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White House Communications Agency (WHCA) Presidential Voice Communications Rack Mount System Mechanical Drawing Package

by Steven P Callaway

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14. ABSTRACT The White House Communications Agency (WHCA) Presidential Voice Communications Rack Mount System served as an update and refurbishment of an existing system. WHCA wanted to update the radios being used in this communications system and looked to the US Army Research Laboratory to accomplish this task. The new system uses 40% less space and is packaged in a single chassis, resulting in vast improvements over the previous system.					
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1. Introduction

The White House Communications Agency (WHCA) Presidential Voice Communications Rack Mount System served as an upgrade of older equipment previously used by WHCA. The customer desired to upgrade their comms equipment from Harris 117F radios to 117G radios. These radios offer a smaller package with increased capabilities. With the decreased size of the radios paired with a more efficient use of space in the units, the new Rack Mount System used 40% less rack space. The Rack Mount System was contained in a single chassis, an improvement over the previous system. This allows for easier transportation, installation, and cabling of the system.

2. Mechanical Requirements

The WHCA Presidential Voice Communications Rack Mount System was designed in 2 versions: an 11 rack unit (11U) chassis that included a fiber optic modem and fiber optic output for network communications, and a 9 rack unit (9U) chassis that did not use a fiber optic modem and instead used direct radio frequency (RF) output from the Harris 117F radio. The version used depended on the customer site requirements where the chassis were installed.

Both 11U and 9U were required to accept 120 VAC power input with a switched outlet, in order it accommodate the installation site. A 24 V AC-to-DC power supply was then required to supply 24 V power to the equipment. Four 117F Harris radios were required to be mounted in the system. The radios needed to be secured in a way that they could be removed and replaced by the user without the use of hand tools. Both 11U and 9U chassis also required a 4-port network switch for operation. A cooling fan was used in the rear of each chassis to enhance equipment cooling.

The 11U chassis required additional equipment to support the fiber optic capability. Two fiber modems were required, mounted in a way that they could be removed and replaced by the user without the use of hand tools. Each radio also required a diplexer to be able to communicate with the fiber modem. The rear panel of the 11U chassis contained the interface connections for the system. Four DB-9 and 4 DB-25 ports were required for radio fill and radio data connections, respectively. Four RJ-45 ports for audio and 1 for a network connection were also required. Four fiber optic feedthroughs were also required for the output of the fiber modem.

The 9U chassis had a shorter required equipment list because of the lack of a fiber optic capability. The same DB-9, DB-25, and RJ-45 requirements held for the 9U

chassis, though 4 N-Type RF connections were required in place of the fiber optic connections.

3. Drawing Package

The following drawing package (Table 1) was used for the fabrication and modification of parts for the WHCA Presidential Voice Communications Rack Mount System. The package was also consulted by US Army Research Laboratory (ARL) technicians for system assembly. The individual drawings are provided in the Appendix.

Table 1 WHCA Presidential Voice Communications Rack Mount System drawing index

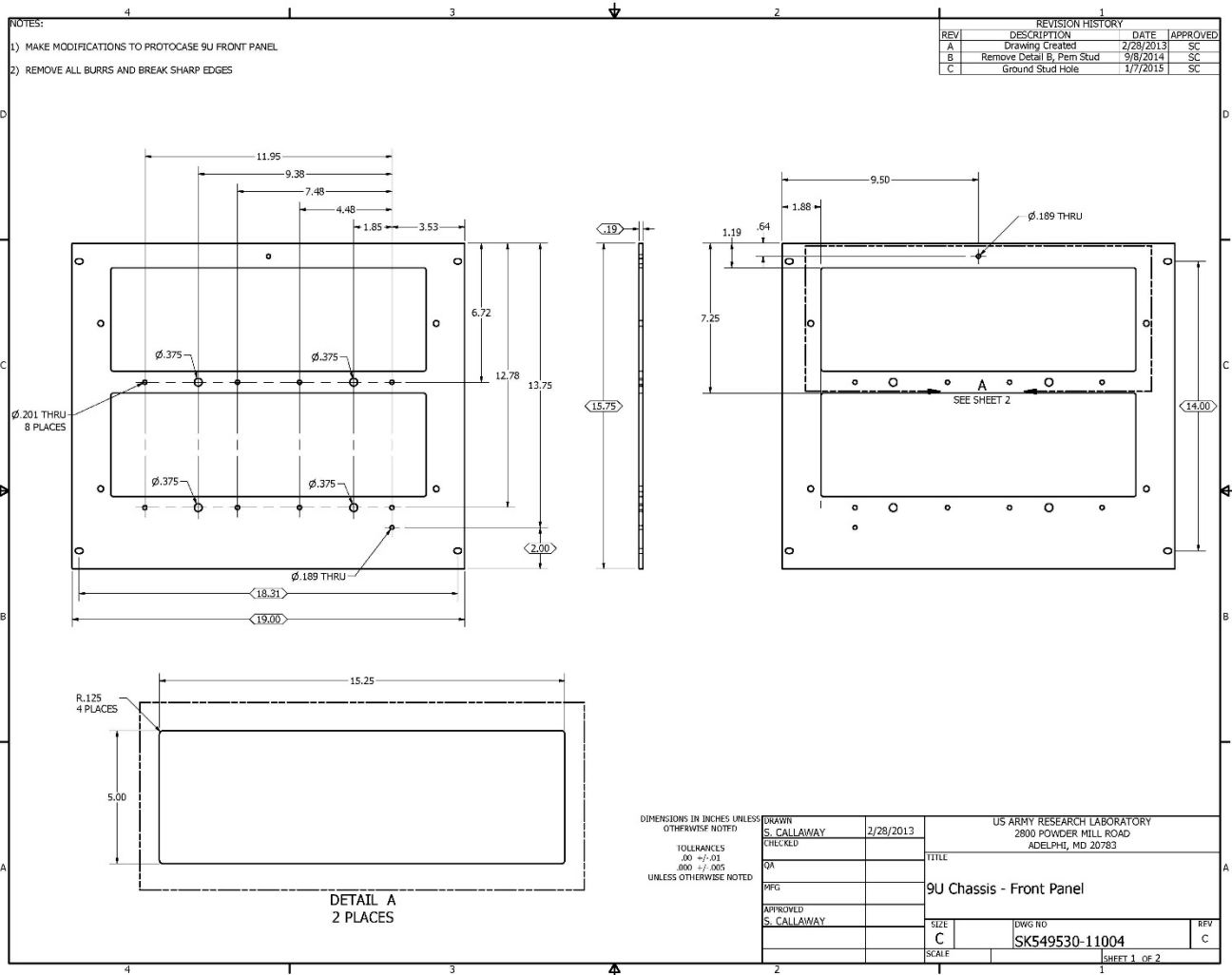
SK549530	
Title	Dash No.
11U Chassis - Side Panel, Right	-12001
11U Chassis - Side Panel, Left	-12002
11U Chassis - Radio Tray	-12003
11U Chassis - Front Panel	-12004
11U Chassis - Rear Panel	-12005
11U Chassis - Fiber Modem Tray	-12006
11U Chassis - Fiber Modem Latch	-12007
11U Chassis - Fiber Modem Mounting Pin	-12008
11U Chassis - Rear Hinge	-12009
9U Chassis - Side Panel, Right	-11001
9U Chassis - Side Panel, Left	-11002
9U Chassis - Radio Tray	-11003
9U Chassis - Front Panel	-11004
9U Chassis - Rear Panel	-11005
9U Chassis - Rear Hinge	-11006
11U/9U Chassis - Bottom Panel	-13001
11U/9U Chassis - Radio Tray Rear Support	-13003
11U/9U Chassis - Radio Guide, Right	-13008
11U/9U Chassis - Radio Guide, Left	-13009
11U/9U Chassis - Radio Guide, Center	-13010
11U/9U Chassis - Radio Guide, Rear	-13011
11U/9U Chassis - Radio Locating Pin	-13012
11U/9U Chassis - Radio Latch 3	-13014

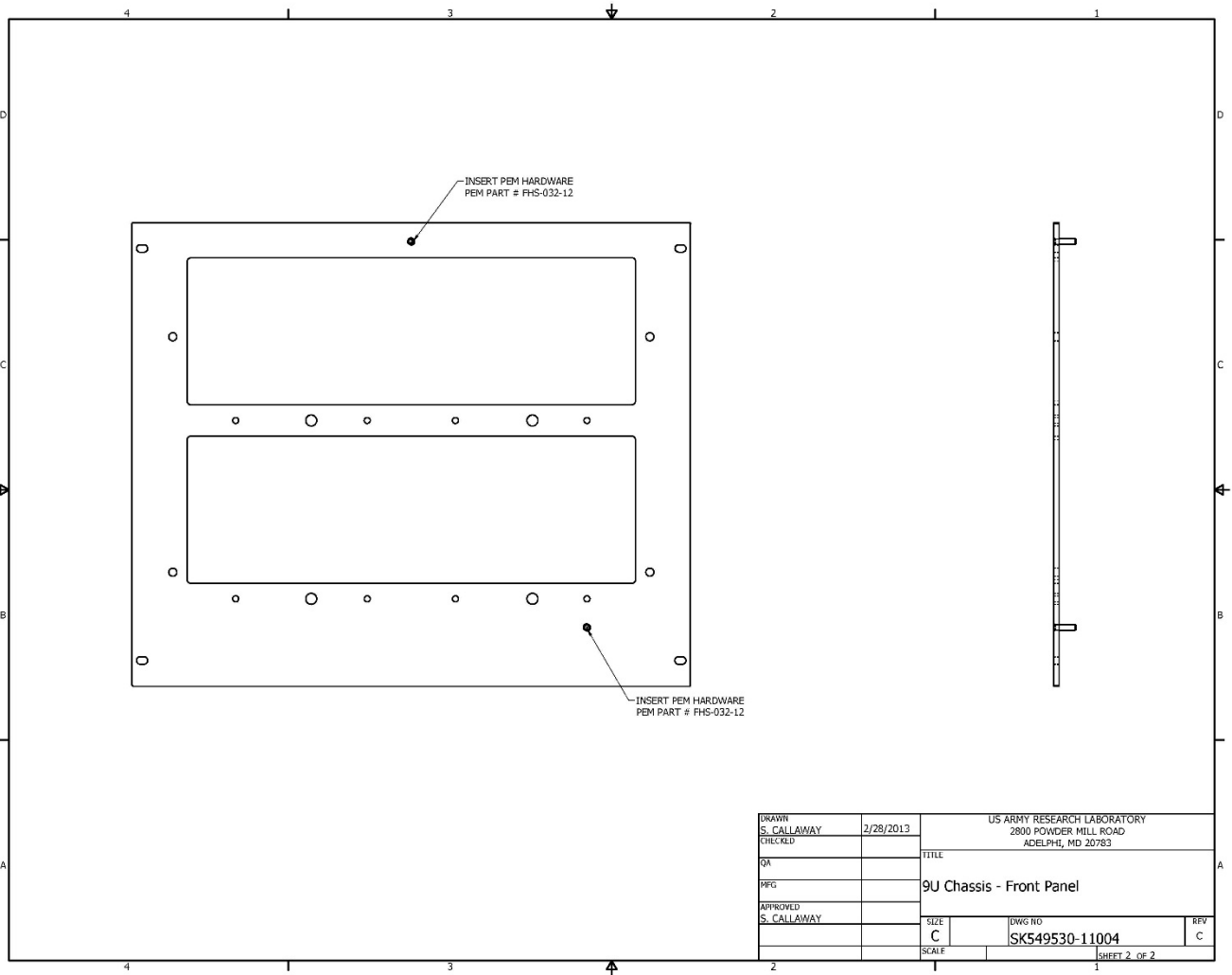
4. Conclusion

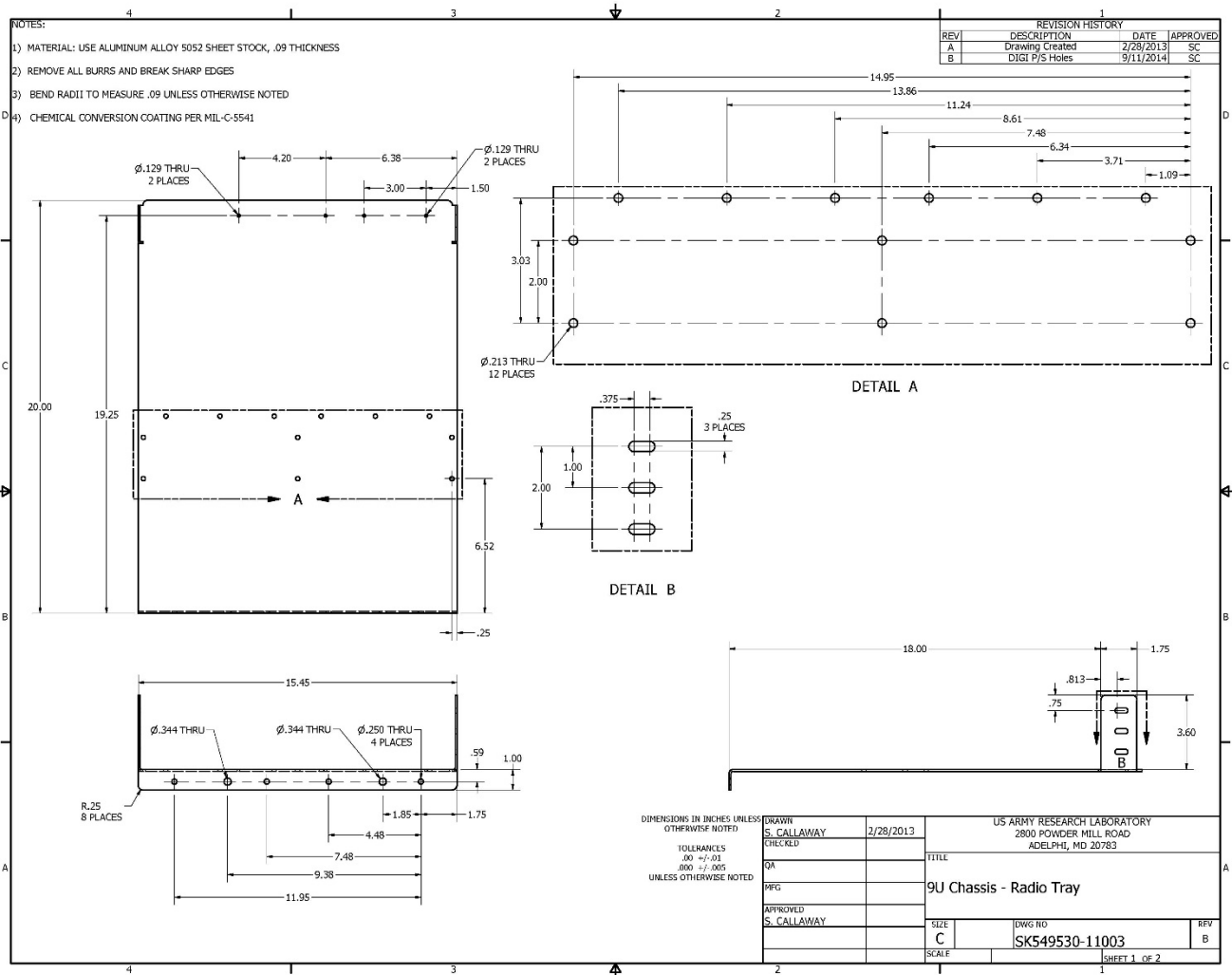
In order to upgrade the WHCA Presidential Voice Communications Rack Mount System, the next-generation Harris radio was installed, the 117G. With the new system, a 40% size reduction was realized, and installation was simplified. A single chassis was used for each system, allowing the majority of cabling to be completed before installation. To date, the systems continue to be deployed in order to keep the entire system current.

