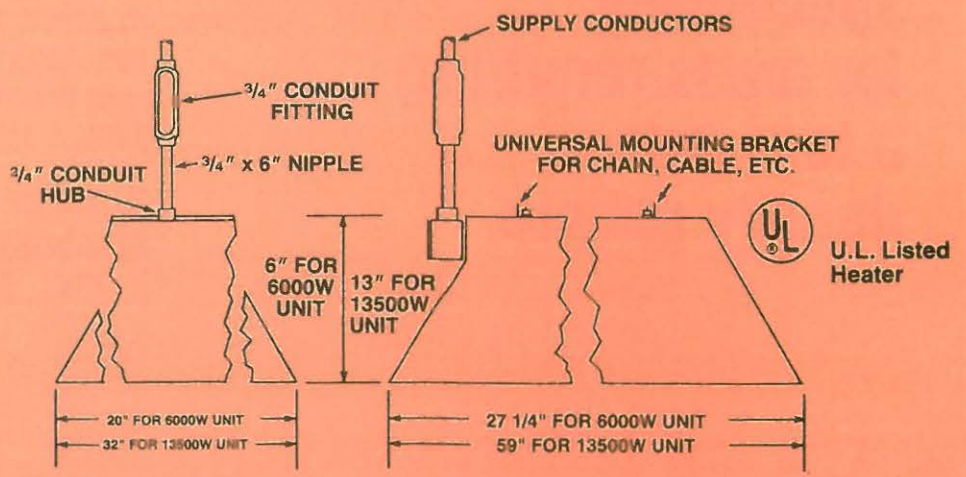
Heating indoor tennis courts



Eliminates excess moisture created by unvented gas infrared heaters, a major concern for metal buildings.

Installation Instructions

1. Minimum clearance dimensions from ceiling to top 24″ & walls to sides & ends 36″.
2. Combustible material should not be placed in the radiation path.
3. Wiring is single-end, insulated, nickelplated, stranded copper wire with 6″ of wire available for connection in conduit fitting.
4. 6″ long nipple and type "C" conduit fitting are packed with heater, but not attached.
5. Spacing from adjacent heaters should be a minimum of 36″.



Aitken Infrared Radiant Heaters

Metal Sheath

Solarod® Overhead Heaters

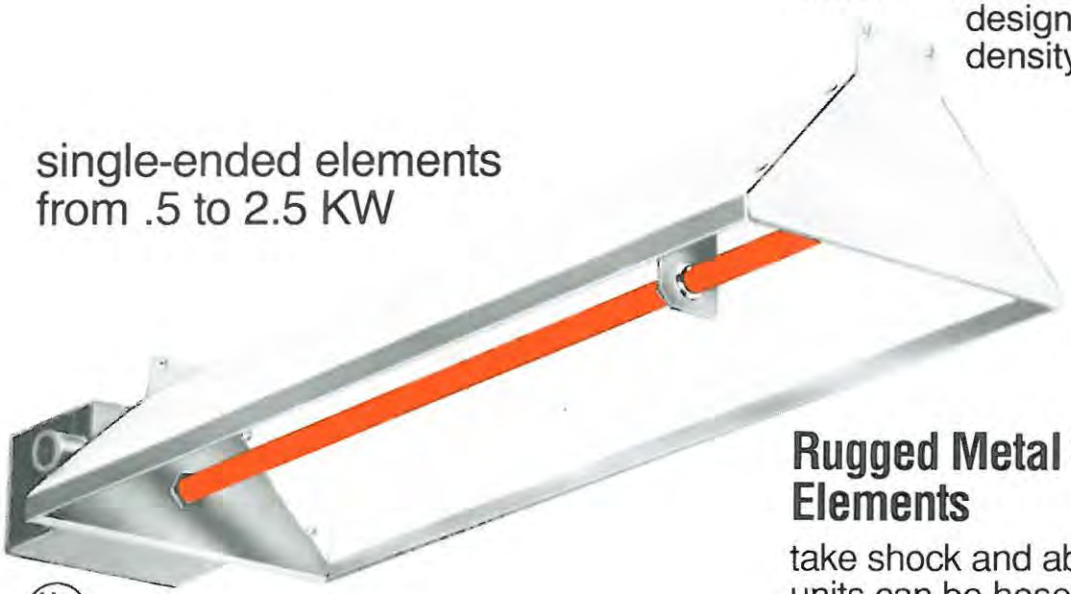
Aitken Solarod® Infrared Electric Heaters

are rugged metal sheath single-ended elements in capacities from 500 to 2500 watts.

Where a Low Mounting Height is Required

Solarod® heaters are specifically designed to give a "low watt density pattern."

single-ended elements from .5 to 2.5 KW



U.L. Listed Heater

Designed specifically for areas requiring a low watt density pattern

Rugged Metal Sheath Elements

take shock and abuse. Moisture proof units can be hosed off to clean when not energized.

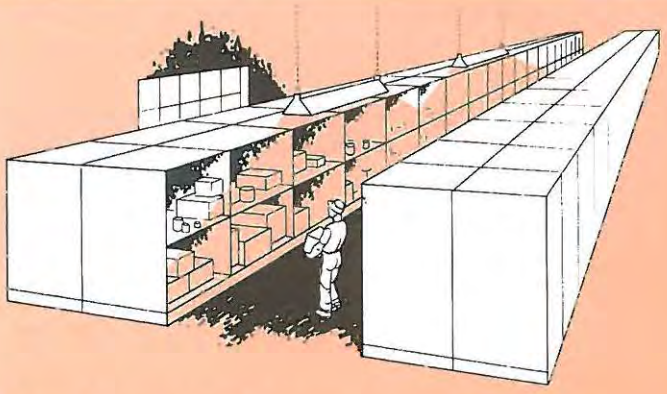
Aitken Solarod® Heaters are Available

in either 120V or 240V... can be regulated with a variety of controllers and thermostats (see accessories on pages 18, 19 and 20).

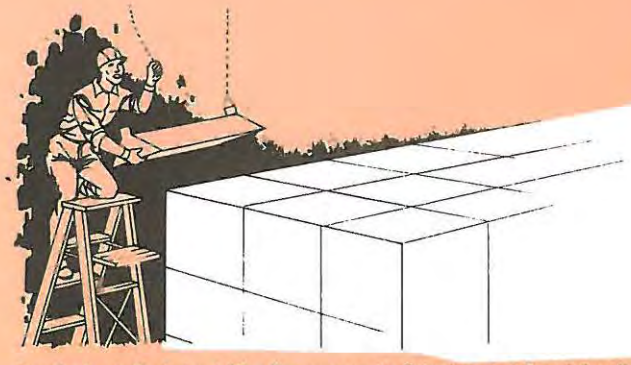
Optional protective screens available:

KW	Screen Model	
.5 KW	PGW-15	
1.0 KW	PGW-20	
1.5 KW	PGW-30	
2.0 KW	PGW-20	(2 screens needed)
2.5 KW	PGW-15	(3 screens needed)

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Broad, "low-watt density" heating pattern for warehouses, aisles, etc.



Easily installed, just like fluorescents (chains not furnished).



Appropriate for remote workstations or rooms used for only part of the day.

Minimum clearance of 3″ from top of unit to ceiling and 12″ from sides or end of unit to vertical wall. Spacing from adjacent heaters 36″ minimum. Minimum mounting height . . . 10′

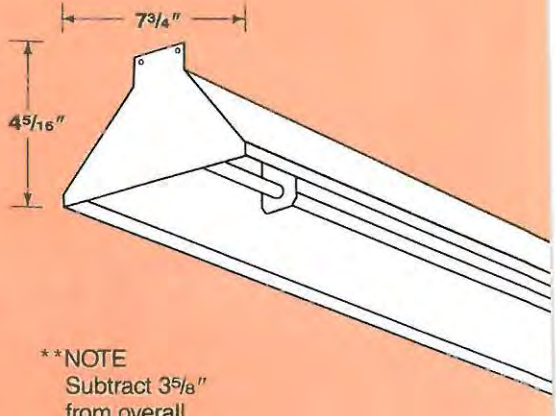
SPECIFICATIONS

Aitken Solarod® Metal Sheath Electric Infrared Heaters

Designation	Amps	K.W.	Voltage	Weight	Overall Length**	Replacement Elements
IPH512	4.10	0.5	120	3 1/4 lbs.	20 5/8"	EPH512
IPH1012	8.33	1.0	120	3 3/4 lbs.	25 1/8"	EPH1012
IPH1024	4.10	1.0	240	3 3/4 lbs.	25 1/8"	EPH1024
IPH1512	12.50	1.5	120	4 1/2 lbs.	34 5/8"	EPH1512
IPH1524	6.25	1.5	240	4 1/2 lbs.	34 5/8"	EPH1524
IPH2024	8.30	2.0	240	5 1/2 lbs.	44 1/8"	EPH2024
IPH2524	10.40	2.5	240	6 1/4 lbs.	51 5/8"	EPH2524

Optional Wire Guard — A Protective Wire Guard is available in three section sizes, combinations of which will fit all heater sizes.

Designation
PWG-15 (15″ Slip-On Section)
One Section fits IPH 512
Three Sections fit IPH 2524
PWG-20 (20″ Slip-On Section)
One Section fits IPH 1012 & IPH 1024
Two Sections fit IPH 2024
PWG-30 (30″ Slip-On Section)
One Section fits IPH 1512 & IPH 1524



**NOTE
Subtract 3 5/8″ from overall dimensions to establish distance between hangers.

Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

Aitken Infrared Radiant Heaters

Heavy Duty, Metal Sheath, Industrial.

Process Modules



For Drying, Baking & Curing

Aitken EXS and EXD infrared Modules are designed primarily as process heaters and are not intended for people or comfort heating. Maximum operating ambient temperature of 350°F. Higher object temperatures can be achieved.

How to choose modules for your process application

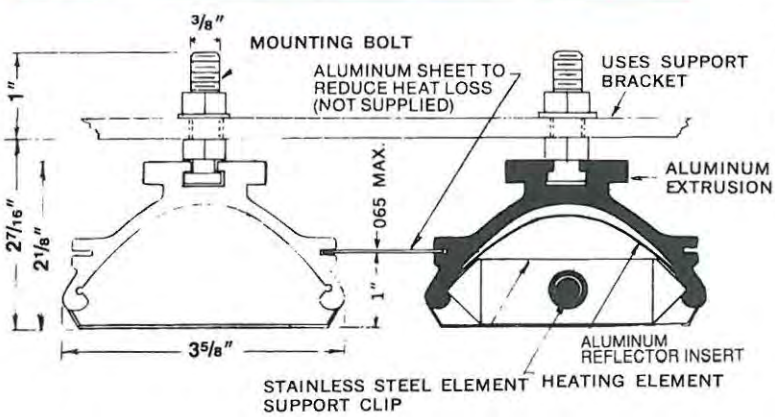
Determine and list the following:

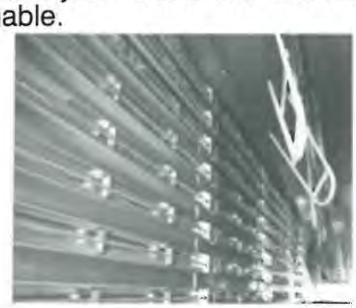
1) Product to be processed
2) Time & temperature required (see below)
3) Surface coating on product if applicable
4) Processing method ie: conveyor and type (overhead or belt) batch processing, etc.
5) Dimensions of product and weight per piece
6) Production rate per hour (in lbs. per hour or pieces per hour)
7) Specific heat
8) Work temperature at start
9) Work temperature at finish
10) Ventilation if required and space restrictions
11) Your power supply

Time and Temperature

Calculate 1) the time needed to produce the required "assembly piece" temperature and 2) the time required to maintain the temperature. You can usually do your own test run by placing one or more infrared heaters directed at the product being processed. Be sure the work piece is in the radiation area of your heater and that the product is not flammable.

Typical Installation





An infrared oven for drying powdered paints.

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Metal sheath heaters allow for precise product temperature control through percentage timers. Operating sheath temperatures of 1450°F. or less means that this equipment is a prime source of far infrared heat. Far infrared means less color sensitivity on the product, and the ability to readily see and evaporate moisture.

Model EXS

For most average installations. Units are single Incoloy® tube in heavy duty extrusions. Replaceable inner reflector. Will mount in any position.

Model EXD

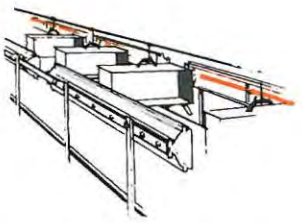
Double element heater for higher watt densities. For applications such as "warm-up" zones in ovens, faster heat input on process equipment. Will mount in any position.

If you need new ovens or your existing ovens are incapable of keeping up with today's requirements, this is your most economical answer. To increase temperature and production, these units can be installed in the existing warm-up zone, or complete oven sections can be fabricated on a simple angle iron frame. For more efficiency, aluminum sheets can be placed between the extrusion slots to form an inner oven shell and reduce the heat loss. To further increase efficiency, glass insulation and an outer shell can be installed.

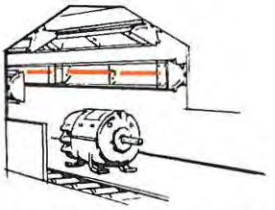
Features:

- Heavy duty extrusions.
- Heavy duty elements designed for continuous operation at temperatures up to 350°F.
- Stainless steel element support clips.
- No ceramics to deteriorate or break.
- High shock resistance–both physical and thermal.
- Easy installation.
- Wide range of sizes and heats.

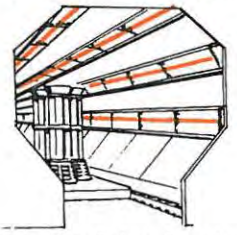
Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present.



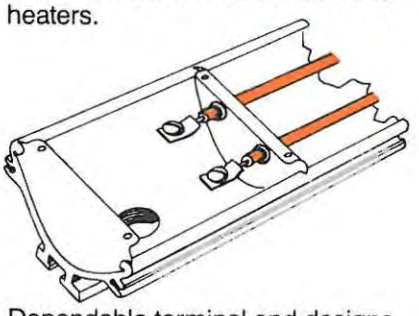
EX Heat Modules suspended without an enclosure for average installations.



EX Heat Modules grouped together for high temperature applications.



EX Heat Modules forming an enclosed oven by the use of bright aluminum sheet inserted between heaters.



Dependable terminal end designs.

Single Element Units (EXS)

Overall Length Inches	Volts	Watts	Amps	Model	Wt.	Replacement Elements
24	120	800	6.7	EXS801	4	HE8120
24	240	800	3.3	EXS802	4	HE8240
30	120	1,100	9.2	EXS1101	5	HE11120
30	240	1,100	4.6	EXS1102	5	HE11240
46	240	1,800	7.5	EXS1802	7	HE18240
46	480	1,800	3.8	EXS1804	7	HE18480
60	240	2,500	10.4	EXS2502	10	HE25240
60	480	2,500	5.2	EXS2504	10	HE25480
72	240	3,000	12.5	EXS3002	11	HE30240
72	480	3,000	6.3	EXS3004	11	HE30480
86	240	3,600	15.0	EXS3602	13	HE36240
86	480	3,600	7.5	EXS3604	13	HE36480

Double Element Units (EXD)

Overall Length Inches	Volts	Watts	Amps	Model	Wt.	Replacement Elements
24	120	1,600	13.3	EXD1601	5	HE8120
24	240	1,600	6.7	EXD1602	5	HE8240
30	120	2,200	18.3	EXD2201	6	HE11120
30	240	2,200	9.2	EXD2202	6	HE11240
46	240	3,600	15.0	EXD3602	8	HE18240
46	480	3,600	7.5	EXD3604	8	HE18240
60	240	5,000	20.8	EXD5002	11	HE25240
60	480	5,000	10.4	EXD5004	11	HE25240
72	240	6,000	25.0	EXD6002	13	HE30240
72	480	6,000	12.5	EXD6004	13	HE30240
86	240	7,200	30.0	EXD7202	15	HE36240
86	480	7,200	15.0	EXD7204	15	HE36240

Heated length 8" less than overall length.

Accessories for Metal Sheath Radiant Heaters



PTO



PTE

Input Controllers

The PTE and PTO type controller is a motor driven percentage timer which "pulses" radiant heaters. It can be set to select desired percentage of a 30 sec. cycle. For example: To get 80% heater output, the timer is set to 80%, creating a cycle of 24 seconds energized and 6 seconds off. It would continue to operate at this cycle until manually changed. A timer can, however, only handle 20A single phase. Timers are normally used in conjunction with contactors. Minimum operating ambient temperature for this type of controller is 32°F.

Type Mounting	Voltage	Non-Inductive Load Rating	Catalog No.
Flush	120v 1 phase	20 amp	PTO 115
W/enclosure	120v 1 phase	20 amp	PTE 115
Flush	240v 1 phase	20 amp	PTO 230
W/enclosure	240v 1 phase	20 amp	PTE 230



IC

Three Phase Controllers

Aitken's Infinite Cycling (IC) Timer lets the user choose from an unlimited number of settings, resulting in the widest possible range of heater output levels. Up to 10 KW balanced loads on 240V 3 phase and up to 20 KW balanced loads on 480V 3 phase. For metal sheath infrared comfort heaters only.

Voltage	Balanced 3 Phase Load Rating	Catalog No.
240-3 phase	10.0 KW	IC 240
480-3 phase	20.0 KW	IC 480



PC

Low Cost Single Phase Controllers

This controller can provide an infinite cycling pattern from zero to continuous heat when controlling metal sheath infrared comfort heaters...up to 1.75 KW on 120V single phase, up to 3.5 KW on 240V single phase.

Voltage	Load Rating	Catalog No.
120-1 phase	1.75 KW	PC-12
240-1 phase	3.5 KW	PC-24



RC

Magnet Contactors

Contactors are used to energize heating loads that exceed the power handling capacity of percentage timers or line voltage thermostats. Contactors are normally supplied with 120V, 60hz coils. 240 or 480V, 60hz coils available. NEMA 1 enclosure included.

Cat. No.	Amp. Rating Per Pole	No. of Poles
RC 303	30	3
RC 403	40	3

High Temp. Lead Wire

Manufactured to the highest standards. Rated for 480°F, 600 volts. UL listed.

AWG	Max. Amps.
10	25
12	20

No. 10 screw size ring tongue connectors for above wire, for temperature up to 800°F.

Cords for Portable Heaters

Cords are shipped separately (not installed) and come in standard 25' and 50' lengths. The heater end of the cord has terminals and the proper size cord grip installed.

For use on Model	Phase	Cord Dia.	Cord No. 25' length	Cord No. 50' length
PHX452 PPH621	1	11/16" O.D.	C10325	C10350
PHX454 PHX455	1	5/8" O.D.	C12325	C12350
SH135231	3	1" O.D.	C8425	C8450
PPH623 PPH643 PPH653 SH135431 SH13553	3	11/16" O.D.	C12425	C12450

NOTE: Plugs are not furnished. There are so many variations available that we are unable to stock them.



DA



TS-TD

Thermostats

Thermostat controls are snap action type for positive operation on both open and close.

Model No.	Temp. Range (°F)	Line Voltage	Rating Amps. Per Pole	No. Poles	Application	Special Features
DA	40°-80°	120 240	25 22	1	Room Thermostat	Built-in Thermometer, Metal Housing
TS	50°-90°	120-240 Max.	22	1	Room Thermostat	—
TD	50°-90°	120-240 Max.	22	2	Room Thermostat	—

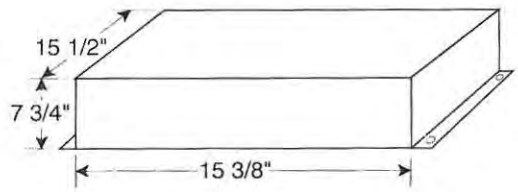
Aitken Control Assemblies for Metal Sheath Radiant Heaters



The large mass inherent in a metal sheath electric radiant type heater permits the use of a pulsing type control. Unlike a quartz infrared heater which turns on or off quickly, a metal sheath heater takes about two minutes to reach its color temperature. When shut off, the metal sheath heater requires about the same amount of time to cool down to room temperature.

Because of this time lag, the metal sheath heater can be recycled to hold a predetermined temperature. A "percentage" input timer is used to control the on/off cycle. This timer has a solid state pulsing device with a 30 second cycle. The control dial is calibrated from 0% to 100%. By turning the dial, you can have your heater energized for any percentage of the 30 second cycle.

For example: To get 80% heater output, the timer is set to 80%, creating a cycle of 24 seconds energized and 6 seconds off. It would continue to operate at this cycle until manually changed.



On-Board Transformer Eliminates Second Voltage Feed

A transformer is desirable to eliminate the need for feeding two voltages: one to the controls and one to the load. Before now, this would mean that three housings were needed to wire together the timer, the contactor and the transformer.

Now Aitken brings these three components in one dust-tight box with an on/off switch and pilot light. It is completely prewired and requires only the three phase feed through the contactor. This makes for a neat, inexpensive, precise control, completely prewired for noninductive loads.

Not suitable for use with quartz infrared heaters.

Models	Total Capacity	Quantity & Ratings Of Contactors	Volts	Max. KW Balance 3 Phase
N324-A	30 amp	(1) 30	240	12.0
N328-A	30 amp	(1) 30	208	10.0
N348-A	30 amp	(1) 30	480	24.0
N424-A	40 amp	(1) 40	240	16.0
N425-A	40 amp	(1) 40	208	13.5
N448-A	40 amp	(1) 40	480	32.0
N624-A	60 amp	(2) 30	240	24.0
N628-A	60 amp	(2) 30	208	20.0
N648-A	60 amp	(2) 30	480	48.0
N824-A	80 amp	(2) 40	240	32.0
N828-A	80 amp	(2) 40	208	27.0

Models	Total Capacity	Quantity & Ratings Of Contactors	Volts	Max. KW Balance 3 Phase
N848-A	80 amp	(2) 40	480	64.0
N924-A	90 amp	(3) 30	240	36.0
N928-A	90 amp	(3) 30	208	30.0
N948-A	90 amp	(3) 30	480	72.0
N1224-A	120 amp	(3) 40	240	48.0
N1228-A	120 amp	(3) 40	208	40.5
N1248-A	120 amp	(3) 40	480	96.0
N1624-A	160 amp	(4) 40	240	64.0
N1628-A	160 amp	(4) 40	208	54.0
N1648-A	160 amp	(4) 40	480	128.0

Aitken Ceiling Paddle Fans



U.L. Listed

Cut Cooling Costs
save up to 33⅓% on heating costs

all for just 13¢ per 24 hour day

SIMPLIFIED ESTIMATING PROCEDURE FOR ALL TYPES OF BUILDINGS

For heat savings, take the square footage of the building and subtract 1200 square feet for every active shipping door. Then divide the remaining sq. ft. of the building by 2000 sq. ft.

EXAMPLE:

35,000 sq. ft. building with 5 active shipping doors.

5 doors × 1200 sq. ft./door = 6000 sq. ft.

35,000 sq. ft.–6000 sq. ft. = 29,000 sq. ft. divided by 2000.

= 14.5 Fans + 5 fans for shipping doors = 19.5 Fans for the total building.

Use your discretion on whether the .5 Fan should be converted to another Fan or simply dropped. One Fan + or – will not significantly affect performance of the system on buildings over 15,000 sq. ft.

Place the 5 Fans for the shipping doors 15 to 20 feet back from the wall, directly opposite the center of the door. The other 14 fans should be distributed, equally spaced, over the balance of the building. The use of a grid system is often the easiest way with the Fan being placed in the center of each grid.

For customers interested in both heat savings and cooling comfort, we suggest the same format as with the heat savings be used, with modifications. Take the square footage of the building and subtract 1000 square feet for every active shipping door. Then divide the remaining sq. ft. of the building by 1200 sq. ft.

EXAMPLE:

35,000 sq. ft. building with 5 active shipping doors.

5 doors × 1000 sq. ft./door = 5000 sq. ft.

35,000 sq. ft.–5,000 sq. ft. = 30,000 sq. ft. divided by 1200.

= 25 Fans + 5 Fans for shipping door = 30 Fans for the total building.

Use the grid system to ease placement as suggested in the "heat savings only" quoting. Any average over .2 Fan add another Fan.

Gently moving air keeps employees, customers and audiences cool and comfortable in offices, factories, shops or meeting rooms. You'll cut air conditioning and heating costs, save on utility bills.

The *Sea Breeze III*

Features

- 10" x ¾" down rod standard
- ⅜" heavy steel "J" hook for easy installation and firm support
- UL listed
- 5 year motor warranty
- 3 aluminum blades, 56" diametrer
- Optional fire sensor for automatic shutdown so unit doesn't "fan" flames in case of fire
- Available in brown or white enameled finish
- Comes with 3-wire cord with plug

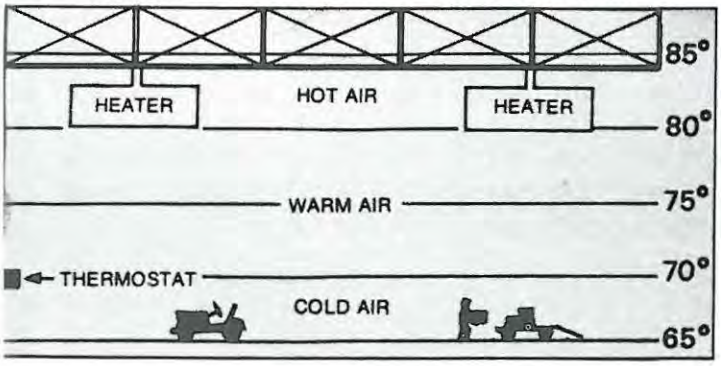
Commercial/Industrial Fan Specifications

Sweep diameter	56"
Number Blades	3
Type of Blades	Aluminum
Number of Speeds	Infinite
CFM High Speed	21,000
Watts - High Speed	104
Amps - High Speed	0.65
R.P.M. - High Speed	340
Color Baked Enamel	White
Color Baked Enamel	Brown
Weight (lbs.)	32
Limited Warranty	5 yr.

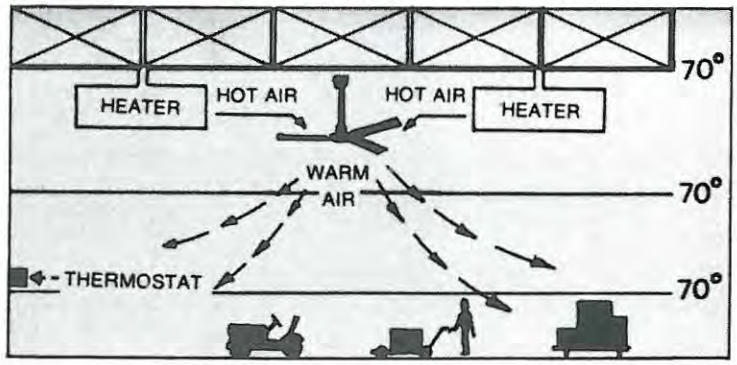
CFM: Effective amount of air volume moved past a plane at 20 feet from the fan.

COLD WEATHER FUEL SAVINGS UP TO 33⅓%

INEFFICIENT HEATING BEFORE SPREADING OF AIR



IN PLANT INSTALLATIONS AFTER AIR IS SPREAD



Solarbeam™ Universal "All-Weather" Quartz Lamp Infrared Heaters

save up to 20% on electric heating bills! Available with butt socket or pigtail lamp connections for indoor or outdoor application.

Aitken Quartz Lamp Infrared Heaters are now available in Universal "All-Weather" models for indoor or outdoor installations. Two kinds of lamp connectors are also available... *"butt socket,"* (push pull spring loaded silver tipped contact for easy snap-in connection) or *"pigtail"*, for a more positive connection on rugged applications where physical abuse is a problem.

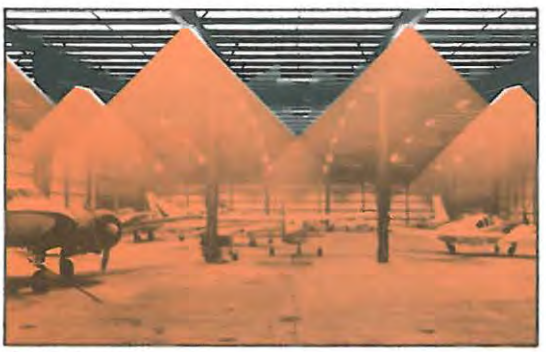
All models can be positioned and mounted as easily as fluorescent lights. Rugged construction is "rain-tite" for indoor-outdoor installation.

