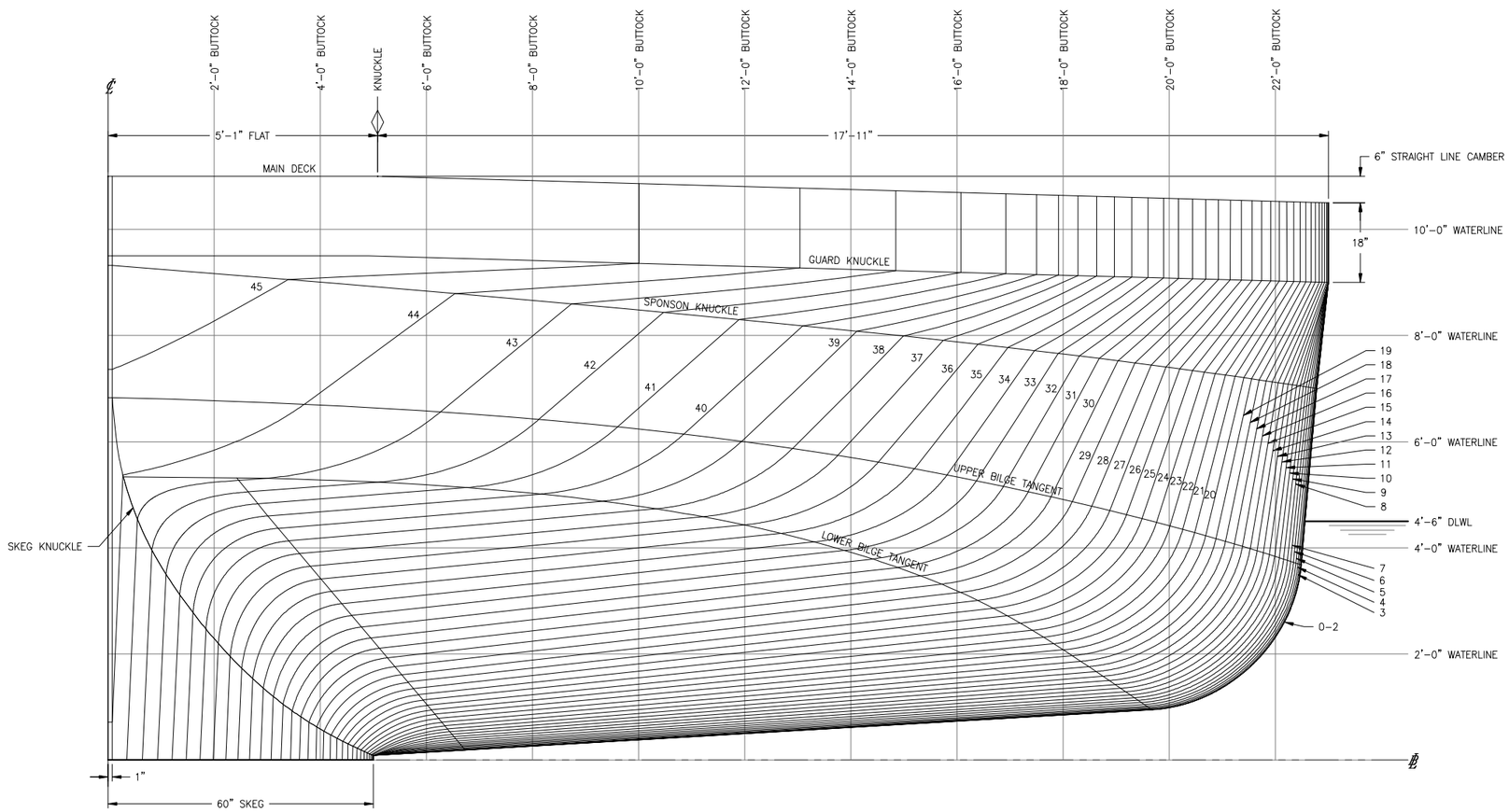


BODY PLAN

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. ALL DIMENSIONS TO MOLDED LINE.

VESSEL PARTICULARS

LENGTH OVERALL:	183'-7"
LENGTH DESIGN LOAD WATERLINE:	178'-0 3/8"
BEAM, MOLDED:	46'-0"
BEAM OVER GUARDS:	46'-10"
DEPTH AT SIDE:	10'-6"
DRAFT AT DLWL:	4'-6"
FREEBOARD AT SIDE:	6'-0"
TOTAL PASSENGER CAPACITY:	300 MAX.
VEHICLE CAPACITY:	40 SV

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD WANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: LINES PLAN

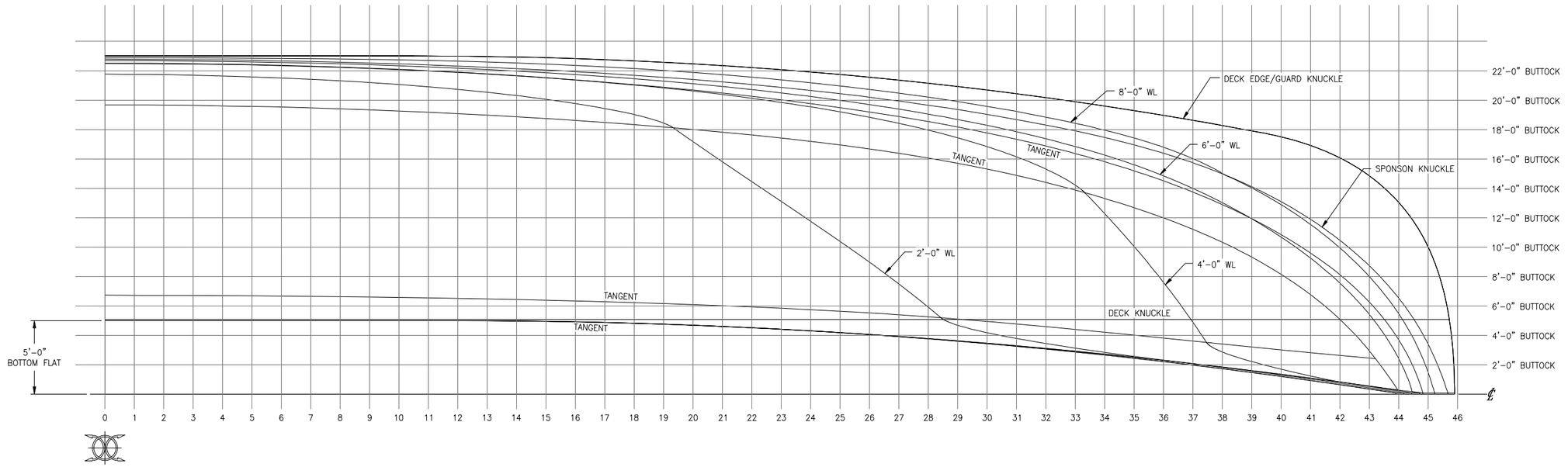
KRYSTA A. JANKOWSKI — STATE OF WASHINGTON — 21055 — REGISTERED PROFESSIONAL ENGINEER
7/25/2018

SIZE	DWG NO.	REV
D	18026-200-100-1	—

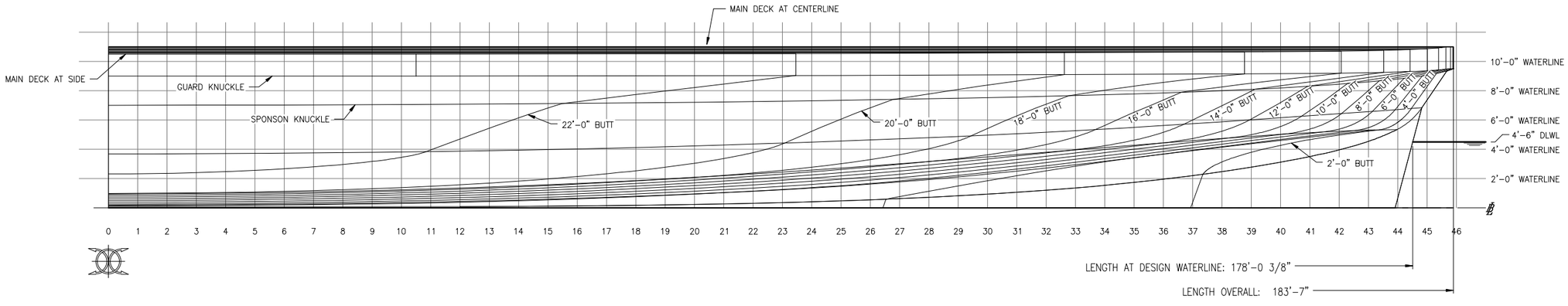
SCALE 3/4" = 1'-0" | FILE NAME 18026-200-100-1- | SHEET 1 OF 2

DWN	MOD	CKD	APVD	APVD DATE
JCG	KAJ	JCG	KAJ	7/25/18

7/25/2018 3:56:31 PM



HALF BREADTH PLAN

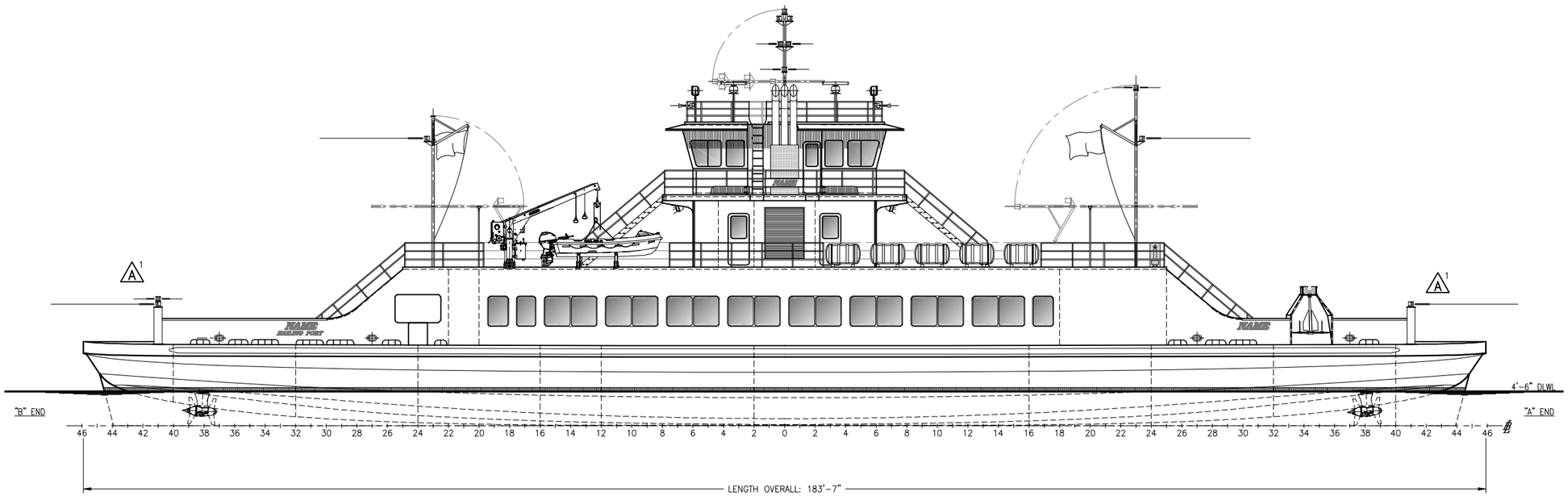


SHEAR PLAN

7/25/2018

SIZE	DWG NO.	REV
D	18026-200-100-1	–
SCALE 1/4" = 1'-0"	FILE NAME 18026-200-100-1-	SHEET 2 OF 2

7/25/2018 3:56:36 PM



OUTBOARD PROFILE

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	ALL 3-5A 2-3D	1. REVISED BULWARK ENDS 2. REVISED FREE STANDING TANKS 3. MOVED LIGHT MAST OUTBOARD	JEH	08/03/18	KAJ

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".

VESSEL PARTICULARS

LENGTH OVERALL:	183'-7"
LENGTH DESIGN LOAD WATERLINE:	178'-3/8"
BEAM, MOLDED:	46'-0"
BEAM OVER GUARDS:	46'-10"
DEPTH AT SIDE:	10'-6"
DRAFT AT DLWL:	4'-6"
FREEBOARD AT SIDE:	6'-0"
TOTAL PASSENGER CAPACITY:	300 MAX.
VEHICLE CAPACITY:	40 SV

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-100-1	LINES PLAN
3.	18026-200-101-7	FIRE ZONE PLAN
4.	18026-200-120-1	MIDSHIP SECTION
5.	18026-200-201-1	MACHINERY ARRANGEMENT
6.	18026-200-624-1	WINDOW SCHEDULE
7.	18026-200-624-2	DOOR SCHEDULE
8.	18026-200-624-3	HATCH SCHEDULE

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: PROFILES AND DECK ARRANGEMENTS

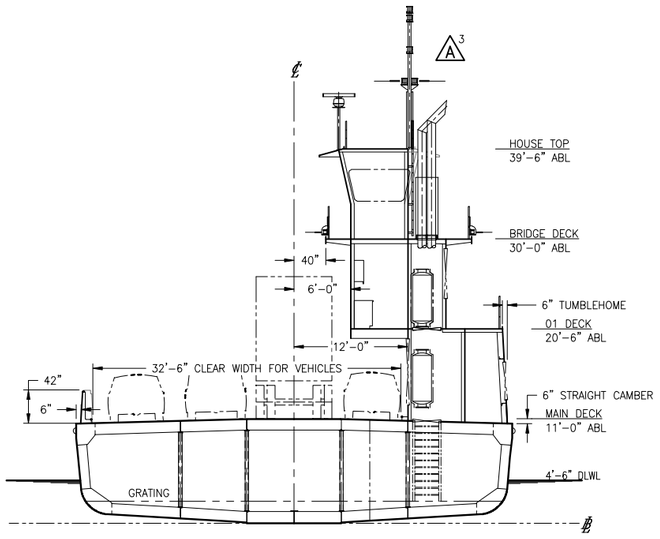
SIZE	DWG NO.	REV
D	18026-200-101-1	A

SCALE	FILE NAME	SHEET
1/8" = 1'-0"	18026-200-101-1-	1 OF 4

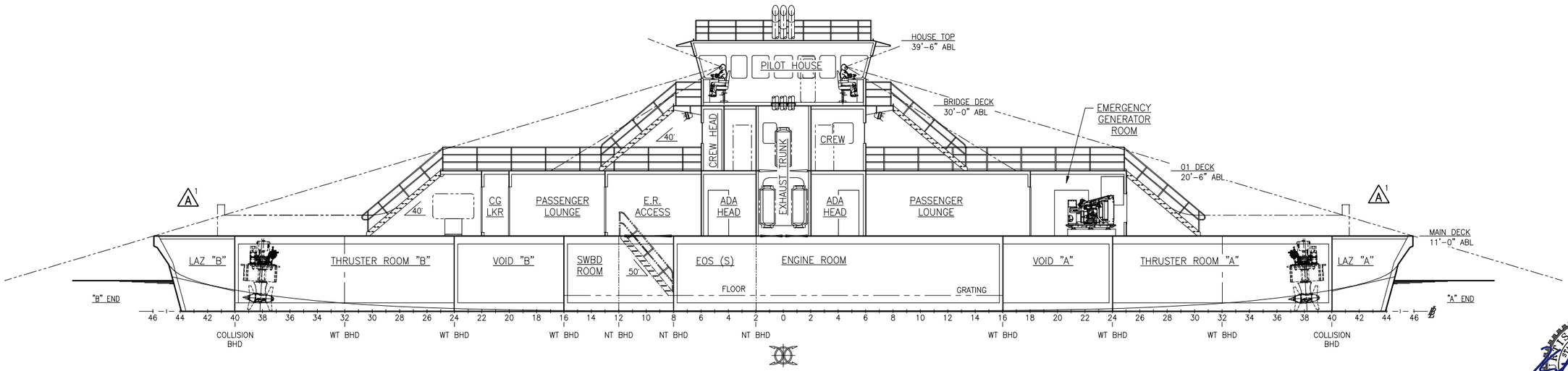
DWN	MOD	CKD	APVD	APVD DATE
JEH		JEH	KAJ	7/25/2018

KRISTA A. JANKOWSKI
STATE OF WASHINGTON
25055
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

8/3/2018 3:11:43 PM



MIDSHIP SECTION



INBOARD PROFILE

8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-1	A
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-1-	SHEET 2 OF 4

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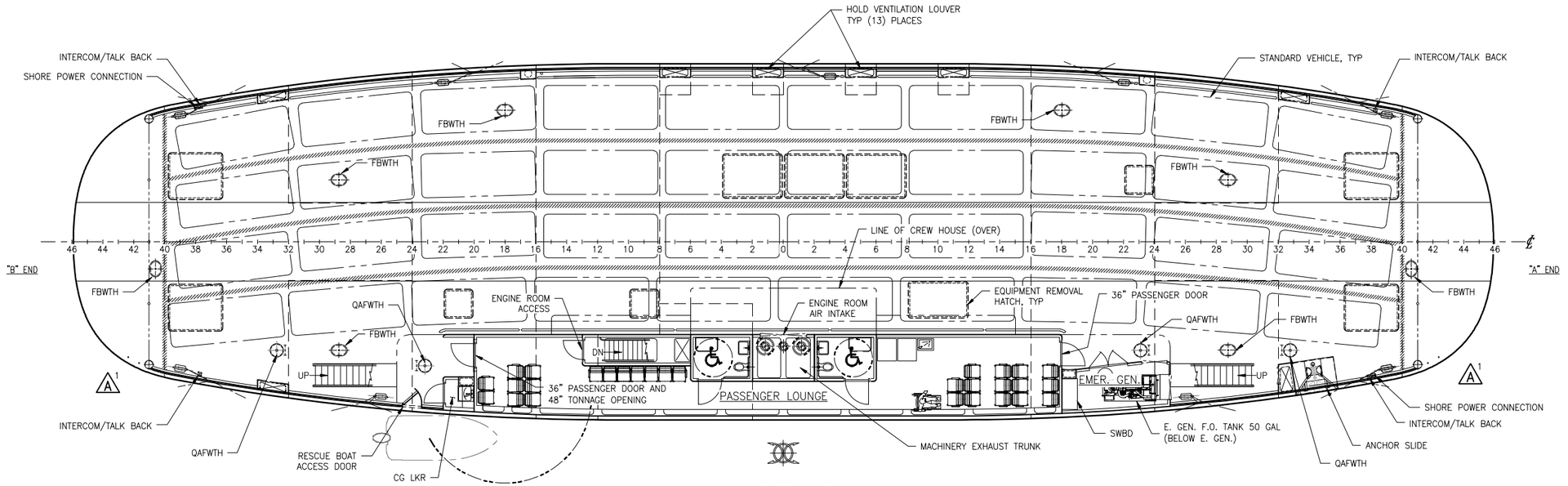
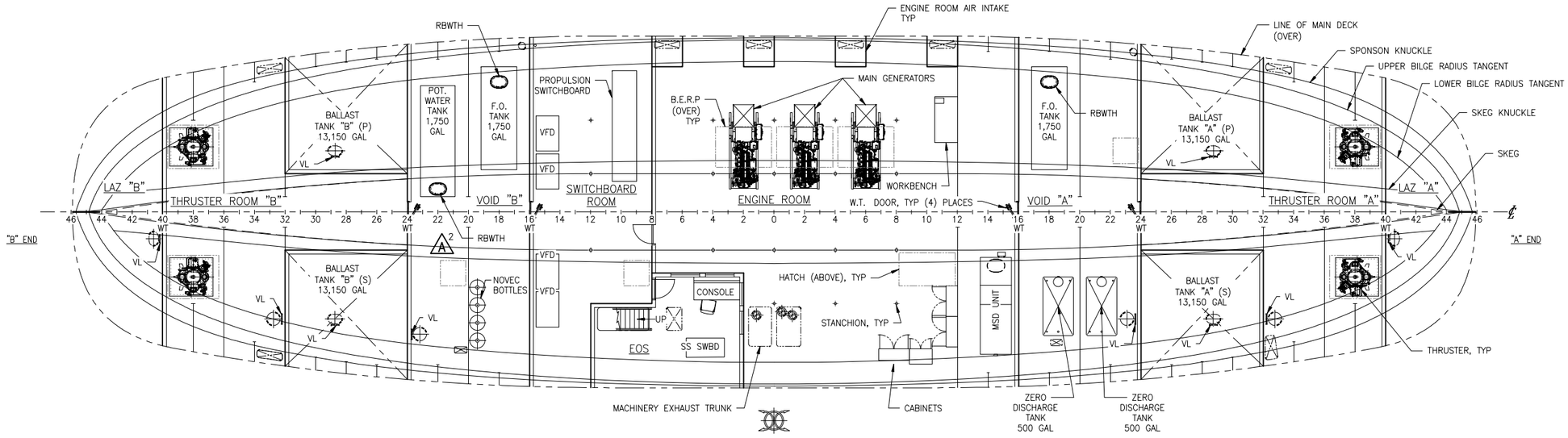


MAIN DECK PLAN

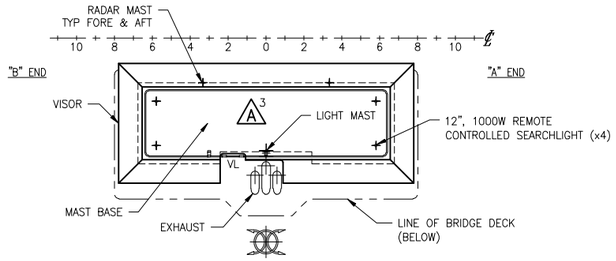


HOLD PLAN

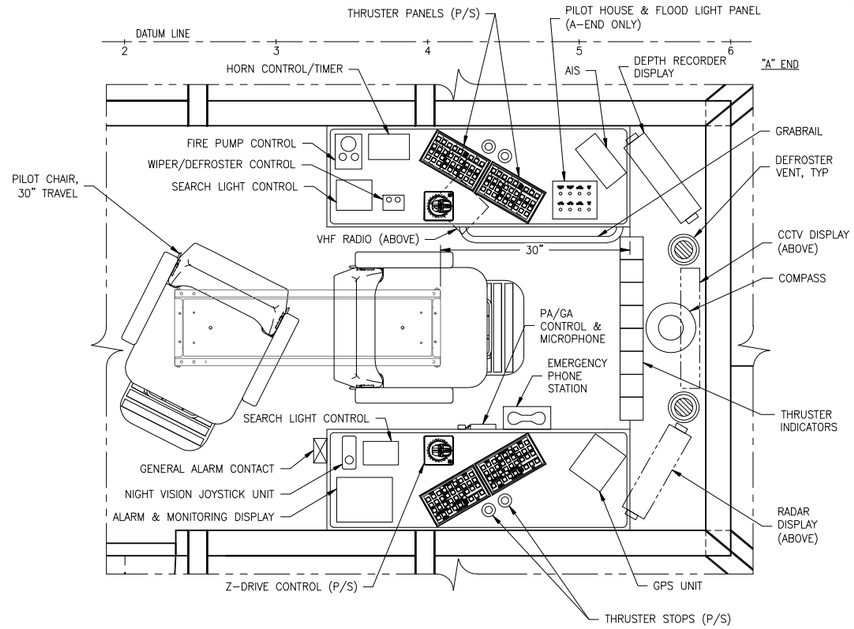
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-1	A
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-1-	SHEET 3 OF 4

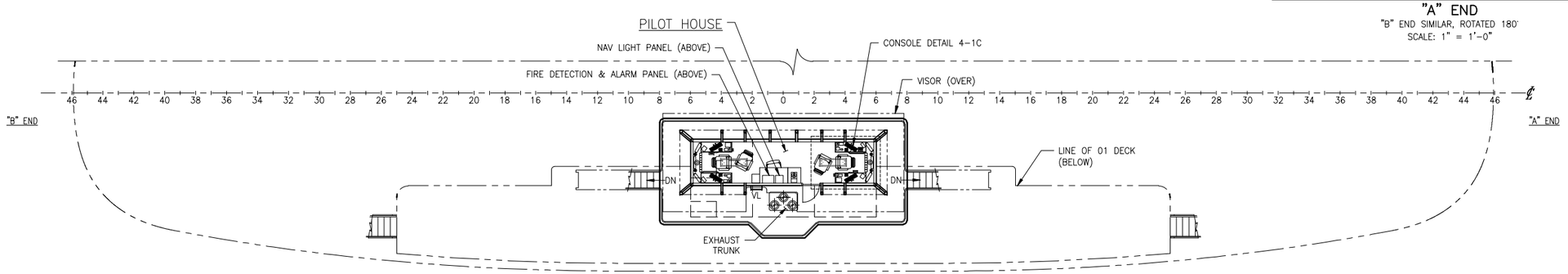
8/3/2018 3:12:01 PM



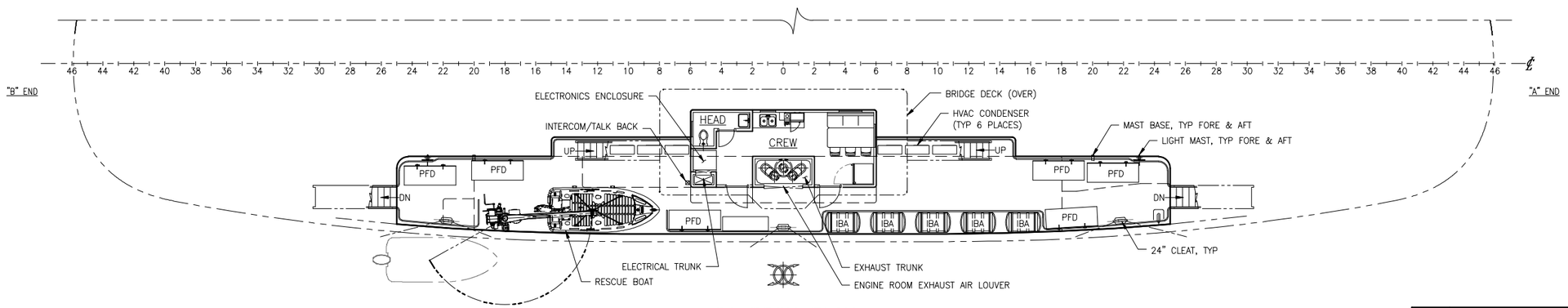
HOUSE TOP PLAN
1/8" = 1'-0"



PILOT HOUSE CONSOLE DETAIL 4-1C
"A" END
"B" END SIMILAR, ROTATED 180°
SCALE: 1" = 1'-0"



BRIDGE DECK PLAN
1/8" = 1'-0"

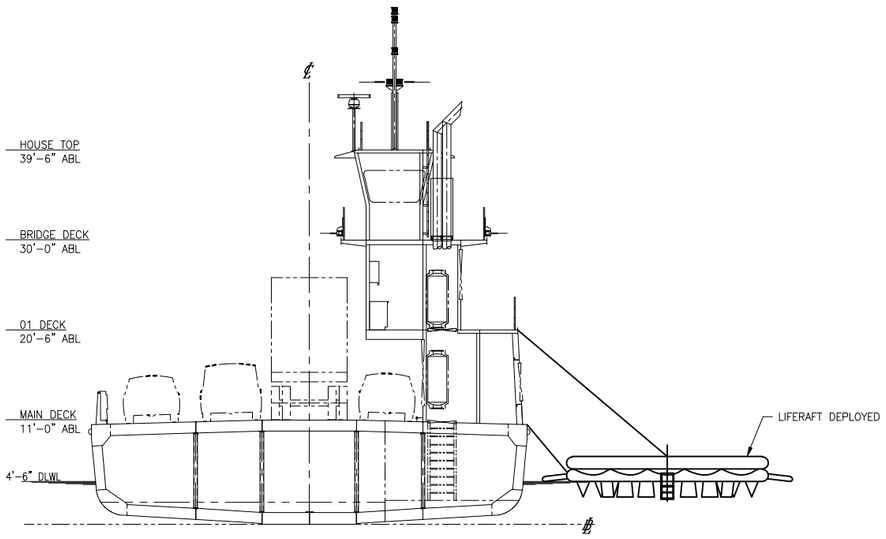


01 DECK PLAN
1/8" = 1'-0"

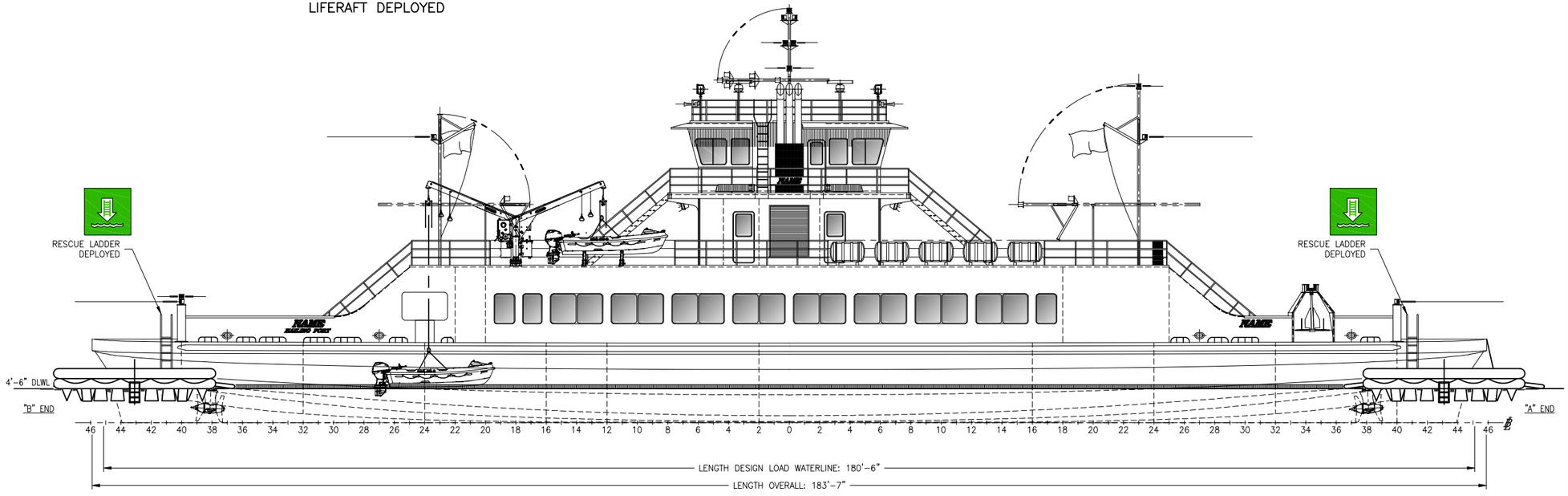
LANIS A. YANKOWSKY
STATE OF WASHINGTON
55055
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-1	A
SCALE: AS NOTED	FILE NAME: 18026-200-101-1-	SHEET 4 OF 4

8/3/2018 3:12:11 PM



MIDSHIP SECTION
LIFERAFT DEPLOYED



OUTBOARD PROFILE

EQUIPMENT LIST

NO.	QTY	DESCRIPTION	COMMENT
1	1	RESCUE BOAT	
2	5	50 PERSON LIFERAFTS	
3	2	RESCUE LADDER	
4	2	LIFE RINGS	
5	2	LIFE RINGS	WITH LINE
6	4	LIFE RINGS	WITH LIGHT
7	300	LIFE JACKETS	ADULT
8	30	LIFE JACKETS	CHILD
9	7	LIFE JACKETS	CREW
10	23	PORTABLE FIRE EXTINGUISHER	TYPE VARIES
11	2	FIRE STATION	
12	1	EYE WASH STATION	

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.

VESSEL PARTICULARS

LENGTH OVERALL:	183'-7"
LENGTH DESIGN LOAD WATERLINE:	178'-3/8"
BEAM, MOLDED:	46'-0"
BEAM OVER GUARDS:	46'-10"
DEPTH AT SIDE:	10'-6"
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FREEBOARD AT SIDE:	6'-0"
TOTAL PASSENGER CAPACITY:	300 MAX.
VEHICLE CAPACITY:	40 SV

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS
3. 46 CFR SUBCHAPTER H

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD WANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: LIFE SAVING EQUIPMENT ARRANGEMENT

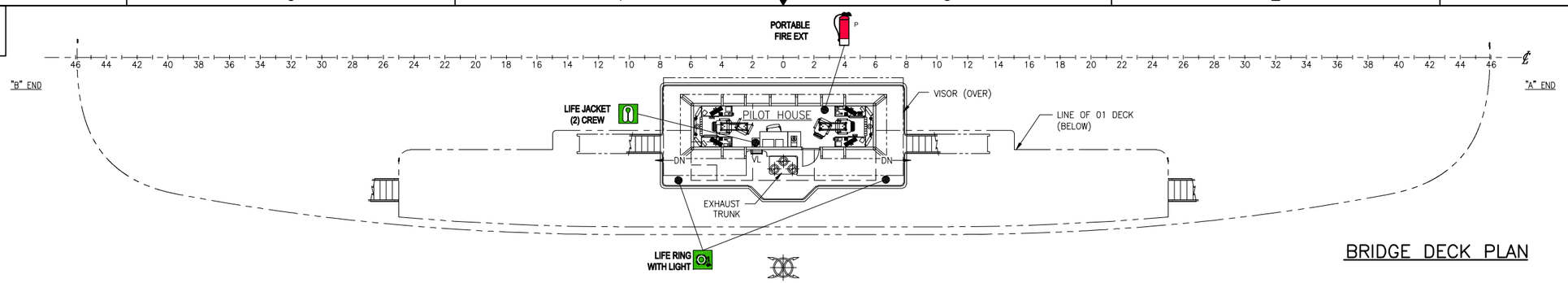
SIZE	DWG NO.	REV
D	18026-200-101-3	–

SCALE	FILE NAME	SHEET	OF
1/8"=1'-0"	18026-200-101-3-	1	4

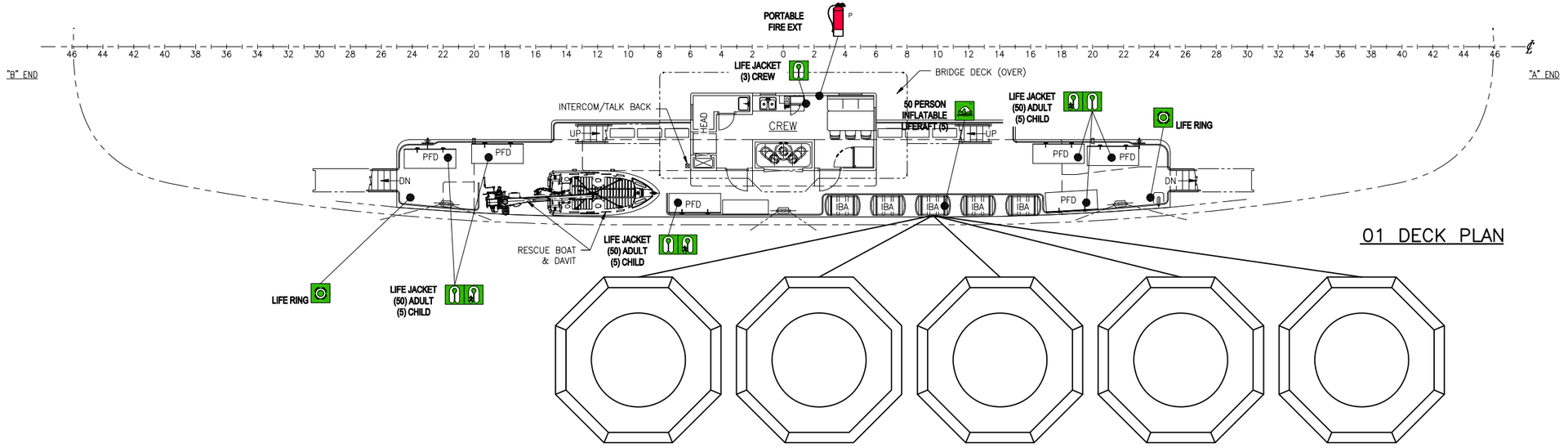
DWN	MOD	CKD	APVD	APVD DATE
MWR	NJB	NJB	KAJ	7/25/18

LISA A. JANKOWSKI
STATE OF WASHINGTON
35055
REGISTERED
PROFESSIONAL ENGINEER
7/25/2018

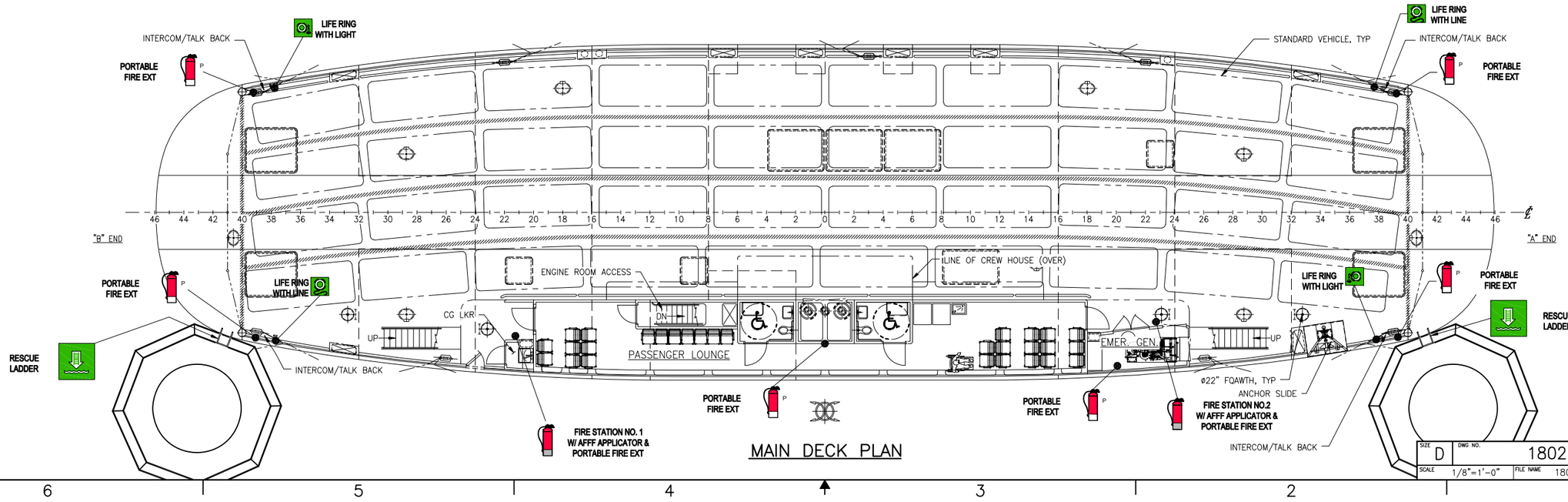
7/25/2018 3:58:01 PM



BRIDGE DECK PLAN



01 DECK PLAN

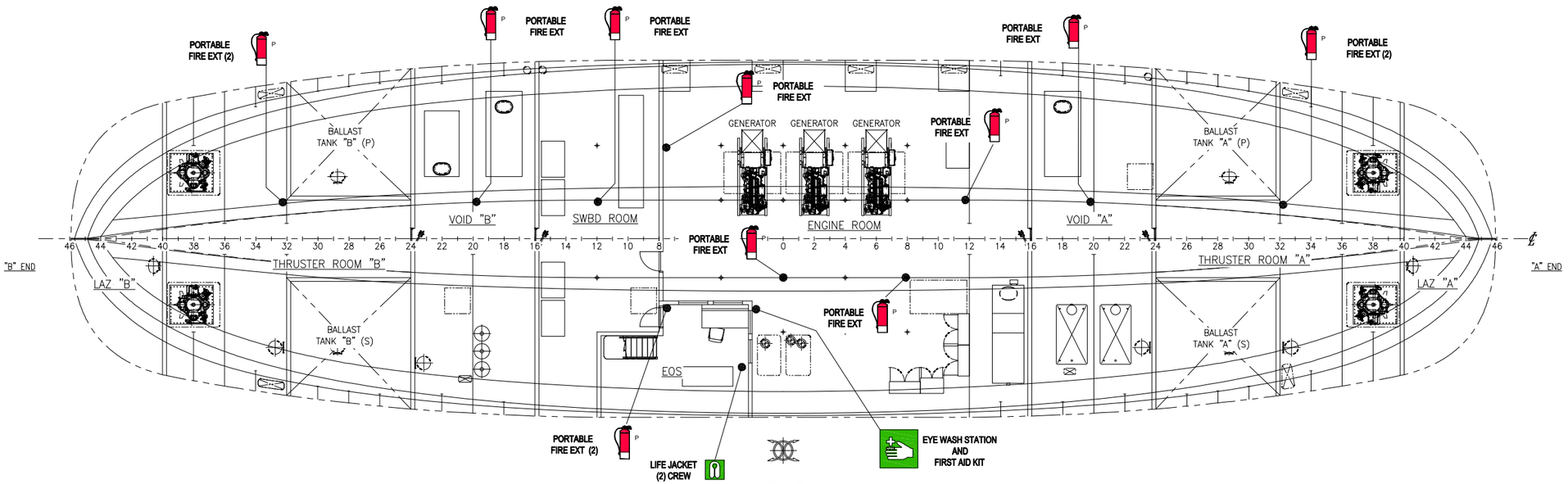


MAIN DECK PLAN

7/25/2018

SIZE	DWG NO.	REV
D	18026-200-101-3	–
SCALE 1/8"=1'-0"	FILE NAME 18026-200-101-3-	SHEET 2 OF 4

7/25/2018 3:58:13 PM

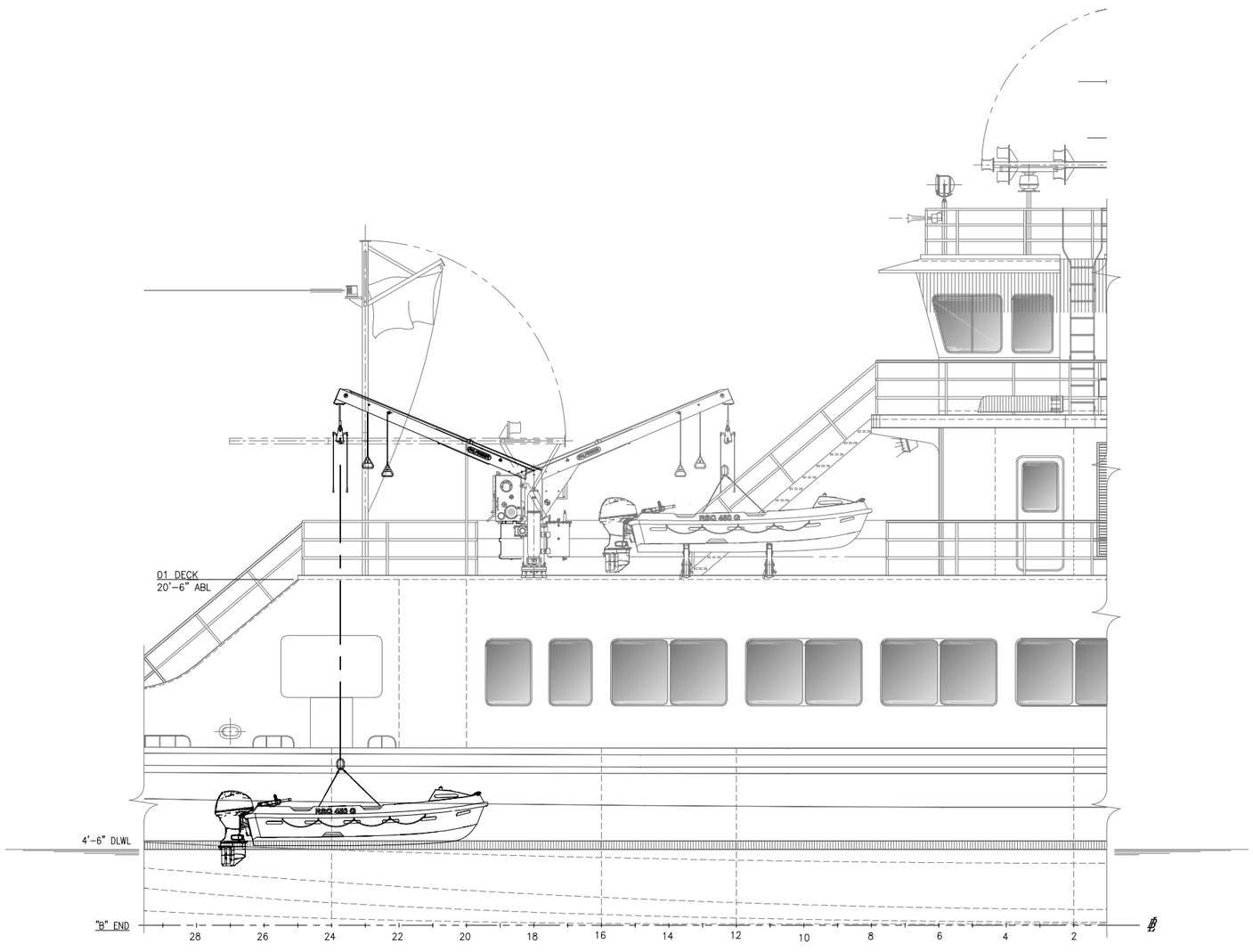


HOLD PLAN

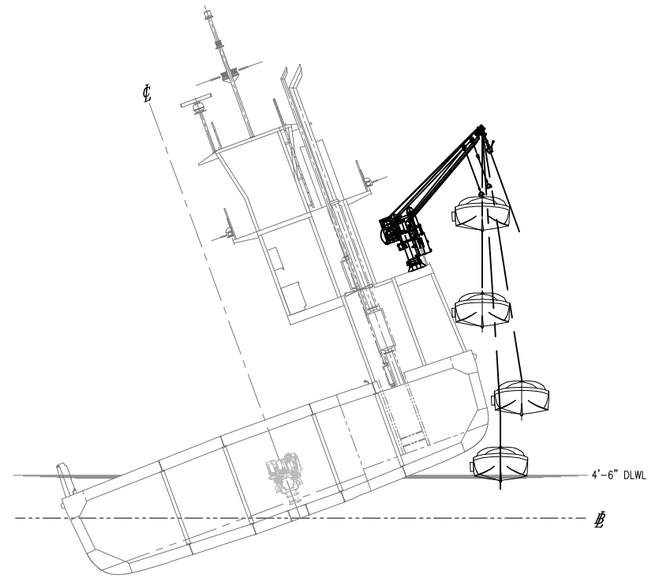
7/25/2018

SIZE	DWG NO.	REV
D	18026-200-101-3	–
SCALE 1/8"=1'-0"	FILE NAME 18026-200-101-3-	SHEET 3 OF 4

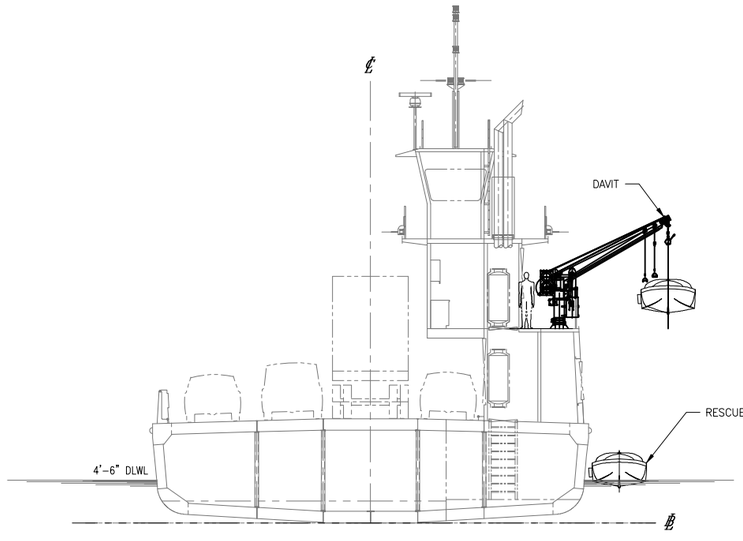
7/25/2018 3:58:33 PM



ELEVATION AT RESCUE BOAT
STARBOARD, "B" END
SCALE: 1/4"=1'-0"



SECTION OF VESSEL AT 20° HEEL
LOOKING FWD
SCALE: 1/8"=1'-0"



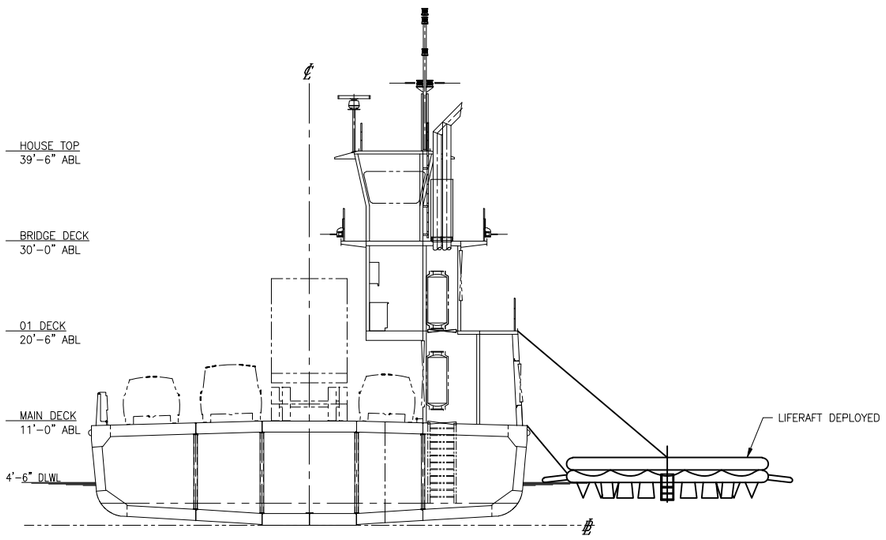
SECTION OF VESSEL AT EVEN KEEL
LOOKING FWD
SCALE: 1/8"=1'-0"

LOUIS A. JANKOWSKI
STATE OF WASHINGTON
25055
REGISTERED
PROFESSIONAL ENGINEER

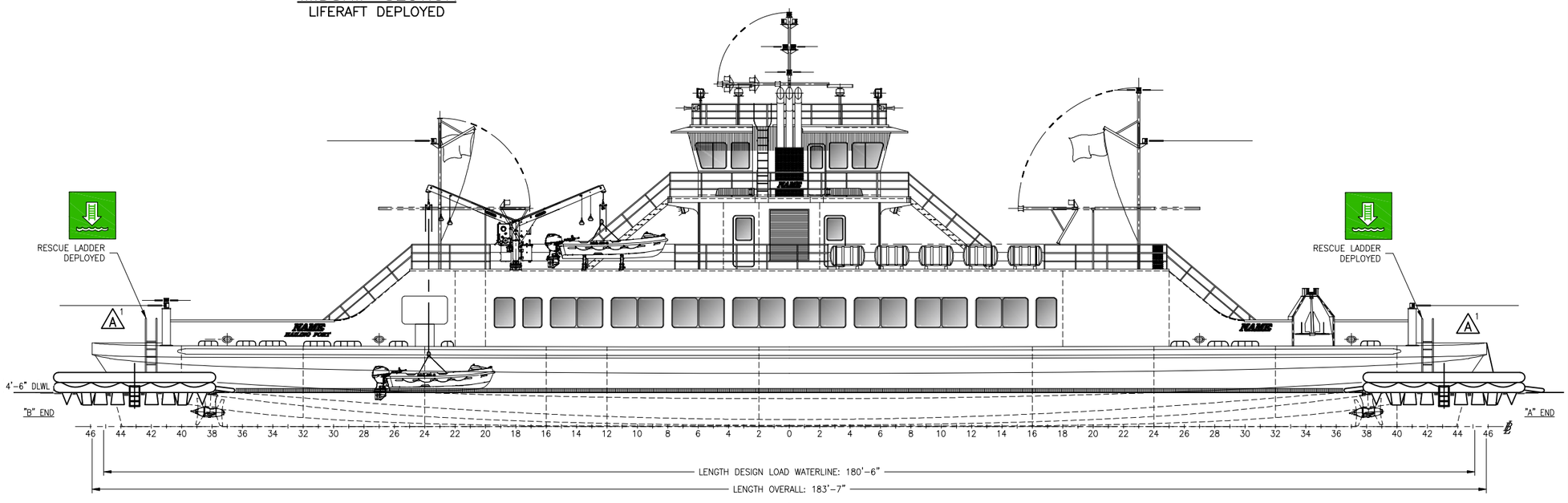
7/25/2018

SIZE	DWG NO.	REV
D	18026-200-101-3	–
SCALE AS NOTED	FILE NAME 18026-200-101-3-	SHEET 4 OF 4

7/25/2018 3:58:43 PM



MIDSHIP SECTION
LIFERAFT DEPLOYED



OUTBOARD PROFILE

EQUIPMENT LIST			
NO.	QTY	DESCRIPTION	COMMENT
1	1	RESCUE BOAT	
2	5	50 PERSON LIFERAFTS	
3	2	RESCUE LADDER	
4	2	LIFE RINGS	
5	2	LIFE RINGS	WITH LINE
6	4	LIFE RINGS	WITH LIGHT
7	300	LIFE JACKETS	ADULT
8	30	LIFE JACKETS	CHILD
9	7	LIFE JACKETS	CREW
10	23	PORTABLE FIRE EXTINGUISHER	TYPE VARIES
11	2	FIRE STATION	
12	1	EYE WASH STATION	

REVISION HISTORY					
REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	SHT 1 SHT 2	1. REVISED LIFE BOAT AND RESCUE LADDER LOCATIONS	KAJ	08/03/18	KAJ

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.

VESSEL PARTICULARS

LENGTH OVERALL:	183'-7"
LENGTH DESIGN LOAD WATERLINE:	178'-3/8"
BEAM, MOLDED:	46'-0"
BEAM OVER GUARDS:	46'-10"
DEPTH AT SIDE:	10'-6"
DRAFT AT DLWL:	4'-6"
FREEBOARD AT SIDE:	6'-0"
TOTAL PASSENGER CAPACITY:	300 MAX.
VEHICLE CAPACITY:	40 SV

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2. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS
3. 46 CFR SUBCHAPTER H

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD WANNS HARBOR, NC 27953

LOUIS A. JANKOWSKI
55055
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: LIFE SAVING EQUIPMENT ARRANGEMENT

SIZE	DWG NO.	REV
D	18026-200-101-3	A

SCALE	FILE NAME	SHEET	OF
1/8"=1'-0"	18026-200-101-3-	1	4

DWN	MOD	CKD	APVD	APVD DATE
MWR	NJB	NJB	KAJ	7/25/18

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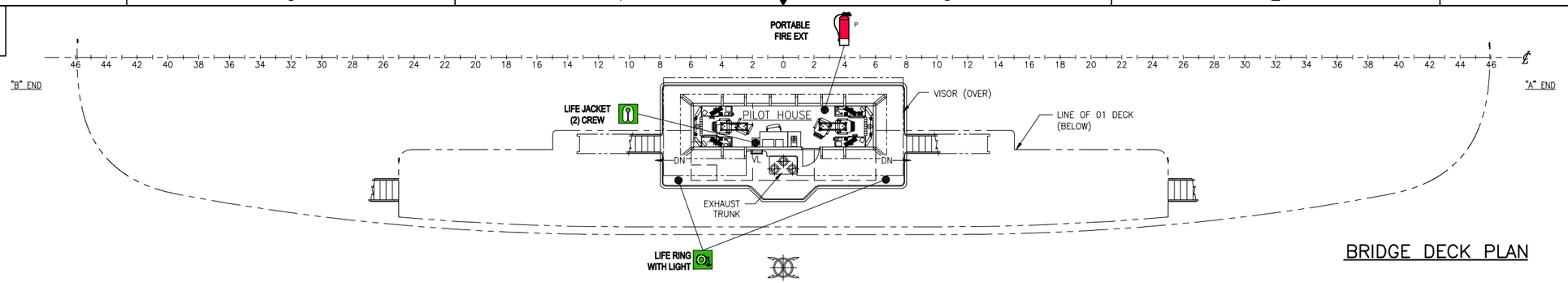
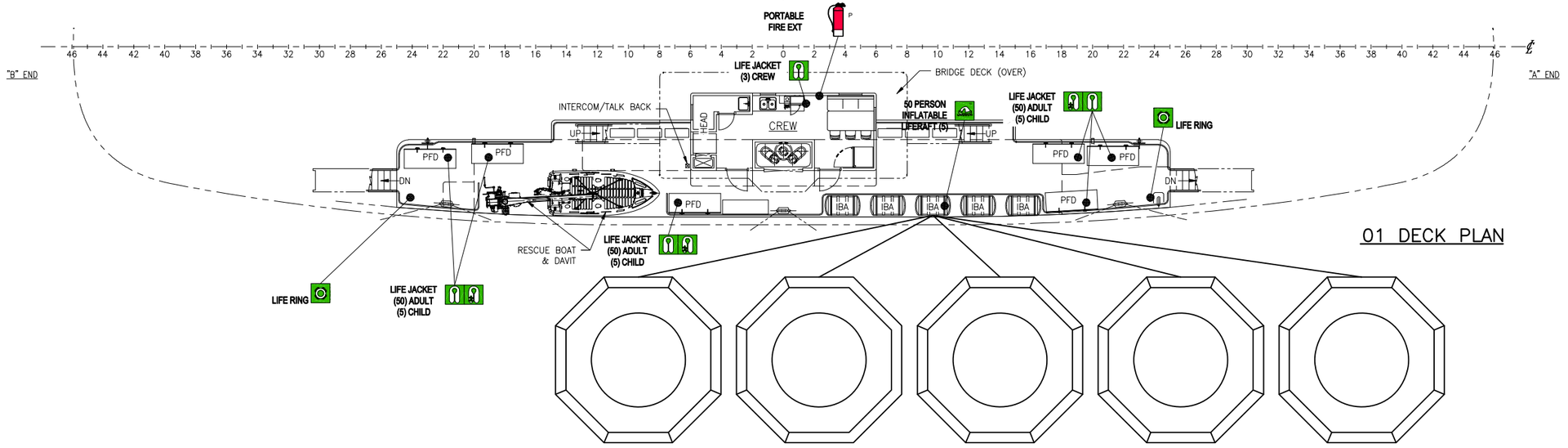
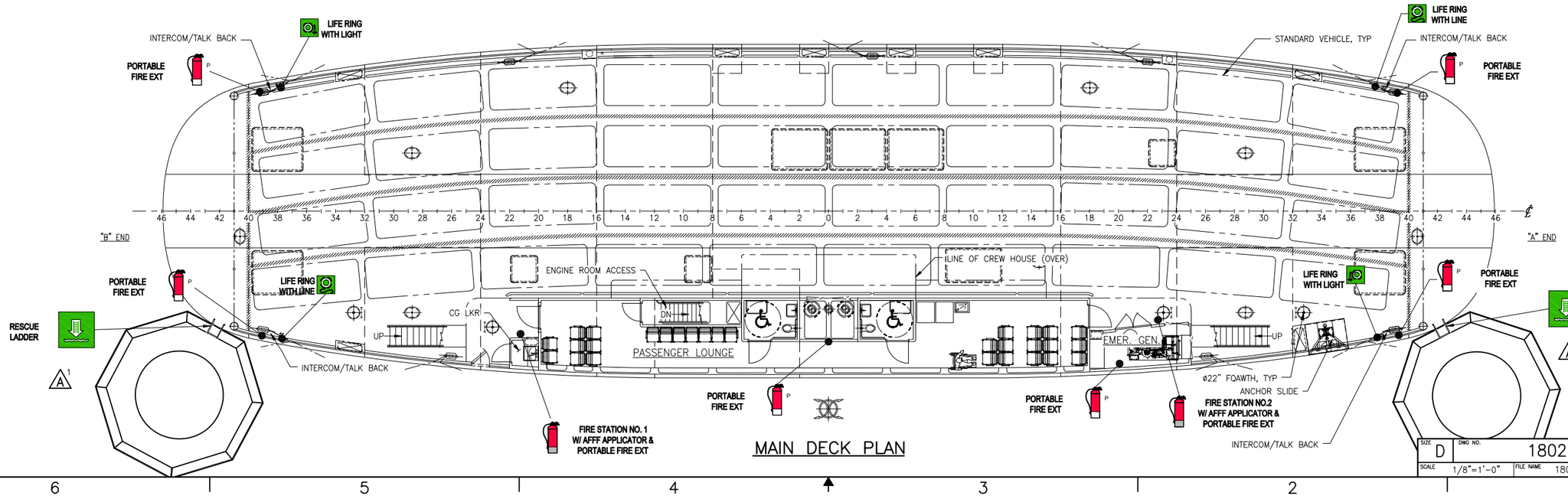


BRIDGE DECK PLAN



01 DECK PLAN

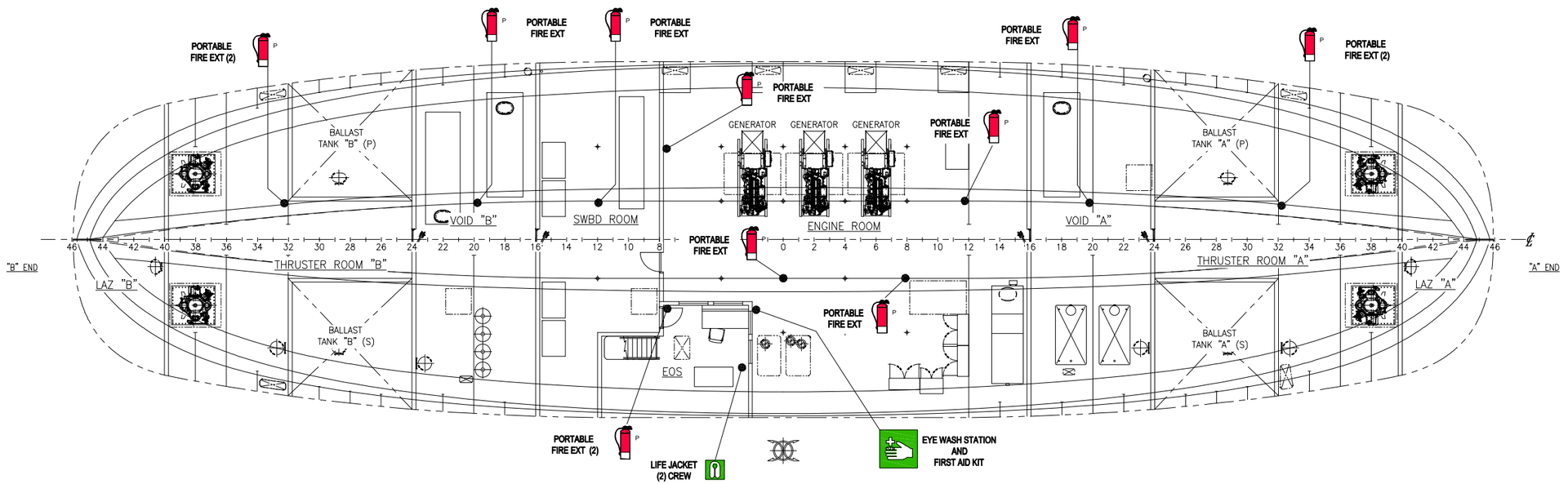


MAIN DECK PLAN

LEWIS A. JANKOFF
STATE OF WASHINGTON
55055
REGISTERED PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-3	A
SCALE 1/8"=1'-0"	FILE NAME 18026-200-101-3-	SHEET 2 OF 4

8/3/2016 3:10:15 PM



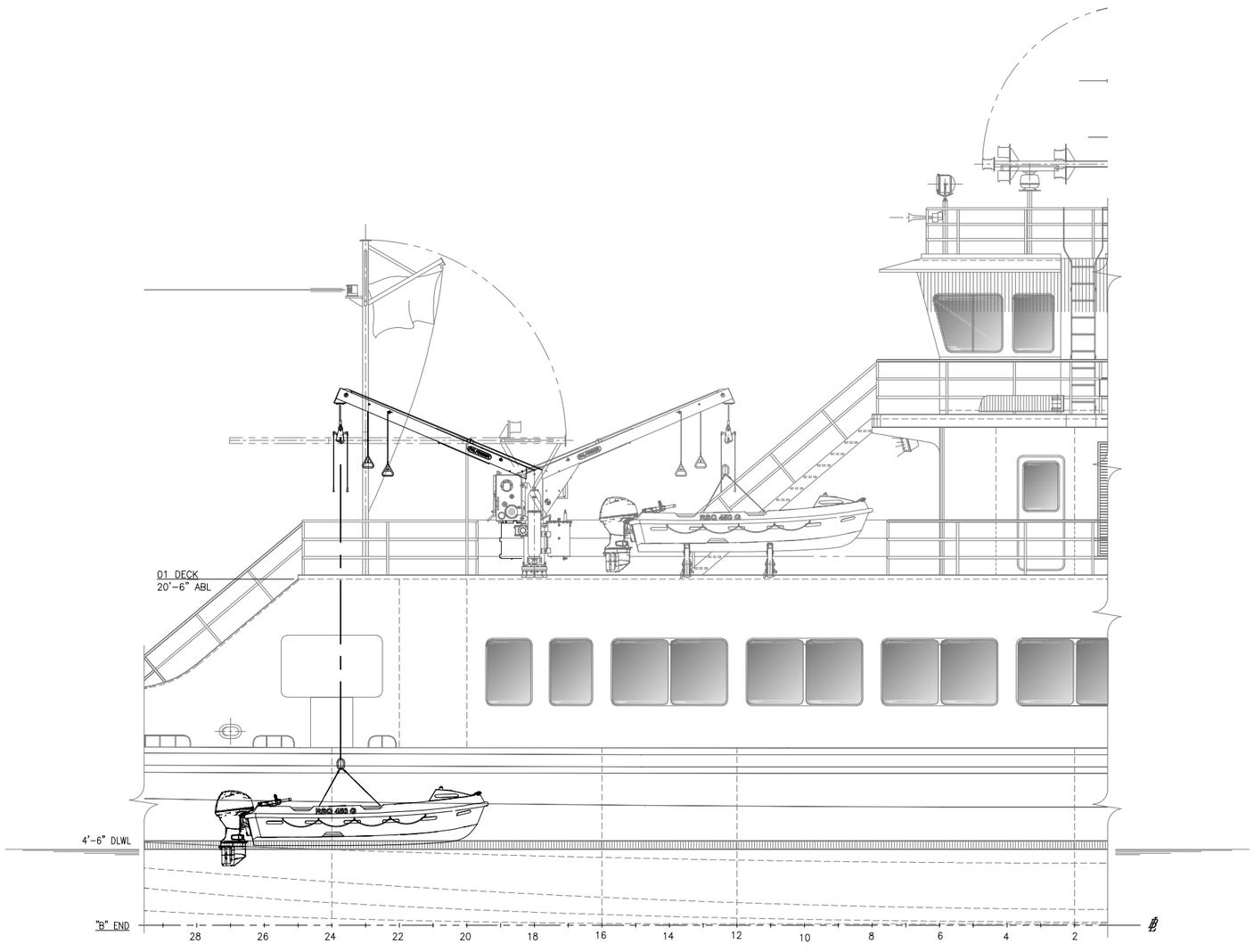
HOLD PLAN

LEWIS A. JANKOWSKI
STATE OF WASHINGTON
55055
REGISTERED
PROFESSIONAL ENGINEER

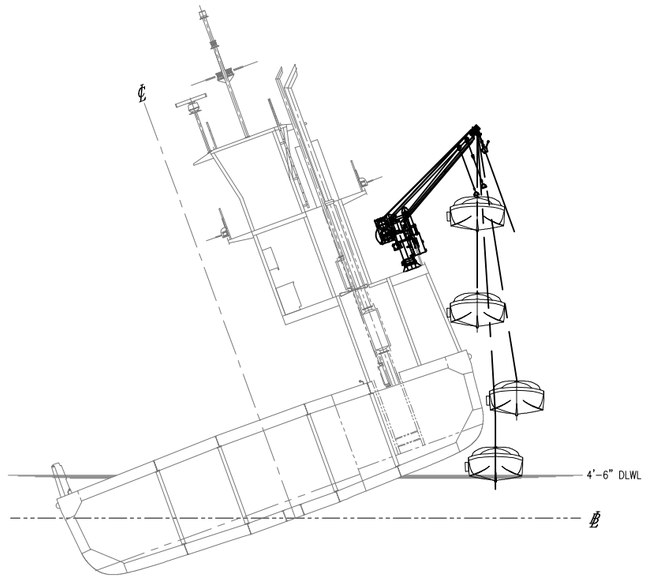
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-3	A
SCALE 1/8"=1'-0"	FILE NAME 18026-200-101-3-	SHEET 3 OF 4

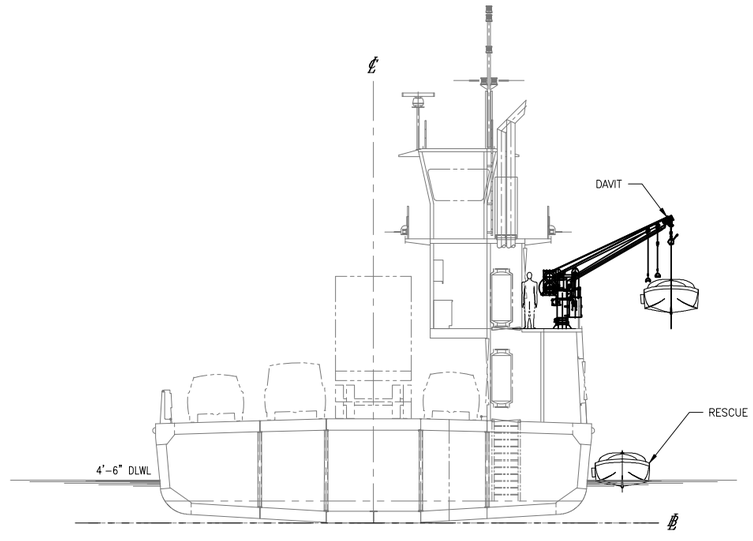
8/3/2018 3:10:34 PM



ELEVATION AT RESCUE BOAT
STARBOARD, "B" END
SCALE: 1/4"=1'-0"



SECTION OF VESSEL AT 20° HEEL
LOOKING FWD
SCALE: 1/8"=1'-0"

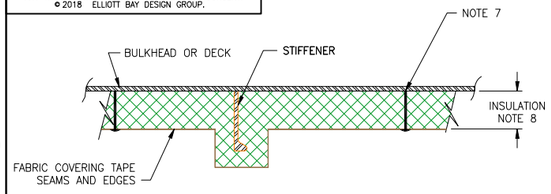


SECTION OF VESSEL AT EVEN KEEL
LOOKING FWD
SCALE: 1/8"=1'-0"

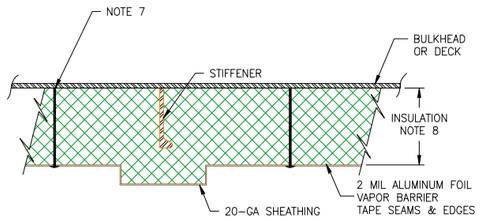
LEWIS A. JANKOWSKI
STATE OF WASHINGTON
55055
REGISTERED PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-3	A
SCALE AS NOTED	FILE NAME 18026-200-101-3-	SHEET 4 OF 4

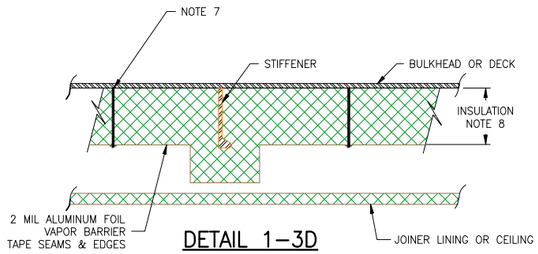
8/3/2018 3:10:45 PM



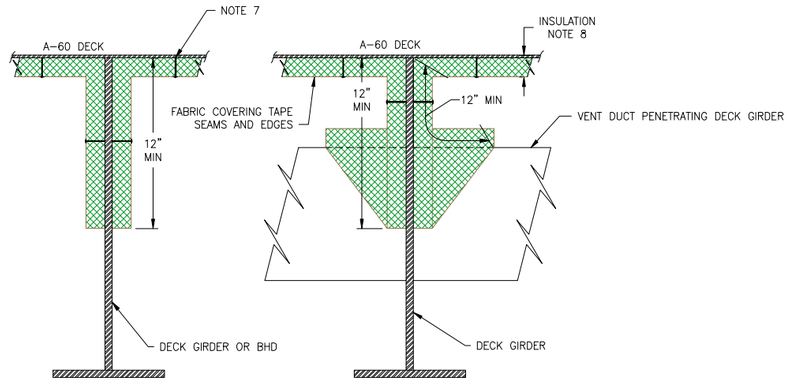
DETAIL 1–6D
BULKHEAD/DECK INSULATION
W/FABRIC COVERING
NOTE 6
SCALE: 3"=1'–0"



DETAIL 1–5D
BULKHEAD/DECK INSULATION
W/SHEATHING
NOTE 3
SCALE: 3"=1'–0"



DETAIL 1–3D
BULKHEAD/DECK INSULATION
W/JOINER LINING OR BULKHEAD PANEL
SCALE: 3"=1'–0"



DETAIL 1–6B
ENGINE ROOM
DECKHEAD INSULATION
NOTE 6
SCALE: 1 1/2"=1'–0"

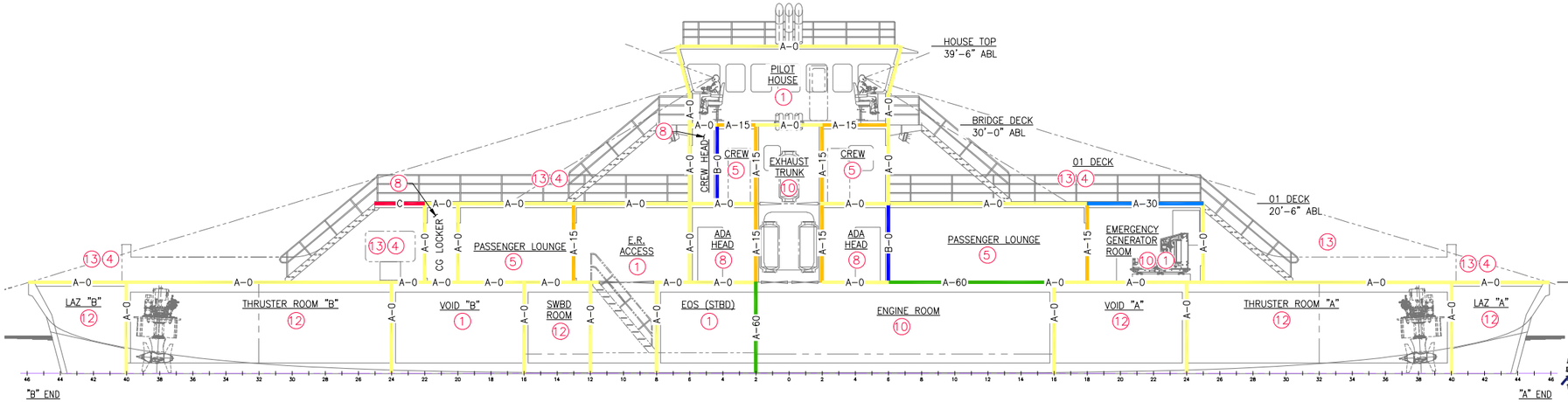
USCG DESIGNATIONS

CONTROL STATIONS	(1)
STAIRWAYS AND ELEVATOR ENCLOSURES	(2)
CORRIDORS	(3)
LIFEBOAT EMBARKATION OR LOWERING STATIONS	(4)
STATEROOMS AND ALL PUBLIC SPACES WITH INCOMBUSTIBLE VENEERS AND TRIM AND FIRE RESISTANT FURNISHINGS	(5)
STATEROOMS AND PUBLIC SPACES OF 500 SQUARE FEET OR LESS WITH COMBUSTIBLE FURNISHINGS, AND ISOLATED STOREROOMS	(6)
PUBLIC SPACES OVER 500 SQUARE FEET WITH COMBUSTIBLE FURNISHINGS	(7)
WASHROOMS, TOILET SPACES, AND ISOLATED PANTRIES WITH INCOMBUSTIBLE FITTINGS	(8)
GALLEYS. MAIN PANTRIES, STOREROOMS, AND WORKSHOPS	(9)
MACHINERY SPACES	(10)
DRY CARGO SPACES	(11)
FUEL AND WATER TANKS AND VOIDS	(12)
OPEN DECKS AND ENCLOSED PROMENADES (NOT SAFETY AREAS)	(13)

LEGEND

A–0 SEE NOTE 2
A–15
A–30
A–60
B–0
B–15
C

USCG DESIGNATION (12)



INBOARD PROFILE
SCALE: 1/8" = 1'–0"

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. WHERE THE FIRE CONTROL DECK TYPE IS NOT INDICATED, THESE DECKS SHALL BE CONSIDERED A–0 DECKS
3. INSTALL 20–GA ALUMINUM SHEATHING OVER ALL BULKHEAD AND DECKHEAD INSULATION IN ENGINE ROOM AND UPTAKE SPACES.
4. SHIPYARD MAY PROPOSE ALTERNATIVE INSULATION METHODS, PROVIDED THEY MEET USCG REQUIREMENTS AND ARE APPROVED BY THE OWNER'S REPRESENTATIVE.
5. FIRE LOAD CALCULATIONS ARE TO BE SUBMITTED TO THE USCG IN ACCORDANCE WITH REFERENCES 3 AND 4.
6. INSTALL FABRIC COVERING OVER INSULATION IN VOIDS AND ELECTRIC DISTRIBUTION SPACES AND ALL OTHER SPACES SUBJECT TO USE AND NOT OTHERWISE COVERED BY SHEATHING OR JOINERY.
7. INSTALL WELD–ON STEEL PINS IN ACCORDANCE WITH INSULATION MANUFACTURER'S USCG APPROVED DETAILS. SECURE INSULATION WITH SPEED CLIP RETAINERS AND ALUMINUM FINISH CAPS AS APPROPRIATE FOR INSULATION AND LININGS APPLIED.
8. INSULATION DENSITY AND THICKNESS TO SUIT FIRE ZONE REQUIREMENTS IN ACCORDANCE WITH REFERENCES 3 AND 4.

REFERENCES

1. 18026–200–832–1 TECHNICAL SPECIFICATION
2. 18026–200–101–0 PROFILES & ARRANGEMENTS
3. 46 CFR SUBCHAPTER H
4. NVIC 9–97 CH. 1

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: FIRE ZONE PLAN

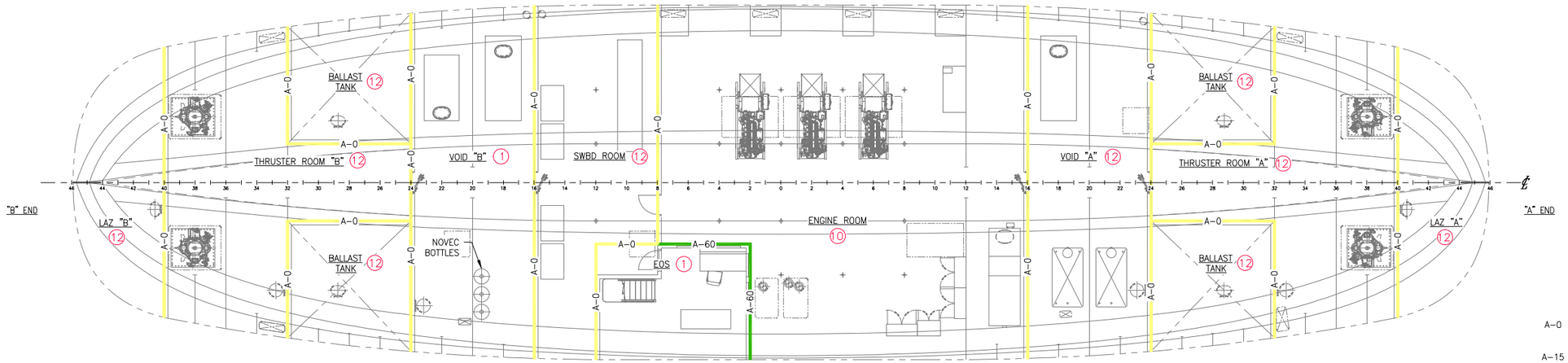
SIZE	DWG NO.	REV
D	18026–200–101–7	–

SCALE	FILE NAME	SHEET	OF
AS NOTED	18026–200–101–7–	1	3

DWN	MOD	CKD	APVD	APVD DATE
ZDL	NJB	NJB	KAJ	7/25/18

JOSHUA A. JANKOWSKI
STATE OF WASHINGTON
25055
REGISTERED PROFESSIONAL ENGINEER
7/25/2018

7/25/2018 3:59:58 PM

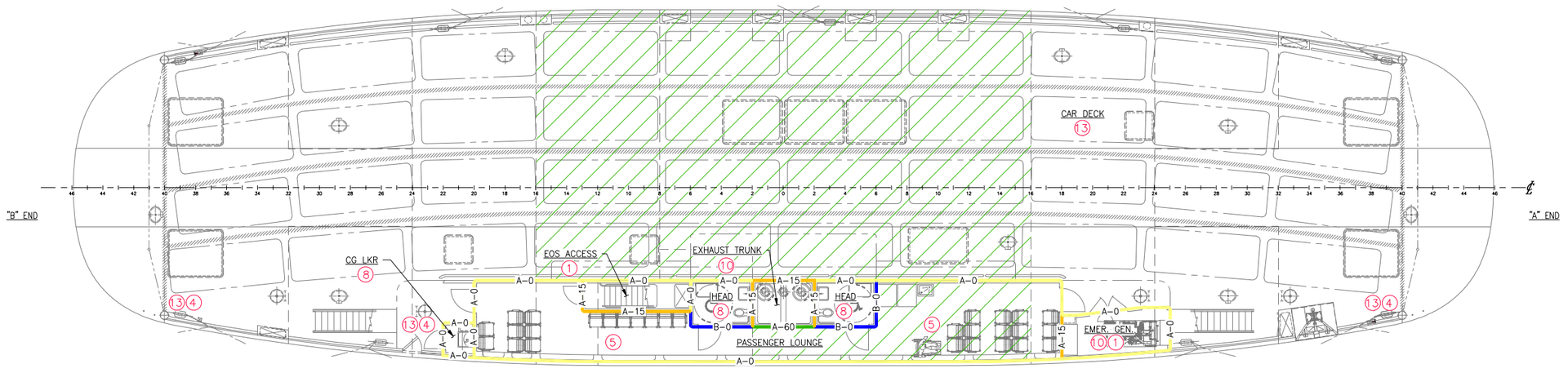


HOLD PLAN

LEGEND

A-0	SEE NOTE 2
A-15	
A-30	
A-60	
B-0	
B-15	
C	

USCG DESIGNATION (12)



MAIN DECK PLAN

7/25/2018

SIZE	DWG NO.	REV
D	18026-200-101-7	–
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-7-	SHEET 2 OF 3

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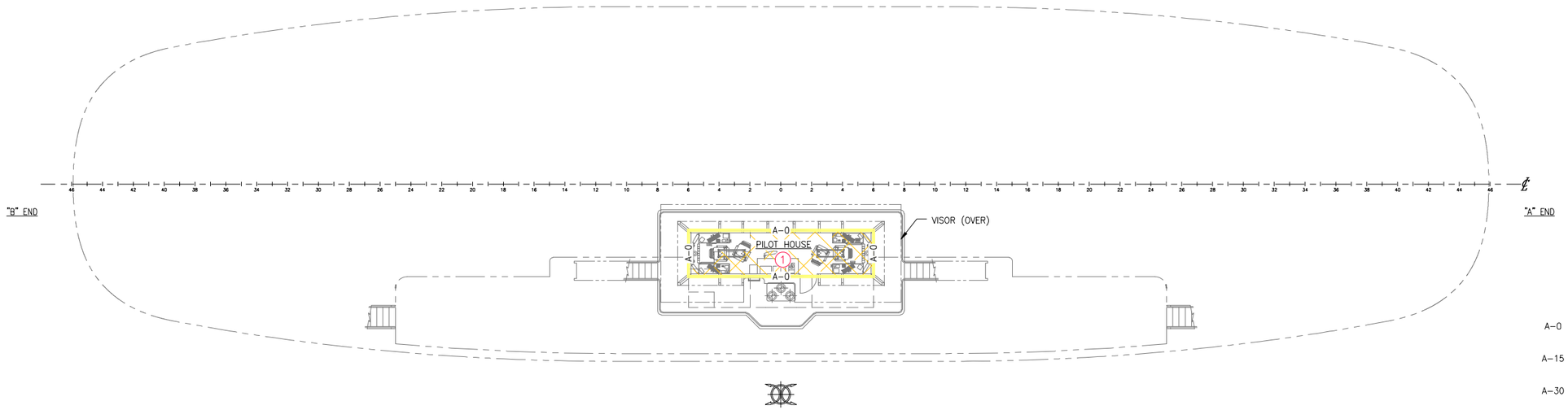
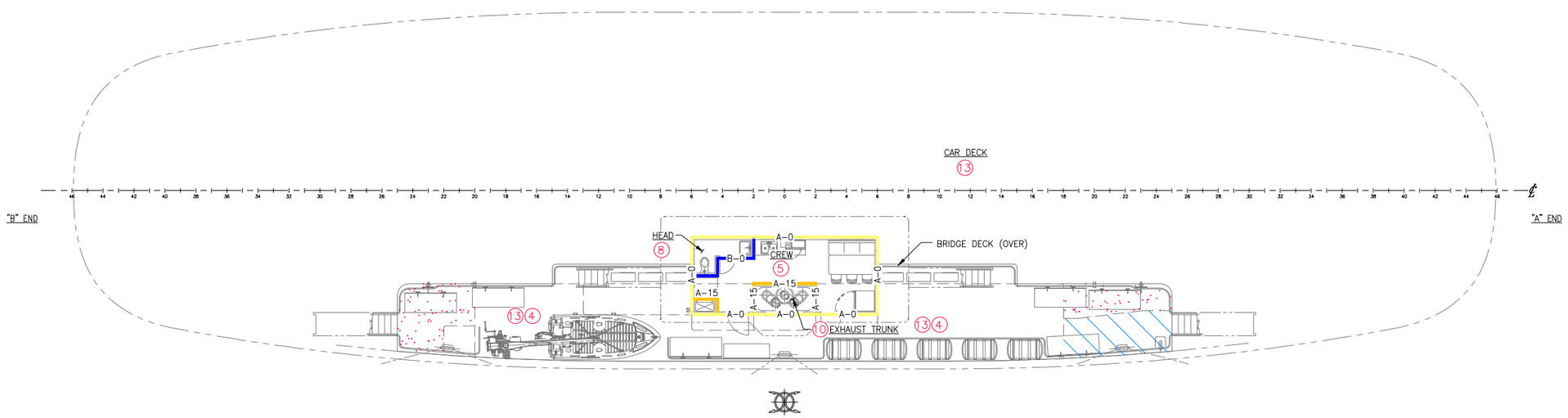


BRIDGE DECK PLAN

LEGEND

A-0	SEE NOTE 2
A-15	
A-30	
A-60	
B-0	
B-15	
C	

USCG DESIGNATION (12)

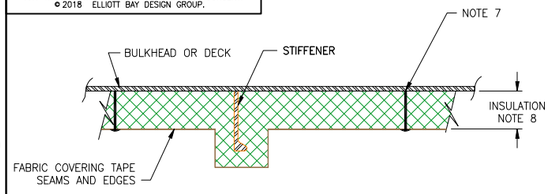


01 DECK PLAN

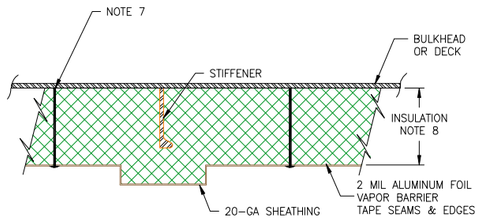
7/25/2018

SIZE	DWG NO.	REV
D	18026-200-101-7	–
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-7-	SHEET 3 OF 3

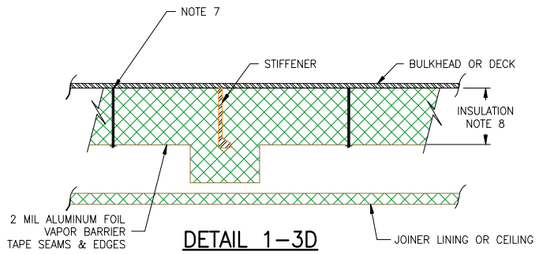
7/25/2018 4:00:16 PM



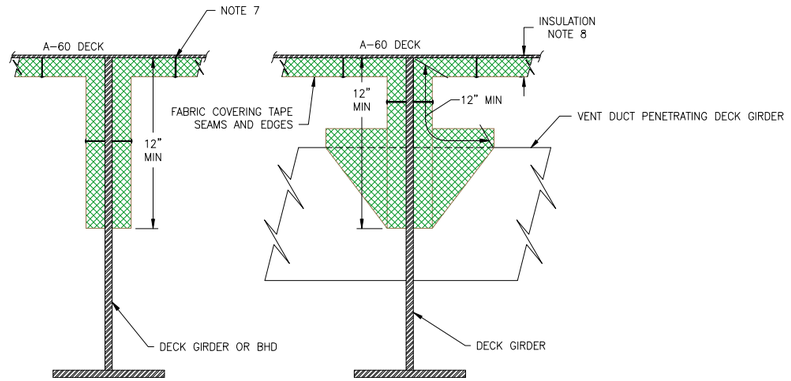
DETAIL 1–6D
BULKHEAD/DECK INSULATION
W/FABRIC COVERING
NOTE 6
SCALE: 3"=1'–0"



DETAIL 1–5D
BULKHEAD/DECK INSULATION
W/SHEATHING
NOTE 3
SCALE: 3"=1'–0"



DETAIL 1–3D
BULKHEAD/DECK INSULATION
W/JOINER LINING OR BULKHEAD PANEL
SCALE: 3"=1'–0"



DETAIL 1–6B
ENGINE ROOM
DECKHEAD INSULATION
NOTE 6
SCALE: 1 1/2"=1'–0"

USCG DESIGNATIONS

CONTROL STATIONS	(1)
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CORRIDORS	(3)
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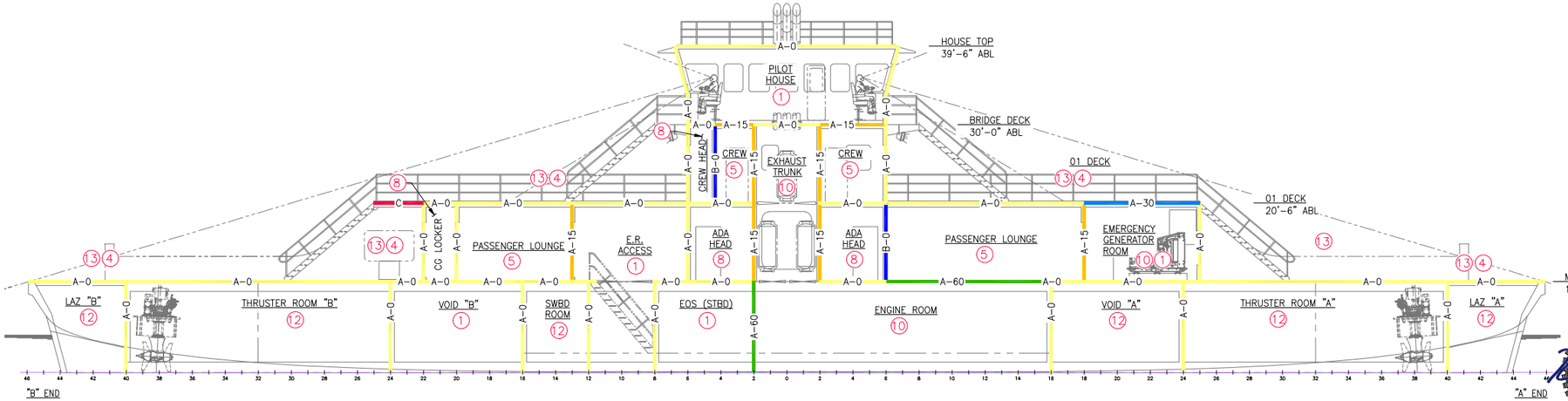
FUEL AND WATER TANKS AND VOIDS	(12)
OPEN DECKS AND ENCLOSED PROMENADES (NOT SAFETY AREAS)	(13)

LEGEND

- A–0 SEE NOTE 2
- A–15
- A–30
- A–60
- B–0
- B–15
- C

USCG DESIGNATION (12)



INBOARD PROFILE
SCALE: 1/8" = 1'–0"

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	2–4C	1. REVISED EOS BOUNDARY	KAJ	08/03/18	KAJ

GENERAL NOTES

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2. 18026–200–101–0 PROFILES & ARRANGEMENTS
3. 46 CFR SUBCHAPTER H
4. NVIC 9–97 CH. 1

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Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: FIRE ZONE PLAN

SIZE	DWG NO.	REV
D	18026–200–101–7	A

SCALE	FILE NAME	SHEET	OF
AS NOTED	18026–200–101–7–	1	3

DWN	MOD	CKD	APVD	APVD DATE
ZDL	NJB	NJB	KAJ	7/25/18

LOUIS A. JANKOWSKI
STATE OF WASHINGTON
55055
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

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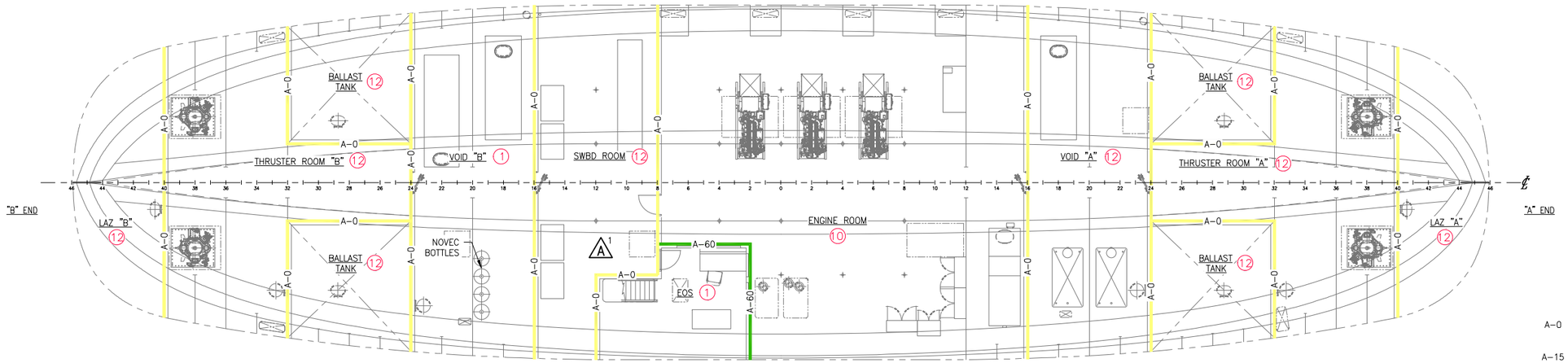
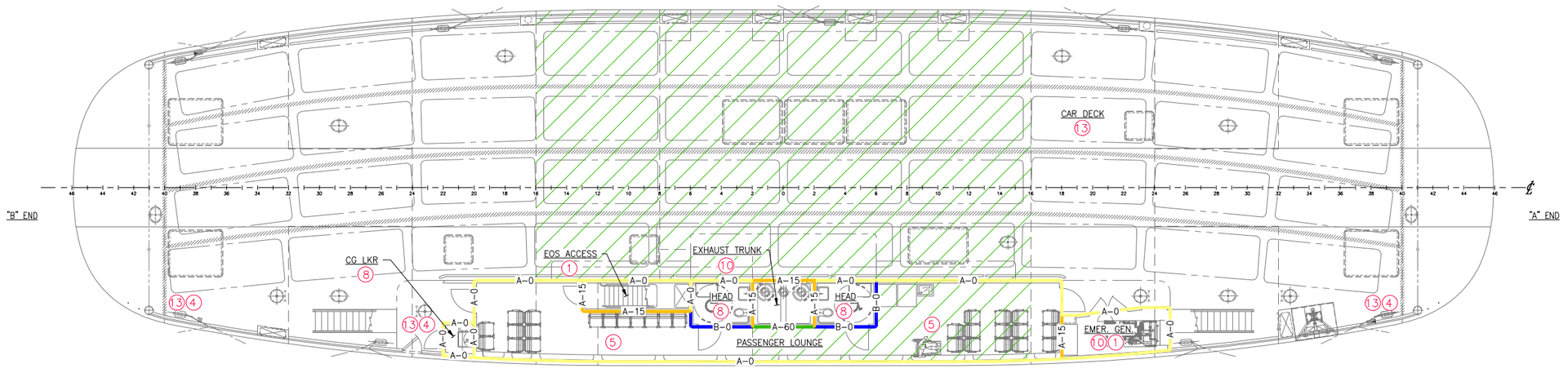


HOLD PLAN

LEGEND

A-0	SEE NOTE 2
A-15	
A-30	
A-60	
B-0	
B-15	
C	

USCG DESIGNATION 12

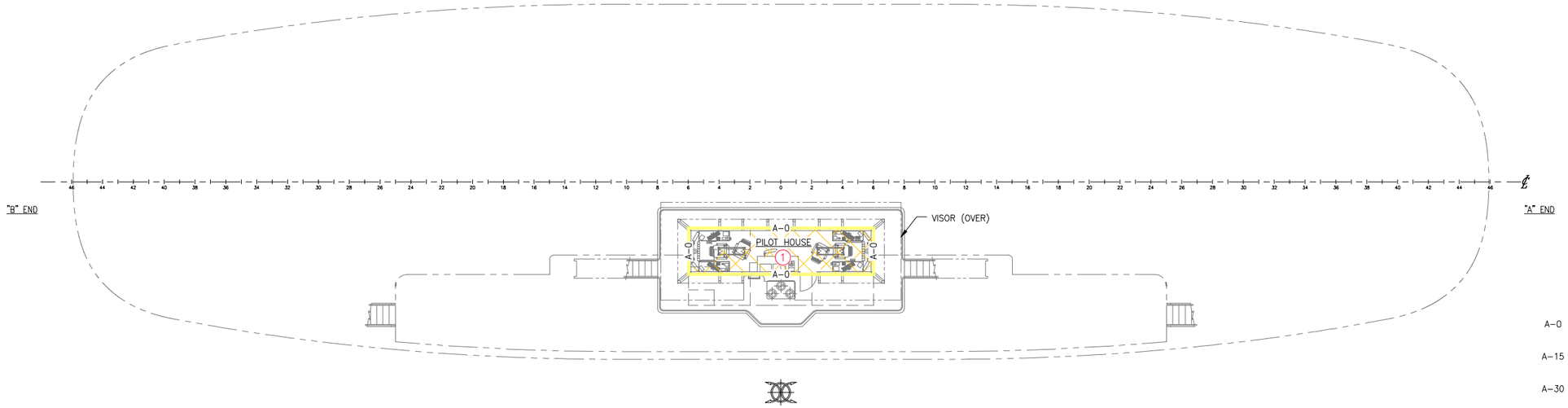


MAIN DECK PLAN

8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-7	A
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-7-	SHEET 2 OF 3

8/3/2018 2:56:07 PM

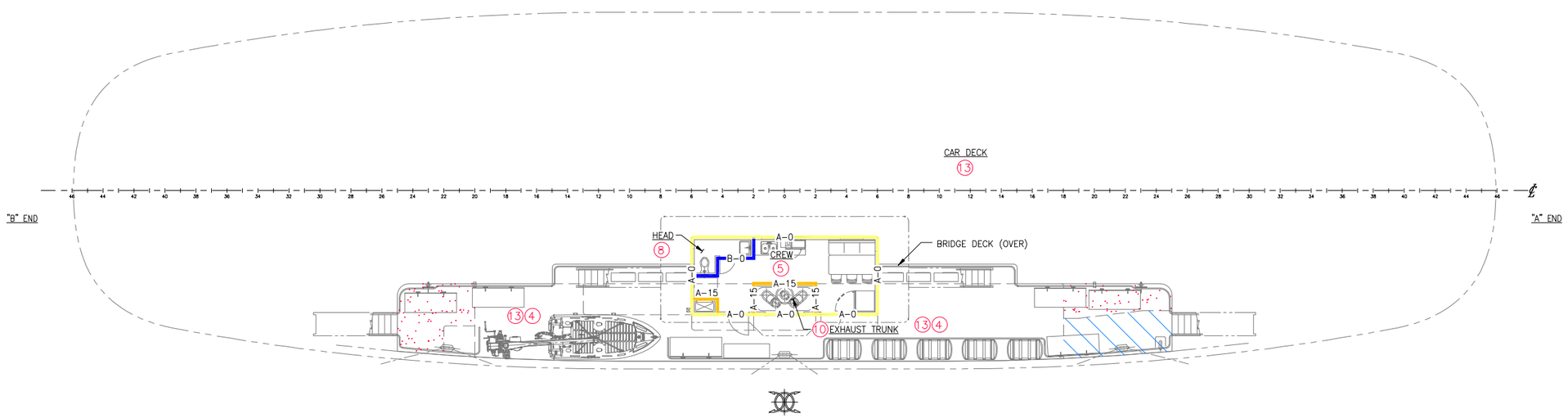


BRIDGE DECK PLAN

LEGEND

A-0	SEE NOTE 2
A-15	
A-30	
A-60	
B-0	
B-15	
C	

USCG DESIGNATION 12

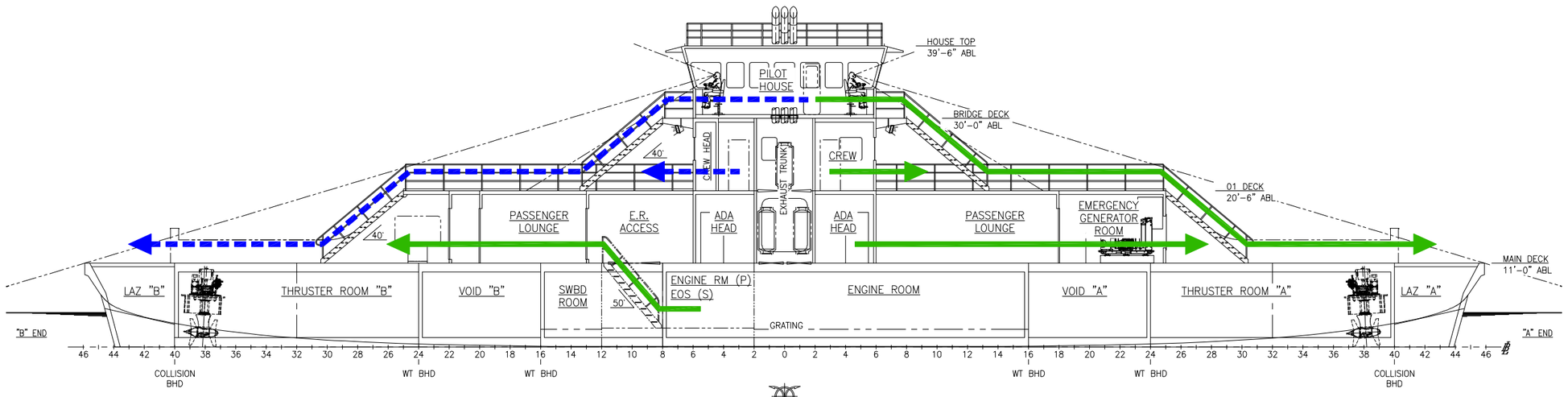


01 DECK PLAN

DENIS A. JANKOWIAK
STATE OF WASHINGTON
55055
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-7	A
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-7-	SHEET 3 OF 3

8/3/2018 2:56:21 PM



INBOARD PROFILE

PRIMARY MEANS OF ESCAPE

SECONDARY MEANS OF ESCAPE

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. OWNER TO SUPPLY A CERTIFICATE OF ALTERNATE COMPLIANCE APPROVED BY THE UNITED STATES COAST GUARD WHICH ALLOWS FOR THE USE OF HINGED, DOGGED WATERTIGHT DOORS BELOW THE BULKHEAD DECK IN WAY OF ESCAPE ROUTES.

VESSEL PARTICULARS

LENGTH OVERALL:	183'-7"
LENGTH DESIGN LOAD WATERLINE:	178'-0 3/8"
BEAM, MOLDED:	46'-0"
BEAM OVER GUARDS:	46'-10"
DEPTH AT SIDE:	10'-6"
DRAFT AT DLWL:	4'-6"
FREEBOARD AT SIDE:	6'-0"
TOTAL PASSENGER CAPACITY:	300 MAX.
VEHICLE CAPACITY:	40 SV

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-101-0 PROFILES AND DECK ARRANGEMENTS
3. 46 CFR SUBCHAPTER H
4. NVIC 9-97 CH.1

NORTH CAROLINA FERRY SYSTEM
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Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: EMERGENCY EVACUATION PLAN

SIZE	DWG NO.	REV
D	18026-200-101-8	–

SCALE	FILE NAME	SHEET	OF
1/8"=1'-0"	18026-200-101-8-	1	3

DWN	MOD	CKD	APVD	APVD DATE
MWR	NJB	NJB	KAJ	7/25/18

MELISSA A. JANKOWSKI
STATE OF WASHINGTON
20055
REGISTERED
PROFESSIONAL ENGINEER
7/25/2018

7/25/2018 4:32:48 PM

GENERAL NOTES

HOLD

THRUSTER ROOM A & B (NORMALLY UNOCCUPIED)
PRIMARY: W.T. DOORS TO STAIRS
SECONDARY: V.L. TO ESCAPE HATCH IN MAIN DECK

VOID A & B (NORMALLY UNOCCUPIED)
PRIMARY: W.T. DOORS TO STAIR
SECONDARY: V.L. TO ESCAPE HATCH IN MAIN DECK

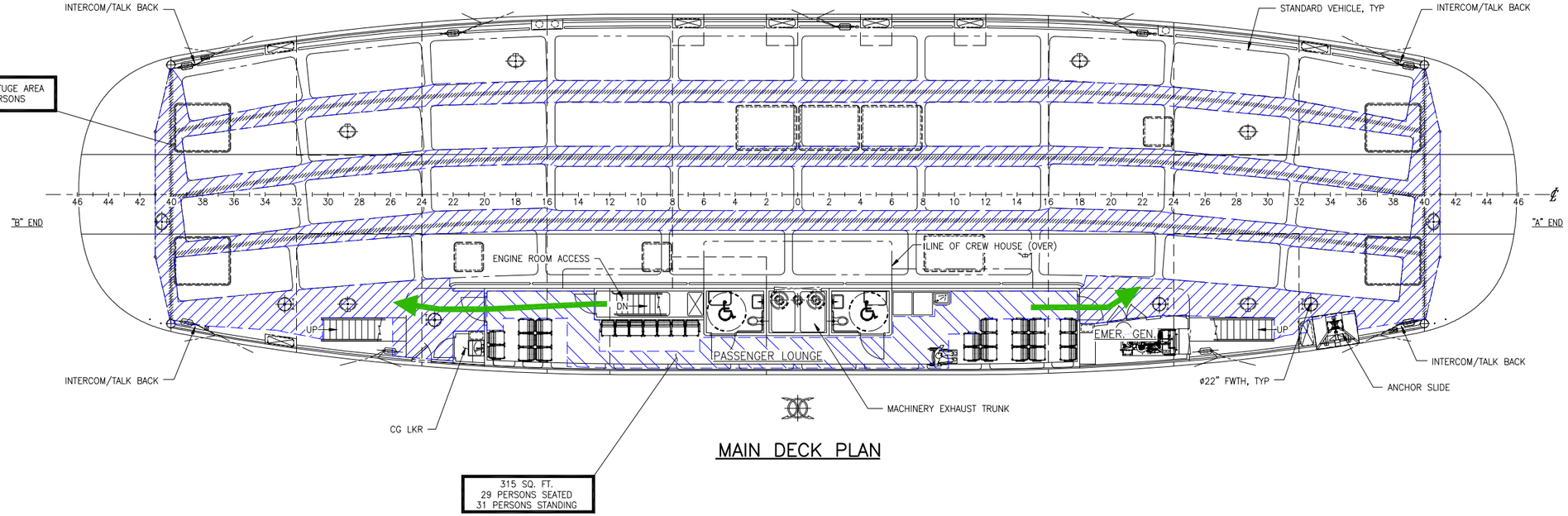
ENGINE ROOM (NORMALLY OCCUPIED)
PRIMARY: TO SWBD ROOM, UP STAIR
SECONDARY: W.T. DOOR TO VOID A, UP V.L. TO MAIN DECK

SWITCHBOARD ROOM & EOS (NORMALLY OCCUPIED)
PRIMARY: UP STAIR
SECONDARY: W.T. DOORS TO VOID B, UP V.L. TO MAIN DECK

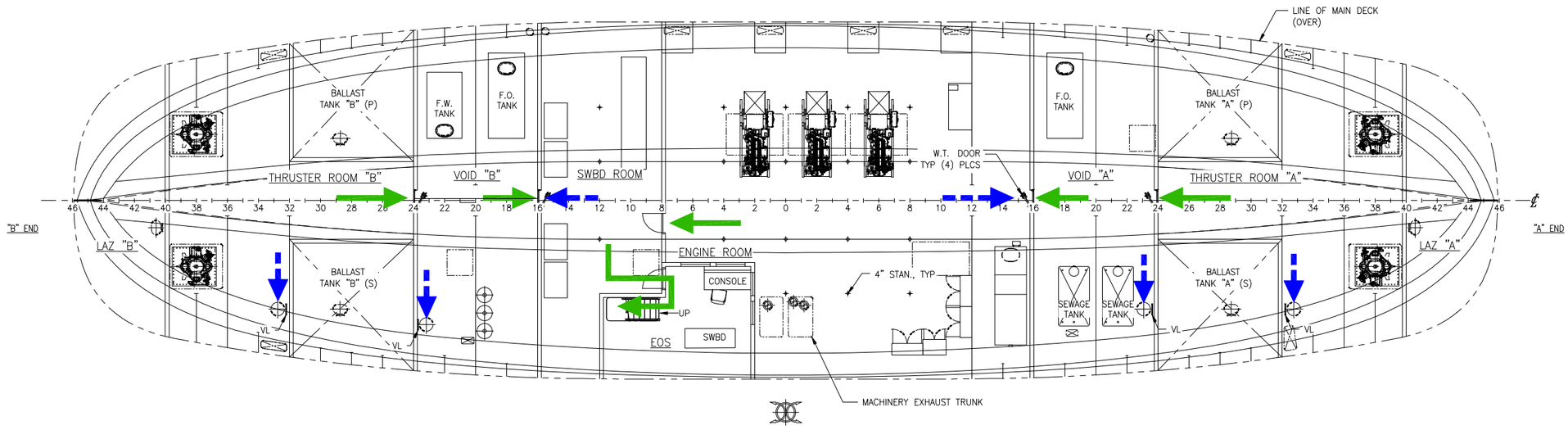
MAIN DECK

PASSENGER LOUNGE
PRIMARY: THROUGH DOORS TO ASSEMBLY AREAS ON MAIN DECK

ASSEMBLY AREAS
MAIN DECK OFFERS >1500 SQ FT PROVIDING REFUGE FOR MORE THAN 300 PASSENGERS.



