SkillsUSA
NORTH DAKOTA

2025

State

Welding Fabrication

Contest

2025 North Dakota State

Welding Fabrication Contest

A team of three contestants will build rocket stove designed to attach to a 2" receiver hitch. In order to save on costs, the 2" square tubing to connect the stove to the receiver is not being supplied in the Bill of Materials (BOM) or in the contest prints. If contestants want to connect the rocket stove to a vehicle, the 2" square tubing should be long enough to prevent heat from the stove from causing damage to the vehicle and the tubing should be a minimum of 3/16" wall thickness.

The design of the stove has pot-leveling nuts to compensate for the carrier vehicle being un-level. In order to control material costs, the prints and the BOM do not have the bolts required to use this feature.

Item #3 - 2 ½" square tubing has an inner seam which will require some custom fitting to a 2" square tubing if the final project will be connected to a receiver hitch (FITTING THIS PIECE WILL NOT BE PART OF THE CONTEST)

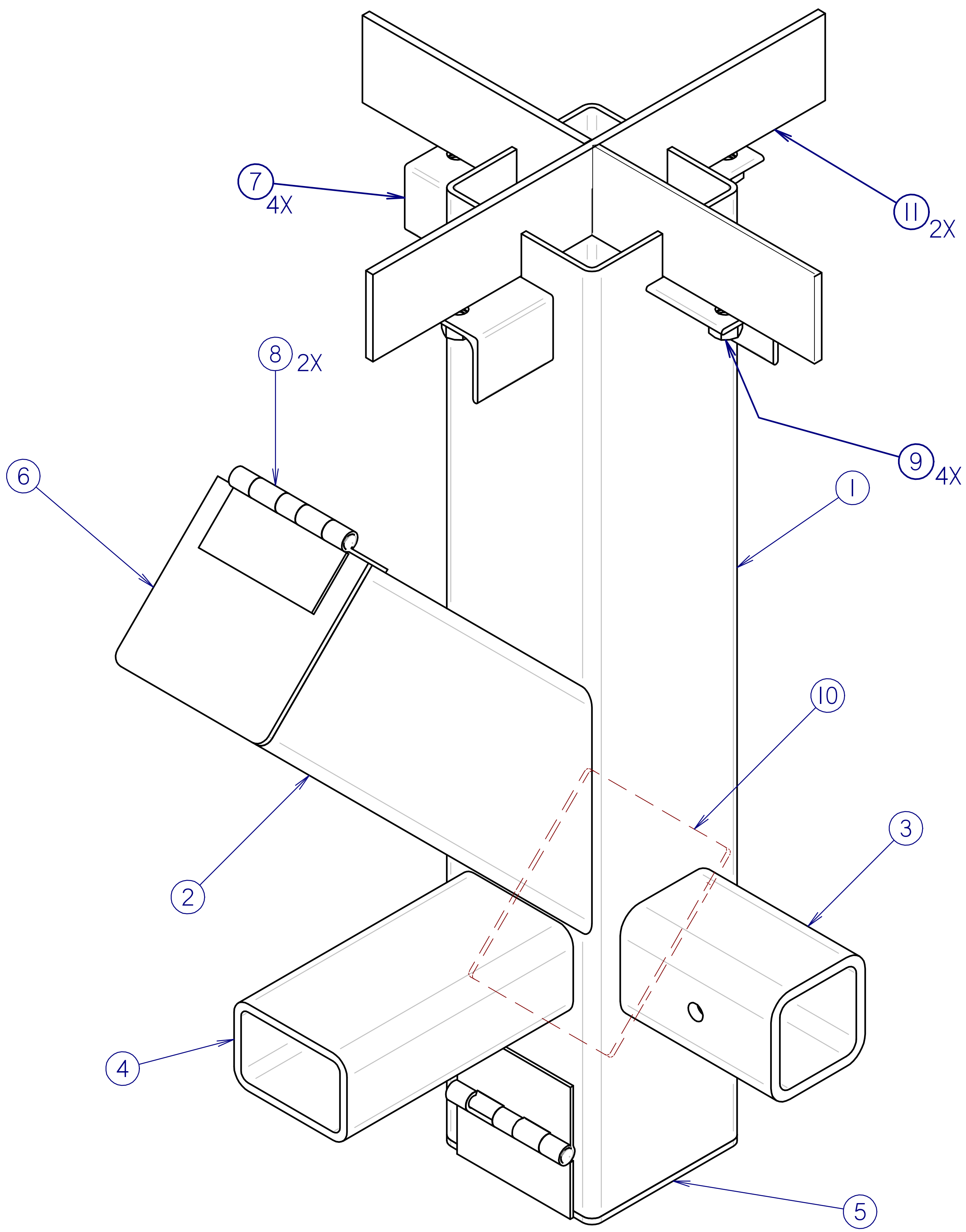
General Contest Parameters:

- Metal may be cut with oxy-fuel torch or with the cutoff wheels in the tool list
- Only two abrasive cutoff wheels can be used by each team
- Each team may have one 4 ½ grinder (grinder, flap, and cutting discs must be utilized by the same grinder)
- All welds will be done in accordance with the AWS welding symbol
  - Welding using the incorrect process will result in a score of zero points for that weld
  - Welds will be scored by judges and will be final
- Components placed in an incorrect orientation to the print will result in a score of zero points for the welds associated with the component
  - Components installed upside-down
  - Components installed on an incorrect surface
  - Components grossly out of dimension
    - Grossly will be at the discretion of the individual judge
    - Points may be deducted in the Fit Up section of the Scoring Rubric for components marginally out of dimension
- Teams should bring one 3/8" UNC bolt to ensure the leveling nuts are properly positioned and the threads will freely allow the bolt to be threaded in and back out
  - A 3/8" UNC tap and driver tool are on the tool list
  - Nuts should be positioned square and contact item #11 Leveling Legs squarely

2025 SkillsUSA North Dakota Welding Fabrication

Bill of Materials

Item	Qty	Description
1.	1	4” X 4” X 36” 11 Gauge Tubing
2.	1	4” X 14” X 10 Gauge Plate
3.	1	2” X 3” X 6” X 1/8” Tubing
4.	1	2 ½” X 2 ½” X 4” X ¼” Tubing
5.	1	2” X 24” X 3/16” Plate/Strap
6.	1	1 ½” X 1 ½” X 10” X 1/8” Angle
7.	4	3/8” UNC Nuts
8.	2	3” Weld on hinges



