CIMWD-222 Syllabus

Tool & Die Welding (SMAW)

Recommended Textbook:

Welding: Principles and Applications 8th Edition

Course Description:

Covers safety protocols, preparation procedures, and welding techniques used to weld tool steel used in tools and dies. Focuses on using the shielded metal arc welding process.

Course Topics

1. SMAW pad build-up.
2. SMAW line build-up.
3. SMAW knife edge.
4. Broken bolt removal.

Learning Objectives

1. Demonstrate the proper preparation techniques for the repair of a tool or die.
2. *Perform a weld using the proper techniques for the repair of a tool or die using the Shielded Metal Arc Welding process.
3. Demonstrate the proper technique for removing a broken bolt.

Competency-Based Education

The Welding Program at Henry Ford College uses a system of learning called Competency-Based Education (CBE). This competency-based welding program is centered on teaching specific job skills required in industry and mastery of these skills.

CBE is a very personalized teaching system that has the following characteristics:

- Ongoing Program
- Open entry - flexible schedule
- Credit granted for work completed
- Evaluation (grades) based on performance
- Fixed content in each course
- Variety of student levels served in each class
- Work at your own pace
- Live or taped lectures and demonstrations

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This competency-based program has several very important benefits for you:

- You will be given a list of the skills and knowledge needed to complete the program successfully.
- Your performance will not be compared to that of other students, but to a fixed standard, which has been set for the program.
- If you have already acquired certain skills required for this program, you may simply demonstrate this and begin focusing your attention on new skills.
- You will be able to review learning materials several times in order to attain the skill or knowledge.
- If you are able to attain the skills easily, you may progress through the program faster than the average person. If you progress through the program faster than average, you can graduate in a shorter time frame.

What's Required of You:

For this system to work, you will be expected to:

1. Assume the responsibility for your own learning. Your instructor will give you assistance, but the actual responsibility for learning rests with you, the student.
2. Utilize the materials provided for you. The program's resources have been carefully chosen and developed to help you learn.
3. Devote your energy to attaining the skills and knowledge required for your program.

The Instructor's Role:

The instructors in HFC's Welding Program work with students individually and guide them through the learning process with the help of many different learning resources. In CBE, instructors are often referred to as learning managers because they manage the activities in the program and facilitate the learning process. If you are having difficulty, you should go to your instructor with your problem. The instructor's goal is to find the most effective way to help you learn the tasks in the program.

How your grade is computed in this program:

If your class is a designated lecture module, your grade will be based off of an exit quiz. When a passing grade is complete, you will be able to move on to the next module.

If this class is a designated lab module, your grade will be based off of a grading matrix. You will evaluate your competencies along with the instructor.

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Criteria	Points	Information	Grade
Follow Safety Rules for Project	10		
Welding Machine was Set Correctly	10		
Followed Instructions Given	10		
Correct Assembly and Fit-up	10		
Visual Inspection of Weld	10		

Grading Scale:

A+ = 100-98
A = 97-93
A- = 92-90
B+ = 89-87
B = 86-83
B- = 82-80
C+ = 79-77
C = 76-73
C- = 72-70
D+ = 69-67
D = 66-63
D- = 62-60
E = 59-below

Estimated Time for Projects:

Project 1: 10 hrs
Project 2: 10 hrs
Project 2: 10 hrs

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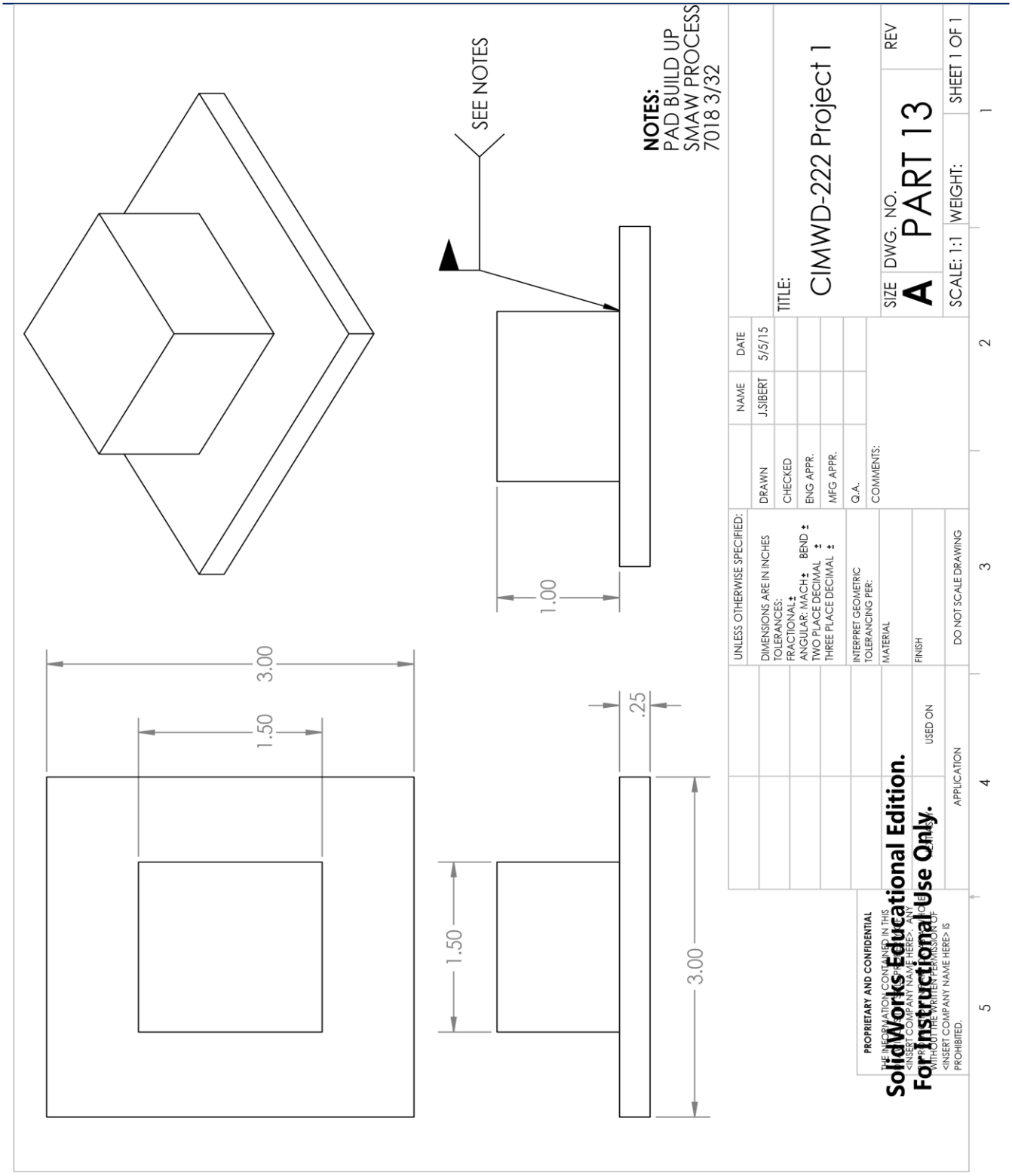

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Tool & Die Welding (SMAW)

Welding Procedure Specification

WPS Name	CIMWD-222 Project 1

Weld Type	Pad Build-Up
Welding Process	SMAW
Position	Flat
Material	1/4" Steel
Joint Type	
Backing Option	
Backing Material	

Polarity	DC+
Electrode	E7018 3/32
Transfer Mode	
Tungsten Electrode	
Shielding Gas	
Flow Rate	
Cup Size	

Welding Procedure

Weld Layers	Pass No.	Process	Filler Metal Classification	Filler Metal Diameter in (mm)	Current Amps	Current Type and Polarity	Wire Feed Speed	Volts	Remarks
Pad		SMAW	E7018	3/32"	75a	DC+			

Technique:
A pad build up using stringer beads. Looking for bead quality and bead placement. 3"x3"x1 1/2" high.

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Tool & Die Welding (SMAW)

Heat Treatment:
Preheat Temperature-

Post Heat Temperature-

Interpass Temperature- Quench every 2-3 passes

Stress Relieving-

Additional Notes:

Show the instructor progress every 30 minutes minimum.

