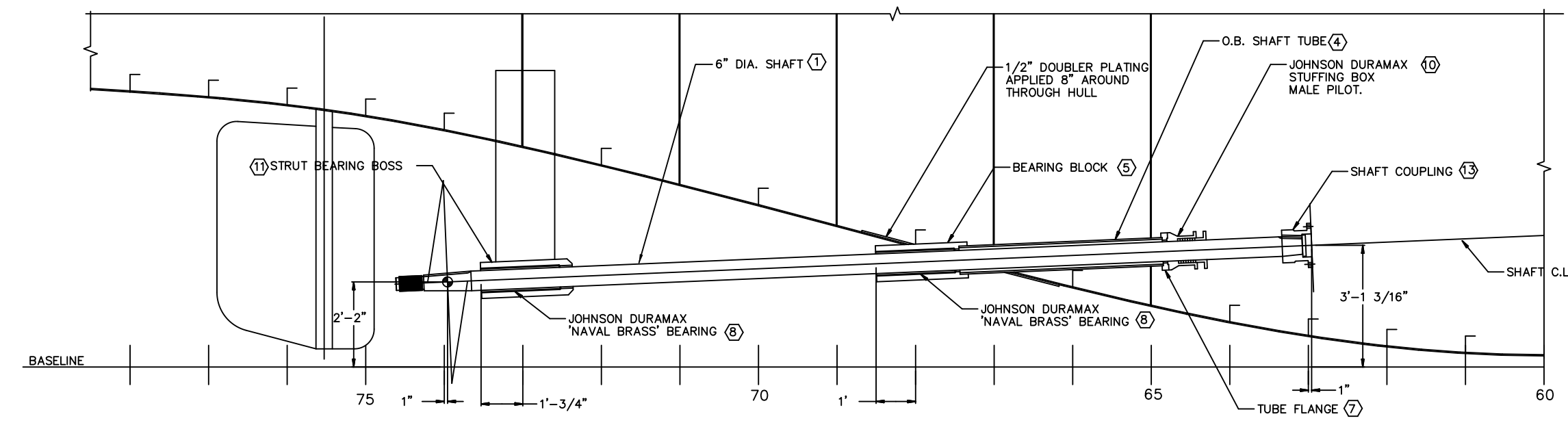
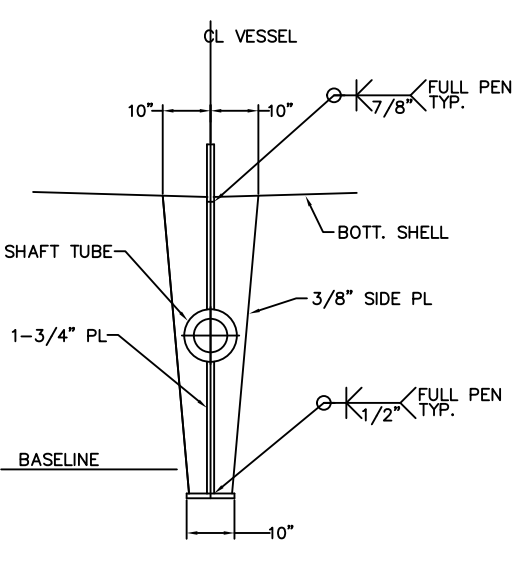


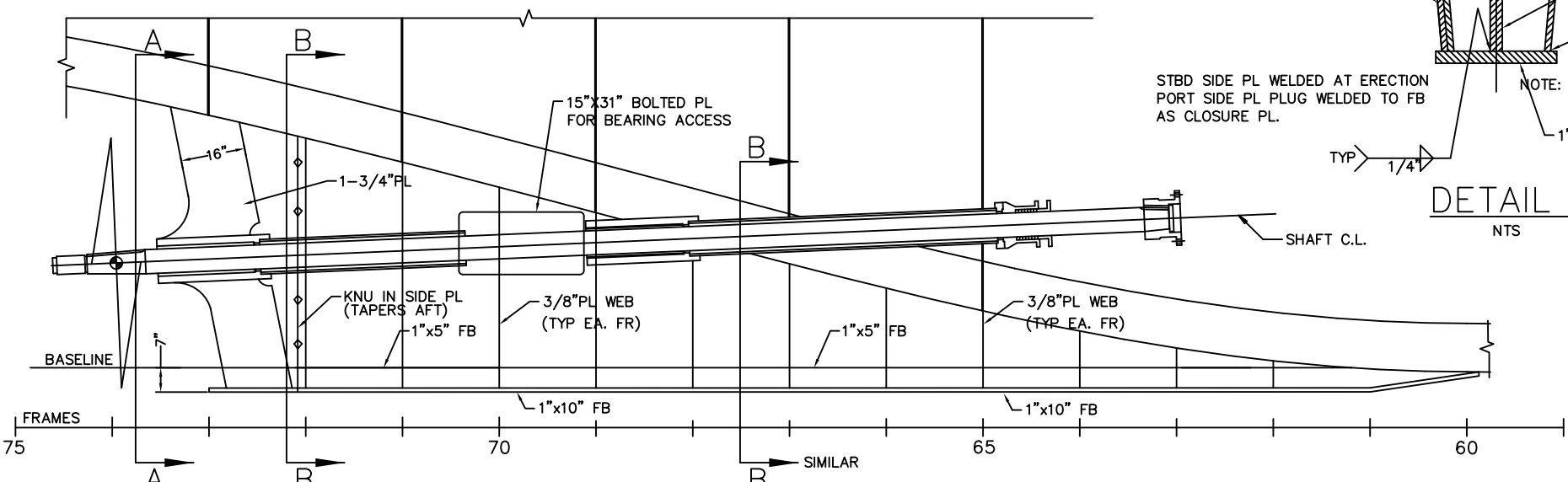
CENTERLINE SHAFT ARRANGEMENT
STBD SIDE LKG INBOARD