ITEM NO.	QTY	DESCRIPTION	MATERIAL
1	1	4" SQUARE TUBING 21 3/4" LONG (WITH CUTOUTS PER DETAIL. SHEET NO. 2 - BASE TUBE)	PLAIN CARBON STEEL
2	1	4" SQUARE TUBING 12 3/8" LONG (WITH ONE END MITERED PER DETAIL. SHEET NO. 2 - MATERIAL FEED TUBE)	PLAIN CARBON STEEL
3	1	2 1/2" SQUARE TUBING 4" LONG (WITH ONE THRU HOLE PER DETAIL. SHEET NO. 2 - SIDE TUBE)	PLAIN CARBON STEEL
4	1	2" X 3" RECTANGULAR TUBING 6" LONG (SEE DETAIL. SHEET NO. 3 - IGNITION TUBE)	PLAIN CARBON STEEL
5	1	4" X 4" - 10 GAUGE (SEE DETAIL. SHEET NO. 3 - BOTTOM PLATE)	PLAIN CARBON STEEL
6	1	4" X 4" 10 GAUGE (SEE DETAIL. SHEET NO. 3 - DOOR)	PLAIN CARBON STEEL
7	4	1 1/2" X 1 1/2"" X 2" ANGLE (SEE DETAIL. SHEET NO. 4 - LEVELING ANGLE)	PLAIN CARBON STEEL
8	2	PURCHASED HINGE (SEE DETAIL. SHEET NO. 4)	NA
9	4	PURCHASED 3/8"-16 UNC HEX NUT (SEE DETAIL. SHEET NO. 4)	NA
10	1	3 3/4 X 4 5/8 10 GAUGE (SEE DETAIL. SHEET NO. 4 - SHELF)	PLAIN CARBON STEEL
11	2	2" X 12" 3/16" THK (SEE DETAIL. SHEET NO. 5 - LEVELING LEG)	PLAIN CARBON STEEL

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES AND FRACTIONS OF AN INCH
TOLERANCES
FRACTIONAL: ±1/16
ANGULAR: ±1/2°
DECIMALS: XX ±.01 XXX ±.005

MATERIAL: NA

FINISH: NA

DWG PREPARED IN ACCORDANCE WITH: ASME Y14.5M - 1994

THIRD ANGLE PROJECTION

	NAME	DATE
DRAWN	D. MATNEY	01/29/19
CHECKED		
ENG APPR.		
MFG APPR.		

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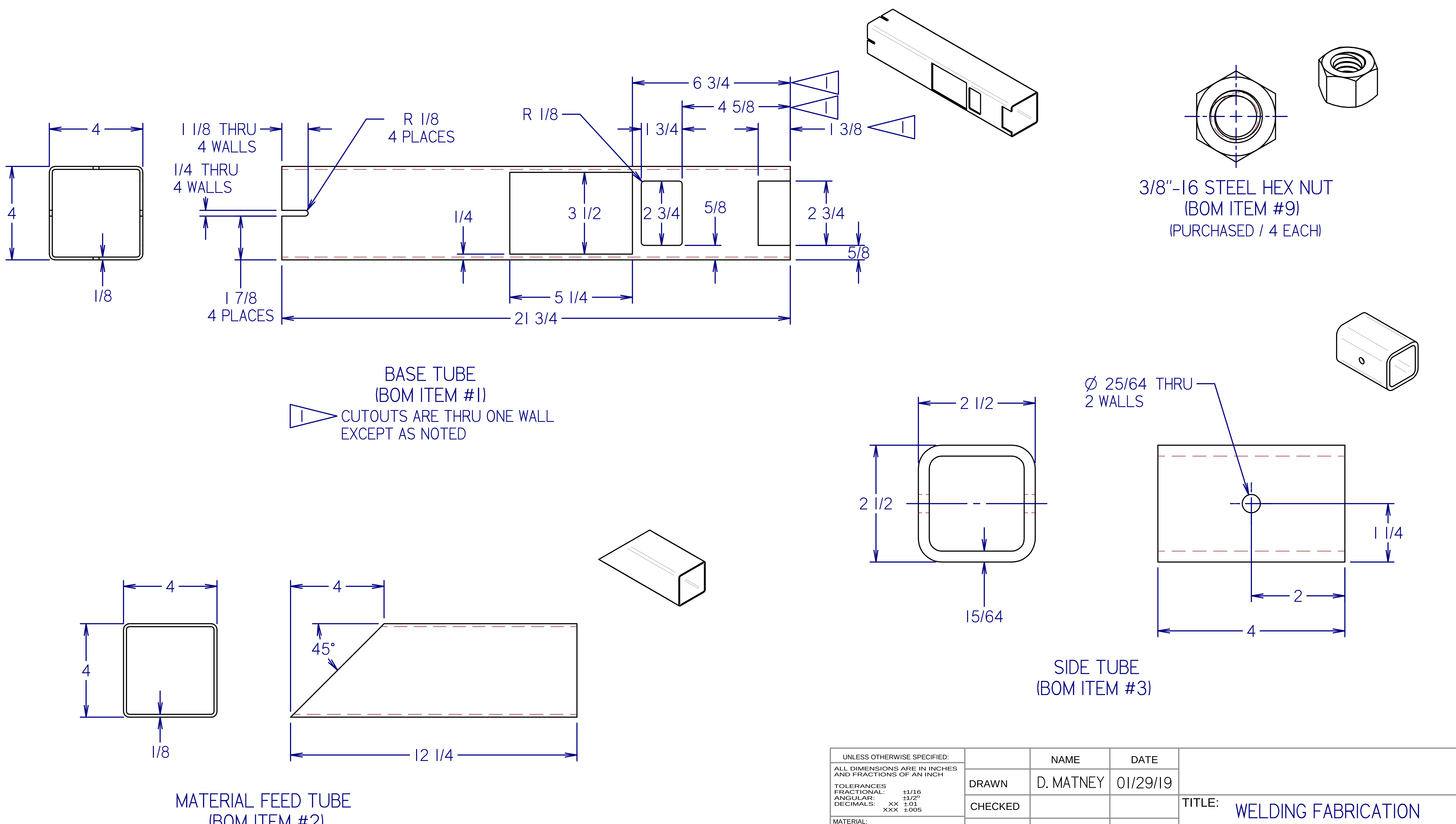
TITLE: WELDING FABRICATION CONTEST PRINT

