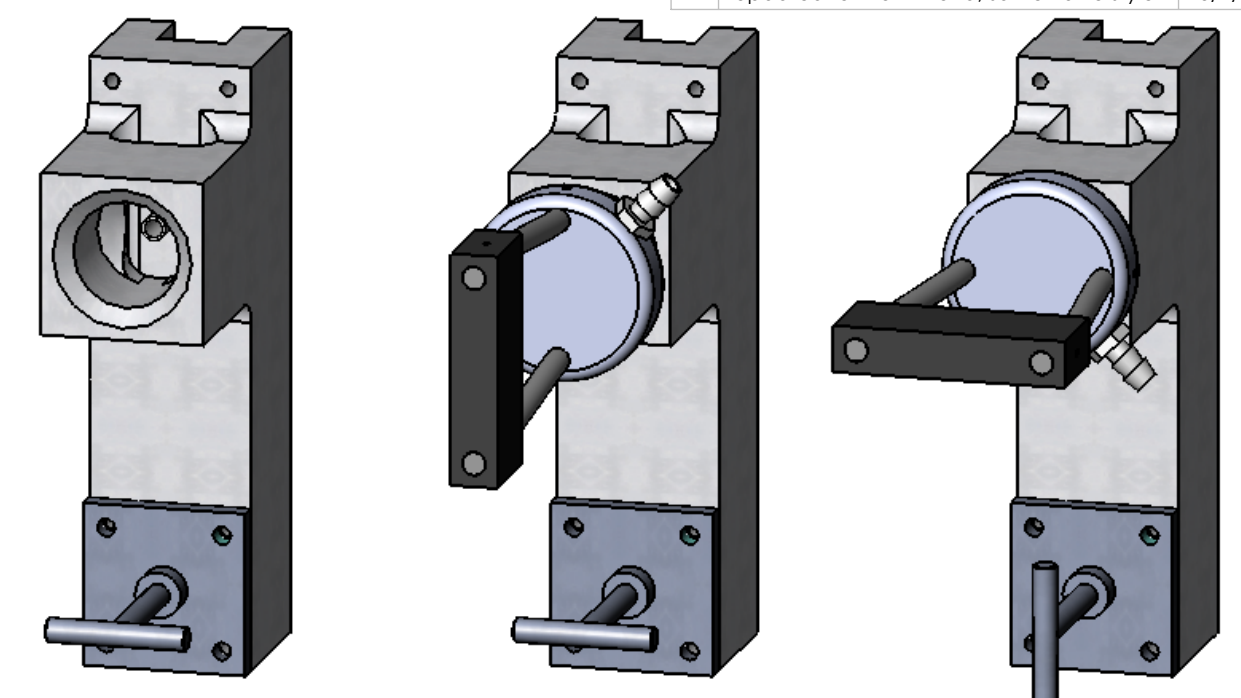
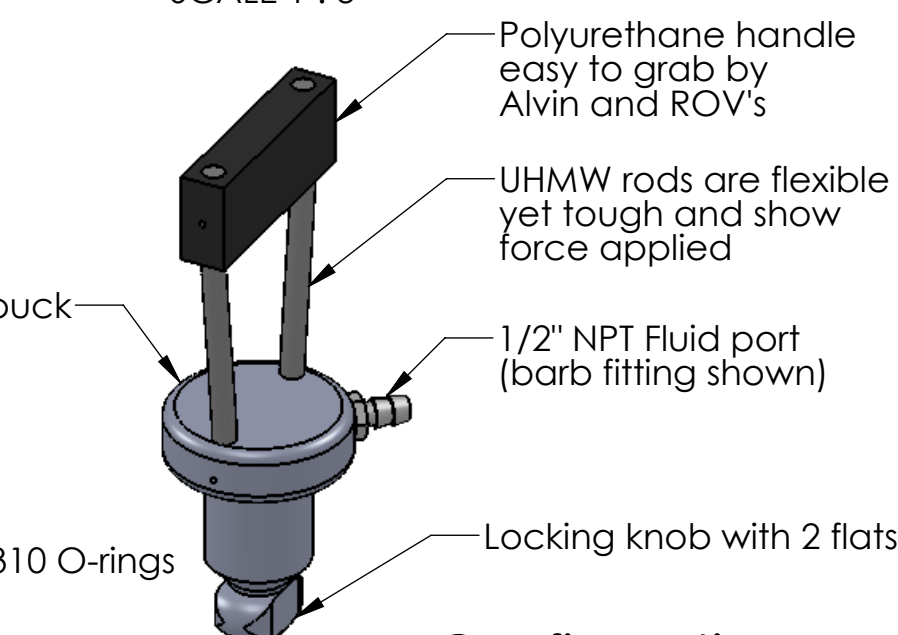
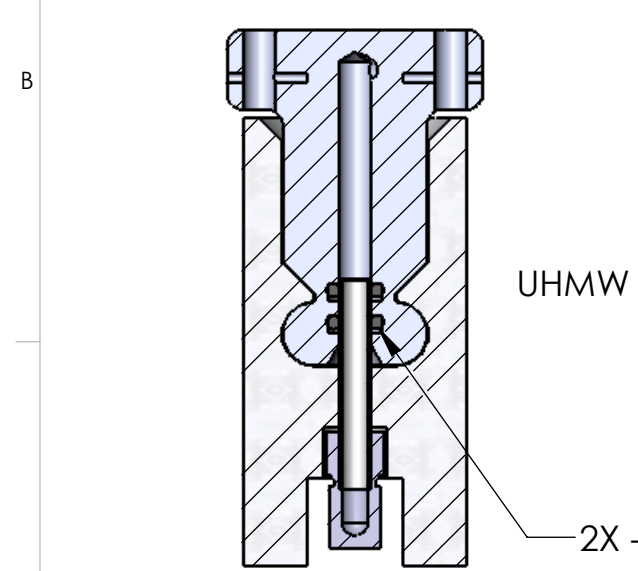