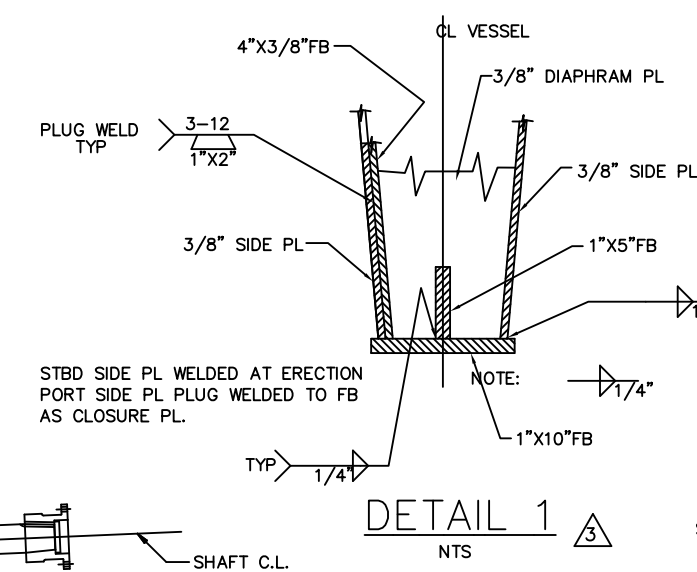
SHAFT ARRANGEMENT 11'-0" OFF CL P/S
PORT SIDE LKG OUTBOARD - STBD SIDE SIM. OPP. HAND
1/2"=1'-0"



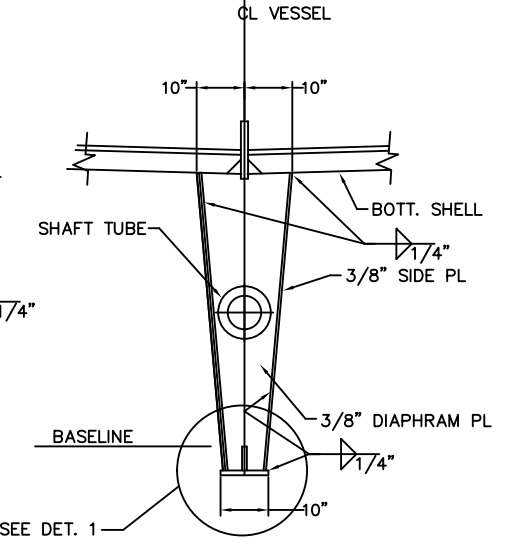
SECTION A-A
1/2"=1'-0"



SKEG ELEVATION
1/2"=1'-0"



DETAIL 1
NTS



SECTION B-B
1/2"=1'-0"

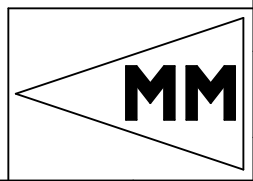
BILL OF MATERIALS			
MK	QTY	DESCRIPTION	MATERIAL
1	3	SHAFT, 6" O.D. X 23'-1 1/8" LNG., AQUAMET 17 OR EQUAL	17-4PH
2	1	CL FWD TUBE, 8" SCHEDULE 80 PIPE, 6'-4 1/2" LNG.	A-53
3	1	CL AFT TUBE, 8" SCHEDULE 80 PIPE. 4'-3" LNG.	A-53
4	2	OUTBOARD TUBE, 8" SCHEDULE 80 PIPE, 5'-2 3/16" LNG.	A-53
5	4	BEARING BLOCK, 11" O.D. X 7" I.D. X 2'-2" LNG. ROUND MECHANICAL TUBING STOCK	A-516
6		NOT USED	
7	3	TUBE FLANGE, 11 3/8" DIA. 2" THK. PLATE	A-36
8	6	JOHNSON DURAMAX 'NAVAL BRASS' BEARING, PRT. #871532100 BEARING CODE: GALE 7.5"ODX6"IDX24"LG	
9		NOT USED	
10	3	JOHNSON DURAMAX STUFFING BOX, WATER & AIR SERVICE, #26000-065	
11	2	STRUT BEARING BOSS, 11" O.D. X 7" I.D. X 2'-4" LNG. ROUND MECHANICAL TUBING STOCK	A-516
12	2	SHAFT STRUT, 1 3/4" FORMED STEEL PLATE, ABS GRADE B OR EQUAL	A-36
13	3	SHAFT COUPLING, TWIN DISC PART #1002312	STEEL
14	3	PULL PLATE, 1" THK. X 6 1/2" DIA	A-36
15	9	PULL PLATE SCREWS, 1" UNC-8 GRADE 8 CAPSCREWS	
16	5	PROPELLER KEYS, BRASS TWO AS SPARES	TYPE-4 Ni AI BRONZE
17	5	COUPLING KEYS, STEEL TWO AS SPARES	1040 STEEL
18	24	STUFFING BOX SCREWS, 5/8" DIA. UNC CAPSCREWS	316L
19		NOT USED	
20		NOT USED	
21	3	SHAFT NUT, 4 1/4" X 4 TPI X 4 1/4" DEEP	TYPE-4 Ni AI BRONZE
22	3	JAM NUT, 4 1/4" X 4 TPI X 2 1/4" DEEP	TYPE-4 Ni AI BRONZE