SIZE B | DWG. NO. | VER 01

SCALE NOT TO SCALE | SHEET 1 OF 7



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ANGULAR: ±1/2°
DECIMALS: XX ±.01 XXX ±.005

MATERIAL: NA

FINISH: NA

DWG PREPARED IN ACCORDANCE WITH: ASME Y14.5M - 1994

THIRD ANGLE PROJECTION

	NAME	DATE
DRAWN	D. MATNEY	01/29/19
CHECKED		
ENG APPR.		
MFG APPR.		

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TITLE: WELDING FABRICATION CONTEST PRINT

SIZE: B | DWG. NO. | VER 01

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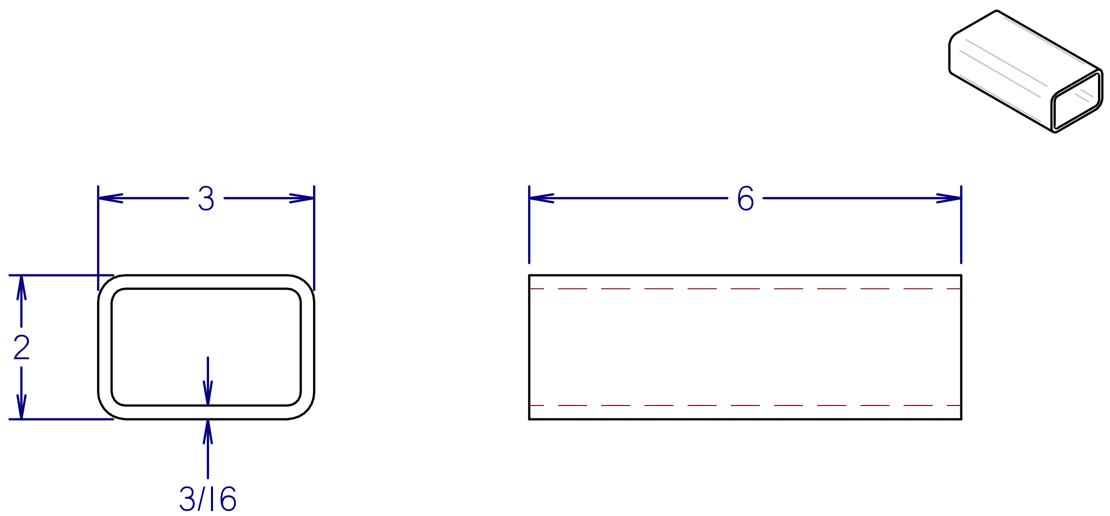
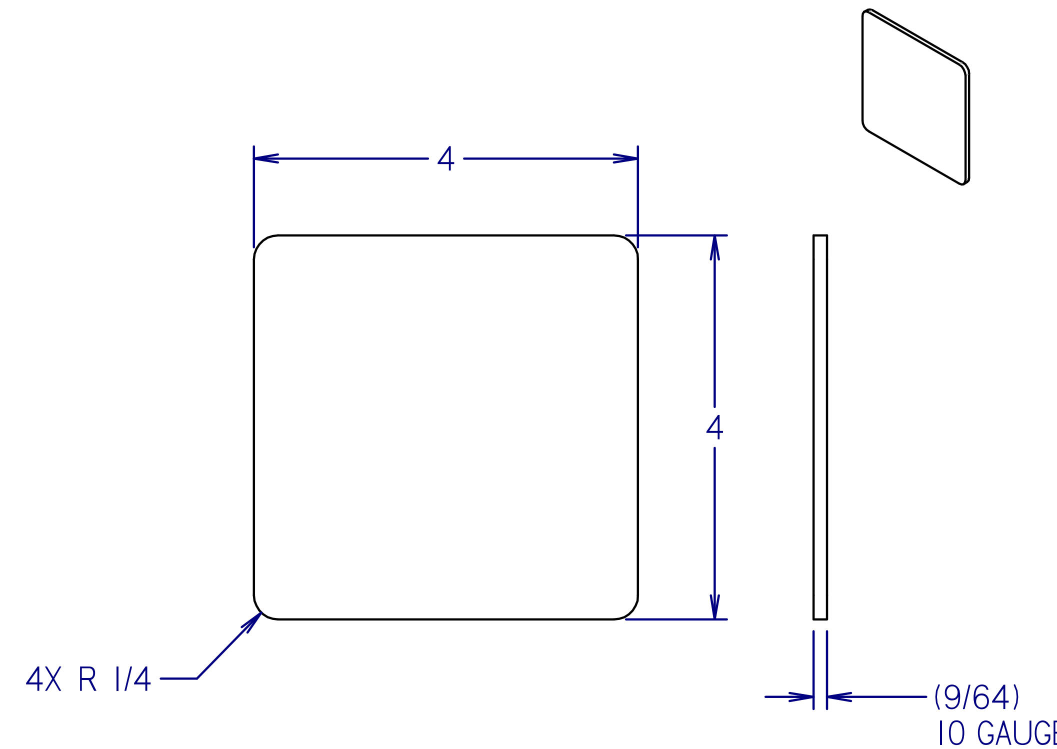
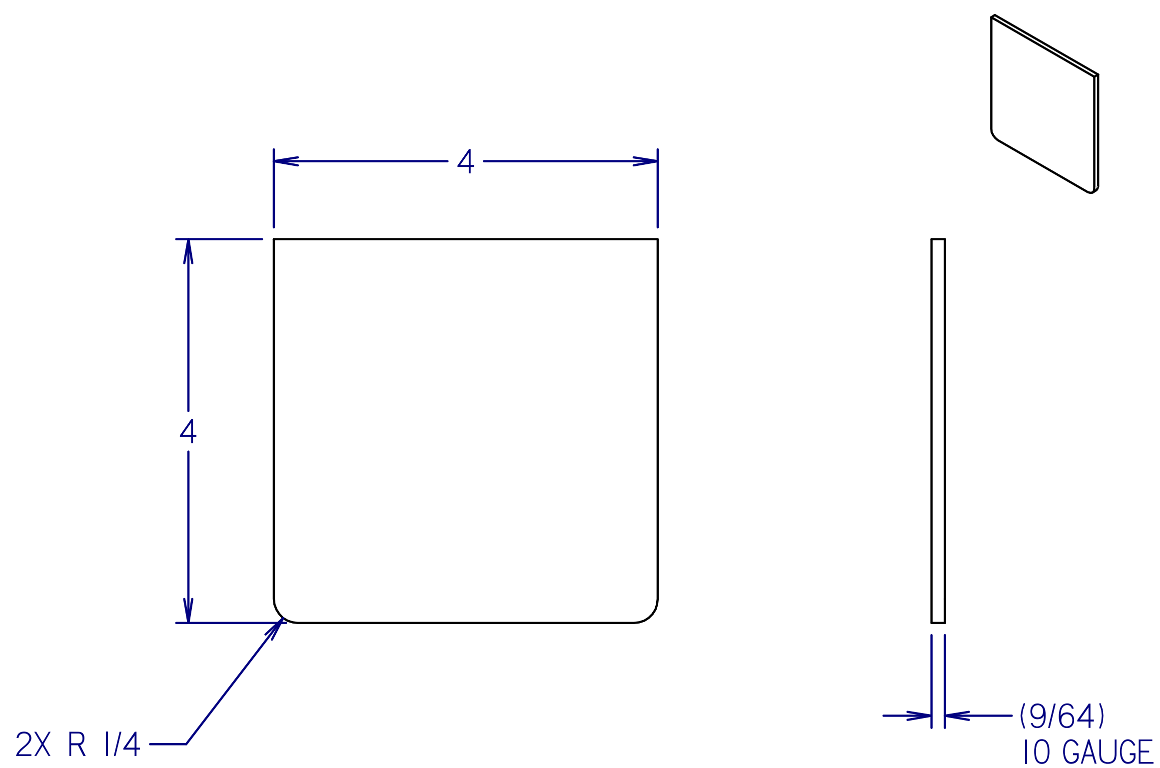


