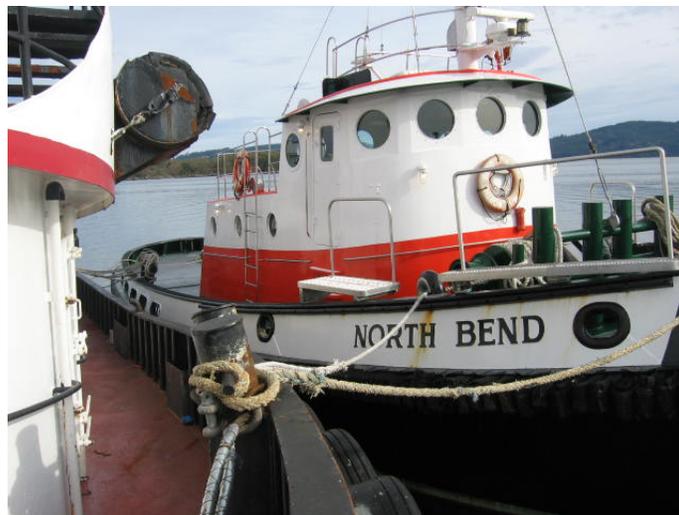
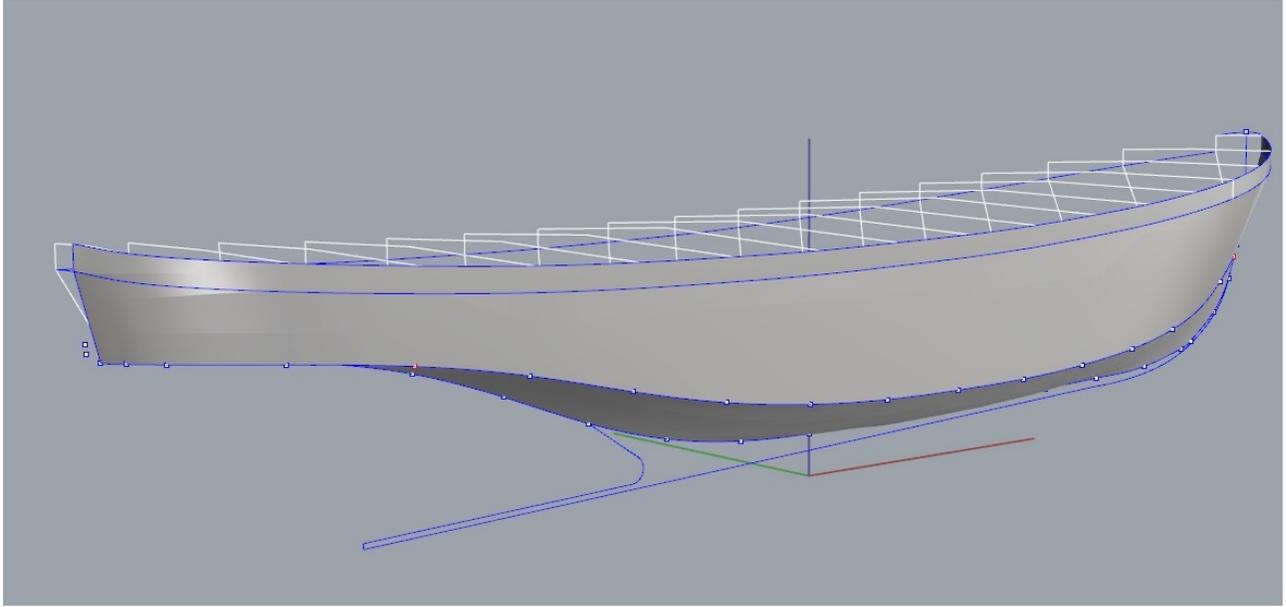


Tug / Pilotboat repower with sponson addition

This is an example of a concept design – intended to demonstrate the feasibility of the owner’s desire to increase horsepower and bollard pull without making an prohibitively costly investment in a new tug. The impetus for the conversion was gain capability to handle the occasional bulk carrier at a port that gets relatively few ship calls.