Protective wire guard available as an option.

Aitken Quartz Lamp Infrared Heaters use up to 20% less KW than conventional electric heat when used for comfort heating.



High ceiling metal building



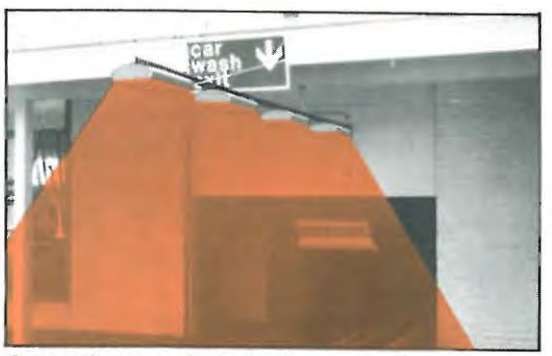
Drafty hangar



Lofty stone buildings



High bay factories



Convenience and service for car wash



Walkways and entrances



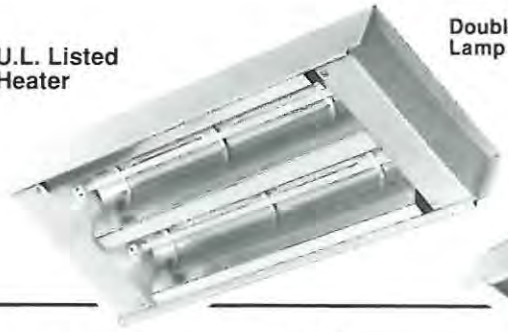
Parking ramp snow melting

Quartz Lamp Infrared Heaters are now used for...

Bank entryways
Basketball courts
Bus shelters
Canopies
Car washes
Drive-ins
Factories
Farms
Foundries
Garages
Grandstands
Gymnasiums
Indoor tennis courts
Kennels
Laundries
Loading docks
Lobbies
Locker rooms
Lumber mills
Machine shops
Milking parlors
Parking lots
Patios
Restaurant fronts
Guard houses
Service stations
Skating rinks
Ski lodges
Snow melting
Stadiums
Stock rooms
Store fronts
Toll booths
Utility rooms
Warehouses
Water pumps

Solarbeam™ Universal "All-Weather" Quartz Lamp Infrared Heaters

U.L. Listed Heater



Double Lamp

Aitken

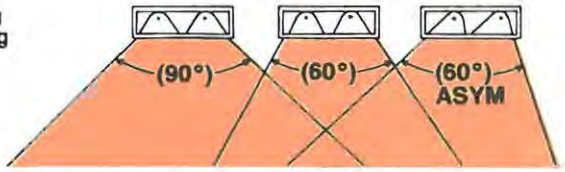


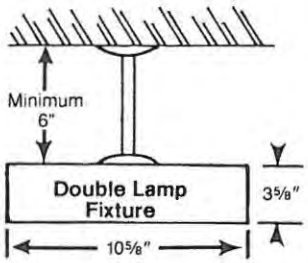
Single lamp for narrow aisles or corridors when limited watt density is required.

Minimum mounting height — 10 feet. Where ceilings are under 10 feet...or other reasons seem to dictate less than a 10-foot mounting height, consult a qualified infrared authority for advice. Do not install closer than 24 inches to a vertical surface. Can be stem mounted to any supporting surface. For supply connections use wire suitable for at least 75°C (167°F).



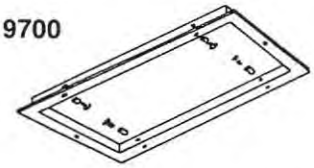
Note: Threaded casting for easy mounting



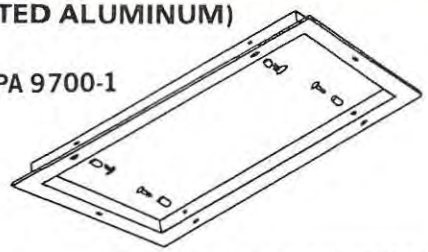


RECESSING FRAMES (PAINTED ALUMINUM)

PA 9700



PA 9700-1



Installation:
Cut out dimensions are: 12⅛" x 28" for Part PA 9700
12⅛" x 37" for Part PA 9700-1
Mount recessing frame in ceiling. (6) holes (5/16") dia. are provided in frame.
Holes must be drilled in heater housing.

NOTE: USE ONLY IN FIREPROOF CONSTRUCTION. USE ONLY WHERE LOCAL CODES OR INSPECTION ALLOWS. MOUNTING OF HEATER IN THIS MANNER VOIDS U.L. LISTING. MINIMUM CAVITY DEPTH — 12".

Model		Dimensions (Ht.L.W.)	Reflector	No.Lamps	Watts	Volts	Amps	Ship. Wt.
Butt Socket	Pigtail							
QH 169	QHL 169	3 5/8 x 25 1/2 x 5 3/4	90°	1	1600	208V, 240V, 277V	(See Lamps)	9 lbs.
NA	QHL 259	3 5/8 x 34 1/2 x 5 3/4	90°	1	2500	480	5.21	11 lbs.
Butt Socket	Pigtail							
QH 109	QHL 109	3 5/8 x 14 1/2 x 10 5/8	90°	2	1000	120V	8.3	10 lbs.
QH 106	QHL 106	3 5/8 x 14 1/2 x 10 5/8	60°	2	1000	120V	8.3	10 lbs.
QH 106A	QHL 106A	3 5/8 x 14 1/2 x 10 5/8	60°A	2	1000	120V	8.3	10 lbs.
QH 329**	QHL 329**	3 5/8 x 25 1/2 x 10 5/8	90°	2	3200	Specify*	15.4 @ 208V	14 lbs.
QH 326**	QHL 326**	3 5/8 x 25 1/2 x 10 5/8	60°	2	3200	208V, 277V	13.4 @ 240V	14 lbs.
QH 326A**	QHL 326A**	3 5/8 x 25 1/2 x 10 5/8	60°A	2	3200	or 240V	11.6 @ 277V	14 lbs.
NA	QHL 509	3 5/8 x 34 1/2 x 10 5/8	90°	2	5000	480	10.4	18 lbs.
NA	QHL 506	3 5/8 x 34 1/2 x 10 5/8	60°	2	5000	480	10.4	18 lbs.
NA	QHL 506A	3 5/8 x 34 1/2 x 10 5/8	60°A	2	5000	480	10.4	18 lbs.

*The 3200 watt units available in either 208V, 240V, or 277V. Specify on order.
**Can be series wired with 240V lamps to operate on 480V.

Accessories - For Painted & Stainless Models

Recessing Frames	Description
PA 9700	For 3200 watt units
PA 9700-1	For 5000 watt units

Red Vycor Sleeves Mask out illumination from lamps. For butt socket or pigtail lamps. Specify heater model.

P 70069	Fits 500 watt lamp QH heaters
P 70070	Fits 1600 watt lamp QH heaters
P 70080	Fits 2500 watt lamp QH heaters
P 80069	Fits 500 watt lamp QHL heaters
P 80070	Fits 1600 watt lamp QHL heaters
P 80080	Fits 2500 watt lamp QHL heaters

Wire Guards

P 54580-2	Fits 1000 watt double lamp unit
P 54580	Fits 3200 watt double lamp unit
P 54580-1	Fits 5000 watt double lamp unit
P 54581	Fits 1600 watt single lamp unit
P 54581-1	Fits 2500 watt single lamp unit

Quartz Lamps	Watts	Volts	Amps
Butt Socket			
P70010	500	120	4.17
P70013	1600	208	7.69
P70014	1600	240	6.67
P70015	1600	277	5.78
P70016	2500	480	5.21
Pigtail			
P80005	500	120	4.17
P80208	1600	208	7.69
P80240	1600	240	6.67
P80277	1600	277	5.78
P80480	2500	480	5.21

Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

New Stainless Steel
U.L. Listed Heater

Corrosion Resistant
Never Needs Painting

Minimum mounting height — 10 feet. Where ceilings are under 10 feet...or other reasons seem to dictate less than a 10-foot mounting height, consult a qualified infrared authority for advice. Do not install closer than 24 inches to a vertical surface. Can be stem-mounted to any supporting surface. For supply connections use wire suitable for at least 75°C (167°F).

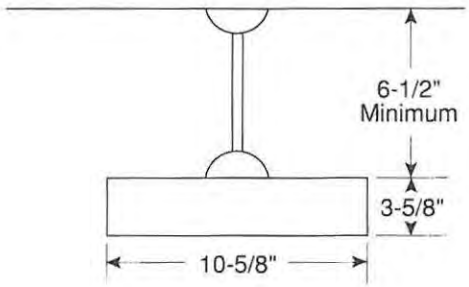


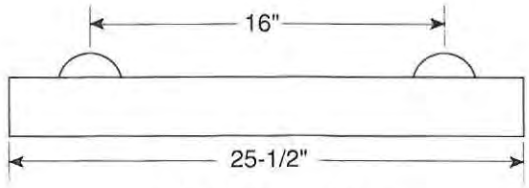
(Shown with double stem mounting)

U.L. Listed Heater

Model		Dimensions (Ht. x L. x W.)	Reflector	No. of Lamps	Watts	Volts	Amps	Ship. Wt.
Single Lamp Fixtures								
Butt Socket	**Pigtail**							
(1) SQH 169	SQHL 169	3 5/8 x 25 1/2 x 5 3/4	90°	1	1600	208V, 240V, 277V	(See Lamps)	9 lbs.
(1) NA	SQHL 259	3 5/8 x 34 1/2 x 5 3/4	90°	1	2500	480	5.21	11 lbs.
Double Lamp Fixtures								
Butt Socket	**Pigtail**							
SQH 329*	SQHL 329**	3 5/8 x 25 1/2 x 10 5/8	90°	2	3200	Specify* 208V,	15.4 @ 208V	15 lbs.
SQH 326**	SQHL 326**	3 5/8 x 25 1/2 x 10 5/8	60°	2	3200	277V or	13.4 @ 240V	15 lbs.
SQH 326A**	SQHL 326A**	3 5/8 x 25 1/2 x 10 5/8	60°A	2	3200	240V	11.6 @ 277V	15 lbs.
NA	SQHL 509	3 5/8 x 34 1/2 x 10 5/8	90°	2	5000	480	10.4	18 lbs.
NA	SQHL 506	3 5/8 x 34 1/2 x 10 5/8	60°	2	5000	480	10.4	18 lbs.
NA	SQHL 506A	3 5/8 x 34 1/2 x 10 5/8	60°A	2	5000	480	10.4	18 lbs.

*The 3200 watt units available in either 208V, 240V, or 277V. Specify on order.
**Can be series wired with 240V lamps to operate on 480V.

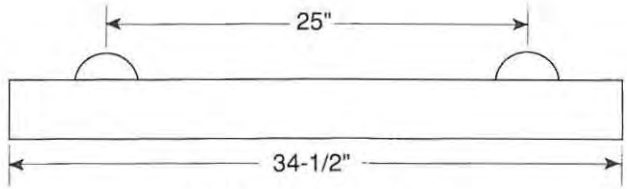




3200 Watt SQH SQHL

Only stainless steel two-lamp models have double stems.

NOTE: Furnished with 6" long pipe stem with 3/4" thread for easy mounting with cover plate and gasket.



5000 Watt SQHL

Aitken Horizontal/Downflow Unit Heaters
AUH-SA-Series

- Horizontal & Downflow Operation in One Unit
- From 2.5 to 7.5 KW
- From 8,533 to 25,598 BTU's/hr.
- Easy hinged access

Applications
Very flexible heaters for supplementary or primary heating of warehouses, factories, public buildings, stores, service stations, stockrooms, offices, large or exposed areas or additions.

Horizontal & Downflow
All heaters come with a ceiling mounting bracket that can be used in four indexed positions: straight out (horizontal), straight down (downflow), and two intermediate positions, as well as any position in between Louvers adjust up and down for additional control of throw direction. The louvers have stops to prevent complete closing of the discharge area. The heater body also has top center hole with weld nut for mounting the heater and allowing it to rotate 360°. A wall mounting bracket is also available.

Easy to Install & Service
By removing one screw, the bottom control box swings down on hinges for complete access to controls and wiring. Loosening four Phillips-head screws through keyhole slots at the front of the heater allows full access to heating element, fan delay control, safety high limit cutouts, fan blades and motor. Complete access to the motor is obtained through the back by removing the four screws holding the fan guard.

Prolonged Element Life
Efficient design of the plate fin elements allows uniform discharge of all heated air, resulting in lower internal operating temperatures and prolonged element life. The steel fins are copper-brazed to the tubular, steel-sheathed, low-watt density heating element. Fins and elements are closely fitted into the discharge area in a uniform grid pattern to assure that all incoming air is discharged through the heating element.

Quiet Operation
The motor's unit-bearing design includes high starting and running torques. Large, dynamically-balanced fan blades provide maximum air flow with minimum turbulence and noise.

Automatic Fan Control
All 5 and 7.5 KW heaters have an automatic fan-delay control. The control delays the fan until the heating element is warm, preventing the circulation of cold air. The control also runs the fan until the heating element has cooled after the heating cycle. This delay reduces residual internal heat and extends component life.

Heavy-Duty Contactors
The 480-volt and 550-volt 5 KW models and all 7.5 KW models are shipped with factory-installed, heavy-duty, 3-pole contractors.

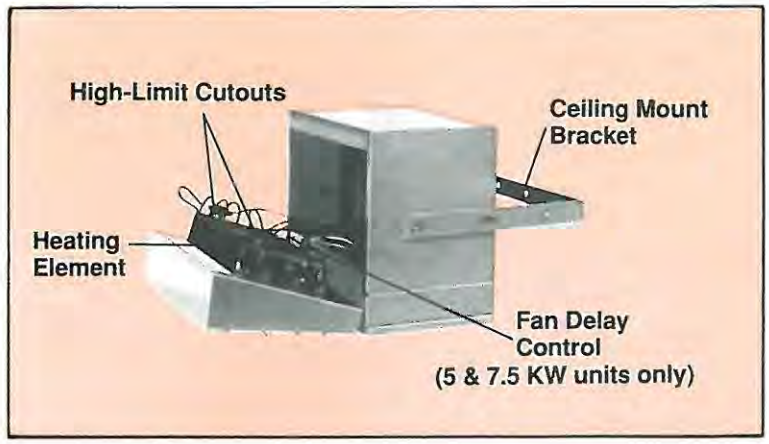
Internal Transformers
All motors and contactor coils are 208-, 240- or 277-volts and operate directly off the line voltage of 208-, 240- and 277-volt heaters, and on the secondary of a factory-installed step-down power transformer on 480- and 550-volt heaters so a separate fan and motor control power source is not needed.

Thermal Cutout
A high-limit thermal cutout automatically shuts off the heater in the event of overheating and reactivates it when operating temperatures return to normal. An optional disconnect switch is also available.

Optional 24-Volt & 120-Volt Controls*
24-volt coil and 120-volt coil relays are available to control 208- through 550-volt AUH-SA heaters. These relays are particularly useful with energy management systems that are centrally-controlled, employing 24-volt or 120-volt control systems. 24-volt coil relays with 208/240-volt transformers are also available to control all 208-, 240-, 480-, and 550-volt heaters. NOTE: None of the above can be used with 3Ø AUH-520-SA or AUH-524-SA heaters.

* With the addition of an AUH-TA-1 built-in thermostat or a remote thermostat to the appropriate AUH-SA heater, the heater can be wired to operate in the right set back mode.







10 KW to 50 KW

Enclosed Motor

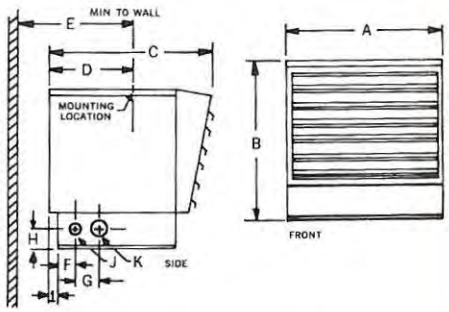
. . . Simple Design. Sides are removable for easy cleaning or servicing.

Plate Fin Heating Element

Steel fins, copper brazed to low watt density, steel sheathed tubular heating elements. All air passing through is uniformly heated for maximum efficiency by the large finned heating area. Lower internal temperatures prolong life of the non-glowing elements.



Danger — Aitken Unit Heaters must not be operated where flammable gases or vapors are present.



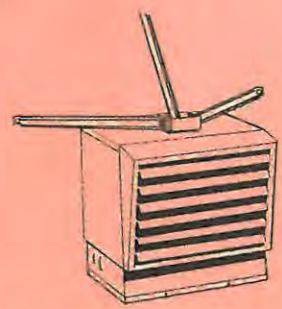
Combination Ceiling/Wall Bracket, Model CWB



Hinged cover gives easy access to wiring chambers.



Units can be wall or ceiling mounted.

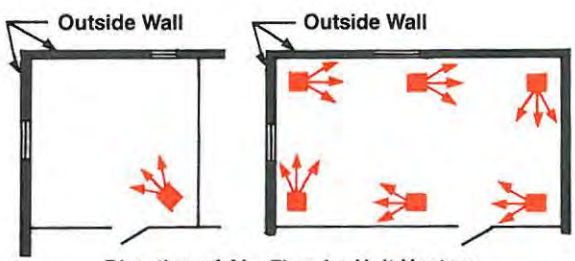


Mountings pivot so unit can be turned to direct air flow.

Unit Dimensions for All Models

	2.5, 3.3, 5 & 7.5 KW	10, 12.5, 15 & 20 KW	25, 30, 40 & 50 KW
A	14″	18″	26″
B	12 1/2″	18″	24″
C	13 1/4″	17 1/2″	23 1/8″
D	6 1/2″	9 15/32″	9 15/32″
E	13″	*	20″
F	1 3/4″	2″	2″
G	1 3/8″	2 1/2″	2 3/4″
H	1 1/2″	2 1/4″	2 1/4″
J	1/2″, 3/4″ (2)	3/4″, 1″ (2)	1″, 1 1/2″ (2)
K	1/2″ (1)	1″, 1 1/4″, 1 1/2″ (3)	1″, 1 1/2″, 2″ (3)

*13″ for 10, 12.5 and 15KW models; 16″ for 20KW models.



Direction of Air Flow for Unit Heaters

Location of Heaters

Mounting heights shown in mounting height column in the selection chart on page 29 should not be exceeded. Mounting heaters too high will require setting louvers sharply to direct warm air toward the floor decreasing distance of air throw. Heaters should be arranged so that the discharge air stream will be parallel to and "wipe" exposed walls rather than blowing at them and will not be restricted by columns, machinery, etc. This gives you a circular flow of heated air moving around the area's inside perimeter.

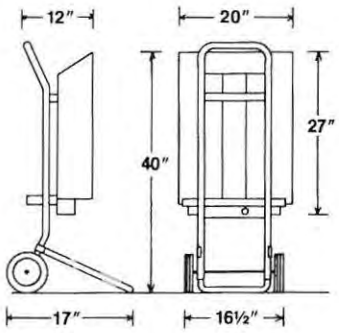
You should also try to direct heated air across areas of high heat loss, i.e. glass windows and doors, open doorways, plant doors, etc. Heaters should be installed out of reach of personnel and when mounted in a downflow configuration, not directly above your people.

Aitken Infrared Radiant Heaters

Heavy Duty, Metal Sheath, Industrial.

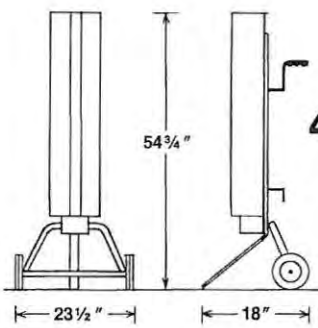
6 & 4.5 KW Portables





6 KW PPH

BOTH CAN BE SHIPPED UPS



4.5 KW PHX



Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

Versatile People Heaters

Whenever you have a heating problem that does not require a permanent installation, here is your most economical answer.

Features Are:

6 KW CAPACITY
Delivers about 20,000 BTU's of sunlike radiant heat; 4.5 KW delivers 15,300 BTU's.

PROVIDES WARMTH
Heat coverage within a 90° arc up to 12 feet away (indoor) on the 6 KW; within a 90° arc up to 10 feet on the 4.5 KW.

NEARLY INDESTRUCTIBLE
Made of heavy gauge aluminum with impact-resistant heating elements.

PORTABLE
Can be operated from welder outlets, disconnect switches or lighting distribution centers.

OPERATES IN ANY POSITION
Standing upright, on its back, side or face.

REMOVABLE HEATING UNITS
Where space requires, the heater can be removed from the cart by loosening one bolt (on 6 KW unit only).

CLEAN
No combustion by-products, no fumes, no vents required.

WEATHERPROOF
Can be operated indoors or out, or hosed off to clean, when not energized.

Cord Optional-See page 18

Model	Watts	Volts	Amps	Phase	Replacement Elements
PPH628	6,000	208	16.7	3	HE20208
PPH623	6,000	240	14.5	3*	HE20240
PPH643	6,000	480	7.2	3	HE20480
PPH653	6,000	550	6.3	3	HE20555
PHX4528	4,500	208	21.6	1	HE45208
PHX452	4,500	240	18.8	1	HE45240
PHX454	4,500	480	9.4	1	HE45480
PHX455	4,500	550	8.2	1	HE45550

Protective screen included.
*Can be converted to single phase.
Shipping weight 36 lbs. on the 6 KW; 30 lbs. on the 4.5 KW.
277 volt and 600 volt available as special order.

Aitken • Series AUH (UL) U.L. Listed Heaters

Electric Unit Heater Selection Chart

Catalog No.	(KW) CAP.	BTU/hr.	HTR. VOLT.	Phase	Htr. Amps 1 Ø	Htr. Amps 3Ø	Fan Mtr. HP	Fan Mtr. Volt.	Fan Mtr. RPM	Air vol. CFM	Air Temp. Rise	Throw	Max. Mtg. Ht.	Contactor	Built In Branch Circuit Fusing No. of Fuses	Built In Branch Circuit Fusing Fuse Rating (AMPS)	Ship. Wt. (Lbs.)
*AUH-220-SA			208		12.0	—		208									25
*AUH-224-SA	2.50	8,533	240	1	10.4	—	6W	240	1400	270	30°	16'	8'	Not Reqd.	Not Reqd.		25
*AUH-227-SA			277		9.0	—		277									25
*AUH-320-SA			208		15.9	—		208									25
*AUH-324-SA	3.33	11,365	240	1	13.9	—	6W	240	1400	270	38°	16'	8'	Not Reqd.	Not Reqd.		25
*AUH-327-SA			277		12.0	—		277						Built In			25
*AUH-348-SA			480	3	—	4		208									30
*AUH-520-SA			208	1 or 3	24.0	14.4		208						Not Reqd.			26
*AUH-524-SA			240	1 or 3	20.8	12.0		240						Not Reqd.			25
*AUH-527-SA	5.00	17,065	277	1	18.1	—	6W	240	1400	270	60°	16'	8'	Not Reqd.	Not Reqd.		26
*AUH-548-SA			480	1 or 3	10.4	6.0		208						Built In			30
*AUH-555-SA			550	1 or 3	9.1	5.2		240						Built In			30
*AUH-720-SA			208	1 or 3	36.1	20.8		208									27
*AUH-724-SA			240	1 or 3	31.3	18.1		240									27
*AUH-728-SA	7.50	25,598	277	1	27.1	—	6W	240	1400	270	85°	18'	8'	Built In	Not Reqd.		27
*AUH-748-SA			480	1 or 3	15.6	9.0		208									30
*AUH-755-SA			550	1 or 3	13.6	7.9		240									27
*AUH-1020-M	9.60	32,765	208	1 or 3	47.8	27.6		208			61°						62
*AUH-1024-M	10.00	34,130	240	1 or 3	43.3	25.7		240			63°						62
*AUH-1027-M	10.00	34,130	277	1	37.6	—	1/10	240	1550	500	63°	20'	9'	Built In	Not Reqd.		68
*AUH-1048-M	10.00	34,130	480	1 or 3	21.6	12.8		208			63°						72
*AUH-1055-M	10.00	34,130	550	1 or 3	18.6	10.7		240			63°						72
*AUH-1220-M			208	1 or 3	61.7	36.3		208							6	30	68
*AUH-1224-M			240	1 or 3	53.7	31.7		240							6	30	68
*AUH-1227-M	12.50	42,663	277	1	46.7	—	1/10	240	1550	750	58°	28'	11'	Built In	Not Reqd.		74
*AUH-1248-M			480	1 or 3	27.6	16.6		208							Not Reqd.		78
*AUH-1255-M			550	1 or 3	24.0	14.5		240							Not Reqd.		80
*AUH-1520-M			208	1 or 3	73.8	43.3		208							6	30	68
*AUH-1524-M			240	1 or 3	64.1	37.7		240							6	30	68
*AUH-1527-M	15.00	51,195	277	1	55.8	—	1/10	240	1550	750	63°	28'	11'	Built In	3	25	74
*AUH-1548-M			480	1 or 3	32.1	18.8		208							Not Reqd.		78
*AUH-1555-M			550	1 or 3	28.0	16.5		240							Not Reqd.		80
*AUH-2020-M	19.20	65,530	208	1 or 3	94.0	54.8		208			60°				6	40	70
*AUH-2024-M	20.00	68,260	240	1 or 3	84.9	49.7		240			63°				6	35	70
*AUH-2027-M	20.00	68,260	277	1	73.7	—	1/10	240	1550	1000	63°	32'	13'	Built In	3	30	76
*AUH-2048-M	20.00	68,260	480	1 or 3	42.5	24.8		208			63°				Not Reqd.		78
*AUH-2055-M	20.00	68,260	550	1 or 3	37.1	21.7		240			63°				Not Reqd.		80
AUH-2520-L			208			71.3		208							6	50	121
AUH-2524-L	25.00	85,325	240	3	—	62.0	1/3	240	1550	1300	61°	34'	14'	Built In	6	45	128
AUH-2548-L			480			31.1		208							Not Reqd.		136
AUH-2555-L			550			27.1		240							Not Reqd.		142
AUH-3020-L	29.80	101,700	208			85.0		208			52°				6	60	139
AUH-3024-L	30.00	103,390	240	3	—	74.1	1/3	240	1550	1800	53°	38'	15'	Built In	6	55	139
AUH-3048-L	30.00	103,390	480			36.9		208			53°				Not Reqd.		142
AUH-3055-L	30.00	103,390	550			32.2		240			53°				Not Reqd.		142
AUH-4020-L	40.00	136,520	208			112.9		208			58°				12	40	144
AUH-4024-L	40.00	136,520	240	3	—	98.1	1/3	240	1550	2200	58°	45'	15'	Built In	12	35	144
AUH-4048-L	39.00	133,107	480			47.9		208			56°				Not Reqd.		145
AUH-4055-L	40.00	136,520	550			42.8		240			58°				Not Reqd.		152
AUH-5020-L			208			140.7		208							12	50	144
AUH-5024-L	50.00	170,650	240	3	—	122.2	1/3	240	1550	2800	57°	58'	15'	Built In	12	45	144
AUH-5048-L			480			61.1		208							6	45	152
AUH-5055-L			550			53.3		240							6	40	152

*Catalog Nos. indicated with an * have carts available for portable use. See page 28 for cart model numbers. Cords are accessories; see page 20.

In Catalog No., "SA" indicates supplied with saddle type mounting bracket. **See page 25 for dimensions.**

AUH 524-T Electric
UNIVERSAL HEATER



- Eight wattages, two voltages
- To 5,000 watts
- Horizontal and downflow in one unit
- Built-in thermostat
- Complete with mounting bracket

Connect to 208 or 240 VAC • Field Adjust to 4 Different Wattages for each Voltage

U.L. Listed Heater

Catalog Number	Volts	Watts	BTU per hr.	Phase	Fan Motor Watts	Control Circuit & Fan Motor Volts	Fan Motor RPM	Air Volume CFM	Throw	Min. Mtg. Ht.	Heater Amps	Min. Ckt. Amps	Approx. Ship Wt. (Lbs.)
AUH-524T	208	1874	6396	1	6	208	1450	350	18′	6′	9.0	11.3	25
		2500	8533								12.0	15.0	
		3123	10659								15.0	18.8	
		3750	12799								18.0	22.5	
	240	2500	8533			240					10.4	13.0	
		3332	11365								13.9	17.4	
		4165	14215								17.4	21.8	
		5000	17065								20.9	26.1	

See page 25 for dimensions.