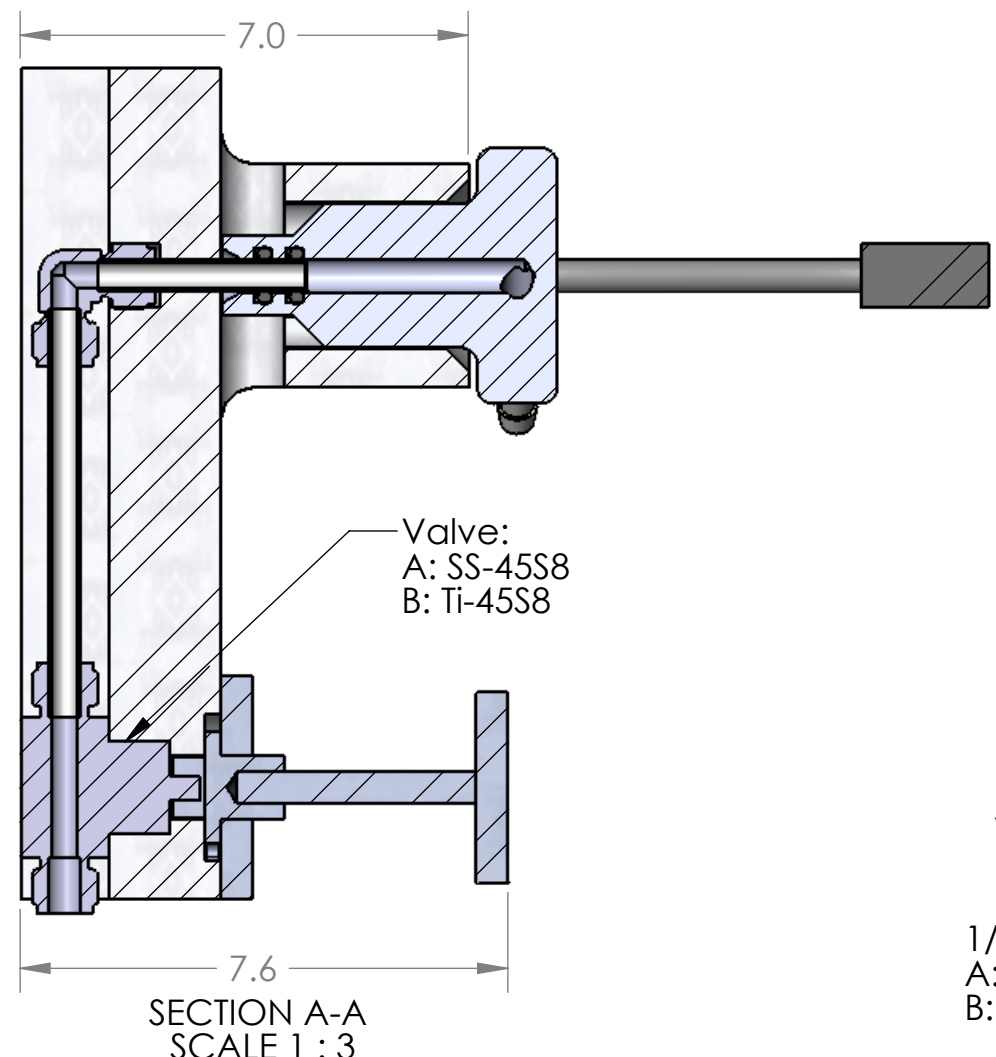
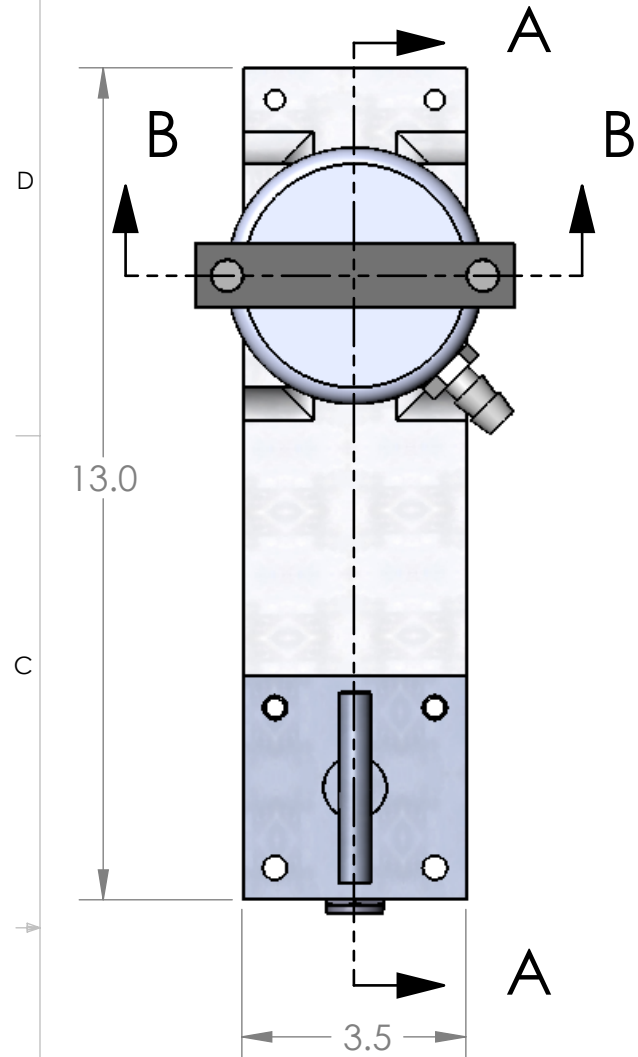
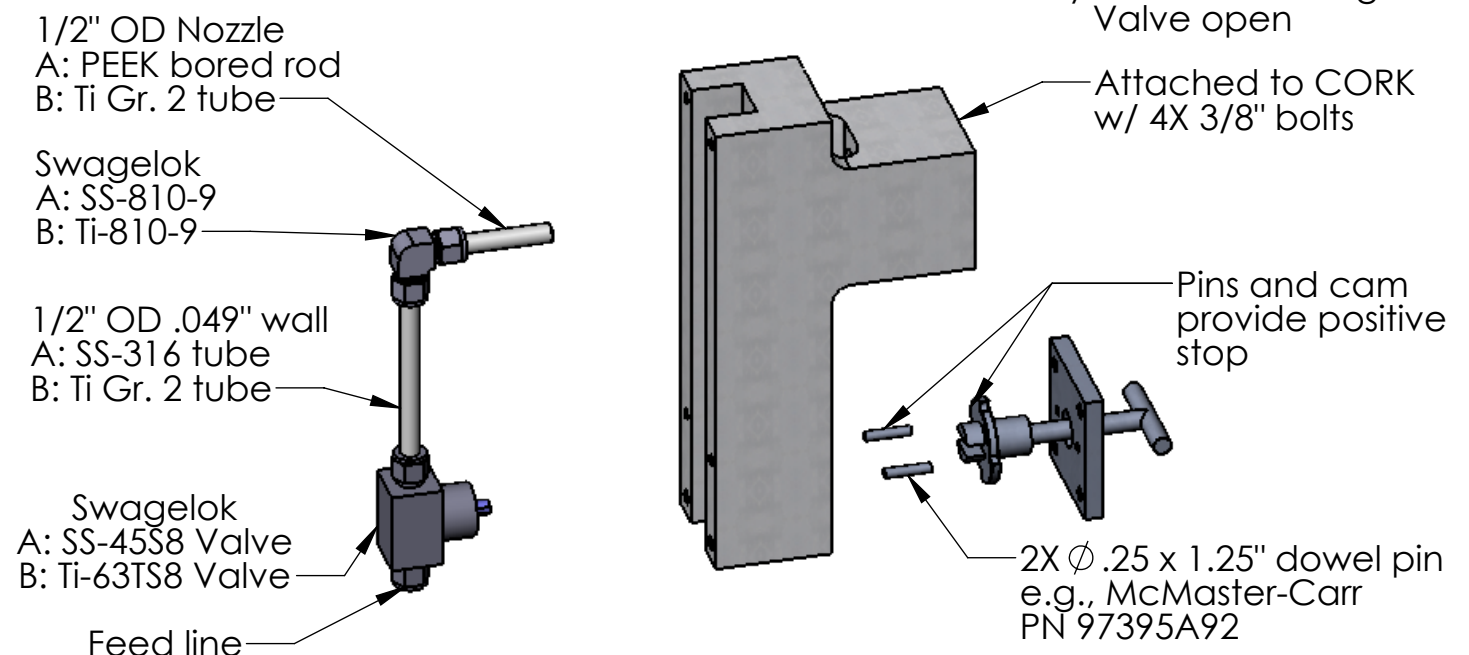


