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REVISIONS

|                 |
|-----------------|
| INITIAL RELEASE |
|-----------------|

|  |         |
|--|---------|
|  | X/XX/01 |
|--|---------|

J.E.

SECTION D-D  
SCALE 1 : 1.25

SECTION G-G  
SCALE 1.5 : 1

—DRILL TO MATCH  
1/8"

SECTION A-A

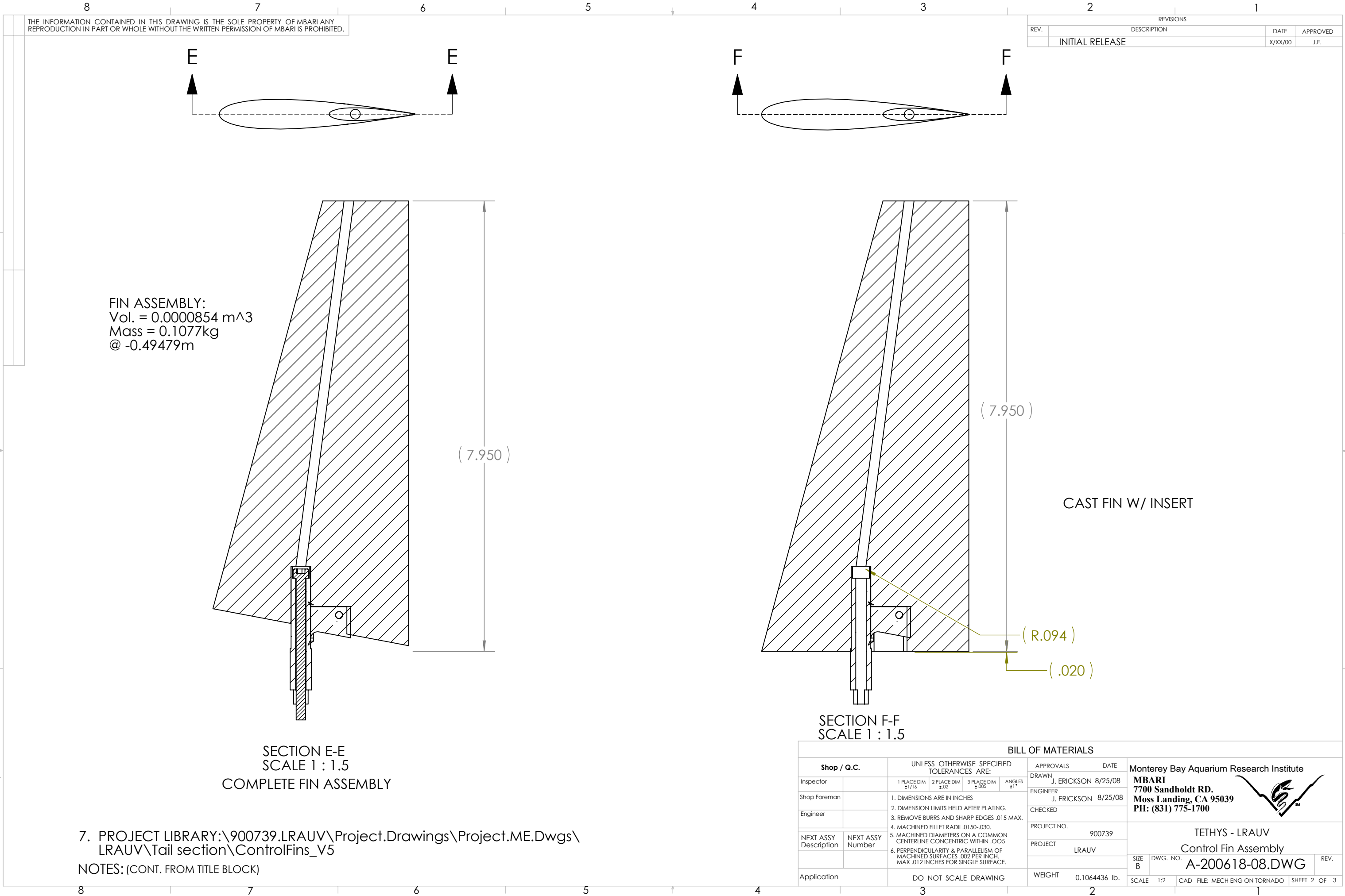
|         |      |                      |                               |          |               |                  |
|---------|------|----------------------|-------------------------------|----------|---------------|------------------|
| 6       | 1    | 7889A44              | 1/8 Polyporpylene Welding Rod |          | McMaster-Carr | Polypropylene    |
| 5       | 1    | #8-32 UNC-2A x 2 1/2 | SOC HD CAP SCREW              |          | MCMaster-CARR | 316 SS           |
| 3       | 1    | P-201715-15          | Fin AxleTab_Ver.6             |          | MBARI         | 6AL-4V Titanium  |
| 2       | 1    | P-201716-15          | Fin Axle_Ver.6 (Base Part)    |          | MBARI         | 6AL-4V Titanium  |
| 1       | 1    | P-200617-08          | Control Fin_V5                | B        | MBARI         | D90_Polyurethane |
| ITEM NO | QTY. | Part_Number          | DESCRIPTION                   | Revision | Vendor        | MATERIAL         |