Portable Unit Heater Carts

Now available for KW capacities... 2.5, 3.3, 5, 7.5, 10, 12.5, 15, 20 and in all voltages. Rolls right to those cold, "trouble" locations. Not supplied w/cord. To order: Specify "Portable" in front of catalog No.

Cart number HCUS fits 2.5 KW - 7.5 KW models
Cart number HCUL fits 10 KW - 20 KW models

Aitken Electric Utility Heater

U.L. Listed Heater

automatic 24 hr. heat for
- pipes • pumps • pump houses
- hydraulic and oil equipment
- ticket booths • well pits • garages
- toll booths • construction shacks

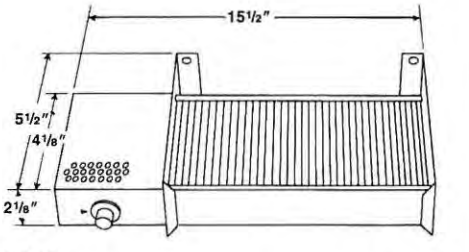


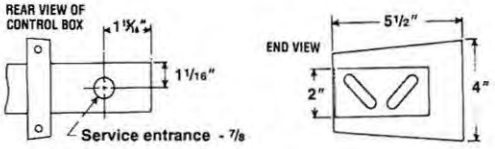
- ☐ Built-in thermostat, 40° to 100° range
- ☐ Steel-sheathed heating element
- ☐ Steel plate fins copper brazed to element
- ☐ 20 gauge welded steel housing with phosphatized baked-enamel finish
- ☐ Steel mounting brackets
- ☐ Pre-punched service entrance
- ☐ Pre-wired control box, with built-in thermal safety cutout.

SPECIFICATIONS

CATALOG NO.	VOLTS	AMPS	WATTS	BTU/hr.	SHIPPING WT. (LBS.)
APH-500A	120	4.2@ 120V	500	1708	7
	208	1.8@ 208V	375	1284	7
	240	2.1@ 240V	500	1708	7

*Heater is dual voltage, can be operated on either 120 or 240 volts AC.
OVERALL DIMENSIONS: 15½" long, 4" high, 5½" deep.





Danger Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

Aitken Downflow Electric Unit Heaters

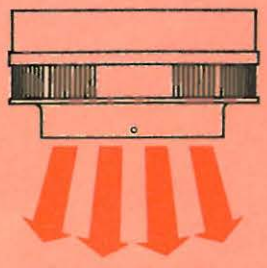
in 31 models from 10 KW to 50 KW

for high capacity, high bay heating in factories, garages, stockrooms, stores, commercial buildings

Standard heater is available with optional air diffusers to heat all types of industrial and commercial buildings. Aitken Downflow Heaters are particularly effective where there are high ceilings or tall equipment and building columns that interfere with horizontal air movement.

Warm Air Coverage

These performance tables show approximate warm air coverage when heater is mounted at the given height. Mounting height is optional and air coverage will vary accordingly. Surrounding conditions such as any nearby air flow obstructions, drafts, etc., should also be considered in determining heater location and mounting height.

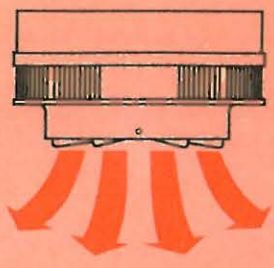


Standard Heater

Standard Heater
(No Diffuser)

This is the basic heater with no diffuser. It delivers a straight downflow air pattern. For special applications, select one of the 2 diffusers shown below.

PLAIN OUTLET	AUD 10	AUD 15	AUD 20	AUD 25	AUD 30	AUD 40	AUD 50
MOUNTING HT.	14′	20′	18′	22′	20′	18′	28′
DIAMETER Spread @ Floor	25′	25′	22′	45′	43′	35′	40′

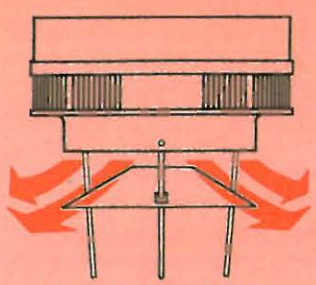


Optional Adjustable Vane Diffuser

Adjustable Vane Diffuser Type RD

A popular diffuser in general heating applications. Vanes adjust for a wide variety of settings from a concentrated straight down discharge to a wide floor area coverage.

TYPE RD ADJUSTABLE VANE DIFFUSER	AUD 10	AUD 15	AUD 20	AUD 25	AUD 30	AUD 40	AUD 50
STRAIGHT DOWN* MOUNTING HT.	18′	25′	23′	28′	26′	24′	28′
DIAMETER Spread @ Floor	28′	25′	23′	40′	38′	35′	40′
45° ANGLE* MOUNTING HT.	11′	17′	15′	18′	16′	14′	18′
DIAMETER Spread @ Floor	40′	36′	34′	55′	50′	48′	55′
*Setting of Adjustable Vanes							



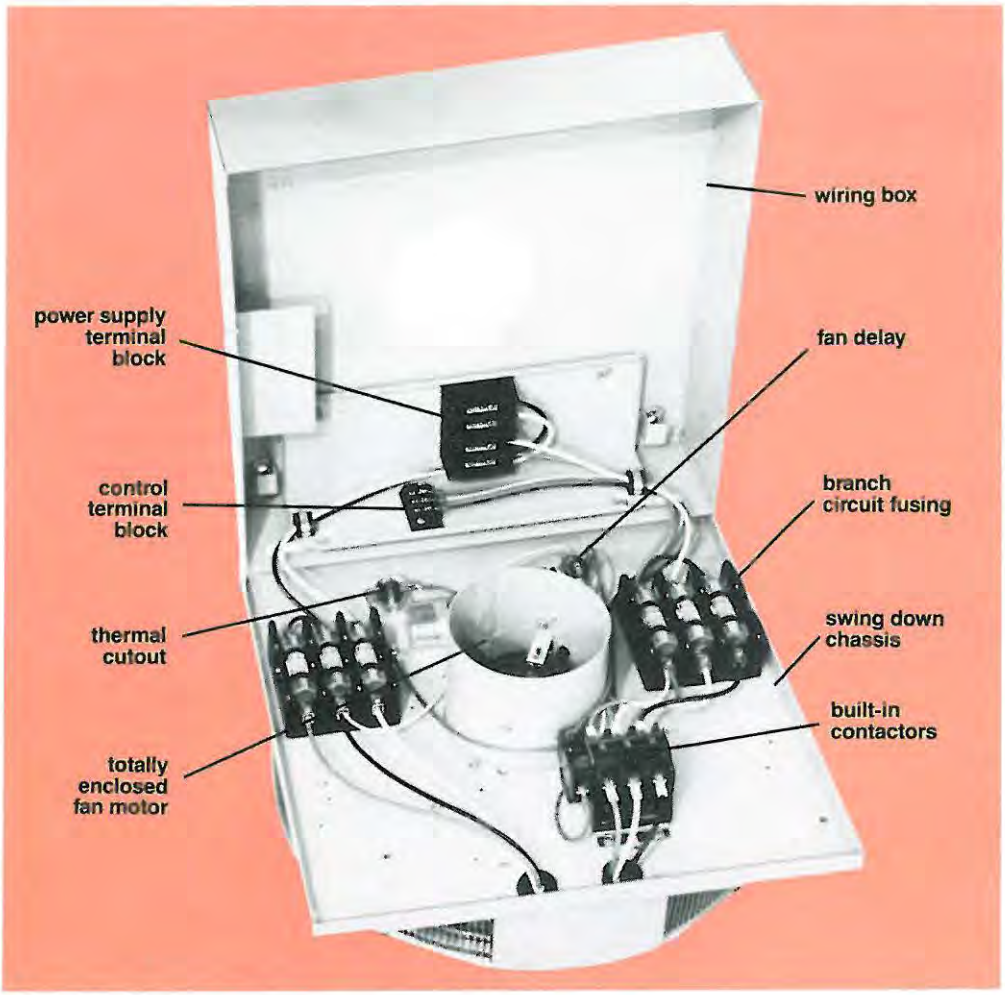
Optional Cone Diffuser

Cone Diffuser Type CD

Often used for low mounting height applications. Provides symmetrical dispersion of air from side to side, adjusts up or down to change diameter of floor coverage. Mounting height is for cone in "up" position.

TYPE CD CONE DIFFUSER	AUD 10	AUD 15	AUD 20	AUD 25	AUD 30	AUD 40	AUD 50
MOUNTING HT.	12′	18′	16′	19′	16′	15′	18′
DIAMETER Spread @ Floor	31′	35′	30′	50′	48′	43′	45′

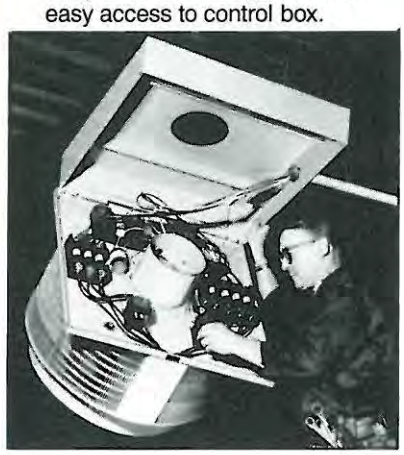
Easily Installed . . . Easily Serviced





Normal operating position.

Hinged heater swings down for easy access to control box.



The heater body top plate is hinged to the control box and swings down to give full access to the roomy control and wiring compartment.

Terminal blocks with identified terminals are conveniently located in the control box for power supply connection.

Appropriate wiring diagrams are included with each heater.

Knockouts are provided for cable or conduit entrance.

The design of the control box and the swing-down heater make it possible to clean and service the unit when necessary without dismounting the heater.

General Specifications

AITKEN DOWNFLOW HEATER U. L. Listed • *Designed for ceiling mounting*

Control Box — Has four threaded mounting holes located at the top of the heater. Hinged-design feature permits the heater, with chassis attached, to swing down for full access to all built-in wiring and controls without dismounting the heater.

Branch Circuit Fusing — All heaters drawing 48 amps or more have built-in branch circuit fusing as standard, eliminating external branch fusing and additional wiring. All heater and control wiring connections terminate in the control box.

Contactors — All heaters have the necessary contactors built-in, making external contactors and additional wiring unnecessary.

Fan Motor — The totally enclosed, permanently lubricated fan motor is mounted within a metal cylindrical air-by-pass sleeve, shielding it from the incoming heated air, and permitting it to operate in a cooler ambient temperature. Fan motor and controls operate directly off line voltage of 208 and 240 volt heaters. On 277, 480, and 550 volt heaters a transformer is built into the unit to provide proper fan motor and control operation.

Heating Element — The heating elements are guaranteed for five years. Non-glowing design consists of a special resistance wire enclosed in a steel sheath to which steel plate fins are brazed. The heating elements cover the entire air intake area for uniform heating.

Fan Delay — Built in fan delay operates the fan until all heat is dissipated from the heating element.

Thermal Cutout — Thermal cutout is built into the system to automatically shut off heater in event of overheating due to any cause.

Diffusers — (Optional) Type of diffuser shown on plans can be supplied with the heater.

Aitken Downflow Electric Unit Heaters

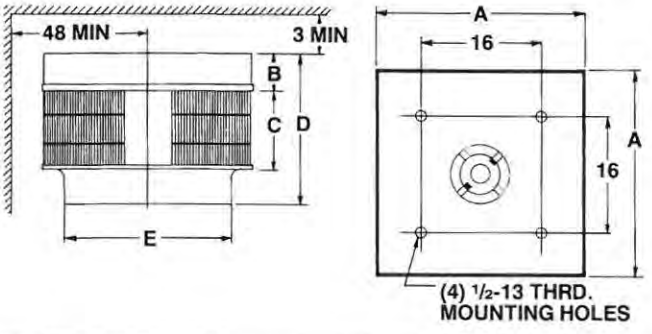
Downflow Accessories

Catalog No.	For the Following Heater Capacities	Description	Ship Wt. (lbs.)
AUD-ET	All	A cooling thermostat mounts directly to heater and closes on temperature rise. As warm air rises thermostat closes, energizing only the fan, to push warm air down. This "economizer" thermostat should be set lower than the unit thermostat, becoming the first heat stage.	0.5
AWT-1	All	Line voltage wall thermostat single pole. 25 amps at 208-240 VAC mounted in an enclosed box.	2.0
ASW	All	Summer-Winter fan switch kit for remote installation. Provides summer fan operation.	0.5
AHD-TR2	All (except AUH-520S & AUH-524S 3-phase heaters)	Heavy duty, 24-volt coil relay and transformer, 208V or 240V transformer primary to be used with AUH-Series heaters. Time delay relay takes 45-60 seconds to close when energized.	1.0
AHD-R2		Heavy-duty, 24-volt coil relay, 120-277V contacts for all AUH's except 520 and 524-SA.	1.0
ARD-1 ARD-2 ARD-3 ARD-4	10KW 15KW, 20KW 25KW, 30KW, 40KW 50KW	Adjustable Vane Diffusers - Vanes adjust from straight up and down to 45° angle, for general heating applications.	3.0 5.0 5.0 7.0
ACD-1 ACD-2	10KW, 15KW, 10KW 25KW, 30KW, 40KW, 50KW	Cone Diffusers - Provide symmetrical dispersion of air. Cone adjusts up and down to change diameter of air coverage at floor level.	3.0 4.0

Danger - Hazard of fire. Infrared radiant heaters must not be operated where combustible materials, flammable gases or vapors are present. Combustible material should not be placed in radiation path.

Dimensions in Inches

KW	No. Elements	Fan Size	A	B	C	D	E DIA.
10	1	10	19	5 1/16	3 13/16	12 7/8	10 1/2
15	1	12	19	5 1/16	3 13/16	12 7/8	12 1/2
20	1	12	19	5 1/16	3 13/16	12 7/8	12 1/2
25	2	14	19	5 1/16	7 5/16	16 3/8	14 3/4
30	2	14	19	5 1/16	7 5/16	16 3/8	14 3/4
40	2	14	19	5 1/16	7 5/16	16 3/8	14 3/4
50	2	16	28	6 1/16	7 5/16	18 3/8	16 3/4



Selection Chart

All Heaters Have Built-In Contactors and Thermal Cutouts

Catalog No.	(KW) Cap.	BTU/hr.	Htr. Volt.	Phase	Heater Amps. (Incl. Fan Motor.) 1 ϕ	Heater Amps. (Incl. Fan Motor.) 3 ϕ	Fan Mtr. H.P.	Control Circuit Voltage	Fan Mtr. RPM	Air Flow (CFM) At Final Temp.	Air Flow (CFM) At 70°F	Outlet Air Velocity (FPM)	Temp. Rise	Built-in Branch Circuit Fusing No. of Fuses	Built-in Branch Circuit Fusing Fuse Rtg. Amps.	Approx. Ship. Wt. (lbs.)
AUD-1020	9.6	32,765	208	1 or 3	46.2	27.1	1/20	208	1720	750	705	1460	44°	Not Req'd.		66
AUD-1024	10	34,130	240	1 or 3	41.7	24.0		240			700		46°	Not Req'd.		62
AUD-1027	10	34,130	277	1	36.1	–		240			700		46°	Not Req'd.		68
AUD-1048	10	34,130	480	1 or 3	20.8	12.0		208			700		46°	Not Req'd.		68
AUD-1055	10	34,130	550	1 or 3	18.2	10.5		240			700		46°	Not Req'd.		68
AUD-1520	15	51,195	208	1 or 3	72.1	41.5	1/20	208	1700	1330	1260	1700	39°	6	60	66
AUD-1524			240	1 or 3	62.5	36.1		240						6	60	66
AUD-1527			277	1	54.2	–		240						3	30	68
AUD-1548			480	1 or 3	31.3	18.0		208						Not Req'd.		73
AUD-1555			550	1 or 3	27.3	15.8		240						Not Req'd.		73
AUD-2020	20	68,260	208	1 or 3	92.3	53.3	1/6	208	1700	1330	1230	1700	51°	6	60	63
AUD-2024			240	1 or 3	83.3	48.1		240						6	60	63
AUD-2027			277	1	72.2	–		240						3	30	68
AUD-2048			480	1 or 3	41.7	24.0		208						Not Req'd.		73
AUD-2055			550	1 or 3	36.4	21.1		240						Not Req'd.		73
AUD-2520	25	85,325	208	3	—	69.2	1/6	208	1650	1980	1860	1830	43°	6	60	82
AUD-2524			240		—	60.1		240						6	60	82
AUD-2548			480		—	30.1		208						Not Req'd.		85
AUD-2555			550		—	26.4		240						Not Req'd.		85
AUD-3020	30	102,390	208	3	—	81.6	1/6	208	1650	1980	1835	1830	52°	6	60	75
AUD-3024			240		—	70.9		240						6	60	82
AUD-3048			480		—	35.4		208						Not Req'd.		90
AUD-3055			550		—	31.1		240						Not Req'd.		85
AUD-4020	40	136,520	208	3	—	109.4	1/6	208	1650	1980	1775	1830	69°	12	60	80
AUD-4024			240		—	93.7		240					69°	6	60	75
AUD-4048			480		—	46.8		208					69°	Not Req'd.		85
AUD-4055			550		—	40.7		240					69°	Not Req'd.		85
AUD-5020	50	170,650	208	3	—	137.8	1/6	208	1650	2500	2240	1790	69°	12	60	165
AUD-5024			240		—	118.6		240						12	60	165
AUD-5048			480		—	59.4		208						6	60	180
AUD-5055			550		—	51.8		240						6	60	180



LIMITED WARRANTY

EXCLUDING RAIL CAR THAWER & DIE HEATERS

WARRANTY APPLIES TO REPLACEMENT OF PARTS AND/OR UNIT ONLY

1. Metal Sheath Infrared-

Infrared metal sheath comfort heaters are warranted to be free from material defects and/or workmanship for a period not to exceed 2 years from shipping date. Process modules are warranted for 1 year from shipping date.

2. Quartz Infrared-

Aitken quartz comfort heaters are warranted to be free from material and/or workmanship defects for a period of 1 year from shipping date. This includes paint and finish.

Infrared quartz lamps are warranted by the OEM Manufacturer for 1 year from date of shipment by Aitken. Aitken will assist customers with failure claims during this period.

3. Gas Infrared-

Aitken gas infrared heaters are warranted for a period of 1 year from date of shipping, to be free from material and/or workmanship defects.

4. Ceiling Fans-

Ceiling fans (motor only) are warranted for 5 years from shipping date.

5. Unit Heaters-

Unit heaters are warranted from a period of 1 year from shipping date to be free of defects resulting from material and/or workmanship.

Unit heater elements are warranted for 5 years from shipping date.

Under no circumstance do these implied warranties include labor for installation or removal of heaters and/or parts.

Heat source (element/lamp) warranties exclude failures caused by overvoltage, corrosives, or physical damage to the unit.

Failed units may be returned to the factory (prepaid) for repair. Aitken will, at our option, repair or replace units that have failed during the warranty period and return them freight collect.

The warranties set forth herein shall be in lieu of any and all other warranties expressed or implied, and in no event shall Aitken be liable for any breach of warranty in any amount exceeding the purchase price of its product.

Aitken shall in no way be responsible for the proper use and maintenance of its products, nor shall any warranty extend to the improper application, installation, negligence, alteration, abuse or misuse of its products.

Aitken Products, Inc. • P.O. Box 151 • 566 N. Eagle Street • Geneva, Ohio 44041
(216) 466-5711 • Fax: (216) 466-5716

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Cat. 94 Printed in USA.

Maximam Cap.

	UpTime (Hour)	Shift	UpTime (day)	upTime (Ratio)	cycletime	Yield	Volume		Man power Melting (1×4)
CASTING	24HV	2	30	85%	8	100% 92	4,590 1228	4860.	
Air Quench	"	"	"	"	"	" 100	4590 1130		1×4
Saw	"	"	"	"	3	" 100	2,240 1130		
Deburr.	"	"	"	"	5	" 100	7344 1130		
H/T Solution	"	"	"	"	6.5HV.	" 100	4590 1130	16 pcs/Basket 24 hrs/every	(1×4)
straightening	"	"	"	"	5	" 95	7344 1130		1×4
H/T Aging	"	"	"	"	24 HV	" 100	2736 1074	16pcs/basket	
Dye penetration.	"	"	"	"	15(7.5)	" 98	4296. 1074	2pcs/Hanger	
pection						95	1052		1×4
Packing						81.5	1000		
Die maint									?
Fac. maint									—
Handling									—
								other	Die cast (1×4) G/L (1×4) Tech (1) specialist !

(DIE)
Total 30+ ?
(Add New) 12+ ?

CAPACITY NPOWER

11/4/96

	Melting	Casting	Inspection	Air cooling Quench	Saw	Deburring	H/T Basket	H/T Solution	Straighten	H/T Age	Hardness check	Dye Penetration	Inspection (Appear Dimension)	Packing	Storage	Others
Handling	Forklift	Manipulator					Fork lift		Automatic	Fork lift			Forklift			
Labor	"1x4"	1x4					"1x4"		1X4						"1x4"	G/L 1 TECH. 1 specialist (Dena)
Equipment	Ladle Forklift	1		1	1		15	"1"	1	1	"1"	1				Laber 4X2=8 MELTINE (4)
Up Time (Hour)	24	24						24	22	24		22				TRANSP. (4) DIE MAIN. ?
Shift																
Up Time (Day)	30	20					30									
Up Time (Ratio)	90%	92%						98%	85%	98%		85% Dryer : 5	85%			
Cycle Time		8	1	5	5	3		6.5	5	4		(10)	5			
[redacted]		[redacted]					BASKET No./DAY	5.0	[redacted]	[redacted]	KET	[redacted]	[redacted]	KET		
(1000)		19.9					BASKET No./DAY	2.5	28.0	[redacted]		28.6	[redacted]			
		min.	min.	min.	min.	min.		hr	min.	hr		min.	min.			
umber/cycle		1						16	1	16		1	1			
Max capacity		3312			5299	8832			6732	2822.4		3366				Total Yield
Yield		90%					98%					85%				75%
ax cap.*Yield		2981			4769	7949			6597	2766		2861				
Production Number		1334		[redacted]			1200		[redacted]			1176	[redacted]			1000
Notice (Open issue)																

X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			6		
PROD. NUM.	1000	PCS							NEED BASKET NUM.(age.)			4		
CASTING	1538		54	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			7.2
(YELD RATIO)	(65%)													
H/T (SOL.)	1538		54	PCS	7	Hr	16	PCS/BASKET	3	BASKET/DAY	OUT PUTT	2.1	Hr/BASKET	
H/T (AGEING)	1538		54	PCS	3.5		32	PCS/BASKET	2	BASKET/DAY	Aging m/c working hr.			7.7
X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			9		
PROD. NUM.	2000	PCS							NEED BASKET NUM.(age.)			6		
CASTING	3077		##	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			14.4
YELD RATIO)	(65%)													
H/T (SOL.)	3077		##	PCS	7	Hr	16	PCS/BASKET	7	BASKET/DAY	OUT PUTT	1.0	Hr/BASKET	
H/T (AGEING)	3077		##	PCS	3.5		32	PCS/BASKET	4	BASKET/DAY	Aging m/c working hr.			14
X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			12		
PROD. NUM.	3000	PCS							NEED BASKET NUM.(age.)			8		
CASTING	4615		##	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			21.6
(YELD RATIO)	(65%)													
H/T (SOL.)	4615		##	PCS	7	Hr	16	PCS/BASKET	10	BASKET/DAY	OUT PUTT	0.7	Hr/BASKET	
H/T (AGEING)	4615		##	PCS	3.5		32	PCS/BASKET	6	BASKET/DAY	Aging m/c working hr.			19

X- MENBER															
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			6			
PROD. NUM.	1000	PCS							NEED BASKET NUM.(age.)			4			
CASTING	1333		47	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.				6.2
(YELD RATIO)	(75%)														
H/T (SOL.)	1333		47	PCS	7	Hr	16	PCS/BASKET	3	BASKET/DAY	OUT PUTT	2.4	Hr/BASKET		
H/T (AGEING)	1333		47	PCS	3.5		32	PCS/BASKET	2	BASKET/DAY	Aging m/c working hr.				6.9
X- MENBER															
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			8			
PROD. NUM.	2000	PCS							NEED BASKET NUM.(age.)			5			
CASTING	2667		94	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.				12.5
YELD RATIO)	(75%)														
H/T (SOL.)	2667		94	PCS	7	Hr	16	PCS/BASKET	6	BASKET/DAY	OUT PUTT	1.2	Hr/BASKET		
H/T (AGEING)	2667		94	PCS	3.5		32	PCS/BASKET	3	BASKET/DAY	Aging m/c working hr.				12
X- MENBER															
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			11			
PROD. NUM.	3000	PCS							NEED BASKET NUM.(age.)			7			
CASTING	4000		##	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.				18.7
(YELD RATIO)	(75%)														
H/T (SOL.)	4000		##	PCS	7	Hr	16	PCS/BASKET	9	BASKET/DAY	OUT PUTT	0.8	Hr/BASKET		
H/T (AGEING)	4000		##	PCS	3.5		32	PCS/BASKET	5	BASKET/DAY	Aging m/c working hr.				17

CROSS MENBER															
	MONTH		DAILY	CYCL TIME											
PRODUCTION NUMBER	1000	PCS													
CASTING	1333		46.78	8	Min		2.13	Hr (TIME OF FILL FOR BASKET)							
(YELD RATIO)	(75%)												NEED BASKET NUMB		6
H/T (SOLUTION)	1333		46.78	7	Hr		16	PCS/BASKET		3	BASKET/DAY		OUT PUTT BAS	2.394	Hr/BASKET
H/T (AGEING)	1333		46.78	3.5				PCS/BASKET			BASKET/DAY				
CROSS MENBER															
	MONTH		DAILY	CYCL TIME											
PRODUCTION NUMBER	2000	PCS													
CASTING	2667		93.57	8	Min		2.13	Hr (TIME OF FILL FOR BASKET)							
(YELD RATIO)	(75%)												NEED BASKET NUMB		8
H/T (SOLUTION)	2667		93.57	7	Hr		16	PCS/BASKET		6	BASKET/DAY		OUT PUTT BAS	1.197	Hr/BASKET
H/T (AGEING)	2667		93.57	3.5				PCS/BASKET			BASKET/DAY				

	#	DESCR	VENDOR	AMT							
CROSS MEMBER ITEM											
	F214	LOW PRESSURE DIE CAST MACHINE	EMPIRE	406776							
		HANDLING EQUIPMENT(ROBOT & MANIPULATOR)									
		QUENCH TANK FOR CASTING		10000							
		STRAIGHTENING MACHINE (TRIM PRESS)		60000							
		H/T FURNACE		900000							
		LOAD/UNLOAD PIVOTING SCISSORS		15000							
		ENVIRONMENT									
	SUB TOTAL			1391776							

X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			6		
PROD. NUM.	1000	PCS							NEED BASKET NUM.(age.)			4		
CASTING	1176		41	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			5.5
(YELD RATIO)	(85%)													
H/T (SOL.)	1176		41	PCS	7	Hr	16	PCS/BASKET	3	BASKET/DAY	OUT PUTT	2.7	Hr/BASKET	
H/T (AGEING)	1176		41	PCS	3.5		32	PCS/BASKET	2	BASKET/DAY	Aging m/c working hr.			6.3
X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			8		
PROD. NUM.	2000	PCS							NEED BASKET NUM.(age.)			5		
CASTING	2353		83	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			11.0
YELD RATIO)	(85%)													
H/T (SOL.)	2353		83	PCS	7	Hr	16	PCS/BASKET	5	BASKET/DAY	OUT PUTT	1.4	Hr/BASKET	
H/T (AGEING)	2353		83	PCS	3.5		32	PCS/BASKET	3	BASKET/DAY	Aging m/c working hr.			11
X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			10		
PROD. NUM.	3000	PCS							NEED BASKET NUM.(age.)			6		
CASTING	3529		##	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			16.5
(YELD RATIO)	(85%)													
H/T (SOL.)	3529		##	PCS	7	Hr	16	PCS/BASKET	8	BASKET/DAY	OUT PUTT	0.9	Hr/BASKET	
H/T (AGEING)	3529		##	PCS	3.5		32	PCS/BASKET	4	BASKET/DAY	Aging m/c working hr.			15

