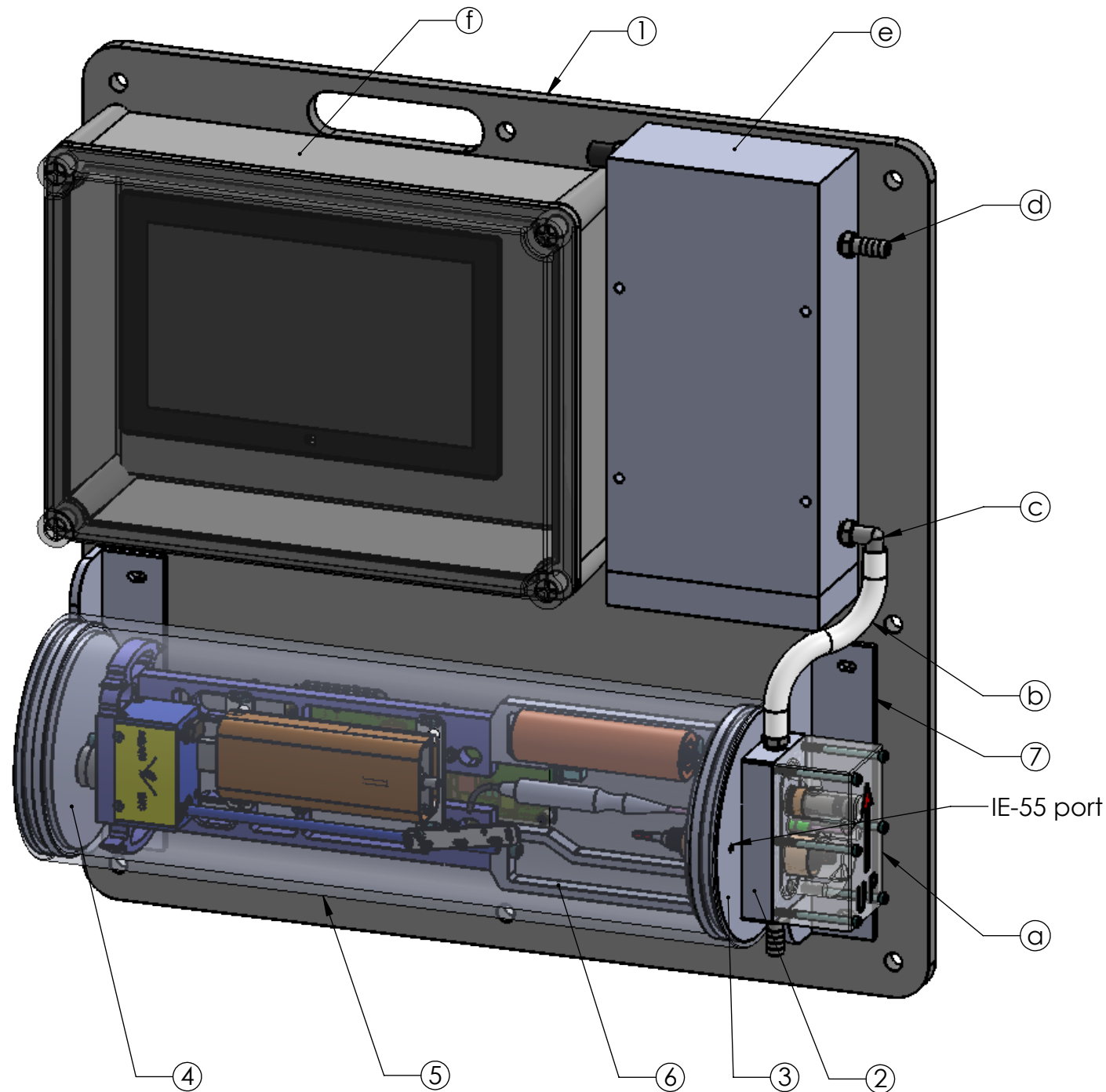


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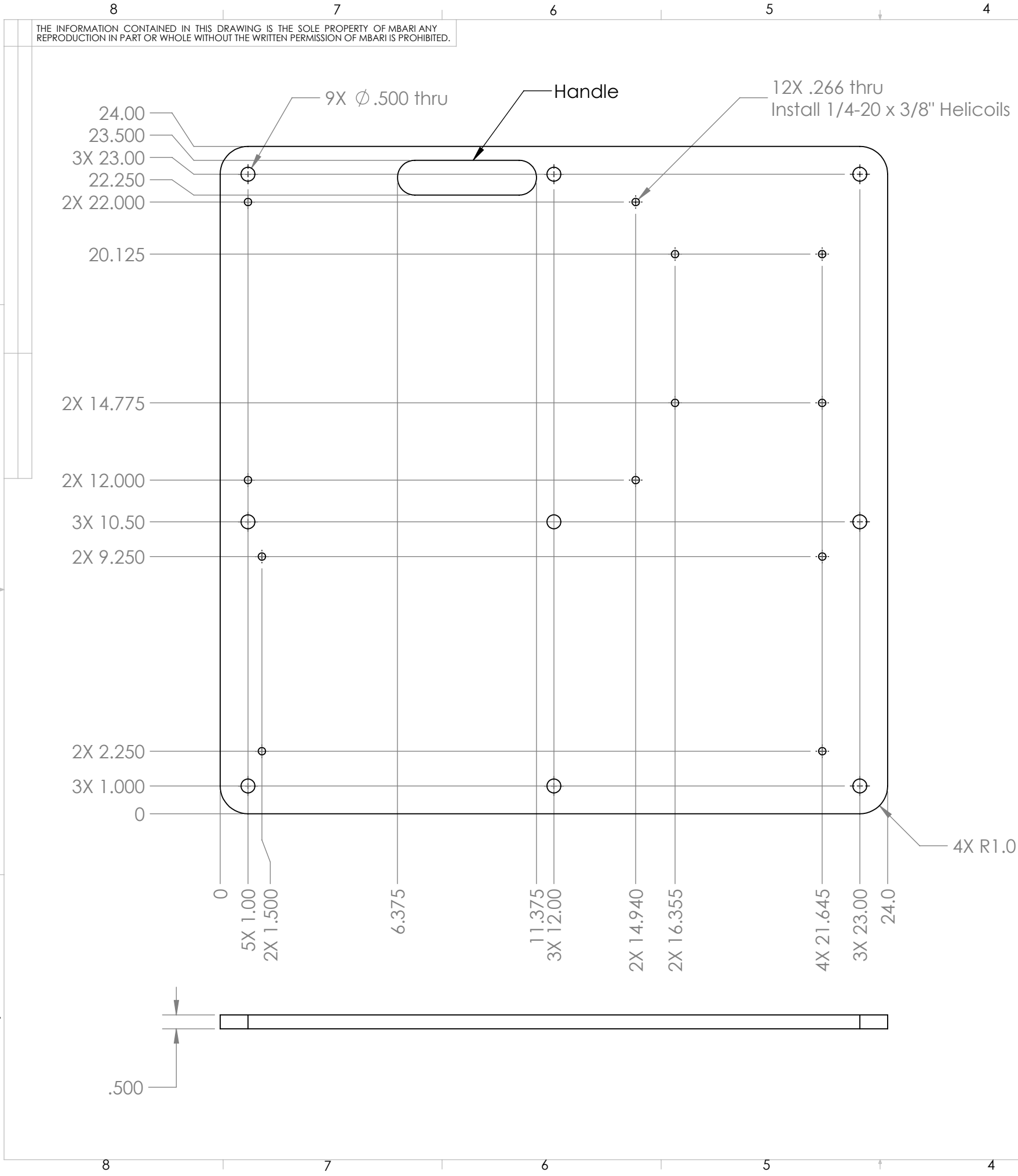
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Updated for water jetting	11/3/17	hwj