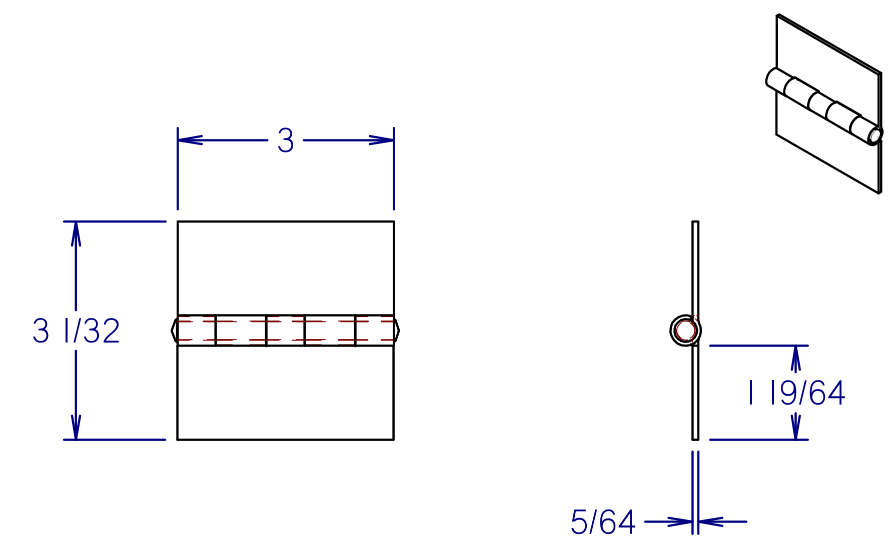
IGNITION TUBE
(BOM ITEM #4)



BOTTOM PLATE
(BOM ITEM #5)



DOOR
(BOM ITEM #6)



HINGE
(BOM ITEM #8)
(PURCHASED / 2 EACH)

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ALL DIMENSIONS ARE IN INCHES AND FRACTIONS OF AN INCH TOLERANCES FRACTIONAL: ±1/16 ANGULAR: ±1/2° DECIMALS: XX ±.01 XXX ±.005	DRAWN	D. MATNEY	01/29/19
	CHECKED		
MATERIAL: NA	ENG APPR.		
FINISH: NA	MFG APPR.		
DWG PREPARED IN ACCORDANCE WITH: ASME Y14.5M - 1994	SkillsUSA NORTH DAKOTA		
THIRD ANGLE PROJECTION			