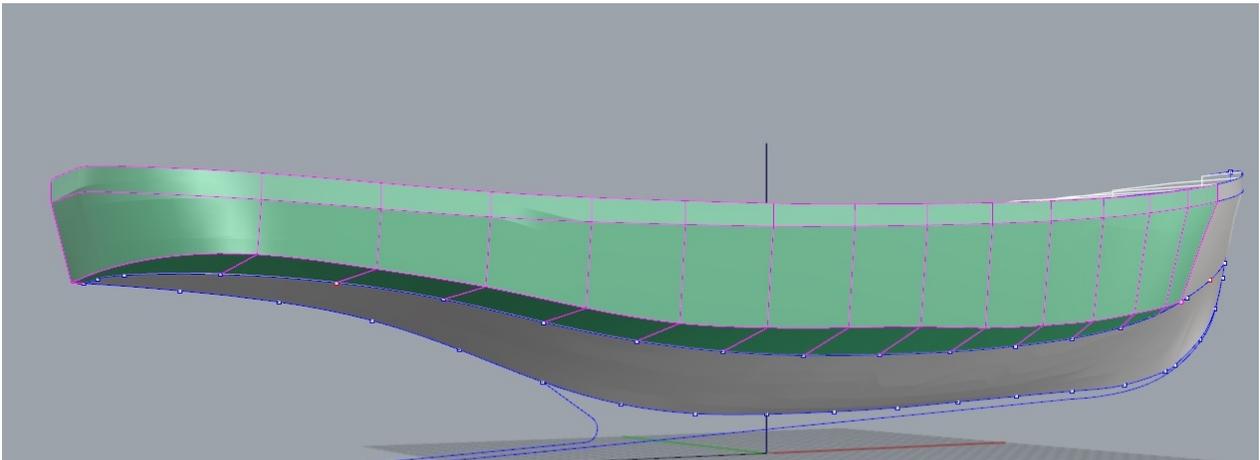
The single-screw tug has been well maintained for many years and used primarily for pilotage service. The concept design shows before and after arrangement, with addition of sponsons and conversion to twin-screw propulsion. A complicating factor, with this smallish tug is the need to comply with EPA Tier 4 exhaust gas emissions, which has phased in recently for new marine diesel engines.





NORTH BEND
AS-IS (without sponsons) (beam = 21'-8")
pic0 - shows stbd half of hull

AW 9/8/16



NORTH BEND
SPONSON-9-6A.3dm (increases beam to 28'-8")
pic1 - shows stbd sponson half in green

AW 9/8/16

NOTES

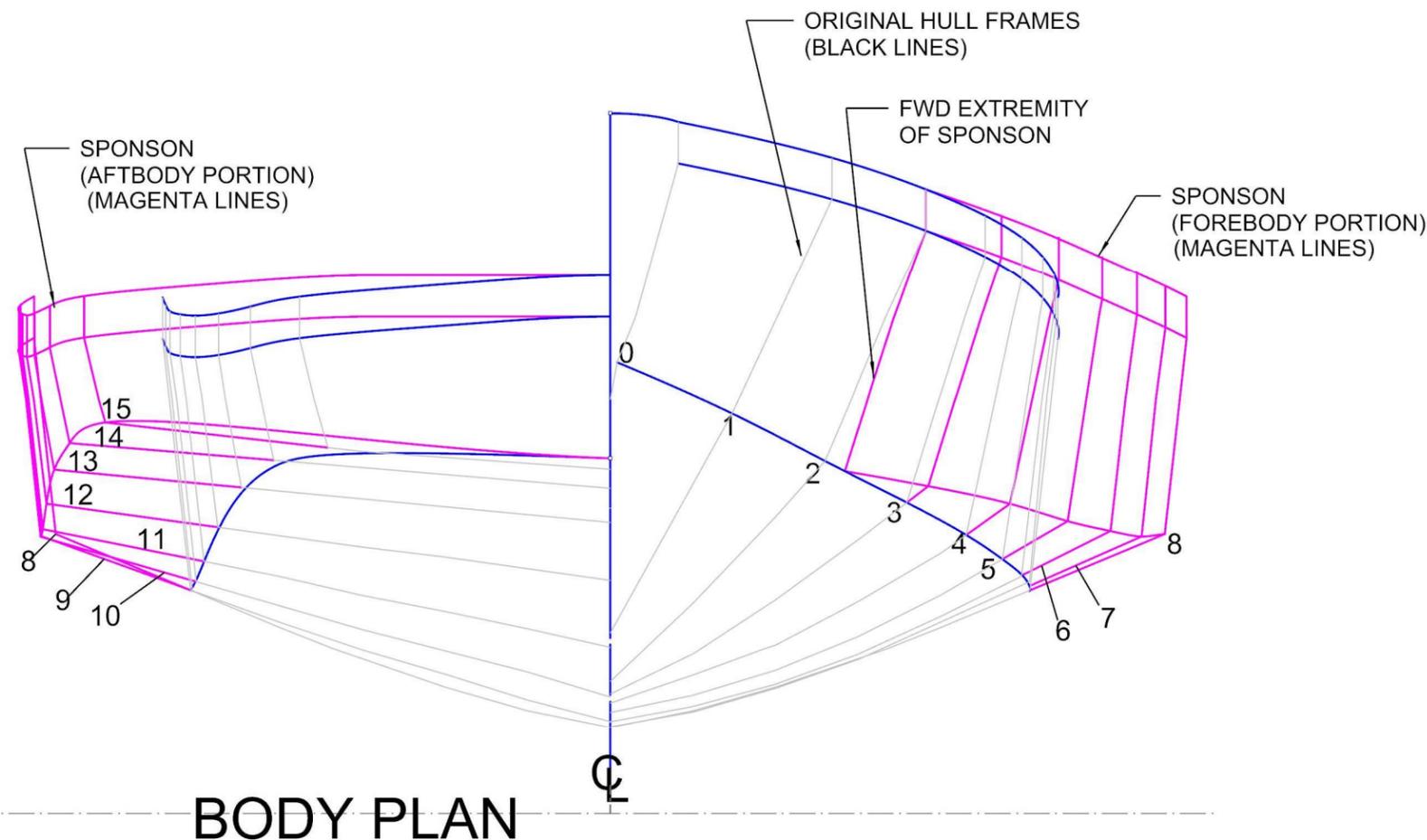
1. THIS PROJECT ENTAILS CONVERSION OF THE BOAT FROM SINGLE ENGINE, SINGLE SCREW TO TWIN ENGINE, TWIN SCREW. IN ORDER TO PROVIDE ADEQUATE INTACT STABILITY, SPONSONS ARE TO BE ADDED, INCREASING THE MOLDED BEAM FROM 21'-8" TO 28'-8".
2. PURPOSE OF THIS EARLY STAGE DESIGN DRAWING IS TO FACILITATE THE ESTIMATION OF ROUGH SHIPYARD PRICING FOR THE PROJECT.
3. SHEETS 2 THROUGH 4 SHOW THE BOAT "AS-IS", BASED ON REFERENCES 1 AND 2 AND ALSO SHIPCHECK OCT. 23-24, 2016. SHEETS 5 THROUGH 7 SHOW THE NEW CONFIGURATION IN A PRELIMINARY, NON-DETAILED MANNER.
4. THE SPONSONS ARE SHOWN IN MAGENTA COLOR.

