

HEGER DRY DOCK, INC

77 Main Street, Suite 9
Hopkinton, MA 01748

(508) 829-1800
www.Hegerdrydock.com

February 23rd, 2022

Attention: Vincent Magers, Dockmaster, NASSCO San Diego

Subject: Memo – BUILDER FDD, Keel Line Loading Capacity (2022)

Enclosures: (1) HEGER’s Pontoon Deck gauging plan, dated 1/10/2022
(2) Pontoon Deck UT survey results, dated 1/23/2022
(2) HEGER’s Pontoon Deck Analysis, dated 2/4/2022

Reference: (A) Memo – BUILDER FDD Revised Operational Limits and Repair Plan (2021), dated 11/23/2021

1.0 Introduction

HEGER DRY DOCK, Inc. (HDD) was previously tasked by NASSCO SAN DIEGO to conduct an engineering review of the aging BUILDER dry dock, suggest operational parameters/limitations, and develop a repair plan for current or future corrosion. In summary, HDD identified it is imperative to closely monitor the condition of the corroding pontoon deck and adjust the operational limitations of the keel line loading capacity based on surveyed findings. Refer to Reference A for additional information.

Following the submittal of Reference A to NAVSEA and subsequent conversations, the following procedure was tentatively agreed upon for determining certifiable keel line loading capacities on a biennial basis (every other year):

1. Conduct a comprehensive Ultrasonic Thickness (UT) gauging survey of the middle 80-ft of the dock’s pontoon deck plating; this areas contributes to transverse strength and keel line loading capacities. Gauging shall be done in a tight grid (i.e. a belt along every BHD frame with a transverse spacing of 8’ between measurements). The location of the belts, from survey to survey, shall shift 2’ along the length of the dock.
2. HDD will calculate the average pontoon deck thickness for each of the three different dock sections (i.e. Original, NASSCO, and Strengthened).
3. Once the averages are determined for each section, a thickness of 0.026-inches will be subtracted from the average; this accounts for potential future corrosion in the 2-years between gauging surveys, per NSTM 100 Category D. These adjusted UT averages will be referred to as the “Corrected UT Average” for each section.
4. The “Corrected UT Average” will be used in combination with “HEGER’s recommended keel line capacity chart” to determine the keel line capacity for each section.

Furthermore, if the rated capacity of the dock falls below the desired rating and affects the ability to dock certain NAVY vessel classes, repairs to corroded areas of the dock could be implemented to increase the keel line loading capacity of the dock once repairs are completed and adequately signed off on.

2.0 Gauging Survey Results

HDD developed a pontoon deck gauging plan for NASSCO to execute (refer to Enclosure 1). HDD’s plan called for 65 belts along the length of the dock (a 12’ spacing); each belt specified 13 measurements in the middle 80-ft of the dock.

In the event a measurement was taken, with corrosion levels exceeding 20%, a more refined grid (see sketch below) was taken around the reading to better ascertain the general condition of the area and rule out any potential “bad” quality UT measurements. An average of all 9 shots, in the refined grid, was taken as the measurement for the specified location.