NOTE:
ALL WELDING AND WORKMANSHIP IN ACCORDANCE WITH ABS RULES FOR BUILDING AND CLASSING STEEL VESSELS UNDER 90 METERS (295 FEET) IN LENGTH 1998

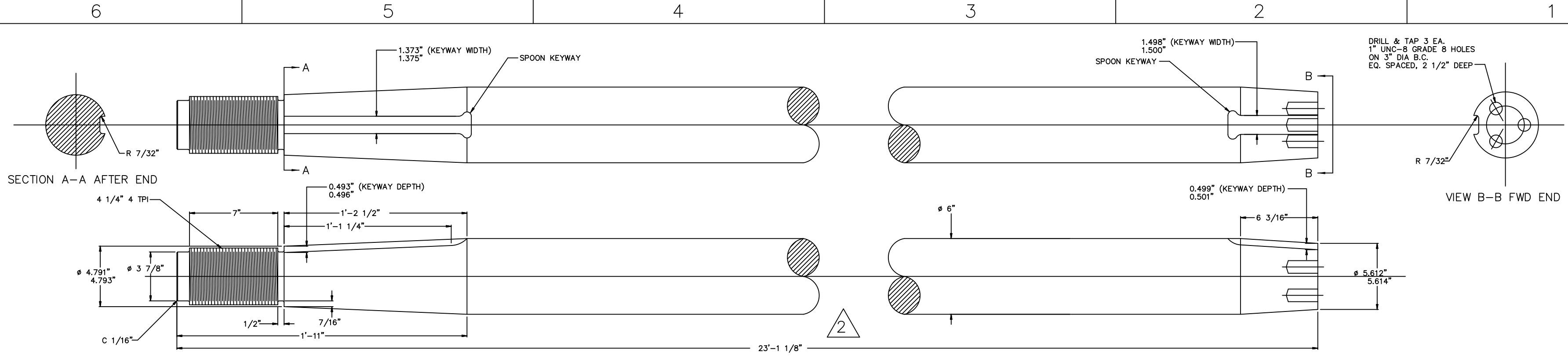
3	1. ADDED SKEG ELEVATION AND DETAILS. (SHT1) 2. ALTERED BILL OF MATERIAL. (SHT1) 3. ADDED CL AFT SHAFT TUBE DETAIL. (SHT2) 4. REVISED BEARING BLOCK DETAILS AND ADDED PREP DETAIL PER SHIPYARD INSTRUCTIONS. (SHT2) 5. REVISED OUTBD STRUT DET TO AS BUILT. (SHT3) 6. REVISED STRUT BEARING BOSS PER SHIPYARD INSTRUCTIONS. (SHT3)	RLP 11/3/99
2	1. CHANGED FWD CL BEARING FROM SPLIT TYPE TO STANDARD. 2. DELETED PIECE NUMBER 6. 3. DELETED PIECE NUMBER 9. 4. DELETED PIECE NUMBER 19. 5. ALTERED BILL OF MATERIALS.	RLP 6/20/99
1	ISSUED FOR CONSTRUCTION.	RLP 5/14/99

DRAWN BY: PDSI -JFK	DATE: 4/20/99
CHECKED BY:	DATE:
APPROVED BY:	DATE:
APPROVED BY:	DATE:
SCALE: 1/2"=1'-0"	CONTRACT NO: S-185-32
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DWG. NO: S-185-M4	

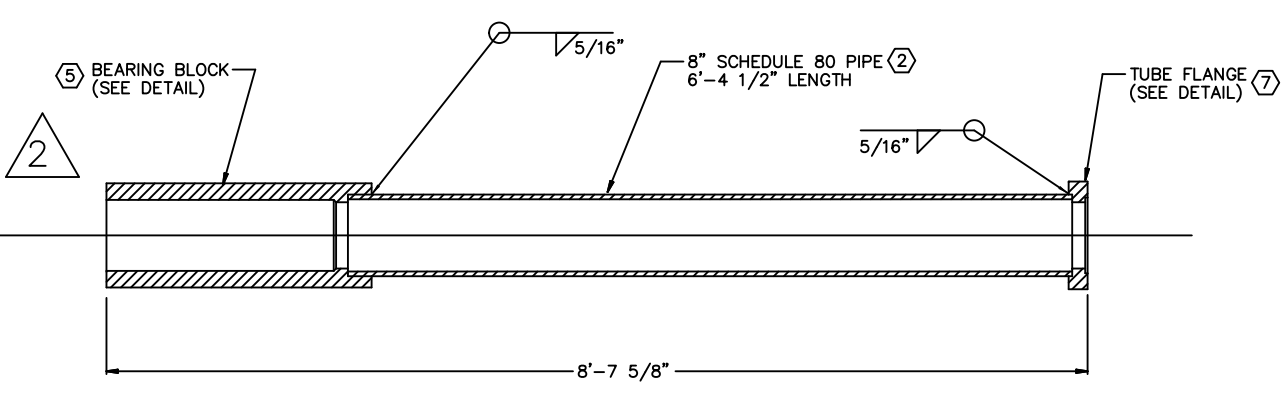
TITLE: 160'x40'x13' RESEARCH VESSEL	
SHAFTING DETAILS	
PREPARED FOR: CAMERON OFFSHORE BOATS, INC CAMERON, LOUISIANA	
MARINE MANAGEMENT INC. MARINE DESIGNERS AND SURVEYORS	SHT: 1 OF: 3
P.O. Box: 1803 Ocean Springs, MS 39566-1803 Ph: 601-872-2846 Fax: 601-872-0606 Online: rpayne@atlasyn.com	ALT NO: 3