X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			6		
PROD. NUM.	1000	PCS							NEED BASKET NUM.(age.)			4		
CASTING	1111		39	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			5.2
(YELD RATIO)	(90%)													
H/T (SOL.)	1111		39	PCS	7	Hr	16	PCS/BASKET	2	BASKET/DAY	OUT PUTT	2.9	Hr/BASKET	
H/T (AGEING)	1111		39	PCS	3.5		32	PCS/BASKET	2	BASKET/DAY	Aging m/c working hr.			6
X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			8		
PROD. NUM.	2000	PCS							NEED BASKET NUM.(age.)			5		
CASTING	2222		78	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			10.4
YELD RATIO)	(90%)													
H/T (SOL.)	2222		78	PCS	7	Hr	16	PCS/BASKET	5	BASKET/DAY	OUT PUTT	1.4	Hr/BASKET	
H/T (AGEING)	2222		78	PCS	3.5		32	PCS/BASKET	3	BASKET/DAY	Aging m/c working hr.			10
X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			10		
PROD. NUM.	3000	PCS							NEED BASKET NUM.(age.)			6		
CASTING	3333		##	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			15.6
(YELD RATIO)	(90%)													
H/T (SOL.)	3333		##	PCS	7	Hr	16	PCS/BASKET	7	BASKET/DAY	OUT PUTT	1.0	Hr/BASKET	
H/T (AGEING)	3333		##	PCS	3.5		32	PCS/BASKET	4	BASKET/DAY	Aging m/c working hr.			15

X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			6		
PROD. NUM.	1000	PCS							NEED BASKET NUM.(age.)			4		
CASTING	1429		50	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			6.7
(YELD RATIO)	(70%)													
H/T (SOL.)	1429		50	PCS	7	Hr	16	PCS/BASKET	3	BASKET/DAY	OUT PUTT	2.2	Hr/BASKET	
H/T (AGEING)	1429		50	PCS	3.5		32	PCS/BASKET	2	BASKET/DAY	Aging m/c working hr.			7.2
X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			9		
PROD. NUM.	2000	PCS							NEED BASKET NUM.(age.)			6		
CASTING	2857		##	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			13.4
YELD RATIO)	(70%)													
H/T (SOL.)	2857		##	PCS	7	Hr	16	PCS/BASKET	6	BASKET/DAY	OUT PUTT	1.1	Hr/BASKET	
H/T (AGEING)	2857		##	PCS	3.5		32	PCS/BASKET	4	BASKET/DAY	Aging m/c working hr.			13
X- MENBER														
	MONTH		DAILY		CYCL TIME				NEED BASKET NUM.(sol.)			12		
PROD. NUM.	3000	PCS							NEED BASKET NUM.(age.)			7		
CASTING	4286		##	PCS	8	Min	2.13	Hr (TIME OF FILL FOR BASKET)			cast m/c working hr.			20.1
(YELD RATIO)	(70%)													
H/T (SOL.)	4286		##	PCS	7	Hr	16	PCS/BASKET	9	BASKET/DAY	OUT PUTT	0.7	Hr/BASKET	
H/T (AGEING)	4286		##	PCS	3.5		32	PCS/BASKET	5	BASKET/DAY	Aging m/c working hr.			18

CROSSMEMBER CAPACITY MANPOWER CURRENT DATA

7/21/97

	MELTING	CASTING	INSPECTION	AIR COOLING QUENCH	SAW	DEBURRING	H/T BASKET	H/T SOLUTION	STRAIGHTEN	H/T AGING	HARDNESS CHECK	DYE PENETRATION	INSPECTION (APPEAR DIMENSION)	PACKING	STORAGE	OTHERS
HANDLING	FORK LIFT	MANIPULATOR					FORK LIFT		AUTOMATIC	FORK LIFT			FORK LIFT			G/L 1
LABOR	0	4					0			4					0	SPECIALIST 1 DIEMAINT 2
EQUIPMENT	LADLE FORK LIFT	1		1	1		15	1	1	1	1	0				TOTAL LABOR ~~TOTAL~~ 12
UP TIME (HOUR)	24	24					24		22	24		22				
SHIFT																
UP TIME (DAY)	30	~~20~~ 15					30									
UP TIME (RATIO)	90%	92%						98%	85%	98%			85%			
CYCLE TIME		8 min	1 min	8 min	2 min	5 min		6.5 hr	5 min	4.5 hr		10 min	5 min			
NUMBER/CYCLE		1					16		1	16		1	1			
MAX CAPACITY		3312			13248	5299			6732	2509		0				TOTAL YIELD
YIELD		94%						98%				98%				90%
MAX CAPACITY * YIELD		~~3113~~ 2335			12453	4981			6597	2459		0				
PRODUCTION NUMBER		8308					7809					7653				7500
		4431					4165					4082				4000
		3877					3644					3571				3500
		2215					2082					2041				2000
		1108					1041					1020				1000

CROSSMEMBER CAPACITY MANPOWER 7500 PCS

7/21/97

	MELTING	CASTING	INSPECTION	AIR COOLING QUENCH	SAW	DEBURRING	H/T BASKET	H/T SOLUTION	STRAIGHTEN	H/T AGING	HARDNESS CHECK	DYE PENETRATION	INSPECTION (APPEAR DIMENSION)	PACKING	STORAGE	OTHERS
HANDLING	FORK LIFT	MANIPULATOR					FORK LIFT		AUTOMATIC	FORK LIFT			FORK LIFT			G/L 0
																SPECIALIST 1
LABOR	0	8					0					8			0	DIEMAINT 2
EQUIPMENT	LADLE FORK LIFT	2		1	1		15	1	1	2	1	0				LABOR TOTL 19
UP TIME (HOUR)	24	24					24		22	24		22				
SHIFT																
UP TIME (DAY)	30	24					30									
UP TIME (RATIO)	90%	92%						98%	85%	98%			85%			
CYCLE TIME		7 min	1 min	8 min	2 min	3 min		6.5 hr	4 min	2.8 hr		10 min	5 min			
NUMBER/CYCLE		1					16		1	16		1	1			
MAX CAPACITY		9084			15898	10598			8415	8064		0				TOTAL YIELD
YIELD		94%					98%					98%				90%
MAX CAPACITY * YIELD		8539			14944	9962			8247	7903		0				
PRODUCTION NUMBER		8308					7809					7653				7500
		4431					4165					4082				4000
		3877					3644					3571				3500
		2215					2082					2041				2000
		1108					1041					1020				1000

NOTE

1) WE HAVE TO REDUCE DEBARRING CYCLETIME FROM 5min. TO 3min. IF IT IS 5 min. FOR 1 PCS,IT IS NOT POSSIBLE BY SOLITARY LABOR.
2) WE HAVE TO REDUCE AIGING CYCLETIME FROM 4.5Hr TO 2.8 Hr. AND WE NEED TO ADD A AGING FURNACE.
3) WE HAVE TO REDUCE CASTING CYCLETIME FROM 8min TO 7 min. AND WE NEED TO ADD A CASTING MACHINE.
4) WE HAVE TO REDUCE STRAIGHTEN CYCLETIME FROM 5Hr TO 4 min.

CROSSMEMBER CAPACITY MANPOWER 2000 PCS

7/21/97

	MELTING	CASTING	INSPECTION	AIR COOLING QUENCH	SAW	DEBURRING	H/T BASKET	H/T SOLUTION	STRAIGHTEN	H/T AGING	HARDNESS CHECK	DYE PENETRATION	INSPECTION (APPEAR DIMENSION)	PACKING	STORAGE	OTHERS
HANDLING	FORK LIFT	MANIPULATOR					FORK LIFT		AUTOMATIC	FORK LIFT			FORK LIFT			G/L 0
																SPECIALIST 1
LABOR	2	4					0		4						0	DIEMAINT 1
EQUIPMENT	LADLE FORK LIFT	1		1	1		15	1	1	1	1	0				LABOR TOTL 12
UP TIME (HOUR)	24	24					24		22	24		22				
SHIFT																
UP TIME (DAY)	30	*15*					*26*									
UP TIME (RATIO)	90%	92%						98%	85%	98%			85%			
CYCLE TIME		8 min	1 min	*8* min	*2* min	*5* min		6.5 hr	5 min	*4.5* hr		10 min	5 min			
NUMBER/CYCLE		1					16		1	16		1	1			
MAX CAPACITY		2484			9936	3974			5834	2174		0				TOTAL YIELD
YIELD		*94%*					98%					*98%*				90%
MAX CAPACITY * YIELD		2335			9340	3736			5718	2131		0				
PRODUCTION NUMBER		8308					7809					7653				7500
		4431					4165					4082				4000
		3877					3644					3571				3500
		2215					2082					2041				2000
		1108					1041					1020				1000

NOTE

1) WE HAVE TO REDUCE DEBURRING CYCLETIME FROM 5min. TO 3min. IF IT IS 5 min. FOR 1 PCS,IT IS NOT POSIBLE BY SOLITARY LABOR.

CAPACITY MANPOWER

11/4/96

	Melting	Casting	Inspection	Air cooling Quench	Saw	Deburring	H/T Basket	H/T Solution	Straighten	H/T Age	Hardness check	Dye Penetration	Inspection (Appear Dimension)	Packing	Storage	Others
Handling	Forklift	Manipulator					Forklift		Automatic	Forklift			Forklift			
Labor	"1x4"	1x4					"1x4"		1X4							G/L 1, Specialist TECH 1
Equipment	Ladle Forklift	1		1	1		15	"1"	1	1	"1"	1				Laber 4X2=8
Up Time (Hour)	24	24						24	22	24		22				MELTING (4)
Shift																TRANSP. (4)
Up Time (Day)	30	20					30									DIE MAIN ?
Up Time (Ratio)	90%	92%						98%	85%	98%		85%	85%			
Cycle Time		8	1	5	5			6.5	5	4.5		10	5			
[redacted]		[redacted]					BASKET No./DAY	5.0	[redacted]	[redacted]		[redacted]	[redacted]			
(1000)		19.9					BASKET No./DAY	2.5	28.0	[redacted]		28.6	[redacted]			
		min.	min.	min.	min.	min.		hr	min.	hr		min.	min.			
umber/cycle		1						16	1	16		1	1			
Max capacity		3312			5299	8832			6732	2822.4		3366				Total Yield
Yield		90%							98%			85%				75%
ax cap.*Yield		2981			4769	7949			6597	2766		2861				
Production Number		1334		[redacted]					[redacted]			[redacted]				[redacted]
									1200			1176				1000
Notice (Open issue)	4 pcs / 2 hr good 2 pcs / 1 hr 3 days 보관															

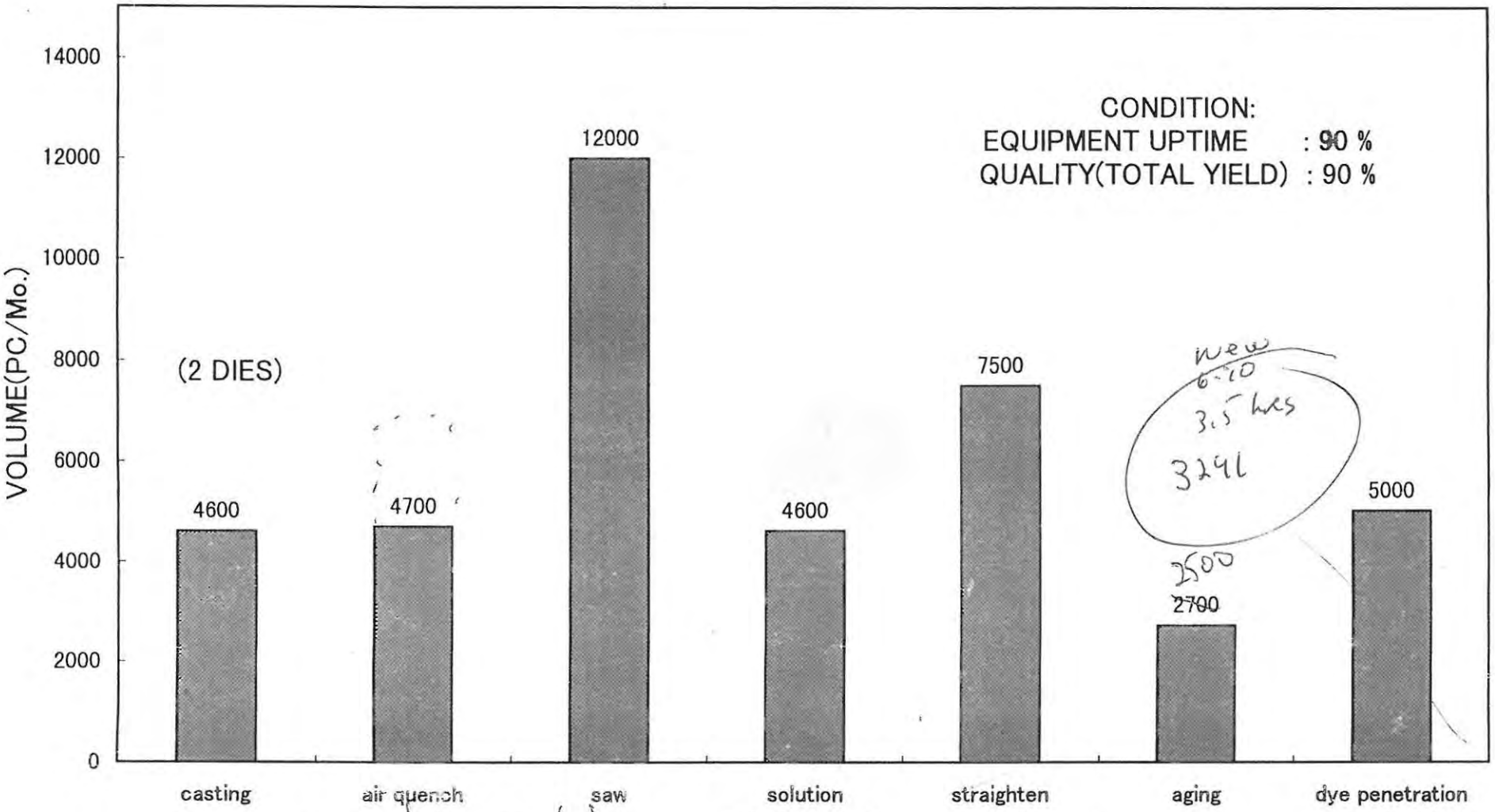
90% of Limit

2400

1200

CROSS31.xls

MAXIMUM CAPACITY OF EQUIPMENT



new 6-10 3.5 hrs 3241

2500

2700

transfer machine

order end of work first of 99

aging same

Air quench ADD ON

2500

3.0-22

3.0 30

Author: Haru Yamamoto at HMADT
Date: 9/1/98 6:00 PM
Priority: Normal
CC: Taka Matsumoto at AAP-PO, Elaine Lochtefeld at AAP-PO, Alan Kohlrieser at AAP-PO, Martin Bando at AAP-PO
TO: Randy Wendel at AAP-PO
CC: jrelder.nkb@effingham.net at NXINTERNET, robp.nkb@effingham.net at NXINTERNET, Kinzo Watanabe
Subject: Re: Crossmember forecast

Aluminum crossmember forecast (as of 8/31/98):

Sep.98	2,000
Oct.98	2,265
Nov.98	1,736
Dec.98	1,530
Jan.99	1,108
Feb.99	1,765
Mar.99	2,008
Apr.99	1,953
May.99	2,112
Jun.99	2,442
Jul.99	3,796
Aug.99	4,572
Sep.99	4,201
Oct.99	4,070
Nov.99	3,872
Dec.99	3,261

From Jan.00 is not applicable right now, but the volume will be around 7,500 due to the introduction of ST22 (Chrysler & Dodge version).

H.Y./HMA-DT

---------- Reply Separator ----------
Subject: Crossmember forecast
Author: Randy Wendel at AAP-PO
Date: 98/09/01 13:30

Haru,

Elaine was told by Rob at NKB that they are preparing to produce 7500 crossmembers per month from June 1999. Rob also asked Elaine what AAP is doing to prepare for this big volume.

This seems to conflict with the budget forecast you showed for 99 1st half, which was 2760 per month.

Could you please confirm again the crossmember forecast for fiscal years 1999 and 2000, so that everyone at AAP can be very clear on what we need to prepare and when?

Thanks,

Randy

TRUE POSITION MEASUREMENT
"Handling Your Industrial CMM Needs"

14121 Hinton Mill Rd. - Marysville, OH 43040
Ph 937-642-1236 Fax 937-642-1237
E-Mail: trueposition@compuserve.com

FAX

Date: 10/31/97

To: AAP St. Marys Corp.
Darrel Brackney
Phone: 419-394-7840
Fax: 419-394-4776

From: True Position Measurement
Steve Young
Phone: 937-642-1236
Fax: 937-642-1237

Pages: 5 (Including cover page)

Subject: Romer Portable CMM Quote

Darrel,
I apologize for this taking so long. This quote shows the reduced price Romer has until the end of the year.
If you have any questions please give me a call anytime.

Steve

ROMER INC.
Corporate Office
AAP 10-31-97

5145 Avenida Encinas
Carlsbad, CA 92008
Tel: 760.438.1725
Fax: 760.438.3512
e-mail: romerinc@adnc.com
internet: http://www.romer.com

ROMER®

the ROMER 1028™
PORTABLE ARTICULATED ARM COORDINATE MEASURING MACHINE SYSTEM (AACMM)

ARM:

- The arm is manufactured from high-grade carbon graphite construction which makes the arm highly stable, and only weighs 14 lbs.
- It has the ability to measure throughout a 9.0 diameter measuring envelope. Each axis is equipped with precision bearings specially adapted for robotic arms.
- The base provides for ease of installation at the measuring site.
- Infinite rotation at each joint provides unhindered inspection in hard to reach areas.

SOFTWARE:

SUPRASTUFF Software is an application program for the ROMER with the following features:

- Standard features are: set of points, set of point normals, single point, single point normal, line, plane, circle, sphere, cylinder, slot, cone, curve, angle, length and part reference.
- PROBE COMMAND remotely controls the software by using the ROMER arm as a 3D mouse. No keyboard operation is required, allowing easy one person operation.
- Measured and theoretical geometric features displayed as icons in a relational storage work screen.
- Graphical display of all geometric features for reverse engineering and inspection applications.
- Retrace points guided measurement to inspect at pre-defined surface point locations dictated by the theoretical data. The ROMER operates in this mode to provide the same advantages as a DCC CMM machine.
- Section-cut guided measurement to inspect profiles or reverse-engineer a part at pre-defined cut-planes.
- Location guided measurement to position parts or fixtures for assembly.
- Stitch mode guided measurement to reverse engineer a part at a pre-defined distance.
- Section-cut measurements include multiple cut planes in parallel, hatch, radial and user-definable orientations.
- Visual and audible feedback to aid an operator in performing all guided measurement tasks.
- Time based scan mode measurements for geometric features.
- Best fit limit checks to alert an operator of unintentional measurements.
- Referencing capabilities to translate all data to the part coordinate system.
- Construction of new features from existing geometric features.
- Record (teach) and playback macros for repetitive tasks with enhanced editing capabilities.
- Inspection results between measured and theoretical data output to the screen, printer or file.
- Heading capability for creation of professional inspection reports.
- Data file formats: Dimensional Measuring Interface Specifications (DMIS), Statistical Process Control.
- On-line help and examples.
- User-interface in 4 languages: English, French, Spanish and German.
- Auto probe detection verifies the correct probe is installed before each measurement sequence.
- Graphic display is available for all geometric features.
- Mouse control is available at the computer.

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- One thousand data points may be measured in a single set of points.
- All measured data is stored in high memory.
- New custom keyboard is available (i.e. Suprastuff or QWERTY).
- Standard deviation and maximum fit error for all geometric features.
- Retrace points with "far/near" graphical part view.
- Multiple section cut guided measurements.
- Runs under Windows 95 which allows a user to Alt-Tab between applications.

TRANSPORTATION CASE:

The *ROMER 1028™* and all components are contained in one case, designed for all modes of travel. The case is fitted with protective foam inside for extra protection in the rough environments of baggage handling systems and factories. Everything is designed for on-site measurement.

MEASURING PROBES:

- 1 15mm Ball Probe
- 1 6 mm Ball Probe
- 1 Point Probe

BASICS:

Set up time: Approximately 10 minutes
Accuracy:
2 Sigma point accuracy of ± 0.0035 inches
2 Sigma length accuracy of ± 0.007 inches
Measuring Volume: 9.0 Foot span

PRICING:

the ROMER 1028™ includes: Pentium Notebook Computer with Soft Carrying Case and Suprastuff Software with Surfaces, Probes, Magnetic mounting base, and Training.	$ 55,000.00

OPTIONS:

Kinematic Quick Change Probes (# 6-2000-02-00464) (#6-2000-02-00437) Allows for fast probe changes without requalifying	$ 3,975.00
Counterbalance Supports the weight of the arm for one handed operation	$ 3,000.00
Kinematic Quick Change Mount (#3-2000-02-00035) Provides repeatable mounting system	$ 2,995.00
On-site Training A Romer engineer will travel to your facility for personal on-site Training on your parts. (Plus expenses)	$ 950.00/day

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TRAINING:

Three days (approx. 6 hours per day) training at **Romer Inc.**, in Dearborn, Michigan or at **Romer Inc.,** in Carlsbad, California will be offered using comparable equipment for two or three operators. One trainee must be the person designated to be responsible for the machine's performance. On site training will be offered at an additional cost

TERMS AND CONDITIONS:

A. Prices effective until December 31, 1997.
B. Prices F.O.B. Carlsbad, California.
C. Ship: within 90 days after receipt of order.
D. Warranty: One year parts and labor. Repairs done at **Romer Inc., CA. or Romer Inc., MI.** service office.
E. Acceptance testing performed at **Romer Inc.**, Carlsbad, CA.
F. Terms : Net 30.
G. All customs, duties and taxes paid by customer.
H. All shipments must be via Air Freight.
I. All Purchase Orders shall be written to:

Romer Inc.
5145 Avenida Encinas
Carlsbad, CA 92008
(760) 438-1725

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ROMER INC.
Corporate Office

5145 Avenida Encinas
Carlsbad, CA 92008
Tel: 760.438.1725
Fax: 760.438.3512
e-mail: romerinc@adnc.com
internet: http://www.romer.com

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the ROMER SERVICE COMMITMENT

At Romer when you take delivery of your articulated arm measuring system you have our commitment to quality for life.

The following are services that come standard with every Romer system:

WARRANTY:
- Parts one year
- Labor one year

(Any manufacturing defect or failure from normal use and handling)

CERTIFICATION:
- If at any time during the first year your system requires re-certification it is covered (Limit 2 times all shipping charges paid by customer)

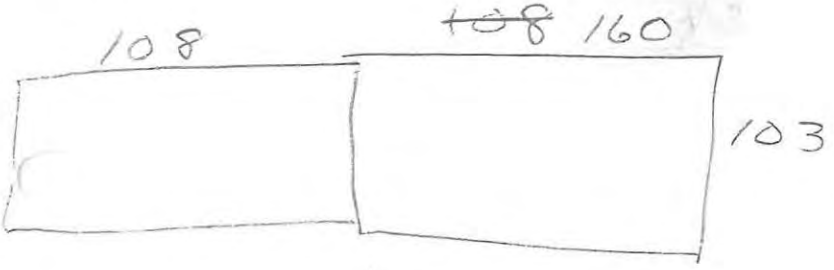
SOFTWARE:
- Software updates free, within the same level, for the life of the machine
- Your input for software enhancements are always welcome

TRAINING:
- Class room training is done exclusively for your company
- Focused on your specific application requirements
- Complete users manual with screen printouts and step by step commands
- 8 video tapes demonstrating software features for an easy introduction to measuring
- On-site training available (additional fee required)

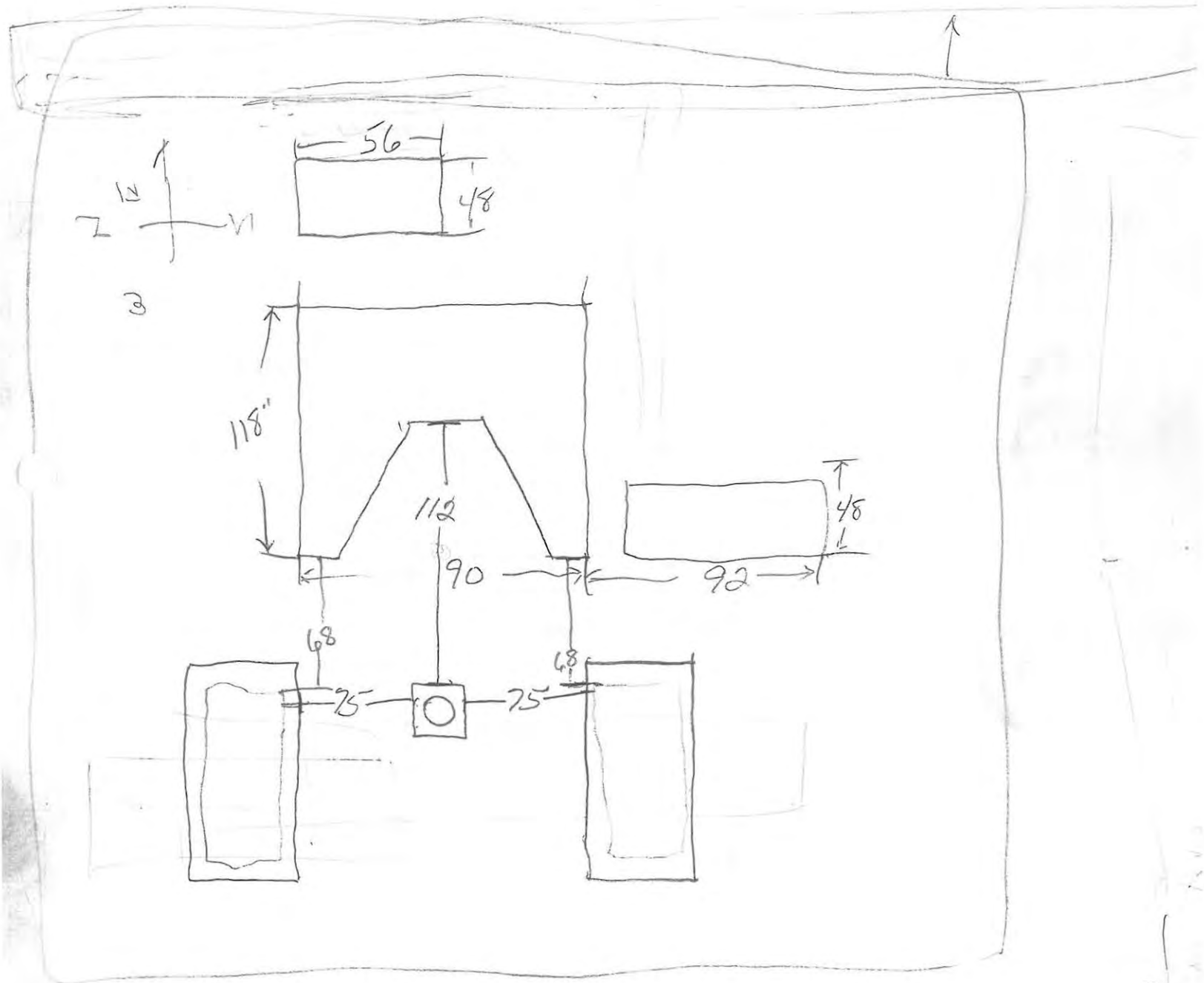
TECHNICAL SUPPORT:
- Any Romer user (not limited to staff trained by Romer) can call, fax or e-mail technical questions
- Service and repair completed in two working days
- In the event repairs require additional time, attempts will be made for a replacement arm until original equipment can be returned

Note: All warranties are effective from the date of delivery, customer will pay for all shipping charges.

©ROMER Inc. 1/97



73 5/8



40,000 lbs

Start up

Parts - Pam Detval
616-683-4182

F. Service - Dan Kelmare

Attach to them.

AAP m/c # Job No.
A345E

Assembly #
MCE0213200
MCM0213300

Rockwell
- 1-800-328-3960 - Order
- 612-942-3600 - Infro
- 1-800-328-3983 - Tech.