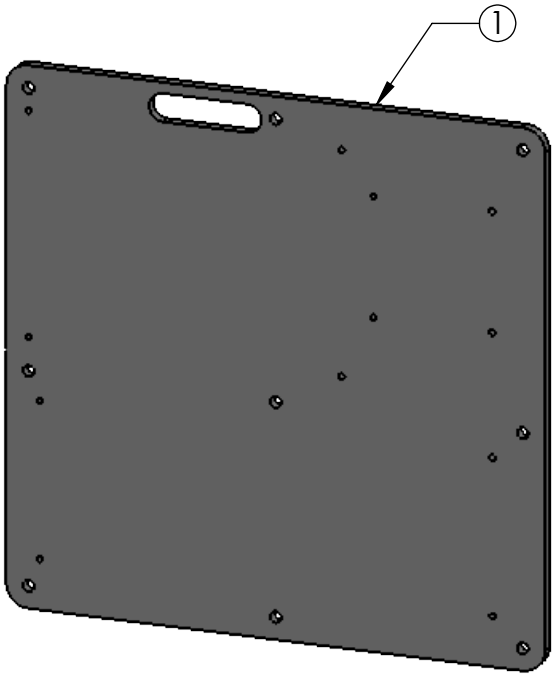
f	1		Controller	Washdown Enclosure (McMaster 69945K156)
e	1		CTD	Seabird SBE45
d	3		Straight fitting	McMaster 5372K117
c	1		Angle fitting	McMaster 5372K317
b	1		Tygon tube	3/8" ID by 5/8" OD
a	1		Flowcell	Printed (ProtoCafe; Clear H6K)
Item No.	Qty	Part No.	Description	Material Specification
Other Parts				

11	1		Lathe Mount	1" Gray PVC sheet
10	1		Calibration adapter	1" Gray PVC sheet
9	1		Calibration adapter pipe	6" Sch-40 pipe (white PVC)
8	1		Modified EquiTech Stem	PEEK
7	2		Angle Bracket	2" x 1/4" PVC angle (McMaster 8659K51)
6	2		Chassis Mount	1/2" Al plate
5	1		Housing	6" Sch-40 pipe (white PVC)
4	1		sbEndcap-connector end	1" Gray PVC sheet
3	1		sbEndcap-sensor end	1" Gray PVC sheet
2	1		Sensor Block	PEEK
1	1		Mounting Board	HDPE , UHMW or similarly tough, 3/8" sheet
Item No.	Qty	Part No.	Description	Material Specification

Bill of Materials													
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:				APPROVALS		DATE		Monterey Bay Aquarium Research Institute MBARI 7700 Sandholdt RD. Moss Landing, CA 95039 PH: (831) 775-1700 			
Inspector		1 PLACE DIM ±1/16	2 PLACE DIM ±.02	3 PLACE DIM ±.005	ANGLES ±1°	DRAWN Hans Jannasch	10/20/17	ENGINEER					
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING. 3. REMOVE BURRS AND SHARP EDGES .015 MAX. 4. MACHINED FILLET RADII .0150-.030. 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE.				CHECKED		PROJECT NO.					
Engineer						PROJECT							
NEXT ASSY Description	NEXT ASSY Number									Shipboard pH and ISUS SIZE B DWG. NO. 321jaha-Shipboard_pH+ISUS REV. A			
Application		DO NOT SCALE DRAWING				WEIGHT							
								SCALE 1:3		CAD FILE: Tornado/chem/SWfiles		SHEET 1 OF 9	



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Updated for water jetting	11/3/17	hwj