## BILL OF MATERIALS

|                                                          |  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               |                  |                     |             |                           |                                                                                                                                          |          |      |   |
|----------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|---------------|------------------|---------------------|-------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------|------|---|
| <b>Shop / Q.C.</b>                                       |  | <b>UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:</b>                                                                                                                                                                                                                                                                                               |                     |                      |               | <b>APPROVALS</b> |                     | <b>DATE</b> |                           | <b>Monterey Bay Aquarium Research Institute</b><br> |          |      |   |
| Inspector                                                |  | 1 PLACE DIM<br>±1/16                                                                                                                                                                                                                                                                                                                            | 2 PLACE DIM<br>±.02 | 3 PLACE DIM<br>±.005 | ANGLES<br>±1° | DRAWN            | J. ERICKSON 8/25/08 |             |                           | <b>MBARI</b><br><b>7700 Sandholdt RD.</b><br><b>Moss Landing, CA 95039</b><br><b>PH: (831) 775-1700</b>                                  |          |      |   |
| Shop Foreman                                             |  | 1. DIMENSIONS ARE IN INCHES<br>2. DIMENSION LIMITS HELD AFTER PLATING.<br>3. REMOVE BURRS AND SHARP EDGES .015 MAX.<br>4. MACHINED FILLET RADII .0150-.030.<br>5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005<br>6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE. |                     |                      |               | ENGINEER         | J. ERICKSON 8/25/08 |             |                           |                                                                                                                                          |          |      |   |
| Engineer                                                 |  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | CHECKED          | J.S. 2/28/17        |             |                           |                                                                                                                                          |          |      |   |
|                                                          |  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | PROJECT NO.      | 900739              |             |                           |                                                                                                                                          |          |      |   |
| NEXT ASSY Description<br>NEXT ASSY Number<br>A-200502-08 |  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | PROJECT          | LRAUV               |             |                           | TETHYS - LRAUV<br>Control Fin Assembly<br><b>A-200618-08.DWG</b>                                                                         |          |      |   |
| Application                                              |  | DO NOT SCALE DRAWING                                                                                                                                                                                                                                                                                                                            |                     |                      |               | WEIGHT           | 0.1064436 lb.       |             |                           | SIZE<br>B                                                                                                                                | DWG. NO. | REV. |   |
|                                                          |  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | SCALE            | 1:2                 | CAD         | FILE: MECH ENG ON TORNADO | SHEET                                                                                                                                    | 1        | OF   | 3 |

7. PROJECT LIBRARY:\900739.LRAUV\Project.Drawings\Project.ME.Dwgs\  
LRAUV\Tail section\ControlFins\_V5

NOTES: (CONT. FROM TITLE BLOCK)



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| REVISIONS |                 |         |          |
|-----------|-----------------|---------|----------|
| REV.      | DESCRIPTION     | DATE    | APPROVED |
|           | INITIAL RELEASE | X/XX/00 | J.E.     |

FIN ASSEMBLY:  
Vol. = 0.0000854 m^3  
Mass = 0.1077kg  
@ -0.49479m

CAST FIN W/ INSERT

SECTION E-E  
SCALE 1 : 1.5  
COMPLETE FIN ASSEMBLY

SECTION F-F  
SCALE 1 : 1.5

7. PROJECT LIBRARY:\900739.LRAUV\Project.Drawings\Project.ME.Dwgs\  
LRAUV\Tail section\ControlFins\_v5  
NOTES: (CONT. FROM TITLE BLOCK)