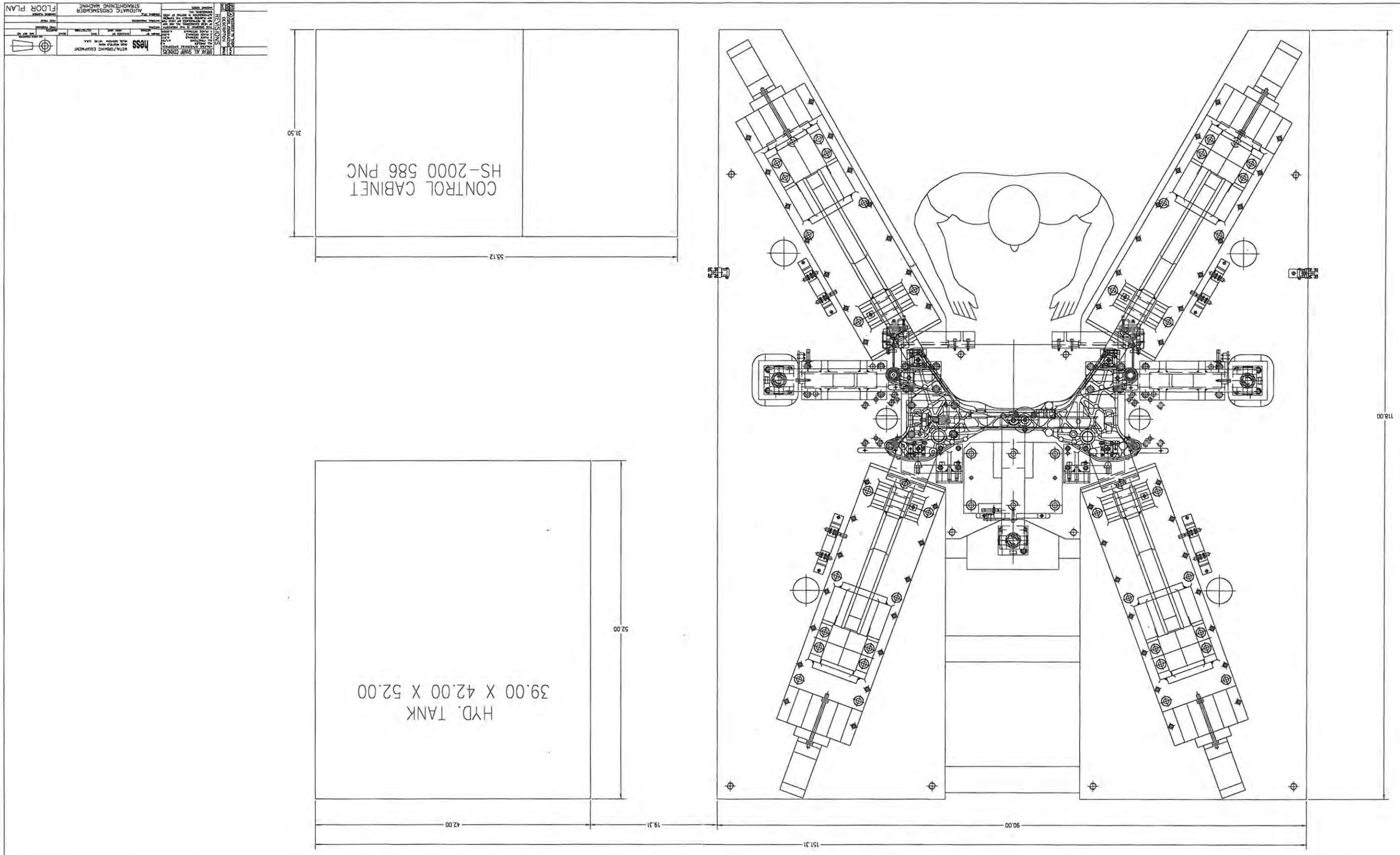
Reliance Electro craft cable — Encoder cable
9101-1399 - length (075) - motor cable 9101-1366-075

Brake - cable

Check Drive fuse — L 1st on left

Industrial Control
9267 Reliegh St.
Zeeland, Mich. 49464

-800-878-6722



G:\CAD\Spinr\10_Digit\FCE0062100\FCE0062150 Wed Feb 18 14:34:56 1
PLOTTED BY IRISH MIKE

Fax Cover Sheet

hess m·a·e, inc.

2950 Redfield Road · Niles, Michigan 49120-4940 USA · Phone (616) 683-9050 · Fax (616 [illegible]0

Number of pages including this one: 2. Please contact us if you do not receive all pages. Thank you!

DATE: 12-12-97

TO: AAP St. Marys

ATTN.: Alan Konleiesen

FAX: 419-394-4776

FROM: Jack

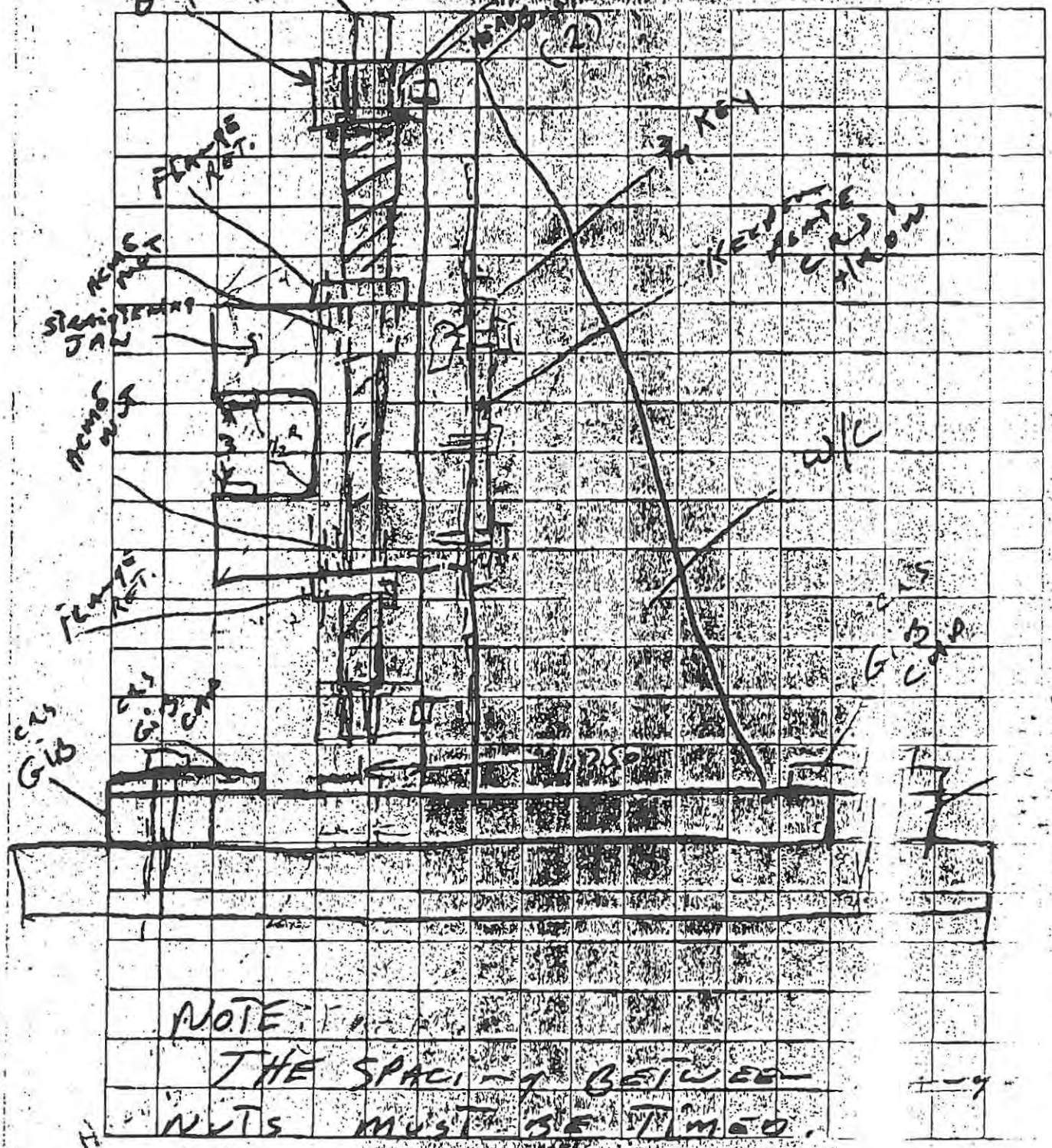
SUBJECT:

Alan:

Here is the sketch of your 6" Hammon. The Two Flanges Containing the Brass Nut must be In-Line. One of them must have Some Loose. If you can't Line them-up They Take one of them out

Jack

MIDSTATES
TOOL & DIE & ENGINEERING, INC.
23816 Cooper Drive Elkhart, IN 46514 (219) 264-3521



AAP

ST. MARYS CORP.

INTEROFFICE CORRESPONDENCE

TO: Norm, Randy, Mark, Nadereh, Mike, Daryl

FROM: Alan Kohlrieser

DATE: November 20, 1997

SUBJECT: Automatic Straighten Machine

TEST #1: 5 pc. Test:

Indicators 5 & 6 - Setpoint 139.50 "nominal"
Indicators 1 - Setpoint 114.0 "nominal"

PART NO.	CMM			STRAIGHTENER		
	#1	#5 (difference)	#6 (difference)	#1	#5	#6
X71	113.5	.1	1.3	113.8	.4	.1
X34	113.8	.1	.8	113.8	.2	.3
C63	113.4	.2	.7	113.8	-.2	.2
X45	113.9	.2	.2	113.6	-.2	.1
X36	114.4	.1	.1	113.7	.1	.1

TEST #2: 4 pc. Test:

Indicator #5 set at 139.0: 0.5 from nominal
Indicator #6 set at 139.5: nominal
Indicator #1 set at 114.0: nominal

PART NO.	CMM			STRAIGHTENER		
	#1	#5 (diff.)	#6 (diff.)	#1	#5	#6
B8	114	.4	.0	114	.4	-.3
C77	114.5	.2	.4	113.9	.1	.1
B7	114.4	.1	.1	113.9	-.1	-.3
B108	113.6	.2	.0	114	.1	-.4

After machining, 7 out of 9 were okay.
Pieces #X71and B8 were rejected due to thin wall in areas #2 and #3.
I believe these rejects were due to galling.

TEST 3: After modification of #2 & #3 fixed locators and #4 area support:

Setpoint #5 & #6: 139.50
Setpoint #1: 114.00
Adjustable post #4 area

PART NO.	CMM			STRAIGHTENER		
	#1	#5 (diff.)	#6 (diff.)	#1	#5	#6
BB13	113.7	.1	-.1	113.8	.2	.2
B113	113.4	.1	-.1	113.9	.2	.1
BB11	113.6	.3	.0	114	.2	.1
BB12	114	.1	-.2	114	.1	.1
BB9	114.8	.3	-.4	113.6	.4	.1

NOTE: It was very hard to adjust #4 area; will continue to modify this.

TEST #4:

Setpoint #5 & #6: 139.50
Setpoint #1: 114.00
No post area #4

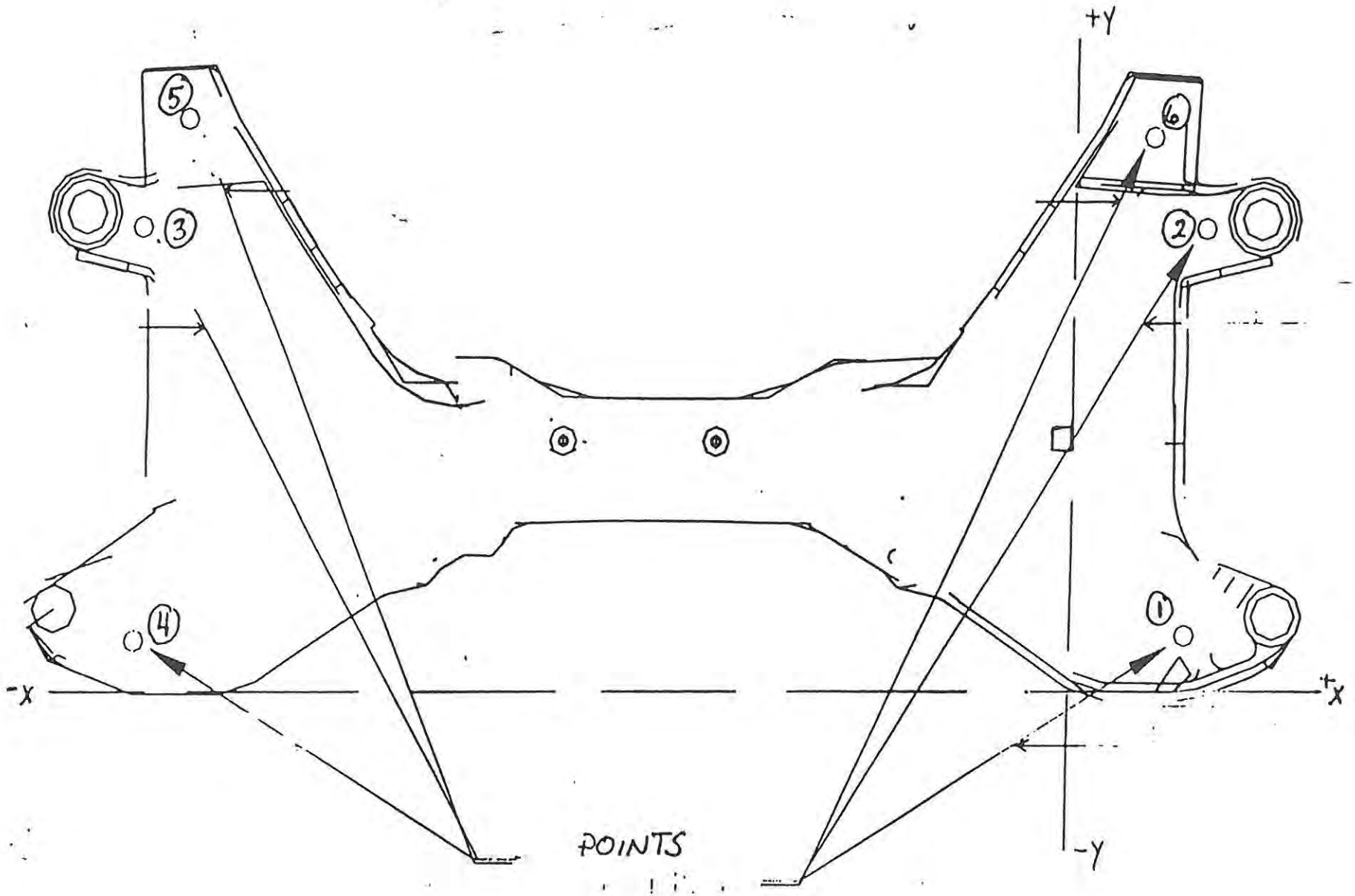
PART NO.	CMM			STRAIGHTENER		
	#1	#5 (diff.)	#6 (diff.)	#1	#5	#6
BB9	114.2	.2	-.2	114	.0	.1
B101	113.6	.2	.1	113.9	.1	.1
#38	113.8	-.1	-.1	114	.1	.1
#31	113.5	-.1	.0	114	.1	.1
#29	114	-.1	.1	113.8	.1	.2
#43	113.6	0	.2	114	-.1	.3

After reviewing machining results and correlating CMM and Straightening data, I feel very confident we have a good concept for automatic straighten machine.

I will send the above 6 pcs. and 3 pcs. from Test #3 to NKB for machining trial. This test will be done with NKB new fixture.

Part #:

Insp. by:

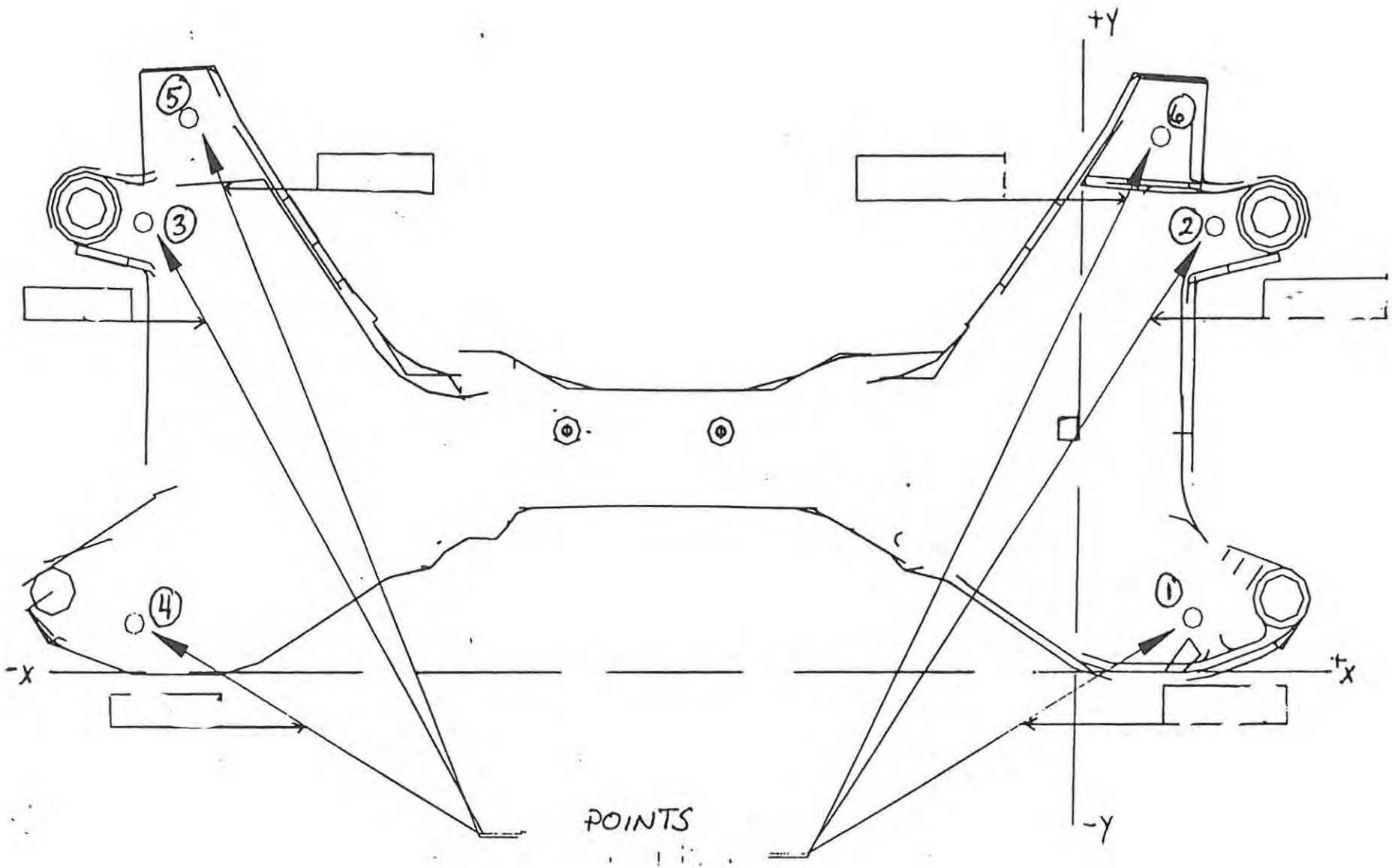


114 24.5 (24.75)

	Crossmember cmm			Straightener		
Part #	Point #1	5	6	Point #1	5	6
x71	113.49	25.56	26.77	113.78 -.22	25.14 .39	24.82 .07
x34	113.78	25.64	26.25	113.78 -.22	24.93 .18	25 .25
C63	113.36	25.74	26.20	113.75 -.25	24.51 -.24	24.94 .21
x45	113.89	25.67	25.67	113.58 -.42	24.58 -.17	24.86 .11
x36	114.36	25.44	25.44	113.70 -.30	24.72 -.03	24.62 -.13

Part #: _____

Insp. by: _____



To: Nadereh, Daryl, Alan, Mark
cc: NKB, JR
Date: September 15th , 1997

From: Steve Neargarder

Subject: Crossmember Measurements

Here is the summary of the manually straightened crossmembers that will be shipped to NKB. The alignment on these pieces was calculated off of the base where the two bosses are located. The twist was calculated by creating a plane by projecting #4 point up 114.00mm and measuring another point on #2 and #3 then measuring the distance to #1.

Part #	**Area #1** Spec. 137.00 ±1.00	**Area #2** Spec. 23.00 ±1.00	**Area #3** Spec. 23.00 ±1.00	**Area #4** Spec. 137.00 ±1.00	**Area #5** Spec. 162.50 ±1.00	**Area #6** Spec. 162.50 ±1.00	**Twist** Spec. 114.00 ±0.50
B29	136.77	22.50	22.67	137.08	161.55	161.60	113.93
B31	137.19	22.74	22.98	137.50	162.04	162.84	113.68
B37	137.17	23.19	22.95	137.00	162.09	161.62	113.87
B39	136.82	22.57	22.64	137.04	161.54	162.70	113.90
B41	137.19	22.94	22.80	137.15	161.93	161.85	113.97
B42	136.89	22.90	22.99	137.08	162.33	162.20	113.89
P98	136.96	22.65	22.75	137.04	161.92	161.67	114.03
B24	137.29	23.14	22.40	136.59	161.57	162.18	114.00
B62	137.13	23.01	22.85	136.87	161.98	162.05	113.86
B45	137.13	22.85	22.93	136.95	161.84	162.40	113.87
P66	136.52	22.68	23.06	136.88	162.25	161.30	113.86
P117	136.87	23.16	23.31	137.15	162.39	163.15	113.88
ISIR Samples							
P78	136.73	23.40	23.43	137.05	162.50	162.47	113.67
P75	137.05	23.08	23.30	137.20	162.43	162.09	113.96

HESS - MAE, INC.

2950 Redfield Rd./ Niles, MI. 49120 / (616)683-9050 / FAX (616)683- 8350

TELEFAX TRANSMITTAL

To: Mr. Alan Kohlrieser 8-26-97

Company: AAP- StMarys Pages 3

Alan:

Based on the results from your past straightening attempts on the straightening fixture we can not get enough clamping force to keep the casting from moving. We therefore propose the following changes.

1. Clamp over the (2) bosses at point A-1 and A-2 (see sketch)
2. Remove one of the current pads and only clamp on one of them at point A-3 (see sketch) with a strap type clamp
3. Us the side clamps to take part fit-up after the casting is clamped

This should give us enough clamping force, We do not like to go beyond the undistorted section of the casting but, we feel that we have no choice.

The cost to do this is $3,545 and it will take 5-7 working days for the time we receive the fixture

Sincerely,

Jack Querry

Correspondence Memorandum

Hess - MAE Inc.

Telephone Call
☐ Incoming ☐ Outgoing

Meeting
Location _____

Company AAP - ST. Marys

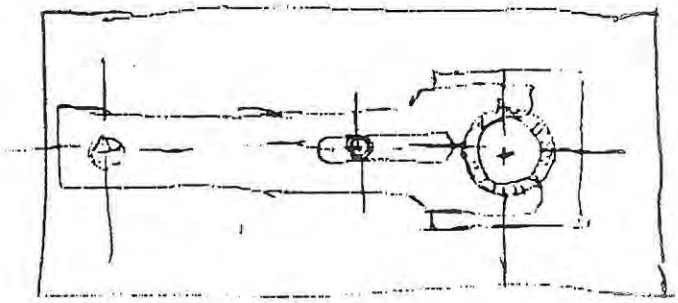
Date 8-26-97

Person(s)

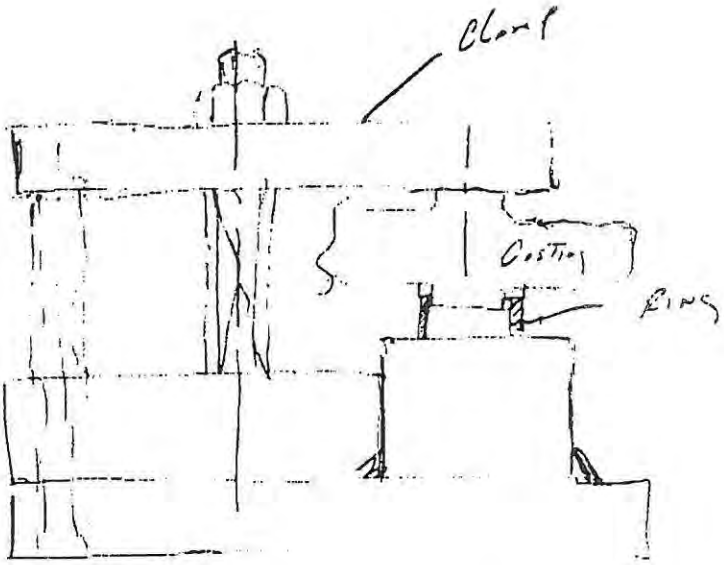
MAE

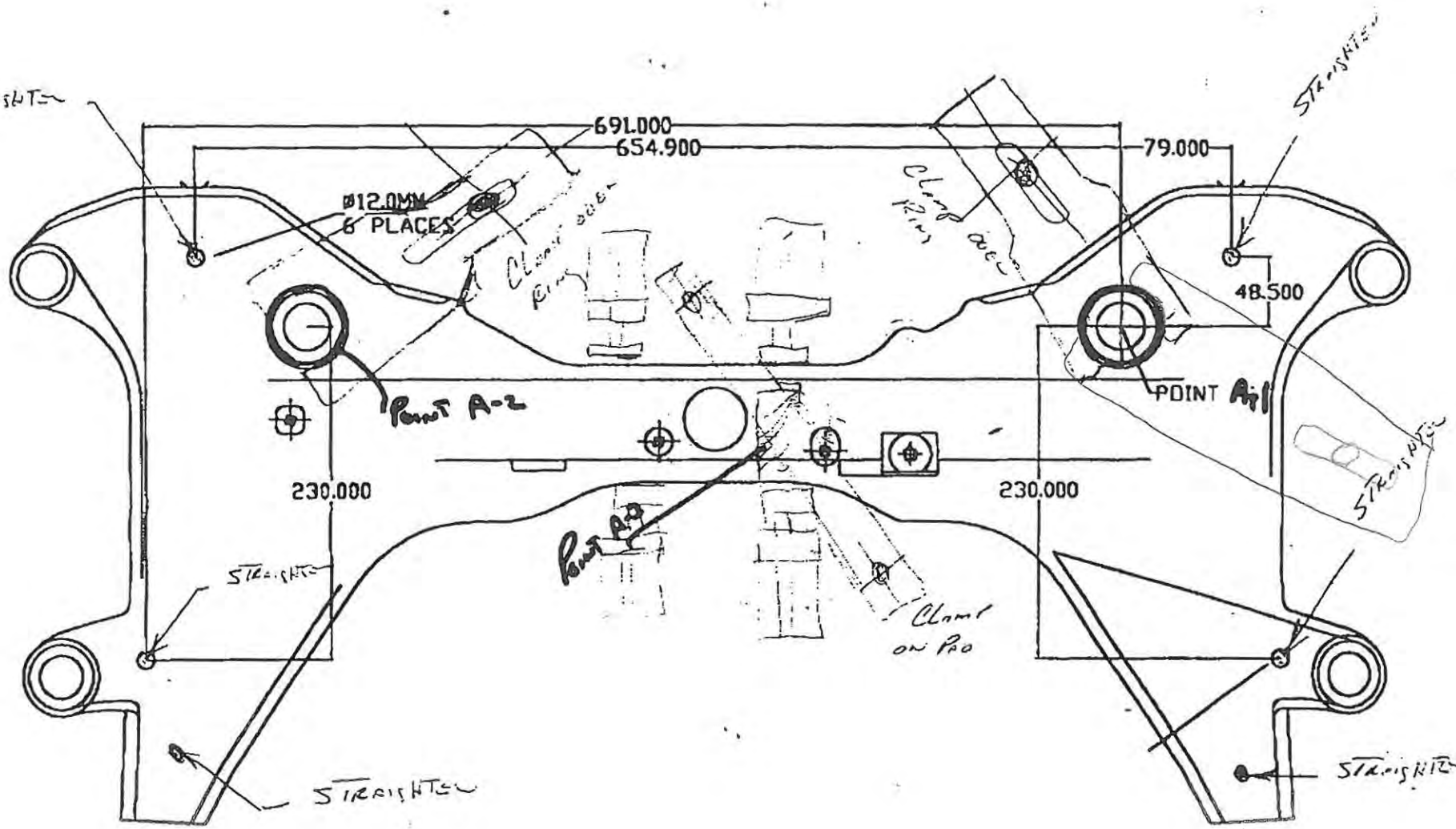
Subject

Follow-up



Distribution:





NKB

ROTATION_ 180°

To: Nadereh, Daryl, Alan, Mark
cc: NKB, JR
Date: August 26th , 1997

From: Steve Neargarder

Subject: Crossmember Measurements

Here is the summary of the manually straightened crossmembers that will be shipped to NKB. The alignment on these pieces was calculated off of the base where the two bosses are located. The twist was calculated by creating a plane by projecting #4 point up 114.00mm and measuring another point on #2 and #3 then measuring the distance to #1.