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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Added black UHMW, Ti version	4/30/10	HWJ
B	Updated for North Pond; same valve style	5/2/10	HWJ



Valve (closed) and stem
 Connector at insertion angle
 Connector locked at any non-vertical angle Valve open



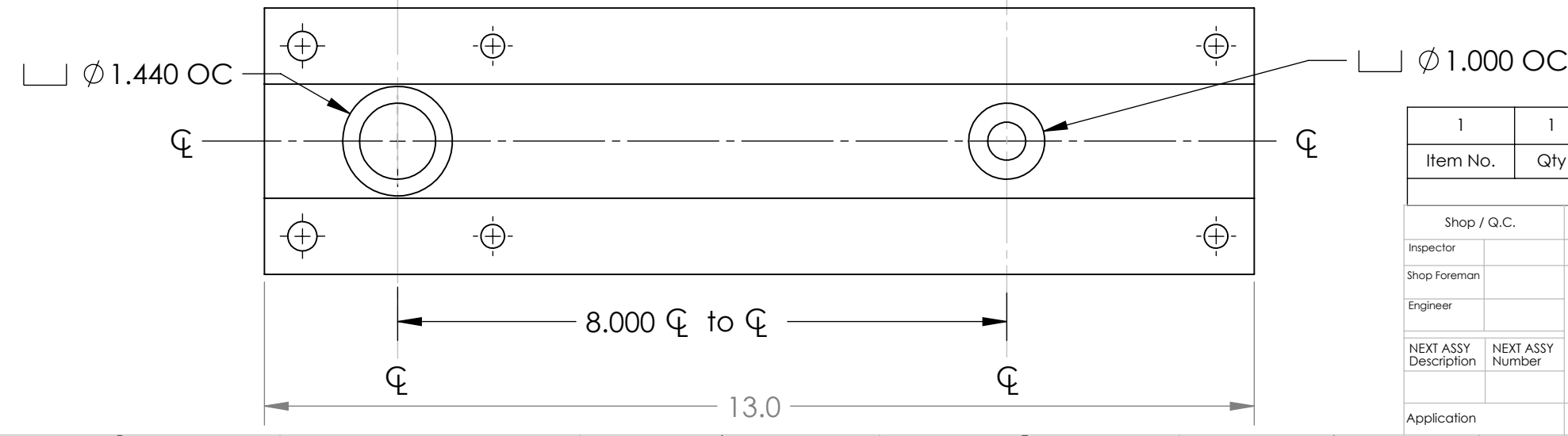
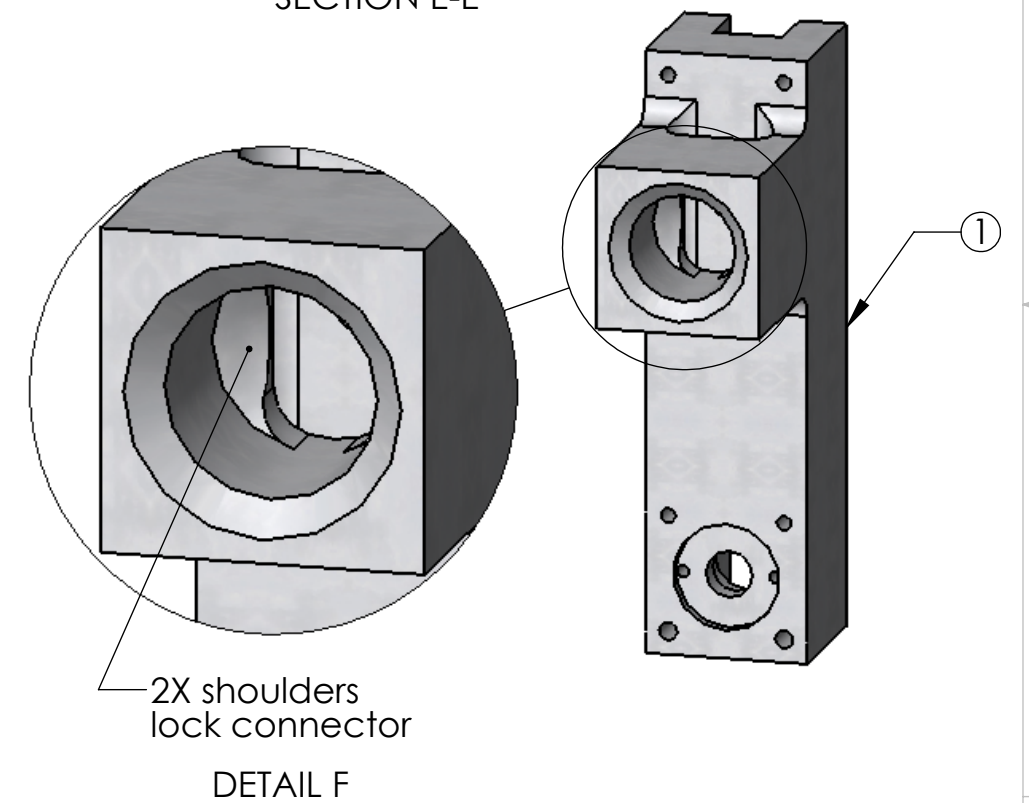
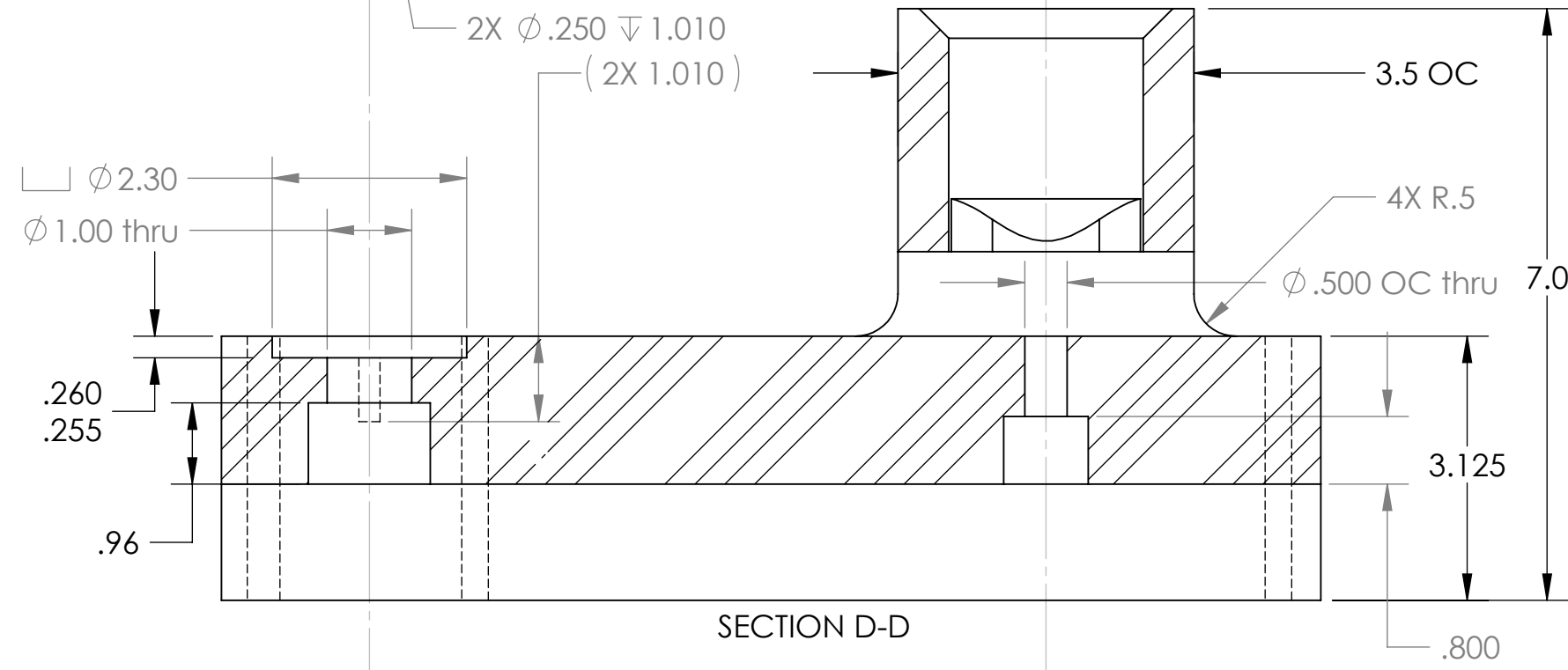
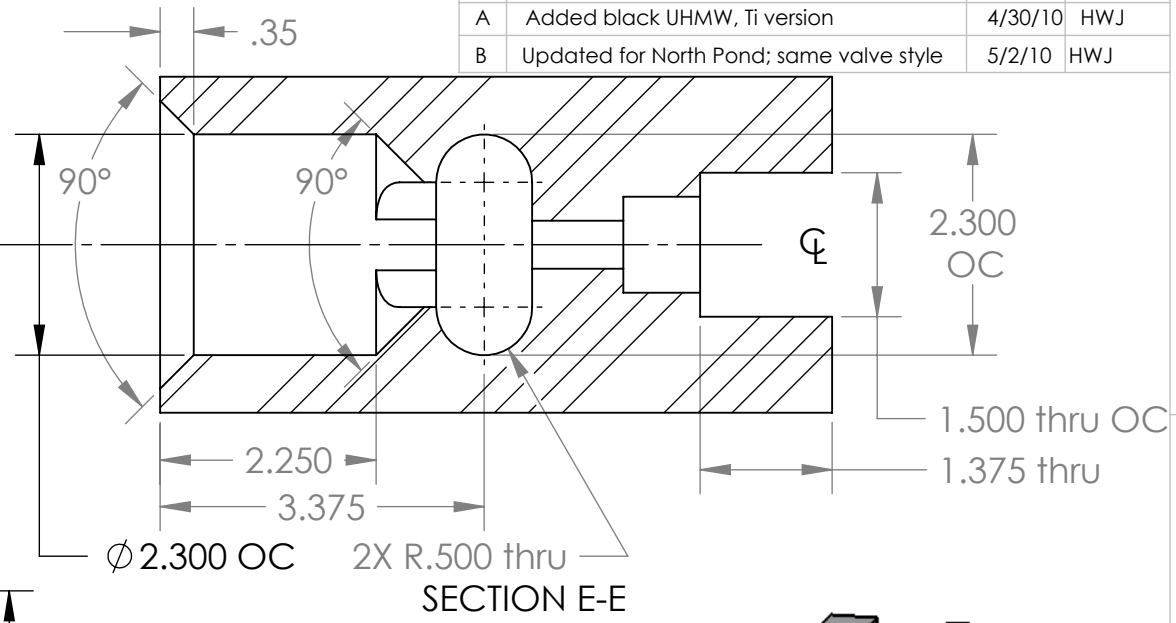
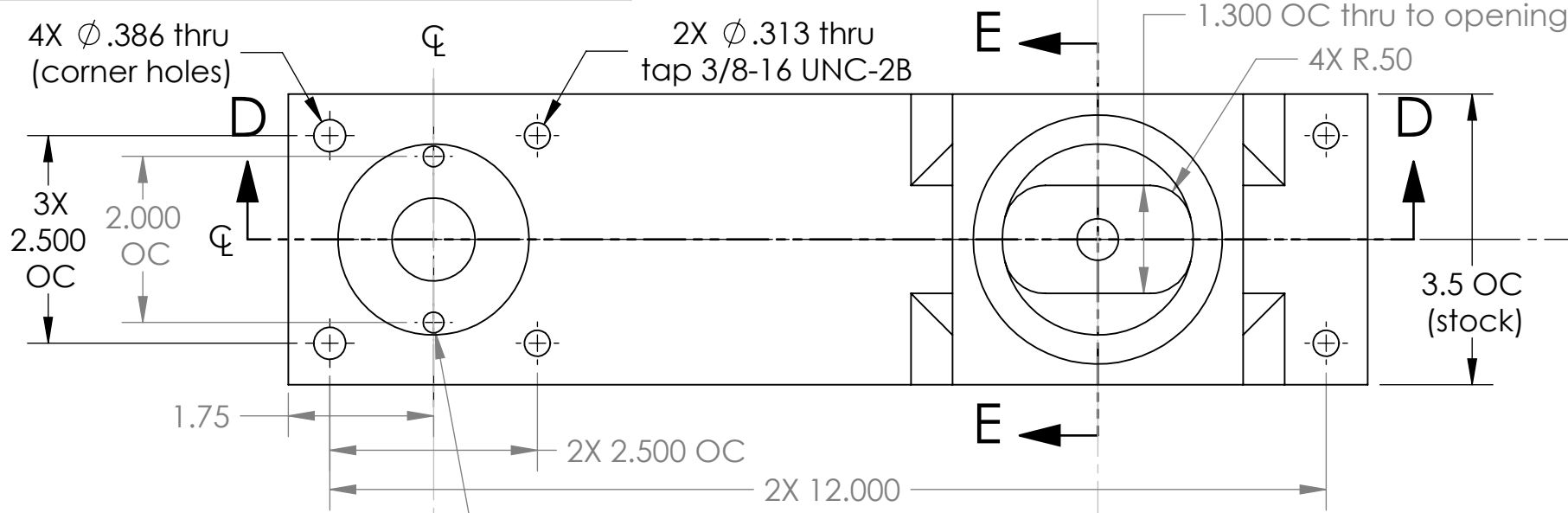
Configurations:
 A: Stainless steel version
 B: Titanium version