MAIN DECK PLAN



HOLD PLAN

PRIMARY MEANS OF ESCAPE
SECONDARY MEANS OF ESCAPE
ASSEMBLY AREAS
PASSENGER STANDING

LOUIS A. JANKOWSKI — STATE OF WASHINGTON — 25055 — REGISTERED PROFESSIONAL ENGINEER

7/25/2018

SIZE	DWG NO.	REV
D	18026-200-101-8	–
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-8-	SHEET 2 OF 3

7/25/2018 4:32:57 PM

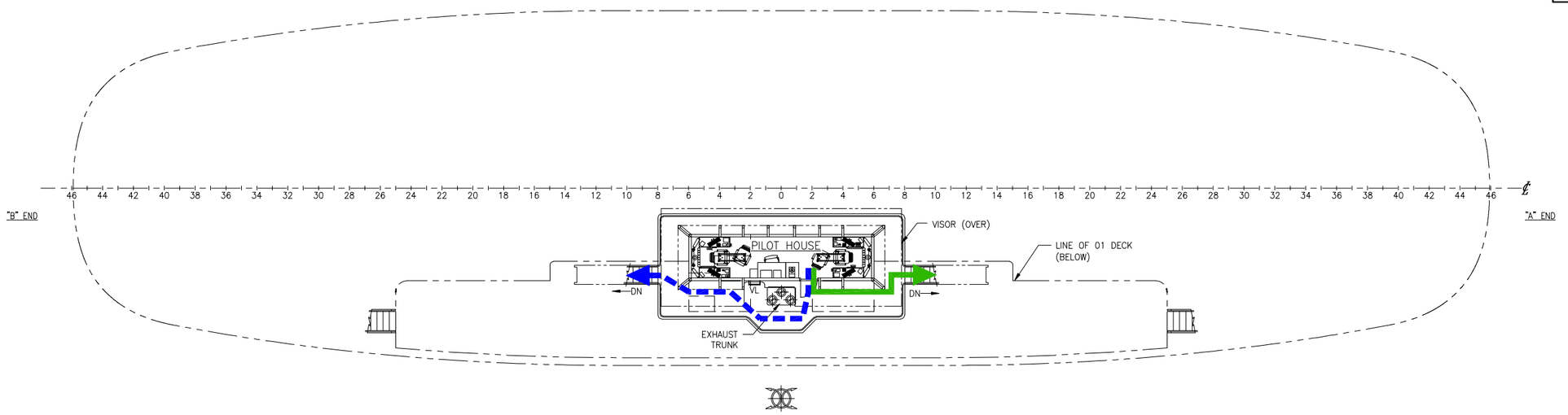
GENERAL NOTES

01 DECK

CREW LOUNGE
PRIMARY: DOWN STAIRS TO MAIN DECK ASSEMBLY AREAS

BRIDGE DECK

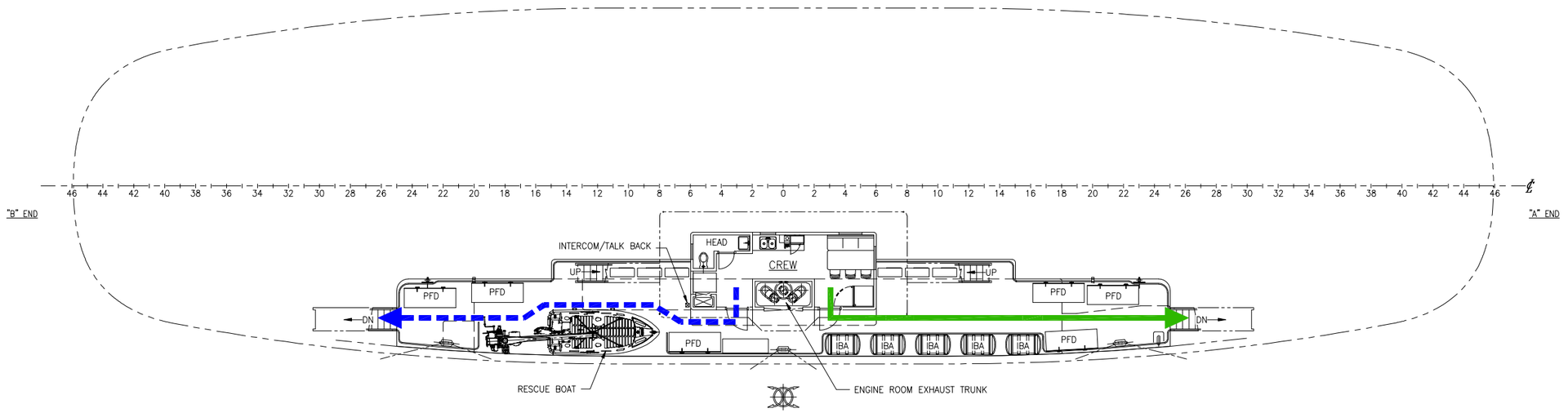
PILOT HOUSE
PRIMARY: DOWN STAIRS TO MAIN DECK ASSEMBLY AREAS



BRIDGE DECK PLAN
CREW ONLY

PRIMARY MEANS OF ESCAPE

SECONDARY MEANS OF ESCAPE



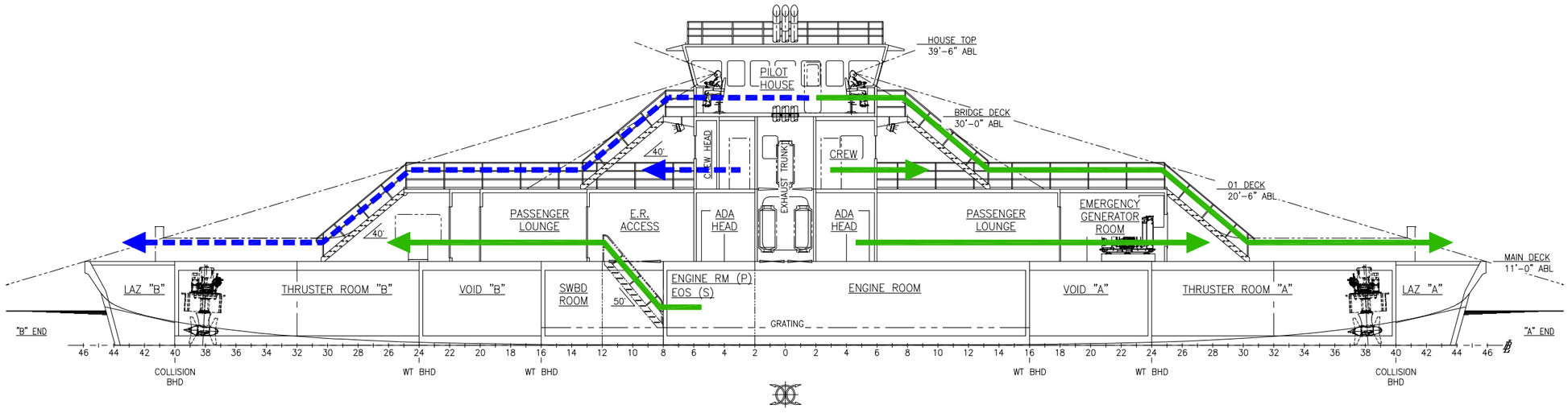
01 DECK PLAN
CREW ONLY

LOUIS A. JANKOWSKI
STATE OF WASHINGTON
35055
REGISTERED
PROFESSIONAL ENGINEER

7/25/2018

SIZE	DWG NO.	REV
D	18026-200-101-8	–
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-8-	SHEET 3 OF 3

7/25/2018 4:33:07 PM



INBOARD PROFILE

PRIMARY MEANS OF ESCAPE

SECONDARY MEANS OF ESCAPE

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	2-4A 2-3C	1. REVERSED EOS DOOR SWING 2. REVISED MAIN DECK REFUGE AREA	KAJ	08/03/18	KAJ

GENERAL NOTES

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4. NVIC 9-97 CH.1

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD WANG HARBOR, NC 27953

KURT S. A. JANKOWSKI
STATE OF WASHINGTON
55055
REGISTERED PROFESSIONAL ENGINEER
8/3/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: EMERGENCY EVACUATION PLAN

SIZE	DWG NO.	REV
D	18026-200-101-8	A

SCALE	FILE NAME	SHEET
1/8"=1'-0"	18026-200-101-8-	1 OF 3

DWN	MOD	CKD	APVD	APVD DATE
MWR	NJB	NJB	KAJ	7/25/18

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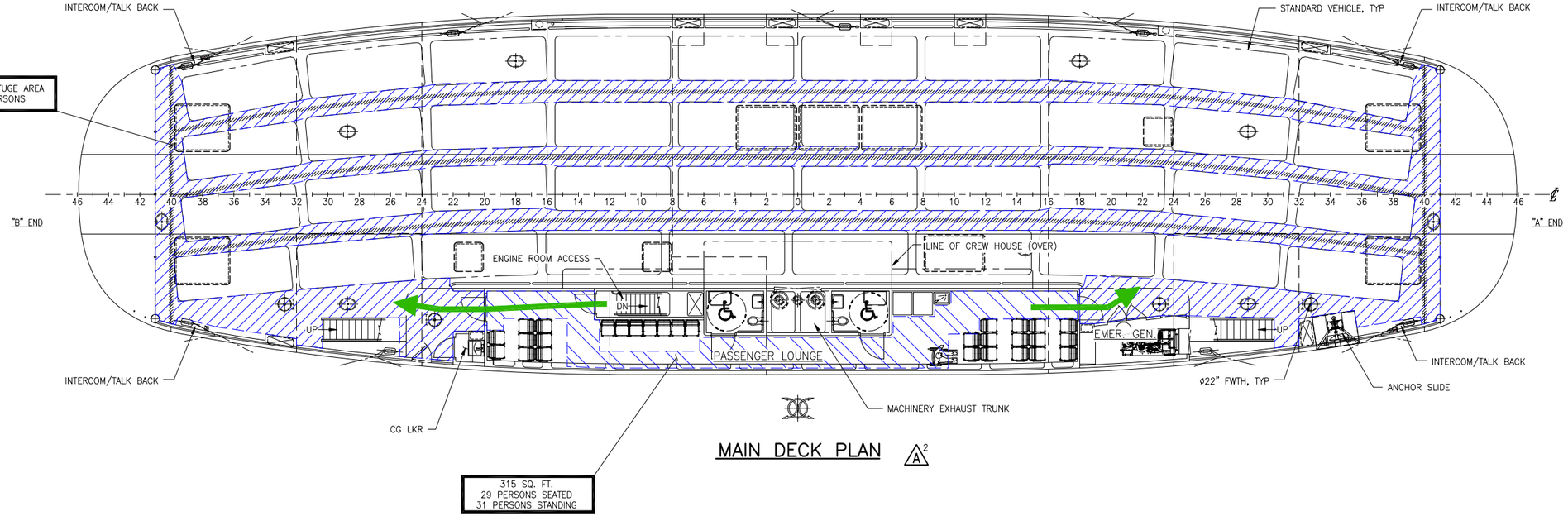
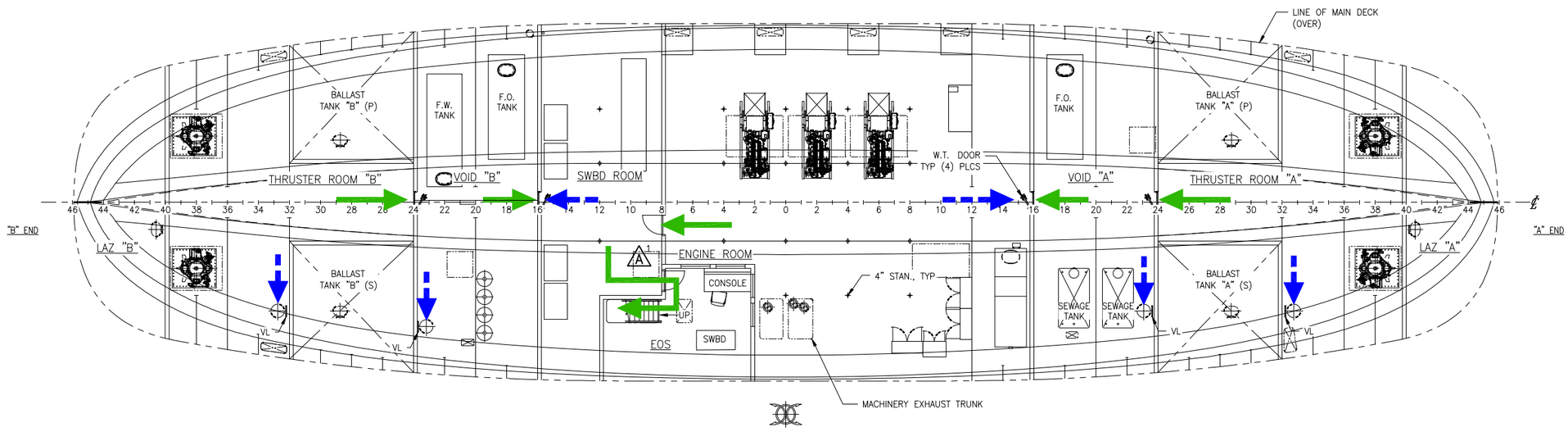


MAIN DECK PLAN A2



HOLD PLAN

GENERAL NOTES

HOLD

THRUSTER ROOM A & B (NORMALLY UNOCCUPIED)
PRIMARY: W.T. DOORS TO STAIRS
SECONDARY: V.L. TO ESCAPE HATCH IN MAIN DECK

VOID A & B (NORMALLY UNOCCUPIED)
PRIMARY: W.T. DOORS TO STAIR
SECONDARY: V.L. TO ESCAPE HATCH IN MAIN DECK

ENGINE ROOM (NORMALLY OCCUPIED)
PRIMARY: TO SWBD ROOM, UP STAIR
SECONDARY: W.T. DOOR TO VOID A, UP V.L. TO MAIN DECK

SWITCHBOARD ROOM & EOS (NORMALLY OCCUPIED)
PRIMARY: UP STAIR
SECONDARY: W.T. DOORS TO VOID B, UP V.L. TO MAIN DECK

MAIN DECK

PASSENGER LOUNGE
PRIMARY: THROUGH DOORS TO ASSEMBLY AREAS ON MAIN DECK

ASSEMBLY AREAS
MAIN DECK OFFERS >1500 SQ FT PROVIDING REFUGE FOR MORE THAN 300 PASSENGERS.

PRIMARY MEANS OF ESCAPE
SECONDARY MEANS OF ESCAPE
ASSEMBLY AREAS
PASSENGER STANDING

DENIS A. JANKOWIY
STATE OF WASHINGTON
55055
REGISTERED
PROFESSIONAL ENGINEER

8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-8	A
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-8-	SHEET 2 OF 3

8/3/2018 3:09:06 PM

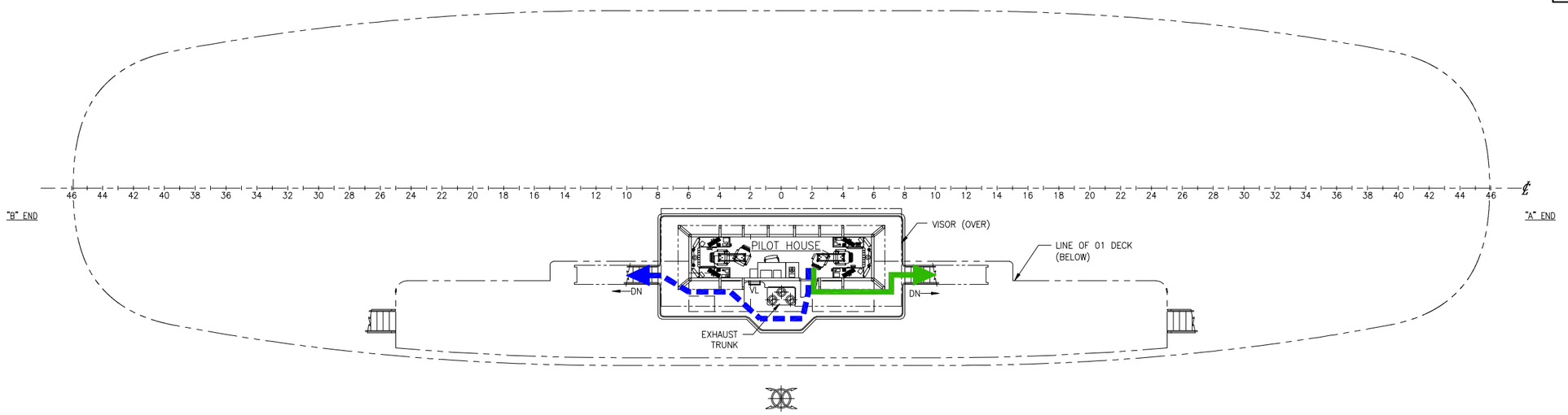
GENERAL NOTES

01 DECK

CREW LOUNGE
PRIMARY: DOWN STAIRS TO MAIN DECK ASSEMBLY AREAS

BRIDGE DECK

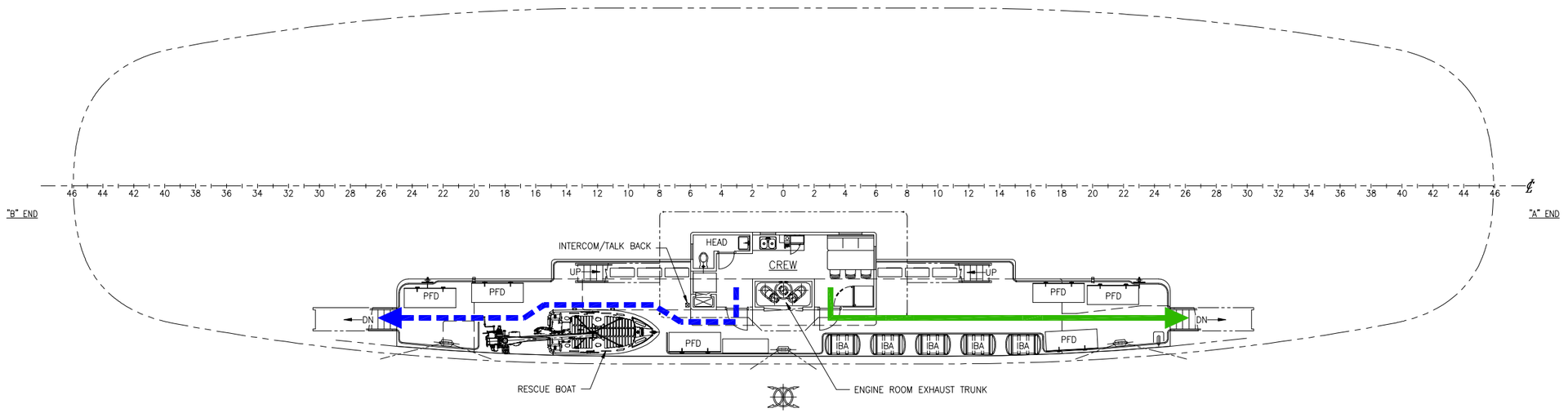
PILOT HOUSE
PRIMARY: DOWN STAIRS TO MAIN DECK ASSEMBLY AREAS



BRIDGE DECK PLAN
CREW ONLY

PRIMARY MEANS OF ESCAPE

SECONDARY MEANS OF ESCAPE

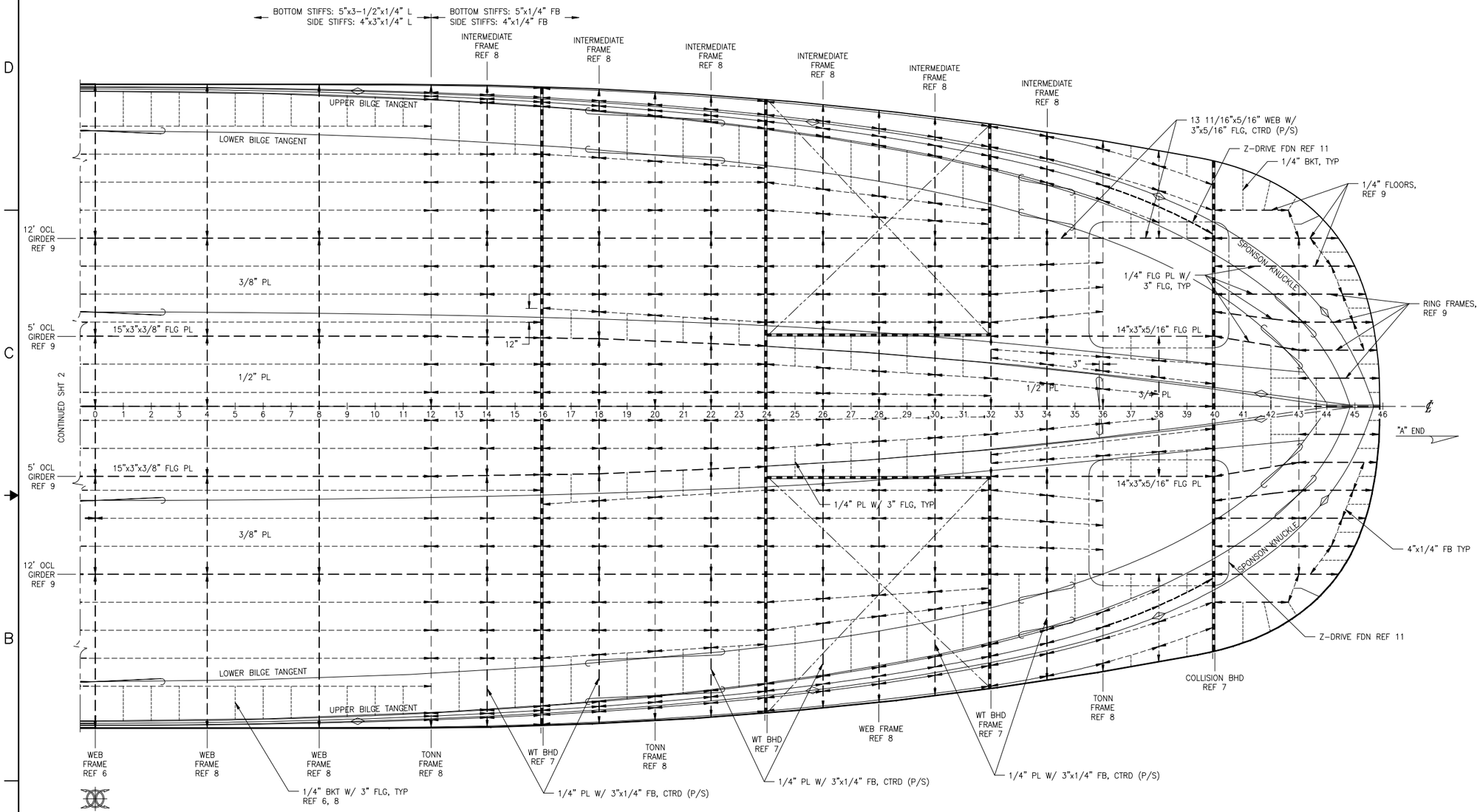


01 DECK PLAN
CREW ONLY

DENIS A. JANKOWSKI
STATE OF WASHINGTON
55055
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-101-8	A
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-101-8-	SHEET 3 OF 3

8/3/2018 3:09:16 PM



PLAN 1-4A
BOTTOM SHELL – 'A' END
REFLECTED PLAN

KEEL PL:	3/4" AT ENDS, 1/2" ELSEWHERE
BOTTOM SHELL PL:	3/8" TYP U.N.O.
SIDE SHELL PL:	5/16" TYP U.N.O.
BOTTOM STIFFENERS (FR 16B-12A):	5"x3-1/2"x1/4"L TYP U.N.O.
BOTTOM STIFFENERS (ELSEWHERE):	5"x1/4" FB TYP U.N.O.
SIDE SHELL STIFFENERS (FR 16B-12A):	4"x3"x1/4"L TYP U.N.O.
SIDE SHELL STIFFENERS (ELSEWHERE):	4"X1/4" FB TYP U.N.O.
C.V.K.:	14 5/8" WEB W/ 9"x1" FLG
BOTTOM GIRDERS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM INTERMEDIATE FRAMES:	14"x3"x1/4" FLG PL TYPE U.N.O.
SIDE WEBS:	12"x3"x1/4" FLG PL TYP U.N.O.

LEGEND
- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. LONGITUDINAL STIFFENERS SHALL BE WELDED TIGHT AT EACH TRANSVERSE FRAME FROM 12A TO END "A" AND 16B TO END "B".

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-100-1	LINES PLAN
4.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
5.	18026-200-110-1	BOTTOM AND SIDE SHELL
6.	18026-200-120-1	MIDSHIP SECTION
7.	18026-200-120-3	HULL TRANSVERSE BULKHEADS
8.	18026-200-120-4	HULL TRANSVERSE FRAMES
9.	18026-200-120-5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026-200-130-2	MAIN DECK
11.	18026-200-180-1	PROPULSION UNIT FOUNDATIONS

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
35700
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

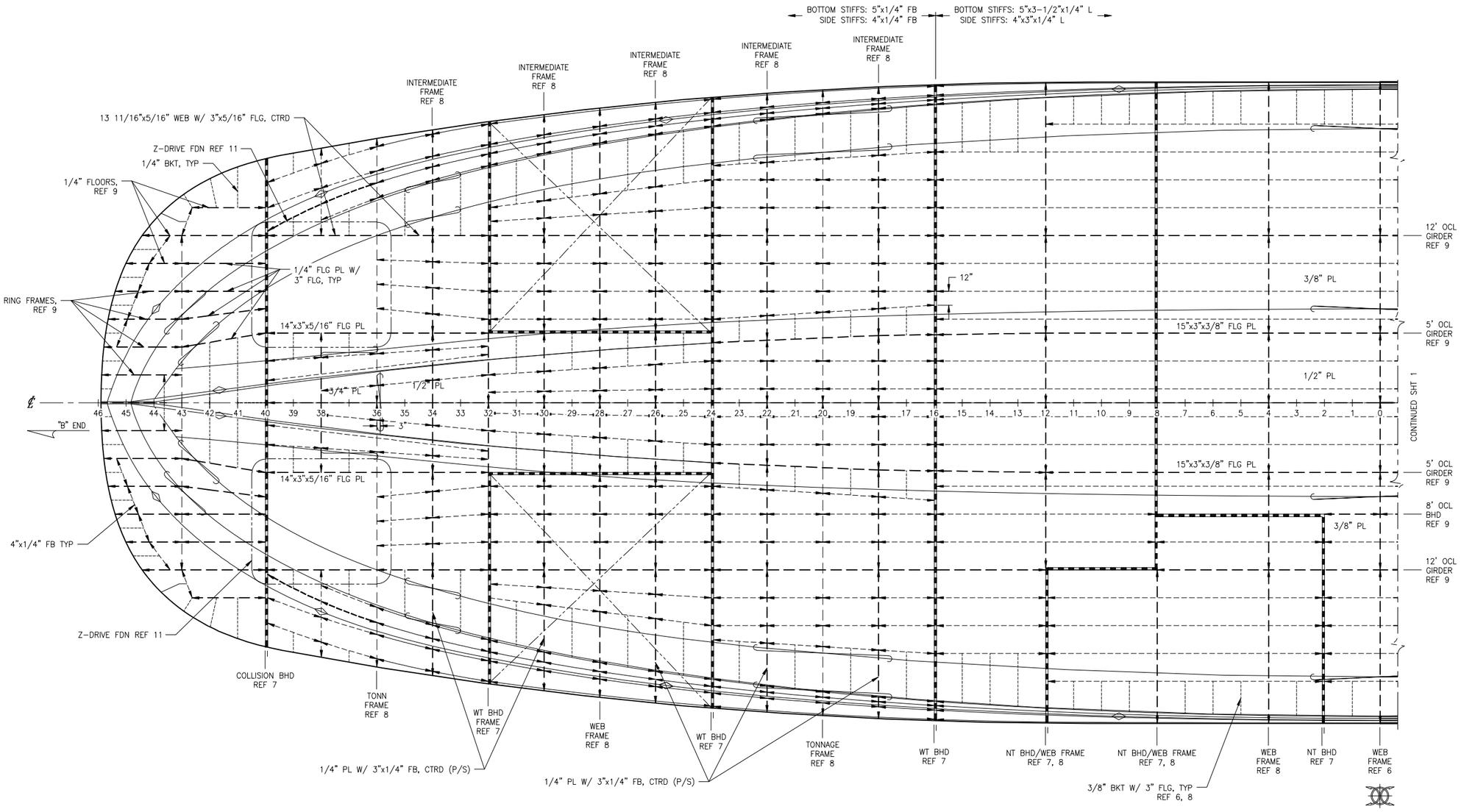
TITLE: BOTTOM AND SIDE SHELL

SIZE	DWG NO.	REV
D	18026-200-110-1	—

SCALE	FILE NAME	SHEET	OF
1/4" = 1'-0"	18026-200-110-1-	1	3

DWN	MOD	CKD	APVD	APVD DATE
JCG		SKW	SKW	7/26/2018

7/30/2018 3:51:32 PM



PLAN 2-4A

BOTTOM SHELL - 'B' END

REFLECTED PLAN

KEEL PL:	3/4" AT ENDS, 1/2" ELSEWHERE
BOTTOM SHELL PL:	3/8" TYP U.N.O.
SIDE SHELL PL:	5/16" TYP U.N.O.
BOTTOM STIFFENERS (FR 16B-12A):	5"x3-1/2"x1/4"L TYP U.N.O.
BOTTOM STIFFENERS (ELSEWHERE):	5"x1/4" FB TYP U.N.O.
SIDE SHELL STIFFENERS (FR 16B-12A):	4"x3"x1/4"L TYP U.N.O.
SIDE SHELL STIFFENERS (ELSEWHERE):	4"X1/4" FB TYP U.N.O.
C.V.K.:	14 5/8" WEB W/ 9"x1" FLG
BOTTOM GIRDERS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM INTERMEDIATE FRAMES:	14"x3"x1/4" FLG PL TYPE U.N.O.
SIDE WEBS:	12"x3"x1/4" FLG PL TYP U.N.O.

LEGEND

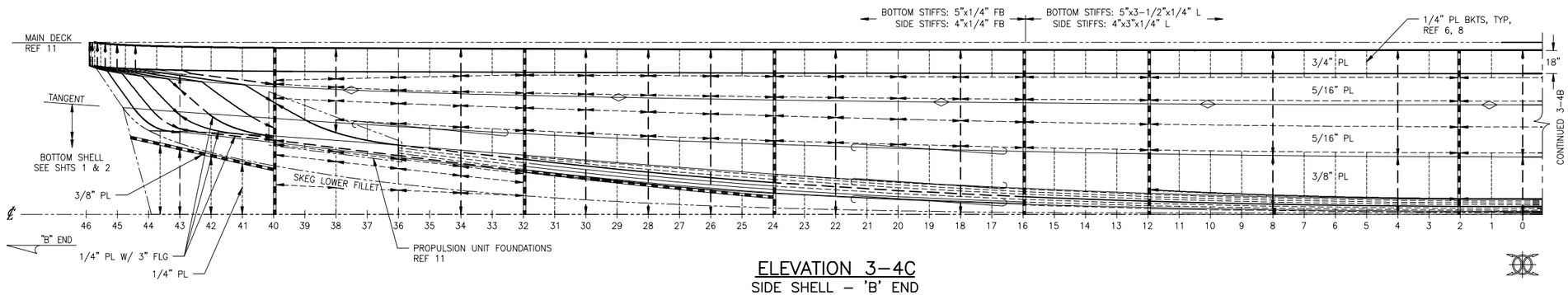
- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
5570
REGISTERED PROFESSIONAL ENGINEER

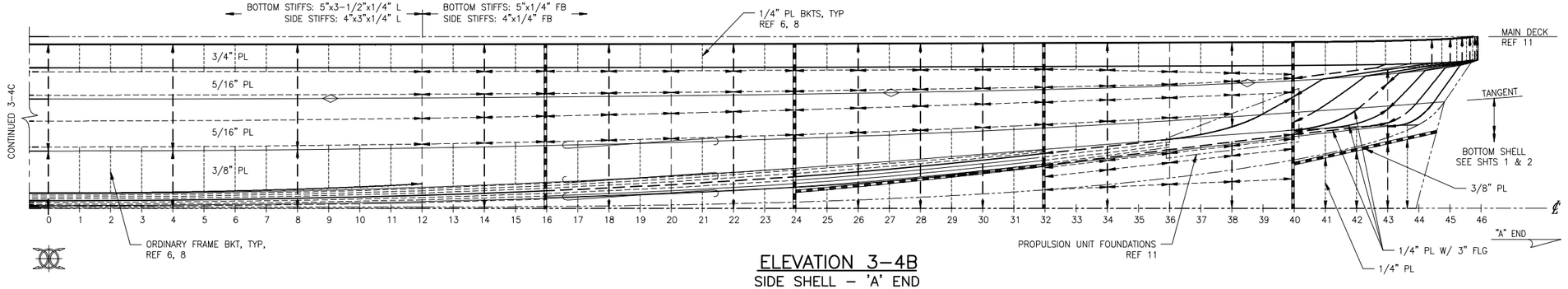
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-110-1	-
SCALE 1/4" = 1'-0"	FILE NAME 18026-200-110-1-	SHEET 2 OF 3

7/30/2018 3:51:36 PM



ELEVATION 3–4C
SIDE SHELL – 'B' END
STBD SHOWN, PORT SIM., OPP.
EOS BHDS STBD SIDE ONLY



ELEVATION 3–4B
SIDE SHELL – 'A' END
STBD SHOWN, PORT SIM., OPP.

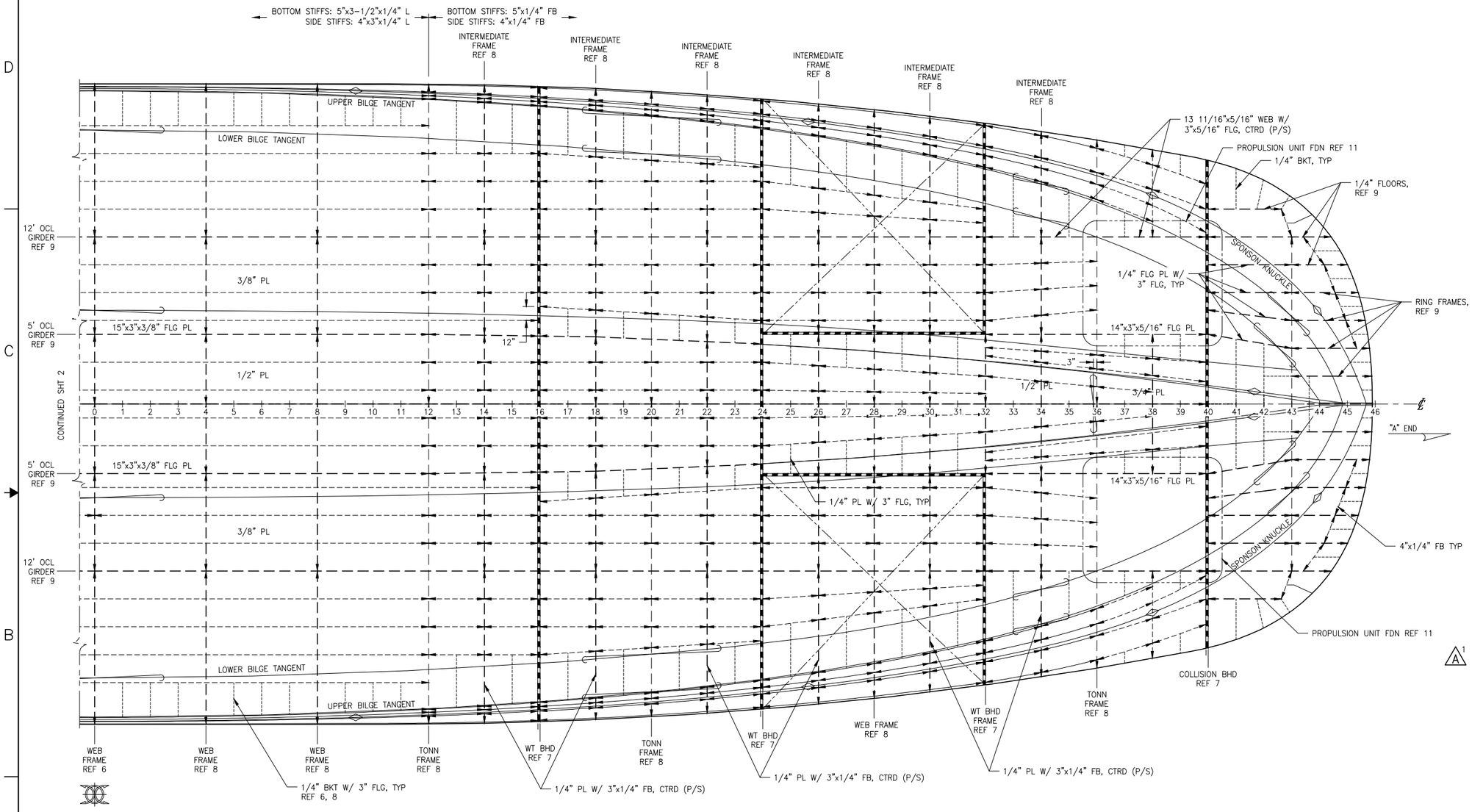
LEGEND
- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

KEEL PL:	3/4" AT ENDS, 1/2" ELSEWHERE
BOTTOM SHELL PL:	3/8" TYP U.N.O.
SIDE SHELL PL:	5/16" TYP U.N.O.
BOTTOM STIFFENERS (FR 16B–12A):	5"x3–1/2"x1/4"L TYP U.N.O.
BOTTOM STIFFENERS (ELSEWHERE):	5"x1/4" FB TYP U.N.O.
SIDE SHELL STIFFENERS (FR 16B–12A):	4"x3"x1/4"L TYP U.N.O.
SIDE SHELL STIFFENERS (ELSEWHERE):	4"X1/4" FB TYP U.N.O.
C.V.K.:	14 5/8" WEB W/ 9"x1" FLG
BOTTOM GIRDERS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM INTERMEDIATE FRAMES:	14"x3"x1/4" FLG PL TYPE U.N.O.
SIDE WEBS:	12"x3"x1/4" FLG PL TYP U.N.O.

SAMUEL WATERHOUSE
STATE OF WASHINGTON
25670
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–110–1	–
SCALE 1/4" = 1'–0"	FILE NAME 18026–200–110–1–	SHEET 3 OF 3

7/30/2018 3:51:41 PM



PLAN 1-4A
BOTTOM SHELL - 'A' END
REFLECTED PLAN

LEGEND

- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

KEEL PL:	3/4" AT ENDS, 1/2" ELSEWHERE
BOTTOM SHELL PL:	3/8" TYP U.N.O.
SIDE SHELL PL:	5/16" TYP U.N.O.
BOTTOM STIFFENERS (FR 16B-12A):	5"x3-1/2"x1/4"L TYP U.N.O.
BOTTOM STIFFENERS (ELSEWHERE):	5"x1/4" FB TYP U.N.O.
SIDE SHELL STIFFENERS (FR 16B-12A):	4"x3"x1/4"L TYP U.N.O.
SIDE SHELL STIFFENERS (ELSEWHERE):	4"X1/4" FB TYP U.N.O.
C.V.K.:	14 5/8" WEB W/ 9"x1" FLG
BOTTOM GIRDERS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM INTERMEDIATE FRAMES:	14"x3"x1/4" FLG PL TYPE U.N.O.
SIDE WEBS:	12"x3"x1/4" FLG PL TYP U.N.O.

SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	1-2B	1. CORRECTED REFERENCED DRAWING TITLE	SKW	8/6/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. LONGITUDINAL STIFFENERS SHALL BE WELDED TIGHT AT EACH TRANSVERSE FRAME FROM 12A TO END "A" AND 16B TO END "B".

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-100-1	LINES PLAN
4.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
5.	18026-200-110-1	BOTTOM AND SIDE SHELL
6.	18026-200-120-1	MIDSHIP SECTION
7.	18026-200-120-3	HULL TRANSVERSE BULKHEADS
8.	18026-200-120-4	HULL TRANSVERSE FRAMES
9.	18026-200-120-5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026-200-130-2	MAIN DECK
11.	18026-200-180-1	MAIN MACHINERY FOUNDATIONS

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: BOTTOM AND SIDE SHELL

SIZE	DWG NO.	REV
D	18026-200-110-1	A

SCALE	FILE NAME	SHEET	OF
1/4" = 1'-0"	18026-200-110-1A	1	3

DWN	MOD	CKD	APVD	APVD DATE
JCG	SKW	SKW	SKW	7/26/2018

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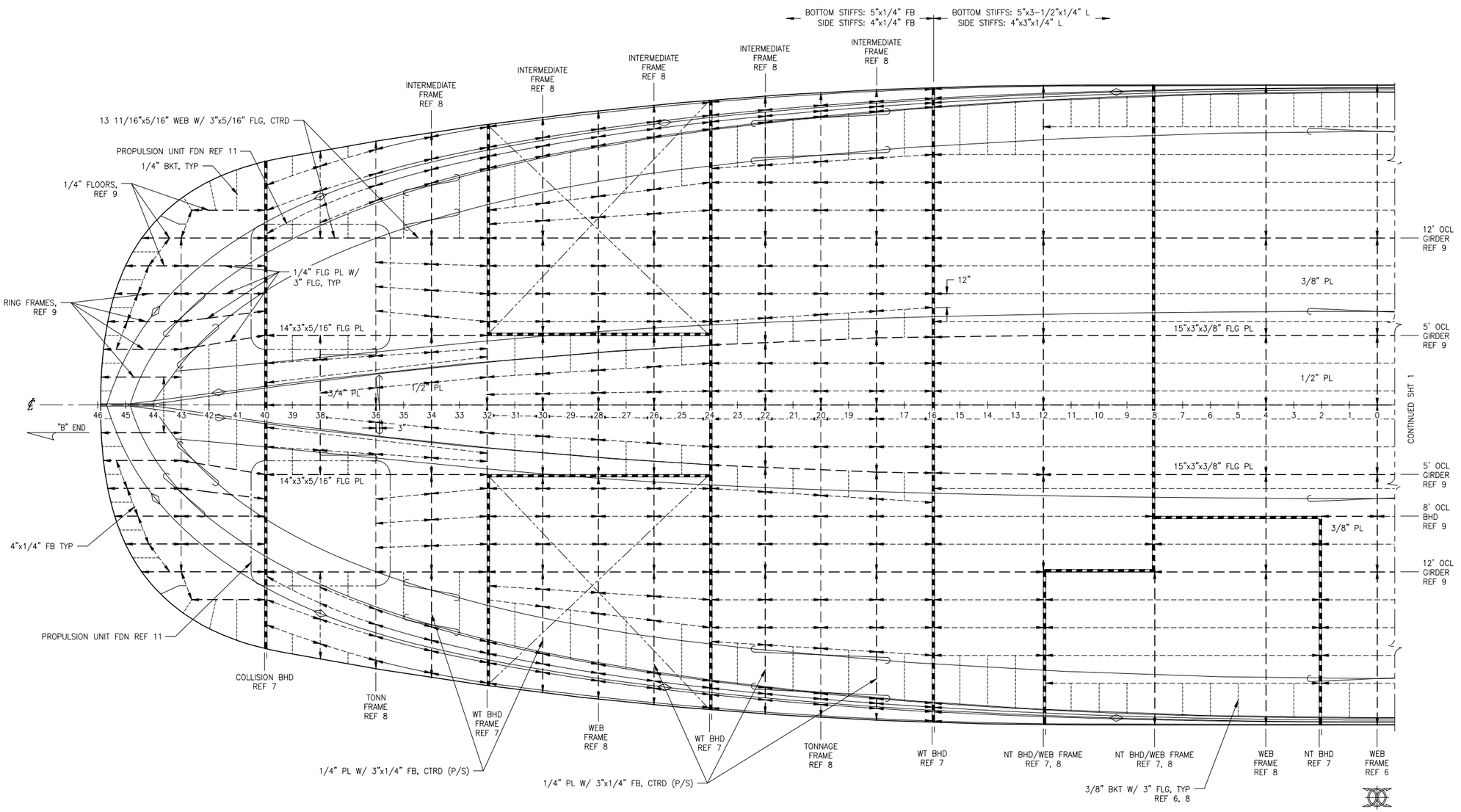


PLAN 2-4A

BOTTOM SHELL - 'B' END

REFLECTED PLAN

KEEL PL:	3/4" AT ENDS, 1/2" ELSEWHERE
BOTTOM SHELL PL:	3/8" TYP U.N.O.
SIDE SHELL PL:	5/16" TYP U.N.O.
BOTTOM STIFFENERS (FR 16B-12A):	5"x3-1/2"x1/4"L TYP U.N.O.
BOTTOM STIFFENERS (ELSEWHERE):	5"x1/4" FB TYP U.N.O.
SIDE SHELL STIFFENERS (FR 16B-12A):	4"x3"x1/4"L TYP U.N.O.
SIDE SHELL STIFFENERS (ELSEWHERE):	4"X1/4" FB TYP U.N.O.
C.V.K.:	14 5/8" WEB W/ 9"x1" FLG
BOTTOM GIRDERS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM INTERMEDIATE FRAMES:	14"x3"x1/4" FLG PL TYPE U.N.O.
SIDE WEBS:	12"x3"x1/4" FLG PL TYP U.N.O.

LEGEND

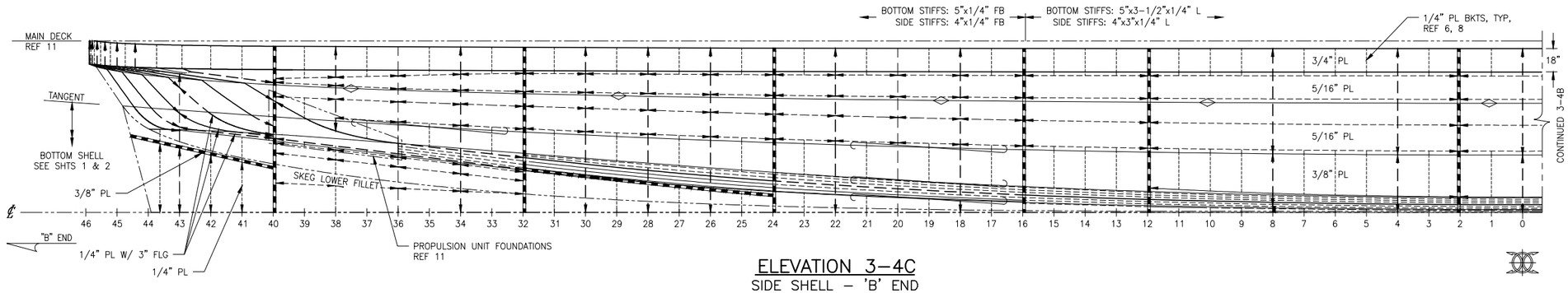
- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER

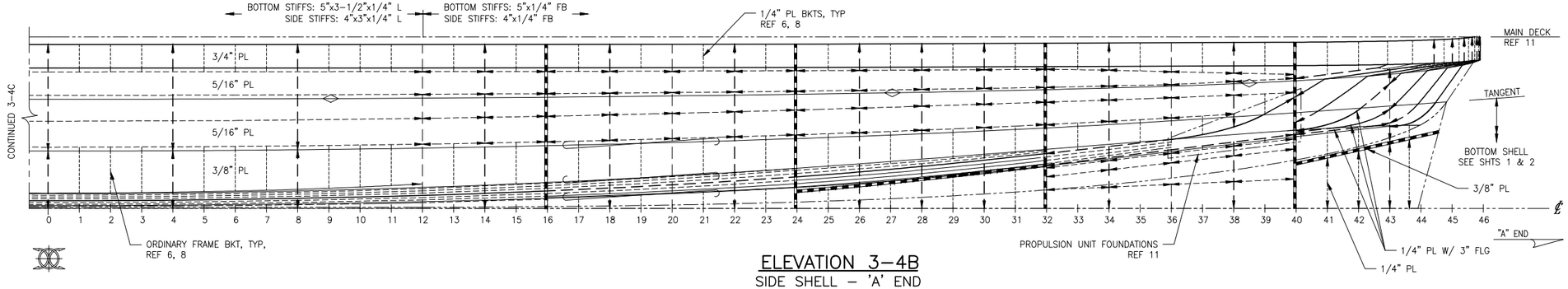
8/6/2018

SIZE	DWG NO.	REV
D	18026-200-110-1	A
SCALE 1/4" = 1'-0"	FILE NAME 18026-200-110-1A	SHEET 2 OF 3

8/6/2018 11:41:08 AM



ELEVATION 3–4C
SIDE SHELL – 'B' END
STBD SHOWN, PORT SIM., OPP.
EOS BHDS STBD SIDE ONLY



ELEVATION 3–4B
SIDE SHELL – 'A' END
STBD SHOWN, PORT SIM., OPP.

LEGEND

- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

KEEL PL:	3/4" AT ENDS, 1/2" ELSEWHERE
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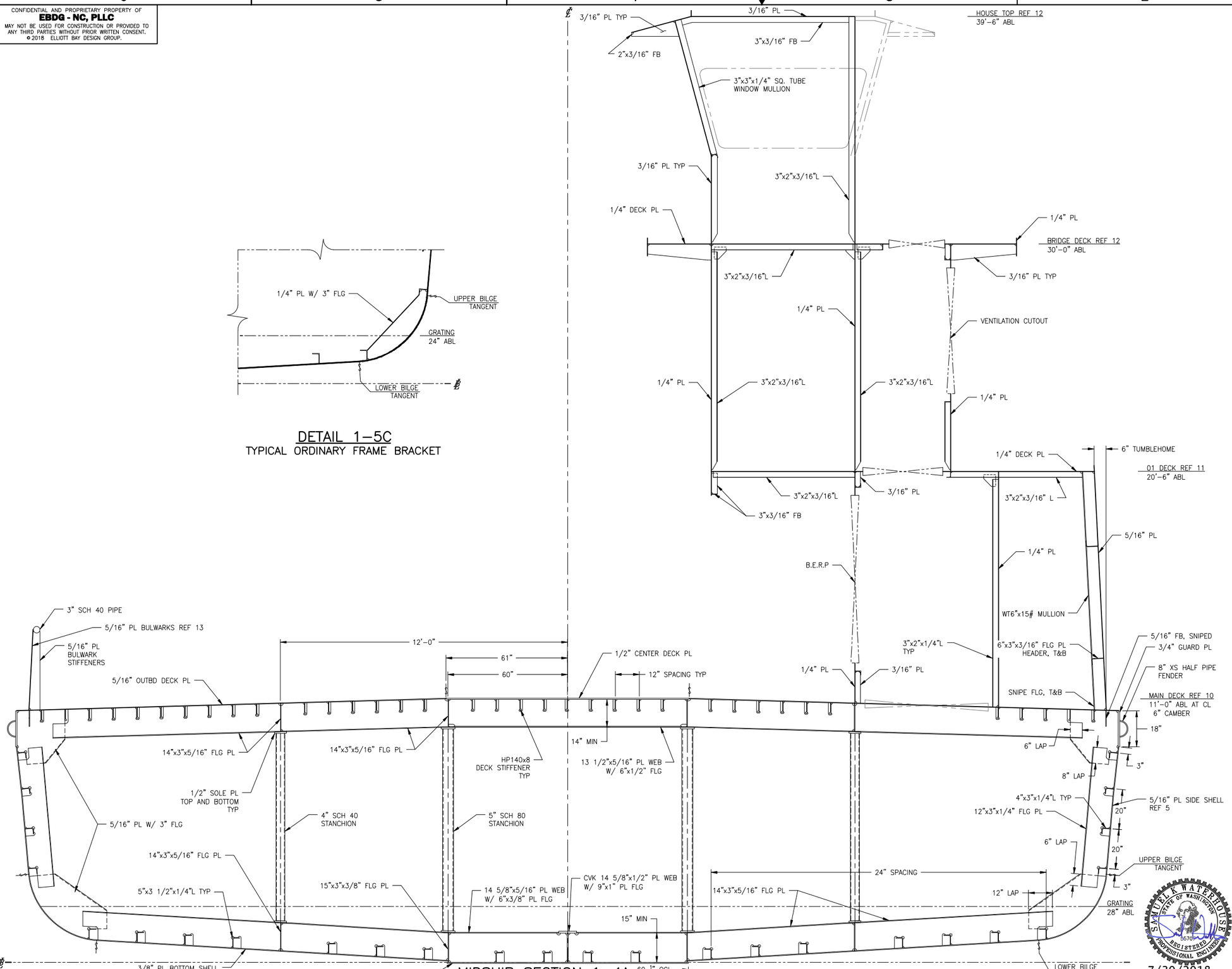
SIDE SHELL PL:	5/16" TYP U.N.O.
BOTTOM STIFFENERS (FR 16B–12A):	5"x3–1/2"x1/4"L TYP U.N.O.
BOTTOM STIFFENERS (ELSEWHERE):	5"x1/4" FB TYP U.N.O.
SIDE SHELL STIFFENERS (FR 16B–12A):	4"x3"x1/4"L TYP U.N.O.
SIDE SHELL STIFFENERS (ELSEWHERE):	4"X1/4" FB TYP U.N.O.
C.V.K.:	14 5/8" WEB W/ 9"x1" FLG
BOTTOM GIRDERS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
BOTTOM INTERMEDIATE FRAMES:	14"x3"x1/4" FLG PL TYPE U.N.O.
SIDE WEBS:	12"x3"x1/4" FLG PL TYP U.N.O.

SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

SIZE	DWG NO.	REV
D	18026–200–110–1	A
SCALE 1/4" = 1'–0"	FILE NAME 18026–200–110–1A	SHEET 3 OF 3

8/6/2018 11:41:13 AM

DETAIL 1–5C
TYPICAL ORDINARY FRAME BRACKET



MIDSHIP SECTION 1–4A

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
26709
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. MAIN DECK SHALL BE CONSTRUCTED SUCH THAT THE TOP SIDE OF THE DECK PLATE IS FLUSH. THE 1/2" DECK PLATE WILL THEN BE 3/16" INSIDE THE "MOLDED LINE".

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATION
2.	18026–200–061–1	SCANTLING CALCULATIONS
3.	18026–200–100–1	LINES PLAN
4.	18026–200–101–1	PROFILES AND DECK ARRANGEMENTS
5.	18026–200–110–1	BOTTOM AND SIDE SHELL
6.	18026–200–120–1	MIDSHIP SECTION
7.	18026–200–120–3	HULL TRANSVERSE BULKHEADS
8.	18026–200–120–4	HULL TRANSVERSE FRAMES
9.	18026–200–120–5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026–200–130–2	MAIN DECK
11.	18026–200–150–1	SUPERSTRUCTURE MAIN DECK TO 01 DECK
12.	18026–200–150–2	SUPERSTRUCTURE 01 DECK TO PILOT HOUSE TOP
13.	18026–200–150–3	MAIN DECK BULWARKS

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: MIDSHIP SECTION

SIZE	DWG NO.	REV
D	18026–200–120–1	–

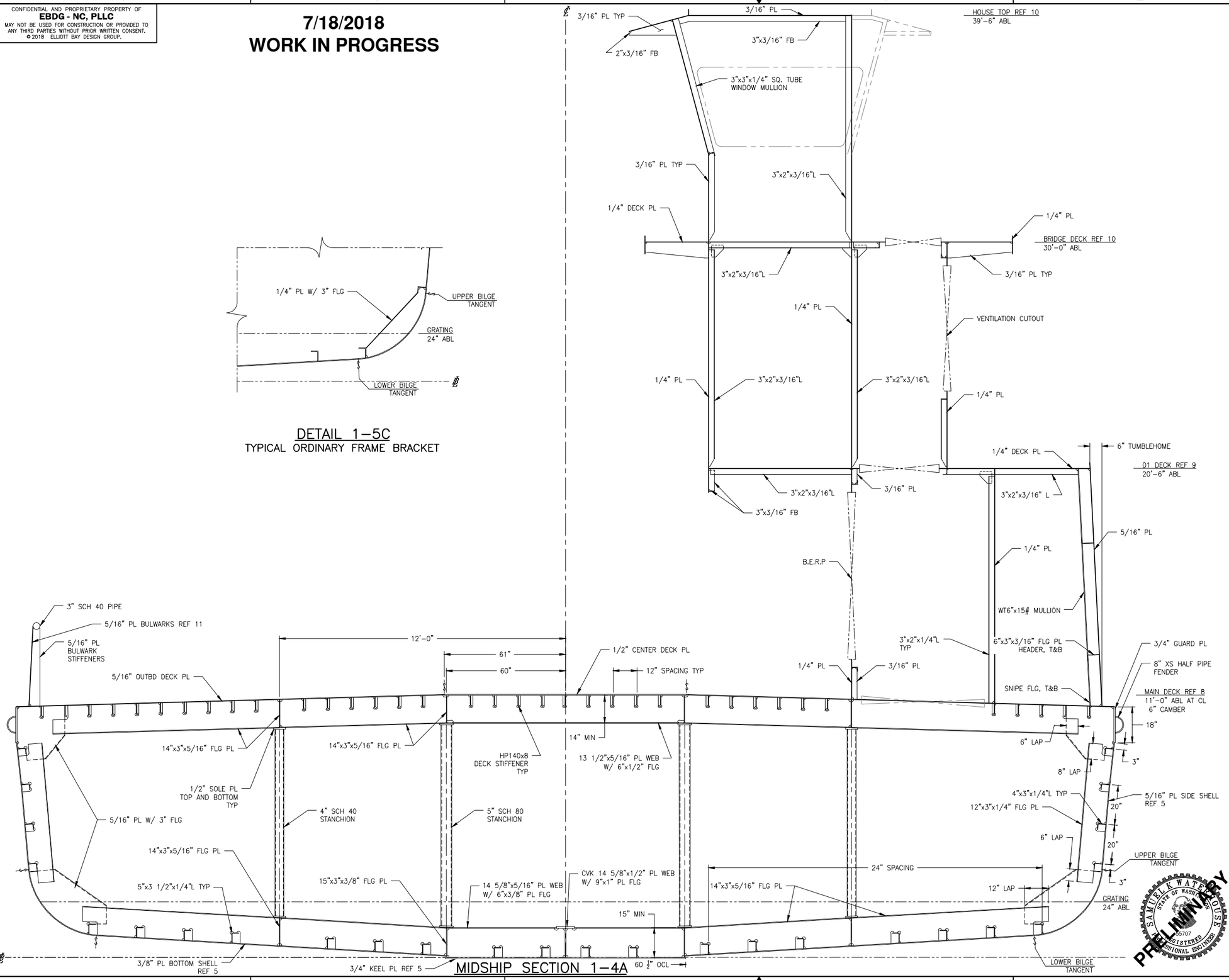
SCALE	FILE NAME	SHEET
1/2"=1'–0"	18026–200–120–1–	1 OF 1

DWN	MOD	CKD	APVD	APVD DATE
JCG		SKW	SKW	7/26/2018

7/30/2018 3:59:42 PM

7/18/2018
WORK IN PROGRESS

DETAIL 1–5C
TYPICAL ORDINARY FRAME BRACKET



MIDSHIP SECTION 1–4A

REVISION HISTORY					
REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. MAIN DECK SHALL BE CONSTRUCTED SUCH THAT THE TOP SIDE OF THE DECK PLATE IS FLUSH. THE 1/2" DECK PLATE WILL THEN BE 3/16" INSIDE THE "MOLDED LINE".

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATION
2.	18026–200–061–1	SCANTLING CALCULATIONS
3.	18026–200–100–1	LINES PLAN
4.	18026–200–101–1	PROFILES AND DECK ARRANGEMENTS
5.	18026–200–110–1	BOTTOM AND SIDE SHELL
6.	18026–200–120–3	HULL TRANSVERSE BULKHEADS
7.	18026–200–120–5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
8.	18026–200–130–2	MAIN DECK
9.	18026–200–150–1	SUPERSTRUCTURE MAIN DECK TO 01 DECK
10.	18026–200–150–2	SUPERSTRUCTURE 01 DECK TO PILOT HOUSE TOP
11.	18026–200–150–3	MAIN DECK BULWARKS

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

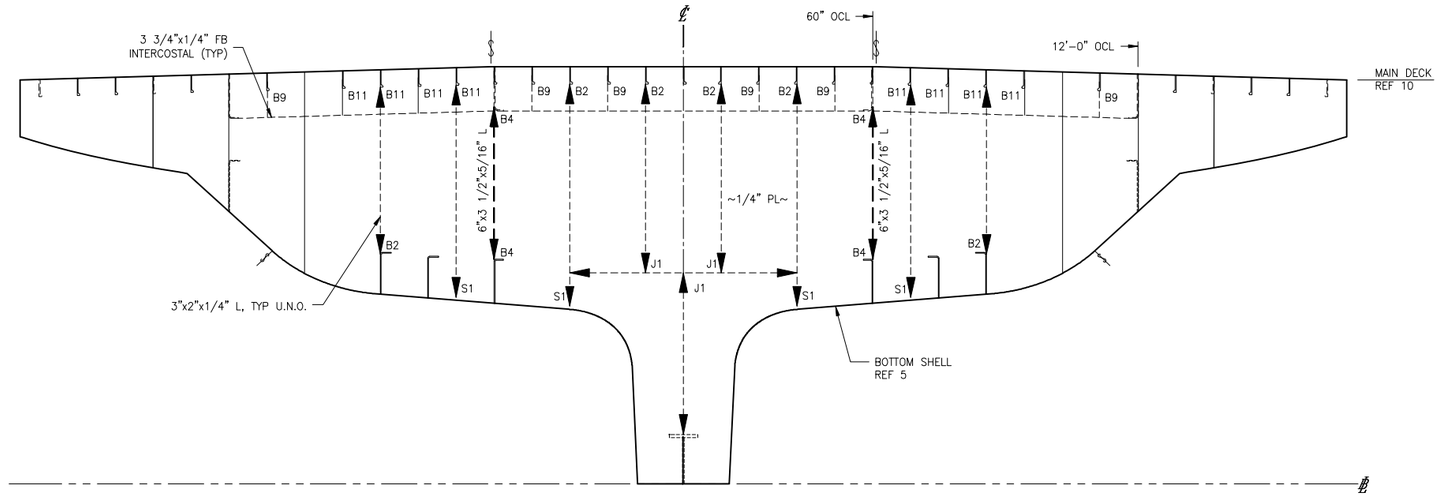
TITLE: MIDSHIP SECTION

SAMUEL K WATERHOUSE — STATE OF WASHINGTON — 25707 — REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY

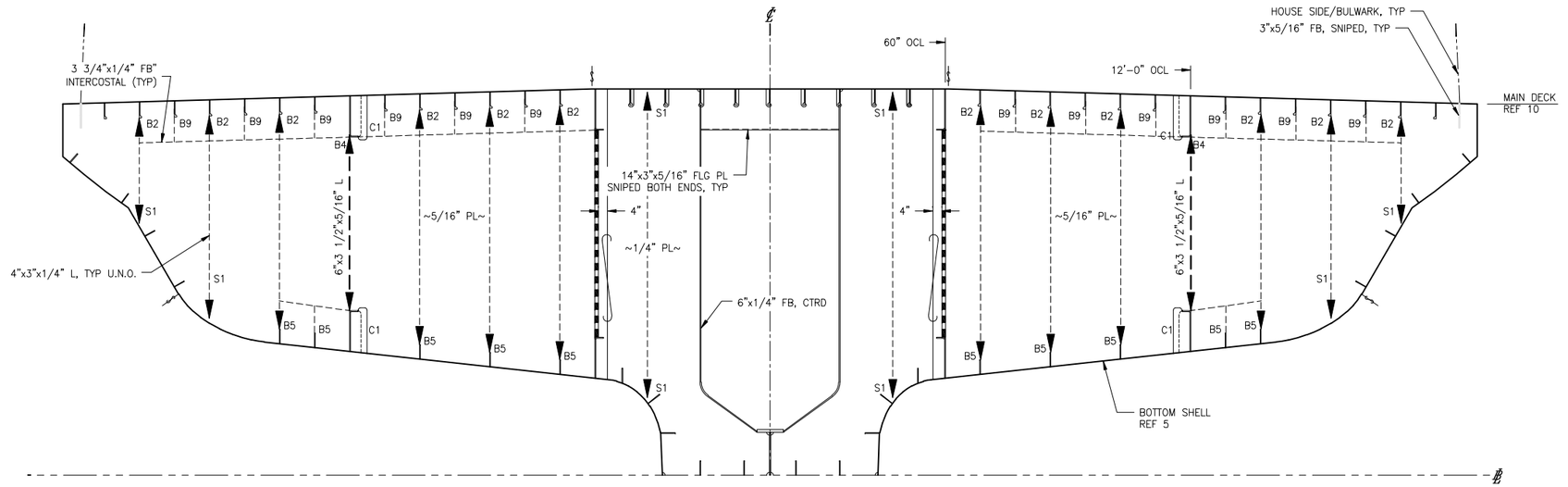
SIZE	DWG NO.	REV
D	18026–200–120–1	–

SCALE	FILE NAME	SHEET	OF
1/2"=1'–0"	18026–200–120–1–	1	1

DWN	MOD	CKD	APVD	APVD DATE
JCG		XXX	SKW	6/26/2018



SECTION 1–4C
WT BHD, FRAME 40, 'B' END
LOOKING FWD
'A' END SIM/OPP U.N.O.



SECTION 1–4A
WT BHD, FRAME 32, 'B' END
LOOKING FWD
'A' END SIM/OPP U.N.O.

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATION
2.	18026–200–061–1	SCANTLING CALCULATIONS
3.	18026–200–100–1	LINES PLAN
4.	18026–100–101–1	PROFILES AND DECK ARRANGEMENTS
5.	18026–200–110–1	BOTTOM AND SIDE SHELL
6.	18026–120–120–1	MIDSHIP SECTION
7.	18026–200–120–3	HULL TRANSVERSE BULKHEADS
8.	18026–200–120–4	HULL TRANSVERSE FRAMES
9.	18026–200–120–5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026–200–130–2	MAIN DECK
11.	18026–200–180–1	PROPULSION UNIT FOUNDATION

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

STATE OF WASHINGTON
STUART K. WATEHOUSE
5570
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

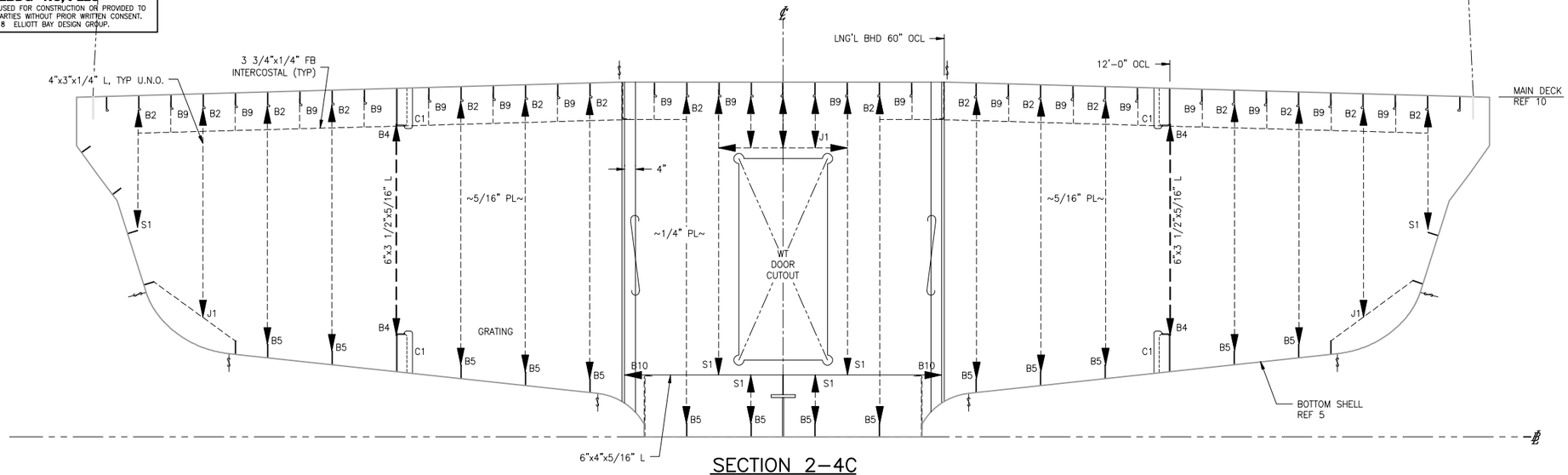
TITLE: HULL TRANSVERSE BULKHEADS

SIZE	DWG NO.	REV
D	18026–200–120–3	–

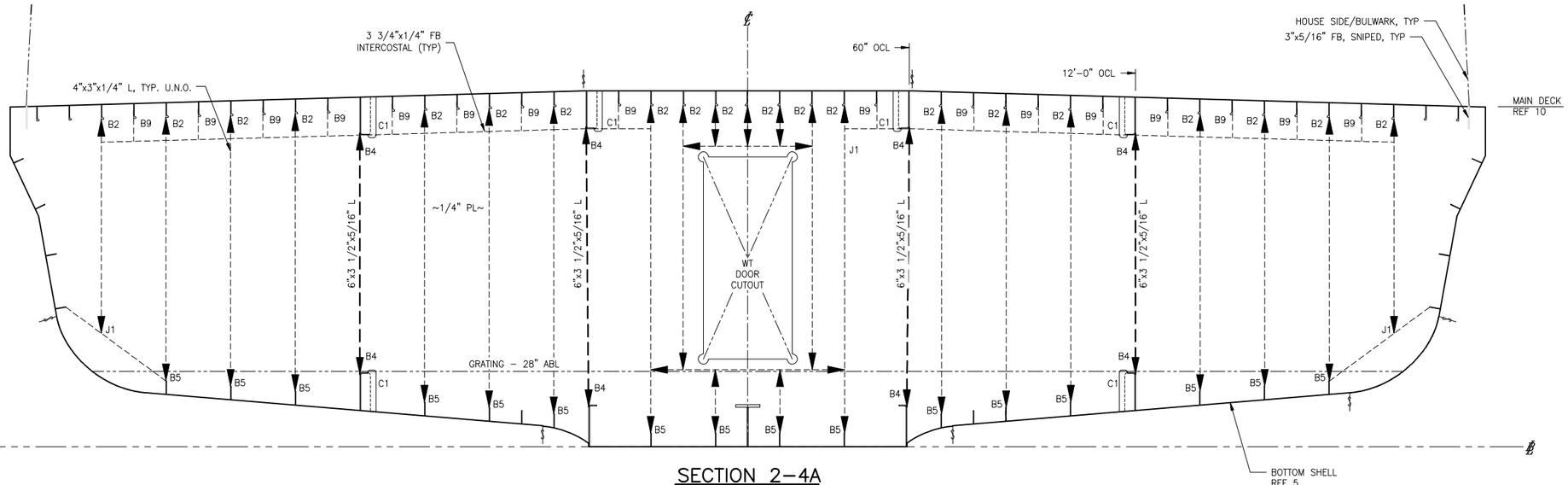
SCALE	FILE NAME	SHEET	OF
1/2" = 1'–0"	18026–200–120–3–	1	5

DWN	MOD	CKD	APVD	APVD DATE
JCG		SKW	SKW	7/26/2018

7/30/2018 4:02:54 PM



SECTION 2–4C
WT BHD, FRAME 24, 'B' END
LOOKING FWD
'A' END SIM/OPP U.N.O.

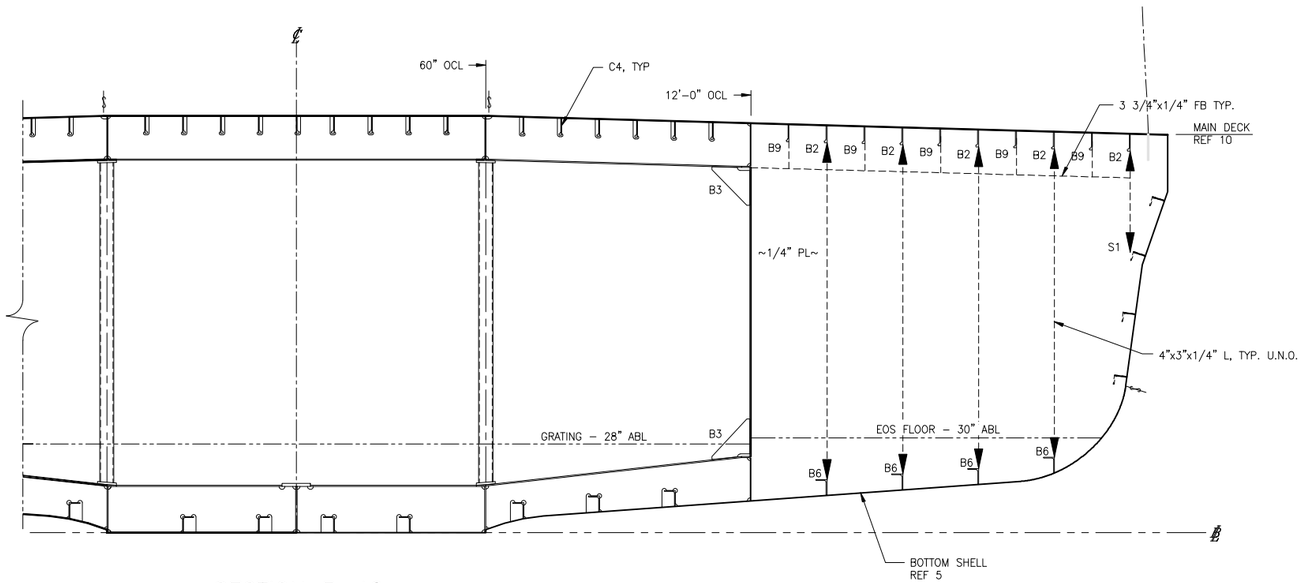


SECTION 2–4A
WT BHD, FRAME 16, 'B' END
LOOKING FWD
'A' END SIM/OPP U.N.O.

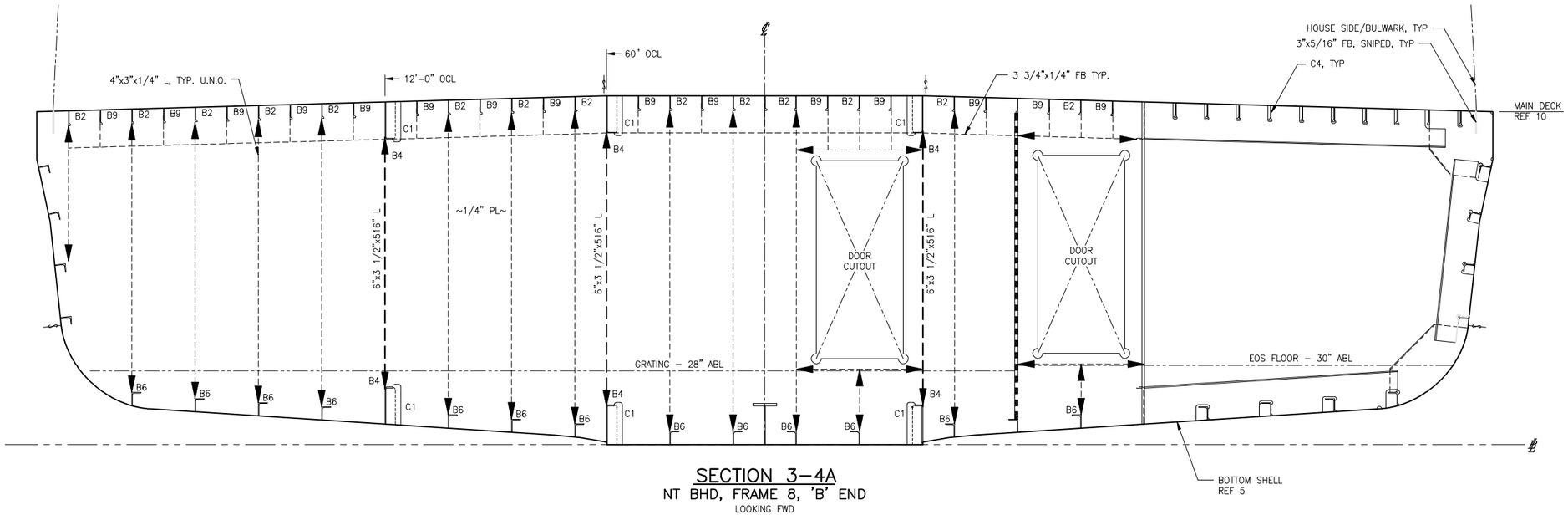
SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
5570
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-120-3	–
SCALE 1/2" = 1'-0"	FILE NAME 18026-200-120-3-	SHEET 2 OF 5

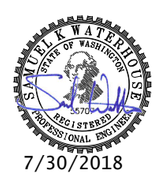
7/30/2018 4:02:58 PM



SECTION 3-4C
NT BHD, FRAME 12, 'B' END
LOOKING FWD



SECTION 3-4A
NT BHD, FRAME 8, 'B' END
LOOKING FWD



7/30/2018

SIZE	DWG NO.	REV
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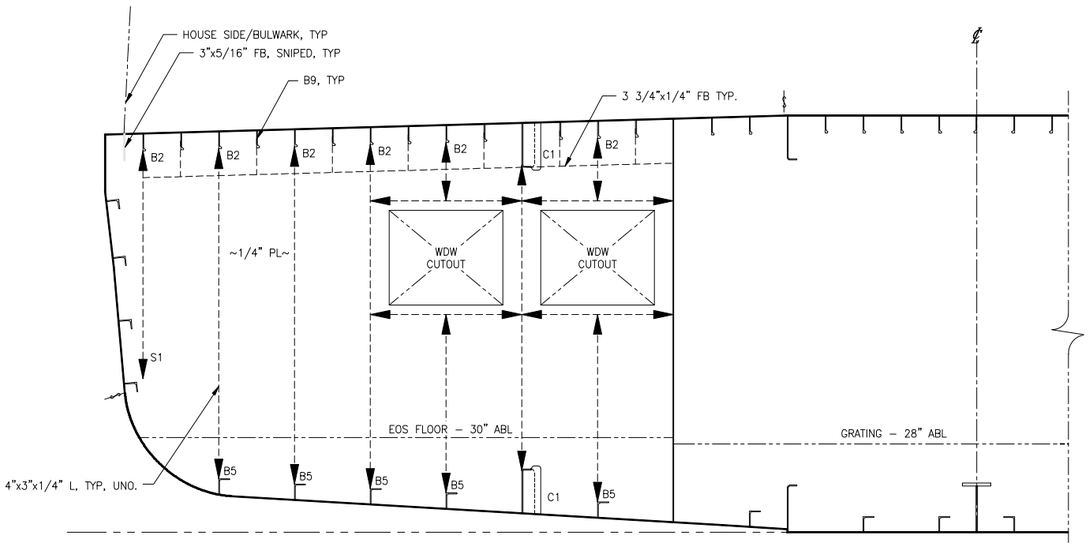
SCALE 1/2" = 1'-0"	FILE NAME 18026-200-120-3-	SHEET 3 OF 5

7/30/2018 4:03:03 PM



SECTION 4–4B

NT BHD, FRAME 2, 'B' END

LOOKING AFT

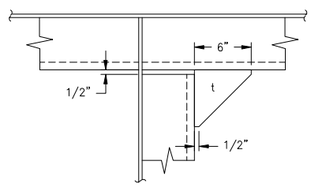
STATE OF WASHINGTON
SAUER K WATERHOUSE
35704
REGISTERED PROFESSIONAL ENGINEER

7/30/2018

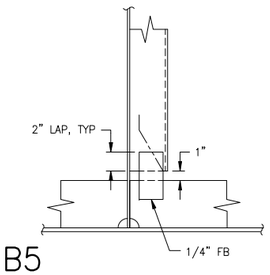
SIZE	DWG NO.	REV
D	18026–200–120–3	–
SCALE 1/2" = 1'–0"	FILE NAME 18026–200–120–3–	SHEET 4 OF 5

7/30/2018 4:03:08 PM

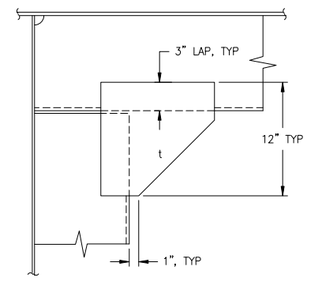
B2



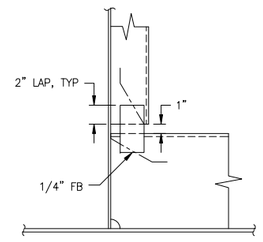
B5



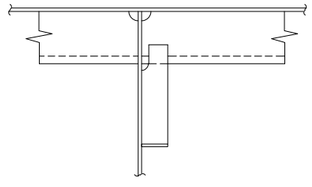
B4



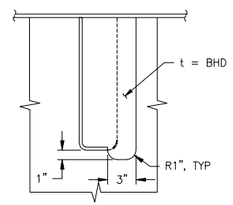
B7



B9



C1



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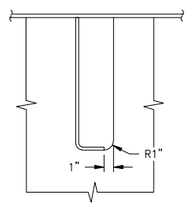
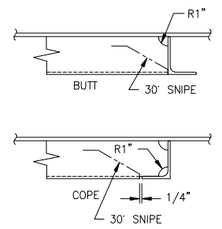
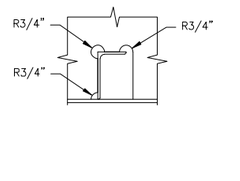


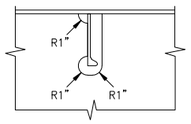
J1



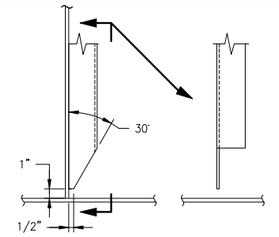
C3



C4



S1



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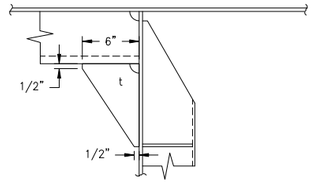
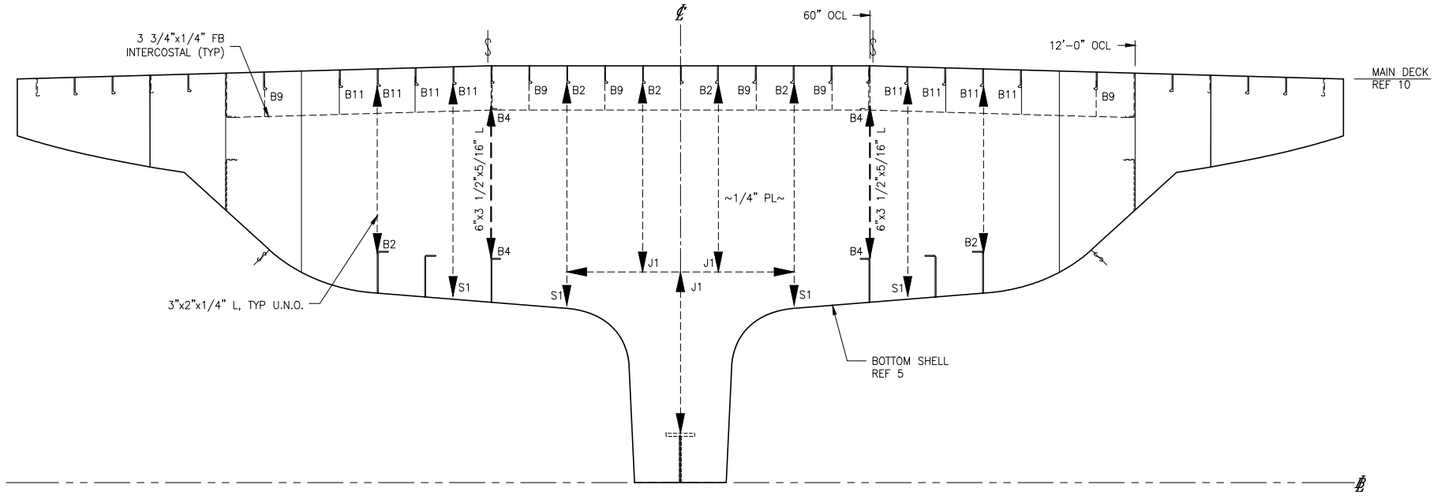


SAMUEL K WATERHOUSE
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

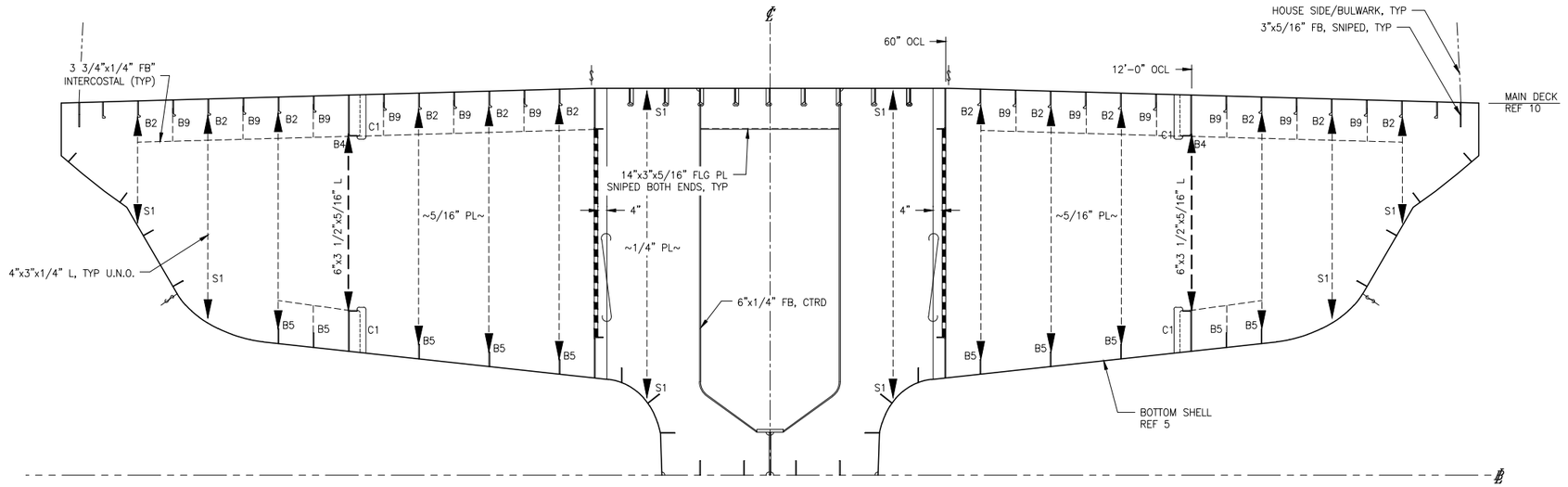
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-120-3	–
SCALE 1 1/2" = 1'-0"	FILE NAME 18026-200-120-3-	SHEET 5 OF 5

7/30/2018 4:03:13 PM



SECTION 1–4C
WT BHD, FRAME 40, 'B' END
LOOKING FWD
'A' END SIM/OPP U.N.O.



SECTION 1–4A
WT BHD, FRAME 32, 'B' END
LOOKING FWD
'A' END SIM/OPP U.N.O.

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	3–4A 3–4C 4–4B	1. CHANGED EOS GRATING LEVEL TO 28"	SKW	8/2/18	SKW
B	1–2B	1. CORRECTED REFERENCED DRAWING TITLE	SKW	8/6/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATION
2.	18026–200–061–1	SCANTLING CALCULATIONS
3.	18026–200–100–1	LINES PLAN
4.	18026–100–101–1	PROFILES AND DECK ARRANGEMENTS
5.	18026–200–110–1	BOTTOM AND SIDE SHELL
6.	18026–120–120–1	MIDSHIP SECTION
7.	18026–200–120–3	HULL TRANSVERSE BULKHEADS
8.	18026–200–120–4	HULL TRANSVERSE FRAMES
9.	18026–200–120–5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026–200–130–2	MAIN DECK
11.	18026–200–180–1	MAIN MACHINERY FOUNDATIONS

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

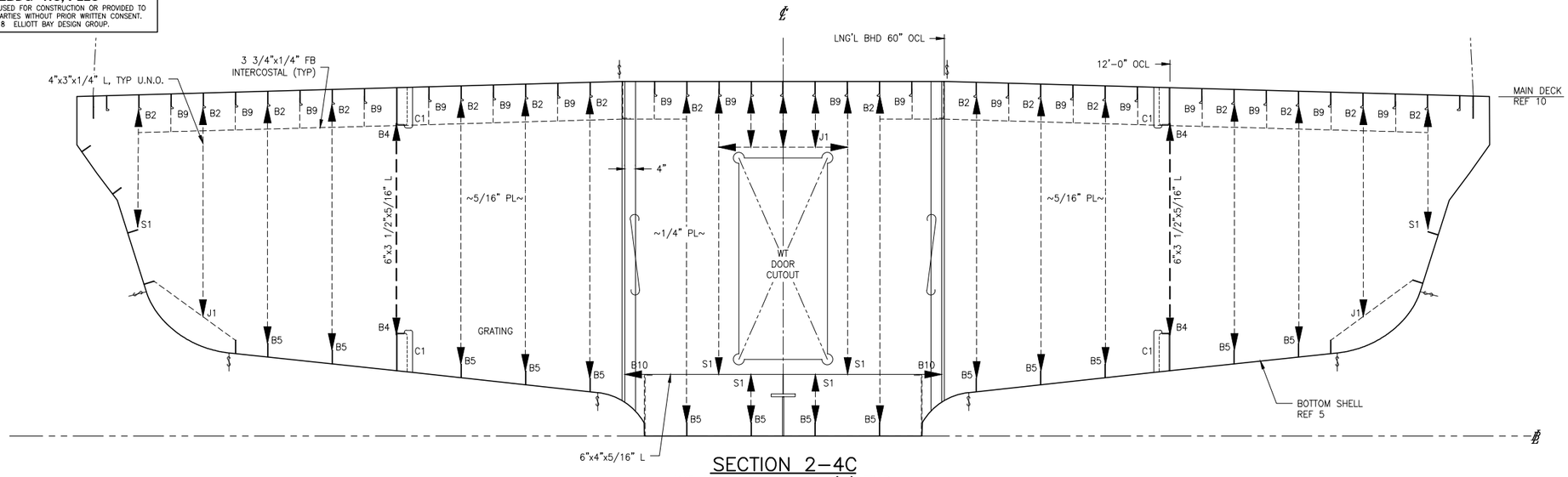
TITLE: HULL TRANSVERSE BULKHEADS

SIZE	DWG NO.	REV
D	18026–200–120–3	B

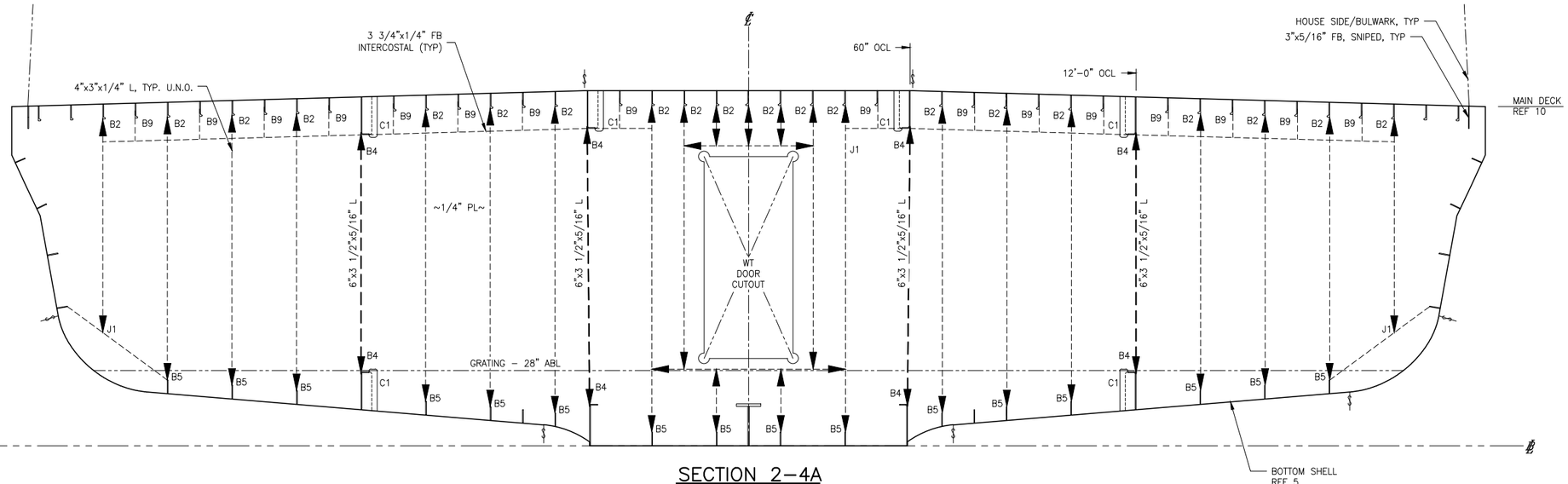
SCALE	FILE NAME	SHEET	OF
1/2" = 1'–0"	18026–200–120–3B	1	5

DWN	MOD	CKD	APVD	APVD DATE
JCG	SKW	SKW	SKW	7/26/2018

8/6/2018 11:04:06 AM



SECTION 2–4C
WT BHD, FRAME 24, 'B' END
LOOKING FWD
'A' END SIM/OPP U.N.O.

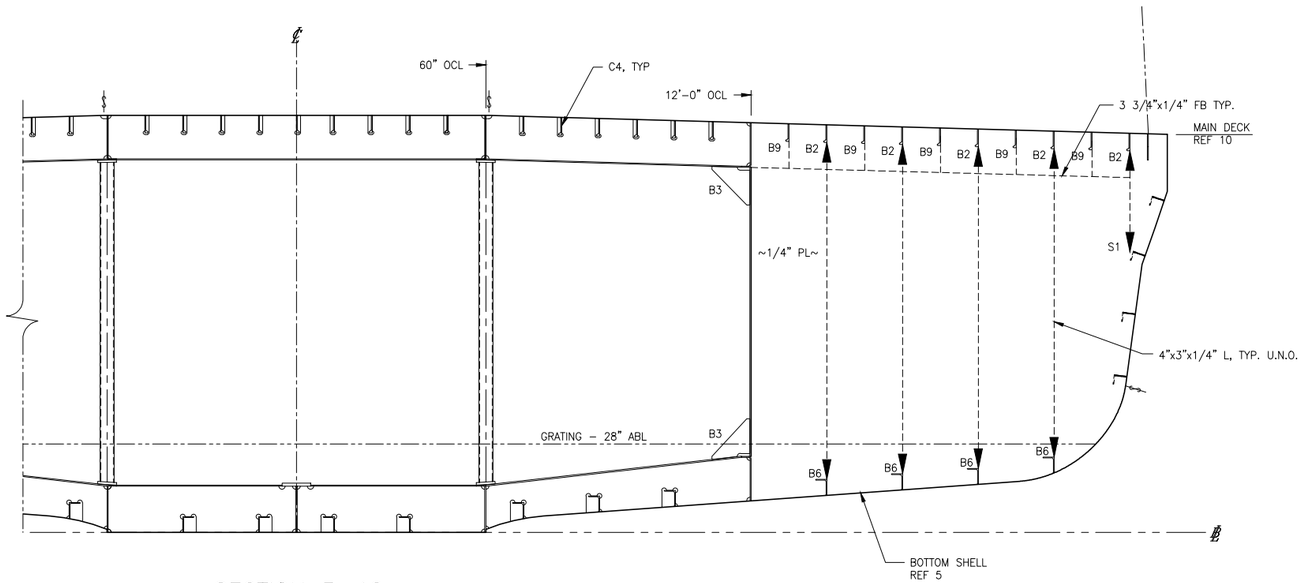


SECTION 2–4A
WT BHD, FRAME 16, 'B' END
LOOKING FWD
'A' END SIM/OPP U.N.O.

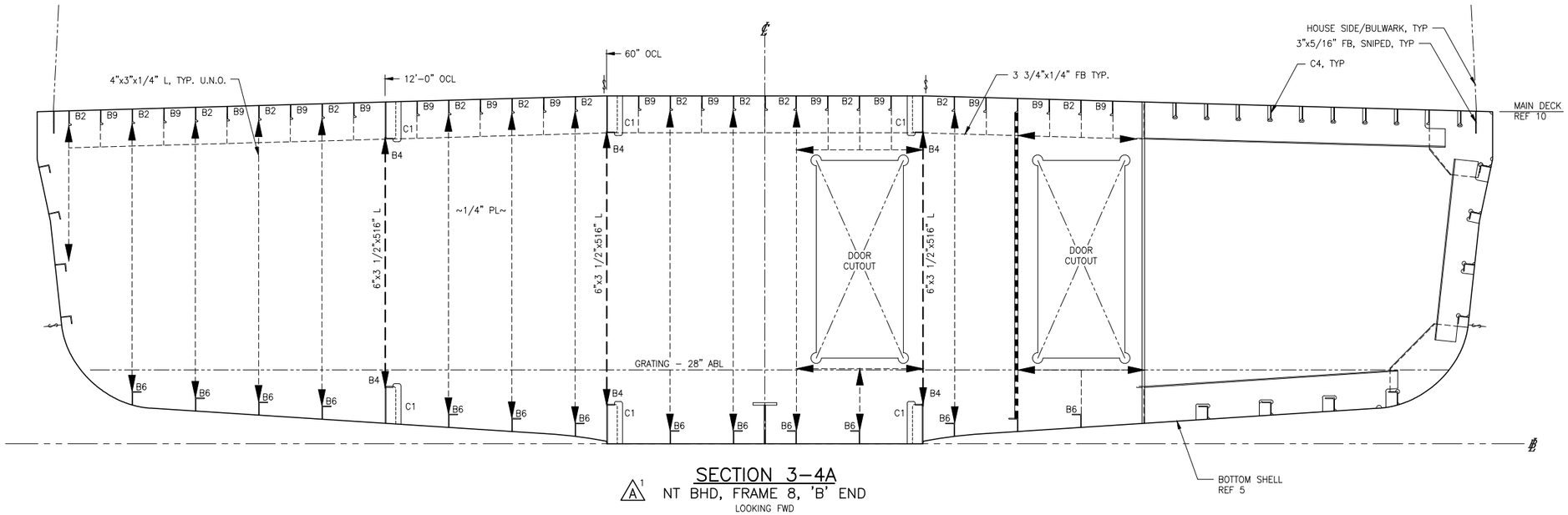
SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED PROFESSIONAL ENGINEER
8/6/2018

SIZE	DWG NO.	REV
D	18026-200-120-3	B
SCALE 1/2" = 1'-0"	FILE NAME 18026-200-120-3B	SHEET 2 OF 5

8/6/2018 11:04:11 AM



SECTION 3–4C
NT BHD, FRAME 12, 'B' END
LOOKING FWD

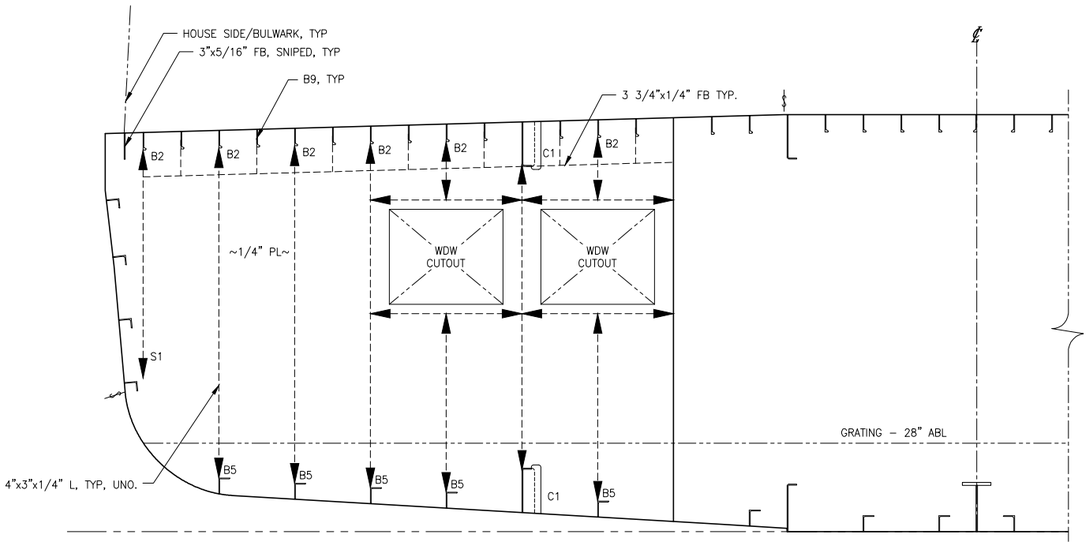


SECTION 3–4A
NT BHD, FRAME 8, 'B' END
LOOKING FWD

STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

SIZE	DWG NO.	REV
D	18026-200-120-3	B
SCALE 1/2" = 1'-0"	FILE NAME 18026-200-120-3B	SHEET 3 OF 5

8/6/2018 11:04:16 AM



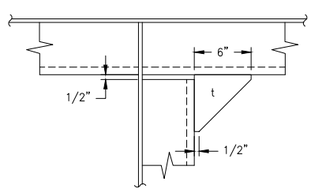
SECTION 4–4B
NT BHD, FRAME 2, 'B' END
LOOKING AFT

8/6/2018

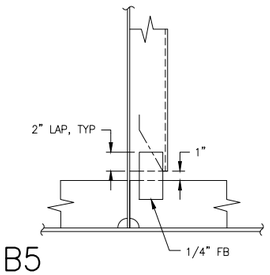
SIZE	DWG NO.	REV
D	18026–200–120–3	B
SCALE 1/2" = 1'–0"	FILE NAME 18026–200–120–3B	SHEET 4 OF 5

8/6/2018 11:04:21 AM

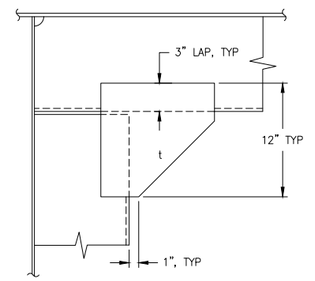
B2



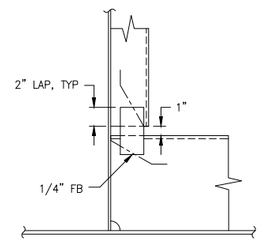
B5



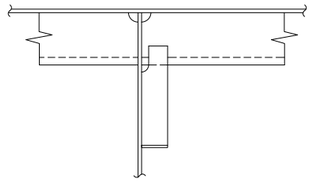
B4



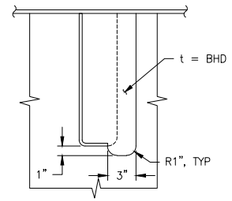
B7



B9



C1



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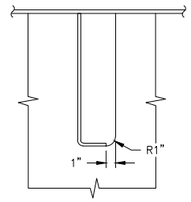
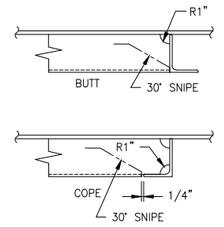
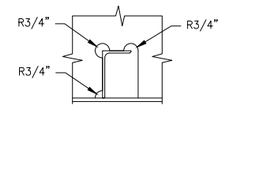


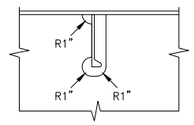
J1



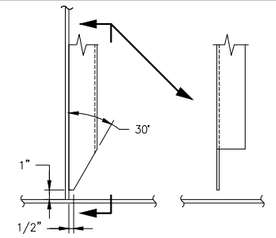
C3



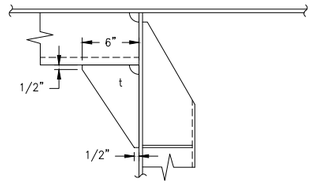
C4



S1



B11

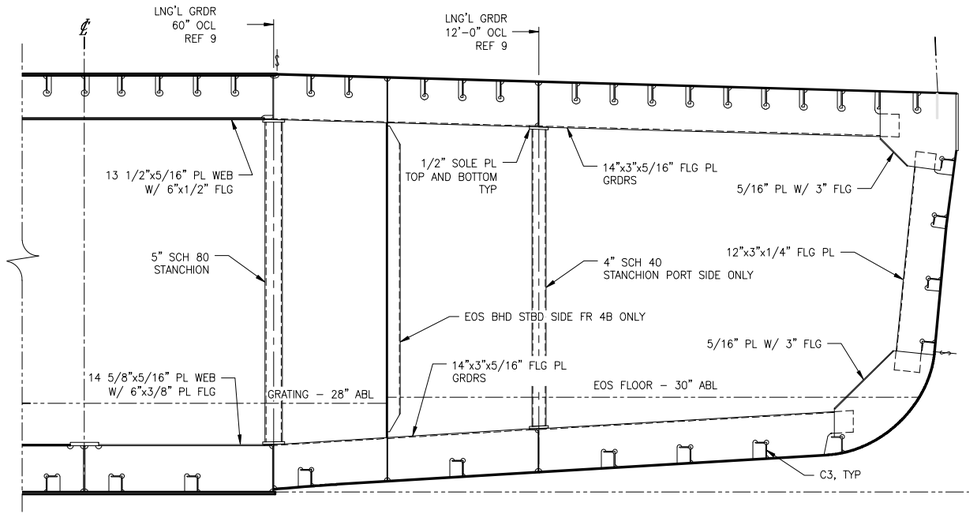


SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER

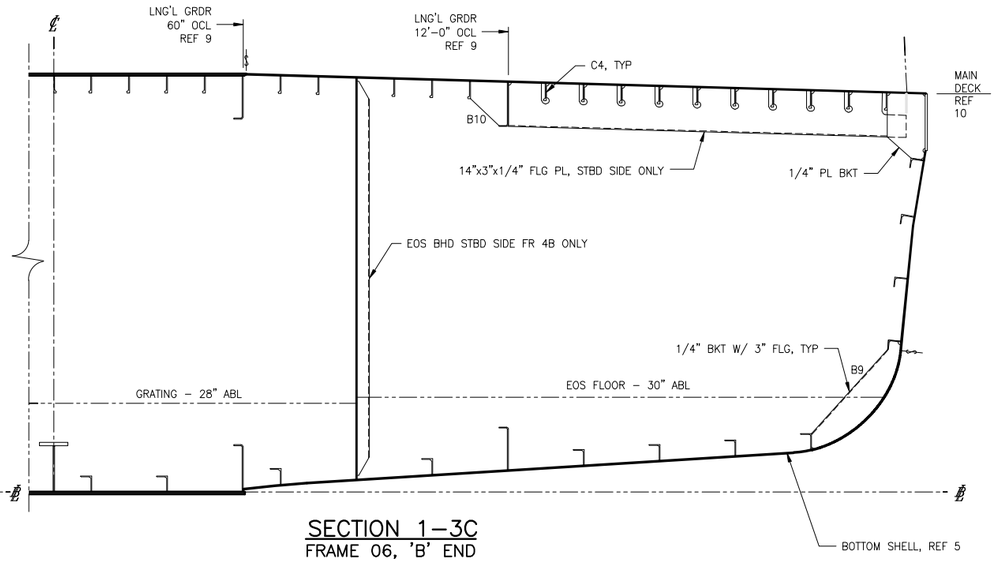
8/6/2018

SIZE	DWG NO.	REV
D	18026-200-120-3	B
SCALE 1 1/2" = 1'-0"	FILE NAME 18026-200-120-3B	SHEET 5 OF 5

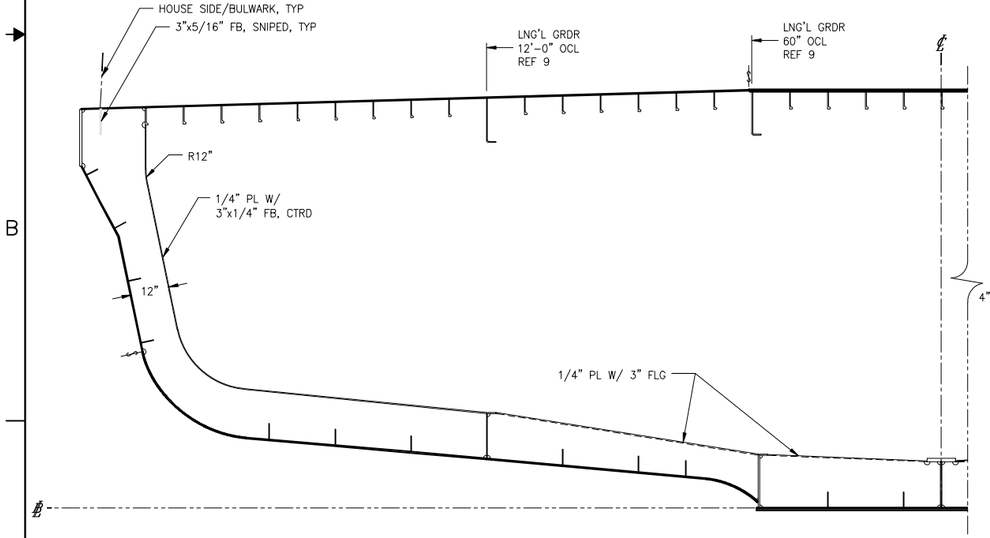
8/6/2018 11:04:26 AM



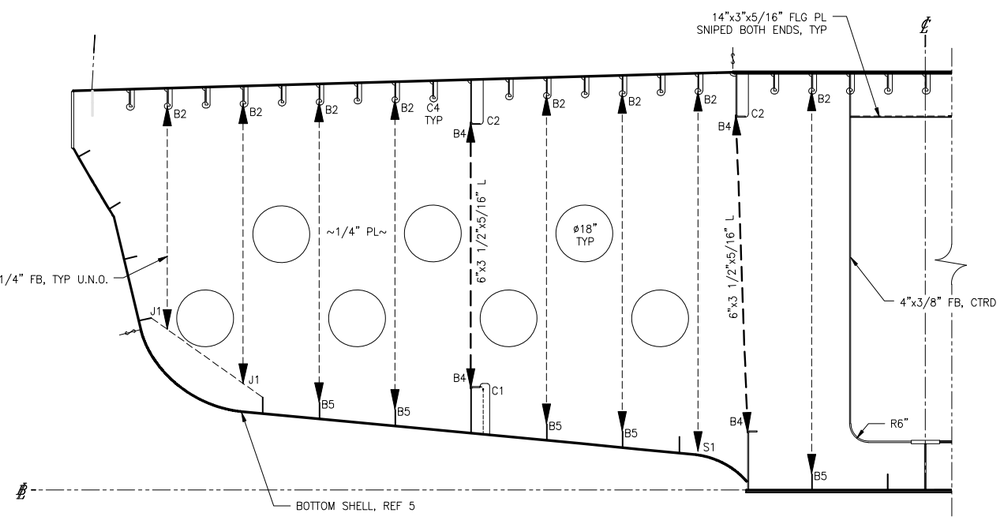
SECTION 1–5C
FRAME 04, 'B' END
LOOKING FWD; STBD SIM/OPP
FRAMES 4A, 8A, 12B SIM. U.N.O.