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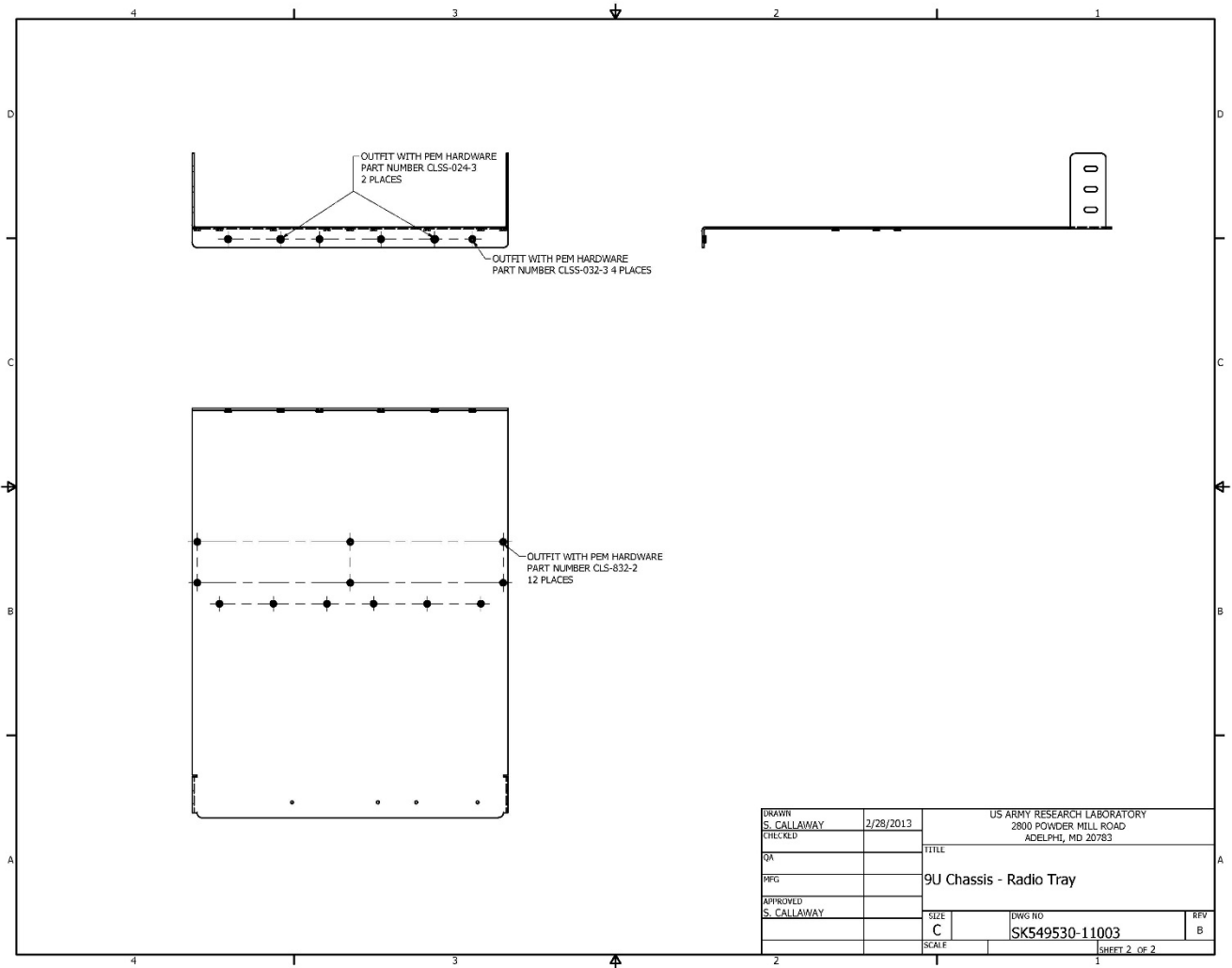
Appendix. WHCA Presidential Voice Communications Rack Mount System Drawings

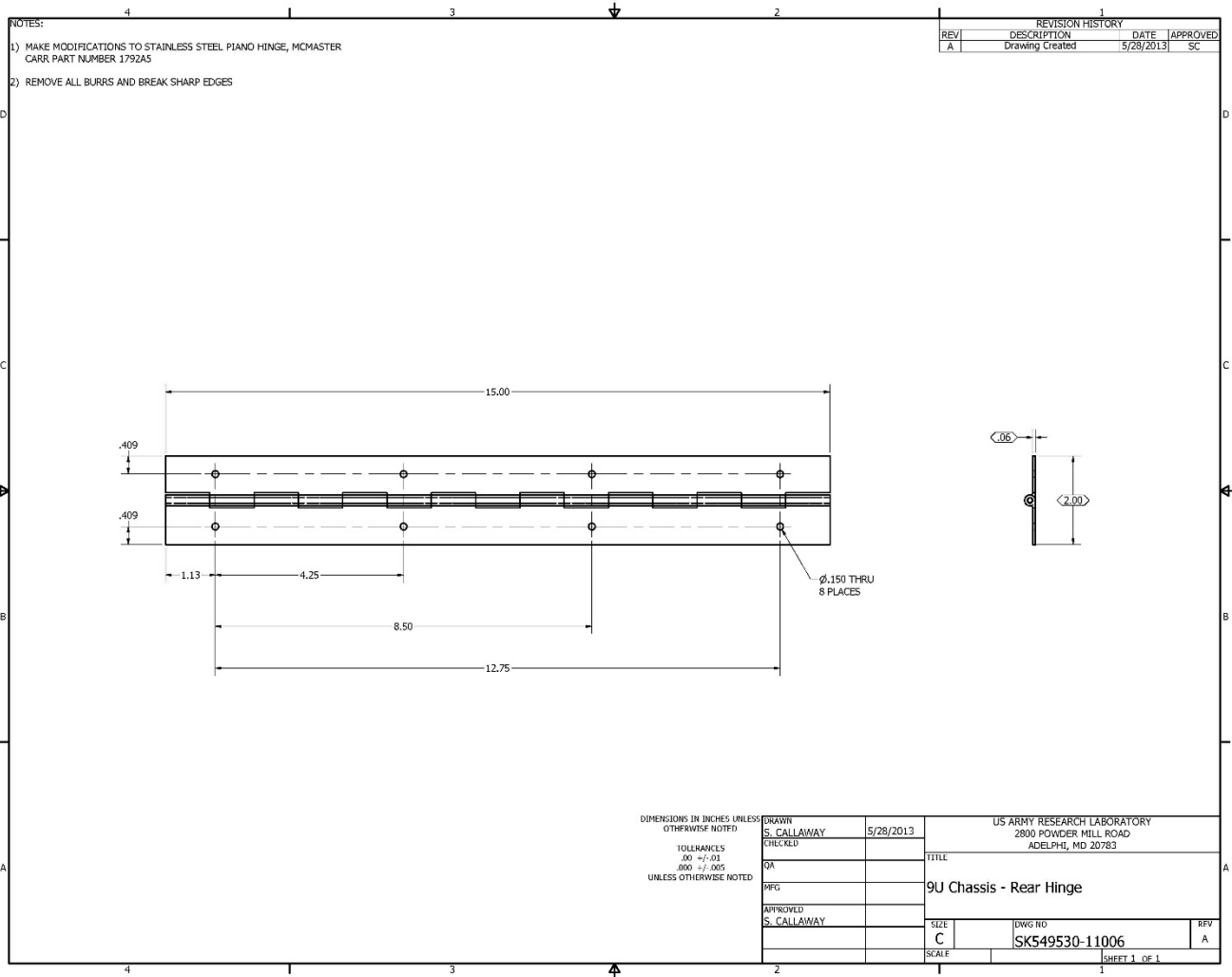


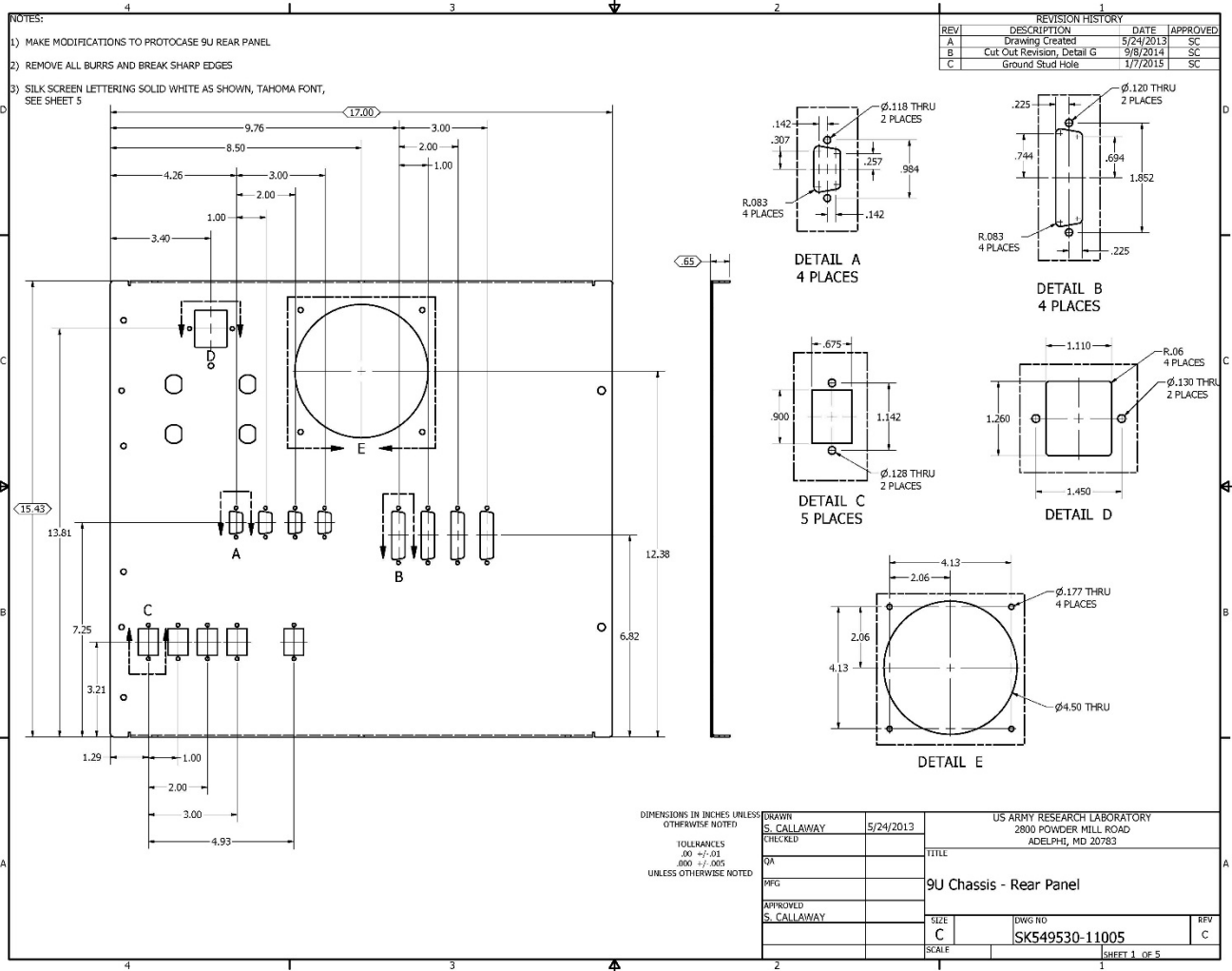


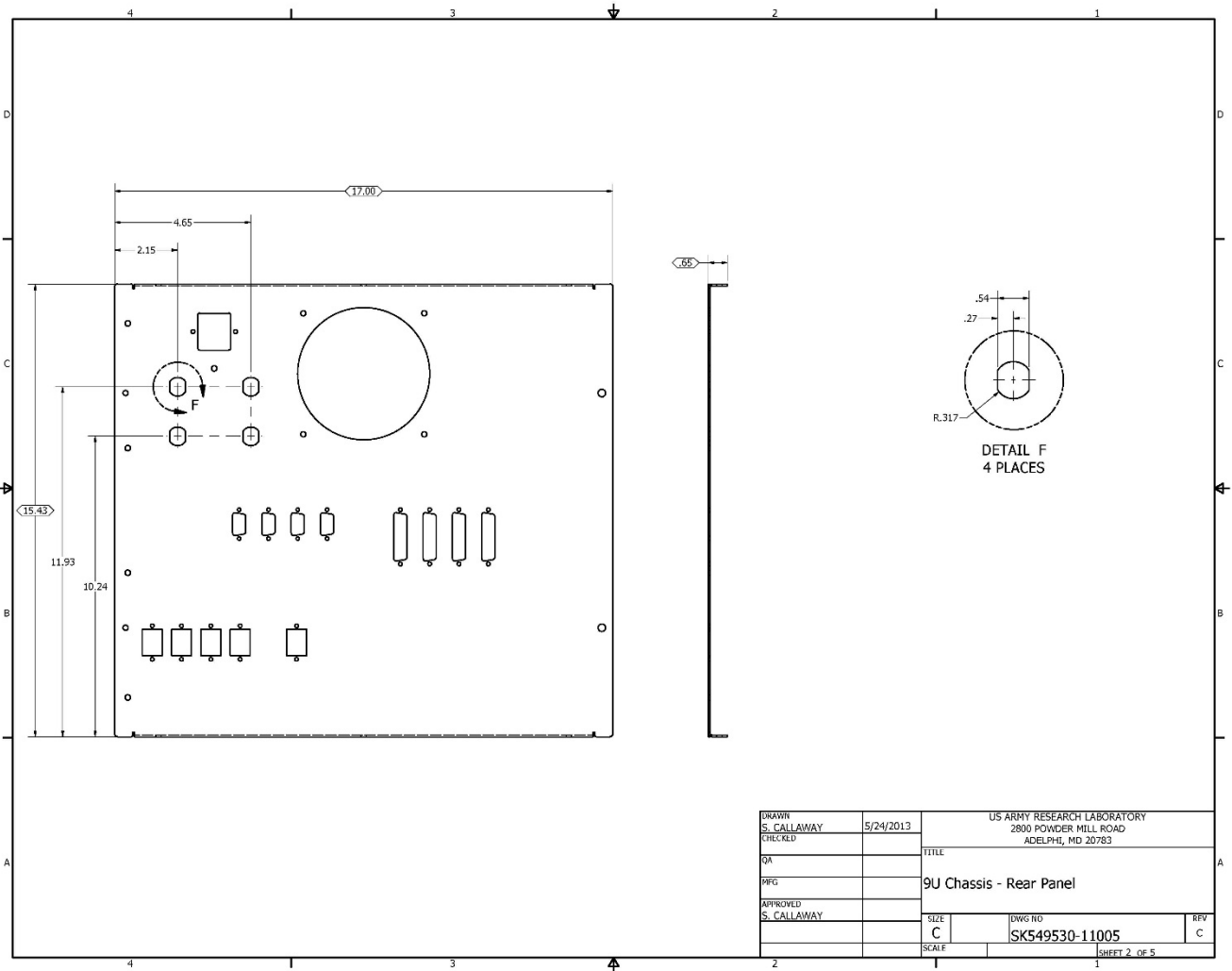


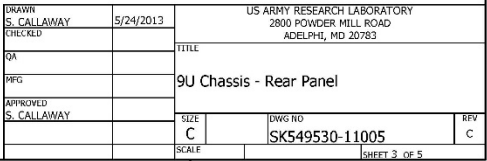
DRAWN S. CALLAWAY		2/28/2013		US ARMY RESEARCH LABORATORY 2800 POWDER MILL ROAD ADELPHI, MD 20783	
CHECKED				TITLE	
QA				9U Chassis - Radio Tray	
PFG				DWG NO	
APPROVED S. CALLAWAY		SIZE C		SK549530-11003	
		SCALE		REV B	
				SHEET 2 OF 2	

