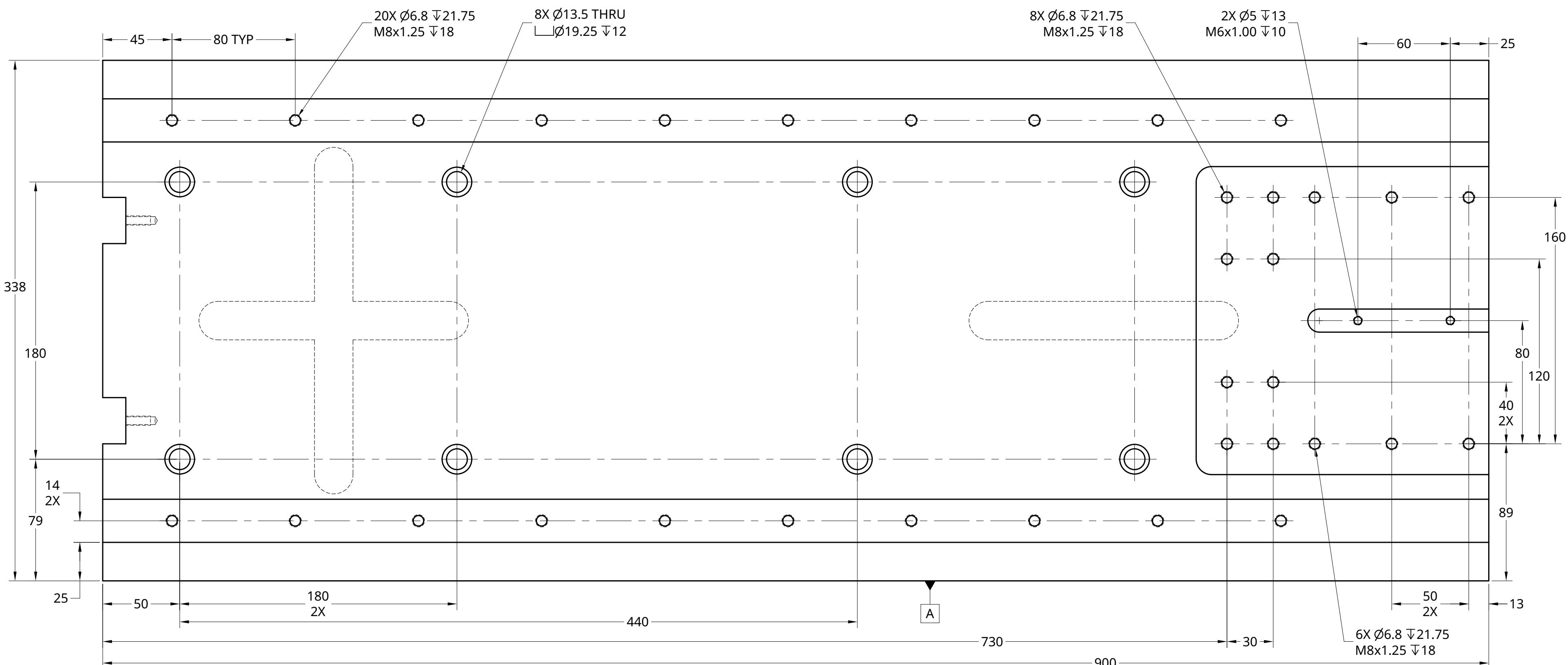


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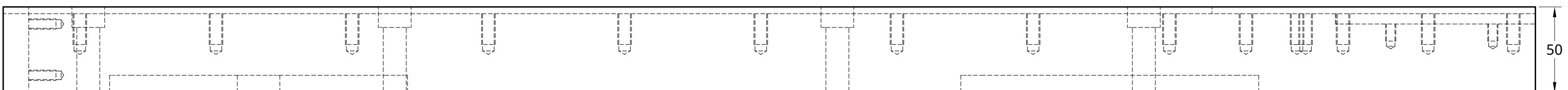
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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES XX = ±0. XXX = ±0.00 XXXX = ±0.000 SURFACE FINISH		NAME DRAWN CHECKED APPROVED	DATE 10/16/2019
DO NOT SCALE DRAWING BREAK ALL SHARP EDGES AND REMOVE BURRS		DRILL UNIT MAIN ASSEMBLY DETAILS BASE PLATE	TITLE
THIRD ANGLE PROJECTION		MATERIAL STEEL 8620	VOLUME 14566452 mm ³
REV.	BR-549-C-001	DWG NO.	SCALE 1:2 WEIGHT 114,347 kg SHEET 1 of 20

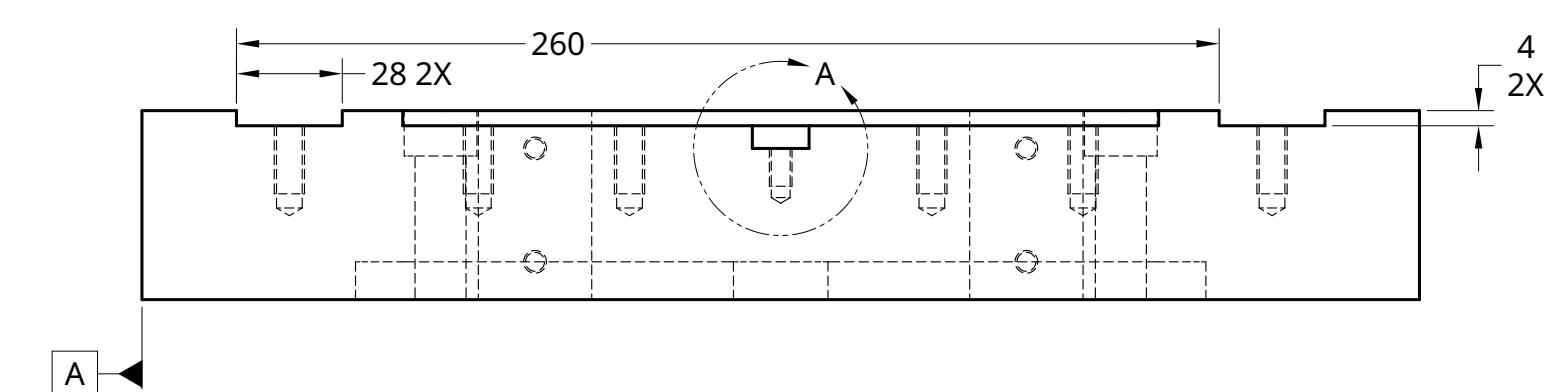
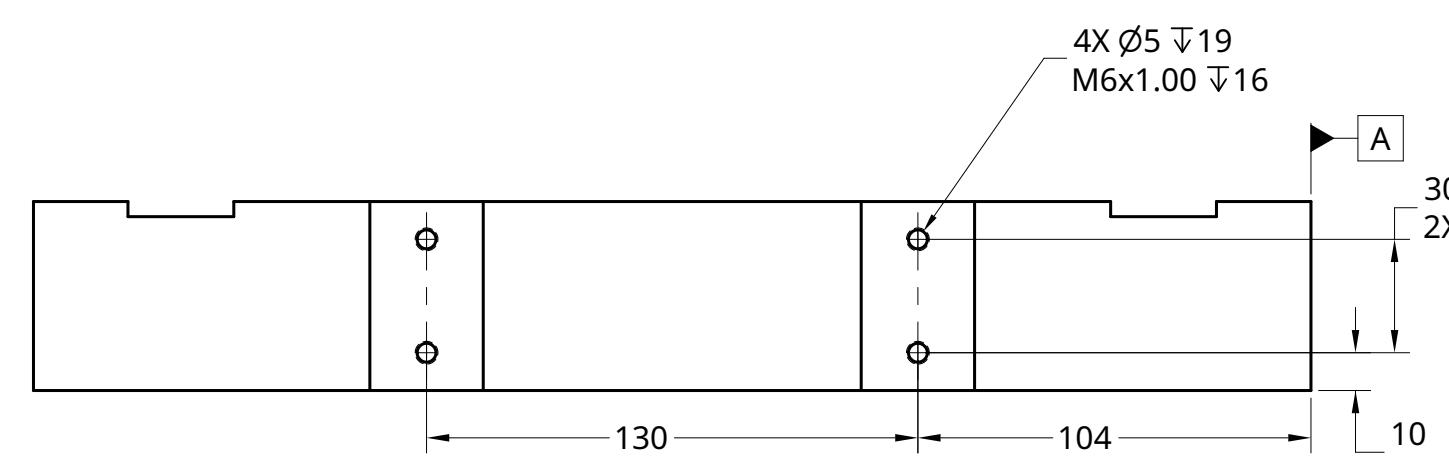
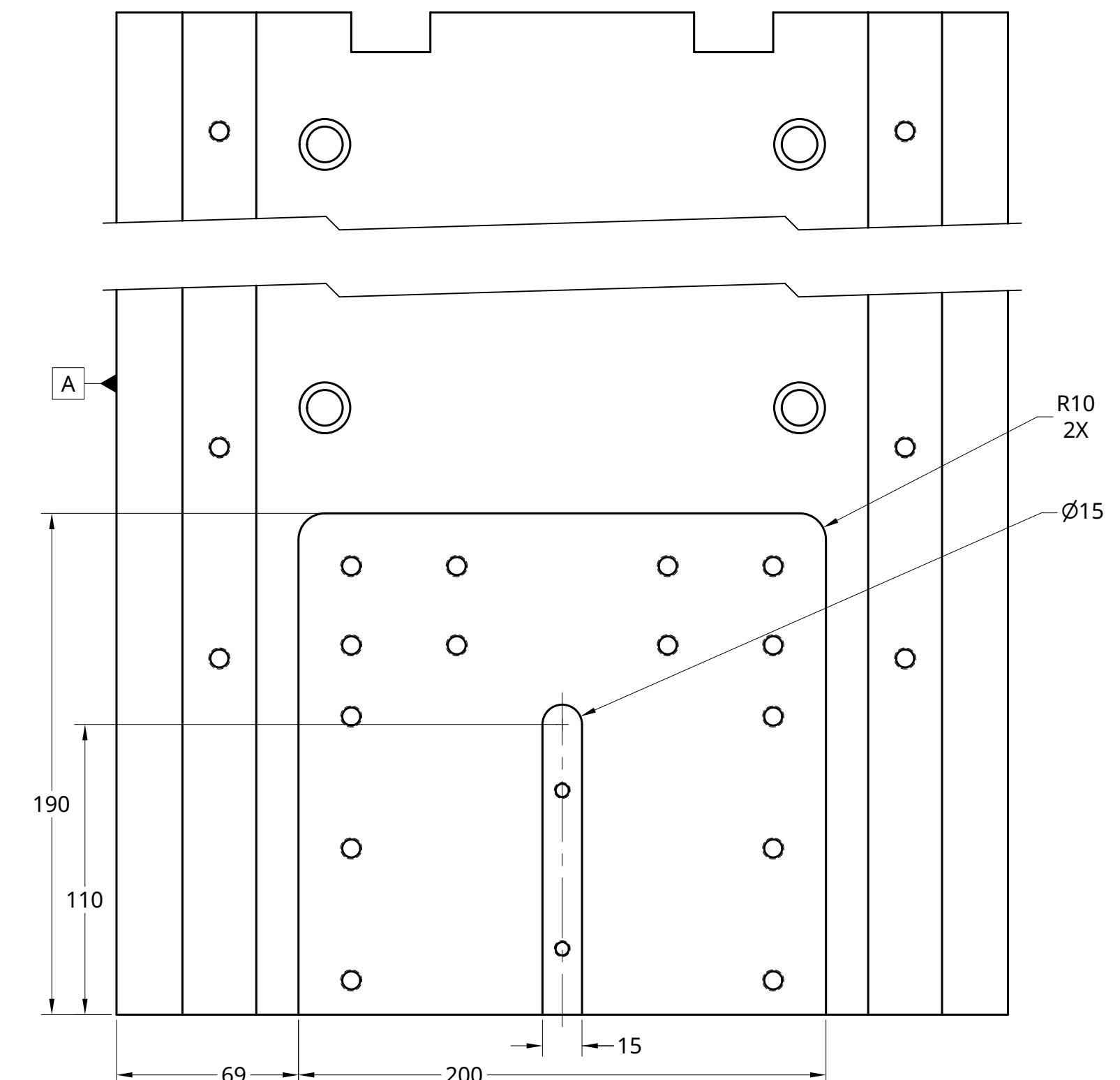
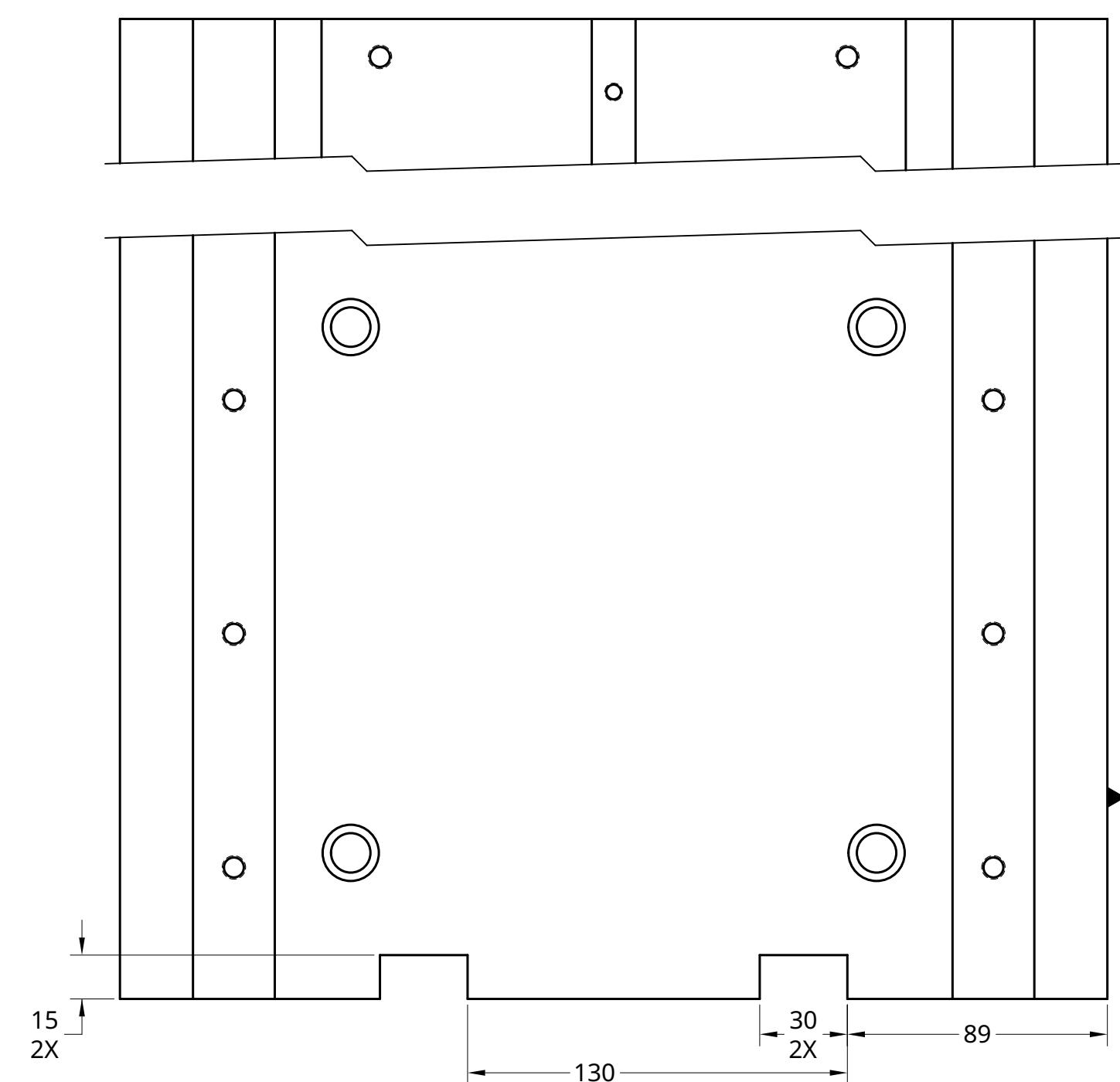
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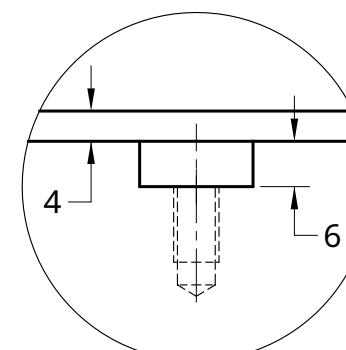
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LEFT VIEW