Part #	**Area #1** Spec. 137.00 ±1.00	**Area #2** Spec. 23.00 ±1.00	**Area #3** Spec. 23.00 ±1.00	**Area #4** Spec. 137.00 ±1.00	**Area #5** Spec. 162.50 ±1.00	**Area #6** Spec. 162.50 ±1.00	**Twist** Spec. 114.00 ±0.50
P65	136.56	23.06	23.25	136.88	162.18	161.65	113.83
P97	137.44	23.20	22.98	137.50	162.04	162.84	113.68
P86	136.77	23.14	23.00	137.14	162.36	162.02	113.61
P88	137.48	23.06	22.67	137.09	161.64	161.75	113.92
P107	136.59	22.81	22.78	136.71	161.69	161.69	113.74
P67	136.64	22.25	23.16	137.12	162.04	162.30	114.31
P87	136.92	22.67	22.91	137.25	161.87	162.74	113.89
P110	137.03	22.96	23.20	137.05	162.60	161.82	114.18
P108	136.72	23.08	22.84	137.16	162.11	162.32	113.54
P118	136.70	23.19	23.21	137.31	162.82	162.43	113.52

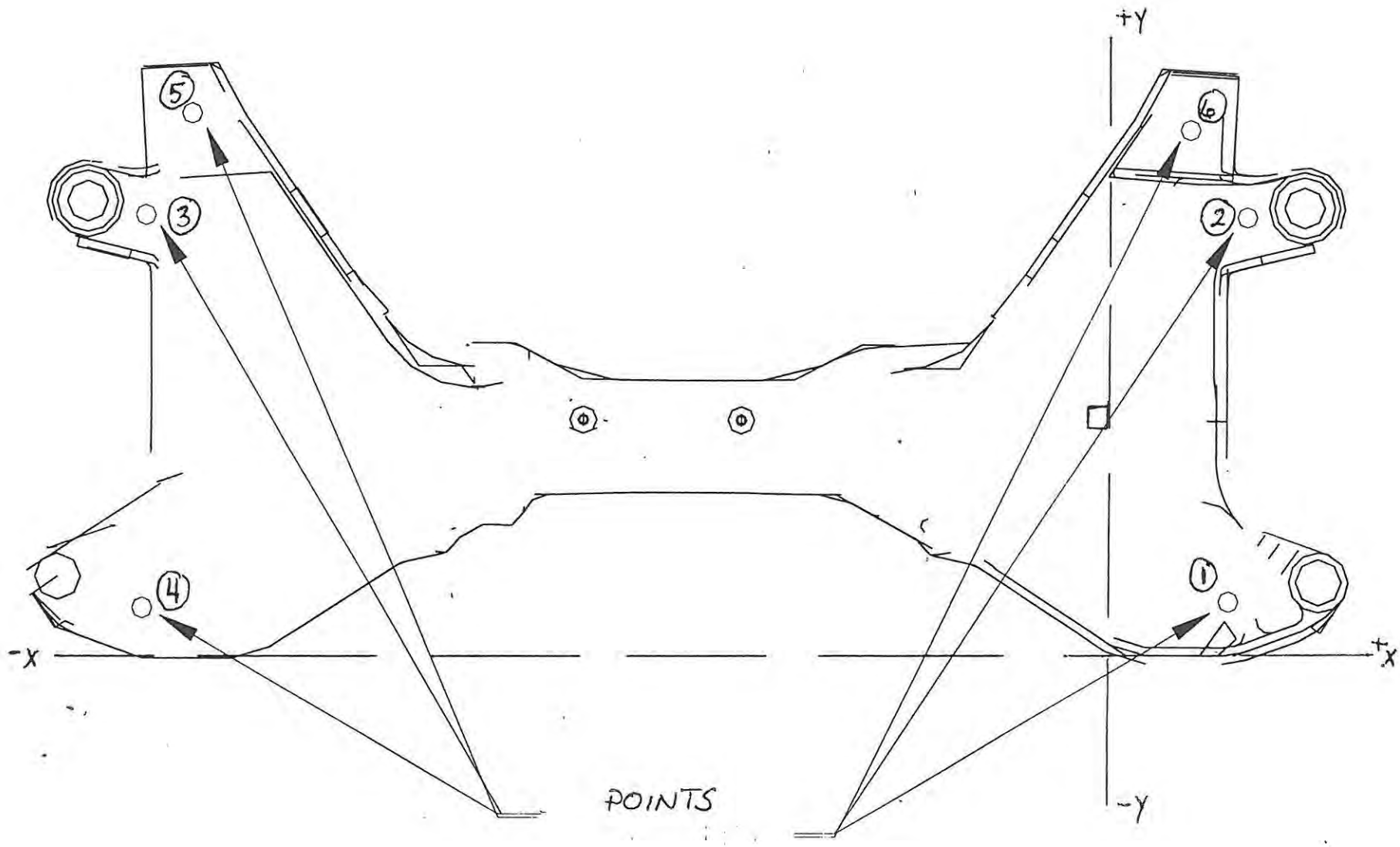
To: Nadereh, Daryl, Alan, Mark
cc: NKB, JR
Date: August 20th , 1997

From: Steve Neargarder

Subject: Crossmember Measurements

Here is the summary of the manually straightened crossmembers that will be shipped to NKB. The alignment on these pieces was calculated off of the base where the two bosses are located. The twist was calculated by creating a plane by projecting #4 point up 114.00mm and measuring another point on #2 and #3 then measuring the distance to #1.

Part #	**Area #1** Spec. 137.00 ±1.00	**Area #2** Spec. 23.00 ±1.00	**Area #3** Spec. 23.00 ±1.00	**Area #4** Spec. 137.00 ±1.00	**Area #5** Spec. 162.50 ±1.00	**Area #6** Spec. 162.50 ±1.00	**Twist** Spec. 114.00 ±0.50
P47	136.20 (.8)	23.18	23.53	137.07	162.99	162.29	113.62
P104	136.59	22.99	23.41	137.26	162.88	162.21	113.57
P56	136.71	23.36	22.95	137.01	162.13	162.42	113.51
P100	136.71	22.08	23.04	137.37	161.37	161.31	114.33
P76	137.03	23.71	23.18	136.90	162.34	162.79	113.63
P49	136.99	22.46	22.17	136.91	162.60	160.70	113.88
P105	136.77	23.81	23.84	136.77	163.07	163.44	114.03
P58	137.21	23.47	23.20	137.45	162.49	162.66	113.78
P94	136.64	22.50	23.10	136.88	160.77	161.61	114.01
P103	137.40	23.76	23.44	137.11	163.05	162.84	114.03
P79	136.94	22.94	23.29	136.88	162.96	161.52	114.31
P109	136.59	22.94	23.43	136.78	162.78	163.28	113.52
P115	136.98	23.35	23.64	137.21	162.96	162.64	114.01
P54	136.75	23.06	23.53	137.42	162.96	161.88	113.70


+Y
5
6
3
2
4
1
-X
+X
-Y
POINTS

AAP

ST. MARYS CORP.

INTEROFFICE CORRESPONDENCE

TO: Nadereh, Mark, Steve, Daryl

FROM: Alan Kohlrieser

DATE: July 28, 1997

SUBJECT: CROSSMEMBER MEASUREMENT

Here is the summary of the manually straightened crossmembers that will be shipped to NKB. NKB will use these parts for their machining testing. If the parts are good, they can use them for POB trials.

The alignment on these pieces was calculated off of the base where the two bosses are located.

PART NO.	AREA #1 SPEC. 137.00 ±1.00	AREA #2 SPEC. 23.00 ±1.00	AREA #3 SPEC. 23.00 ±1.00	AREA #4 SPEC. 137.00 ±1.00	AREA #5 SPEC. 162.50 ±1.00	AREA #6 SPEC. 162.50 ± 1.00
P48	136.28	22.04	22.93	137.25	161.76	161.86
P57	137.32	22.75	22.62	137.76	161.58	162.10
P60	136.43	22.49	22.55	137.53	161.78	162.03
P61	136.16	22.39	22.99	137.77	161.57	161.56
P63	136.44	22.33	22.89	137.17	161.69	162.53
P64	136.27	22.72	23.85	137.18	163.15	161.53
P68	136.61	22.74	22.34	137.10	161.76	162.19
P72	136.59	22.55	22.58	137.27	161.69	161/83
P80	136.62	22.01	22.68	137.67	161.95	161.67
P96	136.03	22.96	22.59	136.94	161.81	162.08

To: Nadereh, Daryl, Alan

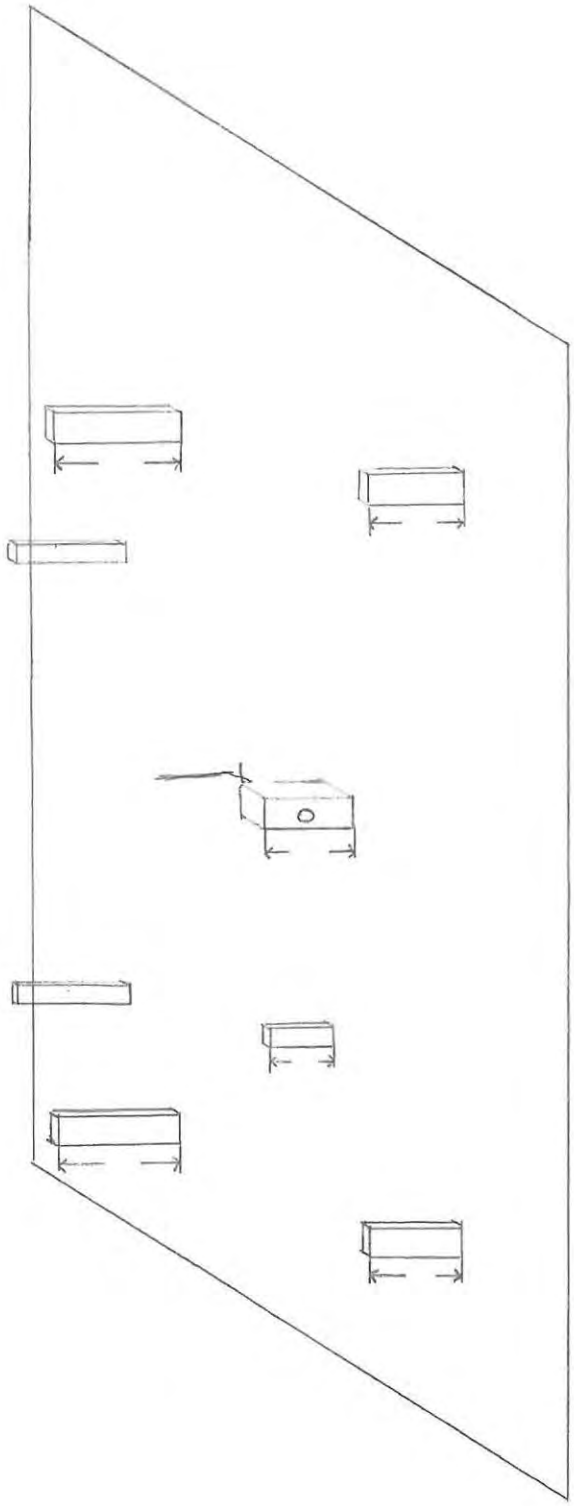
Date: July 10th, 1997

From: Steve Neargarder

Subject: Crossmember Measurements

Here is the summary of the manually straightened crossmembers that will be shipped to
NKB. The alignment on these pieces was calculated off of the base where the two bosses are located.

Part #	**Area #1** Spec. 137.00 ±1.00	**Area #2** Spec. 23.00 ±1.00	**Area #3** Spec. 23.00 ±1.00	**Area #4** Spec. 137.00 ±1.00	**Area #5** Spec. 162.50 ±1.00	**Area #6** Spec. 162.50 ±1.00
P73	136.35	23.73	22.30	136.42	161.56	162.80
P35	136.40	23.08	23.48	136.51	162.75	162.40
P77	136.30	22.32	22.80	137.48	161.75	161.74
P71	136.03	23.59	23.50	136.32	162.78	162.96
P112	136.95	22.14	23.06	137.06	162.03	161.69
P30	136.95	22.04	23.01	136.59	161.71	161.96
P70	136.90	22.92	23.16	136.84	162.40	161.94
P89	136.80	23.63	23.82	137.51	163.02	162.88
P74	136.75	23.09	22.51	136.96	161.95	161.78
P111	137.10	23.63	23.27	136.12	162.48	163.18
P32	136.55	22.96	23.12	136.89	161.77	162.86
P31	136.74	23.82	23.43	136.78	162.78	163.28



To: .,Nadereh, Daryl
From: Steve Neargarder
Date: May 8th,1997

Summary of crossmember measurements before heat treatment

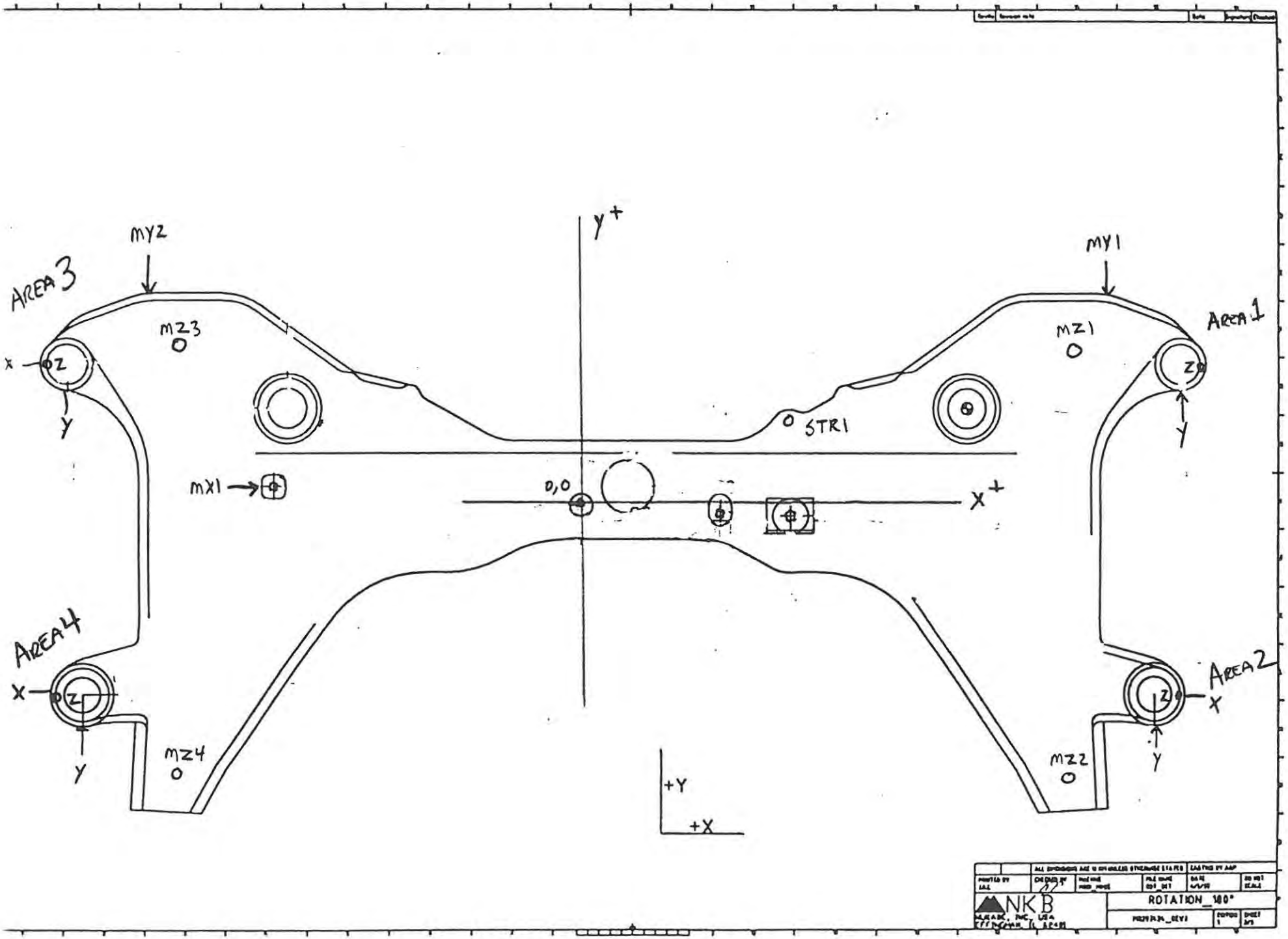
This is a comparison of measurements between castings directly from the cast machine.

	#1	#2	#3	#4	#5	#6	#7	#8	average	min	max	range
Area 1 Z	167.5	168.85	168.69	169.58	169.5	169.32	168.97	168.58	168.8738	167.5	169.58	2.08
Y	99.39	97.54	99.29	96.31	96.47	97.13	95.83	98.22	97.5225	95.83	99.39	3.56
Area 2 Z	33.24	33.38	33.53	31.23	31.1	32.12	32.12	33.23	32.49375	31.1	33.53	2.43
X	519.08	519.09	519.16	518.82	519.18	518.72	518.3	518.66	518.8763	518.3	519.18	0.88
Y	-184.2	-185.49	-184.28	-185.84	-185.39	-185.59	-186.85	-185.14	-185.348	-186.85	-184.2	2.65
Area 3 Z	167.17	166.64	166.98	168.35	168.53	167.26	167.6	166.45	167.3725	166.45	168.53	2.08
X	-457.78	-457.89	-458.01	-457.74	-457.71	-457.74	-457.63	-457.74	-457.78	-458.01	-457.63	0.38
Y	94.84	94.86	93.79	93.44	92.53	94.44	95.02	95.28	94.275	92.53	95.28	2.75
Area 4 Z	32.21	30.36	30.97	29.22	28.93	30.37	30.38	31.37	30.47625	28.93	32.21	3.28
X	-447.54	-448.17	-447.39	-448.08	-447.84	-447.84	-447.97	-447.98	-447.851	-448.17	-447.39	0.78
Y	-188.68	-187.96	-189.1	-188.16	-188.75	-188.05	-187.68	-187.87	-188.281	-189.1	-187.68	1.42
MZ1 Z	147.81	149.06	148.55	149.79	150.05	149.27	149.32	148.34	149.0238	147.81	150.05	2.24
MZ2 Z	177.09	176.66	177.15	174.35	173.89	175.44	175.58	176.97	175.8913	173.89	177.15	3.26
MZ3 Z	147.29	147.14	147.27	148.58	149.2	147.65	148.06	146.72	147.7388	146.72	149.2	2.48
MZ4 Z	176.97	174.69	175.29	173.08	172.63	174.47	174.68	175.66	174.6838	172.63	176.97	4.34
MY1 Y	174.94	172.88	174.63	171.19	171.27	172.24	171.09	173.74	172.7475	171.09	174.94	3.85
MY2 Y	171.03	171.09	170.09	169.42	168.35	170.57	171.01	171.57	170.3913	168.35	171.57	3.22
MX1 X	-269.82	-270.04	-269.92	-270.16	-269.91	-269.87	-269.96	-269.9	-269.948	-270.16	-269.82	0.34
STR1 Z	177.51	178.24	177.98	178.93	179.12	178.4	178.46	177.86	178.3125	177.51	179.12	1.61

Nukabe will use points MZ1-4, MY1-2,and MX1 to align part for machining.
Hess mae will use point STR1 for part alignment in the straightening machine.

* Excessive flash was present on all 8 PCs.
* Die nuts were loose due to disassembling of the die.

Note: To establish a accurate study of the variation of the crossmember, the die and casting machine must be set-up and running correctly.
This study is not a good representation of our process due to problems with the die.
When the die and machine are operating correctly and a study is done, then this would be a true capability study.
Please make sure when the next study is requested that these conditions are meet.


AREA 3
myz
mz3
x
z
y
y+
mx1
0,0
x+
STR1
my1
mz1
AREA 1
z
y
AREA 4
x
z
y
mz4
+Y
+X
AREA 2
x
z
y
mz2
ROTATION_180°
NKB

To: Nadereh, Al MARK ~~Frank~~, Daryl
From: Steve Neargarder

Date: May 15th, 1997

Subject: Crossmember Measurements

The following table is the summary of the measurements before and after heat treatment.
The alignment of these parts was the same as the previous study done on March 21st, 1997.

	Test Piece #1 HT Position 4B			Test Piece #2 HT Position 3A			Test Piece #3 HT Position 2A			Test Piece #4 HT Position 3B			
	Before HT	After HT	Dif	Before HT	After HT	Dif	Before HT	After HT	Dif	Before HT	After HT	Dif	Average
Area 1 Z	167.5	168.24	**-0.74**	168.85	168.5	**0.35**	168.69	169.4	**-0.71**	169.58	168.82	**0.76**	-0.085
Y	99.39	97.51	**1.88**	97.54	97.48	**0.06**	99.29	96.91	**2.38**	96.31	96.81	**-0.5**	0.955
Area 2 Z	33.24	31.56	**1.68**	33.38	32.82	**0.56**	33.53	32.14	**1.39**	31.23	30.6	**0.63**	1.065
X	519.08	518.14	**0.94**	519.09	517.84	**1.25**	519.16	518.01	**1.15**	518.82	517.75	**1.07**	1.1025
Y	-184.2	-186.18	**1.98**	-185.49	-186.48	**0.99**	-184.28	-186.73	**2.45**	-185.84	-186.46	**0.62**	1.51
Area 3 Z	167.17	166.37	**0.8**	166.64	164.81	**1.83**	166.98	166.12	**0.86**	168.35	166.19	**2.16**	1.4125
X	-457.78	-457.93	**0.15**	-457.89	-458.33	**0.44**	-458.01	-457.94	**-0.07**	-457.74	-458.21	**0.47**	0.2475
Y	94.84	94.32	**0.52**	94.86	94.83	**0.03**	93.79	94.17	**-0.38**	93.44	93.31	**0.13**	0.075
Area 4 Z	32.21	32.07	**0.14**	30.36	31.57	**-1.21**	30.97	30.95	**0.02**	29.22	31.22	**-2**	-0.7625
X	-447.54	-447.98	**0.44**	-448.17	-447.94	**-0.23**	-447.39	-447.78	**0.39**	-448.08	-447.84	**-0.24**	0.09
Y	-188.68	-189.15	**0.47**	-187.96	-189.13	**1.17**	-189.1	-189.02	**-0.08**	-188.16	-189.7	**1.54**	0.775
MZ1 Z	147.81	149.12	**-1.31**	149.06	148.96	**0.1**	148.55	149.7	**-1.15**	149.79	149.87	**-0.08**	-0.61
MZ2 Z	177.09	176.2	**0.89**	176.66	177.38	**-0.72**	177.15	176.47	**0.68**	174.35	175.25	**-0.9**	-0.0125
MZ3 Z	147.29	147.27	**0.02**	147.14	145.83	**1.31**	147.27	147.02	**0.25**	148.58	147.11	**1.47**	0.7625
MZ4 Z	176.97	176.61	**0.36**	174.69	176.39	**-1.7**	175.29	175.33	**-0.04**	173.08	175.54	**-2.46**	-0.96
MY1 Y	174.94	172.78	**2.16**	172.88	172.93	**-0.05**	174.63	171.88	**2.75**	171.19	171.8	**-0.61**	1.0625
MY2 Y	171.03	170.49	**0.54**	171.09	171.36	**-0.27**	170.09	170.43	**-0.34**	169.42	169.65	**-0.23**	-0.075
MX1 X	-269.82	-269.89	**0.07**	-270.04	-270.11	**0.07**	-269.92	-269.9	**-0.02**	-270.16	-270.25	**0.09**	0.0525
STR1 Z	177.51	178.09	**-0.58**	178.24	177.82	**0.42**	177.98	178.38	**-0.4**	178.93	178.49	**0.44**	-0.03

	Test Piece #5 HT Position 2B			Test Piece #6 HT Position 4A			Test Piece #7 HT Position 1B			Test Piece #8 HT Position 1A			
	Before HT	After HT	Dif	Before HT	After HT	Dif	Before HT	After HT	Dif	Before HT	After HT	Dif	Average
Area 1 Z	169.5	168.86	**0.64**	169.32	169.22	**0.1**	168.97	167.98	**0.99**	168.58	168.06	**0.52**	0.5625
Y	96.47	96.21	**0.26**	97.13	96.93	**0.2**	95.83	98.16	**-2.33**	98.22	98.72	**-0.5**	-0.5925
Area 2 Z	31.1	30.62	**0.48**	32.12	31.93	**0.19**	32.12	33.3	**-1.18**	33.23	32.75	**0.48**	-0.0075
X	519.18	518.25	**0.93**	518.72	517.78	**0.94**	518.3	518.39	**-0.09**	518.66	518.29	**0.37**	0.5375
Y	-185.39	-186.56	**1.17**	-185.59	-186.61	**1.02**	-186.85	-186.2	**-0.65**	-185.14	-184.99	**-0.15**	0.3475
Area 3 Z	168.53	166.56	**1.97**	167.26	165.56	**1.7**	167.6	166.09	**1.51**	166.45	165.48	**0.97**	1.5375
X	-457.71	-458.03	**0.32**	-457.74	-458.08	**0.34**	-457.63	-458.29	**0.66**	-457.74	-458.14	**0.4**	0.43
Y	92.53	93.33	**-0.8**	94.44	94.38	**0.06**	95.02	93.75	**1.27**	95.28	94.65	**0.63**	0.29
Area 4 Z	28.93	30.91	**-1.98**	30.37	31.04	**-0.67**	30.38	30.98	**-0.6**	31.37	31.44	**-0.07**	-0.83
X	-447.84	-448.12	**0.28**	-447.84	-447.95	**0.11**	-447.97	-447.56	**-0.41**	-447.98	-447.92	**-0.06**	-0.02
Y	-188.75	-189.31	**0.56**	-188.05	-188.92	**0.87**	-187.68	-189.57	**1.89**	-187.87	-188.76	**0.89**	1.0525
MZ1 Z	150.05	149.88	**0.17**	149.27	149.64	**-0.37**	149.32	148.73	**0.59**	148.34	148.19	**0.15**	0.135
MZ2 Z	173.89	174.78	**-0.89**	175.44	176.26	**-0.82**	175.58	177.88	**-2.3**	176.97	177.06	**-0.09**	-1.025
MZ3 Z	149.2	147.8	**1.4**	147.65	146.59	**1.06**	148.06	146.88	**1.18**	146.72	146.13	**0.59**	1.0575
MZ4 Z	172.63	174.95	**-2.32**	174.47	175.46	**-0.99**	174.68	175.75	**-1.07**	175.66	176.09	**-0.43**	-1.2025
MY1 Y	171.27	171.26	**0.01**	172.24	172	**0.24**	171.09	173.6	**-2.51**	173.74	174.31	**-0.57**	-0.7075
MY2 Y	168.35	169.45	**-1.1**	170.57	170.76	**-0.19**	171.01	170.08	**0.93**	171.57	171.13	**0.44**	0.02
MX1 X	-269.91	-269.96	**0.05**	-269.87	-269.99	**0.12**	-269.96	-270.04	**0.08**	-269.9	-270.01	**0.11**	0.09
STR1 Z	179.12	178.7	**0.42**	178.4	178.27	**0.13**	178.46	178.3	**0.16**	177.86	177.94	**-0.08**	0.1575

Nukabe will use points MZ1-4, MY1-2,and MX1 to align part for machining.
Hess mae will use point STR1 for part alignment in the straightening machine.

* Excessive flash was present on all 8 PCs.
* Die nuts were loose due to disassembling of the die.

Summary of crossmember measurements before heat treatment

This is a comparison of measurements between castings directly from the cast machine.