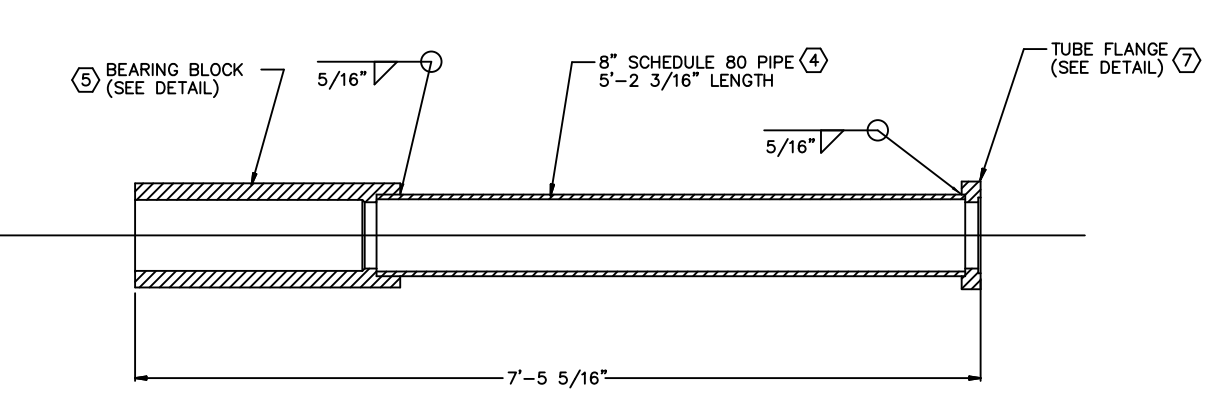
ALT. 3
S-185-M4



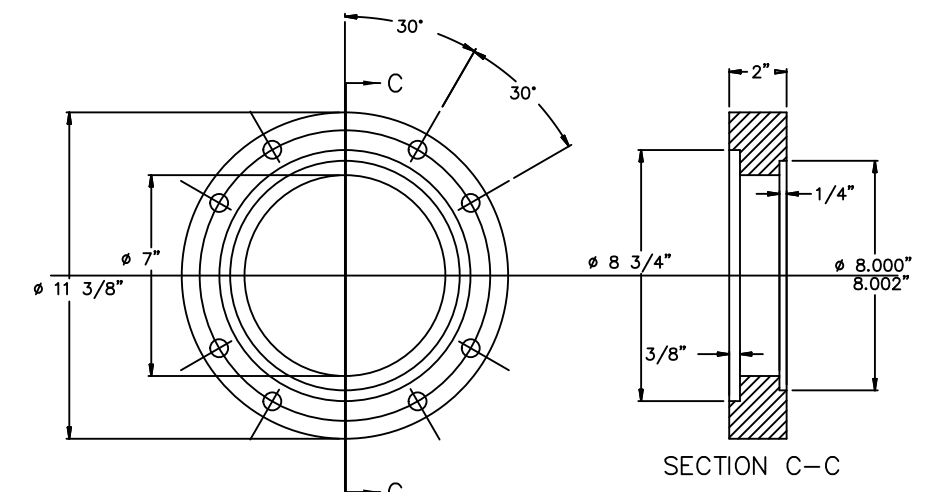
① PROPELLER SHAFT (C.L. & OUTBOARD)
SCALE: 3" = 1'-0"



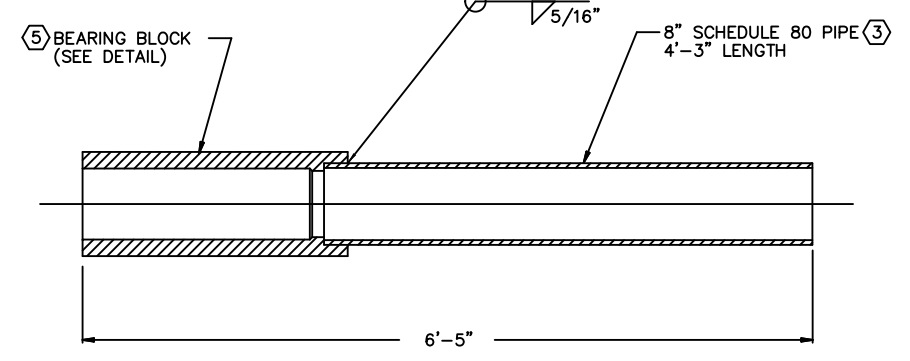
CENTERLINE FWD. SHAFT TUBE
SCALE: 1" = 1'-0"