DETAIL A
SCALE 1:1

UNLESS OTHERWISE SPECIFIED, .XX + .0-. .XXX + .00-. .XXXX + .0000-		NAME	DATE
DRAWN	BRIAN BRADY	10/16/2019	
CHECKED			
APPROVED			
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL	VOLUME	
	STEEL 8620	14566452 mm ³	
	REV.		
Ferris State University		DRILL UNIT MAIN ASSEMBLY DETAILS BASE PLATE	
SIZE	DWG NO.	BR-549-C-001	
C		REV.	
SCALE 1:2	WEIGHT 114,347 kg	SHEET 2 of 20	

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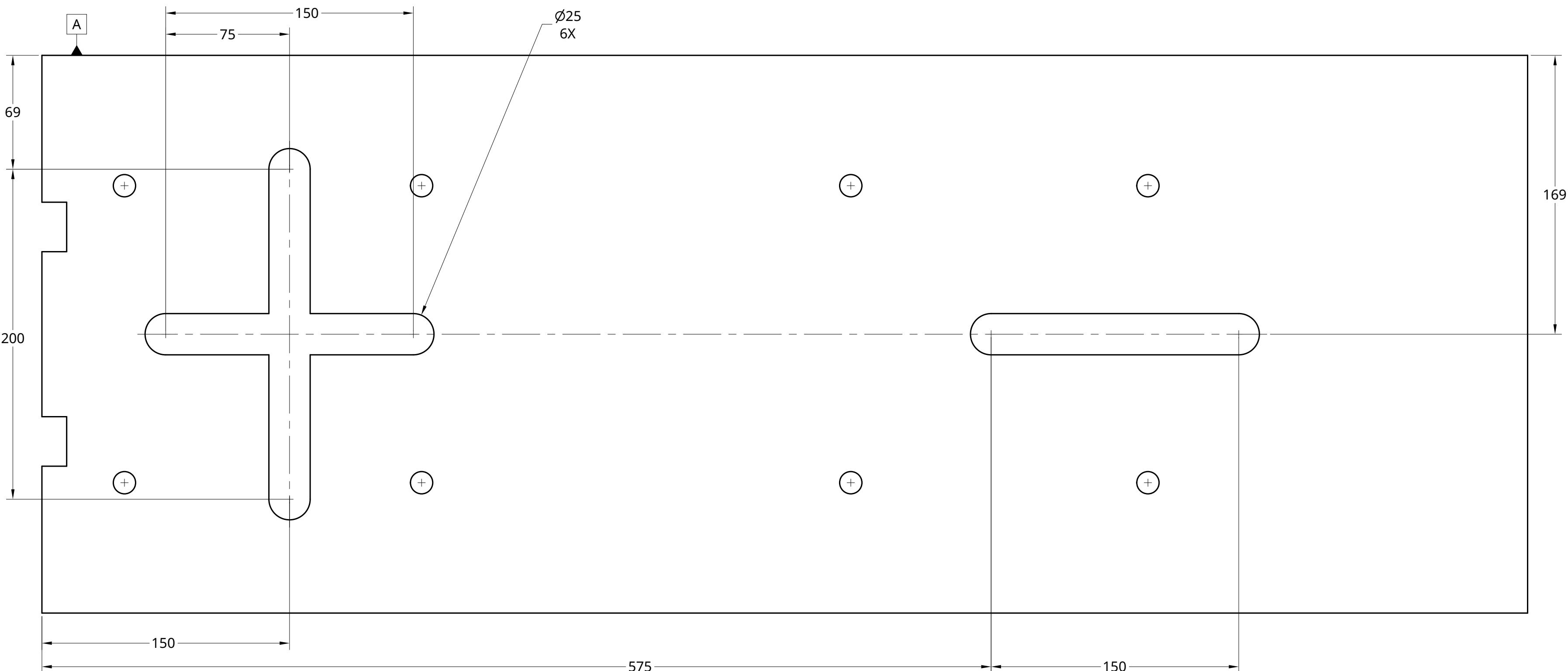
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UNLESS OTHERWISE SPECIFIED, .XX ±.0-. .XXX ±.00-. .XXXX ±.000-. SURFACE FINISH		NAME DRAWN BRIAN BRADY	DATE 10/16/2019
		CHECKED	
		APPROVED	
DO NOT SCALE DRAWING BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION		MATERIAL STEEL 8620	VOLUME 14566452 mm ³
		REV.	
TITLE DRILL UNIT MAIN ASSEMBLY DETAILS BASE PLATE		SIZE C DWG NO. BR-549-C-001	SCALE 1:2 WEIGHT 114.347 kg SHEET 3 of 20

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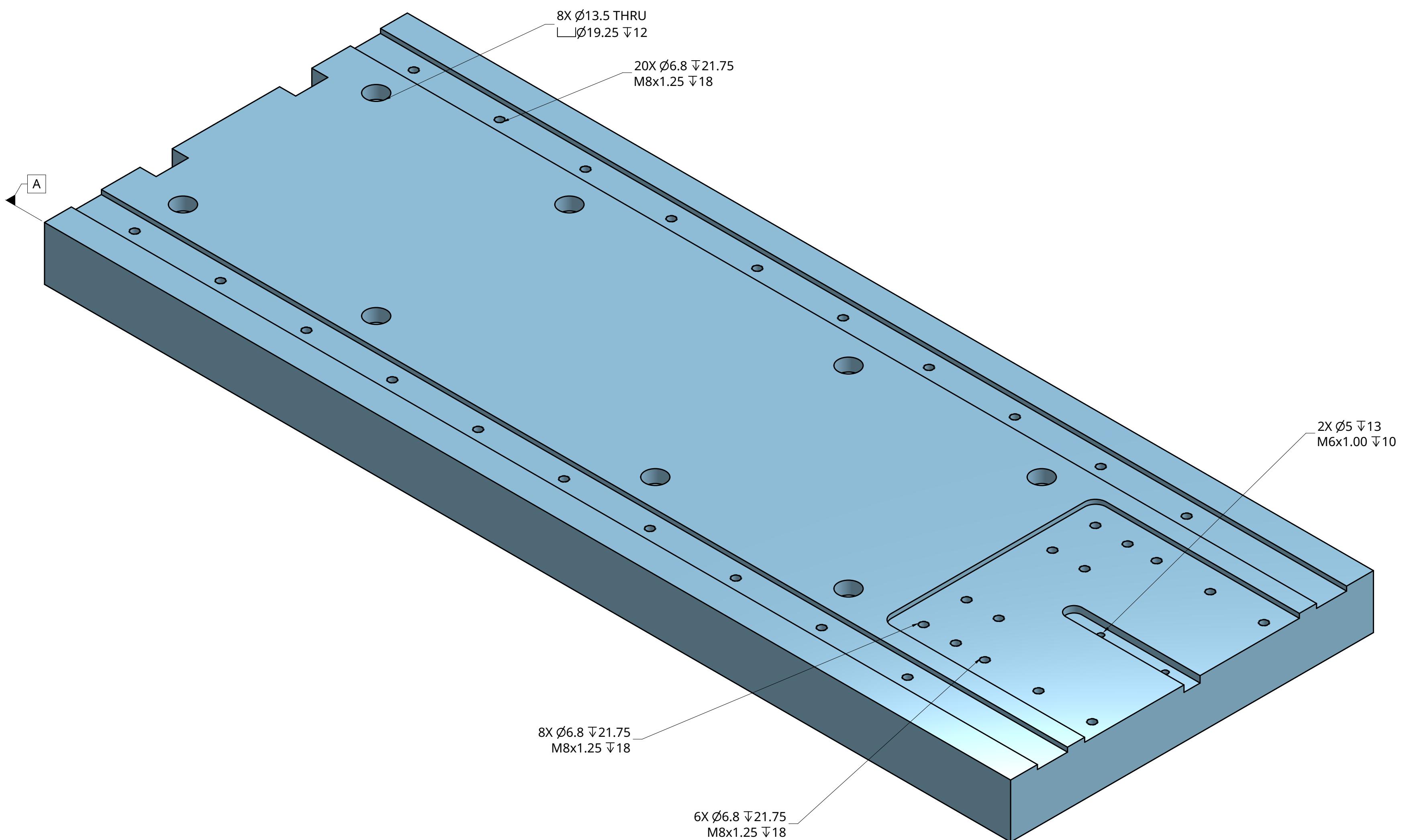
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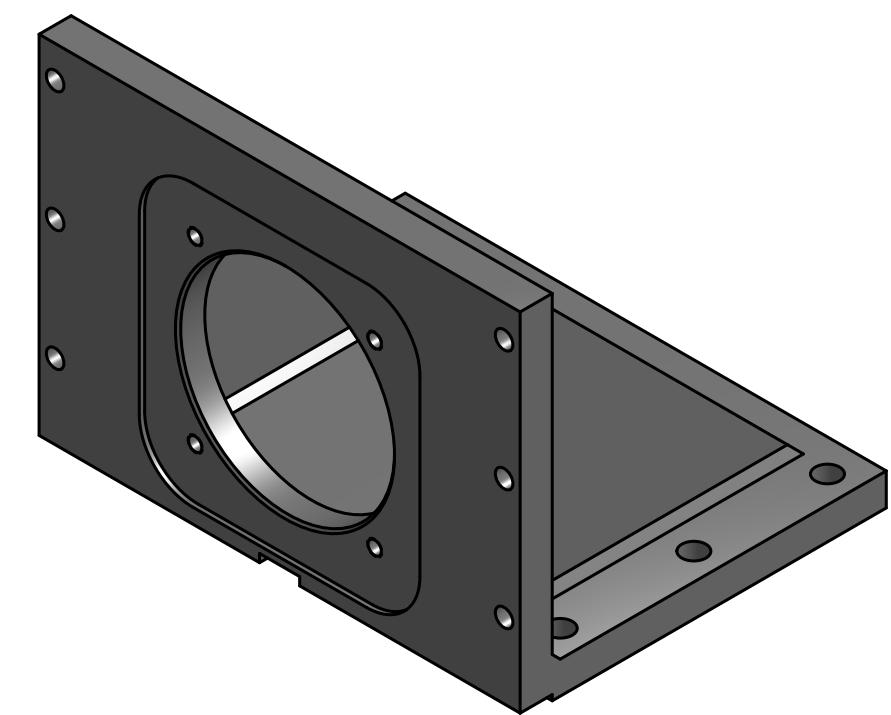
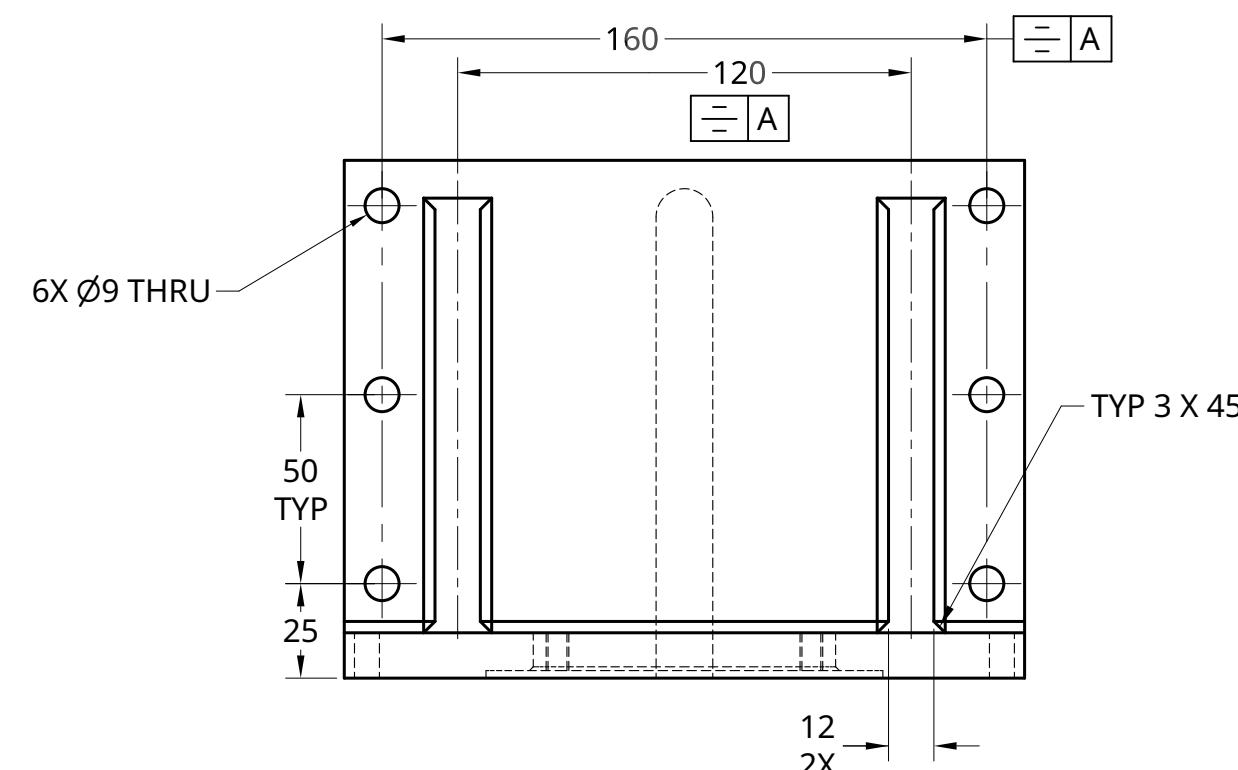
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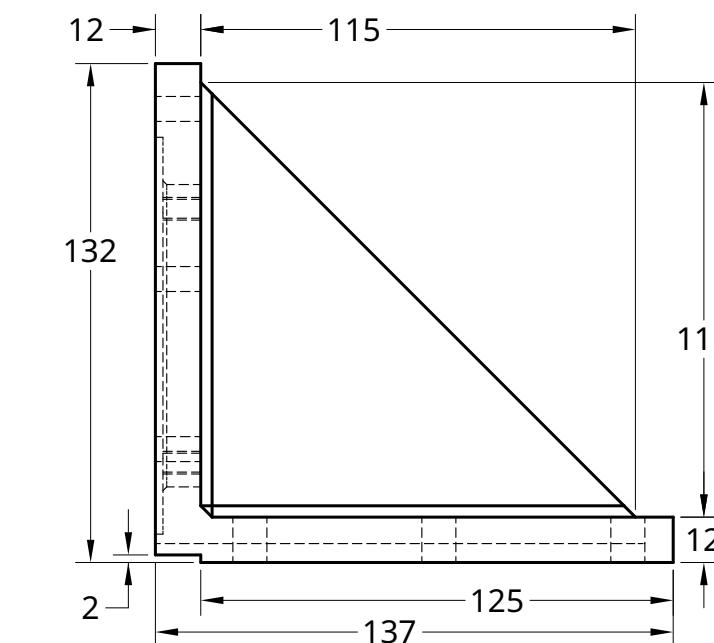
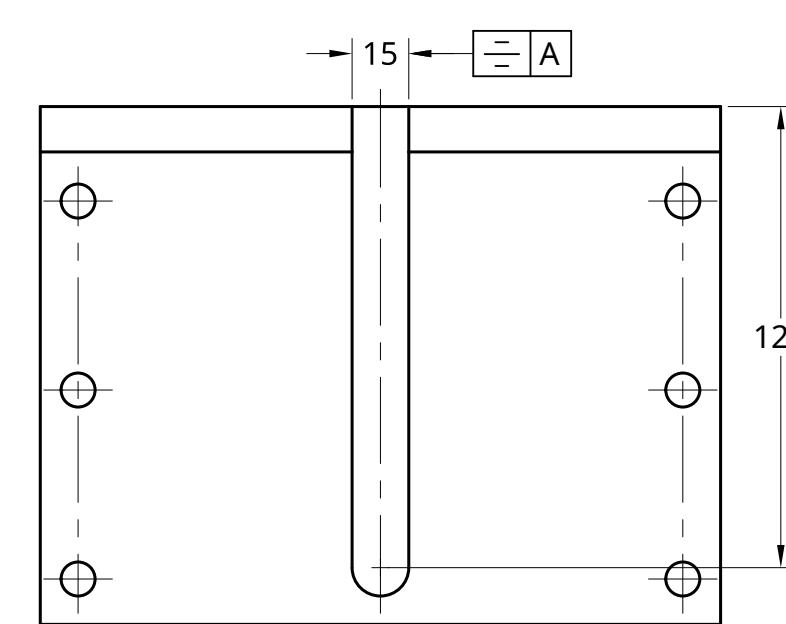
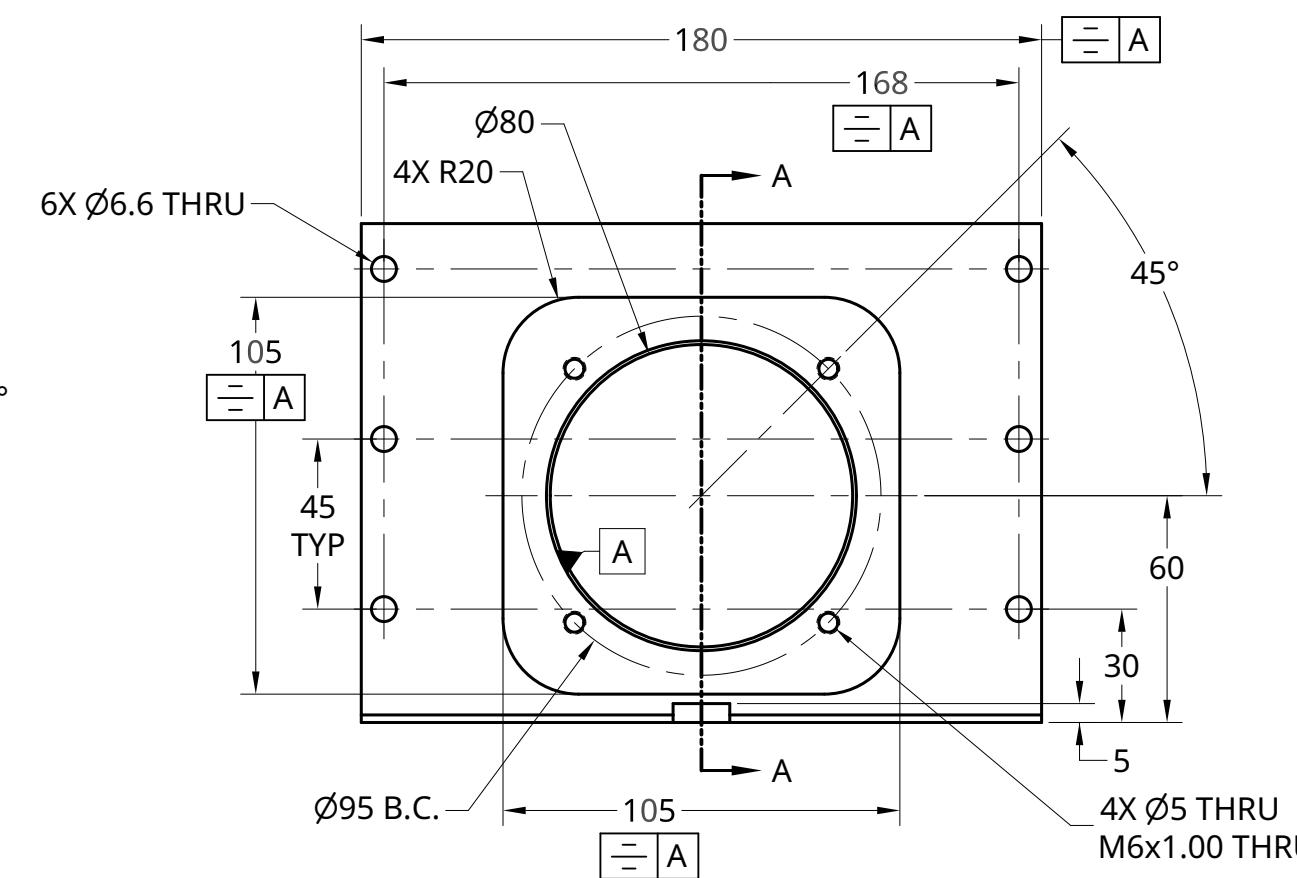
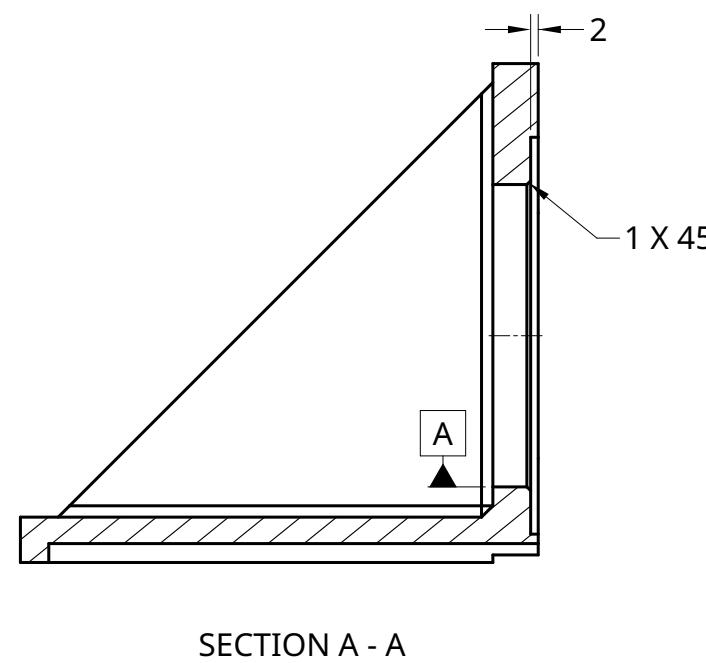


UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES .XX ±.0. .XXX ±.00. .XXXX ±.000. SURFACE FINISH		NAME DRAWN CHECKED APPROVED	DATE 10/16/2019
DO NOT SCALE DRAWING BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION		MATERIAL STEEL 8620	VOLUME 1456652 mm ³
		SCALE 1:2	WEIGHT 114.347 kg
TITLE DRILL UNIT MAIN ASSEMBLY DETAILS BASE PLATE	SIZE C	DWG NO. BR-549-C-001	REV.
			4 of 20

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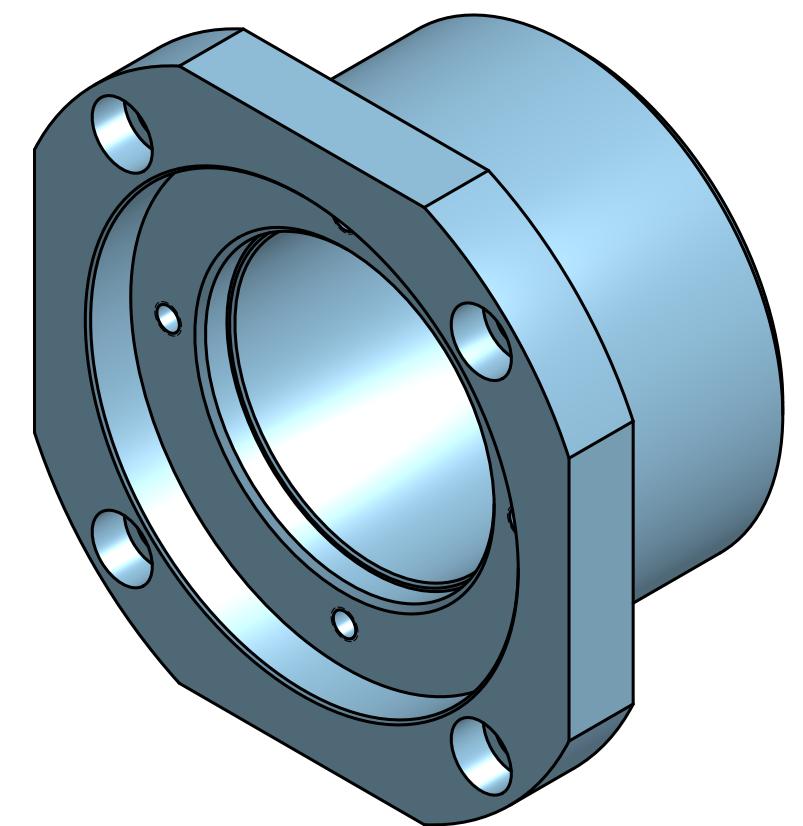
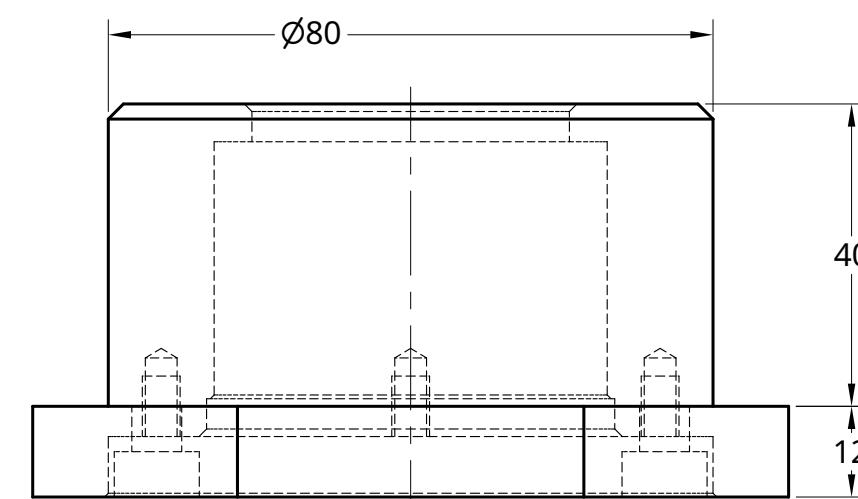
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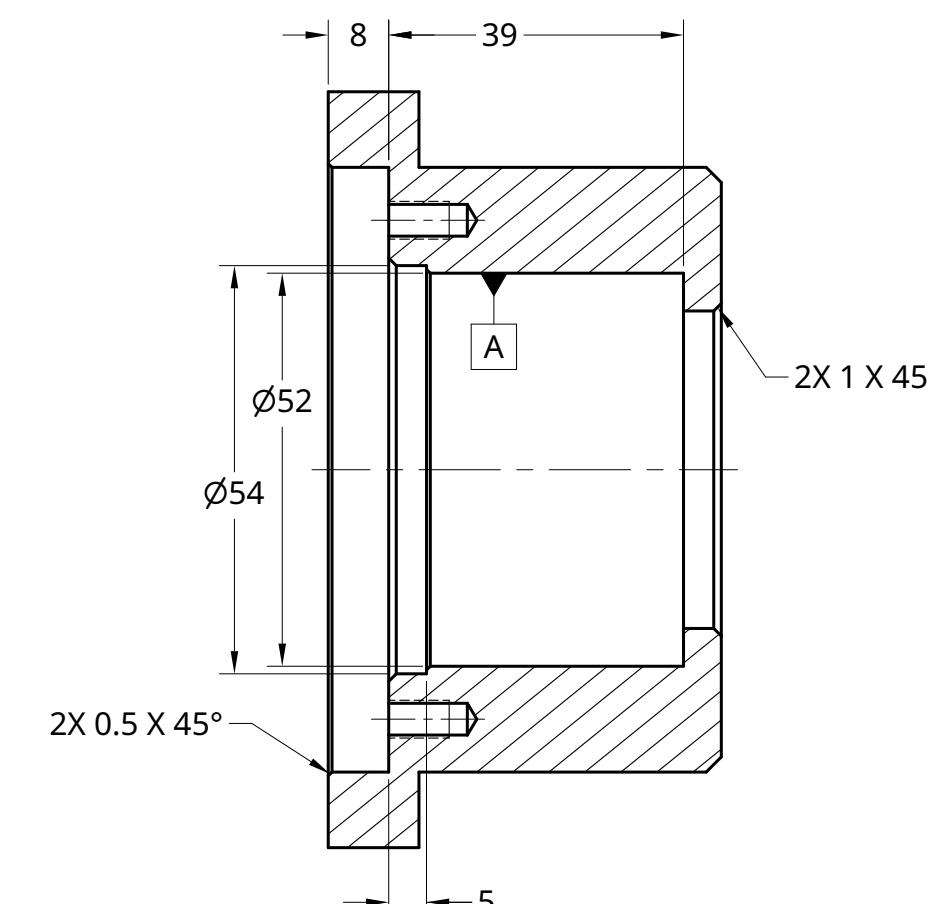
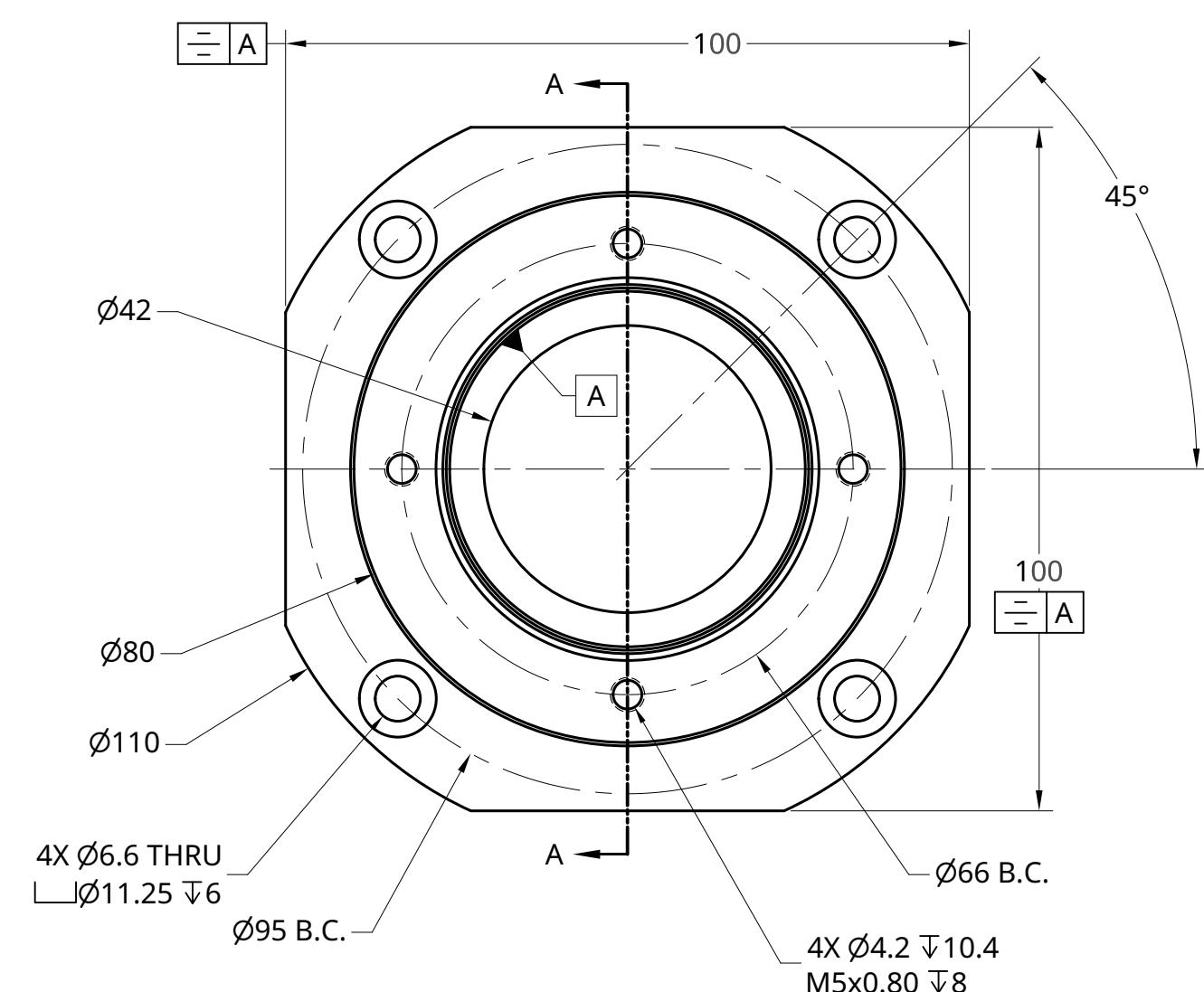
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DO NOT SCALE DRAWING BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION		MATERIAL STEEL 1020	VOLUME 278550 mm ³
		SCALE 1:2	WEIGHT 2.187 kg
REV.		SHEET 5 of 20	