CONTENTS

- SHT 1 BODY PLAN, NOTES, REFERENCES
- SHT 2 INBOARD PROFILE - EXISTING
- SHT 3 ARRANGEMENT ABOVE DECK - EXISTING
- SHT 4 ARRANGEMENT BELOW DECK - EXISTING
- SHT 5 INBOARD PROFILE - REPOWERED CONFIGURATION
- SHT 6 ARRANGEMENT ABOVE DECK - REPOWERED CONFIGURATION
- SHT 7 ARRANGEMENT BELOW DECK - REPOWERED CONFIGURATION

REFERENCES:

1. DON HUDSON DWG No. 09339-2, LINES & OFFSETS
2. DON HUDSON DWG No. 09339-3, HULL ARRANGEMENT - PLAN, PROFILE, SECTION
3. OUTLINE SPECIFICATION FOR REPOWERING, AW, REV 11/8/2017
4. CATERPILLAR PUBLICATION LEBM0023-04, "APPLICATION & INSTALLATION GUIDE - CAT CLEAN EMISSIONS MODULE"



REVISIONS

REV	DESCRIPTION	DATE	BY

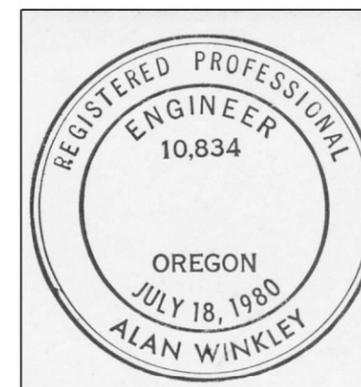
ALAN WINKLEY NAVAL ARCHITECTURE, LLC
 1367 Jacobsen Boulevard
 Bremerton, Washington 98310
 (360) 373-8361