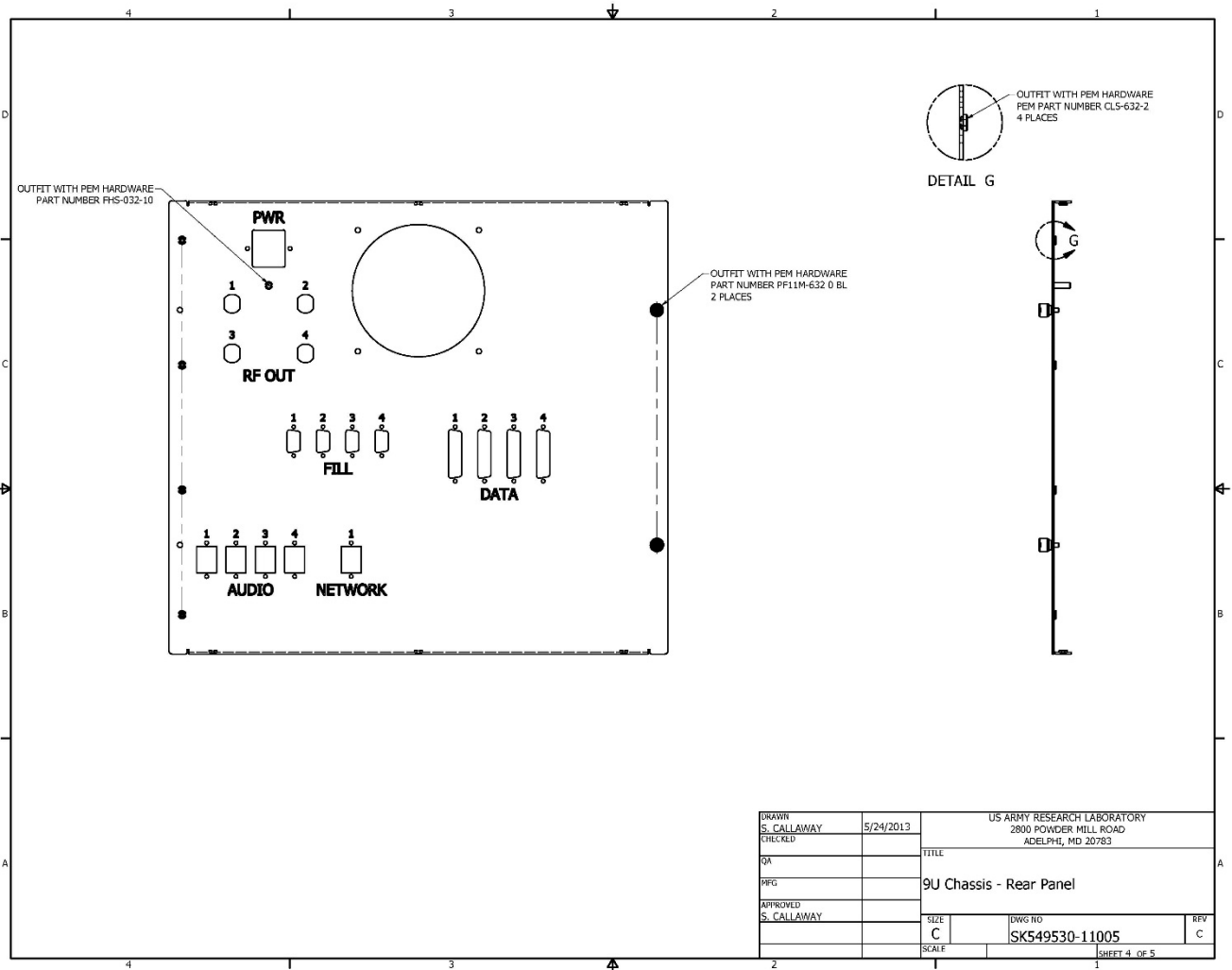




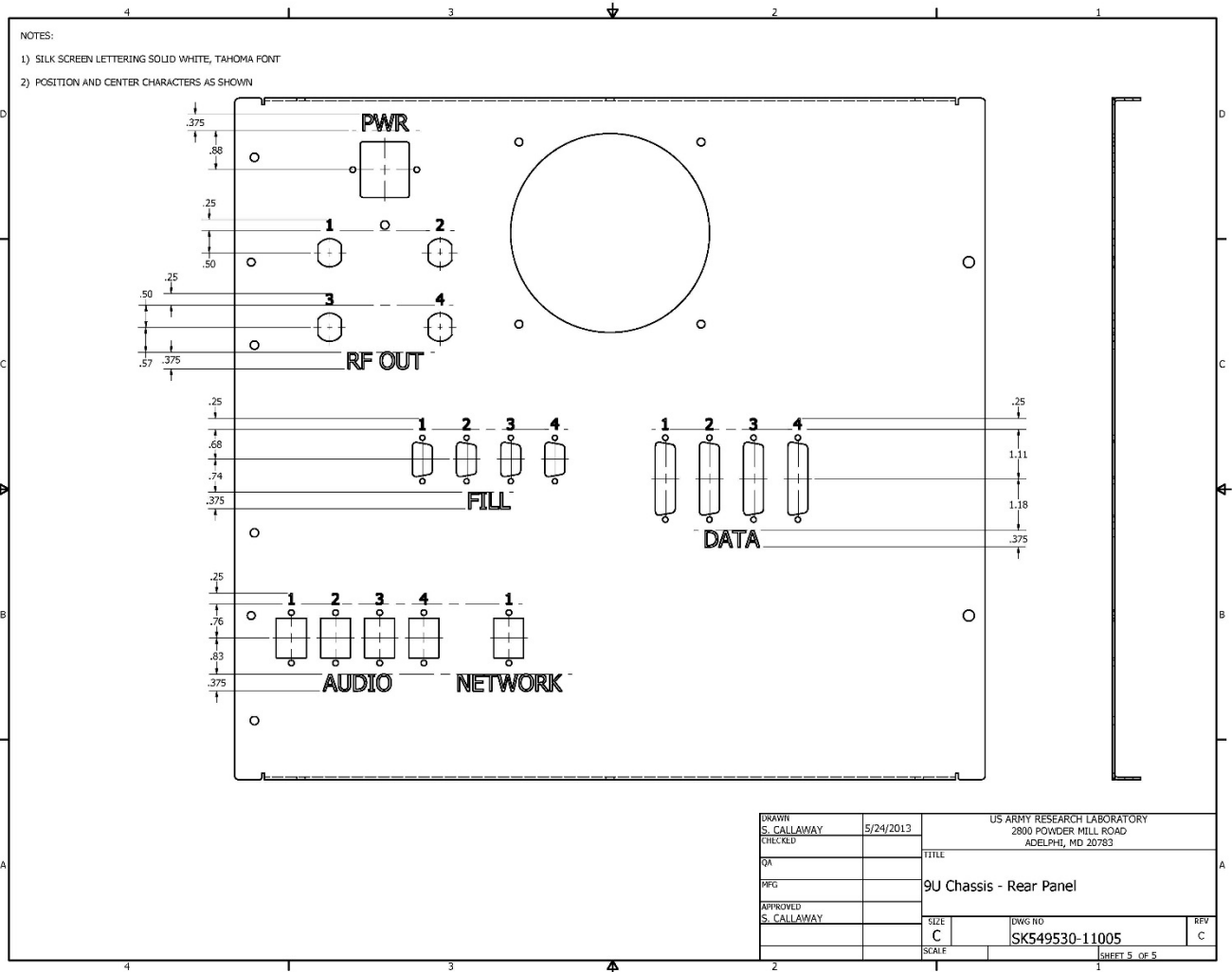


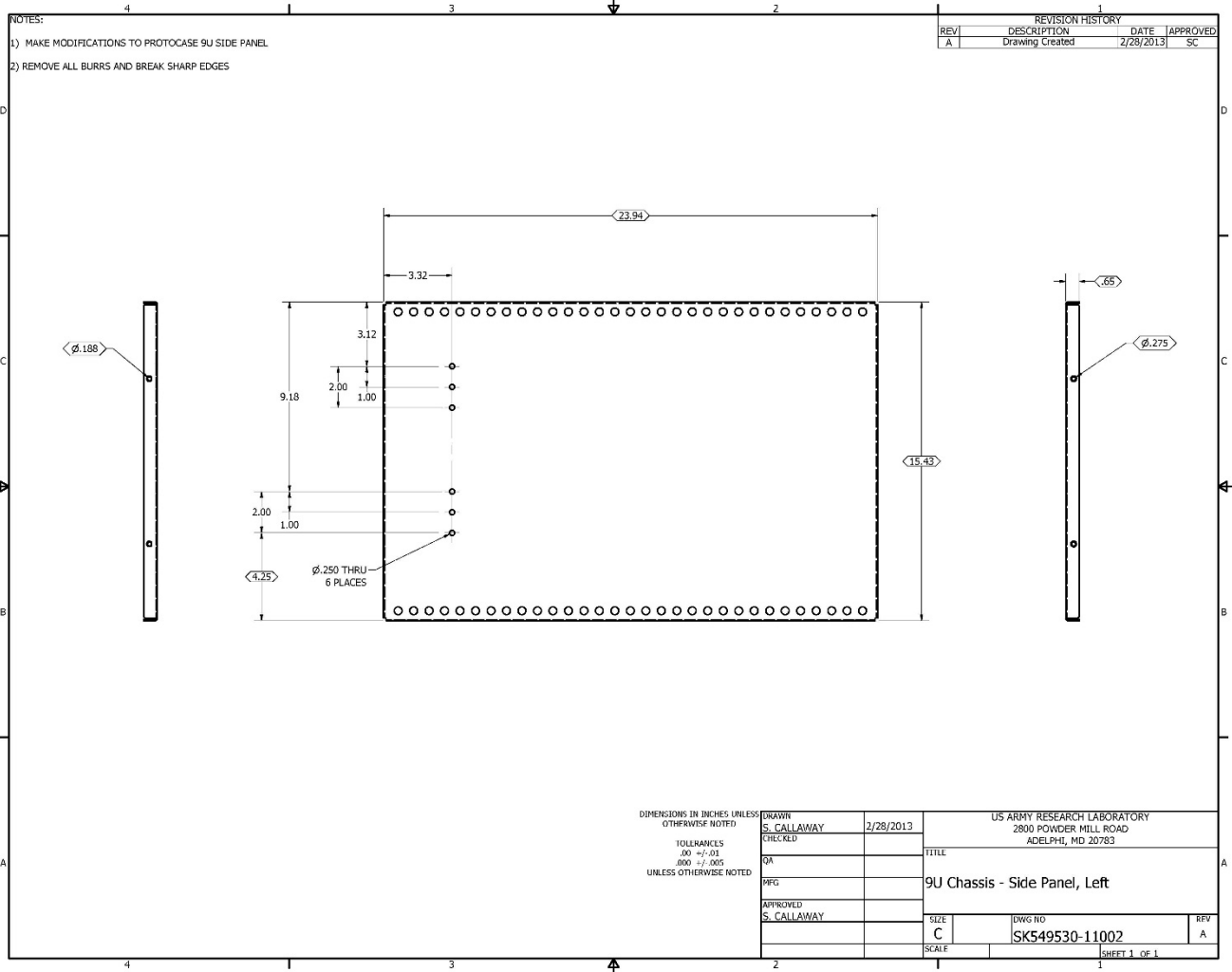


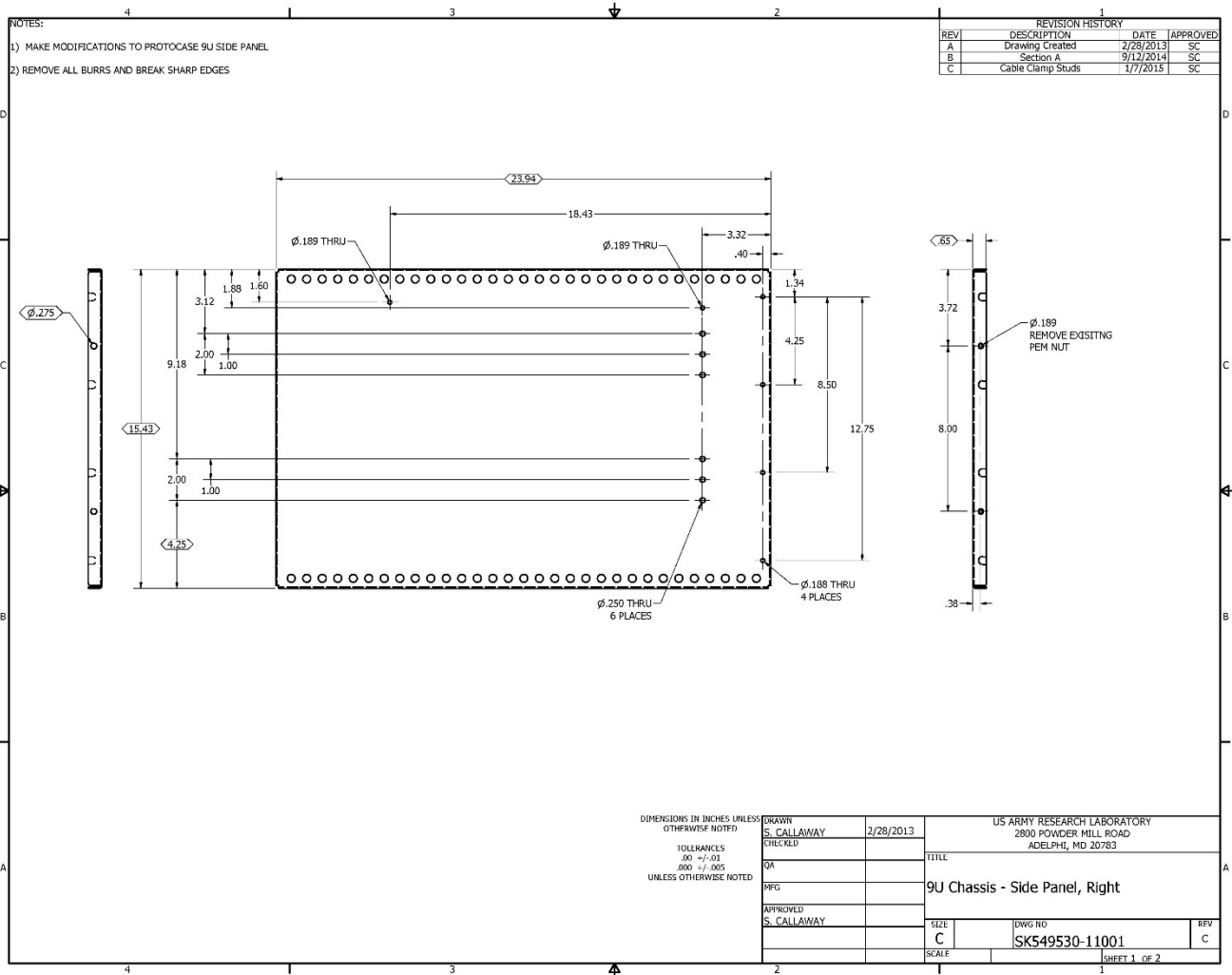


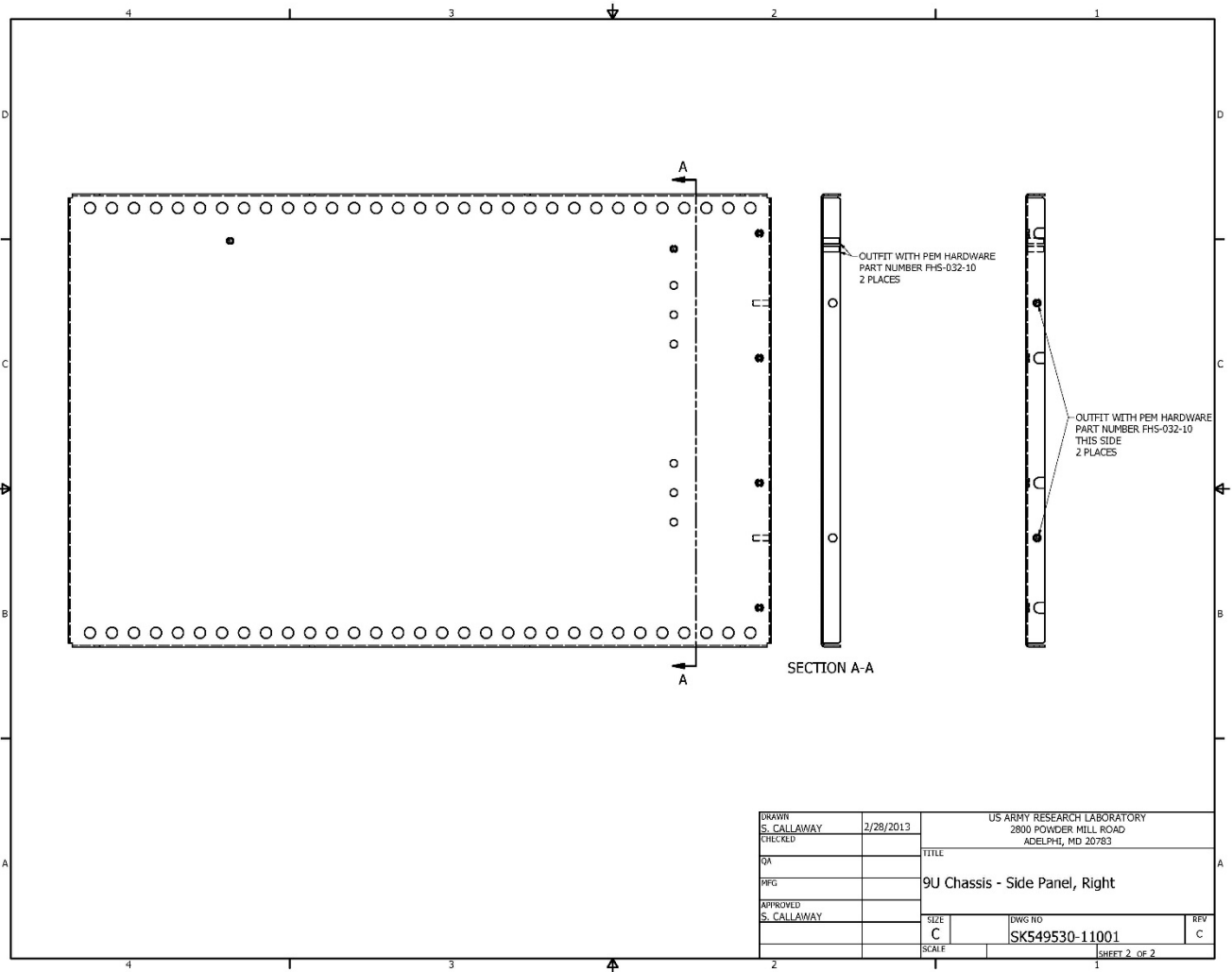


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CHECKED			2800 POWDER MILL ROAD		
QA			ADELPHI, MD 20783		
PFG			TITLE		
APPROVED			9U Chassis - Rear Panel		
S. CALLAWAY			SIZE	DWG NO	REV
			C	SK549530-11005	C
			SCALE	SHEET 4 OF 5	