Ferris State University
DRILL UNIT
MAIN ASSEMBLY DETAILS
BALL SCREW SUPPORT BRACKET
SIZE C DWG NO. BR-549-C-002

D



C



SECTION A - A

A

UNLESS OTHERWISE SPECIFIED, .XX = ±.0-. .XXX = ±.00-. XXXX = ±.000-. SURFACE FINISH		NAME DRAWN CHECKED APPROVED	DATE 10/16/2019
Ferris State University			
DRILL UNIT MAIN ASSEMBLY DETAILS BALL SCREW BEARING HOUSING			
SIZE 	DWG NO. BR-549-C-003	VOLUME 172398 mm ³	REV.
SCALE 1:1	WEIGHT 1.353 kg	SHEET 6 of 20	

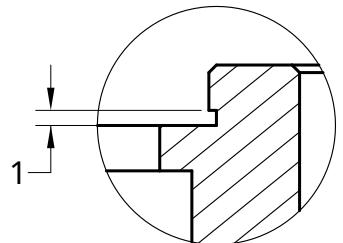
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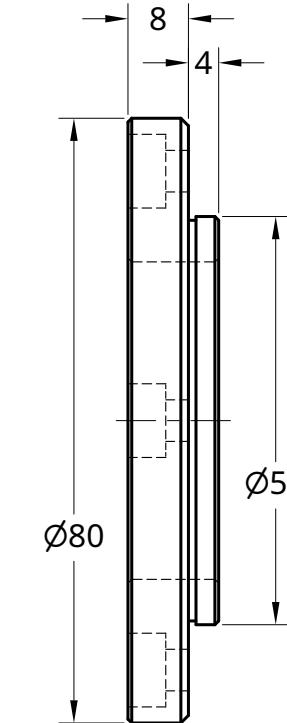
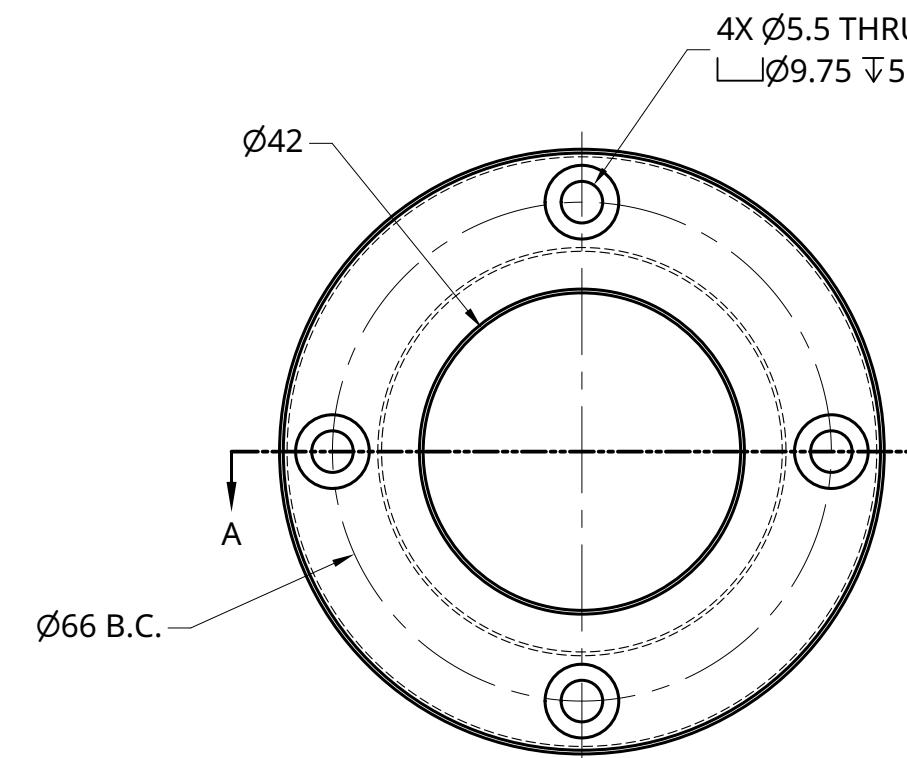
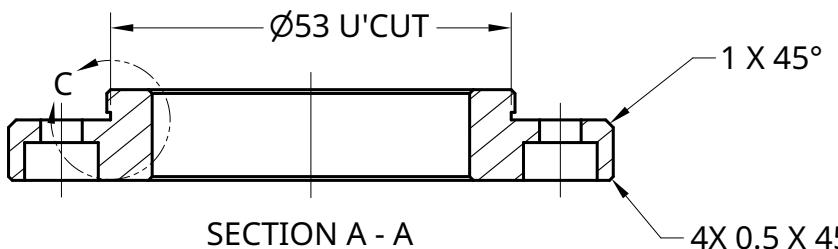
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DETAIL C
SCALE 2:1



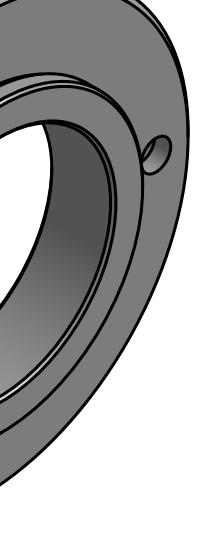
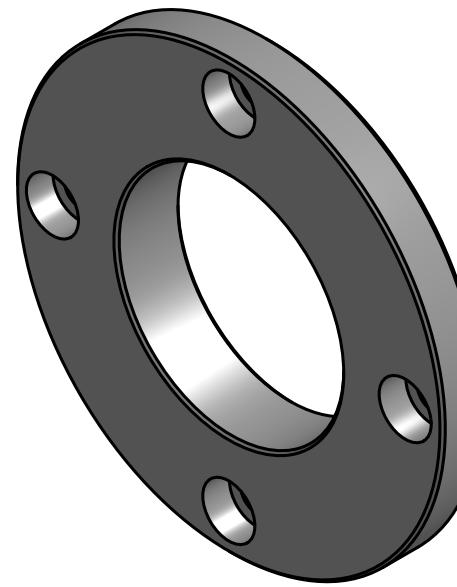
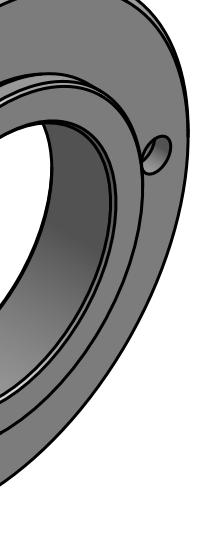
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES				DRAWN CHECKED APPROVED	NAME BRIAN BRADY	DATE 10/16/2019	TITLE DRILL UNIT MAIN ASSEMBLY DETAILS BALL SCREW BEARING CAP
.XX = ± 0.000	.XXX = ± .000	ANGULAR = ± °	FRACTIONAL = ±				
SURFACE FINISH ✓							
DO NOT SCALE DRAWING							
BREAK ALL SHARP EDGES AND REMOVE BURRS							
THIRD ANGLE PROJECTION	MATERIAL STEEL 4130	VOLUME 30675 mm³	REV.				
SCALE 1:1	WEIGHT 0.241 kg	SHEET 7 of 20					

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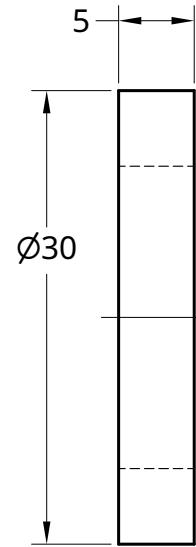
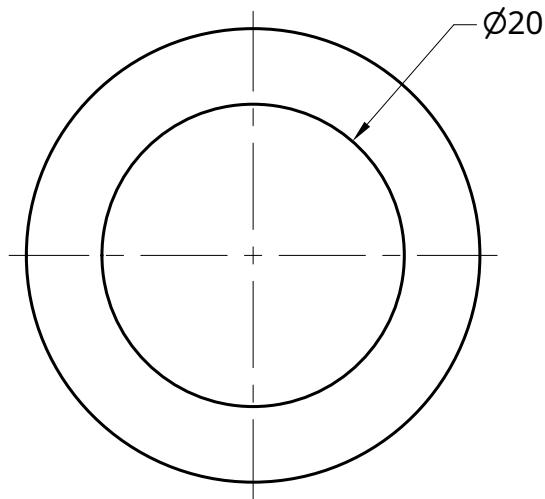
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UNLESS OTHERWISE SPECIFIED,
DIMENSIONS ARE IN INCHES

.XX = ±.0-
.XXX = ±.00-
.XXXX = ±.000-

ANGULAR = ± °
FRACTIONAL = ±

SURFACE FINISH ✓

DO NOT SCALE DRAWING

BREAK ALL SHARP EDGES AND
REMOVE BURRS

THIRD ANGLE PROJECTION



DRAWN

CHECKED

APPROVED

NAME

BRIAN BRADY

DATE

10/16/2019

TITLE

Ferris State University
DRILL UNIT
MAIN ASSEMBLY DETAILS
BALL SCREW BEARING SPACER

SIZE

A

DWG NO.

BR-549-C-005

REV.

MATERIAL

VOLUME

1963 mm³

SCALE

2:1

WEIGHT

0.015 kg

SHEET

8 of 20

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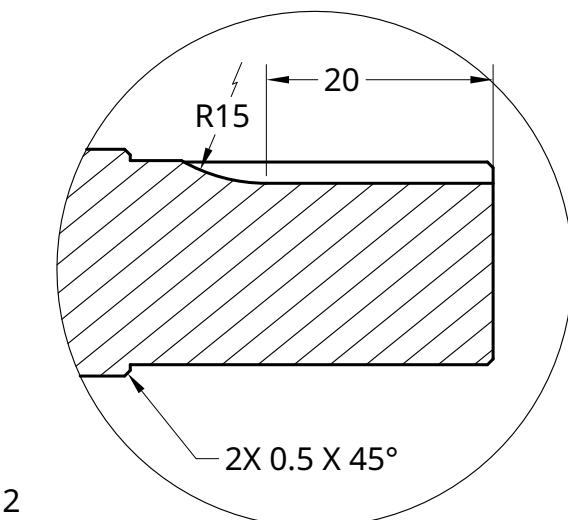
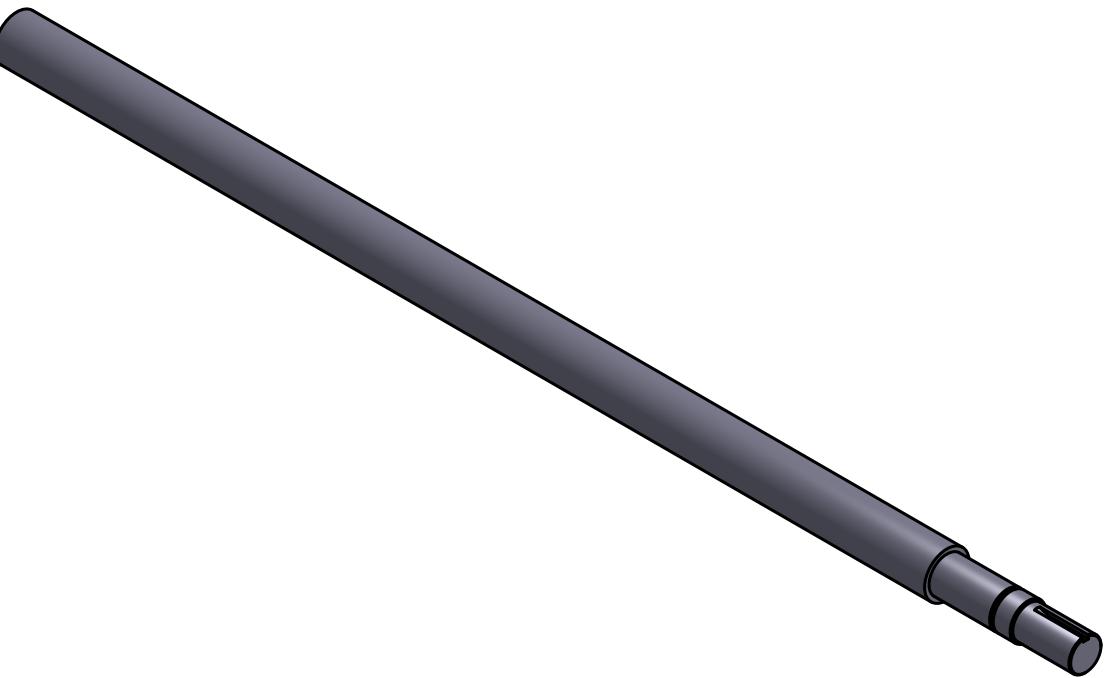
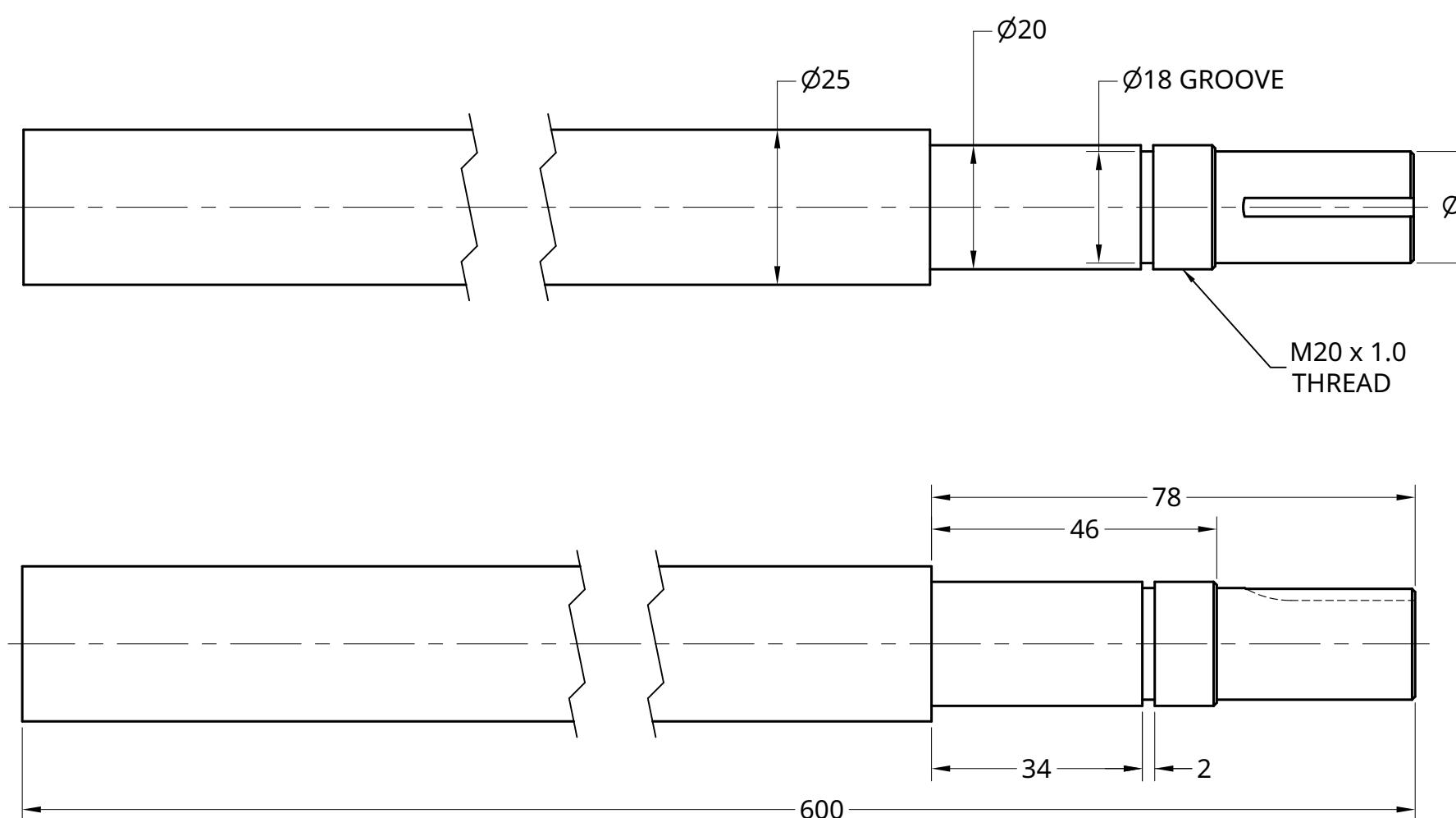
C