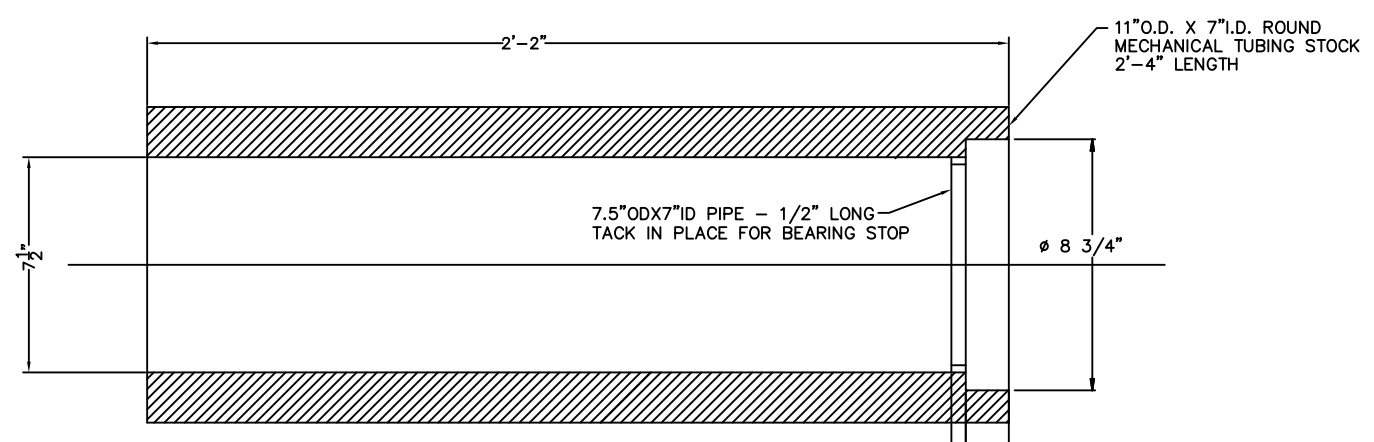
OUTBOARD SHAFT TUBE
SCALE: 1" = 1'-0"



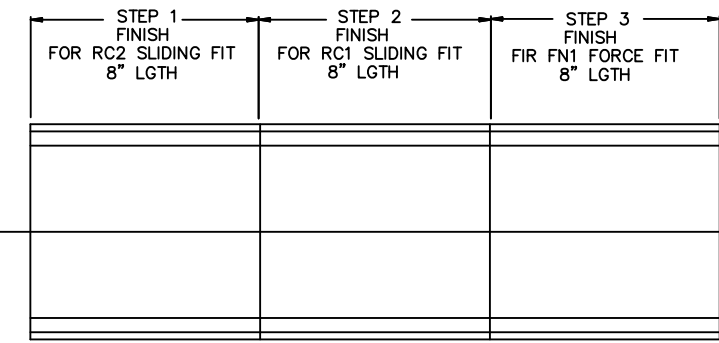
⑦ SHAFT TUBE FLANGE FORWARD FACE
SCALE: 3" = 1'-0"



CENTERLINE AFT SHAFT TUBE
SCALE: 1" = 1'-0"



⑤ BEARING BLOCK DETAIL
SCALE: 3" = 1'-0"



③ BEARING PREP DETAIL
SCALE: 3" = 1'-0"

NOTES:
1) ALL WELDING AND WORKMANSHIP IN ACCORDANCE WITH ABS RULES FOR BUILDING AND CLASSING STEEL VESSELS UNDER 90 METERS (295 FEET) IN LENGTH 1998