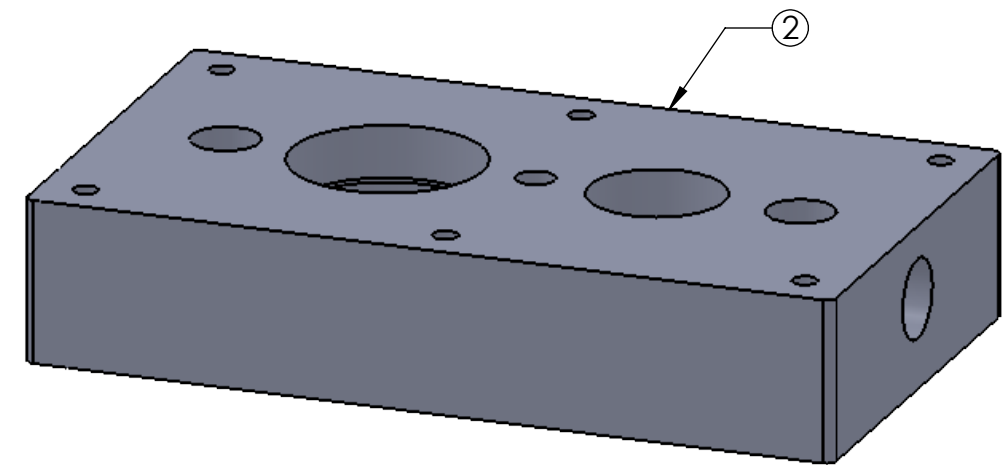
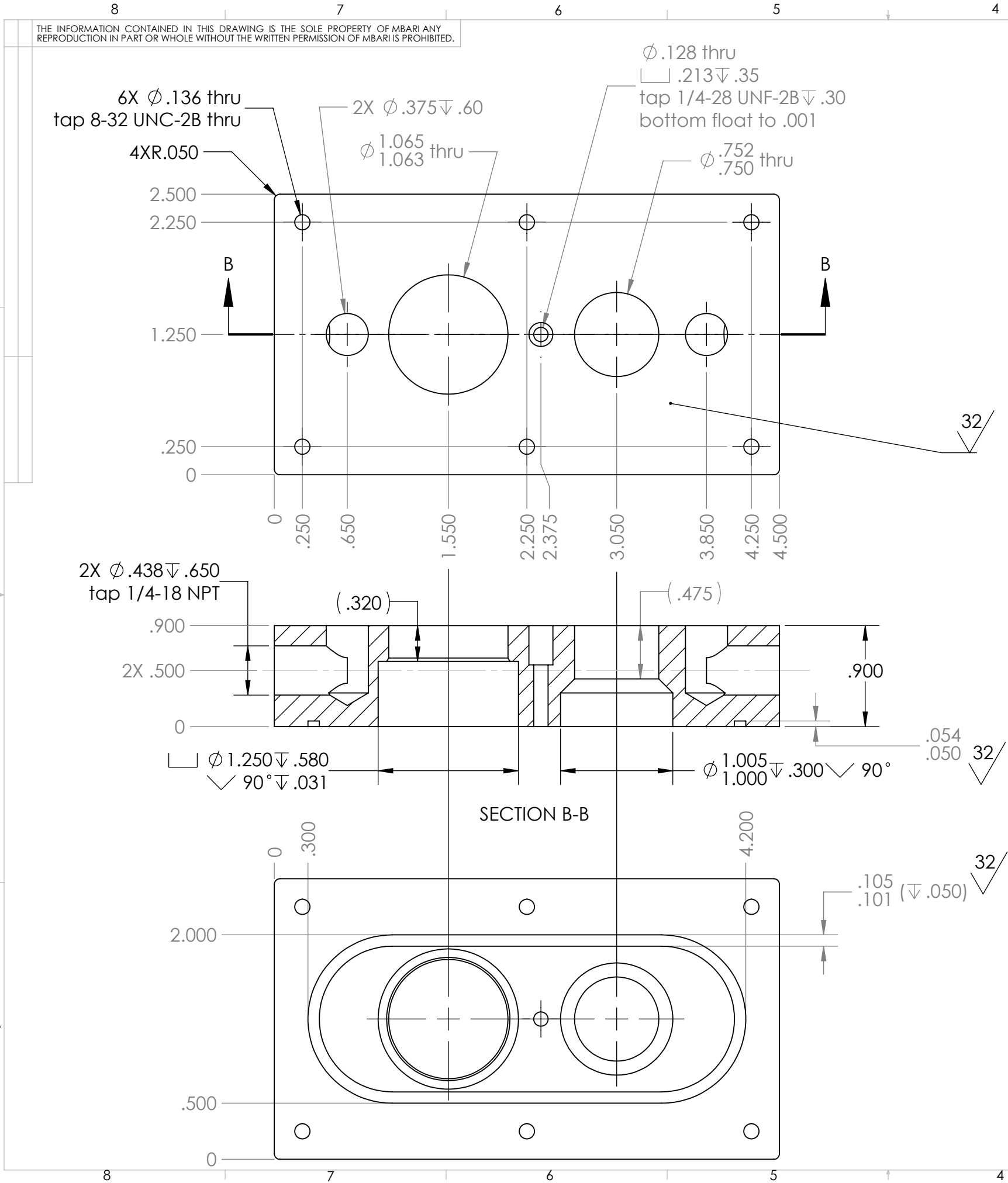


1		1		Mounting Board		Black HDPE or UHMW, 3/8" sheet				
Item No.		Qty	Part No.	Description		Material Specification				
Bill of Materials										
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS		DATE		Monterey Bay Aquarium Research Institute	
Inspector		1 PLACE DIM ±1/16	2 PLACE DIM ±.02	3 PLACE DIM ±.005	ANGLES ±1°	DRAWN Hans Jannasch		10/20/17		MBARI
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING. 3. REMOVE BURRS AND SHARP EDGES .015 MAX. 4. MACHINED FILLET RADII .0150-.030. 