NORTH BEND - REPOWER

CONCEPTUAL ARRANGEMENT

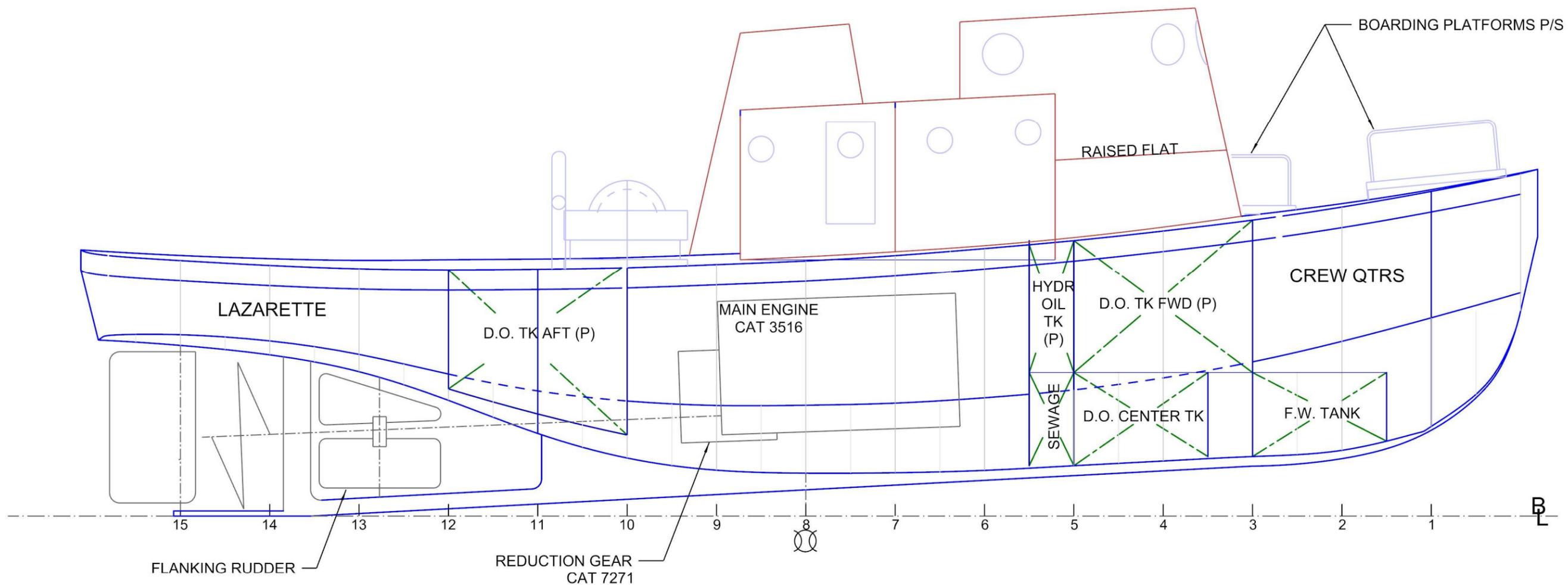
FOR SCALE 1/4" = 1'-0"
 DATE NOV 8, 2017
 DRAWN BY AW

DRAWING No. **6217-1** REV - SHEET 1/7

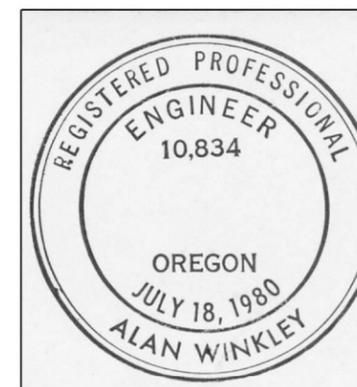


EXPIRES 6/30/2018

SIGNED HARDCOPY ON FILE



INBOARD PROFILE - EXISTING CONFIGURATION



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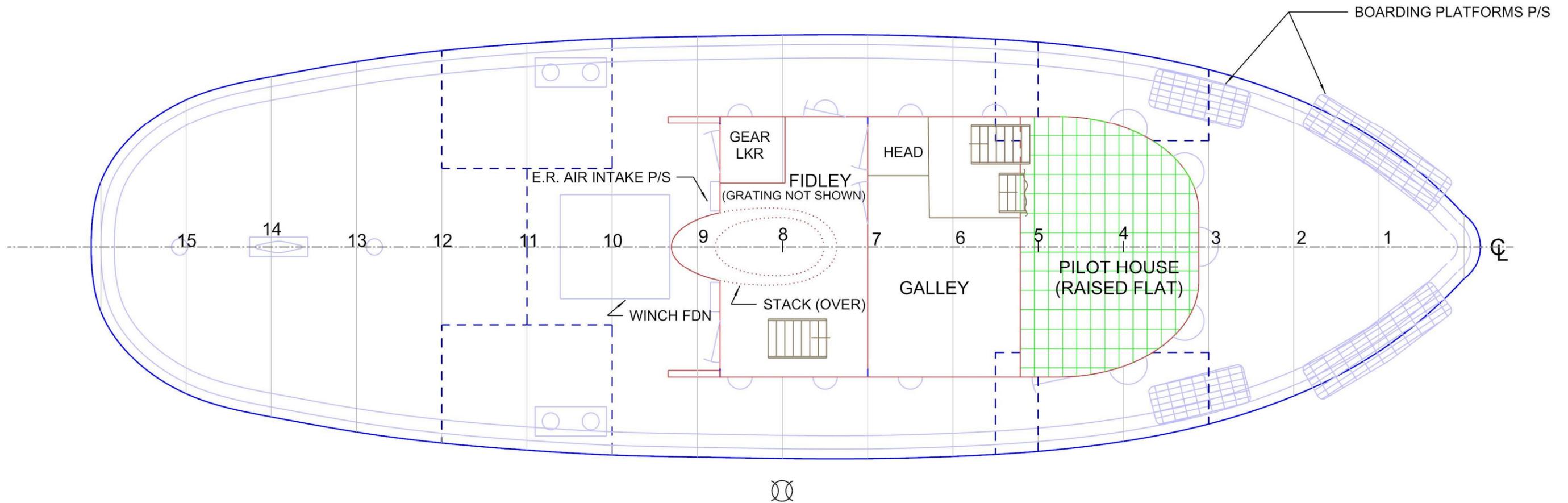
ALAN WINKLEY NAVAL ARCHITECTURE, LLC
 1367 Jacobsen Boulevard
 Bremerton, Washington 98310
 (360) 373-8361