SECTION 1–3C
FRAME 06, 'B' END
LOOKING FWD
'A' END SIM/OPP, U.N.O.



SECTION 1–5A
FRAME 18, 'B' END
LOOKING FWD; STBD SIM/OPP
FRAMES 22, 26, 30, SIM. U.N.O.
'A' END SIM/OPP, INCLUDING 14A



SECTION 1–3A
FRAME 20 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP; INCLUDING FR 12

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
25707
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-100-1	LINES PLAN
4.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
5.	18026-200-110-1	BOTTOM AND SIDE SHELL
6.	18026-200-120-1	MIDSHIP SECTION
7.	18026-200-120-3	HULL TRANSVERSE BULKHEADS
8.	18026-200-120-4	HULL TRANSVERSE FRAMES
9.	18026-200-120-5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026-200-130-2	MAIN DECK
11.	18026-200-180-1	PROPULSION UNIT FOUNDATIONS

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

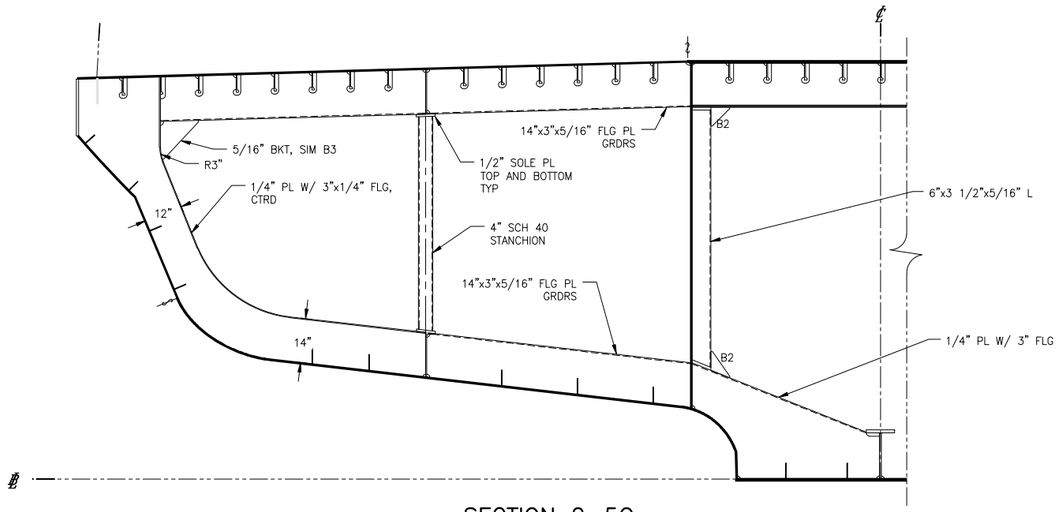
TITLE: HULL TRANSVERSE FRAMES

SIZE	DWG NO.	REV
D	18026-200-120-4	–

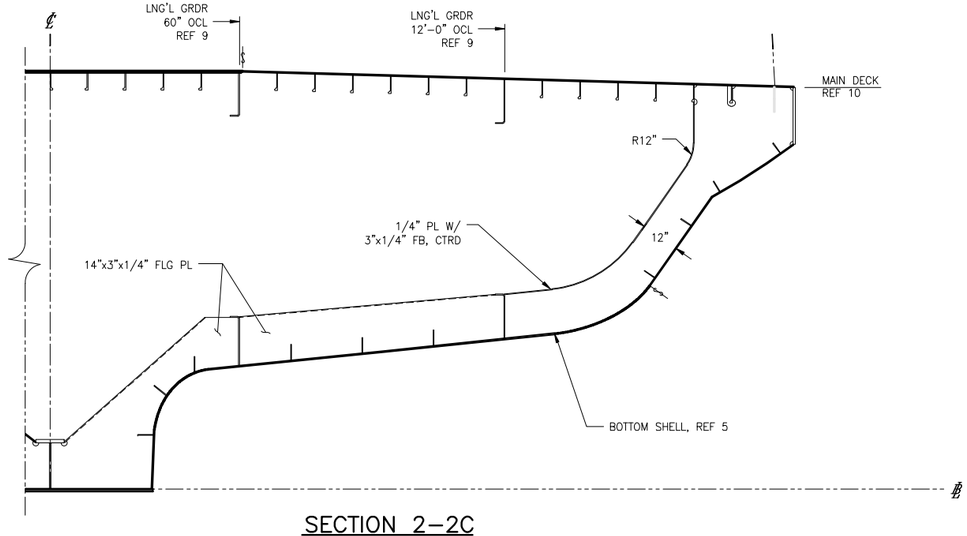
SCALE	FILE NAME	SHEET	OF
1/2" = 1'-0"	18026-200-120-4-	1	4

DWN	MOD	CKD	APVD	APVD DATE
JCG		SKW	SKW	7/26/2018

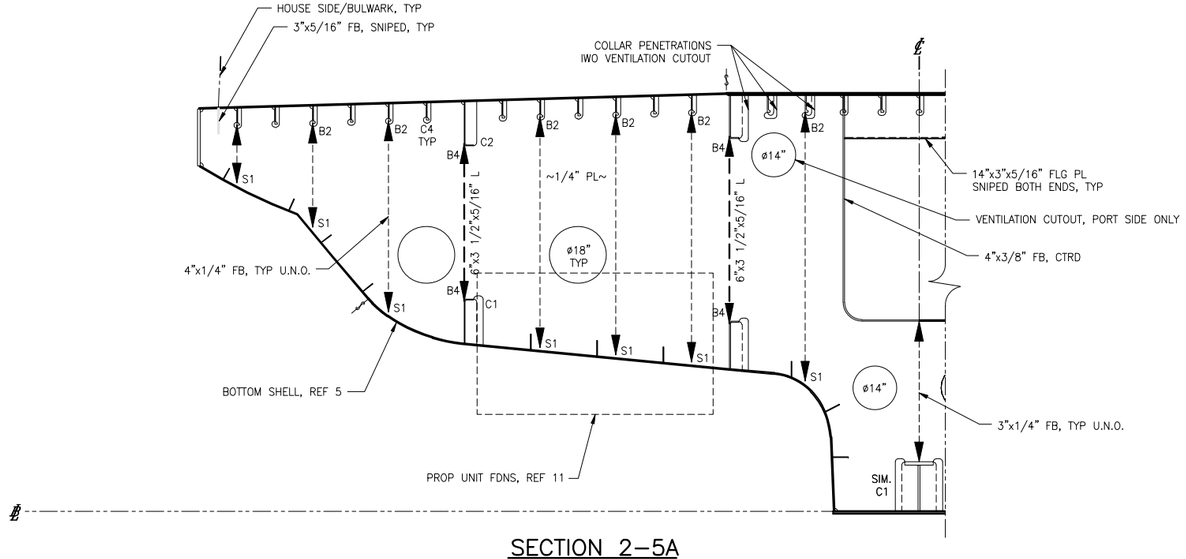
7/30/2018 4:08:19 PM



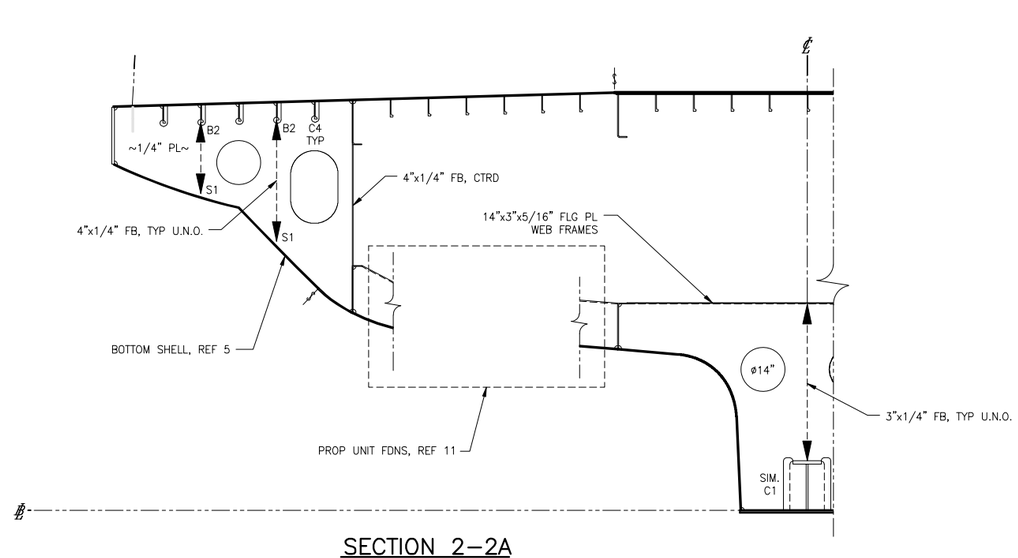
SECTION 2–5C
FRAME 28, 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP



SECTION 2–2C
FRAME 34, 'B' END
LOOKING FWD
'A' END SIM/OPP, U.N.O.



SECTION 2–5A
FRAME 36, 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP



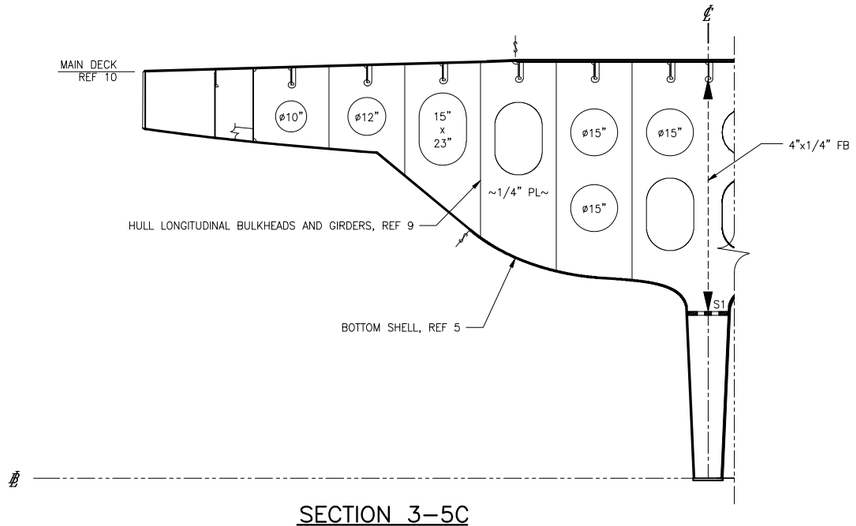
SECTION 2–2A
FRAME 38, 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
557
REGISTERED
PROFESSIONAL ENGINEER

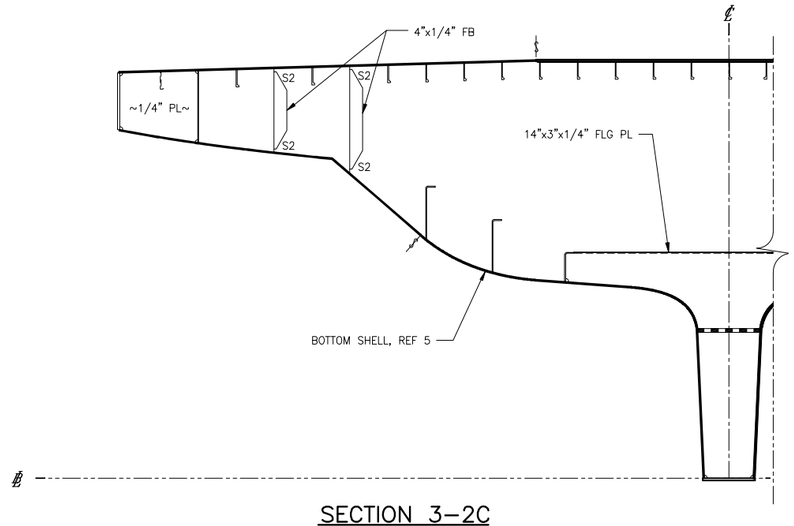
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–120–4	–
SCALE 1/2" = 1'–0"	FILE NAME 18026–200–120–4–	SHEET 2 OF 4

7/30/2018 4:08:23 PM



SECTION 3–5C
FRAME 43, 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP



SECTION 3–2C
FRAME 42, 'B' END
LOOKING FWD; STBD SIM/OPP
FRAMES 41 SIM. U.N.O.
'A' END SIM/OPP

KEY

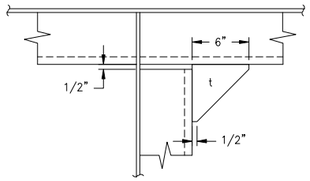
- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
5700
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

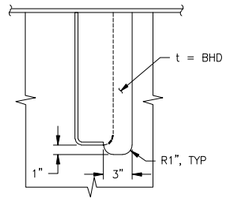
SIZE	DWG NO.	REV
D	18026–200–120–4	–
SCALE 1/2" = 1'–0"	FILE NAME 18026–200–120–4–	SHEET 3 OF 4

7/30/2018 4:08:28 PM

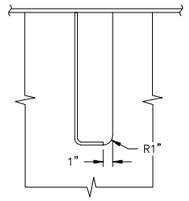
B2



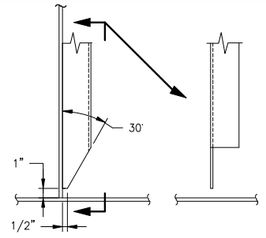
C1



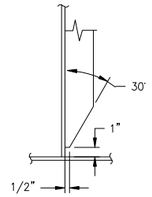
C2



S1

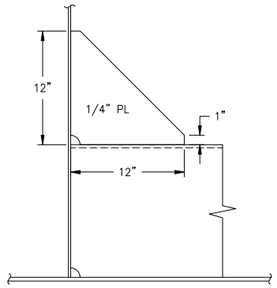


S2

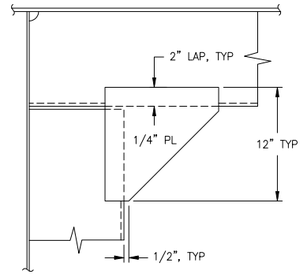


FLAT BAR SNIPE

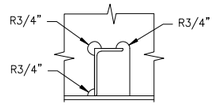
B3



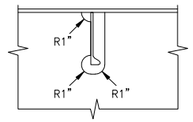
B4



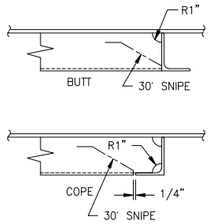
C3



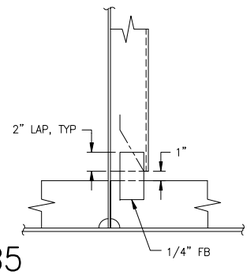
C4



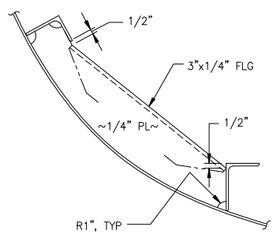
J1



B5



B9

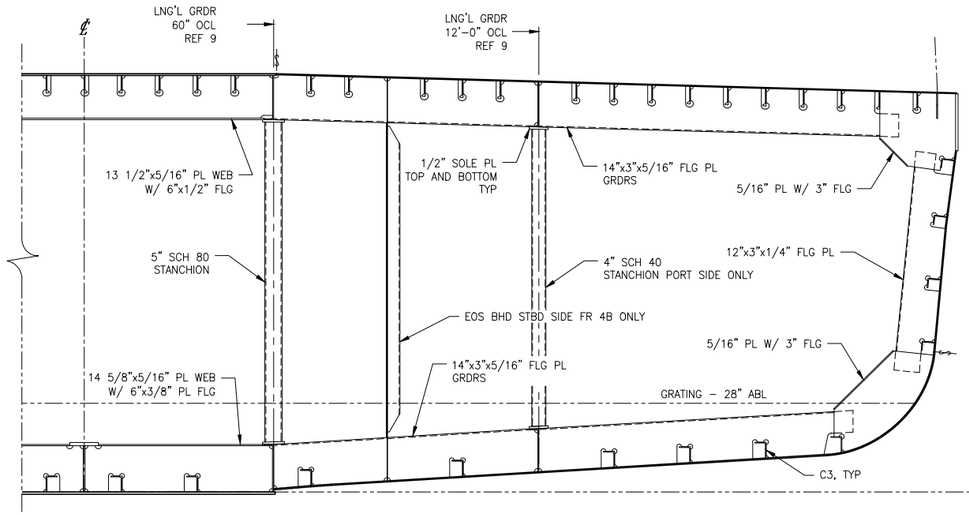


SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
5670
REGISTERED
PROFESSIONAL ENGINEER

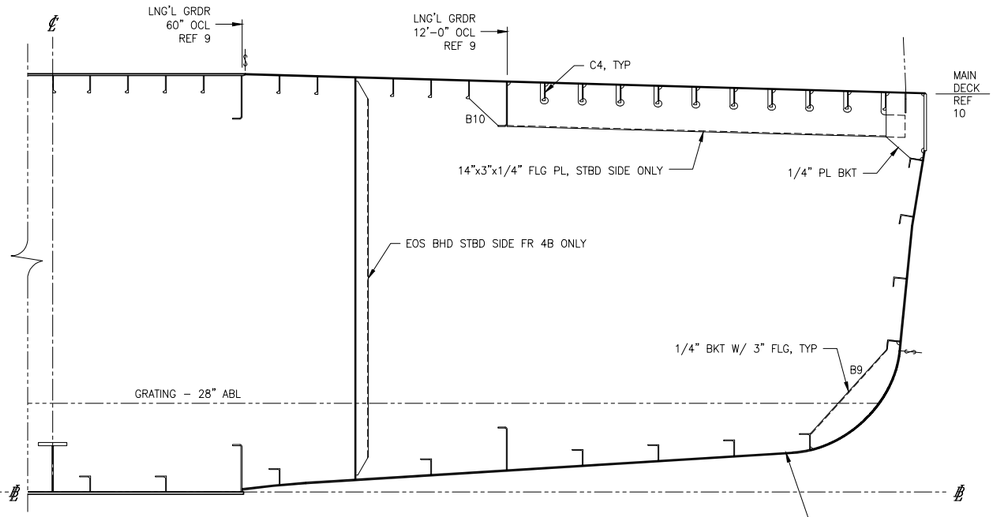
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-120-4	–
SCALE 1 1/2" = 1'-0"	FILE NAME 18026-200-120-4-	SHEET 4 OF 4

7/30/2018 4:08:33 PM



A1 SECTION 1–5C
FRAME 04, 'B' END
LOOKING FWD; STBD SIM/OPP
FRAMES 4A, 8A, 12B SIM. U.N.O.



A1 SECTION 1–3C
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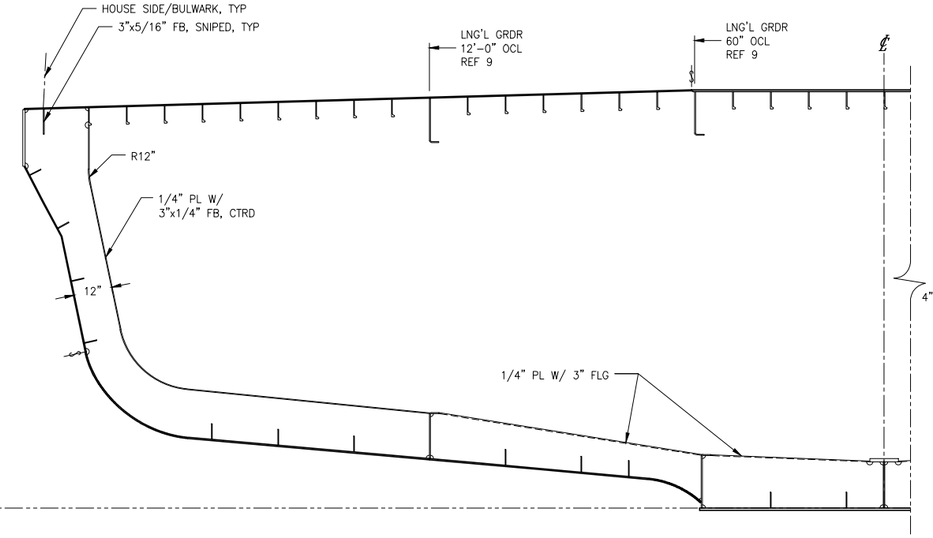
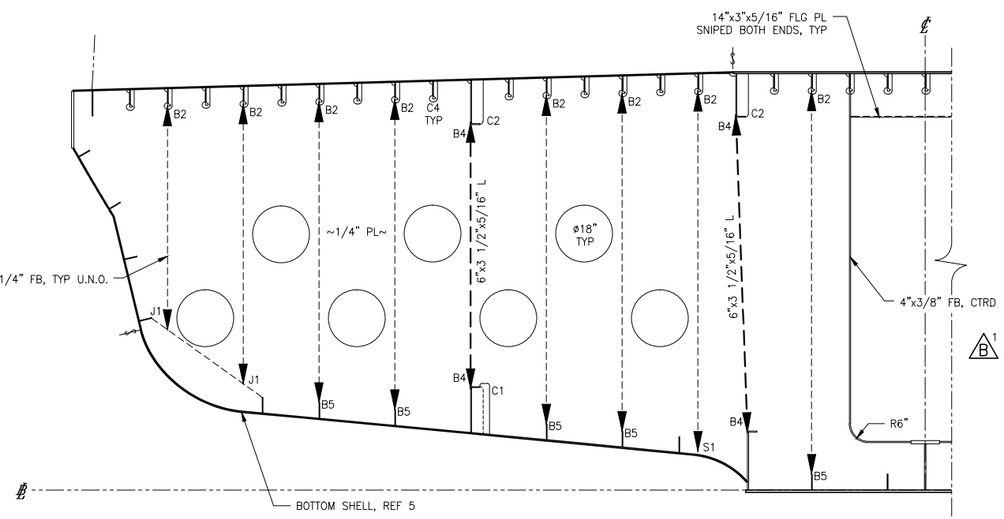
LOOKING FWD
'A' END SIM/OPP, U.N.O.



SECTION 1–5A
FRAME 18, 'B' END
LOOKING FWD; STBD SIM/OPP
FRAMES 22, 26, 30, SIM. U.N.O.
'A' END SIM/OPP, INCLUDING 14A



SECTION 1–3A
FRAME 20 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP; INCLUDING FR 12

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	1–3C 1–5C	1. CHANGED EOS GRATING LEVEL TO 28"	SKW	8/2/18	SKW
B	1–2B	1. CORRECTED REFERENCED DRAWING TITLE	SKW	8/6/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATION
2.	18026–200–061–1	SCANTLING CALCULATIONS
3.	18026–200–100–1	LINES PLAN
4.	18026–200–101–1	PROFILES AND DECK ARRANGEMENTS
5.	18026–200–110–1	BOTTOM AND SIDE SHELL
6.	18026–200–120–1	MIDSHIP SECTION
7.	18026–200–120–3	HULL TRANSVERSE BULKHEADS
8.	18026–200–120–4	HULL TRANSVERSE FRAMES
9.	18026–200–120–5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026–200–130–2	MAIN DECK
11.	18026–200–180–1	MAIN MACHINERY FOUNDATIONS

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

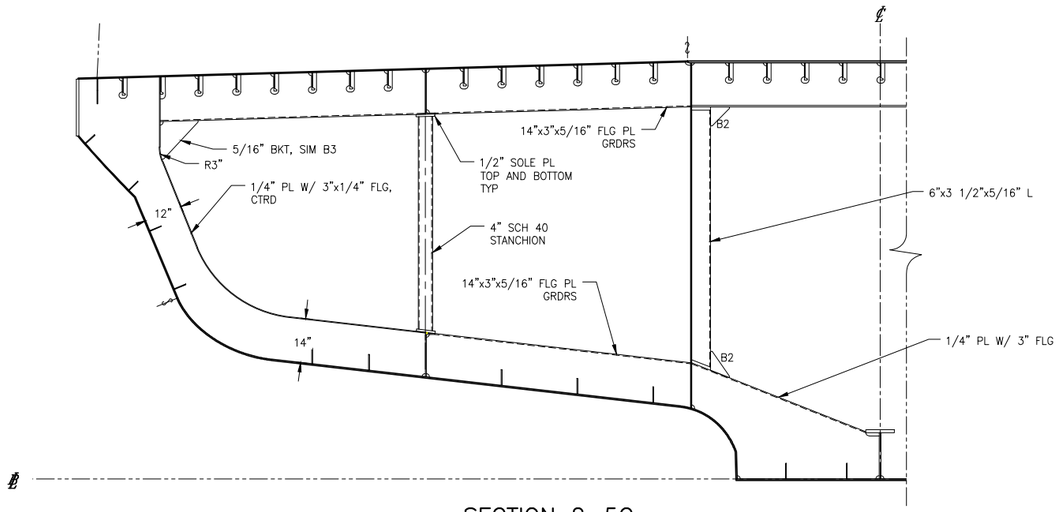
TITLE: HULL TRANSVERSE FRAMES

SIZE	DWG NO.	REV
D	18026–200–120–4	B

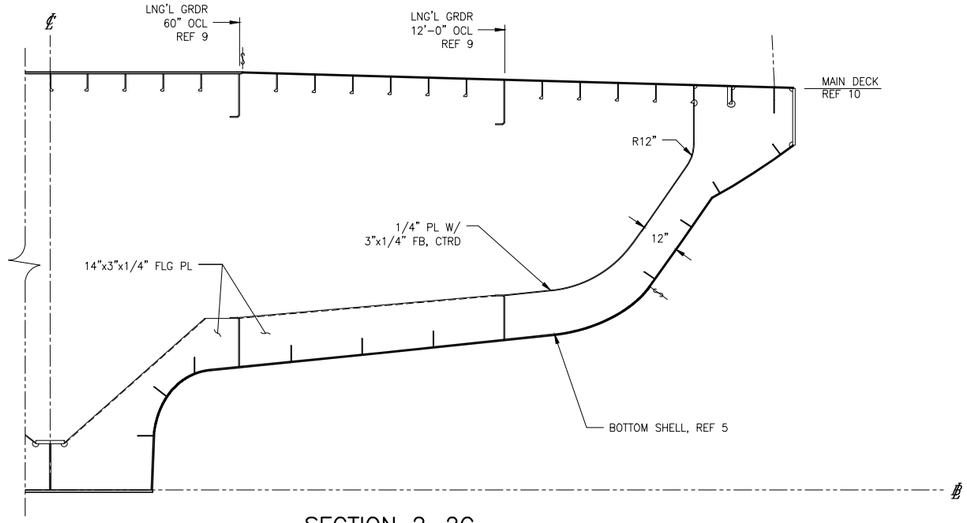
SCALE	FILE NAME	SHEET	OF
1/2" = 1'–0"	18026–200–120–4B	1	4

DWN	MOD	CKD	APVD	APVD DATE
JCG	SKW	SKW	SKW	7/26/18

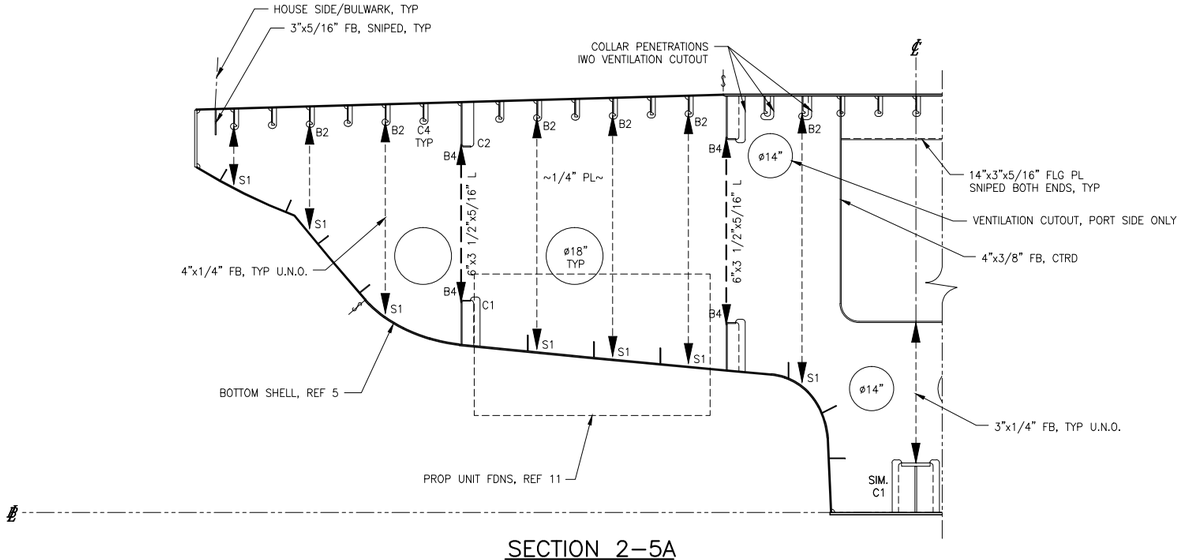
8/6/2018 11:05:51 AM



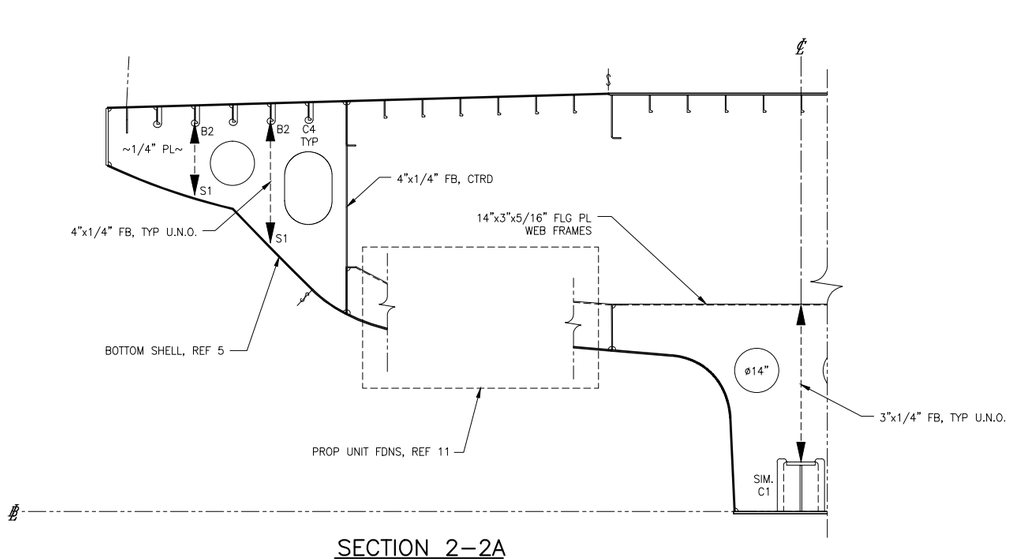
SECTION 2–5C
FRAME 28, 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP



SECTION 2–2C
FRAME 34, 'B' END
LOOKING FWD
'A' END SIM/OPP, U.N.O.



SECTION 2–5A
FRAME 36, 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP



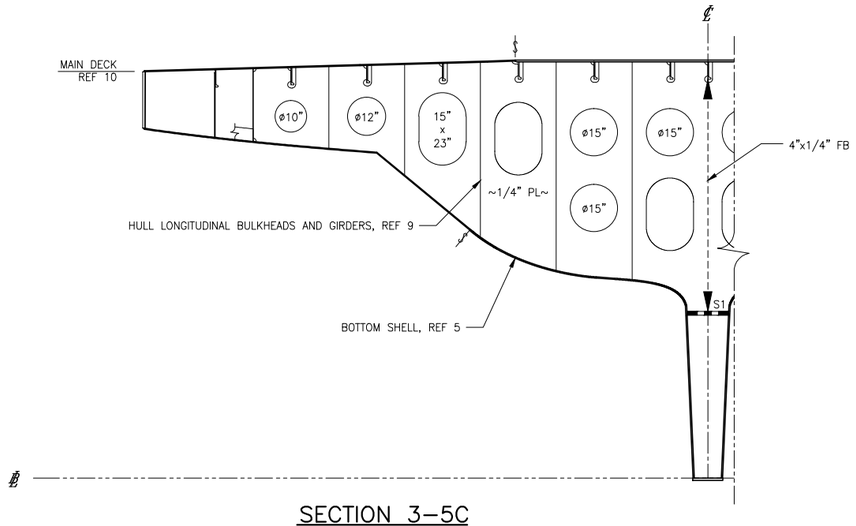
SECTION 2–2A
FRAME 38, 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER

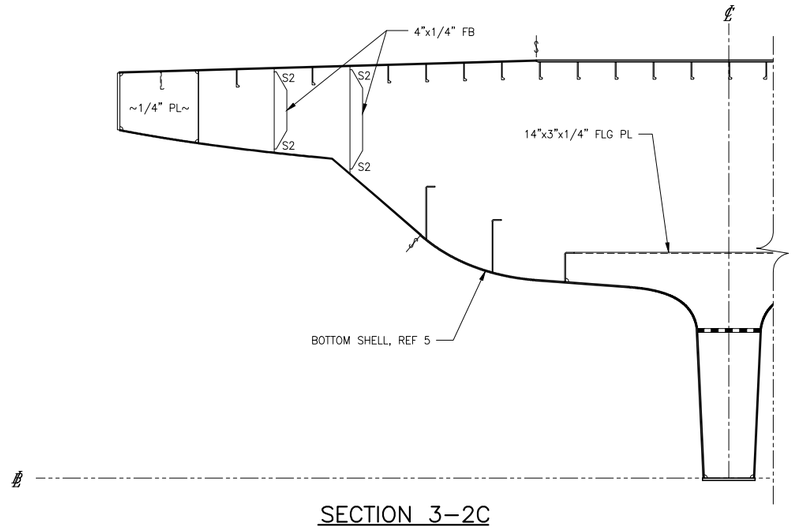
8/6/2018

SIZE	DWG NO.	REV
D	18026–200–120–4	B
SCALE 1/2" = 1'–0"	FILE NAME 18026–200–120–4B	SHEET 2 OF 4

8/6/2018 11:05:55 AM



SECTION 3–5C
FRAME 43, 'B' END
LOOKING FWD; STBD SIM/OPP
'A' END SIM/OPP



SECTION 3–2C
FRAME 42, 'B' END
LOOKING FWD; STBD SIM/OPP
FRAMES 41 SIM. U.N.O.
'A' END SIM/OPP

KEY

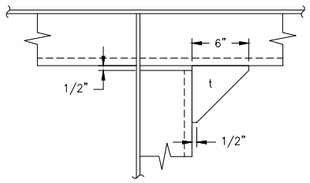
- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

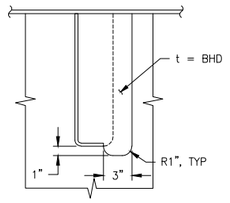
SIZE	DWG NO.	REV
D	18026–200–120–4	B
SCALE 1/2" = 1'–0"	FILE NAME 18026–200–120–4B	SHEET 3 OF 4

8/6/2018 11:06:00 AM

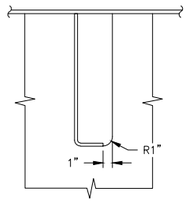
B2



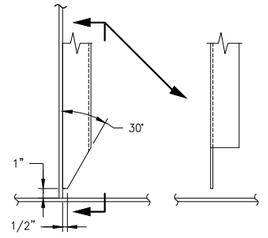
C1



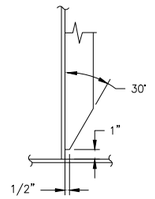
C2



S1

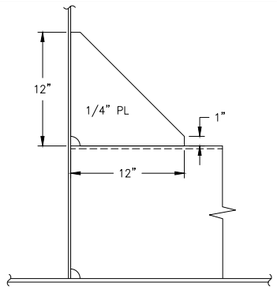


S2

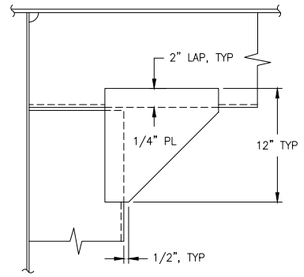


FLAT BAR SNIPE

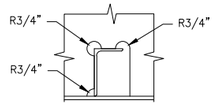
B3



B4



C3



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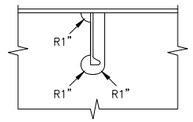
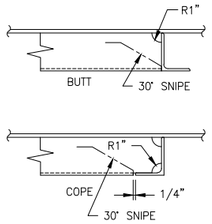
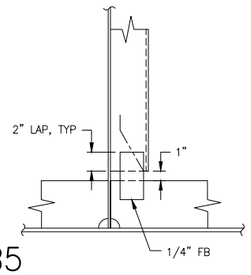


J1



B5



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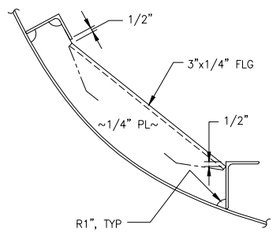
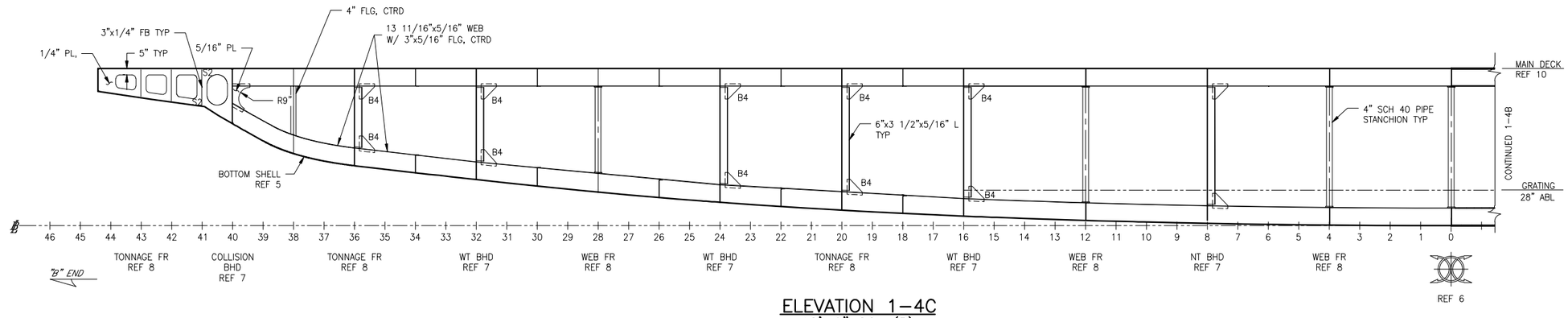


SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER

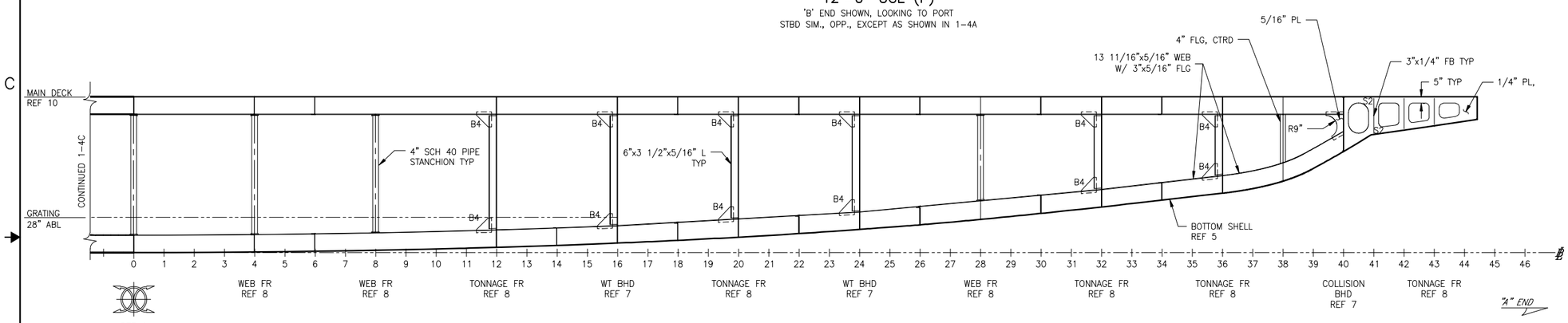
8/6/2018

SIZE	DWG NO.	REV
D	18026-200-120-4	B
SCALE 1 1/2" = 1'-0"	FILE NAME 18026-200-120-4B	SHEET 4 OF 4

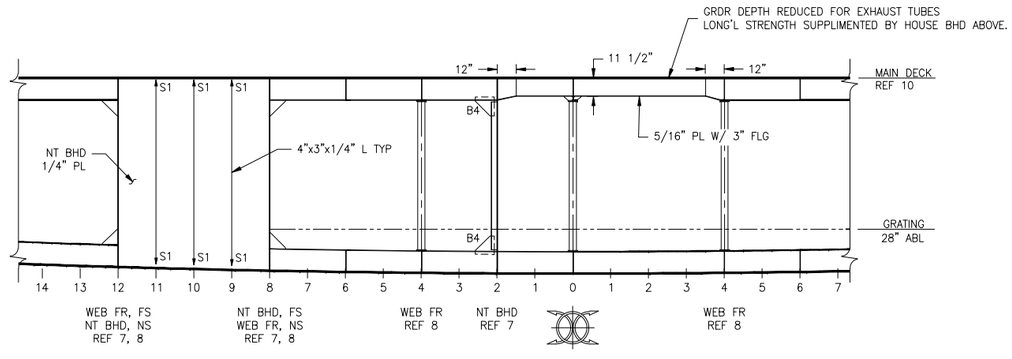
8/6/2018 11:06:05 AM



ELEVATION 1–4C
12'–0" OCL (P)
'B' END SHOWN, LOOKING TO PORT
STBD SIM., OPP., EXCEPT AS SHOWN IN 1–4A



ELEVATION 1–4B
12'–0" OCL PORT
'A' END SHOWN, LOOKING TO PORT
STBD SIMILAR OPPOSITE



ELEVATION 1–4A
12'–0" OCL STBD
LOOKING TO PORT

KEY
- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

MAIN DECK PL – CENTER:	1/2" TYP U.N.O.
MAIN DECK PL – OUTBD:	5/16" TYP U.N.O.
MAIN DECK STIFFENERS:	HP140x8 TYP U.N.O.
MAIN DECK GIRDERS & WEBS:	14"x3"x5/16" FL PL TYP U.N.O.
STANCHIONS – 5' OCL:	5" SCH 80 TYP U.N.O.
STANCHIONS – 12' OCL:	4" SCH 40 TYP U.N.O.

SAMUEL K WATERHOUSS
STATE OF WASHINGTON
5570
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-100-1	LINES PLAN
4.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
5.	18026-200-110-1	BOTTOM AND SIDE SHELL
6.	18026-200-120-1	MIDSHIP SECTION
7.	18026-200-120-3	HULL TRANSVERSE BULKHEADS
8.	18026-200-120-4	HULL TRANSVERSE FRAMES
9.	18026-200-120-5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026-200-130-2	MAIN DECK
11.	18026-200-180-1	PROPULSION UNIT FOUNDATIONS
12.	18026-200-624-1	WINDOW SCHEDULE
13.	18026-200-624-2	DOOR SCHEDULE

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

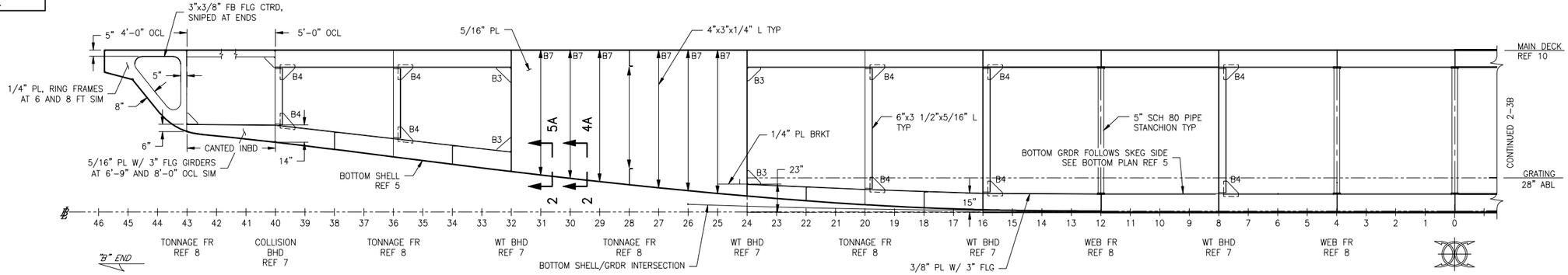
TITLE: HULL LONGITUDINAL BULKHEADS AND GIRDERS

SIZE	DWG NO.	REV
D	18026-200-120-5	—

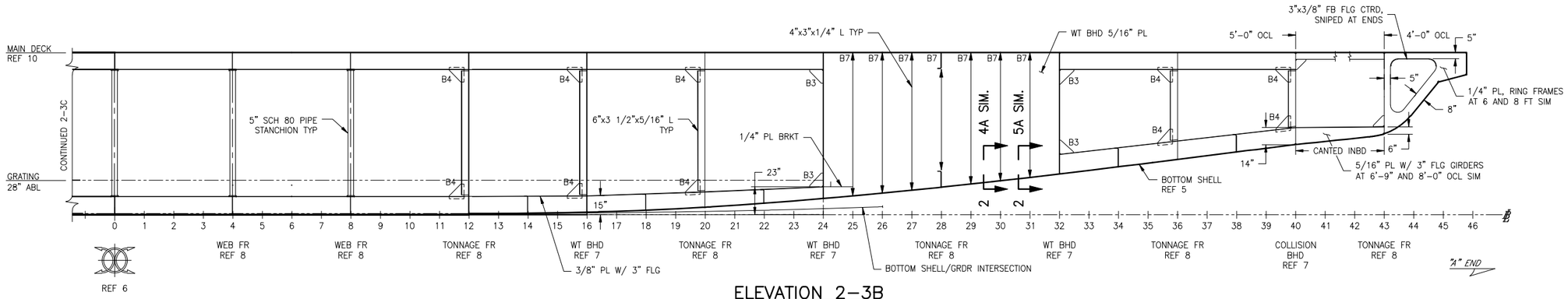
SCALE 1/4" = 1'-0" | FILE NAME 18026-200-120-5- | SHEET 1 OF 4

DWN	MOD	CKD	APVD	APVD DATE
JCG		SKW	SKW	7/26/2018

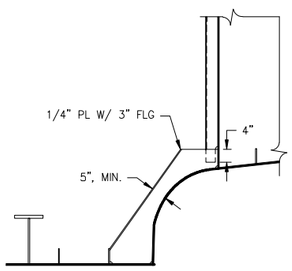
7/30/2018 4:05:16 PM



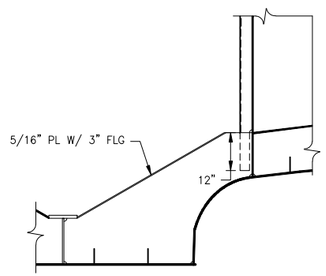
ELEVATION 2–3C
5'–0" (U.N.O.) OCL PORT
'B' END SHOWN LOOKING TO PORT
STBD SIMILAR OPPOSITE



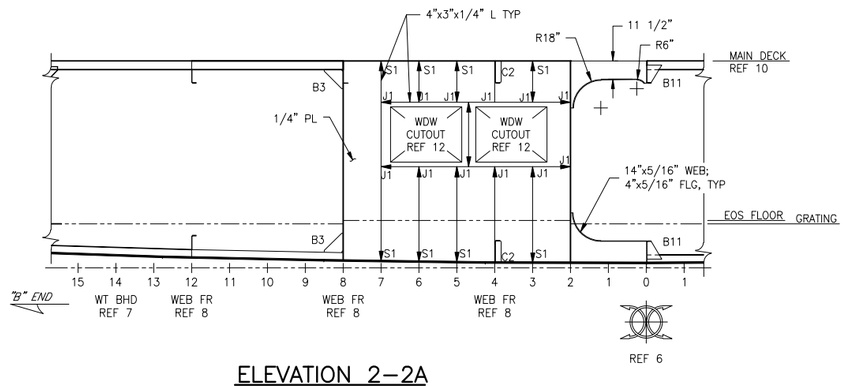
ELEVATION 2–3B
5'–0" (U.N.O.) OCL PORT
'A' END SHOWN LOOKING TO PORT
STBD SIMILAR OPPOSITE



DETAIL 2–5A
FR 31 SHOWN – 29, 27 & 25 SIM
LOOKING TO 'B' END
SCALE: 1/2" = 1'–0"



DETAIL 2–4A
FR 30 SHOWN – 26, 28 SIM
LOOKING TO 'B' END
SCALE: 1/2" = 1'–0"



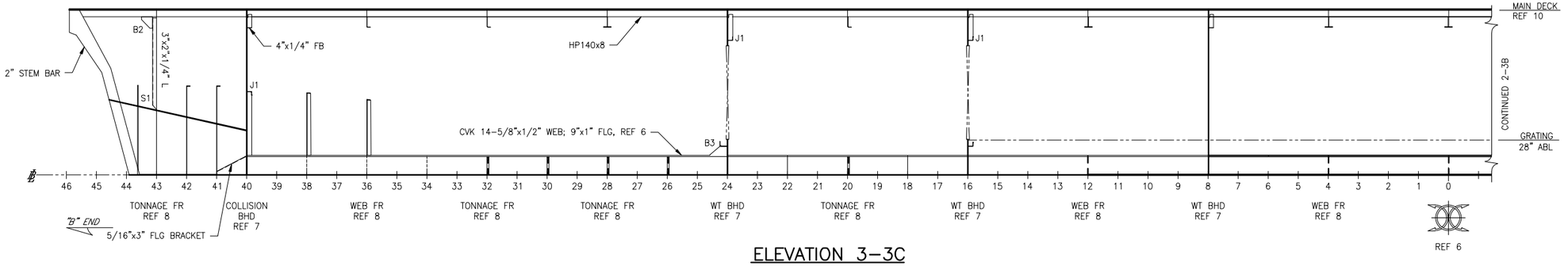
ELEVATION 2–2A
EOS NT BHD 8'–0" OCL STBD
'B' END SHOWN, LOOKING TO PORT

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
21571
REGISTERED PROFESSIONAL ENGINEER

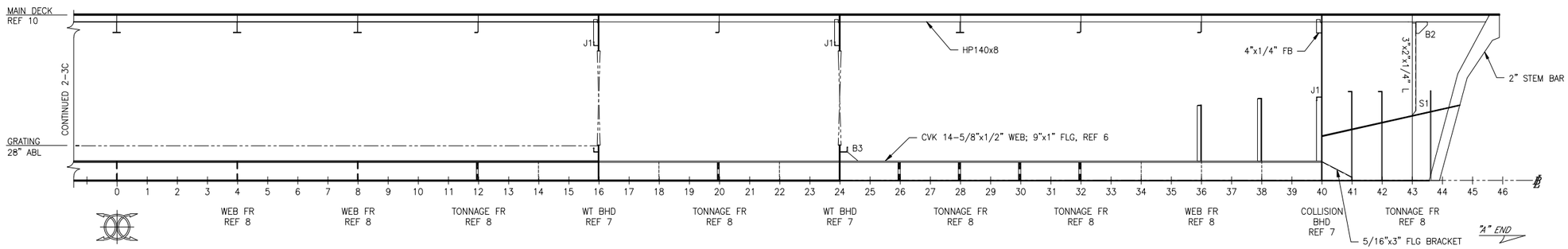
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–120–5	–
SCALE 1/4" = 1'–0"	FILE NAME 18026–200–120–5–	SHEET 2 OF 4

7/30/2018 4:05:20 PM



ELEVATION 3-3C
CENTERLINE
'B' END SHOWN LOOKING TO PORT

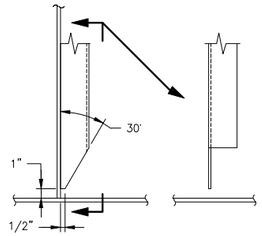


ELEVATION 3-3B
CENTERLINE
'A' END SHOWN LOOKING TO PORT

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55706
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-120-5	–
SCALE 1/4" = 1'-0"	FILE NAME 18026-200-120-5-	SHEET 3 OF 4

7/30/2018 4:05:25 PM



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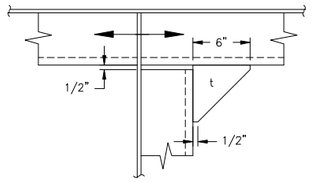

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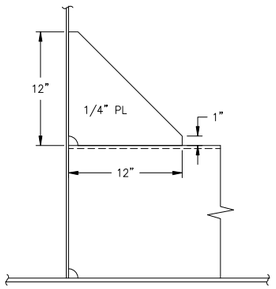

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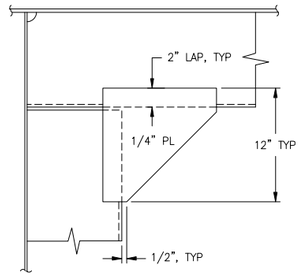

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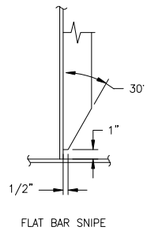
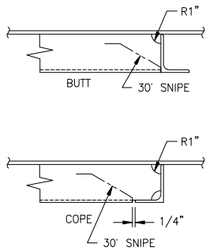


FLAT BAR SNIPE

S2



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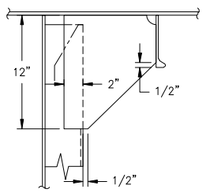
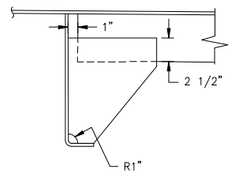


B7

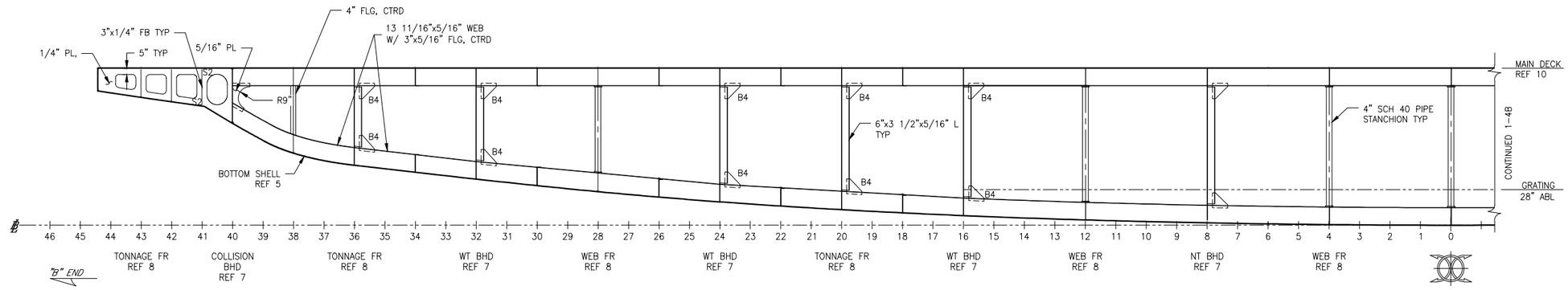


B11

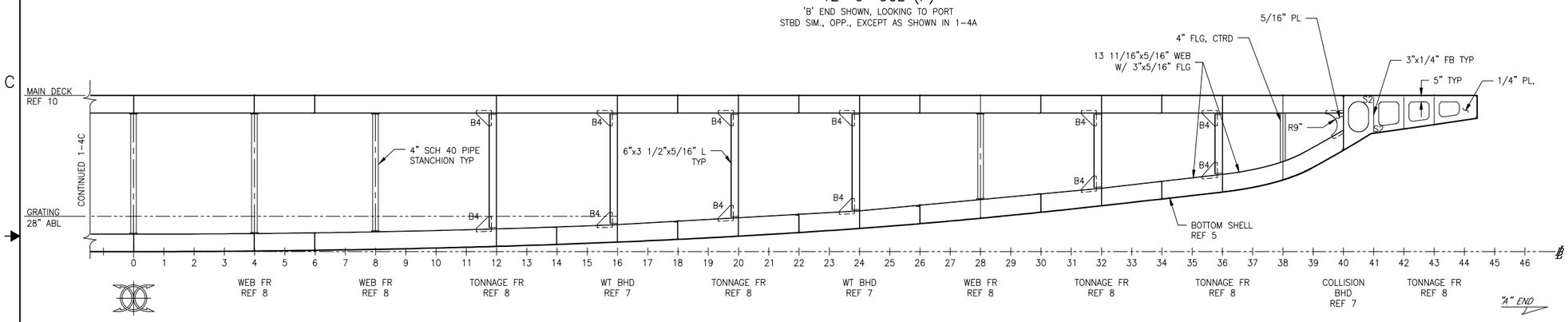
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-120-5	—
SCALE 1 1/2" = 1'-0"	FILE NAME 18026-200-120-5-	SHEET 4 OF 4

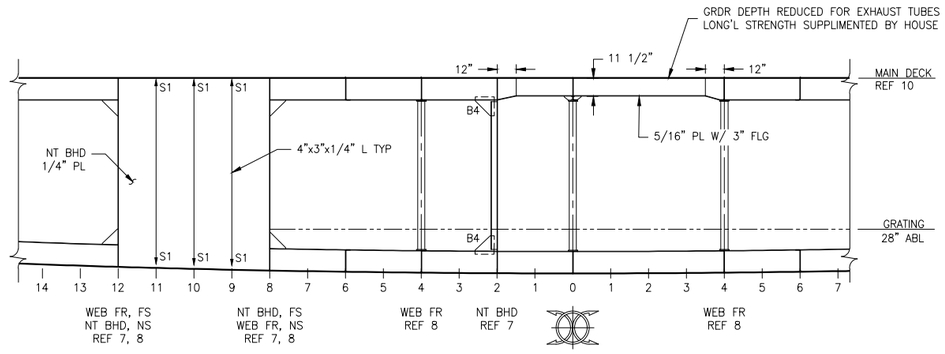
7/30/2018 4:06:30 PM



ELEVATION 1–4C
12'–0" OCL (P)
'B' END SHOWN, LOOKING TO PORT
STBD SIM., OPP., EXCEPT AS SHOWN IN 1–4A



ELEVATION 1–4B
12'–0" OCL PORT
'A' END SHOWN, LOOKING TO PORT
STBD SIMILAR OPPOSITE



ELEVATION 1–4A
12'–0" OCL STBD
LOOKING TO PORT

KEY
- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

MAIN DECK PL – CENTER:	1/2" TYP U.N.O.
MAIN DECK PL – OUTBD:	5/16" TYP U.N.O.
MAIN DECK STIFFENERS:	HP140x8 TYP U.N.O.
MAIN DECK GIRDERS & WEBS:	14"x3"x5/16" FL PL TYP U.N.O.
STANCHIONS – 5' OCL:	5" SCH 80 TYP U.N.O.
STANCHIONS – 12' OCL:	4" SCH 40 TYP U.N.O.

B1

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED PROFESSIONAL ENGINEER
8/6/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	2–2A	1. CHANGED EOS GRATING LEVEL TO 28"	SKW	8/2/18	SKW
B	1–2B	1. CORRECTED REFERENCED DRAWING TITLE	SKW	8/6/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATION
2.	18026–200–061–1	SCANTLING CALCULATIONS
3.	18026–200–100–1	LINES PLAN
4.	18026–200–101–1	PROFILES AND DECK ARRANGEMENTS
5.	18026–200–110–1	BOTTOM AND SIDE SHELL
6.	18026–200–120–1	MIDSHIP SECTION
7.	18026–200–120–3	HULL TRANSVERSE BULKHEADS
8.	18026–200–120–4	HULL TRANSVERSE FRAMES
9.	18026–200–120–5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026–200–130–2	MAIN DECK
11.	18026–200–180–1	MAIN MACHINERY FOUNDATIONS
12.	18026–200–624–1	WINDOW SCHEDULE
13.	18026–200–624–2	DOOR SCHEDULE

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

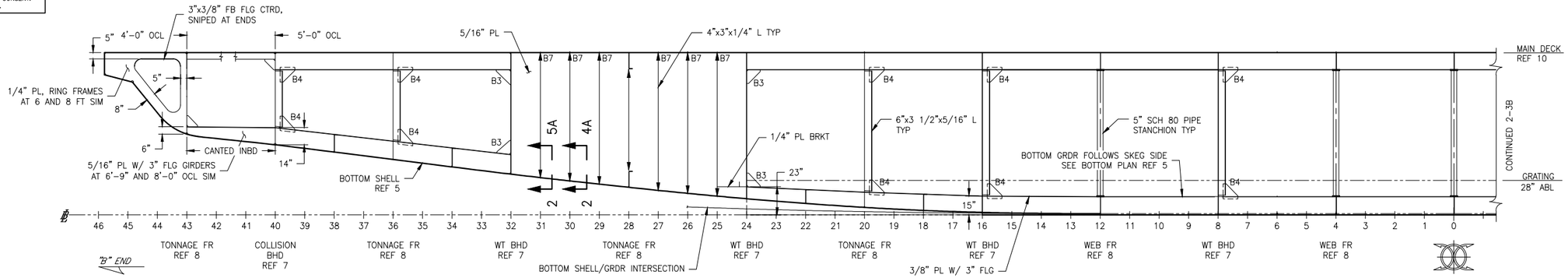
TITLE: HULL LONGITUDINAL BULKHEADS AND GIRDERS

SIZE	DWG NO.	REV
D	18026–200–120–5	B

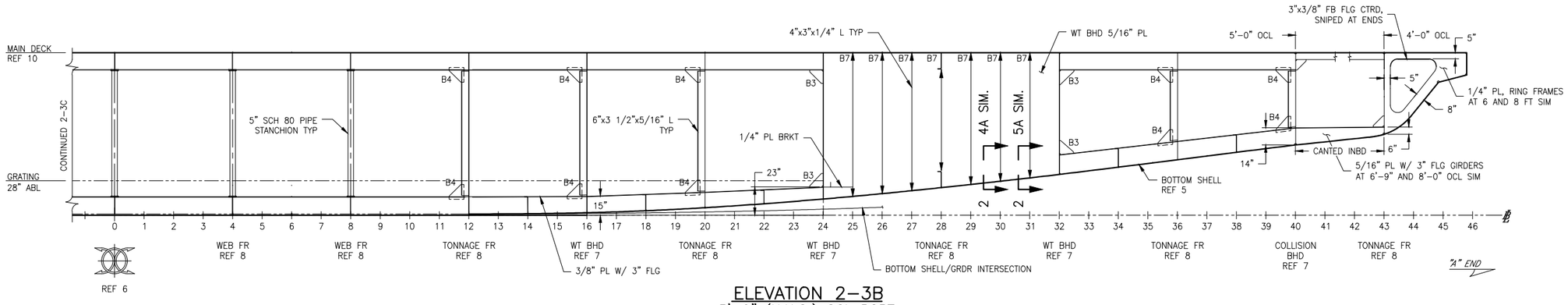
SCALE 1/4" = 1'–0" | FILE NAME 18026–200–120–5B | SHEET 1 OF 4

DWN	MOD	CKD	APVD	APVD DATE
JCG	SKW	SKW	SKW	7/26/2018

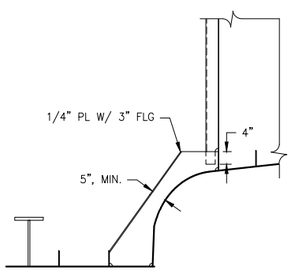
8/6/2018 11:07:32 AM



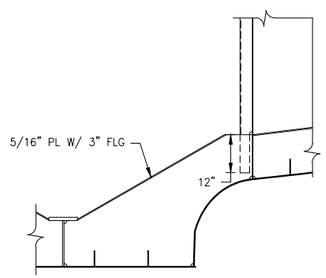
ELEVATION 2–3C
5'–0" (U.N.O.) OCL PORT
'B' END SHOWN LOOKING TO PORT
STBD SIMILAR OPPOSITE



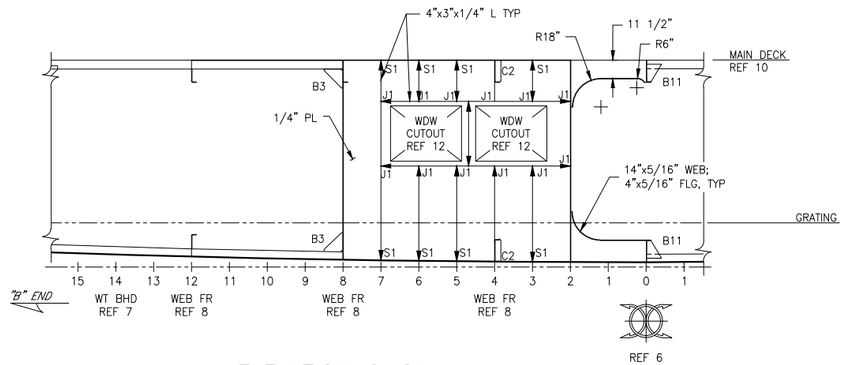
ELEVATION 2–3B
5'–0" (U.N.O.) OCL PORT
'A' END SHOWN LOOKING TO PORT
STBD SIMILAR OPPOSITE



DETAIL 2–5A
FR 31 SHOWN – 29, 27 & 25 SIM
LOOKING TO 'B' END
SCALE: 1/2" = 1'–0"



DETAIL 2–4A
FR 30 SHOWN – 26, 28 SIM
LOOKING TO 'B' END
SCALE: 1/2" = 1'–0"

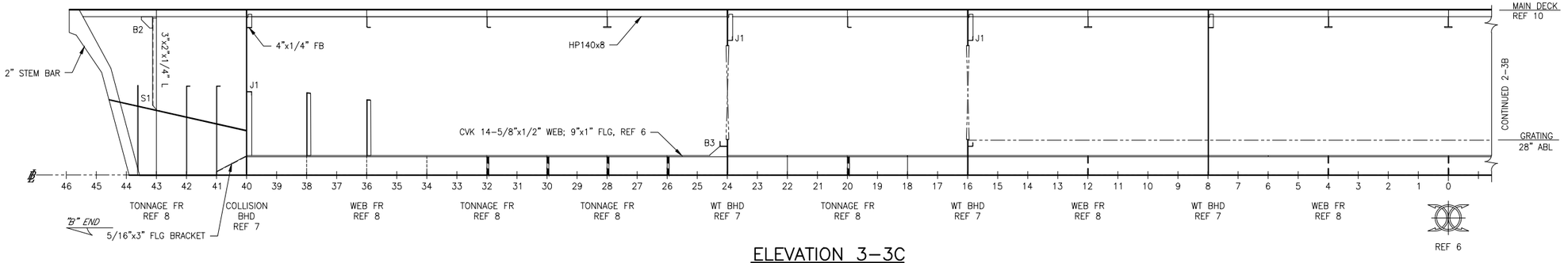


ELEVATION 2–2A
A1 EOS NT BHD 8'–0" OCL STBD
'B' END SHOWN, LOOKING TO PORT

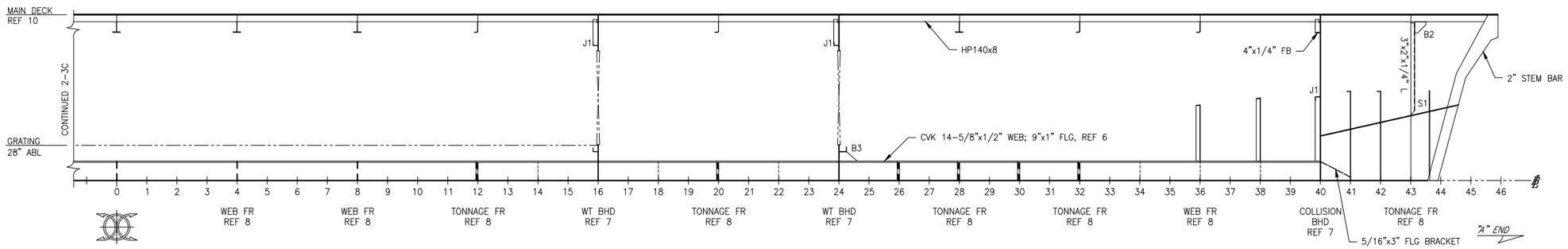
8/6/2018

SIZE	DWG NO.	REV
D	18026–200–120–5	B
SCALE 1/4" = 1'–0"	FILE NAME 18026–200–120–5B	SHEET 2 OF 4

8/6/2018 11:07:37 AM



ELEVATION 3-3C
CENTERLINE
'B' END SHOWN LOOKING TO PORT

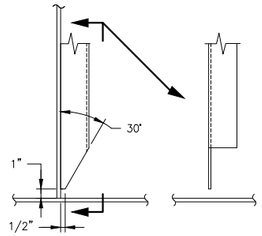


ELEVATION 3-3B
CENTERLINE
'A' END SHOWN LOOKING TO PORT

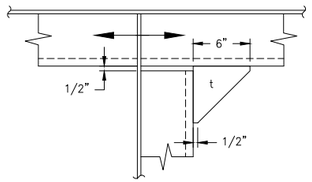
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

SIZE	DWG NO.	REV
D	18026-200-120-5	B
SCALE 1/4" = 1'-0"	FILE NAME 18026-200-120-5B	SHEET 3 OF 4

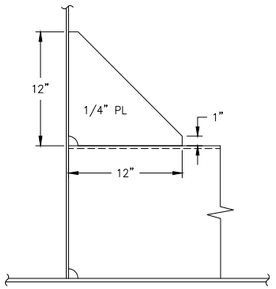
8/6/2018 11:07:42 AM



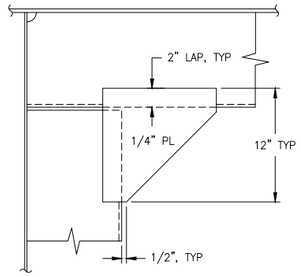
S1



B2



B3



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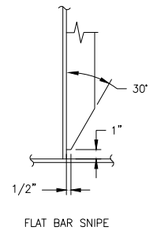
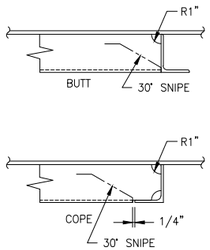
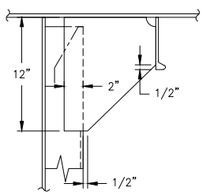


FLAT BAR SNIPE

S2



J1



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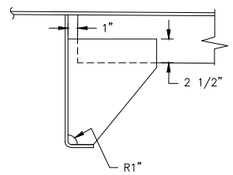
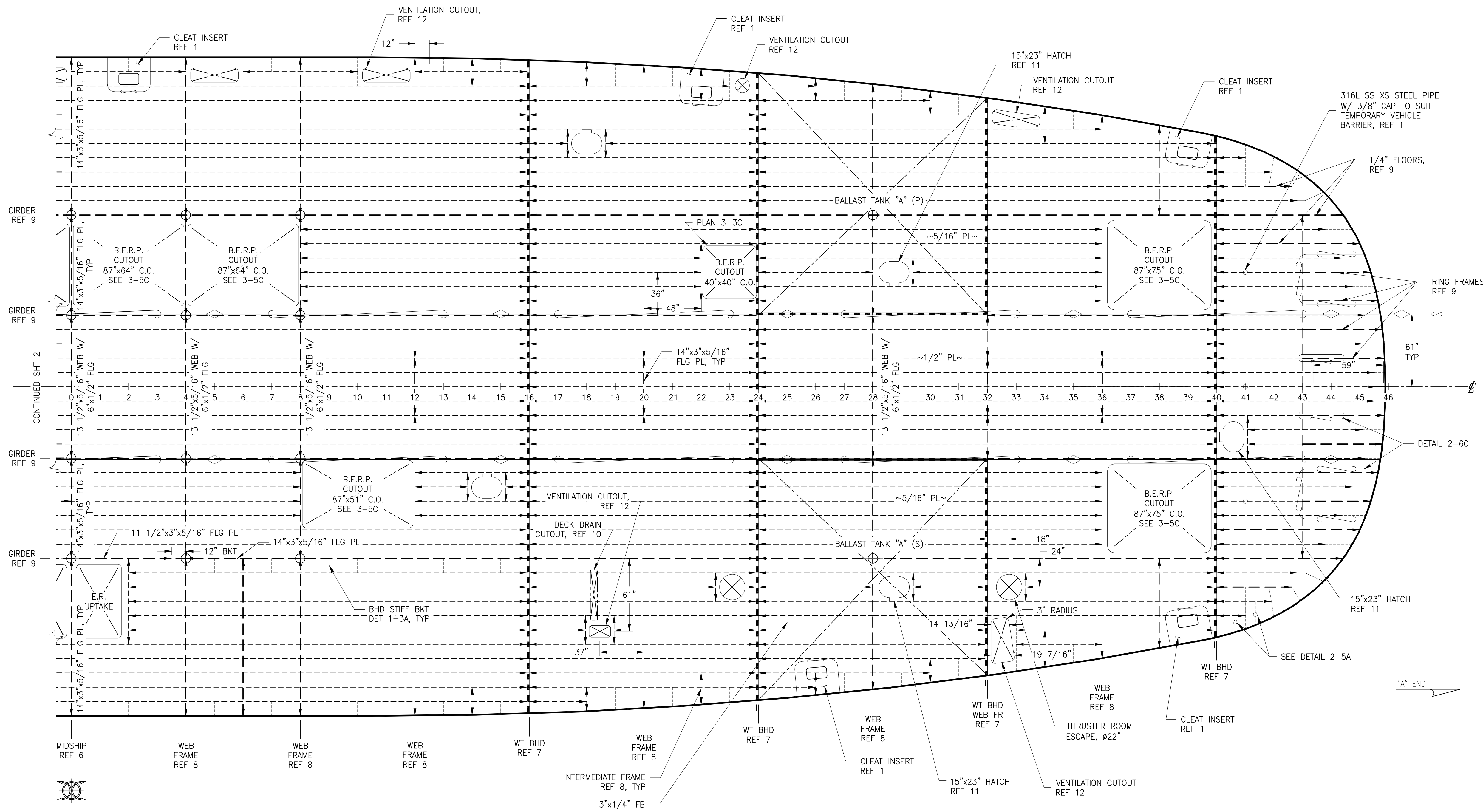


B11

8/6/2018

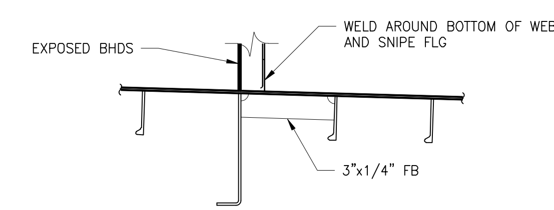
SIZE	DWG NO.	REV
D	18026-200-120-5	B
SCALE 1 1/2" = 1'-0"	FILE NAME 18026-200-120-5B	SHEET 4 OF 4

8/6/2018 11:07:47 AM



PLAN 1-4A
MAIN DECK – 'A' END

MAIN DECK PL – CENTER:	1/2" TYP U.N.O.
MAIN DECK PL – OUTBD:	5/16" TYP U.N.O.
MAIN DECK STIFFENERS:	HP140x8 TYP U.N.O.
MAIN DECK GIRDERS & WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
STANCHIONS – 5' OCL:	5" SCH 80 TYP U.N.O.
STANCHIONS – 12' OCL:	4" SCH 40 TYP U.N.O.



DETAIL 1-3A
BHD STIFFENER BKT
1"=1'-0"

LEGEND

- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. TOP SURFACE OF MAIN DECK TO BE FLUSH THROUGHOUT, SEE REF 1.
4. ABBREVIATION "C.O." MEANS "CLEAR OPENING"

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-100-1	LINES PLAN
4.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
5.	18026-200-110-1	BOTTOM AND SIDE SHELL
6.	18026-200-120-1	MIDSHIP SECTION
7.	18026-200-120-3	HULL TRANSVERSE BULKHEADS
8.	18026-200-120-4	HULL TRANSVERSE FRAMES
9.	18026-200-120-5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026-200-526-1	DECK DRAIN PIPING SYSTEM
11.	18026-200-624-3	HATCH SCHEDULE
12.	18026-200-513-1	MACHINERY VENTILATION ARRANGEMENT

NORTH CAROLINA FERRY SYSTEM

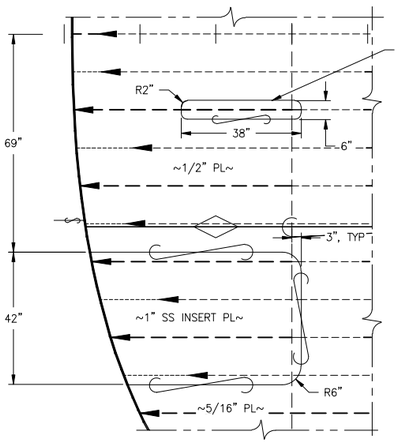
Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: MAIN DECK

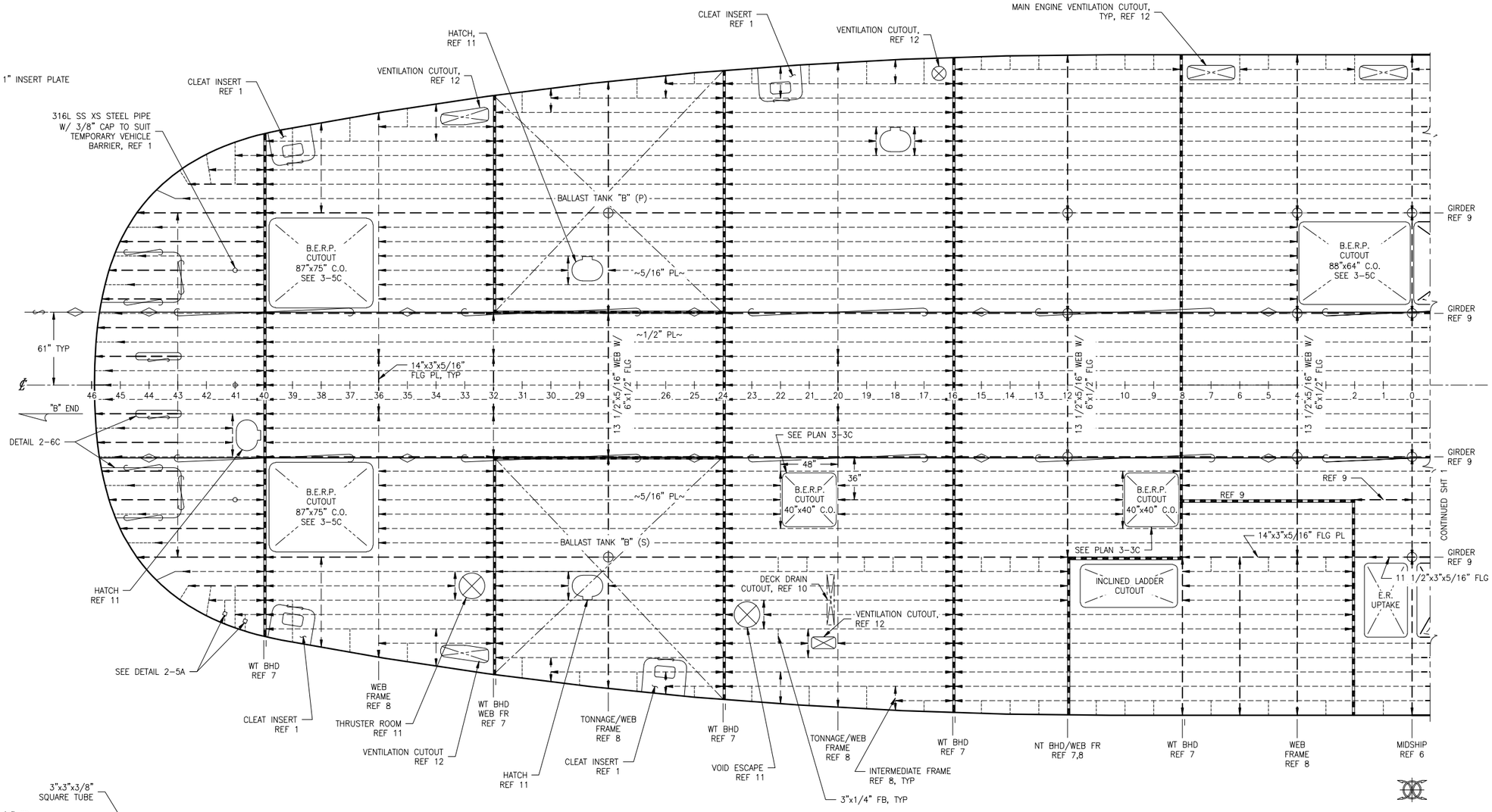
SIZE: D | DWG NO. 18026-200-130-2 | REV –
SCALE 1/4"=1'-0" | FILE NAME 18026-200-130-2- | SHEET 1 OF 3
DWN JCG | MOD | CKD SKW | APVD SKW | APVD DATE 7/26/2018

SAMUEL K WATERHOUSE — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER
7/30/2018



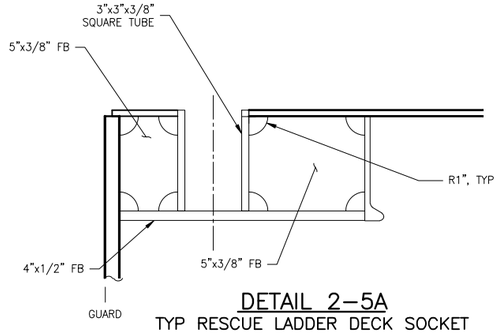
DETAIL 2–6C
MAIN DECK LOADING ZONE
INSERT PLATES
SCALE: 1/2" = 1'-0"

NOTE:
'B' END STARBOARD SHOWN
PORT SIM./OPP.
'A' END SIM./OPP.



PLAN 2–3A
MAIN DECK – 'B' END
SCALE: 1/4" = 1'-0"

MAIN DECK PL – CENTER:	1/2" TYP U.N.O.
MAIN DECK PL – OUTBD:	5/16" TYP U.N.O.
MAIN DECK STIFFENERS:	HP140x8 TYP U.N.O.
MAIN DECK GIRDERS & WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
STANCHIONS – 5' OCL:	5" SCH 80 TYP U.N.O.
STANCHIONS – 12' OCL:	4" SCH 40 TYP U.N.O.



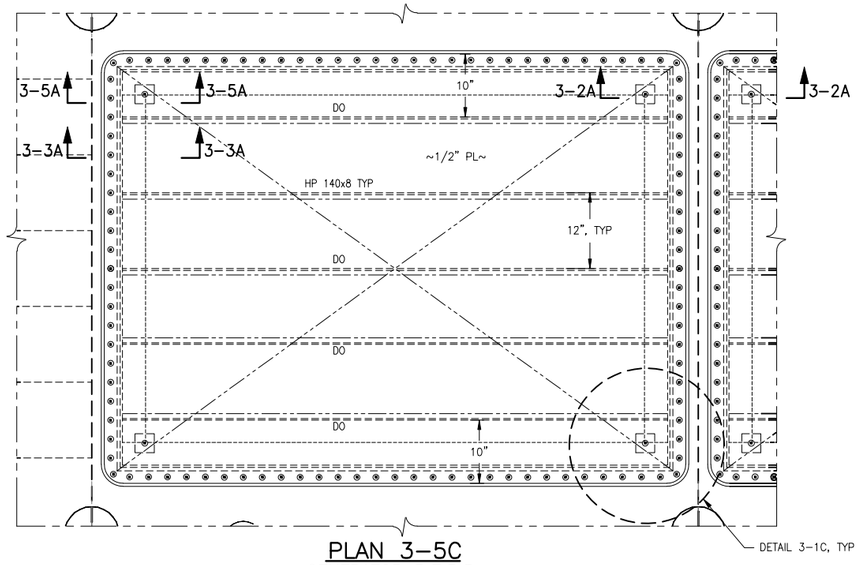
DETAIL 2–5A
TYP RESCUE LADDER DECK SOCKET
SCALE: 3" = 1'-0"

LEGEND
- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

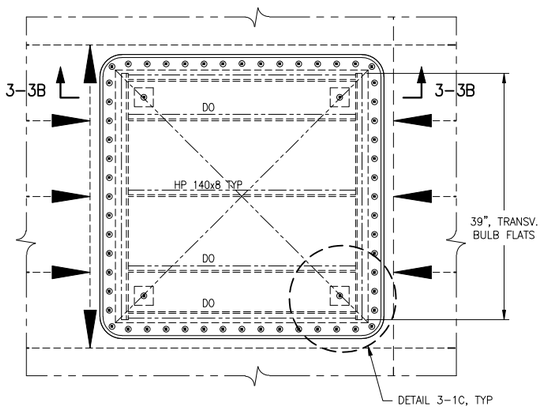
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-130-2	–
SCALE AS NOTED	FILE NAME 18026-200-130-2-	SHEET 2 OF 3

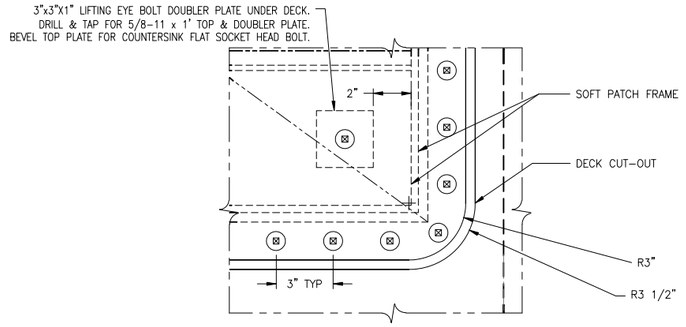
7/30/2018 4:07:23 PM



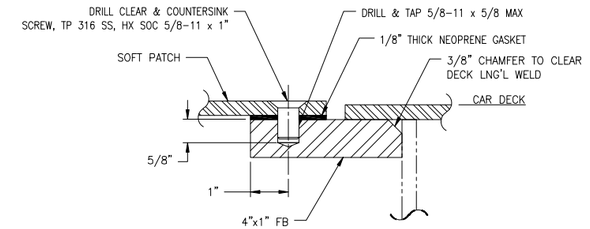
PLAN 3-5C
GENERATOR B.E.R.P.
ALL OTHER LARGE EQUIPMENT B.E.R.P. SIM
1"=1'-0"



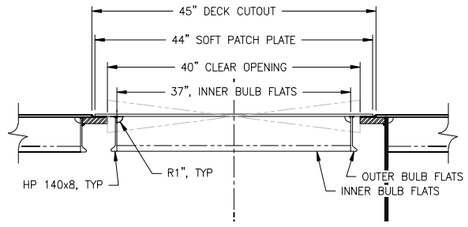
PLAN 3-3C
SMALL EQUIPMENT REMOVAL B.E.R.P.
SIDE B SHOWN; SIDE A ROTATE 180 ABOUT FR 0
1"=1'-0"



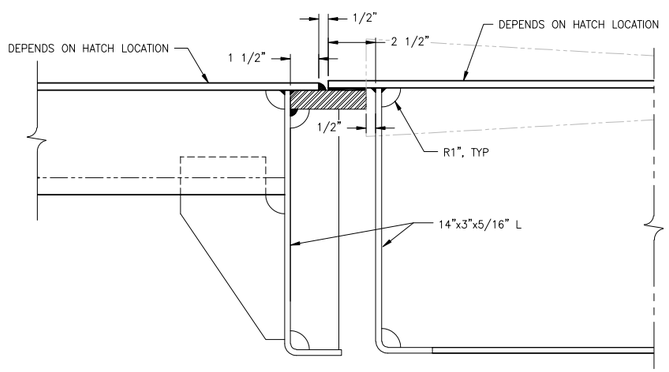
DETAIL 3-1C
TYPICAL HATCH CORNER
3"=1'-0"



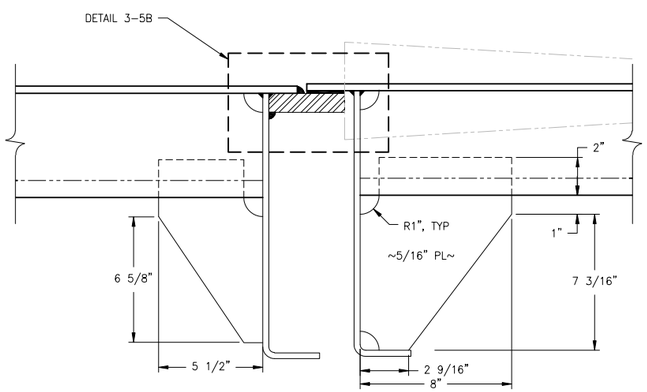
DETAIL 3-5B
6"=1'-0"



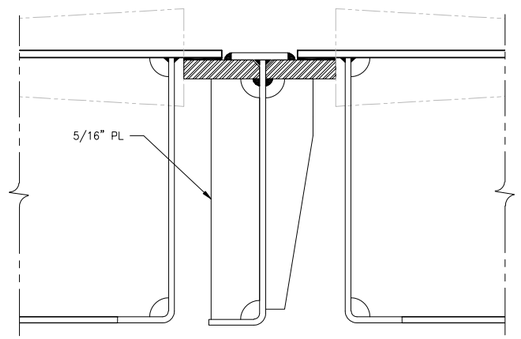
SECTION 3-3B
TYPICAL FRAME
1"=1'-0"



DETAIL 3-5A
TYPICAL HATCH SUPPORT
3"=1'-0"



DETAIL 3-3A
TYPICAL BRACKET DETAIL
3"=1'-0"

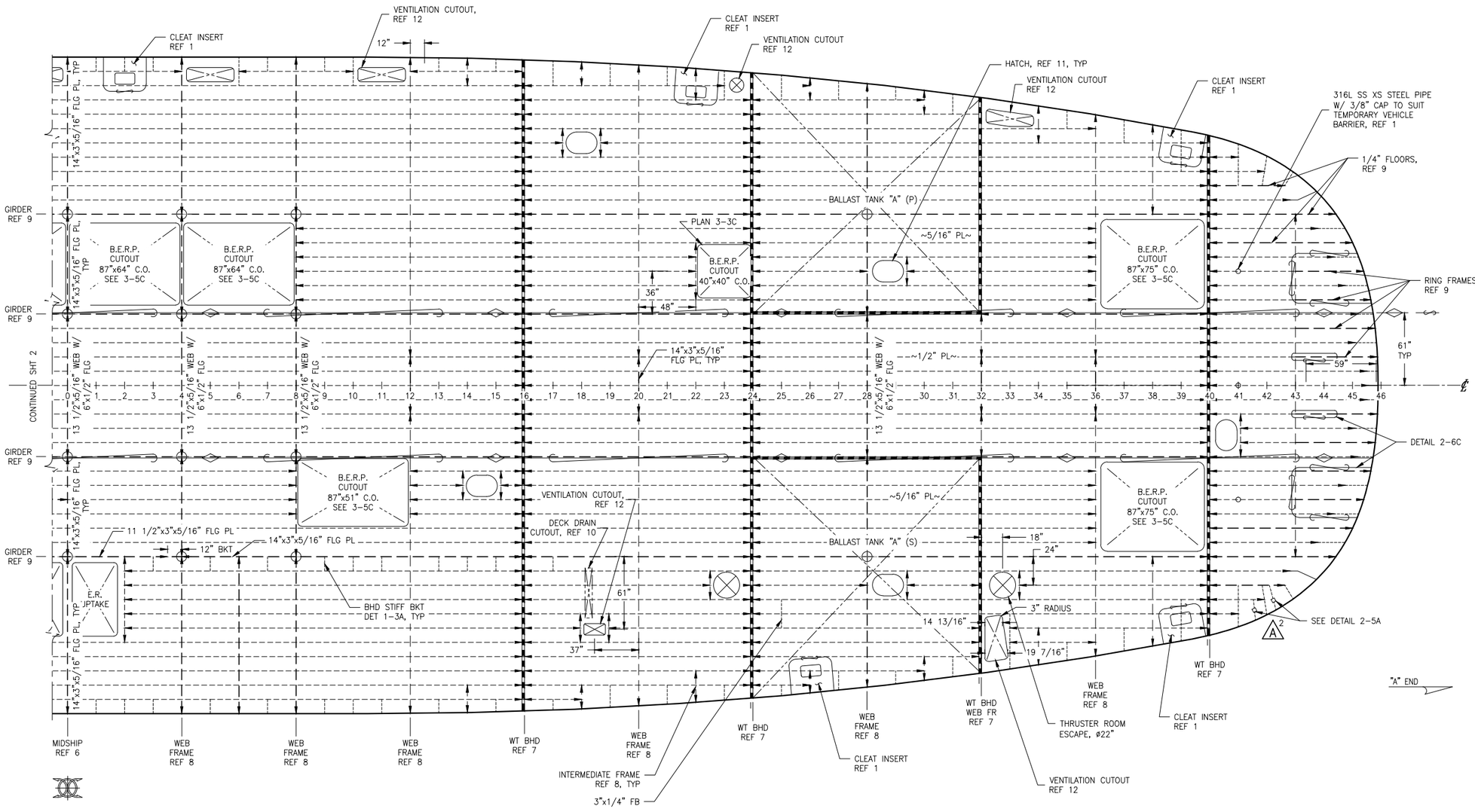


DETAIL 3-2A
TYPICAL BRACKET DETAIL
3"=1'-0"

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
5570
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-130-2	–
SCALE AS NOTED	FILE NAME 18026-200-130-2-	SHEET 3 OF 3

7/30/2018 4:07:28 PM

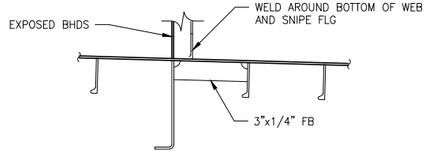


PLAN 1-4A
MAIN DECK – 'A' END

LEGEND

- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

MAIN DECK PL – CENTER:	1/2" TYP U.N.O.
MAIN DECK PL – OUTBD:	5/16" TYP U.N.O.
MAIN DECK STIFFENERS:	HP140x8 TYP U.N.O.
MAIN DECK GIRDERS & WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
STANCHIONS – 5' OCL:	5" SCH 80 TYP U.N.O.
STANCHIONS – 12' OCL:	4" SCH 40 TYP U.N.O.



DETAIL 1-3A
BHD STIFFENER BKT
1"=1'-0"

A1

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED PROFESSIONAL ENGINEER
8/6/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	SHT1 SHT2 1-2B 2-5B	1. CHANGED HATCH CUTOUT BLOCK AND CALLOUTS 2. MOVED RESCUE LADDER DECK SOCKETS ENDWARDS.	SKW	8/2/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. TOP SURFACE OF MAIN DECK TO BE FLUSH THROUGHOUT, SEE REF 1.
4. ABBREVIATION "C.O." MEANS "CLEAR OPENING"

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-100-1	LINES PLAN
4.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
5.	18026-200-110-1	BOTTOM AND SIDE SHELL
6.	18026-200-120-1	MIDSHIP SECTION
7.	18026-200-120-3	HULL TRANSVERSE BULKHEADS
8.	18026-200-120-4	HULL TRANSVERSE FRAMES
9.	18026-200-120-5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
10.	18026-200-526-1	DECK DRAIN PIPING SYSTEM
11.	18026-200-624-3	HATCH SCHEDULE
12.	18026-200-513-1	MACHINERY VENTILATION ARRANGEMENT

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: MAIN DECK

SIZE	DWG NO.	REV
D	18026-200-130-2	A

SCALE	FILE NAME	SHEET	OF
1/4"=1'-0"	18026-200-130-2A	1	3

DWN	MOD	CKD	APVD	APVD DATE
JCG	SKW	SKW	SKW	7/26/2018

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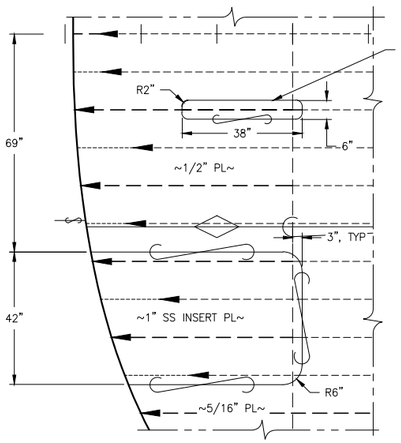
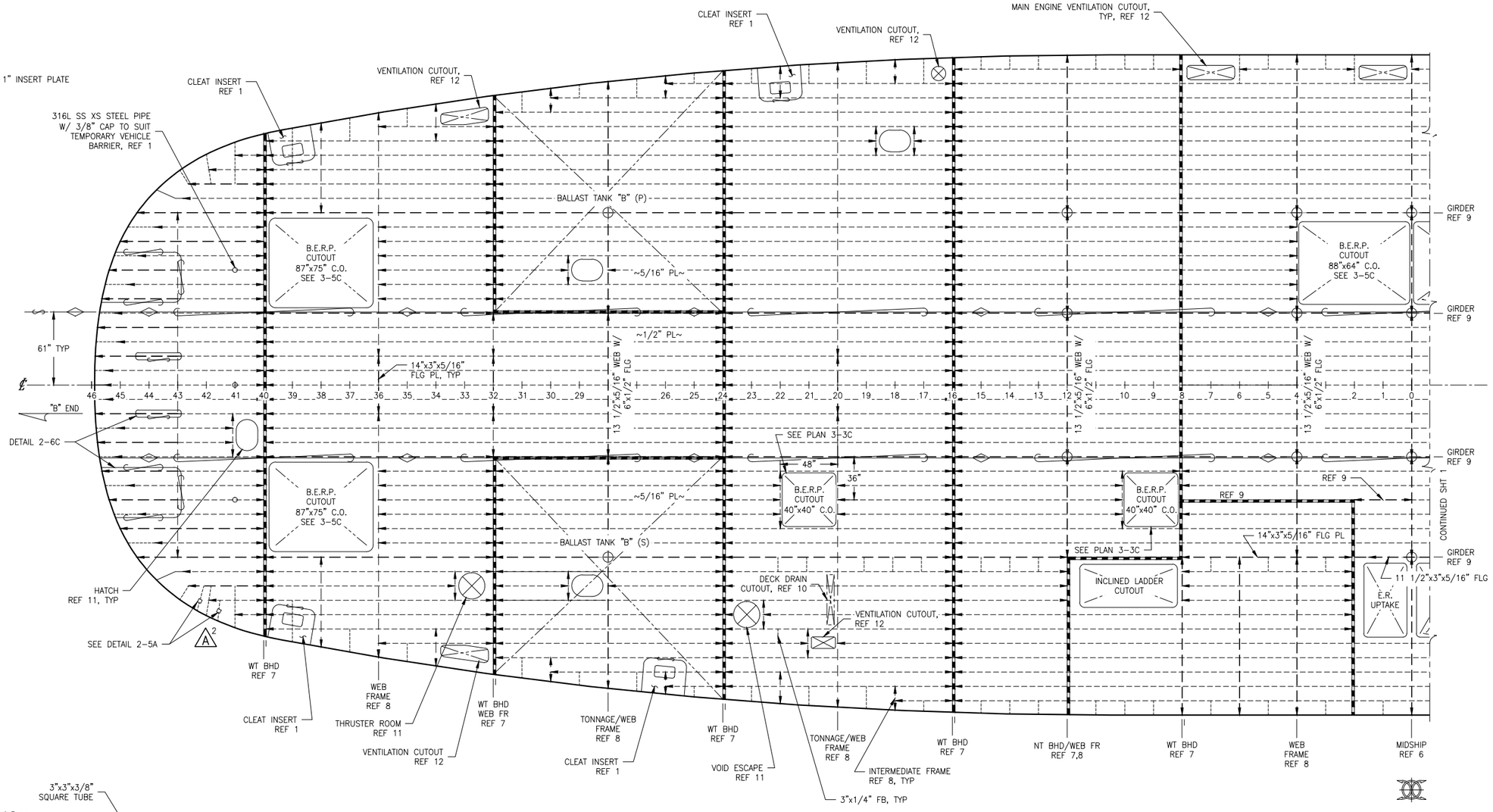


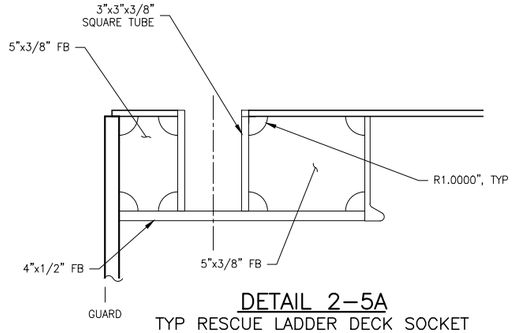
DETAIL 2–6C
MAIN DECK LOADING ZONE
INSERT PLATES
SCALE: 1/2" = 1'-0"

NOTE:
'B' END STARBOARD SHOWN
PORT SIM./OPP.
'A' END SIM./OPP.



PLAN 2–3A
MAIN DECK – 'B' END
SCALE: 1/4" = 1'-0"

MAIN DECK PL – CENTER:	1/2" TYP U.N.O.
MAIN DECK PL – OUTBD:	5/16" TYP U.N.O.
MAIN DECK STIFFENERS:	HP140x8 TYP U.N.O.
MAIN DECK GIRDERS & WEBS:	14"x3"x5/16" FLG PL TYP U.N.O.
STANCHIONS – 5' OCL:	5" SCH 80 TYP U.N.O.
STANCHIONS – 12' OCL:	4" SCH 40 TYP U.N.O.



