Haven't pulled one yet

LIGO LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

ADVANCED LIGO FTIR SAMPLE RECORD

Document:	LIGO-E		-v1	Date:	9/27/19		
Submitter:	Name:	Matthew Heintze		Email address:	mheintze@ligo-la.caltech.edu	Location:	LHO
Title:	FTIR: TMS X-end Baffles "Sample 1"						
System(s):	TMS						
Assembly(ies):	TMS shroud baffle (Don't have DCC on me)						
Bake Load:	9656		☒ Pre-Bake		~~☐~~ Class A	☒	URGENT?
JIRA URL:			☐ Post Bake		☒ Class B		
Notes:	Done on all panels in 4" x 2.5" square, twice over in same area. Have marked on drawing, where sample taken				Air Bake in LHO large bake oven		

PARTS				SAMPLES			
#	Part No.	SN	Description	#	Type	Description (for holes indicate "through" or "blind")	Amount
1	D1900260-01	N/A	TMS Shroud Assy. Roof Panel	1	Surface	taken near edge. See drawing	Area (cm^2): 4" x 2.5" (x2)
				2	~~Holes~~		# ~~of Holes~~:
2	D1900390	N/A	TMS Shroud Assy. Side Panel	3	Surface	taken near middle. See drawing	Area (cm^2): 4" x 2.5" (x2)
				4	~~Holes~~		# ~~of Holes~~:
3	D1900261	N/A	TMS Shroud Assy. Bottom Panel	5	Surface	taken near edge. See drawing	Area (cm^2): 4" x 2.5" (x2)
				6	~~Holes~~		# ~~of Holes~~:
4	D1900257	N/A	TMS Shroud Assy. Front Panel	7	Surface	taken near edge. See drawing	Area (cm^2): 4" x 2.5" (x2)
				8	~~Holes~~		# ~~of Holes~~:
5	D1900258	N/A	TMS Shroud Assy. Rear Panel	9	Surface	taken near edge. See drawing	Area (cm^2): 4" x 2.5" (x2)
				10	~~Holes~~		# ~~of Holes~~:

LIGO

ADVANCED LIGO FTIR SAMPLE RECORD

6	D1900391	-01	N/A TMS Shroud Assy. ALS Panel	11	Surface	taken between holes. See	Area (cm^2): 4" x 2.5" (x2)
				12	~~Holes~~	diagram	# of ~~Holes~~:
7	D1900391	-02	N/A TMS Shroud Assy. ALS Panel	13	Surface	taken between holes. See	Area (cm^2): 4" x 2.5" (x2)
				14	~~Holes~~	diagram	# of ~~Holes~~:
8	D1900259	#1	TMS Shroud Assy SIDE PANEL	15	Surface	taken @ edge. See	Area (cm^2): 4" x 2.5" (x2)
				16	~~Holes~~	diagram	# of ~~Holes~~:
9	D1900259	#2	"	17	Surface	" "	Area (cm^2): 4" x 2.5" (x2)
				18	~~Holes~~	/	# of ~~Holes~~:
10	D1900260	-02	TMS Shroud Assy. Roof Panel	19	Surface	taken @ center see	Area (cm^2): 4" x 2.5" (x2)
				20	~~Holes~~	diagram	# of ~~Holes~~:

Instructions:

1) All parts must be sampled. The sampling must be at least 5% of the total area and at least 5% of the total number of holes. Surface samples and hole samples are to be separate. Sampling fewer than all parts in a bake load, or sampling less than 5% of the area or holes requires a waiver from the Vacuum Review Board, or a LIGO Vacuum Review Team member (see the Advanced LIGO VRB wiki for member list). *(Sampling requirements are defined in section 5.1 of E0900480.)*
2) Read the instructions on how to take FTIR samples, given in document LIGO-E0900479. Make sure that the sample bottles are tightly sealed!
3) Reserve a Document Number (E-type) from the LIGO Document Control Center (DCC): https://dcc.ligo.org/cgi-bin/private/DocDB/ReserveHome
4) Complete the form above.
5) File this completed form in the DCC under the reserved number as revision 1, i.e. –v1.
6) If off-site ship a printed copy of this completed form and the FTIR Samples (properly packaged) to Calum Torrie at Caltech. Follow ALL procedures laid out in LIGO-T1700469: Documentation associated with shipping "dangerous goods" in excepted quantities.
7) Once at Caltech Calum will review (for need and priority) and then forward a printed copy of this completed form and the FTIR Samples (properly packaged) to:

   Attn: Jerami Mennella, Jet Propulsion Laboratory
   Bldg 83 room 1014800 Oak Grove drive Pasadena, California 91109-8099
8) Calum will then send an email to Jerami.Mennella@jpl.nasa.gov indicating that an FT IR sample package is in route and indicate whether testing results are urgent or not.
9) JPL should put the LIGO document number of this sample form into the header of their FTIR analysis report and email this report to the submitter (email given in form).
10) The completed FTIR analysis report from JPL is to be reviewed and approved by the Vacuum Review Team member at the submitter's location. The Vacuum Review Team member makes any desired notations on the report and then files the report (*.pdf) into the DCC as version –v2 of the document number of this completed sample record form. This DCC record should also be associated with the event "FTIR Testing". If approved, the VRT member also indicates electronic approval on the –v2 DCC record. The VRT member also informs the submitter via email whether the FTIR sampled load is approved or rejected.

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

LIGO **ADVANCED LIGO FTIR SAMPLE RECORD**

Document:	LIGO-E		-v1	Date:					
Submitter:	Name:			Email address:			Location:		
Title:	FTIR: TMS X-END BAFFLE "SAMPLE 1" Cont								
System(s):									
Assembly(ies):									
Bake Load:			☐	Pre-Bake		☐	Class A	☐	URGENT?
JIRA URL:			☐	Post Bake		☐	Class B		
Notes:									

PARTS				SAMPLES			
#	Part No.	SN	Description	#	Type	Description (for holes indicate "through" or "blind")	Amount
1	D1900389	N/A	TMS SHROUD FRONT PANEL	1	Surface	Edge. See diagram	Area (cm²): 4"x2.5"(x2)
				2	Holes		# of Holes:
2	D1900392	B1	TMS Shroud Assy Window cover	3	Surface	Bottom. See diagram	Area (cm²):
				4	Holes	"	# of Holes: 4"x2.5"(x2)
3	D1900392	02	"	5	Surface		Area (cm²):
				6	Holes	"	# of Holes: 4"x2.5"(x2)
4	D1900392	03	"	7	Surface		Area (cm²):
				8	Holes	"	# of Holes: 4"x2.5"(x2)
5	D1900392	04	"	9	Surface	"	Area (cm²): 4"x2.5"(x2)
				10	Holes		# of Holes:

ADVANCED LIGO FTIR SAMPLE RECORD

6				11	Surface		Area (cm^2):
				12	Holes		# of Holes:
7				13	Surface		Area (cm^2):
				14	Holes		# of Holes:
8				15	Surface		Area (cm^2):
				16	Holes		# of Holes:
9				17	Surface		Area (cm^2):
				18	Holes		# of Holes:
10				19	Surface		Area (cm^2):
				20	Holes		# of Holes:

Instructions:

1) All parts must be sampled. The sampling must be at least 5% of the total area and at least 5% of the total number of holes. Surface samples and hole samples are to be separate. Sampling fewer than all parts in a bake load, or sampling less than 5% of the area or holes requires a waiver from the Vacuum Review Board, or a LIGO Vacuum Review Team member (see the Advanced LIGO VRB wiki for member list). *(Sampling requirements are defined in section 5.1 of E0900480.)*
2) Read the instructions on how to take FTIR samples, given in document LIGO-E0900479. Make sure that the sample bottles are tightly sealed!
3) Reserve a Document Number (E-type) from the LIGO Document Control Center (DCC): https://dcc.ligo.org/cgi-bin/private/DocDB/ReserveHome
4) Complete the form above.
5) File this completed form in the DCC under the reserved number as revision 1, i.e. –v1.
6) If off-site ship a printed copy of this completed form and the FTIR Samples (properly packaged) to Calum Torrie at Caltech. Follow ALL procedures laid out in LIGO-T1700469: Documentation associated with shipping "dangerous goods" in excepted quantities.
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   Attn: Jerami Mennella, Jet Propulsion Laboratory
   Bldg 83 room 1014800 Oak Grove drive Pasadena, California 91109-8099

8) Calum will then send an email to Jerami.Mennella@jpl.nasa.gov indicating that an FTIR sample package is in route and indicate whether testing results are urgent or not.
9) JPL should put the LIGO document number of this sample form into the header of their FTIR analysis report and email this report to the submitter (email given in form).
10) The completed FTIR analysis report from JPL is to be reviewed and approved by the Vacuum Review Team member at the submitter's location. The Vacuum Review Team member makes any desired notations on the report and then files the report (*.pdf) into the DCC as version –v2 of the document number of this completed sample record form. This DCC record should also be associated with the event "FTIR Testing". If approved, the VRT member also indicates electronic approval on the –v2 DCC record. The VRT member also informs the submitter via email whether the FTIR sampled load is approved or rejected.

Haven't Pulled one yet

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

LIGO ADVANCED LIGO FTIR SAMPLE RECORD

Document:	LIGO-E		-v1	Date:	9/27/17				
Submitter:	Name:	Matt Heintze		Email address:	mheintze@ligo-la.caltech.edu		Location:	LLO	
Title:	FTIR: TMS X-END BAFFLES "SAMPLE 2"								
System(s):	TMS								
Assembly(ies):	TMS SHROUD BAFFLE (Don't have ICC on me)								
Bake Load:	9659		[X] Pre-Bake		[ ] Class A		[X] URGENT?		
JIRA URL:			[ ] Post Bake		[X] Class B				
Notes:	Done on all panels in 4" x 2.5" Square, twice over in same area. Have marked on drawing where sample taken				Air Bake LLO large Bake oven				

PARTS				SAMPLES			
#	Part No.	SN	Description	#	Type	Description (for holes indicate "through" or "blind")	Amount
1	D1900260-1	N/A	Roof Panel	1	Surface	Near centre. See diag	Area (cm^2): 4" x 2.5" (x2)
				2	Holes		# of Holes:
2	D1900260-2	N/A	"	3	Surface	Near edge. See diag	Area (cm^2): 4" x 2.5" (x2)
				4	Holes		# of Holes:
3	D1900259	1	SIDE PANEL	5	Surface	Near centre. See diag	Area (cm^2): 4" x 2.5" (x2)
				6	Holes		# of Holes:
4	D1900259	2	SIDE PANEL	7	Surface	"	Area (cm^2): 4" x 2.5" (x2)
				8	Holes		# of Holes:
5	D1900391-01	N/A	~~Spare~~ ALS PANEL	9	Surface	Between holes and edge.	Area (cm^2): 4" x 2.5" (x2)
				10	Holes	See diagram	# of Holes:

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ADVANCED LIGO FTIR SAMPLE RECORD

6	D1400391-02	N/A	ALS Panel	11	Surface	Between holes and edge.	Area (cm^2): 4" x 2.5" (x2)
				12	Holes	See diagram	# of Holes:
7	D1400258 ~~D1400258~~	N/A	Rear Panel	13	Surface	In centre. See diagram	Area (cm^2): 4" x 2.5" (x2)
				14	Holes		# of Holes:
8	D1400257	N/A	Front Panel	15	Surface	Near edge. See diagram	Area (cm^2): 4" x 2.5" (x2)
				16	Holes		# of Holes:
9	D1400261	N/A	Bottom Panel	17	Surface	Near centre. See diagram	Area (cm^2): 4" x 2.5" (x2)
				18	Holes		# of Holes:
10	D1400390	N/A	SIDE PANEL	19	Surface	Near edge. See diagram	Area (cm^2): 4" x 2.5" (x2)
				20	Holes		# of Holes:

Instructions:

1) All parts must be sampled. The sampling must be at least 5% of the total area and at least 5% of the total number of holes. Surface samples and hole samples are to be separate. Sampling fewer than all parts in a bake load, or sampling less than 5% of the area or holes requires a waiver from the Vacuum Review Board, or a LIGO Vacuum Review Team member (see the Advanced LIGO VRB wiki for member list). *(Sampling requirements are defined in section 5.1 of E0900480.)*
2) Read the instructions on how to take FTIR samples, given in document LIGO-E0900479. Make sure that the sample bottles are tightly sealed!
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Title: TMS X-END BAFFLES "SAMPLE 2" cont.