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Ferris State University			
DRILL UNIT MAIN ASSEMBLY DETAILS BALL SCREW - ALTERED			
SIZE	DWG NO.	REV.	
B	BR-549-C-006		
SCALE	1:1	WEIGHT	2.187 kg
		SHEET	9 of 20

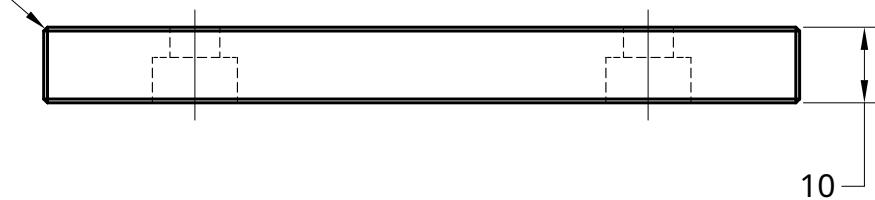
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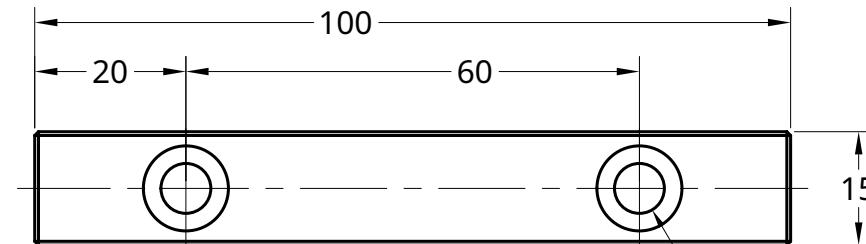
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0.5 X 45°
ALL EDGES

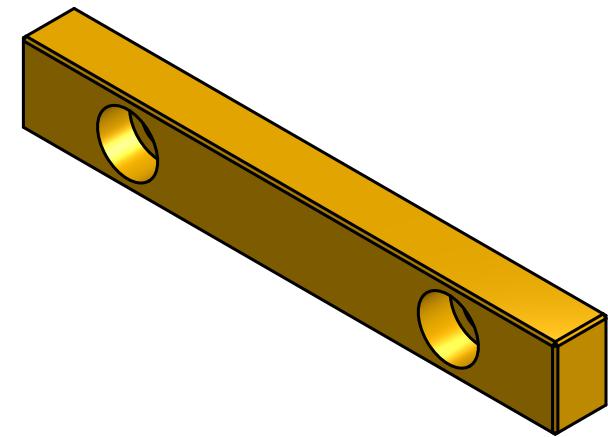


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2X $\varnothing 6.6$ THRU
 $\varnothing 11.25 \downarrow 6$

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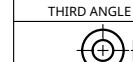


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UNLESS OTHERWISE SPECIFIED,
DIMENSIONS ARE IN INCHES

XX = ±.0-
 XXX = ±.00-
 XXXX = ±.000-
 SURFACE FINISH ✓

DO NOT SCALE DRAWING

BREAK ALL SHARP EDGES AND
REMOVE BURRS

DRAWN
CHECKED
APPROVED

BRIAN BRADY

10/16/2019

NAME
DATE

DATE

TITLE

Ferris State University
DRILL UNIT
MAIN ASSEMBLY DETAILS
15 X 10 X 100 KEY

SIZE

A

DWG NO.

REV.

BR-549-C-007

SCALE

1:1

WEIGHT

0.106 kg

SHEET

10 of 20

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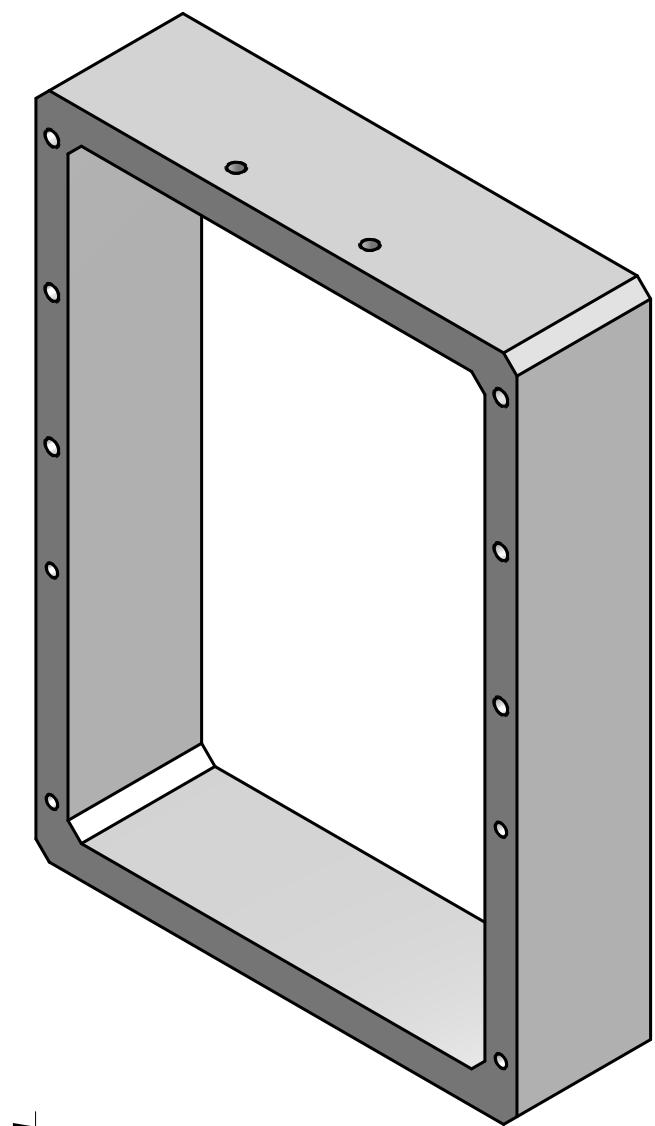
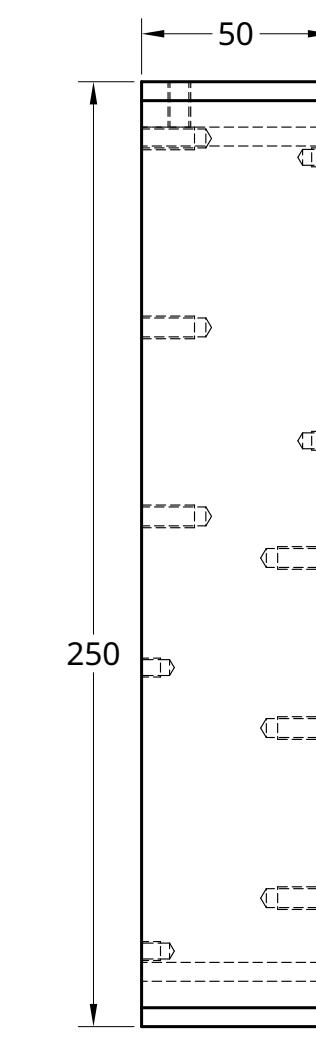
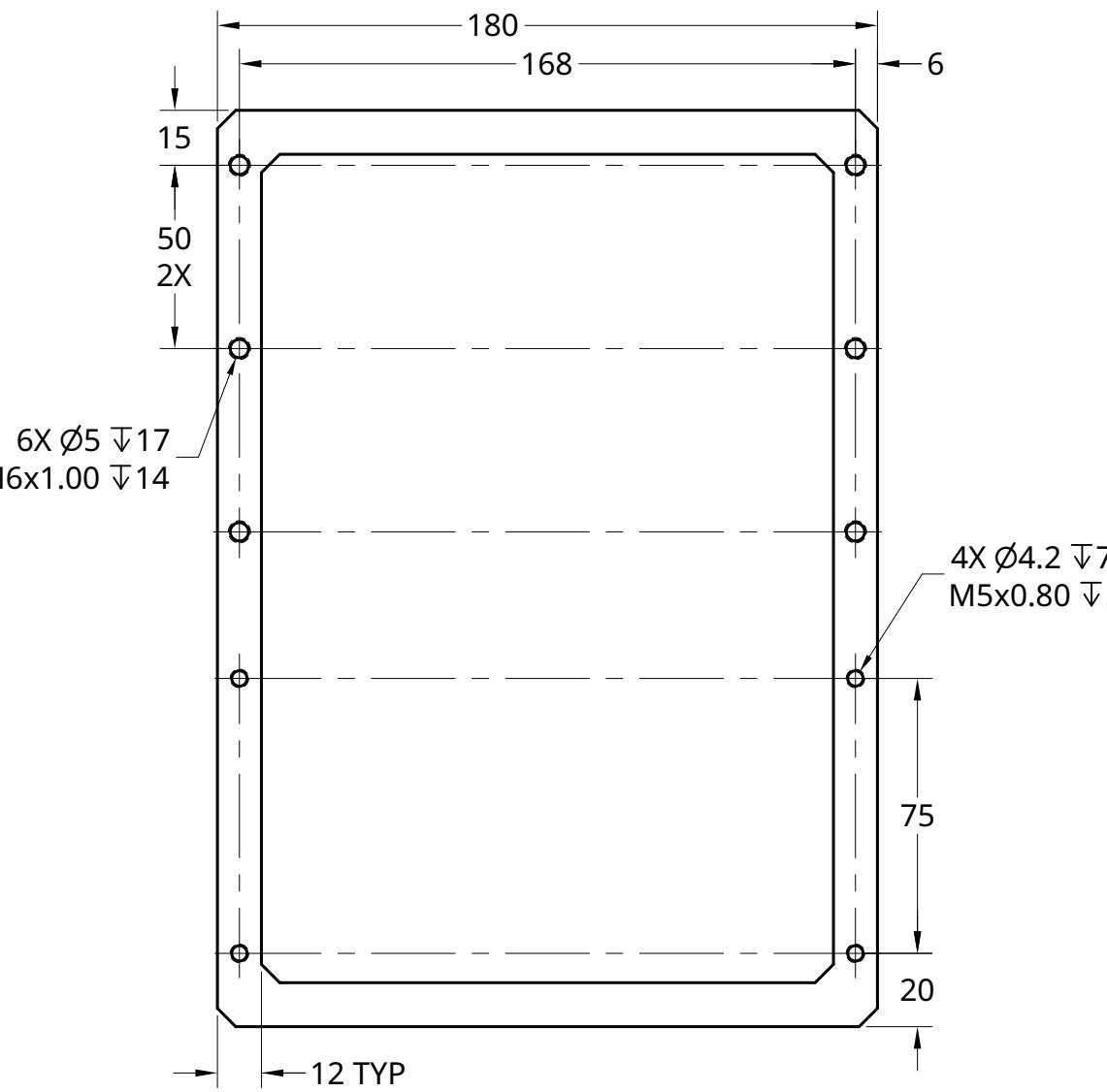
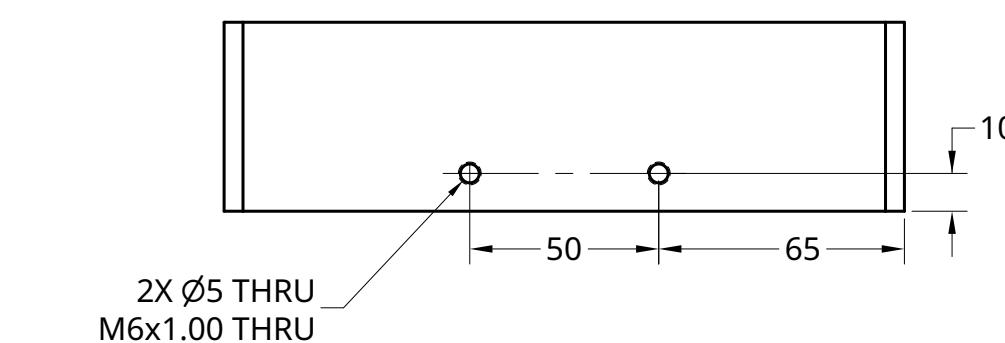
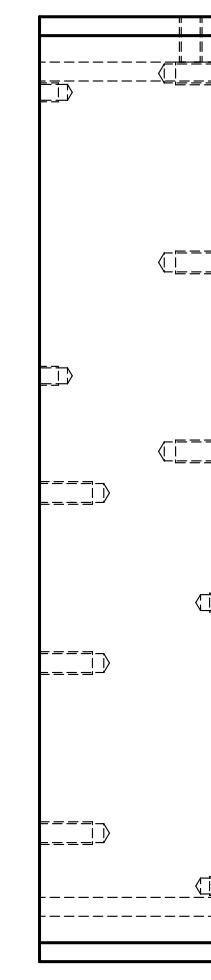
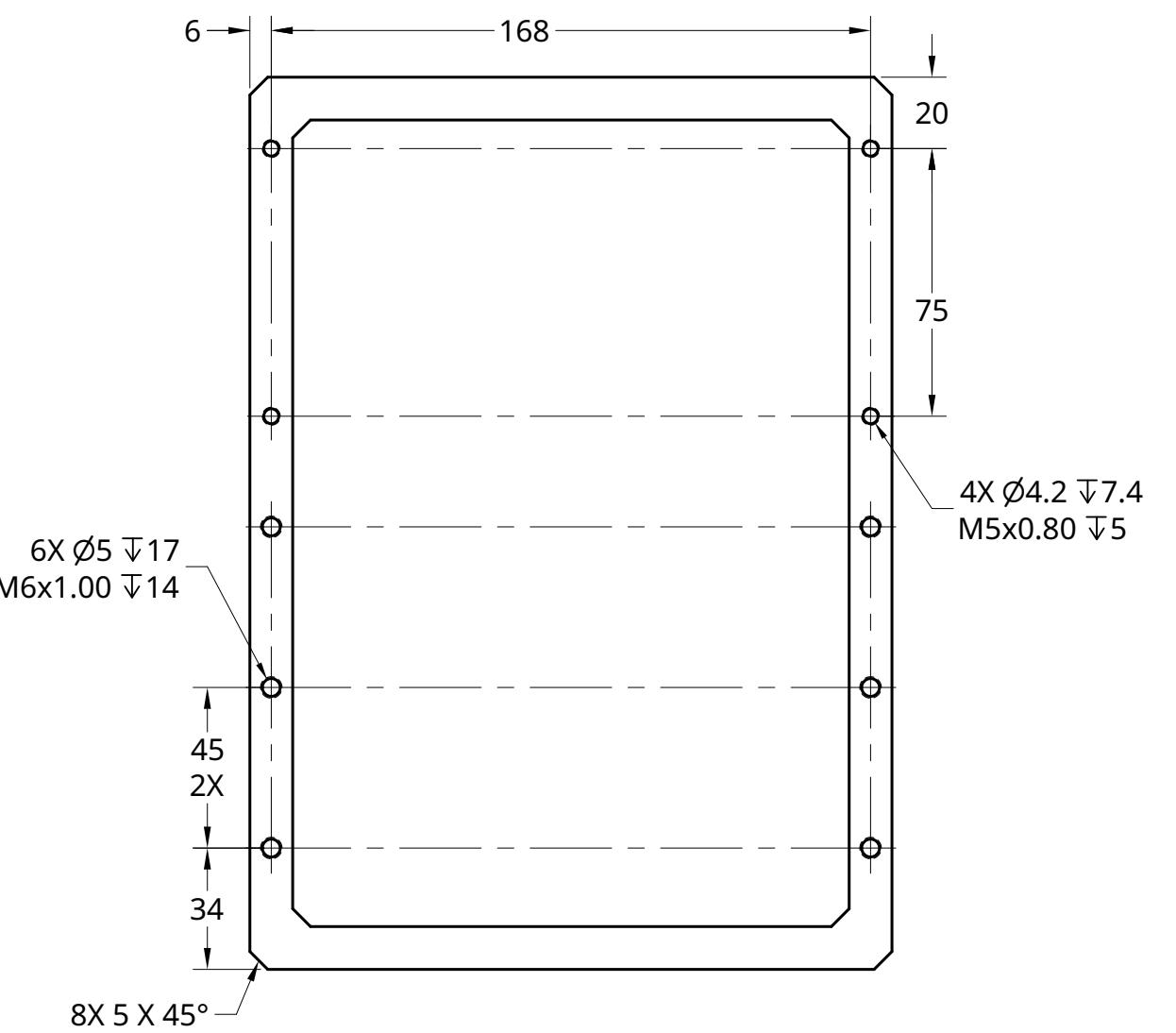
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UNLESS OTHERWISE SPECIFIED, .XX ± .XX .XXX ± .XXX .XXXX ± .XXXX	NAME DRAWN BRIAN BRADY	DATE 10/16/2019
SURFACE FINISH ✓	CHECKED	
	APPROVED	
DO NOT SCALE DRAWING		
BREAK ALL SHARP EDGES AND REMOVE BURRS		
THIRD ANGLE PROJECTION	MATERIAL STEEL 1020	VOLUME 481738 mm ³
SCALE 1:2	WEIGHT 3.791 kg	HEET 11 of 20
REV.		
Ferris State University		
DRILL UNIT		
MAIN ASSEMBLY DETAILS		
SERVO BELT HOUSING		
SIZE C	DWG NO. BR-549-C-008	REV.