DETAIL 2–5A
TYP RESCUE LADDER DECK SOCKET
SCALE: 3" = 1'-0"

LEGEND
- BULKHEAD
- LONG GIRDER/ WEB FRAME
- ORDINARY STIFFENER
- BRACKET
- PLATE SEAM
- KNUCKLE
- TONNAGE FRAME
- STANCHION UNDER DECK

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED PROFESSIONAL ENGINEER

8/6/2018

SIZE	DWG NO.	REV
D	18026-200-130-2	A
SCALE AS NOTED	FILE NAME 18026-200-130-2A	SHEET 2 OF 3

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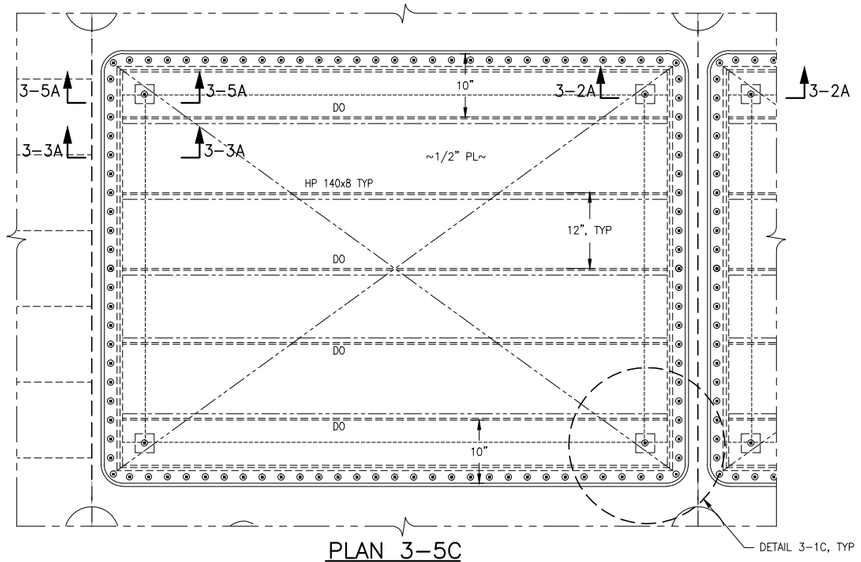
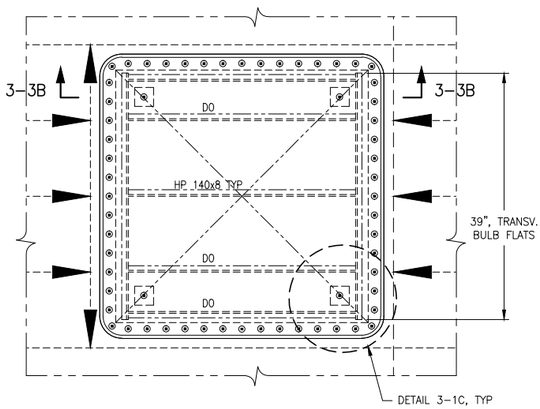
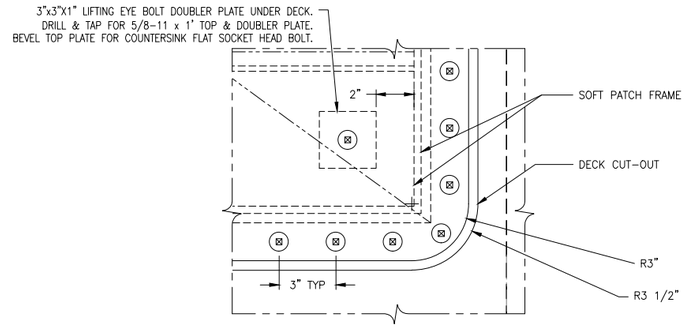


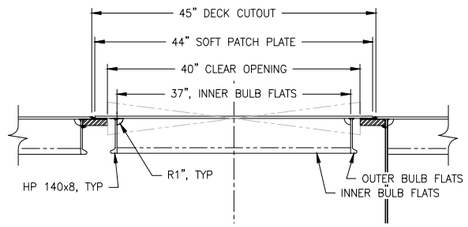
PLAN 3-5C
GENERATOR B.E.R.P.
ALL OTHER LARGE EQUIPMENT B.E.R.P. SIM
1"=1'-0"



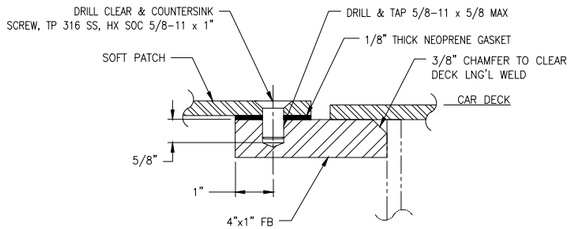
PLAN 3-3C
SMALL EQUIPMENT REMOVAL B.E.R.P.
SIDE B SHOWN; SIDE A ROTATE 180 ABOUT FR 0
1"=1'-0"



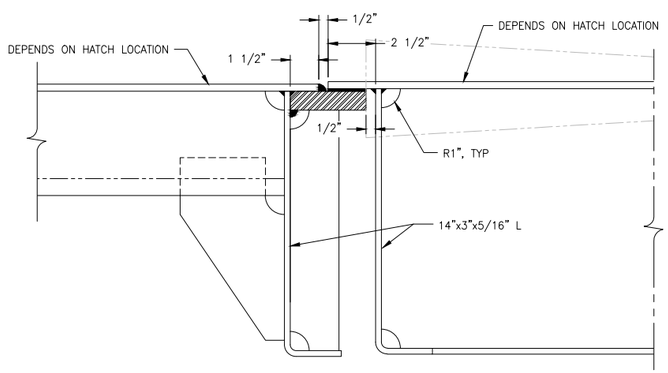
DETAIL 3-1C
TYPICAL HATCH CORNER
3"=1'-0"



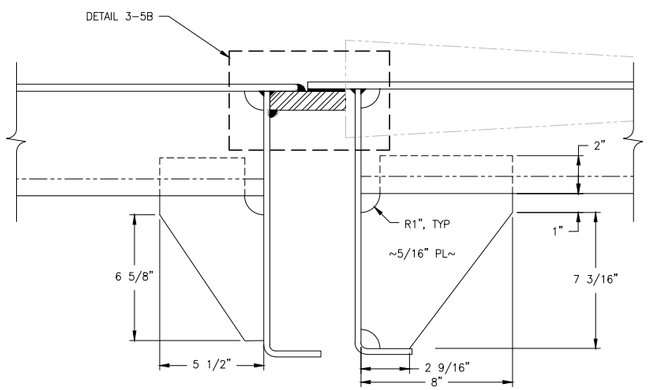
SECTION 3-3B
TYPICAL FRAME
1"=1'-0"



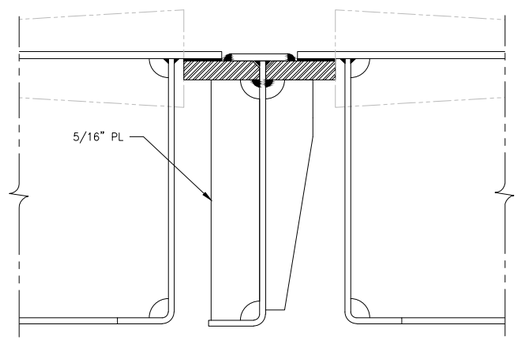
DETAIL 3-5B
6"=1'-0"



DETAIL 3-5A
TYPICAL HATCH SUPPORT
3"=1'-0"



DETAIL 3-3A
TYPICAL BRACKET DETAIL
3"=1'-0"

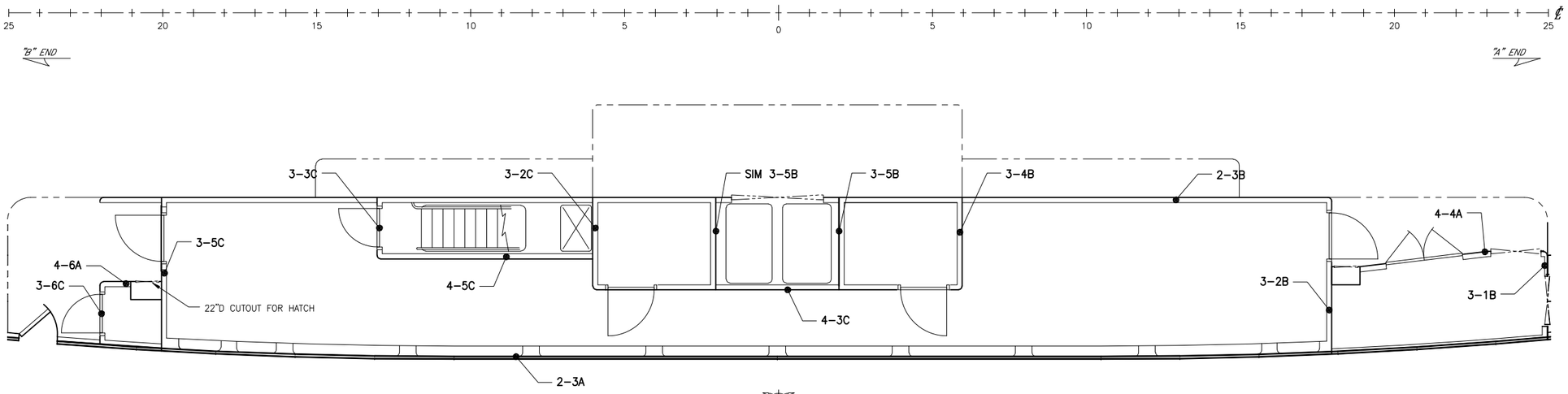


DETAIL 3-2A
TYPICAL BRACKET DETAIL
3"=1'-0"

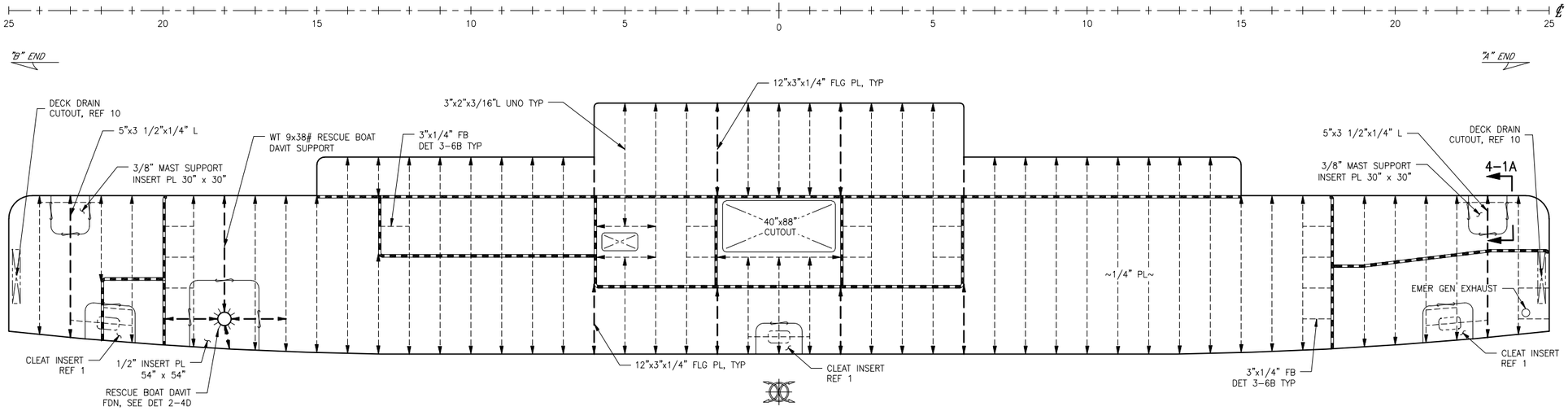
SAMUEL K. WATERHOUSS
STATE OF WASHINGTON
55707
REGISTERED PROFESSIONAL ENGINEER
8/6/2018

SIZE	DWG NO.	REV
D	18026-200-130-2	A
SCALE AS NOTED	FILE NAME 18026-200-130-2A	SHEET 3 OF 3

8/6/2018 11:12:34 AM



KEY PLAN 1-4C
MAIN DECK BULKHEADS



DECK PLAN 1-4A
01 DECK

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

SAMUEL K. WATERHOUSE — STATE OF WASHINGTON — 15705 — REGISTERED PROFESSIONAL ENGINEER
7/30/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. TRANSVERSE BULKHEAD STIFFENER SPACING = 24" UNO
4. MAIN DECK CURTAIN PLATE 5/16" PLATE UNO
   STIFFENERS 3"x3"x1/4" L THROUGHOUT UNO
5. CONTRACTOR SHALL VERIFY STRUCTURE FOR ALL FOUNDATIONS PRIOR TO CONSTRUCTION. SEE REF 1.

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
4.	18026-200-120-1	MIDSHIP SECTION
5.	18026-200-130-2	MAIN DECK
6.	18026-200-150-2	SUPERSTRUCTURE 01 DECK TO PILOT HOUSE TOP
7.	18026-200-150-3	MAIN DECK BULWARKS
8.	18026-200-513-1	MACHINERY VENTILATION ARRANGEMENT
9.	18026-200-624-1	MASTS
10.	18026-200-526-1	DECK DRAIN PIPING SYSTEM
9.	18026-200-624-1	WINDOW SCHEDULE
10.	18026-200-624-3	DOOR SCHEDULE
11.	18026-200-624-3	HATCH SCHEDULE

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

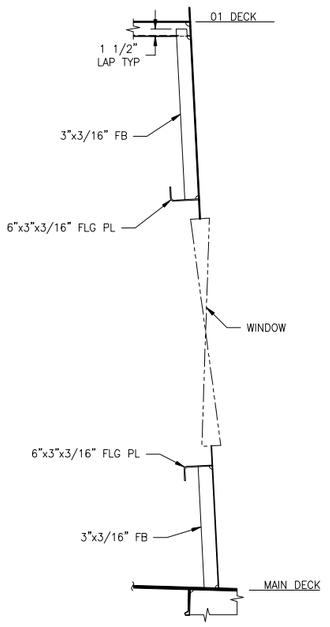
TITLE: SUPERSTRUCTURE
MAIN DECK TO 01 DECK

SIZE	DWG NO.	REV
D	18026-200-150-1	—

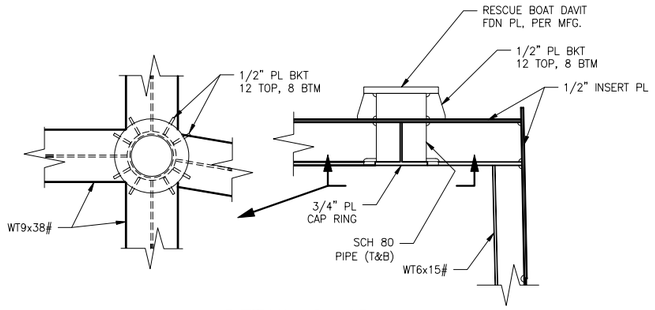
SCALE	FILE NAME	SHEET	OF
1/4"=1'-0"	18026-200-150-1-	1	4

DWN	MOD	CKD	APVD	APVD DATE
SKW		JCG	SKW	7/26/2018

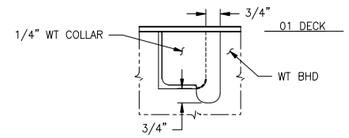
7/30/2018 4:10:41 PM



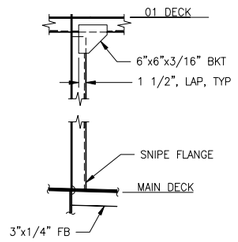
DETAIL 2–6C
TYP CURTAIN PLATE STIFFENERS
SCALE: 3/4"=1'–0"



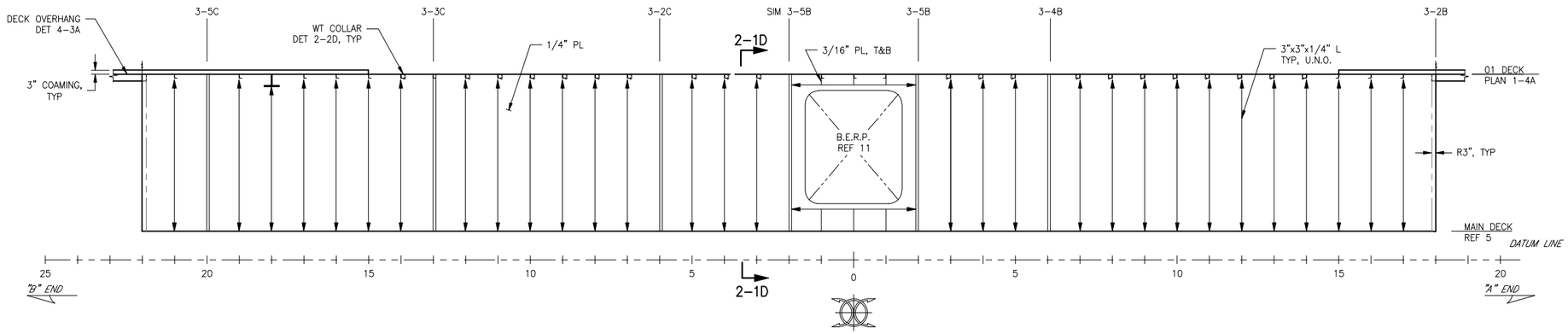
DETAIL 2–4D
RESCUE BOAT DAVIT FOUNDATION
SECT @ FR 18 & VIEW FROM BELOW
SEE NOTE 5
SCALE: 3/4"=1'–0"



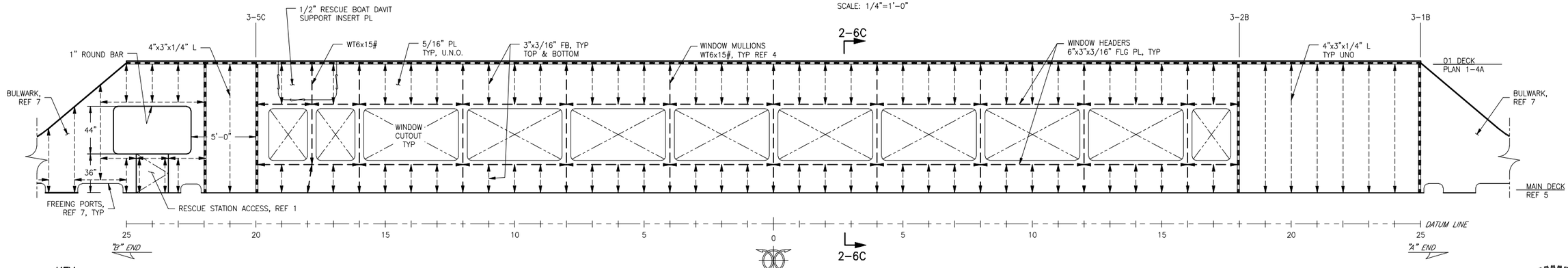
DETAIL 2–2D
TYPICAL WT COLLAR
SCALE: 3"=1'–0"



DETAIL 2–1D
TYP BKTS
SCALE: 3/4"=1'–0"



ELEVATION 2–3B
12'–0" OCL BHD
LOOKING TO CL
SCALE: 1/4"=1'–0"



ELEVATION 2–3A
22'–6" OCL
LOOKING TO CL
SCALE: 1/4"=1'–0"

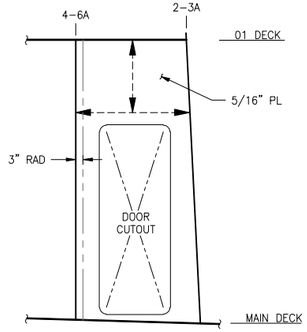
KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

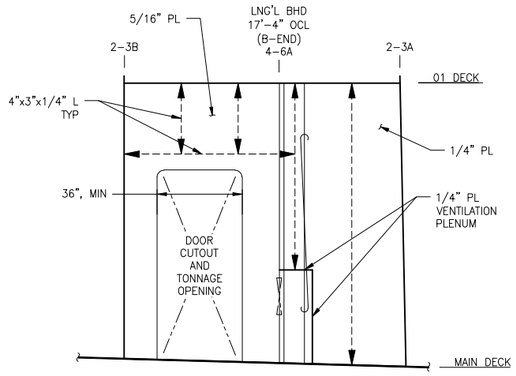
SAMUEL K. WATERHOUSE — STATE OF WASHINGTON — 15570 — REGISTERED PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–150–1	–
SCALE: AS NOTED	FILE NAME: 18026–200–150–1–	SHEET 2 OF 4

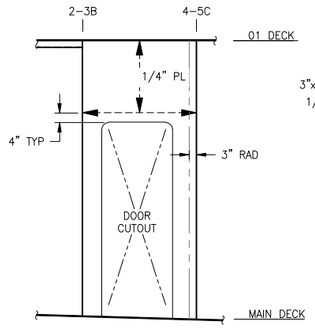
7/30/2018 4:10:46 PM



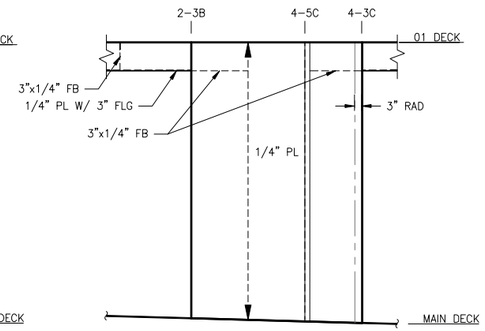
SECTION 3–6C
FR 22, B–END
LOOKING TO A–END
3/8"=1'–0"



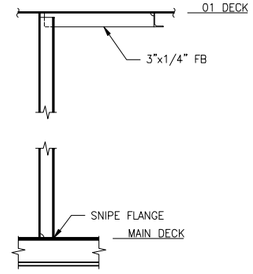
SECTION 3–5C
FR 20, B–END
LOOKING TO A–END
3/8"=1'–0"



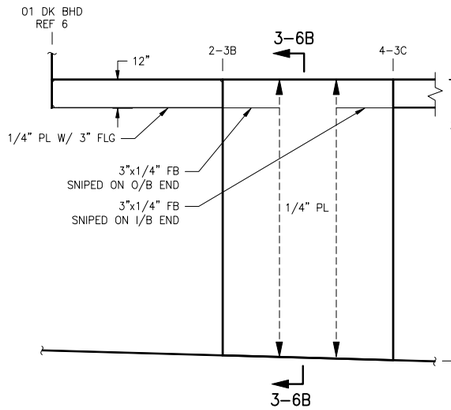
SECTION 3–3C
FR 13, B–END
LOOKING TO A–END
3/8"=1'–0"



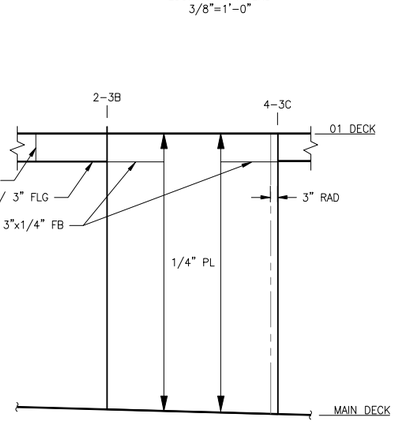
SECTION 3–2C
FR 06, B–END
LOOKING TO A–END
3/8"=1'–0"



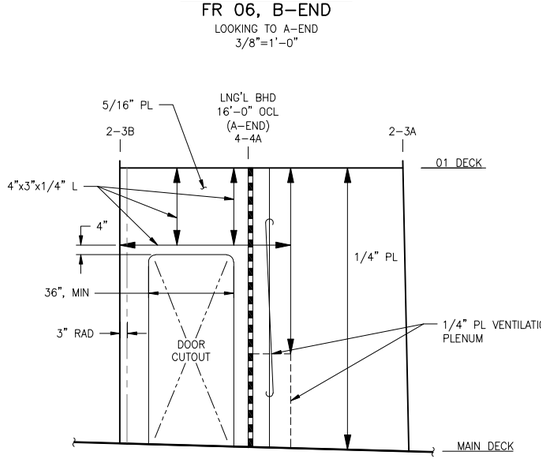
DETAIL 3–6B
TYPICAL TRANSVERSE BHD STIFFENER
SCALE: 3/4"=1'–0"



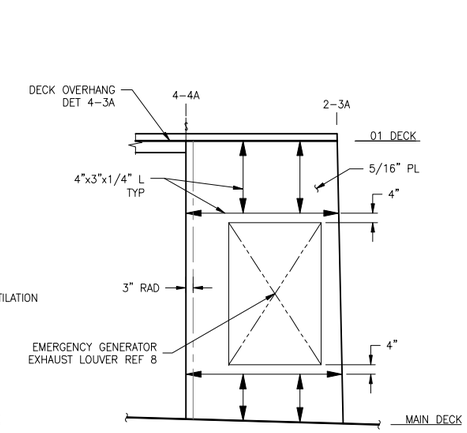
SECTION 3–5B
FR 02, A–END
LOOKING TO A–END
B–END SIM/OPP
3/8"=1'–0"



SECTION 3–4B
FR 06, A–END
LOOKING TO A–END
3/8"=1'–0"



SECTION 3–2B
FR 18, A–END
LOOKING TO A–END
3/8"=1'–0"



SECTION 3–1B
FR 25, A–END
LOOKING TO A–END
3/8"=1'–0"

KEY

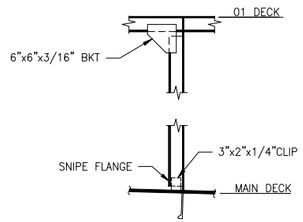
- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

NOTE:
BHD PLATE 1/4"
STIFFENERS 3"x3"x1/4" L UNO

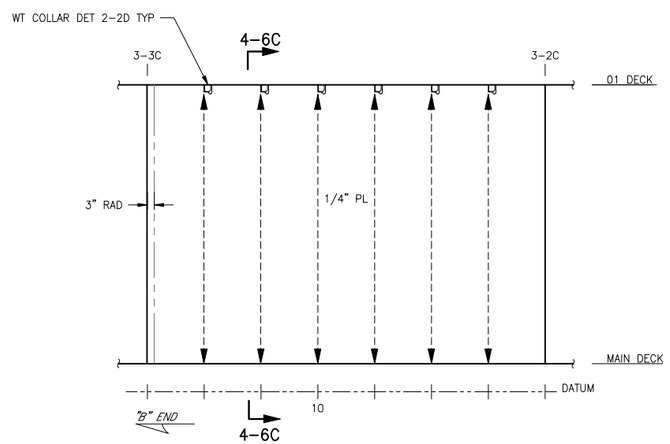
SAMUEL K WATERHOUSS
STATE OF WASHINGTON
15770
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–150–1	–
SCALE AS NOTED	FILE NAME 18026–200–150–1–	SHEET 3 OF 4

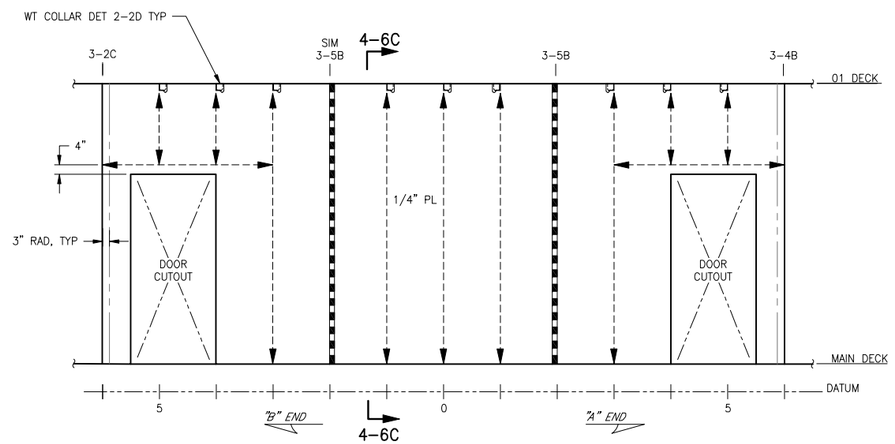
7/30/2018 4:10:51 PM



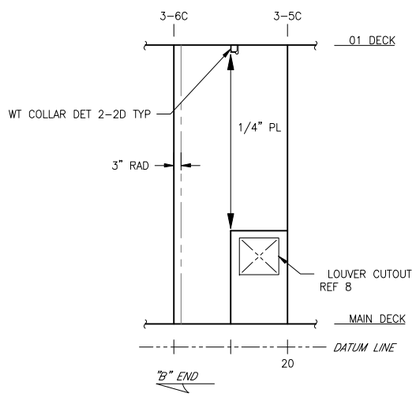
DETAIL 4–6C
TYP BKTS
SCALE: 3/4"=1'–0"



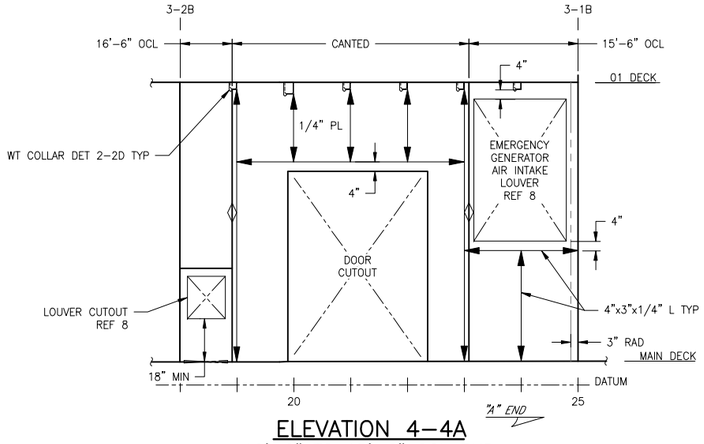
ELEVATION 4–5C
16'–0" OCL BHD
LOOKING TO CL
SCALE: 3/8"=1'–0"



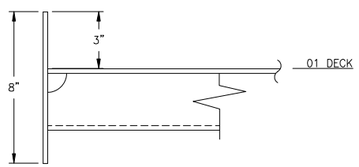
ELEVATION 4–3C
18'–0" OCL BHD
LOOKING TO CL
SCALE: 3/8"=1'–0"



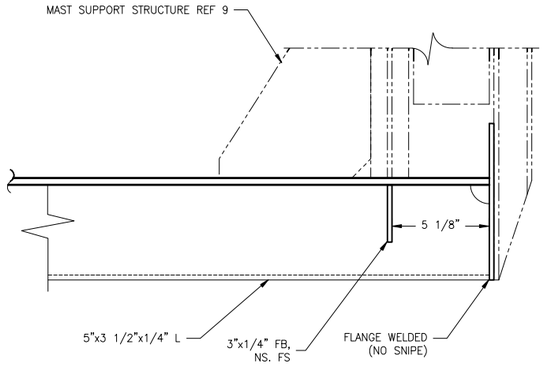
ELEVATION 4–6A
17'–4" OCL BHD
LOOKING TO CL
SCALE: 3/8"=1'–0"



ELEVATION 4–4A
16'–6" TO 15'–6" OCL BHD
LOOKING TO CL
SCALE: 3/8"=1'–0"



DETAIL 4–3A
DECK EDGE AT OVERHANGS
SCALE: 3"=1'–0"



DETAIL 4–1A
MAST SUPPORT STIFFENER
FRAME 23 A,B–END
SCALE: 3"=1'–0"

KEY

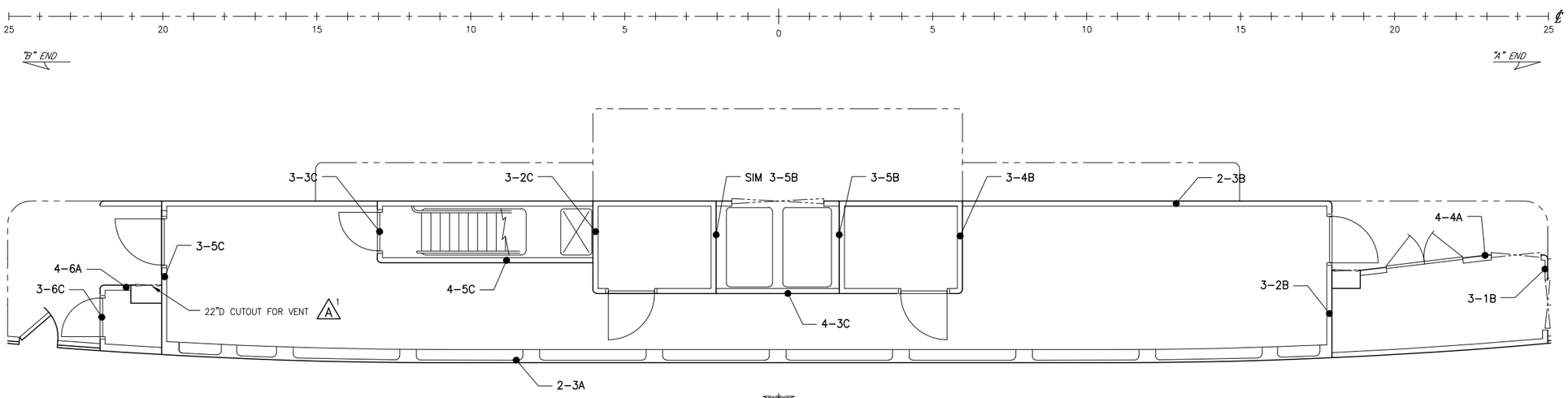
- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

NOTE:
BHD PLATE 1/4"
STIFFENERS 3"x3"x1/4" L UNO

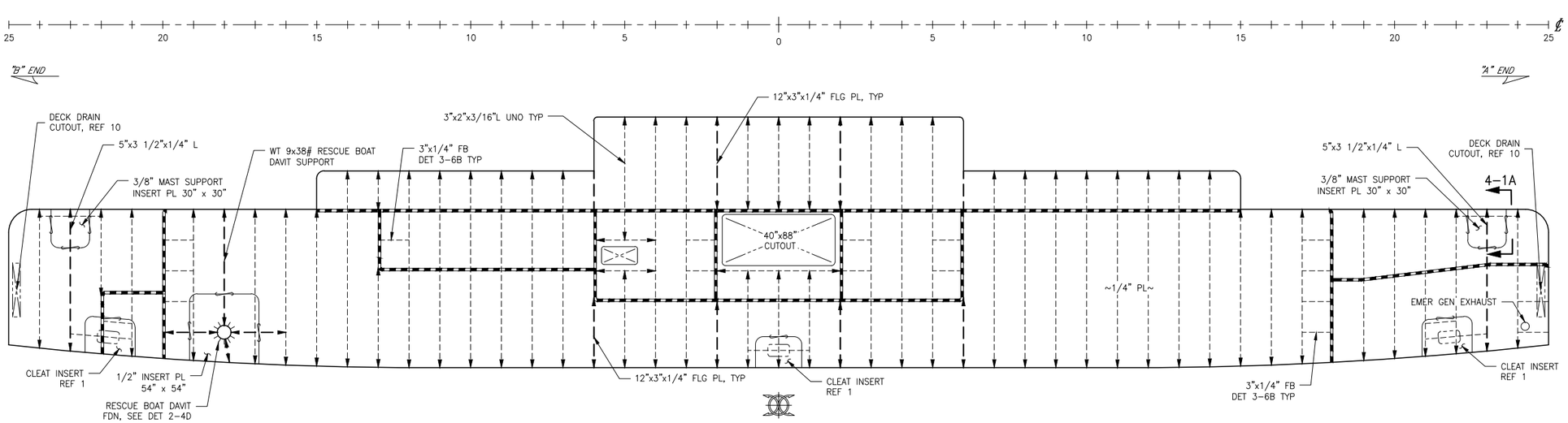
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
15704
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–150–1	–
SCALE: AS NOTED	FILE NAME: 18026–200–150–1–	SHEET 4 OF 4

7/30/2018 4:10:56 PM



KEY PLAN 1-4C
MAIN DECK BULKHEADS



DECK PLAN 1-4A
01 DECK

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

SAMUEL K WATERHOUSE — STATE OF WASHINGTON — 55707 — REGISTERED PROFESSIONAL ENGINEER
8/3/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	1-5C	1. CHANGED VENT CALLOUT	SKW	8/2/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. TRANSVERSE BULKHEAD STIFFENER SPACING = 24" UNO
4. MAIN DECK CURTAIN PLATE 5/16" PLATE UNO
   STIFFENERS 3"x3"x1/4" L THROUGHOUT UNO
5. CONTRACTOR SHALL VERIFY STRUCTURE FOR ALL FOUNDATIONS PRIOR TO CONSTRUCTION. SEE REF 1.

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
4.	18026-200-120-1	MIDSHIP SECTION
5.	18026-200-130-2	MAIN DECK
6.	18026-200-150-2	SUPERSTRUCTURE 01 DECK TO PILOT HOUSE TOP
7.	18026-200-150-3	MAIN DECK BULWARKS
8.	18026-200-513-1	MACHINERY VENTILATION ARRANGEMENT
9.	18026-200-170-1	MASTS
10.	18026-200-526-1	DECK DRAIN PIPING SYSTEM
9.	18026-200-624-1	WINDOW SCHEDULE
10.	18026-200-624-3	DOOR SCHEDULE
11.	18026-200-624-3	HATCH SCHEDULE

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

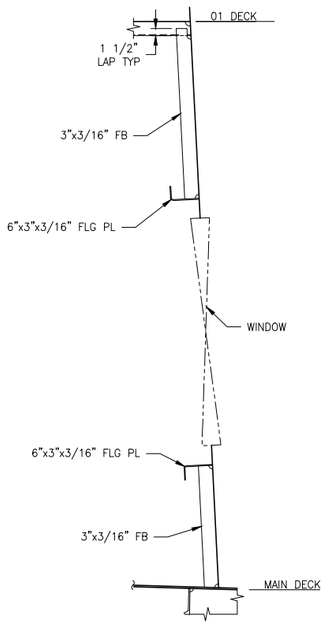
TITLE: SUPERSTRUCTURE
MAIN DECK TO 01 DECK

SIZE	DWG NO.	REV
D	18026-200-150-1	A

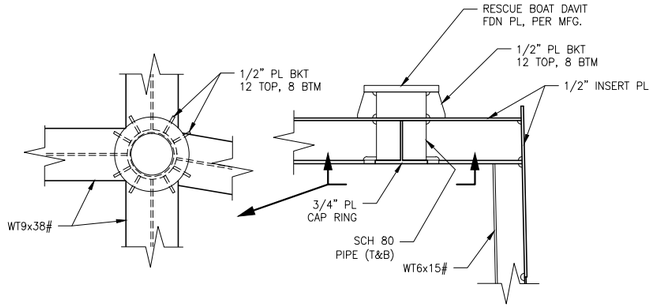
SCALE	FILE NAME	SHEET	OF
1/4"=1'-0"	18026-200-150-1A	1	4

DWN	MOD	CKD	APVD	APVD DATE
SKW	SKW	JCG	SKW	7/26/2018

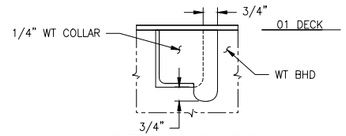
8/3/2018 2:16:01 PM



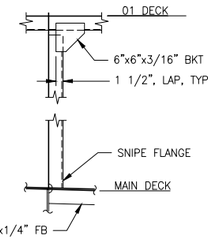
DETAIL 2–6C
TYP CURTAIN PLATE STIFFENERS
SCALE: 3/4"=1'–0"



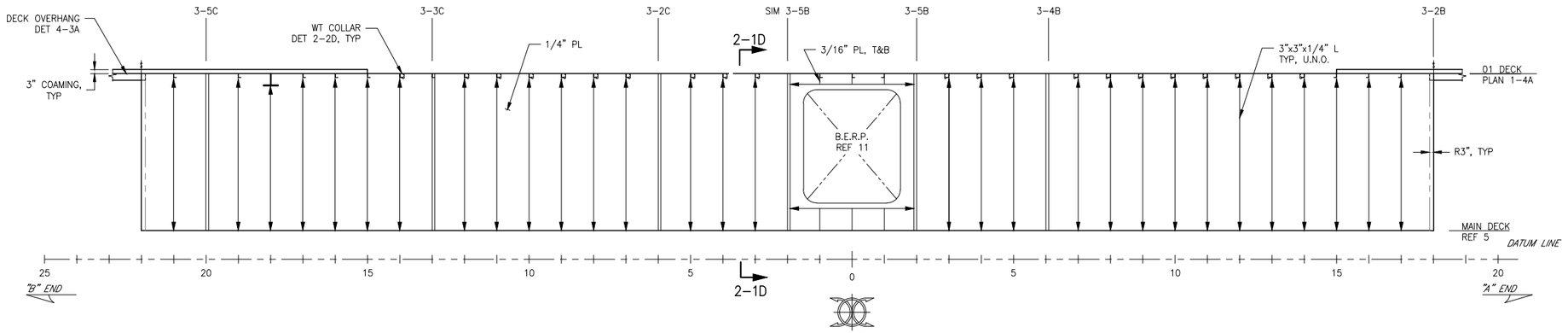
DETAIL 2–4D
RESCUE BOAT DAVIT FOUNDATION
SECT @ FR 18 & VIEW FROM BELOW
SEE NOTE 5
SCALE: 3/4"=1'–0"



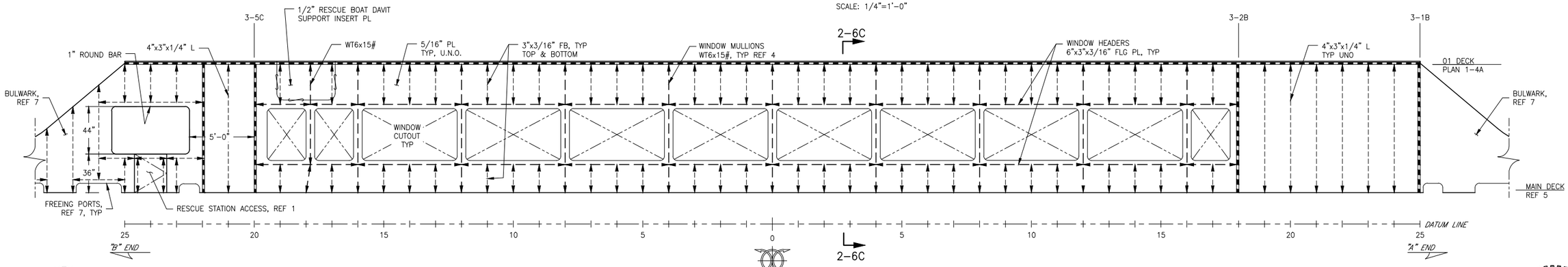
DETAIL 2–2D
TYPICAL WT COLLAR
SCALE: 3"=1'–0"



DETAIL 2–1D
TYP BKTS
SCALE: 3/4"=1'–0"



ELEVATION 2–3B
12'–0" OCL BHD
LOOKING TO CL
SCALE: 1/4"=1'–0"



ELEVATION 2–3A
22'–6" OCL
LOOKING TO CL
SCALE: 1/4"=1'–0"

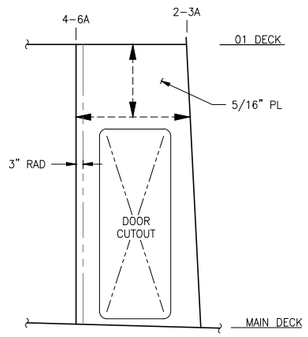
KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

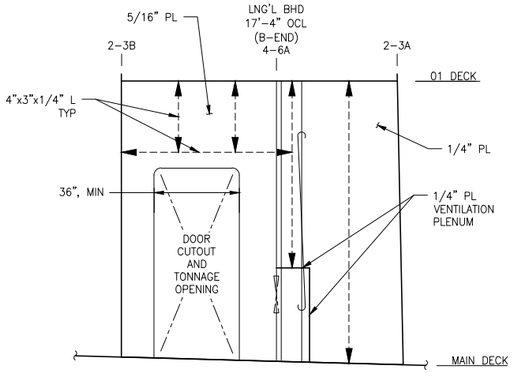
SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026–200–150–1	A
SCALE: AS NOTED	FILE NAME: 18026–200–150–1A	SHEET 2 OF 4

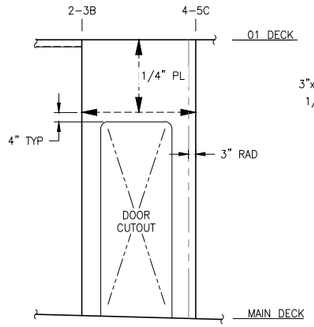
8/3/2018 2:18:05 PM



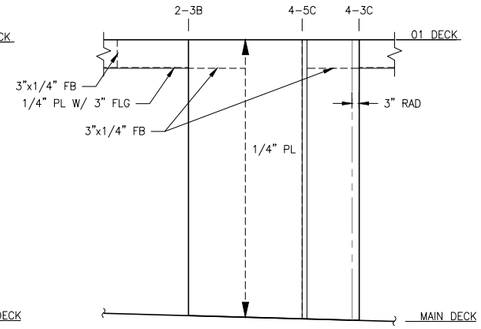
SECTION 3–6C
FR 22, B–END
LOOKING TO A–END
3/8"=1'–0"



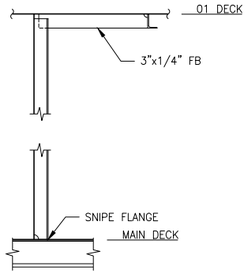
SECTION 3–5C
FR 20, B–END
LOOKING TO A–END
3/8"=1'–0"



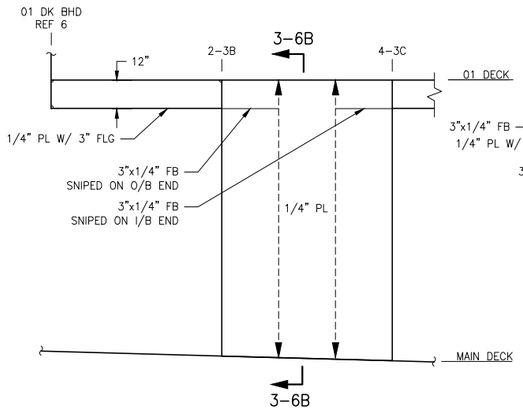
SECTION 3–3C
FR 13, B–END
LOOKING TO A–END
3/8"=1'–0"



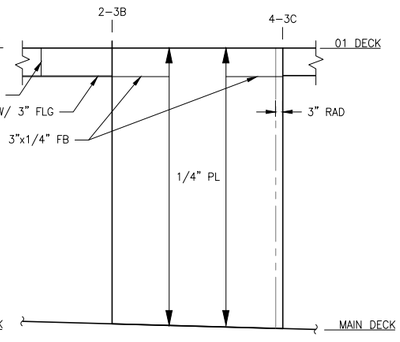
SECTION 3–2C
FR 06, B–END
LOOKING TO A–END
3/8"=1'–0"



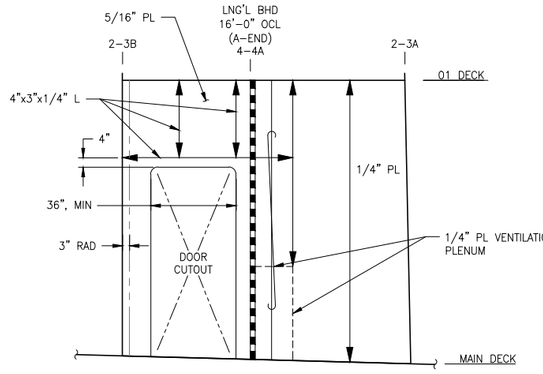
DETAIL 3–6B
TYPICAL TRANSVERSE BHD STIFFENER
SCALE: 3/4"=1'–0"



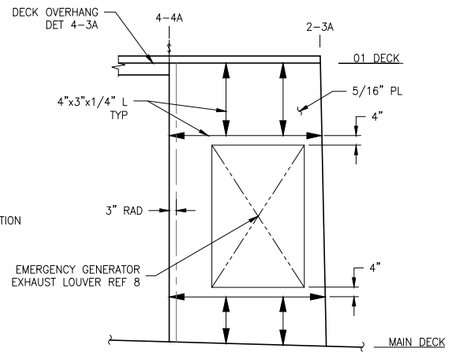
SECTION 3–5B
FR 02, A–END
LOOKING TO A–END
B–END SIM/OPP
3/8"=1'–0"



SECTION 3–4B
FR 06, A–END
LOOKING TO A–END
3/8"=1'–0"



SECTION 3–2B
FR 18, A–END
LOOKING TO A–END
3/8"=1'–0"



SECTION 3–1B
FR 25, A–END
LOOKING TO A–END
3/8"=1'–0"

KEY

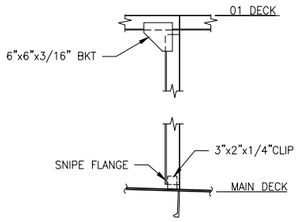
- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

NOTE:
BHD PLATE 1/4"
STIFFENERS 3"x3"x1/4" L UNO

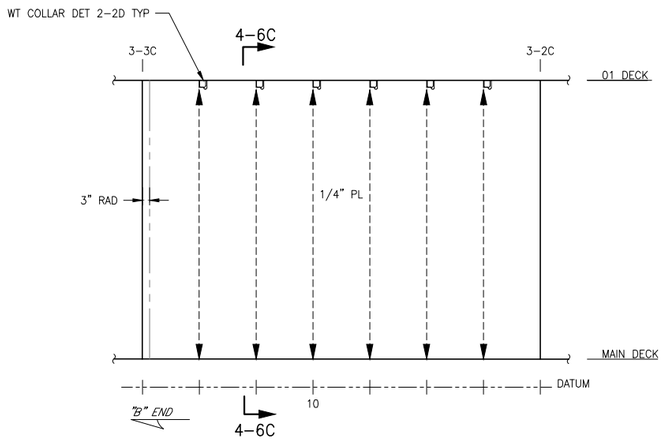
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026–200–150–1	A
SCALE AS NOTED	FILE NAME 18026–200–150–1A	SHEET 3 OF 4

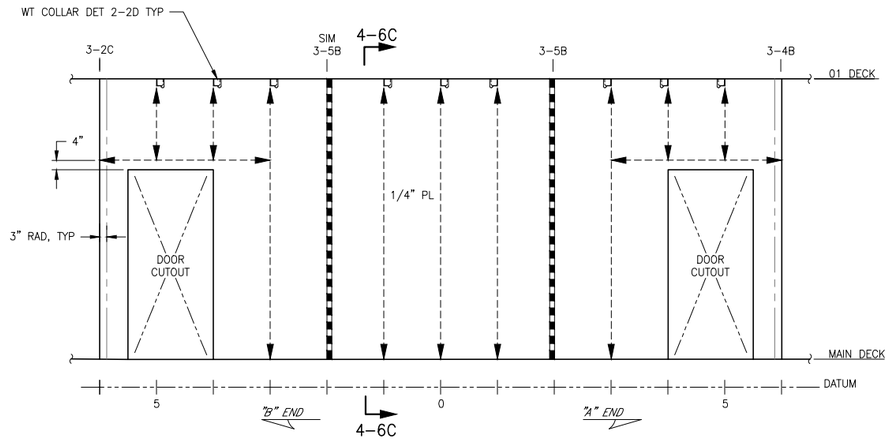
8/3/2018 2:18:11 PM



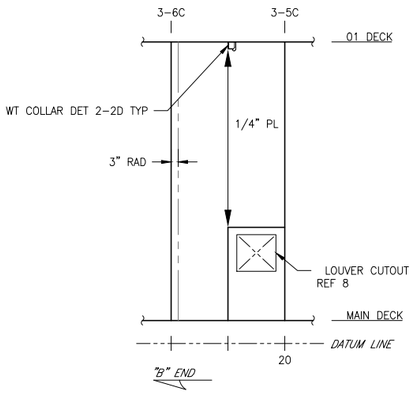
DETAIL 4–6C
TYP BKTS
SCALE: 3/4"=1'–0"



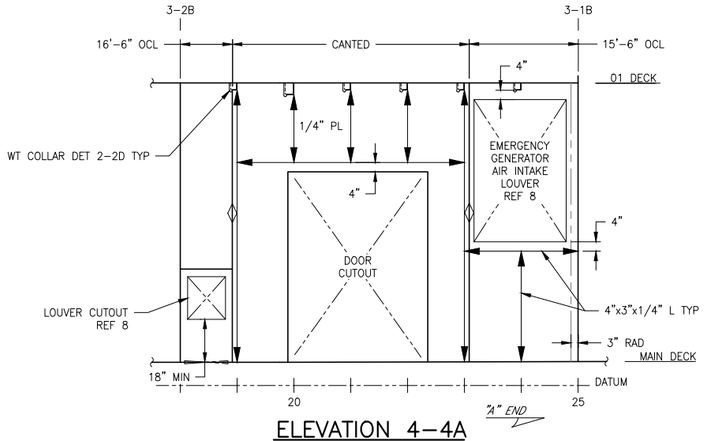
ELEVATION 4–5C
16'–0" OCL BHD
LOOKING TO CL
SCALE: 3/8"=1'–0"



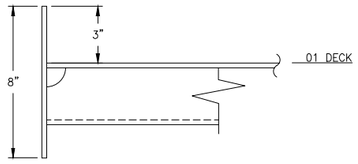
ELEVATION 4–3C
18'–0" OCL BHD
LOOKING TO CL
SCALE: 3/8"=1'–0"



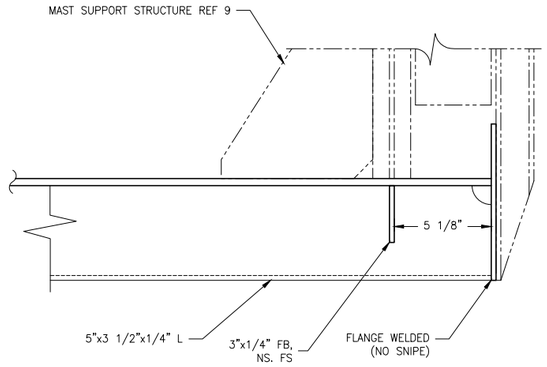
ELEVATION 4–6A
17'–4" OCL BHD
LOOKING TO CL
SCALE: 3/8"=1'–0"



ELEVATION 4–4A
16'–6" TO 15'–6" OCL BHD
LOOKING TO CL
SCALE: 3/8"=1'–0"



DETAIL 4–3A
DECK EDGE AT OVERHANGS
SCALE: 3"=1'–0"



DETAIL 4–1A
MAST SUPPORT STIFFENER
FRAME 23 A,B–END
SCALE: 3"=1'–0"

KEY

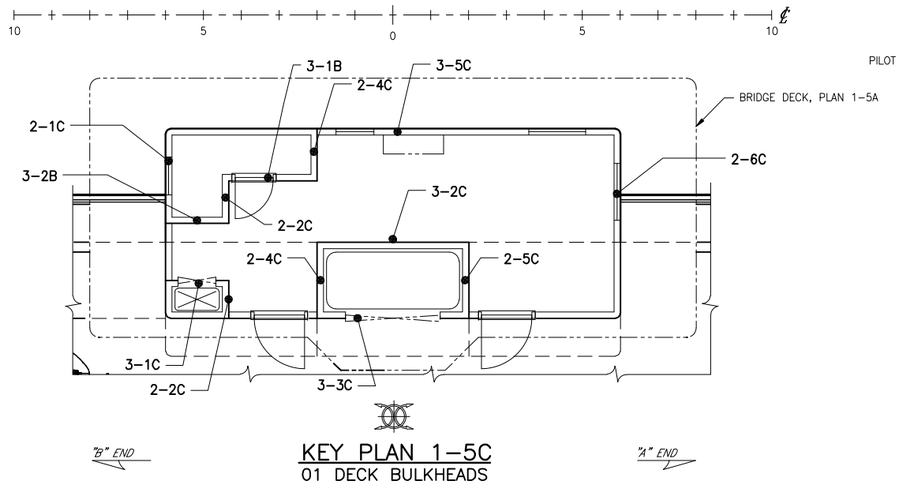
- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE
- KNUCKLE

NOTE:
BHD PLATE 1/4"
STIFFENERS 3"x3"x1/4" L UNO

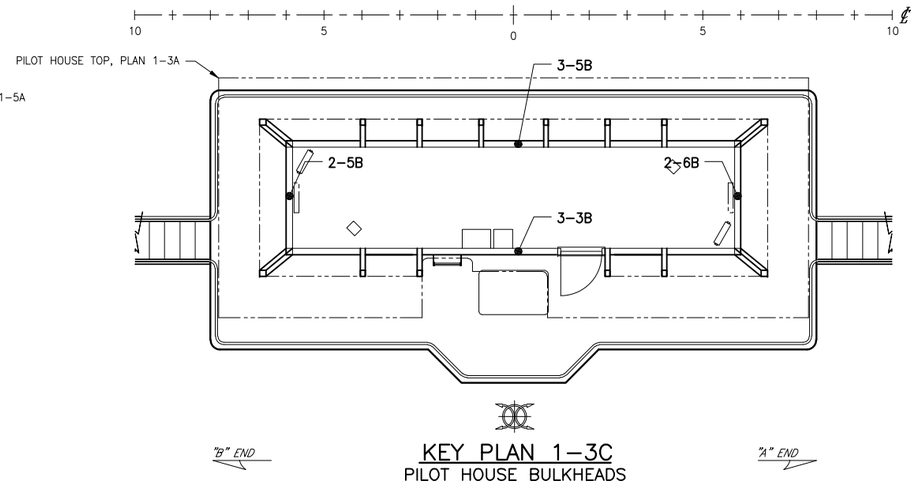
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026–200–150–1	A
SCALE	FILE NAME	SHEET / OF
AS NOTED	18026–200–150–1A	4 / 4

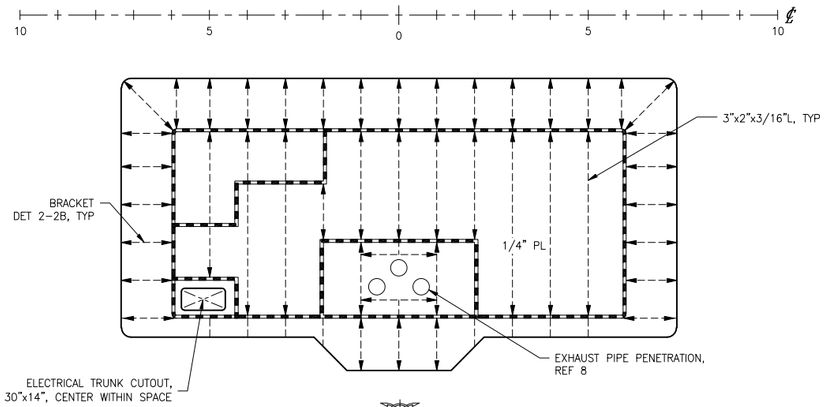
8/3/2018 2:18:16 PM



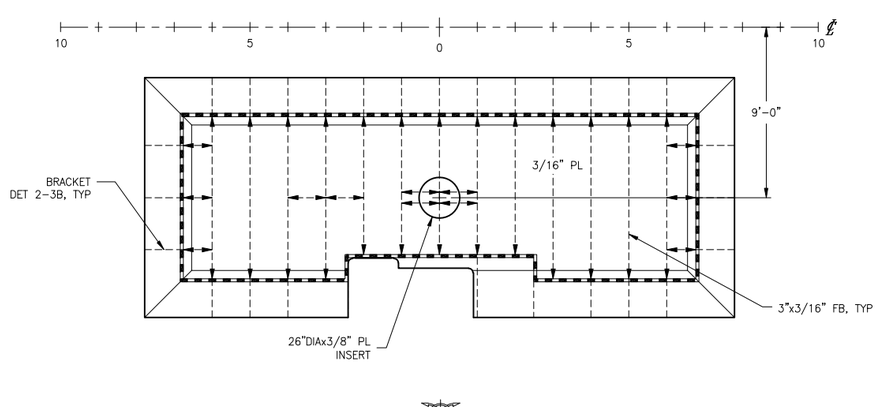
KEY PLAN 1–5C
01 DECK BULKHEADS



KEY PLAN 1–3C
PILOT HOUSE BULKHEADS



PLAN 1–5A
BRIDGE DECK



PLAN 1–3A
PILOT HOUSE TOP

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE

SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
5670
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. TRANSVERSE BULKHEAD STIFFENER SPACING = 24" U.N.O.
4. CONTRACTOR SHALL VERIFY STRUCTURE FOR ALL FOUNDATIONS PRIOR TO CONSTRUCTION. SEE REF 1.

REFERENCES

1.	18026-200-832-1	TECHINCAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
4.	18026-200-120-1	MIDSHIP SECTION
5.	18026-200-130-2	MAIN DECK
6.	18026-200-150-1	SUPERSTRUCTURE MAIN DECK TO 01 DECK
7.	18026-200-150-3	MAIN DECK BULWARKS
8.	18026-200-259-1	EXHAUST ARRANGEMENT
9.	18026-200-624-1	WINDOW SCHEDULE
10.	18026-200-624-3	DOOR SCHEDULE
11.	18026-200-624-3	HATCH SCHEDULE

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

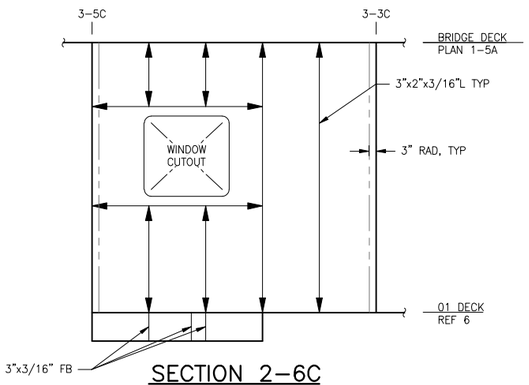
TITLE: SUPERSTRUCTURE
01 DECK TO PILOT HOUSE TOP

SIZE	DWG NO.	REV
D	18026-200-150-2	–

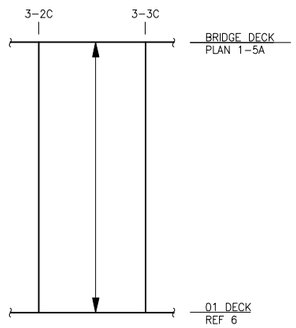
SCALE	FILE NAME	SHEET	OF
1/4"=1'-0"	18026-200-150-2-	1	3

DWN	MOD	CKD	APVD	APVD DATE
SKW		JCG	SKW	7/26/2018

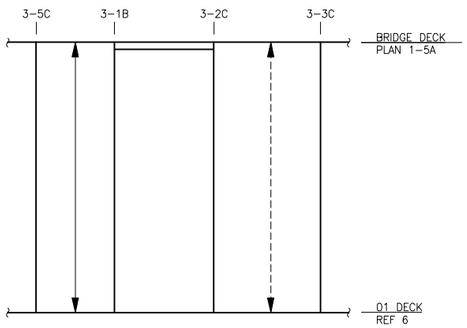
7/30/2018 4:12:03 PM



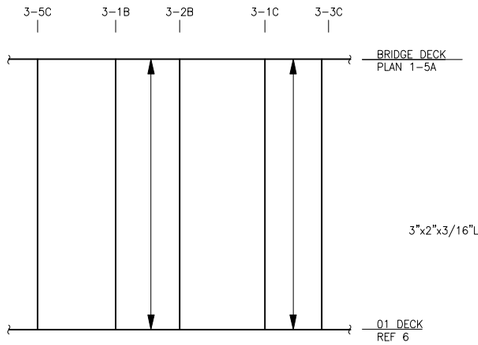
SECTION 2-6C
FR 06, A-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



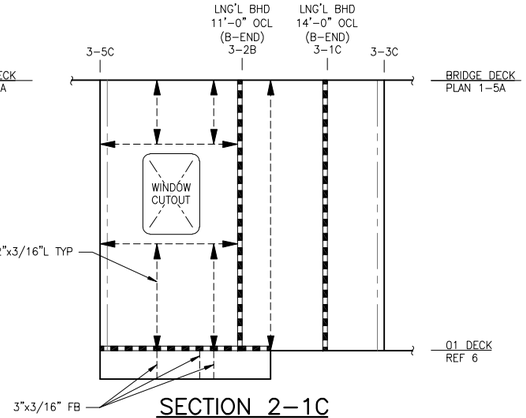
SECTION 2-5C
FR 02, A-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



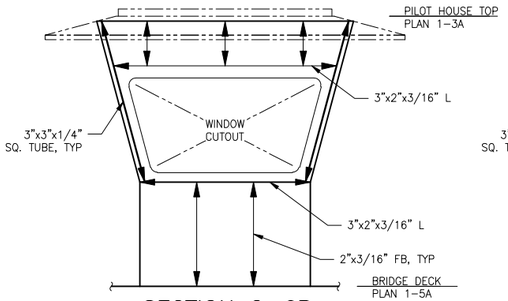
SECTION 2-4C
FR 02, B-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



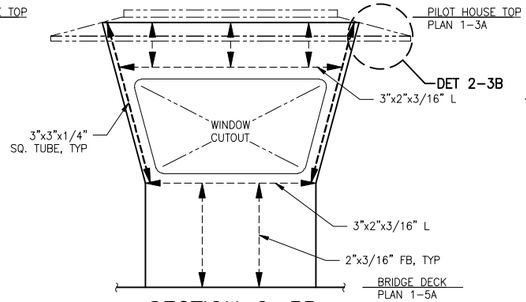
SECTION 2-2C
FR 04+8", B-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



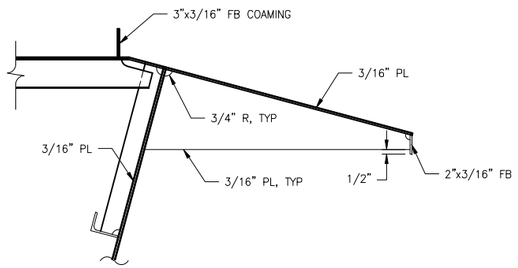
SECTION 2-1C
FR 06, B-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



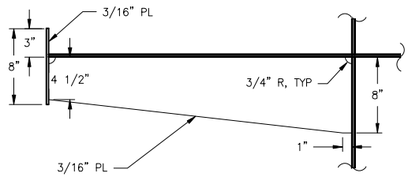
SECTION 2-6B
FR 06, A-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



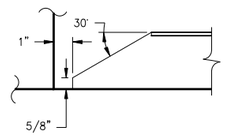
SECTION 2-5B
FR 06, B-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



DETAIL 2-3B
VISOR BRACKET
PILOT HOUSE
SCALE: 1 1/2"=1'-0"



DETAIL 2-2B
BRIDGE DECK BKT
SCALE: 1 1/2"=1'-0"



DETAIL 2-1B
TYPICAL END SNIPE
ALL STIFFENERS SNIPED BOTH ENDS
UNLESS NOTED OR SHOWN OTHERWISE
SCALE: 3"=1'-0"

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE

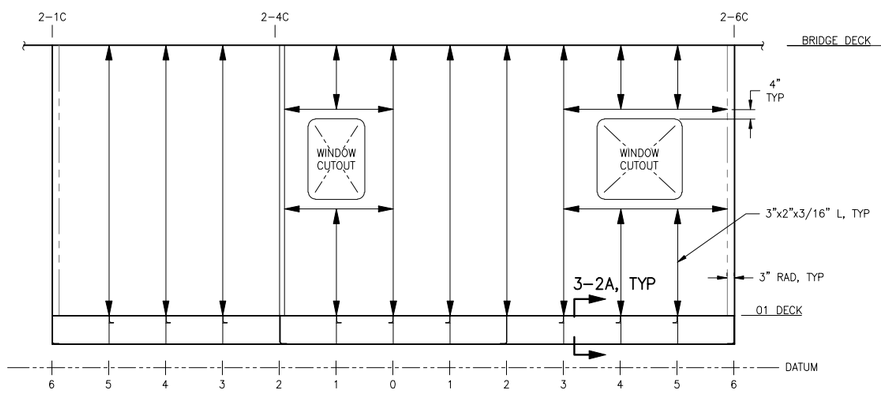
NOTE:
01 DECK BULKHEADS 1/4" PLATE UNO.
PILOT HOUSE BULKHEADS 1/4" PLATE UNO.
STIFFENERS 3"x2"x3/16" L THROUGHOUT UNO.
SNIPE ENDS PER DETAIL 2-1B

NOTE:
LONGITUDINAL BULKHEAD STIFFENER SPACING = 24" U.N.O.

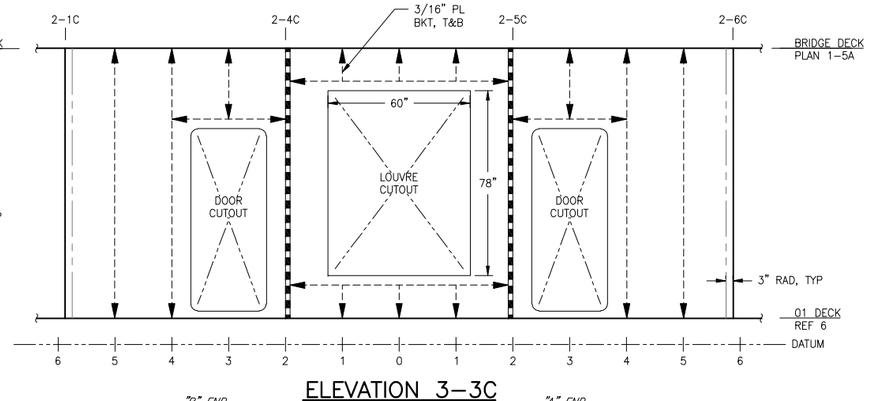
SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
557
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-150-2	—
SCALE: AS NOTED	FILE NAME: 18026-200-150-2-	SHEET 2 OF 3

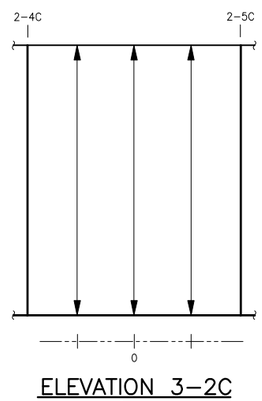
7/30/2018 4:12:12 PM



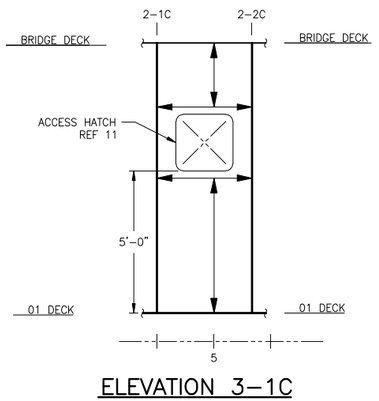
ELEVATION 3-5C
6' OCL
LOOKING TO PORT



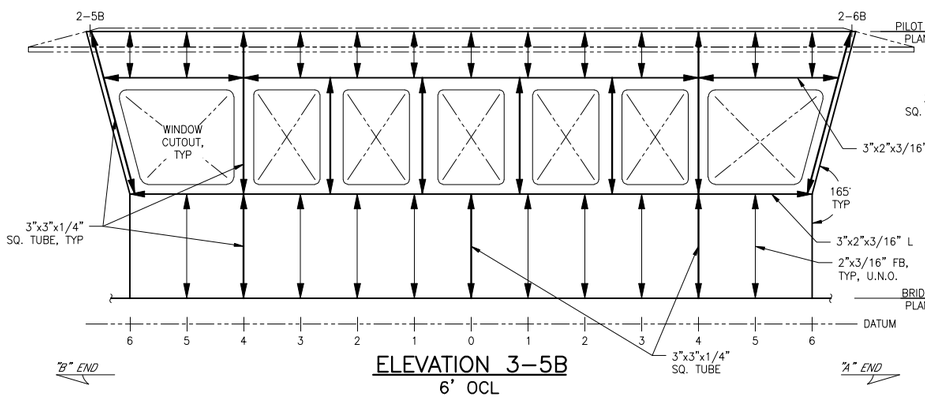
ELEVATION 3-3C
16' OCL
LOOKING TO PORT



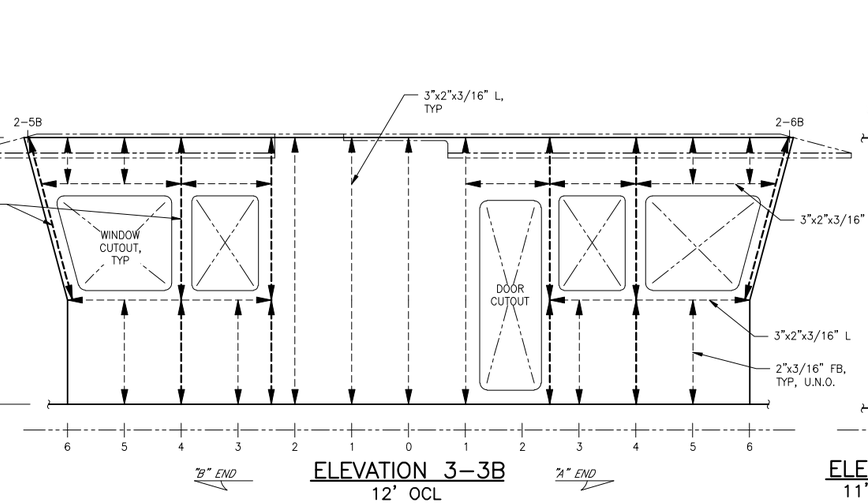
ELEVATION 3-2C
12' OCL
LOOKING TO PORT



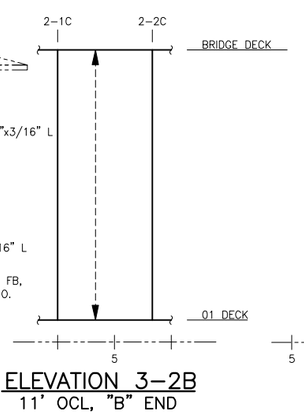
ELEVATION 3-1C
14' OCL
LOOKING TO PORT



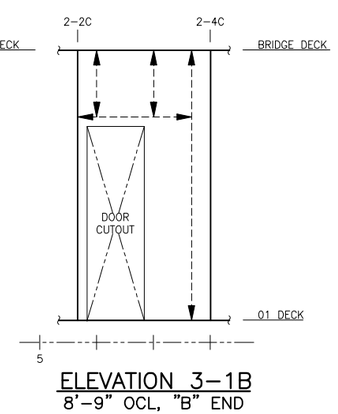
ELEVATION 3-5B
6' OCL
LOOKING TO PORT



ELEVATION 3-3B
12' OCL
LOOKING TO PORT



ELEVATION 3-2B
11' OCL, "B" END
LOOKING TO PORT



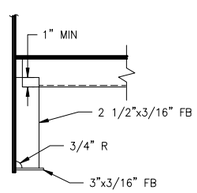
ELEVATION 3-1B
8'-9" OCL, "B" END
LOOKING TO PORT

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE

NOTE:
BRIDGE DECK BULKHEADS 1/4" PLATE UNO.
PILOT HOUSE BULKHEADS 3/16" PLATE UNO.
STIFFENERS 3"x2"x3/16" L THROUGHOUT UNO.
SNIPE ENDS PER DETAIL 2-1B

NOTE:
TRANSVERSE BULKHEAD STIFFENER SPACING = 24" U.N.O.

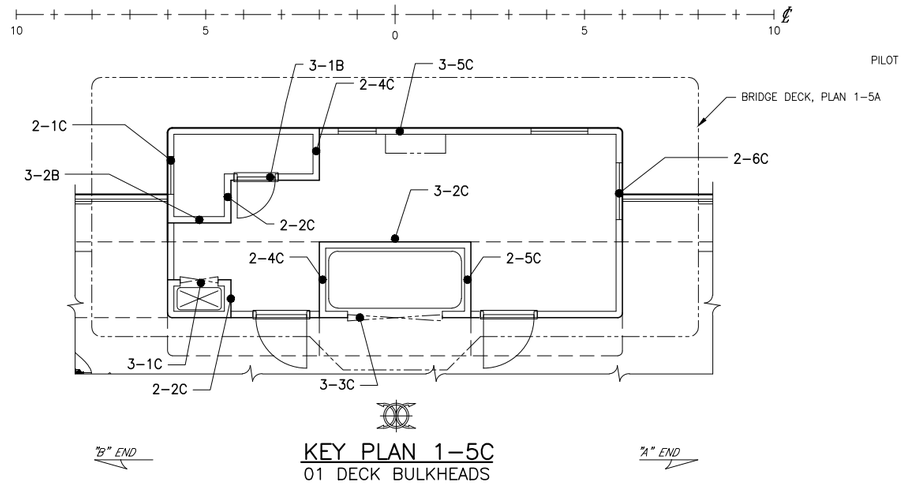


DETAIL 3-2A
COAMING BRACKET

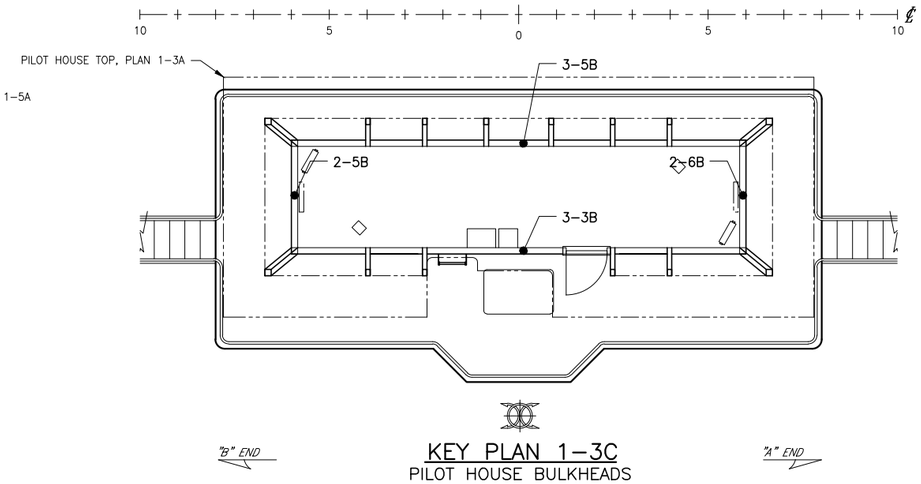
SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
557
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026-200-150-2	—
SCALE 3/8"=1'-0"	FILE NAME 18026-200-150-2-	SHEET 3 OF 3

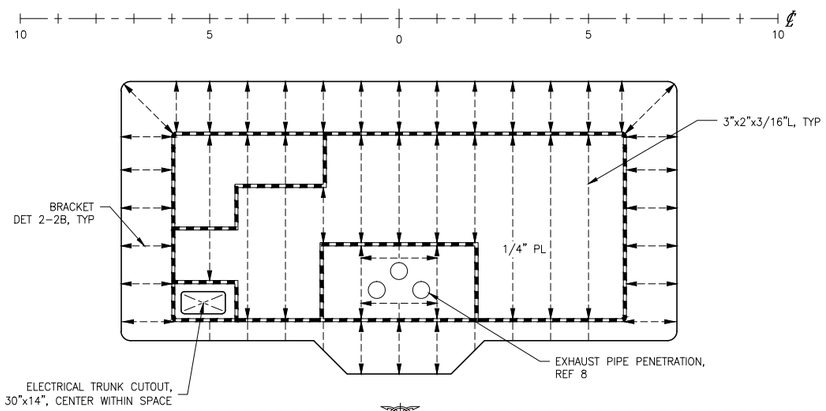
7/30/2018 4:12:17 PM



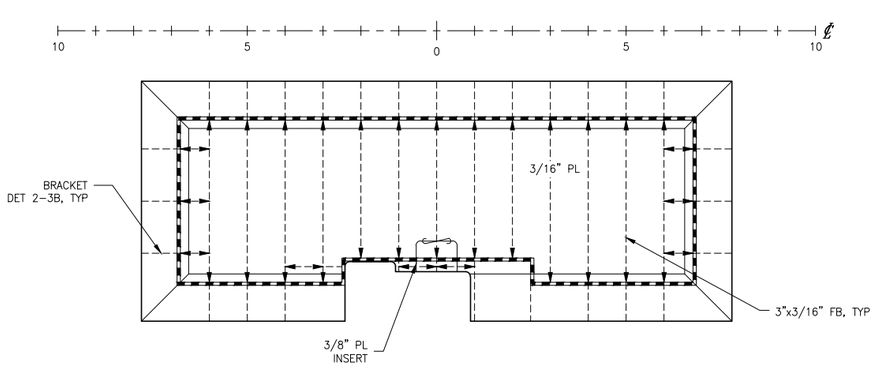
KEY PLAN 1–5C
01 DECK BULKHEADS



KEY PLAN 1–3C
PILOT HOUSE BULKHEADS



PLAN 1–5A
BRIDGE DECK



PLAN 1–3A A1
PILOT HOUSE TOP

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	1–3A	1. MOVED MIDSHIP MAST TO SAME TRANSVERSE CENTER AS END MASTS	SKW	8/2/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. TRANSVERSE BULKHEAD STIFFENER SPACING = 24" U.N.O.
4. CONTRACTOR SHALL VERIFY STRUCTURE FOR ALL FOUNDATIONS PRIOR TO CONSTRUCTION. SEE REF 1.

REFERENCES

1.	18026-200-832-1	TECHINCAL SPECIFICATION
2.	18026-200-061-1	SCANTLING CALCULATIONS
3.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
4.	18026-200-120-1	MIDSHIP SECTION
5.	18026-200-130-2	MAIN DECK
6.	18026-200-150-1	SUPERSTRUCTURE MAIN DECK TO 01 DECK
7.	18026-200-150-3	MAIN DECK BULWARKS
8.	18026-200-259-1	EXHAUST ARRANGEMENT
9.	18026-200-624-1	WINDOW SCHEDULE
10.	18026-200-624-3	DOOR SCHEDULE
11.	18026-200-624-3	HATCH SCHEDULE

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: SUPERSTRUCTURE
01 DECK TO PILOT HOUSE TOP

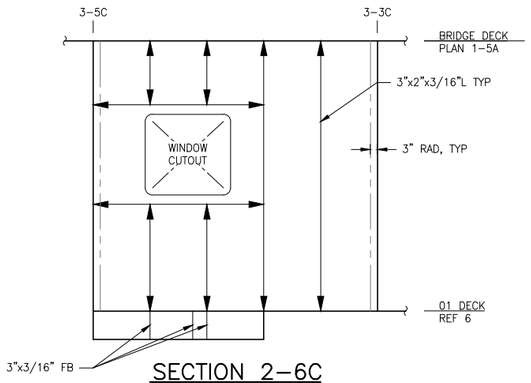
SIZE	DWG NO.	REV
D	18026-200-150-2	A

SCALE	FILE NAME	SHEET	OF
1/4"=1'-0"	18026-200-150-2A	1	3

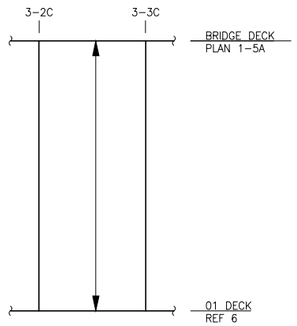
DWN	MOD	CKD	APVD	APVD DATE
SKW	SKW	JCG	SKW	7/26/18

STAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED PROFESSIONAL ENGINEER
8/3/2018

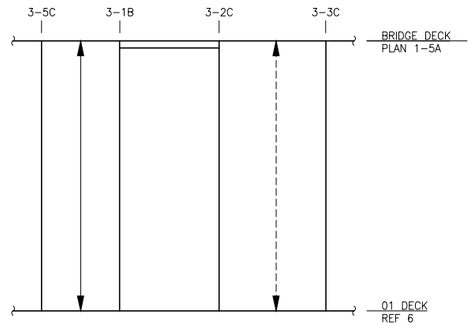
8/3/2018 2:24:55 PM



SECTION 2-6C
FR 06, A-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



SECTION 2-5C
FR 02, A-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



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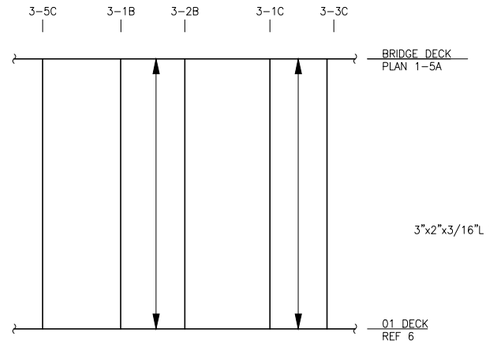
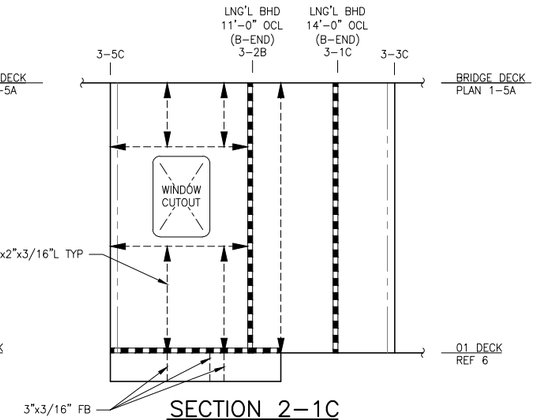
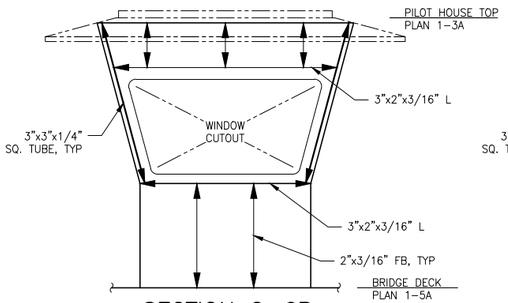
FR 02, B-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



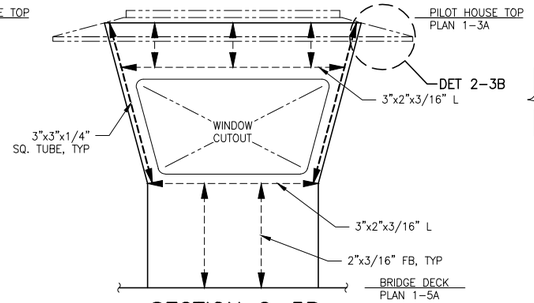
SECTION 2-2C
FR 04+8", B-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



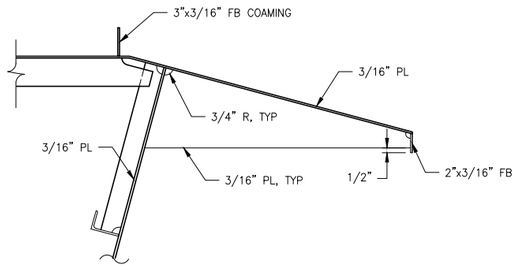
SECTION 2-1C
FR 06, B-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



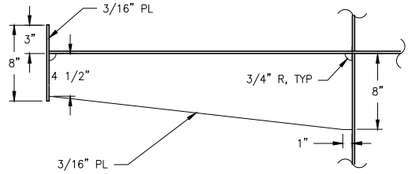
SECTION 2-6B
FR 06, A-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



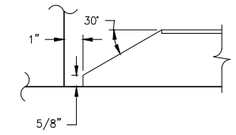
SECTION 2-5B
FR 06, B-END
LOOKING TO A-END
SCALE: 3/8"=1'-0"



DETAIL 2-3B
VISOR BRACKET
PILOT HOUSE
SCALE: 1 1/2"=1'-0"



DETAIL 2-2B
BRIDGE DECK BKT
SCALE: 1 1/2"=1'-0"



DETAIL 2-1B
TYPICAL END SNIPE
ALL STIFFENERS SNIPED BOTH ENDS
UNLESS NOTED OR SHOWN OTHERWISE
SCALE: 3"=1'-0"

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE

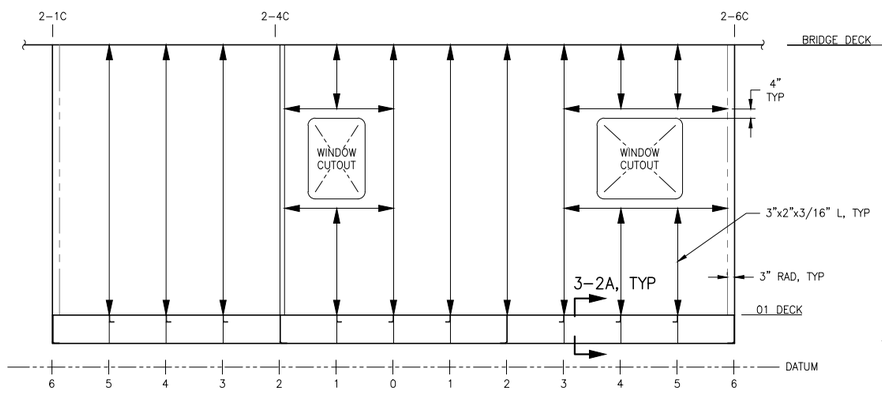
NOTE:
01 DECK BULKHEADS 1/4" PLATE UNO.
PILOT HOUSE BULKHEADS 1/4" PLATE UNO.
STIFFENERS 3"x2"x3/16" L THROUGHOUT UNO.
SNIPE ENDS PER DETAIL 2-1B

NOTE:
LONGITUDINAL BULKHEAD STIFFENER SPACING = 24" U.N.O.

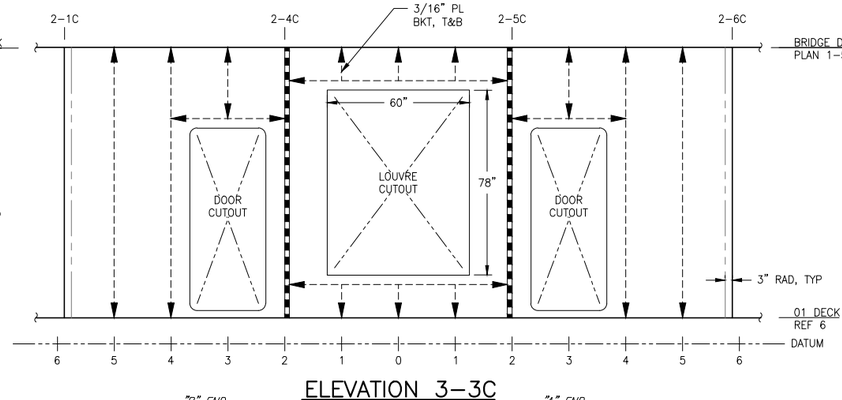
SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-150-2	A
SCALE AS NOTED	FILE NAME 18026-200-150-2A	SHEET 2 OF 3

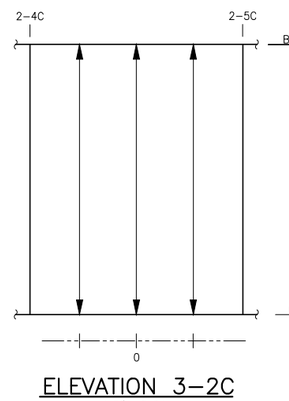
8/3/2018 2:25:05 PM



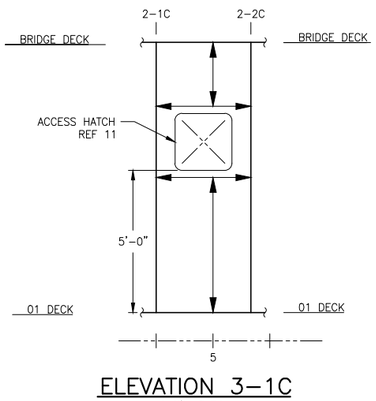
ELEVATION 3-5C
6' OCL
LOOKING TO PORT



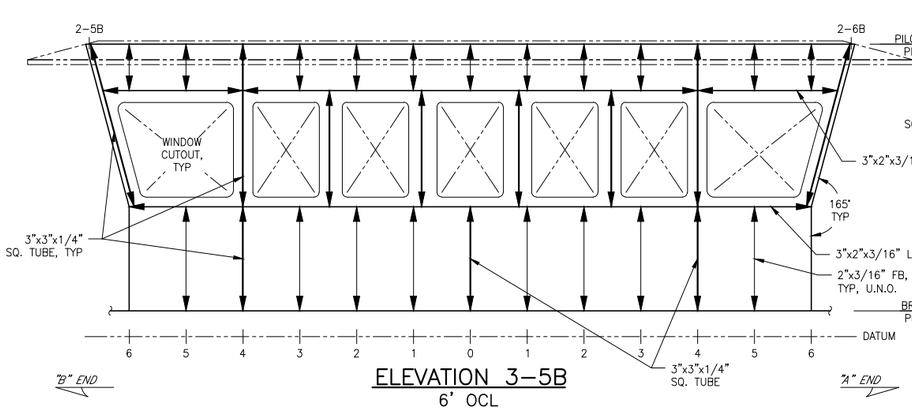
ELEVATION 3-3C
16' OCL
LOOKING TO PORT



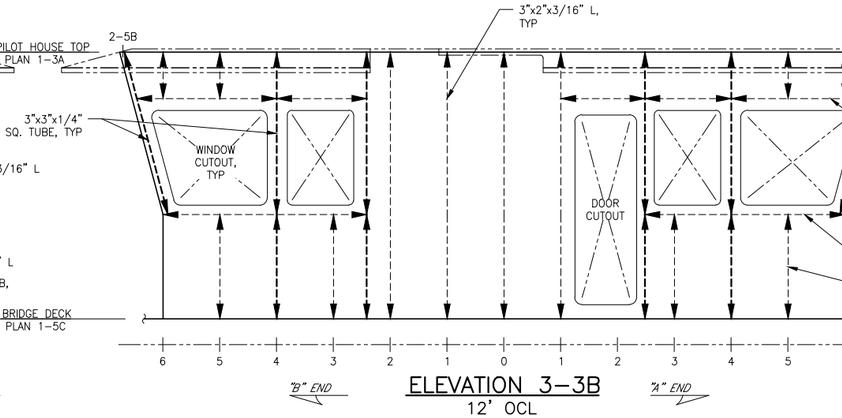
ELEVATION 3-2C
12' OCL
LOOKING TO PORT



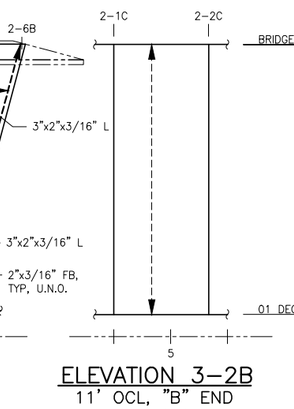
ELEVATION 3-1C
14' OCL
LOOKING TO PORT



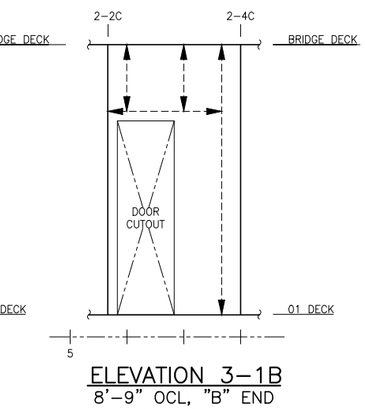
ELEVATION 3-5B
6' OCL
LOOKING TO PORT



ELEVATION 3-3B
12' OCL
LOOKING TO PORT



ELEVATION 3-2B
11' OCL, "B" END
LOOKING TO PORT



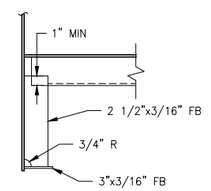
ELEVATION 3-1B
8'-9" OCL, "B" END
LOOKING TO PORT

KEY

- BULKHEAD FARSIDE
- BULKHEAD NEARSIDE
- GIRDER FARSIDE
- GIRDER NEARSIDE
- ORDINARY STIFFENER FARSIDE
- ORDINARY STIFFENER NEARSIDE

NOTE:
BRIDGE DECK BULKHEADS 1/4" PLATE UNO.
PILOT HOUSE BULKHEADS 3/16" PLATE UNO.
STIFFENERS 3"x2"x3/16" L THROUGHOUT UNO.
SNIPE ENDS PER DETAIL 2-1B

NOTE:
TRANSVERSE BULKHEAD STIFFENER SPACING = 24" U.N.O.



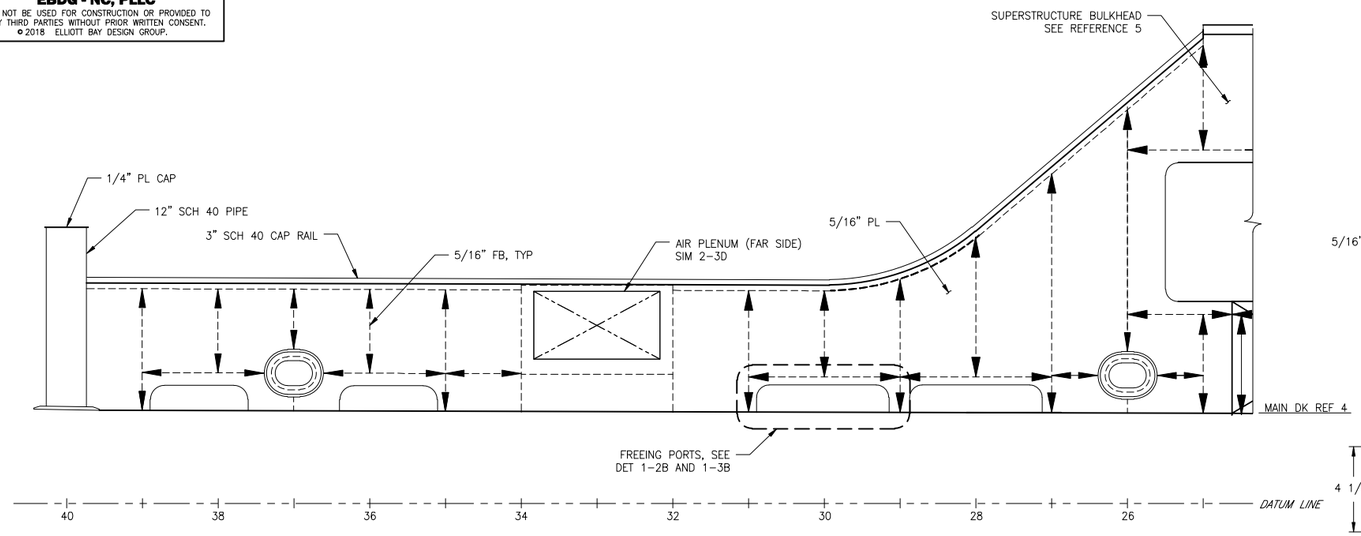
DETAIL 3-2A
COAMING BRACKET

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER

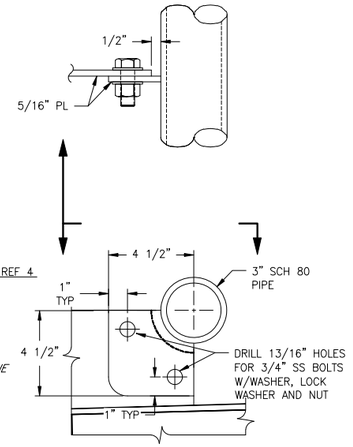
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-150-2	A
SCALE 3/8"=1'-0"	FILE NAME 18026-200-150-2A	SHEET 3 OF 3

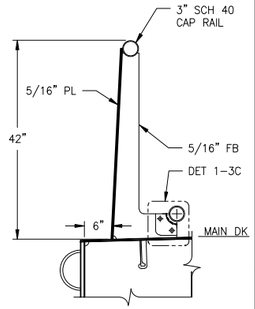
8/3/2018 2:25:09 PM



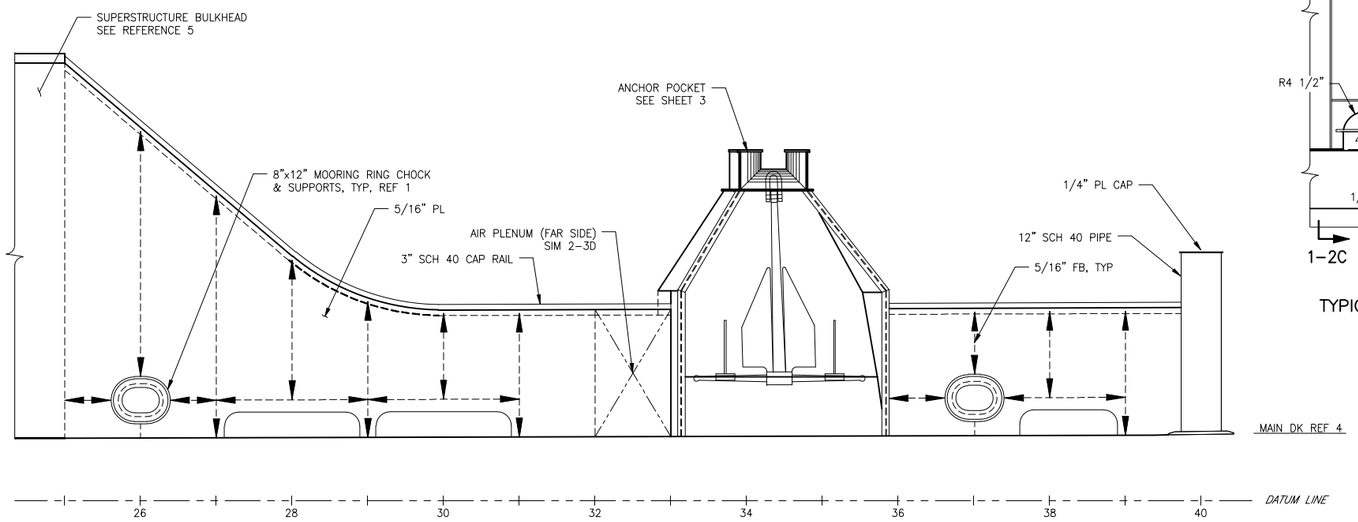
LONGITUDINAL ELEVATION 1–5C
STARBOARD BULWARK – B END
LOOKING TO CENTERLINE
SCALE: 1/2"=1'-0"



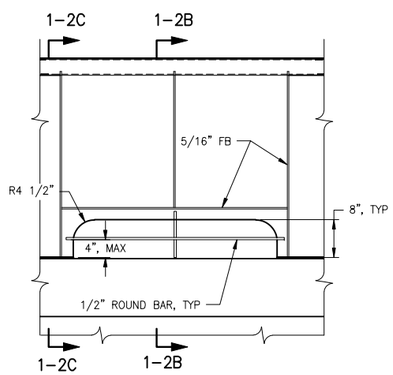
DETAIL 1–3C
TYPICAL RUB RAIL ATTACHEMENT
SCALE: 3"=1'-0"



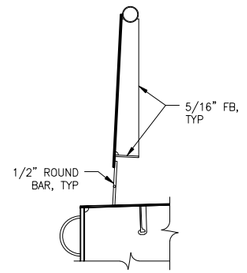
SECTION 1–2C
TYPICAL BULWARK STRUCTURE
SCALE: 3/4"=1'-0"



LONGITUDINAL ELEVATION 1–5A
STARBOARD BULWARK – A END
LOOKING TO CENTERLINE
SCALE: 1/2"=1'-0"



DETAIL 1–3B
TYPICAL FREEING PORT DETAIL
LOOKING OUTBOARD
SCALE: 3/4"=1'-0"



DETAIL 1–2B
TYPICAL FREEING PORT DETAIL
LONGITUDINAL SECTION
SCALE: 3/4"=1'-0"

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. CONTRACTOR SHALL VERIFY STRUCTURE FOR ALL FOUNDATIONS PRIOR TO CONSTRUCTION. SEE REF 1.