PARTS

#	PART #	SN	DESCR
1	D1900389	N/A	Front Panel
2	D1900392	1	Window cover
3	D1900392	2	"
4	D1900392	3	"
5	D1900392	4	"

SAMPLES

#	TYPE	DESCRIP	AMOUNT
1			
2		Near Centre. See diagram	4"x2.5" (x2)
3		Near top. See diagram	4"x2.5" (x2)
4		"	"
5		"	"
		4	"

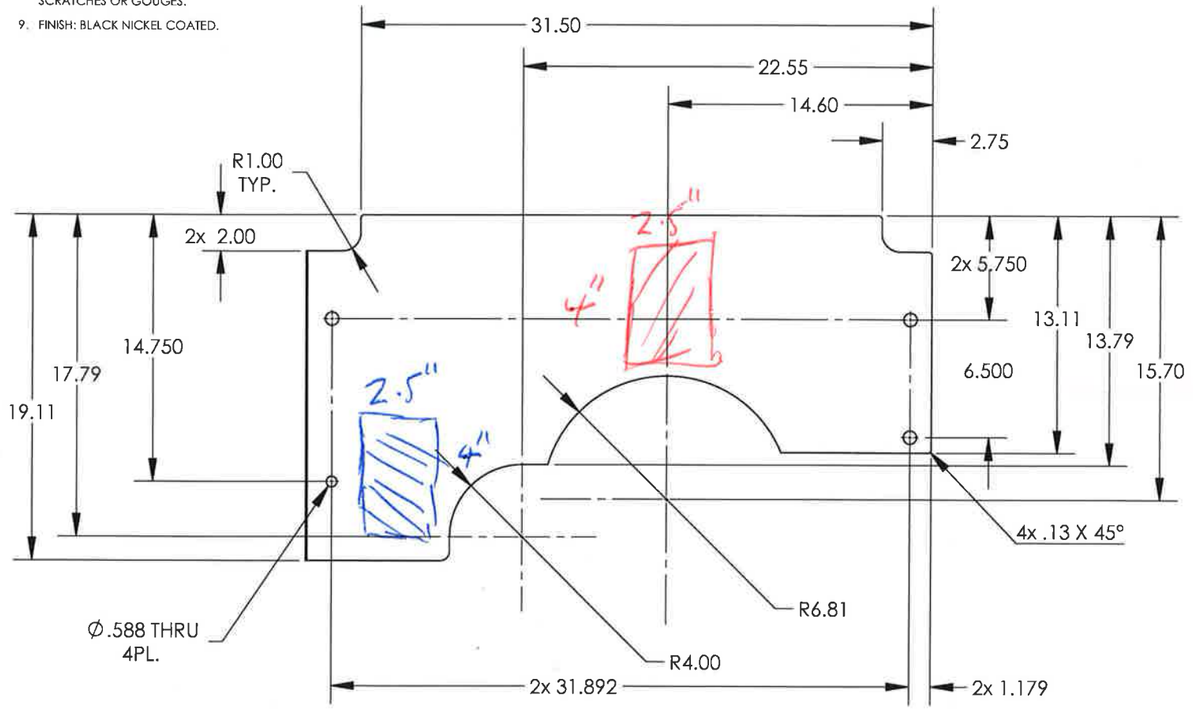
NOTES CONTINUED:

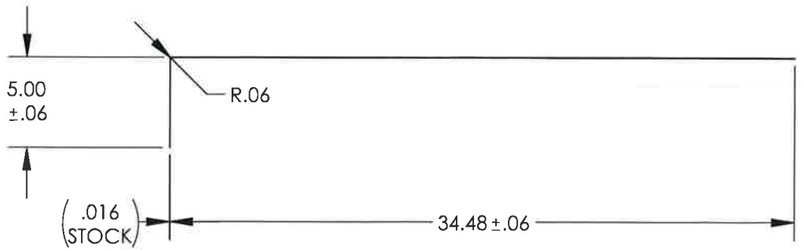
5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX

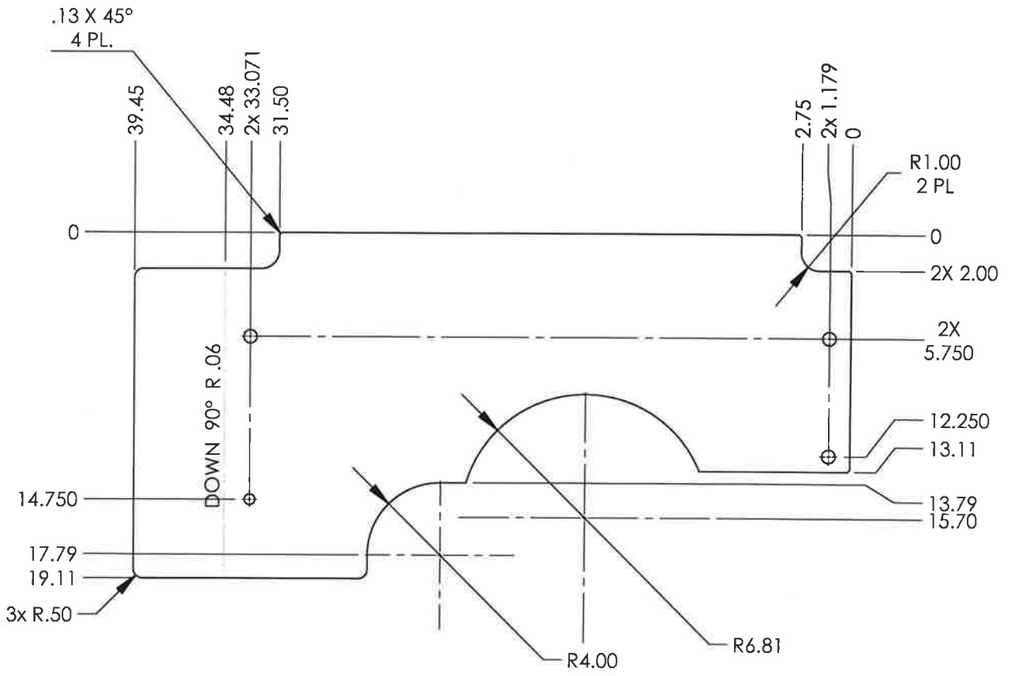
Sample 1

Sample 2

6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.
9. FINISH: BLACK NICKEL COATED.







FLAT STATE

(ALL DIMENSIONS SHOWN ONLY FOR REFERENCE)

D1900260-01	REV.	DATE	DCN #	DRAWING TREE #
	v1	28 AUG 2019	E1900196-x0	-
	-	-	-	-
	-	-	-	-

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015. FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al

FINISH: AS NOTED μinch

LIGO

CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: aLIGO

SUB-SYSTEM: AOS

NEXT ASSY: D1900262

PART NAME: aLIGO, SLIC, TMS SHROUD ASSY., ROOF PANEL

DESIGNER	E.SANCHEZ	15 AUG 2019	
DRAFTER	E.SANCHEZ	27 AUG 2019	
CHECKER	SEE DCC	SEE DCC	
APPROVAL	SEE DCC	SEE DCC	

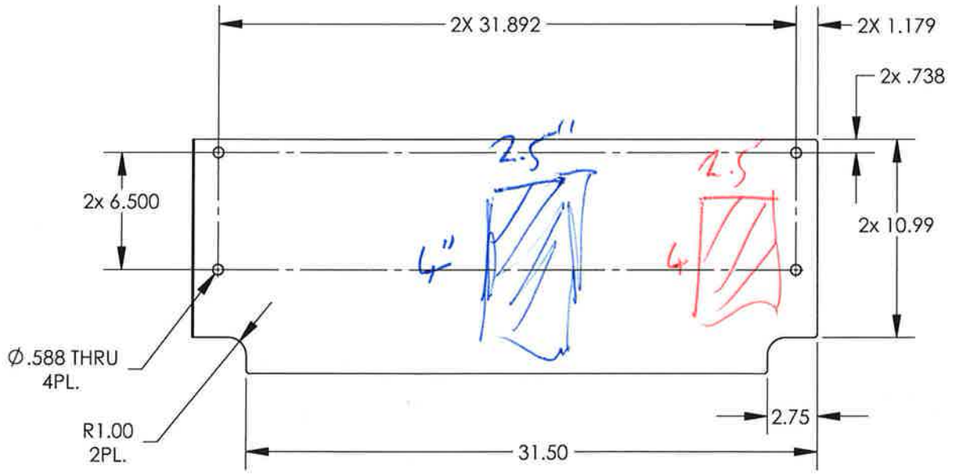
SIZE: B DWG. NO.: D1900260 REV.: v1

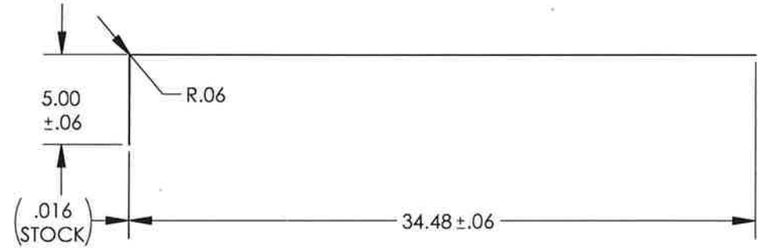
SCALE: 1:8 PROJECTION:

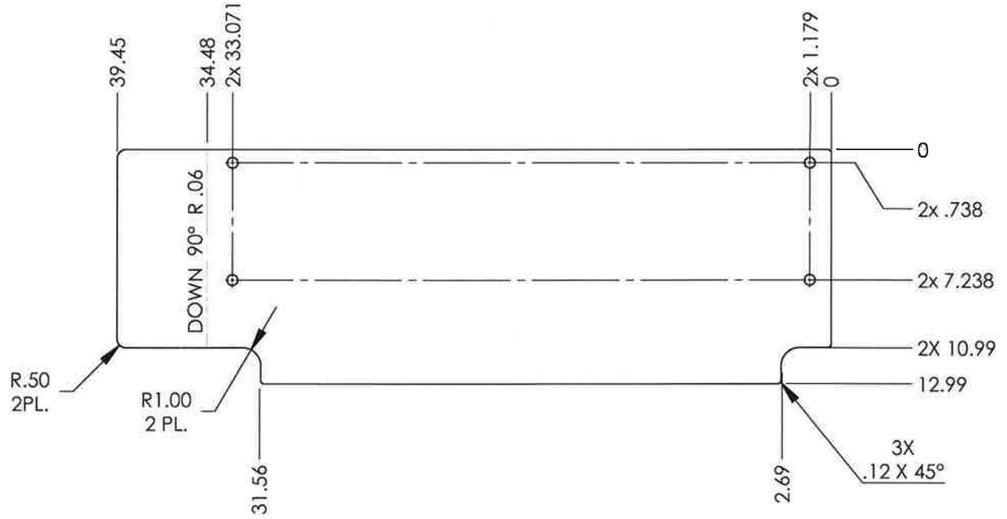
SHEET 1 OF 2

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900260 aLIGO, SLIC, TMS SHROUD ASSY., ROOF PANEL

D1900260-02







FLAT STATE

(ALL DIMENSIONS SHOWN ONLY FOR REFERENCE)

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE	DWG. NO.	REV.
B	D1900260	v1

SCALE: 1:8 PROJECTION: SHEET 2 OF 2

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900260 aLIGO, SLIC, TMS SHROUD ASSY., ROOF PANEL

REV.	DATE	DCN #	DRAWING TREE #
v1	27 AUG 2019	E1900196-x0	-
-	-	-	-
-	-	-	-

NOTES CONTINUED:

5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX

6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364

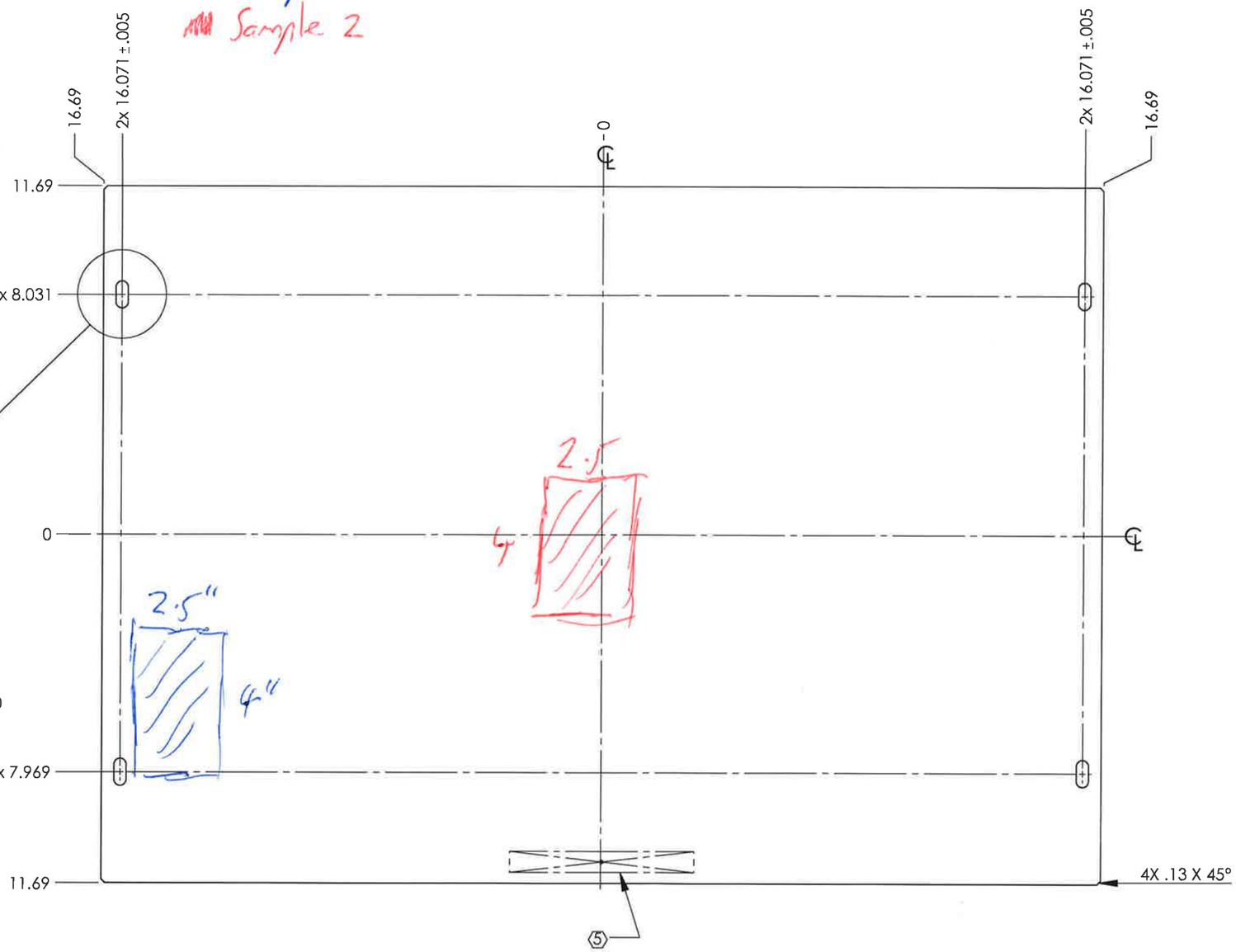
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364

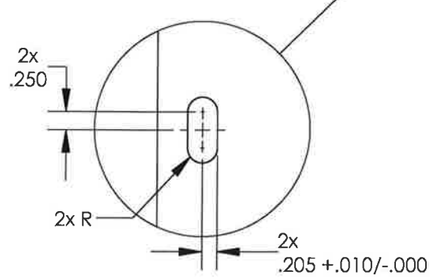
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.

9. FINISH: BLACK NICKEL COATED.

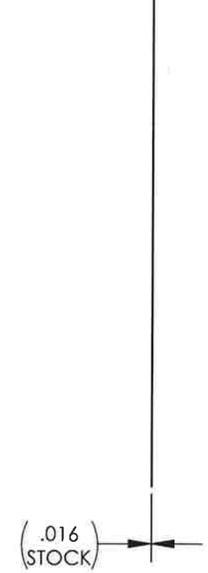
Sample 1

Sample 2





DETAIL A
SCALE 1 : 2
4 PL.
THRU



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015, FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al

FINISH: AS NOTED µinch

NEXT ASSY:

SYSTEM:

SUB-SYSTEM: AOS

LIGO — CALIFORNIA INSTITUTE OF TECHNOLOGY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

aLIGO

D1900262

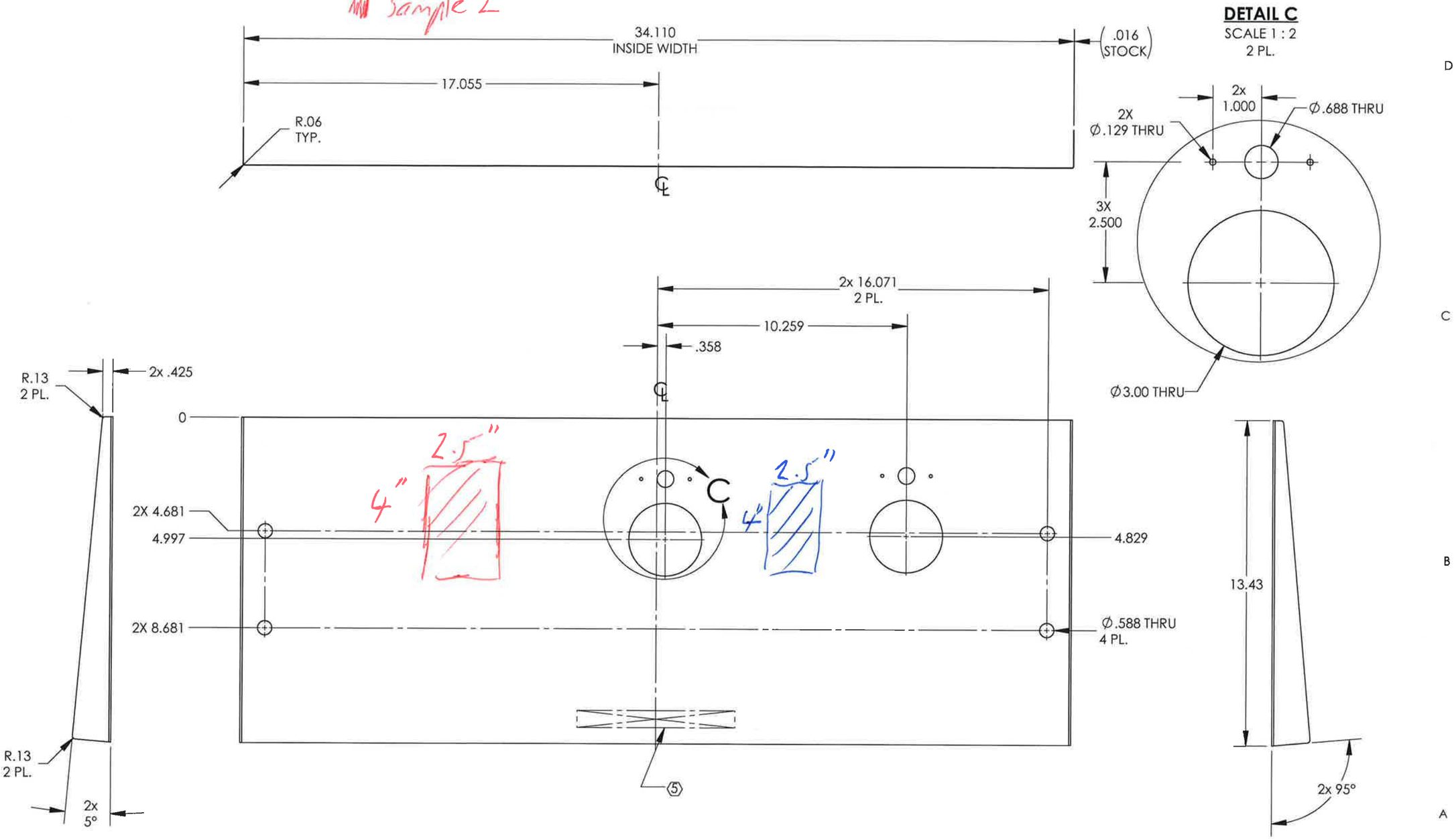
PART NAME: aLIGO, SLIC, TMS SHROUD ASSY., SIDE PANEL