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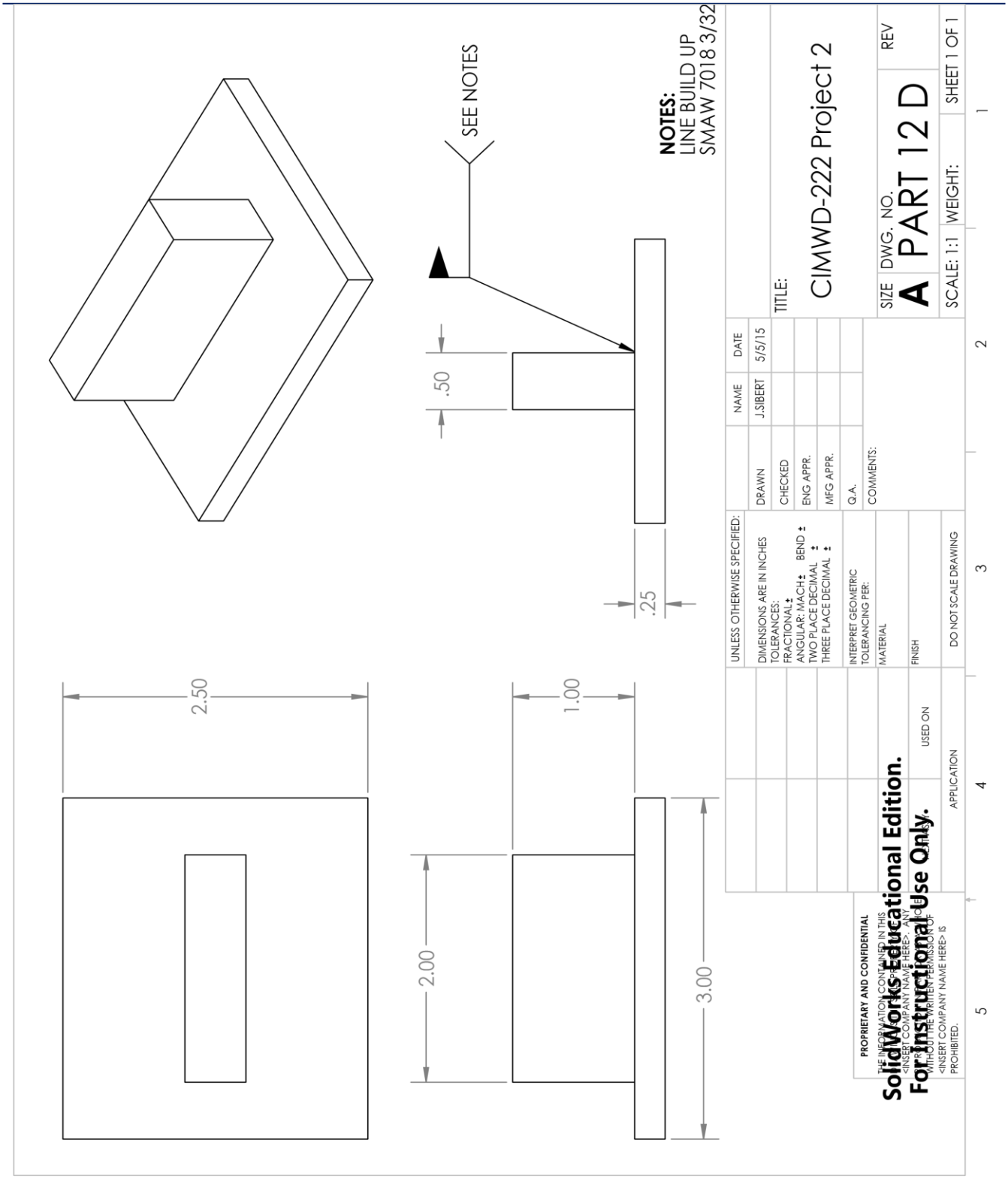
Tool & Die Welding (SMAW)



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Tool & Die Welding (SMAW)

Welding Procedure Specification

WPS Name	CIMWD-222 Project 2

Weld Type	Line Build-Up
Welding Process	SMAW
Position	Flat
Material	1/4" Steel
Joint Type	
Backing Option	
Backing Material	

Polarity	DC+
Electrode	E7018 3/32
Transfer Mode	
Tungsten Electrode	
Shielding Gas	
Flow Rate	
Cup Size	

Welding Procedure

Weld Layers	Pass No.	Process	Filler Metal Classification	Filler Metal Diameter in (mm)	Current Amps	Current Type and Polarity	Wire Feed Speed	Volts	Remarks
Pad		SMAW	E7018	3/32"	75a	DC+			

Technique:
A line build up using stringer beads. Looking for bead quality and bead placement. 3 ½"x1 1/2" high.

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Tool & Die Welding (SMAW)

Heat Treatment:
Preheat Temperature-

Post Heat Temperature-

Interpass Temperature- Quench every 2-3 passes

Stress Relieving-

Additional Notes:

Show the instructor progress every 30 minutes minimum.