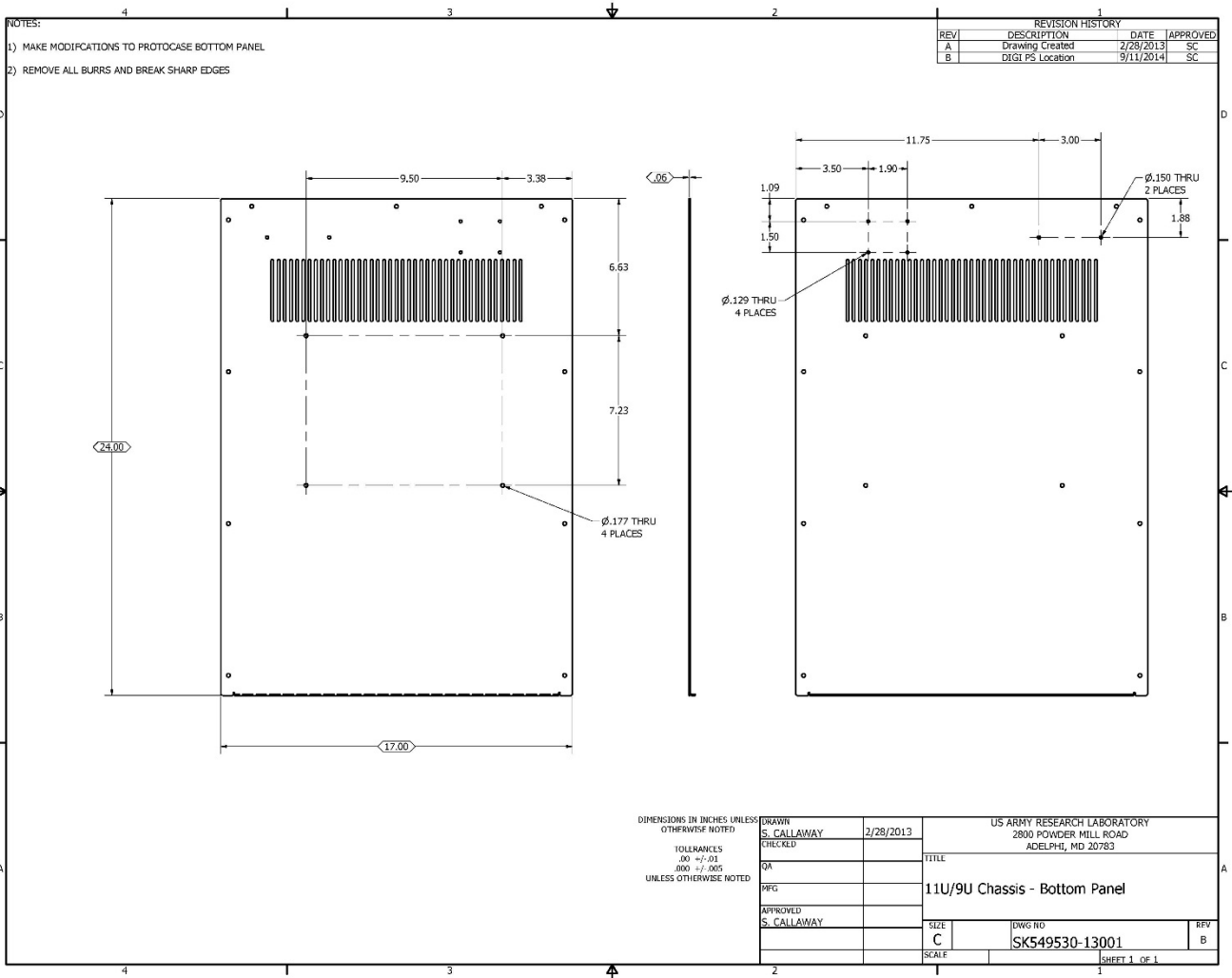


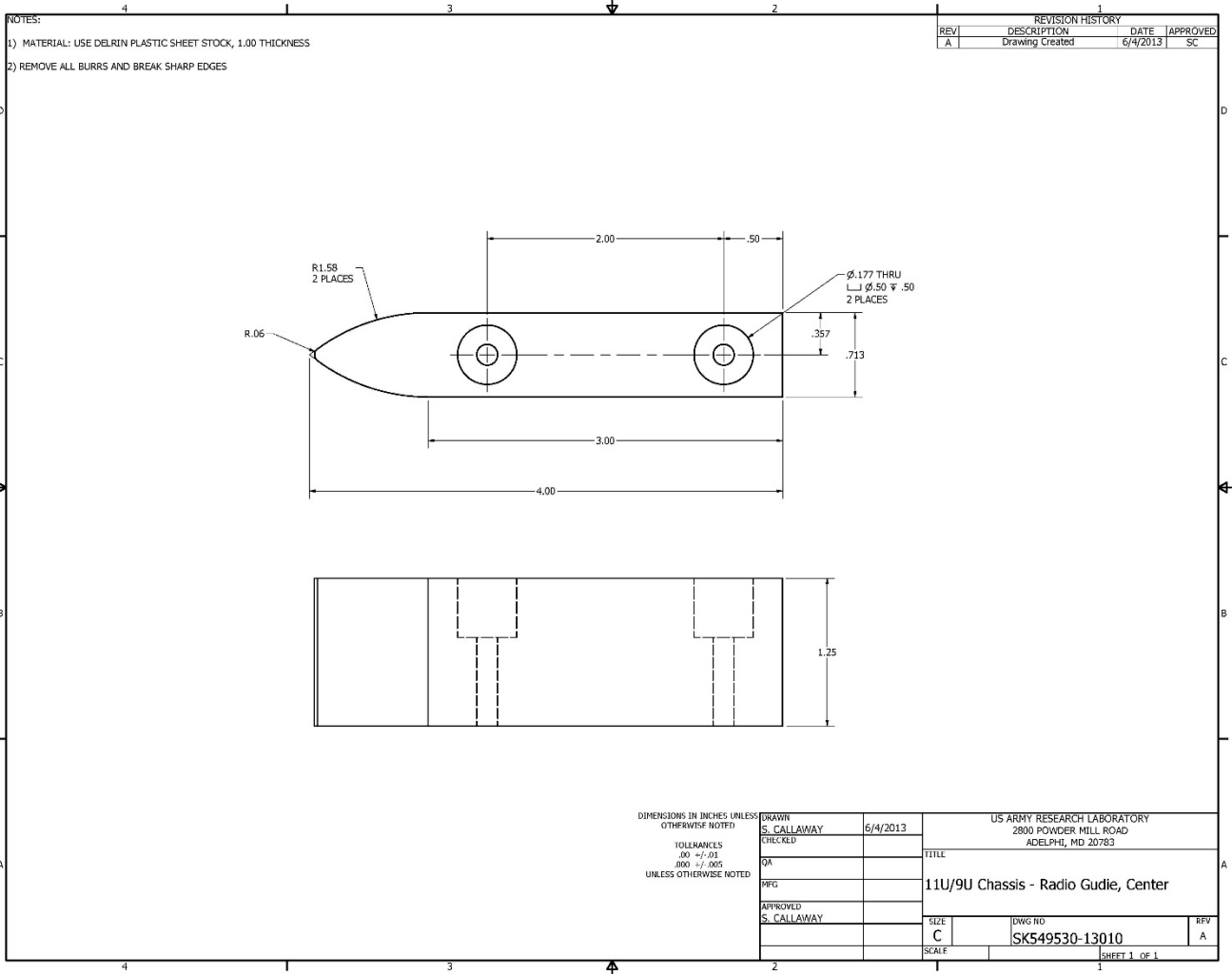


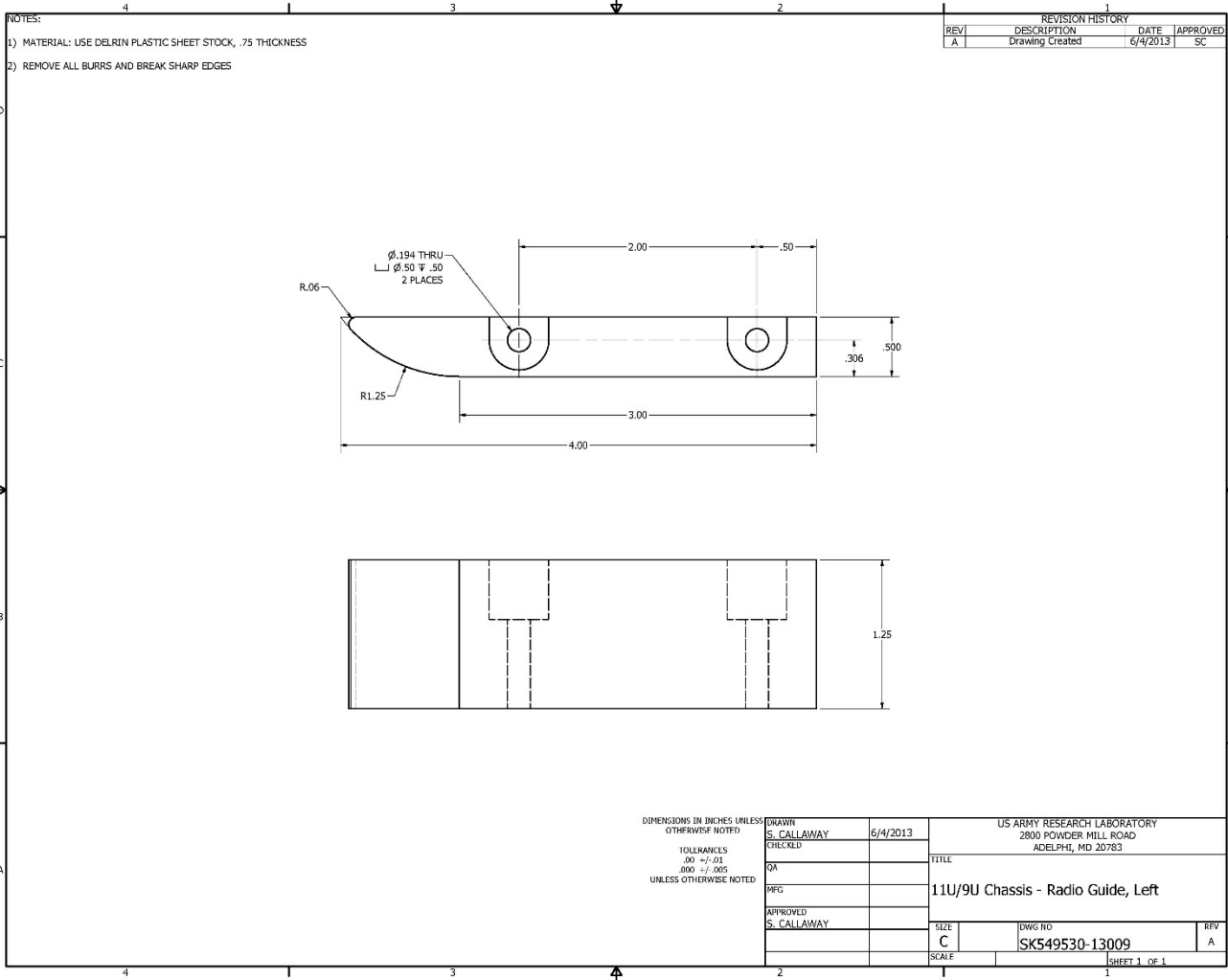


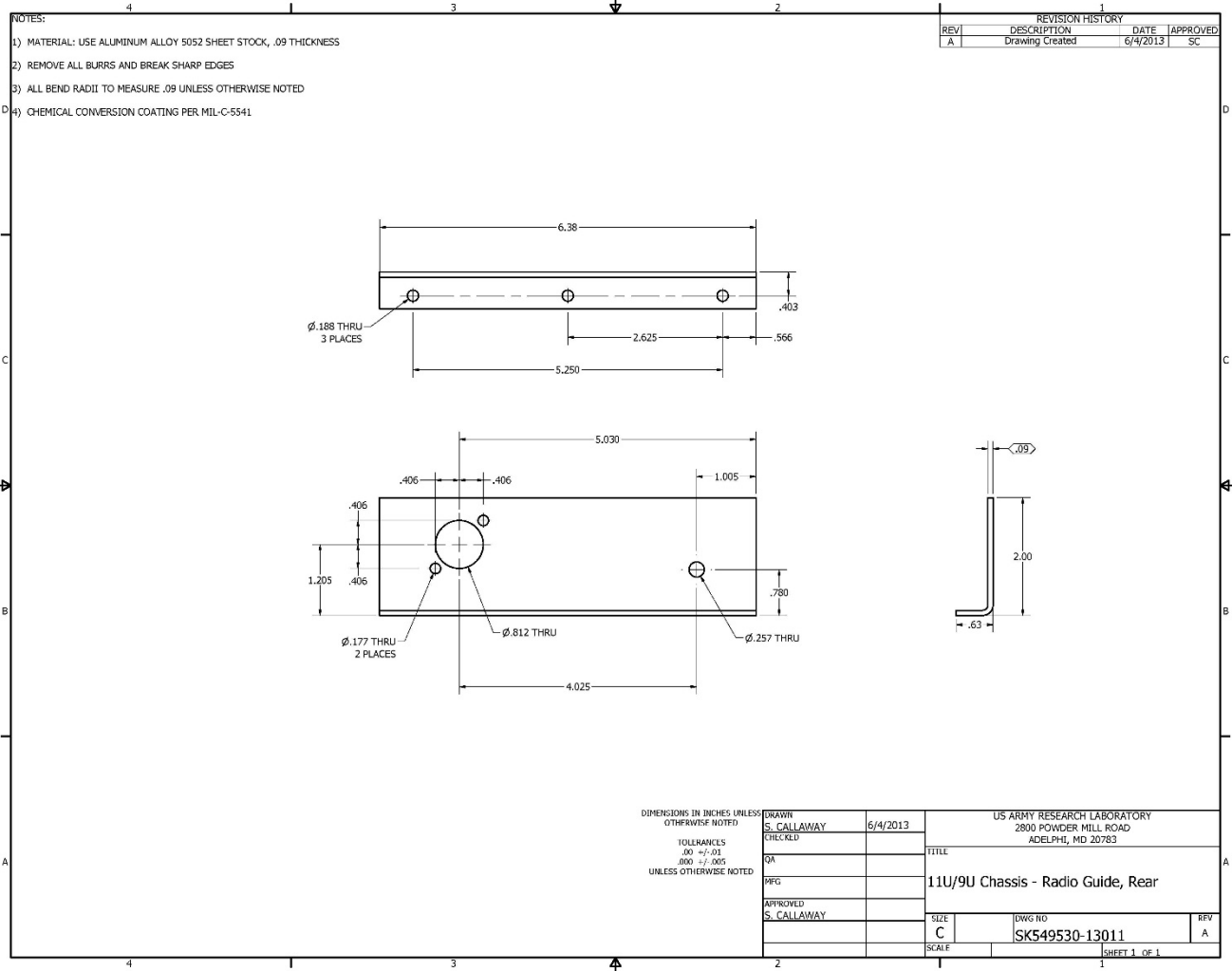


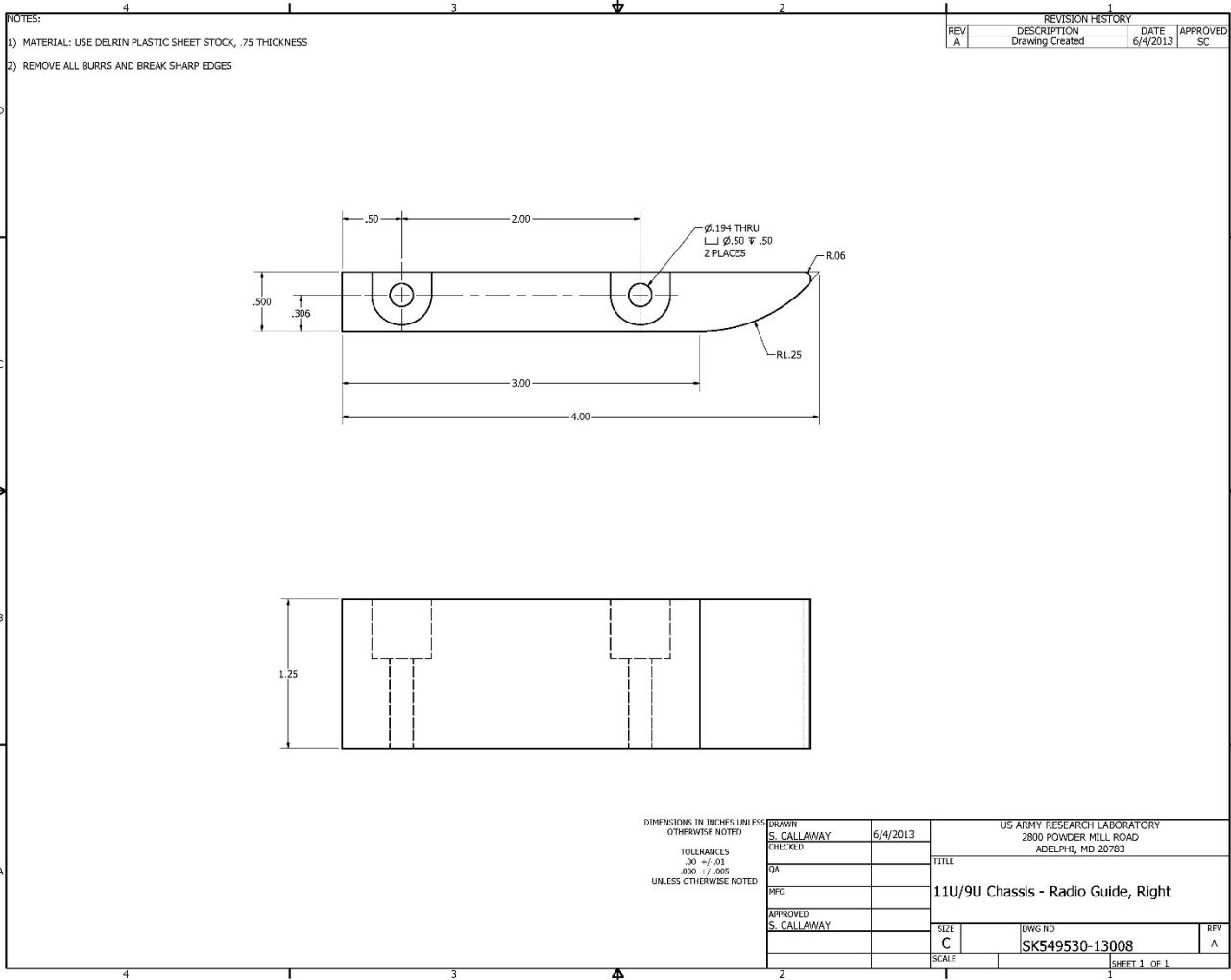
DRAWN S. CALLAWAY		2/28/2013		US ARMY RESEARCH LABORATORY	
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QA				ADELPHI, MD 20783	
PFG				TITLE	
APPROVED				9U Chassis - Side Panel, Right	
S. CALLAWAY				SIZE	REV
				C	C
				DWG NO	
				SK549530-11001	
				SCALE	SHEET 2 OF 2