| BILL OF MATERIALS     |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               |             |                               |                 |                                                                                                                                                                                                                                                                                                 |
|-----------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|---------------|-------------|-------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shop / Q.C.           |                  | UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:                                                                                                                                                                                                                                                                                                      |                     |                      |               | APPROVALS   |                               | DATE            |                                                                                                                                                                                                                                                                                                 |
| Inspector             |                  | 1 PLACE DIM<br>±1/16                                                                                                                                                                                                                                                                                                                            | 2 PLACE DIM<br>±.02 | 3 PLACE DIM<br>±.005 | ANGLES<br>±1° | DRAWN       | J. ERICKSON                   | 8/25/08         | <div>Monterey Bay Aquarium Research Institute</div> <div><b>MBARI</b></div> <div><b>7700 Sandholdt RD.</b></div> <div><b>Moss Landing, CA 95039</b></div> <div><b>PH: (831) 775-1700</b></div> <div></div> |
| Shop Foreman          |                  | 1. DIMENSIONS ARE IN INCHES<br>2. DIMENSION LIMITS HELD AFTER PLATING.<br>3. REMOVE BURRS AND SHARP EDGES .015 MAX.<br>4. MACHINED FILLET RADII .0150-.030.<br>5. MACHINED DIAMETERS ON A COMMON CENTERLINE CONCENTRIC WITHIN .005<br>6. PERPENDICULARITY & PARALLELISM OF MACHINED SURFACES .002 PER INCH. MAX .012 INCHES FOR SINGLE SURFACE. |                     |                      |               | ENGINEER    | J. ERICKSON                   | 8/25/08         |                                                                                                                                                                                                                                                                                                 |
| Engineer              |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | CHECKED     |                               |                 |                                                                                                                                                                                                                                                                                                 |
| NEXT ASSY Description | NEXT ASSY Number |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | PROJECT NO. | 900739                        |                 |                                                                                                                                                                                                                                                                                                 |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | PROJECT     | LRAUV                         |                 |                                                                                                                                                                                                                                                                                                 |
| Application           |                  | DO NOT SCALE DRAWING                                                                                                                                                                                                                                                                                                                            |                     |                      |               | WEIGHT      | 0.1064436 lb.                 |                 |                                                                                                                                                                                                                                                                                                 |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | SIZE B      | DWG. NO.                      | A-200618-08.DWG | REV.                                                                                                                                                                                                                                                                                            |
|                       |                  |                                                                                                                                                                                                                                                                                                                                                 |                     |                      |               | SCALE 1:2   | CAD FILE: MECH ENG ON TORNADO |                 | SHEET 2 OF 3                                                                                                                                                                                                                                                                                    |

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



TETHYS - LRAUV  
Control Fin Assembly

A-200618-08.DWG

87654321

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REV.

DESCRIPTION

DATE

APPROVED

INITIAL RELEASE

FINS ARE MOLDED IN BRIGHT ORANGE FOR VISIBILITY

#5 AND 6 ARE WELDED TOGETHER

MBARI IS USING A FIN MOLD WHICH YIELDS FINS THAT DO NOT REQUIRE TRIMMING ON THE BASE (AS BEFORE) ONLY LIGHT SANDING TO SMOOTH SURFACES AND EDGES.

AN 11/32" DRILL IS USED TO REAM OUT THECYLINDRICAL CAVITY IN FIN BASE, CLEAR OTHER FLASHING FROM THE SLOT AREA

INSERT THE SCREW AND SLIDE THE FIN AXLE INTO THE FIN, LIGHT TAPPING MAY BE NECESSARY

LINE UP BY SIGHT THE 1/8" HOLE IN THE FLAG SECTION, DRILL TO MATCH,

INSTALL A SHORT PIECE OF 1/8" ROD, SECURE WITH SUPER GLUE IF NECESSARY

Shop / Q.C.

Inspector

Shop Foreman

Engineer

NEXT ASSY Description

NEXT ASSY Number

Application

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:

1. PLACE DIM 2. PLACE DIM 3. PLACE DIM 4. ANGLES

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.

DO NOT SCALE DRAWING

APPROVALS

DATE

DRAWN

NAME

9/27/00

ENGINEER

NAME

9/27/00

CHECKED

PROJECT NO.

XXX

PROJECT

ZZZZZZZZ

WEIGHT

Monterey Bay Aquarium Research Institute

MBARI

7700 Sandholdt RD.

Moss Landing, CA 95039

PH: (831) 775-1700



A-200618-08\_Fin\_Assem\_V6

SIZE B

DWG. NO.

100XXXDWG

REV.

SCALE 1:2

CAD FILE: MECH ENG ON TORNADO

SHEET 3 OF 3