DESIGNER	E.SANCHEZ	15 AUG 2019	SIZE DWG. NO. REV.
DRAFTER	E.SANCHEZ	27 AUG 2019	B D1900259 v1
CHECKER	SEE DCC	SEE DCC	
APPROVAL	SEE DCC	SEE DCC	SCALE: 1:4 PROJECTION: SHEET 1 OF 1

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900259 aLIGO, SLIC, TMS SHROUD ASSY., SIDE PANEL

D1900391-02 DETAIL (USED ON Yarm)

Sample 1
Sample 2



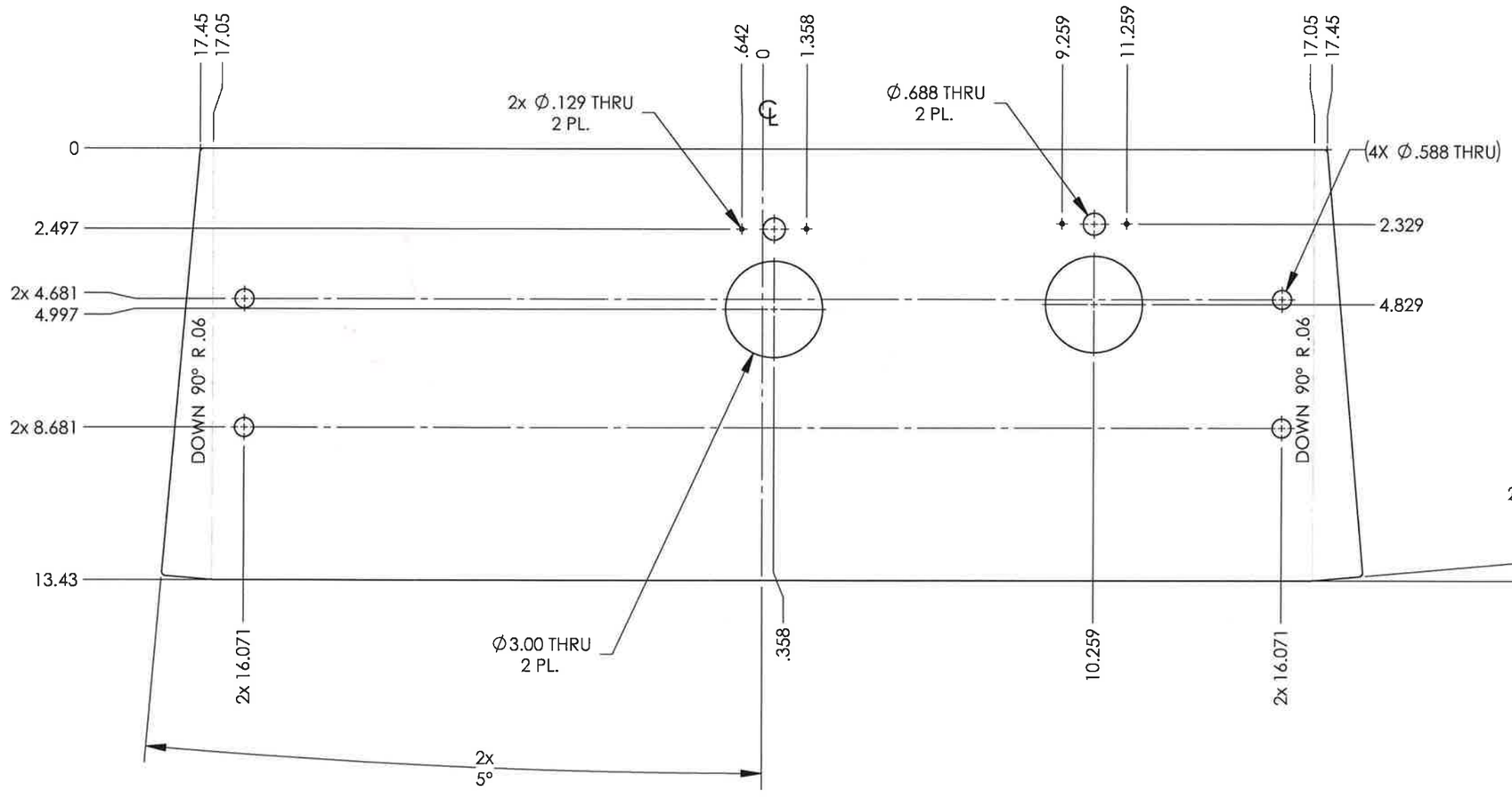
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE	DWG. NO.	REV.
B	D1900391	v2

SCALE: 1:4 PROJECTION: SHEET 3 OF 4

PART PDM VERSION: y-003
DWG PDM VERSION: y-003
D1900391 aLIGO, SLIC, TMS SHROUD ASSY., ALS PANEL.SLDPRT

D1900391-02 DETAIL (USED ON Yarm)



FLAT STATE

(ALL DIMENSIONS SHOWN ONLY FOR REFERENCE)

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE	DWG. NO.	REV.
B	D1900391	v2

SCALE: 1:4 PROJECTION: SHEET 4 OF 4

PART PDM VERSION: y-003
DWG PDM VERSION: y-003
D1900391 aLIGO, SLIC, TMS SHROUD ASSY., ALS PANEL.SLDPRT

NOTES CONTINUED:

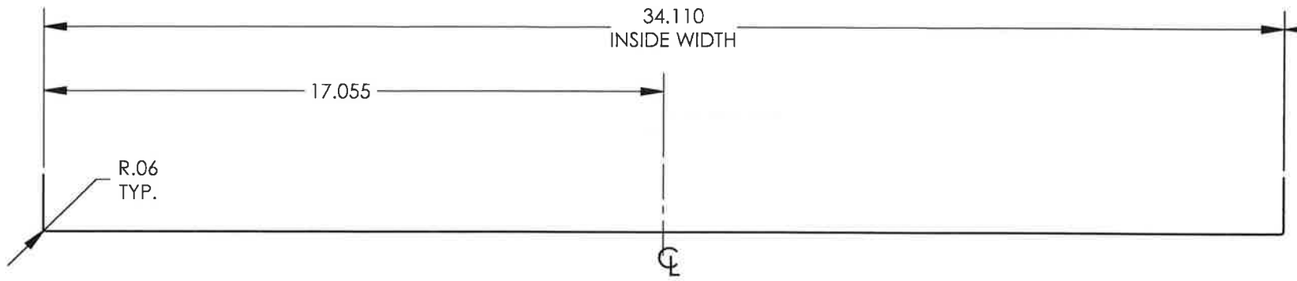
(5) SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX

6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.
9. FINISH: BLACK NICKEL COATED.

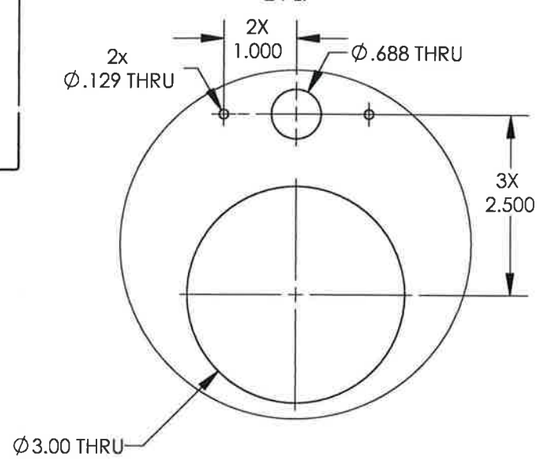
Sample 1
Sample 2

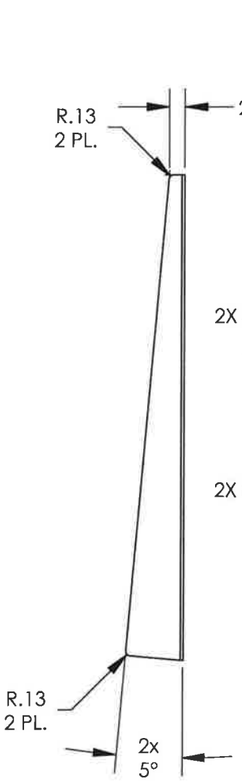
D1900391-01 DETAIL (USED ON Xarm)

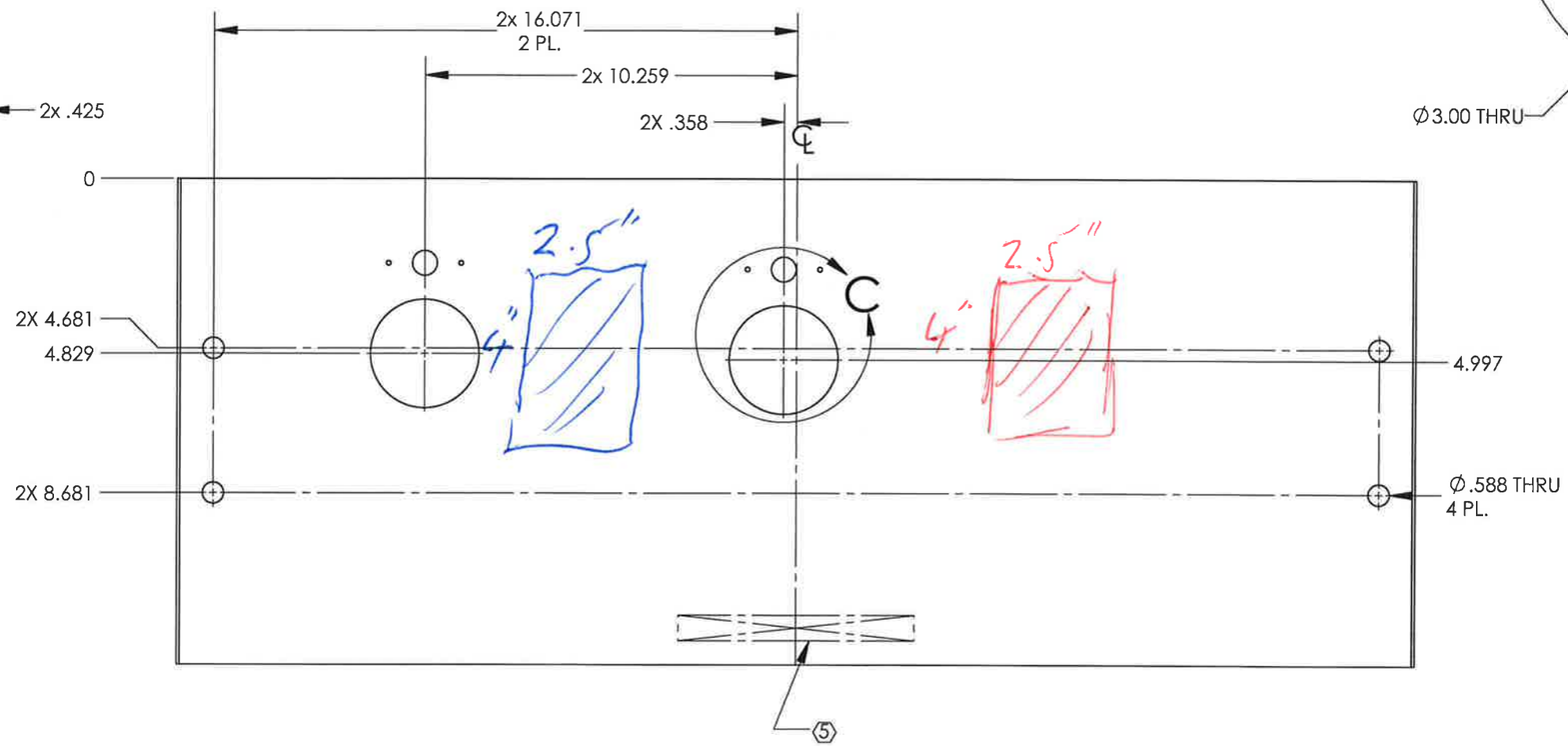
REV.	DATE	DCN #	DRAWING TREE #
v1	28 AUG 2019	-	-
v2	03 SEP 2019	E1900196-x0	-
-	-	-	-

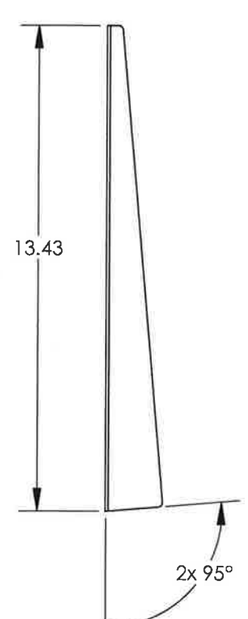


DETAIL C
SCALE 1 : 2
2 PL.









NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015, FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al

FINISH AS NOTED µinch

NEXT ASSY

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM aLIGO

SUB-SYSTEM AOS

D1900262

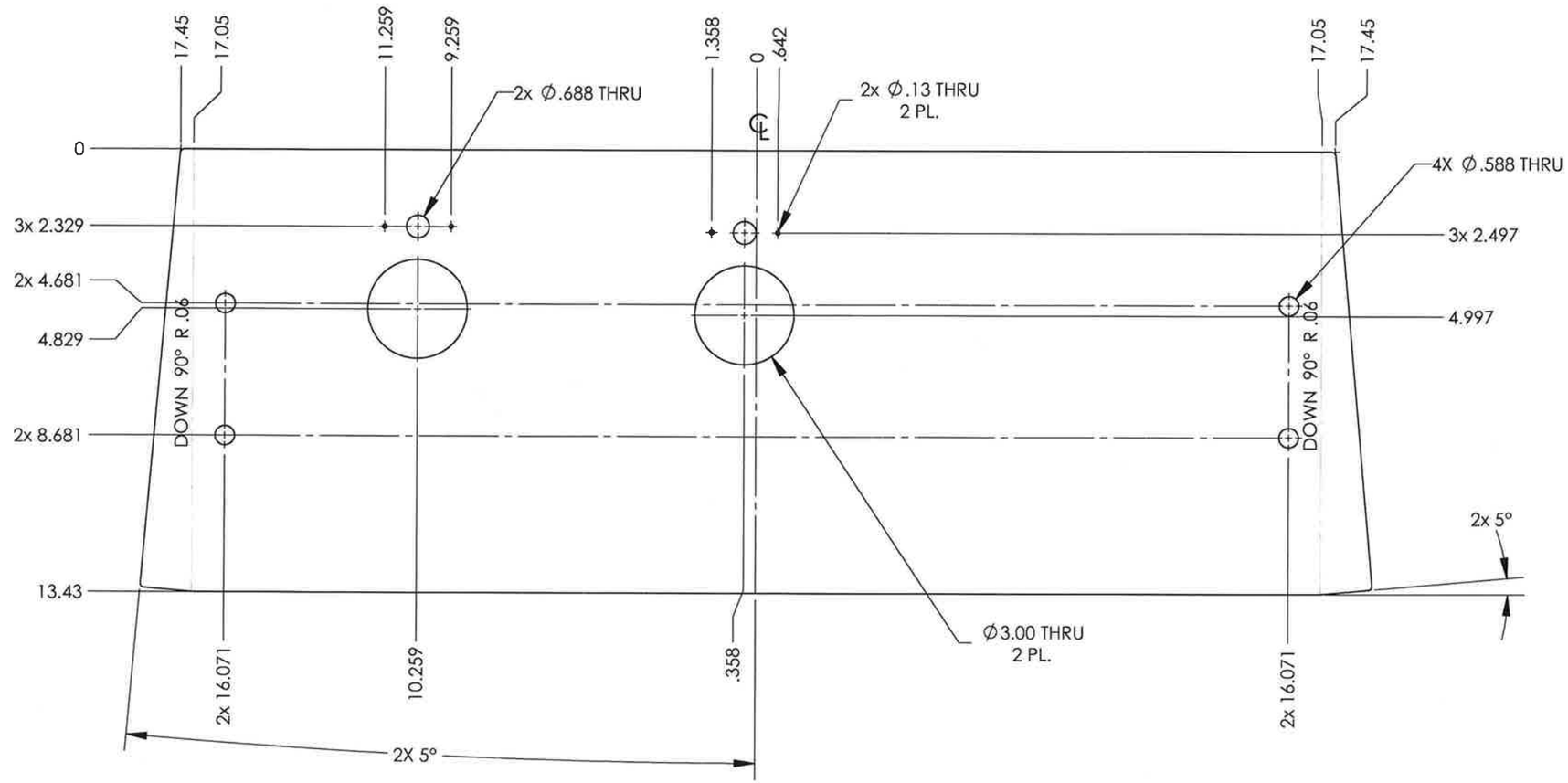
PART NAME aLIGO, SLIC, TMS SHROUD ASSY., ALS PANEL

DESIGNER	E.SANCHEZ	15 AUG 2019	**SIZE** B
DRAFTER	E.SANCHEZ	27 AUG 2019	**DWG. NO.** D1900391
CHECKER	SEE DCC	SEE DCC	**REV.** v2
APPROVAL	SEE DCC	SEE DCC	**SCALE:** 1:4 **PROJECTION:**

SHEET 1 OF 4

PART PDM VERSION: y-003
DWG PDM VERSION: y-003
D1900391 aLIGO, SLIC, TMS SHROUD ASSY., ALS PANEL.SLDPRT

D1900391-01 DETAIL (USED ON Xarm)



FLAT STATE

(ALL DIMENSIONS SHOWN ONLY FOR REFERENCE)

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE B | DWG. NO. D1900391 | REV. v2

SCALE: 1:4 | PROJECTION: | SHEET 2 OF 4

PART PDM VERSION: y-003
DWG PDM VERSION: y-003
D1900391 aLIGO, SLIC, TMS SHROUD ASSY., ALS PANEL.SLDPRT

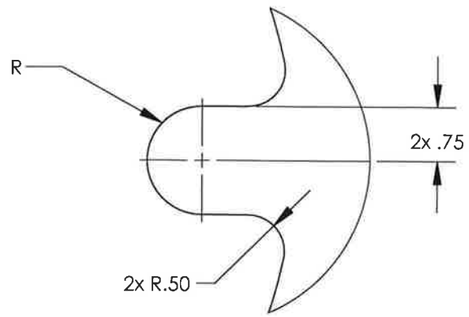
NOTES CONTINUED:

Ⓢ SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX

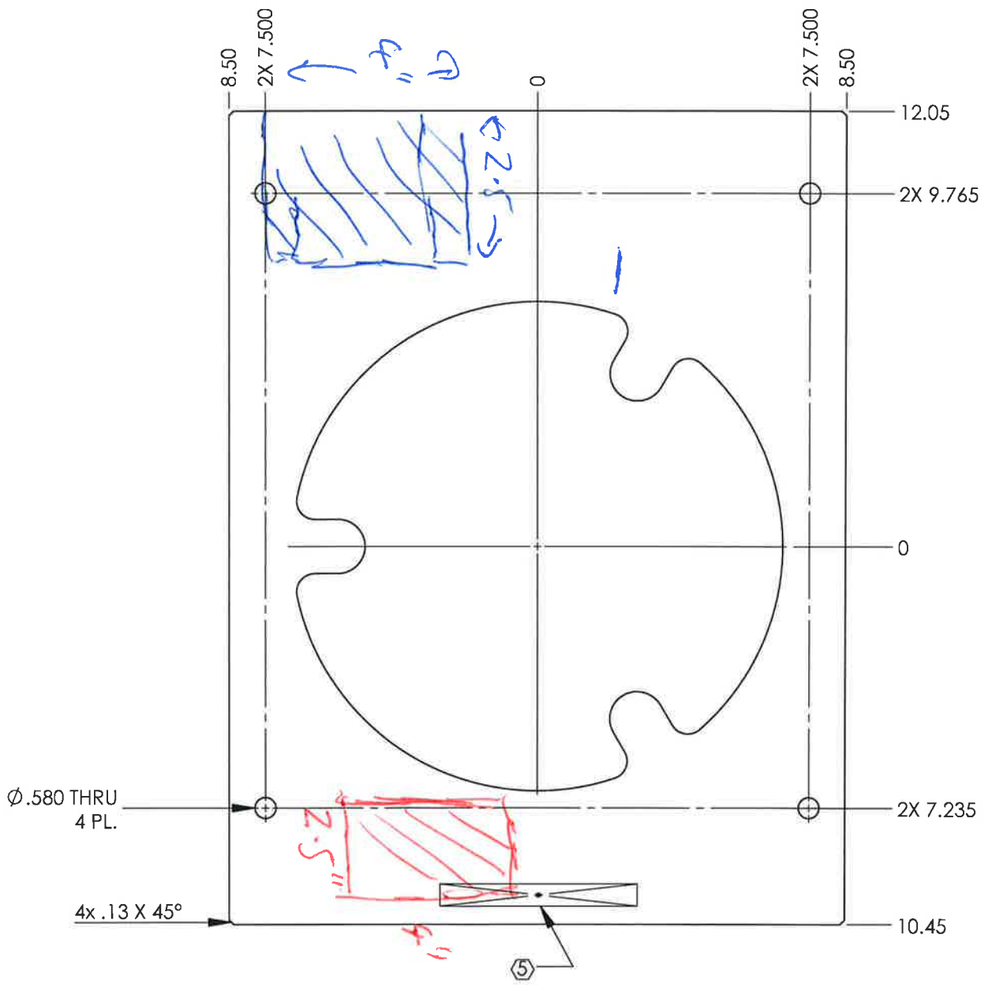
6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.
9. FINISH: BLACK NICKEL COATED.