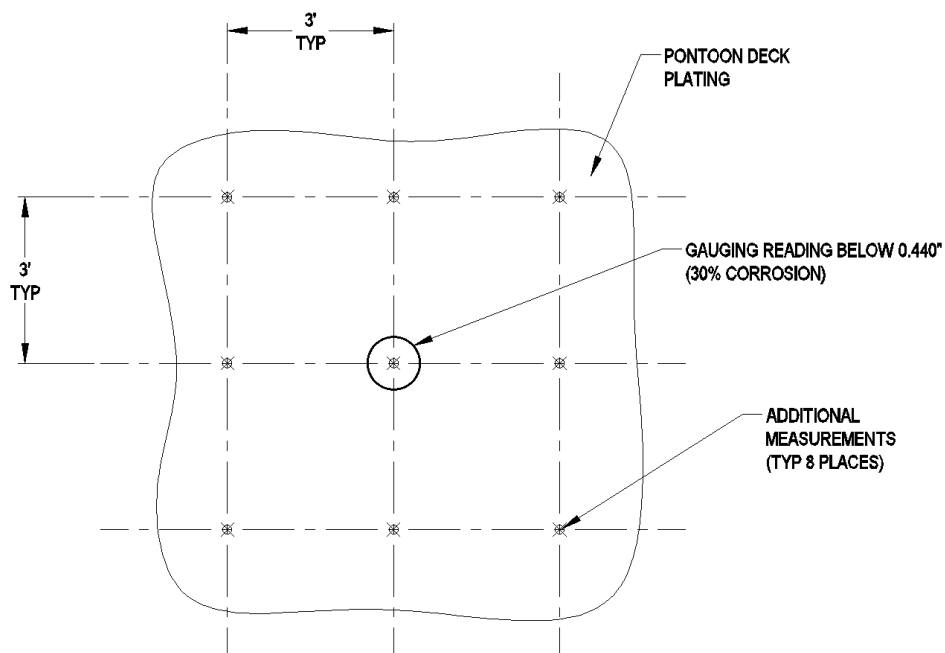


FIGURE 1 - REFINED GAUGING GRID IN WAY OF LOCALIZED CORROSION UT

The results of the survey attached in Enclosure 2. The gauging results were used as the basis for HEGER’s analysis which is attached in Enclosure 3.

In general the condition of the plating was found to be as follows:

	<u>Strengthened Section</u>	<u>NASSCO Section</u>	<u>Original Section</u>
Average Measurement	0.590-in	0.630-in	0.578-in
Percent Wasted	6%	0%	8%
Corrosion Rate since 2020 (for reference)	0.09 mm/yr	0.08 mm/yr	0.09 mm/yr

Refer to the figure, on the next page, for a general arrangement illustrating the 3 different dock sections:

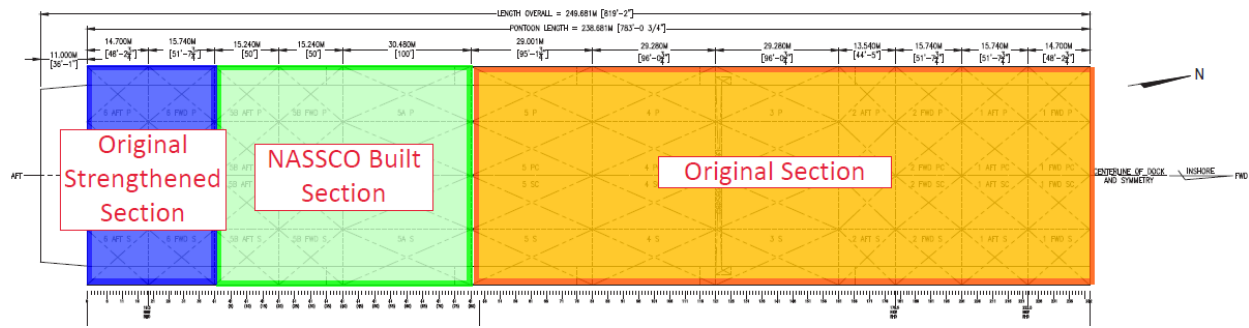


FIGURE 2 - PLAN VIEW OF BUILDER FDD

3.0 Keel Line Loading Capacity

HEGER previously provided the “recommended structural capacity vs pontoon deck corrosion” curve, shown in Figure 3, to determine keel line loading capacities of the dock based on the surveyed levels of corrosion. The curve plots pontoon deck corrosion levels along the horizontal axis against structural keel line loading capacities along the vertical axis for the three different pontoon section designs. The chart was developed with principle stress calculations and substantiated with detailed Finite Element Analysis (FEA). Refer to Reference A for further details.