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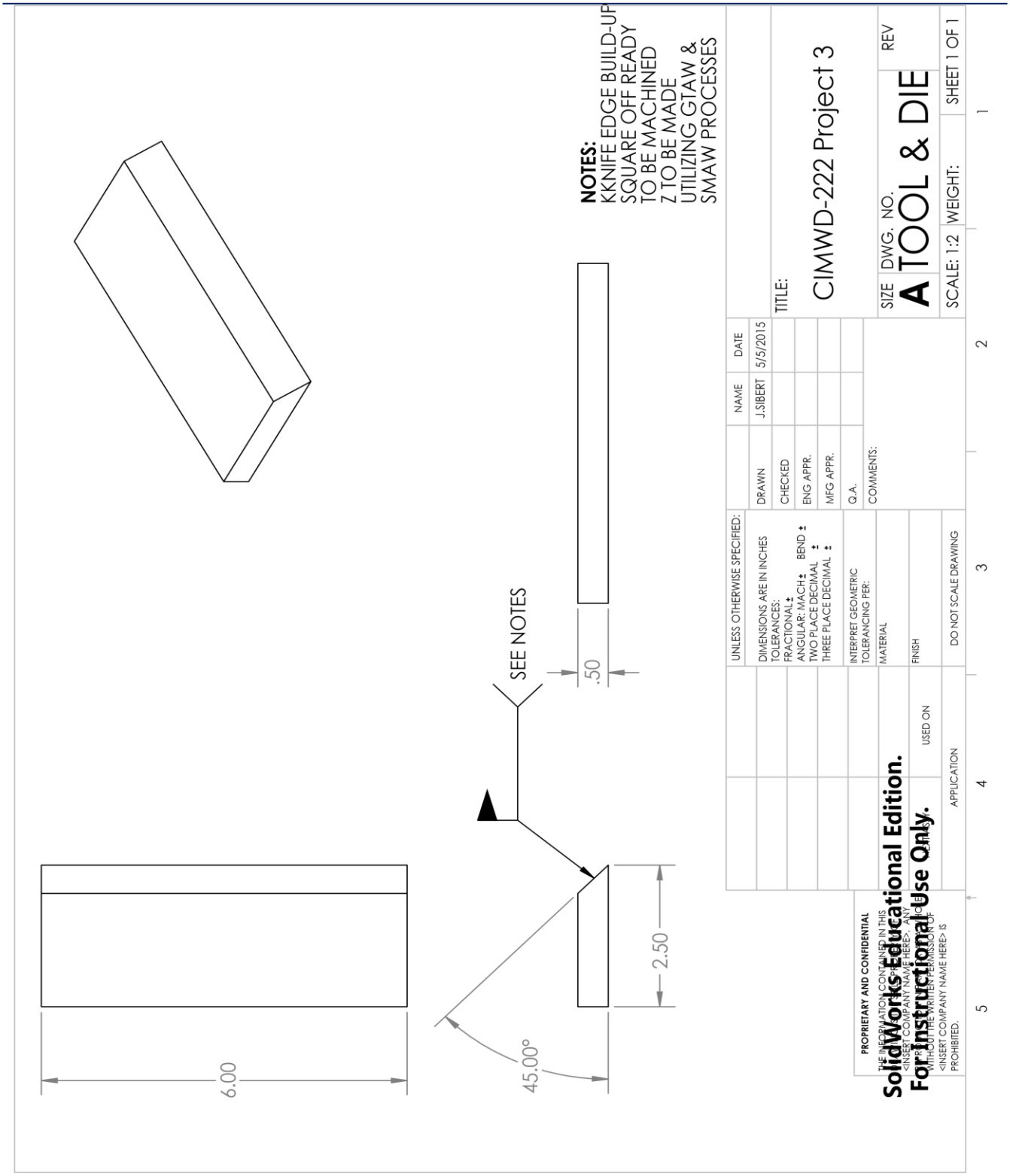
Tool & Die Welding (SMAW)



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Tool & Die Welding (SMAW)

Welding Procedure Specification

WPS Name	CIMWD-222 Project 3

Weld Type	Knife Edge Build-Up
Welding Process	SMAW
Position	Flat and Horizontal
Material	1/4" Steel
Joint Type	
Backing Option	
Backing Material	

Polarity	DC+
Electrode	E7018 3/32
Transfer Mode	
Tungsten Electrode	
Shielding Gas	
Flow Rate	
Cup Size	

Welding Procedure

Weld Layers	Pass No.	Process	Filler Metal Classification	Filler Metal Diameter in (mm)	Current Amps	Current Type and Polarity	Wire Feed Speed	Volts	Remarks
Pad		SMAW	E7018	3/32"	75a	DC+			

Technique:
A knife edge build up using stringer beads. Looking for bead quality and bead placement.

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Tool & Die Welding (SMAW)

Heat Treatment:
Preheat Temperature-

Post Heat Temperature-

Interpass Temperature- Quench every 2-3 passes

Stress Relieving-

Additional Notes:

Show the instructor progress every 30 minutes minimum.

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