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°	Designer	Hans Jannasch 2/10/2010	
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 .015-.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		
Engineer						PROJECT	Univ of Alaska	
NEXT ASSY Description	NEXT ASSY Number					Borehole Valve and Connector For North Pond 2010		
Application	DO NOT SCALE DRAWING					WEIGHT		
						SIZE B	DWG. NO. 102jD-BrehoValve+ConnectorNP	REV. B
						SCALE 1:3	CAD FILE: Tornado/chem/SWfiles	SHEET 1 OF 5

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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Added black UHMW, Ti version	4/30/10	HWJ
B	Updated for North Pond; same valve style	5/2/10	HWJ



1	1		BH Valve Body	3.5" UHMW (black)
Item No.	Qty	Part No.	Description	Material Specification

Shop / Q.C.				UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:				APPROVALS		DATE
Inspector		1 PLACE DIM \pm 1/16	2 PLACE DIM \pm .02	3 PLACE DIM \pm .005	ANGLES \pm 1°	Designer	Hans Jannasch		2/10/2010	
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 .015-.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				
Engineer						PROJECT	Univ of Alaska			
NEXT ASSY Description	NEXT ASSY Number					PROJECT		Univ of Alaska		
Application	DO NOT SCALE DRAWING				WEIGHT					

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**Borehole Valve and Connector
 For North Pond 2010**

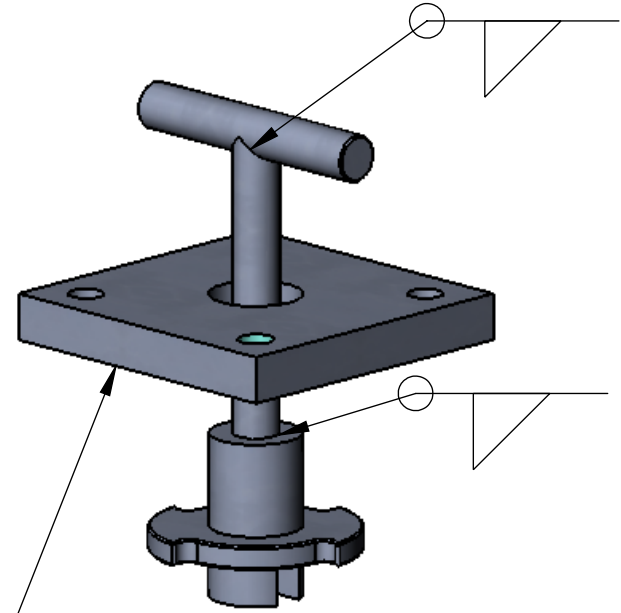
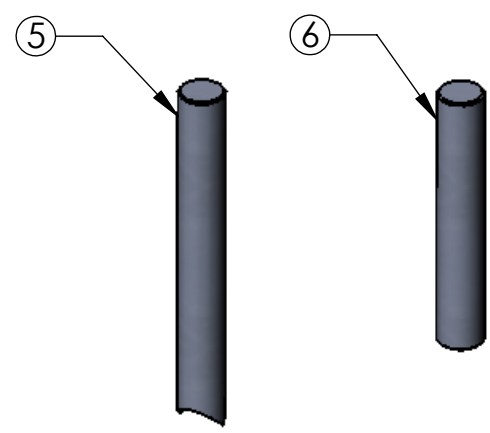
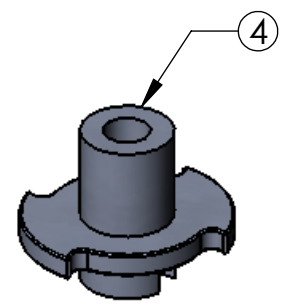
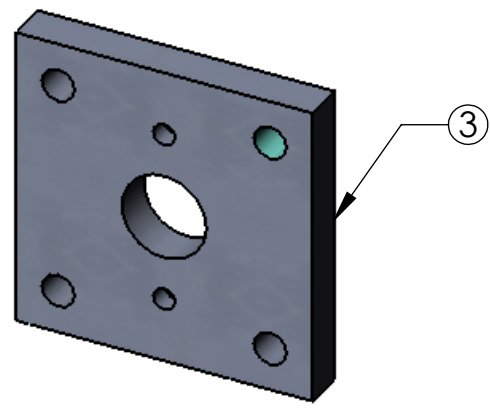
SIZE	DWG. NO.	REV.
B	102jD-BrehoValve+ConnectorNP	B
SCALE	1:3	CAD FILE: Tomado/chem/SWfiles
		SHEET 2 OF 5

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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Added black UHMW, Ti version	4/30/10	HWJ
B	Updated for North Pond; same valve style	5/2/10	HWJ