HEGER RECOMMENDED STRUCTURAL CAPACITY VS PONTOON DECK CORROSION

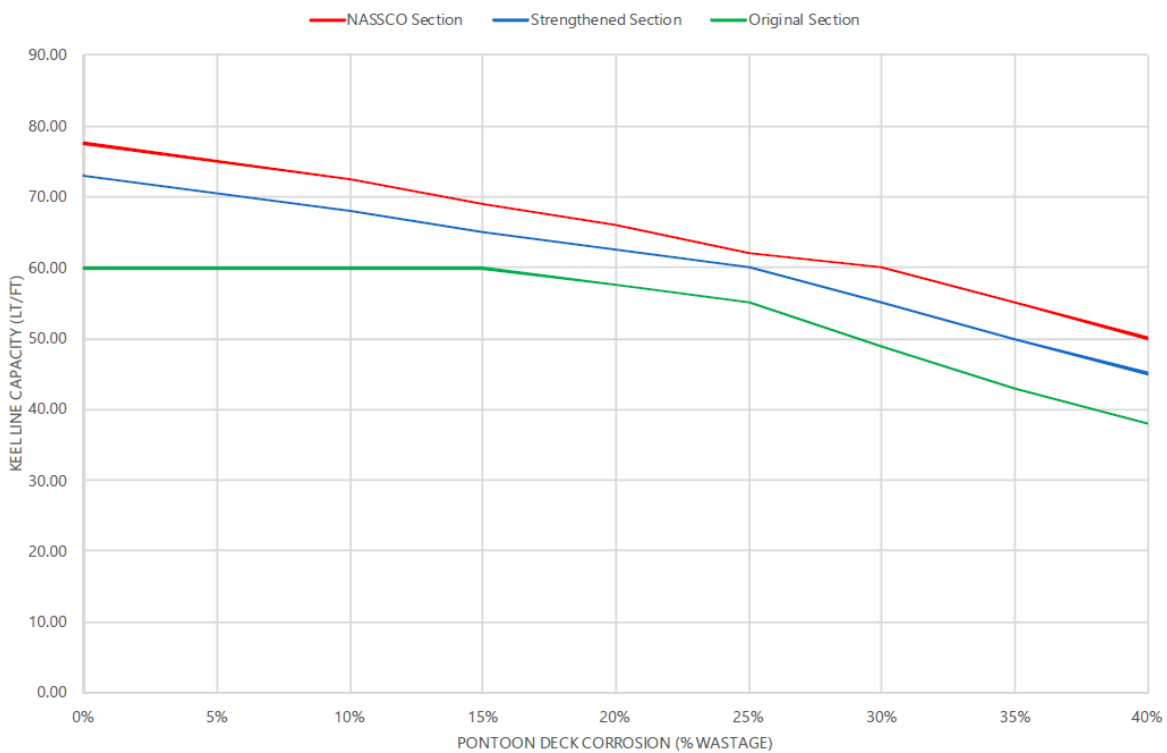


FIGURE 3 - CHART OF KEEL LINE CAPACITY VS PONTOON DECK CORROSION

NOTE: The levels of pontoon deck corrosion only pertain to the middle 80-ft of the dock; plating further outboard does not significantly contribute to the keel line capacity of the dock and it's minimum plating thicknesses is governed by head pressure limitation or vehicular loading demands.

Heger Dry Dock, Inc.

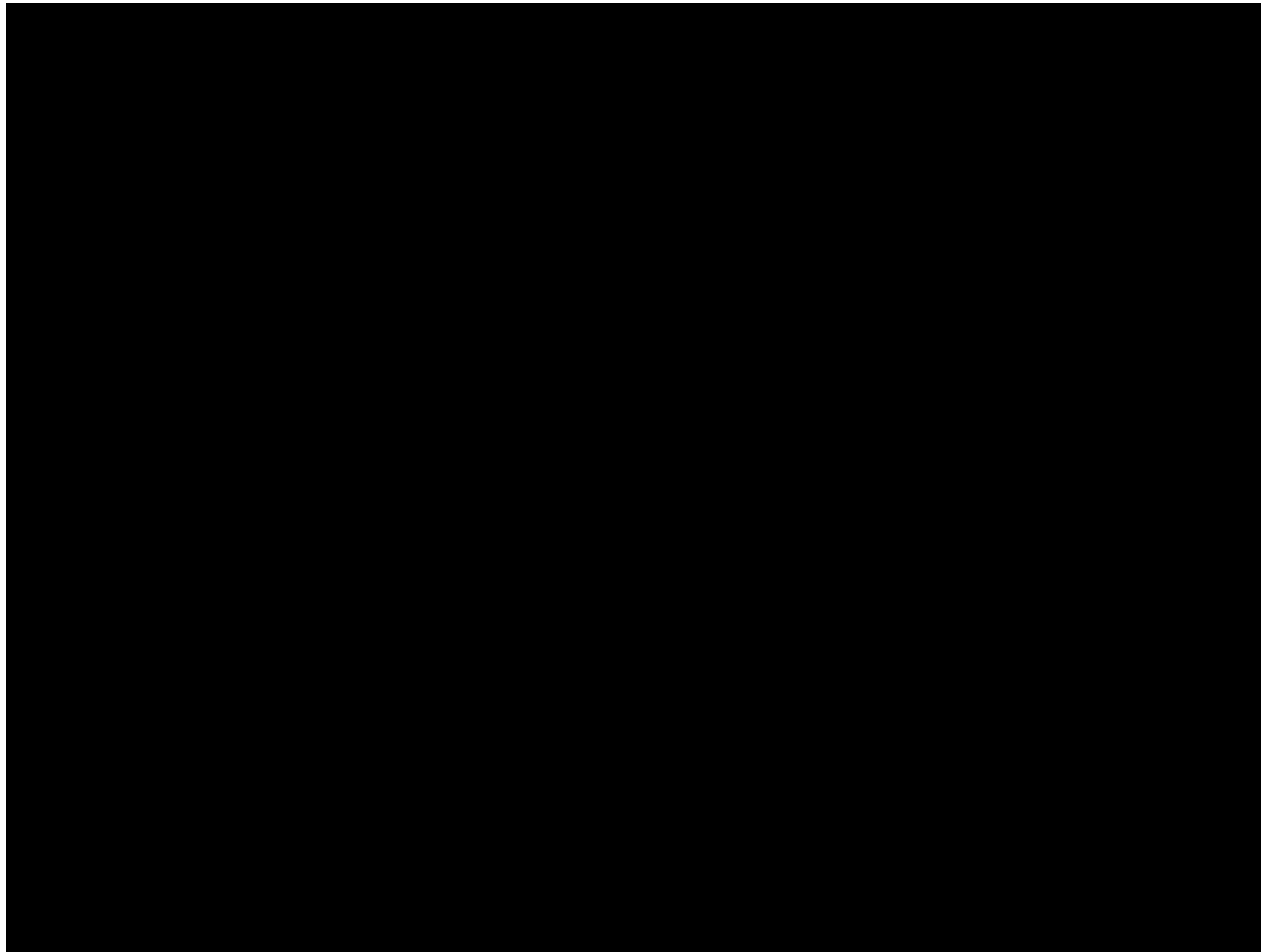
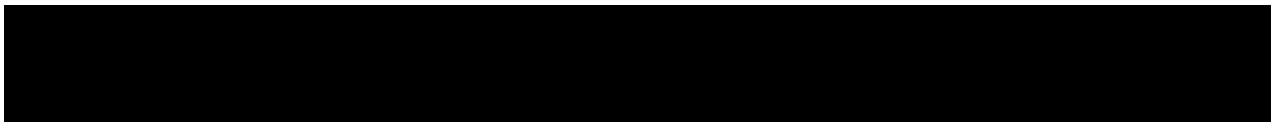
BUILDER FDD, Keel Line Loading Capacity (2022)