TITLE: WELDING FABRICATION CONTEST PRINT

SIZE	DWG. NO.	VER
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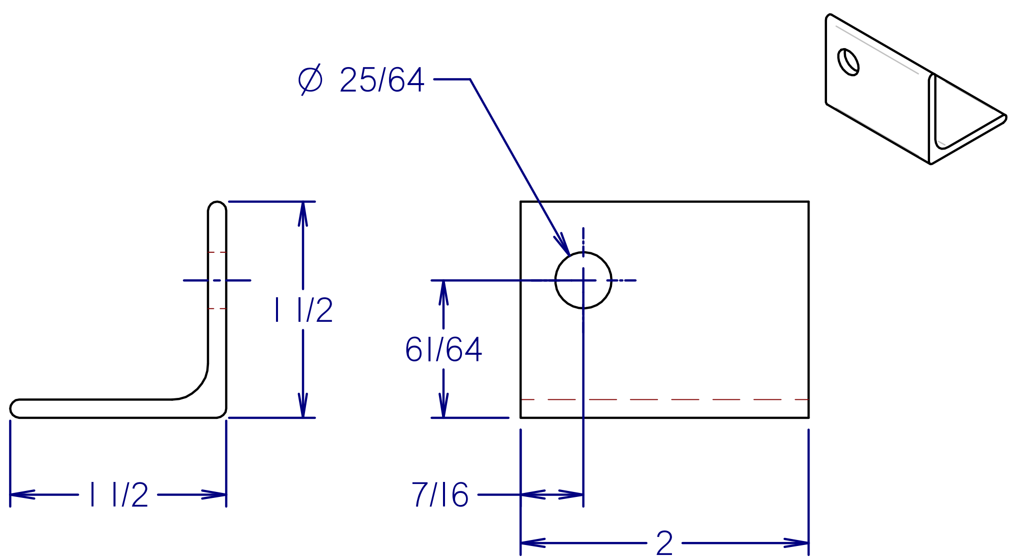
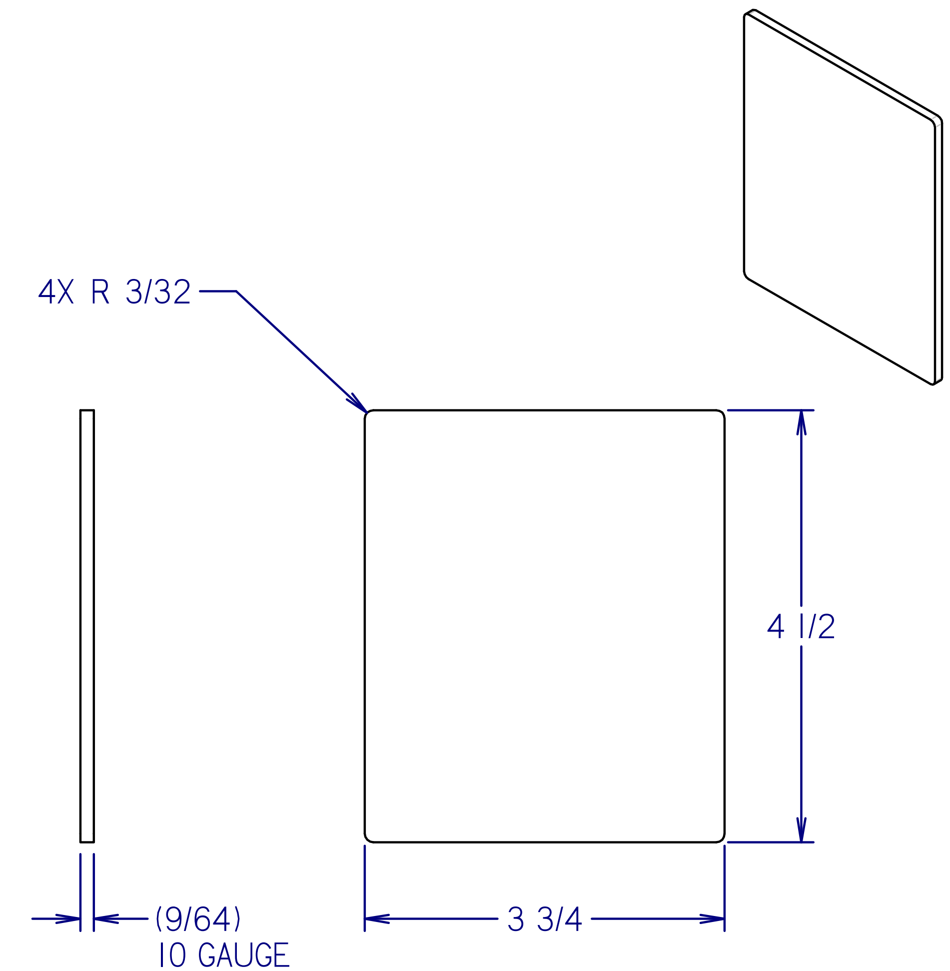
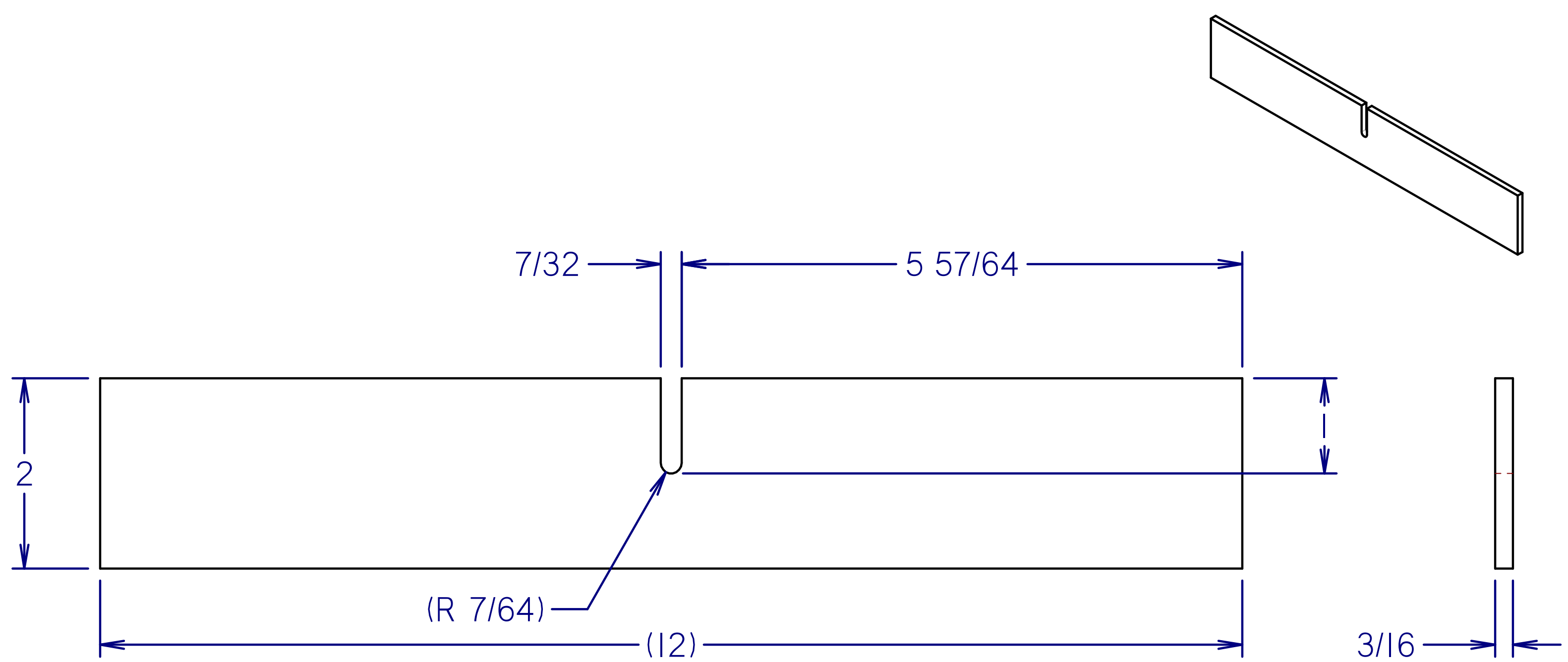