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
3.	18026-200-120-1	MIDSHIP SECTION
4.	18026-200-130-1	MAIN DECK
5.	18026-200-150-1	SUPERSTRUCTURE, MAIN DECK TO 01 DECK
6.	18026-200-513-1	MACHINERY VENTILATION ARRANGEMENT

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
6570
REGISTERED PROFESSIONAL ENGINEER
7/30/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

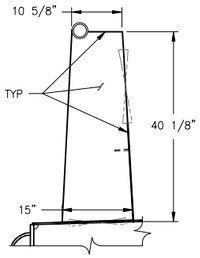
TITLE: MAIN DECK BULWARKS

SIZE	DWG NO.	REV
D	18026-200-150-3	–

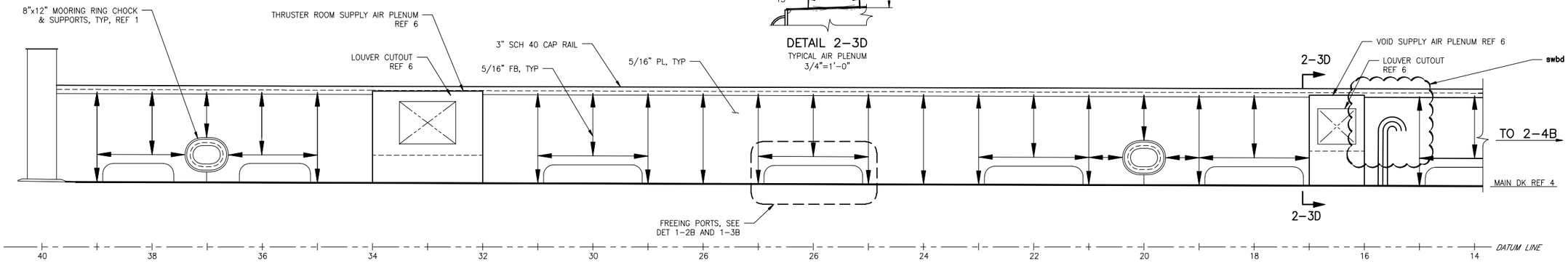
SCALE	FILE NAME	SHEET	OF
AS NOTED	18026-200-150-3-	1	3

DWN	MOD	CKD	APVD	APVD DATE
SKW		MEJ	SKW	7/26/2018

7/30/2018 4:13:40 PM

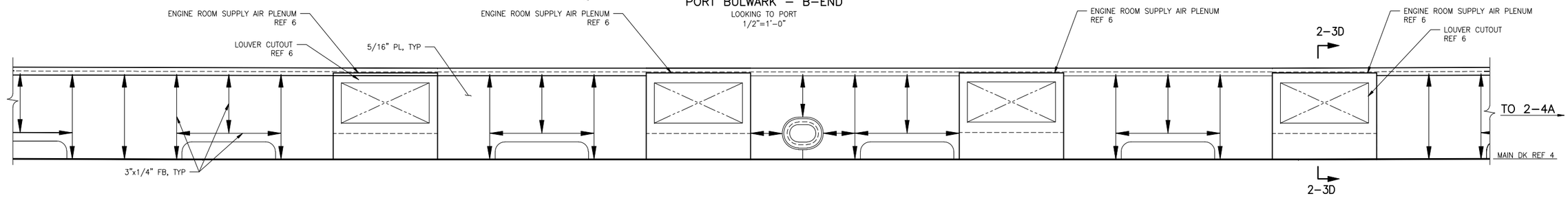


DETAIL 2–3D
TYPICAL AIR PLENUM
3/4"=1'–0"



"B" END

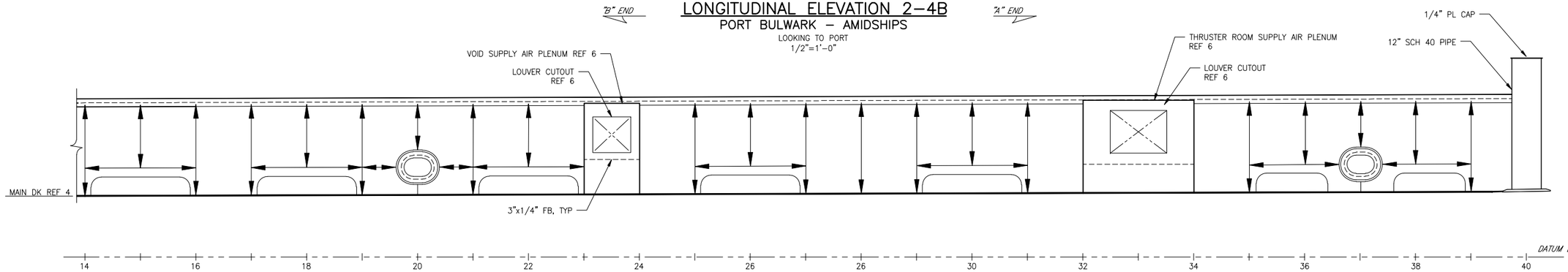
LONGITUDINAL ELEVATION 2–4C
PORT BULWARK – B–END
LOOKING TO PORT
1/2"=1'–0"



"B" END

LONGITUDINAL ELEVATION 2–4B
PORT BULWARK – AMIDSHIPS
LOOKING TO PORT
1/2"=1'–0"

"A" END



"A" END

LONGITUDINAL ELEVATION 2–4A
PORT BULWARK – A–END
LOOKING TO PORT
1/2"=1'–0"

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
25709
REGISTERED
PROFESSIONAL ENGINEER

7/30/2018

SIZE	DWG NO.	REV
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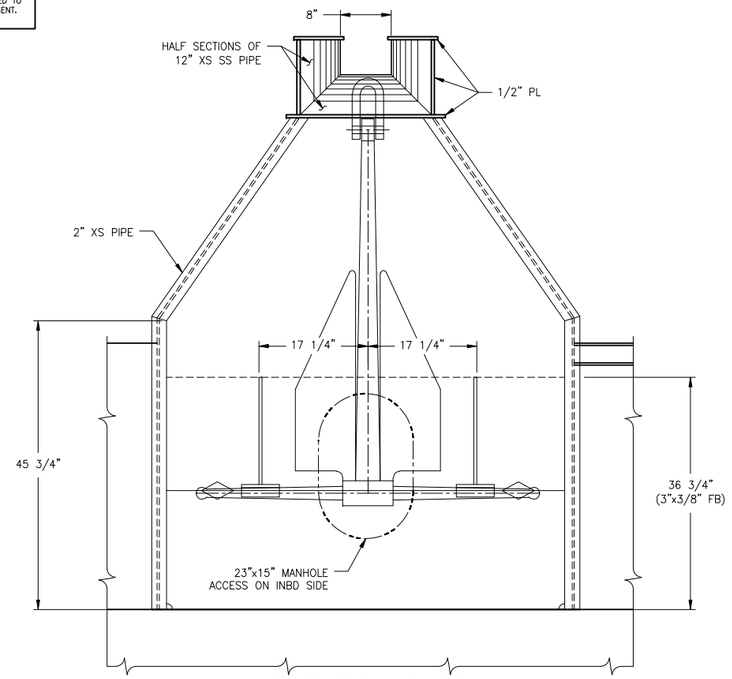
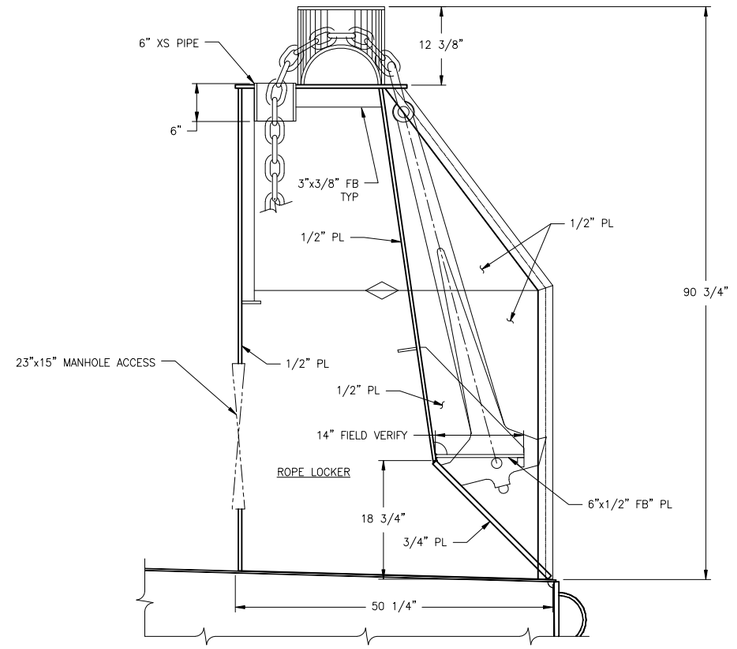
SCALE AS NOTED	FILE NAME 18026–200–150–3–	SHEET 2 OF 3

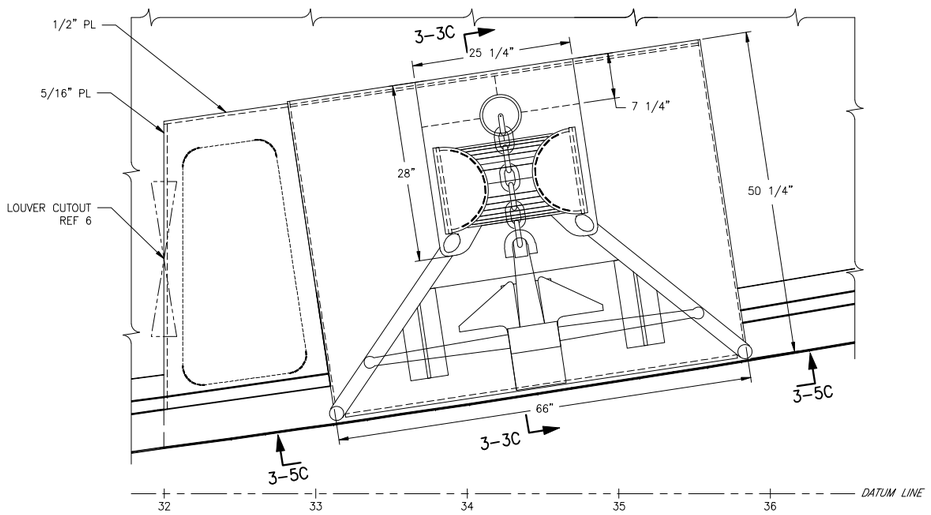
7/30/2018 4:13:44 PM



ELEVATION 3–5C
ANCHOR POCKET LOOKING INBD
SCALE: 1"=1'–0"



SECT 3–3C
ANCHOR POCKET LOOKING FWD
SCALE: 1"=1'–0"

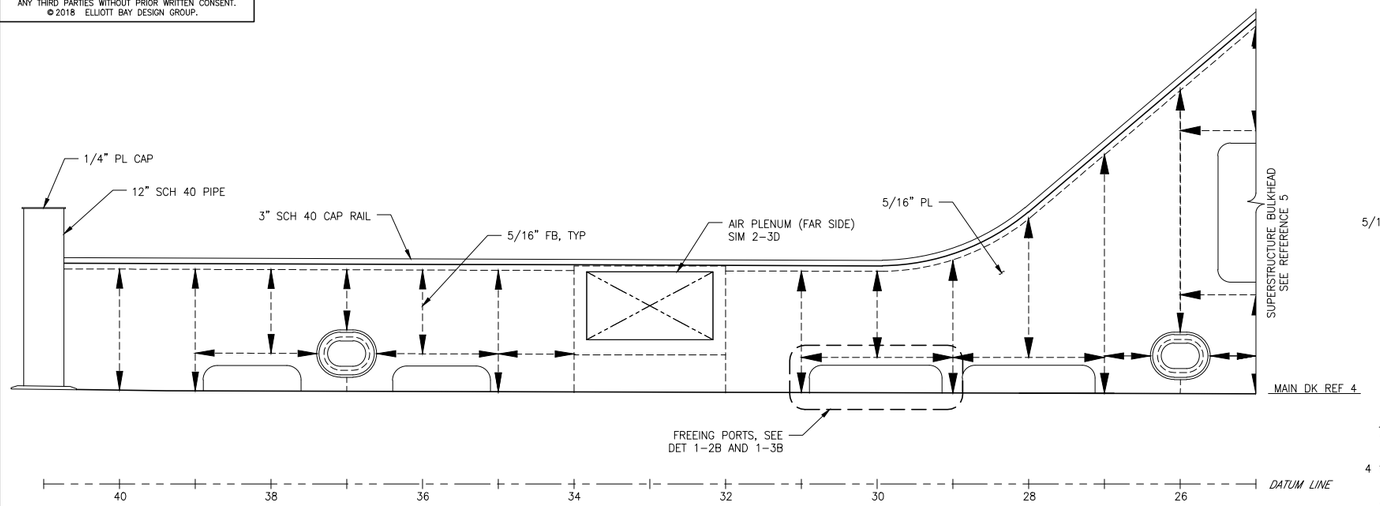


PLAN 3–5A
ANCHOR POCKET AND AIR PLENUM
SCALE: 1"=1'–0"

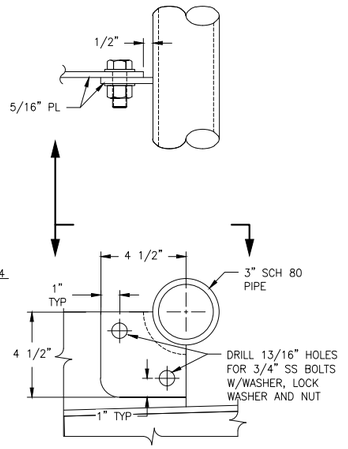
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
25707
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–150–3	–
SCALE AS NOTED	FILE NAME 18026–200–150–3–	SHEET 3 OF 3

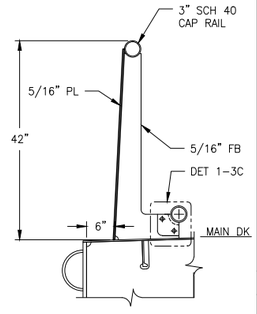
7/30/2018 4:13:49 PM



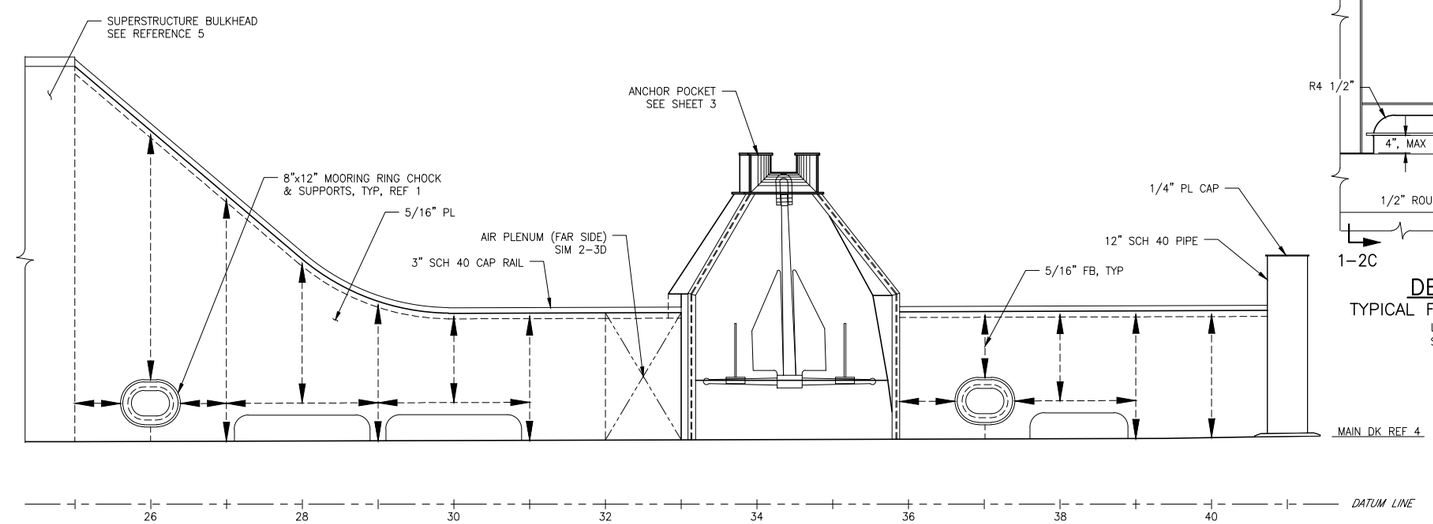
LONGITUDINAL ELEVATION 1-5C
STARBOARD BULWARK – B END
LOOKING TO CENTERLINE
SCALE: 1/2"=1'-0"



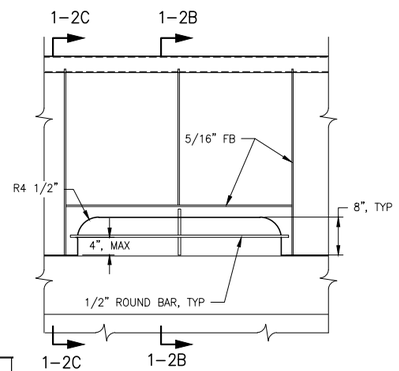
DETAIL 1-3C
TYPICAL RUB RAIL ATTACHMENT
SCALE: 3"=1'-0"



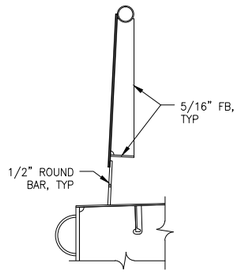
SECTION 1-2C
TYPICAL BULWARK STRUCTURE
SCALE: 3/4"=1'-0"



LONGITUDINAL ELEVATION 1-5A
STARBOARD BULWARK – A END
LOOKING TO CENTERLINE
SCALE: 1/2"=1'-0"



DETAIL 1-3B
TYPICAL FREEING PORT DETAIL
LOOKING OUTBOARD
SCALE: 3/4"=1'-0"



DETAIL 1-2B
TYPICAL FREEING PORT DETAIL
LONGITUDINAL SECTION
SCALE: 3/4"=1'-0"

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	SHT1 SHT2	1. MOVED BULWARK END POSTS ENDWARDS 24".	SKW	8/2/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24".
3. CONTRACTOR SHALL VERIFY STRUCTURE FOR ALL FOUNDATIONS PRIOR TO CONSTRUCTION. SEE REF 1.

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
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RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

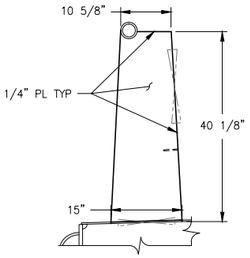
TITLE: MAIN DECK BULWARKS

SIZE D | DWG NO. 18026-200-150-3 | REV A
SCALE AS NOTED | FILE NAME 18026-200-150-3A | SHEET 1 OF 3
DWN SKW | MOD SKW | CKD MEJ | APVD SKW | APVD DATE 7/26/2018

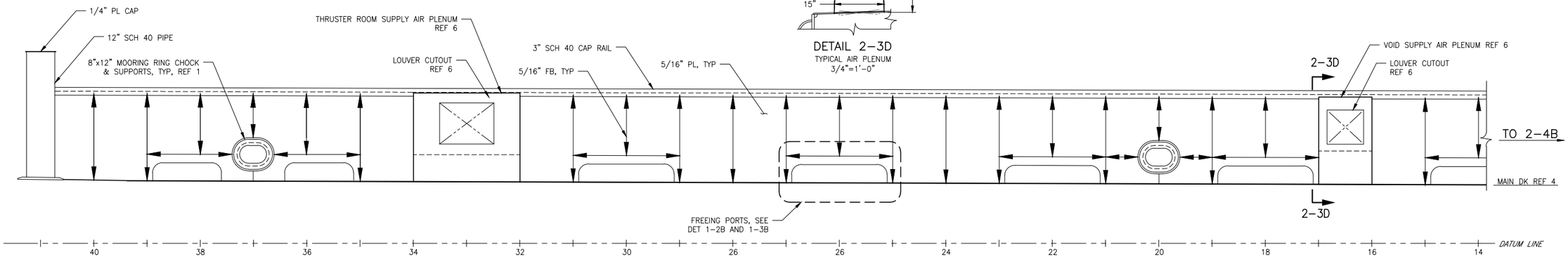
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER

A1 8/3/2018

8/3/2018 2:44:38 PM

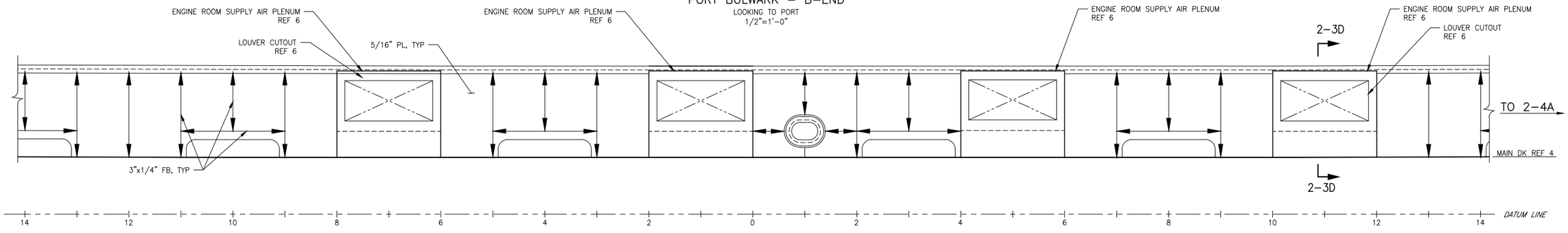


DETAIL 2–3D
TYPICAL AIR PLENUM
3/4"=1'–0"



"B" END

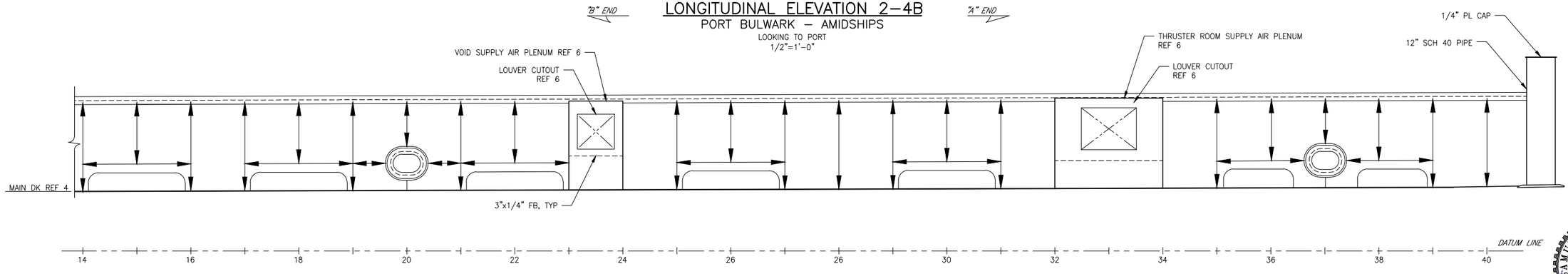
LONGITUDINAL ELEVATION 2–4C
PORT BULWARK – B–END
LOOKING TO PORT
1/2"=1'–0"



"B" END

LONGITUDINAL ELEVATION 2–4B
PORT BULWARK – AMIDSHIPS
LOOKING TO PORT
1/2"=1'–0"

"A" END



"A" END

LONGITUDINAL ELEVATION 2–4A
PORT BULWARK – A–END
LOOKING TO PORT
1/2"=1'–0"

SAMUEL K WATERHOUSE
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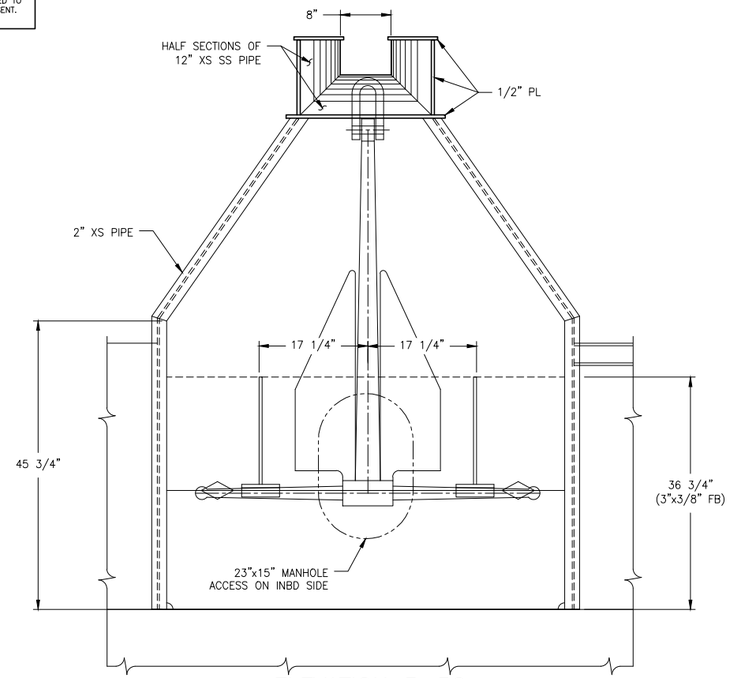
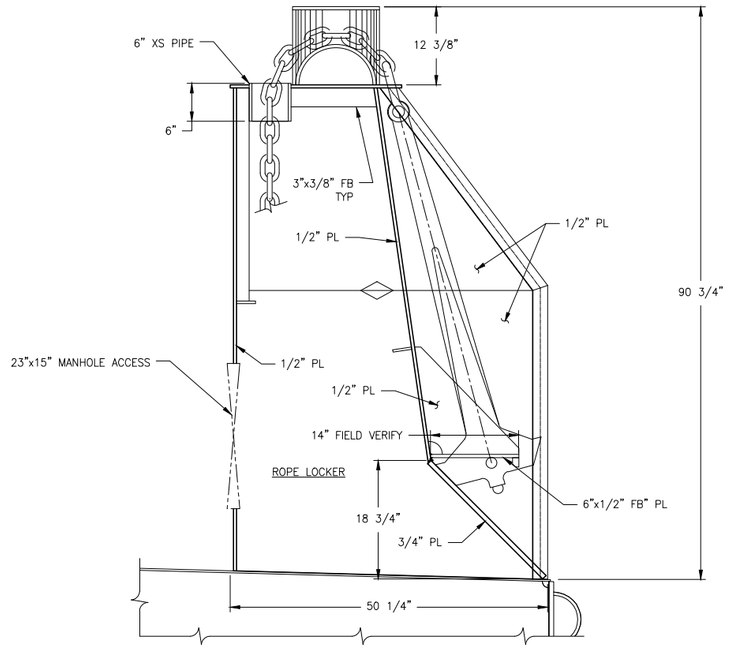
A1

8/3/2018

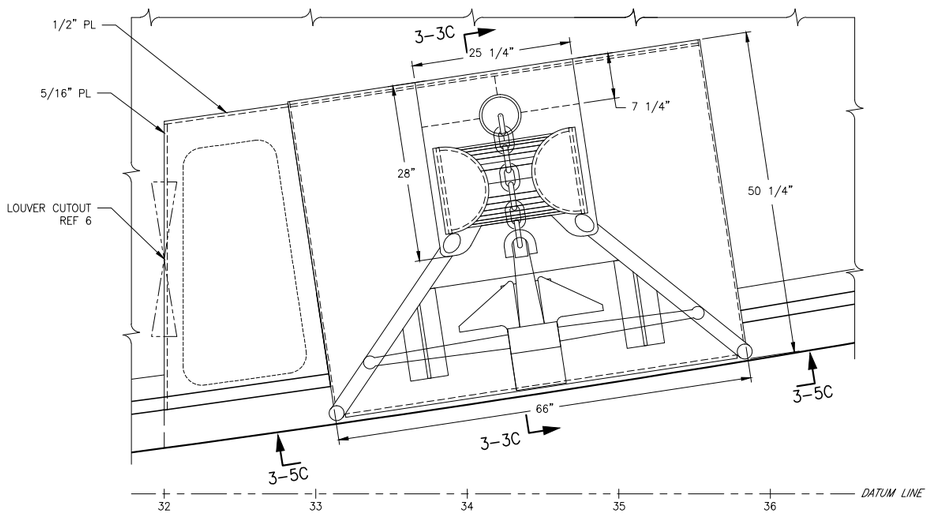
SIZE	DWG NO.	REV
D	18026–200–150–3	A
SCALE AS NOTED	FILE NAME 18026–200–150–3A	SHEET 2 OF 3



ELEVATION 3–5C
ANCHOR POCKET LOOKING INBD
SCALE: 1"=1'–0"



SECT 3–3C
ANCHOR POCKET LOOKING FWD
SCALE: 1"=1'–0"

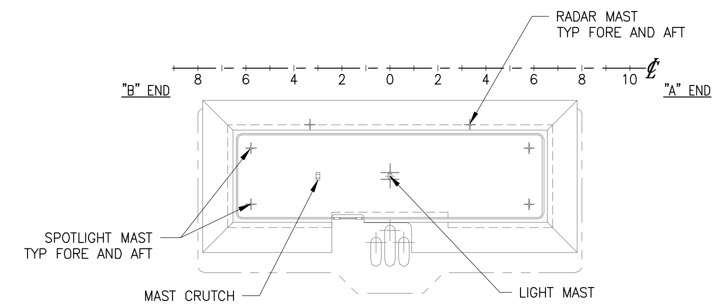


PLAN 3–5A
ANCHOR POCKET AND AIR PLENUM
SCALE: 1"=1'–0"

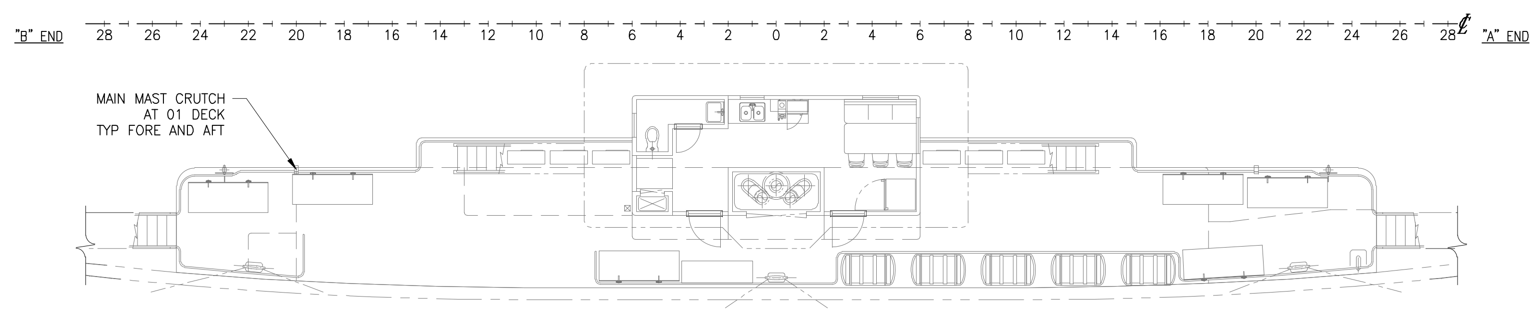
SAMUEL K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026–200–150–3	A
SCALE: AS NOTED	FILE NAME: 18026–200–150–3A	SHEET 3 OF 3

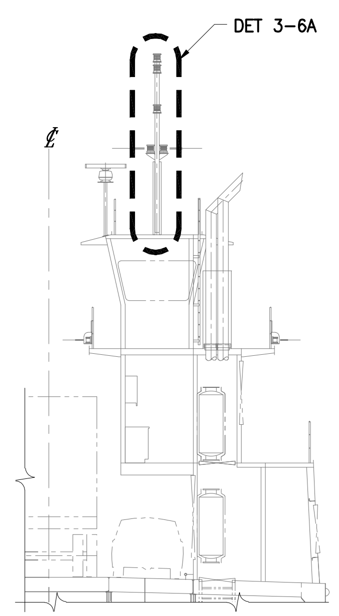
8/3/2018 2:44:48 PM



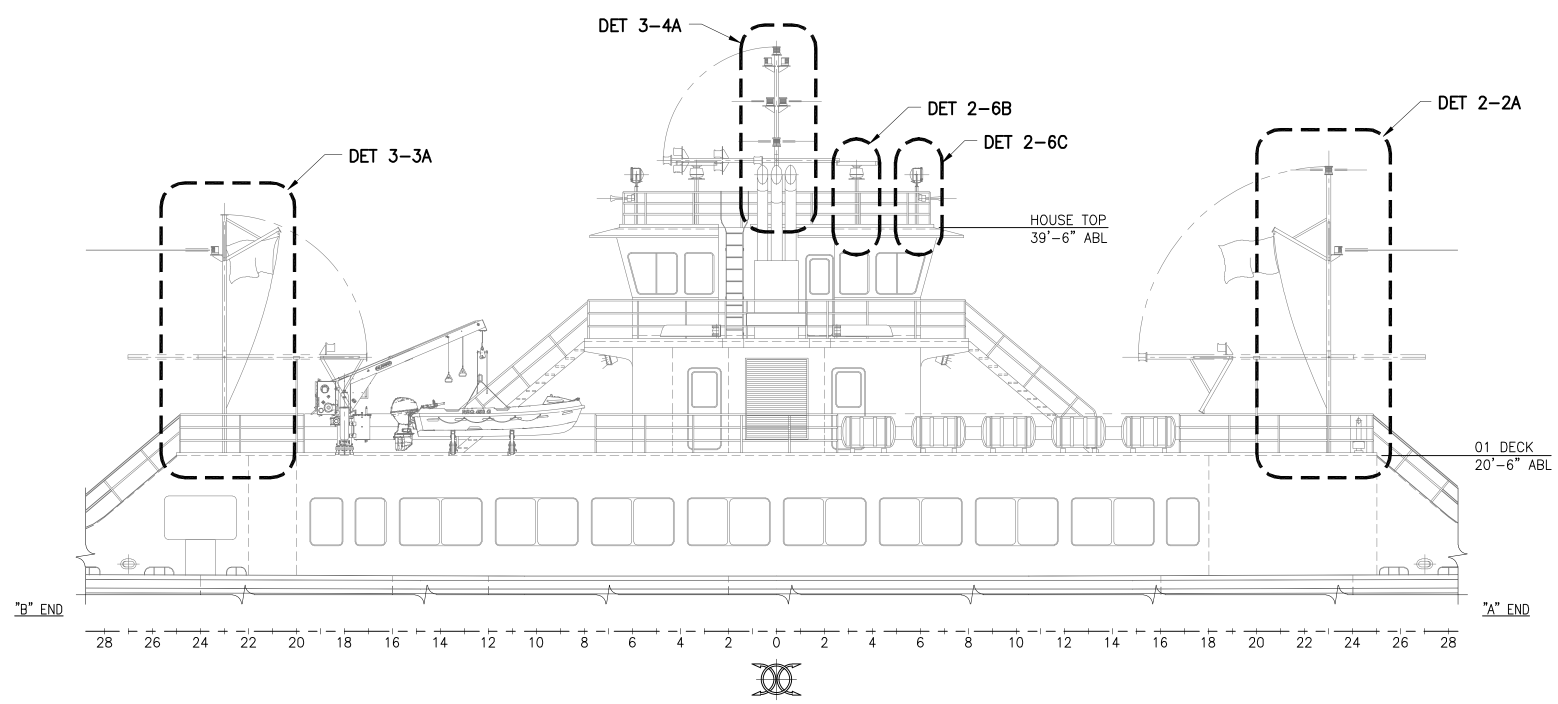
PLAN 1-4D
PILOT HOUSE TOP



PLAN 1-4B
01 DECK



SECTION 1-6A
MIDSHIP LOOKING TO "A" END



ELEVATION 1-4A
OUTBOARD PROFILE

7/30/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. CONTRACTOR SHALL VERIFY STRUCTURE AND FOUNDATIONS FOR ALL MASTS PRIOR TO CONSTRUCTION. SEE REFERENCE 1.
4. CONTRACTOR SHALL BALANCE THE MASTS ABOUT THE PIVOT POINT FOR EASE OF LOWERING AND RAISING THE MASTS USING A LENGTH OF SOLID STEEL MATCHING THE SIZE OF THE MAST SQUARE TUBE.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-061-1 SCANTLING CALCULATIONS
3. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS
4. 18026-200-120-1 MIDSHIP SECTION
5. 18026-200-150-1 SUPERSTRUCTURE MAIN DECK TO 01 DECK
6. 18026-200-150-2 SUPERSTRUCTURE 01 DECK TO PILOT HOUSE TOP
7. 18026-200-422-1 NAVIGATION LIGHTING ARRANGEMENT AND BLOCK DIAGRAM

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

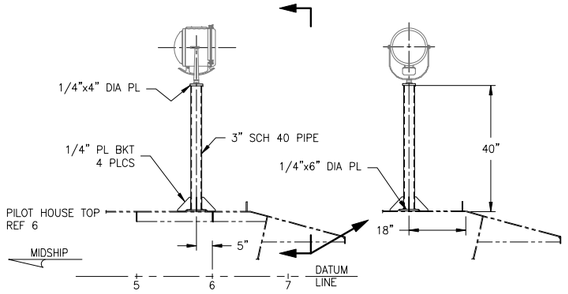
CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: MASTS

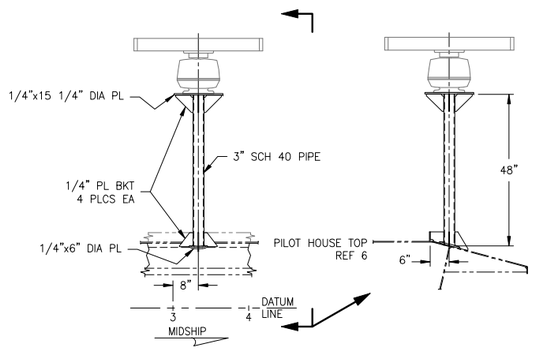
SIZE	DWG NO.	REV
D	18026-200-170-1	—

SCALE	FILE NAME	SHEET
1/8"=1'-0"	18026-200-170-1-	1 OF 3

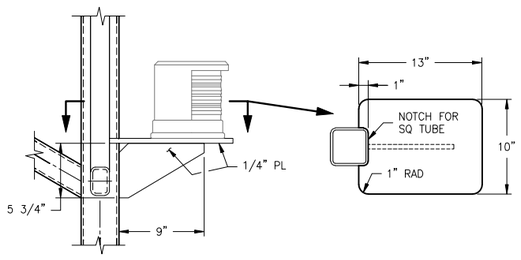
DWN	MOD	CKD	APVD	APVD DATE
JEH		SKW	SKW	7/27/2018



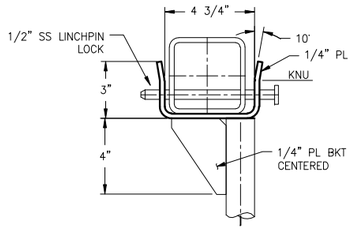
DETAIL 2–6C
SPOTLIGHT MAST
'A' END SHOWN, 'B' END SIM, OPP
4 REQUIRED, 2 AT EACH END



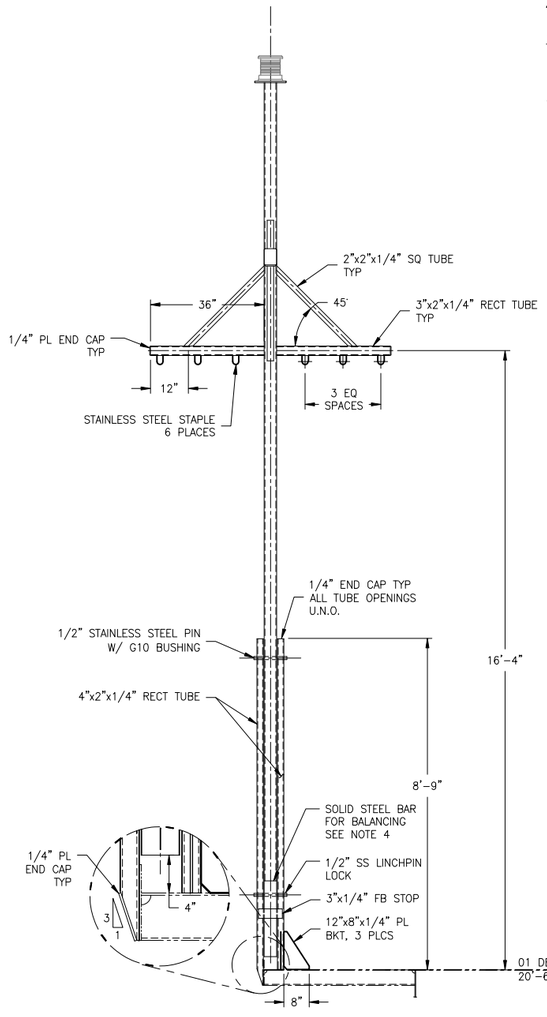
DETAIL 2–6B
RADAR MAST
'A' END SHOWN, 'B' END SIM, OPP
2 REQUIRED, 1 AT EACH END



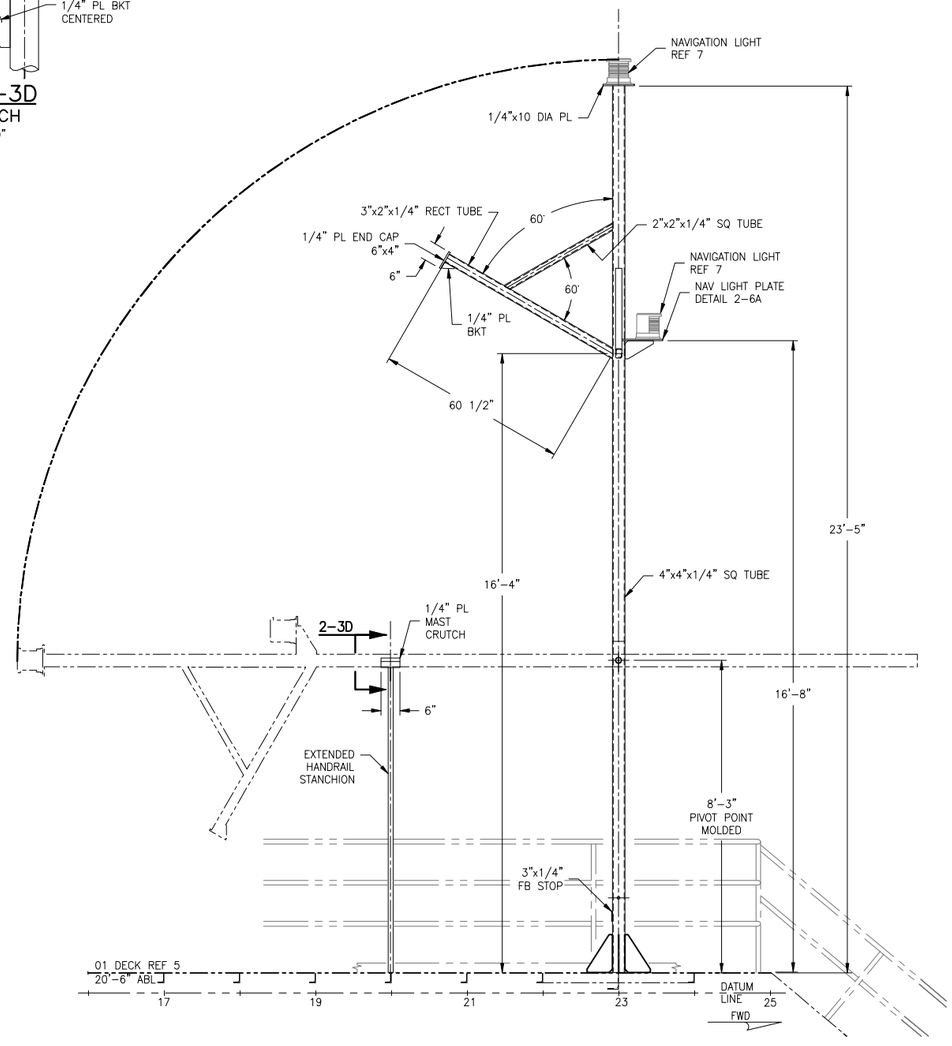
DETAIL 2–6A
TYP NAV LIGHT PLATE
SCALE: 1 1/2"=1'–0"



DETAIL 2–3D
MAST CRUTCH
SCALE: 3"=1'–0"



SECTION 2–4A
FRAME 23, LOOKING TO "A" END

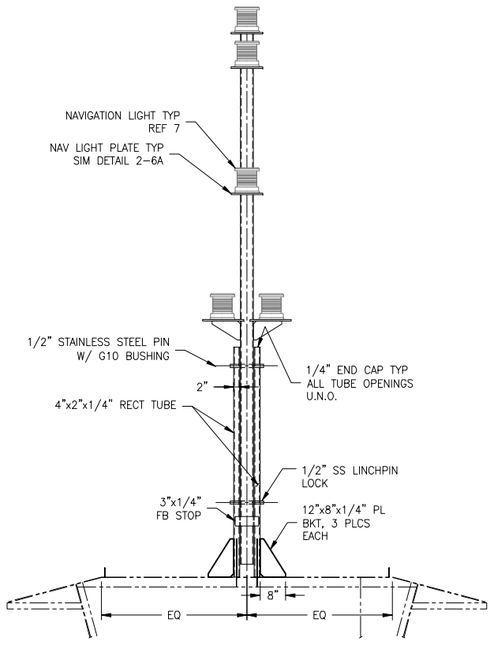


ELEVATION 2–2A
MAIN MAST
'A' END LKG PORT

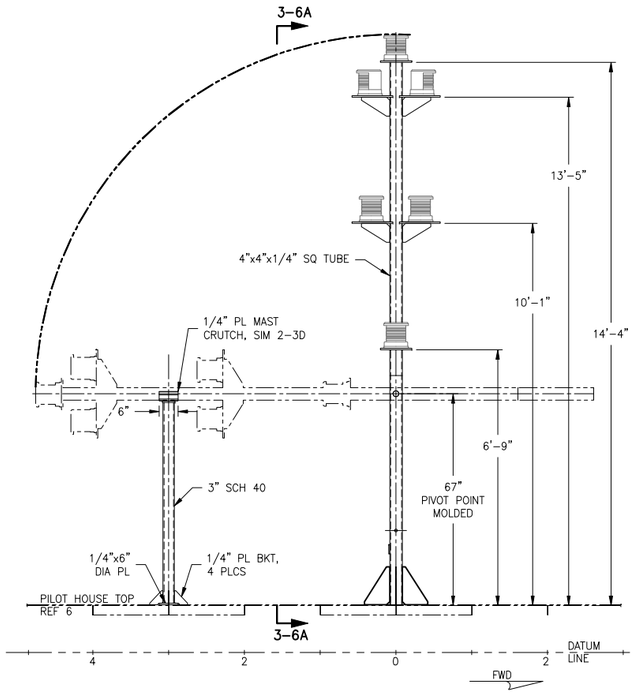
7/30/2018

SIZE D	DWG NO. 18026–200–170–1		REV –
SCALE 1/2"=1'–0" U.N.O.	FILE NAME 18026–200–170–1–	SHEET 2	OF 3

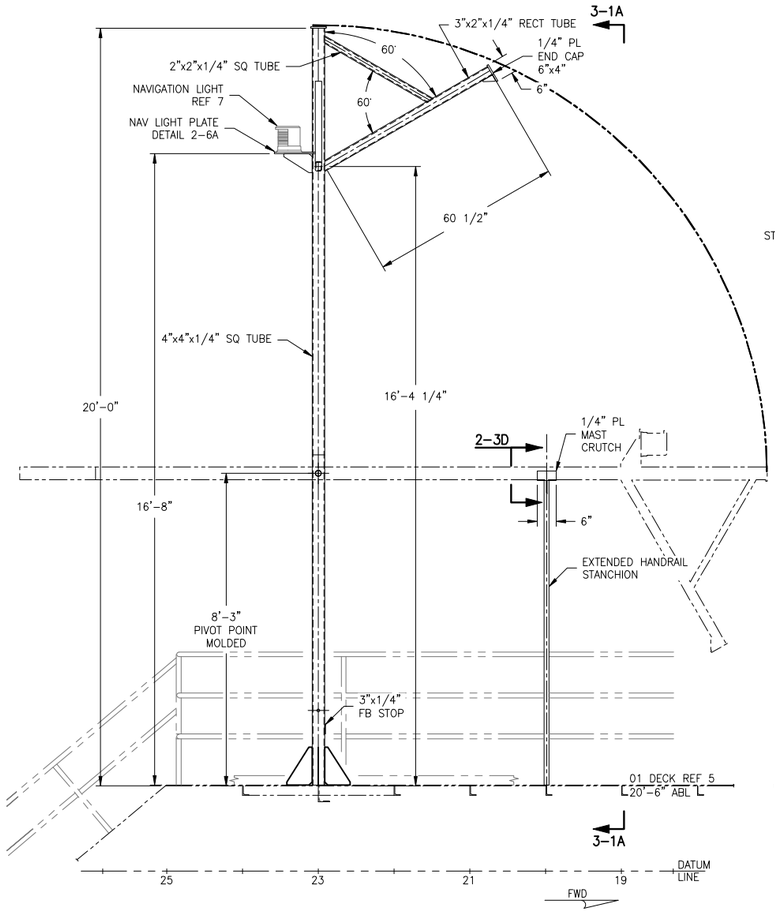
7/30/2018 4:16:42 PM



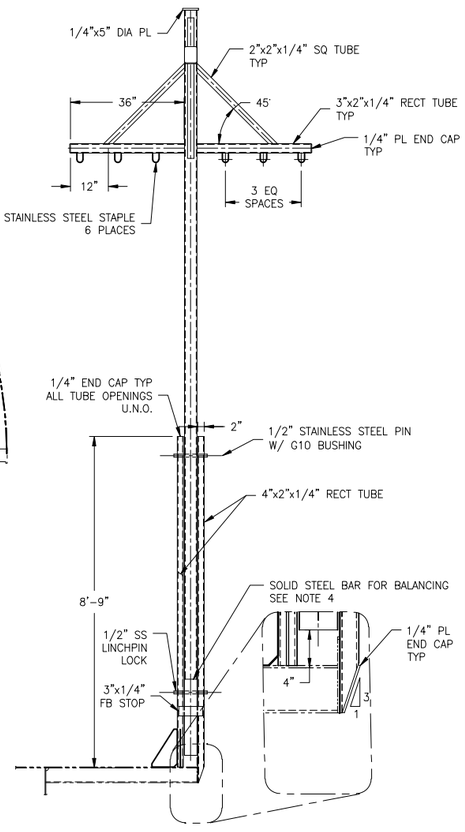
SECTION 3–6A
FRAME 0, LOOKING TO "A" END



ELEVATION 3–4A
LIGHT MAST
MIDSHIP



ELEVATION 3–3A
MAIN MAST
'B' END LKG PORT

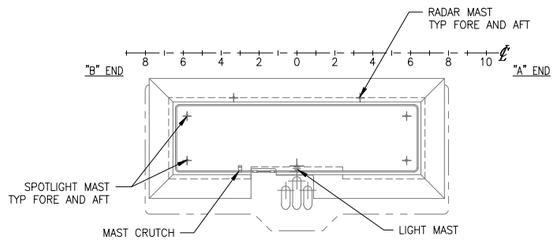


SECTION 3–1A
FRAME 23, LOOKING TO "B" END

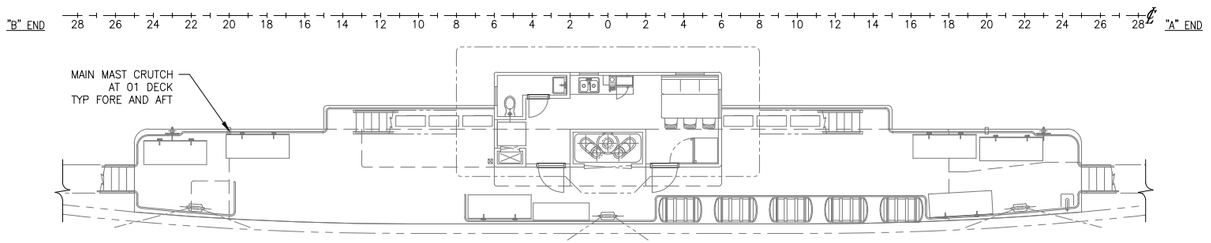
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
35706
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–170–1	–
SCALE 1/2"=1'–0"	FILE NAME 18026–200–170–1–	SHEET 3 OF 3

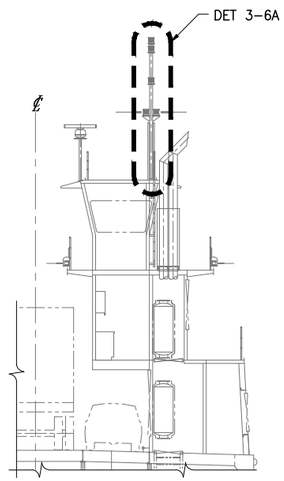
7/30/2018 4:16:47 PM



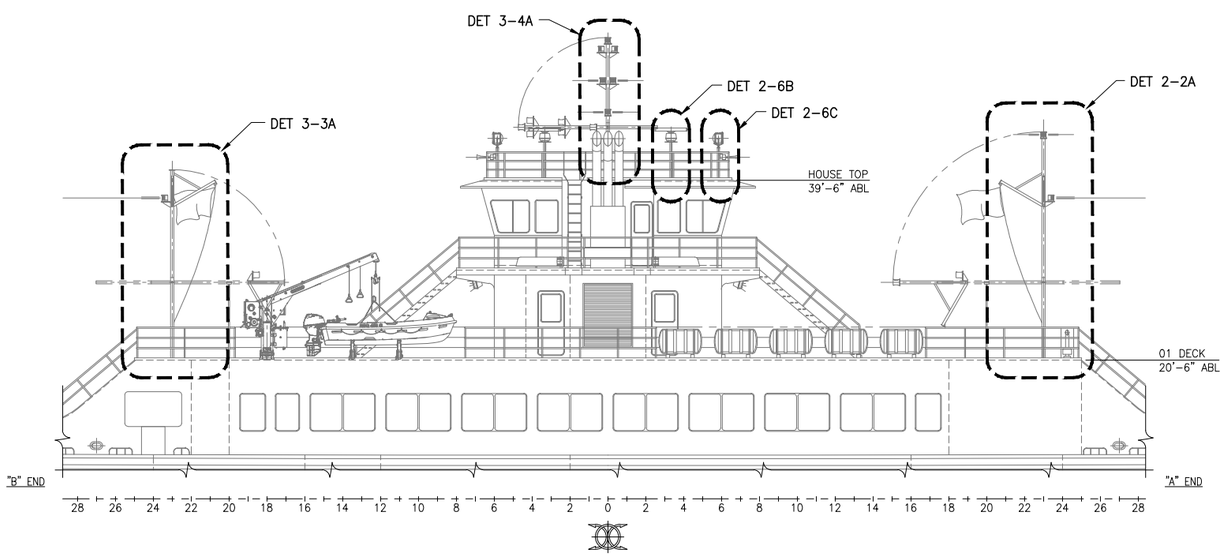
PLAN 1–4D
PILOT HOUSE TOP (A/1)



PLAN 1–4B
01 DECK



SECTION 1–6A
MIDSHIP LOOKING TO "A" END (A/1)



ELEVATION 1–4A
OUTBOARD PROFILE

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	1–6A 1–4D 3–6A	1. MOVED MIDSHIP MAST TO SAME TRANSVERSE CENTER AS END MASTS	SKW	7/31/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. CONTRACTOR SHALL VERIFY STRUCTURE AND FOUNDATIONS FOR ALL MASTS PRIOR TO CONSTRUCTION. SEE REFERENCE 1.
4. CONTRACTOR SHALL BALANCE THE MASTS ABOUT THE PIVOT POINT FOR EASE OF LOWERING AND RAISING THE MASTS USING A LENGTH OF SOLID STEEL MATCHING THE SIZE OF THE MAST SQUARE TUBE.

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATION
2.	18026–200–061–1	SCANTLING CALCULATIONS
3.	18026–200–101–1	PROFILES AND DECK ARRANGEMENTS
4.	18026–200–120–1	MIDSHIP SECTION
5.	18026–200–150–1	SUPERSTRUCTURE MAIN DECK TO 01 DECK
6.	18026–200–150–2	SUPERSTRUCTURE 01 DECK TO PILOT HOUSE TOP
7.	18026–200–422–1	NAVIGATION LIGHTING ARRANGEMENT AND BLOCK DIAGRAM

STAMUK K. WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED PROFESSIONAL ENGINEER
8/3/2018

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: MASTS

SIZE	DWG NO.	REV
D	18026–200–170–1	A

SCALE	FILE NAME	SHEET	OF
1/8"=1'–0"	18026–200–170–1A	1	3

DWN	MOD	CKD	APVD	APVD DATE
JEH	SKW	SKW	SKW	7/27/2018

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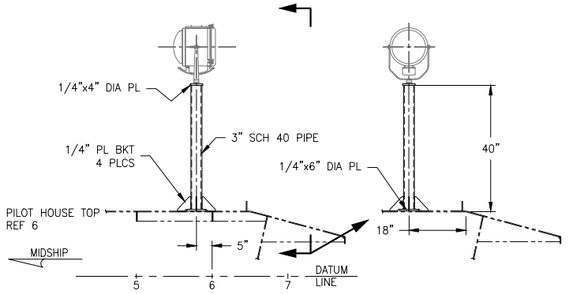
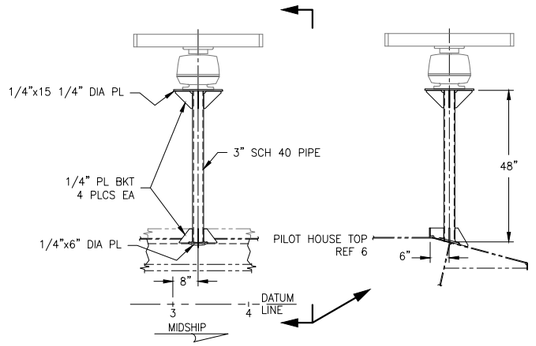
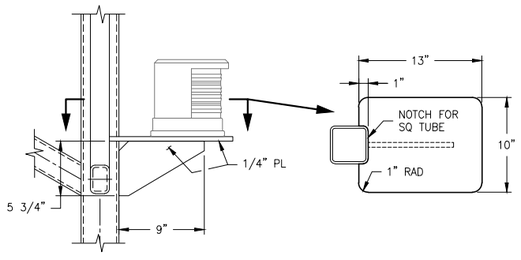


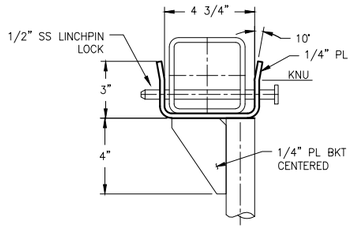
DETAIL 2–6C
SPOTLIGHT MAST
'A' END SHOWN, 'B' END SIM, OPP
4 REQUIRED, 2 AT EACH END



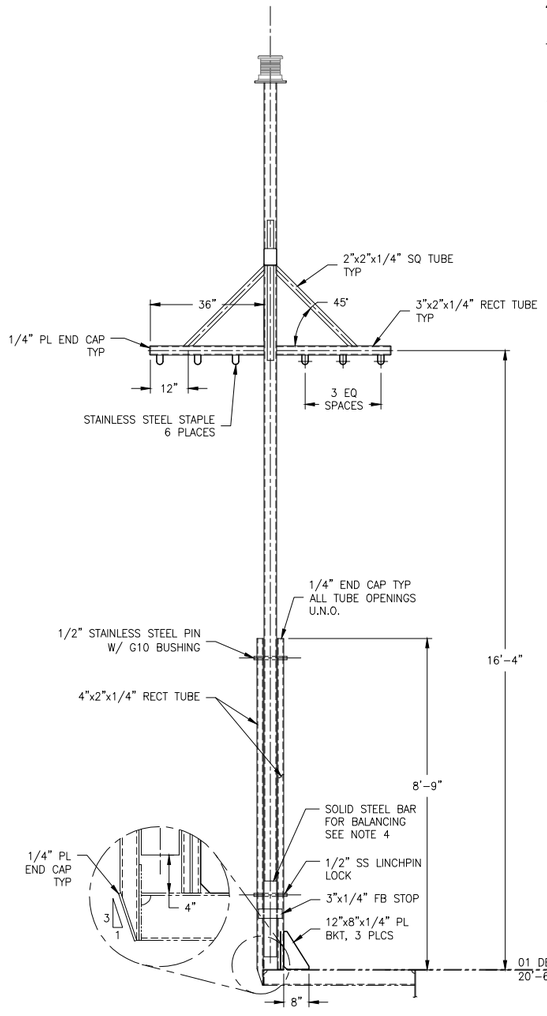
DETAIL 2–6B
RADAR MAST
'A' END SHOWN, 'B' END SIM, OPP
2 REQUIRED, 1 AT EACH END



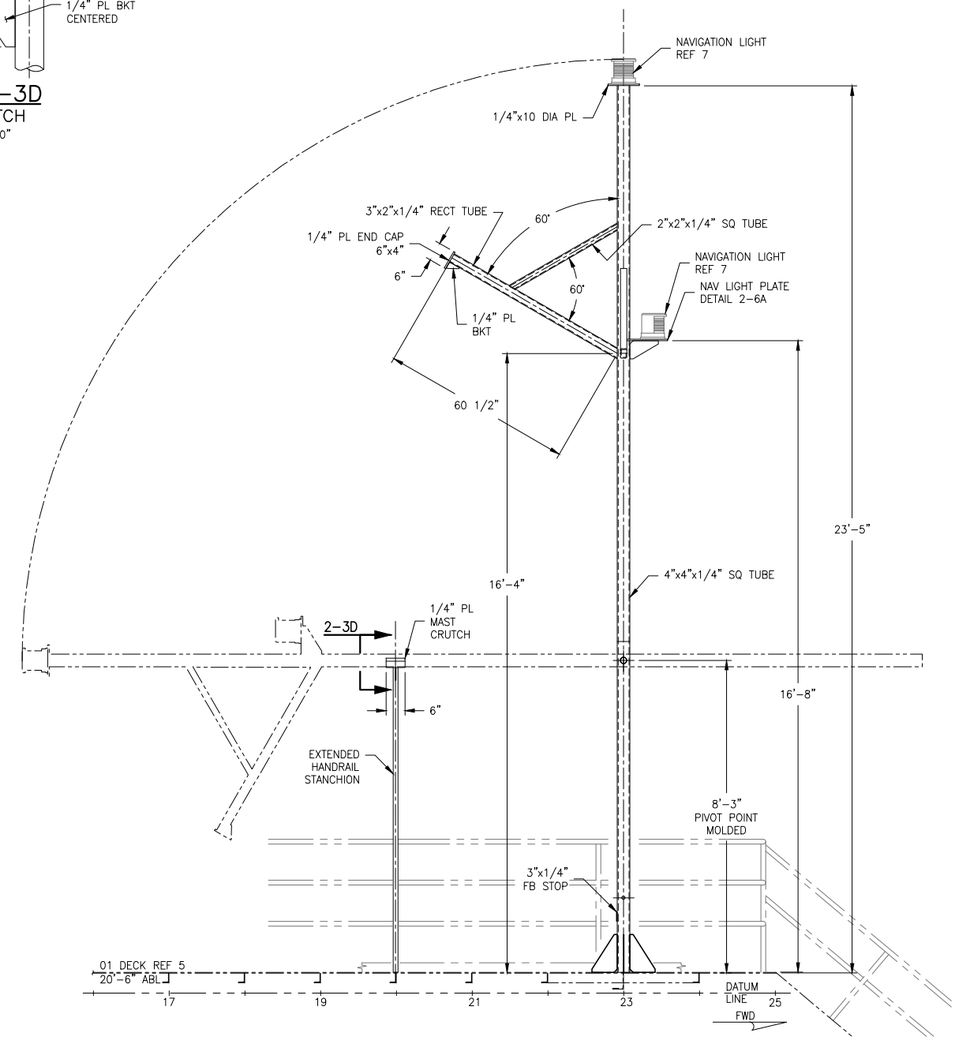
DETAIL 2–6A
TYP NAV LIGHT PLATE
SCALE: 1 1/2"=1'-0"



DETAIL 2–3D
MAST CRUTCH
SCALE: 3"=1'-0"



SECTION 2–4A
FRAME 23, LOOKING TO "A" END

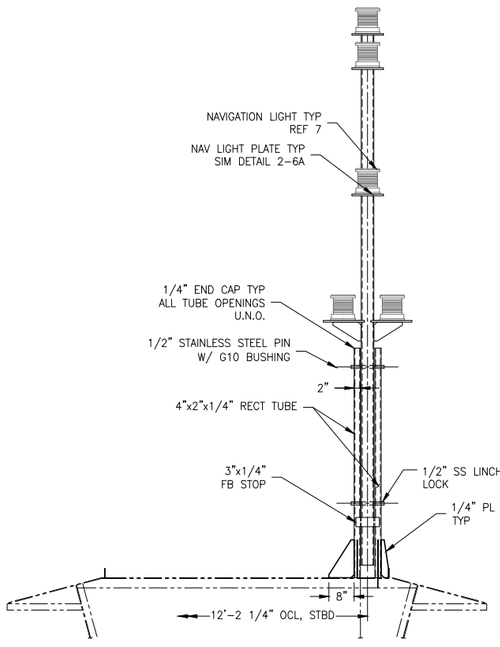


ELEVATION 2–2A
MAIN MAST
'A' END LKG PORT

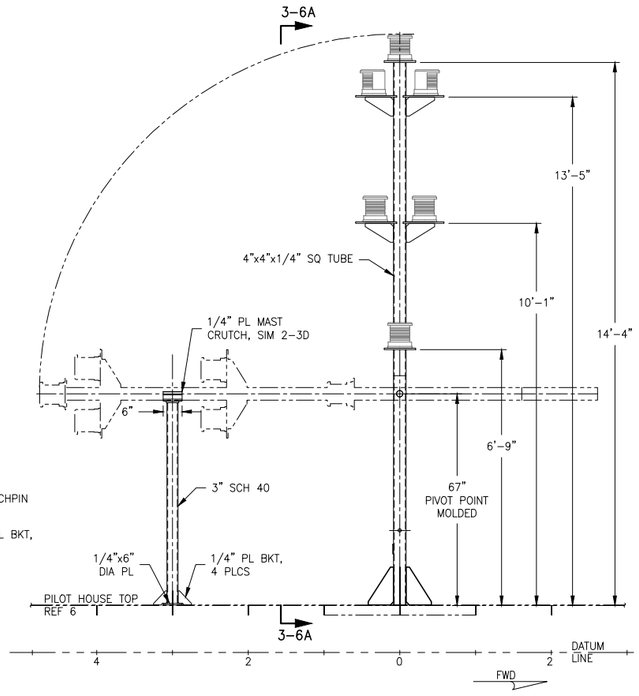
SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026–200–170–1	A
SCALE 1/2"=1'-0" U.N.O.	FILE NAME 18026–200–170–1A	SHEET 2 OF 3

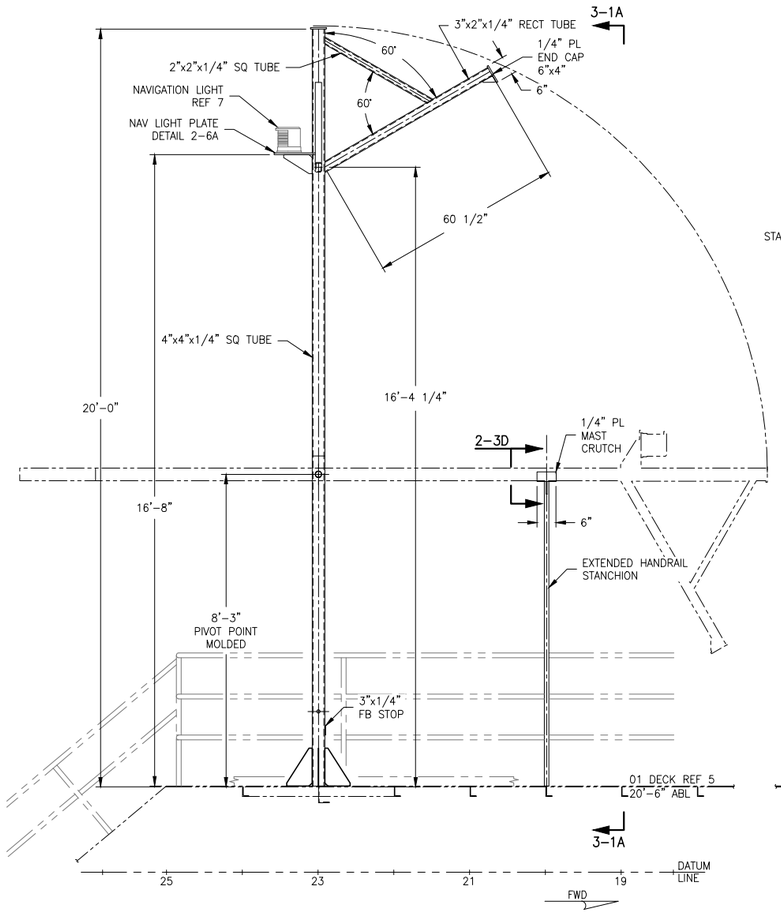
8/3/2018 2:45:40 PM



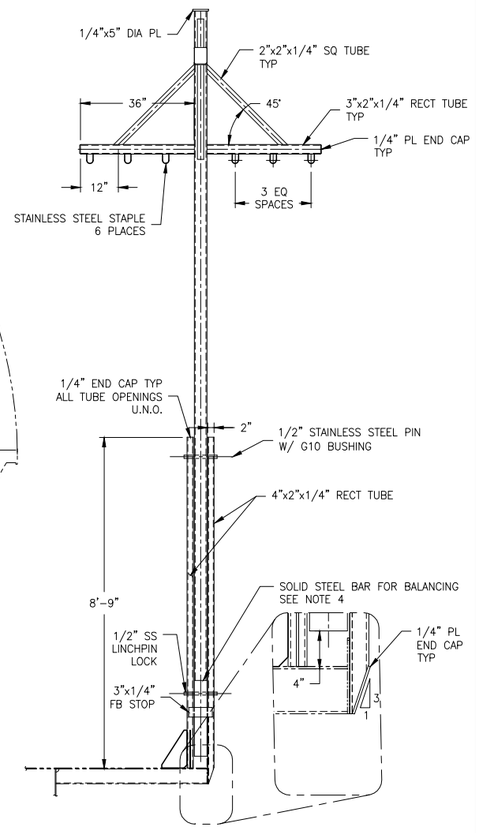
SECTION 3–6A
FRAME 0, LOOKING TO "A" END



ELEVATION 3–4A
LIGHT MAST
MIDSHIP



ELEVATION 3–3A
MAIN MAST
'B' END LKG PORT



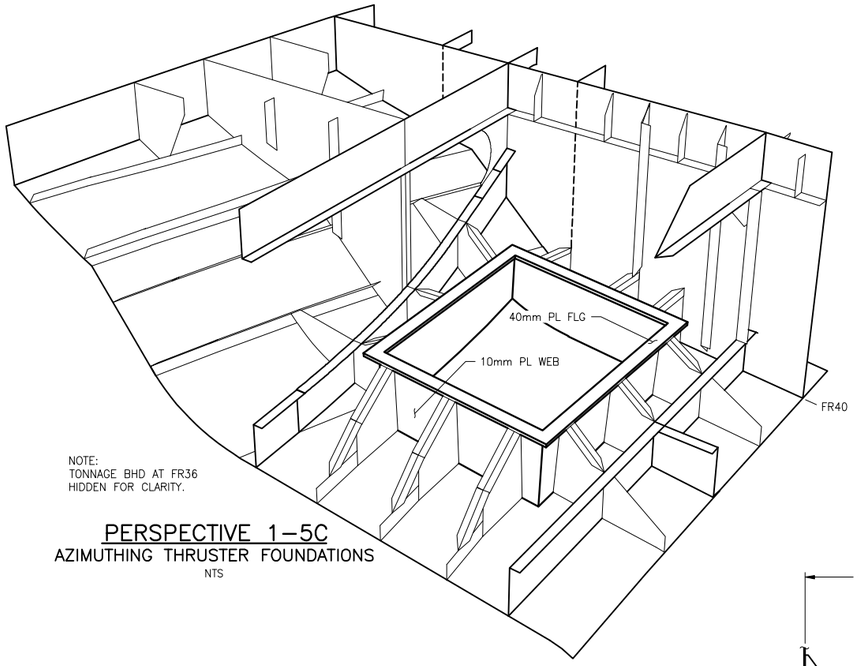
SECTION 3–1A
FRAME 23, LOOKING TO "B" END

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER

8/3/2018

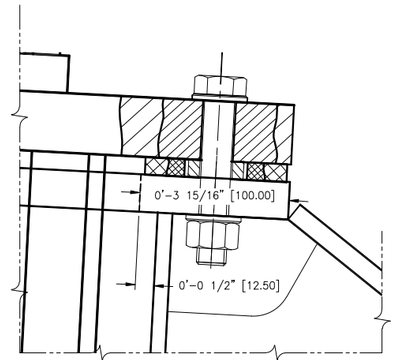
SIZE	DWG NO.	REV
D	18026–200–170–1	A
SCALE 1/2"=1'–0"	FILE NAME 18026–200–170–1A	SHEET 3 OF 3

8/3/2018 2:45:54 PM

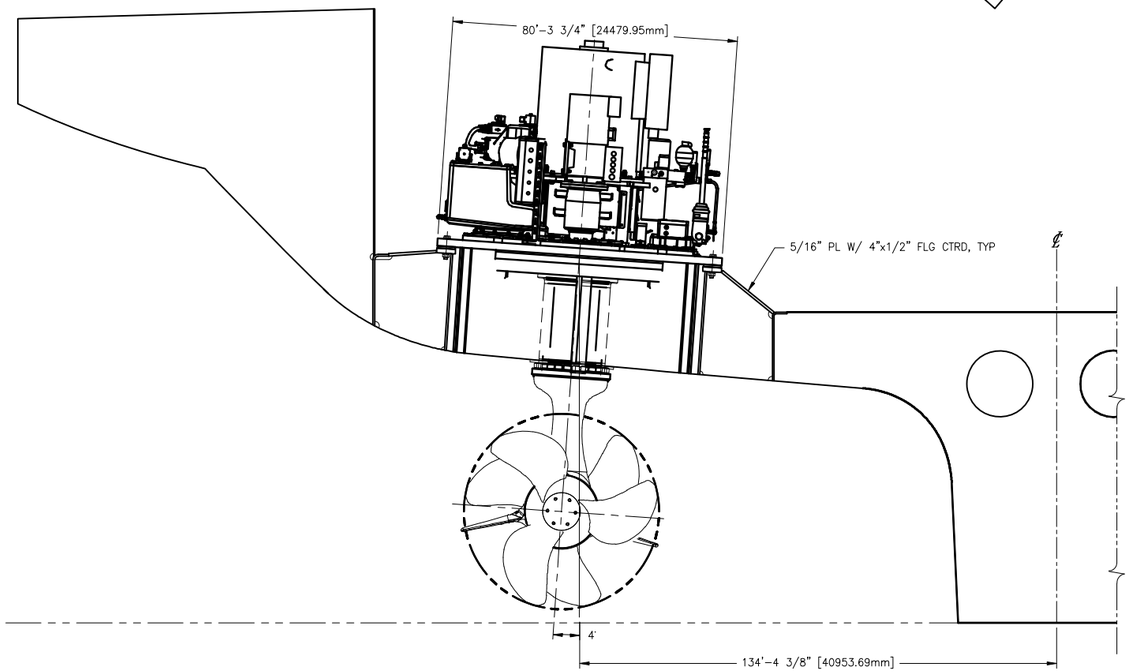


NOTE:
TONNAGE BHD AT FR36
HIDDEN FOR CLARITY.

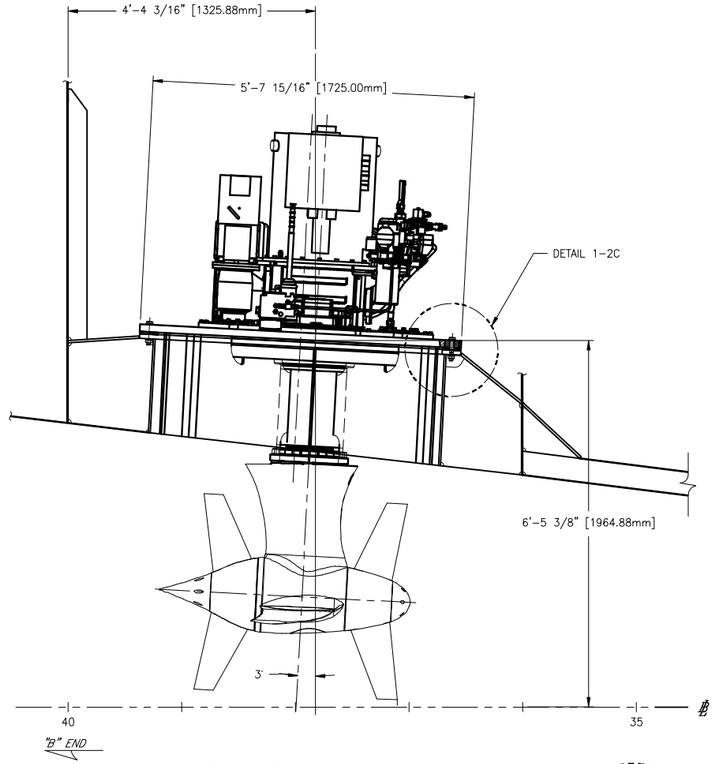
PERSPECTIVE 1–5C
AZIMUTHING THRUSTER FOUNDATIONS
NTS



DETAIL 1–2C
FLANGE DETAIL
SCALE: 3" = 1'–0"
WELL AND FLANGE DIMENSIONS TO BE IN ACCORDANCE WITH VENDOR REQUIREMENTS



SECTION 1–5A
AZIMUTHING THRUSTER TYP TRANS SECTION
FR38 LOOKING TO B–END
SCALE: 3/4" = 1'–0"



ELEVATION 1–3A
AZIMUTHING THRUSTER TYP LONG SECTION
8'–4 3/4" OCL LOOKING TO CL
B–END PORT SHOWN, STBD AND A–END SIM.
SCALE: 3/4" = 1'–0"

SAUREK WATERHOUSE
STATE OF WASHINGTON
15709
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. PROPULSION UNIT FOUNDATION CONNECTION DETAILS SHALL BE MADE TO MANUFACTURER'S SATISFACTION.
4. BRACKETS SUPPORTING PROPULSION UNIT FLANGE SHALL BE DESIGNED TO ALLOW PROPER ACCESS TO BOLTS.
5. THESE FOUNDATIONS ARE PROVIDED FOR GUIDANCE ONLY. FINAL FOUNDATION DESIGN SHALL BE PERFORMED BY THE CONTRACTOR AND REVIEWED BY THE OWNER AND EQUIPMENT MANUFACTURERS.

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATION
2.	18026–200–061–1	SCANTLING CALCULATIONS
3.	18026–200–100–1	LINES PLAN
4.	18026–200–101–1	PROFILES AND DECK ARRANGEMENTS
5.	18026–200–110–1	BOTTOM AND SIDE SHELL
6.	18026–200–120–3	HULL TRANSVERSE BULKHEADS
7.	18026–200–120–4	HULL TRANSVERSE FRAMES
8.	18026–200–120–5	HULL LONGITUDINAL BULKHEADS AND GIRDERS
9.	EINBAUZEICHNUNG FER–180069–01	SCHOTTEL

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: PROPULSION UNIT FOUNDATIONS

SIZE	DWG NO.	REV
D	18026–200–180–1	–

SCALE	FILE NAME	SHEET	OF
AS NOTED	18026–200–180–1–	1	2

DWN	MOD	CKD	APVD	APVD DATE
JCG		SKW	SKW	7/26/2018

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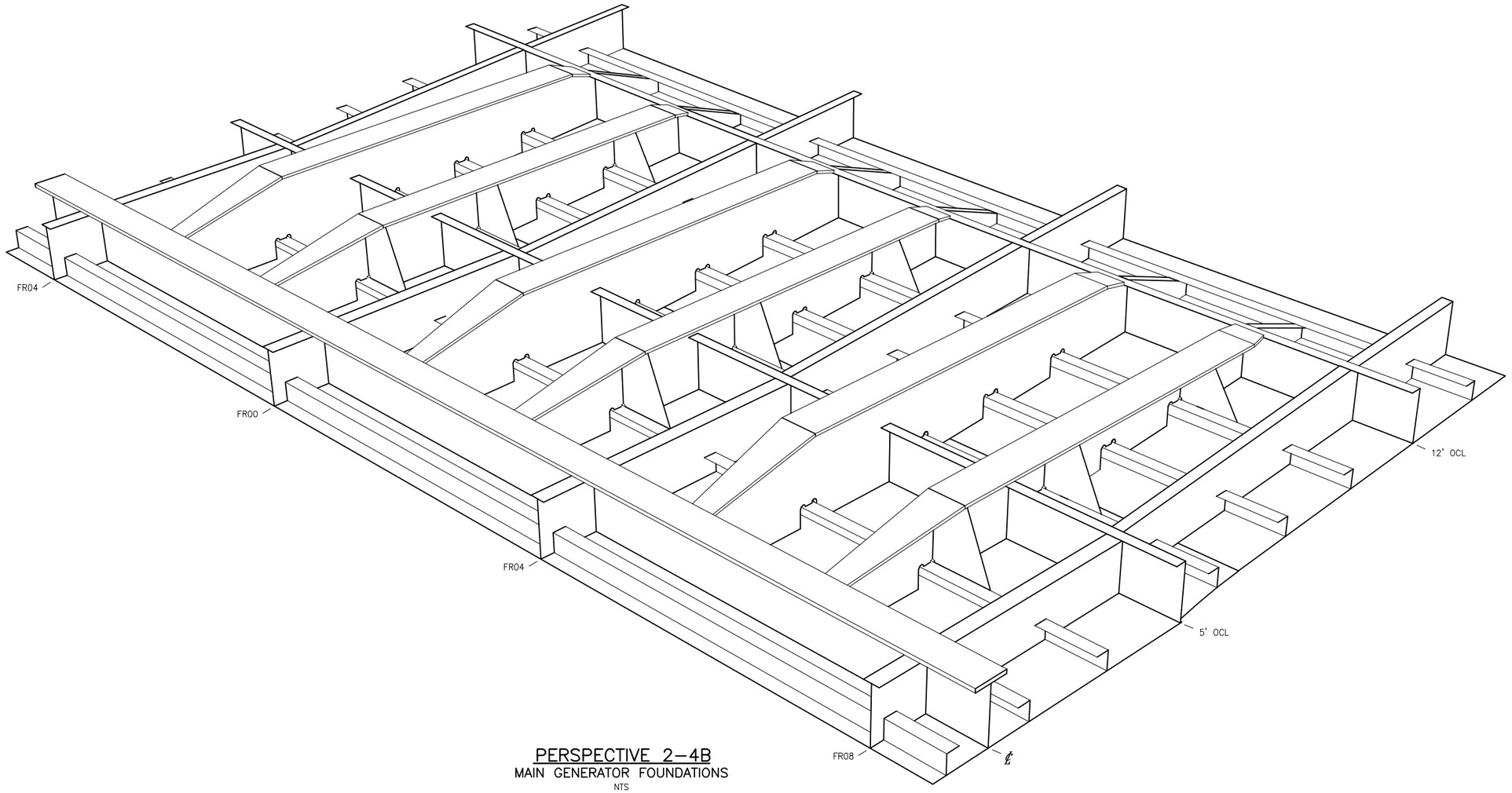
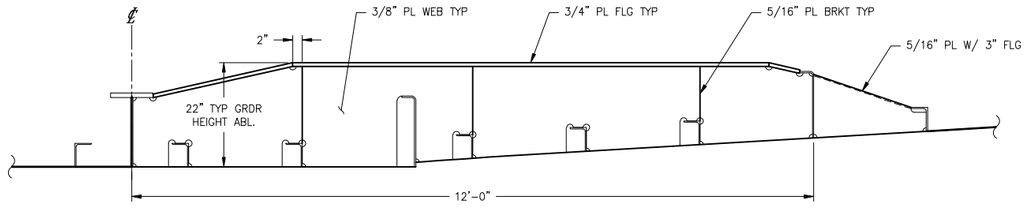


PERSPECTIVE 2–4B
MAIN GENERATOR FOUNDATIONS
NTS



SECTION 2–3A
TYP MAIN GEN FDN
LOOKING TO B–END
SCALE: 3/4" = 1'–0"

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER
7/30/2018

SIZE	DWG NO.	REV
D	18026–200–180–1	–
SCALE AS NOTED	FILE NAME 18026–200–180–1–	SHEET 2 OF 2

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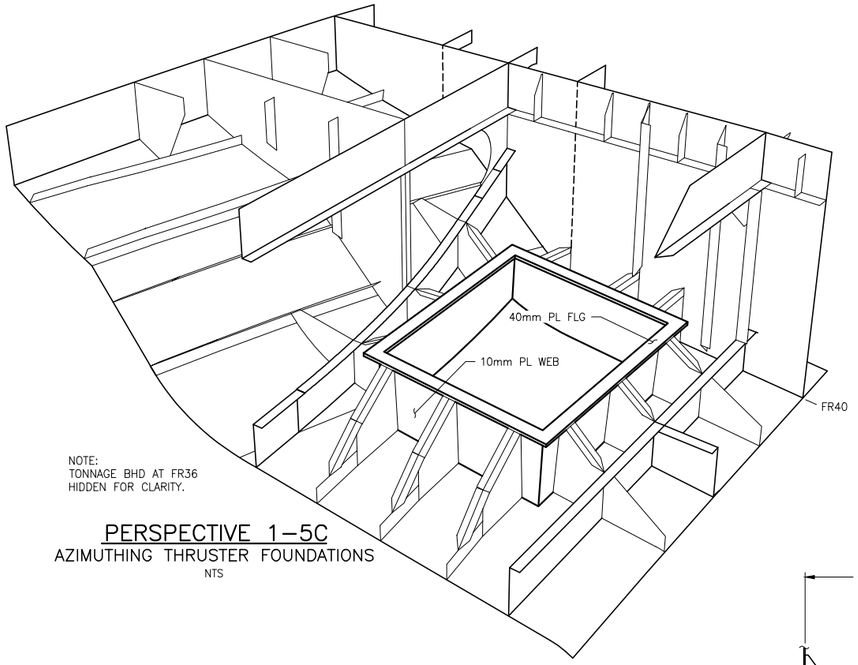
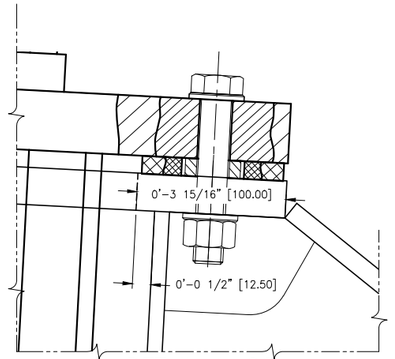
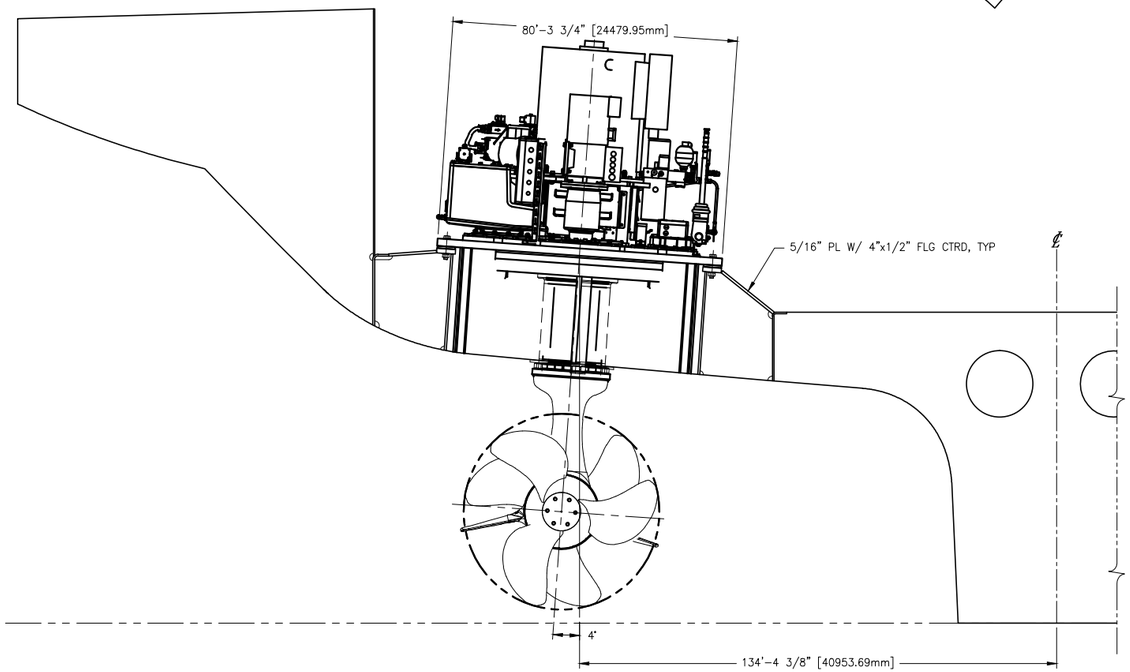


NOTE:
TONNAGE BHD AT FR36
HIDDEN FOR CLARITY.

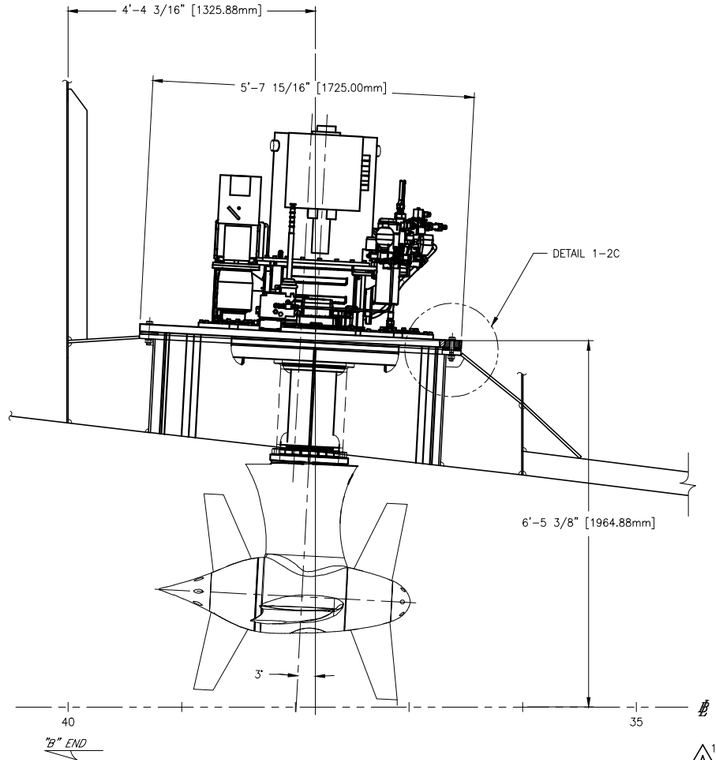
PERSPECTIVE 1–5C
AZIMUTHING THRUSTER FOUNDATIONS
NTS



DETAIL 1–2C
FLANGE DETAIL
SCALE: 3" = 1'-0"
WELL AND FLANGE DIMENSIONS TO BE IN ACCORDANCE WITH VENDOR REQUIREMENTS



SECTION 1–5A
AZIMUTHING THRUSTER TYP TRANS SECTION
FR38 LOOKING TO B-END
SCALE: 3/4" = 1'-0"



ELEVATION 1–3A
AZIMUTHING THRUSTER TYP LONG SECTION
8'-4 3/4" OCL LOOKING TO CL
B-END PORT SHOWN, STBD AND A-END SIM.
SCALE: 3/4" = 1'-0"

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	1–1A	1. CORRECTED DRAWING TITLE	SKW	8/6/18	SKW

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. PROPULSION UNIT FOUNDATION CONNECTION DETAILS SHALL BE MADE TO MANUFACTURER'S SATISFACTION.
4. BRACKETS SUPPORTING PROPULSION UNIT FLANGE SHALL BE DESIGNED TO ALLOW PROPER ACCESS TO BOLTS.
5. THESE FOUNDATIONS ARE PROVIDED FOR GUIDANCE ONLY. FINAL FOUNDATION DESIGN SHALL BE PERFORMED BY THE CONTRACTOR AND REVIEWED BY THE OWNER AND EQUIPMENT MANUFACTURERS.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-061-1 SCANTLING CALCULATIONS
3. 18026-200-100-1 LINES PLAN
4. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS
5. 18026-200-110-1 BOTTOM AND SIDE SHELL
6. 18026-200-120-3 HULL TRANSVERSE BULKHEADS
7. 18026-200-120-4 HULL TRANSVERSE FRAMES
8. 18026-200-120-5 HULL LONGITUDINAL BULKHEADS AND GIRDERS
9. EINBAUZEICHNUNG FER-180069-01 SCHOTTEL

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: MAIN MACHINERY FOUNDATIONS

SIZE	DWG NO.	REV
D	18026-200-180-1	A

SCALE	FILE NAME	SHEET	OF
AS NOTED	18026-200-180-1A	1	2

DWN	MOD	CKD	APVD	APVD DATE
JCG	SKW	SKW	SKW	7/26/2018

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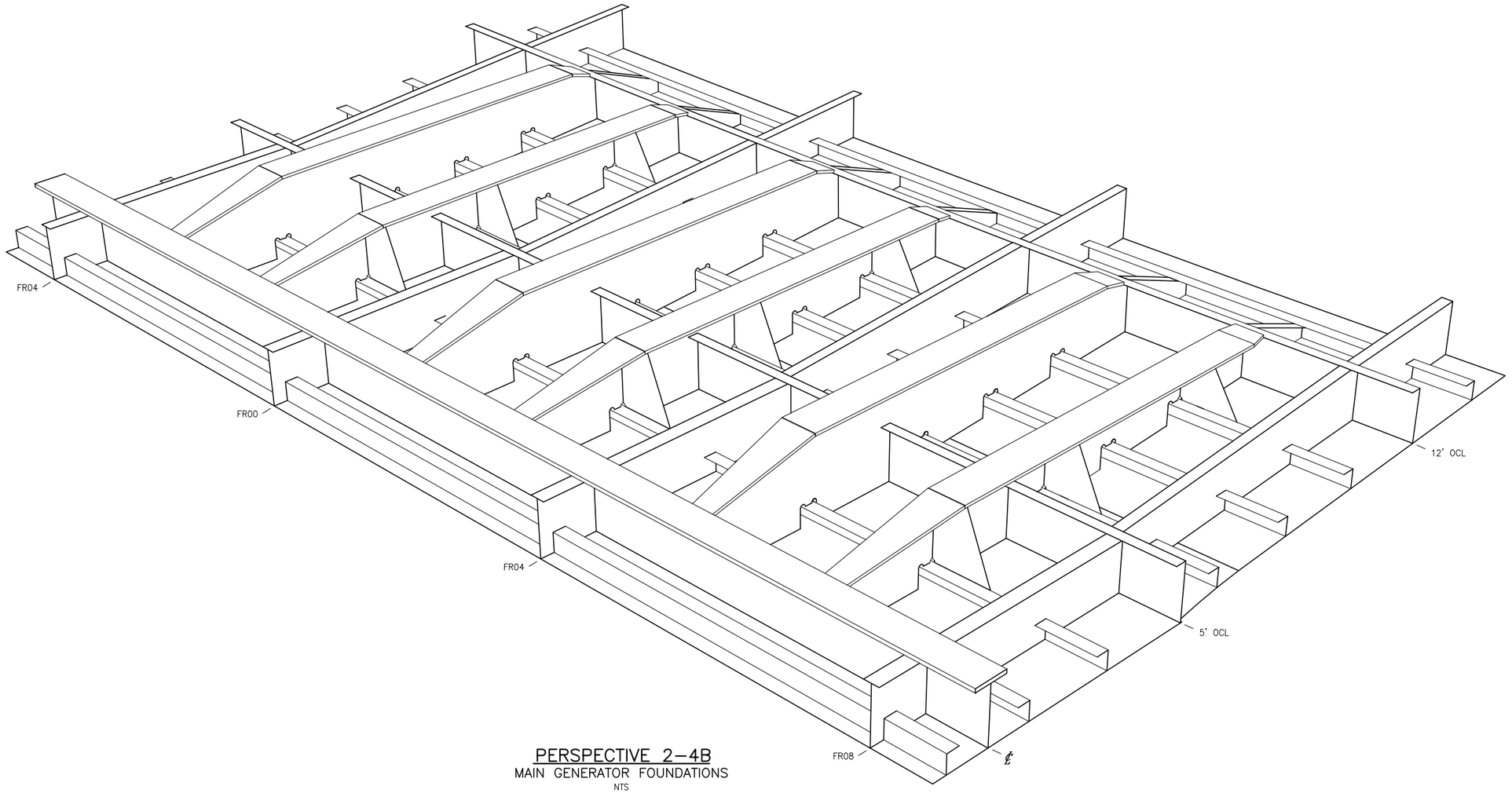
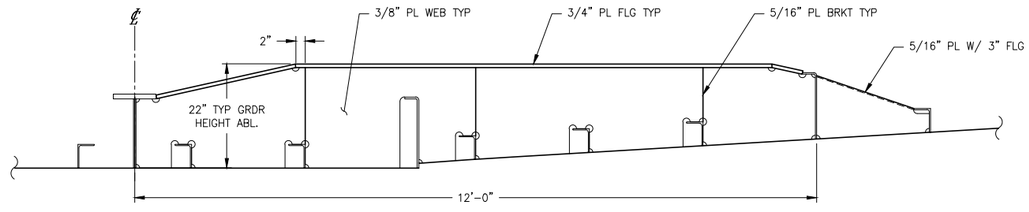


PERSPECTIVE 2–4B
MAIN GENERATOR FOUNDATIONS
NTS



SECTION 2–3A
TYP MAIN GEN FDN
LOOKING TO B–END
SCALE: 3/4" = 1'–0"

SAMUEL K WATERHOUSE
STATE OF WASHINGTON
55707
REGISTERED
PROFESSIONAL ENGINEER
8/6/2018

SIZE	DWG NO.	REV
D	18026–200–180–1	A
SCALE: AS NOTED	FILE NAME: 18026–200–180–1A	SHEET 2 OF 2

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EQUIPMENT LIST

ITEM#	QTY	DESCRIPTION	COMMENT
01	3	DIESEL GENERATOR	
02	1	PROPULSION SWITCHBOARD	
03	4	PROPULSION VFD CABINET	
04	2	FIRE PUMP	
05	2	FIRE PUMP STRAINER	
06	2	BALLAST PUMP	
07	2	BALLAST PUMP STRAINER	
08	1	BALLAST MANIFOLD	
09	2	BILGE PUMP	
10	2	BILGE PUMP STRAINER	
11	2	SEA CHEST STRAINER	
12	1	MSD	
13	2	ZERO DISCHARGE PUMP	
14	2	ZERO DISCHARGE HOLDING TANK	500 GAL
15	3	SEA CHEST	
16	1	WORK BENCH	
17	1	6" HEAVY VICE	
18	1	WASTE OIL PUMP	
19	1	WASTE OIL TANK	60 GAL
20	1	LUBE OIL TANK	60 GAL
21	1	EOS CONSOLE	
22	1	SHIPS SERVICE SWITCHBOARD	
23	3	DIESEL GENERATOR SILENCER	
24	1	SWITCHBOARD ROOM SUPPLY FAN	
25	4	ENGINE ROOM SUPPLY FAN	
26	2	PROPULSION DRIVE HEAT EXCHANGER	
27	1	PROPULSION VFD COOLING CABINET	
28	2	SWBD ROOM FAN COIL	
29	4	MACHINERY SPACE HVAC CHILLER	
30	1	BILGE MANIFOLD "A"	
31	1	BILGE MANIFOLD "B"	
32	2	AIR COMPRESSOR WITH RECEIVER	
33	2	POTABLE WATER PUMP	
34	1	POTABLE WATER PUMP STRAINER	
35	1	POTABLE WATER PRESSURE TANK	
36	4	AZIMUTH THRUSTER	
37	4	AZIMUTH THRUSTER CONTROL CABINET	
38	1	EOS SUPPLY FAN	
39	1	EMERGENCY GENERATOR (EGEN)	
40	1	EGEN FO TANK	50 GAL
41	1	EMERGENCY SWITCHBOARD	
42	1	EGEN SILENCER	
43	1	EGEN START BATTERY BANK	
44	3	ENGINE START BATTERY BANK	
45	2	FRESH WATER COOLING PUMP	
46	2	FRESH WATER COOLING HEAT EXCHANGER	
47	2	CHILLED WATER PUMP	
48	4	ENGINE ROOM, SWBD ROOM & EOS FIRE SUPPRESSION BOTTLES	
49	2	SUPPLY FAN – VOID	
50	2	SUPPLY FAN – THRUSTER ROOM	
51	1	FUEL OIL TRANSFER PUMP	
52	1	WASTE OIL HOSE REEL	
53	1	EGEN FIRE SUPPRESSION BOTTLE	
54	1	EOS FAN COIL	
55	2	AUX SEAWATER PUMP	

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24"
3. EQUIPMENT LAYOUT IS PRELIMINARY. FINAL EQUIPMENT POSITION IS SUBJECT TO DESIGN DEVELOPMENT AND OWNER APPROVAL.
4. EQUIPMENT INSTALLATION SHALL PERMIT FREE PASSAGE ALONG WALKWAYS AND LADDERWAYS, FREE ACCESS TO ALL DOORS, ESCAPE HATCHES, AND ACCESS OPENINGS, AND SHALL BE FREE OF ALL INTERFERENCES FOR THE DISASSEMBLY, INSPECTION, AND REPAIR OF VITAL EQUIPMENT AND MACHINERY.
5. REMOVABLE GUARDS SHALL BE INSTALLED OVER EXPOSED ROTATING COMPONENTS.

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-101-1	PROFILES AND DECK ARRANGEMENTS
3.	18026-200-256-1	COOLING SYSTEM SCHEMATIC
4.	18026-200-259-1	EXHAUST ARRANGEMENT
5.	18026-200-261-1	FUEL OIL PIPING SYSTEM SCHEMATIC
6.	18026-200-320-1	PROPULSION AND SHIPS SERVICE ELECTRICAL ONE LINE DIAGRAM
7.	18026-200-513-1	MACHINERY VENTILATION ARRANGEMENT
8.	18026-200-521-1	FIRE MAIN SYSTEM SCHEMATIC
9.	18026-200-528-1	SANITARY DRAIN PIPING SCHEMATIC
10.	18026-200-529-1	BILGE AND BALLAST PIPING SCHEMATIC
11.	18026-200-529-2	LUBE OIL AND WASTE OIL PIPING SCHEMATIC
12.	18026-200-533-1	POTABLE AND SANITARY WATER PIPING SCHEMATIC
13.	18026-200-551-1	COMPRESSED AIR PIPING SCHEMATIC

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

MICHAEL E. JOHNSON
STATE OF WASHINGTON
49387
REGISTERED
PROFESSIONAL ENGINEER
Michael E. Johnson
8/3/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: MACHINERY ARRANGEMENT

SIZE	DWG NO.	REV
D	18026-200-201-1	–

SCALE	FILE NAME	SHEET	OF
NONE	18026-200-201-1-	1	3

DWN	MOD	CKD	APVD	APVD DATE
JEH		MEJ	MEJ	8/2/18

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BILGE TANGENTS
SUPPLY AIR PLENUM ABOVE, TYP SEE REF 7
SUPPLY AIR DUCTING ABOVE
ELECTRICAL PANEL
COOLANT STORAGE CABINET
POTABLE WATER TANK
F.O. TANK "B"
AIR REEL
EQUIPMENT REMOVAL HATCHES ABOVE TYP
FIRE STATION
HOSE BIB
HOSE BIB (BELOW)
VOID "B"
SWITCHBOARD ROOM
ENGINE ROOM
ELECTRICAL PANELS
EYE WASH STATION
EXHAUST PIPING ABOVE SEE REF 4
STANCHION TYP
EQUIPMENT REMOVAL HATCH ABOVE
UP
EOS
TRANSFORMER (2 STACKED)
STORAGE CABINET
STORAGE CABINETS
ESCAPE HATCH
EXHAUST AIR VENT ABOVE
EXTENT OF GRATINGS
EXHAUST AIR TRUNK ABOVE
SPACE RESERVED FOR BATTERY BANKS, CHARGERS AND PANELS
"B" END
"A" END

PLAN 2-4A
ENGINE ROOM AND VOID "B"
SCALE: 3/8"=1'-0"

MICHAEL E. JOHNSON
STATE OF WASHINGTON
49387
REGISTERED PROFESSIONAL ENGINEER
Michael E. Johnson
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-201-1	—
SCALE: AS NOTED	FILE NAME: 18026-200-201-1-	SHEET 2 OF 3

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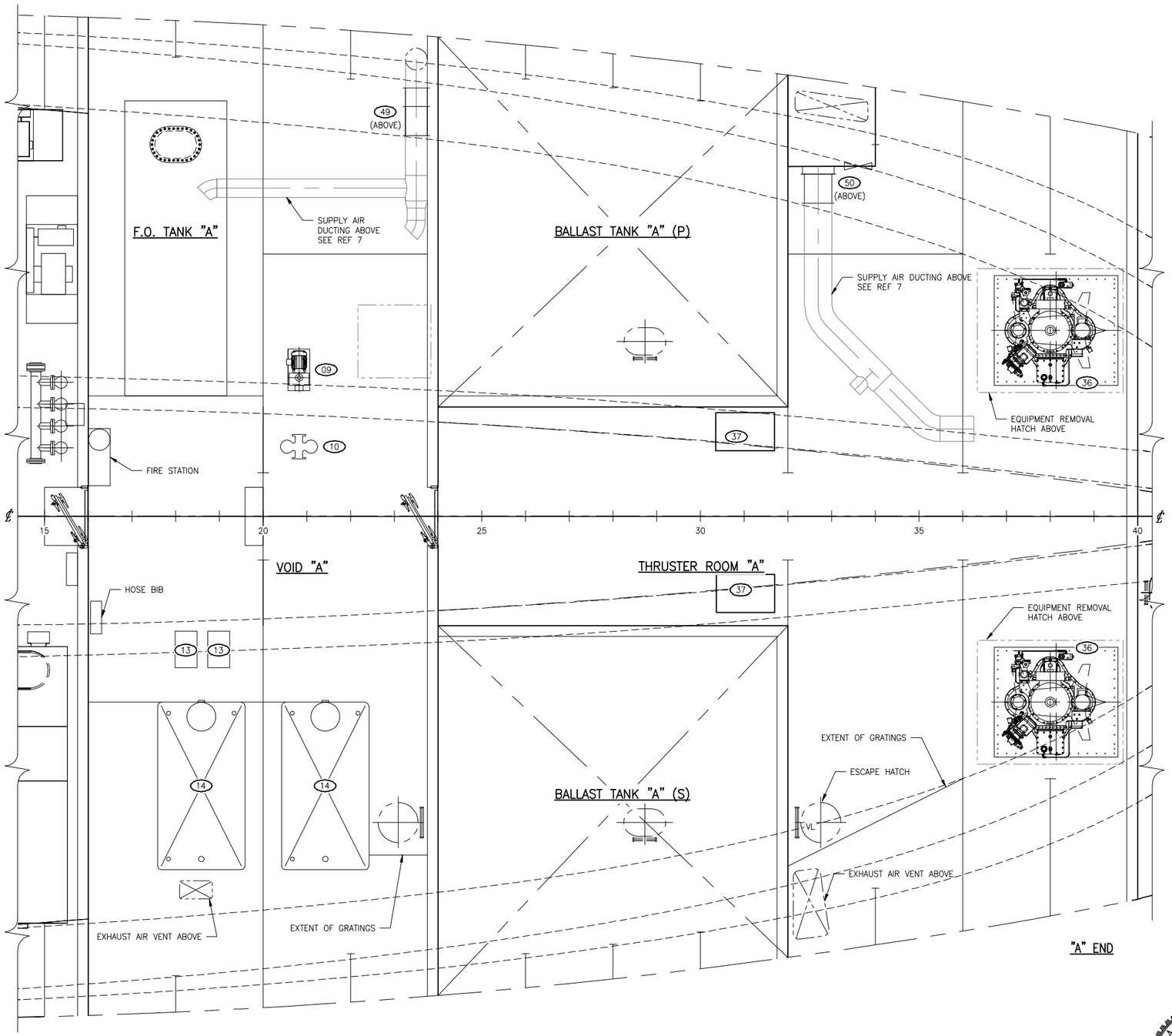
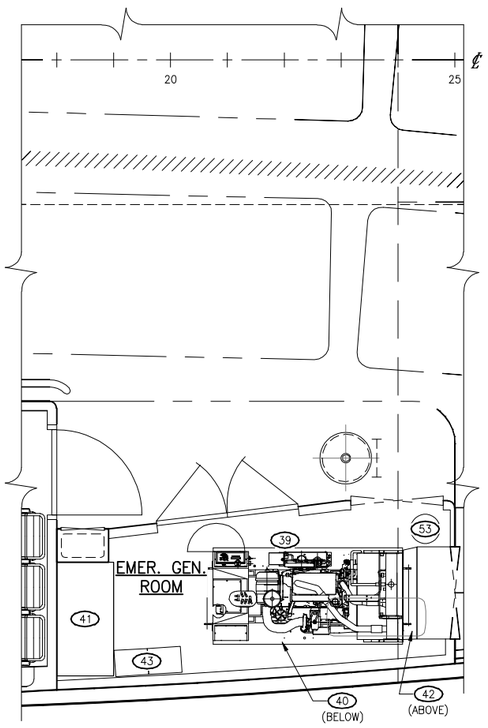


PLAN 3–4A
VOID "A" AND THRUSTER ROOM "A"
THRUSTER ROOM "B" OPP SIM
SCALE: 3/8"=1'-0"



PLAN 3–1B
EMERGENCY GENERATOR ROOM
SCALE: 3/8"=1'-0"

MICHAEL E. JOHNSON
STATE OF WASHINGTON
45387
REGISTERED PROFESSIONAL ENGINEER
Michael E. Johnson
8/3/2018

SIZE	DWG NO.	REV
D	18026–200–201–1	–
SCALE: AS NOTED	FILE NAME: 18026–200–201–1–	SHEET 3 OF 3

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MATERIAL SCHEDULE

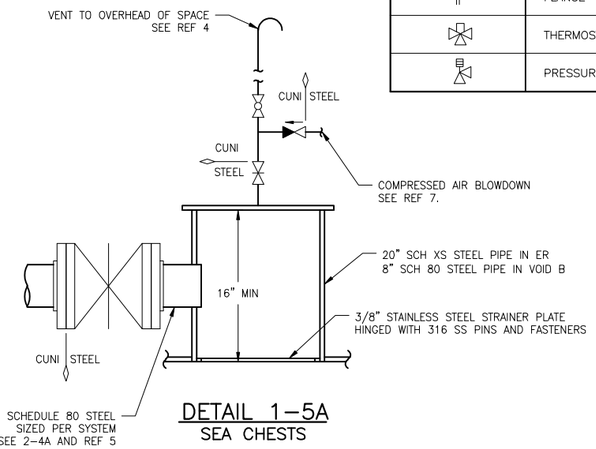
SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
SEAWATER COOLING MAWP: 50 PSIG MAX TEMP: 110°F	2 1/2" & ABOVE	CU-NI 90/10 ASTM B466 SEAMLESS CLASS 200	FLANGE: CU-NI 90/10 ANSI B16.5 SLIP-ON OR WELD NECK, 150#	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE-SAFE TYPE APPROVED	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BUTTERFLY: BRONZE OR LINED DUCTILE IRON, WAFER TYPE CHECK: BRONZE ASTM B61 OR B62, 150#, FLANGED	BUTTERFLY: BRONZE TRIM, RENEWABLE DISK CHECK: BRONZE DISK, RENEWABLE SEATS & SEALS	CU-NI 90/10, BUTT WELD	SEE NOTE 20	–
	2" & BELOW		CU-NI 90/10 UNION, SOCKET WELD, ASTM B369, 150#	–	–	BALL: BRONZE ASTM B61 OR B62, THREADED	BALL: CHROME PLATED BRONZE BALL PTFE SEATS	CU-NI 90/10 UNION, SOCKET WELD	SEE NOTE 20	–
FRESH WATER COOLING MAWP: 50 PSIG MAX TEMP: 110°F	ALL	STAINLESS STEEL ASTM A312, GRADE TP 316L SEAMLESS ANSI B36.19 SCH 10S	PRESS-FIT STAINLESS STEEL ASTM A351, A743 AND A744, GRADE CF8M TP 316 SCH 10S EPDM SEALS	ARAMID FIBERS WITH A NEOPRENE BINDER	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BALL: STAINLESS STEEL CF8M ASTM A351, THREADED	BALL: STAINLESS STEEL BALL, PTFE SEATS	PRESS-FIT STAINLESS STEEL ASTM A351, A743 AND A744, GRADE CF8M TP 316 SCH 10S EPDM SEALS	SEE NOTE 20	–
SHELL CONNECTIONS MAWP: 50 PSIG MAX TEMP: AMBIENT	ALL	CARBON STEEL ASTM A53 OR A106, GR B, ANSI B36.10 SCH 80 SEAMLESS	FLANGE CARBON STEEL ASTM A105 ANSI B16.5 SLIP-ON OR WELD NECK, 150#	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE-SAFE TYPE APPROVED	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	GATE: DUCTILE IRON ASTM A395 OR CARBON STEEL ASTM A216 FLANGED, 150#	GATE: STAINLESS STEEL RENEWABLE DISC AND SEAT ASTM A182	CARBON STEEL ASTM A234, GR WPB ANSI B16.9 BUTT WELD SCH 80	–	–

EQUIPMENT LIST

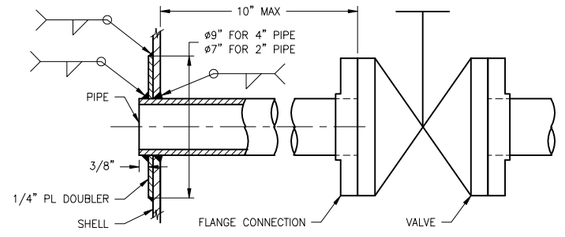
QTY	SERVICE	TYPE	MODEL	CAPACITY	DRIVE	NOTES
2	ENGINE ROOM SEA CHEST STRAINER	6" DUPLEX	–	560 GPM	–	PERFORATED CU-NI BASKET CU-NI BODY
2	AUXILIARY SEA WATER PUMP	CENTRIFUGAL	–	96 GPM @ 50' TDH	208V/3ϕ/60Hz 3 HP TEFC MOTOR 1800 RPM	BRONZE BODY AND IMPELLER SEE NOTES 10, 19
2	FW COOLING PUMP	CENTRIFUGAL	–	50 GPM @ 73' TDH	208V/3ϕ/60Hz 3 HP TEFC MOTOR 3500 RPM	STAINLESS STEEL BODY AND IMPELLER SEE NOTES 10, 19
2	FW COOLING HEAT EXCHANGER	TITANIUM PLATE AND FRAME	–	36 KW HEAT REJECTION	–	SEE NOTES 15, 23
2	PROPULSION DRIVE HEAT EXCHANGER	TITANIUM PLATE AND FRAME	BY PROPULSION DRIVE SUPPLIER	17 KW HEAT REJECTION	–	SEE NOTES 15, 23

SYMBOLS LIST

	PIPE		VALVE, STOP CHECK
▷	REDUCER		VENT
	GATE VALVE		OVERBOARD DISCHARGE
	BALL VALVE	P	PRESSURE GAUGE
	SWING CHECK VALVE	VP	VACUUM/PRESSURE GAUGE
	FLEXIBLE CONNECTION	DP	DIFFERENTIAL PRESS GAUGE
	HEAT EXCHANGER		PIPE PLUG
	DUPLEX STRAINER	PS	SWITCH, PRESSURE
	CENTRIFUGAL PUMP		PIPE PENETRATION, DECK/BHD
	SEA CHEST		THERMOMETER
‖	FLANGE		AUTOMATIC BALANCING VALVE
	THERMOSTATIC VALVE	PT	PRESSURE TRANSDUCER
	PRESSURE RELIEF VALVE		



DETAIL 1-5A
SEA CHESTS



DETAIL 1-3A
OVERBOARD DISCHARGE

GENERAL NOTES (CONT.)