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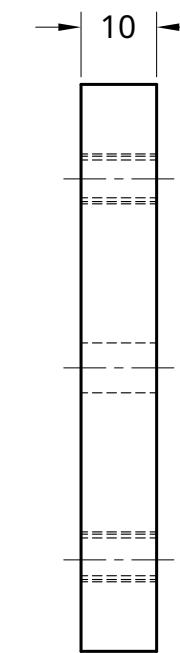
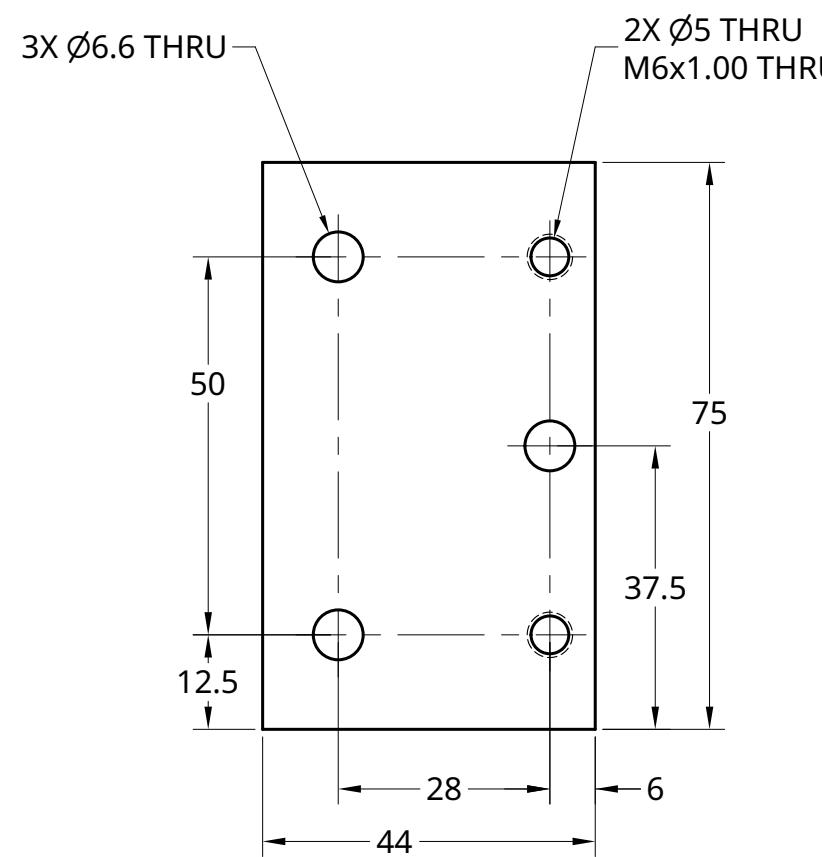
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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES .XX = ±.0- ANGULAR = ± ° .XXX = ±.00- FRACTIONAL = ± .XXXX = ±.000-			DRAWN	NAME	DATE
			SURFACE FINISH	BRIAN BRADY	10/16/2019
			CHECKED		
			APPROVED		
DO NOT SCALE DRAWING BREAK ALL SHARP EDGES AND REMOVE BURRS			THIRD ANGLE PROJECTION	MATERIAL	VOLUME
				STEEL 1020	31581 mm ³
				SCALE	1:1
				WEIGHT	0.249 kg
				REV.	
				SIZE	DWG NO.
				B	BR-549-C-009
				SCALE	1:1
				WEIGHT	0.249 kg
				REV.	
				SHEET	12 of 20

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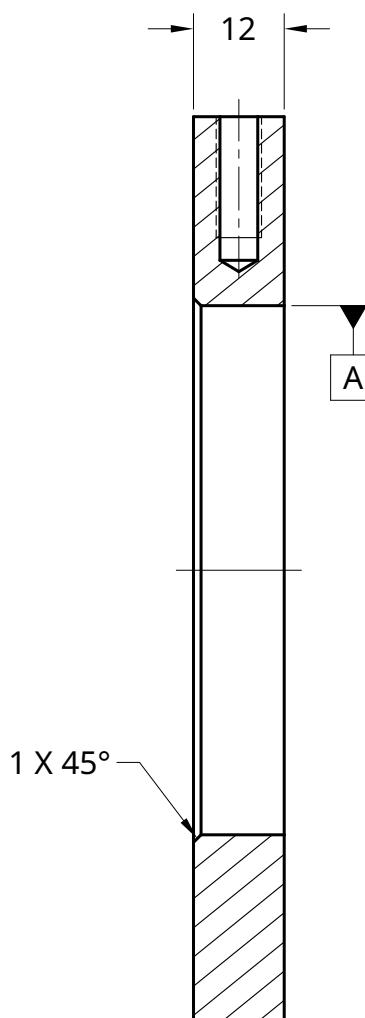
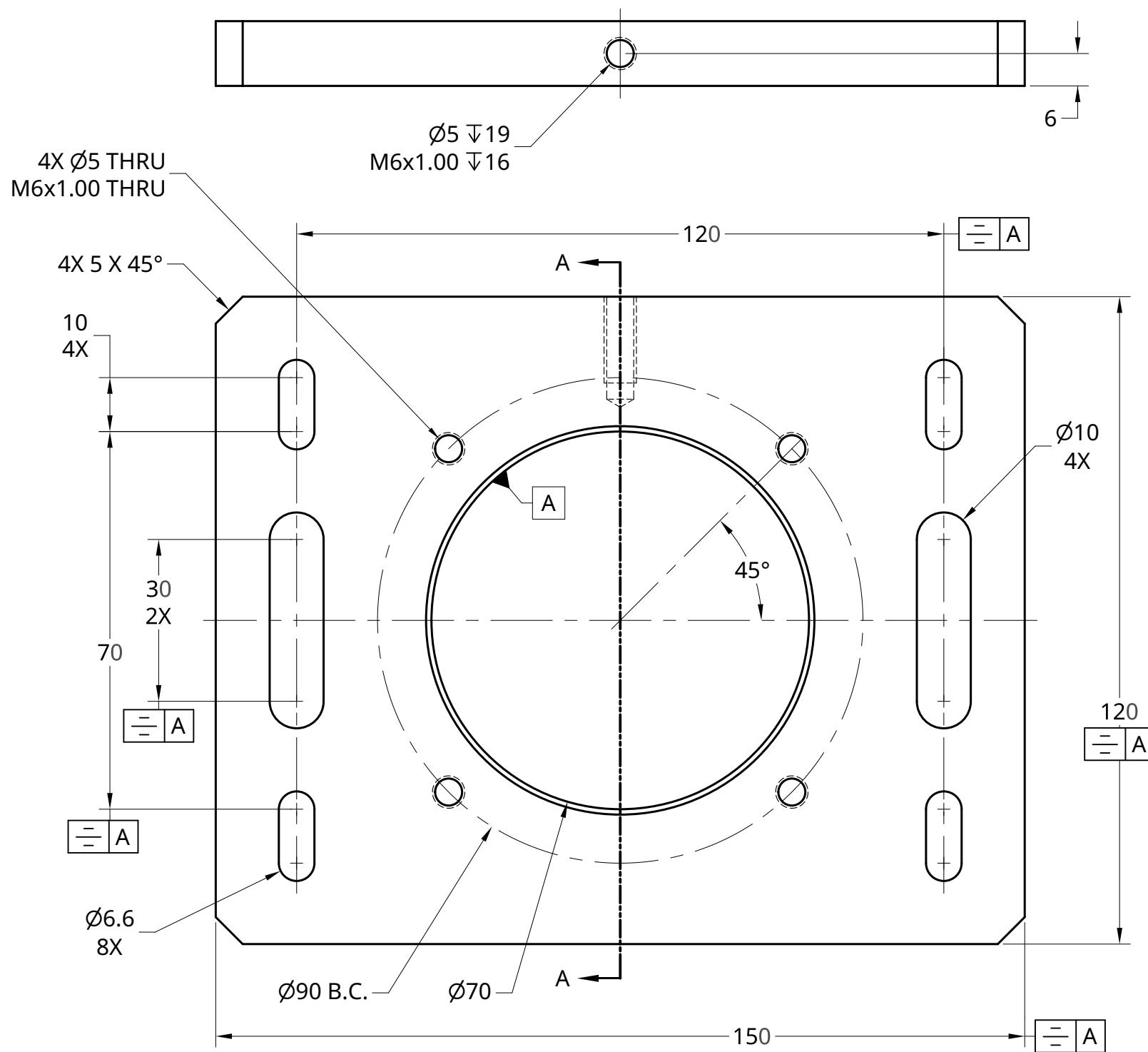
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SECTION A - A

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES $.XX = \pm .0-$ $.XXX = \pm .00-$ $XXXX = \pm .000-$		NAME	DATE
DRAWN	BRIAN BRADY	10/16/2019	
CHECKED			TITLE
APPROVED			DRILL UNIT
DO NOT SCALE DRAWING			MAIN ASSEMBLY DETAILS
BREAK ALL SHARP EDGES AND REMOVE BURRS			SERVO MOTOR ADAPTER
THIRD ANGLE PROJECTION	MATERIAL	VOLUME	
	STEEL 8620	153887 mm ³	REV.

Ferris State University		
DRILL UNIT		
MAIN ASSEMBLY DETAILS		
SERVO MOTOR ADAPTER		
SIZE	DWG NO.	REV.
B	BR-549-C-010	
SCALE	1:1	WEIGHT
		1.208 kg
		Sheet 13 of 20

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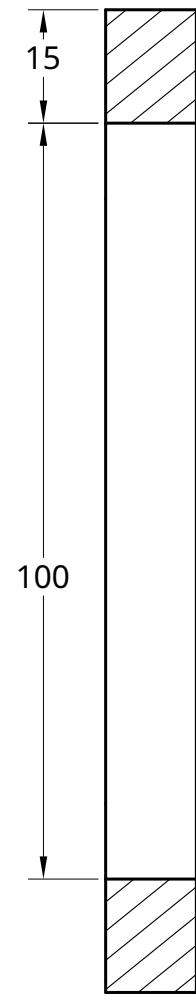
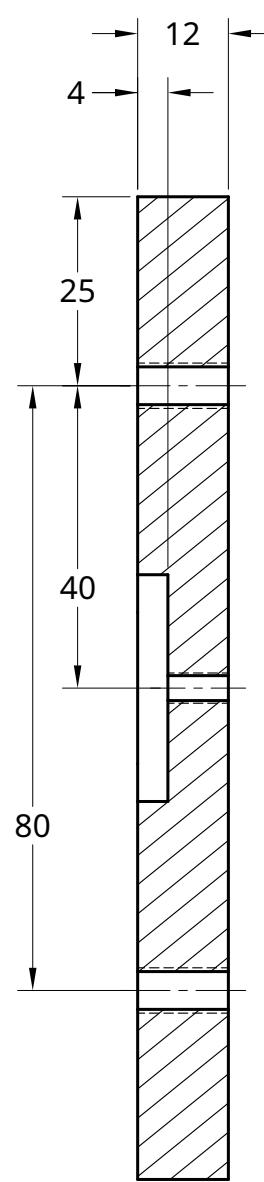
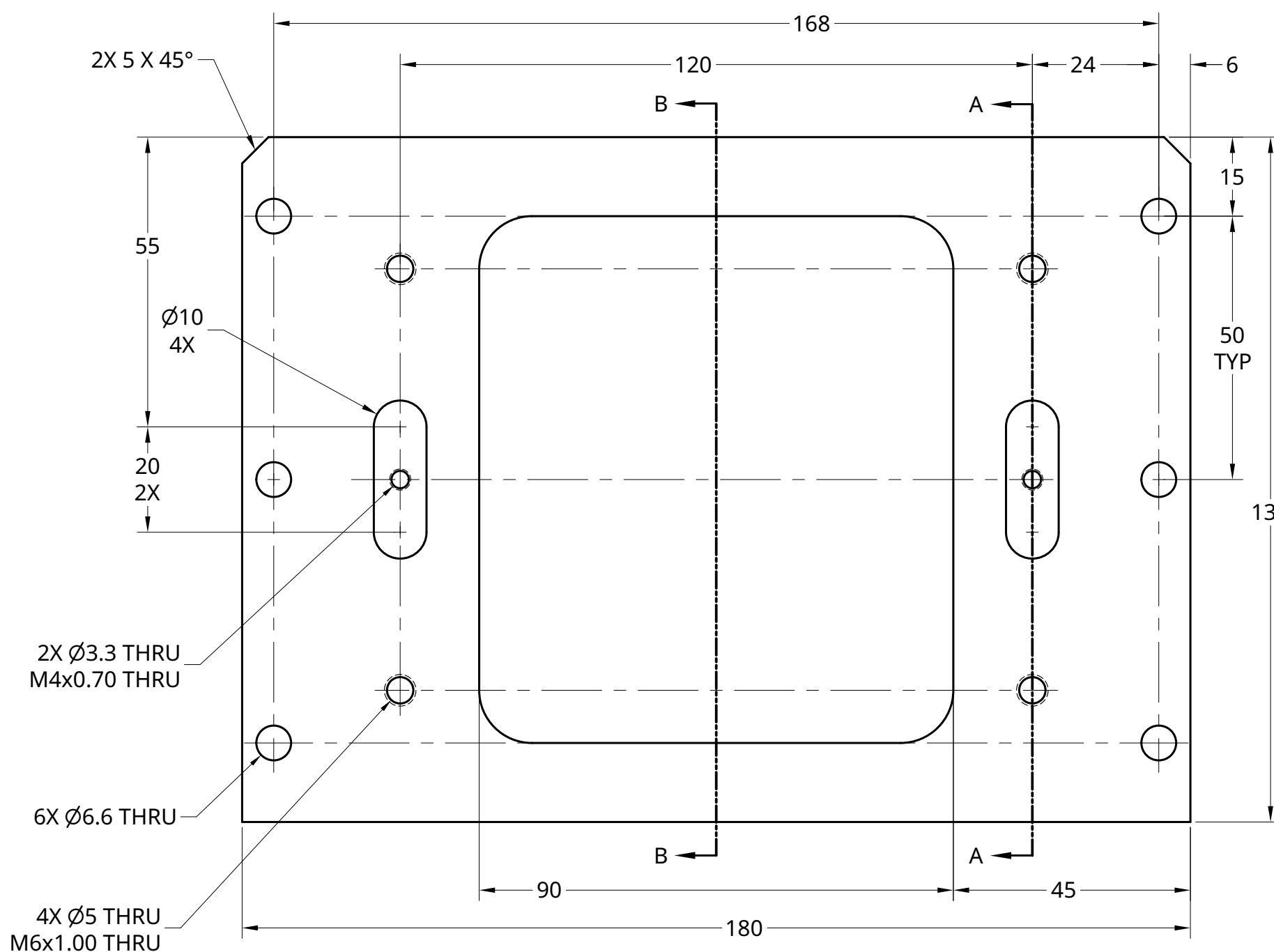
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UNLESS OTHERWISE SPECIFIED,
DIMENSIONS ARE IN INCHES
.XX = ±.0- .XXX = ±.00- .XXXX = ±.000- ANGULAR = ± °
SURFACE FINISH ✓ FRACTIONAL = ±