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE.				ENGINEER		7700 Sandholdt RD. Moss Landing, CA 95039 PH: (831) 775-1700		
Engineer						CHECKED				
PROJECT NO.										
NEXT ASSY Description	NEXT ASSY Number					PROJECT		Shipboard pH and ISUS		
Application		DO NOT SCALE DRAWING				WEIGHT		SIZE B	DWG. NO. 321jaha-Shipboard_pH+ISUS	REV. A
								SCALE 1:3	CAD FILE: Tornado/chem/SWfiles	SHEET 2 OF 9

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Moss Landing, CA 95039
PH: (831) 775-1700



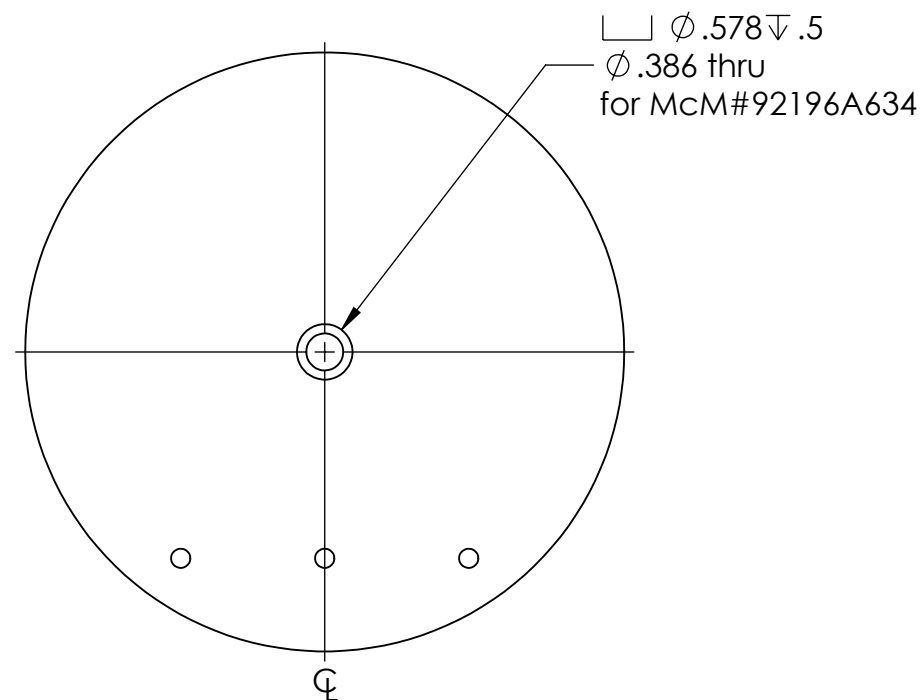
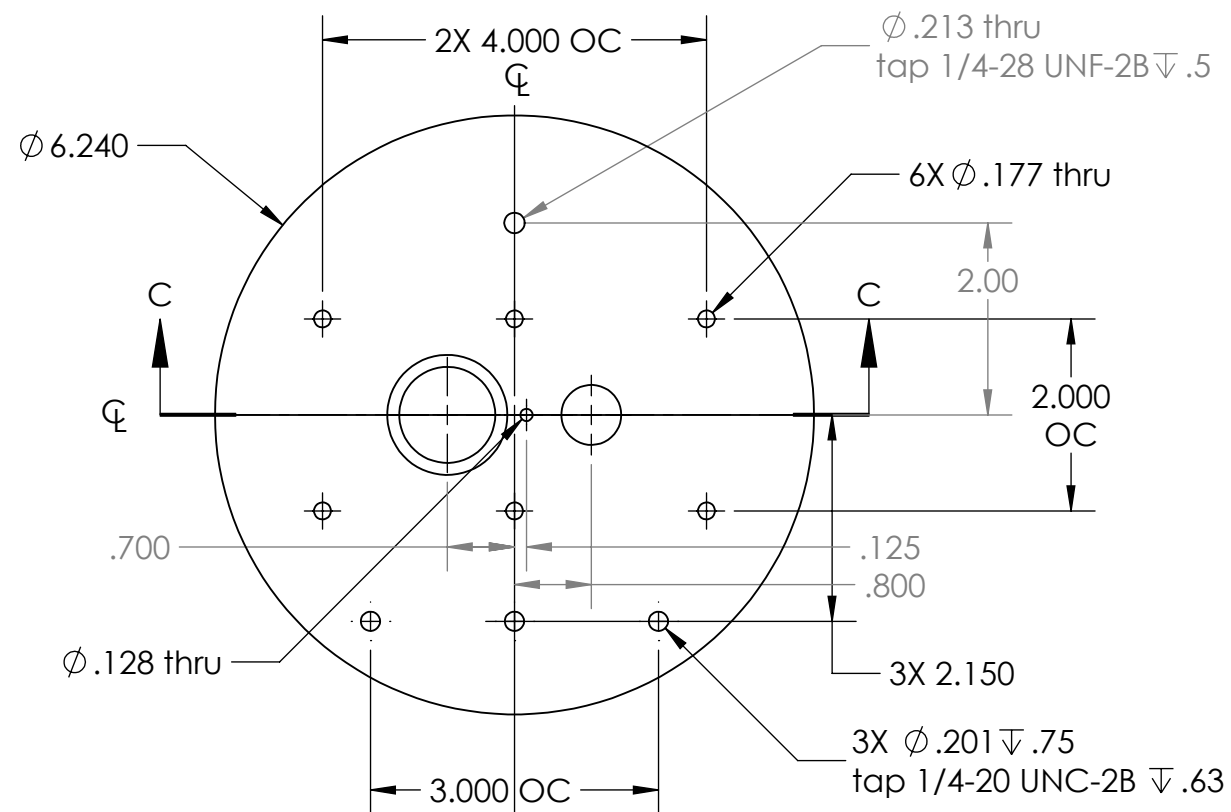
Shipboard pH and ISUS