11. MATERIAL TRANSITIONS FROM STEEL TO COPPER NICKEL PIPE SHALL BE ACCOMPLISHED VIA FLANGED JOINTS. THE JOINTS SHALL BE FITTED WITH GALVANIC ISOLATION KITS TO PREVENT DIRECT METAL TO METAL CONTACT.
12. WELDED FITTINGS SHALL BE TIG WELDED. SIL-BRAZING IS NOT ACCEPTABLE.
13. WHERE PIPING PENETRATES BULKHEADS OR DECKS, WELDED SLEEVES OR PENETRATION SLEEVES WITH SLIPSIL SEALING PLUGS OR RISE/NOFIRNO SEALING MAY BE USED. INSTALL PIPING TRANSITS IN ACCORDANCE WITH REGULATORY REQUIREMENTS AND MANUFACTURER'S APPROVED INSTALLATION DETAILS.
14. SEA CHEST CROSSOVER AND SEAWATER COOLING PIPING SHALL BE FITTED WITH TAKEDOWN JOINTS AT MAXIMUM 10 FT INTERVALS TO ALLOW COMPLETE DISASSEMBLY AND CLEANING OR REMOVAL OF THE PIPING ASSEMBLY WITHOUT REMOVAL OR MODIFICATION OF STRUCTURE.
15. HEAT EXCHANGERS SHALL BE SELECTED FOR A MAXIMUM SEA WATER TEMPERATURE OF 86F. EACH FW COOLING HEAT EXCHANGER SHALL BE SIZED TO ACOMMODATE THE FULL SYSTEM LOAD.
16. INSTALL PIPING INSULATION IN ACCORDANCE WITH REF 1.
17. EXPANSION TANKS SHALL BE SIZED IN ACCORDANCE WITH THE ENGINE MANUFACTURER'S REQUIREMENTS.
18. TEMPERATURE TRANSDUCERS AND THERMOMETERS SHALL BE INSTALLED IN THERMOWELLS.
19. AUXILIARY SEAWATER AND FRESH WATER COOLING PUMPS SHALL BE CONFIGURED FOR RUNNING/STANDBY OPERATION. STANDBY PUMP SHALL AUTOMATICALLY START IF RUNNING PUMP FAILS. PUMP RUNNING INDICATION AND FAILOVER FROM RUNNING TO STANDBY PUMP SHALL BE INDICATED IN THE SHIPS ALARM AND MONITORING SYSTEM. SEE REF 1.
20. FLEXIBLE HOSES SHALL BE AN APPROVED TYPE MEETING SAE J1942 WITH APPROVED FITTINGS. HOSES SHALL NOT BE MORE THAN 30" IN LENGTH.
21. EACH SEA WATER SUPPLY TO THE ENGINE MOUNTED SEA WATER PUMPS SHALL BE INSTALLED WITH A CHECK VALVE BELOW THE LEVEL OF LIGHTSHIP WATERLINE AND A PIPE LOOP UPSTREAM OF THE PUMP SUCTION TO MAINTAIN PRIME.
22. CONNECT TO SHIPS ALARM AND MONITORING SYSTEM TO PROVIDE REMOTE PRESSURE INDICATION AND LOW PRESSURE ALARM.
23. HEAT EXCHANGER CAPACITIES AND FLOW RATES ARE BASED ON PRELIMINARY VENDOR DATA AND SUBJECT TO CHANGE. THE CONTRACTOR SHALL SELECT HEAT EXCHANGERS TO SUIT THE INSTALLED EQUIPMENT AND ADJUST THE COOLING SYSTEM DESIGN TO SUIT.
24. AUTOMATIC BALANCING VALVES SHALL BE SUITABLE FOR SEAWATER SERVICE WITH NAVAL BRONZE BODIES, AND REPLACEABLE ORIFICE CARTRIDGES.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. PROVIDE GAUGE PIPING ASSEMBLIES AND MATERIALS FOR GAUGES AND INSTRUMENTS CONFIGURED IN ACCORDANCE WITH ASTM F721. VALVES, TUBING, AND FITTINGS SHALL BE 316 STAINLESS STEEL.
5. AVOID POCKETS IN THE PIPE LINES. LOW POINT DRAINS AND HIGH POINT VENTS SHALL BE FITTED TO ENABLE DRAINING AND VENTING OF PIPES WHERE POCKETS DO OCCUR. PROVIDE A 1" VALVED DRAIN WITH PLUG AT THE LOWEST POINT OF EACH COOLING CIRCUIT. PROVIDE 1/2" BOSSES WITH PLUGS AT ALL HIGH POINTS.
6. THE PIPING SYSTEM SHALL BE CLEANED AND TESTED IN ACCORDANCE WITH USCG REQUIREMENTS. SEE REF 1.
7. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO THE BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES.
8. VALVES LOCATED BELOW THE FLOOR PLATES SHALL BE PROVIDED WITH REACH RODS. ALL VALVES SHALL BE PROVIDED WITH VISUAL POSITION INDICATION.
9. OVERBOARD SHELL PENETRATIONS SHALL BE LOCATED AS FAR ABOVE BASELINE AS POSSIBLE WHILE STILL BEING UNDER THE GUARDS.
10. TOTAL DYNAMIC HEAD OF PUMPS FOR REQUIRED FLOW ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL PROVIDE PUMPS MEETING THE REQUIRED FLOW WITH THE INSTALLED PIPING SYSTEM. PUMP MOTORS SHALL BE SELECTED TO PREVENT MOTOR OVERLOAD OVER THE ENTIRE PUMP OPERATING RANGE.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATIONS
2. 18026-200-110-1 BOTTOM AND SIDE SHELL
3. 18026-200-120-4 HULL TRANSVERSE FRAMES
4. 18026-200-506-1 FILLS, VENTS, AND SOUNDS
5. 18026-200-521-1 FIRE MAIN SYSTEM SCHEMATIC
6. 18026-200-529-1 BILGE AND BALLAST PIPING SCHEMATIC
7. 18026-200-551-1 COMPRESSED AIR PIPING SCHEMATIC
8. 18026-200-513-1 MACHINERY VENTILATION ARRANGEMENT

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

MICHAEL E. JOHNSON
STATE OF WASHINGTON
49387
REGISTERED PROFESSIONAL ENGINEER
8/3/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: COOLING SYSTEM SCHEMATIC

SIZE	DWG NO.	REV
D	18026-200-256-1	–

SCALE	FILE NAME	SHEET	OF
NTS	18026-200-256-1-	1	3

DWN	MOD	CKD	APVD	APVD DATE
NJB			MEJ	7/31/18

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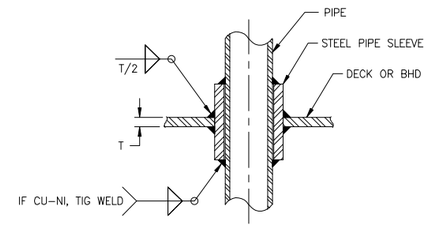
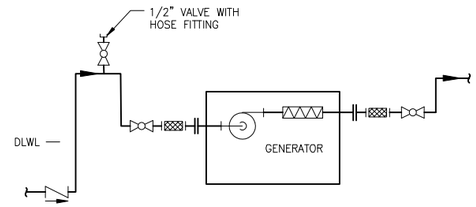


DETAIL 2-1D
TYP DECK/BHD PENETRATION
SEE NOTE 13



DETAIL 2-1C
TYP ENGINE CONNECTION
SEE NOTE 21

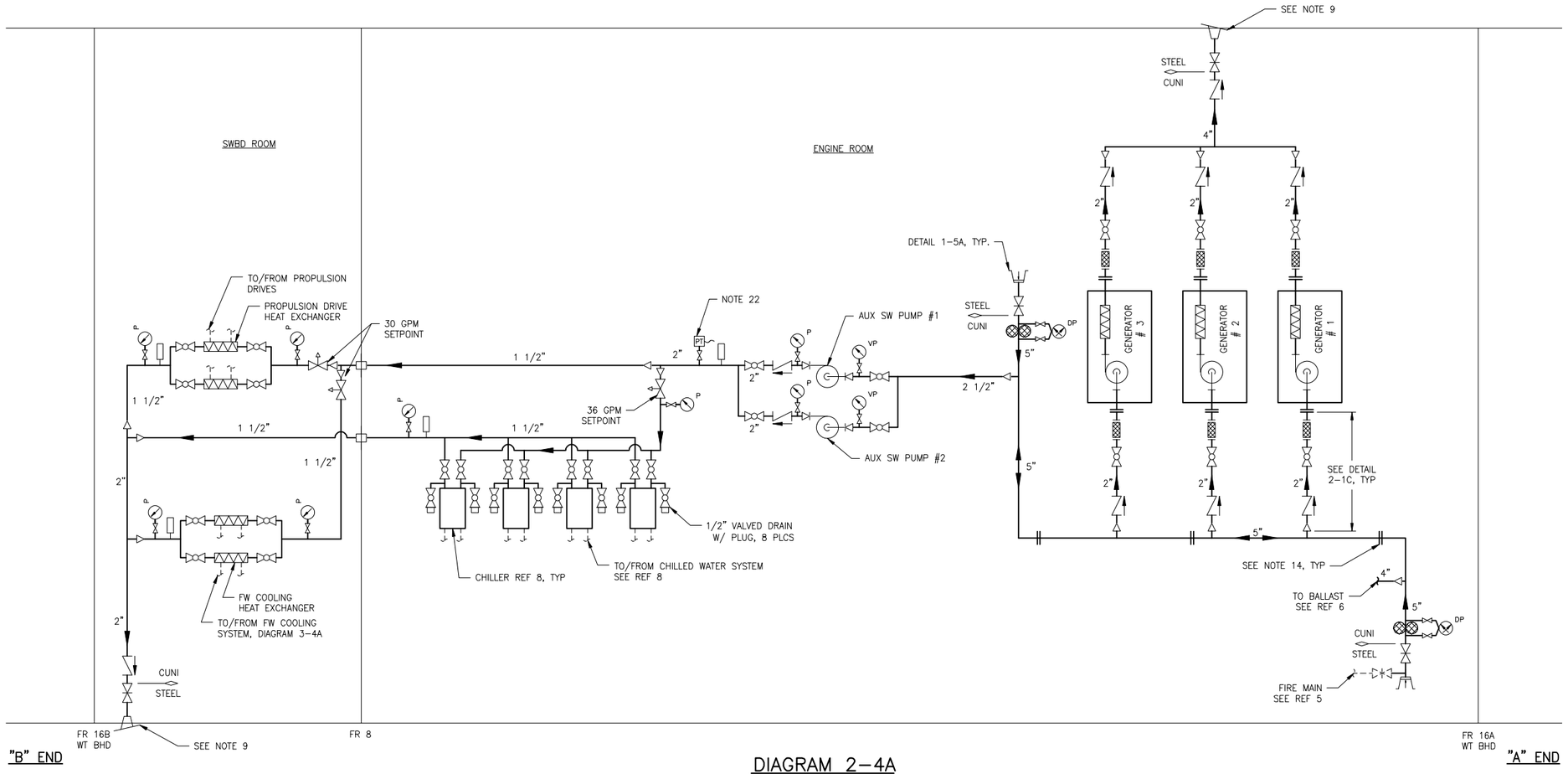


DIAGRAM 2-4A
AUXILIARY SEA WATER COOLING SYSTEM

8/3/2018

SIZE	DWG NO.	REV
D	18026-200-256-1	–
SCALE NTS	FILE NAME 18026-200-256-1-	SHEET 2 OF 3

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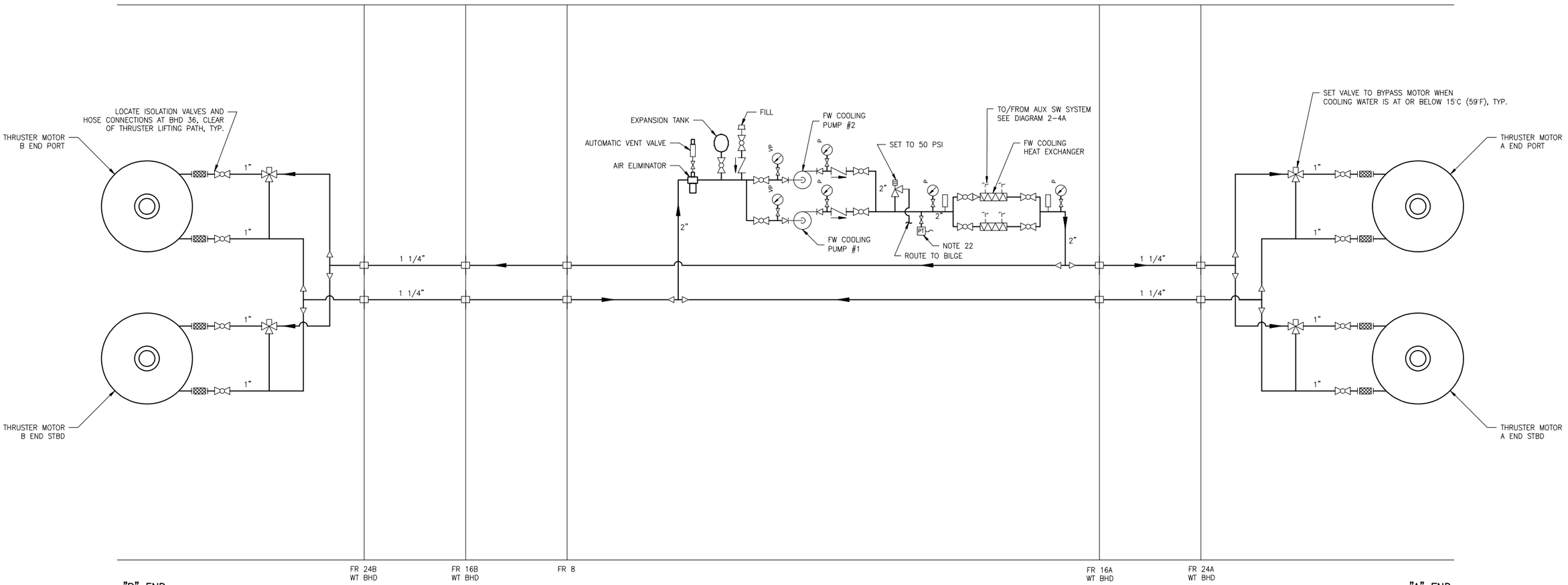


DIAGRAM 3-4A
AZIMUTH THRUSTER FW COOLING SYSTEM

8/3/2018

SIZE	DWG NO.	REV
D	18026-200-256-1	–
SCALE NTS	FILE NAME 18026-200-256-1P0	SHEET 3 OF 3

8/3/2018 1:47:02 PM

MATERIAL SCHEDULE

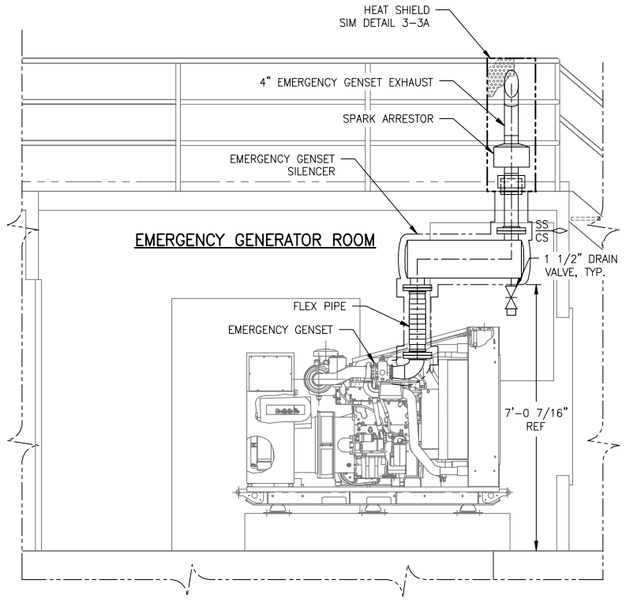
SERVICE	SIZE	PIPE	TAKEDOWN JOINTS			FITTINGS	VALVES		REMARKS
			MATERIAL	GASKETS	BOLTING		BODY	TRIM	
DIESEL ENGINE EXHAUST MAX TEMP: 760°F	6" & BELOW	CARBON STEEL, ASTM A53 OR A106, GR B, SEAMLESS OR ERW SCH 40 ANSI B36.10	3/4" PLATE FLANGE, CARBON STEEL ASTM A105, 150# ANSI B16.5, FFSO	304L SS SPIRAL WOUND METALLIC W/ FLEXIBLE GRAPHITE FILLER	BOLTS OR STUDS: ASTM A193, GR B7 ANSI B18.2.1 NUTS: ASTM A194 GR 2H ANSI B18.2.2	CARBON STEEL ASTM A234, SCH 40 BUTT WELD ANSI B16.9	DRAIN VALVES (GATE): FORGED STEEL ASTM A105 800# THREADED OR SOCKET WELD	DRAIN VALVES: STAINLESS STEEL	
	8" TO 12"	CARBON STEEL, ASTM A53 OR A106, GR B, SEAMLESS OR ERW SCH 20 ANSI B36.10				CARBON STEEL ASTM A234, SCH 20 BUTT WELD ANSI B16.9			
EXHAUST EXPOSED TO WEATHER	ALL	STAINLESS STEEL ASTM A312, GR TP316L ANSI B36.10 SCH 40 6" & BELOW SCH 20 8"–12"	–	–	–	–	–	–	

SYMBOLS LIST

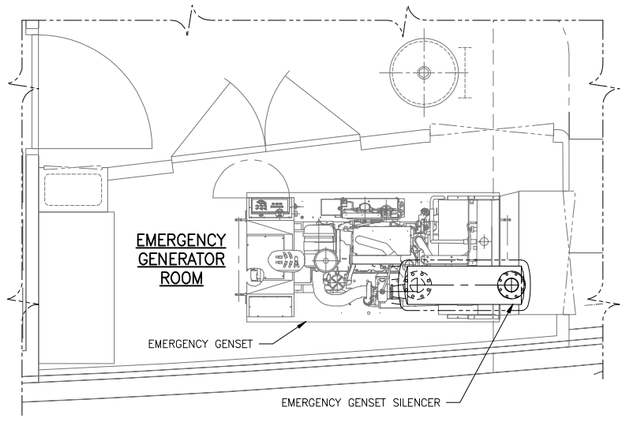
	GATE VALVE W/ SCREWED PLUG
	MATERIAL TRANSITION

EQUIPMENT SCHEDULE

QTY	SERVICE	SIZE	CAPACITY/REMARKS
3	MAIN GENERATOR SILENCER	10" END IN/END OUT	CRITICAL GRADE SPARK ARRESTING
1	EMERGENCY GENSET SILENCER	4" SIDE IN/SIDE OUT	CRITICAL GRADE
1	EMERGENCY GENSET SPARK ARRESTOR	4"	316 SS
3	MAIN GENERATOR TURBO OUTLET EXPANSION JOINT	ENGINE VENDOR SUPPLY	SEE NOTE 6
4	ANSI FLANGED EXPANSION JOINT	6"	SEE NOTE 6
3	ANSI FLANGED EXPANSION JOINT	10"	SEE NOTE 6



ELEVATION 1–2B
EMERGENCY GENSET EXHAUST
LOOKING INBOARD
SCALE: 1/2"=1'–0"



PLAN 1–2A
EMERGENCY GENSET EXHAUST
SCALE: 1/2"=1'–0"

MICHAEL E JOHNSON
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Michael E. Johnson
7/31/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. PIPING SHALL BE ROUTED AS DIRECTLY AS POSSIBLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS.
2. PRIOR TO FABRICATION OF MATING PIPE ASSEMBLIES, VERIFY EQUIPMENT CONNECTIONS FOR SIZE, LOCATION AND TYPE IN ACCORDANCE WITH MANUFACTURER CERTIFIED DRAWINGS, OR DIRECTLY FROM THE EQUIPMENT. TEMPLATE BOLTING PATTERNS AND CONNECTIONS AS REQUIRED.
3. ALL BOLTED FLANGES ARE TO BE MATED UP FREE OF STRAIN.
4. WEIGHT TRANSMITTED TO THE ENGINE CONNECTION IS NOT TO EXCEED THE MANUFACTURERS' RECOMMENDATIONS IN HOT AND COLD CONDITIONS.
5. EXHAUST PIPING AND SILENCERS SHALL BE RESILIENTLY SUPPORTED TO REDUCE NOISE TRANSMISSION.
6. EACH EXPANSION JOINT SHALL BE MULTI–PLY TY321 CONVOLUTED STAINLESS STEEL, WITH A FIXED FLANGE AT ONE END AND A FLOATING FLANGE AT THE OTHER. A FLOW DIRECTION ARROW SHALL BE PERMANENTLY MARKED ON EACH EXPANSION JOINT.
7. EXHAUST PIPING, SILENCERS, AND COMPONENTS SHALL BE INSULATED WITH REMOVABLE INSULATION BLANKETS THROUGHOUT THE MACHINERY SPACES AND STACKS. EXHAUST BLANKETS SHALL BE FABRICATED FROM NEEDLED OR WOVEN GLASS MAT WITH A STAINLESS STEEL MESH INTERIOR LINER, SILICONE IMPREGNATED GLASS CLOTH EXTERIOR LINER, AND FASTENED USING STAINLESS STEEL HOOKS AND LACING.
8. DRAIN VALVES SHALL BE PROVIDED NEAR THE BOTTOM OF VERTICAL EXHAUST RUNS AND AT LOW POINTS WHERE MOISTURE MAY ACCUMULATE.
9. 1/4" PIPE TAPS SHALL BE INSTALLED ON ENGINE EXHAUST OUTLET PIPING FOR BACK PRESSURE MEASUREMENT.
10. PIPE, RAIN HAT, HEAT SHIELD, FASTENERS & HANGERS EXPOSED TO WEATHER SHALL BE TYPE 316L STAINLESS STEEL. PIPE MATERIAL TRANSITIONS TO SS SHALL OCCUR 12" BELOW THE DECK PENETRATION.
11. FINAL DIMENSIONING AND HANGER DETAILS SHALL BE COMPLETED BY CONTRACTOR AND ARE SUBJECT TO OWNER APPROVAL.
12. FINAL EXPANSION JOINT QUANTITIES AND LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR DEPENDING ON THE EXHAUST HANGER ARRANGEMENT.
13. EXHAUST PIPE SHALL BE ROUTED AS HIGH IN THE OVERHEAD AS PRACTICABLE. MAINTAIN OVERHEAD HEIGHT OF 6'–8" WHEREVER POSSIBLE.

REFERENCES

1.	18026–200–832–1	TECHNICAL SPECIFICATIONS
2.	18026–200–101–1	PROFILES AND DECK ARRANGEMENTS
3.	18026–200–201–1	MACHINERY ARRANGEMENT
4.	18026–200–513–1	MACHINERY VENTILATION ARRANGEMENT

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: EXHAUST ARRANGEMENT

SIZE	DWG NO.	REV
D	18026–200–259–1	–

SCALE	FILE NAME	SHEET	OF
AS NOTED	18026–200–259–1–	1	3

DWN	MOD	CKD	APVD	APVD DATE
JEH		MEJ	MEJ	

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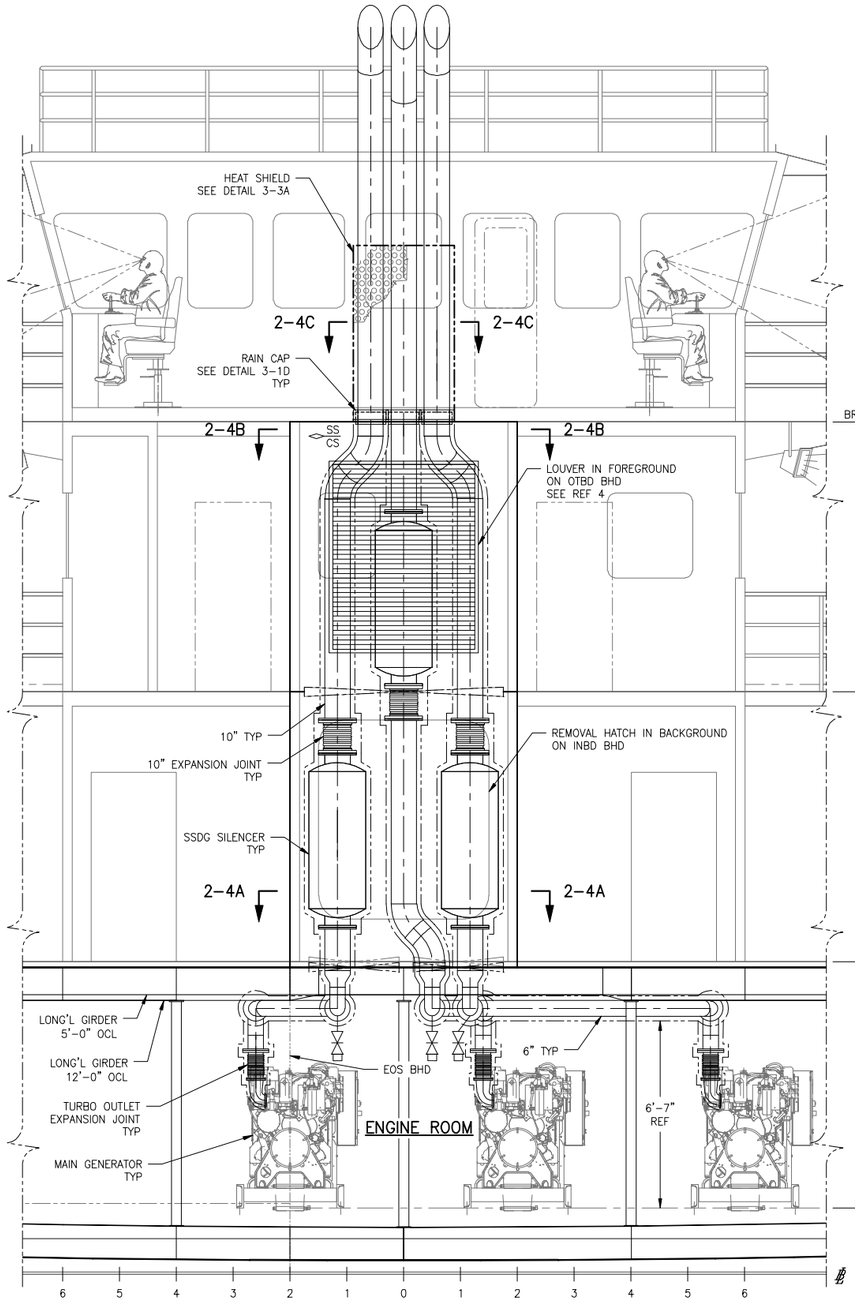
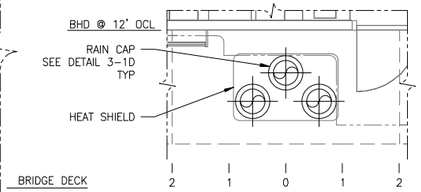
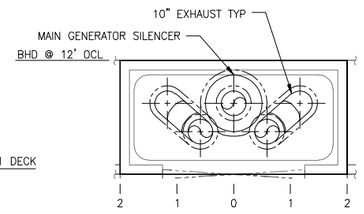


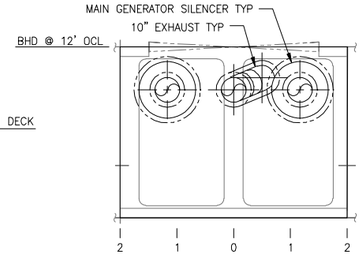
ELEVATION 2-5A
SHIP SERVICE GENERATOR EXHAUST
12' OCL STBD SHOWN WITH BACKGROUND
LOOKING PORT
SCALE: 3/8"=1'-0"



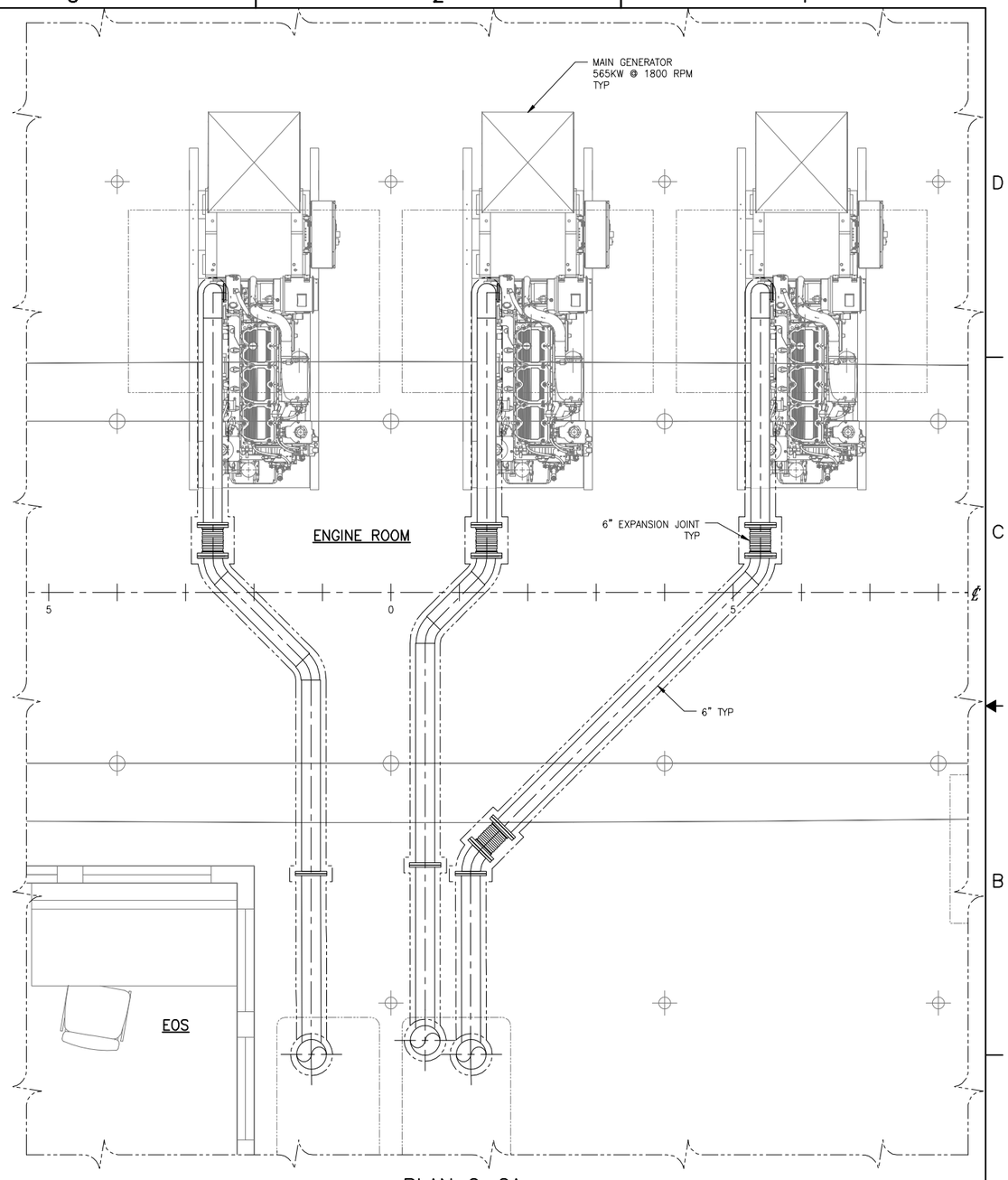
PLAN 2-4C
EXHAUST PIPING AT BRIDGE DECK
SCALE: 3/8"=1'-0"



PLAN 2-4B
EXHAUST PIPING AT 01 DECK
SCALE: 3/8"=1'-0"



PLAN 2-4A
EXHAUST PIPING AT MAIN DECK
SCALE: 3/8"=1'-0"



PLAN 2-2A
MAIN ENGINE AND SSDG EXHAUST
SCALE: 1/2"=1'-0"

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7/31/2018

SIZE	DWG NO.	REV
D	18026-200-259-1	—
SCALE: AS NOTED	FILE NAME: 18026-200-259-1-	SHEET 2 OF 3

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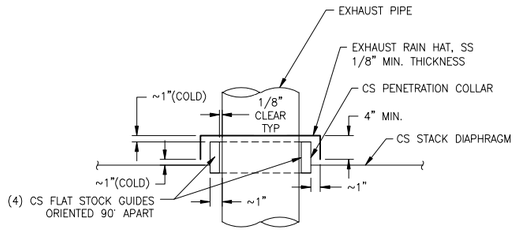
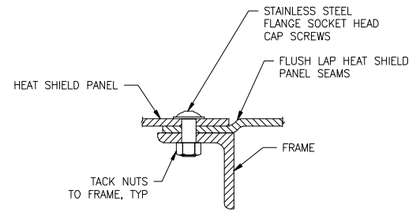
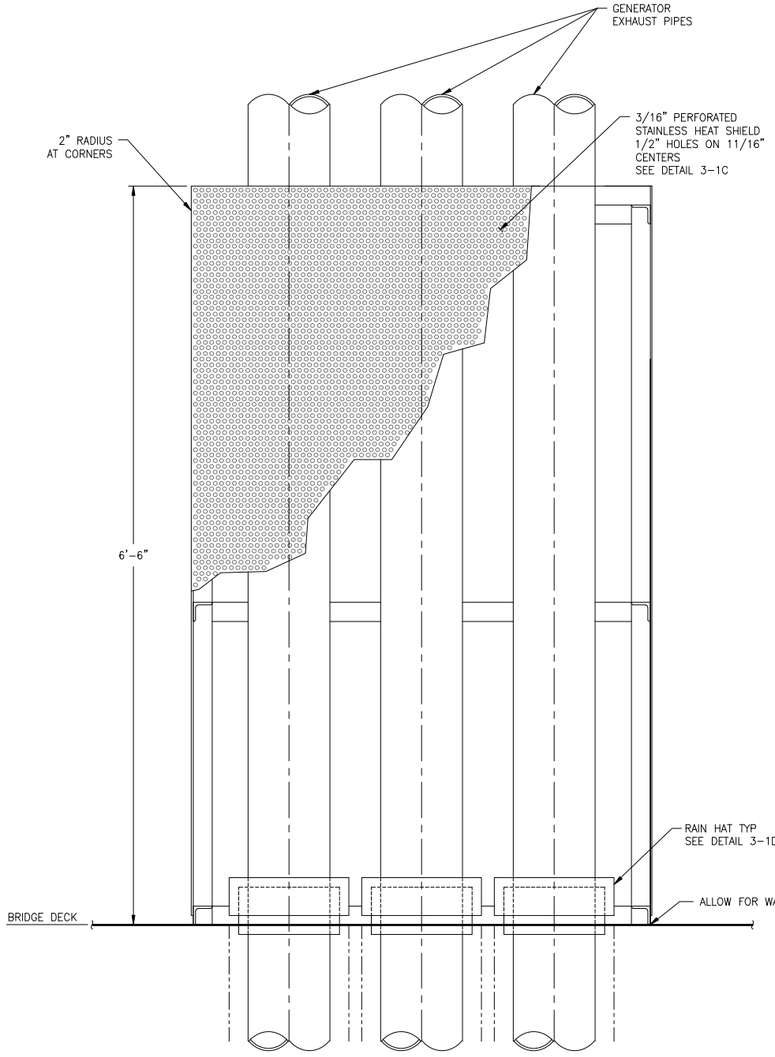


DETAIL 3–1D
TYP RAIN CAP
NO SCALE



DETAIL 3–1C
HEAT SHIELD PANEL SEAM
SCALE: 6"=1'–0"



DETAIL 3–3A
HEAT SHIELD
SCALE: 1–1/2"=1'–0"

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STATE OF WASHINGTON
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7/31/2018

SIZE	DWG NO.	REV
D	18026–200–259–1	–
SCALE: AS NOTED	FILE NAME: 18026–200–259–1–	SHEET 3 OF 3

7/31/2018 8:37:06 PM

MATERIAL SCHEDULE

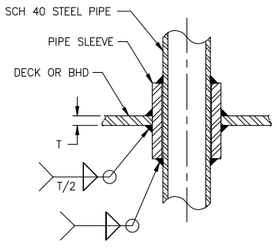
SERVICE	SIZE	PIPE	TAKEDOWN JOINTS			VALVES		FITTINGS	FLEXIBLE CONNECTIONS
			MATERIAL	GASKETS	BOLTING	BODY	TRIM		
FUEL OIL MAWP: 100 PSIG MAX TEMP: 120°F	ALL	CARBON STEEL ASTM A53 OR A106, GRADE B SEAMLESS ANSI B36.10 SCH 40	UNION GROUND JOINT CARBON STEEL ASTM A105 ANSI B16.11 SOCKET WELD	–	–	BALL: CARBON STEEL ASTM A216 GR WCB SOCKET WELD 3–PIECE 1500 PSI SWING CHECK: CARBON STEEL ASTM A216 GR WCB 150#, SOCKET WELD SEE NOTES 12&14	BALL: CHROME PLATED CARBON STEEL BALL RPTFE SEATS SWING CHECK: STAINLESS STEEL	CARBON STEEL ASTM A105 ANSI B16.11 3000# SOCKET WELD	SAE J1942 COMPLIANT HOSE SEE NOTE 6

EQUIPMENT & PUMP LIST

QTY	SERVICE	TYPE	MODEL	CAPACITY	REMARKS
1	FUEL OIL TRANSFER PUMP	HAND OPERATED ROTARY VANE	–	10 GAL/ 115 REV	INLINE INSTALLATION
3	GENSET FUEL OIL FILTER	TURBINE FILTER 2 ELEMENT	–	6 GPM 10 MICRON	ASTM F1201
1	EDG FUEL OIL FILTER	TURBINE FILTER 1 ELEMENT	–	3 GPM 10 MICRON	ASTM F1201
1	SIGHT FLOW INDICATOR	VISUAL	–	–	–

SYMBOLS LIST

	SUPPLY PIPE
	RETURN PIPE
	PIPE UP
	PIPE DOWN
	BULKHEAD PENETRATION
	REDUCER
	PLUG
N.S. / N.O.	NORMALLY SHUT / NORMALLY OPEN
	BALL VALVE, REACH ROD
	BALL VALVE
	SWING CHECK VALVE
	FLEXIBLE CONNECTION
	SIMPLEX FILTER
	DUPLEX FILTER
	SPILL CONTAINMENT/DRIP PAN
	MANUALLY OPERATED PUMP
	SIGHT FLOW INDICATOR
LS	LEVEL SENSOR



DETAIL 1–6A
TYP DECK/BHD PENETRATION

GENERAL NOTES (CONT)

10. ALL VALVES LOCATED BELOW THE FLOOR PLATES SHALL BE PROVIDED WITH REACH RODS. ALL VALVES SHALL BE PROVIDED WITH VISUAL CLOSURE STATUS.
11. PIPE THREAD SEALING TAPE, GALVANIZED PIPE, OR FITTINGS SHALL NOT BE USED.
12. VALVES CONSTRUCTED OF DUCTILE IRON, ASTM A395, MAY BE SUBSTITUTED WHERE PERMITTED BY ABS AND USCG REQUIREMENTS.
13. PIPE BENDS MAY BE USED IN LIEU OF ELBOWS WHERE PRACTICABLE. BENDS SHALL HAVE A BEND RADIUS OF FIVE TIMES NOMINAL DIAMETER WHEREVER PRACTICAL, WITH A MINIMUM RADIUS OF THREE TIMES NOMINAL DIAMETER.
14. TANK SHUT–OFF VALVES SHALL BE POSITIVE SHUTOFF AND HAVE FIRE SAFE METALLIC SEATS. TANK VALVES SHALL BE OPERABLE FROM THE MAIN DECK VIA FLEXIBLE TYPE REACH ROD ASSEMBLY.
15. REACH ROD OPERATOR SHALL BE LOCATED OUTBOARD OF THE CAR TIRE RAIL, CLEAR OF THE VEHICLE LANES AND OTHER OBSTRUCTIONS.
16. EACH FUEL OIL TANK SHALL BE FITTED WITH A LEVEL SENSOR. EACH SENSOR SHALL BE INSTALLED THROUGH THE TOP OF THE TANK AND INTERFACED WITH THE SHIPS ALARM AND MONITORING SYSTEM. CONFIGURE TO PROVIDE CONTINUOUS LEVEL INDICATION, LOW & HIGH LEVEL ALARMS. SEE REF 1.
17. PIPING SHALL BE CLEANED AND TESTED IN ACCORDANCE WITH USCG REQUIREMENTS. SEE REF 1.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO THE BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES.
5. WHERE PIPES PENETRATE TANK BOUNDARIES, BULKHEADS, OR DECKS HEAVY WEIGHT SPOOL PIECES OR REINFORCING PENETRATION FITTINGS SHALL BE USED. SEE DETAIL 1–6A.
6. FLEXIBLE HOSE SECTIONS BETWEEN THE ENGINE ATTACHED CONNECTIONS AND VESSEL PIPING SHALL BE 37" SAE FLARE SWIVEL ON BOTH ENDS. FLEXIBLE HOSE SHALL BE FLAME RESISTANT IN ACCORDANCE WITH 46 CFR 56.60–25. HOSE ASSEMBLIES SHALL NOT BE LESS THAN 9" IN LENGTH NOR MORE THAN 24" IN LENGTH.
7. DO NOT ROUTE PIPING CONTAINING FUEL OIL NEAR ANY ELECTRICAL DEVICES OR EQUIPMENT. DO NOT LOCATE TAKEDOWN JOINTS AROUND, NEAR, OR OVER ELECTRICAL EQUIPMENT. ROUTE ALL FUEL OIL PIPING AT LEAST 18 INCHES AWAY FROM ANY SURFACE THAT NORMALLY HAS AN OPERATING TEMPERATURE OF 450°F OR GREATER.
8. ARRANGE LEVEL INDICATOR TO PROVIDE INDICATION THROUGH THE GREATEST RANGE OF TANK LEVEL AS PRACTICABLE. LEVEL INDICATOR SHALL BE LOCATED ADJACENT TO TANK TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
9. DRIP PANS WITH UP–TURNED, SEALED, FLANGED EDGES SHALL BE PROVIDED BENEATH ALL FILTERS, PUMPS, STRAINERS, AND ANY OTHER EQUIPMENT THAT CONTAINS OIL AND REQUIRES PERIODIC MAINTENANCE. DRIP PANS SHALL BE PROVIDED WITH DRAIN VALVES.

REFERENCES

1. 18026–200–832–1 TECHNICAL SPECIFICATION
2. 18026–200–506–1 FILLS, VENTS, AND SOUNDS

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: FUEL OIL PIPING SYSTEM SCHEMATIC

MICHAEL E. JOHNSON — STATE OF WASHINGTON — 49387 — REGISTERED PROFESSIONAL ENGINEER

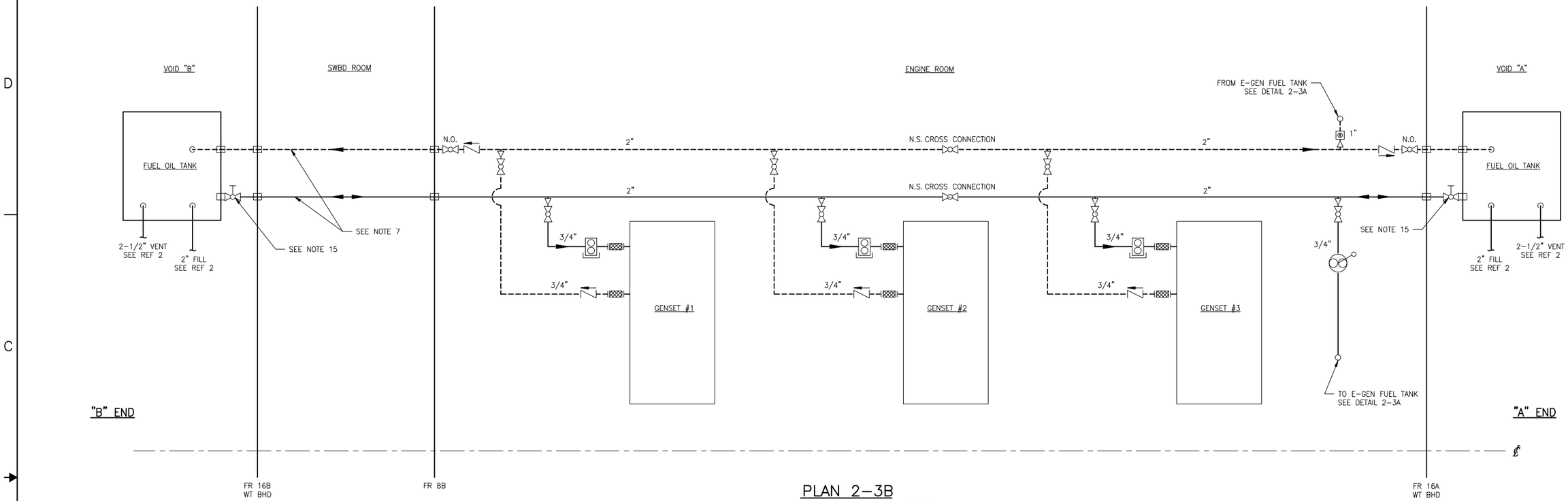
7/31/2018

SIZE	DWG NO.	REV
D	18026–200–261–1	–

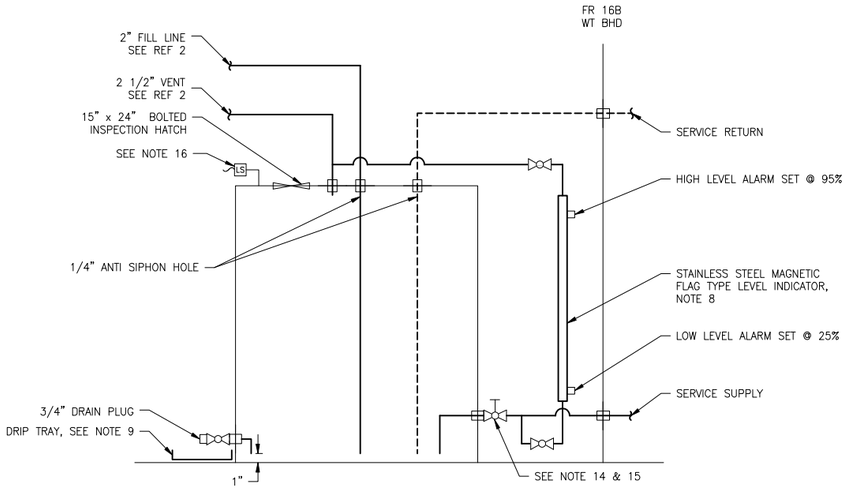
SCALE	FILE NAME	SHEET	OF
NONE	18026–200–261–1–	1	2

DWN	MOD	CKD	APVD	APVD DATE
NJB	JEH		MEJ	7/31/18

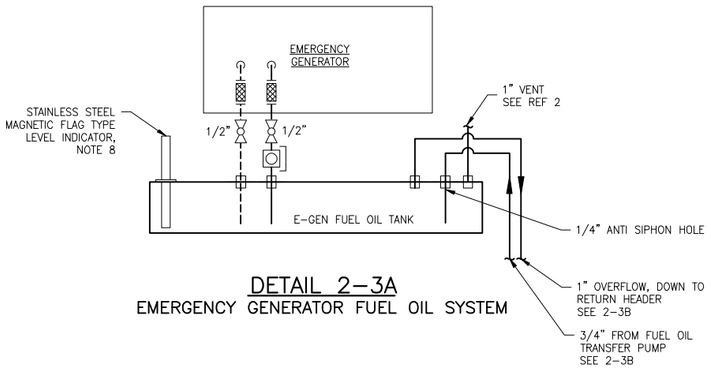
7/31/2018 8:34:56 PM



PLAN 2-3B
FUEL OIL SYSTEM SCHEMATIC



DETAIL 2-5A
TYP STORAGE TANK
"B" END SHOWN, "A" SIMILAR



DETAIL 2-3A
EMERGENCY GENERATOR FUEL OIL SYSTEM

MICHAEL E. JOHNSON
STATE OF WASHINGTON
49387
REGISTERED
PROFESSIONAL ENGINEER

7/31/2018

SIZE	DWG NO.	REV
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SCALE NONE	FILE NAME 18026-200-261-1-	SHEET 2 OF 2

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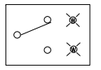
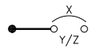
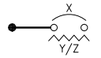
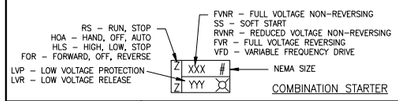
SYMBOLS LIST

	TRANSFER SWITCH (NORMAL CONNECTION SHOWN) ABT – AUTOMATIC BUS TRANSFER MBT – MANUAL BUS TRANSFER ⊗ – PWR AVAILABLE INDICATION (LED)
	CIRCUIT BREAKER X – NUMBER OF POLES Y – CIRCUIT BREAKER FRAME SIZE Z – CIRCUIT BREAKER TRIP SETTING
	CIRCUIT BREAKER W/ TRIP DEVICE ST – SHUNT TRIP UV – UNDER VOLTAGE TRIP
	GENERATOR
	FVNR – FULL VOLTAGE NON-REVERSING SS – SOFT START RVNR – REDUCED VOLTAGE NON-REVERSING FVR – FULL VOLTAGE REVERSING VFD – VARIABLE FREQUENCY DRIVE RS – RUN, STOP HOA – HAND, OFF, AUTO HLS – HIGH, LOW, STOP FOR – FORWARD, OFF, REVERSE LVP – LOW VOLTAGE PROTECTION LVR – LOW VOLTAGE RELEASE Z XXX # Z YYY NEMA SIZE COMBINATION STARTER
XX	CONTROL DEVICES/FUNCTIONS PB – PUSH-BUTTON PB/IL – PUSH-BUTTON, ILLUMINATED PS – PRESSURE SWITCH LS – LEVEL SWITCH FR – FIRE SHUTDOWN RELAY FS – FLOW SWITCH DS – DISCONNECT SWITCH TH – THERMOSTAT SC – SPEED CONTROL
C	OEM CONTROLLER SUPPLIED/INTEGRAL WITH EQUIPMENT
LVRE	CONTROLLER, LOW-VOLTAGE RELEASE EFFECT MOUNTED ADJACENT TO EQUIPMENT
IND	INDICATOR LIGHTS
hp/kW	MOTOR
	SWITCH NORMALLY CLOSED
	SWITCH NORMALLY OPEN
_ kW	EQUIPMENT
	LIGHTING
	DUPLEX RECEPTACLE
	SHORE POWER INLET
	JUNCTION BOX
	DC POWER SUPPLY
V A kW	SWITCHBOARD INSTRUMENT
	MOMENTARY SWITCH NORMALLY CLOSED
	SELECTION SWITCH
	TRANSFORMER

GENERAL NOTES – CONT'D

6. AVAILABLE FAULT CURRENT IS ESTIMATED AS 10 TIMES THE COMBINED MAXIMUM GENERATOR CURRENT PLUS 4 TIMES THE CONNECTED MOTOR LOAD.
   GENERATOR CURRENT (2x565KW) 2x10x 680A =13600A
   XFMR CURRENT (EST 150KVA) 4 x 144A = 578A
   AVAILABLE FAULT CURRENT 14178A
7. CABLES HAVE BEEN DERATED FOR DOUBLE BANKING, HOWEVER, CABLES SHALL BE SINGLE BANKED WHEREVER PRACTICAL.
8. GROUND DETECTION AND INDICATION SHALL BE PROVIDED IN COMPLIANCE WITH SUBCHAPTER J REGULATIONS.
9. CABLES SHALL BE LABELED WITH PERMANENTLY PRINTED POLYOLEFIN OR EMBOSSED ALUMINUM CABLE TAGS PERMANENTLY ATTACHED TO THE CABLE BY BANDING. CABLES SHALL BE LABELED ON EACH SIDE OF EACH BULKHEAD AND DECK PENETRATION, AND AT EACH ELECTRICAL ENCLOSURE.
10. ALL NON-CURRENT CARRYING METAL EQUIPMENT SHALL BE EFFECTIVELY GROUNDED TO SHIP STRUCTURE. GROUNDING CONDUCTORS SHALL BE ADDED IN WAY OF ISOLATION MOUNTS, POURED CHOCKS, AND OTHER INSULATING FOUNDATIONS.
11. CONVENIENCE RECEPTACLES IN HEADS, CLEANING GEAR LOCKERS, THE VEHICLE SPACE, EXTERIOR, CREW GALLEY, MECHANICAL SPACES, AND OTHER SPACES PRESCRIBED BY USCG SHALL INCLUDE GROUND FAULT CIRCUIT INTERRUPTION PROTECTION.
12. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING A CIRCUIT BREAKER COORDINATION STUDY, AND ADJUSTING CIRCUIT BREAKER TRIP RATINGS AS NECESSARY TO FACILITATE COORDINATION.
13. SINGLE CONDUCTOR CABLE SHALL NOT BE USED FOR AC POWER DISTRIBUTION.
14. CABLES SHOWN ARE SIZED PER IEEE-45 (2002) TABLE 25. CABLE SIZING IS BASED UPON 90 DEGREE C CONDUCTOR TEMPERATURE, 45 DEGREE C AMBIENT TEMPERATURE OUTSIDE OF CLASS A MACHINERY SPACES, AND 50 DEGREE C AMBIENT TEMPERATURE WITHIN CLASS A MACHINERY SPACES.
15. PANEL P205 TO BE PROVIDED WITH SHUNT TRIP FOR VENTILATION SHUTDOWN. ONE MANUAL ACTIVATION SWITCH IS TO BE LOCATED IN THE PILOT HOUSE AND ONE AUTOMATIC SWITCH IS TO BE CONNECTED TO THE ENGINE ROOM FIRE SUPPRESSION SYSTEM.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS AND IEEE-45 (2002).
2. SWITCHBOARD INTERLOCKS SHALL PREVENT PARALLELING OF POWER SUPPLIES.
3. PENETRATIONS AT WATERTIGHT AND FIRE RATED BULKHEADS AND DECKS, AND AT ELECTRICAL ENCLOSURES, SHALL BE SEALED WITH APPROVED STUFFING TUBES OR MULTI-CABLE TRANSITS (MCT). CABLES PASSING THROUGH OTHER PENETRATIONS SHALL BE SECURED AND PROTECTED FROM CHAFING.
4. IN GENERAL, EQUIPMENT SHALL BE RATED AS FOLLOWS:
   MECHANICAL SPACES: 1P22 OR NEMA 12
   FINISHED INTERIORS: 1P20 OR NEMA 1
   EXTERIOR, VEHICLE DK NON-LIGHTING: 1P56 OR NEMA 4X
   EXTERIOR, VEHICLE DK LIGHTING: 1P55 OR NEMA 4X
5. POWER DISTRIBUTION CABLE SHALL MEET THE REQUIREMENTS OF IEEE-1580 (2010). CABLES SHALL USE TYPE LSX OR LSE INSULATION AND TYPE L OR TPO JACKETING. UNLESS REQUIRED BY USCG, CABLE SHALL BE UNARMORED AND UNSHIELDED. CABLE TYPE DESIGNATIONS USE THE FOLLOWING ABBREVIATIONS:
   S- SINGLE CONDUCTOR
   D- TWO CONDUCTOR
   T- THREE CONDUCTOR
   F- FOUR CONDUCTOR
   NUMBERS IN CABLE TYPE DESIGNATION INDICATE CONDUCTOR SIZE IN CIRCULAR MILS. CABLE MEETING THE SPECIFICATIONS OF MIL-C-24643 MAY BE SUBSTITUTED.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-300-1 AC AND DC ELECTRICAL LOADS ANALYSIS
3. 18026-200-330-1 POWER AND LIGHTING PLAN
4. 18026-200-422-1 NAVIGATION LIGHTING ARRGMT AND BLOCK DIAGRAM

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: PROPULSION AND SHIPS SERVICE ELECTRICAL ONE LINE DIAGRAM

SIZE	DWG NO.	REV
D	18026-200-320-1	–

SCALE	FILE NAME	SHEET	OF
NONE	18026-200-320-1-	1	11

DWN	MOD	CKD	APVD	APVD DATE
JEH		TMH	TMH	8/2/2018

TAYLOR M HERRICK
STATE OF WASHINGTON
48360
REGISTERED PROFESSIONAL ENGINEER
8/2/2018

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GENERATOR ENGINE NO. 1
599kWm PRIME

GENERATOR ENGINE NO. 2
599kWm PRIME

GENERATOR ENGINE NO. 3
599kWm PRIME

G1 GENERATOR NO. 1
565kWe, 600VAC, 60HZ,
680A, 0.80 PF

G2 GENERATOR NO. 2
565kWe, 600VAC, 60HZ,
680A, 0.80 PF

G3 GENERATOR NO. 3
565kWe, 600VAC, 60HZ,
680A, 0.80 PF

G01 (3) T-313

G02 (3) T-313

G03 (3) T-313

PROPULSION SWITCHBOARD
600V, 3ø-3W, 1500A, 50kAIC, IP22 ENCLOSURE

V A Hz KW — 3P 800/780 M

PORT BUS

3P 1000/1000

STARBOARD BUS

3P 500/350 — P601 (2) T-168 — ACTIVE FILTER — A END STBD VFD 6 PULSE, 600VAC, 400A, 325kW, DFE — BRAKING RESISTOR — P601M (2) T-168 VFD CABLE — 230kW — THRUSTER A END STBD — PROPULSION MOTOR A END STBD 250kW, 1241RPM BI-DIRECTIONAL

3P 500/350 — P603 T-500 — ACTIVE FILTER — B END PORT VFD 6 PULSE, 600VAC, 400A, 325kW, DFE — BRAKING RESISTOR — P603M (2) T-168 VFD CABLE — 230kW — PROPULSION MOTOR B END PORT 250kW, 1241RPM BI-DIRECTIONAL — THRUSTER B END PORT

3P 400/400 — T-1-605 T-168 — T-1 △ 150 kVA 600/208-120V 3PH 60HZ — T-1-205 (3) T-168 — TO SHIP SERVICE SWITCHBOARD

3P 100/90 — 607 T-66 — 607A T-66 — SEE DETAIL 1-3A — 607B T-66 — B END PORT THRUSTER CONTROL POWER — A END STBD THRUSTER CONTROL POWER

3P 500/350 — P602 T-500 — ACTIVE FILTER — A END PORT VFD 6 PULSE, 600VAC, 400A, 325kW, DFE — BRAKING RESISTOR — P602M (2) T-168 VFD CABLE — 230kW — THRUSTER A END PORT — PROPULSION MOTOR A END PORT 250kW, 1241RPM BI-DIRECTIONAL

3P 500/350 — P604 T-500 — ACTIVE FILTER — B END STBD VFD 6 PULSE, 600VAC, 400A, 325kW, DFE — BRAKING RESISTOR — P604M (2) T-168 VFD CABLE — 230kW — PROPULSION MOTOR B END STBD 250kW, 1241RPM BI-DIRECTIONAL — THRUSTER B END STBD

3P 400/400 — T-2-606 T-168 — T-2 △ 150 kVA 600/208-120V 3PH 60HZ — T-2-206 (3) T-168 — TO SHIP SERVICE SWITCHBOARD

3P 100/90 — 608 T-66 — 608A T-66 — SEE DETAIL 1-3A — 608B T-66 — A END PORT THRUSTER CONTROL POWER — B END STBD THRUSTER CONTROL POWER

TO THRUSTER CONTROL POWER A END — 3P 100/90 — FROM SWITCHBOARD BREAKER

TO THRUSTER CONTROL POWER B END — 3P 100/90

DETAIL 1-3A
CONTROL POWER DISTRIBUTION
LOCATED ADJACENT TO SWITCHBOARD

TAYLOR M HERINCKX — STATE OF WASHINGTON — 48360 — REGISTERED PROFESSIONAL ENGINEER

8/2/2018

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FROM TRANSFORMER T-1
FROM TRANSFORMER T-2
SHORE POWER INLET 1
SHORE POWER INLET 2
SP-1-200 F-212
SP-2-200 F-212
SEE DETAIL 2-2B
SP-200 F-212
T-1-205
T-2-206
INTERLOCK

SHIP SERVICE SWITCHBOARD
208/120V, 3ø-4W, 650A, 10kAIC, IP22 ENCLOSURE

3P 200/175	3P 200/125	3P 100/100	3P 100/90	3P UV 100/90	3P 100/100	3P 100/100	3P 150/110	3P 100/40	3P 100/30	3P 100/15	3P 100/15	3P 100/15	1P 100/15	1P 100/20						
P201 F-168	P202 F-106	P203 F-106	P204 F-66	P205 F-66	P206 F-106	P207 F-106	P208 T-66	P209 T-16	P210 T-10	P211 T-4	P212 T-4	P213 T-4	P214 T-4	P215 T-4	P216	P217	P218	P219	P220	
EMERGENCY SWBD BUS TIE	PANEL P202 ENGINE ROOM END A (SHT 4)	PANEL P203 ENGINE ROOM END B (SHT 5)	PANEL P204 PILOT HOUSE (SHT 6)	PANEL P205 HOLD VENTILATION (SHT 6)	PANEL P206 HVAC 1 (SHT 7)	PANEL P207 HVAC 2 (SHT 8)	FIRE PUMP NO. 2	RESCUE BOAT DAVIT	BILGE PUMP NO. 2	GENERATOR 1 JW HEATER	GENERATOR 2 JW HEATER	GENERATOR 3 JW HEATER	EOS LIGHTS	EOS BATTERY CHARGER 240C2	BLANK (3P)	BLANK (3P)	BLANK (3P)	BLANK (3P)	BLANK (3P)	
				VENTILATION SHUTDOWN			PILOT HOUSE PUMP CONTROL PANEL A PILOT HOUSE PUMP CONTROL PANEL B P208-M T-66 25HP	P209-M T-16 7KW	P210-M T-10 5HP	1.5KW	1.5KW	1.5KW		1KW						

EMERGENCY GENERATOR
65eKW, 208/120V, 3ø-4W, 0.8 PF
EMERG
EG201 (2) F-106
AUTO SWITCH AND INTERLOCK

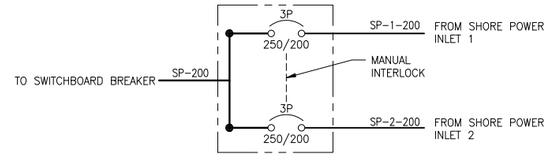
EMERGENCY SWITCHBOARD
208V, 3ø-4W, 250A, 10kAIC, IP22 ENCLOSURE

AUTO BUS TRANSFER
208V, 3ø, 250A, 10kAIC

GROUND DETECTION TO MAIN SWBD

3P 100/110	3P 100/30	3P 100/15	3P 100/20	3P 100/30	1P 100/15	1P 100/15	1P 100/15	1P 100/15						
EP201 T-83	EP202 T-10	EP203 T-4	EP204 T-4	EP205 T-10	EP206 T-4	EP207 T-4	EP208 T-4	EP209 T-4	EP210	EP211	EP212	EP213	EP214	
EP201-M T-83 25HP	EP202-M T-10 5HP	1KW			500W									
FIRE PUMP NO. 1	BILGE PUMP NO. 1	EGEN JW HEATER	PANEL EP204 ENGINE ROOM (SHT 9)	PANEL EP205 PILOT HOUSE (SHT 9)	EGEN STARTING BATTERY CHARGER (24DC)	VOID & THRUSTER RM E LTS - A END	VOID & THRUSTER RM E LTS - B END	EMERGENCY GENERATOR RM E LTS	BLANK (3P)	BLANK (3P)	BLANK (3P)	BLANK (3P)	BLANK (3P)	

DETAIL 2-2B
SHORE POWER TRANSFER SWITCH
LOCATED ADJACENT TO SWITCHBOARD



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D	18026-200-320-1	—
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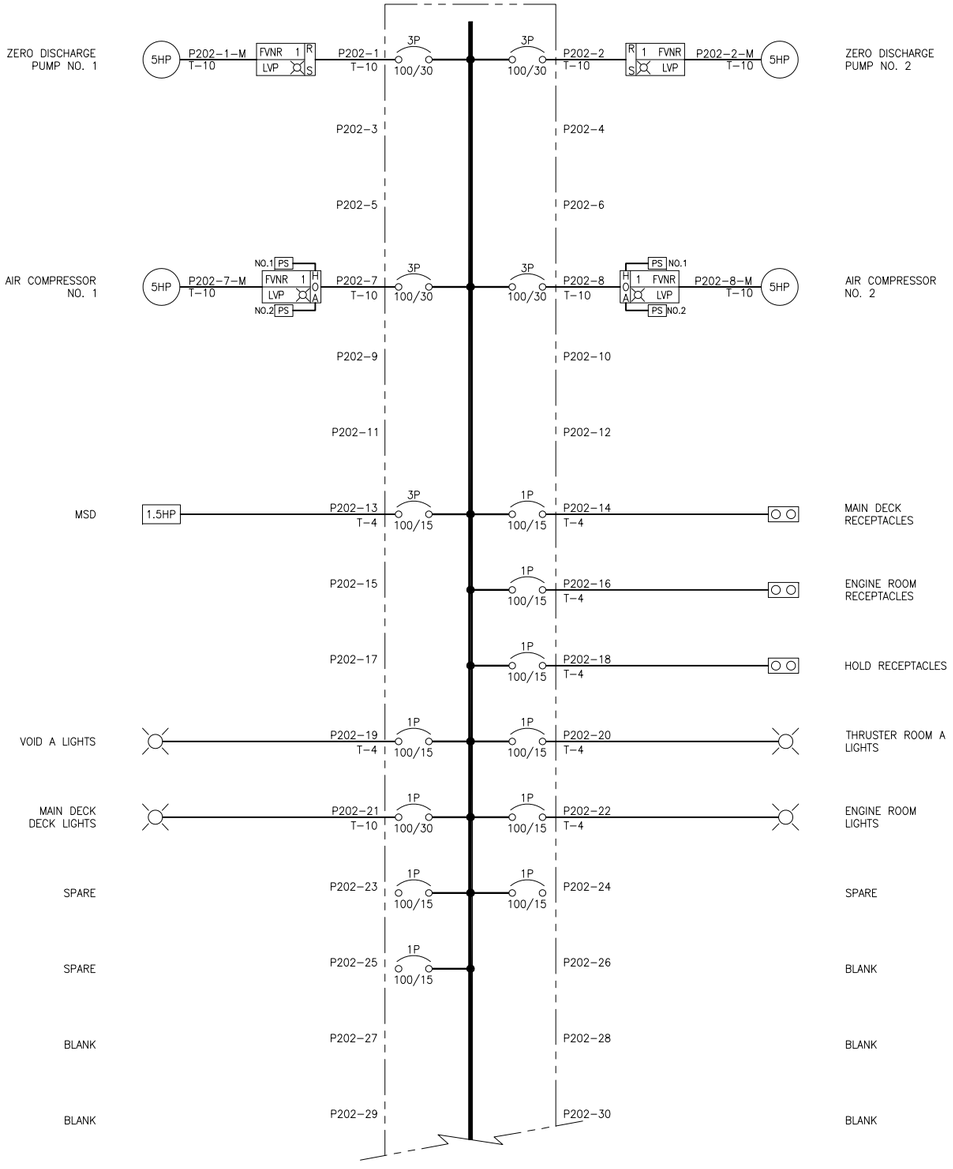
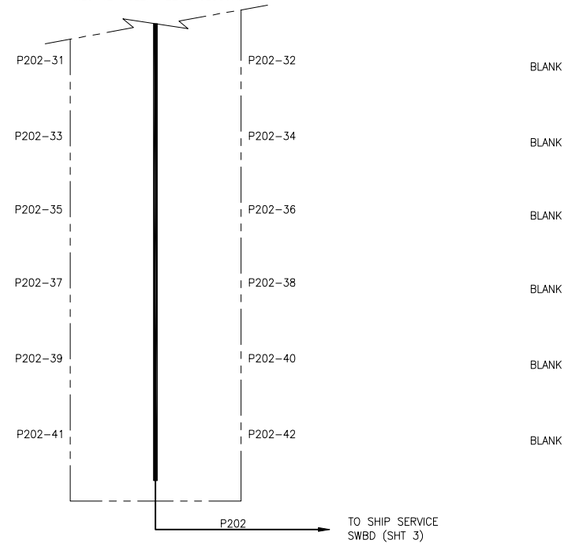
PANEL P202
ENGINE ROOM END A
208/120V, 3ø–4W, 100A, 10kAIC,
MLO 42 POLE, IP22 ENCLOSURE



PANEL P202
ENGINE ROOM END A (CONT.)
208/120V, 3ø–4W, 100A, 10kAIC,
MLO 42 POLE, IP22 ENCLOSURE



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D	18026-200-320-1	–
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PANEL P203
ENGINE ROOM END B

208/120V, 3ø–4W, 100A, 10kAIC, MLO 42 POLE, IP22 ENCLOSURE

BALLAST PUMP NO. 1	2HP	P203-1-M T-4	FVNR 0 LVP H O A	P203-1 T-4	3P 100/15	P203-2 T-4	BALLAST PUMP NO. 2
				P203-3		P203-4	
				P203-5		P203-6	
WASTE OIL PUMP	2HP	P203-7-M T-10	FVNR 1 LVP R S	P203-7 T-10	1P 100/30	P203-8 T-4	GENERATOR HEATER NO. 1
POTABLE WATER PUMP NO. 1	1HP	P203-9-M T-4	PS FVNR 0 LVP O A	P203-9 T-4	1P 100/20	P203-10 T-4	GENERATOR HEATER NO. 2
POTABLE WATER PUMP NO. 2	1HP	P203-11-M T-4	PS FVNR 0 LVP O A	P203-11 T-4	1P 100/20	P203-12 T-4	GENERATOR HEATER NO. 3
HOLD RECEPTACLES				P203-13 T-4	1P 100/15	P203-14 T-4	ENGINE ROOM SWBD ROOM LIGHTS NO. 2
THRUSTER ROOM B LIGHTS				P203-15 T-4	1P 100/15	P203-16 T-16	STARTING BATTERY CHARGER NO. 2 (24 DC)
VOID B LIGHTS				P203-17 T-4	1P 100/15	P203-18 T-16	STARTING BATTERY CHARGER NO. 3 (24 DC)
SWITCHBOARD RM/EOS RECEPTACLES				P203-19 T-4	1P 100/15	3P 100/30 P203-20 F-10	END A / END B TRANSFER SPAN POWER SUPPLY
MACHINERY SPACE HVAC CHILLER 1	2.5KW	P203-21-M T-4	FVNR 0 LVP H O A	P203-21 T-4	3P 100/15	P203-22 T-4	MACHINERY SPACE HVAC CHILLER 2
				P203-23		P203-24	
				P203-25		P203-26	
AUX SW COOLING PUMP NO. 1	3HP	P203-27-M T-4	FVNR 0 LVP H O A	P203-27 T-4	3P 100/15	P203-28 T-4	AUX SW COOLING PUMP NO. 2
				P203-29		P203-30	

PANEL P203
ENGINE ROOM END B (CONT.)

208/120V, 3ø–4W, 100A, 10kAIC, MLO 42 POLE, IP22 ENCLOSURE

				P203-31		P203-32	
FW COOLING PUMP NO. 1	3HP	P203-33-M T-4	FVNR 0 LVP H O A	P203-33 T-4	3P 100/15	3P 100/15 P203-34 T-4	FW COOLING PUMP NO. 2
				P203-35		P203-36	
				P203-37		P203-38	
BLANK				P203-39		P203-40	BLANK
BLANK				P203-41		P203-42	BLANK

P203 → TO SHIP SERVICE SWBD (SHT 3)

TAYLOR MERENCKY — STATE OF WASHINGTON — 48360 — REGISTERED PROFESSIONAL ENGINEER

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PANEL P204
PILOT HOUSE
208/120V, 3ø-4W, 100A, 10kAIC, MLO 30 POLE, IP20 ENCLOSURE

SHIP'S NETWORK SYSTEM	200W	P204-1 T-4	1P 100/15	1P 100/15	P204-2 T-4	250W	CCTV SYSTEM
SEARCH LIGHTS A (2)		P204-3 T-10	1P 100/30	1P 100/30	P204-4 T-10		SEARCH LIGHTS B (2)
NAVIGATION LIGHTS (PRIMARY) (REF 4)		P204-5 T-4	1P 100/15	1P 100/30	P204-6 T-10	2KW	PILOT HOUSE WINDOW HEATERS
MAIN DECK AND 01 DECK LIGHTS		P204-7 T-4	1P 100/15	1P 100/15	P204-8 T-4	LVRE 500W	CREW HEAD EXHAUST FAN
PILOT HOUSE WINDOW WIPERS	500W	P204-9 T-4	1P 100/15	1P 100/15	P204-10 T-4	LVRE 0.5HP	PASSENGER LOUNGE EXHAUST FAN
WATER HEATER	2KW	P204-11 T-10	1P 100/30	1P 100/15	P204-12 T-4	1.3KW	PILOT HOUSE REFRIGERATOR AND COFFEE MAKER
PILOT HOUSE LIGHTS		P204-13 T-4	1P 100/15	1P 100/15	P204-14 T-4	0.9KW	CREW LOUNGE REFRIGERATOR
CREW LOUNGE COFFEE MAKER	1KW	P204-15 T-4	1P 100/15	1P 100/15	P204-16 T-4	1.2KW	CREW LOUNGE MICROWAVE
PILOT HOUSE RECEPTACLES		P204-17 T-4	1P 100/15	1P 100/15	P204-18 T-4		CREW LOUNGE LIGHTS
CREW LOUNGE RECEPTACLES		P204-19 T-4	1P 100/15	1P 100/15	P204-20 T-4		PASSENGER LOUNGE LIGHTS
PASSENGER LOUNGE RECEPTACLES A		P204-21 T-4	1P 100/15	1P 100/15	P204-22 T-4	1.2KW	VENDING MACHINES AND DRINKING FOUNTAIN
PASSENGER LOUNGE RECEPTACLES B		P204-23 T-4	1P 100/15	1P 100/15	P204-24 T-4		PILOT HOUSE FLOOD LIGHTS
SPARE		P204-25	1P 100/15	1P 100/15	P204-26		SPARE
SPARE		P204-27	1P 100/15	1P 100/15	P204-28		SPARE
SPARE		P204-29	1P 100/15	1P 100/15	P204-30		SPARE

P204 → TO SHIP SERVICE SWBD (SHT 3)

PANEL P205
HOLD VENTILATION
208/120V, 3ø-4W, 100A, 10kAIC, MLO 30 POLE, IP22 ENCLOSURE

ENGINE ROOM SUPPLY FAN NO. 1	3HP	P205-1-M T-4	LVP FVNR 0 (R/S) FR	P205-1 T-4	3P 100/15	3P 100/15	P205-2 T-4	R/S LVP 0 FVNR FR	P205-2-M T-4	3HP	ENGINE ROOM SUPPLY FAN NO. 2
				P205-3			P205-4				
				P205-5			P205-6				
ENGINE ROOM SUPPLY FAN NO. 3	3HP	P205-7-M T-4	LVP FVNR 0 (R/S) FR	P205-7 T-4	3P 100/15	3P 100/15	P205-8 T-4	R/S LVP 0 FVNR FR	P205-8-M T-4	3HP	ENGINE ROOM SUPPLY FAN NO. 4
				P202-9			P205-10				
				P205-11			P205-12				
EOS SUPPLY FAN	20W	P205-13-M T-4	LVRE	P205-13 T-4	1P 100/15	1P 100/15	P205-14 T-4	LVRE	P205-14-M T-4	20W	SWBD ROOM SUPPLY FAN
THRUSTER ROOM A SUPPLY FAN	1HP	P205-15-M T-4	LVP FVNR 00 (R/S) FR	P205-15 T-4	3P 100/15	3P 100/15	P205-16 T-4	R/S LVP 00 FVNR FR	P205-16-M T-4	1HP	THRUSTER ROOM B SUPPLY FAN
				P205-17			P205-18				
				P205-19			P205-20				
VOID A SUPPLY FAN	0.5HP	P205-21-M T-4	LVP FVNR 0 (R/S) FR	P205-21 T-4	1P 100/15	1P 100/15	P205-23 T-4	R/S LVP 0 FVNR FR	P205-23-M T-4	0.5HP	VOID B SUPPLY FAN
SPARE				P205-23	1P 100/15	1P 100/15	P205-24				SPARE
SPARE				P205-25	3P 100/30		P205-26				BLANK
BLANK				P205-27			P205-28				BLANK
BLANK				P205-29			P205-30				BLANK

P205 → TO SHIP SERVICE SWBD (SHT 3)

8/2/2018

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D	18026-200-320-1	–
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PANEL P206
HVAC 1

208/120V, 3ø–4W, 225A, 10kAIC,
MLO 30 POLE, IP22 ENCLOSURE

ENGINE ROOM UNIT HEATER NO. 1	5KW	P206–1 T–4	3P 100/20		3P 100/20	P206–2 T–4	5KW	ENGINE ROOM UNIT HEATER NO. 2
		P206–3		BLANK		P206–4		BLANK
		P206–5		BLANK		P206–6		BLANK
CREW ROOM HEAT PUMP	4.5KW	P206–7 T–16	2P 100/40		2P 100/40	P206–8 T–16	4.5KW	PASSENGER LOUNGE HEAT PUMP NO. 1
		P206–9		BLANK		P206–10		BLANK
PASSENGER LOUNGE HEAT PUMP NO. 2	4.5KW	P206–11 T–16	2P 100/40		2P 100/40	P206–12 T–16	4.5KW	PASSENGER LOUNGE HEAT PUMP NO. 3
		P206–13		BLANK		P206–14		BLANK
MACHINERY SPACE HVAC CHILLER 3	2.5KW	P206–15–M T–4 FVNR 0 LVP H O A	P206–15 T–4 3P 100/15		3P 100/15	P206–16 T–4 H O A 0 FVNR LVP	P206–16–M T–4 2.5KW	MACHINERY SPACE HVAC CHILLER 4
		P206–17		BLANK		P206–18		BLANK
		P206–19		BLANK		P206–20		BLANK
SWBD ROOM FAN COIL UNIT NO. 1	1HP	P206–21–M T–4 LVP FVNR R 00 S	P206–21 T–4 2P 100/15		2P 100/15	P206–22 T–4 R S LVP 00 FVNR	P206–22–M T–4 1HP	SWBD ROOM FAN COIL UNIT NO. 2
		P206–23		BLANK		P206–24		BLANK
SPARE		P206–25	2P 100/15		2P 100/15	P206–26		SPARE
SPARE		P206–27		BLANK		P206–28		SPARE
BLANK		P206–29		BLANK		P206–30		BLANK

PANEL P206
HVAC 1 (CONT.)

208/120V, 3ø–4W, 225A, 10kAIC,
MLO 30 POLE, IP22 ENCLOSURE

P206–31		P206–32	BLANK
P206–33		P206–34	BLANK
P206–35		P206–36	BLANK
P206–37		P206–38	BLANK
P206–39		P206–40	BLANK
P206–41		P206–42	BLANK

P206 → TO SHIP SERVICE SWBD (SHT 3)

TAYLOR M HERRICKS
STATE OF WASHINGTON
48360
REGISTERED
PROFESSIONAL ENGINEER

Taylor Hericks

8/2/2018

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D	18026–200–320–1	–
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PANEL P207
HVAC 2

208/120V, 3ø–4W, 225A, 10kAIC,
MLO 42 POLE, IP22 ENCLOSURE

PILOT HOUSE HEAT PUMP 1	4.5KW	P207-1 T-16	2P 100/40	2P 100/40	P207-2 T-16	4.5KW	PILOT HOUSE HEAT PUMP 2	SPARE
		P207-3			P207-4			SPARE
PASSENGER LOUNGE HEATERS 1	4KW	P207-5 T-10	2P 100/30	2P 100/40	P207-6 T-16	5KW	PILOT HOUSE HEATERS	BLANK
		P207-7			P207-8			BLANK
PASSENGER LOUNGE HEATERS 2	4KW	P207-9 T-10	2P 100/30	3P 100/20	P207-10 T-4	5KW	ENGINE ROOM HEATER NO. 3	BLANK
		P207-11			P207-12			BLANK
CREW LOUNGE HEATERS	3KW	P207-13 T-4	2P 100/20		P207-14			
		P207-15	3P 100/15	P207-16 T-4	H O A FVNR LVP	P207-16-M T-4	2HP CHILLED WATER PUMP 1	
CHILLED WATER PUMP 2	2HP P207-17-M T-4	H O A FVNR LVP	P207-17 T-4	3P 100/15		P207-18		
		P207-19			P207-20			
		P207-21	3P 100/15	P207-22 T-4	H O A 00 FVNR LVP	P207-22-M T-4	1.5HP SWBD COOLING PUMP 1	
SWBD COOLING PUMP 2	1.5HP P207-23-M T-4	H O A 00 FVNR LVP	P207-23 T-4	3P 100/15		P207-24		
		P207-25			P207-26			
		P207-27	2P 100/20	P207-28 T-4	H O A 00 FVNR LVP	P207-28-M T-4	2KW EOS FAN COIL UNIT	
SPARE		P207-29	3P 100/15		P207-30			

PANEL P207
HVAC 2 (CONT.)

208/120V, 3ø–4W, 225A, 10kAIC,
MLO 42 POLE, IP22 ENCLOSURE

P207-31	2P 100/20	P207-32	SPARE
P207-33		P207-34	SPARE
P207-35		P207-36	BLANK
P207-37		P207-38	BLANK
P207-39		P207-40	BLANK
P207-41		P207-42	BLANK

P207 → TO SHIP SERVICE SWBD (SHT 3)

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SIZE	DWG NO.	REV
D	18026-200-320-1	–
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PANEL EP204
ENGINE ROOM
208/120V, 3ø-4W, 100A, 10kAIC, MLO 30 POLE, IP22 ENCLOSURE

ENGINE ROOM EMERGENCY LIGHTS		EP204-1 T-4	1P 100/15	1P 100/15	EP204-2 T-4		EOS AND SWITCHBOARD ROOM EMERGENCY LIGHTS
ENGINE ORDER TELEGRAPH	100W	EP204-3 T-4	1P 100/15	1P 100/15	EP204-4 T-4	300W	MACHINERY ALARM AND MONITORING SYSTEM
FIRE DETECTION SYSTEM	400W	EP204-5 T-4	1P 100/15	1P 100/15	EP204-6 T-4	400W	PROPULSION MONITORING AND INDICATION
EOS CONSOLE	200W	EP204-7 T-4	1P 100/15	1P 100/15	EP204-8 T-4	500W	STARTING BATTERY CHARGER NO. 1 (24VDC)
ENGINE ROOM BATTERY CHARGER (DC1)	2KW	EP204-9 T-4	1P 100/20	1P 100/15	EP204-10 T-4		ER AND SWBD RM EMERG RECEP
SPARE		EP204-11	1P 100/15	1P 100/15	EP204-12		SPARE
BLANK		EP204-13			EP204-14		BLANK
BLANK		EP204-15			EP204-16		BLANK
BLANK		EP204-17			EP204-18		BLANK
BLANK		EP204-19			EP204-20		BLANK
BLANK		EP204-21			EP204-22		BLANK
BLANK		EP204-23			EP204-24		BLANK
BLANK		EP204-25			EP204-26		BLANK
BLANK		EP204-27			EP204-28		BLANK
BLANK		EP204-29			EP204-30		BLANK

EP204 → TO EMERGENCY SWBD (SHT 3)

PANEL EP205
PILOT HOUSE
208/120V, 3ø-4W, 100A, 10kAIC, MLO 30 POLE, IP22 ENCLOSURE

PILOT HOUSE 12V BATTERY CHARGER (12DC1)	1KW	EP205-1 T-4	1P 100/15	1P 100/15	EP205-2 T-4		NAVIGATION LIGHTS (SECONDARY) (REF 4)
PILOT HOUSE 24V BATTERY CHARGER (24DC3)	2KW	EP205-3 T-4	1P 100/20	1P 100/15	EP205-4	100W	ESS SYSTEM IP PHONE/ COMMAND INTERCOM
INFRARED NIGHT VISION	1KW	EP205-5 T-4	1P 100/15	1P 100/15	EP205-6 T-4	300W	PUBLIC ADDRESS AND GENERAL ALARM SYSTEM
RADAR WITH AIS AND CHARTPLOTTER	700W	EP205-7 T-4	1P 100/15	1P 100/15	EP205-8 T-4	400W	PILOT HOUSE CONSOLE
01 DECK EMERGENCY LIGHTS		EP205-9 T-4	1P 100/15	1P 100/15	EP205-10 T-4		PILOT HOUSE EMERGENCY LIGHTS
CREW LOUNGE EMERGENCY LIGHTS		EP205-11 T-4	1P 100/15	1P 100/15	EP205-12 T-4		PASSENGER LOUNGE EMERGENCY LIGHTS
LIFE RAFT LAUNCHING LIGHTS		EP205-13 T-4	1P 100/15	1P 100/15	EP205-14		SPARE
MAIN DECK EXTERIOR EMERGENCY LIGHTS		EP205-15 T-4	1P 100/15	1P 100/15	EP205-16		SPARE
SPARE		EP205-17	1P 100/15	1P 100/15	EP205-18		SPARE
BLANK		EP205-19			EP205-20		BLANK
BLANK		EP205-21			EP205-22		BLANK
BLANK		EP205-23			EP205-24		BLANK
BLANK		EP205-25			EP205-26		BLANK
BLANK		EP205-27			EP205-28		BLANK
BLANK		EP205-29			EP205-30		BLANK

EP205 → TO EMERGENCY SWBD (SHT 3)

JASON HERINCKX
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D	18026-200-320-1	–
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PANEL 24DC1
24VDC DISTRIBUTION
ENGINE ROOM
24VDC, 2W, 100A, 10kAIC, MLO
30 POLE, NEMA-12 ENCLOSURE

GENERATOR 1 CONTROL POWER	100W	24DC1-1 D-4	2P 100/15	2P 100/20	24DC1-2 D-4	360W	BACKUP THRUSTER CONTROL A END STBD
GENERATOR 2 CONTROL POWER	100W	24DC1-3 D-4	2P 100/15	2P 100/20	24DC1-4 D-4	360W	BACKUP THRUSTER CONTROL B END PORT
MACHINERY ALARM AND MONITORING	200W	24DC1-5 D-4	2P 100/15	2P 100/15	24DC1-6 D-4	200W	TANK MONITORING SYSTEM
FIRE DAMPERS W/ ELECTRIC ACTUATORS	250W	24DC1-7 D-4	2P 100/15	2P 100/15	24DC1-8 D-4	120W	PROPULSION DRIVE CONTROL A END STBD
PROPULSION DRIVE CONTROL B END PORT	120W	24DC1-9 D-4	2P 100/15	2P 100/15	24DC1-10		SPARE
SPARE		24DC1-11	2P 100/15		24DC1-12		BLANK
BLANK		24DC1-13		2P 100/90	24DC1-14 D-41		CROSS CONNECT TO 24DC2

BATTERY DISCONNECT W/ FUSE 100A
24DC1 D-41
CHARGER 24DC1-BC (1.8kW)
AC INPUT EP204-9 T-4 → TO EP204 (SHT 9)
S-41
24DC1-BAT BANK
24VDC, 50AH, 0.5 HR RATE
(2) BATTERIES AT MIN 50AH EACH
50°F AMBIENT

PANEL 24DC2
24VDC DISTRIBUTION
EOS
24VDC, 2W, 100A, 10kAIC, MLO
30 POLE, NEMA-1 ENCLOSURE

GENERATOR 3 CONTROL POWER	100W	24DC2-1 D-4	2P 100/15	2P 100/20	24DC2-2 D-4	360W	BACKUP THRUSTER CONTROL A END PORT
BACKUP THRUSTER CONTROL B END STBD	360W	24DC2-3 D-4	2P 100/20	2P 100/15	24DC2-4 D-4	200W	ENGINE ORDER TELEGRAPH
MAIN SWITCHBOARD CONTROL POWER DC UPS	200W	24DC2-5 D-4	2P 100/15	2P 100/15	24DC2-6 D-4	120W	PROPULSION DRIVE CONTROL A END PORT
PROPULSION DRIVE CONTROL B END STBD	120W	24DC2-7 D-4	2P 100/15	2P 100/15	24DC2-8		SPARE
BLANK		24DC2-9			24DC2-10		BLANK
BLANK		24DC2-11			24DC2-12		BLANK
BLANK		24DC2-13		2P 100/90	24DC2-14		CROSS CONNECT TO 24DC1

BATTERY DISCONNECT W/ FUSE 100A
24DC2 D-41
CHARGER 24DC2-BC (1kW)
AC INPUT P21 → TO S.S. SWBD (SHT 3)
S-41
24DC2-BAT BANK
24VDC, 50AH, 0.5 HR RATE
(2) BATTERIES AT MIN 50AH EACH
50°F AMBIENT

CHARGER START1-BC (500W)
AC INPUT EP204-8 T-4 → TO EP204 (SHT 9)
S-41
START1-BAT BANK
TO GENERATOR 1 STARTING MOTOR

ENGINE STARTING SYSTEM NO. 1

CHARGER START2-BC (500W)
AC INPUT P203-16 T-4 → TO P203 (SHT 5)
S-41
START2-BAT BANK
TO GENERATOR 2 STARTING MOTOR

ENGINE STARTING SYSTEM NO. 2

CHARGER START3-BC (500W)
AC INPUT P203-18 T-4 → TO P203 (SHT 5)
S-41
START3-BAT BANK
TO GENERATOR 3 STARTING MOTOR

ENGINE STARTING SYSTEM NO. 3

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PANEL 12DC1
12VDC DISTRIBUTION
PILOTHOUSE
12VDC, 2W, 100A, 10kAIC, MLO
30 POLE, NEMA-12 ENCLOSURE

VHF RADIO NO. 1	30W	12DC1-1 D-4	2P 100/15	2P 100/15	12DC1-2 D-4	30W	VHF RADIO NO. 2
LOUD HAILER	60W	12DC1-3 D-4	2P 100/15	2P 100/15	12DC1-4 D-4	16W	DEPTH SOUNDER/ WEATHER DISPLAYS
GPS CHART PLOTTER NO. 1	50W	12DC1-5 D-4	2P 100/15	2P 100/15	12DC1-6 D-4	10W	GPS CHART PLOTTER NO. 2
SATELLITE COMPASS	10W	12DC1-7 D-4	2P 100/15	2P 100/15	12DC1-8 D-4	10W	ANEMOMETER
SPARE		12DC1-9	2P 100/15	2P 100/15	12DC1-10		SPARE
SPARE		12DC1-11	2P 100/15		12DC1-12		BLANK
BLANK		12DC1-13			12DC1-14		BLANK

BATTERY DISCONNECT W/ FUSE 50A
12DC1 D-16
CHARGER 12DC1-BC (360W)
AC INPUT EP205-1 T-4
TO EP205 (SHT 9)
S-16
12DC1-BAT BANK
12VDC, 30AH, 0.5 HR RATE,
(1) BATTERY AT MIN 30AH
40°F AMBIENT

PANEL 24DC3
24VDC DISTRIBUTION
PILOTHOUSE
24VDC, 2W, 100A, 10kAIC, MLO
30 POLE, NEMA-1 ENCLOSURE

RADAR NO. 1	270W	24DC3-1 D-4	2P 100/15	2P 100/15	24DC3-2 D-4	270W	RADAR NO. 2
AIS	250W	24DC3-3 D-4	2P 100/15	2P 100/30	24DC3-4 D-4	500W	ELECTRONIC HORN
NAV LIGHTS AND CONTROL PANEL	30W	24DC3-5 D-4	2P 100/15	2P 100/15	24DC3-6 D-4	100W	FOG SIGNAL TIMER
THRUSTER CONTROL AND MONITORING	250W	24DC3-7 D-4	2P 100/15	2P 100/15	24DC3-8		SPARE
SPARE		24DC3-9	2P 100/15	2P 100/15	24DC3-10		SPARE
BLANK		24DC3-11			24DC3-12		BLANK
BLANK		24DC3-13			24DC3-14		BLANK

BATTERY DISCONNECT W/ FUSE 100A
24DC3 D-41
CHARGER 24DC3-BC (1.8KW)
AC INPUT EP205-3
TO EP205 (SHT 9)
S-41
24DC3-BAT BANK
24VDC, 45AH, 0.5 HR RATE
(2) BATTERIES AT MIN 45AH EACH
40°F AMBIENT

TO EMERGENCY GENERATOR CONTROL POWER;
EMERGENCY SWITCHBOARD SECONDARY CONTROL POWER;
EMERGENCY GENERATOR ROOM FIRE DAMPERS
DC UPS
D-6
CHARGER EDG-BC (500W)
AC INPUT EP206 T-4
TO EMERGENCY SWBD (SHT 3)
S-10
EDG-BAT BANK
TO EMERGENCY GENERATOR ENGINE STARTING MOTOR

EMERGENCY GENERATOR STARTING SYSTEM

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SYMBOLS LIST

S	OVERHEAD 4 FT LIGHT FIXTURE, SURFACE MOUNTED, DRIP PROOF
ES	OVERHEAD 4 FT LIGHT FIXTURE, SURFACE MOUNTED, DRIP PROOF, W/ EMERGENCY BATTERY BACKUP
	OVERHEAD RECESSED DOWN LIGHT
R	OVERHEAD RECESSED DOWN LIGHT, W/RED LENS
E	OVERHEAD RECESSED DOWN LIGHT, W/EMERGENCY BATTERY BACKUP
S	2FT LIGHT FIXTURE, SURFACE MOUNTED
ES	2FT LIGHT FIXTURE, SURFACE MOUNTED, W/ EMERGENCY BATTERY BACKUP
	DECK LIGHT, BULKHEAD MOUNT
E	EMERGENCY DECK LIGHT, BULKHEAD MOUNT
	JUNCTION BOX, 4x4, WATERTIGHT, DEPENDING ON LOCATION
	SWITCH, SPST, 120V/20A, WATERTIGHT, DEPENDING ON LOCATION
	LINES PASS THROUGH, NOT JOINED OR SPLICED
EXIT	ILLUMINATED EXIT SIGN
	FLOODLIGHT
E	FLOODLIGHT, FOR EMERGENCY SERVICE
	DUPLEX RECEPTACLE, SURFACE OR RECESS MOUNTED DEPENDING ON LOCATION
	SHORE POWER INLET
	SEARCHLIGHT, 1000W

INDEX

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS AND IEEE-45 (2002).
2. UNLESS NOTED OTHERWISE, ALL CABLING IS DEFINED IN REFERENCE 2. CABLE TYPE SPECIFICATION IS SHOWN IN REFERENCE 2.
3. LIGHT FIXTURES LABELED WITH AN 'E' ARE SUPPLIED BY THE EMERGENCY BUS. FIXTURES EQUIPPED WITH INTERNAL BACKUP BATTERIES SHALL BE CAPABLE OF POWERING THE FIXTURE FOR AT LEAST 30 MINUTES.
4. LIGHT FIXTURES SHALL BE INSTALLED IN THE OVERHEAD SPACE OF THE DECK SHOWN.
5. ALL LIGHT FIXTURES SHALL BE LED TYPE WITH THE EXCEPTION OF THE FOUR (4) SEARCHLIGHTS ON THE PILOT HOUSE TOP.
6. LIGHT LOCATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE FINAL LOCATION AND ORIENTATION TO PROVIDE OPTIMAL ILLUMINATION AND TO AVOID INTERFERENCES.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-330-1 PROPULSION AND SHIPS SERVICE ELECTRICAL ONE LINE DIAGRAM

TAYLOR M HERING INC. STATE OF WASHINGTON 48360 REGISTERED PROFESSIONAL ENGINEER

8/2/2018

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: POWER AND LIGHTING PLAN

SIZE	DWG NO.	REV
D	18026-200-330-1	–

SCALE	FILE NAME	SHEET	OF
NONE	18026-200-330-1-	1	6

DWN	MOD	CKD	APVD	APVD DATE
NJB	JEH	TMH	TMH	8/2/2018

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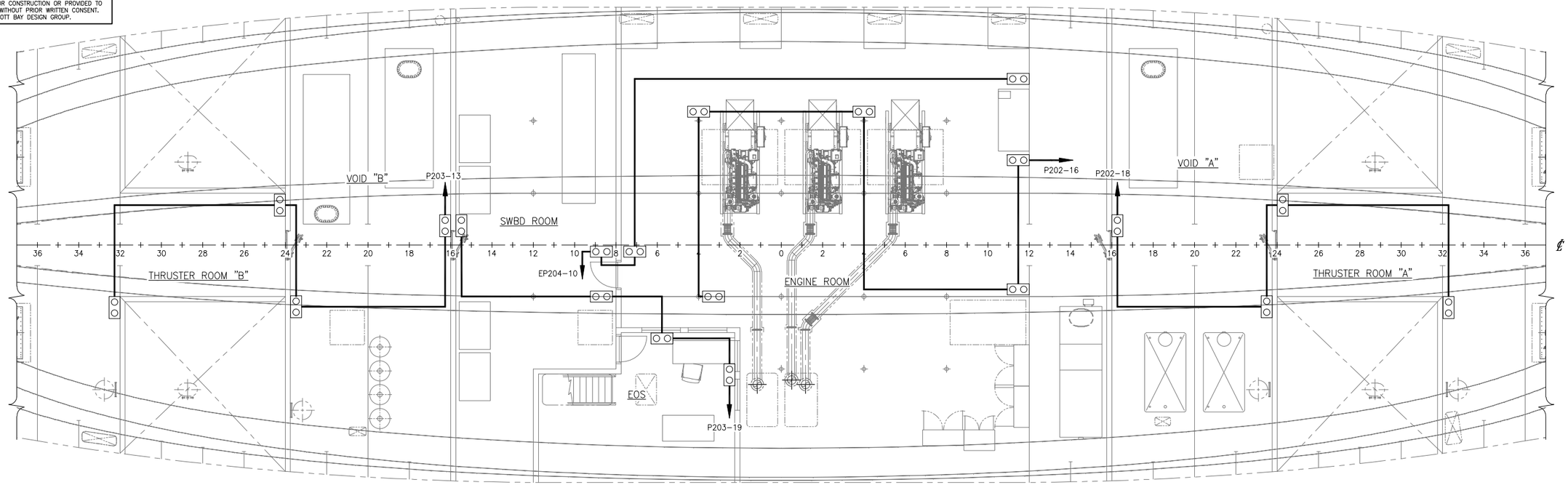
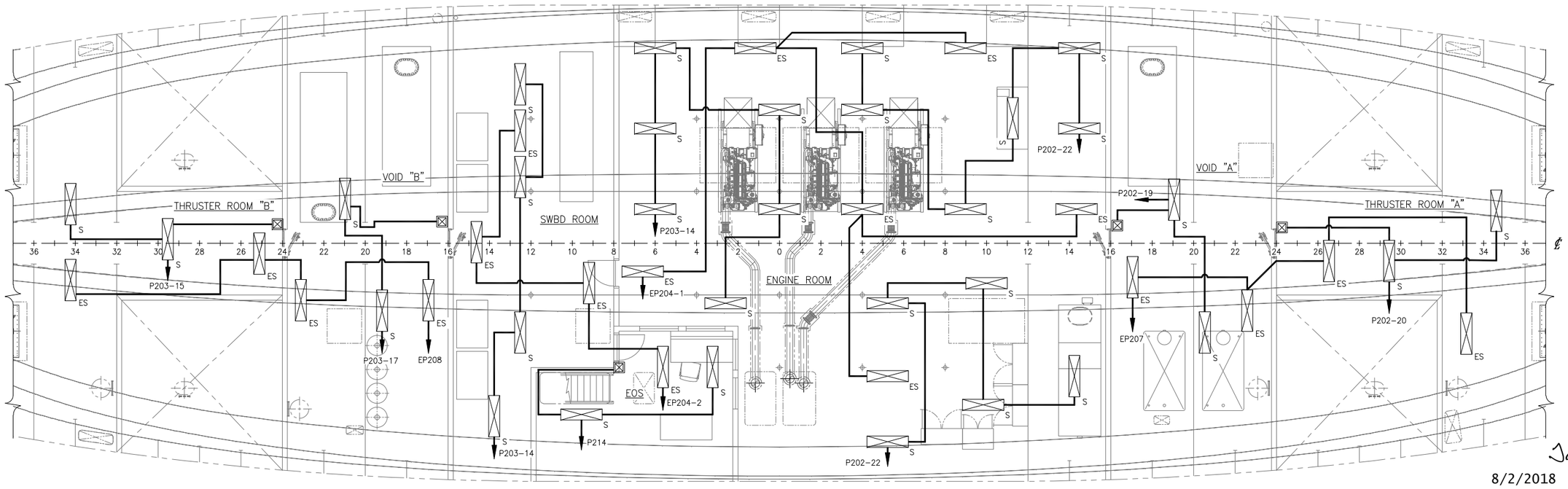


"B" END

PLAN 2–4C
HOLD RECEPTACLES
SCALE: 3/16"=1'-0"

"A" END



"B" END

PLAN 2–4A
HOLD LIGHTING
SCALE: 3/16"=1'-0"

"A" END

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D	18026-200-330-1	–
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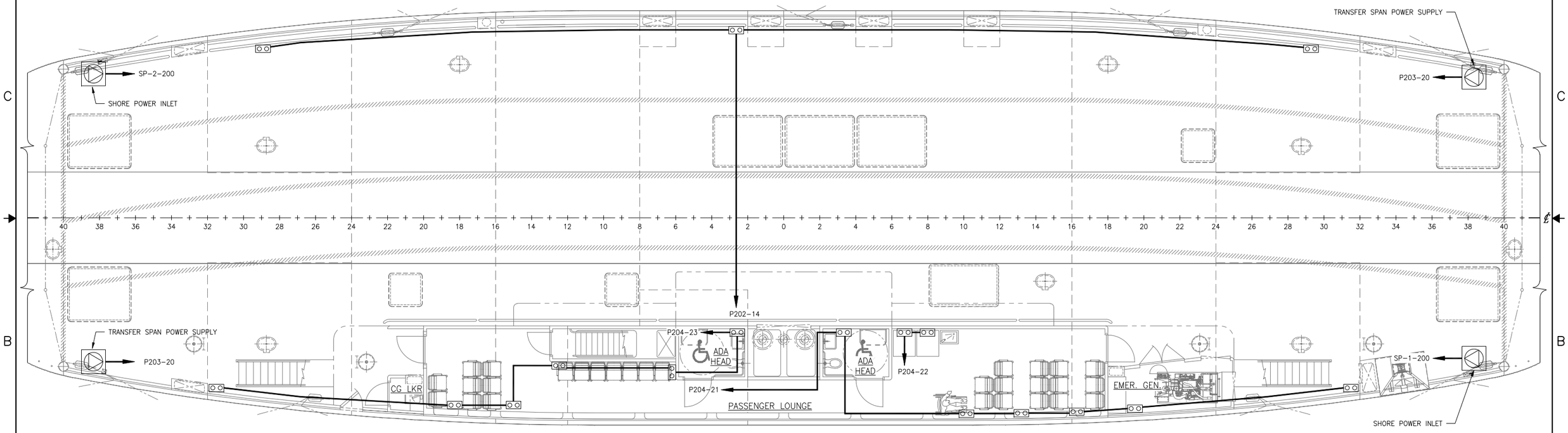

"B" END

"A" END

PLAN 3-4B
MAIN DECK RECEPTACLES
SCALE: 3/16"=1'-0"

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D	18026-200-330-1	–
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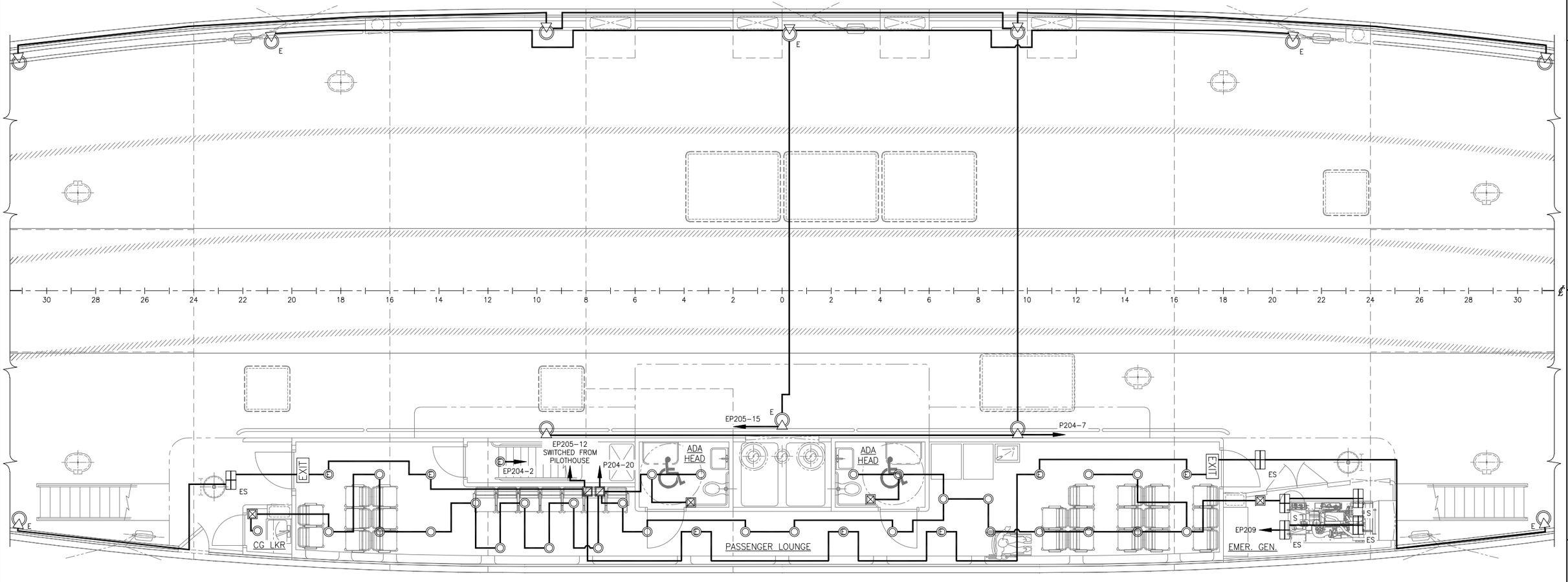