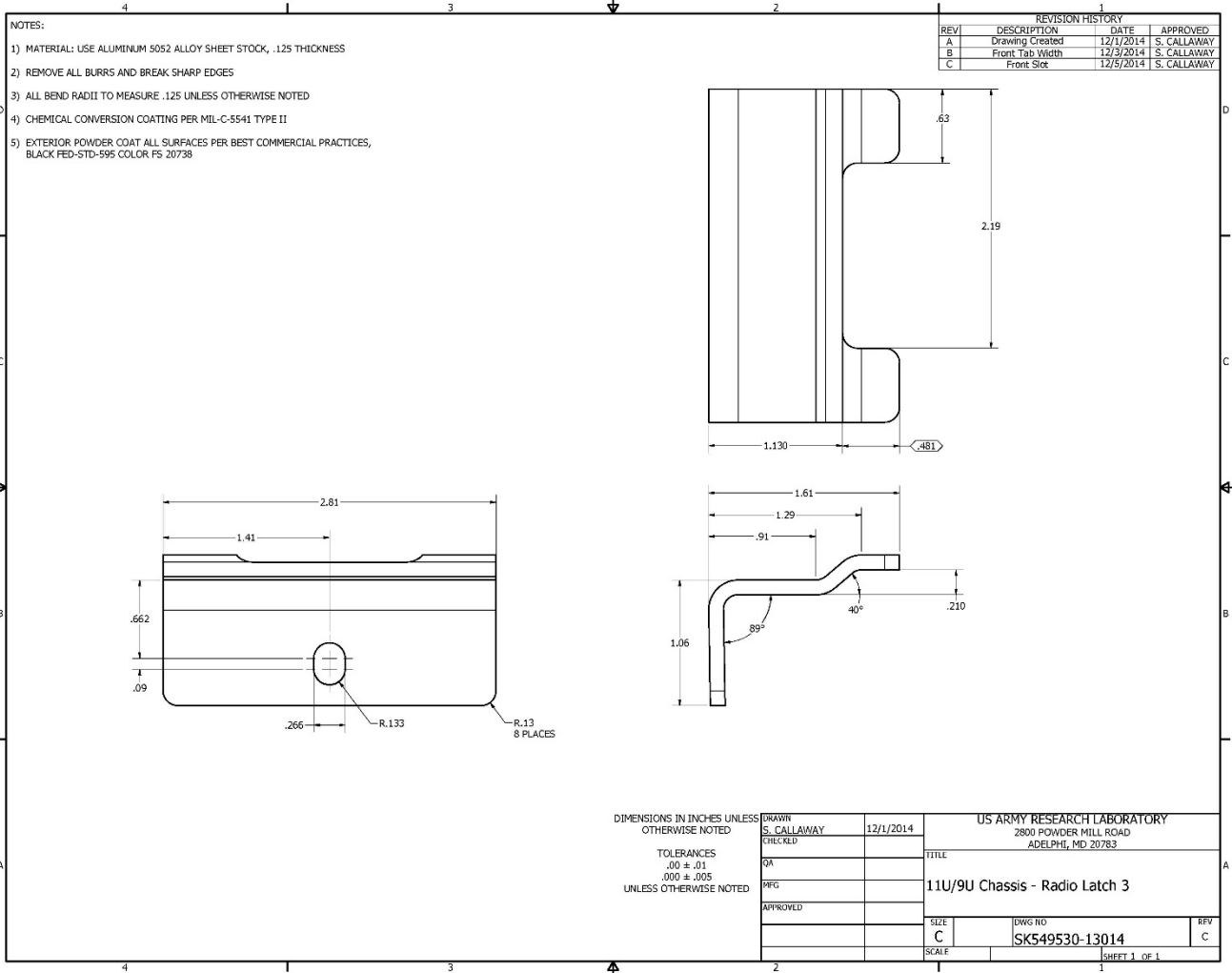


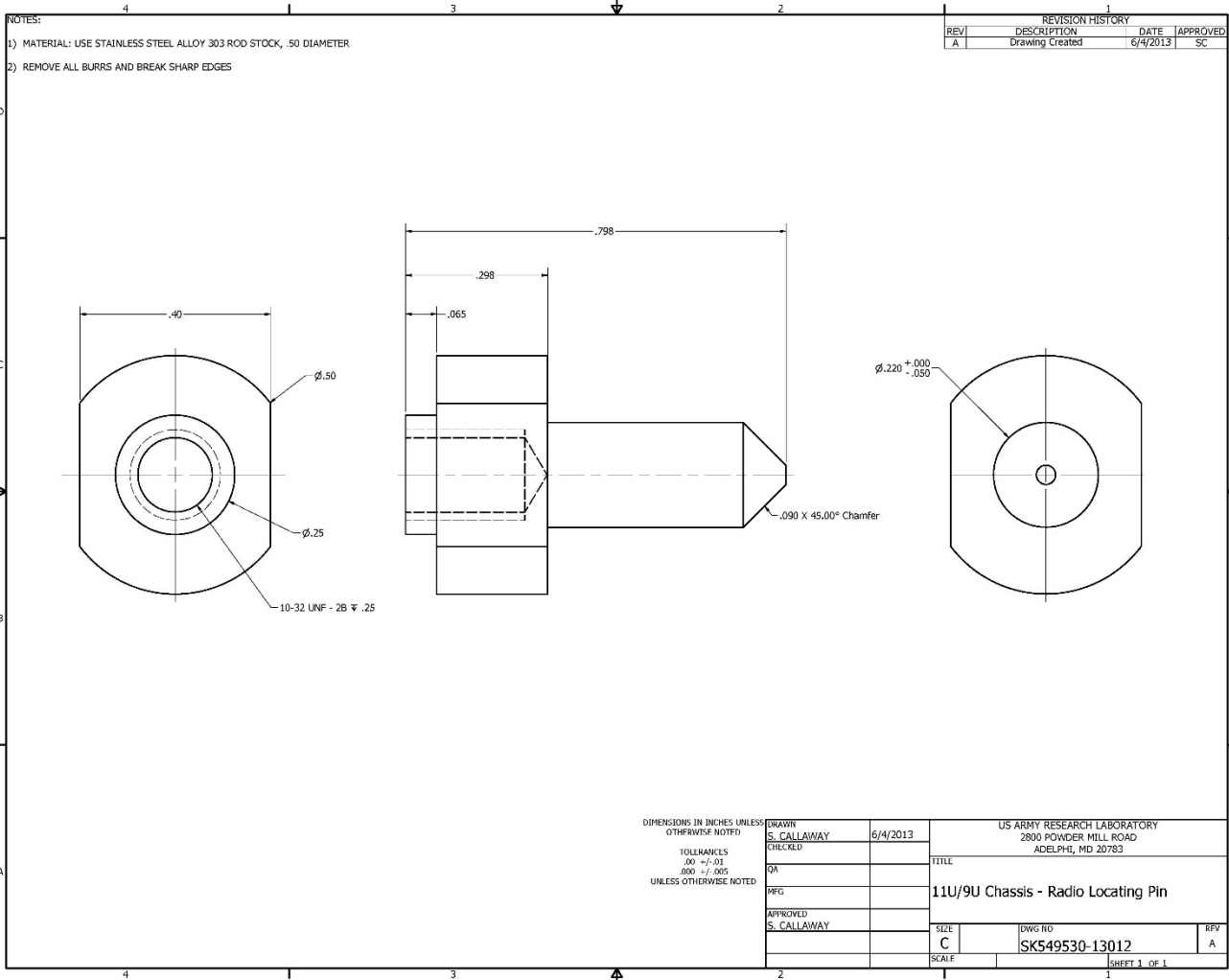


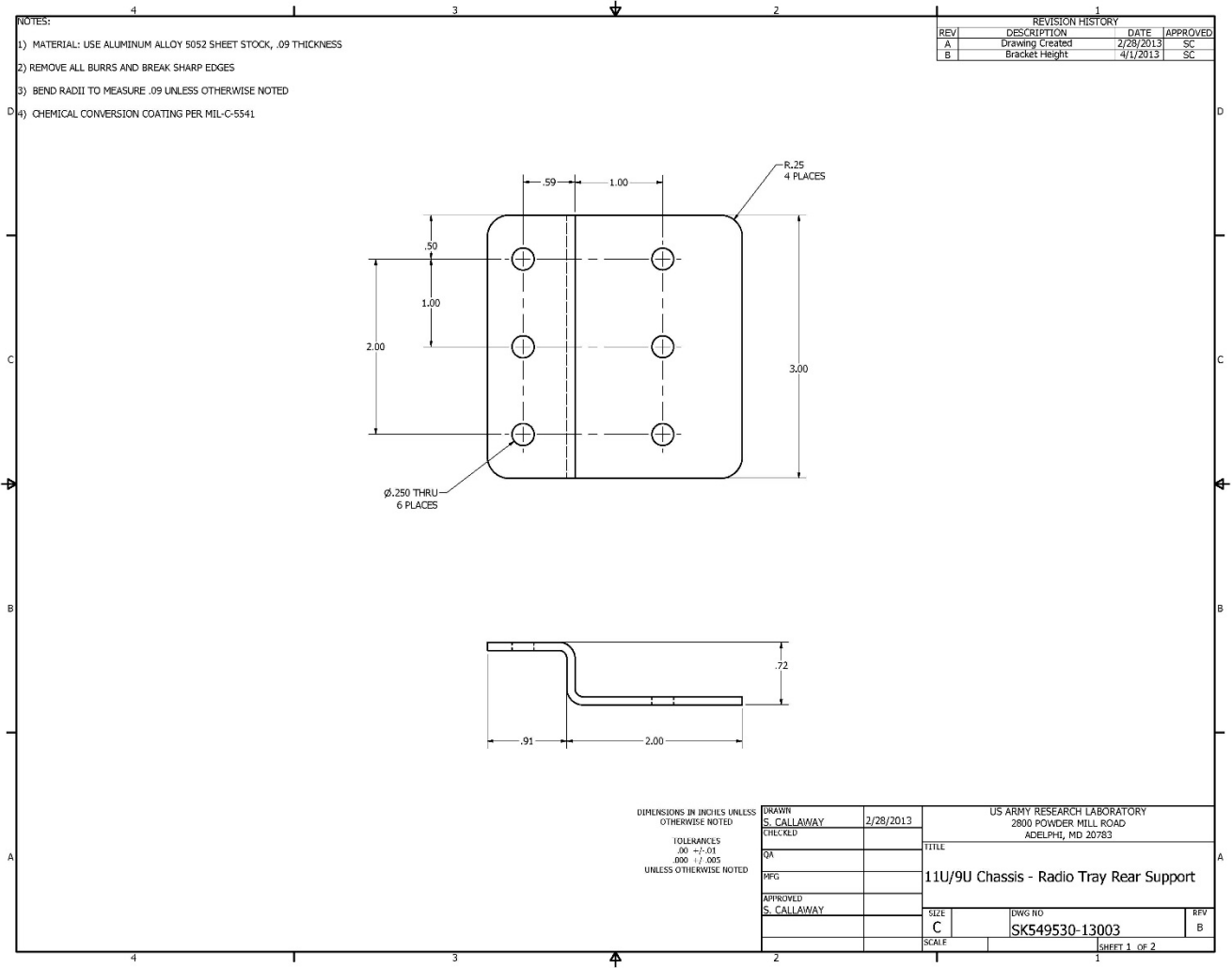


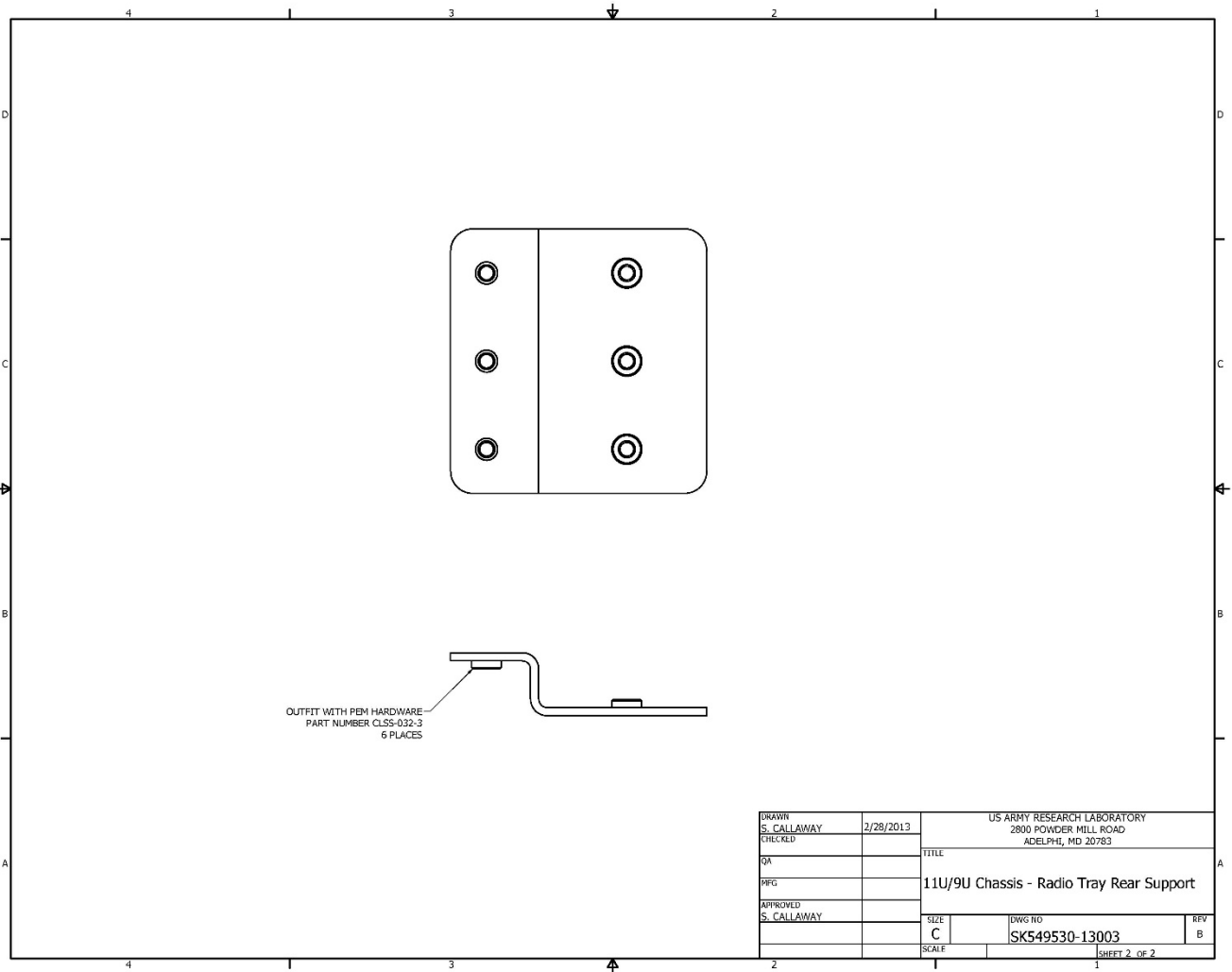


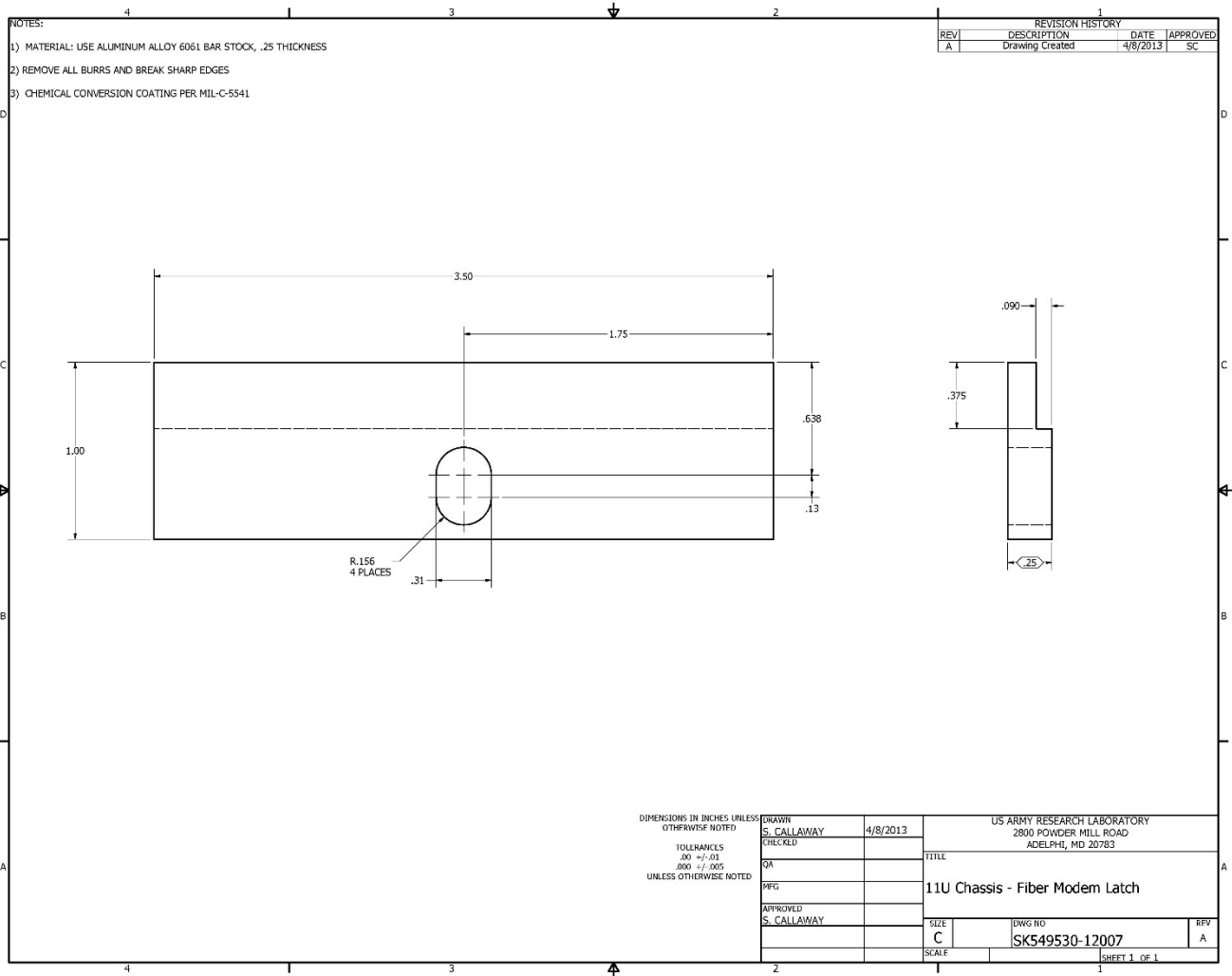




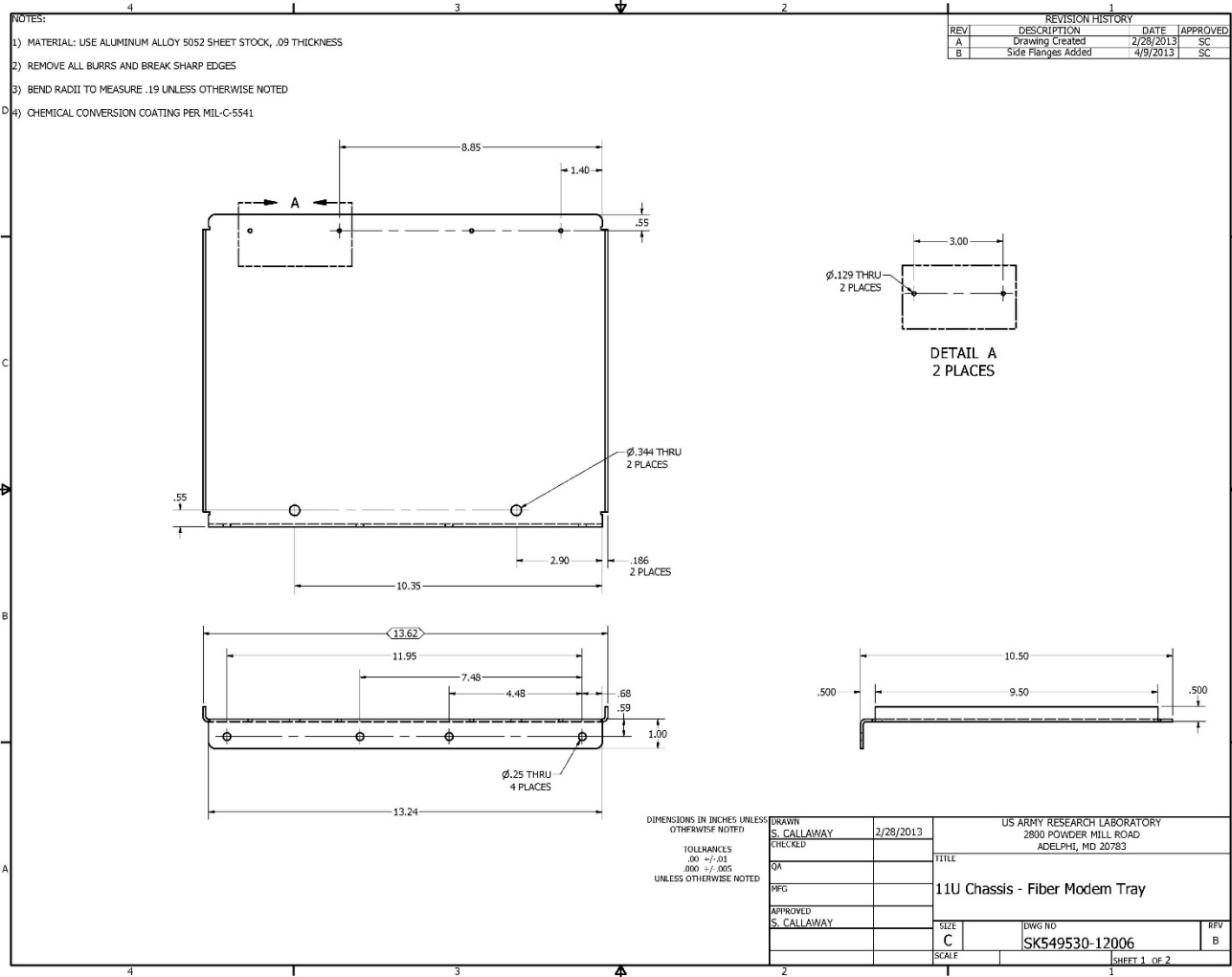


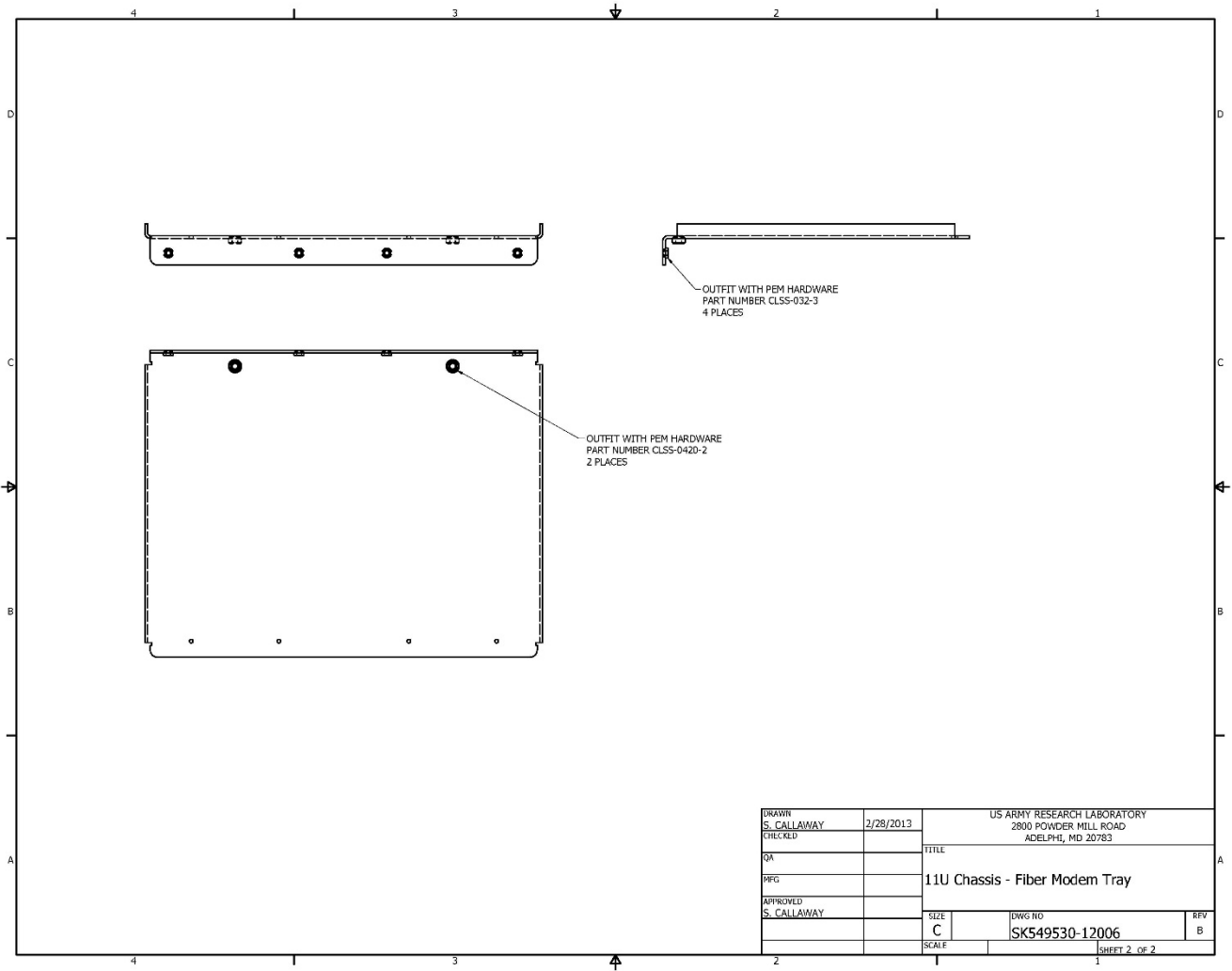










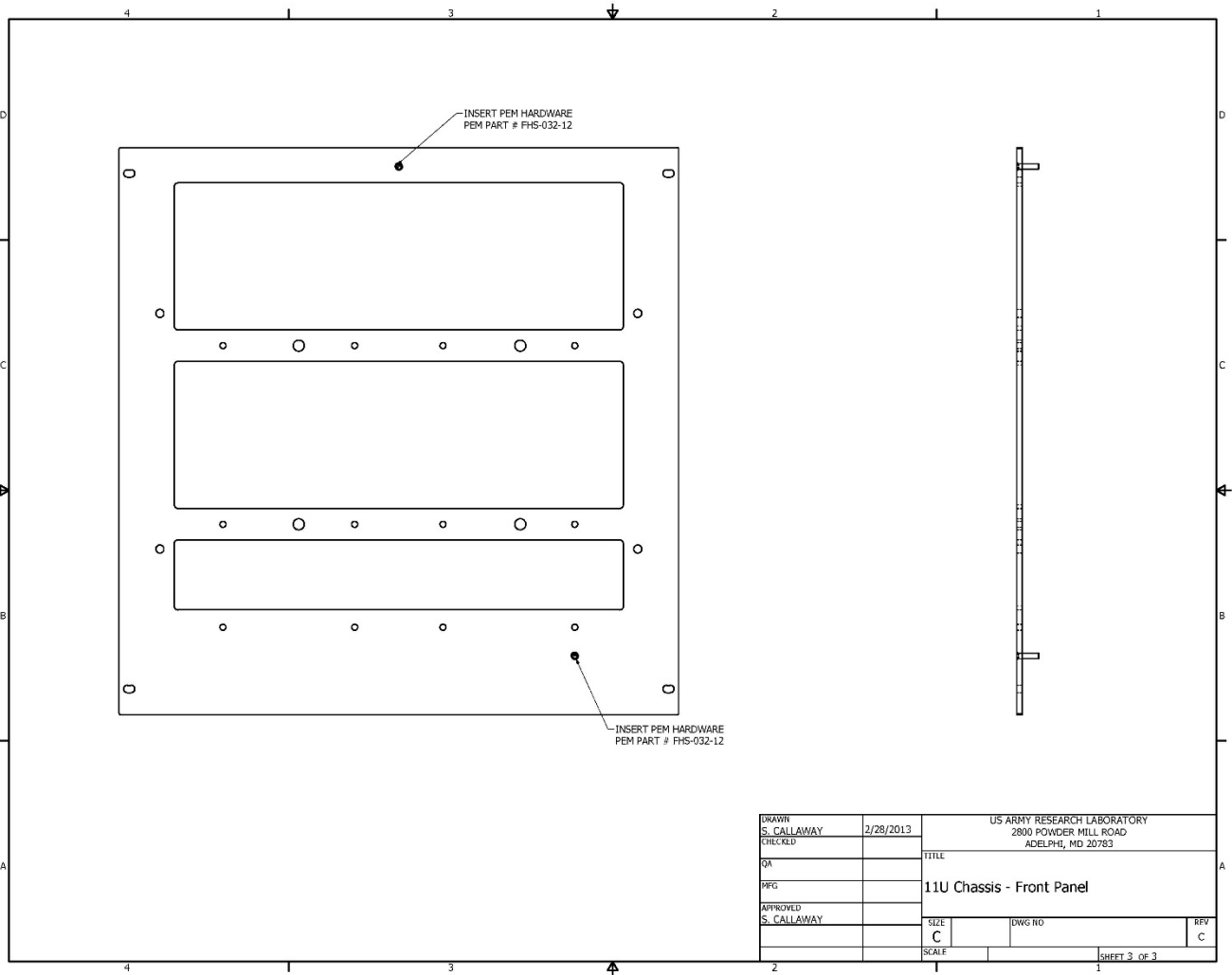