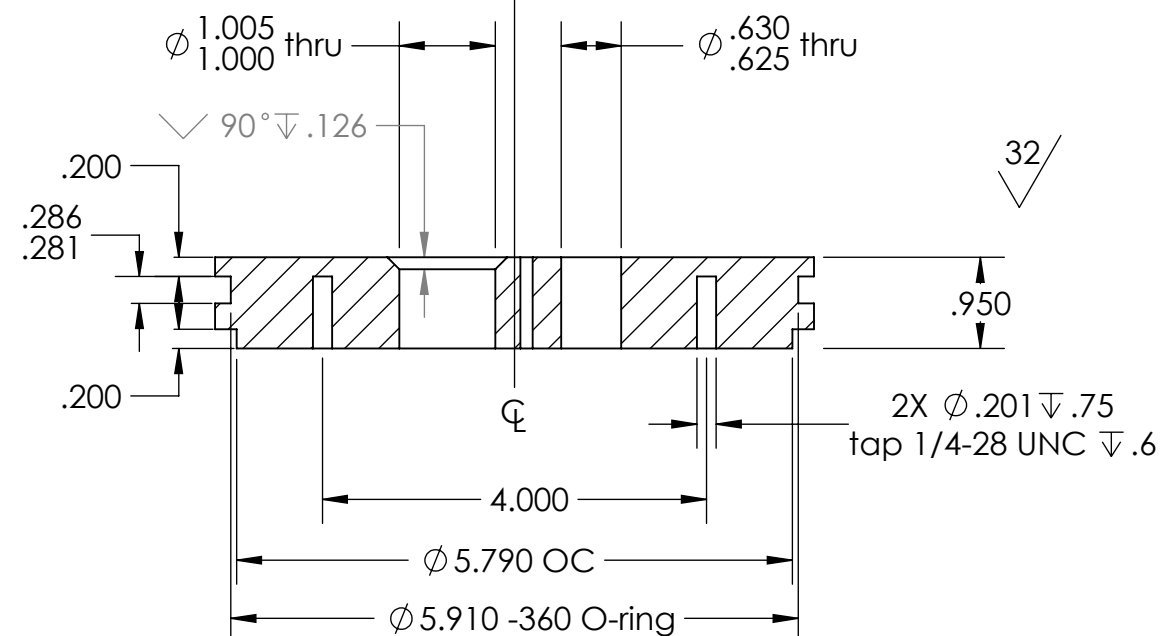
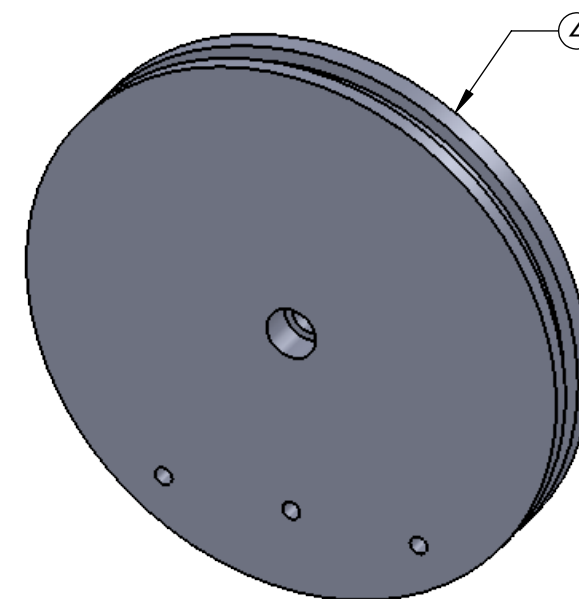
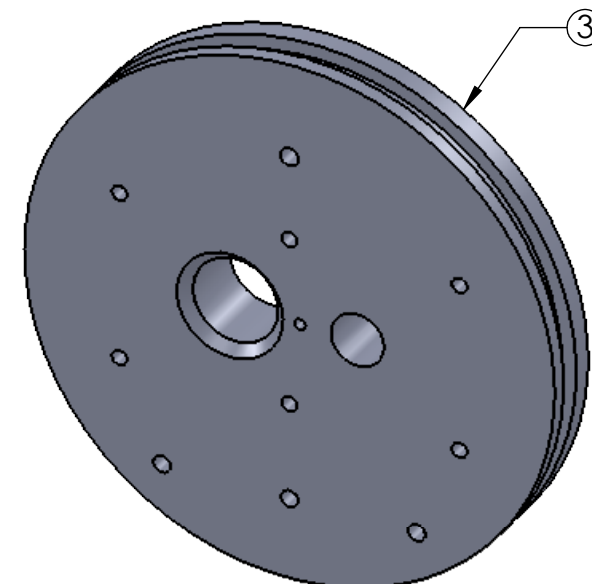
2		1		Sensor Block		PEEK	
Item No.		Qty	Part No.	Description		Material Specification	
Bill of Materials							
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:				APPROVALS DATE	
Inspector		1 PLACE DIM ±1/16	2 PLACE DIM ±.02	3 PLACE DIM ±.005	ANGLES ±1°	DRAWN Hans Jannasch 10/20/17	
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING. 3. REMOVE BURRS AND SHARP EDGES .015 MAX. 4. MACHINED FILLET RADII .0150-.030. 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE.				ENGINEER	
Engineer						CHECKED	
NEXT ASSY Description						NEXT ASSY Number	
Application		DO NOT SCALE DRAWING				PROJECT NO.	
						PROJECT	
						WEIGHT	
		3				2	
Monterey Bay Aquarium Research Institute							
MBARI 7700 Sandholdt RD. Moss Landing, CA 95039 PH: (831) 775-1700							
Shipboard pH and ISUS							
		SIZE B		DWG. NO. 321jaha-Shipboard_pH+ISUS		REV. A	
		SCALE 1:3		CAD FILE: Tornado/chem/SWfiles		SHEET 3 OF 9	