LEVELING ANGLE
(BOM ITEM #7)
(4 REQUIRED)



SHELF
(BOM ITEM #10)



LEVELING LEG
(BOM ITEM #11)

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MATERIAL: NA	CHECKED		
FINISH: NA	ENG APPR.		
DWG PREPARED IN ACCORDANCE WITH: ASME Y14.5M - 1994	MFG APPR.		
THIRD ANGLE PROJECTION	SkillsUSA NORTH DAKOTA		

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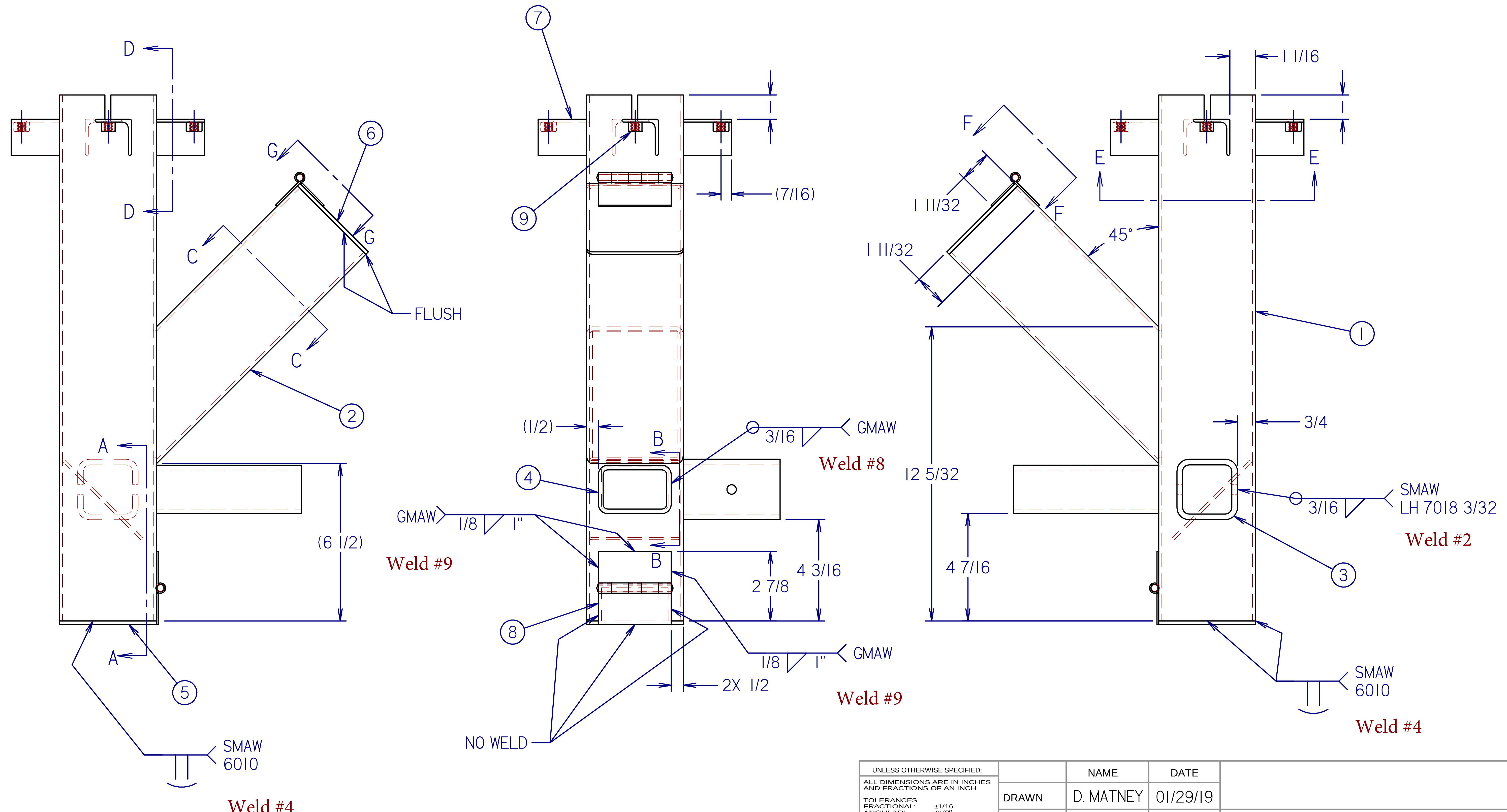
SIZE B	DWG. NO.	VER 01	
SCALE NOT TO SCALE		SHEET 4	OF 7



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DWG PREPARED IN ACCORDANCE WITH: ASME Y14.5M - 1994
THIRD ANGLE PROJECTION

	NAME	DATE
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ENG APPR.		
MFG APPR.		