The average readings for each dock section, presented in Section 2.0 of this memorandum, were corrected for potential future corrosion that may occur in the next 2-years. The loss of material thickness over the 2-years was taken a 0.026-inches (0.33 mm/yr) based on NSTM 100 Category D as a standard. The assumed loss of thickness essentially adds 4% of wastage to the surveyed average. The corrected average UT measurements, for each section, are as follows:

	<u>Strengthened Section</u>	<u>NASSCO Section</u>	<u>Original Section</u>
Corrected Average UT Measurement	0.564-in	0.604-in	0.552-in
Percent Wasted	10%	4%	12%

The keel line loading capacities associated with the "Corrected Average UT Measurement" provided above are as follows:

- Strengthened Section, Frame 242 to 42 (484-ft) = 67.4 LT/ft
- NASSCO Section, Frame 42 to 41 (200-ft)= 75.3 LT/ft
- Original Section, Frame 41 to 0 (100-ft) = 60.0 LT/ft



Heger Dry Dock, Inc.

BUILDER FDD, Keel Line Loading Capacity (2022)

4.0 Conclusion

Based on HEGER's review of the BUILDER's recently conducted pontoon deck gauging surveys, the following keel line loading capacities are recommended:

- Strengthened Section, Frame 242 to 42 (484-ft) = 67.4 LT/ft
- NASSCO Section, Frame 42 to 41 (200-ft) = 75.3 LT/ft
- Original Section, Frame 41 to 0 (100-ft) = 60.0 LT/ft

Furthermore, in review of the UT data, HDD noticed that all gauging measurements were within the pontoon deck plating corrosion tolerance of 35% wastage. As such, HEGER does not recommend any repairs to the plating deck structure at this time. However, the plating thickness of the deck shall continue to be monitored in future surveys to ensure the corrosion levels below 35% are maintained.

Please contact us if you have any questions or comments regarding the analysis summarized in this memorandum.

HEGER DRY DOCK



2/23/2022

Heger Dry Dock, Inc.

BUILDER FDD, Keel Line Loading Capacity (2022)

[Enclosure 1 - HEGER's Pontoon Deck Gauging Plan](#)