NORTH BEND - REPOWER

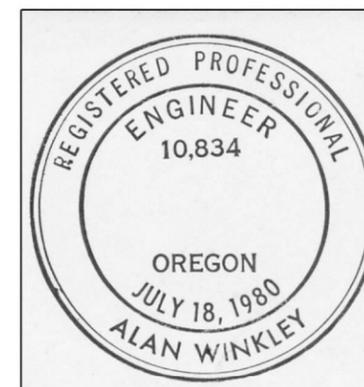
CONCEPTUAL ARRANGEMENT

FOR COOS BAY PILOT BOAT CO.
 SCALE 3/16" = 1'-0"
 DATE NOV 8, 2017
 DRAWN BY AW

DRAWING No. **6217-1** REV - SHEET 2/7



ARRANGEMENT ABOVE DECK - EXISTING CONFIGURATION



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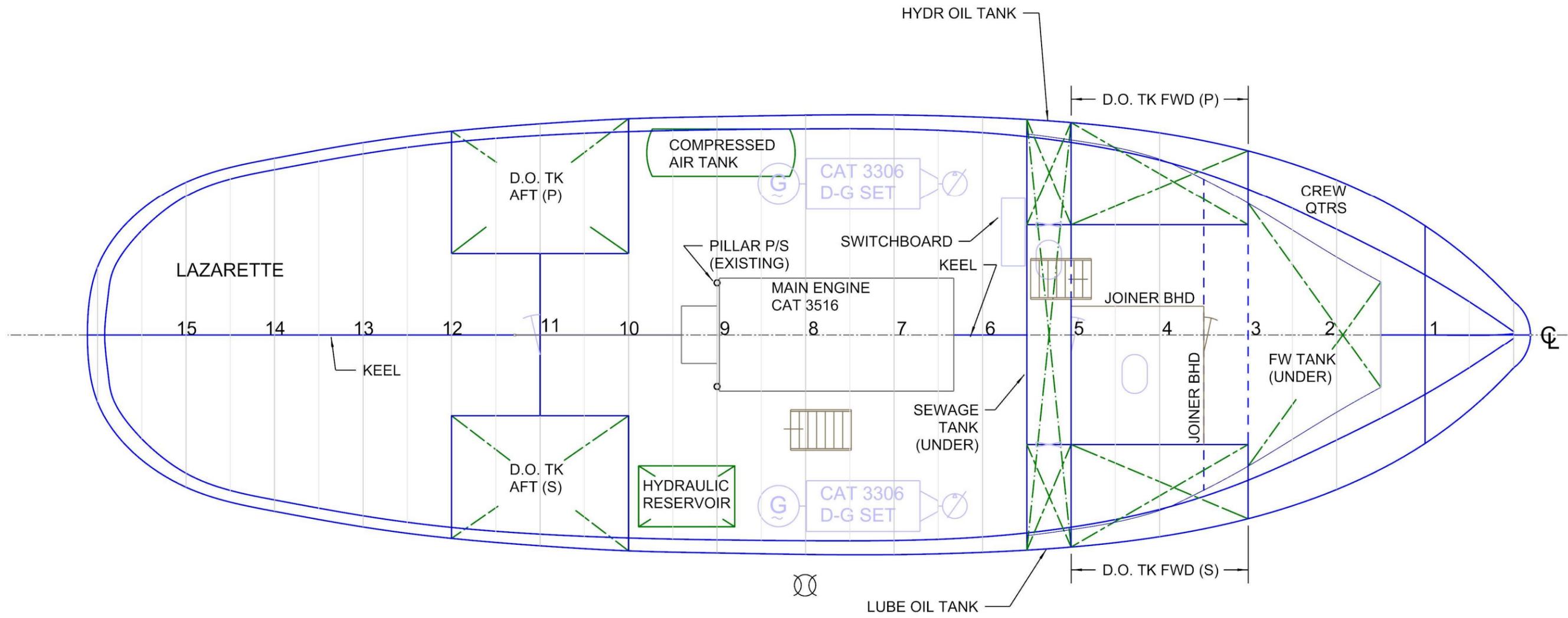
ALAN WINKLEY NAVAL ARCHITECTURE, LLC
 1367 Jacobsen Boulevard
 Bremerton, Washington 98310
 (360) 373-8361