"B" END

"A" END

PLAN 4–4A
MAIN DECK LIGHTING
SCALE: 1/4"=1'–0"

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SIZE	DWG NO.	REV
D	18026-200-330-1	–
SCALE: AS NOTED	FILE NAME: 18026-200-330-1-	SHEET 4 OF 6

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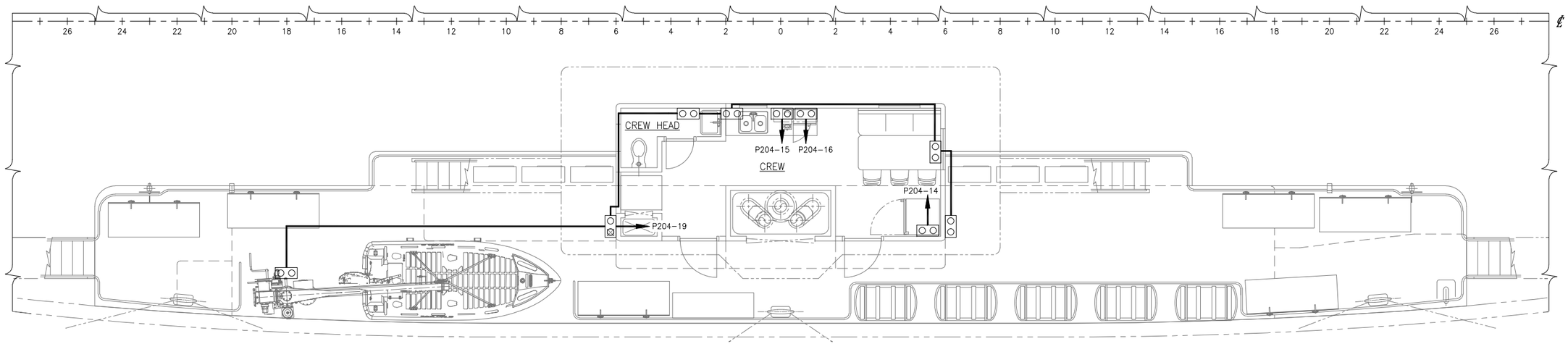
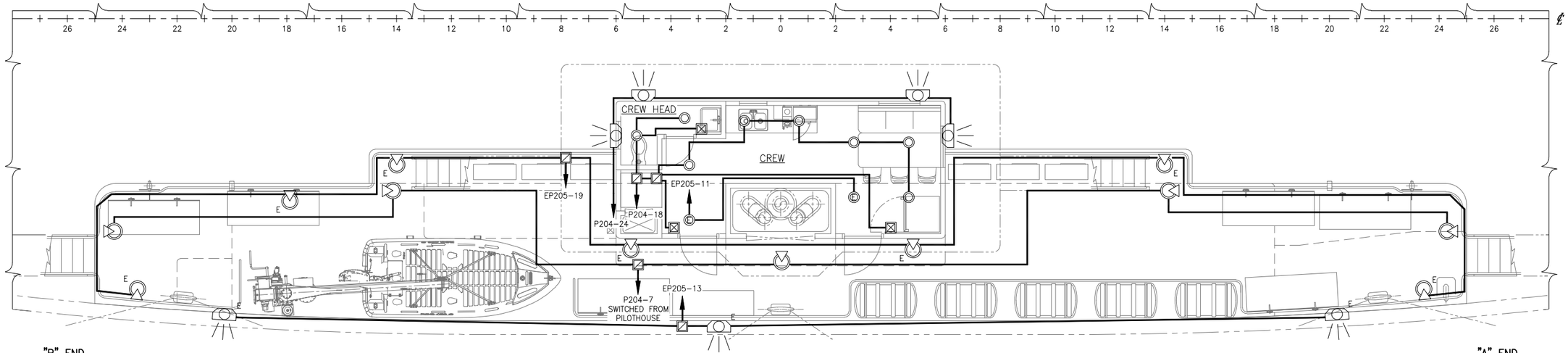


PLAN 5-4C
01 DECK RECEPTACLES
SCALE: 1/4"=1'-0"



PLAN 5-4A
01 DECK LIGHTING
SCALE: 1/4"=1'-0"

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D	18026-200-330-1	–
SCALE AS NOTED	FILE NAME 18026-200-330-1-	SHEET 5 OF 6

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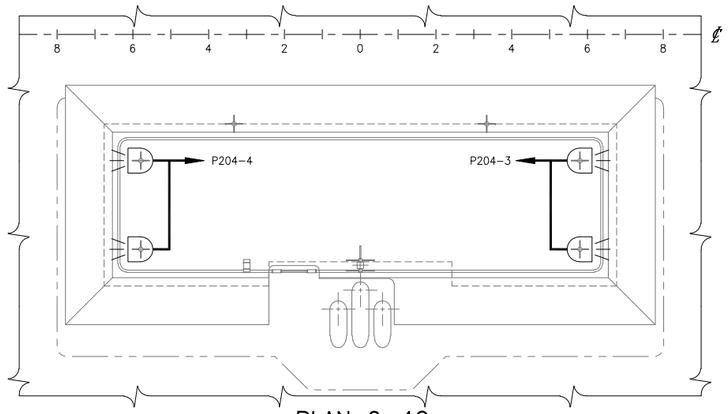

PLAN 6-4C
PILOT HOUSE TOP LIGHTING
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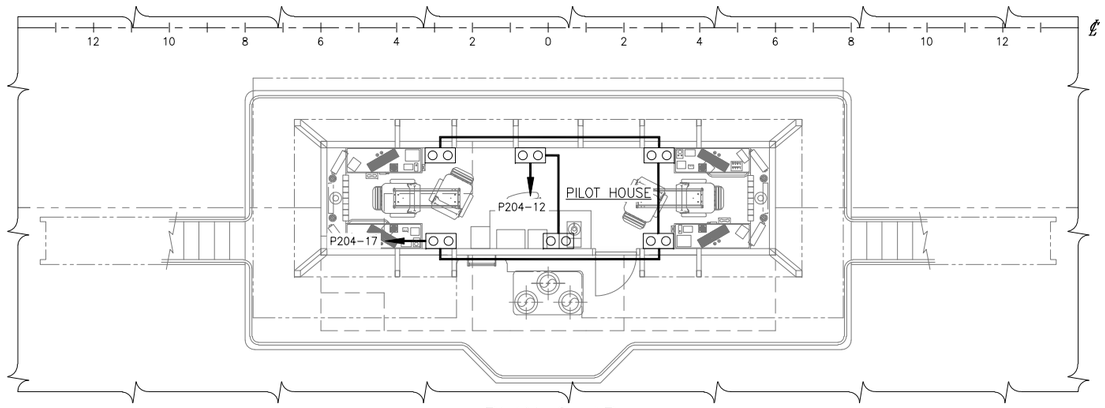
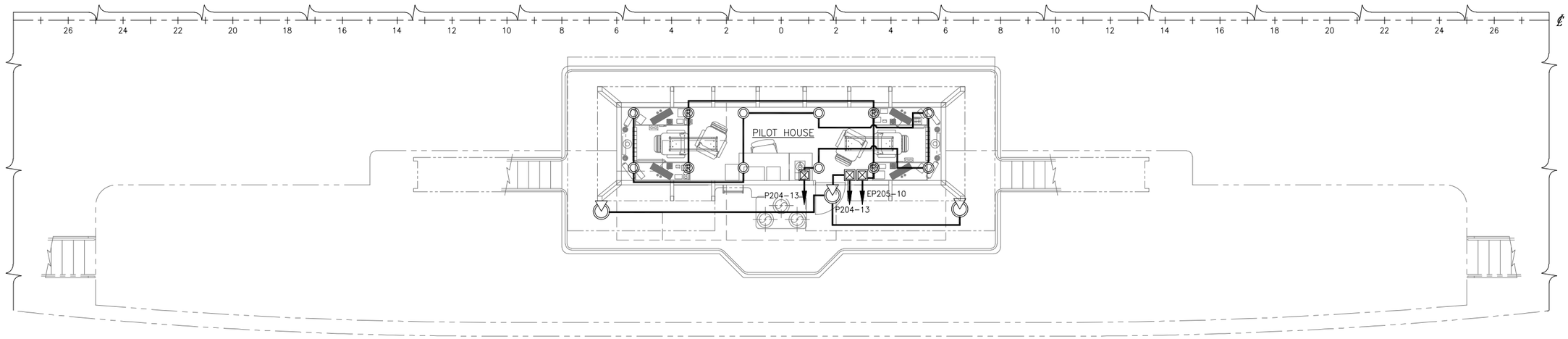


PLAN 6-4B
BRIDGE DECK RECEPTACLES
SCALE: 1/4"=1'-0"



PLAN 6-4A
BRIDGE DECK LIGHTING
SCALE: 1/4"=1'-0"

8/2/2018

Taylor Hertrick
48360
REGISTERED
PROFESSIONAL ENGINEER
STATE OF WASHINGTON
TAYLOR M HERTRICK

SIZE	DWG NO.	REV
D	18026-200-330-1	–
SCALE: AS NOTED	FILE NAME: 18026-200-330-1-	SHEET 6 OF 6

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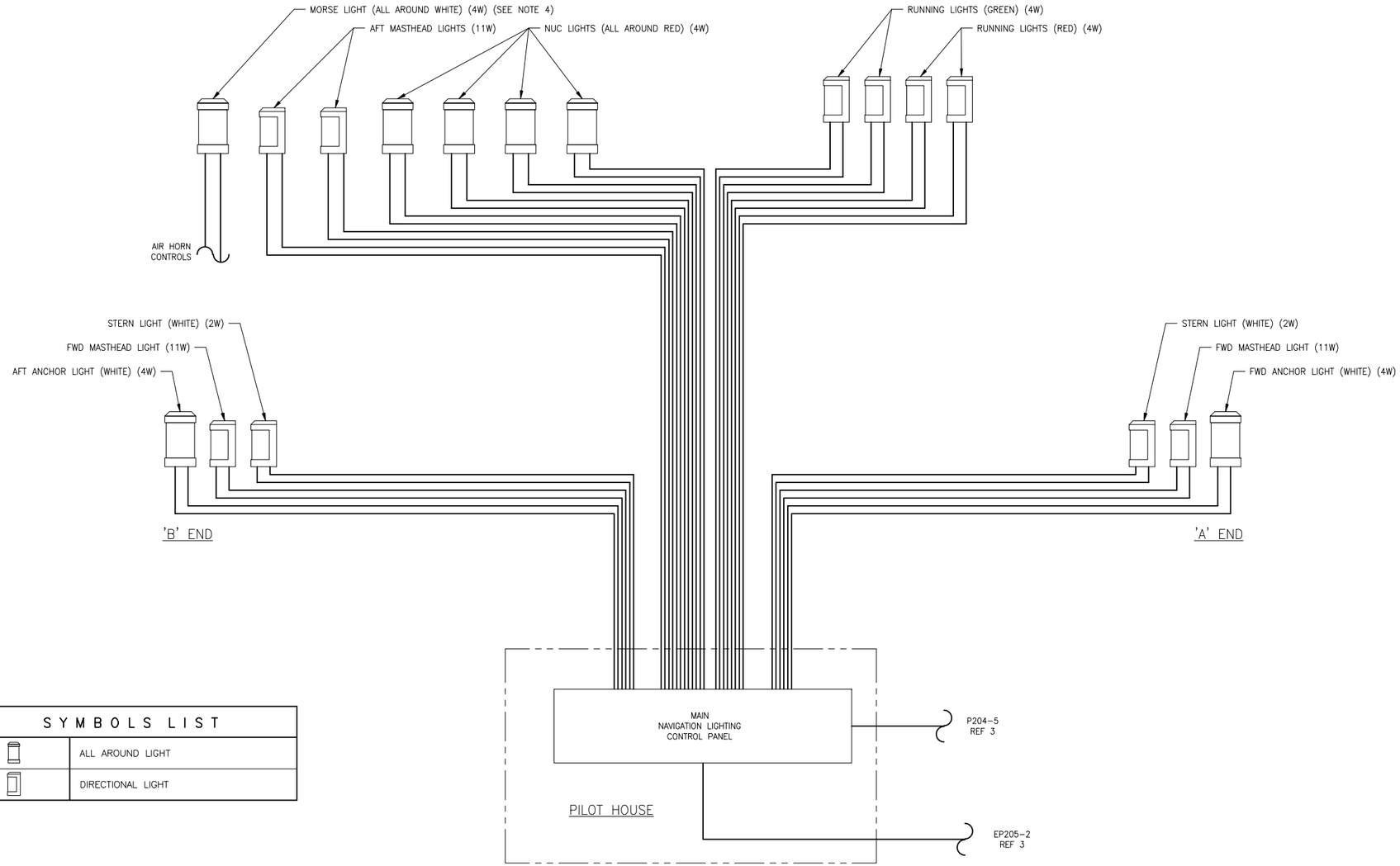
LIST OF NAVIGATION LIGHTS	
LIGHT	QUANTITY
FWD MASTHEAD LIGHT (WHITE)	2
STERN LIGHT (WHITE)	2
AFT MASTHEAD LIGHT (WHITE)	2
ANCHOR LIGHT (WHITE)	2
NOT UNDER COMMAND (RED)	4
RUNNING LIGHT (RED)	2
RUNNING LIGHT (GREEN)	2
MORSE LIGHT (WHITE)	1



SYMBOLS LIST	
	ALL AROUND LIGHT
	DIRECTIONAL LIGHT

DIAGRAM 1-4A
NAVIGATION LIGHTS BLOCK

REVISION HISTORY				
REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS AND IEEE-45 (2002).
3. POWER DISTRIBUTION CABLE SHALL MEET THE REQUIREMENTS OF IEEE-1580 (2001). CABLES SHALL USE 90 DEGREE C TYPE LSX OR LSE INSULATION AND TYPE L OR TPO JACKETING. UNLESS REQUIRED BY USCG, CABLE SHALL BE UNARMORED AND UNSHIELDED. CABLE TYPE DESIGNATIONS USE THE FOLLOWING ABBREVIATIONS.
   S- SINGLE CONDUCTOR
   D- TWO CONDUCTOR
   T- THREE CONDUCTOR
   F- FOUR CONDUCTOR
   CABLE MEETING THE SPECIFICATIONS OF MIL-C-24643 MAY BE SUBSTITUTED.
4. ALL AROUND WHITE MORSE LIGHT ON CENTER MAST SHALL BE CONFIGURED TO ACTIVATE WITH THE SHIP'S HORN.
5. ALL NAVIGATION LIGHTS SHALL BE LED TYPE WITH RANGE AND DEGREE OF VISIBILITY IN ACCORDANCE WITH 72 COLREGS AND REF 1.
6. THE NAVIGATION LIGHTING CONTROL PANEL SHALL BE CONFIGURED FOR AUTOMATIC TRANSFER BETWEEN "A" END FORWARD AND "B" END FORWARD OPERATION. A SIGNAL FROM THE PROPULSION CONTROL SYSTEM SHALL BE PROVIDED FOR THIS PURPOSE. SEE REF 1.
7. THE OWNER WILL PROCURE A CERTIFICATE OF ALTERNATE COMPLIANCE FOR THE NON-STANDARD NAVIGATION LIGHT ARRANGEMENT INDUCED BY VESSEL ASYMMETRY.
8. UNLESS NOTED OTHERWISE, NAVIGATION LIGHT LOCATIONS ARE MIRRORED ABOUT MIDSHIP.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS
3. 18026-200-320-1 PROPULSION AND SHIPS SERVICE ELECTRICAL ONE LINE DIAGRAM

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: NAVIGATION LIGHTING ARRANGEMENT AND BLOCK DIAGRAM

SIZE	DWG NO.	REV
D	18026-200-422-1	—

SCALE	FILE NAME	SHEET	OF
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DWN	MOD	CKD	APVD	APVD DATE
JEH		TMH	TMH	8/2/18

TAYLOR M HERRICK
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8/6/2018

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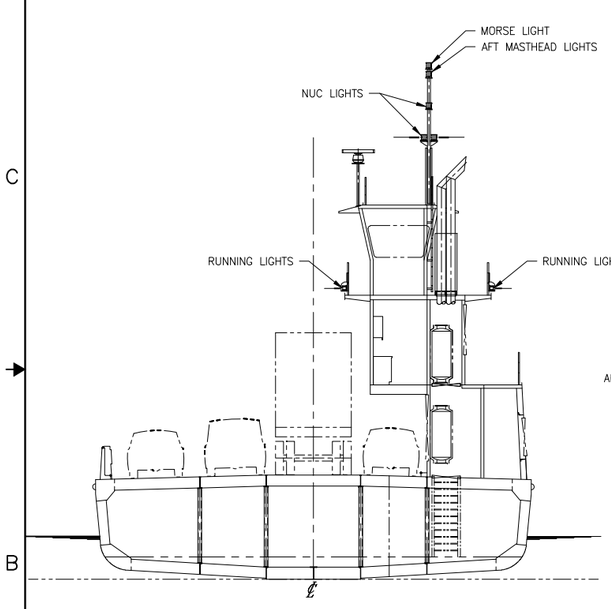
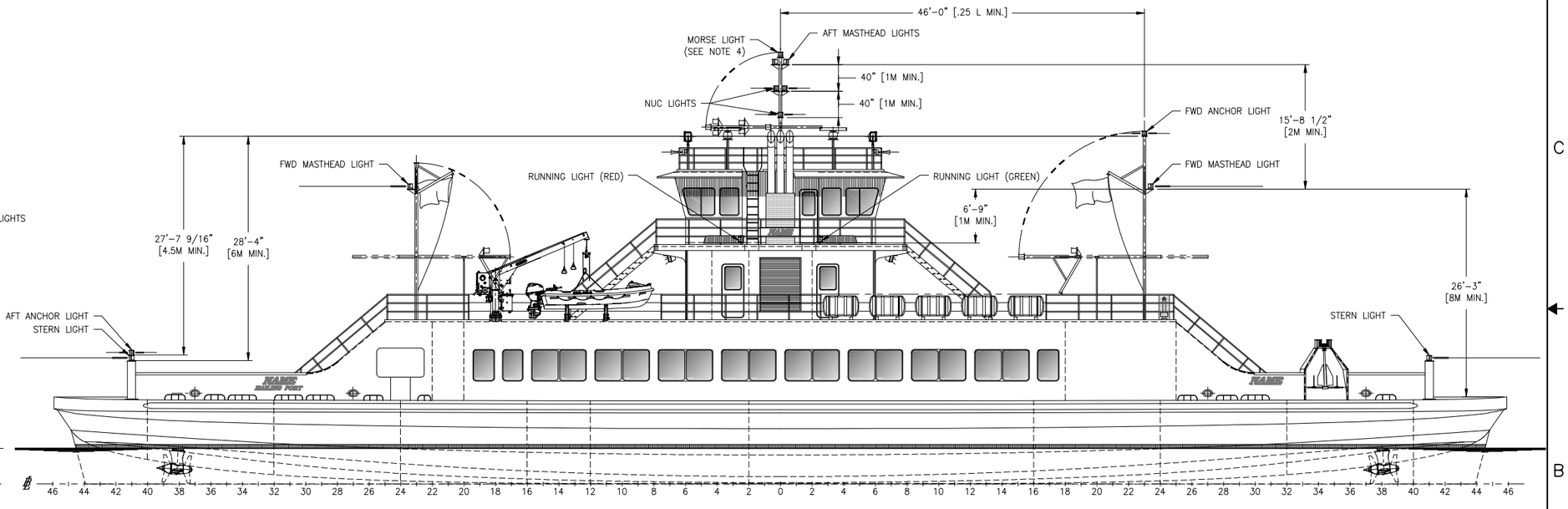


ELEVATION 2–6B
AFT ELEVATION



ELEVATION 2–3B
OUTBOARD PROFILE

TAYLOR M HERRICK
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8/6/2018

SIZE	DWG NO.	REV
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SCALE 1/8" = 1'–0"	FILE NAME 18026–200–422–1–	SHEET 2 OF 2

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MATERIAL SCHEDULE

SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
POTABLE WATER VENT AND FILL IN HOLD MAWP: 50 PSIG MAX TEMP: 120°F	ALL	COPPER, SEAMLESS HARD DRAWN, ASTM B88, TYPE K	FLANGE, 150#, ANSI B16.24, SOLDER JOINT, COPPER	ARAMID FIBERS WITH A NEOPRENE BINDER	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	–	–	WROT COPPER, ANSI B16.22, ASTM B75	–	–
FUEL OIL FILL & VENT, LO FILL & VENT, WO PUMP–OFF & VENT IN HOLD MAWP: 50 PSIG TEMP: 120°F	ALL	CARBON STEEL ASTM A53 OR A106, GRADE B SEAMLESS ANSI B36.10 SCH 40	FLANGE CARBON STEEL ASTM A105 ANSI B16.5 150# SLIP–ON OR WELD NECK	INORGANIC FIBERS WITH A NITRILE BINDER ABS FIRE–SAFE TYPE APPROVED		–	–	CARBON STEEL ASTM A234, GR WPB ANSI B16.9 BUTT WELD LONG RADIUS	–	–
SEA CHEST VENT IN HOLD MAWP: 50 PSIG TEMP: 120°F	ALL	CU–NI 90/10 ASTM B466 OR MIL–T–16420 SEAMLESS CLASS 200	UNION CU–NI 90/10 MSS SP–83 3000# SOCKET END	–		GATE: BRONZE ASTM B61 OR B62 SOCKET END	GATE: BRONZE OR MONEL RENEWABLE DISK & SEAT, SS STEM	CU–NI 90/10 MSS SP–83 3000# SOCKET END	–	–
ZERO DISCHARGE PUMP OFF & VENT IN HOLD MAWP: 50 PSIG TEMP: 120°F	ALL	CPVC SCH 80 ASTM D1784 ASTM F441	SOCKET FLANGE CPVC ASTM F439 ANSI B16.5 150#	EPDM RUBBER ASTM–D1331 FULL FACE		–	–	CPVC ASTM F439		SEE NOTE 21
POTABLE WATER FILL & VENT, ZERO–DISCHARGE TANK PUMP–OFF & VENT, BALLAST VENT, FO FILL & VENT, LO FILL & VENT, WO PUMP OFF & VENT, LAZ "A" & "B" VENTS IN WEATHER MAWP: 50 PSIG MAX TEMP: 120°F	ALL	STAINLESS STEEL ASTM A312 TYPE 316 ANSI B36.10 SCH 80	FLANGE STAINLESS STEEL ASTM A182 TY 316 ANSI B16.5 150# SLIP–ON OR WELD NECK UNION STAINLESS STEEL ASTM A182 TY 316 ANSI B16.11 3000#	SEE IN HOLD GASKET MATERIAL		BALL: STAINLESS STEEL BODY ASTM A351, TYP 316 THREADED OR SW, 1500 PSI	BALL: STAINLESS STEEL BALL RPTFE SEATS	STAINLESS STEEL ASTM A182 TYPE 316 ANSI B16.9 BUTT WELD LONG RADIUS	–	–

TABLE 1 – 5B
FILLS, VENTS & SOUNDING TUBES

SPACE	QTY.	FILL/PUMP–OFF			VENT		SOUNDING TUBE	
		SIZE	TYPE	VALVE	SIZE	VALVE	SIZE	TYPE
POTABLE WATER TANK	1	1 1/2"	FEMALE CAM–LOCK W/PLUG	BALL	2"	BALLCHECK	NONE	–
FUEL OIL TANKS	2	2"	QUICK DISCONNECT	BALL	2–1/2"	BALLCHECK	1 1/2"	FLUSH
EDG FUEL OIL TANK	1	–	–	–	1"	BALLCHECK	1 1/2"	FLUSH
LUBE OIL TANK	1	1 1/2"	MALE CAM–LOCK W/CAP & PLUG	BALL	2"	BALLCHECK	1 1/2"	SELF–CLOSING VALVE
WASTE OIL TANK	1	1 1/2"	MALE CAM–LOCK W/CAP & PLUG	BALL	2"	NONE	1 1/2"	SELF–CLOSING VALVE
ZERO–DISCHARGE TANKS	2	2"	MALE CAM–LOCK W/CAP & PLUG	BALL	3"	BALLCHECK	NONE	–
BALLAST TANKS	4	–	–	–	5"	BALLCHECK	1 1/2"	FLUSH
SEA CHESTS	2	–	–	NONE	1–1/2"	NONE	NONE	–
MARINE SANITATION DEVICE	1	–	–	–	5"	BALLCHECK	NONE	–
LAZ "A" AND "B"	2	–	–	–	2" (2 PLCS)	BALLCHECK	NONE	–

SYMBOLS LIST

- FILL/PUMP–OFF PIPING
- VENT PIPING
- DIRECTION OF FLOW ARROW
- PIPE UP
- PIPE DOWN
- VENT TERMINAL, FLAME SCREEN & BALL CHECK
- VENT TERMINAL WITH BALL CHECK
- MATERIAL TRANSITION
- SOUNDING TUBE TERMINAL
- BULKHEAD PENETRATION
- SELF–CLOSING VALVE
- CAMLOCK FITTING, TABLE 1–5B
- BALL VALVE
- UNION
- VENT TERMINAL
- FLANGE

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURER'S CERTIFIED DRAWINGS AS APPROPRIATE.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. AVOID POCKETS IN THE PIPE LINES. BOSSES AND VALVES OR SCREWED PLUGS SHALL BE FITTED TO ENABLE COMPLETE DRAINING OF PIPES WHERE POCKETS DO OCCUR.
5. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES. ALL COPPER–NICKEL AND COPPER PIPING SHALL BE SUPPORTED USING INSULATED HANGERS.
6. EACH VENT PIPE SHALL BE SLOPED CONTINUOUSLY TO PROVIDE EFFECTIVE DRAINAGE BACK TO THE TANK.
7. PROVIDE AN ENGRAVED LABEL PLATE AT EACH FILL, PUMP–OFF, VENT AND SOUND IN ACCORDANCE WITH REF 1.

GENERAL NOTES (CONT)

8. VENTS TERMINATING IN THE MACHINERY SPACE SHALL BE POSITIONED TO PRECLUDE THE POSSIBILITY OF OVERFLOWING ON ELECTRICAL EQUIPMENT, ENGINES, OR HEATED EQUIPMENT.
9. PROVIDE CONTAINMENT AT OIL FILLS, PUMP–OFFS AND VENTS. SUBMIT DETAILS OF CONTAINMENT TO OWNER FOR APPROVAL PRIOR TO FABRICATION. CONTAINMENT VOLUME SHALL BE A MINIMUM OF 21 GALLONS.
10. PIPE BENDS SHALL BE USED IN LIEU OF ELBOWS WHERE PRACTICABLE. BEND RADII FOR VENT AND OVERFLOWS SHALL BE 5 TIMES NOMINAL PIPE DIAMETER AND 10 FEET FOR SOUNDING TUBES.
11. SOUNDING TUBES THAT TERMINATE AT THE FREEBOARD DECK SHALL HAVE FLUSH SOUNDING TUBE CAPS, STAINLESS STEEL COMMERCIAL WELD–IN TYPE (NOT A PIPE COUPLING) WITH A BRONZE PLUG. EACH FLUSH SOUNDING TUBE SHALL HAVE THE TANK NAME LABELED ON OR NEAR THE CAP. SOUNDING TUBES THAT TERMINATE BELOW THE FREEBOARD DECK SHALL BE FITTED WITH A SELF–CLOSING GATE VALVE. EACH VALVE SHALL HAVE A LABEL INDICATING THE TANK SERVED.
12. SOUNDING TUBES SHALL BE AS VERTICAL AS PRACTICAL AND SHALL TERMINATE AS CLOSE AS POSSIBLE TO THE DEEPEST POINT OF THE TANK OR VOID.
13. NOTED VENT TERMINALS SHALL BE BALL CHECK TYPE WITH PROTECTIVE MESH SCREEN.
14. VENT TERMINALS FOR THE FUEL OIL, LUBE OIL, WASTE OIL SHALL BE FURNISHED WITH SS FLAME SCREENS.
15. SOUNDING TUBE TERMINALS SHALL BE LOCATED IN EASILY ACCESSIBLE LOCATIONS.
16. TANKS SHALL BE FITTED WITH LEVEL SENSORS, HIGH LEVEL ALARMS, AND LOW LEVEL ALARMS PER REF 1. LEVEL SENSORS AND ALARMS SHALL BE INTERFACED WITH THE SHIP'S ALARM AND MONITORING SYSTEM. SEE REF 1.
17. WHERE STEEL PIPING PENETRATES BULKHEADS OR DECKS, REINFORCING SLEEVES SHALL BE USED. SEE DETAIL 2–3B.
18. SEE REFERENCES 4–9 FOR TANK DETAILS.
19. SEE REFERENCE 6 FOR SANITARY DRAINS VENT LINES.
20. MATERIAL TRANSITIONS FROM STEEL TO COPPER SHALL BE ACCOMPLISHED VIA FLANGED JOINTS, THE JOINTS SHALL BE FITTED WITH GALVANIC ISOLATION KITS TO PREVENT DIRECT METAL TO METAL CONTACT.
21. CPVC PIPE AND FITTINGS SHALL HAVE A USCG CERTIFICATE OF APPROVAL THAT STATES CPVC PIPE AND FITTINGS MEET LOW FLAME SPREAD, AND TOXICITY REQUIREMENTS OF THE FTP CODE ANNEX 1, PARTS 2 AND 5. INSTALL PIPING IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION GUIDELINES.
22. WHERE PLASTIC OR COPPER PIPE PENETRATES BULKHEADS OR DECKS, STEEL PENETRATION SLEEVES WITH USCG APPROVED SEALANT AND CRUSHING SLEEVES SHALL BE USED. SEALANT AND SLEEVES SHALL BE RATED FOR WATERTIGHT AND A60 APPLICATIONS. INSTALL PIPING TRANSITS IN ACCORDANCE WITH MANUFACTURER'S APPROVED INSTALLATION DETAILS.
23. EMERGENCY DIESEL GENERATOR FUEL TANK SHALL BE PROVIDED WITH AN OVERFLOW PER REF 5. DRIP CONTAINMENT SHALL BE PROVIDED FOR THE VENT, IT NEED NOT MEET THE 21 GALLON REQUIREMENT OF NOTE 9.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

REFERENCES

1. 18026–200–832–1 TECHNICAL SPECIFICATION
2. 18026–200–101–1 PROFILES AND DECK ARRANGEMENTS
3. 18026–200–201–1 MACHINERY ARRANGEMENT
4. 18026–200–256–1 COOLING SYSTEM SCHEMATIC
5. 18026–200–261–1 FUEL OIL PIPING SYSTEM SCHEMATIC
6. 18026–200–528–1 SANITARY DRAINS SCHEMATIC
7. 18026–200–529–1 BILGE AND BALLAST PIPING SCHEMATIC
8. 18026–200–529–2 LUBE OIL AND WASTE OIL PIPING SCHEMATIC
9. 18026–200–533–1 POTABLE AND SANITARY WATER PIPING SCHEMATIC
10. 18026–200–521–1 FIRE MAIN SYSTEM SCHEMATIC

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

8/3/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: FILLS, VENTS, AND SOUNDS

SIZE	DWG NO.	REV
D	18026–200–506–1	–

SCALE	FILE NAME	SHEET
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DWN	MOD	CKD	APVD	APVD DATE
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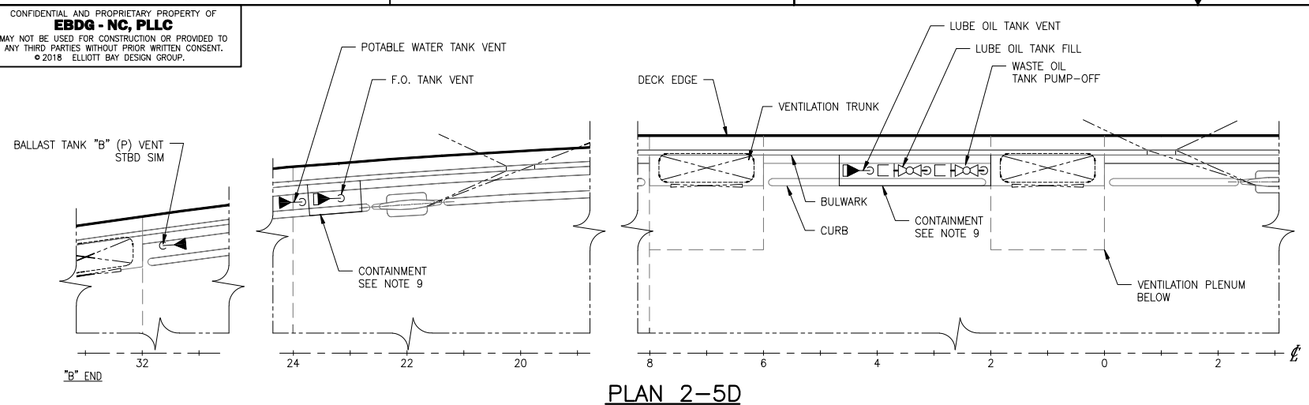
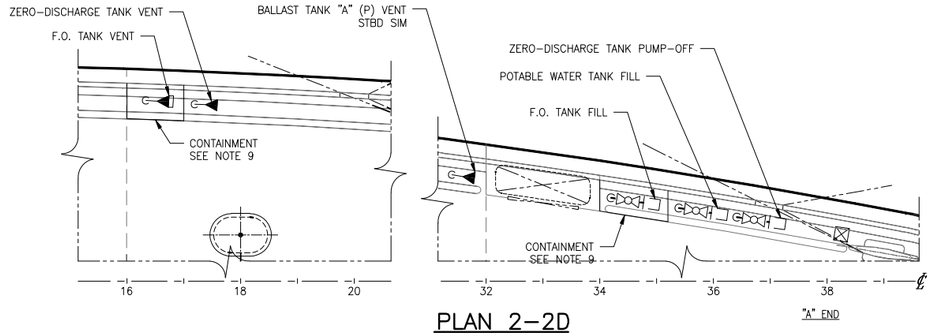
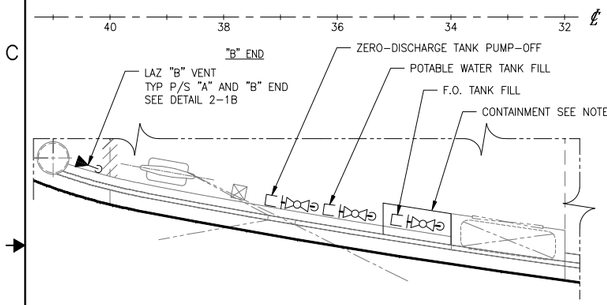


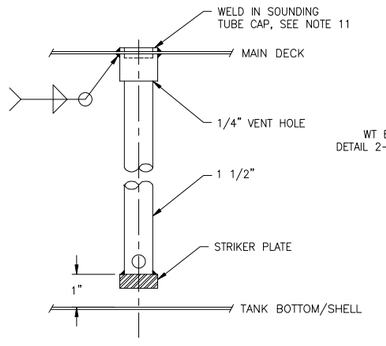
PLAN 2–5D
VENTS AND FILL/PUMP–OFF CONNECTIONS
MAIN DECK, PORT SIDE, B–END
SEE TABLE 1–5B FOR SIZING



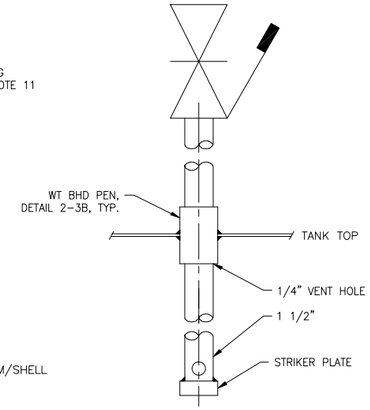
PLAN 2–2D
VENTS AND FILL/PUMP–OFF CONNECTIONS
MAIN DECK, PORT SIDE, A–END
SEE TABLE 1–5B FOR SIZING



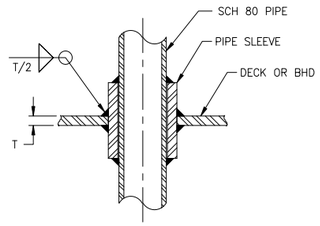
PLAN 2–6B
VENTS AND FILL/PUMP–OFF CONNECTIONS
MAIN DECK, STBD SIDE, B–END
SEE TABLE 1–5B FOR SIZING



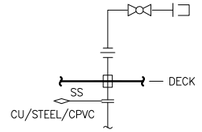
DETAIL 2–5B
SOUNDING TUBE AT FREEBOARD DECK
FUEL OIL & BALLAST TANKS



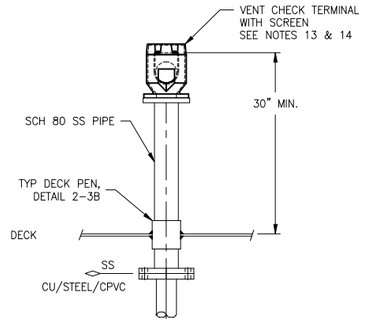
DETAIL 2–4B
SOUNDING TUBE IN ENGINE ROOM
WASTE OIL & LUBE OIL TANKS



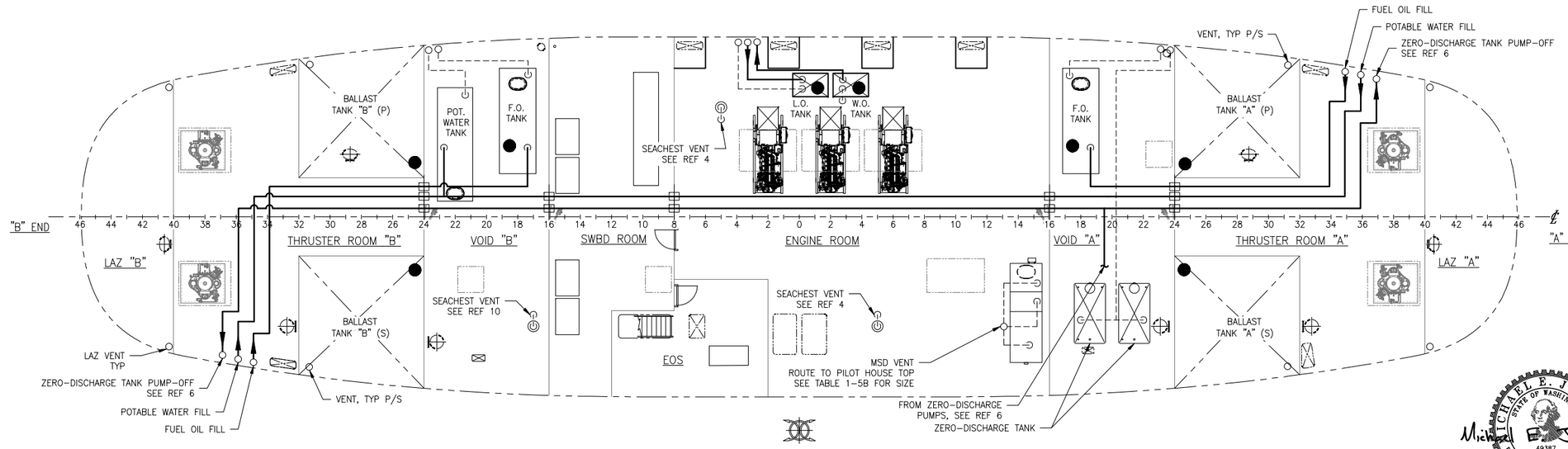
DETAIL 2–3B
TYP DECK/BHD PENETRATION



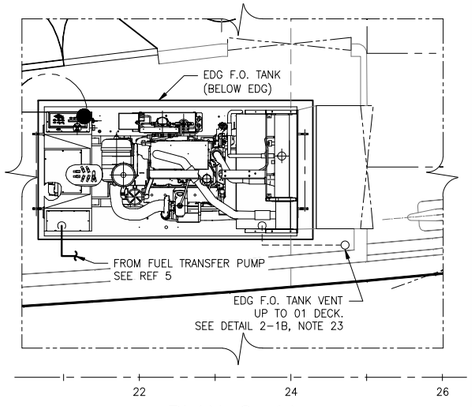
DETAIL 2–2B
TYPICAL DECK CONNECTION



DETAIL 2–1B
TYPICAL VENT



PLAN 2–4A
HOLD



PLAN 2–1A
E–GEN ROOM

MICHAEL E. JOHNSON
STATE OF WASHINGTON
49387
REGISTERED
PROFESSIONAL ENGINEER
Michael E. Johnson
8/3/2018

SIZE	DWG NO.	REV
D	18026–200–506–1	–
SCALE NTS	FILE NAME 18026–200–506–1–	SHEET 2 OF 2

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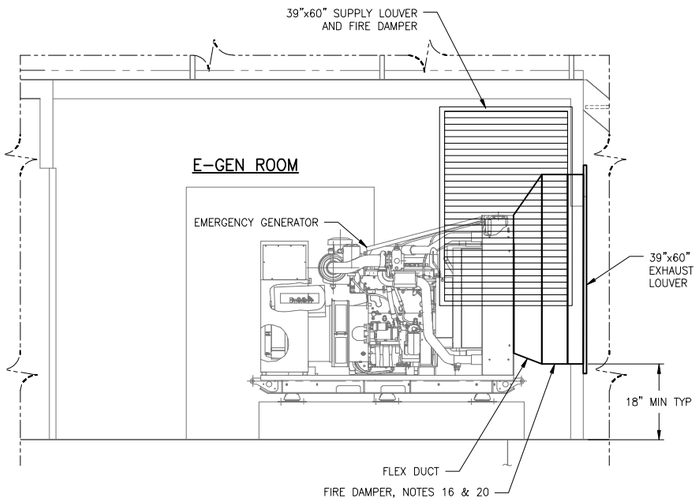
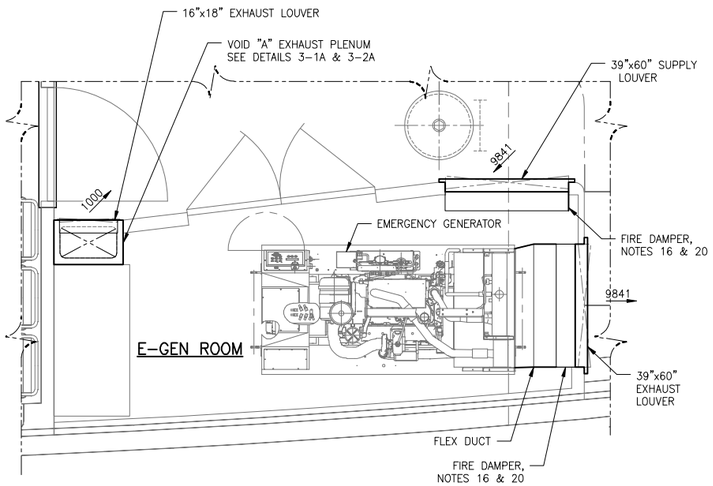


ELEVATION 1-6B
E-GEN ROOM VENTILATION
SCALE: 1/2"=1'-0"



PLAN 1-6A
E-GEN ROOM VENTILATION
SCALE: 1/2"=1'-0"

EQUIPMENT LIST

QTY.	SERVICE	TYPE	SIZE/MODEL	CAPACITY	DRIVE	REMARKS
4	ENGINE ROOM SUPPLY FAN	AXIAL FAN	ø15"	4500 CFM @1.7 IN H2O	208V/3ϕ/60Hz 3 HP TEAO MOTOR 3450 RPM	–
4	ENGINE ROOM SUPPLY FIRE DAMPER	A-60 SQUARE	18"x18"	–	24 VDC ELECTRIC ACTUATOR	316SS CONSTRUCTION USCG APPROVED
8	ENGINE ROOM SUPPLY LOUVER	INDUSTRIAL SINGLE DEFLECTION	12"x18"	–	MANUAL	3" AIRFOIL BLADES ON 3" CENTERS STEEL FRAME
1	ENGINE ROOM EXHAUST FIRE DAMPER	A-60 SQUARE	60"x78"	–	24 VDC ELECTRIC ACTUATOR	316SS CONSTRUCTION USCG APPROVED
4	ENGINE ROOM MIST ELIMINATOR	IMPINGEMENT TYPE	15"x36" OPEN AREA	4500 CFM	–	FACE DRAIN
2	E-GEN ROOM FIRE DAMPER	A-60 SQUARE	39"x60"	–	24 VDC ELECTRIC ACTUATOR	316SS CONSTRUCTION USCG APPROVED
2	VOID SUPPLY FAN	AXIAL FAN	ø12"	1000 CFM @ 1.3 IN H20	120V/1ϕ/60Hz 0.5 HP TEAO MOTOR 3450 RPM	–
2	VOID MIST ELIMINATOR	IMPINGEMENT TYPE	12"x12" OPEN AREA	1000 CFM	–	FACE DRAIN
2	THRUSTER ROOM SUPPLY FAN	AXIAL FAN	ø15"	2000 CFM @ 1.4 IN H20	208V/3ϕ/60Hz 1 HP TEAO MOTOR 3450 RPM	–
2	THRUSTER ROOM MIST ELIMINATOR	IMPINGEMENT TYPE	15"x20" OPEN AREA	2000 CFM	–	FACE DRAIN
1	SWITCHBOARD ROOM SUPPLY FAN	INLINE CENTRIFUGAL	ø4"	50 CFM 0.5 IN H20	120V/1ϕ/60Hz 20.4W MOTOR 2886 RPM	–
1	SWITCHBOARD ROOM OUTDOOR AIR FILTER	–	–	MERV 8	–	–
2	SWITCHBOARD ROOM FAN COIL	CHILLED WATER FAN COIL	–	48,000 BTUH	208V/1ϕ/60Hz 1HP MOTOR	SEE NOTE 37
2	SWITCHBOARD ROOM RETURN AIR FILTER	–	–	MERV 8	–	–
1	EOS FAN COIL	CHILLED WATER FAN COIL	–	36,000 BTUH 2KW HEAT	208V/1ϕ/60Hz MOTOR, 4.1 FLA 2KW HEATER	ELECTRIC HEATING ELEMENT
1	EOS RETURN AIR FILTER	–	–	MERV 8	–	–
1	EOS SUPPLY FAN	INLINE CENTRIFUGAL	ø4"	50 CFM 0.5 IN H20	120V/1ϕ/60Hz 20.4W MOTOR 2886 RPM	–
4	MACHINERY SPACE HVAC CHILLER	SEAWATER COOLED MARINE CHILLER	–	36,000 BTUH	208V/3ϕ/60Hz 9.1A	316SS CHASSIS CU-NI CONDENSER SCROLL COMPRESSOR SEE NOTE 37
2	CHILLED WATER PUMP	CENTRIFUGAL	–	30 GPM @ 90 FT TDH	2 HP 208V/3ϕ/60Hz 3500 RPM	316SS BODY AND IMPELLER SEE NOTES 29, 34
3	MACHY SPACE UNIT HEATER	ELECTRIC UNIT HEATER	–	30 GPM @ 11 FT TDH	208V/3ϕ/60Hz 5KW HEATER 1/4 HP FAN MOTOR	SS CONSTRUCTION, BUILT IN THERMOSTAT

GENERAL NOTES CONT.

14. FANS SHALL BE LABELED WITH NAMEPLATES IDENTIFYING THE UNIT, LISTING THE SYSTEM SERVED BY THE FAN, THE FAN VOLUME IN CUBIC FEET PER MINUTE (CFM), STATIC PRESSURE RATING AT SPECIFIED VOLUME, MOTOR FULL LOAD AMPERAGE, FAN SPEED, AND MOTOR SPEED FOR BELT DRIVEN UNITS, AND MOTOR HORSEPOWER. AIRFLOW DIRECTION SHALL BE IDENTIFIED ON THE FAN EXTERIOR BODY.
15. FIRE DAMPERS SHALL BE PROVIDED WHERE REQUIRED BY REGULATION AND WHERE SHOWN IN THIS DIAGRAM.
16. FIRE DAMPERS SHALL BE ELECTRICALLY ACTUATED, POWER TO OPEN, SPRING CLOSED ON LOSS OF POWER. IN ADDITION, THEY SHALL HAVE ELECTRICAL THERMAL RELEASE, CLOSE AUTOMATICALLY AT A TEMPERATURE OF 162˚F, AND BE CAPABLE OF MANUAL OPERATION.
17. CLOSURE STATUS OF FIRE DAMPERS SHALL BE VISIBLE OUTSIDE THE DUCT. ACCESS COVERS SHALL BE INSTALLED TO ALLOW SERVICE OF DAMPERS AND ACTUATORS IF REQUIRED.
18. ENGINE ROOM AND EOS VENTILATION FANS SHALL SHUT DOWN AND FIRE DAMPERS SHALL CLOSE AUTOMATICALLY UPON RELEASE OF THE FIRE SUPPRESSION SYSTEM INTO THE SPACE. SEE REFERENCE 1.
19. DUCTS SHALL BE ROUTED AS HIGH IN THE OVERHEAD AS PRACTICABLE.
20. EMERGENCY GENERATOR FIRE DAMPERS SHALL BE CONFIGURED TO OPEN ON GENERATOR START AND CLOSE ON GENERATOR STOP.
21. SLIDING CLOSURE PLATES SHALL BE STORED IN STAINLESS STEEL BRACKETS ADJACENT TO WEATHER LOUVERS AND MIST ELIMINATORS. CLOSURE PLATES SHALL BE STOWED IN A SECURE MANNER WHICH ALSO ALLOWS FOR QUICK INSTALLATION.
22. DAMPERS USED AS WEATHER CLOSURES SHALL BE TESTED FOR WEATHER TIGHTNESS IN THE PRESENCE OF A USCG INSPECTOR.
23. ADJUST TERMINAL SIZES AND PROVIDE BALANCING DAMPERS AS REQUIRED TO BALANCE SYSTEM WITHIN 10% OF NOTED AIR FLOWS.
24. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
25. PROVIDE GAUGE PIPING ASSEMBLIES AND MATERIALS FOR GAUGES AND INSTRUMENTS CONFIGURED IN ACCORDANCE WITH ASTM F721. VALVES, TUBING, AND FITTINGS SHALL BE COPPER TUBING.
26. AVOID POCKETS IN THE PIPE LINES. LOW POINT DRAINS AND HIGH POINT VENTS SHALL BE FITTED TO ENABLE DRAINING AND VENTING OF PIPES WHERE POCKETS DO OCCUR. PROVIDE A 1" VALVED DRAIN WITH PLUG AT THE LOWEST POINT OF EACH COOLING CIRCUIT. PROVIDE 1/2" BOSSES WITH PLUGS AT ALL HIGH POINTS.
27. CHILLED WATER PIPING SHALL BE CLEANED AND TESTED IN ACCORDANCE WITH USCG REQUIREMENTS. SEE REF 1.
28. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708 WITH J-BAND HANGARS OR SIMILAR.
29. TOTAL DYNAMIC HEAD OF PUMPS FOR REQUIRED FLOW ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL PROVIDE PUMPS MEETING THE REQUIRED FLOW WITH THE INSTALLED PIPING SYSTEM. PUMP MOTORS SHALL BE SELECTED TO PREVENT MOTOR OVERLOAD OVER THE ENTIRE PUMP OPERATING RANGE.
30. WHERE PIPING PENETRATES BULKHEADS OR DECKS, WELDED SLEEVES OR PENETRATION SLEEVES WITH SLIPSIL SEALING PLUGS OR RISE/NOFIRNO SEALING MAY BE USED. INSTALL PIPING TRANSITS IN ACCORDANCE WITH REGULATORY REQUIREMENTS AND MANUFACTURER'S APPROVED INSTALLATION DETAILS.
31. INSTALL PIPING INSULATION IN ACCORDANCE WITH ASTM F683 AND REF 1.
32. EXPANSION TANK SHALL BE SIZED TO SUIT INTALLED CHILLED WATER PIPING SYSTEM.
33. TEMPERATURE TRANSDUCERS AND THERMOMETERS SHALL BE INSTALLED IN THERMOWELLS.
34. CHILLED WATER PUMPS SHALL BE CONFIGURED FOR RUNNING/STANDBY OPERATION. STANDBY PUMP SHALL AUTOMATICALLY START IF RUNNING PUMP FAILS. PUMP RUNNING INDICATION AND FAILOVER FROM RUNNING TO STANDBY PUMP SHALL BE INDICATED IN THE SHIPS ALARM AND MONITORING SYSTEM. SEE REF 1.
35. CONNECT TO SHIPS ALARM AND MONITORING SYSTEM TO PROVIDE REMOTE PRESSURE INDICATION AND LOW PRESSURE ALARM.
36. AUTOMATIC BALANCING VALVES SHALL HAVE BRASS OR BRONZE BODIES, AND REPLACEABLE ORIFICE CARTRIDGES.
37. MACHINERY SPACE HVAC CAPACITY IS BASED ON PRELIMINARY VENDOR DATA AND SUBJECT TO CHANGE. THE CONTRACTOR SHALL SELECT HVAC EQUIPMENT TO SUIT THE INSTALLED EQUIPMENT AND ADJUST THE HVAC SYSTEM DESIGN TO SUIT.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC ONLY AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT AND IS SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.
3. DUCT VELOCITIES SHALL GENERALLY BE LIMITED TO 3000 FPM.
4. ALL INSTALLED DUCTWORK SHALL BE AIRTIGHT. DUCTWORK SHALL BE MADE OF HOT-DIPPED GALVANIZED STEEL SHEET METAL, WITH THE MINIMUM THICKNESS AND REINFORCEMENT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS AND APPLICABLE USCG REGULATIONS, WHICHEVER IS GREATER. BURNED OFF GALVANIZING SHALL BE REPLACED WITH A SPRAY-ON TYPE GALVANIZING COATING. DUCTS SHALL BE SUITABLY SUPPORTED AND STIFFENED ON THE OUTSIDE TO PREVENT PANTING. ALL FASTENING SHALL BE STAINLESS STEEL. SEE REFERENCE 1.
5. DUCTING SHALL BE RUN AS DIRECTLY AS POSSIBLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS.
6. TAKEDOWN JOINTS SHALL BE PROVIDED AT MAXIMUM 8 FT INTERVALS WHICH ALLOW DISASSEMBLY AND REMOVAL OF DUCTING WITHOUT REMOVAL OR MODIFICATION OF PERMANENT STRUCTURE.
7. DUCTS SHALL BE FITTED WITH REMOVABLE ACCESS PANELS FOR CLEANING OF INTERNAL DUCT SURFACES. SUCH PANELS SHALL BE PROVIDED AT INTERVALS OF NOT MORE THAN 30 FEET, AND IMMEDIATELY UPSTREAM OF SPLITTERS OR TURNING VANES.
8. DUCTING SHALL BE ADEQUATELY SUPPORTED BY HANGERS SPACED AT REGULAR INTERVALS AND RIGIDLY ATTACHED TO VESSEL STRUCTURE.
9. ELBOWS WITH A BEND RADIUS LESS THAN 1 TIMES THE DIAMETER SHALL HAVE SPLITTERS OR TURNING VANES.
10. WEATHER LOUVERS SHALL BE ALUMINUM WITH A STAINLESS STEEL BUG SCREEN. WEATHER LOUVERS SHALL BE REMOVABLE AND FASTENED TO SUPERSTRUCTURE WITH STAINLESS STEEL FASTENINGS.
11. DRAINS SHALL BE PROVIDED AT LOW POINTS OF ALL VENTILATION DUCTING TO ALLOW COMPLETE DRAINAGE OF ANY WATER TRAPPED IN THE DUCTING SYSTEM.
12. VENTILATION FANS SHALL BE MOUNTED USING NOISE/ISOLATION KITS.
13. TO THE EXTENT PRACTICABLE, FANS OF THE SAME SIZE SHALL BE INTERCHANGEABLE.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS
3. 18026-200-150-1 SUPERSTRUCTURE MAIN DECK TO 01 DECK
4. 18026-200-201-1 MACHINERY ARRANGEMENT
5. 18026-200-150-3 MAIN DECK BULWARKS
6. 18026-200-120-3 HULL TRANSVERSE BULKHEADS
7. 18026-200-259-1 EXHAUST ARRANGEMENT
8. 18026-200-256-1 COOLING SYSTEM SCHEMATIC

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MORNS HARBOR, NC 27953

MICHAEL E. JOHNSON STATE OF WASHINGTON 49387 REGISTERED PROFESSIONAL ENGINEER
Michael E. Johnson
8/3/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

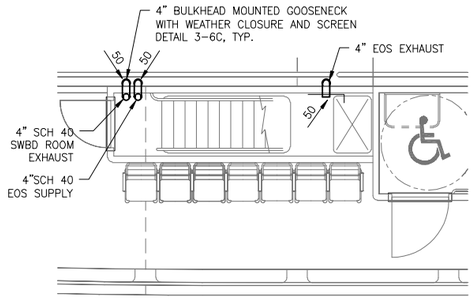
TITLE: MACHINERY VENTILATION ARRANGEMENT

SIZE	DWG NO.	REV
D	18026-200-513-1	–

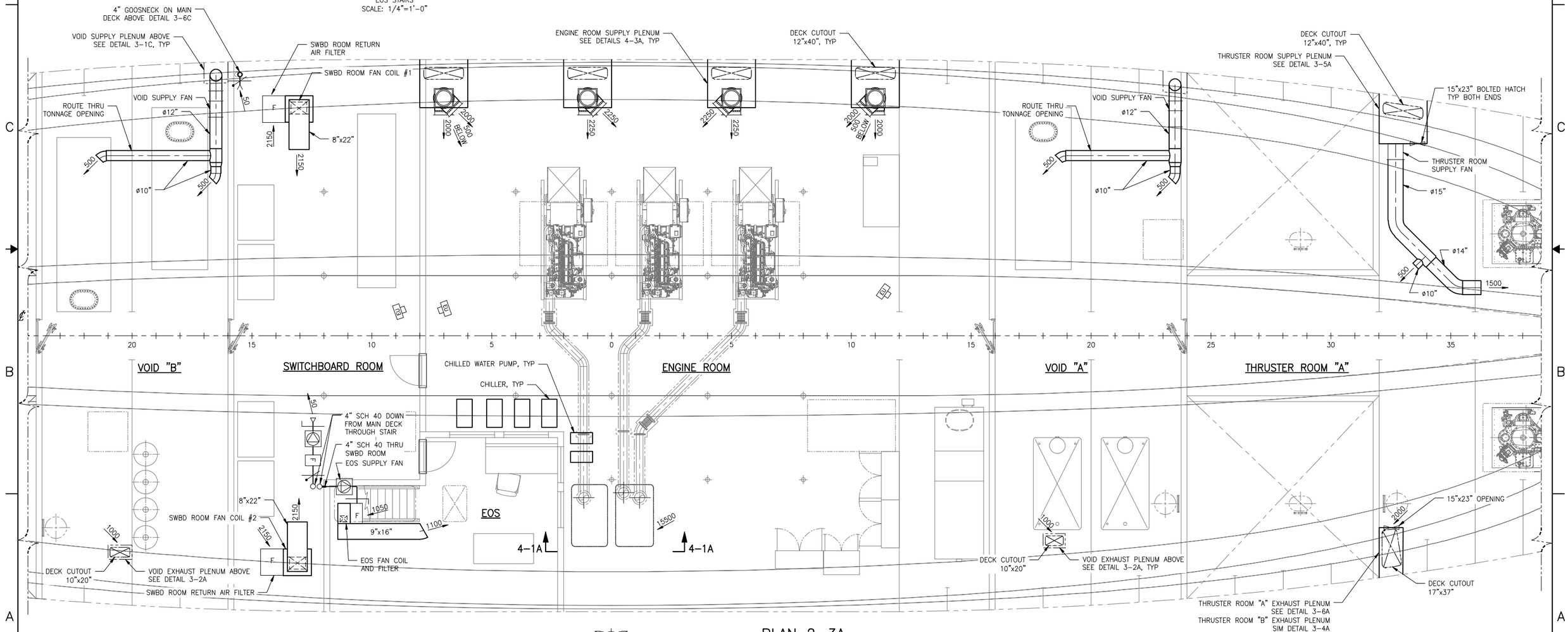
SCALE	FILE NAME	SHEET
AS NOTED	18026-200-513-1-	1 OF 4

DWN	MOD	CKD	APVD	APVD DATE
JEH		NJB	MEJ	8/2/18

HVAC SYMBOLS LIST			
	SUPPLY AIR DUCT	XXX	CFM TO OR FROM TERMINAL
	DUCT UP		FIRE DAMPER (BHD)
	FAN		BALANCING DAMPER (MANUAL)
F	FILTER	EU	ELECTRIC UNIT HEATER
	SUPPLY TERMINAL WITH SCREEN		BALL VALVE W/ SCREWED PLUG
	EXHAUST TERMINAL		



PLAN 2-5D
HOLD VENTILATION
EOS STAIRS
SCALE: 1/4"=1'-0"

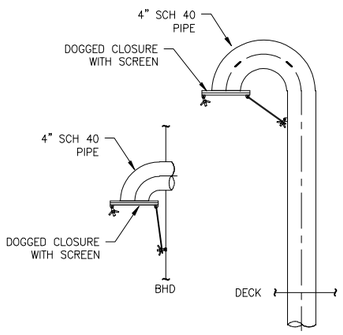


PLAN 2-3A
HOLD VENTILATION
A-END TRUSTER ROOM SHOWN, B-END THRUSTER RM OPP/SIM
SCALE: 1/4"=1'-0"

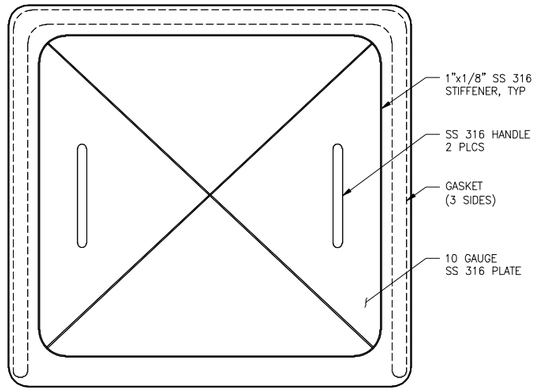
8/3/2018

MICHAEL E. JOHNSON — STATE OF WASHINGTON — 49387 — REGISTERED PROFESSIONAL ENGINEER

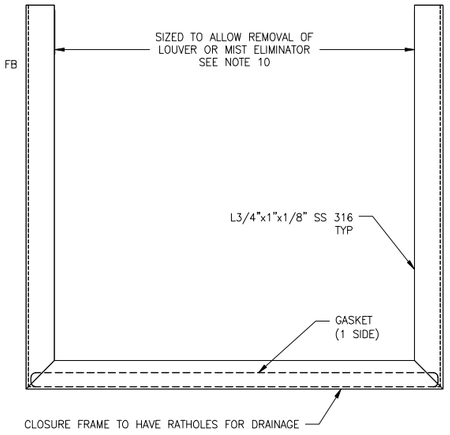
SIZE	DWG NO.	REV
D	18026-200-513-1	–
SCALE: AS NOTED	FILE NAME: 18026-200-513-1-	SHEET 2 OF 4



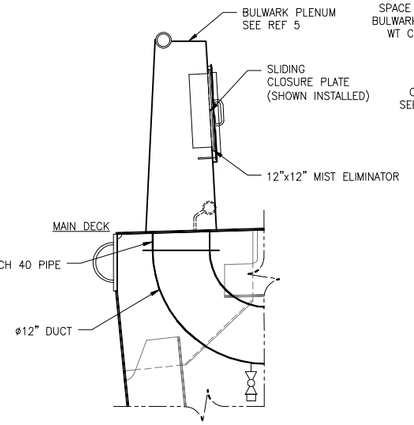
DETAIL 3–6C
SWBD ROOM AND EOS VENT TERMINALS
NTS



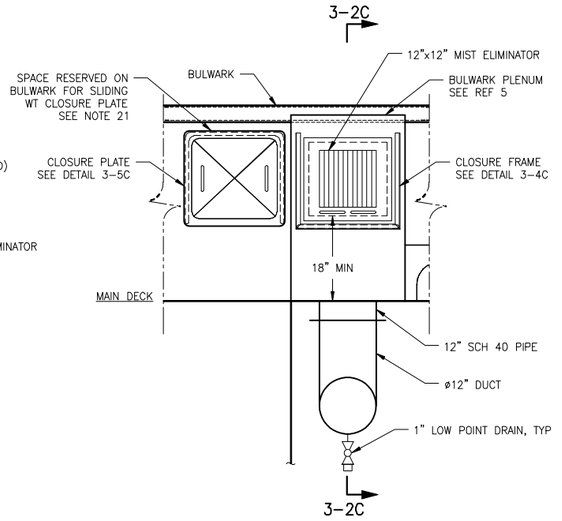
DETAIL 3–5C
TYPICAL SLIDING CLOSURE PLATE
3"=1'–0"



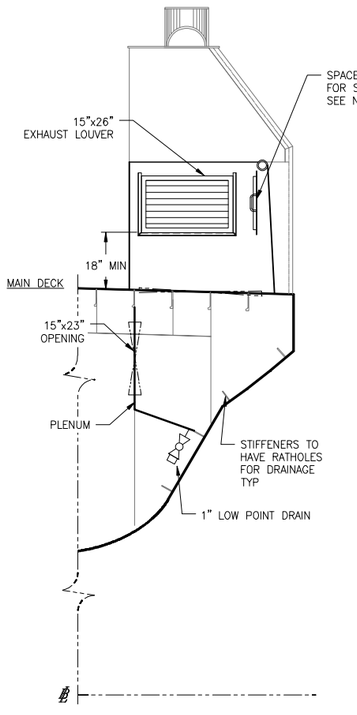
DETAIL 3–4C
TYPICAL SLIDING CLOSURE FRAME
3"=1'–0"



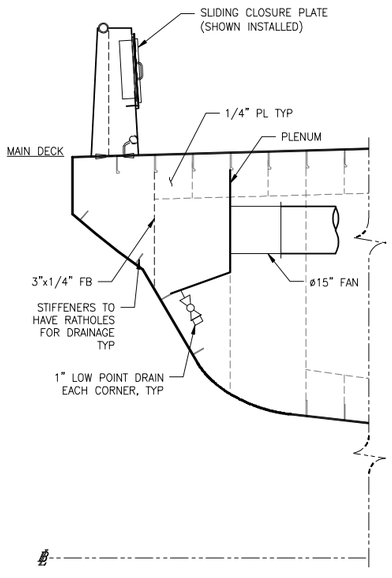
SECTION 3–2C
VOID SUPPLY PLENUM
SCALE: 3/4"=1'–0"



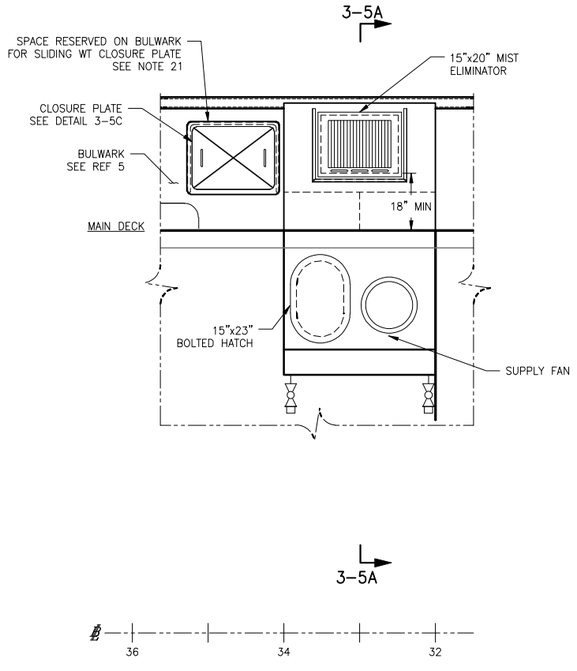
ELEVATION 3–1C
VOID SUPPLY PLENUM
SCALE: 3/4"=1'–0"



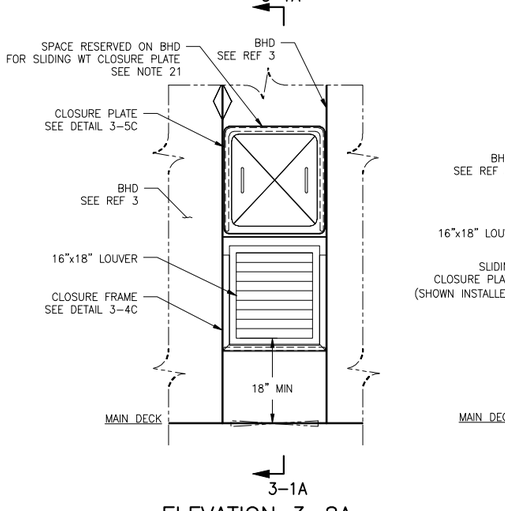
SECTION 3–6A
THRUSTER ROOM "A" EXHAUST
FR 32A – LOOKING AFT
SCALE: 1/2"=1'–0"



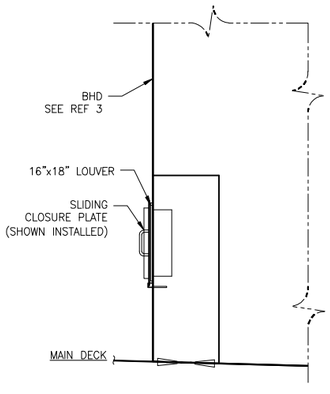
SECTION 3–5A
THRUSTER ROOM "B" SUPPLY
LOOKING FWD TO FR 32B
THRUSTER ROOM "A" SUPPLY SIM/OPP
THRUSTER ROOM "B" EXHAUST SIM
SCALE: 1/2"=1'–0"



ELEVATION 3–4A
THRUSTER ROOM "B" SUPPLY
LOOKING PORT
THRUSTER ROOM "A" SUPPLY SIM/OPP
THRUSTER ROOM "B" EXHAUST SIM
SCALE: 1/2"=1'–0"



ELEVATION 3–2A
VOID EXHAUST PLENUM
"A" END SHOWN – "B" END SIM/OPP
SCALE: 3/4"=1'–0"



SECTION 3–1A
VOID EXHAUST PLENUM
SCALE: 3/4"=1'–0"

Michael E. Johnson
8/3/2018

SIZE	DWG NO.	REV
D	18026–200–513–1	–
SCALE: AS NOTED	FILE NAME: 18026–200–513–1–	SHEET 3 OF 4

MATERIAL SCHEDULE

SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
CHILLED WATER MAWP: 50 PSIG MAX TEMP: 110°F	ALL	COPPER, SEAMLESS HARD DRAWN, ASTM B88, TYPE K	UNION ANSI B16.22, MSS-SP104	ARAMID FIBERS WITH A NEOPRENE BINDER	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BALL: BRONZE 150# THREADED OR SOLDER ENDS, ASTM B62 MSS-SP-72	CHROME PLATED BALL, PTFE SEATS	WROT COPPER, ANSI B16.22, ASTM B75	–	

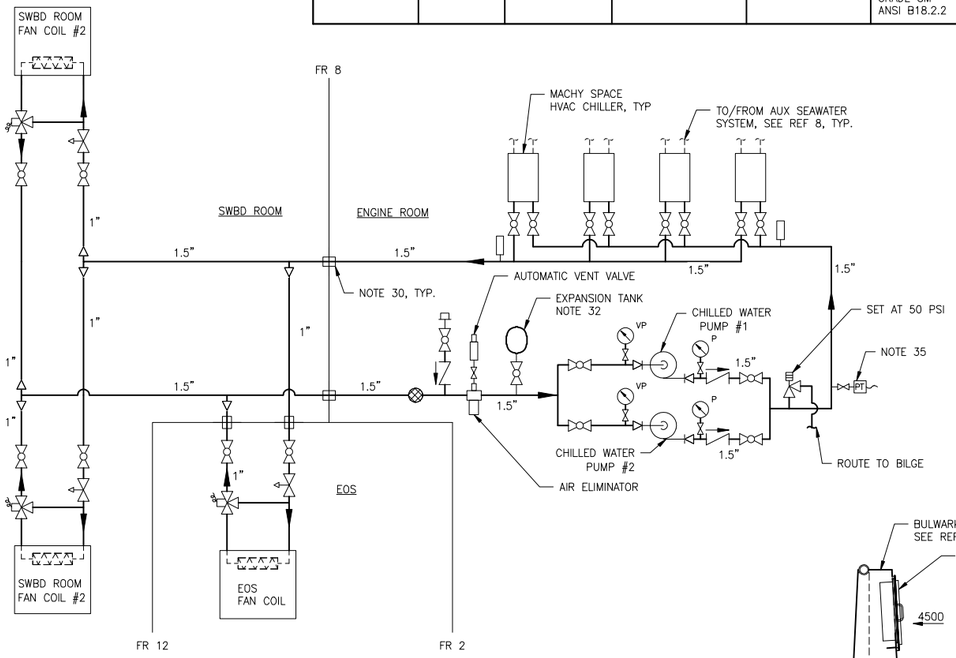
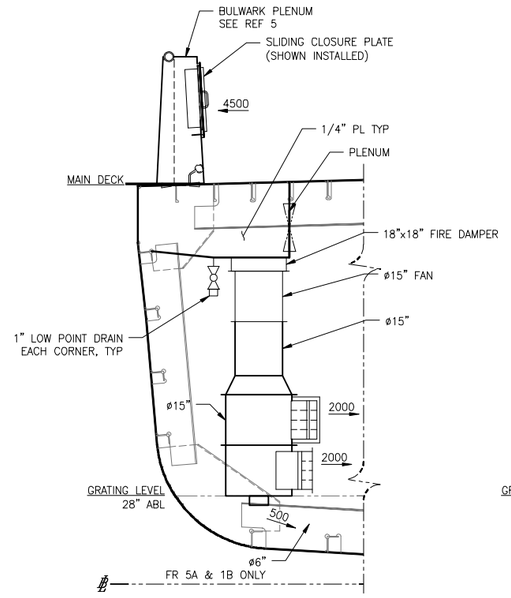
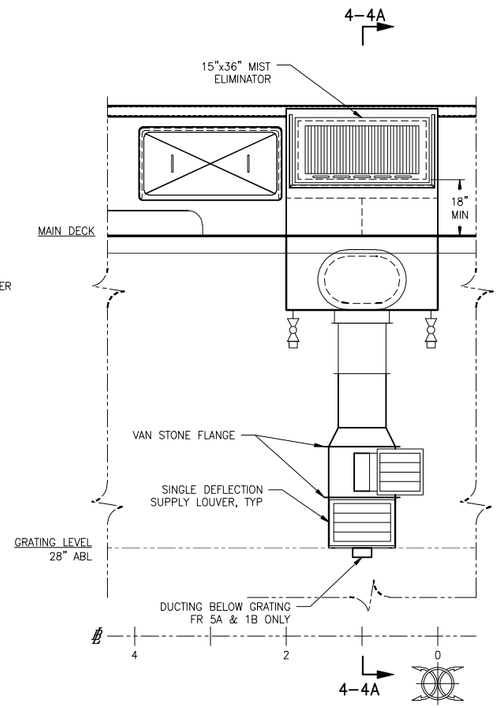


DIAGRAM 4–5B
CHILLED WATER SYSTEM
SCALE: NONE

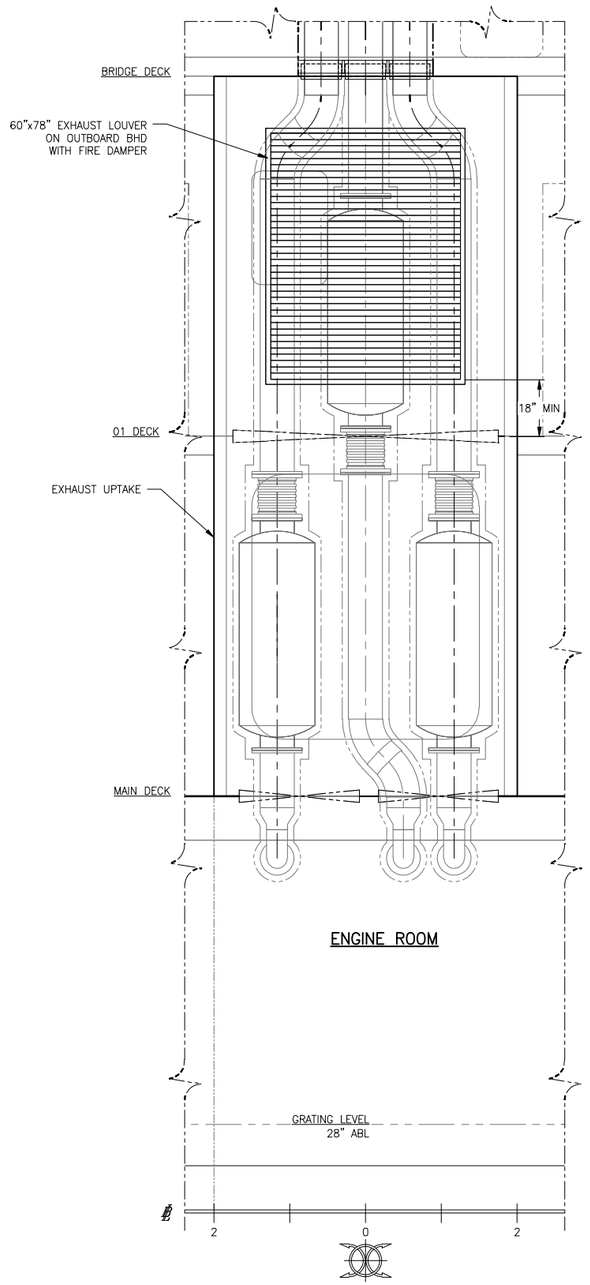
PIPE SYMBOLS LIST	
	PIPE
	REDUCER
	BALL VALVE
	SWING CHECK VALVE
	3-WAY MODULATING THERMOSTATIC VALVE
	AUTOMATIC BALANCING VALVE
	PRESSURE RELIEF VALVE
	CENTRIFUGAL PUMP
	STRAINER, SIMPLEX
P	PRESSURE GAUGE
VP	VACUUM/PRESSURE GAUGE
	PIPE PLUG
PT	PRESSURE TRANSDUCER
	PIPE PENETRATION, DECK/BHD
	THERMOMETER



SECTION 4–4A
ENGINE ROOM SUPPLY
LOOKING FWD TO FR 0
SUPPLY AT FR 4A SIM/OPP
SCALE: 1/2"=1'-0"



ELEVATION 4–3A
ENGINE ROOM SUPPLY PLENUM
LOOKING TO PORT
FR 1B SHOWN, OTHERS SIM.



ELEVATION 4–1A
ENGINE ROOM VENTILATION EXHAUST
LOOKING PORT
SCALE: 1/2"=1'-0"

MICHAEL E. JOHNSON
STATE OF WASHINGTON
49387
REGISTERED PROFESSIONAL ENGINEER
Michael E. Johnson
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-513-1	–
SCALE: AS NOTED	FILE NAME: 18026-200-513-1-	SHEET 4 OF 4

MATERIAL SCHEDULE

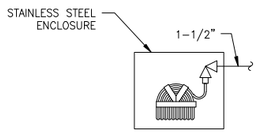
SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
FIREMAIN MAWP: 120 PSIG MAX TEMP: AMBIENT	2 ½" & ABOVE	CU–NI 90/10 ASTM B466 SEAMLESS CLASS 200	FLANGE: CU–NI 90/10 OR BRONZE ASTM B369 ANSI B16.5 SLIP–ON OR WELD NECK, 150#	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE–SAFE TYPE APPROVED	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BUTTERFLY: BRONZE OR LINED DUCTILE IRON, WAFER TYPE CHECK: BRONZE, ASTM B61 OR B62, 150#, FLANGED SEE NOTE 13	BUTTERFLY: BRONZE TRIM, RENEWABLE DISK CHECK: BRONZE DISK, RENEWABLE SEATS & SEALS	CU–NI 90/10 OR BRONZE ASTM B61 OR B62, BUTT WELD	–	–
	2" & BELOW		CU–NI 90/10 UNION, SOCKET WELD, ASTM B369, 150#	–	–	BALL: BRONZE ASTM B61 OR B62, THREADED SEE NOTE 10	BALL: CHROME PLATED BRONZE BALL PTFE SEATS	CU–NI 90/10 UNION, SOCKET WELD	–	
SHELL CONNECTIONS MAWP: 120 PSIG MAX TEMP: AMBIENT	ALL	CARBON STEEL ASTM A53 OR A106, GR B, ANSI B36.10 SCH 80 SEAMLESS	FLANGE CARBON STEEL ASTM A105 ANSI B16.5 SLIP–ON OR WELD NECK, 150#	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE–SAFE TYPE APPROVED	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	GATE: DUCTILE IRON ASTM A395 OR CARBON STEEL ASTM A216 FLANGED, 150#	GATE: STAINLESS STEEL RENEWABLE DISC AND SEAT ASTM A182	CARBON STEEL ASTM A234, GR WPB ANSI B16.9 BUTT WELD SCH 80	–	

EQUIPMENT LIST

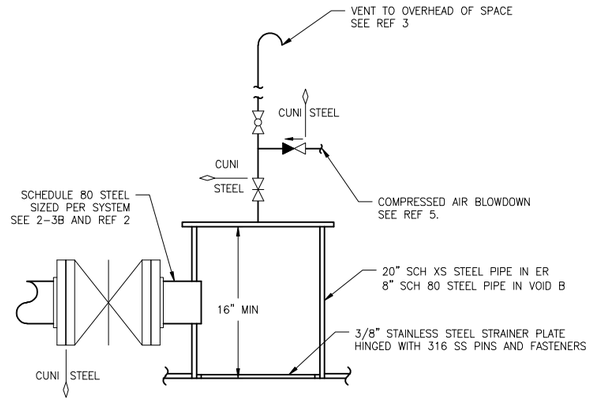
QTY.	SERVICE	TYPE	MODEL	CAPACITY	DRIVE	REMARKS
2	SEA WATER STRAINER 3" NPS	DUPLEX BASKET TYPE	–	–	–	SS BASKET BRONZE BODY
2	FIRE PUMP	HORIZONTAL CENTRIFUGAL	–	170 GPM @ 243' TDH	208v/3ϕ/60Hz 25 HP TEFC MOTOR 3550 RPM	SS 316 BODY

SYMBOLS LIST

	DIRECTION OF FLOW ARROW
	MATERIAL TRANSITION
	REDUCER
	DECK/BHD PENETRATION
	GATE VALVE
	BALL VALVE
	SWING CHECK VALVE
	BUTTERFLY VALVE
	CENTRIFUGAL PUMP
P	PRESSURE GAUGE
	VACUUM PRESSURE GAUGE
PT	PRESSURE TRANSDUCER
	OVERBOARD DISCHARGE
	FIRE STATION
	DUPLEX STRAINER
	ANGLED GLOBE HOSE VALVE
	STOP CHECK VALVE
	SEA CHEST
	BILGE ROSEBOX SUCTION
	GATE VALVE WITH REACH ROD
	DRAIN PLUG
	VALVE, PRESSURE REGULATING
N.S. / N.O.	NORMALLY SHUT / NORMALLY OPEN



DETAIL 1–6B
TYP FIRE STATION
SEE NOTE 11



DETAIL 1–5A
SEA CHEST

GENERAL NOTES (CONT)

11. EACH FIRE STATIONS SHALL BE FITTED WITH A 1–1/2" HOSE VALVE, 50 FEET OF 1–1/2" LINED COMMERCIAL FIRE HOSE CONFORMING TO UL19, A HOSE WRENCH, AND A USCG APPROVED COMBINATION FIRE NOZZLE WITH 5/8" ORIFICE. HOSES SHALL BE CONNECTED AND STOWED IN APPROVED ENCLOSED HOSE RACKS.
12. NOTED VALVES ISOLATE EXTERIOR FIRE STATIONS PERIODICALLY EXPOSED TO FREEZING TEMPERATURES. LOCATE EACH VALVE IN AN EASILY ACCESSIBLE LOCATION AS CLOSE AS POSSIBLE TO THE WEATHER BOUNDARY. WHERE LOCATED BEHIND JOINERY, PROVIDE A HINGED ACCESS PLATE.
13. BUTTERFLY VALVES IN THE FIRE SYSTEM SHALL HAVE PASSED A FIRE TEST SUCH AS API 607. THE CONTRACTOR SHALL SUBMIT DOCUMENTATION.
14. APPROVED MECHANICAL FITTING SYSTEMS MAY BE SUBSTITUTED FOR WELDED FITTINGS. FITTINGS SHALL BE ABS AND USCG APPROVED, AND USED IN ACCORDANCE WITH REGULATORY REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS.
15. MATERIAL TRANSITIONS FROM STEEL TO COPPER NICKEL PIPE SHALL BE ACCOMPLISHED VIA FLANGED JOINTS. THE JOINTS SHALL BE FITTED WITH GALVANIC ISOLATION KITS TO PREVENT DIRECT METAL TO METAL CONTACT.
16. EACH FIRE STATION SHALL BE EQUIPPED WITH PUSH BUTTONS AND RUNNING LIGHTS FOR REMOTE START OF FIRE PUMP NO. 1. FIRE PUMP NO. 2 SHALL BE CAPABLE OF REMOTE START FROM THE EOS AND THE PILOTHOUSE. THE PILOTHOUSE SHALL HAVE RUNNING LIGHTS AND PRESSURE GAUGES FOR BOTH PUMPS. SEE REF 1.
17. WELDED FITTINGS SHALL BE TIG WELDED. SIL–BRAZING IS NOT ACCEPTABLE.
18. WHERE PIPING PENETRATES BULKHEADS OR DECKS, WELDED SLEEVES OR PENETRATION SLEEVES WITH SLIPSIL SEALING PLUGS (ABS CERT NO. 06–LD182012B/1–PDA) OR RISE/NOFIRNO SEALING (ABS CERT NO 09–LD398300B/1–PDA) MAY BE USED. INSTALL PIPING TRANSITS IN ACCORDANCE WITH REGULATORY REQUIREMENTS AND MANUFACTURER'S APPROVED INSTALLATION DETAILS.
19. LOCATE DRAIN VALVES FOR COMPLETE DRAINAGE OF EXTERIOR FIRE STATIONS.
20. THE "A" END MAIN DECK HOSE STATION SHALL BE EQUIPPED WITH A 48" AFFF WAND ASSEMBLY. PROVIDE TWO FIVE–GALLON CONTAINERS OF AFFF FOAM CONCENTRATE AND STOW AS DIRECTED BY OWNER.
21. CONTRACTOR SHALL INSTALL PUMPS SUCH THAT FLOODED SUCTIONS ARE MAINTAINED AT OPERATIONAL LIGHTSHIP DRAFT.
22. LOCATE OVERBOARD SHELL PENETRATION AS FAR ABOVE BASELINE AS POSSIBLE DIRECTLY UNDER THE GUARD.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURER'S CERTIFIED DRAWINGS AS APPROPRIATE.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. AVOID POCKETS IN THE PIPE LINES. BOSSES AND VALVES OR SCREWED PLUGS SHALL BE FITTED TO ENABLE COMPLETE DRAINING OF PIPES WHERE POCKETS DO OCCUR.
5. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES. ALL COPPER–NICKEL PIPING SHALL BE SUPPORTED USING INSULATED HANGERS.
6. THE PIPING SYSTEM SHALL BE CLEANED AND TESTED IN ACCORDANCE WITH USCG REQUIREMENTS. SEE REF 1.
7. VALVES LOCATED BELOW THE FLOOR PLATES SHALL BE PROVIDED WITH REACH RODS. ALL VALVES SHALL BE PROVIDED WITH VISUAL POSITION INDICATION.
8. OVERBOARD SHELL PENETRATIONS SHALL BE LOCATED AS FAR ABOVE BASELINE AS POSSIBLE WHILE STILL BEING UNDER THE GUARDS.
9. TOTAL DYNAMIC HEAD OF PUMPS FOR REQUIRED FLOW ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL PROVIDE PUMPS MEETING THE REQUIRED FLOW WITH THE INSTALLED PIPING SYSTEM. PUMP MOTORS SHALL BE SELECTED TO PREVENT MOTOR OVERLOAD OVER THE ENTIRE PUMP OPERATING RANGE.
10. FIRE STATION HOSE VALVES SHALL BE COMMERCIAL THREADED ANGLE FIRE HOSE VALVES.

REFERENCES

1. 18026–200–832–1 TECHNICAL SPECIFICATION
2. 18026–200–256–1 COOLING SYSTEM DIAGRAM
3. 18026–200–506–1 FILLS, VENTS, AND SOUNDS
4. 18026–200–529–1 BILGE AND BALLAST SCHEMATIC
5. 18026–200–551–1 COMPRESSED AIR PIPING SCHEMATIC

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Michael E. Johnson
49387
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
7/31/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: FIRE MAIN SYSTEM SCHEMATIC

SIZE	DWG NO.	REV
D	18026–200–521–1	–

SCALE	FILE NAME	SHEET	OF
NONE	18026–200–521–1–	1	2

DWN	MOD	CKD	APVD	APVD DATE
NJB	JEH		MEJ	7/31/18

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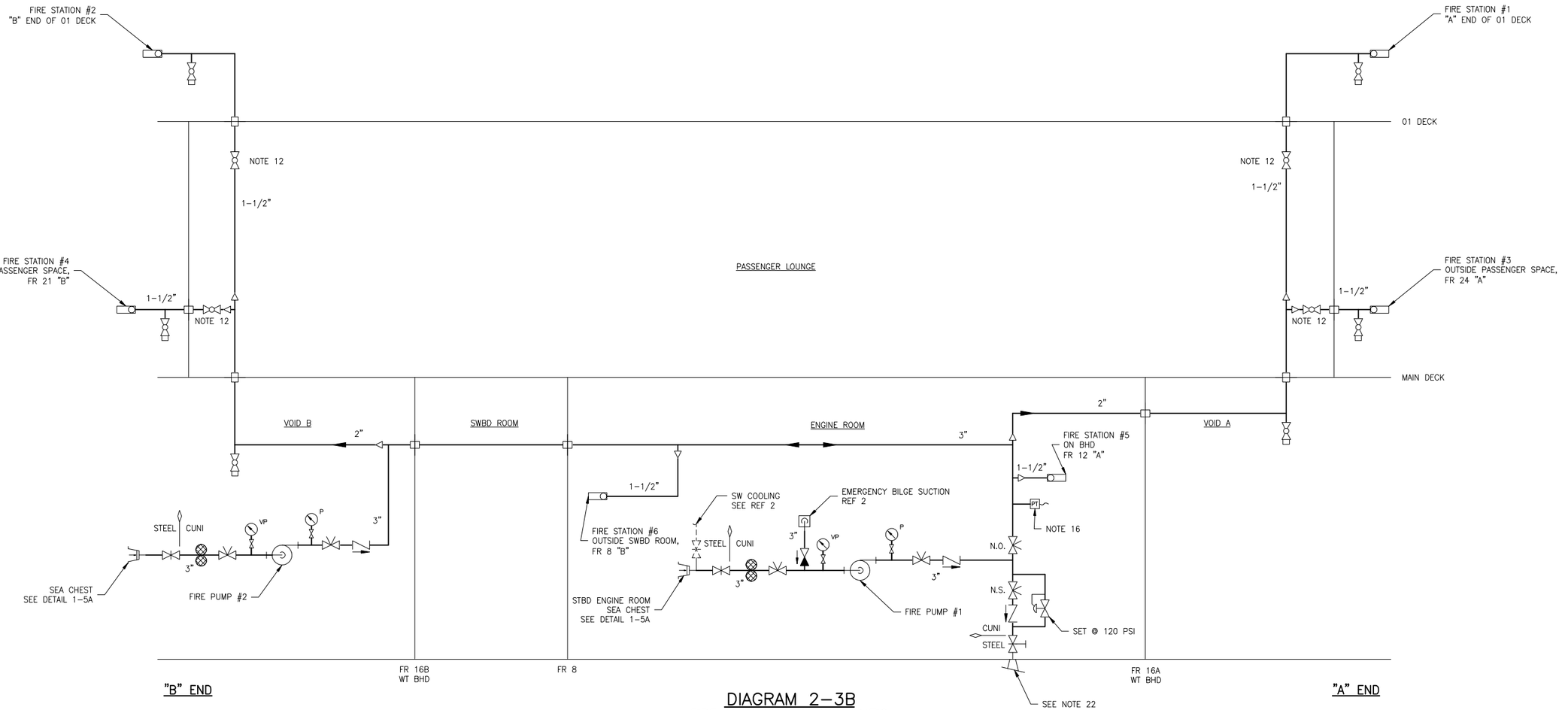
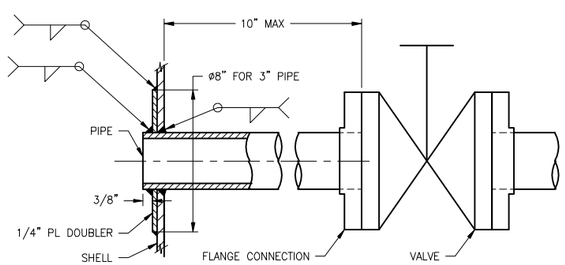


DIAGRAM 2-3B
FIRE MAIN SYSTEM SCHEMATIC



DETAIL 2-5A
OVERBOARD DISCHARGE

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7/31/2018

SIZE	DWG NO.	REV
D	18026-200-521-1	–
SCALE NONE	FILE NAME 18026-200-521-1-	SHEET 2 OF 2

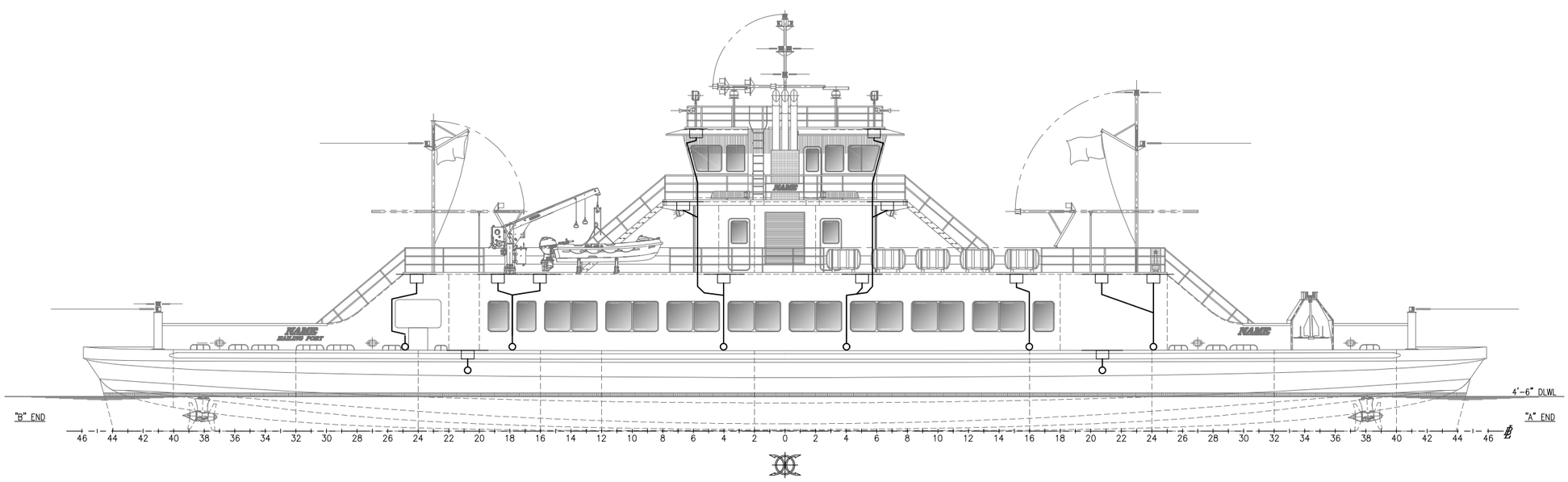
7/31/2018 8:29:12 PM

MATERIAL SCHEDULE

SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
WEATHER DECK DRAIN SYSTEM MAWP: 10 PSIG MAX TEMP: AMBIENT	ALL	STAINLESS STEEL ASTM A312, GRADE TP 316L SEAMLESS ANSI B36.19 SCH 10S	PRESS-FIT STAINLESS STEEL ASTM A351, A743 AND A744, GRADE CF8M TP 316 SCH 10S HNBR SEALS	–	–	–	–	PRESS-FIT STAINLESS STEEL ASTM A351, A743 AND A744, GRADE CF8M TP 316 SCH 10S HNBR SEALS	–	–

SYMBOL LIST

———	PIPE
—o	PIPE UP
—⊖	PIPE DOWN
●	VERTICAL PIPE – EXTENDS UP & DOWN
▣	DECK DRAIN
⊤	DECK DRAIN
◁	OVERBOARD DISCHARGE



ELEVATION 1–4A
OUTBOARD PROFILE

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

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3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES.
5. ALL DRAIN PIPING SHALL BE LED AS DIRECTLY AS PRACTICABLE AND PITCHED NOT LESS THAN 1/8 INCH PER FOOT LONGITUDINALLY OR 1/8 INCH PER FOOT TRANSVERSELY. PIPING SHALL BE PROVIDED WITH SUFFICIENT NUMBER OF ACCESSIBLE CLEANOUT CONNECTIONS, NOT LESS THAN 1 1/2" IPS, FOR CLEARING BY PLUMBER'S SNAKE, COMPRESSED AIR, OR WATER HOSE. CLEANOUT CONNECTIONS AND ACCESS PANELS SHALL BE FITTED FOR EACH DECK.
6. WHERE POSSIBLE, DRAIN PIPES SHALL BE INSTALLED INSIDE THE LINE OF STRUCTURE SO AS TO MINIMIZE INTERFERENCE WITH JOINER SYSTEM, PASSAGEWAYS, ETC.
7. WHERE PIPING PENETRATES BULKHEADS OR DECKS, USE AN APPROVED PENETRATION DETAIL, SEE DETAIL 3-1B.
8. DRAIN ROUTING SHALL NOT OBSTRUCT WINDOWS.
9. ALL DRAINS SHALL TERMINATE WELL ABOVE THE DESIGN LOAD WATERLINE. DRAINS LEADING FROM SUPERSTRUCTURE DECKS SHALL TERMINATE ABOVE THE MAIN DECK.
10. CENTER TROUGH DRAIN IN FRONT OF DOOR OR STAIR. OFFSET CUTOUT THREE INCHES FROM DOOR OR STAIR EDGE.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

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Elliott Bay Design Group
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CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: DECK DRAIN PIPING SCHEMATIC

SIZE	DWG NO.	REV
D	18026-200-526-1	–

SCALE	FILE NAME	SHEET	OF
1/8" = 1'-0"	18026-200-526-1-	1	3

DWN	MOD	CKD	APVD	APVD DATE
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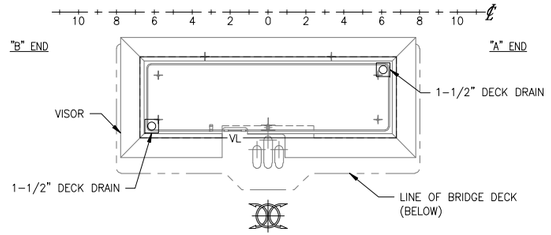
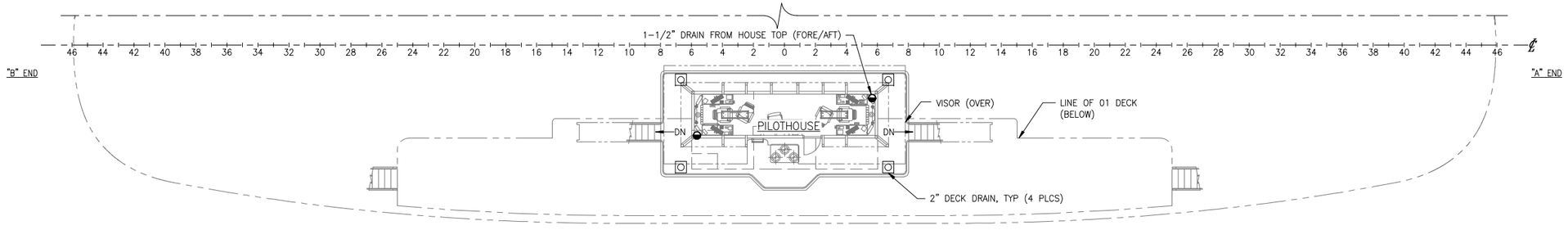
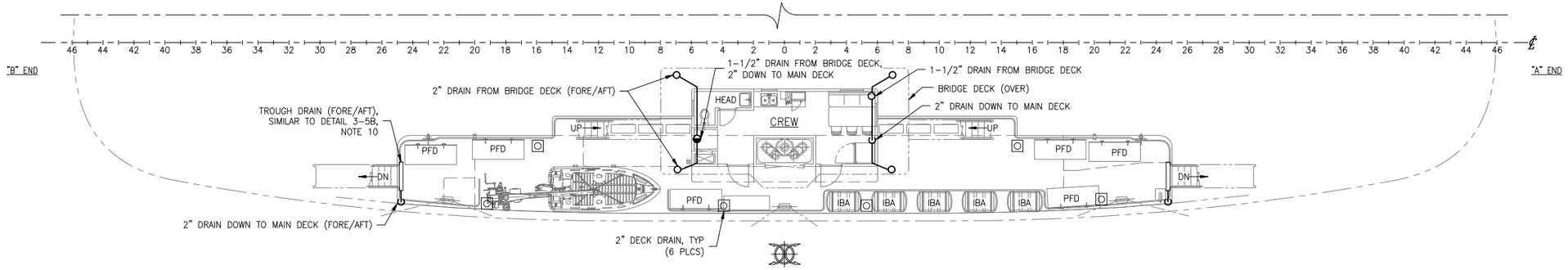


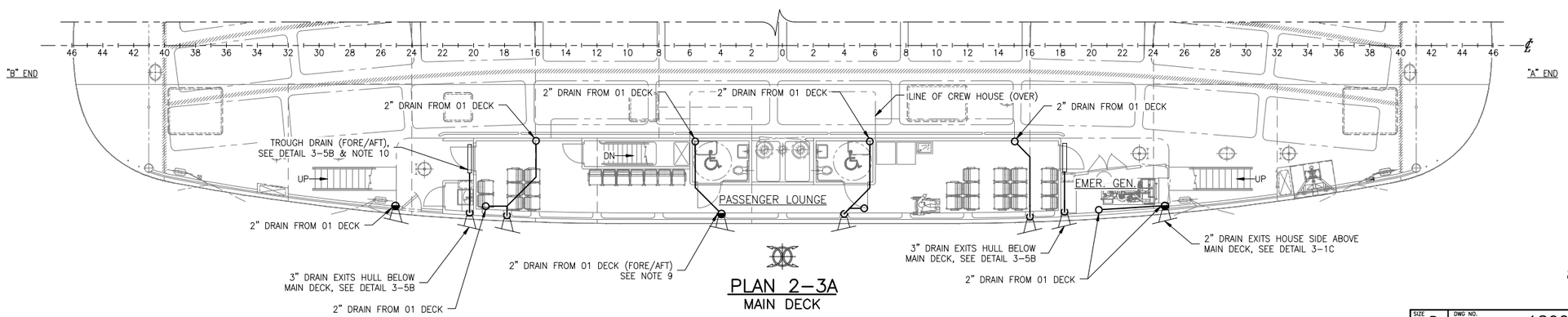
PLAN 2-3D
HOUSE TOP



PLAN 2-3C
BRIDGE DECK



PLAN 2-3B
01 DECK



PLAN 2-3A
MAIN DECK

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8/3/2018

SIZE	DWG NO.	REV
D	18026-200-526-1	—
SCALE 1/8" = 1'-0"	FILE NAME 18026-200-526-1-	SHEET 2 OF 3

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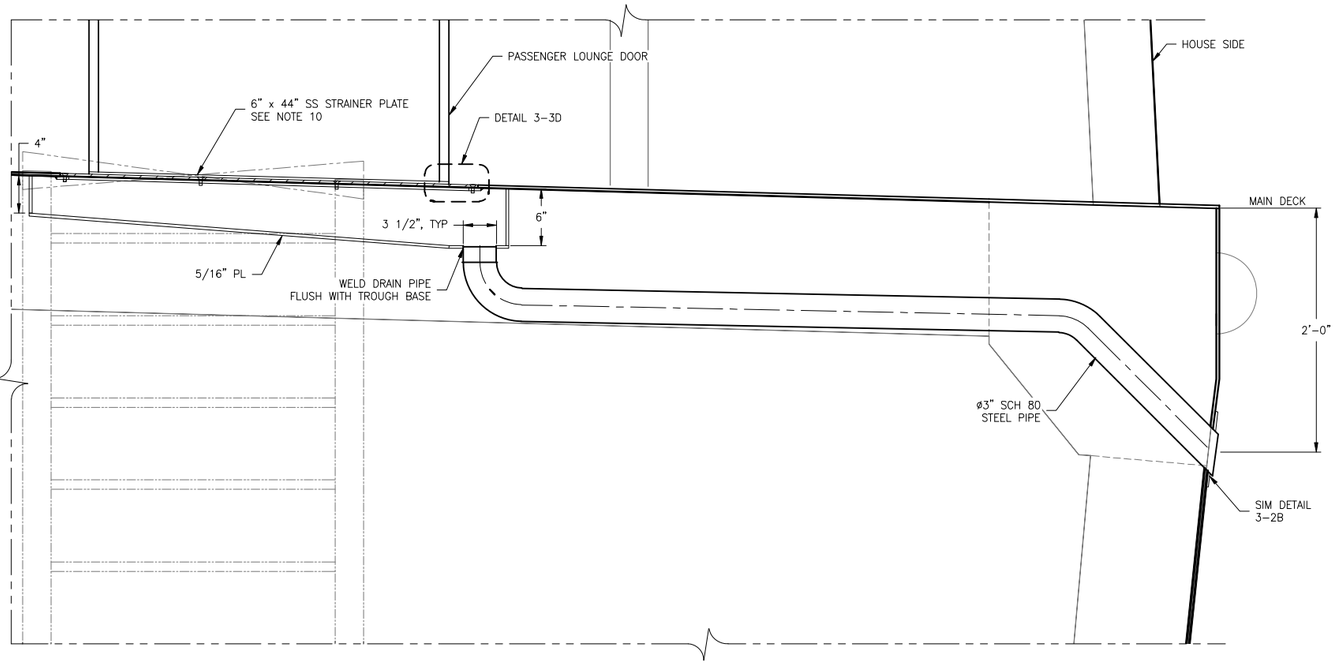
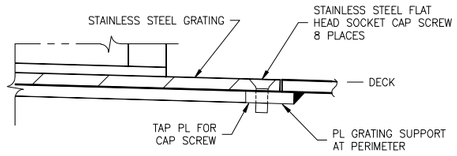
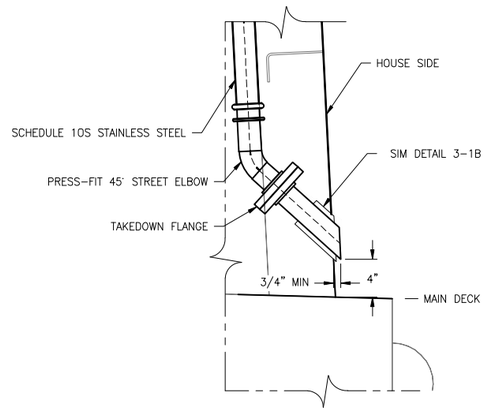