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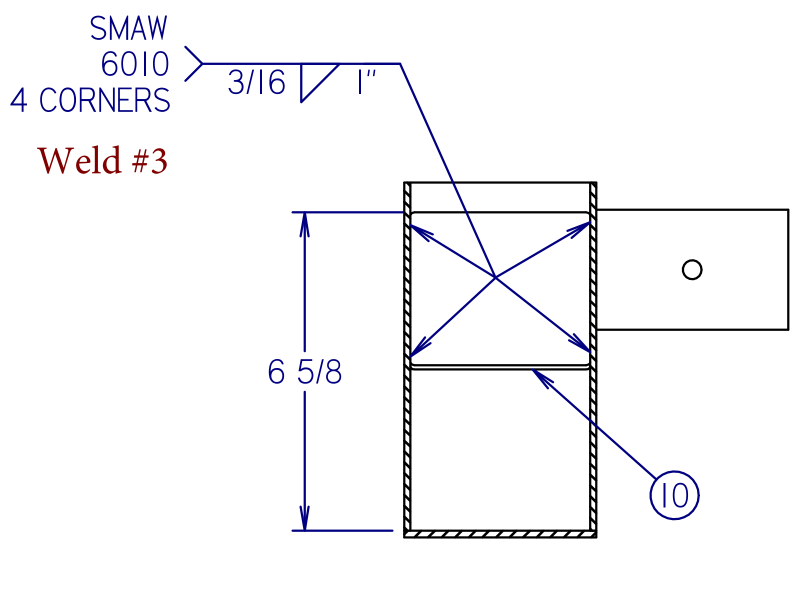
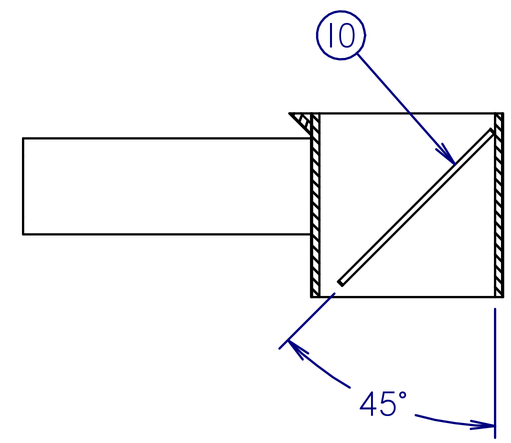
SIZE B | DWG. NO. | VER 01

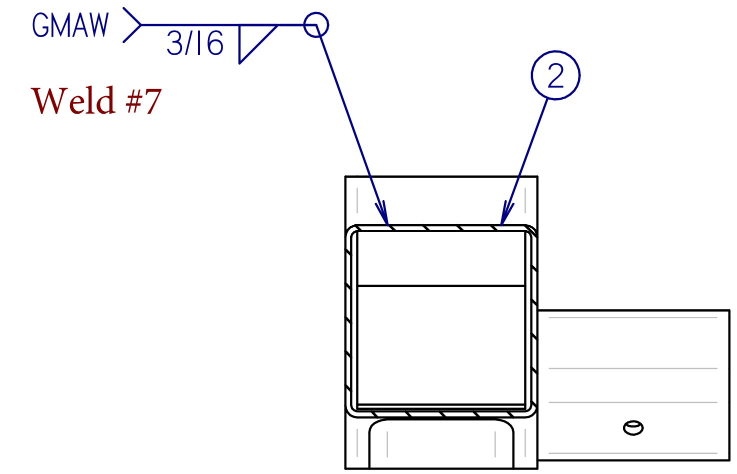
SCALE NOT TO SCALE | SHEET 5 OF 7



SECTION A-A



SECTION B-B



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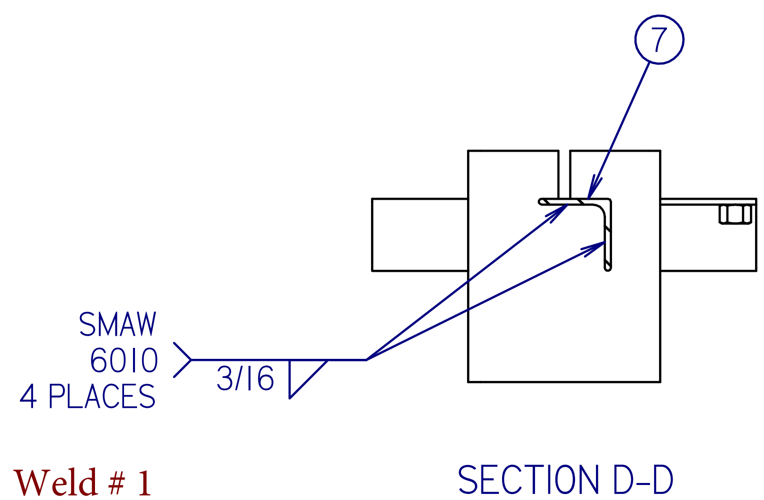

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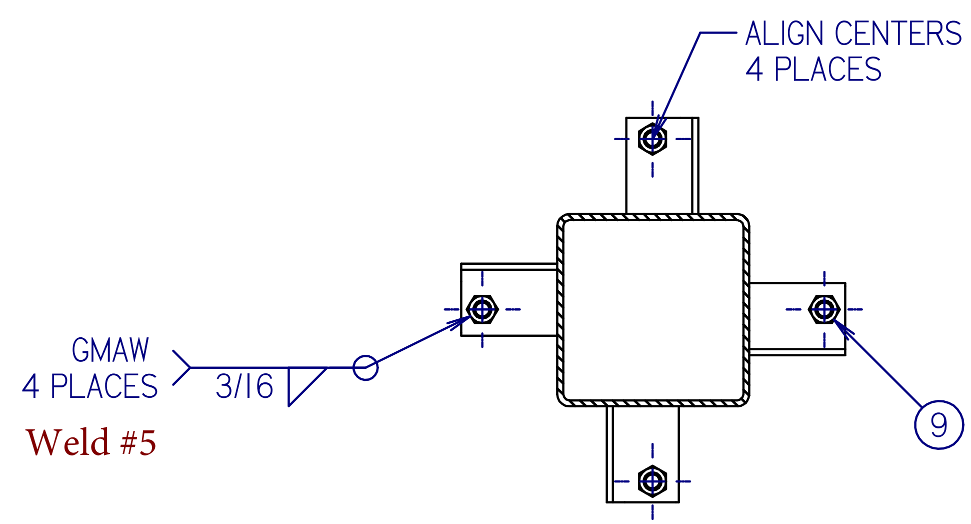