NORTH BEND - REPOWER

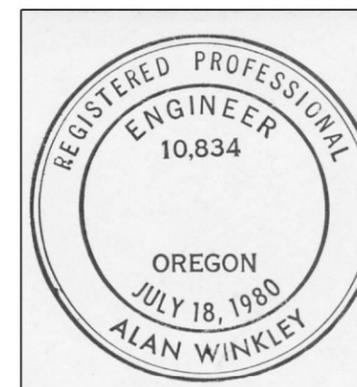
CONCEPTUAL ARRANGEMENT

FOR COOS BAY PILOT BOAT CO.
 SCALE 3/16" = 1'-0"
 DATE NOV 8, 2017
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DRAWING No. **6217-1** REV - SHEET 3/7



ARRANGEMENT BELOW DECK - EXISTING CONFIGURATION



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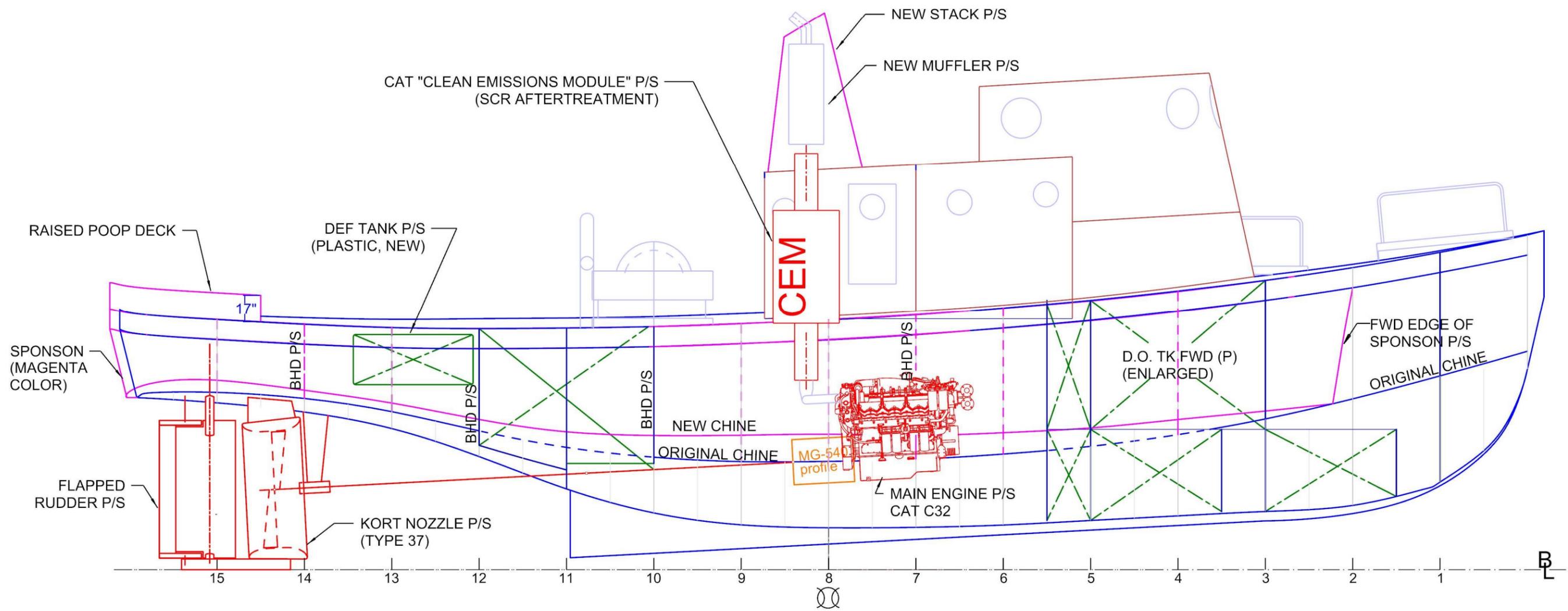
ALAN WINKLEY NAVAL ARCHITECTURE, LLC
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 Bremerton, Washington 98310
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NORTH BEND - REPOWER