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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Updated for water jetting	11/3/17	hwj



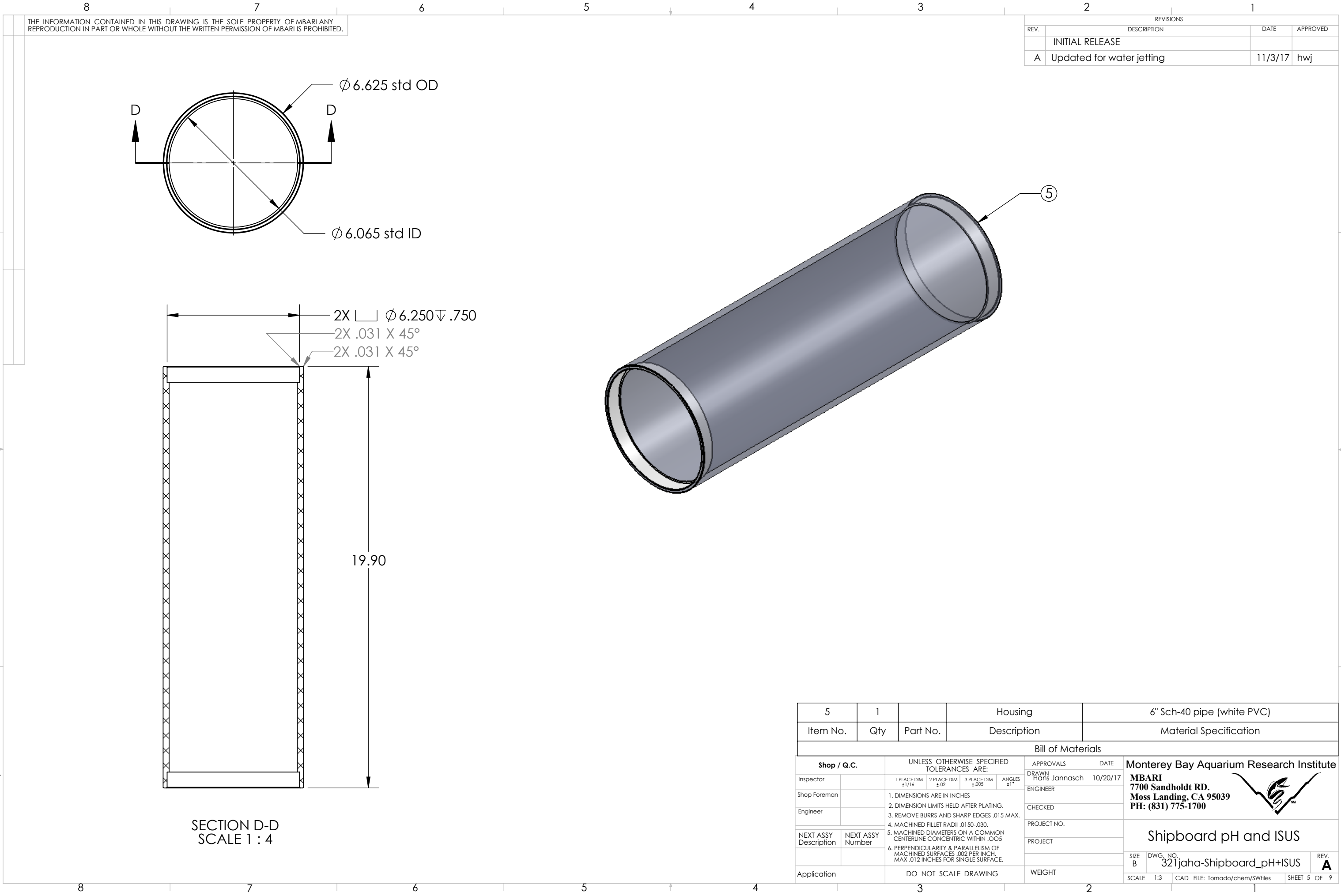
All other dimesions same as Part 3

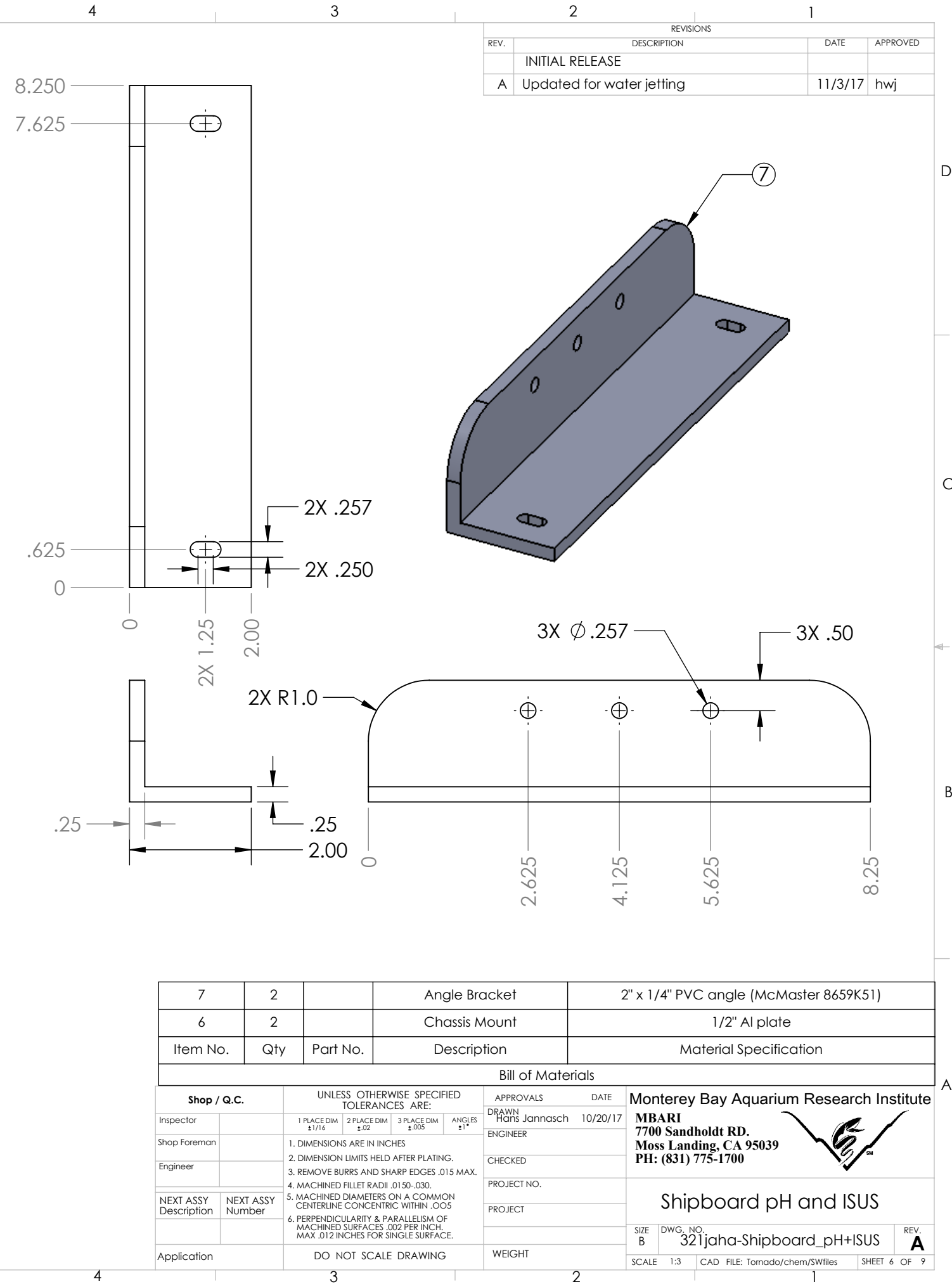
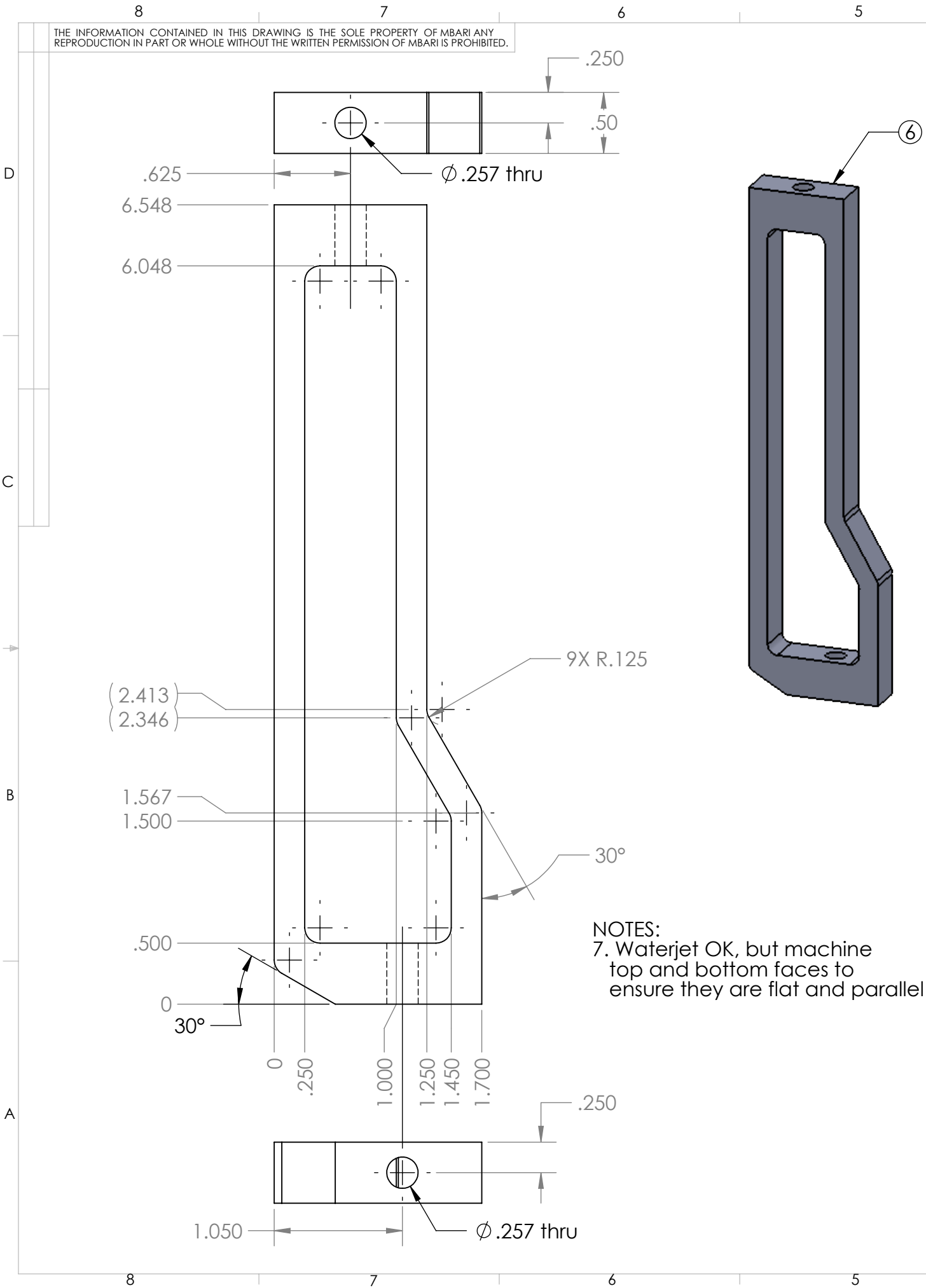