SCALE: AS NOTED

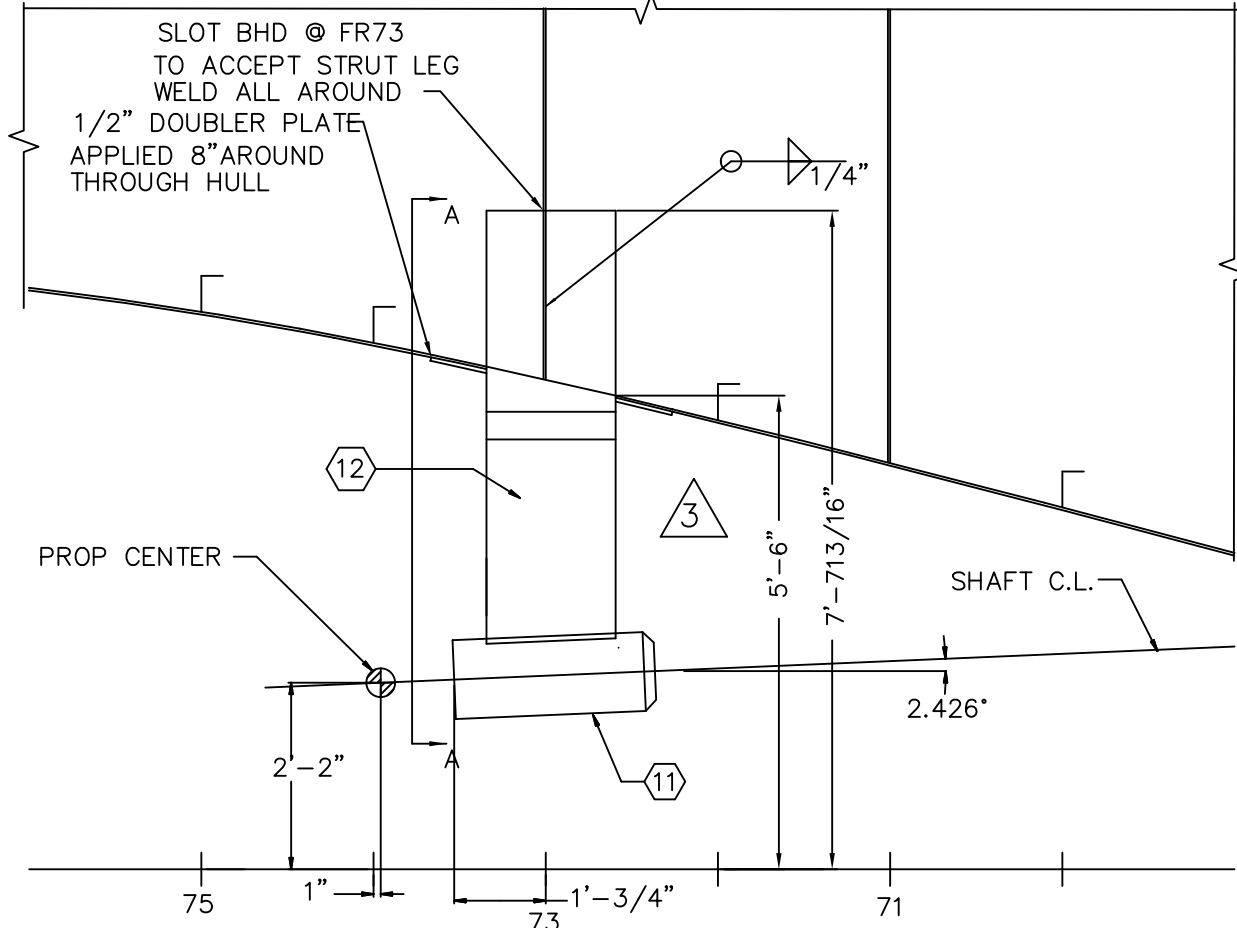
MM

TITLE: 160'x40'x13' RESEARCH VESSEL
SHAFTING DETAILS

MARINE MANAGEMENT INC.
MARINE DESIGNERS and SURVEYORS
P.O. Box: 1803 Ocean Springs, MS 39566-1803
Ph: 601-872-2846 Fax: 601-872-0605 Online: rpayne@katadync.com

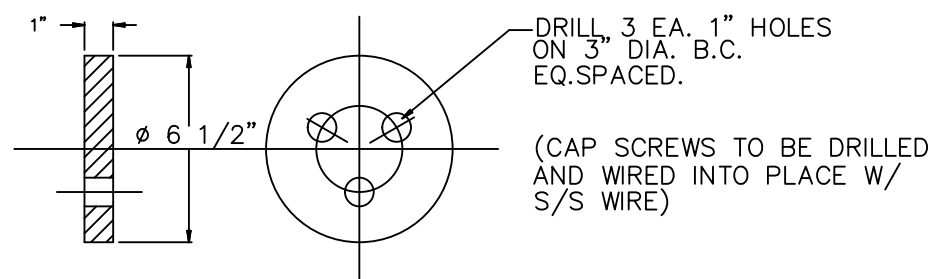
SHT: 2
OF: 3
ALT NO: 3

ALT. 3
S-185-M4

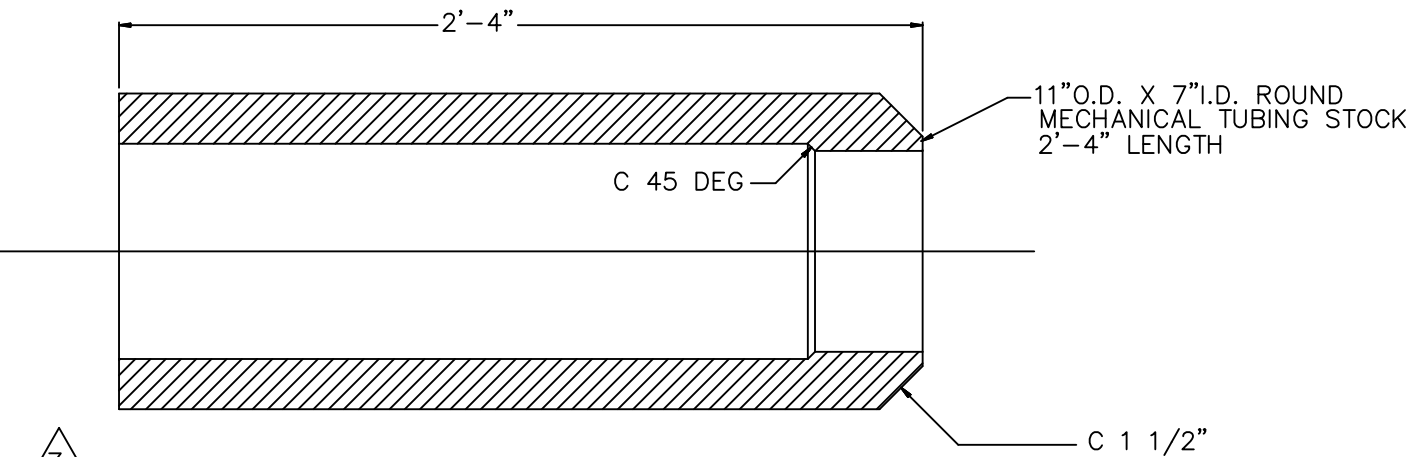


OUTBOARD STRUTS

13'-4 7/8" OFF C.L., STBD. SIDE LKNG INBOARD
 PORT STRUT SIMM. OPP. HAND
 SCALE: 3/4" = 1'-0"