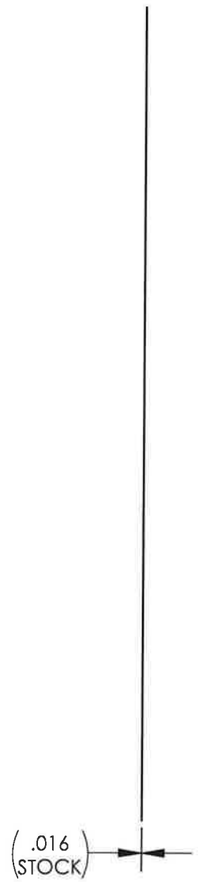
Sample 1
Sample 2

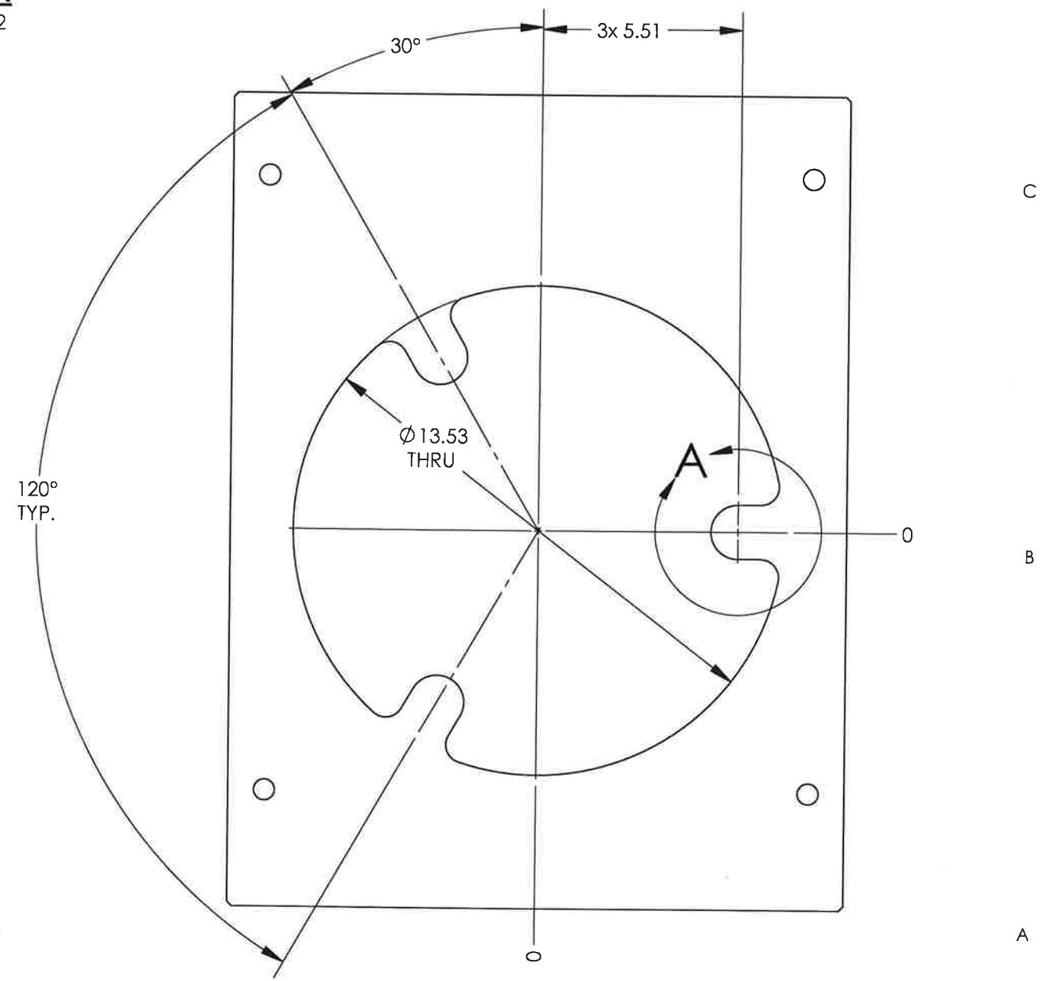
REV.	DATE	DCN #	DRAWING TREE #
v1	27 AUG 2019	E1900196-x0	-
-	-	-	-
-	-	-	-



DETAIL A
SCALE 1 : 2
3 PL.







NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015, FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al

FINISH: AS NOTED µinch

NEXT ASSY

LIGO

CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: aLIGO

SUB-SYSTEM: AOS

D1900262

PART NAME: aLIGO, SLIC, TMS SHROUD ASSY., FRONT PANEL

DESIGNER	E.SANCHEZ	15 AUG 2019	SIZE DWG. NO. REV.
DRAFTER	E.SANCHEZ	27 AUG 2019	B D1900257 v1
CHECKER	SEE DCC	SEE DCC	
APPROVAL	SEE DCC	SEE DCC	SCALE: 1:4 PROJECTION: SHEET 1 OF 1

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900257 aLIGO, SLIC, TMS SHROUD ASSY., FRONT PANEL

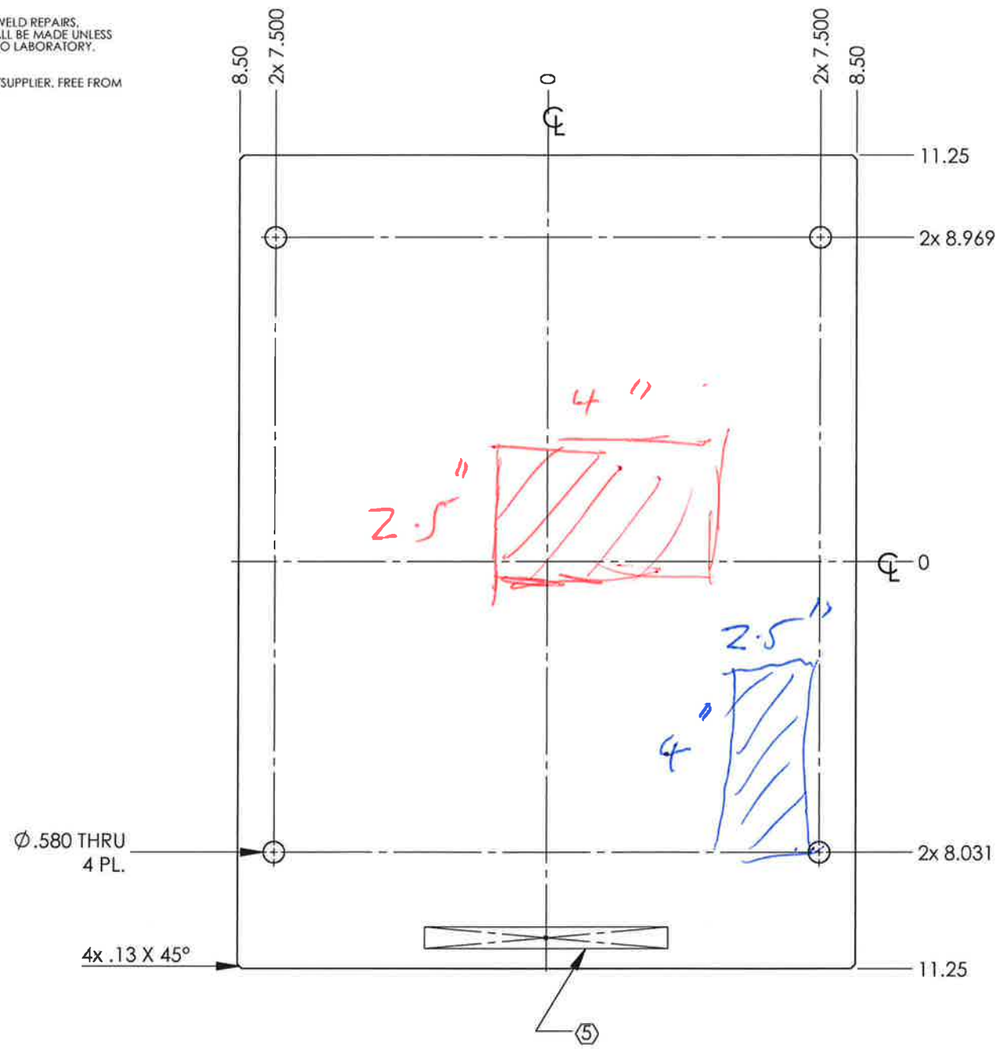
REV.	DATE	DCN #	DRAWING TREE #
v1	27 AUG 2019	E1900196-x0	-
-	-	-	-
-	-	-	-

NOTES CONTINUED:

5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXX-VY, TYPE-XX, S/N XXX

6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.
9. FINISH: BLACK NICKEL COATED.

Sample 1
Sample 2



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015. FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al

FINISH: AS NOTED µinch

NEXT ASSY

SYSTEM: aLIGO

SUB-SYSTEM: AOS

D1900262

LIGO
CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PART NAME: aLIGO, SLIC, TMS SHROUD ASSY., REAR PANEL

DESIGNER	E.SANCHEZ	15 AUG 2019	SIZE	DWG. NO.	REV.
DRAFTER	E.SANCHEZ	27 AUG 2019	B	D190058	v1
CHECKER	SEE DCC	SEE DCC			
APPROVAL	SEE DCC	SEE DCC	SCALE: 1:4	PROJECTION:	SHEET 1 OF 1

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900258 aLIGO, SLIC, TMS SHROUD ASSY., REAR PANEL

REV.	DATE	DCN #	DRAWING TREE #
v1	27 AUG 2019	E1900196-x0	-
-	-	-	-
-	-	-	-

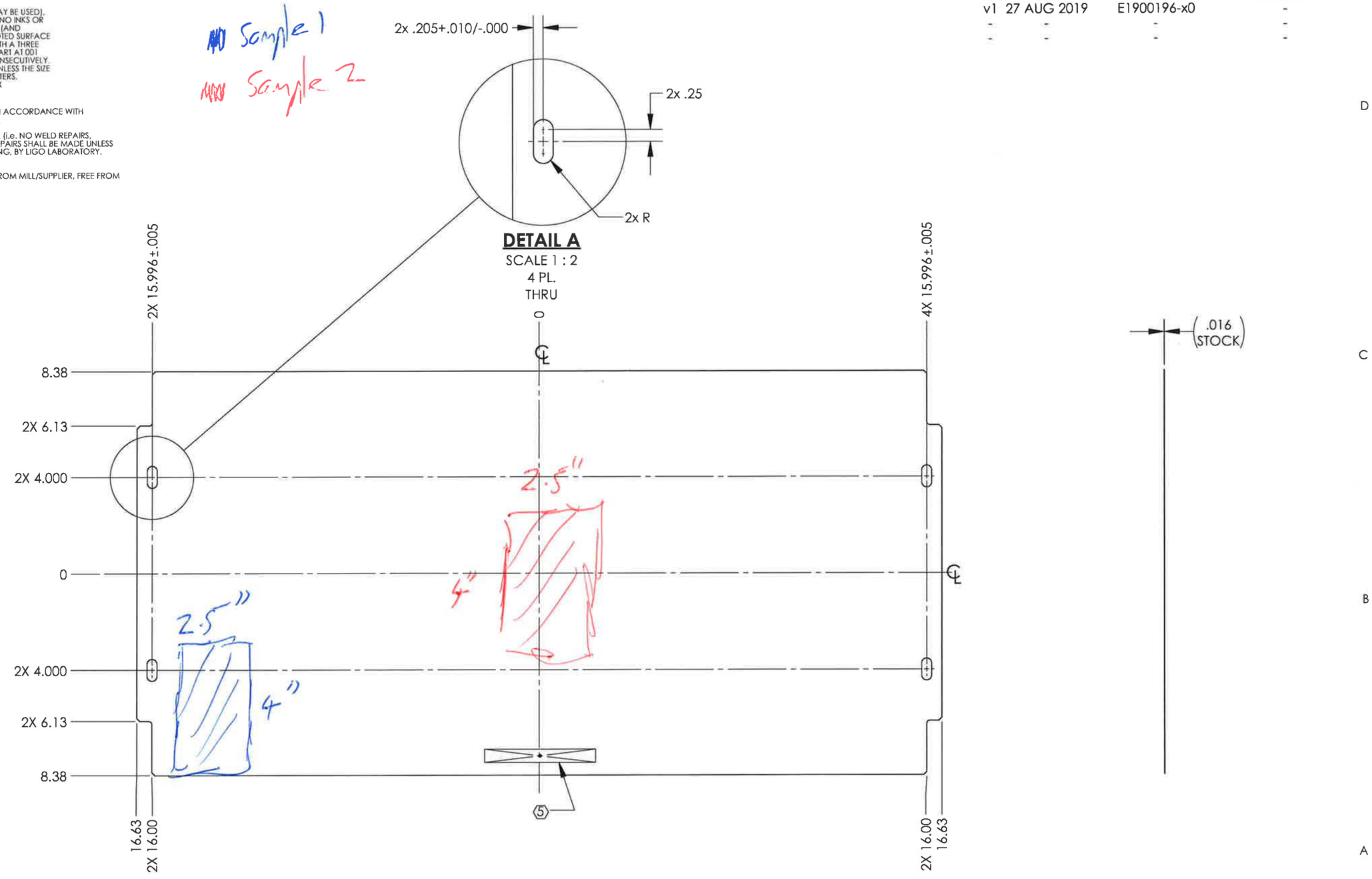
NOTES CONTINUED:

(5) SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX

6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.
9. FINISH: BLACK NICKEL COATED.

Sample 1

Sample 2



NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015, FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al

FINISH: AS NOTED µinch

NEXT ASSY: D1900262

LIGO — CALIFORNIA INSTITUTE OF TECHNOLOGY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: aLIGO

SUB-SYSTEM: AOS

PART NAME: aLIGO, SLIC, TMS SHROUD ASSY., BOTTOM PANEL

DESIGNER	E.SANCHEZ	15 AUG 2019	SIZE	DWG. NO.	REV.
DRAFTER	E.SANCHEZ	27 AUG 2019	B	D1900261	v1
CHECKER	SEE DCC	SEE DCC			
APPROVAL	SEE DCC	SEE DCC	SCALE: 1:4	PROJECTION:	SHEET 1 OF 1

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900261 aLIGO, SLIC, TMS SHROUD ASSY., BOTTOM PANEL

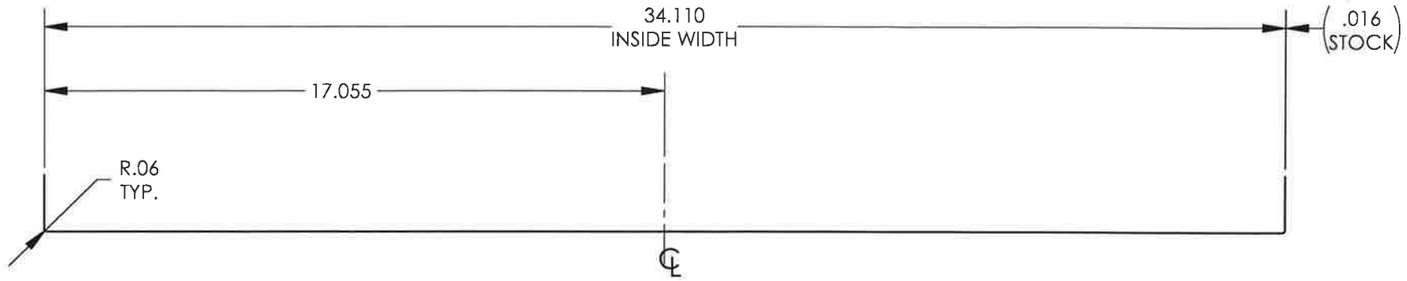
NOTES CONTINUED:

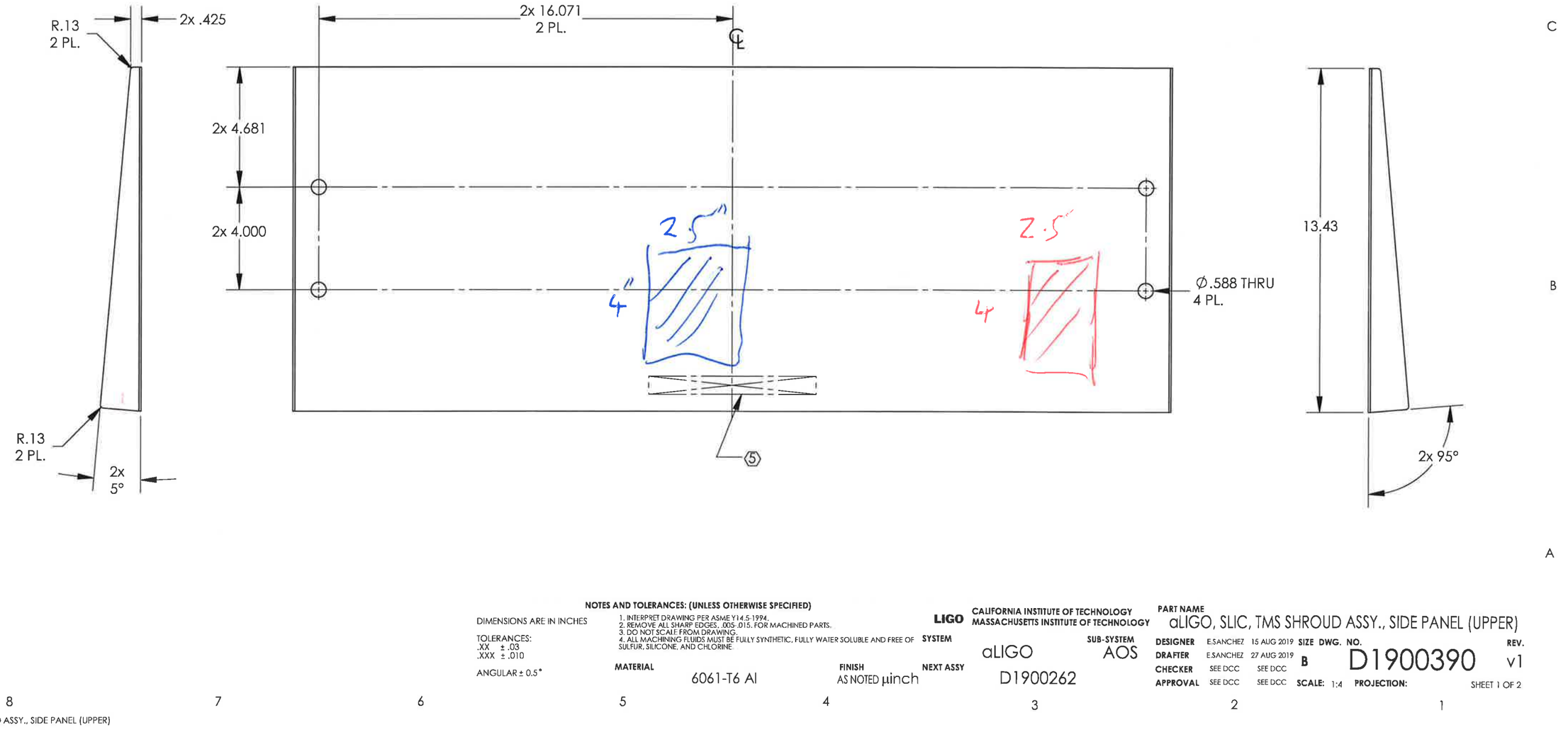
⑤ SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX

6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.
9. FINISH: BLACK NICKEL COATED.

Sample 1
Sample 2

REV.	DATE	DCN #	DRAWING TREE #
v1	27 AUG 2019	E1900196-x0	-
-	-	-	-
-	-	-	-





NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010
ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015, FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al
FINISH: AS NOTED µinch
NEXT ASSY:

LIGO
CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

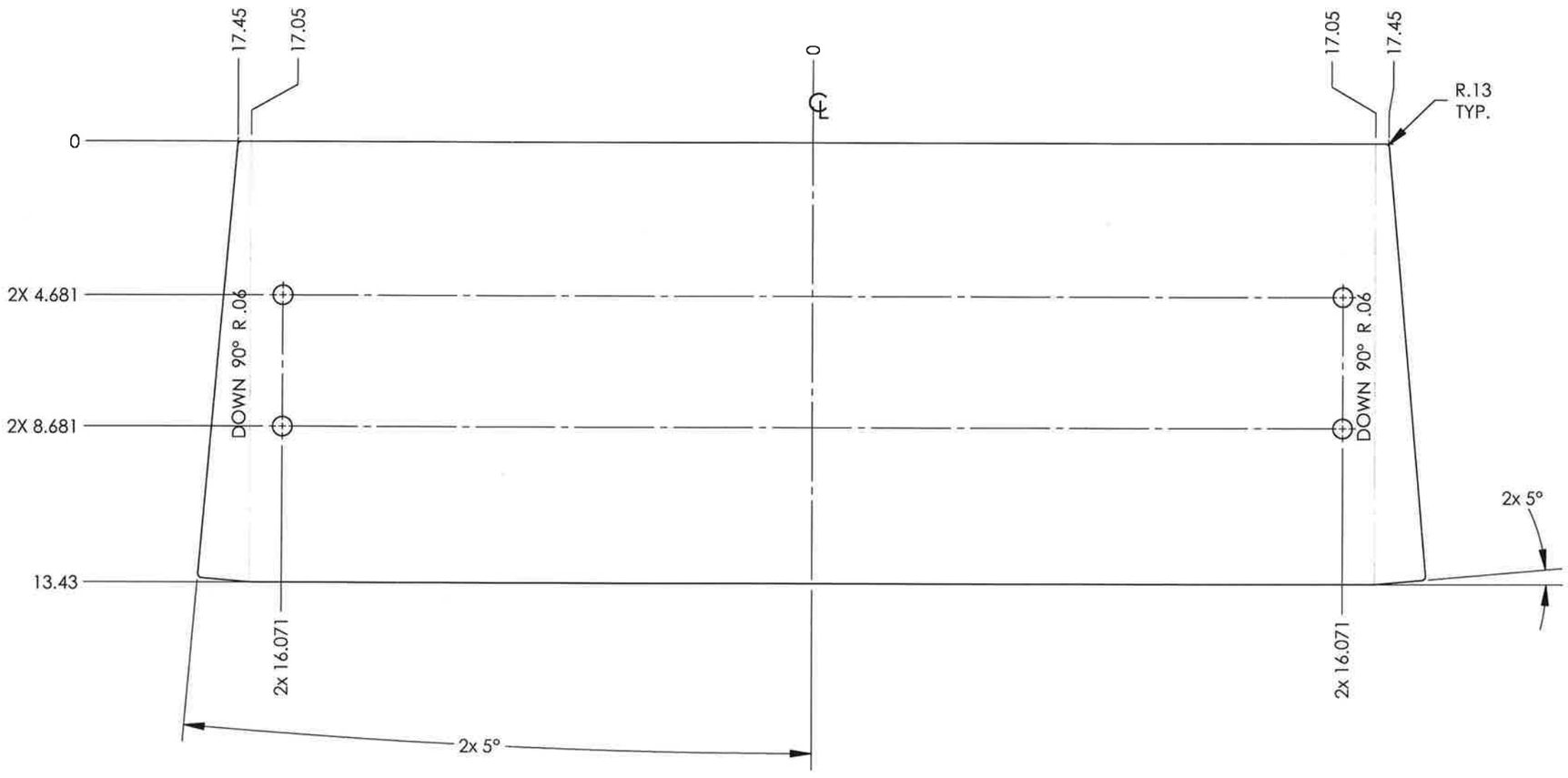
SYSTEM: aLIGO
SUB-SYSTEM: AOS
D1900262

PART NAME: aLIGO, SLIC, TMS SHROUD ASSY., SIDE PANEL (UPPER)