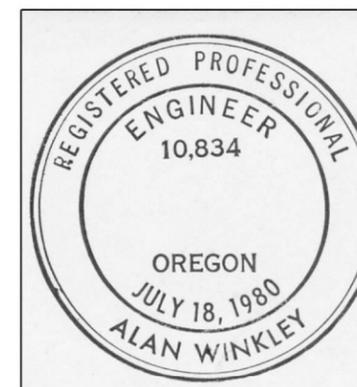
CONCEPTUAL ARRANGEMENT

FOR COOS BAY PILOT BOAT CO.
 SCALE 3/16" = 1'-0"
 DATE NOV 8, 2017
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DRAWING No. **6217-1** REV - SHEET 4/7



INBOARD PROFILE - REPOWERED CONFIGURATION



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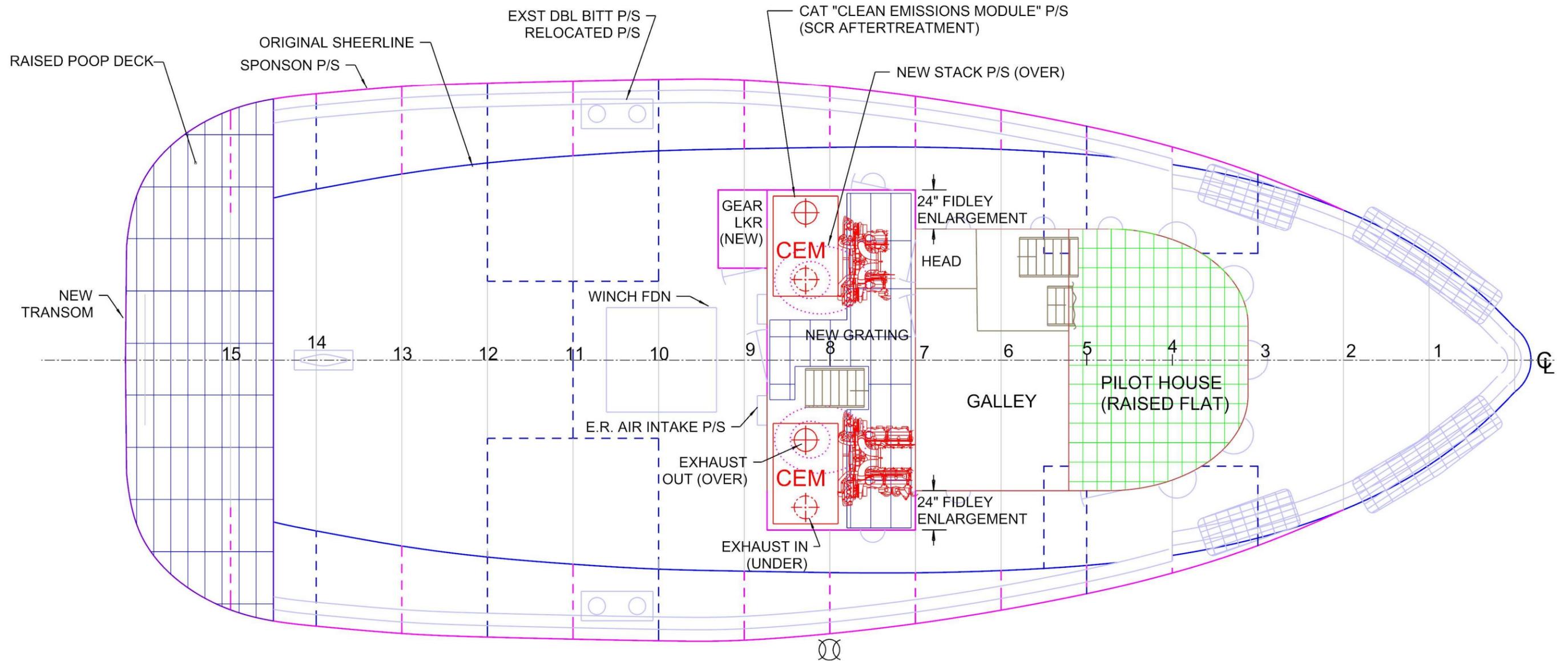
ALAN WINKLEY NAVAL ARCHITECTURE, LLC
 1367 Jacobsen Boulevard
 Bremerton, Washington 98310
 (360) 373-8361