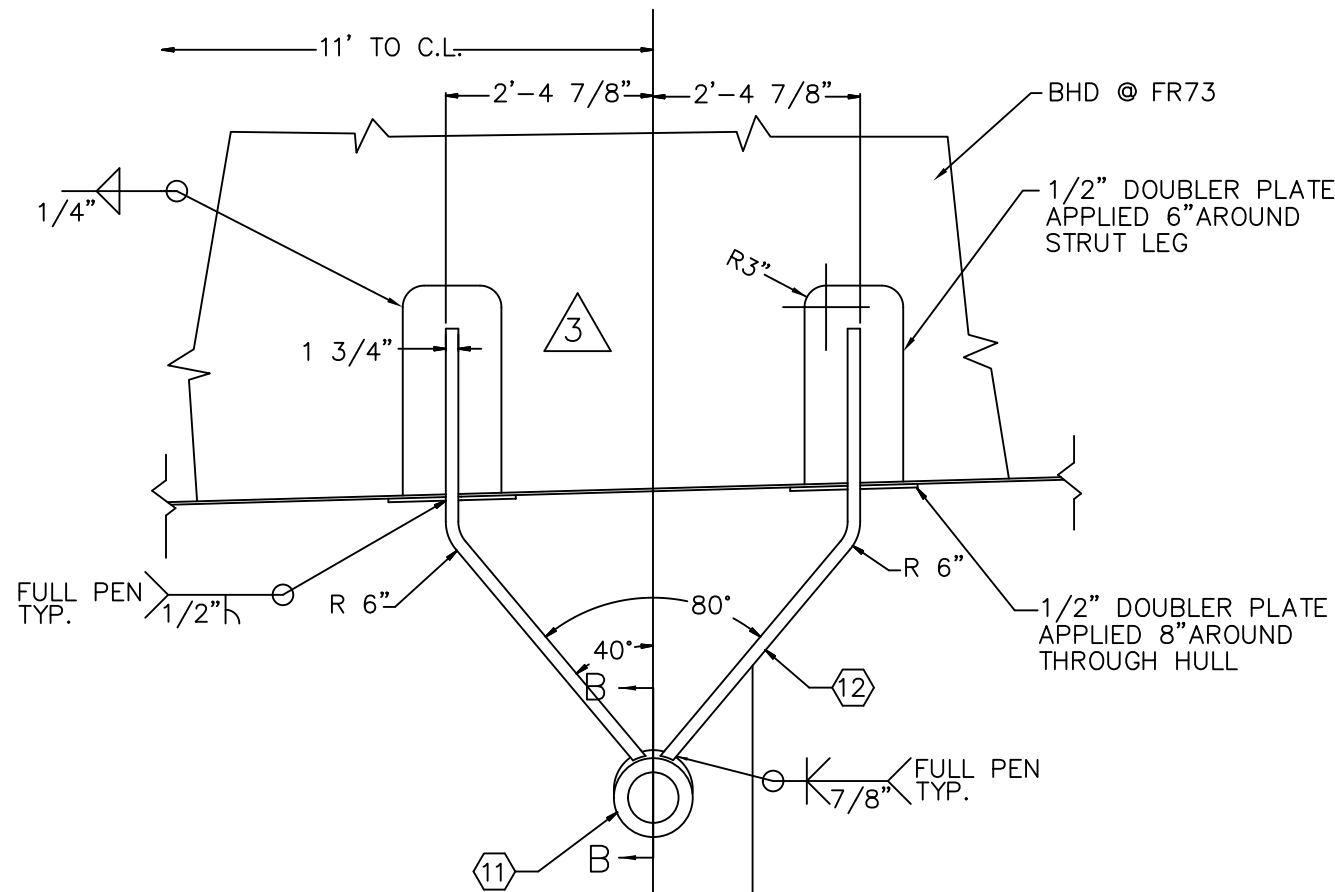


14 PULL PLATE
 SCALE: 3" = 1'-0"



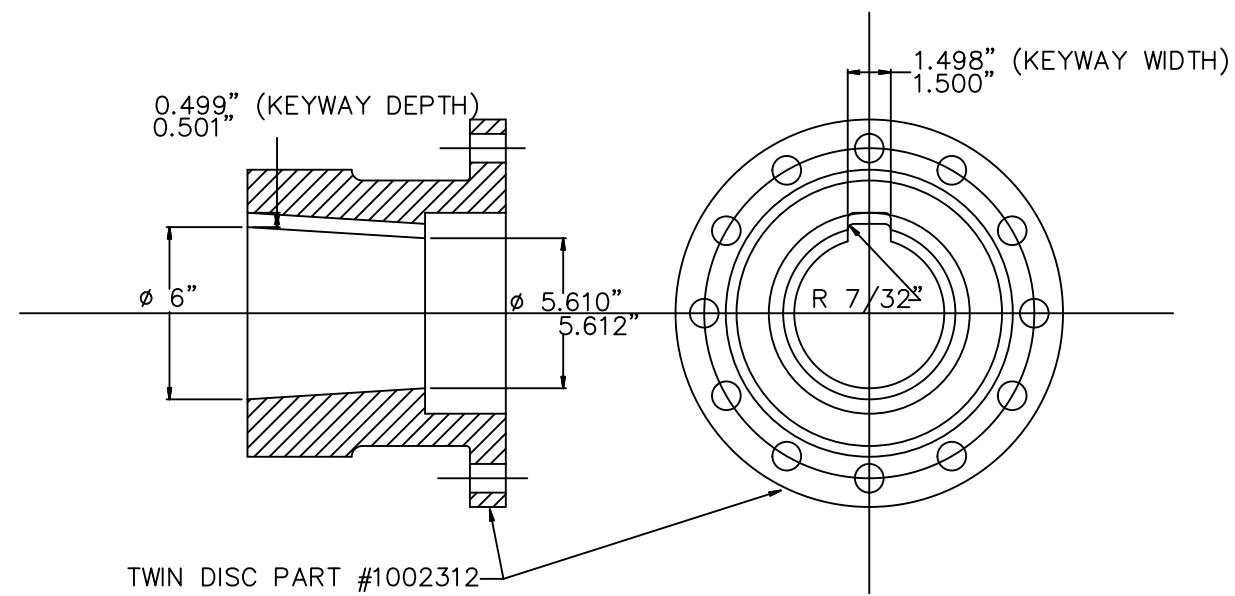
11 SECTION B-B, STRUT BEARING BOSS

SCALE: 3" = 1'-0"
 FOR BEARING FINISH, SEE BEARING PREP DETAIL SHEET 2.



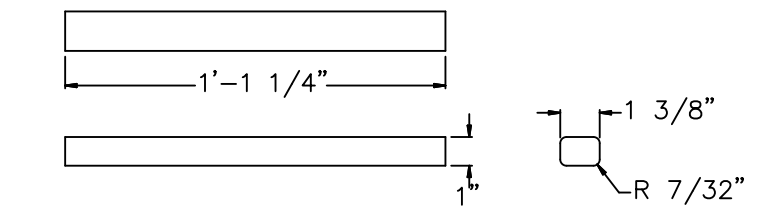
VIEW A-A, LOOKING FORWARD

SCALE: 3/4" = 1'-0"



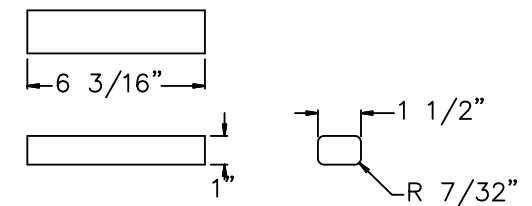
13 SHAFT COUPLING

SCALE: 3" = 1'-0"



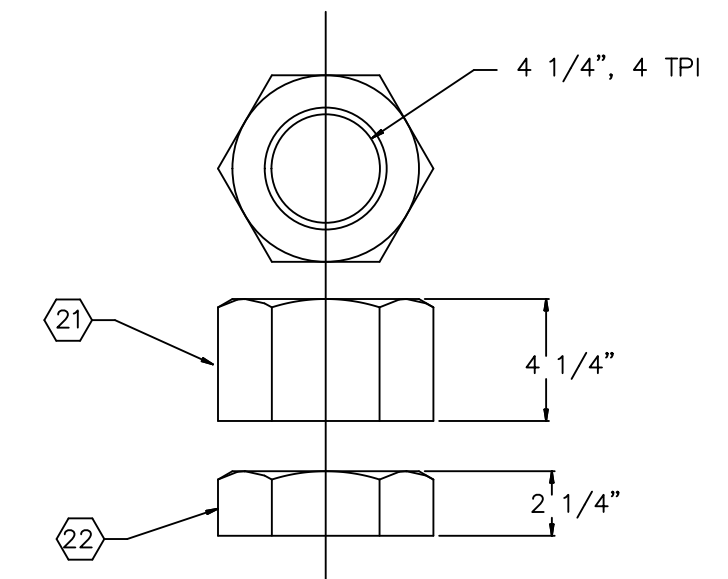
16 PROPELLER KEY

MATERIAL: BRASS
 SCALE: 3" = 1'-0"



17 COUPLING KEY

MATERIAL: STEEL
 SCALE: 3" = 1'-0"



21 SHAFT NUT &

22 JAM NUT

SCALE: 3" = 1'-0"

NOTE:
 ALL WELDING AND WORKMANSHIP IN ACCORDANCE WITH ABS RULES FOR BUILDING AND CLASSING STEEL VESSELS UNDER 90 METERS (295 FEET) IN LENGTH 1998

SCALE: AS NOTED		TITLE: 160'x40'x13' RESEARCH VESSEL	
		SHAFTING DETAILS	
		MARINE MANAGEMENT INC. MARINE DESIGNERS and SURVEYORS	
P.O. Box: 1803 Ocean Springs, MS 39566-1803 Ph: 601-872-2846 Fax: 601-872-0606 Online: rpoym@katadyn.com		SHT: 3	OF: 3
		ALT NO: 3	

ALT. 3 S-185-M4