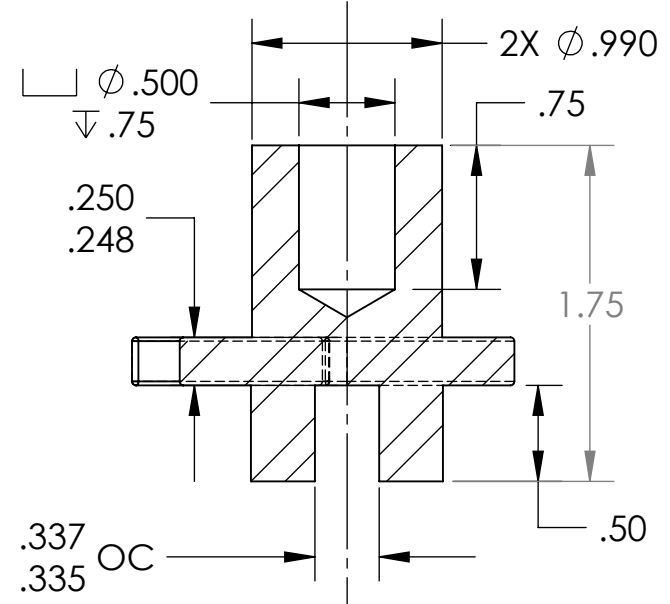
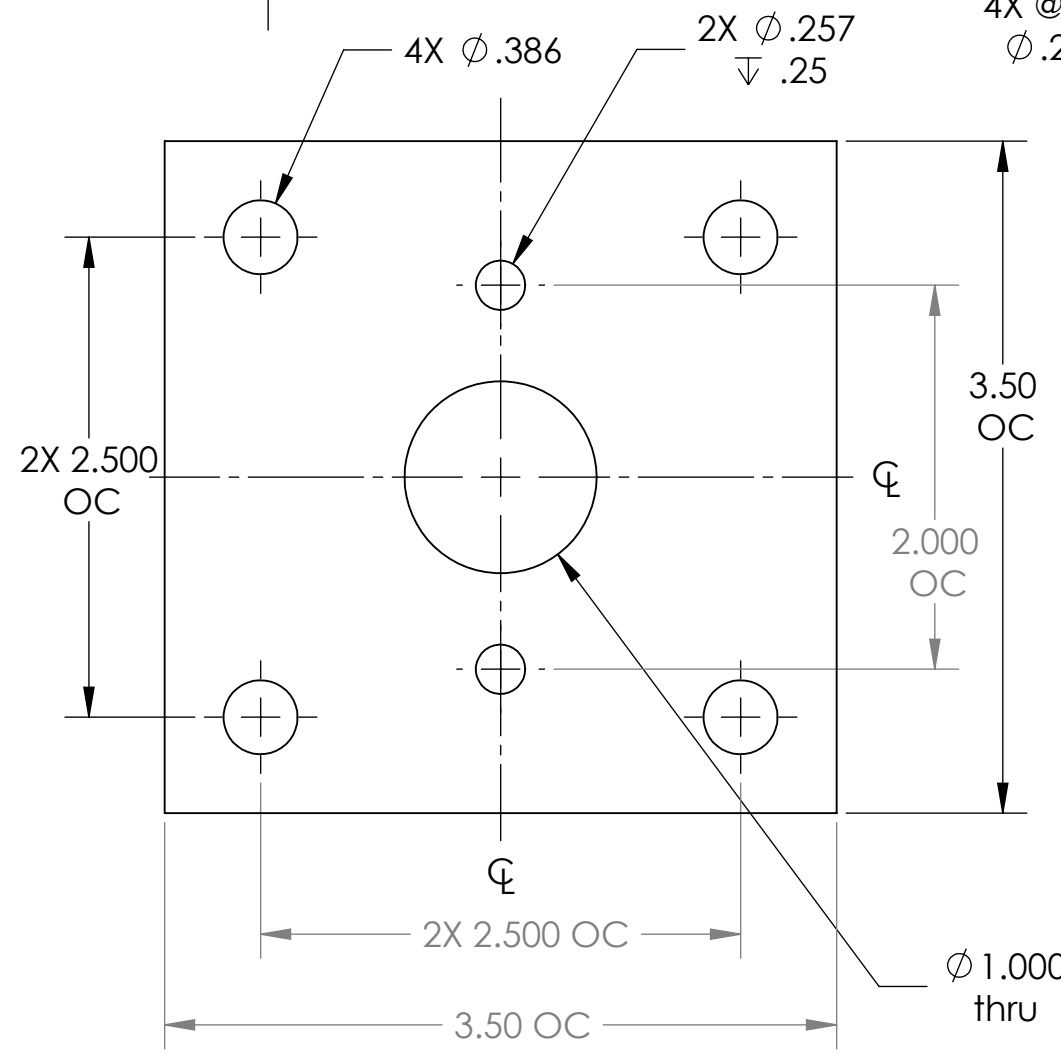
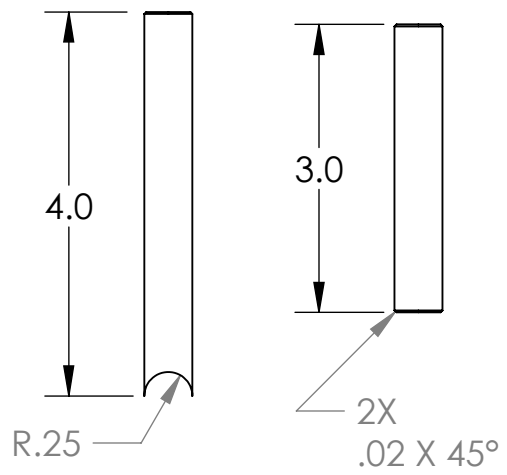
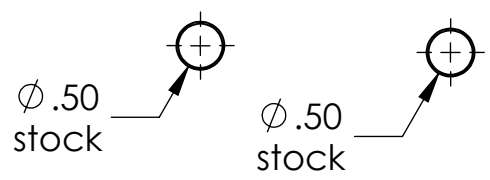
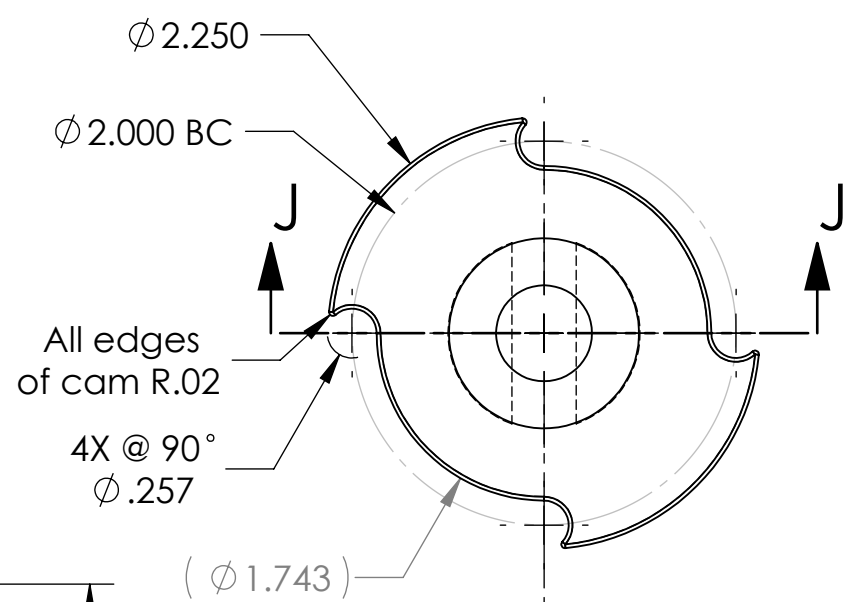
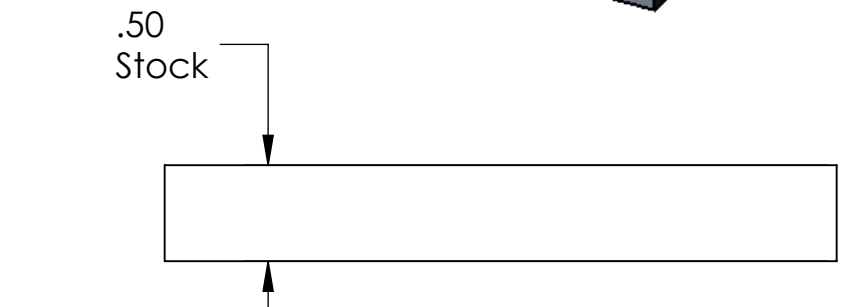
D
C
B
A

D
C
B
A



counterbores on bottom
Valve Handle Assembly

Notes:
7: Clocked so that Handle and slot are aligned ($\pm 1^\circ$)
8: Install plate before welding with counterbored holes towards cam
9: Slot width under cam is only configuration difference.