1

2

3

4

5

D

D

C

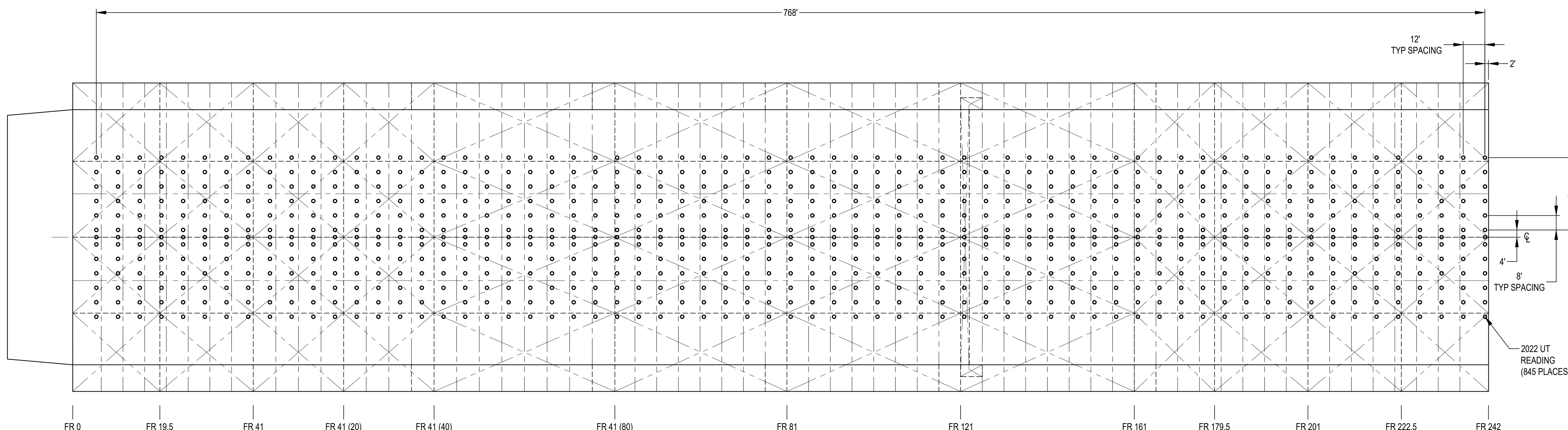
C

B

B

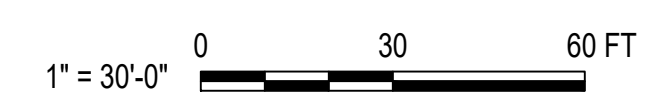
A

A



PLAN VIEW
SCALE 1" = 30'-0"

(A1)



SYMBOL	DESCRIPTION	DATE	APPROV.

HEGER
DRY DOCK, Inc.

DRY DOCK ENGINEERS
DESIGN, INSPECTION AND INVESTIGATION
77 MAIN STREET SUITE 9
HOPKINTON, MA 01748
(508) 429-1800

PRELIMINARY
NOT FOR CONSTRUCTION

DES: MDN DRW: JAH CHK: PHS
CHIEF ENG: MICHAEL NAYLOR

DATE: 01-10-2022

CLIENT NAME AND ADDRESS:
NASSCO
SAN DIEGO, CALIFORNIA

PROJECT TITLE:
BUILDER PONTOON DECK UT LAYOUT- 2022

DRAWING TITLE:
2022 PONTOON DECK UT LAYOUT

SCALE: AS NOTED
PROJECT NO.: 4396-D
CONSTR. CONTR. NO.

SHEET 1 OF 1
G-001

Heger Dry Dock, Inc.