DRAWN	BRIAN BRADY	DATE
CHECKED		10/16/2019
APPROVED		
DO NOT SCALE DRAWING		
BREAK ALL SHARP EDGES AND REMOVE BURRS		
THIRD ANGLE PROJECTION		
MATERIAL		VOLUME
STEEL 8620		167759 mm ³

Ferris State University

DRILL UNIT
MAIN ASSEMBLY DETAILS
SERVO MOUNTING PLATE

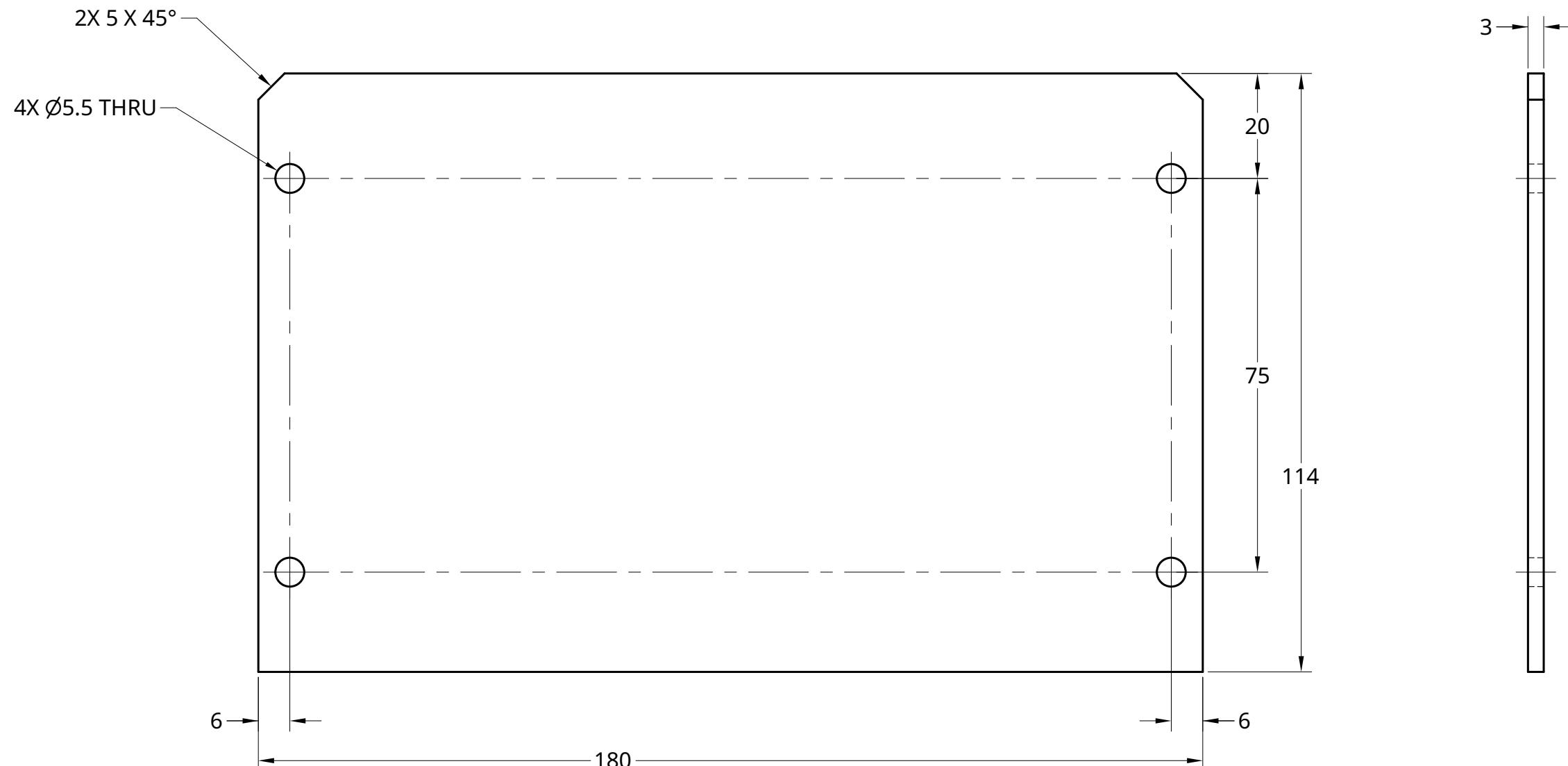
TITLE	BR-549-C-011		
SIZE	B	DWG NO.	
SCALE	1:1	WEIGHT	1.317 kg
REV.		SHEET	14 of 20

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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES . XX = ±0- .XXX = ±0- .XXXX = ±.000- SURFACE FINISH 		NAME	DATE	Ferris State University		
DRAWN	BRIAN BRADY		10/16/2019			
CHECKED				TITLE		
APPROVED						
DO NOT SCALE DRAWING				DRILL UNIT		
BREAK ALL SHARP EDGES AND REMOVE BURRS				MAIN ASSEMBLY DETAILS		
THIRD ANGLE PROJECTION	MATERIAL	VOLUME		UPPER COVER PLATE - SERVO		
	POLYCARBONATE	61200 mm ³	SIZE	DWG NO.		REV.
			B	BR-549-C-012		
SCALE	1:1	WEIGHT	0.073 kg		SHEET	15 of 20

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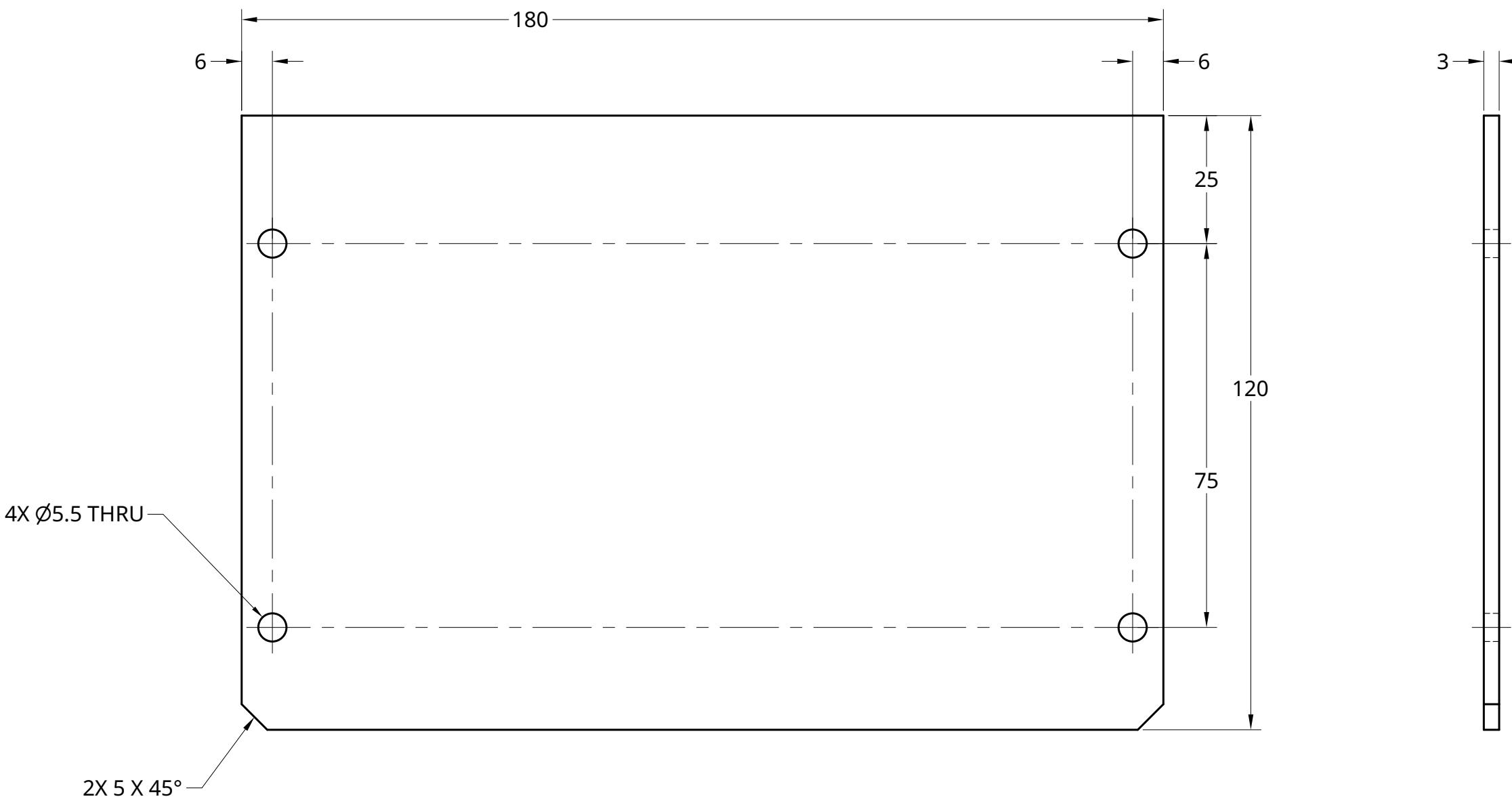
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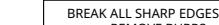
UNLESS OTHERWISE SPECIFIED,
DIMENSIONS ARE IN INCHES
.XX = ±.0-
.XXX = ±.00-
.XXXX = ±.000- ANGULAR = ± °
FRACTIONAL = ±

SURFACE FINISH ✓

DO NOT SCALE DRAWING

BREAK ALL SHARP EDGES AND REMOVE BURRS

THIRD ANGLE PROJECTION



DRAWN BRIAN BRADY DATE
10/16/2019

CHECKED

APPROVED

Ferris State University
DRILL UNIT
MAIN ASSEMBLY DETAILS
LOWER COVER PLATE - SERVO

TITLE

SIZE B DWG NO. BR-549-C-013 REV.

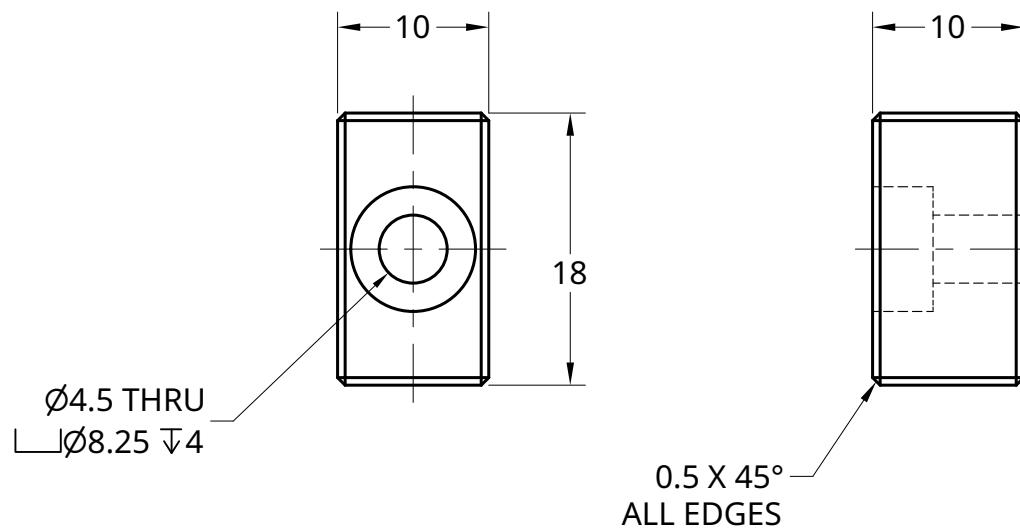
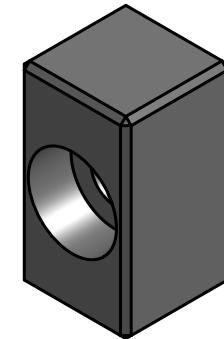
SCALE 1:1 WEIGHT 0.077 kg SHEET 16 of 20