Item No.	Qty	Part No.	Description	Material Specification
6	1		BH Valve handle	316 Stainless Steel
5	1		BH Valve stem	316 Stainless Steel
4	1		BH Valve rotor	316 Stainless Steel
3	1		BH Valve cover	316 Stainless Steel

Shop / Q.C.		UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:		APPROVALS		DATE
Inspector		1 PLACE DIM $\pm 1/16$	2 PLACE DIM $\pm .02$	3 PLACE DIM $\pm .005$	ANGLES $\pm 1^\circ$	Designer Hans Jannasch 2/10/2010
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 .015-.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
Engineer		PROJECT Univ of Alaska				
NEXT ASSY Description	NEXT ASSY Number	PROJECT Univ of Alaska				
Application	DO NOT SCALE DRAWING	WEIGHT				

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Borehole Valve and Connector For North Pond 2010

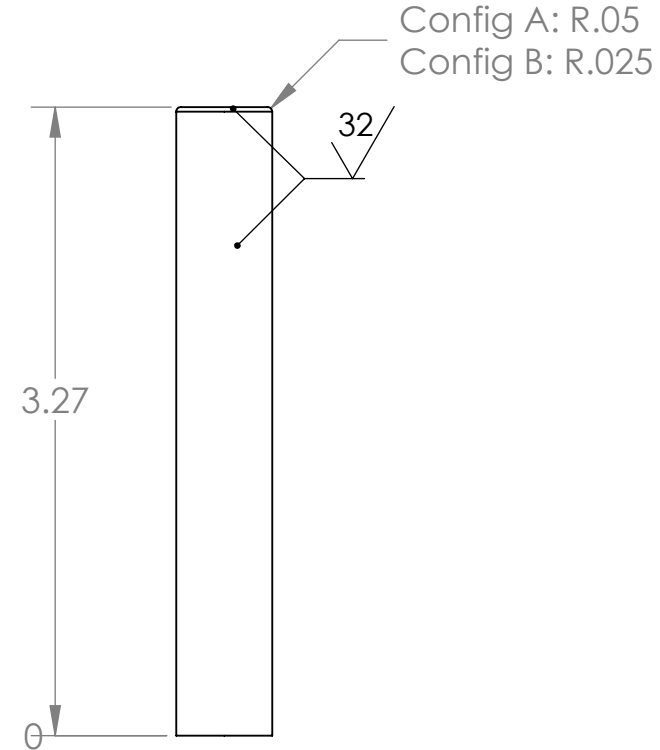
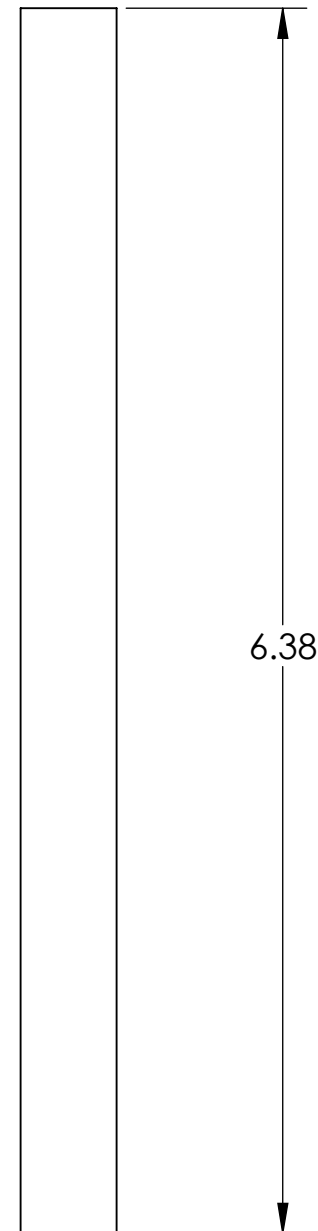
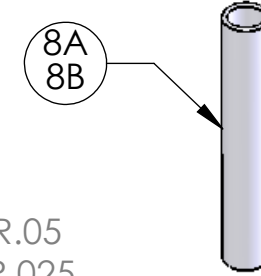
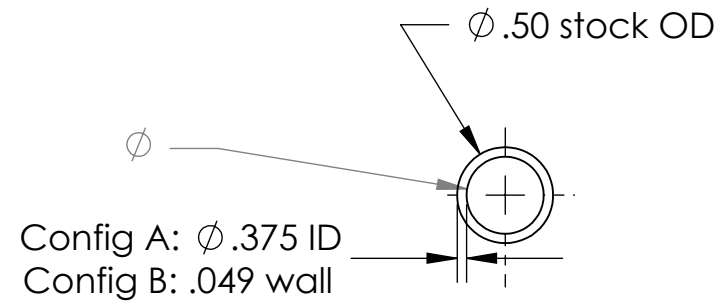
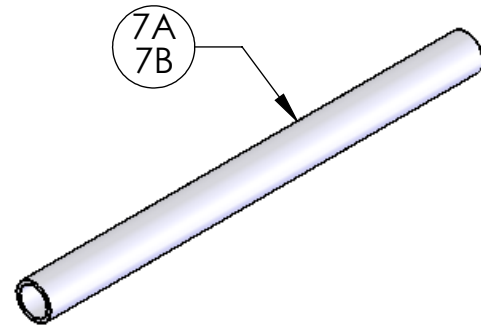
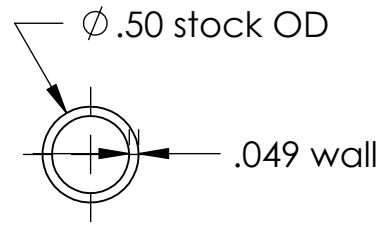
SIZE B DWG. NO. 102JD-BrehoValve+ConnectorNP REV. B
SCALE 1:3 CAD FILE: Tornado/chem/SWfiles SHEET 3 OF 5

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Added black UHMW, Ti version	4/30/10	HWJ
B	Updated for North Pond; same valve style	5/2/10	HWJ