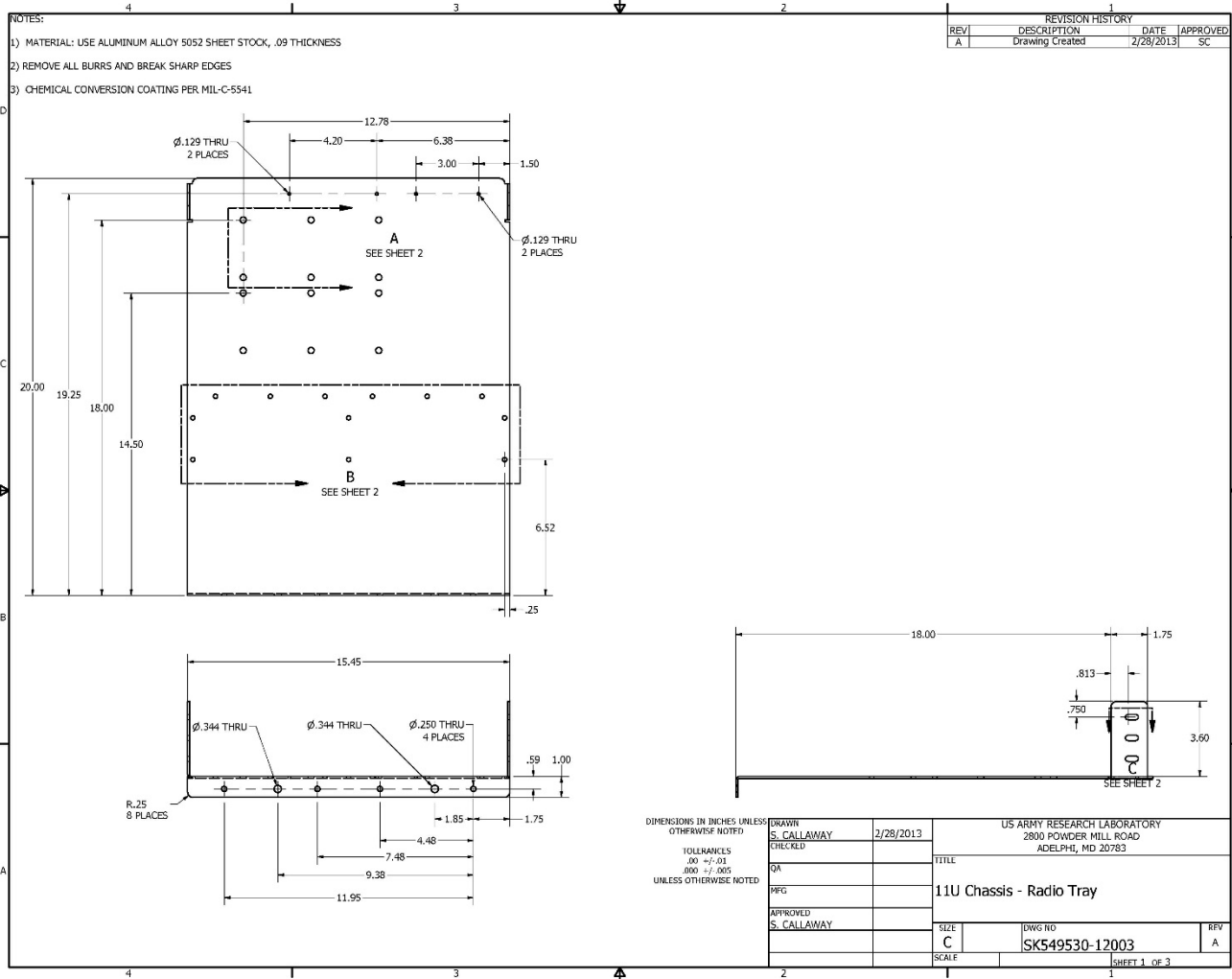


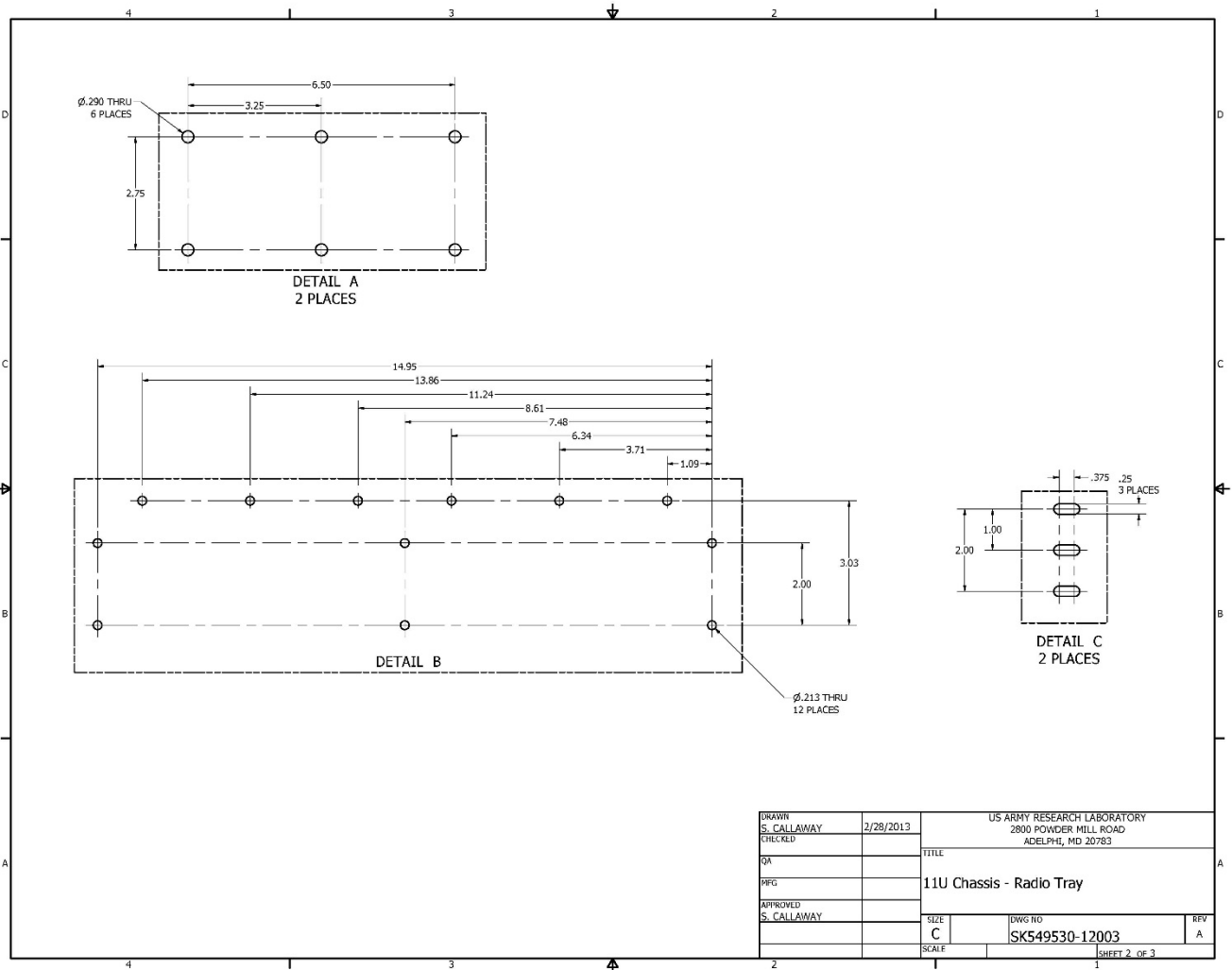
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- 2) REMOVE ALL BURRS AND BREAK SHARP EDGES

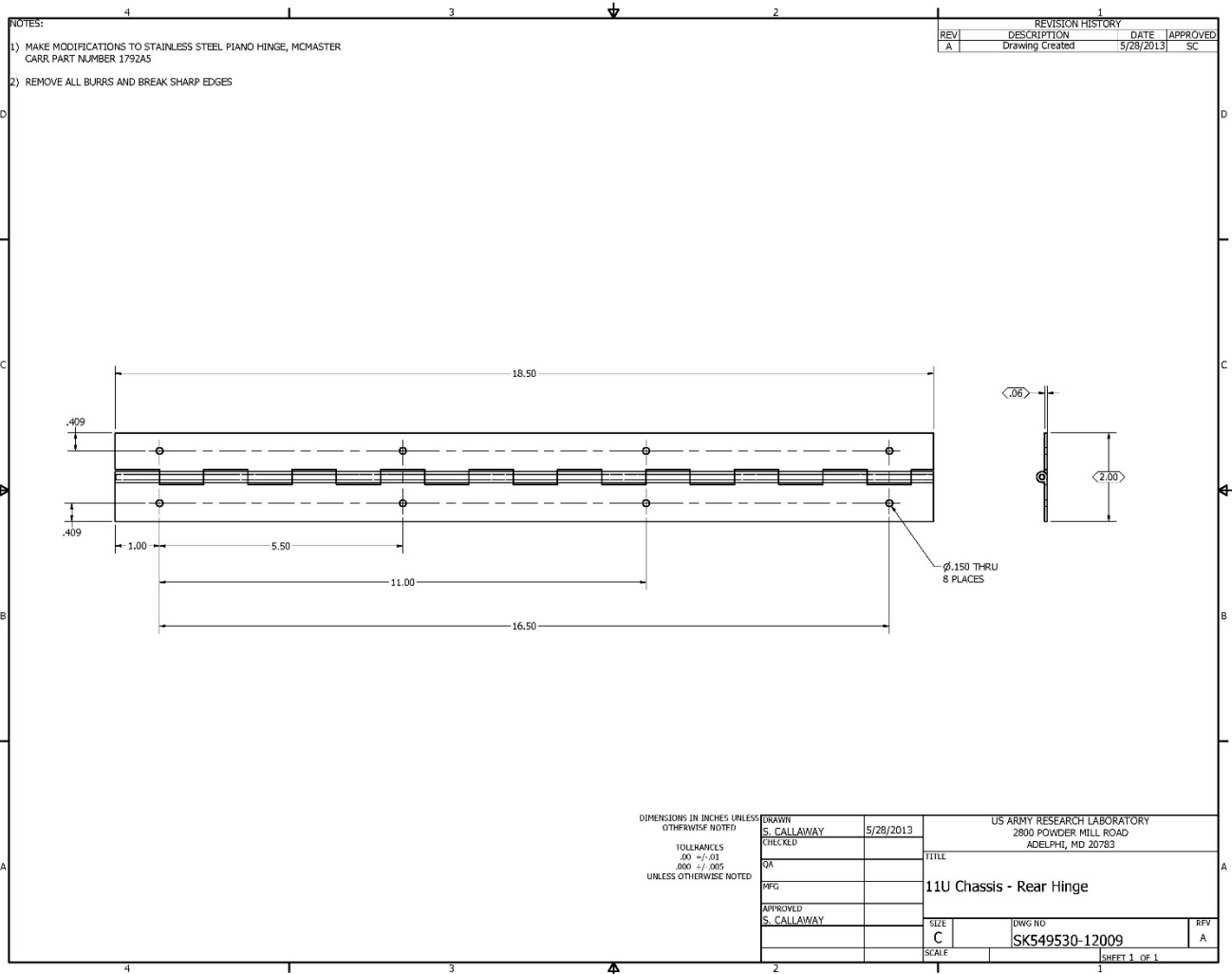
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C	Detail B	10/28/2014	SC

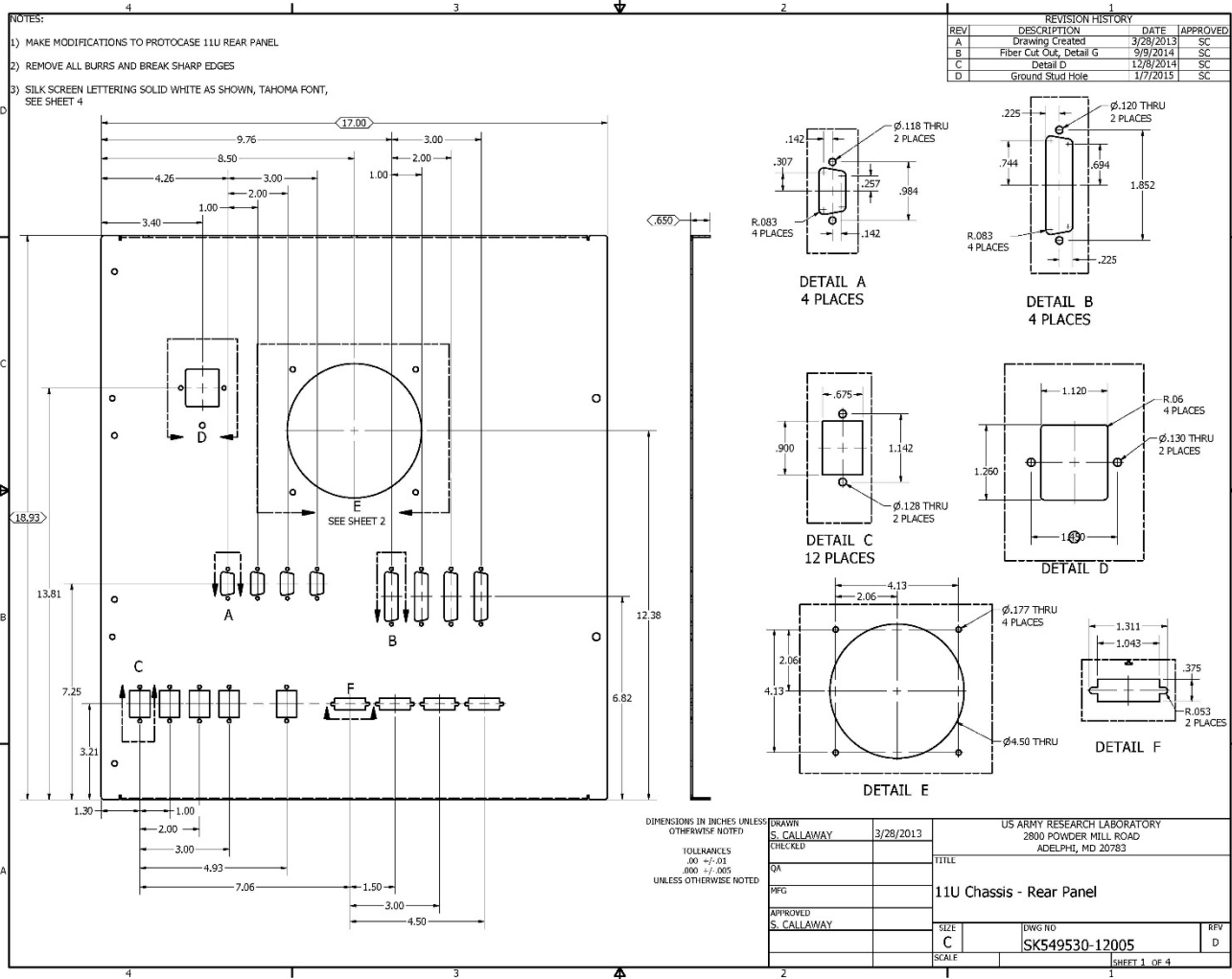
DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED		DRAWN S. CALLAWAY		2/28/2013		US ARMY RESEARCH LABORATORY 2800 POWDER MILL ROAD ADELPHI, MD 20783	
TOLERANCES .00 +/- .01 .000 +/- .005 UNLESS OTHERWISE NOTED		CHECKED QA		TITLE 11U Chassis - Front Panel		REV C	
		PFG		SIZE C		DWG NO	
		APPROVED S. CALLAWAY		SCALE		SHEET 1 OF 3	