	#1	#2	#3	#4	#5	#6	#7	#8	average	min	max	range
Area 1 Z	167.5	168.85	168.69	169.58	169.5	169.32	168.97	168.58	168.8738	167.5	169.58	2.08
Y	99.39	97.54	99.29	96.31	96.47	97.13	95.83	98.22	97.5225	95.83	99.39	3.56
Area 2 Z	33.24	33.38	33.53	31.23	31.1	32.12	32.12	33.23	32.49375	31.1	33.53	2.43
X	519.08	519.09	519.16	518.82	519.18	518.72	518.3	518.66	518.8763	518.3	519.18	0.88
Y	-184.2	-185.49	-184.28	-185.84	-185.39	-185.59	-186.85	-185.14	-185.348	-186.85	-184.2	2.65
Area 3 Z	167.17	166.64	166.98	168.35	168.53	167.26	167.6	166.45	167.3725	166.45	168.53	2.08
X	-457.78	-457.89	-458.01	-457.74	-457.71	-457.74	-457.63	-457.74	-457.78	-458.01	-457.63	0.38
Y	94.84	94.86	93.79	93.44	92.53	94.44	95.02	95.28	94.275	92.53	95.28	2.75
Area 4 Z	32.21	30.36	30.97	29.22	28.93	30.37	30.38	31.37	30.47625	28.93	32.21	3.28
X	-447.54	-448.17	-447.39	-448.08	-447.84	-447.84	-447.97	-447.98	-447.851	-448.17	-447.39	0.78
Y	-188.68	-187.96	-189.1	-188.16	-188.75	-188.05	-187.68	-187.87	-188.281	-189.1	-187.68	1.42
MZ1 Z	147.81	149.06	148.55	149.79	150.05	149.27	149.32	148.34	149.0238	147.81	150.05	2.24
MZ2 Z	177.09	176.66	177.15	174.35	173.89	175.44	175.58	176.97	175.8913	173.89	177.15	3.26
MZ3 Z	147.29	147.14	147.27	148.58	149.2	147.65	148.06	146.72	147.7388	146.72	149.2	2.48
MZ4 Z	176.97	174.69	175.29	173.08	172.63	174.47	174.68	175.66	174.6838	172.63	176.97	4.34
MY1 Y	174.94	172.88	174.63	171.19	171.27	172.24	171.09	173.74	172.7475	171.09	174.94	3.85
MY2 Y	171.03	171.09	170.09	169.42	168.35	170.57	171.01	171.57	170.3913	168.35	171.57	3.22
MX1 X	-269.82	-270.04	-269.92	-270.16	-269.91	-269.87	-269.96	-269.9	-269.948	-270.16	-269.82	0.34
STR1 Z	177.51	178.24	177.98	178.93	179.12	178.4	178.46	177.86	178.3125	177.51	179.12	1.61

Nukabe will use points MZ1-4, MY1-2,and MX1 to align part for machining.
Hess mae will use point STR1 for part alignment in the straightening machine.

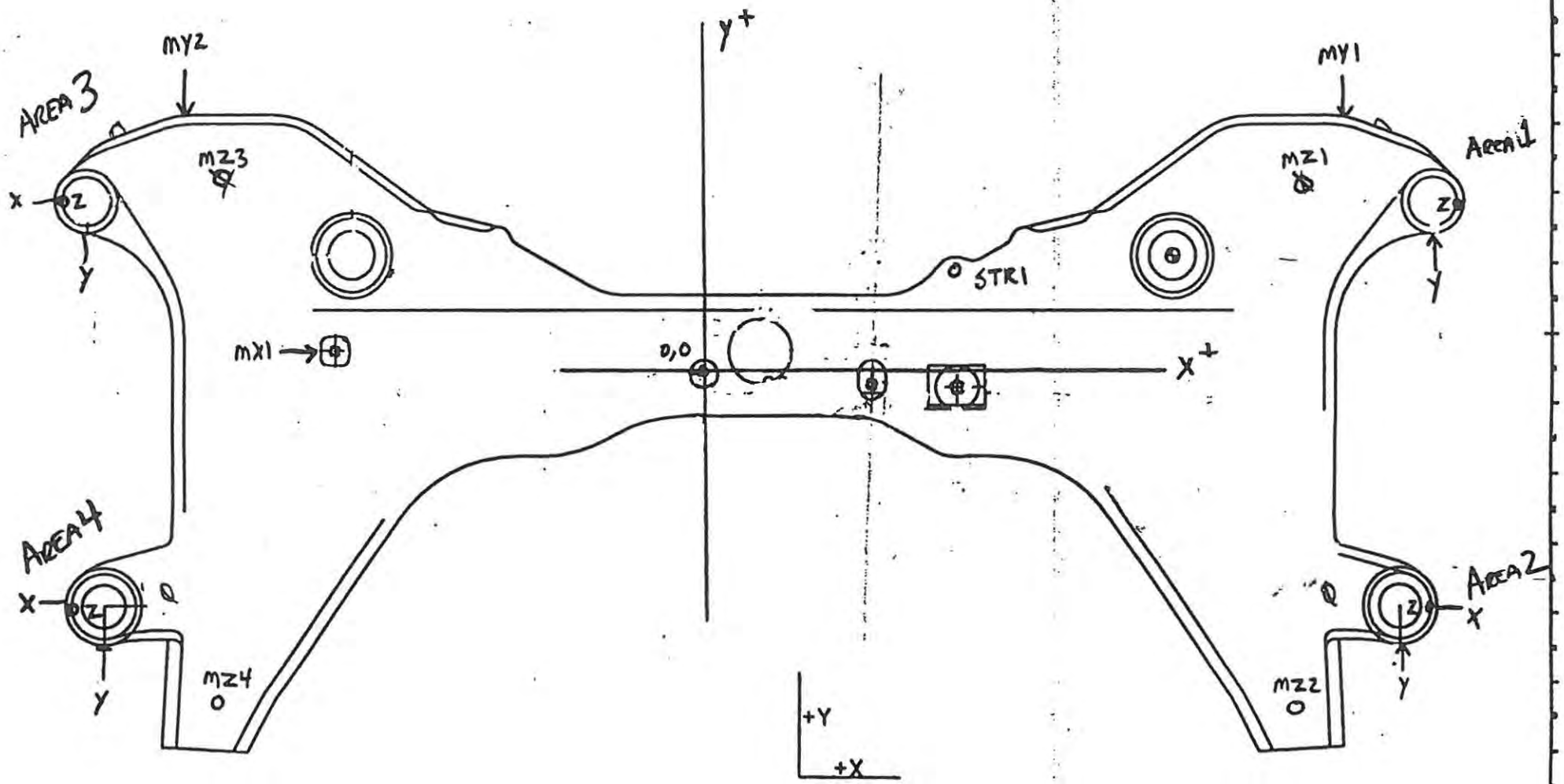
* Excessive flash was present on all 8 PCs.
* Die nuts were loose due to disassembling of the die.

Note: To establish a accurate study of the variation of the crossmember, the die and casting machine must be set-up and running correctly.
This study is not a good representation of our process due to problems with the die.
When the die and machine are operating correctly and a study is done, then this would be a true capability study.
Please make sure when the next study is requested that these conditions are meet.

Summary of crossmember measurements after heat treatment

		#1	#2	#3	#4	#5	#6	#7	#8	average	min	max	range
Area 1	Z	168.24	168.5	169.4	168.82	168.86	169.22	167.98	168.06	168.635	167.98	169.4	1.42
	Y	97.51	97.48	96.91	96.81	96.21	96.93	98.16	98.72	97.34125	96.21	98.72	2.51
Area 2	Z	31.56	32.82	32.14	30.6	30.62	31.93	33.3	32.75	31.965	30.6	33.3	2.7
	X	518.14	517.84	518.01	517.75	518.25	517.78	518.39	518.29	518.0563	517.75	518.39	0.64
	Y	-186.18	-186.48	-186.73	-186.46	-186.56	-186.61	-186.2	-184.99	-186.276	-186.73	-184.99	1.74
Area 3	Z	166.37	164.81	166.12	166.19	166.56	165.56	166.09	165.48	165.8975	164.81	166.56	1.75
	X	-457.93	-458.33	-457.94	-458.21	-458.03	-458.08	-458.29	-458.14	-458.119	-458.33	-457.93	0.4
	Y	94.32	94.83	94.17	93.31	93.33	94.38	93.75	94.65	94.0925	93.31	94.83	1.52
Area 4	Z	32.07	31.57	30.95	31.22	30.91	31.04	30.98	31.44	31.2725	30.91	32.07	1.16
	X	-447.98	-447.94	-447.78	-447.84	-448.12	-447.95	-447.56	-447.92	-447.886	-448.12	-447.56	0.56
	Y	-189.15	-189.13	-189.02	-189.7	-189.31	-188.92	-189.57	-188.76	-189.195	-189.7	-188.76	0.94
MZ1	Z	149.12	148.96	149.7	149.87	149.88	149.64	148.73	148.19	149.2613	148.19	149.88	1.69
MZ2	Z	176.2	177.38	176.47	175.25	174.78	176.26	177.88	177.06	176.41	174.78	177.88	3.1
MZ3	Z	147.27	145.83	147.02	147.11	147.8	146.59	146.88	146.13	146.8288	145.83	147.8	1.97
MZ4	Z	176.61	176.39	175.33	175.54	174.95	175.46	175.75	176.09	175.765	174.95	176.61	1.66
MY1	Y	172.78	172.93	171.88	171.8	171.26	172	173.6	174.31	172.57	171.26	174.31	3.05
MY2	Y	170.49	171.36	170.43	169.65	169.45	170.76	170.08	171.13	170.4188	169.45	171.36	1.91
MX1	X	-269.89	-270.11	-269.9	-270.25	-269.96	-269.99	-270.04	-270.01	-270.019	-270.25	-269.89	0.36
STR1	Z	178.09	177.82	178.38	178.49	178.7	178.27	178.3	177.94	178.2488	177.82	178.7	0.88

Nukabe will use points MZ1-4, MY1-2,and MX1 to align part for machining.
Hess mae will use point STR1 for part alignment in the straightening machine.



ROTATION_180°

To: Nadereh, Alan, Frank,Daryl
From: Steve Neargarder

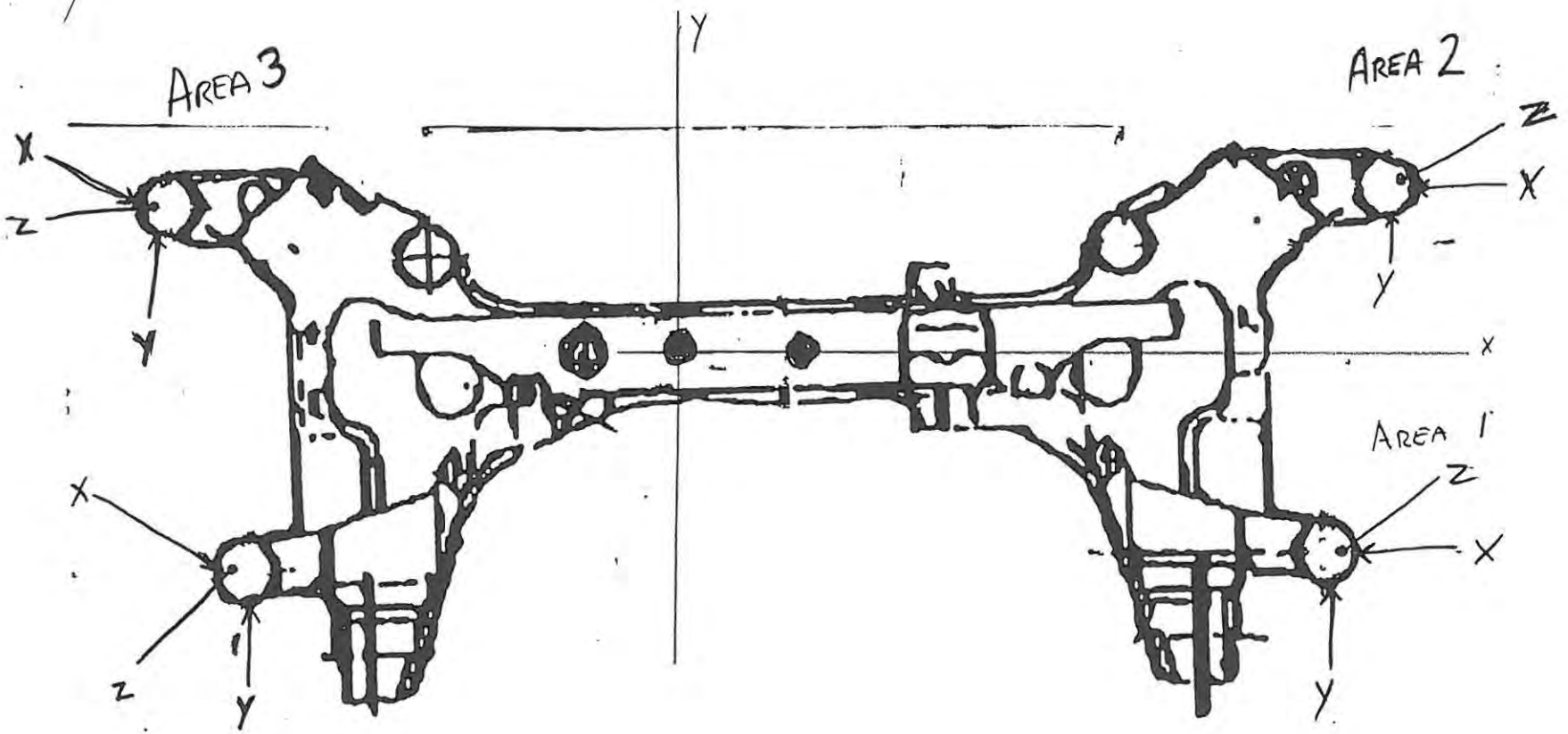
Date: March 21st,1997

Subject: Crossmember Measurements

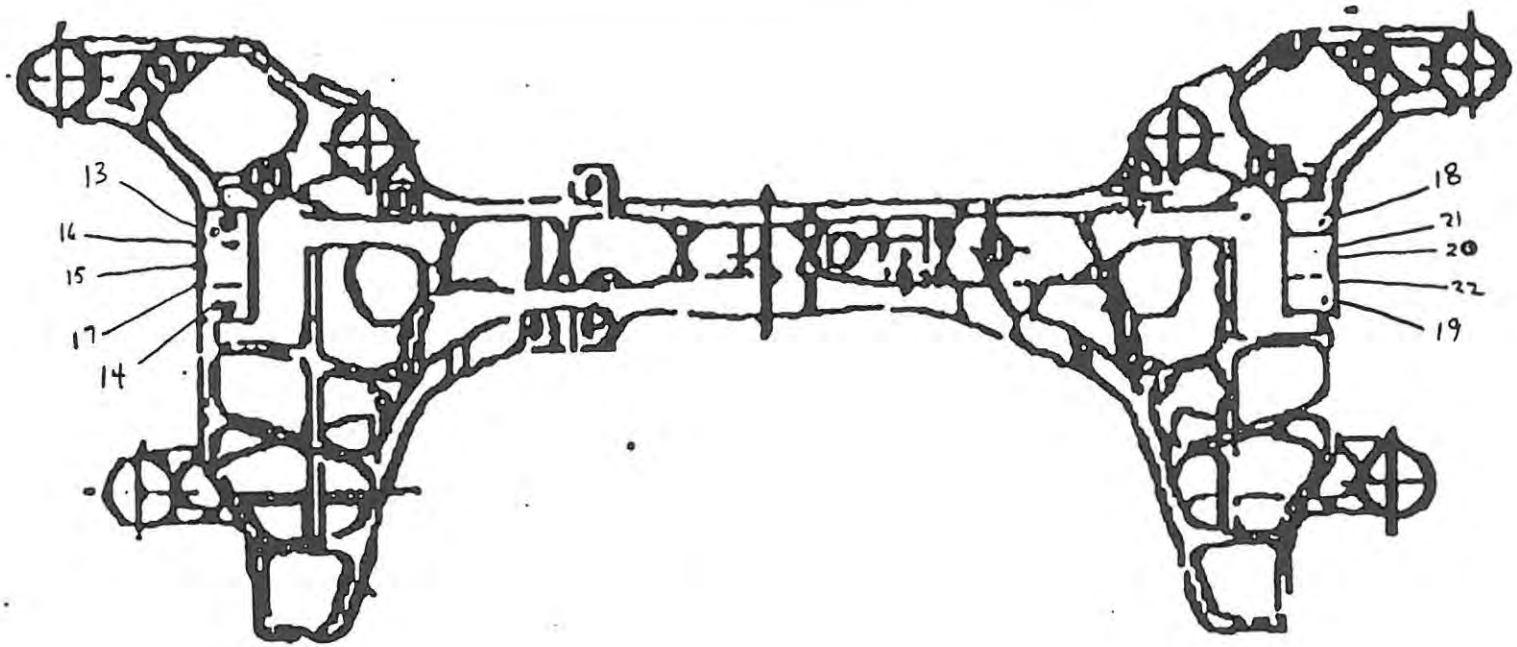
The following table is the summary of the measurements before and after heat treatment. The alignment of these parts were on the base at the bottom..

	Quenched TEST PIECE #1			No Quench TEST PIECE #2		
	Before HT	After HT	DIF	Before HT	After HT	DIF
AREA 1 Z	29.94	29.68	**0.26**	28.79	30.08	**1.29**
X	519.07	518.29	**0.78**	517.90	517.87	**0.17**
Y	-187.35	-187.86	**0.51**	-187.28	-187.89	**0.61**
AREA 2 Z	170.65	170.12	**0.53**	170.74	170.55	**0.19**
X	537.33	537.48	**0.15**	536.75	536.67	**0.08**
Y	93.99	94.06	**0.07**	92.55	93.58	**0.03**
AREA 3 Z	171.10	170.26	**0.84**	170.98	169.99	**0.99**
X	-457.18	-457.31	**0.13**	-457.02	-457.23	**0.21**
Y	93.46	93.63	**0.17**	93.32	93.78	**0.46**
AREA 4 Z	29.74	29.97	**0.23**	29.10	29.52	**0.42**
X	-448.06	-448.55	**0.49**	-448.13	-448.26	**0.13**
Y	-187.64	-187.93	**0.29**	-187.11	-188.52	**1.42**
FLAT 1 TZ	157.71	157.30	**0.41**	157.74	157.80	**0.06**
BZ	157.54	157.19	**0.35**	157.38	157.57	**0.19**
CIR 1 Z	130.77	130.35	**0.42**	130.68	130.83	**0.15**
TY	30.33	30.32	**.01**	29.38	30.03	**0.65**
BY	-2.92	-2.93	**.01**	-3.63	-3.02	**0.61**
FLAT 2 TZ	158.10	157.66	**0.44**	158.03	157.56	**0.47**
BZ	157.83	157.51	**0.32**	157.67	157.37	**0.30**
CIR 2 Z	131.06	130.59	**0.47**	130.90	130.54	**0.36**
TY	30.57	30.53	**0.04**	30.23	30.59	**0.36**
BY	-3.03	-2.79	**0.24**	-2.86	-2.45	**0.41**

Bottom



Top



AAP
ST. MARYS CORP.

FAX FORM

Voice 419-394-7840 FAX 419-394-4776

TO:	CC:	Date: 3/6/97.
Alan, Sam		No. of Pages: 1/1
		From: Frank. K.

Subject: The information for straightening in Japan. (Asahi)

1. datum : use machine datum.
2. clamp : around 16 locations.
   (don't use them together)
3. load location : around 10 axes
4. load : Max 5 t.
5. load direction : almost WL direction (up and down)
   (partly TL direction : forth and back)
6. Frequency : 100 %
7. Failure by straighten : almost 0 %
8. Load : hydraulic type
9. Distorsion : reject over 7 mm distorsion before straightening
   (scrap)
10. Process.
    (1) at first. measure distorsion.
    (2) press.
    (3) repeat (1) and (2) seven to 10 times.
    (4). check by gauge (mainly bushing hole)

※ These are secret.
You can talk it to Hess, but don't pass it.

To: Nadereh, Alan, Frank, Darryl
From: Steve Neargarder

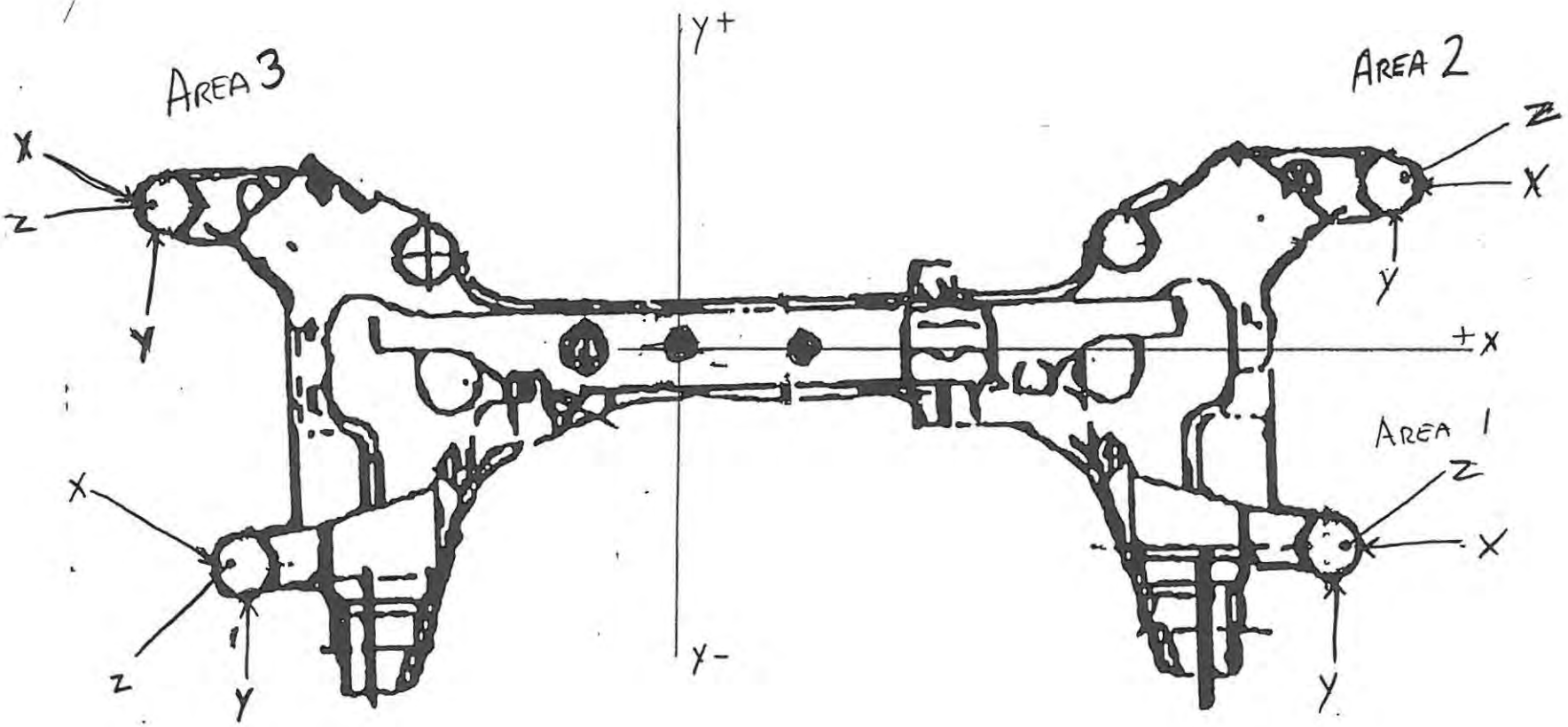
Date: April 9th, 1997

Subject: Crossmember Measurements

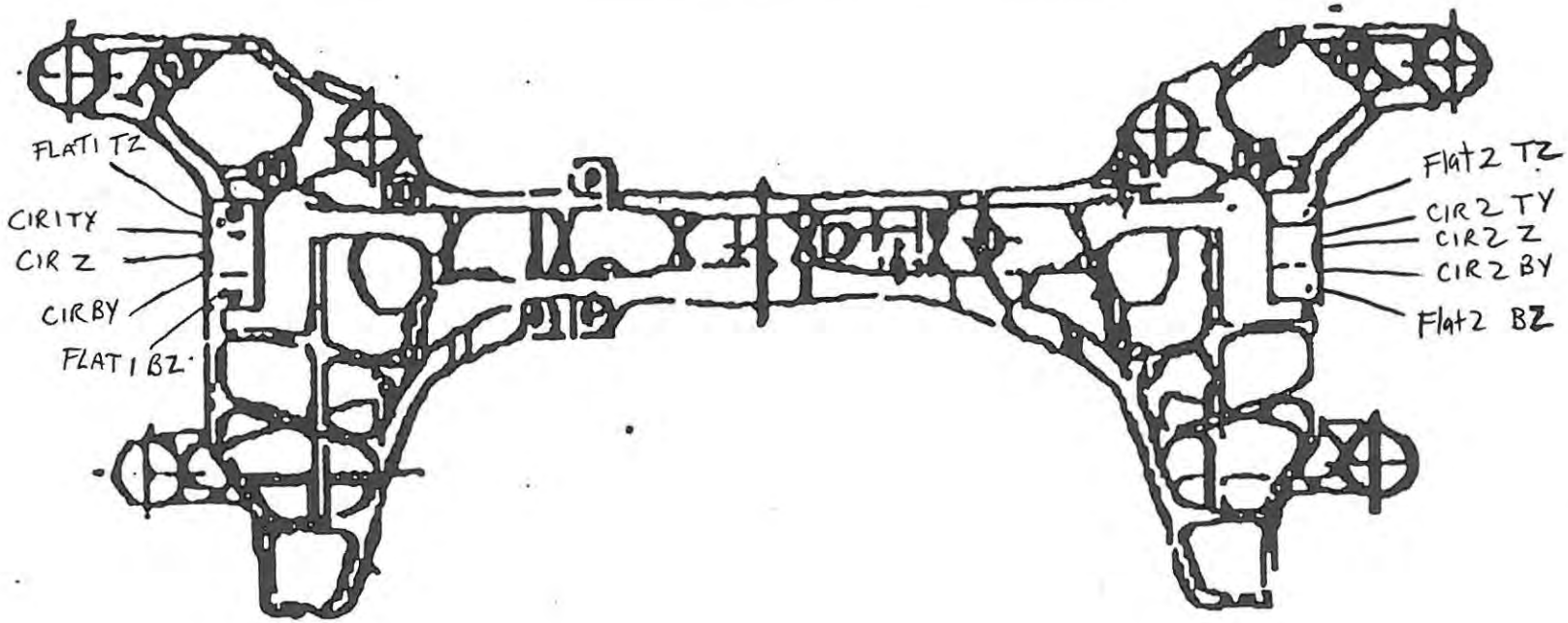
The following table is the summary of the measurements before and after heat treatment.
The alignment of these parts was the same as the previous study done on March 21st, 1997.