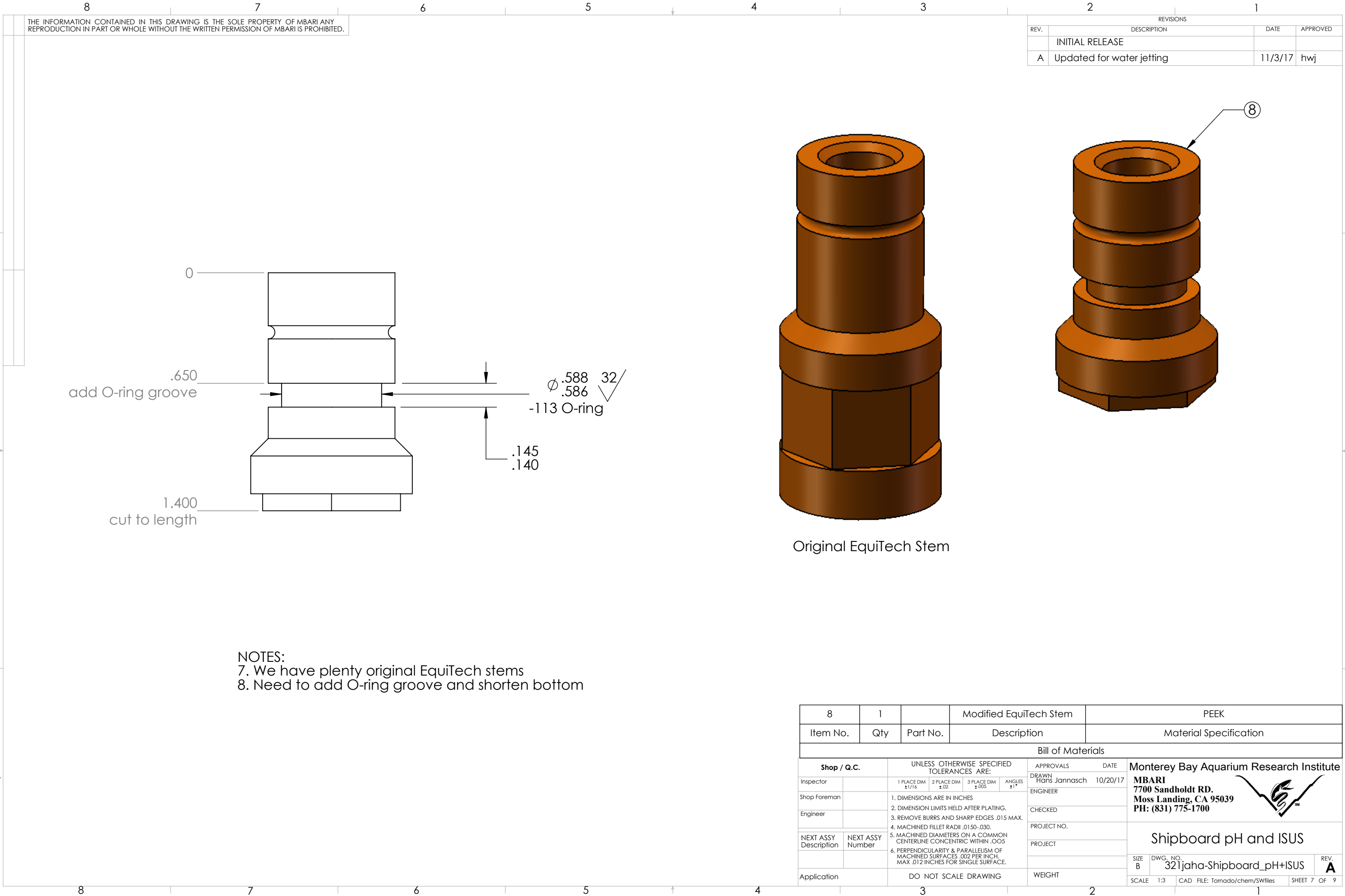
SECTION C-C

4	1		sbEndcap-connector end	Gray PVC
3	1		sbEndcap-sensor end	Gray PVC
Item No.	Qty	Part No.	Description	Material Specification

Bill of Materials											
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:				APPROVALS		DATE		Monterey Bay Aquarium Research Institute MBARI 7700 Sandholdt RD. Moss Landing, CA 95039 PH: (831) 775-1700 	
Inspector		1 PLACE DIM ±1/16	2 PLACE DIM ±.02	3 PLACE DIM ±.005	ANGLES ±1°	DRAWN Hans Jannasch		10/20/17			
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING. 3. REMOVE BURRS AND SHARP EDGES .015 MAX. 4. MACHINED FILLET RADII .0150-.030. 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE.				ENGINEER					
Engineer						CHECKED					
NEXT ASSY Description	NEXT ASSY Number	DO NOT SCALE DRAWING				PROJECT NO.				Shipboard pH and ISUS SIZE B DWG. NO. 321jaha-Shipboard_pH+ISUS REV. A	
						PROJECT					
Application						WEIGHT					
						SCALE 1:3		CAD FILE: Tornado/chem/SWfiles		SHEET 4 OF 4	







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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Updated for water jetting	11/3/17	hwj