DESIGNER	E.SANCHEZ	15 AUG 2019	SIZE: B
DRAFTER	E.SANCHEZ	27 AUG 2019	DWG. NO.: D1900390
CHECKER	SEE DCC	SEE DCC	REV.: v1
APPROVAL	SEE DCC	SEE DCC	SCALE: 1:4

PROJECTION:

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900390 aLIGO, SLIC, TMS SHROUD ASSY., SIDE PANEL (UPPER)



FLAT STATE

(ALL DIMENSIONS SHOWN ONLY FOR REFERENCE)

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE B | DWG. NO. D1900390 | REV. v1

SCALE: 1:4 | PROJECTION: | SHEET 2 OF 2

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900390 aLIGO, SLIC, TMS SHROUD ASSY., SIDE PANEL (UPPER)

REV.	DATE	DCN #	DRAWING TREE #
v1	27 AUG 2019	E1900196-x0	-
-	-	-	-
-	-	-	-

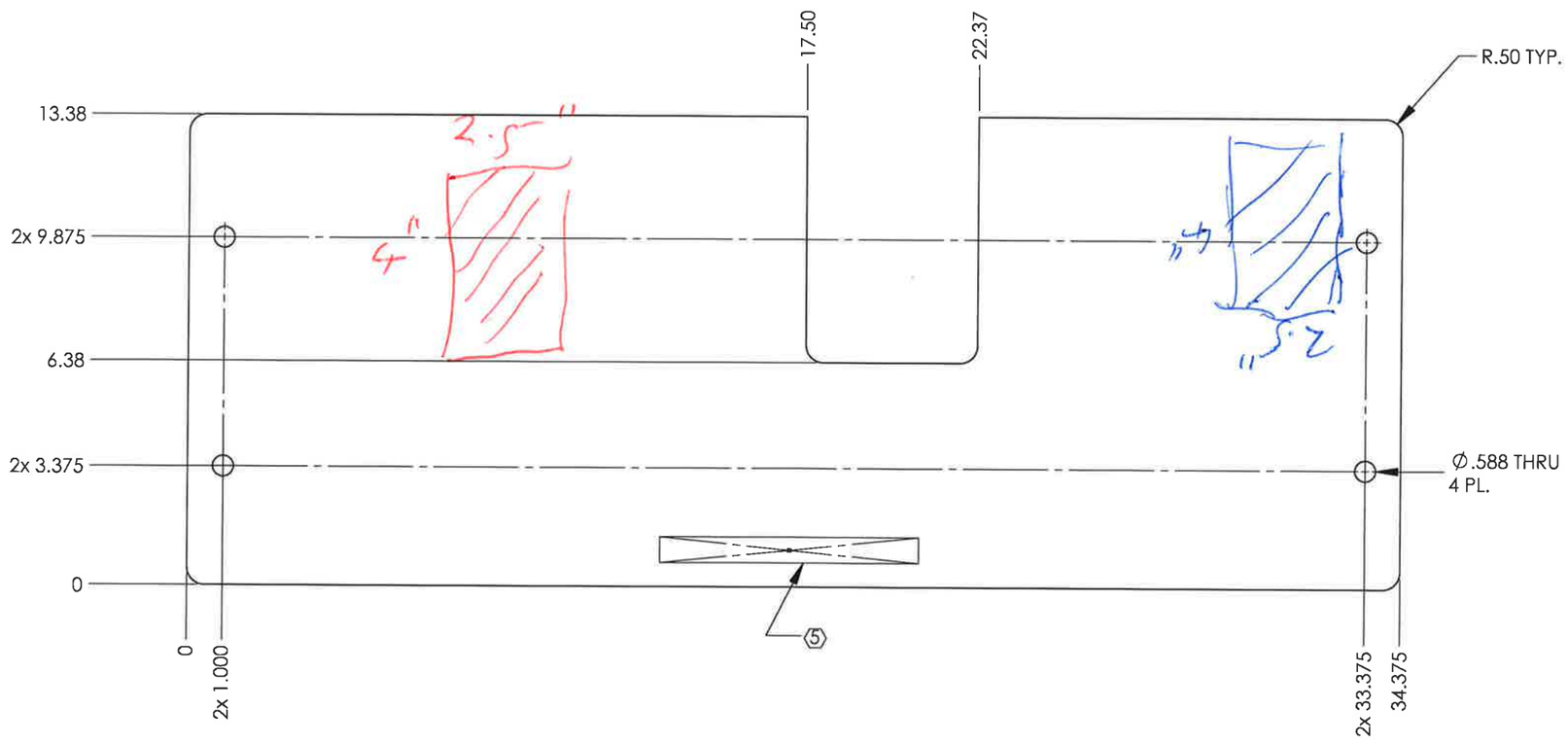
NOTES CONTINUED:

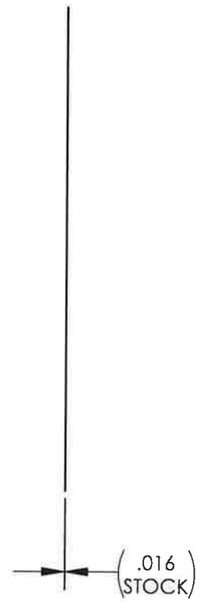
5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX

Sample 1

Sample 2

6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.
9. FINISH: BLACK NICKEL COATED.





NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015. FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL 6061-T6 Al

FINISH AS NOTED µinch

NEXT ASSY

LIGO

CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM aLIGO

SUB-SYSTEM AOS

D1900262

PART NAME aLIGO, SLIC, TMS SHROUD, FRONT PANEL

DESIGNER	E.SANCHEZ	15 AUG 2019	**SIZE** B
DRAFTER	E.SANCHEZ	27 AUG 2019	**DWG. NO.** D1900389
CHECKER	SEE DCC	SEE DCC	**REV.** v1
APPROVAL	SEE DCC	SEE DCC	**SCALE:** 1:4 **PROJECTION:**

SHEET 1 OF 1

PART PDM VERSION: y-001
DWG PDM VERSION: y-002
D1900389 aLIGO, SLIC, TMS SHROUD ASSY., FRONT PANEL (UPPER)

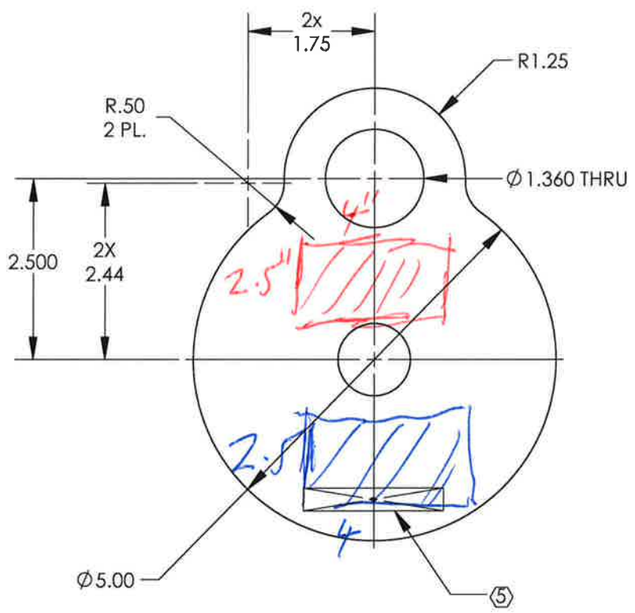
REV.	DATE	DCN #	DRAWING TREE #
v1	28 AUG 2019	E1900196-x0	-
-	-	-	-
-	-	-	-

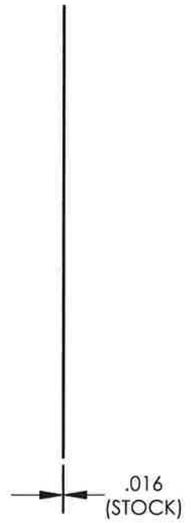
NOTES CONTINUED:

5. SCRIBE, ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR "TYPE" IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXXX-VY, TYPE-XX, S/N XXX

6. ALL PARTS SHALL BE MANUFACTURED IN ACCORDANCE WITH REFER TO LIGO SPECIFICATION E0900364
7. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY. LIGO SPECIFICATION E0900364
8. SURFACE FINISH TO BE AS-PROCESSED FROM MILL/SUPPLIER, FREE FROM SCRATCHES OR GOUGES.
9. FINISH: BLACK NICKEL COATED.

Sample 1
Sample 2





NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

DIMENSIONS ARE IN INCHES

TOLERANCES:
.XX ± .03
.XXX ± .010

ANGULAR ± 0.5°

1. INTERPRET DRAWING PER ASME Y14.5-1994.
2. REMOVE ALL SHARP EDGES, .005-.015, FOR MACHINED PARTS.
3. DO NOT SCALE FROM DRAWING.
4. ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

MATERIAL: 6061-T6 Al

FINISH: AS NOTED µinch

NEXT ASSY:

LIGO — CALIFORNIA INSTITUTE OF TECHNOLOGY, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: aLIGO

SUB-SYSTEM: AOS

D1900262

PART NAME: aLIGO, SLIC, TMS SHROUD ASSY., ALS WINDOW COVER

DESIGNER	E.SANCHEZ	15 AUG 2019	SIZE DWG. NO. REV.
DRAFTER	E.SANCHEZ	27 AUG 2019	B D1900392 v1
CHECKER	SEE DCC	SEE DCC	
APPROVAL	SEE DCC	SEE DCC	SCALE: 1:2 PROJECTION: SHEET 1 OF 1

PART PDM VERSION: y-002
DWG PDM VERSION: y-002
D1900392 aLIGO, SLIC, TMS SHROUD ASSY., ALS WINDOW COVER