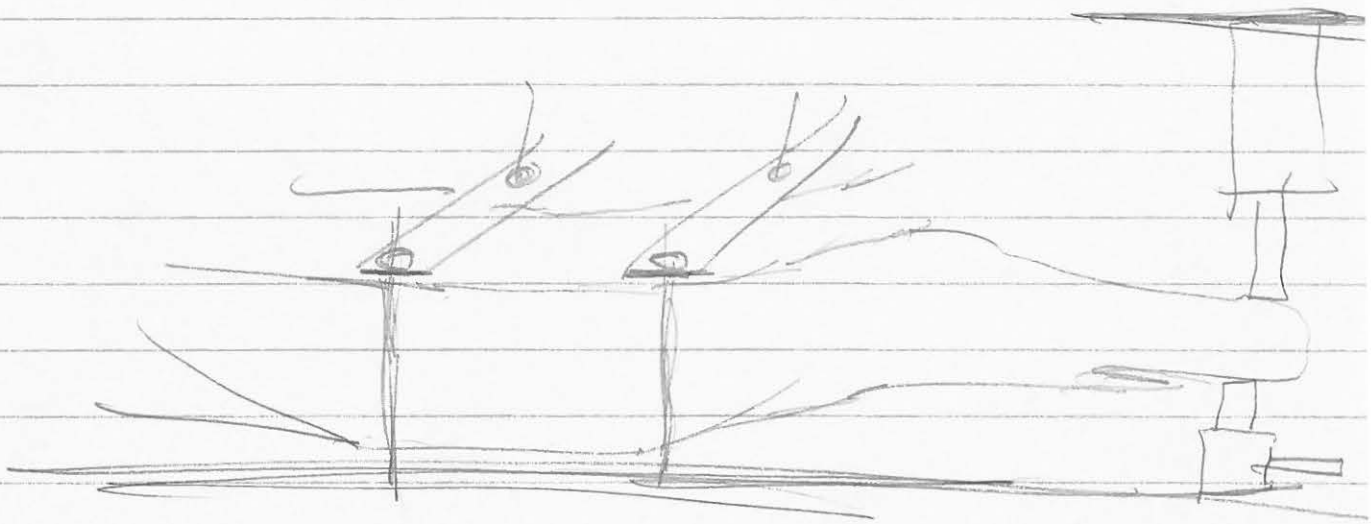
	Test Piece #1			Test Piece #2			Test Piece #3			Test Piece #4			
	Before HT	After HT	Dif	Before HT	After HT	Dif	Before HT	After HT	Dif	Before HT	After HT	Dif	Average
Area 1 Z	30.26	29.64	**0.62**	31.76	29.56	**2.2**	30.04	29.28	**0.76**	30.47	28.66	**1.81**	1.3475
X	518.81	517.88	**0.93**	518.56	517.84	**0.72**	518.68	517.55	**1.13**	518.61	517.63	**0.98**	0.94
Y	-187.1	-188.08	**0.98**	-186.96	-188.43	**1.47**	-187.72	-189.34	**1.62**	-187.24	-188.76	**1.52**	1.3975
Area 2 Z	170.09	169.41	**0.68**	168.82	169.33	**-0.51**	169.57	170.28	**-0.71**	169.95	170.24	**-0.29**	-0.2075
X	537.09	537.48	**-0.39**	536.91	537.38	**-0.47**	537.27	537.62	**-0.35**	536.93	537.53	**-0.6**	-0.4525
Y	94.73	94.32	**0.41**	96.28	93.96	**2.32**	94.06	92.92	**1.14**	94.82	92.9	**1.92**	1.4475
Area 3 Z	170.05	169.19	**0.86**	168.29	169.05	**-0.76**	169.91	168.55	**1.36**	170.05	168.13	**1.92**	0.845
X	-457.2	-457.27	**0.07**	-456.96	-456.89	**-0.07**	-456.96	-456.88	**-0.08**	-457.04	-456.96	**-0.08**	-0.04
Y	94.17	94.68	**-0.51**	96.11	94.59	**1.52**	94.35	94.71	**-0.36**	94.43	94.67	**-0.24**	0.1025
Area 4 Z	30.21	30.44	**-0.23**	31.75	29.97	**1.78**	30.29	30.39	**-0.1**	30.51	30.17	**0.34**	0.4475
X	-448.21	-448.51	**0.3**	-448.59	-448.83	**0.24**	-448.76	-448.56	**-0.2**	-448.64	-448.7	**0.06**	0.1
Y	-187.38	-187.35	**-0.03**	-187.19	-186.9	**-0.29**	-187.44	-186.98	**-0.46**	-187.44	-187.01	**-0.43**	-0.3025
Flat 1 TZ	157.11	156.68	**0.43**	156.85	156.61	**0.24**	156.88	156.81	**0.07**	157.14	156.75	**0.39**	0.2825
BZ	157.24	156.74	**0.5**	157.4	156.71	**0.69**	157.02	156.53	**0.49**	157.34	156.43	**0.91**	0.6475
CIR 1 Z	130.38	129.85	**0.53**	130.33	129.81	**0.52**	130.14	129.88	**0.26**	130.64	129.84	**0.8**	0.5275
TY	31.27	31.04	**0.23**	31.81	30.74	**1.07**	29.59	30.17	**-0.58**	30.22	29.81	**0.41**	0.2825
BY	-2.19	-2.82	**0.63**	-1.27	-3.29	**2.02**	-3.28	-3.65	**0.37**	-2.39	-3.66	**1.27**	1.0725
Flat 2 TZ	157.51	157.07	**0.44**	156.81	157.09	**-0.28**	157.52	157.29	**0.23**	157.44	156.99	**0.45**	0.21
BZ	157.42	157.17	**0.25**	157.41	157.09	**0.32**	157.59	157.42	**0.17**	157.49	157.08	**0.41**	0.2875
CIR 2 Z	130.65	130.28	**0.37**	130.28	130.2	**0.08**	130.69	130.52	**0.17**	130.75	130.21	**0.54**	0.29
TY	30.61	30.71	**-0.1**	31.48	30.59	**0.89**	30.21	30.68	**-0.47**	30.52	30.96	**-0.44**	-0.03
BY	-2.42	-2.35	**-0.07**	-1.04	-2.29	**1.25**	-2.36	-2.46	**0.1**	-2.17	-2.45	**0.28**	0.39

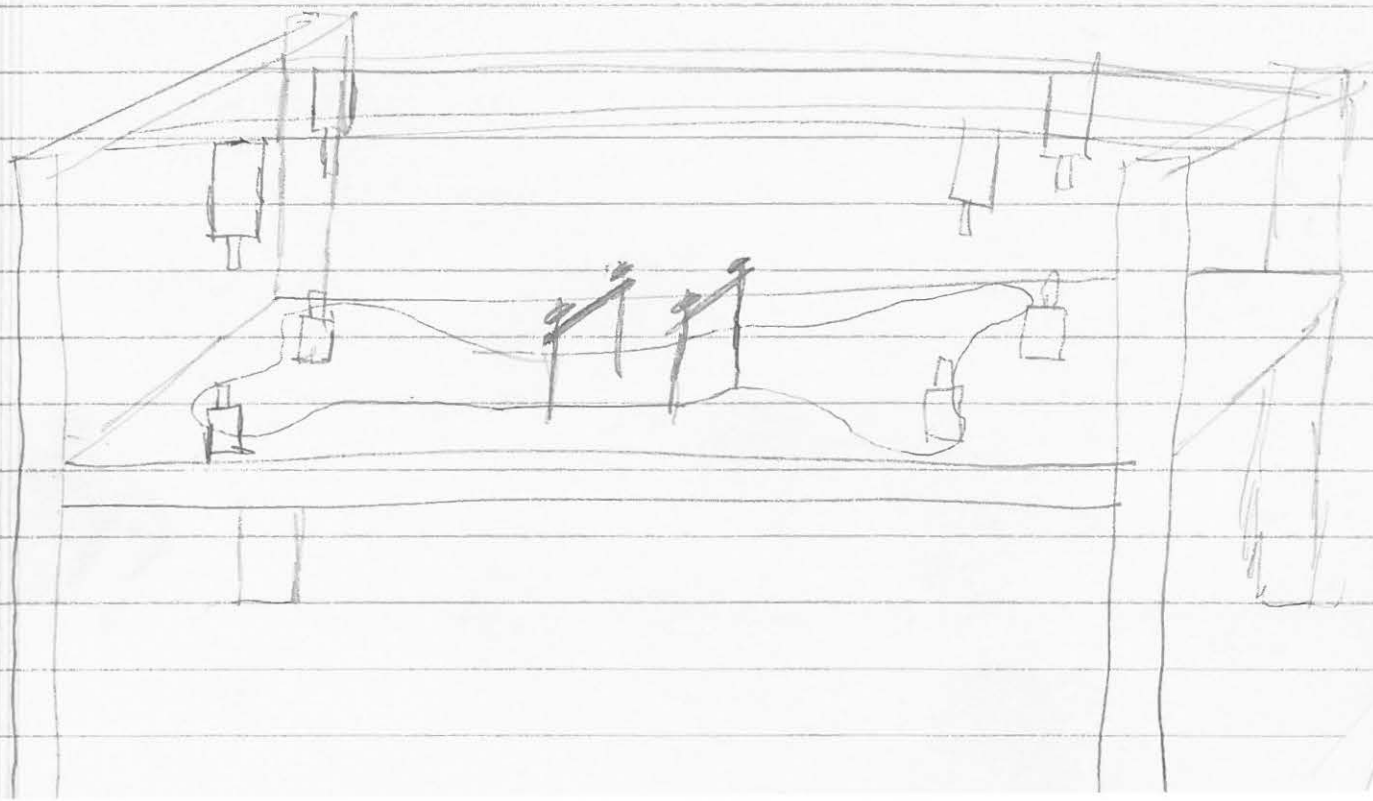
Bottom



Top


FLAT1 TZ
CIR1TY
CIR Z
CIRBY
FLAT1 BZ
Flat2 TZ
CIR2 TY
CIR2 Z
CIR2 BY
Flat2 BZ





AAP

ST. MARYS CORP.

INTEROFFICE CORRESPONDENCE

TO: Norm, Randy, Mark, Nadereh, Daryl

FROM: Alan Kohlrieser

DATE: December 10, 1997

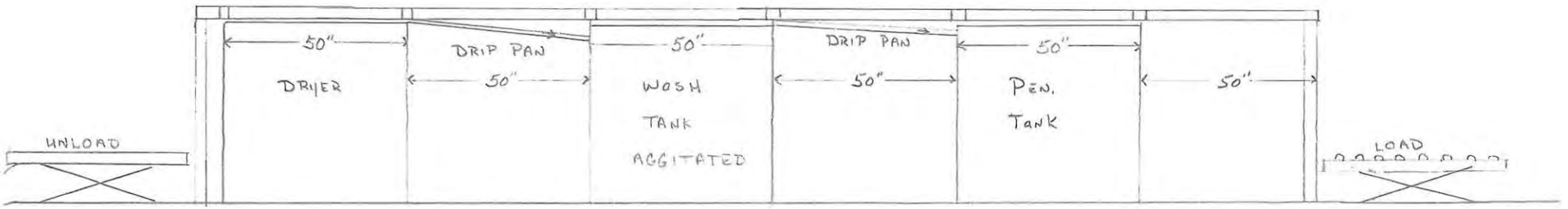
SUBJECT: Crossmember Testing -- Measuring Before & After Aging

16 pc. Test:

	BEFORE AGING			AFTER AGING		
PART NO.	#1	#5	#6	#1	#5	#6
106	113.7	-1.8	.3	114	-1.9	.3
46	113	.4	.4	112.6	.4	.5
14	113.3	.4	.1	113.3	.5	.2
38	114	.2	.6	114	.1	.5
115	113.4	.1	.0	113.2	.1	.2
52	113.3	.5	.5	113.5	.5	.6
9	113.3	.8	.2	113.3	.7	.1
12	112.8	.7	.5	112.8	1.2	.3
13	113.3	.3	.6	113.3	.3	.6
112	113.6	.5	.1	113.6	.5	.1
11	112.9	1.0	.5	112.8	.9	.5
16	113.6	.4	.2	113.5	.4	.1
31	113.7	.1	.4	113.7	.1	.4
101	113.0	.5	.5	112.8	.5	.5
43	112.7	.5	.5	112.8	.5	.5
29	113.4	.5	.7	113.3	.4	.8

KL:MSW:MD:SMtstAge

Auto System
D:D Tank



centura NDT

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X-ray Film and Processing Chemicals
X-ray Paper and Processing Chemicals
Film Viewers and Pocket Comparators
Film Duplicators
Lead Numbers and Letters
Lead Intensifying Screens
Real-Time Systems
Exposure Holders (cardboard and vinyl)
Image Intensifiers
Manipulators
Tube Shutters
Film Hangers
Film Filing Cabinets and Filing Envelopes
Densitometers
Immersion Heaters and Thermometers
Darkroom Safelight and Timers
Dosimeter and Dosimeter Charges
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Penetrameters, Mounting Blocks and Step Wedges
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QUOTATION

From

C.O. WELDING & FABRICATION INC
410 SOUTH MAIN STREET
ST MARYS OH 45885-2512
FAX/PHONE #: (419) 394-3293

SHOP LOCATION/PHONE:
850 SOUTH MAIN STREET
ST MARYS OH 45885
419-394-8867

To

AAP ST MARYS CORP
ATTN: DARRELL BRACKNEY
PO BOX 408
ST MARYS OH 45885

No. 2627

Date 12/13/99

Your No. _____

Your Due Date _____

Terms NET 30 DAYS

Prices quoted are
F.O.B. _____

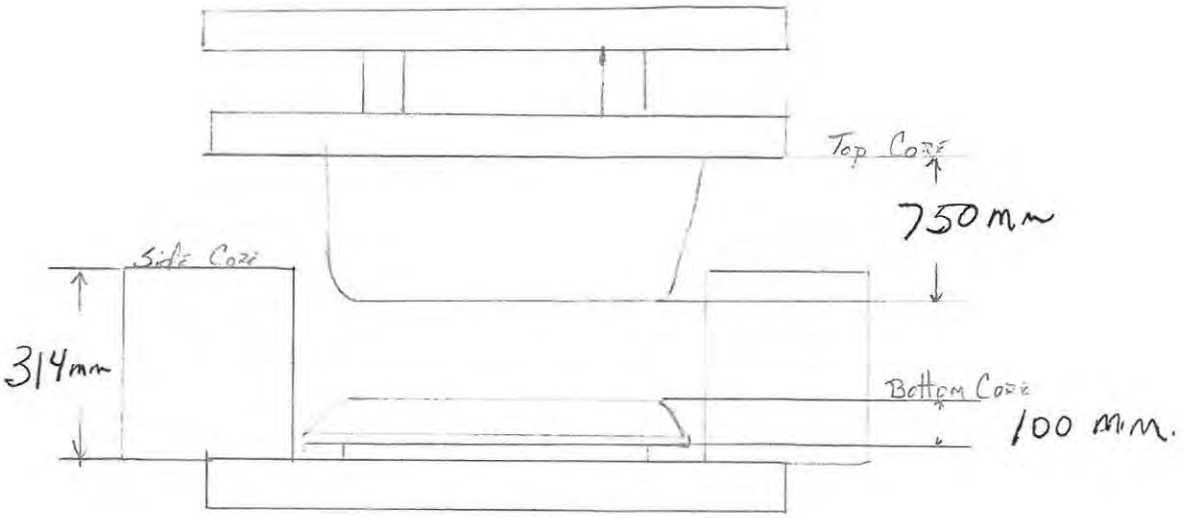
Delivery DATE _____

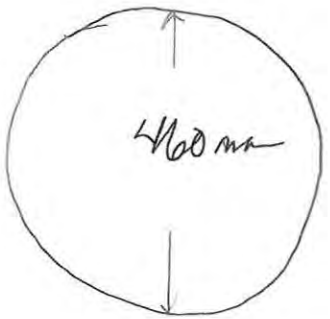
We are pleased to quote as follows:

1	LABOR AND MATERIALS TO CONSTRUCT DOUBLE BURNER FOR CROSS MEMBER DIE AS PER YOUR DRAWING.	$495.00	EA	$495.00

To: Rob Black
From: Daryl Brackney
AAP St. Marys Corp.

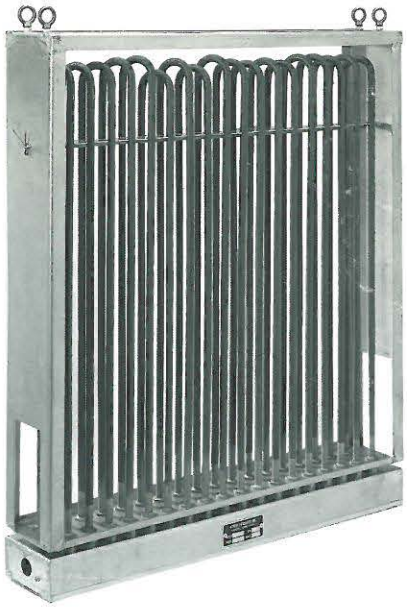
- Here the drawing and measurements you requested. Hopefully this will help.



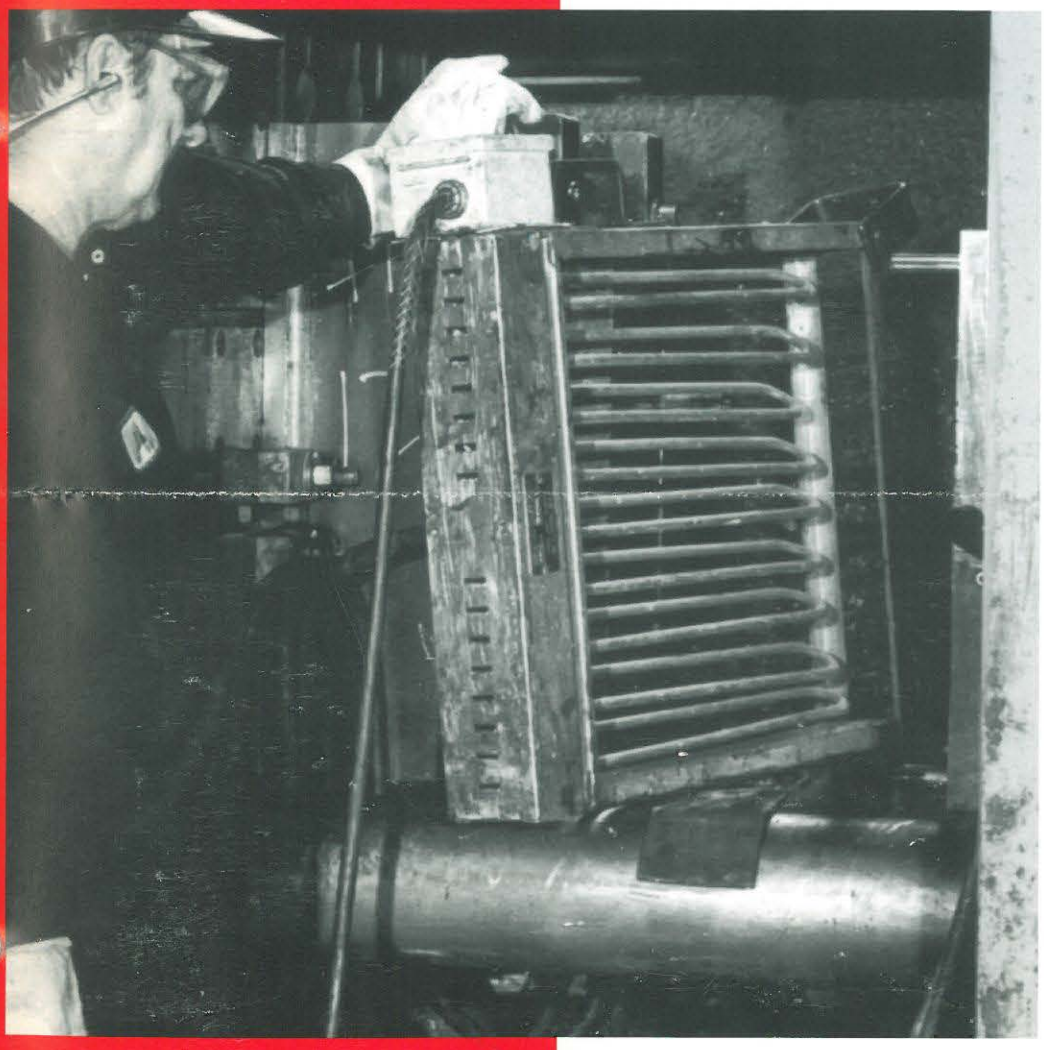


Aitken Electric Infrared Die Heaters





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Same Day Shipping of Heaters & Replacement Parts

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Effective 6/1/97, new area code is 440.

Aitken
PRODUCTS, INC.

Proven In Over 200 Die Casting Plants



Constructed for heavy-duty use, with welded 304 stainless 14-gauge steel. Rust-free, virtually indestructible, with 100% American-made components.

Long life Incoloy® elements, resistant to corrosion and oxidation at high sheath temperatures. Elements can be changed in minutes using simple hand tools.

Pre-wired with 250°C high temperature, asbestos-free wire.

Rugged 1/8" welded aluminum terminal box with .050 vented cover for maximum heat dissipation and long life.

Get a Pre-Heated Die at Shift Start

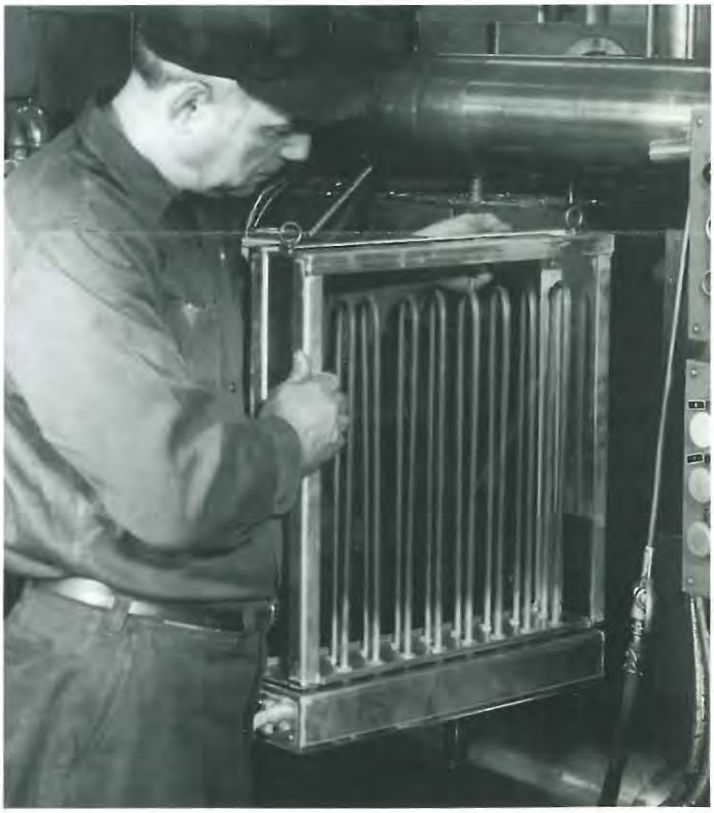
The die heater can be installed in the die after shut-down and programmed to start heating prior to the start of the first shift. This allows production to begin at the start of the shift without costly waiting for die warm-up.

Eliminate Scrap at Start-Up

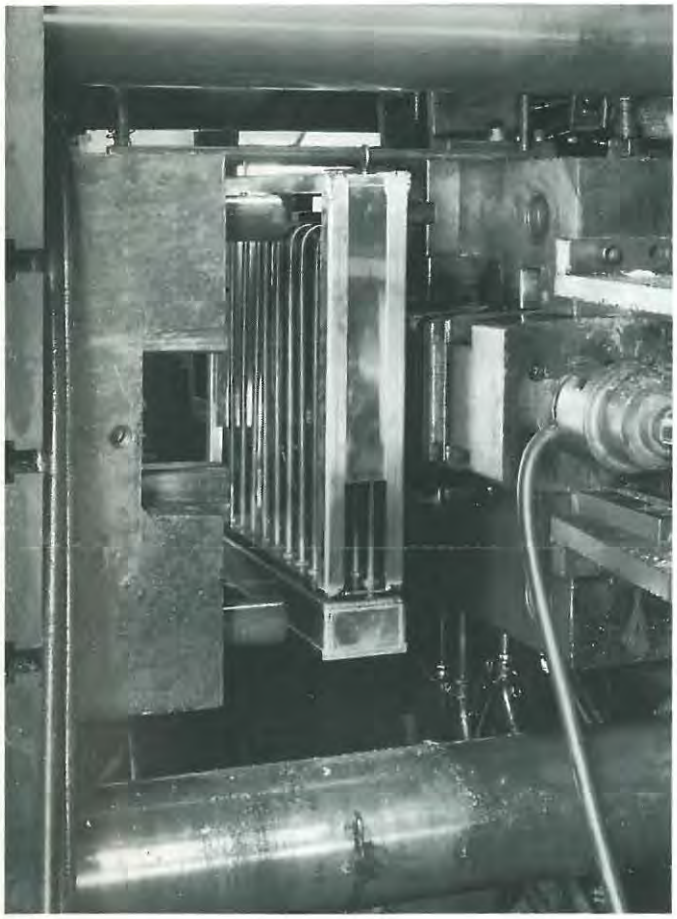
Many of our customers are producing good castings immediately after starting operations. This is accomplished only by using the Aitken Die Heater.

Maintain Die Heat During Production Breaks

Eliminates the need for turning water lines off and on. Just insert heater in the machine with dies wide open and you'll have enough heat to maintain die temperature.



Lightweight, easy to handle. Can be installed or removed in seconds by one man.



Fits easily between die opening. Provides even, penetrating, clean, infrared heat. Many die sections can be pre-heated to 325°F within one hour.



The old-fashioned, open-flame method produces very uneven heating.

Benefit From These Operating Advantages

Reduced Die Maintenance, Increased Die Life

By pre-heating the dies, you reduce the differential between operating and room temperature. The less temperature difference, the less thermal shock and strain on the tooling which leads to die checking. Hence, the lower the thermal shock, the lower the die maintenance and the greater the service life. **Die life may be extended as much as 300%.**

Even Die Temperatures

Some methods of die pre-heating result in extreme unevenness in die temperature. On an average die these extremes could range from relatively cool spots to burned core pins and annealed sections. Using an Aitken infrared die heater, the die temperature will vary approximately 10°F per inch of distance from the unit. Hence, a die cavity four inches deep would be only 40°F lower in temperature than the die surface.

Faster Die Warm-Up

Many die sections can be pre-heated in a machine to temperatures of 325°F within one hour. For example, we are currently heating a 24" x 48" x 10" two cavity die on a 1000 ton Lester machine. At the end of one hour, we are attaining 315°F using two 13.5 kilowatt heaters, one for each die cavity.

No Burned Core Pins or Hoses

The electric heating element has a maximum surface temperature of 1550°F. Should the element come in contact with a core pin, there would not be enough BTUs at the point of contact to cause any harm.

Clean Heat

With the Aitken electric heater, there are no by-products of combustion such as carbon which must be removed from the die surface before operation.

Versatile Models

These units come in many different sizes and are available in most standard voltages (see chart on back cover). The heaters may be operated independently or grouped together on larger dies.

40 Years Of Infrared Heating Knowledge

Aitken Products, Inc. helped pioneer effective, dependable infrared heat over 40 years ago...Today you can benefit from Aitken's vast infrared experience, combined with Dy-Kast's decades of die-casting and forging application knowledge. Satisfied Aitken die heater users include:

- Caterpillar Inc.
- General Electric
- Honda of America
- Reliance Electric
- Rockwell International
- Saturn Corporation



Outstanding Customer Support & Shipping

- **12 standard models always in stock** and ready for shipping within 24 hours from receipt of order.
- **Same day UPS shipping for all replacement parts & elements.**
- All parts can be quickly serviced or replaced by the user, with simple hand tools.
- All products warranted to be free of defects in workmanship or materials.
- Technical support in die-cast applications from Dy-Kast Supply and Equipment, a partner with Aitken for over 30 years.

Standard Sizes Shipped Within 24 Hours!

Custom Sizes & Voltages Also Available: Call for Details.

Model	Element #	KW	Volts	Phase	Heater Dimensions W H D	Weight
DH 923	HE 15024	9	240	3	12" x 22" x 4"	19 lbs.
DH 943	HE 15048	9	460	3	12" x 22" x 4"	19 lbs.
DH 955	HE 15027	9	550	3	12" x 22" x 4"	19 lbs.
DH 13523	HE 15024	13.5	240	3	20" x 22" x 4"	25 lbs.
DH 13543	HE 15048	13.5	460	3	20" x 22" x 4"	25 lbs.
DH 13523 SP	HE 15024	13.5	240	3	17-1/2" x 22" x 4"	25 lbs.
DH 13543 SP	HE 15048	13.5	460	3	17-1/2" x 22" x 4"	25 lbs.
DH 15553	HE 15027	15	550	3	20" x 22" x 4"	25 lbs.
DH 3043	HE 25024	30	460	3	24" x 34" x 5"	48 lbs.
DH 3055	HE 25027	30	550	3	24" x 34" x 5"	48 lbs.
DH 4043	HE 22524	40	480	3	30" x 34" x 5"	77 lbs.
DH 4055	HE 20277	40	550	3	30" x 34" x 5"	77 lbs.

Aitken PRODUCTS, INC.

P.O. Box 151, Geneva, Ohio 44041
Tel: 216-466-5711 • Fax: 216-466-5716
Effective 6/1/97, new area code is 440.

Dy-Kast
Supply and Equipment
26192 Center Ridge Road
P.O. Box 450800
Westlake, Ohio 44145
Tel: 216-333-7777 • Fax: 216-871-8840

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Date: 07/27/98 — Painting Shift Report — Printed: 07/28/98 10:01:14
Team: Scarlet

Part#	Base Coat Good	Base Coat NG	Base Coat Totl	PreTreat Coat Good	PreTreat Coat NG	PreTreat Coat Totl	Clear Coat Good	Clear Coat NG	Clear Coat Totl	Reject to Melt 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	Total
051	271	0	271	0	0	0	356	2	358		1																X-RAY	

Team: Scarlet SHIFT REPORT 10:21:44 Date: 07/27/98

PART NO.		QUANTITY REJECTED
FN10 RH	011	11
TOTAL		11