add O-ring groove

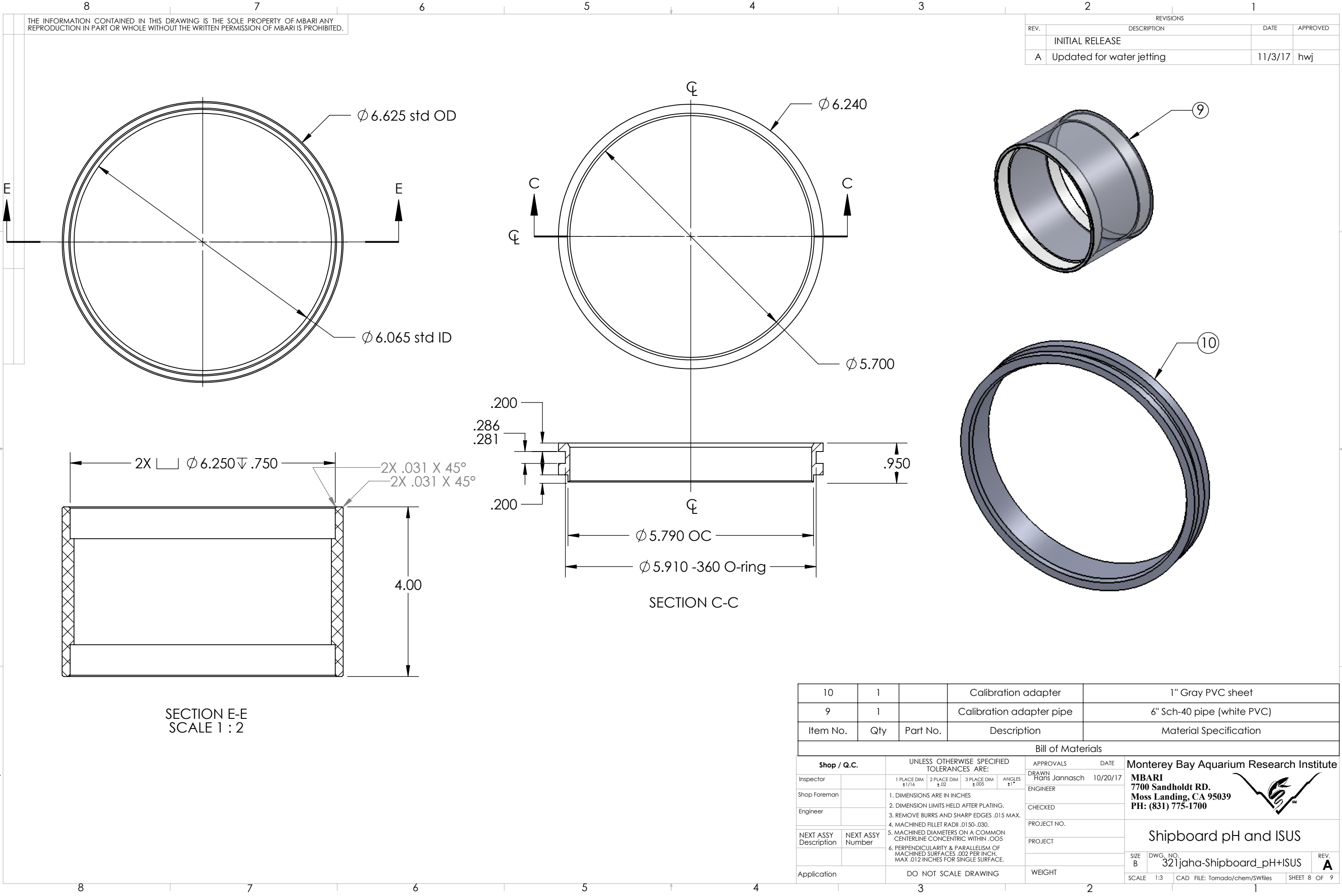
ϕ .588
32/
.586
-113 O-ring

1.400
cut to length

NOTES:
7. We have plenty original EquiTech stems
8. Need to add O-ring groove and shorten bottom

Original EquiTech Stem

8		1		Modified EquiTech Stem		PEEK			
Item No.		Qty	Part No.	Description		Material Specification			
Bill of Materials									
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS		DATE		
Inspector		1 PLACE DIM ±1/16	2 PLACE DIM ±.02	3 PLACE DIM ±.005	ANGLES ±1°	DRAWN Hans Jannasch	10/20/17		
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING. 3. REMOVE BURRS AND SHARP EDGES .015 MAX. 4. MACHINED FILLET RADII .0150-.030. 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH, MAX .012 INCHES FOR SINGLE SURFACE.				ENGINEER	Monterey Bay Aquarium Research Institute MBARI 7700 Sandholdt RD. Moss Landing, CA 95039 PH: (831) 775-1700 		
Engineer						CHECKED			
NEXT ASSY Description	NEXT ASSY Number					PROJECT NO.			
						PROJECT			
Application		DO NOT SCALE DRAWING			WEIGHT		SIZE B	DWG. NO. 321jaha-Shipboard_pH+ISUS	REV. A
							SCALE 1:3	CAD FILE: Tornado/chem/SWfiles	SHEET 7 OF 9



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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Updated for water jetting	11/3/17	hwj

SECTION E-E
SCALE 1 : 2

SECTION C-C

10	1		Calibration adapter	1" Gray PVC sheet				
9	1		Calibration adapter pipe	6" Sch-40 pipe (white PVC)				
Item No.	Qty	Part No.	Description	Material Specification				
Bill of Materials								
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:			APPROVALS DATE		Monterey Bay Aquarium Research Institute MBARI 7700 Sandholdt RD. Moss Landing, CA 95039 PH: (831) 775-1700 	
Inspector		1 PLACE DIM ±1/16	2 PLACE DIM ±.02	3 PLACE DIM ±.005	ANGLES ±1°	DRAWN Hans Jannasch 10/20/17		
Shop Foreman		1. DIMENSIONS ARE IN INCHES 2. DIMENSION LIMITS HELD AFTER PLATING. 3. REMOVE BURRS AND SHARP EDGES .015 MAX. 4. MACHINED FILLET RADII .0150-.030. 5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005 6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE.			ENGINEER			
Engineer					CHECKED			
NEXT ASSY Description	NEXT ASSY Number				PROJECT NO.			
		PROJECT						
Application		DO NOT SCALE DRAWING			WEIGHT		SIZE B DWG. NO. 321jaha-Shipboard_pH+ISUS REV. A	
					SCALE 1:3 CAD FILE: Tornado/chem/SWfiles		SHEET 8 OF 9	

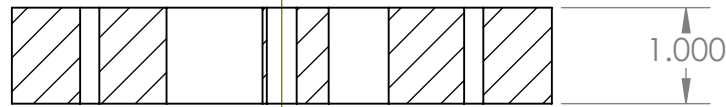
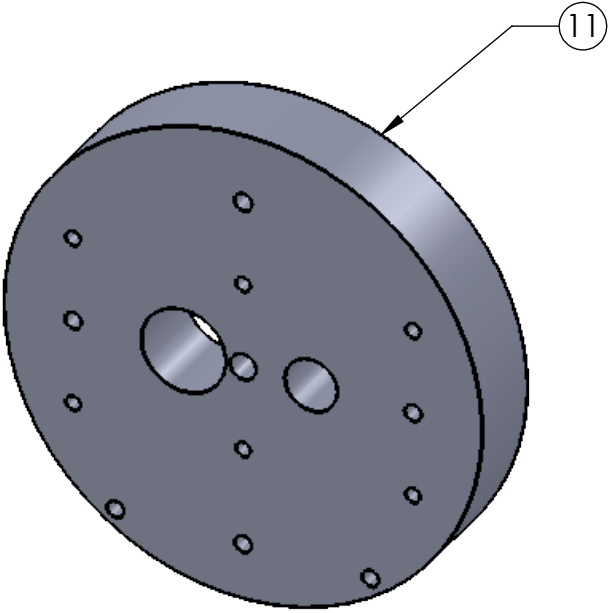
Monterey Bay Aquarium Research Institute
MBARI
7700 Sandholdt RD.
Moss Landing, CA 95039
PH: (831) 775-1700



Shipboard pH and ISUS

SIZE B DWG. NO. 321jaha-Shipboard_pH+ISUS REV. A

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Updated for water jetting	11/3/17	hwj



11	1		Lathe Mount	1" Gray PVC sheet
Item No.	Qty	Part No.	Description	Material Specification
Bill of Materials				
Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS DATE
Inspector		1 PLACE DIM ±.1/16	2 PLACE DIM ±.02	3 PLACE DIM ±.005
Shop Foreman		1. DIMENSIONS ARE IN INCHES		DRAWN Hans Jannasch 10/20/17
Engineer		2. DIMENSION LIMITS HELD AFTER PLATING.		ENGINEER
		3. REMOVE BURRS AND SHARP EDGES .015 MAX.		CHECKED
		4. MACHINED FILLET RADII .0150-.030.		PROJECT NO.
NEXT ASSY Description	NEXT ASSY Number	5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005		PROJECT
		6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE.		
Application	DO NOT SCALE DRAWING		WEIGHT	SIZE B DWG. NO. 321jaha-Shipboard_pH+ISUS REV. A
		SCALE 1:3	CAD FILE: Tornado/chem/SWfiles	SHEET 9 OF 9