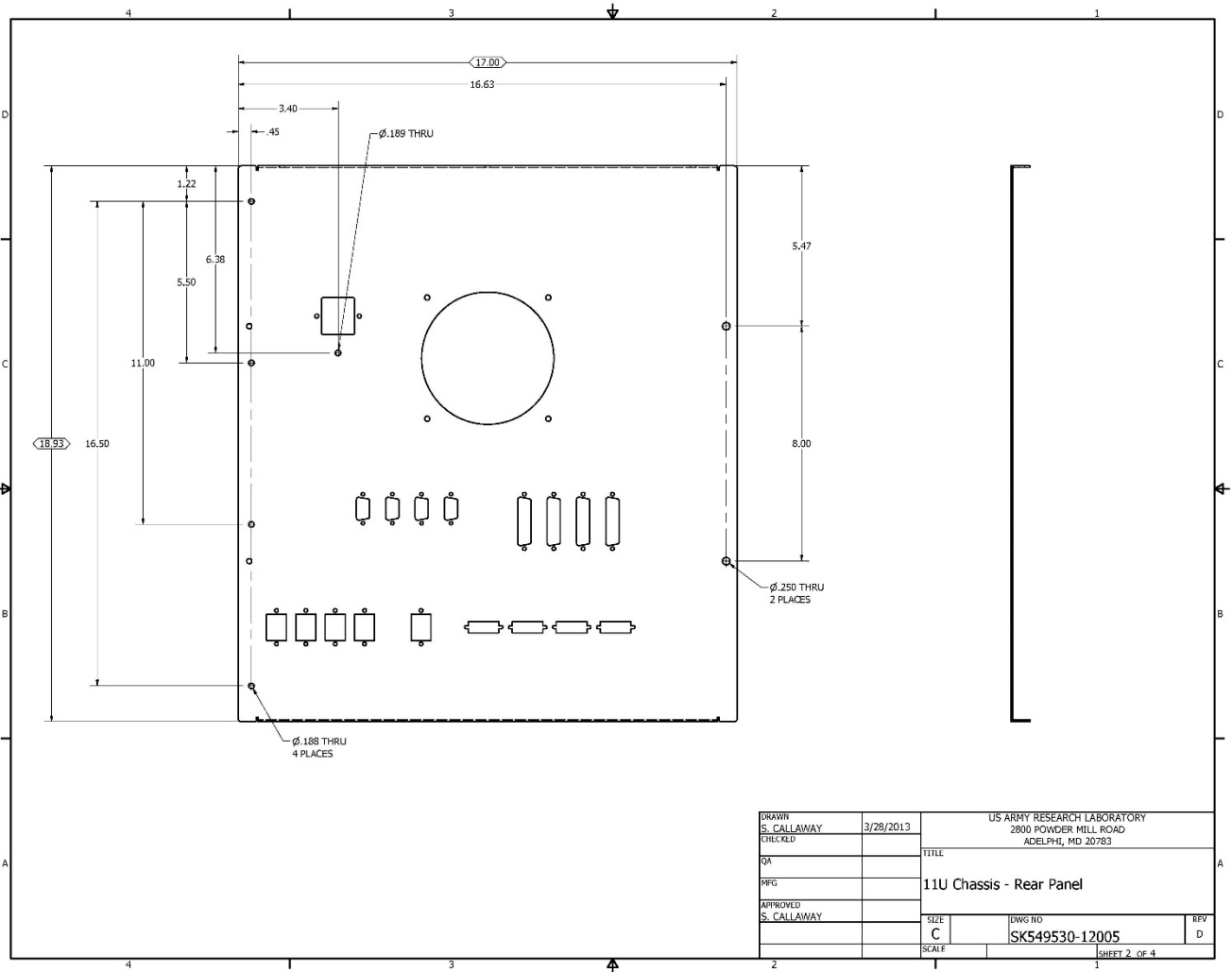


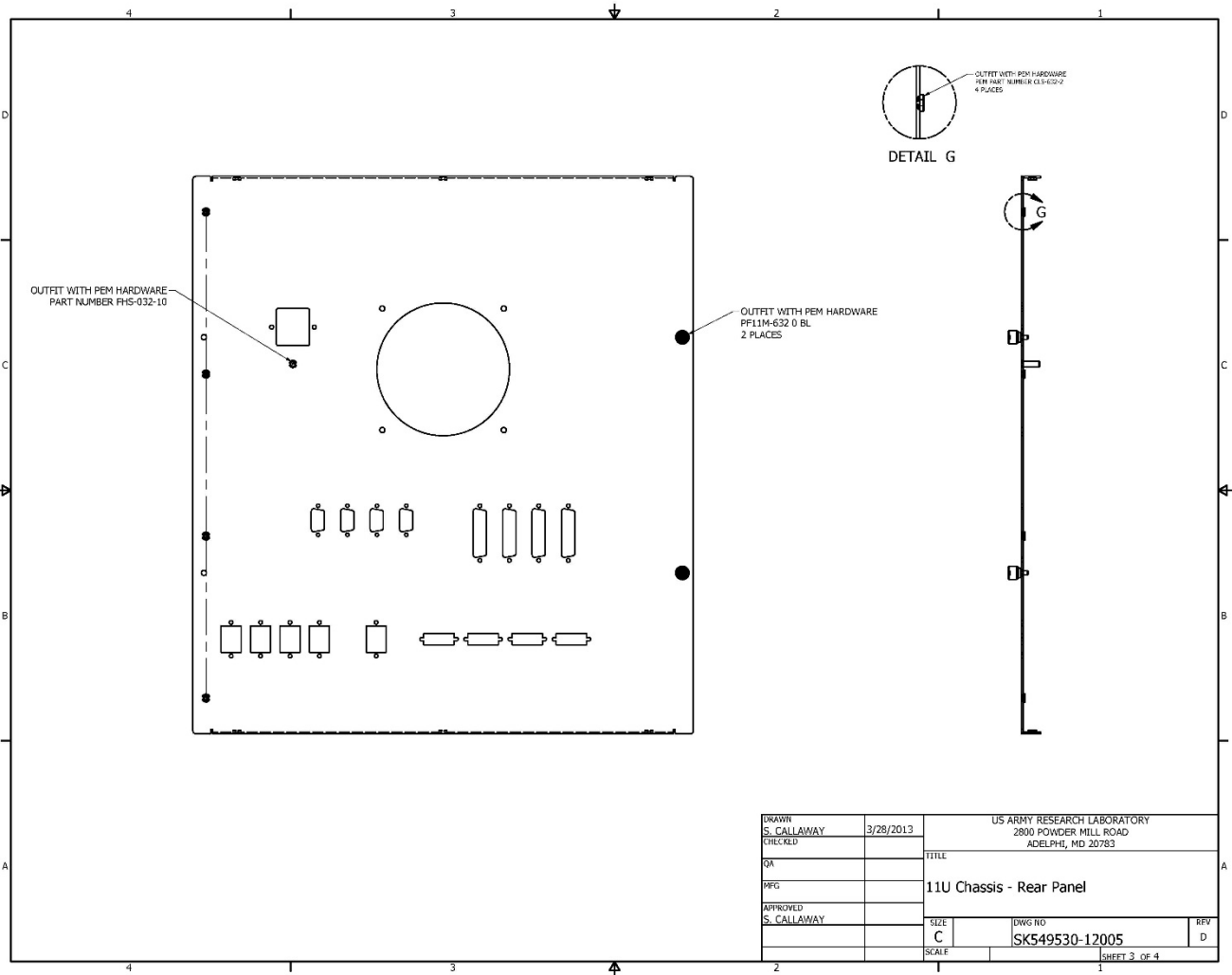


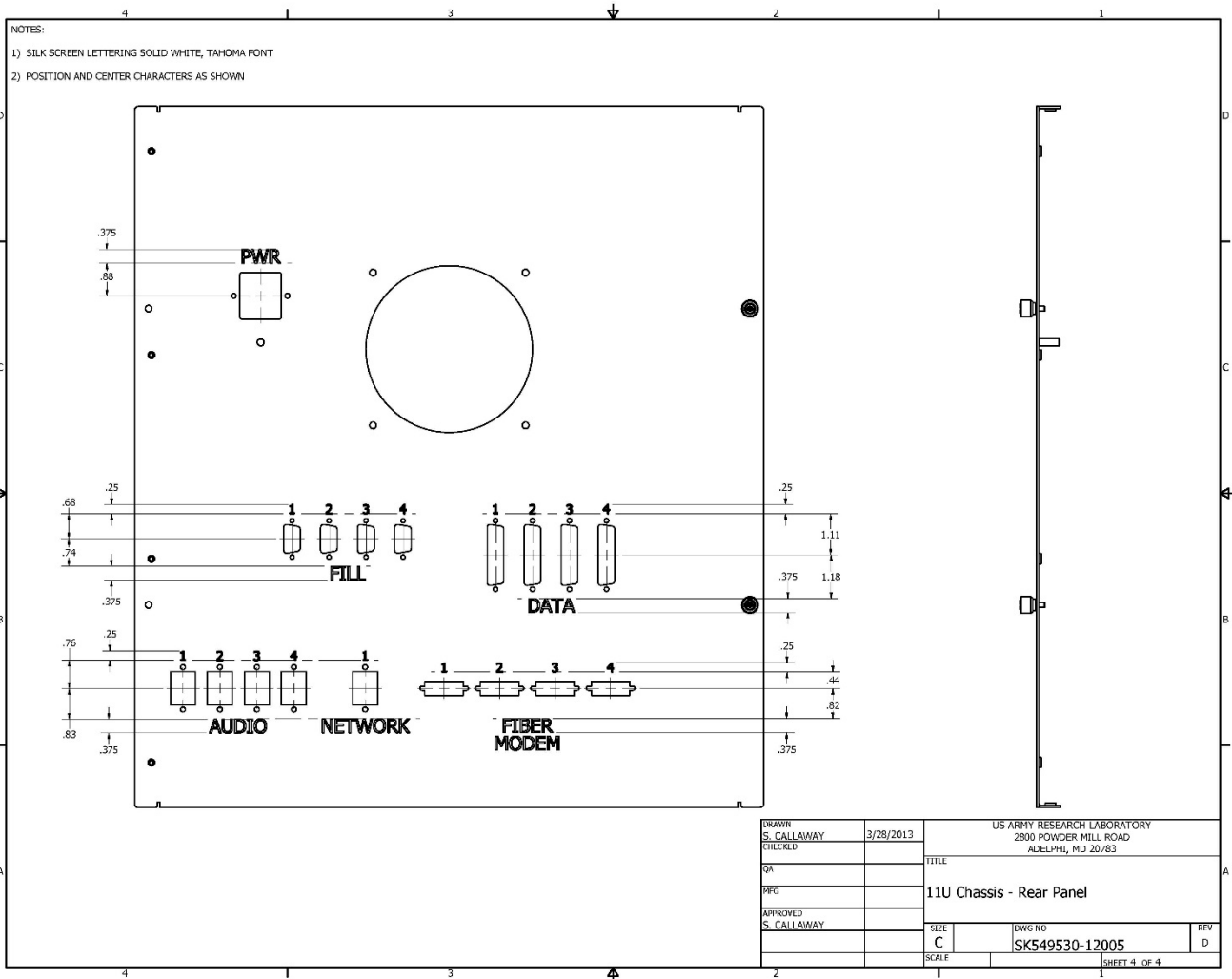


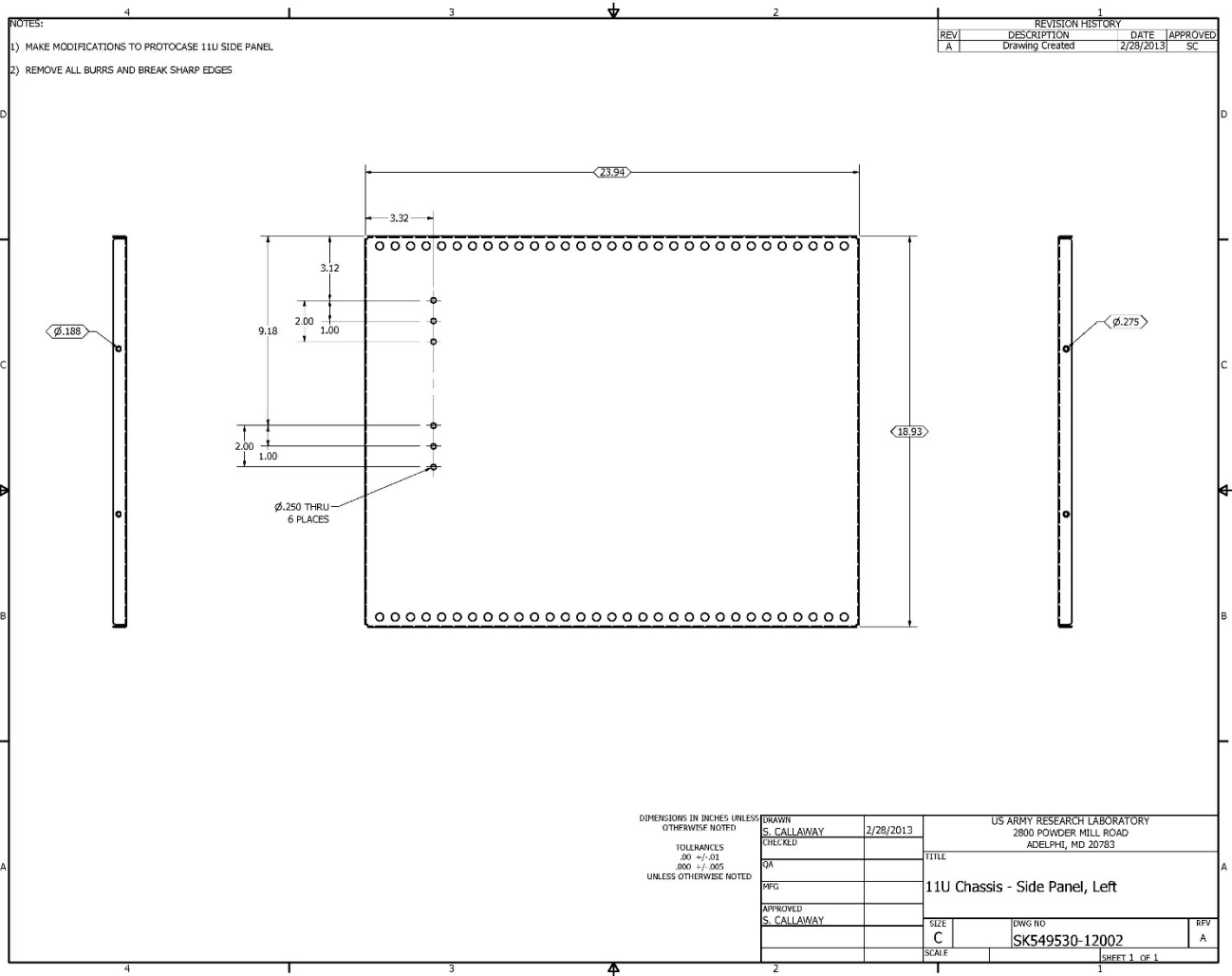


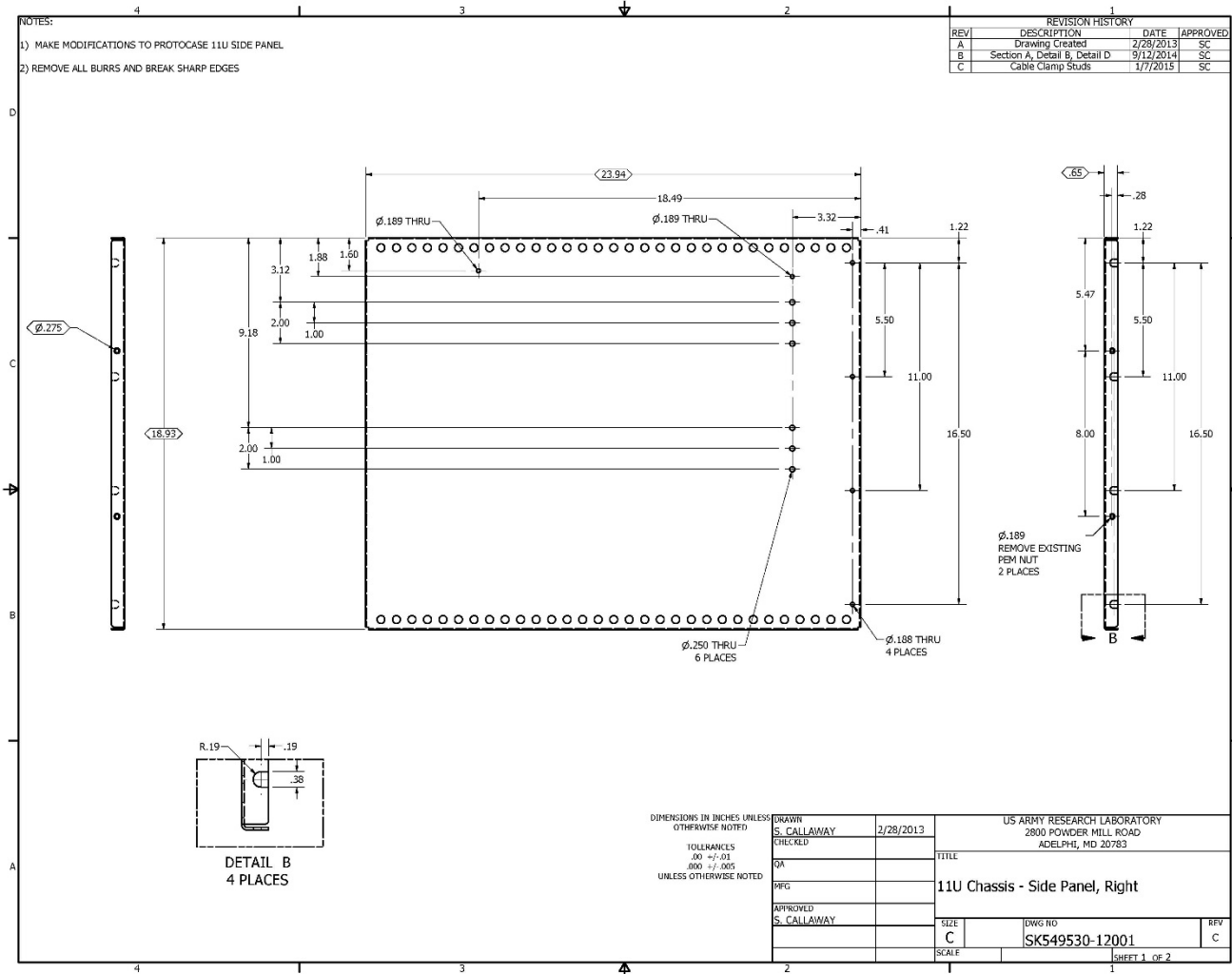


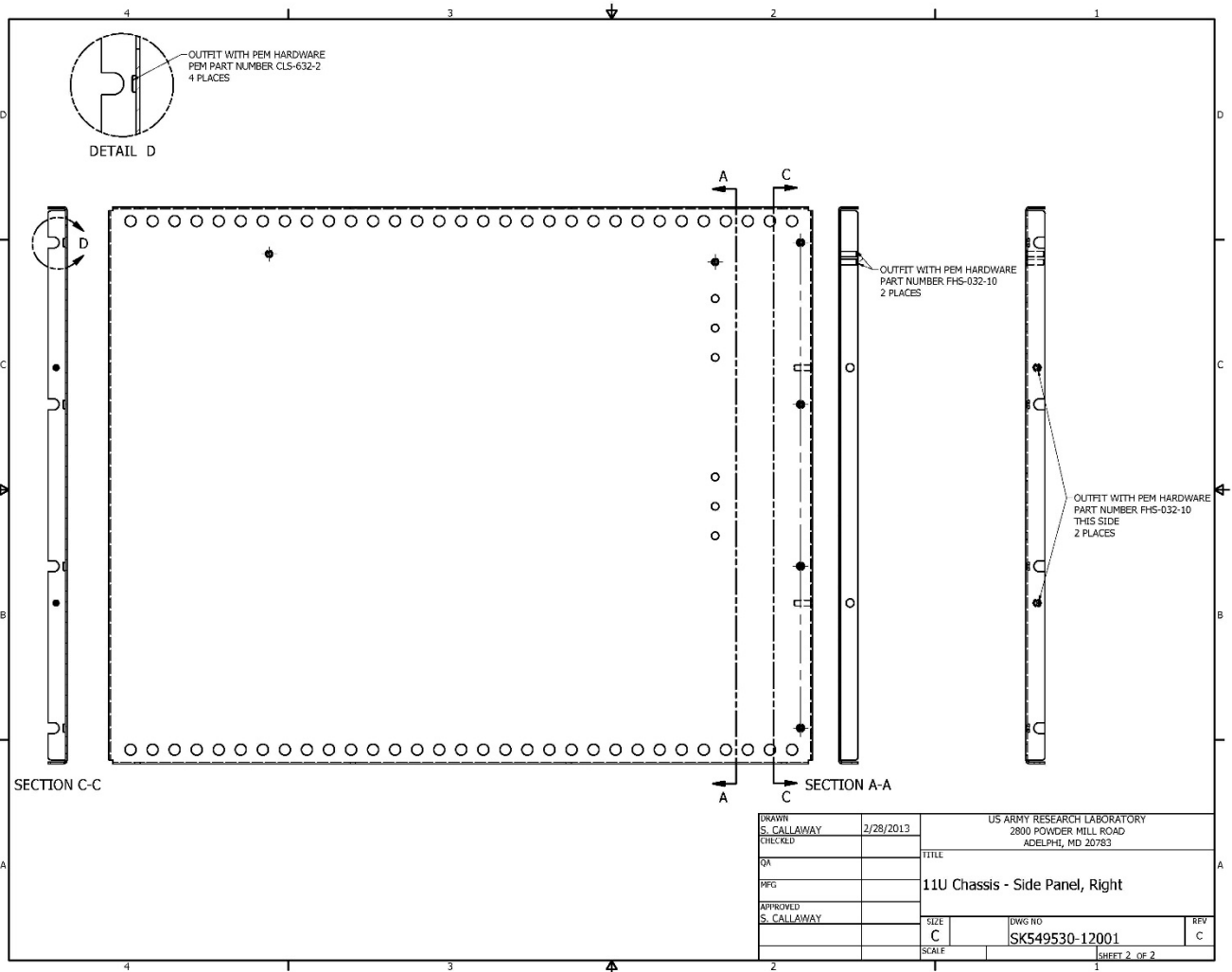












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