NORTH BEND - REPOWER

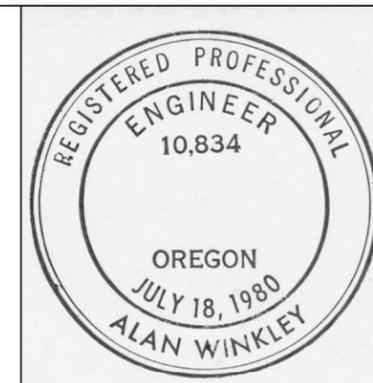
CONCEPTUAL ARRANGEMENT

FOR COOS BAY PILOT BOAT CO.
 SCALE 3/16" = 1'-0"
 DATE NOV 8, 2017
 DRAWN BY AW

DRAWING No. **6217-1** REV - SHEET 5/7



ARRANGEMENT ABOVE DECK - REPOWERED CONFIGURATION



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NORTH BEND - REPOWER

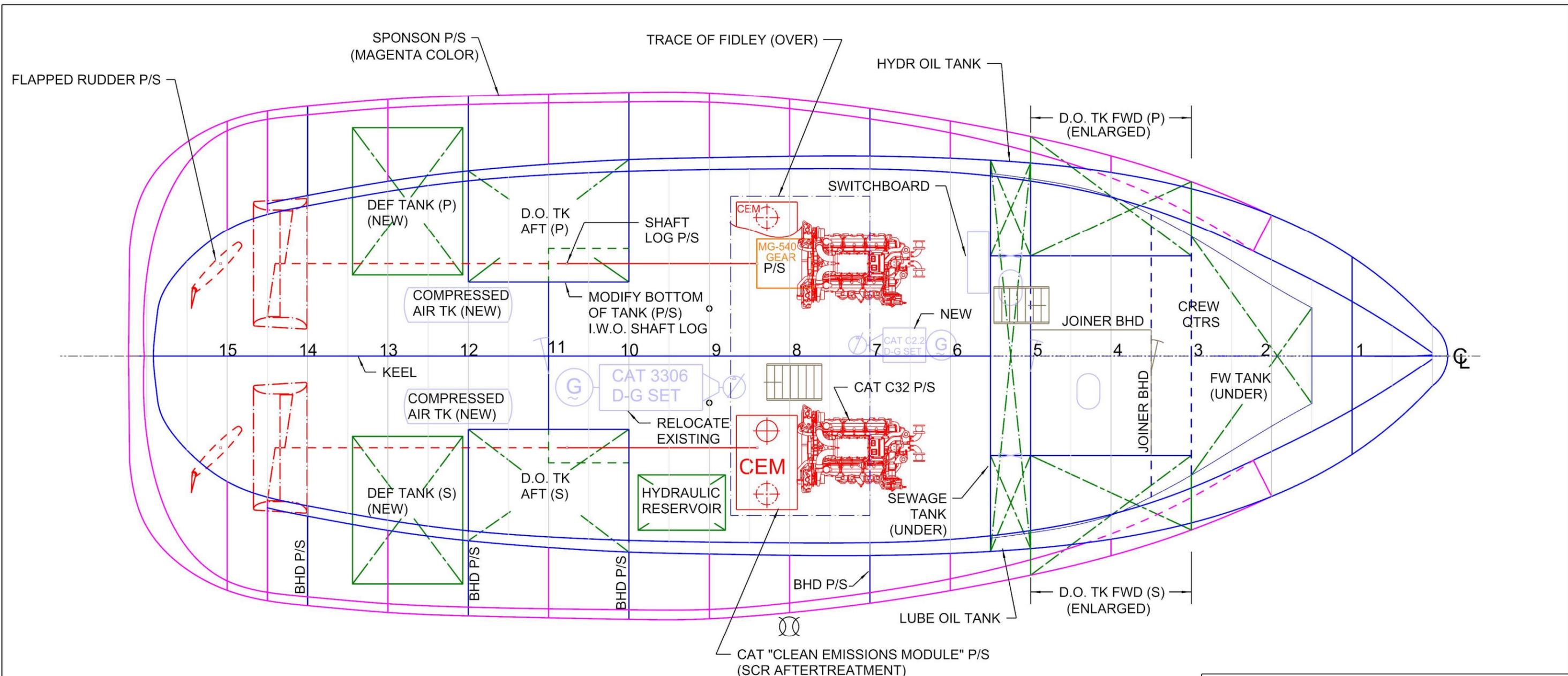
CONCEPTUAL ARRANGEMENT

FOR COOS BAY PILOT BOAT CO.
 SCALE 3/16" = 1'-0"
 DATE NOV 8, 2017
 DRAWN BY AW

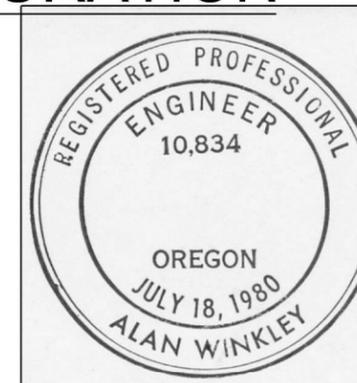
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DRAWING No. **6217-1** REV - SHEET 6/7

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ARRANGEMENT BELOW DECK - REPOWERED CONFIGURATION



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NORTH BEND - REPOWER

CONCEPTUAL ARRANGEMENT

FOR COOS BAY PILOT BOAT CO.
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DRAWING No. **6217-1** REV - SHEET 7/7