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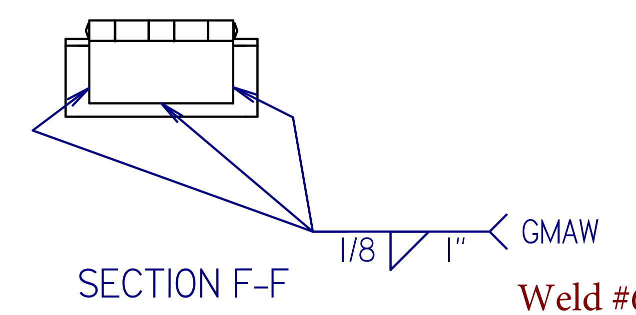

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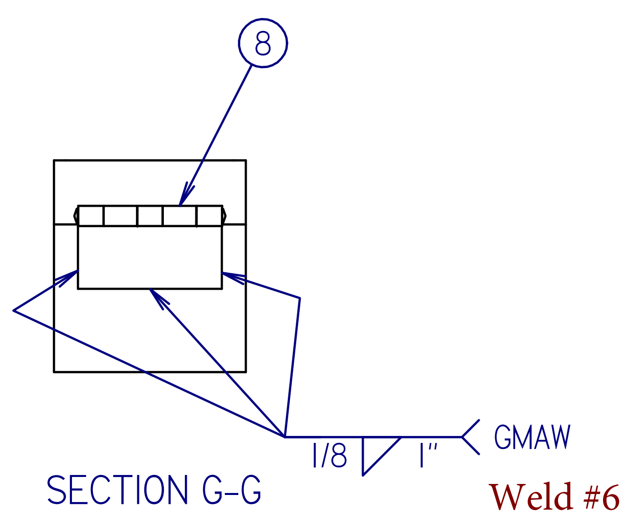
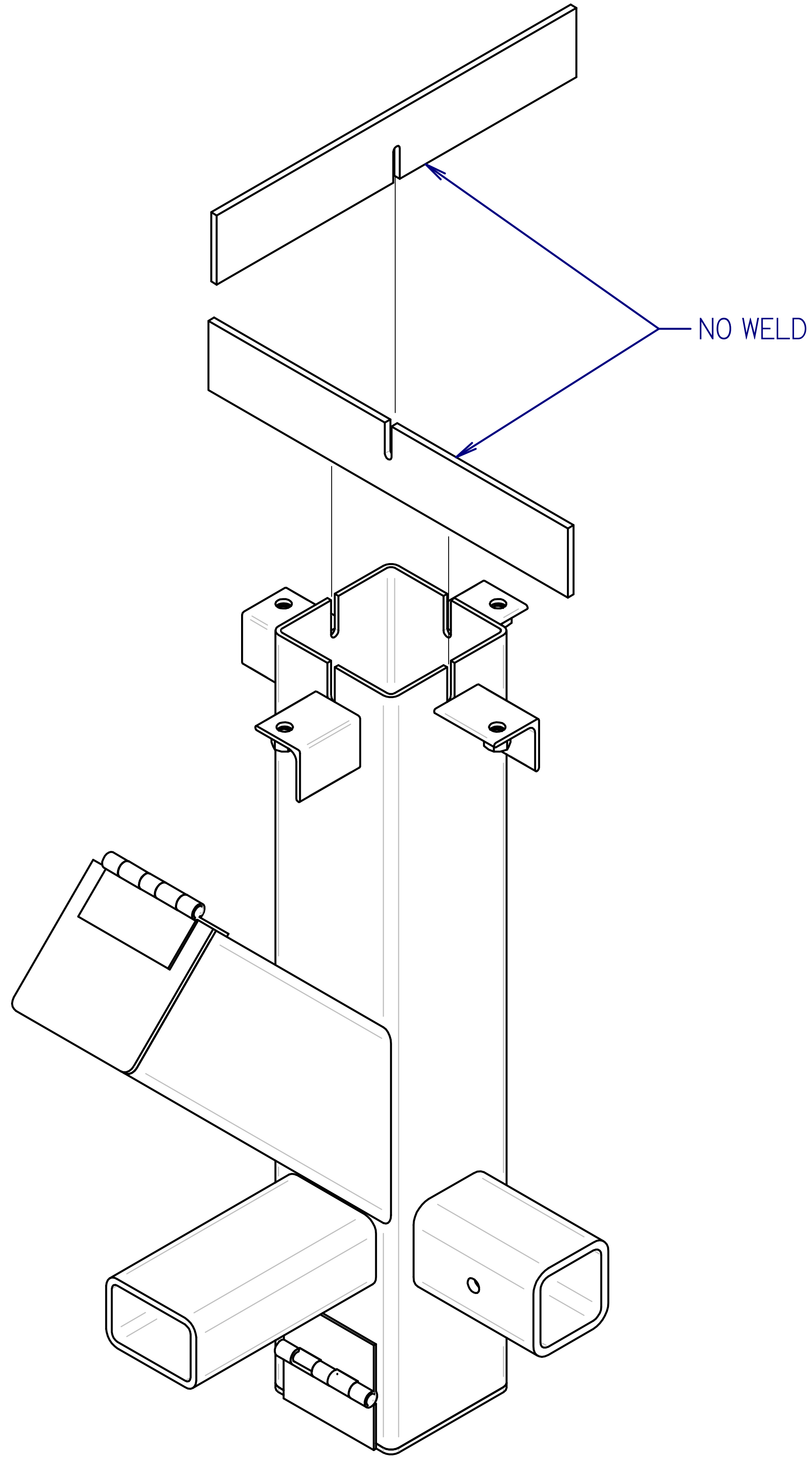


SECTION G-G

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES AND FRACTIONS OF AN INCH TOLERANCES FRACTIONAL: ±1/16 ANGULAR: ±1/2° DECIMALS: XX ±.01 XXX ±.005		NAME	DATE	
	DRAWN	D. MATNEY	01/29/19	TITLE: WELDING FABRICATION CONTEST PRINT
MATERIAL: NA	CHECKED			
FINISH: NA	ENG APPR.			SIZE B
DWG PREPARED IN ACCORDANCE WITH: ASME Y14.5M - 1994	MFG APPR.			DWG. NO.
THIRD ANGLE PROJECTION	SkillsUSA NORTH DAKOTA			VER 01
				SCALE NOT TO SCALE SHEET 6 OF 7



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THIRD ANGLE PROJECTION

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MFG APPR.		

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VER 01
SCALE NOT TO SCALE
SHEET 7 OF 7