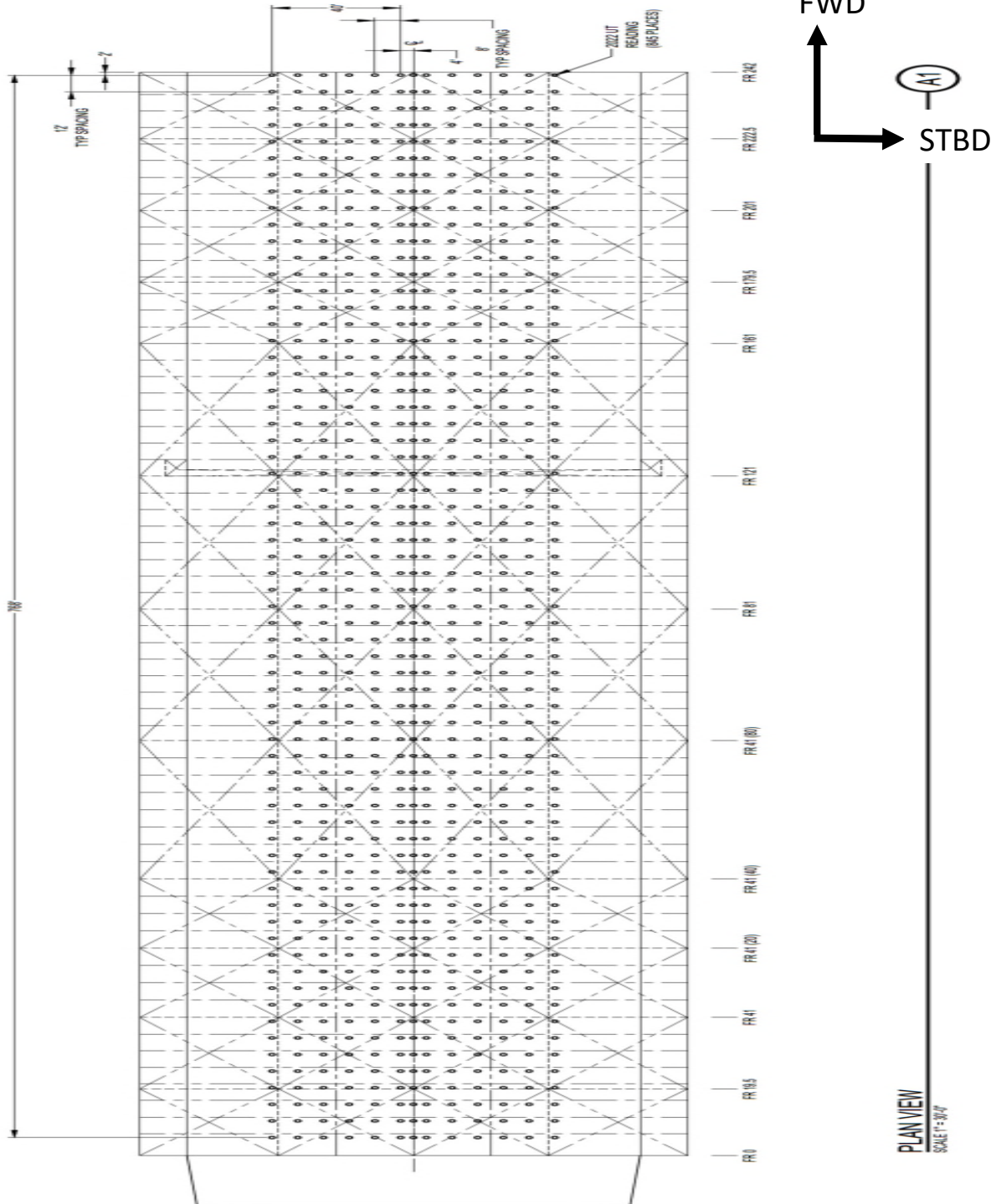
BUILDER FDD, Keel Line Loading Capacity (2022)