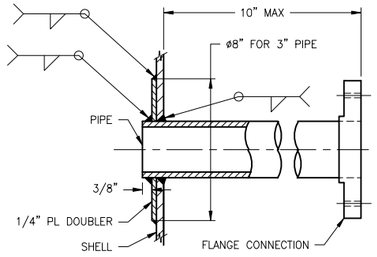
SECTION 3-5B
TYP TROUGH DRAIN DETAIL
MAIN DECK SHOWN, 01 DECK SIMILAR
SCALE: 1-1/2"=1'-0"



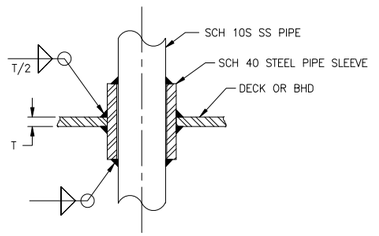
DETAIL 3-3D
TYP GRATING CLIP DETAIL
SCALE: 6"=1'-0"



SECTION 3-1C
TYP DRAIN TERMINAL
ABOVE MAIN DECK
SCALE: 1-1/2"=1'-0"



DETAIL 3-2B
OVERBOARD DISCHARGE
SCALE: NONE



DETAIL 3-1B
TYP DECK/BHD PENETRATION
SCALE: NONE

MICHAEL E. JOHNSON
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8/3/2018

SIZE	DWG NO.	REV
D	18026-200-526-1	–
SCALE: AS NOTED	FILE NAME: 18026-200-526-1-	SHEET 3 OF 3

8/3/2018 2:07:57 PM

MATERIAL SCHEDULE

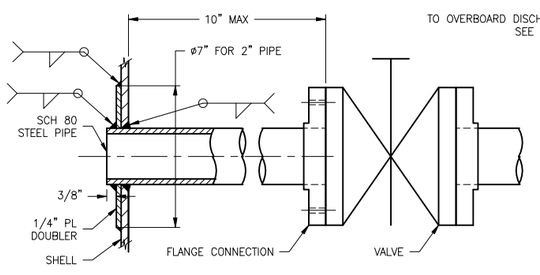
SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
SANITARY DRAINS MAWP: 50 PSIG TEMP: AMBIENT	ALL	CPVC SCH 80 ASTM D1784 ASTM F441	SOCKET FLANGE CPVC ASTM F439 ANSI B16.5, 150#	EPDM RUBBER ASTM-D-1331 FULL FACE	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BALL: CPVC, UNION ENDS CHECK: CPVC, UNION ENDS	BALL: CPVC BALL, SS STEM, EPDM SEALS, FULL PORT CHECK: CPVC, EPDM SEAL	CPVC ASTM F439	–	SEE NOTE 15
SHELL CONNECTIONS AND DRAIN PIPING EXPOSED TO WEATHER MAWP: 50 PSIG MAX TEMP: AMBIENT	ALL	CARBON STEEL ASTM A53 OR A106, GR B, ANSI B36.10 SCH 40	FLANGE CARBON STEEL ASTM A105 ANSI B16.5 SLIP-ON OR WELD NECK, 150#	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE-SAFE TYPE APPROVED		GATE: DUCTILE IRON ASTM A395 OR CARBON STEEL ASTM A216 FLANGED, 150#	GATE: STAINLESS STEEL RENEWABLE DISC AND SEAT ASTM A182	CARBON STEEL ASTM A234, GR WPB ANSI B16.9 BUTT WELD SCH 80	–	–
VENTS EXPOSED TO WEATHER MAWP: 50 PSIG MAX TEMP: AMBIENT	ALL	STAINLESS STEEL ASTM A312 TYPE 316 ANSI B36.10 SCH 40	FLANGE STAINLESS STEEL ASTM A182 TY 316 ANSI B16.5 150# SLIP-ON OR WELD NECK	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE-SAFE TYPE APPROVED		–	–	STAINLESS STEEL ASTM A182 TYPE 316 ANSI B16.9 BUTT WELD LONG RADIUS	–	–

SYMBOLS LIST

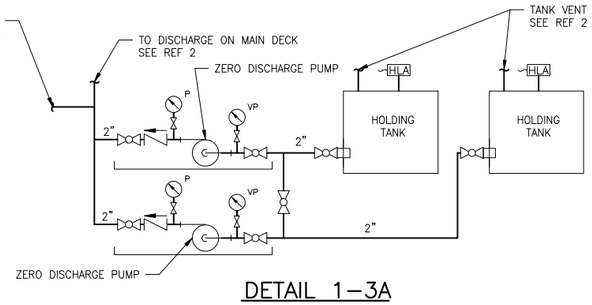
	PIPE
	BALL VALVE
	CLEAN OUT
	P-TRAP
	REDUCER
VP	VACUUM PRESSURE GAUGE
P	PRESSURE GAUGE
	CENTRIFUGAL PUMP
	DECK DRAIN
	PIPE FLANGE
HLA	HIGH LEVEL ALARM
	GATE VALVE
	CHECK VALVE
	DRIP TRAY
	OVERBOARD DISCHARGE
	MATERIAL TRANSITION
	PIPE PENETRATION, DECK/BHD
	VENT

EQUIPMENT LIST

QTY.	SERVICE	TYPE	MODEL	CAPACITY	DRIVE
2	ZERO DISCHARGE PUMP	SELF-PRIMING CENTRIFUGAL	–	105 GPM @ 75 FT TDH	5 HP 3450 RPM TEFC MOTOR 208V/3P/60HZ
1	MARINE SANITATION DEVICE (MSD)	–	–	–	BLOWER: 1 HP PUMP: 1/2 HP 208V/3P/60HZ



DETAIL 1-5A
OVERBOARD DISCHARGE



DETAIL 1-3A
ZERO DISCHARGE SYSTEM
TANK FILLS NOT SHOWN, SEE 2-3A

GENERAL NOTES (CONT)

10. CLEANOUTS CONCEALED IN JOINER BULKHEADS OR SUSPENDED CEILINGS SHALL BE ACCESSIBLE VIA REMOVABLE PANEL. PROVIDE 18" OF CLEAR SPACE IN FRONT OF THE CLEANOUT. ACCESS PANELS SHALL BE CLEARLY LABELED.
11. BLACK AND GRAY WATER WASTE DRAIN PIPING SHALL BE SLOPED DOWNWARD AT NO LESS THAN 1/4" PER FOOT IN TRANSVERSE DIRECTION & 1/8" PER FOOT LONGITUDINALLY.
12. AIR ADMITTANCE VALVES CONCEALED IN JOINER BULKHEADS OR SUSPENDED CEILINGS SHALL BE ACCESSIBLE VIA REMOVABLE PANEL OR CEILING TILE. INSTALL AIR ADMITTANCE VALVES ABOVE FLOOD RIM OF FIXTURE SERVED.
13. THE HOLDING TANKS SHALL BE FITTED WITH LEVEL SENSORS TO INTERFACE WITH THE ALARM AND MONITORING SYSTEM. THE SENSOR SHALL HAVE A HIGH LEVEL ALARM AT 75% FULL. SEE REF 1.
14. MSD AND HOLDING TANK VENTS SHOWN ON REFERENCE 2.
15. CPVC PIPE AND FITTINGS SHALL HAVE A USCG CERTIFICATE OF APPROVAL THAT STATES CPVC PIPE AND FITTINGS MEET LOW FLAME SPREAD AND TOXICITY REQUIREMENTS OF THE FTP CODE ANNEX 1, PARTS 2 AND 5. INSTALL PIPING IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION GUIDELINES.
16. WHERE PLASTIC PIPING PENETRATES BULKHEADS OR DECKS, STEEL PENETRATION SLEEVES WITH USCG APPROVED SEALANT AND CRUSHING SLEEVES SHALL BE USED. SEALANT AND SLEEVES SHALL BE RATED FOR WATERTIGHT AND A-60 APPLICATIONS. INSTALL PIPING TRANSITS IN ACCORDANCE WITH MANUFACTURER'S APPROVED INSTALLATION DETAILS.
17. PROVIDE A STAINLESS STEEL DRIP TRAY BELOW ZERO DISCHARGE PUMPS.
18. CREW HEAD AND DAY ROOM DRAINS SHALL BE ROUTED IN THE UNDER DECK STRUCTURE AS HIGH AS PRACTICABLE AND CLEAR OF THE VEHICLE LANES BELOW. ALL DRAINS EXPOSED TO WEATHER SHALL BE CARBON STEEL.
19. FIT OVERBOARD DISCHARGE WITH A REACH ROD TO THE MAIN DECK, TERMINATE REACH ROD IN AN ACCESSIBLE LOCATION OUTSIDE OF VEHICLE LANES AND CLEAR OF OBSTRUCTIONS.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

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5. TDH OF PUMP FOR REQUIRED FLOW IS APPROXIMATE ONLY. THE CONTRACTOR SHALL PROVIDE A PUMP MEETING THE REQUIRED FLOW WITH THE INSTALLED PIPING SYSTEM. PUMP MOTORS SHALL BE SELECTED TO PREVENT MOTOR OVERLOAD OVER THE ENTIRE PUMP OPERATING RANGE.
6. SANITARY DRAIN PIPING IN THE ACCOMMODATIONS AREAS SHALL BE CONCEALED BEHIND JOINER BULKHEADS OR SUSPENDED CEILINGS.
7. CHANGES OF DIRECTION IN HORIZONTAL DRAIN PIPING SHALL BE MADE WITH WYES OR BENDS OF 45° OR LESS. INTERSECTIONS BETWEEN BRANCHES OF DRAIN PIPING SHALL BE ACCOMPLISHED WITH THE USE OF LATERALS WYES OR SWEEP TEES. IN NO CASE SHALL TWO PIPES INTERSECT AT 90°.
8. HORIZONTAL DRAINAGE LINES WHICH CONNECT DIRECTLY WITH A VERTICAL STACK, SHALL ENTER THROUGH 45° WYE, 60° WYE, COMBINATION WYE AND 45° BEND, SANITARY TEE OR BRANCHES OF EQUIVALENT SWEEP.
9. CLEANOUTS WITH PLUGS SHALL BE FITTED AT THE UPPER TERMINAL OF EACH HORIZONTAL RUN, AT INTERVALS OF NO LESS THAN 1 PER 50 LINEAR FEET OF PIPE IN STRAIGHT RUNS, AND WHEREVER THE AGGREGATE HORIZONTAL CHANGE IN DIRECTION OF HORIZONTAL PIPING EXCEEDS 135°.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-506-1 FILLS, VENTS, AND SOUNDS

NORTH CAROLINA FERRY SYSTEM
8560 SHIPYARD RD MANNS HARBOR, NC 27953

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North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: SANITARY DRAIN PIPING SCHEMATIC

SIZE	DWG NO.	REV
D	18026-200-528-1	–

SCALE	FILE NAME	SHEET	OF
NTS	18026-200-528-1-	1	2

DWN	MOD	CKD	APVD	APVD DATE
NJB	JEH		MEJ	7/31/18

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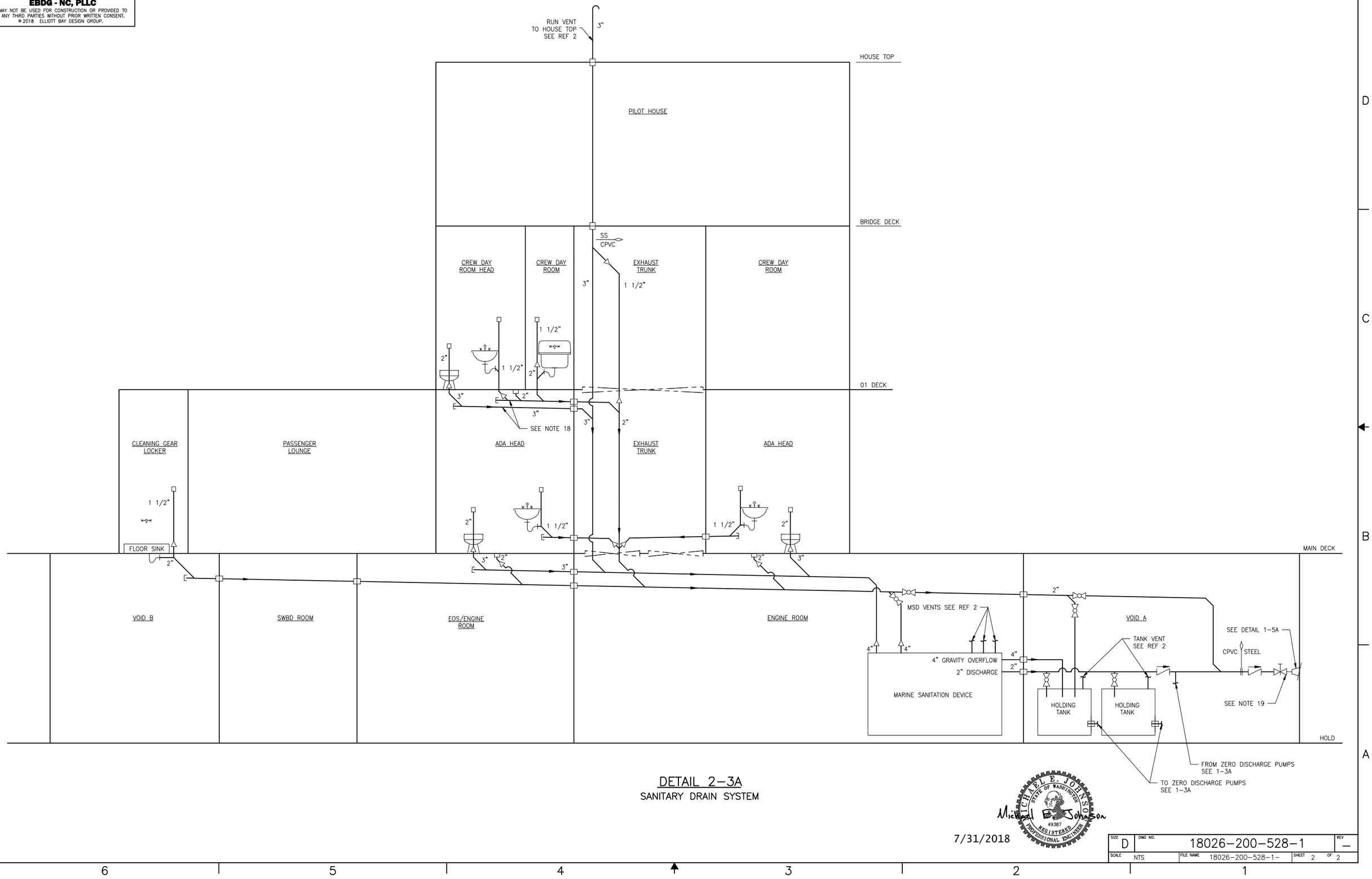

DETAIL 2-3A
SANITARY DRAIN SYSTEM

7/31/2018

MICHAEL E. JOHNSON
STATE OF WASHINGTON
49387
REGISTERED PROFESSIONAL ENGINEER

SIZE	DWG NO.	REV
D	18026-200-528-1	–
SCALE NTS	FILE NAME 18026-200-528-1-	SHEET 2 OF 2

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MATERIAL SCHEDULE

SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
BILGE AND SHELL CONNECTIONS MAWP: 55 PSIG TEMP: AMBIENT	2 ½" & ABOVE	CARBON STEEL ASTM A53 OR A106, GRADE B SEAMLESS ANSI B36.10 SCH 80	FLANGE, CARBON STEEL WELD NECK OR SLIP-ON, 150# ANSI B16.5, ASTM A105	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE-SAFE TYPE APPROVED	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BUTTERFLY: CARBON STEEL ASTM A216 GR WCB 150#, WAFER TYPE SWING CHECK: CARBON STEEL ASTM A216 GR WCB 150#, FLANGED STOP CHECK: CARBON STEEL ASTM A216 GR WCB 150#, FLANGED GATE: CARBON STEEL ASTM A216 GR WCB 150#, FLANGED	BUTTERFLY: SS DISC AND STEM BUNA SEATS SWING CHECK: SS DISC ASTM A182 STOP CHECK: SS RENEWABLE DISC AND SEAT ASTM A276-316 GATE: SS STEM SS RENEWABLE DISC AND SEAT ASTM A182	CARBON STEEL ASTM A234, GR WPB ANSI B16.9 BUTT WELD LONG RADIUS SCH 80	–	NOTE 14
	2" & BELOW		CARBON STEEL UNION, 3000#, SOCKET WELD, GROUND JOINT ANSI B16.11 OR FLANGE, SOCKET WELD OR SLIP-ON, 150#, ANSI B16.5			GATE: CARBON STEEL ASTM A216 GR WCB 150#, FLANGED	GATE: SS STEM SS RENEWABLE DISC AND SEAT ASTM A182			
BALLAST MAWP: 15 PSIG TEMP: AMBIENT	ALL	CU-NI 90/10 ASTM B466 SEAMLESS CLASS 200	FLANGE: CU-NI 90/10 ANSI B16.5 SLIP-ON OR WELD NECK, 150#			BUTTERFLY: BRONZE ASTM B61 OR LINED DUCTILE IRON ASTM A395, WAFER TYPE CHECK: BRONZE, ASTM B61 OR B62, 150#, FLANGED	BUTTERFLY: BRONZE DISK CHECK: BRONZE DISK, RENEWABLE SEATS & SEALS	CU-NI 90/10, BUTT WELD		NOTE 21

SYMBOLS LIST

	PIPE
	REDUCER
	DECK/BULKHEAD PENETRATION
	MANIFOLD, STOP CHECK VALVES
	MATERIAL TRANSITION
	BUTTERFLY VALVE
	GATE VALVE
	BUTTERFLY VALVE, ACTUATED
	GATE VALVE WITH REACH ROD
	SWING CHECK VALVE
	ANGLE STOP CHECK VALVE
	BILGE ROSEBOX SUCTION
P	PRESSURE GAUGE
VP	VACUUM PRESSURE GAUGE
	FLANGE
DP	DIFFERENTIAL PRESSURE GAUGE
	DUPLEX STRAINER
	CENTRIFUGAL PUMP
	OVERBOARD DISCHARGE
	SEA CHEST
	BALLAST SUCTION

EQUIPMENT LIST

QTY.	SERVICE	TYPE	MODEL	CAPACITY	DRIVE	REMARKS
2	BILGE PUMP	CENTRIFUGAL SELF-PRIMING	–	149 GPM @ 40' TDH	208V/3ϕ/60HZ 5 HP TEFC MOTOR 3450 RPM	BRONZE BODY
2	BILGE PUMP STRAINER 3" NPS	DUPLEX BASKET TYPE	–	–	–	SS BASKET BRONZE BODY
2	BALLAST PUMP	CENTRIFUGAL	–	200 GPM 20' TDH	208V/3ϕ/60HZ 2 HP TEFC MOTOR 1165 RPM	SS BODY
2	BALLAST PUMP STRAINER 4" NPS	DUPLEX BASKET TYPE	–	–	–	SS BASKET BRONZE BODY

CALCULATIONS

BILGE SYSTEM (PER 46 CFR 56.50-50)

DATA:
L=178 FT
B=46 FT
D=10.5 FT
C=COMPARTMENT LENGTH (FT)

BILGE MAIN $d = 1 + \sqrt{\frac{L(B+D)}{2500}} = 3.01$ (USE 3" SCH 80 PIPE)

BRANCH SUCTION $d = 1 + \sqrt{\frac{C(B+D)}{1500}}$

COMPARTMENT	C	d	NOMINAL PIPE SIZE (MINIMUM)	ID
LAZARETTE A	11.8	2.000	2"	1.939
THRUSTER ROOM A	32.0	2.098	2"	1.939
VOID A	16.0	2.000	2"	1.939
ENGINE ROOM	48.0	2.345	2 1/2"	2.323
SWITCHBOARD ROOM	16.0	2.000	2"	1.939
VOID B	16.0	2.000	2"	1.939
THRUSTER ROOM B	32.0	2.098	2"	1.939
LAZARETTE B	11.8	2.000	2"	1.939

PUMP CAPACITY TO DEVELOP A SUCTION VELOCITY OF 400 FPM
$Q = 16.32 \times d^2$, WHERE d IS THE BILGE MAIN DIAMETER
Q = 148 GPM

GENERAL NOTES (CONT)

13. TOTAL DYNAMIC HEAD OF PUMPS FOR REQUIRED FLOW ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL PROVIDE PUMPS MEETING THE REQUIRED FLOW WITH THE INSTALLED PIPING SYSTEMS. PUMP MOTORS SHALL BE SELECTED TO PREVENT MOTOR OVERLOAD OVER THE ENTIRE PUMP OPERATING RANGE.
14. VALVES CONSTRUCTED OF DUCTILE IRON, ASTM A395, MAY BE SUBSTITUTED WHERE APPROVED BY USCG & ABS REQUIREMENTS.
15. ALL BILGE LINES SHALL BE ROUTED NO LESS THAN ONE FIFTH OF THE VESSEL BEAM FROM THE SIDE SHELL AND ABOVE THE T/15 LINE IN ACCORDANCE WITH USCG AND ABS REGULATIONS.
16. WHERE PIPES PENETRATE TANK BOUNDARIES, BULKHEADS, OR DECKS HEAVY WEIGHT SPOOL PIECES SHALL BE USED. SEE DETAILS 2-5A AND 3-1C.
17. THE BILGE LINES SERVING THE LAZARETTES SHALL BE FITTED WITH AN ISOLATION VALVE OPERABLE FROM THE MAIN DECK. THE REMOTE OPERATOR SHALL BE A FLUSH MOUNTED DECK BOX WITH REACH ROD.
18. BALLAST CONTROL VALVES SHALL BE AIR OPERATED VALVES WITH CONTROLS LOCATED IN THE EOS. SEE REF 1 AND 5.
19. BALLAST PUMPS SHALL BE CONTROLLED LOCALLY AND FROM THE EOS.
20. MATERIAL TRANSITIONS FROM STEEL TO COPPER NICKEL PIPE SHALL BE ACCOMPLISHED VIA FLANGED JOINTS. THE JOINTS SHALL BE FITTED WITH GALVANIC ISOLATION KITS TO PREVENT DIRECT METAL TO METAL CONTACT.
21. WELDED CU-NI FITTINGS SHALL BE TIG WELDED. SIL-BRAZING IS NOT ACCEPTABLE.
22. CONTRACTOR SHALL INSTALL PUMPS SUCH THAT FLOODED SUCTIONS ARE MAINTAINED AT LIGHTSHIP DRAFT.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. AVOID POCKETS IN THE PIPE LINES. BOSSES AND VALVES OR SCREWED PLUGS SHALL BE FITTED TO ENABLE COMPLETE DRAINING OF PIPES WHERE POCKETS DO OCCUR.
5. THE PIPING SYSTEM SHALL BE CLEANED AND TESTED IN ACCORDANCE WITH USCG REQUIREMENTS. SEE REF 1.
6. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES. ALL COPPER-NICKEL PIPING SHALL BE SUPPORTED USING INSULATED HANGERS.
7. VALVES LOCATED BELOW THE FLOOR PLATES SHALL BE PROVIDED WITH REACH RODS. ALL VALVES SHALL BE PROVIDED WITH VISUAL POSITION INDICATION.
8. BILGE ROSEBOXES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. ROSEBOXES SHALL HAVE AN OPEN AREA OF AT LEAST THREE TIMES THE AREA OF SUCTION PIPE.
9. OVERBOARD PENETRATIONS SHALL BE LOCATED AS FAR ABOVE BASELINE AS POSSIBLE WHILE STILL BEING UNDER THE GUARDS.
10. BILGE SUCTIONS SHALL BE LOCATED AT THE COMPARTMENT LOW POINT.
11. BILGE PUMPS SHALL BE CONTROLLED LOCALLY AND FROM THE EOS.
12. EMERGENCY BILGE SUCTION IS LOCATED ON THE FIRE MAIN SYSTEM. SEE REF 4.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-256-1 COOLING SYSTEM DIAGRAM
3. 18026-200-506-1 FILLS, VENTS, AND SOUNDS
4. 18026-200-521-1 FIRE MAIN SYSTEM SCHEMATIC
5. 18026-200-551-1 COMPRESSED AIR PIPING SCHEMATIC

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

MICHAEL E. JOHNSON — STATE OF WASHINGTON — 49387 — REGISTERED PROFESSIONAL ENGINEER
Michael E. Johnson
7/31/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: BILGE AND BALLAST PIPING SCHEMATIC

SIZE	DWG NO.	REV
D	18026-200-529-1	–

SCALE	FILE NAME	SHEET	OF
NTS	18026-200-529-1-	1	3

DWN	MOD	CKD	APVD	APVD DATE
NJB			MEJ	7/31/18

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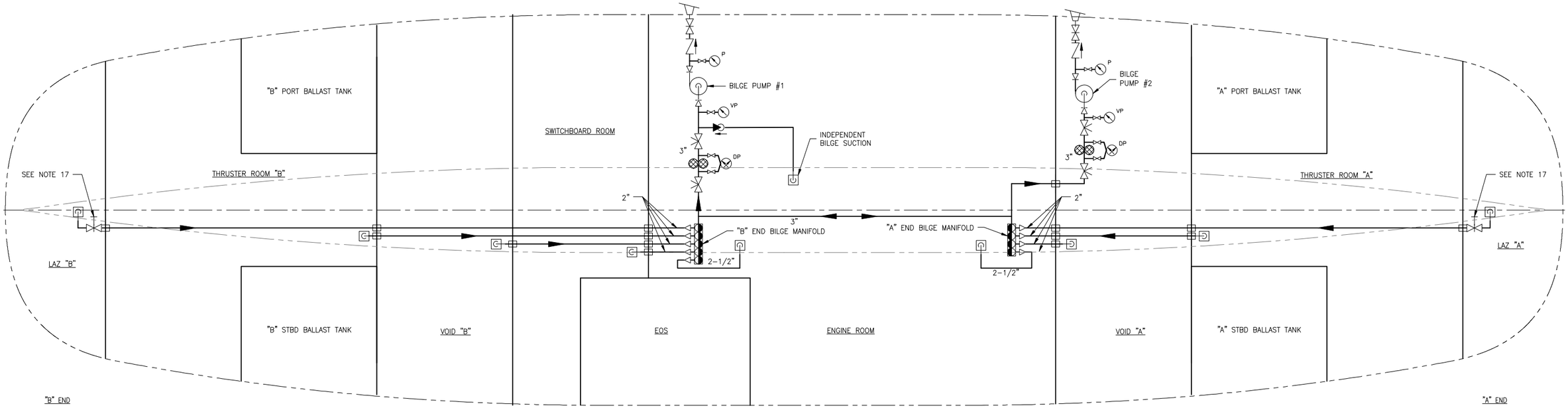
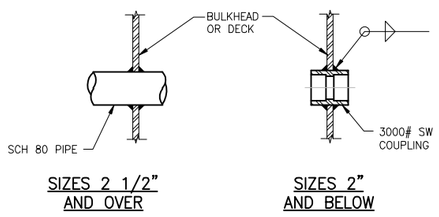
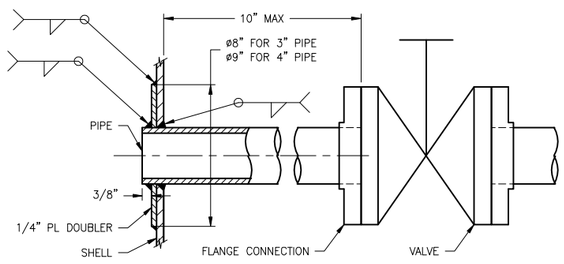


PLAN 2–3B
BILGE SYSTEM DIAGRAM



SIZES 2 1/2" AND OVER | SIZES 2" AND BELOW

DETAIL 2–5A
TYP DECK/BHD PENETRATION



DETAIL 2–3A
OVERBOARD DISCHARGE

MICHAEL E. JOHNSON — STATE OF WASHINGTON — 49387 — REGISTERED PROFESSIONAL ENGINEER

7/31/2018

SIZE	DWG NO.	REV
D	18026-200-529-1	–
SCALE NTS	FILE NAME 18026-200-529-1-	SHEET 2 OF 3

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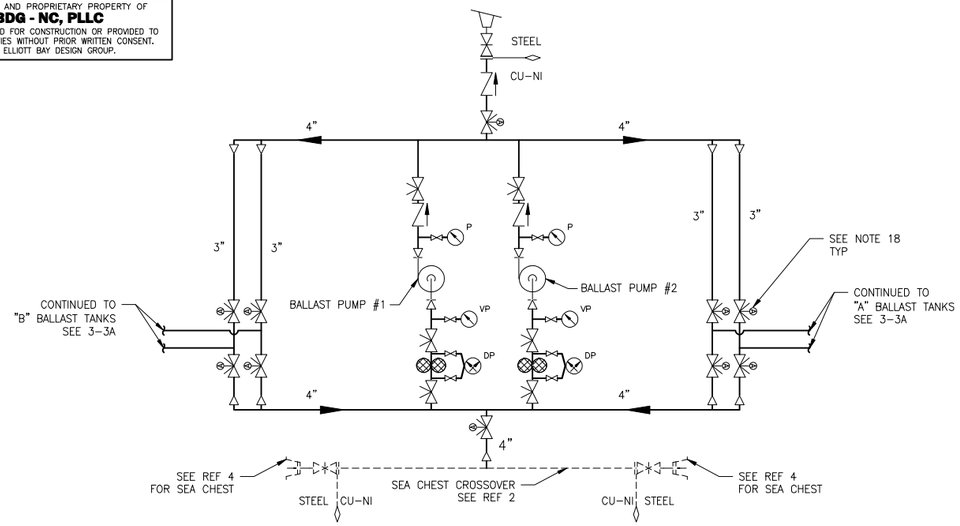
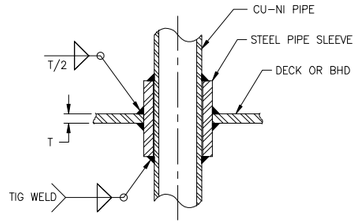
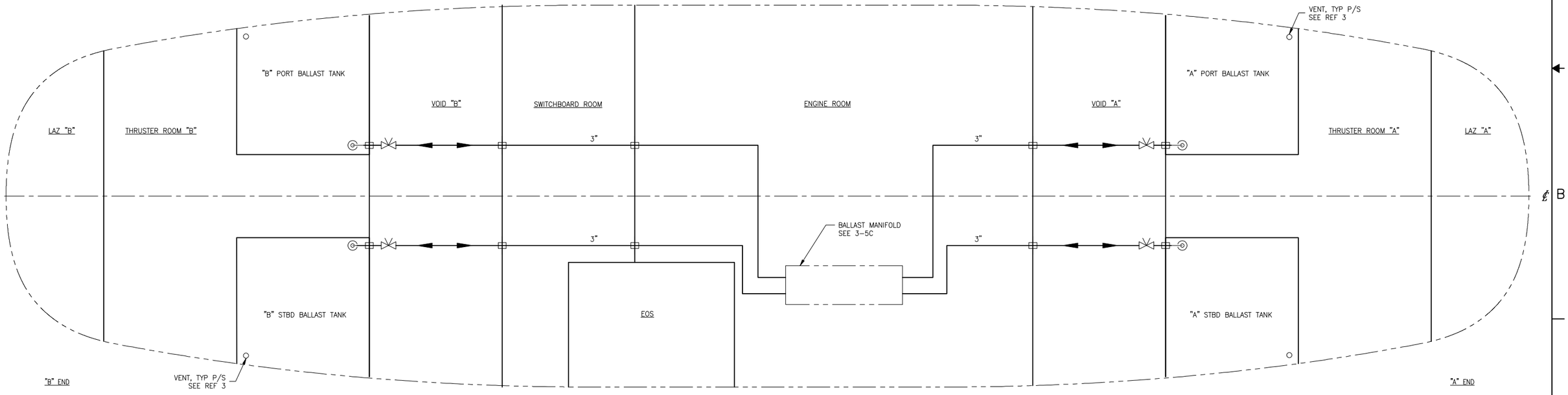


PLAN 3-5C
BALLAST MANIFOLD



DETAIL 3-1C
TYP DECK/BHD PENETRATION
CU-NI PIPING



PLAN 3-3A
BALLAST SYSTEM DIAGRAM

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Michael E. Johnson

7/31/2018

SIZE	DWG NO.	REV
D	18026-200-529-1	–
SCALE NTS	FILE NAME 18026-200-529-1-	SHEET 3 OF 3

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MATERIAL SCHEDULE

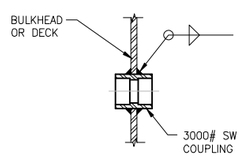
SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
LUBE OIL & WASTE OIL MAWP: 40 PSIG MAX TEMP: 120°F	2" & UNDER	CARBON STEEL ASTM A53 OR A106, GRADE B SEAMLESS ANSI B36.10 SCH 40	UNION GROUND JOINT CARBON STEEL ASTM A105 ANSI B16.11 SOCKET WELD	ARAMID FIBERS WITH A NEOPRENE BINDER	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BALL THREADED, CARBON STEEL, ASTM A105, ASTM A181, OR ASTM A216 GR WCB CHECK THREADED, CARBON STEEL, ASTM A105, ASTM A181, OR ASTM A216 GR WCB	BALL CHROME PLATED BALL, RPTFE OR VITON SEATS CHECK CRES DISC	CARBON STEEL ASTM A105 OR ASTM A234 ANSI B16.11 3000# SOCKET WELD	SAE J1942 COMPLIANT HOSE SEE NOTE 11	

SYMBOLS LIST

	PIPE
	REDUCER
	CHECK VALVE
	BALL VALVE
	BALL VALVE, LOCKING
	GEAR PUMP
	CAMLOCK
	DRIP PAN
	HOSE REEL
	BULKHEAD PIPE PENETRATION
P	PRESSURE GAUGE
	GOOSENECK VENT
	UNION JOINT
	SIMPLEX STRAINER

EQUIPMENT & PUMP LIST

QTY	SERVICE	TYPE	MODEL	CAPACITY	DRIVE
1	WASTE OIL TRANSFER PUMP	GEAR PUMP W/ INTERNAL RELIEF	–	16 GPM @ 30 PSI	2 HP TEFC 208 VAC 3ø 60 Hz 1800 RPM
1	WASTE OIL STRAINER	SIMPLEX BASKET TYPE	–	–	–



DETAIL 1–4A
TYP DECK/BHD PENETRATION

GENERAL NOTES (CONT.)

11. FLEXIBLE HOSE ASSEMBLIES SHALL BE SUITABLE FOR LUBE OIL AND WASTE OIL SERVICE. SUCTION HOSES SHALL BE NON–COLLAPSING.
12. ARRANGE HOSE AND HOSE REEL FOR COMPLETE DRAINAGE TO WASTE OIL TANK. HOSE TO BE STORED DRAINED AND DISCONNECTED.
13. ARRANGE LEVEL INDICATOR TO PROVIDE INDICATION THROUGH THE GREATEST RANGE OF TANK LEVEL AS PRACTICABLE.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION. TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURERS' CERTIFIED DRAWINGS.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. PROVIDE GAUGE PIPING ASSEMBLIES AND MATERIALS FOR GAUGES AND INSTRUMENTS CONFIGURED IN ACCORDANCE WITH ASTM F721. VALVES, TUBING, AND FITTINGS SHALL BE 316 STAINLESS STEEL.
5. WHERE PIPES PENETRATE TANK BOUNDARIES, BULKHEADS, OR DECKS, HEAVY WEIGHT SPOOL PIECES OR REINFORCING PENETRATION FITTINGS SHALL BE USED. SEE DETAIL 1–4A.
6. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE ATTACHED BY WELDING DIRECTLY TO PIPES.
7. LUBE OIL PIPING SHALL NOT BE ROUTED NEAR ELECTRICAL DEVICES OR EQUIPMENT. LUBE OIL PIPING SHALL BE AT LEAST 18 INCHES AWAY FROM ANY SURFACE THAT NORMALLY HAS AN OPERATING TEMPERATURE OF 450°F OR GREATER.
8. GALVANIZED PIPE, FITTINGS, COMPONENTS, ETC. SHALL NOT BE USED.
9. DRIP PANS WITH UP–TURNED, SEALED, FLANGED EDGES SHALL BE PROVIDED BENEATH ALL FILTERS, PUMPS, STRAINERS, HOSE REELS AND ANY OTHER EQUIPMENT THAT CONTAINS OIL AND REQUIRES PERIODIC MAINTENANCE. DRIP PANS SHALL BE PROVIDED WITH DRAIN VALVES.
10. FIT EACH MAIN GENERATOR SUMP WITH A LOCKING DRAIN VALVE, 1" FEMALE CAMLOCK, AND DUST PLUG. TETHER DUST PLUG TO DRAIN LINE WITH A STAINLESS STEEL CHAIN OR CABLE.

REFERENCES

1. 18026–200–832–1 TECHNICAL SPECIFICATION
2. 18026–200–506–1 FILLS, VENTS, AND SOUNDS

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE–ENDED AZIMUTH DRIVE FERRY

TITLE: LUBE OIL AND WASTE OIL PIPING SCHEMATIC

SIZE	DWG NO.	REV
D	18026–200–529–2	–

SCALE	FILE NAME	SHEET
NTS	18026–200–529–2–	1 OF 2

DWN	MOD	CKD	APVD	APVD DATE
NJB	JEH		MEJ	7/31/18

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7/31/2018

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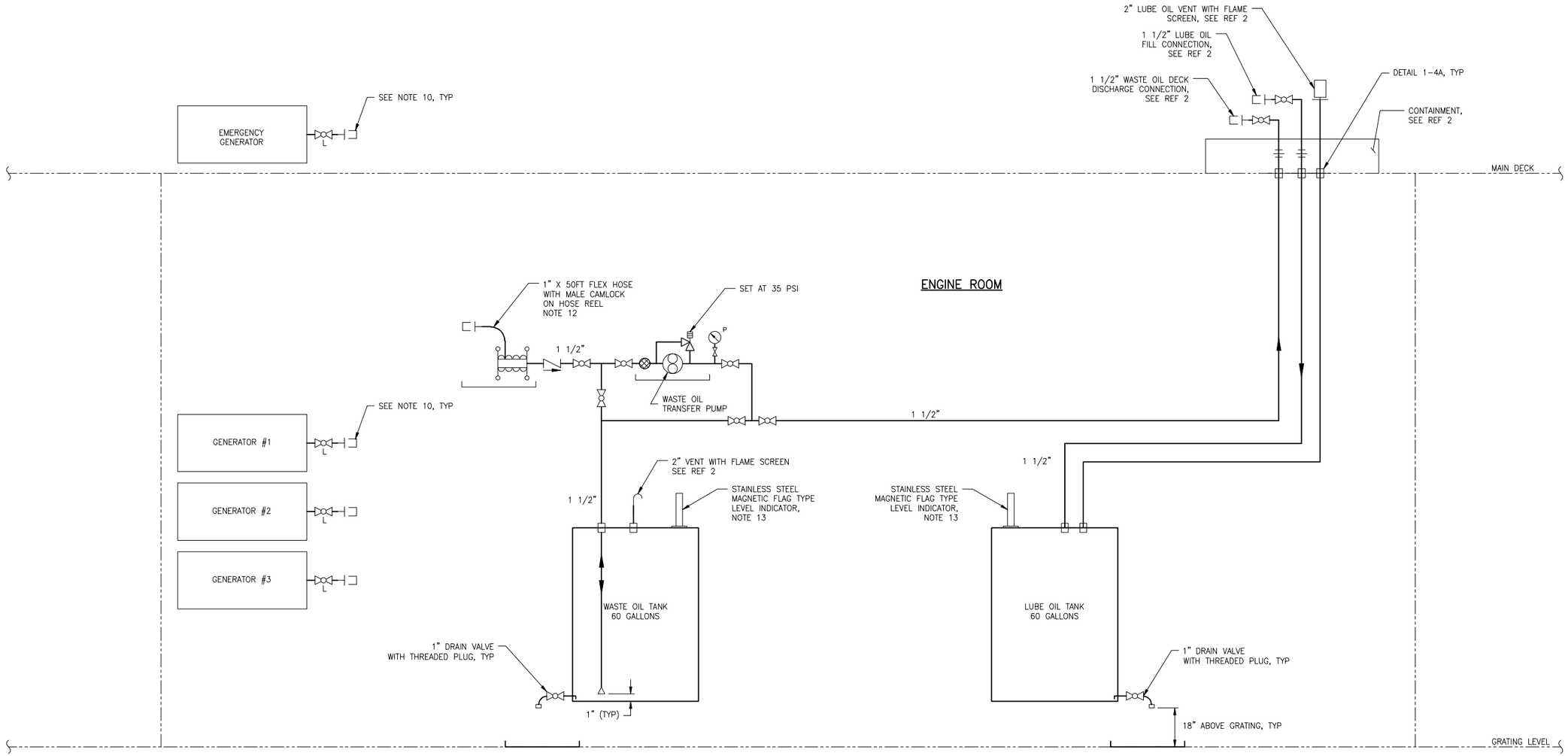

DIAGRAM 2-4A
LUBE OIL AND WASTE OIL SYSTEM

7/31/2018

SIZE	DWG NO.	REV
D	18026-200-529-2	–
SCALE NTS	FILE NAME 18026-200-529-2-	SHEET 2 OF 2

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MATERIAL SCHEDULE

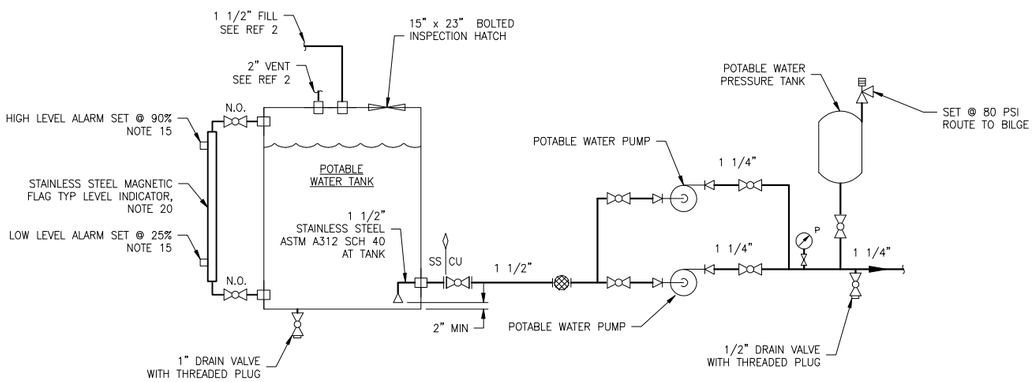
SERVICE	PIPING		TAKEDOWN JOINTS			VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS	BOLTING	BODY	TRIM			
HOT & COLD POTABLE WATER SUPPLY MAWP: 80 PSIG MAX TEMP: 170˚F	ALL	COPPER, SEAMLESS HARD DRAWN, ASTM B88, TYPE K	UNION ANSI B16.22, MSS-SP104 FLANGE, 150#, ANSI B16.24, SOLDER JOINT, COPPER	ARAMID FIBERS WITH A NEOPRENE BINDER	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BALL: BRONZE 150# THREADED OR SOLDER ENDS, ASTM B62 MSS-SP-72 (AT TANK 150# FLANGED, ANSI B16.24)	CHROME PLATED BALL, PTFE SEATS	WROT COPPER, ANSI B16.22, ASTM B75	–	

SYMBOLS LIST

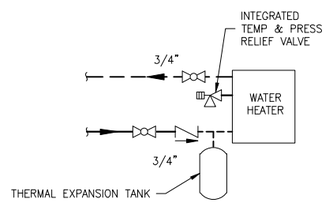
	PIPE – COLD WATER
	PIPE – HOT WATER
▷	REDUCER
	BHD PENETRATION
‖	FLANGE
	BALL VALVE
	SWING CHECK VALVE
	CENTRIFUGAL PUMP
	SIMPLEX STRAINER
	RELIEF VALVE
P	PRESSURE GAUGE
	MATERIAL TRANSITION
	HOSE BIB
	WINDOW SPRAY NOZZLE
	SOLENOID VALVE
	TEMPERING / ANTI-SCALD VALVE

EQUIPMENT LIST

QTY.	DESCRIPTION	TYPE	MODEL	CAPACITY	DRIVE	REMARKS
2	POTABLE WATER SUPPLY PUMP SYSTEM	MULTI-STAGE CENTRIFUGAL	–	8 GPM @ 50 PSIG	1 HP 115V/1P/60Hz	SEE NOTES 8 & 9
1	POTABLE WATER PRESSURE TANK	ASME RATED	–	68 GAL 125 PSI	–	–
1	WATER HEATER	ELECTRIC	–	20 GALLONS	208V/1P/60Hz 2 kW	–
1	THERMAL EXPANSION TANK	ASME RATED	–	2 GAL	–	150 PSI MAX 200˚F MAX
1	STRAINER 1 1/2" NPS	SIMPLEX BASKET TYPE	–	–	–	BRONZE BODY



DETAIL 1–5A
POTABLE WATER SYSTEM
VOID B



DETAIL 1–3A
HOT WATER HEATER
CREW DAY ROOM

GENERAL NOTES (CONT)

12. WATER HAMMER ARRESTORS SHALL BE PROVIDED AND INSTALLED IN SUPPLY LINES TO ANY UNIT WHERE SLOW-CLOSING VALVES ARE NOT USED.
13. ISOLATION VALVES LOCATED BEHIND LININGS SHALL BE PROVIDED WITH LABELED ACCESS OPENINGS.
14. ISOLATION VALVES AND DRAINS SHALL BE PROVIDED FOR ALL PIPING EXPOSED TO WEATHER OR ROUTED THROUGH UNHEATED SPACES. SERVICE SINK FAUCETS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKER AND SPIGOT WITH 1/2" THREADED HOSE END.
15. INTEGRATE TANK LEVEL ALARMS WITH SHIP'S ALARM AND MONITORING SYSTEM.
16. THE POTABLE WATER PRESSURE TANK SHALL BE FITTED WITH AN 80 PSIG SAFETY RELIEF VALVE. THE HOT WATER HEATER SHALL BE FITTED WITH TEMPERATURE/PRESSURE RELIEF VALVE.
17. WHERE COPPER PIPING PENETRATES BULKHEADS OR DECKS, STEEL PENETRATION SLEEVES WITH USCG APPROVED SEALANT AND CRUSHING SLEEVES SHALL BE USED. SEALANT AND SLEEVES SHALL BE RATED FOR WATERTIGHT AND A60 APPLICATIONS. INSTALL PIPING TRANSITS IN ACCORDANCE WITH MANUFACTURER'S APPROVED INSTALLATION DETAILS.
18. MECHANICAL FITTINGS MAY BE SUBSTITUTED FOR WELDED FITTINGS. FITTINGS SHALL BE USCG APPROVED, AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
19. TOILETS SHALL BE 1.28 GPF AND SHALL BE EQUIPPED WITH FLUSH-O-METER VALVE WITH INTEGRAL VACUUM BREAKER AND CONTROL STOP VALVE. SEE REF 1.
20. LEVEL INDICATOR TO PROVIDE INDICATION THROUGH GREATEST RANGE OF TANK LEVEL POSSIBLE.
21. MATERIAL TRANSITIONS FROM STEEL TO COPPER PIPE SHALL BE ACCOMPLISHED VIA FLANGED JOINTS. THE JOINTS SHALL BE FITTED WITH GALVANIC ISOLATION KITS TO PREVENT DIRECT METAL TO METAL CONTACT.
22. EXTERIOR HOSE BIBS SHALL BE FROST FREE. ALL HOSE BIBS SHALL HAVE VACUUM BREAKERS.
23. FIT ALL SINK FAUCETS WITH SUPPLY HOSES AND STOP VALVES AT BULKHEAD.
24. PROVIDE MOMENTARY BUTTON IN PILOT HOUSE CONSOLE TO ACTIVATE WINDOW WASHING SPRAY. COLOCATE PUSH BUTTON WITH WIPER CONTROLS FOR SAME WINDOW.
25. ALL POTABLE WATER VALVES SHALL BE LOCATED FOR EASY ACCESS.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS AND WITH SUFFICIENT TAKE DOWN JOINTS TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING AND REPLACEMENT OF PIPING, VALVES, FITTINGS AND EQUIPMENT.
4. AVOID POCKETS IN THE PIPE LINES. BOSSES AND VALVES OR SCREWED PLUGS SHALL BE FITTED TO ENABLE COMPLETE DRAINING OF PIPES WHERE POCKETS DO OCCUR.
5. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO THE BASIC SHIP STRUCTURE. CARE SHALL BE EXERCISED TO PLACE PIPE HANGERS SO THAT THE STRAIN IS AVOIDED WHERE PIPING IS CONNECTED TO MACHINERY. HANGERS SHALL NOT BE ATTACHED BY WELDING DIRECTLY TO PIPES.
6. HOT & COLD WATER PIPING TO BE INSULATED ACCORDING TO REF 1.
7. SET HOT WATER HEATER THERMOSTAT TO 140˚ F.
8. THE POTABLE WATER PRESSURE PUMP SYSTEM SHALL BE SUPPLIED WITH INTEGRAL PRESSURE SWITCHES TO CONTROL THE PUMP OPERATION. THE PRESSURE SWITCHES SHALL BE SET TO START THE PUMP AT 40 PSI AND STOP IT AT 60 PSI. THE PUMP SHALL HAVE AN INTEGRAL CHECK VALVE.
9. THE POTABLE WATER SYSTEM SHALL BE SUPPLIED WITH TWO PRESSURE PUMPS. NORMAL OPERATION IS ONE PUMP PRESSURIZING THE SYSTEM AND THE SECOND PUMP ON STANDBY.
10. TEMPERATURE TRANSDUCERS AND OTHER TEMPERATURE SENSING DEVICES SHALL BE INSTALLED IN THERMOWELLS.
11. AFTER INSTALLATION & TESTING THE SYSTEM SHALL BE CLEANED, SANITIZED & FLUSHED IN ACCORDANCE WITH USPHS REQUIREMENTS. SEE REF 1.

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-506-1 FILLS, VENTS, AND SOUNDS
3. 18026-200-201-1 MACHINERY ARRANGEMENT

NORTH CAROLINA FERRY SYSTEM
8550 SHIPYARD RD MANNS HARBOR, NC 27953

MICHAEL E. JOHNSON
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Michael E. Johnson
7/31/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: POTABLE AND SANITARY WATER PIPING SCHEMATIC

SIZE	DWG NO.	REV
D	18026-200-533-1	–

SCALE	FILE NAME	SHEET	OF
NTS	18026-200-533-1-	1	2

DWN	MOD	CKD	APVD	APVD DATE
NJB		NJB	MEJ	7/31/18

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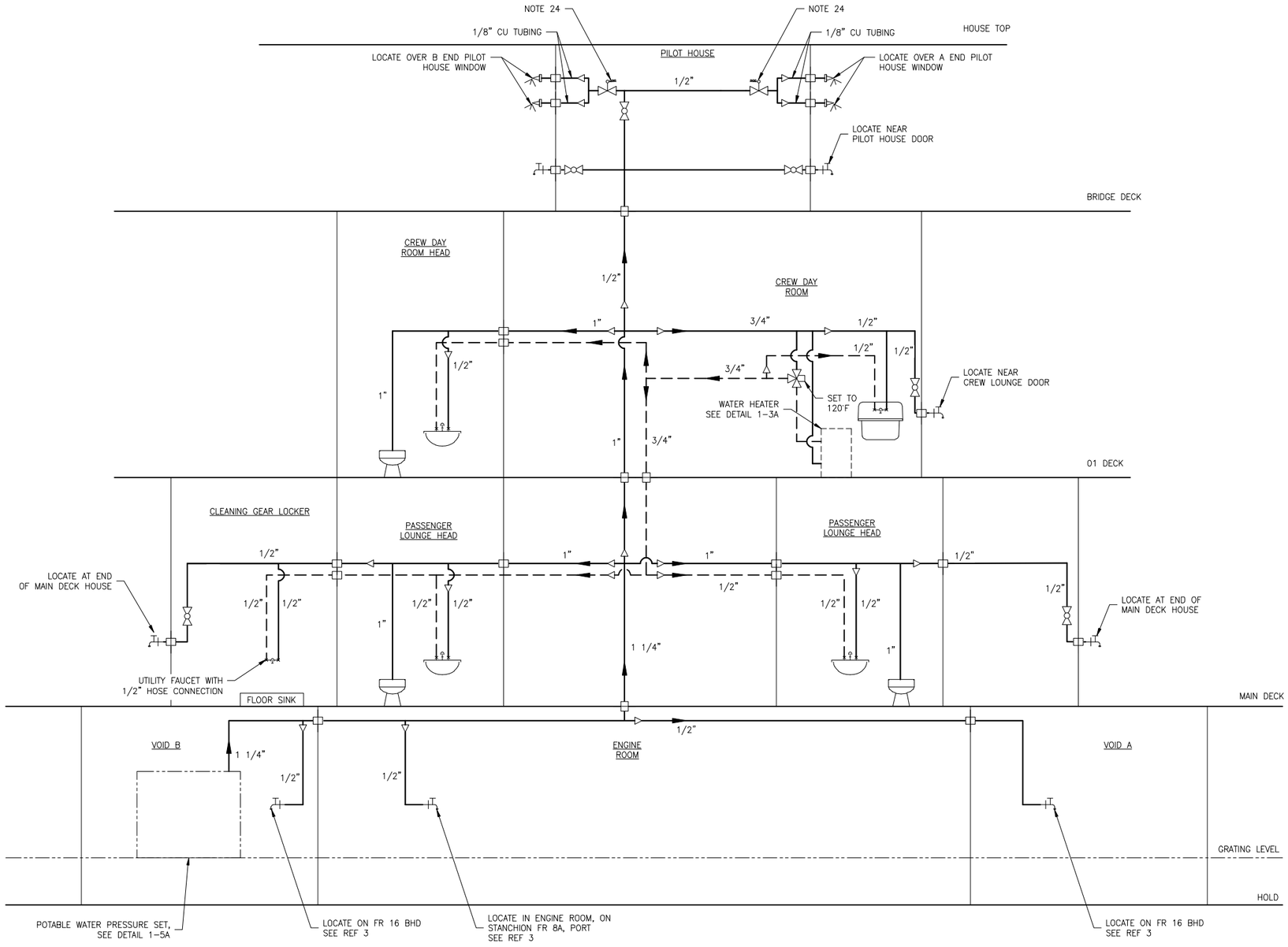

DIAGRAM 2-3A
POTABLE & SANITARY WATER SYSTEM

MICHAEL E. JOHNSON
STATE OF WASHINGTON
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Michael E. Johnson
7/31/2018

SIZE	DWG NO.	REV
D	18026-200-533-1	–
SCALE NTS	FILE NAME 18026-200-533-1-	SHEET 2 OF 2

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MATERIAL SCHEDULE

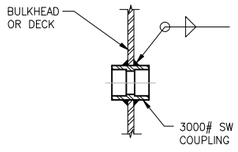
SERVICE	SIZE	PIPE	TAKEDOWN JOINTS			VALVES		FITTINGS	FLEXIBLE CONNECTIONS
			MATERIAL	GASKETS	BOLTING	BODY	TRIM		
COMPRESSED AIR MAWP: 165 PSIG	ALL	CARBON STEEL ASTM A53 OR A106, GRADE B, SEAMLESS ANSI B36.10 SCH 80	UNION, GROUND JOINT CARBON STEEL ASTM A105, 3000# MSS-SP-83 SOCKET WELD	–	–	BALL: CARBON STEEL ASTM A105, SOCKET WELD OR THREADED GATE, GLOBE, CHECK: CARBON STEEL ASTM A105 SOCKET WELD OR THREADED, ANSI B16.34	BALL: STAINLESS STEEL BALL & STEM, PTFE SEATS & SEALS GATE, GLOBE, CHECK: STAINLESS STEEL	CARBON STEEL ASTM A105, 3000# ANSI B16.11 SOCKET WELD	SEE NOTE 9

EQUIPMENT LIST

QTY.	SERVICE	TYPE	MODEL	CAPACITY	DRIVE	REMARKS
2	SHIP SERVICE COMPRESSOR	2 STAGE RECIPROCATING 828 RPM	–	17 SCFM @ 175 PSI	BELT DRIVE 208 VAC/3ϕ/60 Hz 5 HP TEFC MOTOR	NOTE 18
2	SHIP SERVICE RECEIVER	HORIZONTAL AIR RECEIVER	–	80 GAL SEE NOTE 11	–	ASME RATED TO 200 PSIG NOTES 8 & 18
2	SHIP'S HORN	AIR HORN	–	29 CFM 100 PSIG	–	WITH COMBINATION MANUAL/SOLENOID VALVE
1	AIR FILTER	COALESCING	–	5 CFM 80 PSIG	–	5 MICRON W/ OIL REMOVAL
1	AIR DRYER	DESICCANT CARTRIDGE	–	5 CFM 80 PSIG	–	–

SYMBOLS LIST

	PIPE
	BHD PENETRATION
	REDUCER
	BALL VALVE
	GLOBE VALVE
	LIFT CHECK VALVE
	SAFETY RELIEF VALVE
	STOP CHECK VALVE
	COMBINATION MANUAL/SOLENOID VALVE
	PRESSURE REGULATING VALVE
	FLEXIBLE CONNECTION
	STRAINER, WYE TYPE
	AIR COMPRESSOR
	QUICK DISCONNECT
PS	PRESSURE SWITCH
PT	PRESSURE TRANSDUCER
P	PRESSURE GAUGE, LOCAL READING
F	AIR FILTER
	AIR DRYER, CARTRIDGE TYPE
P	AIR REGULATOR W/PRESSURE GAUGE
N.O., N.S.	NORMALLY OPEN, NORMALLY SHUT



DETAIL 1-6A
TYP DECK/BHD PENETRATION
FOR SCH 80 STEEL PIPE 2" AND BELOW

GENERAL NOTES (CONT)

10. STRAINERS SHALL PROTECT REDUCING STATIONS AND OTHER ITEMS OF EQUIPMENT SUPPLIED WITH COMPRESSED AIR.
11. FIRE SUPPRESSION SYSTEM SHALL BE SIZED TO INCLUDE THE VOLUME OF FREE AIR CONTAINED IN THE AIR RECEIVERS.
12. REDUCING STATION RELIEFS SHALL BE SET TO 10% ABOVE REDUCING STATION OUTLET PRESSURE. ROUTE RELIEF LINES TO THE BILGE.
13. WHERE PIPES PENETRATE TANK BOUNDARIES, BULKHEADS, OR DECKS HEAVY WEIGHT SPOOL PIECES OR AN ALTERNATE APPROVED PENETRATION FITTING SHALL BE USED. SEE DETAIL 1-6A.
14. LOW POINTS SHALL BE FITTED WITH DIRT LEGS AND DRAIN VALVES.
15. SERVICE AIR STATIONS' REGULATORS SHALL BE EQUIPPED WITH PRESSURE GAUGE AND FILTER, CAPABLE OF UP TO 14 SCFM, ADJUSTABLE FROM 5 TO 125 PSIG.
16. REDUCING STATIONS SHALL INCLUDE A RELIEVING PRESSURE-REDUCING VALVE PRECEDED BY A WYE STRAINER, ISOLATION VALVES, AND A GLOBE BYPASS VALVE.
17. INTEGRATE AIR SUPPLY PRESSURE SENSORS WITH SHIP'S ALARM AND MONITORING SYSTEM. CONFIGURE FOR LOW PRESSURE ALARM. SEE REF 1.
18. COMPRESSORS SHALL BE SUPPLIED MOUNTED ON HORIZONTAL AIR RECEIVERS.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURER'S CERTIFIED DRAWINGS AS APPROPRIATE.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES.
5. THE PIPING SYSTEM SHALL BE CLEANED, FLUSHED, AND HYDROSTATICALLY PRESSURE TESTED IN ACCORDANCE WITH USCG REQUIREMENTS. SEE REF 1.
6. AIR COMPRESSORS SHALL BE CONFIGURED FOR A LEAD/LAG OPERATION. THE LEAD COMPRESSOR SHALL START AT 130 PSI AND STOP AT 150 PSI. THE LAG COMPRESSOR SHALL START AT 100 PSI AND STOP AT 150 PSI.
7. THE SUPPLY AND DISCHARGE CONNECTIONS TO EACH AIR RECEIVER SHALL BE LOCATED AS HIGH AS PRACTICAL IN THE RECEIVER. SUPPLY AND DISCHARGE SHALL NOT BE THROUGH A COMMON CONNECTION, AND IN NO EVENT SHALL THE DISCHARGE CONNECTION BE AT THE BOTTOM OF THE RECEIVER.
8. AIR RECEIVERS SHALL BE DESIGNED, CERTIFIED AND STAMPED FOR 200 PSI WORKING PRESSURE IN ACCORDANCE WITH ASME & 46 CFR 54. RECEIVERS SHALL BE MOUNTED IN SUCH A WAY THAT UNDER THE MOST EXTREME TRIMMING CONDITIONS, THE DRAIN WILL SAY AT THE LOWEST POINT. ACCESS FOR CLEANING SHALL BE PROVIDED.
9. BURSTING PRESSURE OF FLEX CONNECTIONS SHALL BE AT LEAST 5 TIMES THE WORKING PRESSURE OR 4 TIMES THE RELIEF VALVE SETTING.

REFERENCES

1.	18026-200-832-1	TECHNICAL SPECIFICATION
2.	18026-200-256-1	COOLING SYSTEM DIAGRAM
3.	18026-200-521-1	FIRE MAIN SYSTEM SCHEMATIC
4.	18026-200-529-1	BILGE AND BALLAST SCHEMATIC

NORTH CAROLINA FERRY SYSTEM
8560 SHIPYARD RD MANNS HARBOR, NC 27953

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Michael E. Johnson
7/31/2018

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: COMPRESSED AIR PIPING SCHEMATIC

SIZE	DWG NO.	REV
D	18026-200-551-1	–

SCALE	FILE NAME	SHEET	OF
NTS	18026-200-551-1-	1	2

DWN	MOD	CKD	APVD	APVD DATE
NJB			MEJ	7/31/18

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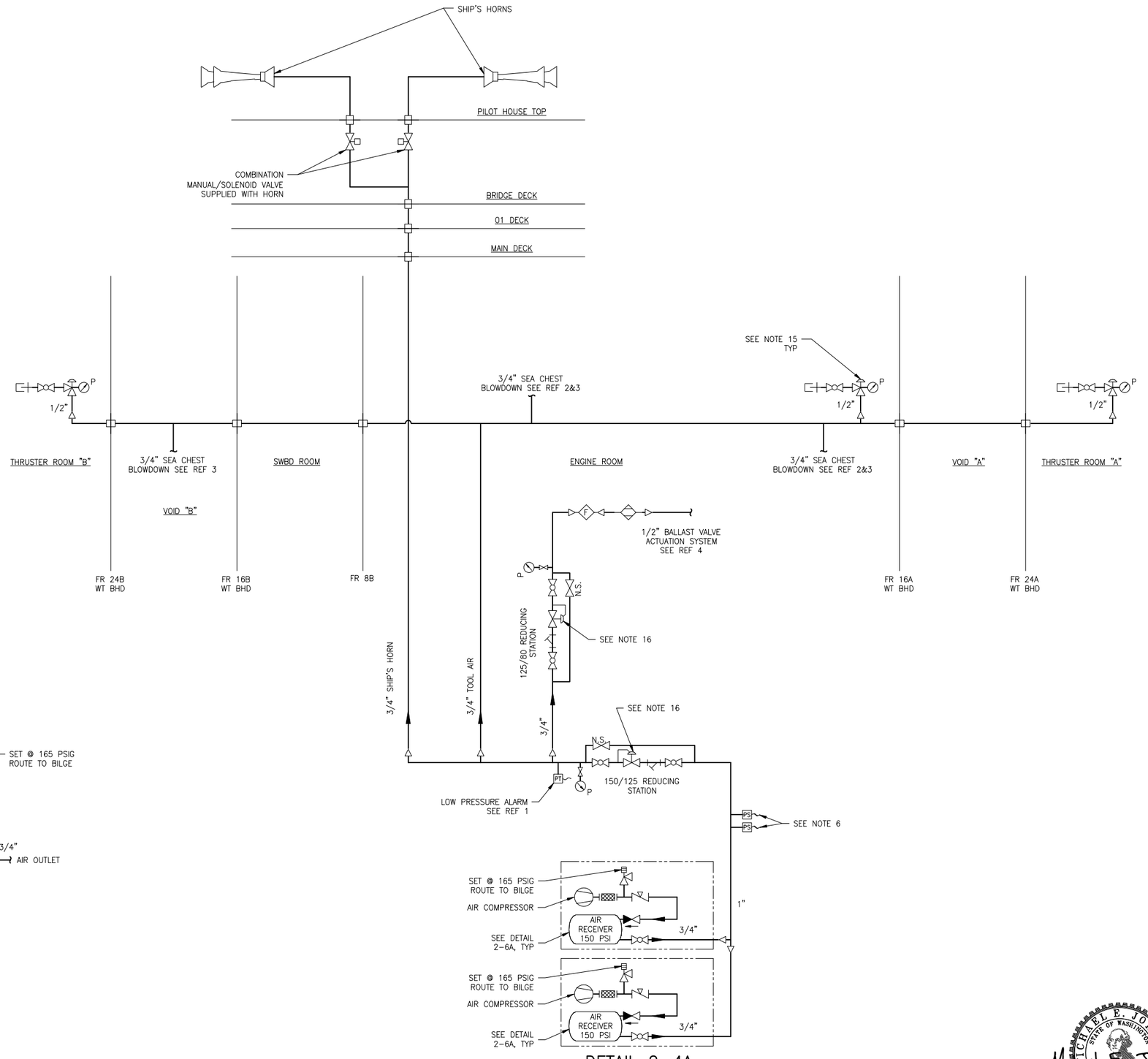

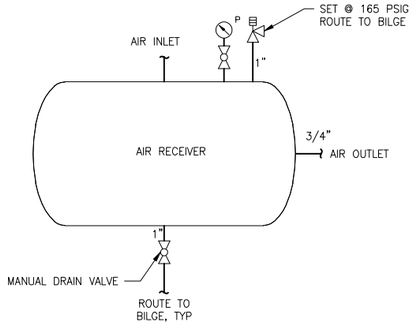

DETAIL 2-6A
AIR RECEIVER

DETAIL 2-4A
COMPRESSORS AND REDUCING STATIONS

7/31/2018

SIZE	DWG NO.	REV
D	18026-200-551-1	–
SCALE NTS	FILE NAME 18026-200-551-1-	SHEET 2 OF 2

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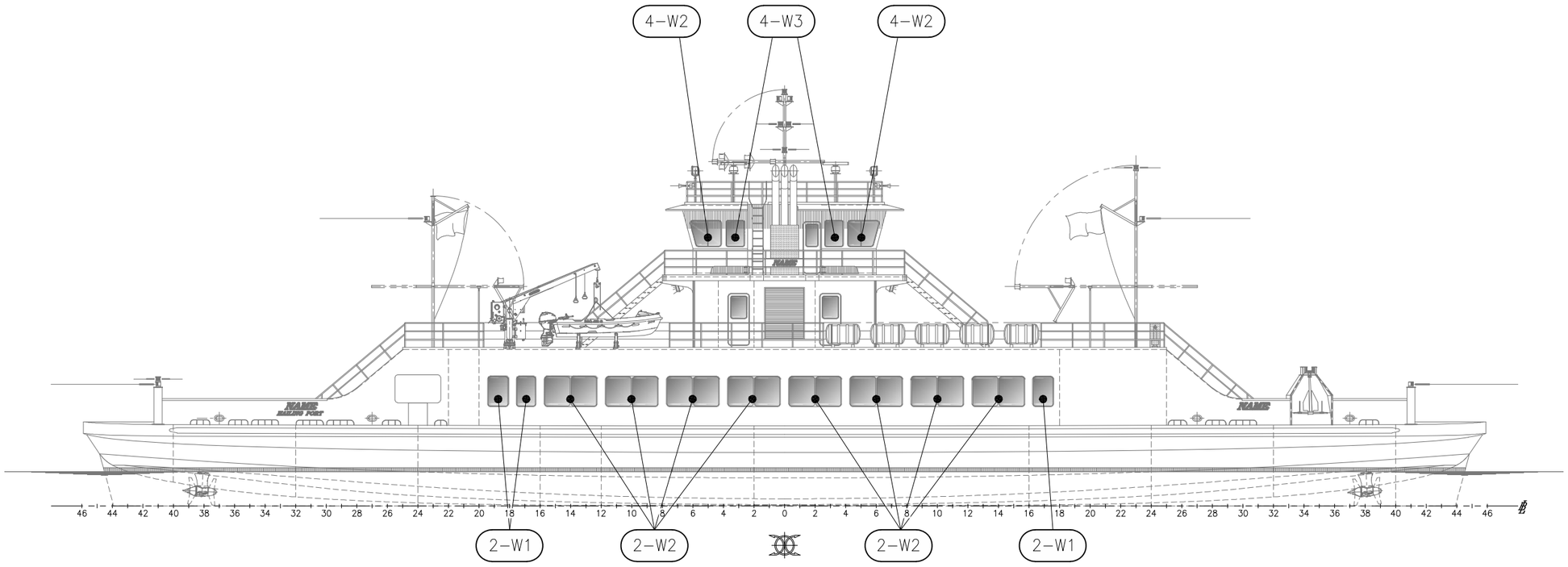
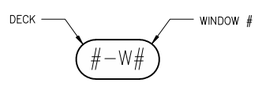
WINDOW LIST

NO.	QTY.	DECK	SPACE	FR / A-B	NOMINAL SIZE (W x H)	THICKNESS (in)	FIRE	REMARKS
1-W1	2	HOLD	EOS	2/B	36 x 35	TBD	A60	WIRE-INSERTED GLASS; GN 6
1-W2	2	HOLD	EOS	5/B	45 x 35	TBD	A60	WIRE-INSERTED GLASS; GN 6
2-W1	3	MAIN	PASSENGER LOUNGE	17/A,18/B	33 x 48	1/4	–	–
2-W2	8	MAIN	PASSENGER LOUNGE	14/A-14/B	81 x 48	1/4	–	–
3-W1	2	01	CREW LOUNGE	4/A,6/A	36 x 36	1/4	–	–
3-W2	1	01	CREW LOUNGE	1/B	24 x 36	1/4	–	–
3-W3	1	01	CREW HEAD	6/B	24 x 36	1/4	–	HORIZONTAL SPLIT, TOP OPEN; PRIVACY GLASS OR SUITABLE TINTED; GN 5
4-W1	2	BRIDGE	PILOT HOUSE	6/A,6/B	82 x 40	1/4	–	CUSTOM SHAPE
4-W2	4	BRIDGE	PILOT HOUSE	5/A,5/B	48 x 40	1/4	–	CUSTOM SHAPE, SLIDING OPENABLE
4-W3	4	BRIDGE	PILOT HOUSE	3/A,3/B	27 x 40	1/4	–	CUSTOM SHAPE
4-W4	2	BRIDGE	PILOT HOUSE	2/A,2/B	30 x 40	1/4	–	CUSTOM SHAPE



OUTBOARD PROFILE

LABEL KEY



REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. ALL GLASS SHALL BE TEMPERED.
4. WINDOWS IN PASSENGER SPACES SHALL HAVE A FINISHED INTERIOR SILL HEIGHT GREATER THAN THE HEIGHT OF THE PASSENGER SEAT BACKS.
5. WINDOW SHALL BE SPLIT HORIZONTALLY AND THE TOP HALF SHALL OPEN. WINDOW SHALL BE PRIVACY GLASS OR SUITABLY TINTED.
6. EOS WINDOWS SHALL HAVE A MINIMUM STC RATING OF 43.

VESSEL PARTICULARS

LENGTH OVERALL:	183'-7"
LENGTH DESIGN LOAD WATERLINE:	178'-3/8"
BEAM, MOLDED:	46'-0"
BEAM OVER GUARDS:	46'-10"
DEPTH AT SIDE:	10'-6"
DRAFT AT DLWL:	4'-6"
FREEBOARD AT SIDE:	6'-0"
TOTAL PASSENGER CAPACITY:	300 MAX.
VEHICLE CAPACITY:	40 SV

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: WINDOW SCHEDULE

8/3/2018

SIZE	DWG NO.	REV
D	18026-200-624-1	–

SCALE	FILE NAME	SHEET	OF
1/8"=1'-0"	18026-200-624-1-	1	3

DWN	MOD	CKD	APVD	APVD DATE
MWR		KAJ	KAJ	8/3/2018

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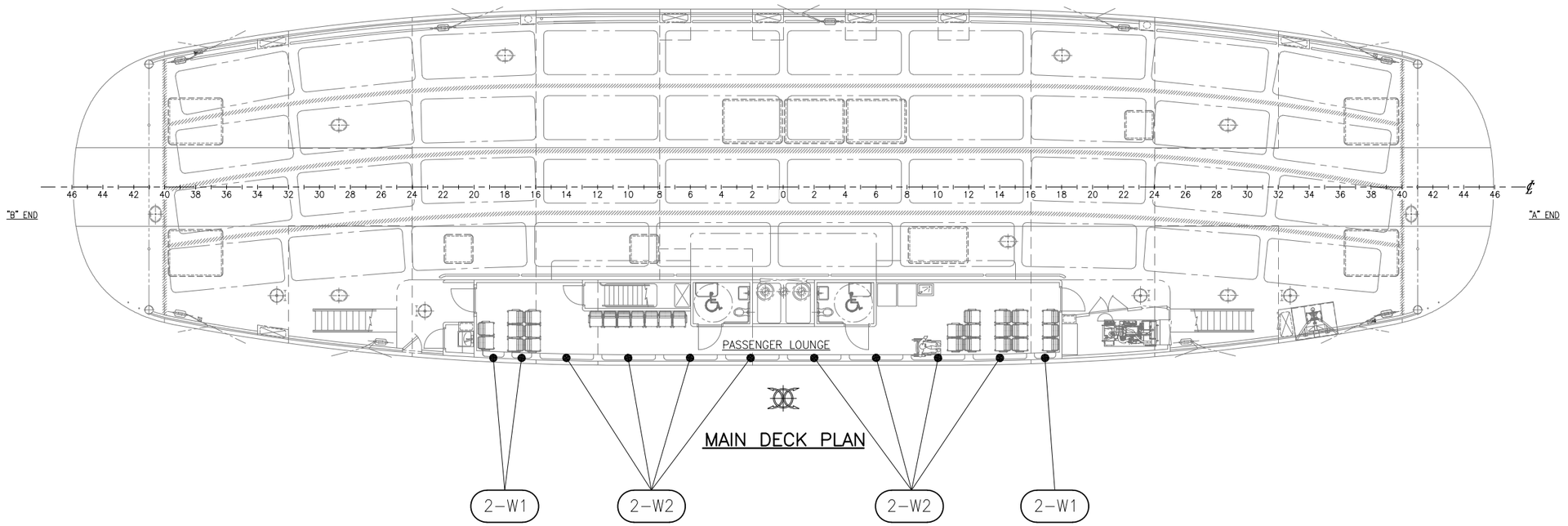
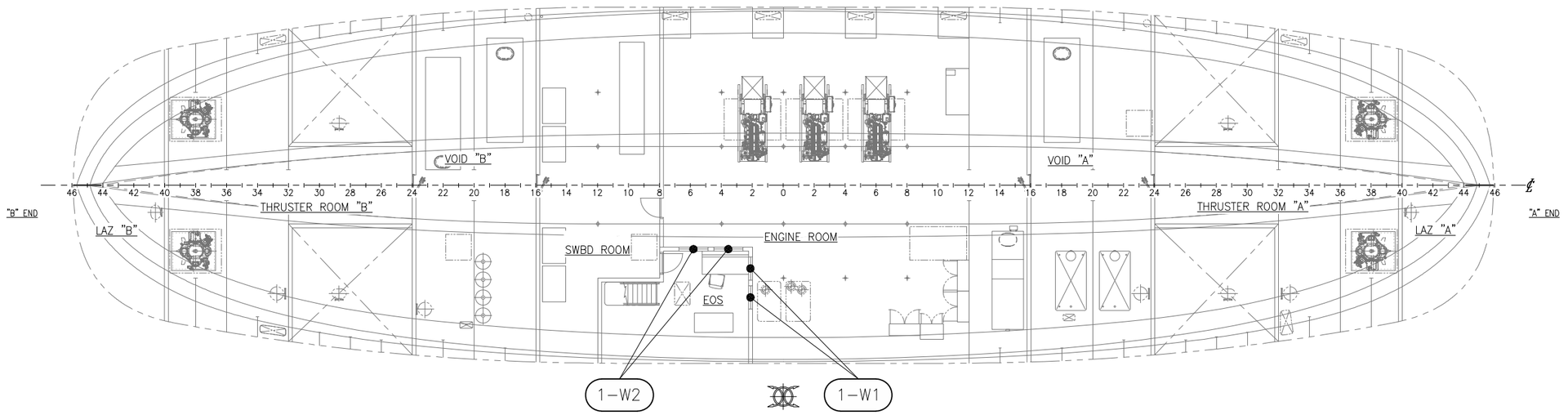


MAIN DECK PLAN



HOLD PLAN

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8/3/2018

SIZE	DWG NO.	REV
D	18026-200-624-1	–
SCALE 1/8"=1'-0"	FILE NAME 18026-200-624-1-	SHEET 2 OF 3

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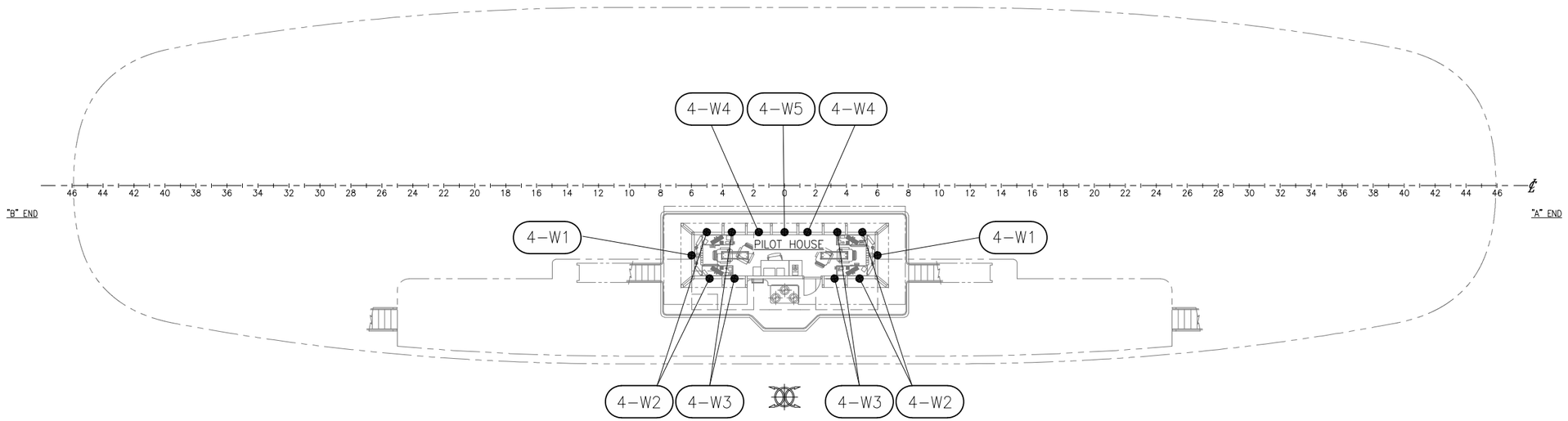
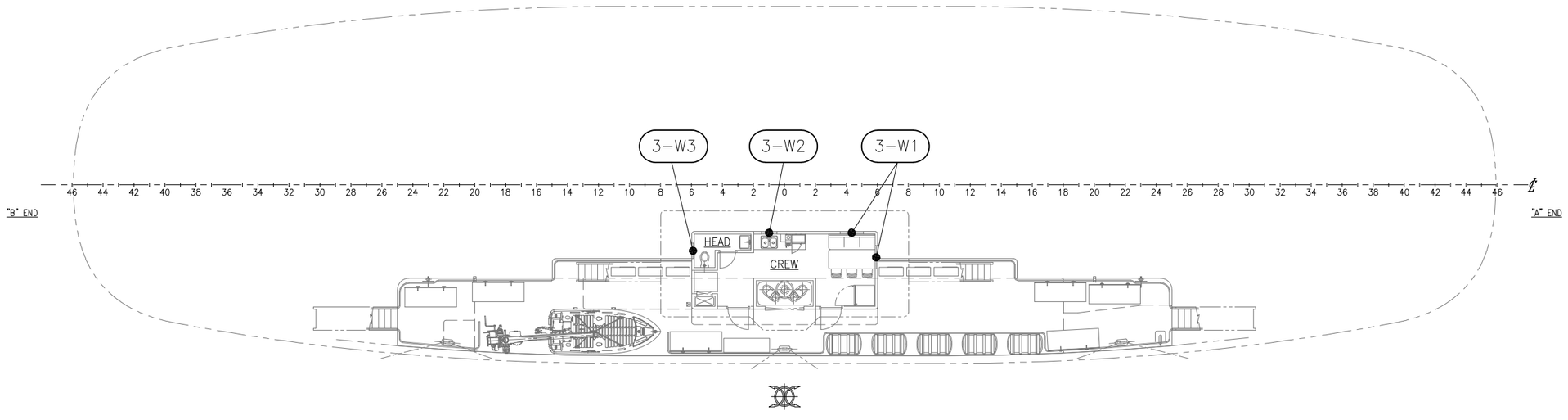


BRIDGE DECK PLAN



01 DECK PLAN

DENIS A. JANKOWSKI
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PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-624-1	–
SCALE 1/8"=1'-0"	FILE NAME 18026-200-624-1-	SHEET 3 OF 3

8/3/2018 2:29:10 PM

JOINER DOOR LIST

NO.	DECK	SPACE	FR-END/P-S	SIZE	FIRE	SWING	SILL	LOCK	WINDOW	REMARKS
1-JD1	HOLD	SWBD ROOM	8-B/S	30 x 80	A-0	LHR	0	NONE	10 x 10	CLOSER
1-JD2	HOLD	EOS	8-B/S	30 x 80	A-0	RHR	0	NONE	10 x 10	CLOSER
2-JD1	MAIN DECK	PASSENGER ADA HEAD	5-A/S	36 x 80	B-0	LH	0	PRIVACY	NONE	CLOSER, 12"x12" LOUVER DOOR, ADA POWER ASSIST
2-JD2	MAIN DECK	PASSENGER ADA HEAD	5-B/S	36 x 80	B-0	RH	0	PRIVACY	NONE	CLOSER, 12"x12" LOUVER DOOR, ADA POWER ASSIST
2-JD3	MAIN DECK	RESCUE BOAT ACCESS	24-B/S	30 x 36	-	LHR	0	CIPHER	NONE	HALF HEIGHT, GENERAL NOTE 8
3-JD1	01 DECK	CREW HEAD	4-B/S	24 x 80	B-0	RH	0	PRIVACY	NONE	CLOSER, 12" x 12" LOUVER DOOR

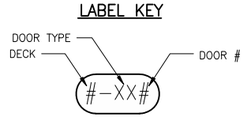
WEATHERTIGHT DOOR LIST

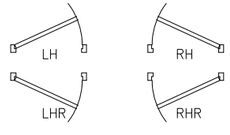
NO.	DECK	SPACE	FR-END/P-S	SIZE	FIRE	SWING	SILL	LOCK	WINDOW	REMARKS
2-WE1	MAIN DECK	EMERGENCY GENERATOR RM	21-A/S	60 x 74	A-0	DBL SWING	6	CIPHER	NONE	
2-WE2	MAIN DECK	PASSENGER LOUNGE	18-A/S	36 x 80	A-0	RH	1/2" MAX	NONE	28 x 34	CLOSER; ADA ACCESS; GENERAL NOTE 7
2-WE3	MAIN DECK	PASSENGER LOUNGE	20-B/S	36 x 80	A-0	RH	1/2" MAX	NONE	28 x 34	CLOSER; TONNAGE OPENING; ADA ACCESS; GENERAL NOTE 7
2-WE4	MAIN DECK	CLEANING LOCKER	22-B/S	30 x 77	A-0	LH	3	KEY	NONE	CLOSER
2-WE5	MAIN DECK	ENGINE ROOM	13-B/S	30 x74	A-15	RH	6	CIPHER	NONE	CLOSER
3-WE1	01 DECK	CREW SPACE	3-A/S	32 x 77	A-0	RH	3	CIPHER	24 x 34	CLOSER
3-WE2	01 DECK	CREW SPACE	3-B/S	32 x 77	A-0	LH	3	CIPHER	24 x 34	CLOSER
4-WE1	BRIDGE DECK	PILOTHOUSE	2-A/S	26 x 74	A-0	RH	6	CIPHER	20 x 34	CLOSER

WATERTIGHT DOOR LIST

NO.	DECK	SPACE	FR-END/P-S	SIZE	FIRE	SWING	SILL	LOCK	REMARKS
1-WT1	HOLD	THRUSTER ROOM "A"	24-A/S	32 x 72	A-0	LH	4.5	NONE	STEEL, QUICK ACTING, SIX OR EIGHT DOG
1-WT2	HOLD	VOID "A"	16-A/S	32 x 72	A-0	LH	4.5	NONE	STEEL, QUICK ACTING, SIX OR EIGHT DOG
1-WT3	HOLD	VOID "B"	16-B/S	32 x 72	A-0	RH	4.5	NONE	STEEL, QUICK ACTING, SIX OR EIGHT DOG
1-WT4	HOLD	THRUSTER ROOM "B"	24-B/S	32 x 72	A-0	RH	4.5	NONE	STEEL, QUICK ACTING, SIX OR EIGHT DOG

LABEL KEY





SECURE SIDE

DETAIL 1-3A
HANDING GUIDE
NO SCALE

8/3/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. DOOR HANDEDNESS LISTED ON TABLES IS DETERMINED FROM A POSITION ON THE SECURE SIDE OF THE DOOR. SEE DETAIL 1-3A.
4. ALL DOOR HANDLES IN PUBLIC SPACES ARE TO BE LEVER TYPE. ALL LOCK SETS ARE TO BE CLASSROOM TYPE (ANSI F84) TO ALLOW CREW AND PASSENGER ESCAPE.
5. FINAL KEY CORES AND CIPHER LOCKS WILL BE OWNER FURNISHED EQUIPMENT.
6. FIRE DOORS LISTED WITH HOLD BACKS ARE TO USE MAGNETIC STYLE, REMOTE RELEASE HOLD BACKS.
7. EXTERIOR WEATHER TIGHT DOORS ARE TO HAVE WELDED FRAMES.
8. RESCUE BOAT ACCESS DOOR SHALL BE A SECTION OF STEEL BULWARK WITH STEEL HINGES AND LOCK.

VESSEL PARTICULARS

LENGTH OVERALL:	183'-7"
LENGTH DESIGN LOAD WATERLINE:	178'-3/8"
BEAM, MOLDED:	46'-0"
BEAM OVER GUARDS:	46'-10"
DEPTH AT SIDE:	10'-6"
DRAFT AT DLWL:	4'-6"
FREEBOARD AT SIDE:	6'-0"
TOTAL PASSENGER CAPACITY:	300 MAX.
VEHICLE CAPACITY:	40 SV

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATIONS
2. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: DOOR SCHEDULE

SIZE	DWG NO.	REV
D	18026-200-624-2	-

SCALE	FILE NAME	SHEET
NONE	18026-200-624-2-	1 OF 3

DWN	MOD	CKD	APVD	APVD DATE
JEH		KAJ	KAJ	8/3/2018

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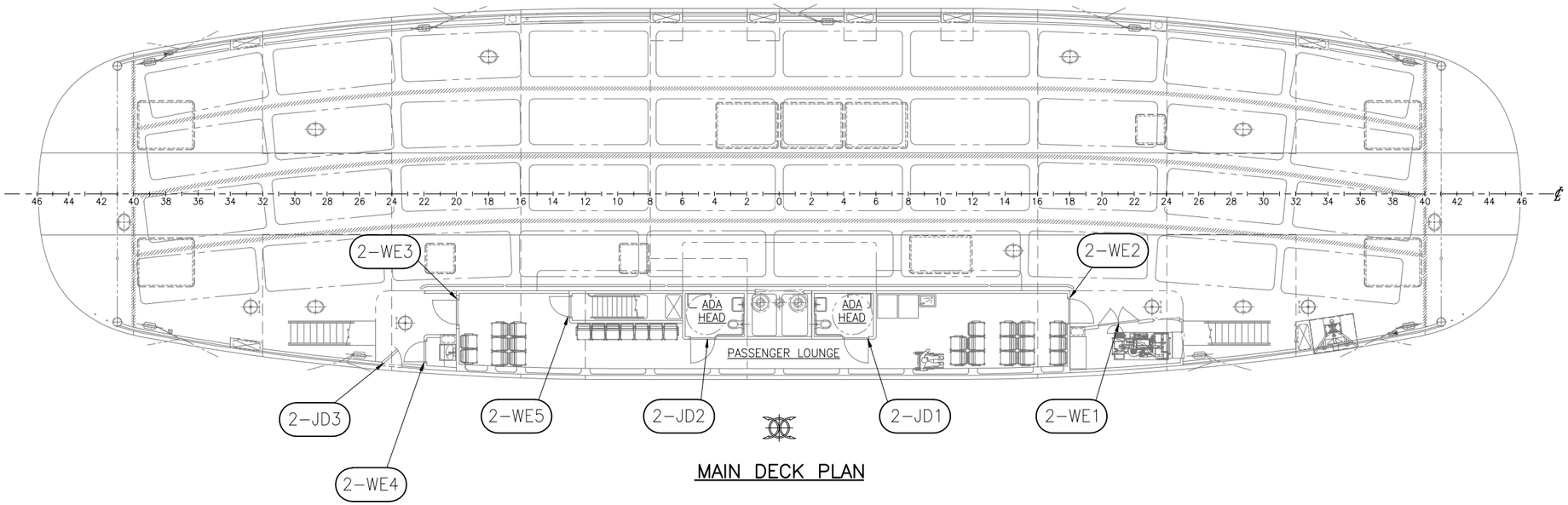
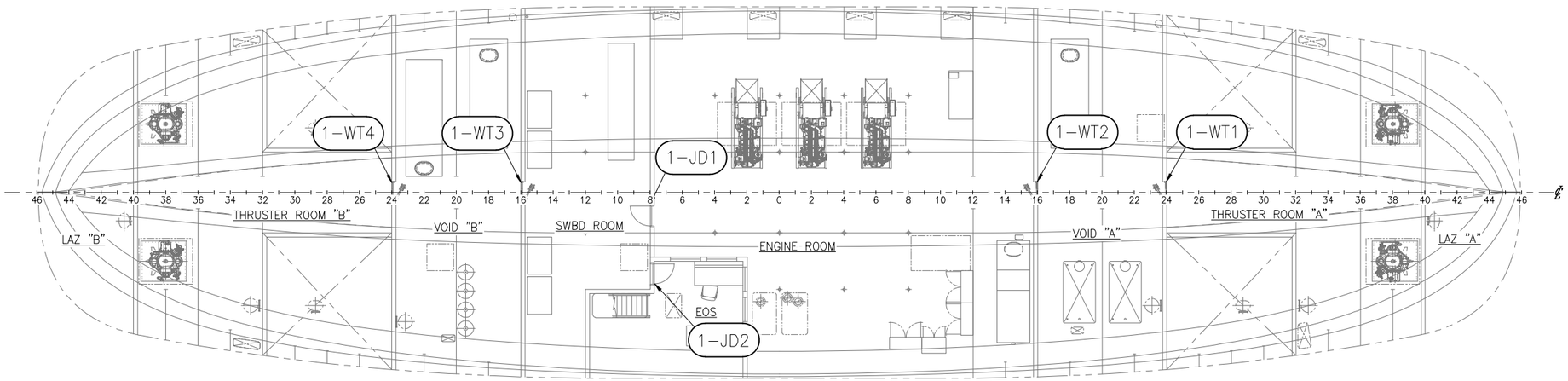


MAIN DECK PLAN



HOLD PLAN

KIRSA A. JANKOWSKI
STATE OF WASHINGTON
25055
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

SIZE	DWG NO.	REV
D	18026-200-624-2	–
SCALE 1/8"=1'-0"	FILE NAME 18026-200-624-2-	SHEET 2 OF 3

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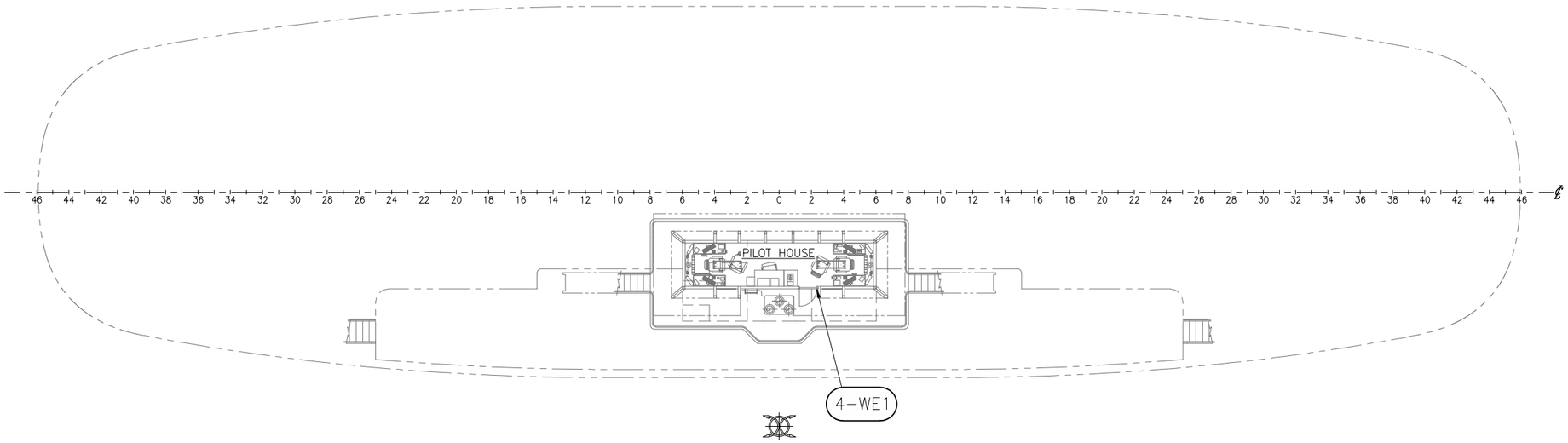
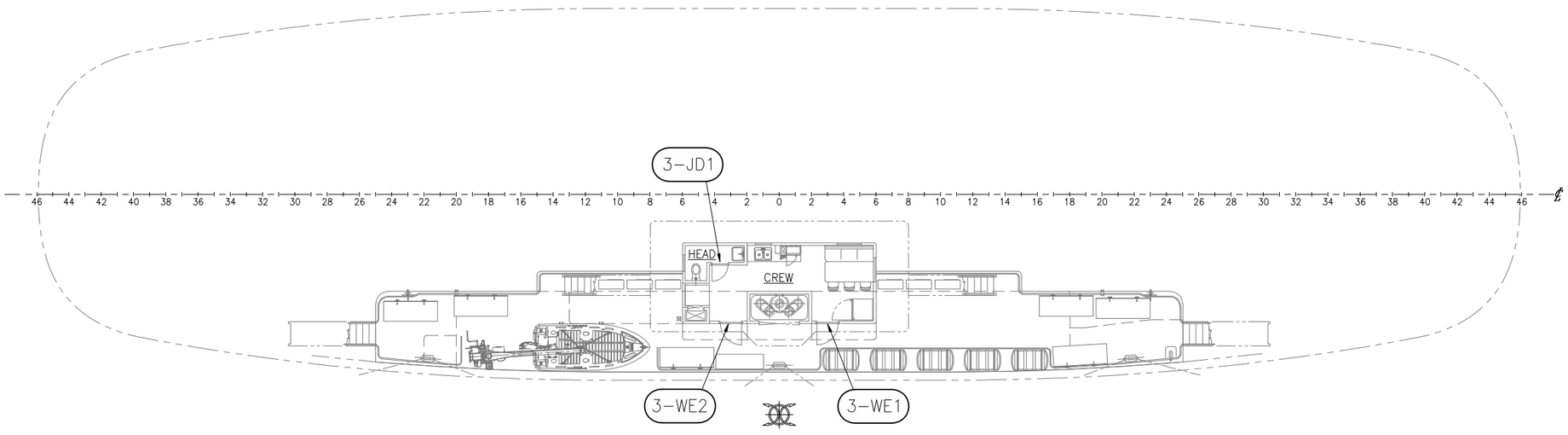


BRIDGE DECK PLAN



01 DECK PLAN

8/3/2018

SIZE	DWG NO.	REV
D	18026–200–624–2	–
SCALE 1/8"=1'–0"	FILE NAME 18026–200–624–2–	SHEET 3 OF 3

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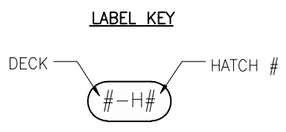
HATCH LIST

NO.	DECK	SPACE	FR-END/P-S	SIZE	COAMING	REMARKS
1-H1	HOLD	POTABLE WATER TANK (P)	22-B/P	15 x 23	2.5	RAISED, BOLTED, WATER TIGHT
1-H2	HOLD	FUEL OIL TANK (A)	18-A/P	15 x 23	2.5	RAISED, BOLTED, OIL TIGHT
1-H3	HOLD	FUEL OIL TANK (B)	18-B/P	15 x 23	2.5	RAISED, BOLTED, OILTIGHT
2-H1	MAIN	LAZ "A"	40.5-A/S	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H2	MAIN	THRUSTER ACCESS	38-A/S	72 x 84	0	EQUIPMENT REMOVAL CAR DECK PLATE, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H3	MAIN	THRUSTER ACCESS	38-A/P	72 x 84	0	EQUIPMENT REMOVAL CAR DECK PLATE, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H4	MAIN	BALLAST TANK (S)	29-A/S	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H5	MAIN	BALLAST TANK (P)	29-A/P	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H6	MAIN	THRUSTER ROOM "A" ESCAPE	33-A/S	22 DIA	0	FLUSH, HINGED, WATER TIGHT, QUICK ACTING, SPRING ASSIST
2-H7	MAIN	VOID "A" ESCAPE	23-A/S	22 DIA	0	FLUSH, HINGED, WATER TIGHT, QUICK ACTING, SPRING ASSIST
2-H8	MAIN	GENERATOR ACCESS	6-A/P	64 x 88	0	EQUIPMENT REMOVAL CAR DECK PLATE, A-60, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H9	MAIN	GENERATOR ACCESS	2-A/P	64 x 88	0	EQUIPMENT REMOVAL CAR DECK PLATE, A-60, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H10	MAIN	GENERATOR ACCESS	2-B/P	64 x 88	0	EQUIPMENT REMOVAL CAR DECK PLATE, A-60, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H11	MAIN	ENG. RM. MACHINERY ACCESS	10-A/S	52 x 86	0	EQUIPMENT REMOVAL CAR DECK PLATE, A-60, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H12	MAIN	EXHAUST ACCESS	0/S	72 x 84	0	STUD, X2 HANDLE, EQUIPMENT REMOVAL PLATE, WATER TIGHT
2-H13	MAIN	BALLAST TANK (S)	29-B/S	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H14	MAIN	BALLAST TANK (P)	29-B/P	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H15	MAIN	VOID "B" ESCAPE	23-B/S	22 DIA	0	FLUSH, HINGED, WATER TIGHT, QUICK ACTING, SPRING ASSIST
2-H16	MAIN	THRUSTER ROOM "B" ESCAPE	33-B/S	22 DIA	0	FLUSH, HINGED, WATER TIGHT, QUICK ACTING, SPRING ASSIST
2-H17	MAIN	THRUSTER ACCESS	38-B/S	72 x 84	0	EQUIPMENT REMOVAL CAR DECK PLATE, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H18	MAIN	THRUSTER ACCESS	38-B/P	72 x 84	0	EQUIPMENT REMOVAL CAR DECK PLATE, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H19	MAIN	LAZ "B"	40.5-B/S	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H20	MAIN	ANCHOR CHAIN STORAGE	34A/S	15 x 23	0	STUD, X2 HANDLE, EQUIPMENT REMOVAL PLATE, WATER TIGHT
2-H21	MAIN	FUEL OIL TANK (A) ACCESS	18-A/P	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H22	MAIN	FUEL OIL TANK (B) ACCESS	18-B/P	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H23	MAIN	MSD ACCESS	14.5-A/S	15 x 23	0	FLUSH, WATER TIGHT, BOLTED
2-H24	MAIN	VOID "A" ACCESS	23-A/P	40 x 40	0	EQUIPMENT REMOVAL CAR DECK PLATE, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H25	MAIN	SWBD ROOM ACCESS	9-B/S	40 x 40	0	EQUIPMENT REMOVAL CAR DECK PLATE, FLUSH, SCREWED, WATER TIGHT, REF 3
2-H26	MAIN	VOID "B" ACCESS	21-B/S	40 x 40	0	EQUIPMENT REMOVAL CAR DECK PLATE, FLUSH, SCREWED, WATER TIGHT, REF 3
3-H1	01 DECK	ELECTRICAL CHASE	5-B/S	24 x 24	0	EQUIPMENT REMOVAL PLATE, FLUSH, SCREWED

LABEL KEY



JURNIS A. JANKOVS
STATE OF WASHINGTON
55055
REGISTERED
PROFESSIONAL ENGINEER
8/3/2018

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. FRAME SPACING IS 24" UNLESS NOTED OTHERWISE.
3. ALL HATCHES ARE TO BE GASKETED, WATERTIGHT. FLUSH HATCHES ON CAR DECK ARE TO USE ADDITIONAL SEALING COMPOUND TO ENSURE WATERTIGHT FIT.
4. SEE REF 3 FOR B.E.R.P. HATCH STRUCTURE.
5. ESCAPE HATCHES SHALL BE PAINTED IN A BRIGHT COLOR CONTRASTING THE DECK.

VESSEL PARTICULARS

LENGTH OVERALL:	183'-7"
LENGTH DESIGN LOAD WATERLINE:	178'-3/8"
BEAM, MOLDED:	46'-0"
BEAM OVER GUARDS:	46'-10"
DEPTH AT SIDE:	10'-6"
DRAFT AT DLWL:	4'-6"
FREEBOARD AT SIDE:	6'-0"
TOTAL PASSENGER CAPACITY:	300 MAX.
VEHICLE CAPACITY:	40 SV

REFERENCES

1. 18026-200-832-1 TECHNICAL SPECIFICATION
2. 18026-200-101-1 PROFILES AND DECK ARRANGEMENTS
3. 18026-200-130-2 MAIN DECK

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD MANNS HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA

PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

TITLE: HATCH SCHEDULE

SIZE	DWG NO.	REV
D	18026-200-624-3	—

SCALE	FILE NAME	SHEET	OF
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DWN	MOD	CKD	APVD	APVD DATE
JEH	MWR	NJB	KAJ	8/3/2018

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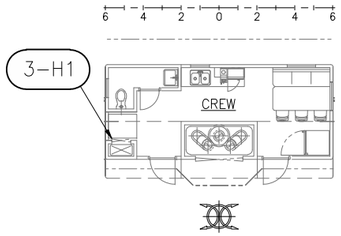
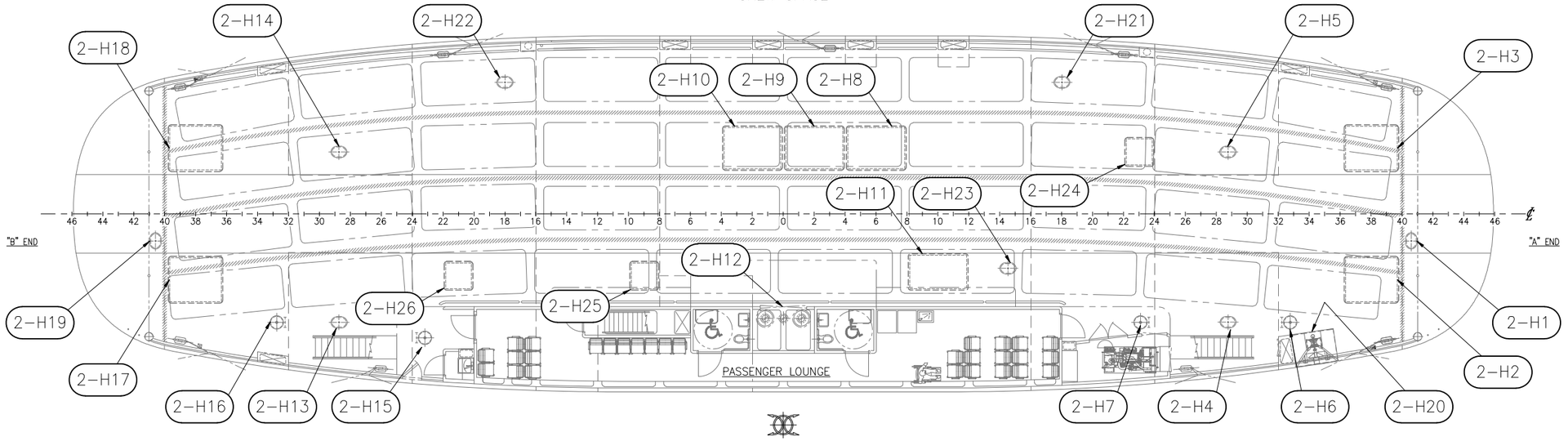
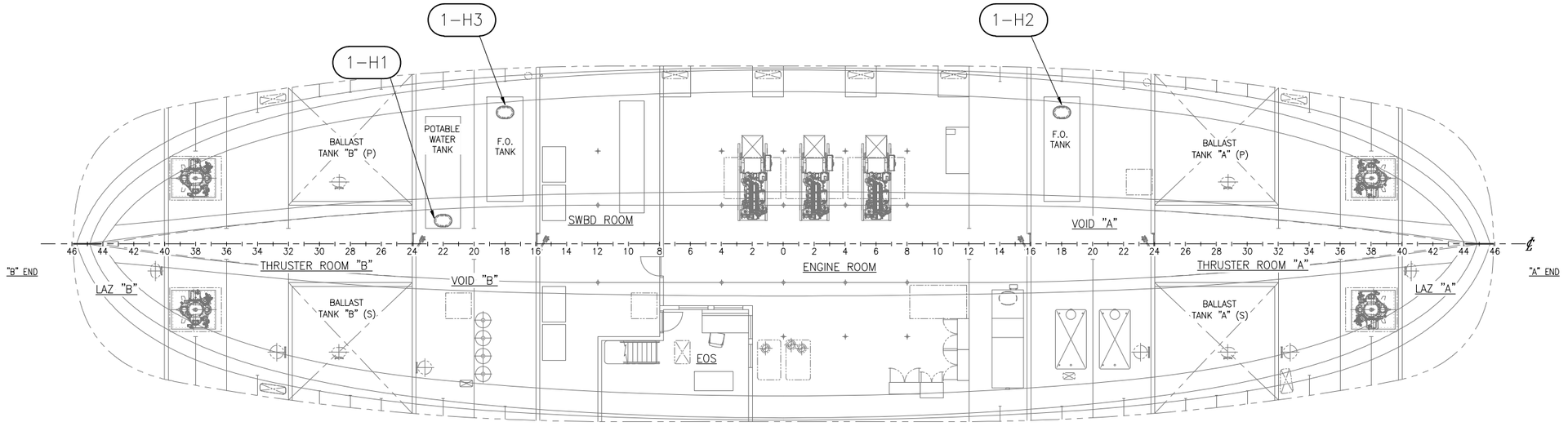


01 DECK PLAN
CREW SPACE



MAIN DECK PLAN



HOLD PLAN

8/3/2018

SIZE	DWG NO.	REV
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SCALE 1/8"=1'-0"	FILE NAME 18026-200-624-3-	SHEET 2 OF 2

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