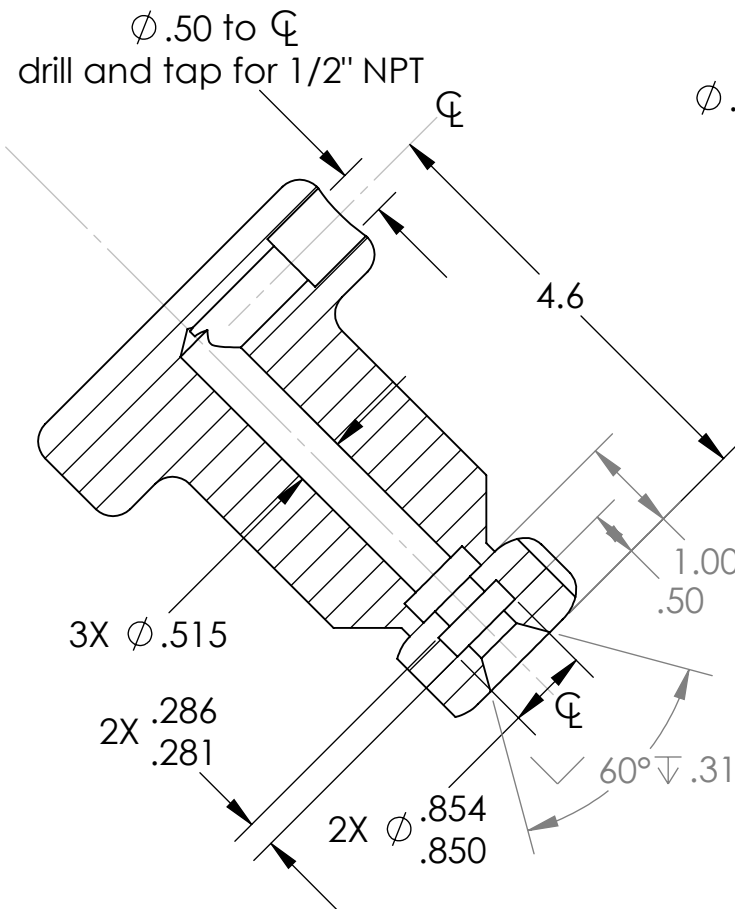
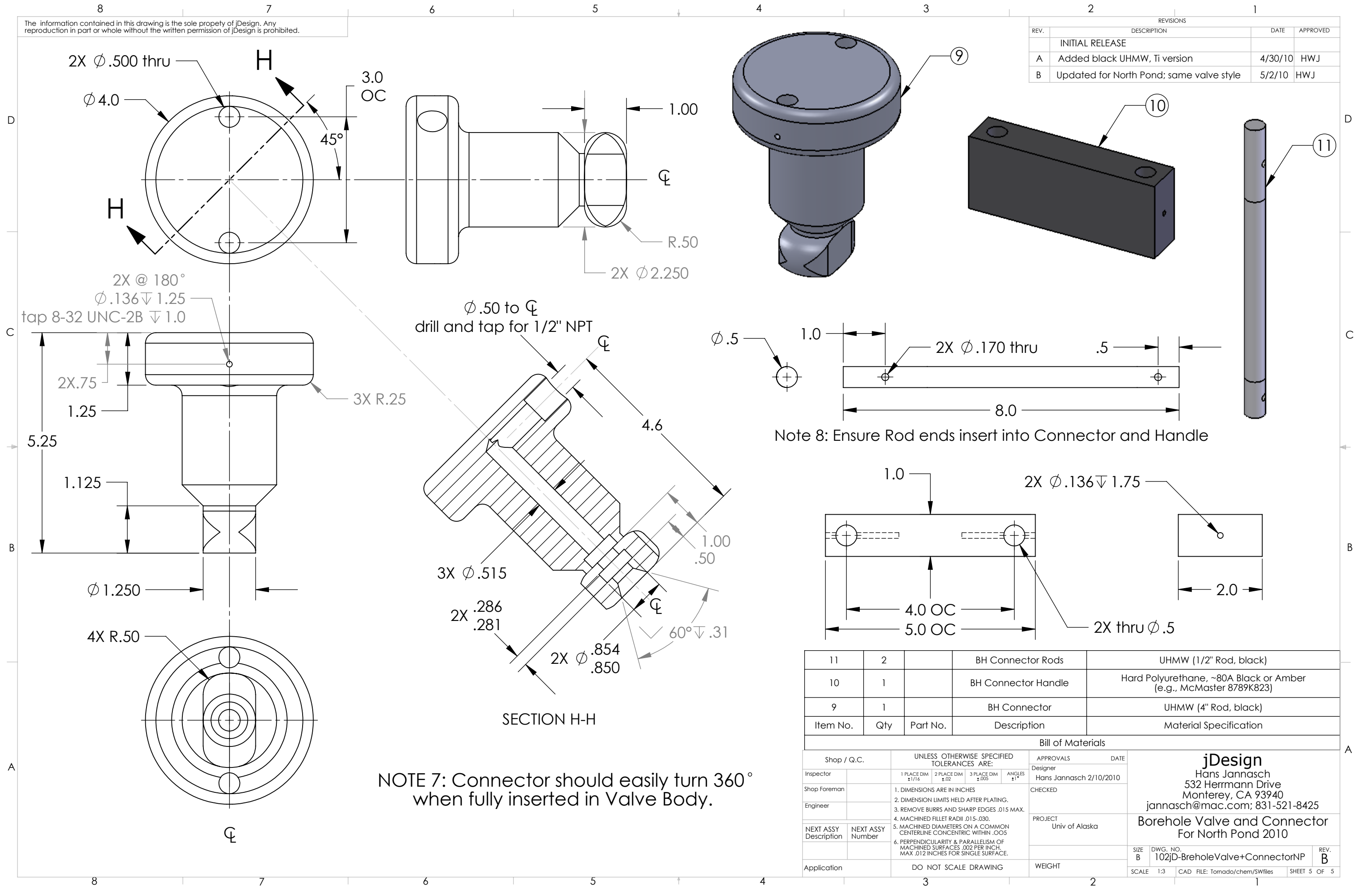


Item No.	Qty	Part No.	Description	Material Specification
8B	1		Nozzle tube (Config B)	Titanium 1/2" OD, .049 wall tubing
8A	1		Nozzle tube (Config A)	PEEK 1/2" OD Rod
7B	1		Connector tube (Config B)	Titanium 1/2" OD, .049 wall tubing
7A	1		Connector tube (Config A)	316 Stainless Steel 1/2" OD, .049 wall tubing

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°	jDesign Hans Jannasch 532 Herrmann Drive Monterey, CA 93940 jannasch@mac.com; 831-521-8425			
Shop Foreman		1. DIMENSIONS ARE IN INCHES				CHECKED		PROJECT					
Engineer		2. DIMENSION LIMITS HELD AFTER PLATING.						Univ of Alaska		Borehole Valve and Connector For North Pond 2010			
NEXT ASSY Description	NEXT ASSY Number	3. REMOVE BURRS AND SHARP EDGES .015 MAX.											
		4. MACHINED FILLET RADII .015-.030.								SIZE	DWG. NO.	REV.	
		5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005								B	102jD-BrehoValve+ConnectorNP	B	
		6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE.								SCALE	1:3	CAD FILE: Tomado/chem/SWfiles	SHEET 4 OF 5
Application		DO NOT SCALE DRAWING				WEIGHT							

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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
	INITIAL RELEASE		
A	Added black UHMW, Ti version	4/30/10	HWJ
B	Updated for North Pond; same valve style	5/2/10	HWJ



Note 8: Ensure Rod ends insert into Connector and Handle

NOTE 7: Connector should easily turn 360° when fully inserted in Valve Body.

Item No.	Qty	Part No.	Description	Material Specification
11	2		BH Connector Rods	UHMW (1/2" Rod, black)
10	1		BH Connector Handle	Hard Polyurethane, ~80A Black or Amber (e.g., McMaster 8789K823)
9	1		BH Connector	UHMW (4" Rod, black)

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°	Designer Hans Jannasch 2/10/2010	
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 .015-.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	
Engineer			
NEXT ASSY Description	NEXT ASSY Number	PROJECT Univ of Alaska	
Application	DO NOT SCALE DRAWING	WEIGHT	

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**Borehole Valve and Connector
For North Pond 2010**

SIZE B DWG. NO. 102JD-BrehoValve+ConnectorNP REV. B
SCALE 1:3 CAD FILE: Tornado/chem/SWfiles SHEET 5 OF 5