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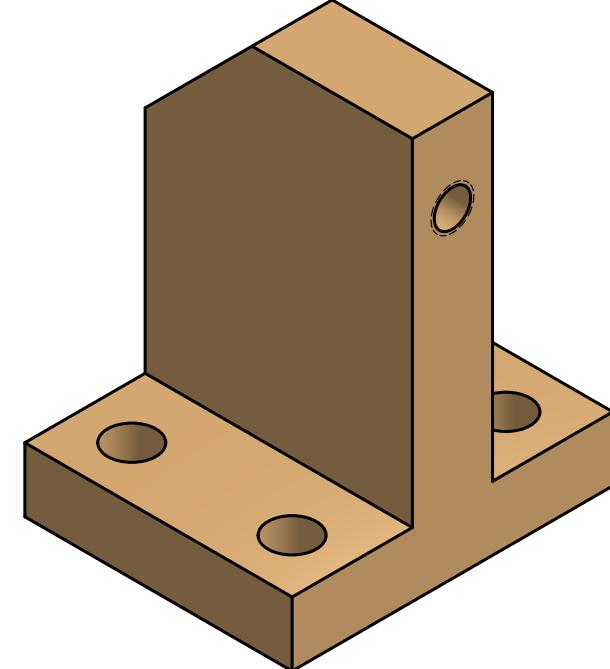
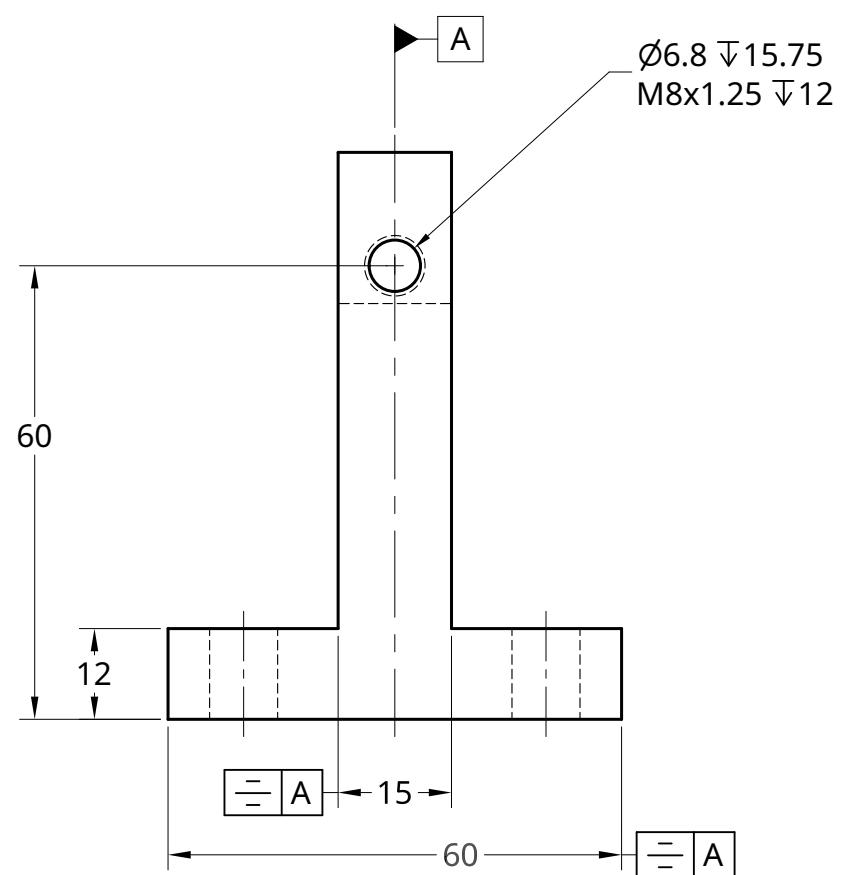
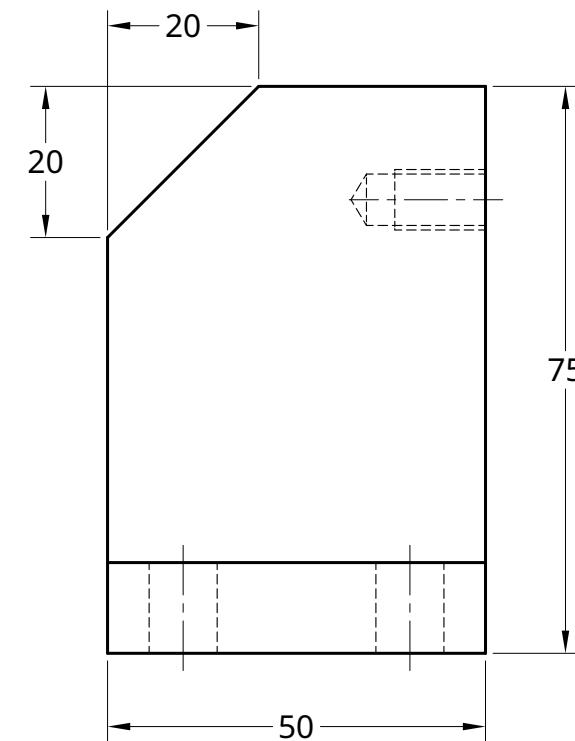
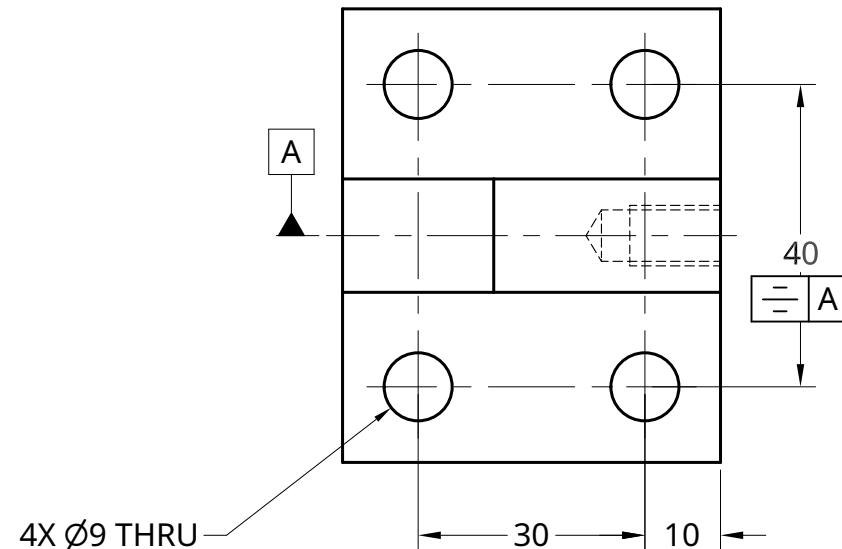
<small>UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES</small> <small>.XX = ±.0- XXX = ±.00- XXXX = ±.000- SURFACE FINISH ✓</small>		DRAWN <small>BRIAN BRADY</small> 10/16/2019	NAME <small></small> DATE <small></small>
CHECKED <small></small>		APPROVED <small></small>	<small>TITLE</small> Ferris State University
DO NOT SCALE DRAWING <small></small>		<small></small>	DRILL UNIT SLIDE PLATE ASSEMBLY DETAILS SMALL SLIDE KEY
BREAK ALL SHARP EDGES AND <small>REMOVE BURRS</small>		<small></small>	<small>SIZE</small> A <small>DWG NO.</small> BR-549-C-014 <small>REV.</small>
THIRD ANGLE PROJECTION 	MATERIAL <small>STEEL 4130</small>	VOLUME <small>1472 mm³</small>	<small>SCALE</small> 2:1 <small>WEIGHT</small> 0.012 kg <small>SHEET</small> 17 of 20

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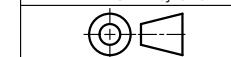


UNLESS OTHERWISE SPECIFIED,
DIMENSIONS ARE IN INCHES
.XX = ±.0-
.XXX = ±.00- ANGULAR = ± °
.XXXX = ±.000- FRACTIONAL = ±
SURFACE FINISH ✓

DO NOT SCALE DRAWING

BREAK ALL SHARP EDGES AND
REMOVE BURRS

THIRD ANGLE PROJECTION



DRAWN BRIAN BRADY DATE 10/16/2019
CHECKED
APPROVED

TITLE

SIZE

SCALE 1:1

Ferris State University

DRILL UNIT

MAIN ASSEMBLY DETAILS

STOP BRACKET - REAR

REV.

B DWG NO.

BR-549-C-015

SCALE

1:1

WEIGHT

0.603 kg

SHEET

18 of 20

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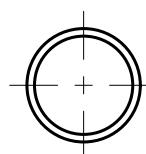
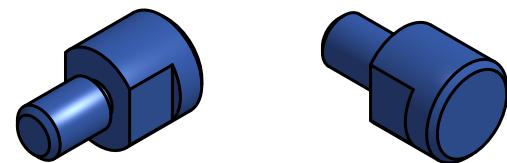
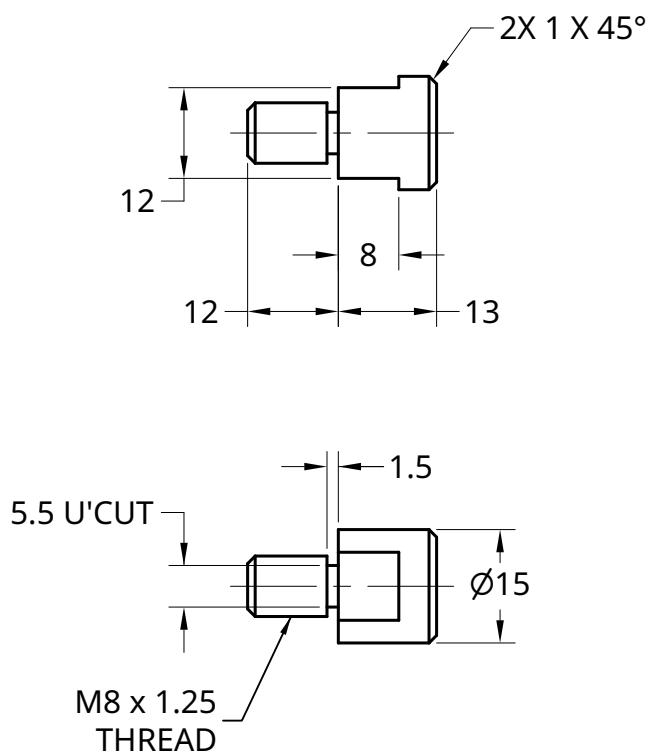
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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES			NAME	DATE	<h1>Ferris State University</h1> <h2>DRILL UNIT</h2> <h3>MAIN ASSEMBLY DETAILS</h3> <h4>STOP BUTTON</h4>				
.XX = ±.0-	.XXX = ±.00-	DRAWN	BRIAN BRADY	10/16/2019					
.XXXX = ±.000-	ANGULAR = ± °	CHECKED			TITLE				
SURFACE FINISH ✓	FRACTIONAL = ±	APPROVED							
DO NOT SCALE DRAWING					SIZE	DWG NO.	REV.		
BREAK ALL SHARP EDGES AND REMOVE BURRS									
THIRD ANGLE PROJECTION		MATERIAL	VOLUME		A	BR-549-C-016			
		STEEL 4130	2680 mm ³	SCALE	1:1	WEIGHT	0.021 kg	SHEET	19 of 20

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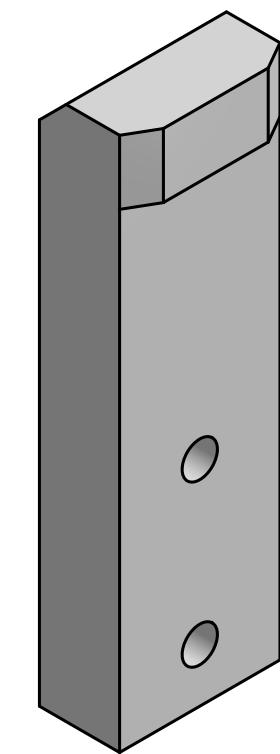
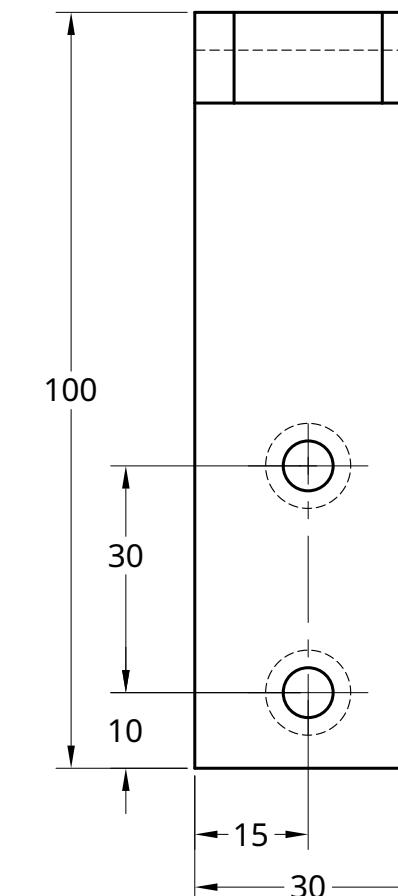
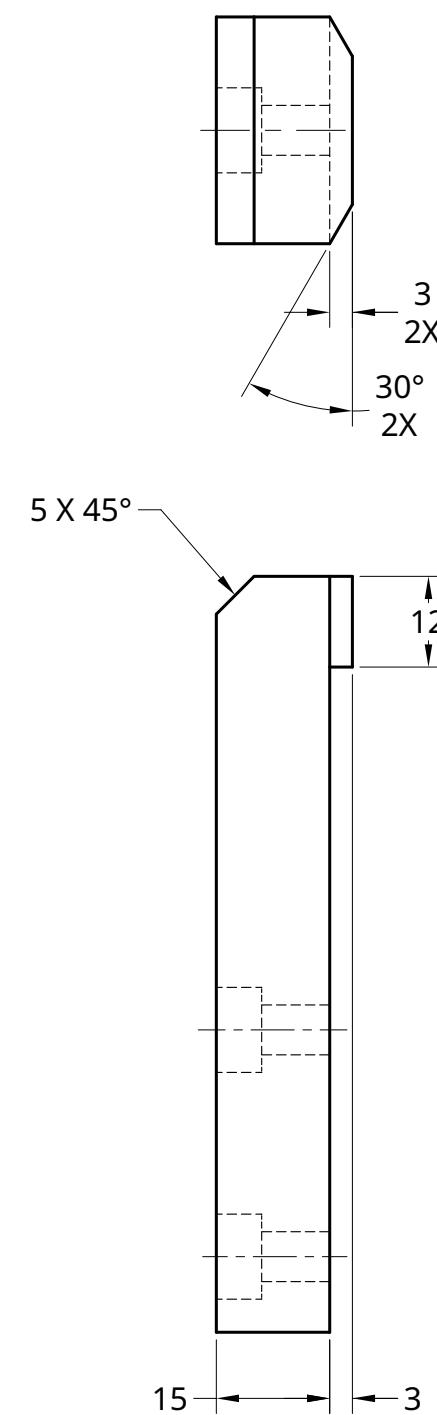
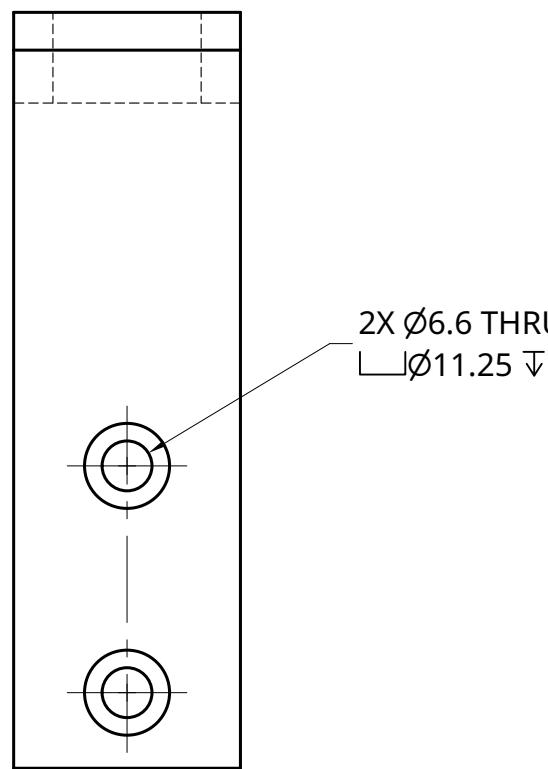
C

B

B

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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES $.XX = \pm 0$ - $.XXX = \pm 00$ - $.XXXX = \pm 000$ - SURFACE FINISH 		NAME	DATE	<h1>Ferris State University</h1> <h2>DRILL UNIT</h2> <h2>MAIN ASSEMBLY DETAILS</h2> <h2>STOP BAR - FRONT</h2>					
	DRAWN	BRIAN BRADY	10/16/2019						
	CHECKED								
	APPROVED								
DO NOT SCALE DRAWING				SIZE	DWG NO.	REV.			
BREAK ALL SHARP EDGES AND REMOVE BURRS									
THIRD ANGLE PROJECTION		MATERIAL	VOLUME	B		BR-549-C-017			
		STEEL 4130	43709 mm ³	SCALE	1:1	WEIGHT	0.343 kg	SHEET	20 of 20