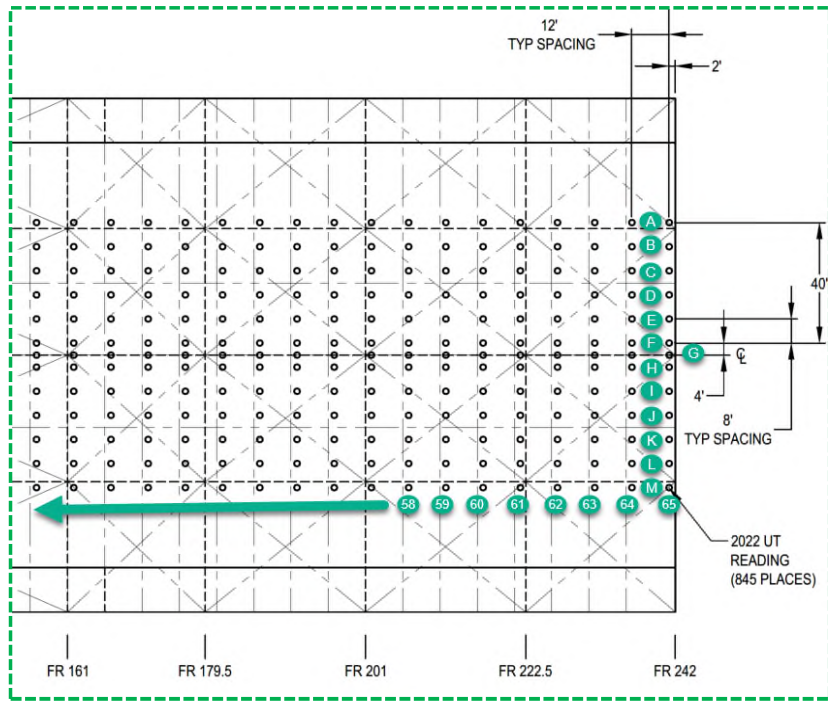
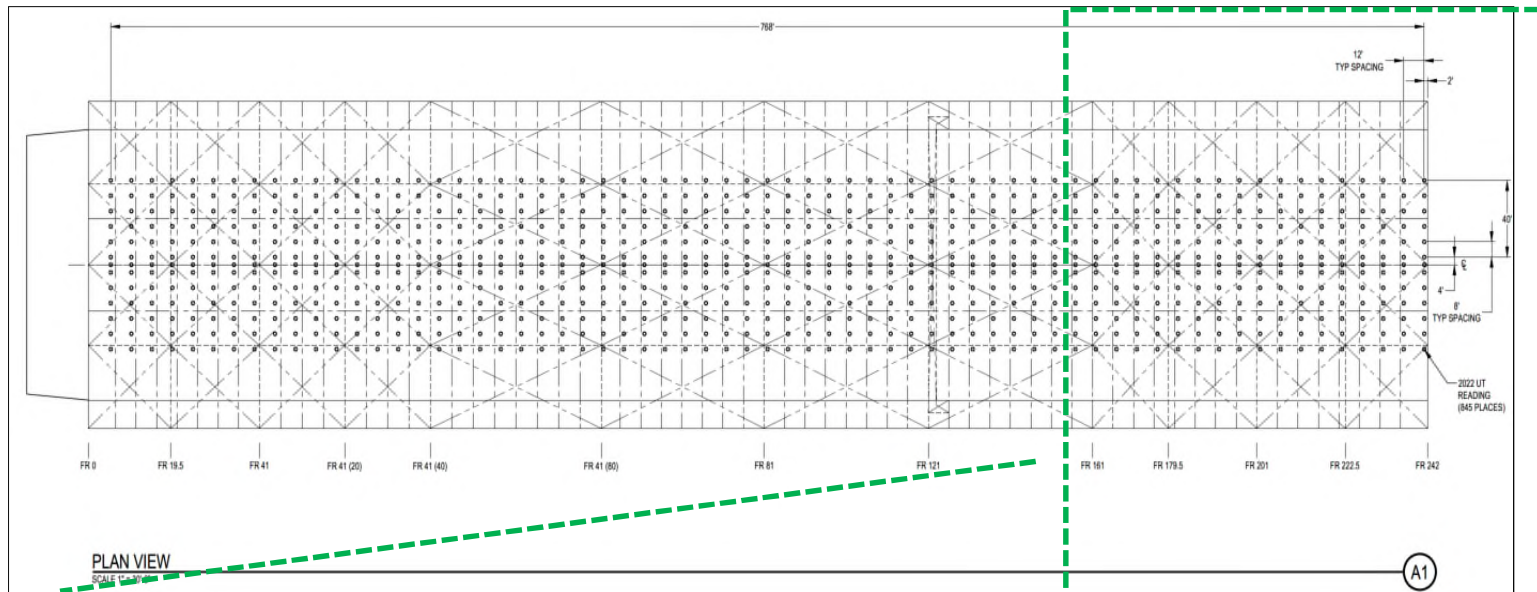
[Enclosure 2 - Pontoon Deck UT Survey Results](#)

**THICKNESS/CORROSION
SURVEY BY UT**

HULL: 460	W.O.NO./ITEM NO./PARA:	8884854
------------------	------------------------	----------------

Sketch/Remarks:





	A	B	C	D	E	F	G	H	I	J	K	L	M
65	0.528	0.534	0.596	0.564	0.634	0.530	0.622	0.698	0.580	0.610	0.618	0.596	0.633
64	0.530	0.674	0.614	0.544	0.694	0.690	0.636	0.696	0.692	0.614	0.622	0.620	0.632
63	0.426	0.614	0.606	0.618	0.618	0.610	0.610	0.614	0.612	0.606	0.544	0.620	0.632
62	0.574	0.608	0.618	0.592	0.610	0.608	0.606	0.548	0.616	0.620	0.614	0.612	0.628
61	0.586	0.612	0.606	0.616	0.624	0.620	0.538	0.616	0.614	0.614	0.612	0.614	0.608
60	0.494	0.606	0.618	0.616	0.619	0.618	0.590	0.612	0.614	0.614	0.608	0.608	0.602
59	0.630	0.610	0.620	0.624	0.616	0.614	0.584	0.612	0.622	0.750	0.612	0.604	0.586
58	0.602	0.596	0.619	0.402	0.610	0.614	0.542	0.604	0.612	0.572	0.614	0.606	0.594
57	0.548	0.548	0.614	0.602	0.586	0.600	0.560	0.566	0.574	0.574	0.614	0.586	0.546
56	0.450	0.614	0.610	0.442	0.612	0.612	0.520	0.580	0.592	0.436	0.612	0.606	0.606
55	0.616	0.612	0.594	0.614	0.616	0.592	0.508	0.604	0.608	0.586	0.612	0.606	0.602
54	0.606	0.614	0.602	0.622	0.598	0.602	0.580	0.584	0.580	0.618	0.618	0.610	0.598
53	0.534	0.602	0.604	0.582	0.602	0.612	0.538	0.560	0.584	0.612	0.614	0.600	0.430
52	0.498	0.490	0.438	0.560	0.460	0.552	0.502	0.604	0.598	0.578	0.472	0.566	0.486
51	0.572	0.462	0.600	0.592	0.560	0.594	0.502	0.572	0.564	0.564	0.538	0.530	0.532
50	0.434	0.592	0.602	0.592	0.598	0.542	0.484	0.534	0.588	0.606	0.556	0.580	0.534
49	0.382	0.574	0.544	0.596	0.604	0.512	0.504	0.576	0.600	0.502	0.486	0.538	0.552
48	0.336	0.590	0.534	0.534	0.594	0.600	0.504	0.604	0.552	0.574	0.382	0.584	0.520
47	0.396	0.588	0.516	0.582	0.532	0.594	0.508	0.604	0.586	0.606	0.592	0.562	0.488
46	0.488	0.570	0.590	0.590	0.608	0.604	0.522	0.610	0.45	0.574	0.548	0.572	0.494
45	0.574	0.588	0.596	0.616	0.602	0.610	0.518	0.606	0.582	0.582	0.604	0.424	0.384
44	0.610	0.304	0.570	0.534	0.534	0.528	0.486	0.610	0.57	0.538	0.642	0.562	0.406
43	0.442	0.504	0.592	0.462	0.590	0.462	0.538	0.614	0.592	0.542	0.560	0.570	0.400
42	0.472	0.506	0.580	0.480	0.602	0.554	0.590	0.608	0.534	0.572	0.576	0.564	0.408
41	0.374	0.402	0.530	0.612	0.516	0.552	0.506	0.586	0.498	0.520	0.576	0.570	0.520
40	0.498	0.502	0.542	0.600	0.554	0.554	0.548	0.570	0.604	0.604	0.572	0.584	0.512
39	0.416	0.588	0.506	0.486	0.480	0.542	0.512	0.530	0.596	0.556	0.468	0.588	0.404
38	0.366	0.604	0.558	0.528	0.592	0.610	0.490	0.516	0.606	0.536	0.580	0.590	0.320
37	0.422	0.480	0.474	0.610	0.598	0.594	0.538	0.584	0.609	0.540	0.614	0.600	0.390
36	0.450	0.560	0.560	0.598	0.614	0.606	0.466	0.610	0.608	0.562	0.562	0.590	0.476
35	0.400	0.546	0.610	0.618	0.600	0.614	0.504	0.566	0.564	0.492	0.566	0.544	0.480
34	0.544	0.580	0.582	0.560	0.600	0.578	0.558	0.578	0.594	0.546	0.528	0.570	0.494
33	0.558	0.588	0.546	0.616	0.606	0.596	0.554	0.604	0.596	0.566	0.526	0.534	0.400
32	0.506	0.580	0.600	0.606	0.610	0.596	0.526	0.590	0.592	0.534	0.504	0.534	0.548
31	0.442	0.600	0.574	0.528	0.564	0.524	0.484	0.608	0.538	0.560	0.578	0.588	0.410
30	0.462	0.586	0.552	0.606	0.574	0.568	0.690	0.604	0.596	0.548	0.584	0.588	0.568
29	0.530	0.532	0.604	0.604	0.570	0.596	0.546	0.612	0.614	0.524	0.564	0.570	0.514
28	0.422	0.578	0.606	0.604	0.624	0.606	0.556	0.618	0.570	0.518	0.534	0.588	0.550
27	0.484	0.572	0.588	0.622	0.620	0.618	0.588	0.622	0.604	0.610	0.590	0.546	0.486
26	0.522	0.618	0.620	0.606	0.618	0.626	0.490	0.612	0.598	0.610	0.582	0.588	0.514
25	0.638	0.644	0.638	0.610	0.630	0.646	0.502	0.644	0.544	0.614	0.532	0.616	0.600
24	0.636	0.632	0.642	0.552	0.606	0.646	0.644	0.636	0.588	0.536	0.636	0.644	0.644
23	0.640	0.644	0.640	0.636	0.646	0.642	0.568	0.642	0.530	0.624	0.636	0.646	0.604
22	0.640	0.646	0.632	0.632	0.644	0.646	0.642	0.636	0.640	0.638	0.638	0.642	0.632
21	0.638	0.640	0.638	0.592	0.646	0.646	0.636	0.632	0.606	0.558	0.616	0.646	0.642
20	0.638	0.632	0.632	0.642	0.648	0.644	0.638	0.644	0.634	0.634	0.642	0.648	0.640
19	0.638	0.640	0.638	0.636	0.646	0.612	0.638	0.642	0.642	0.638	0.640	0.642	0.640
18	0.638	0.640	0.630	0.622	0.648	0.638	0.636	0.638	0.642	0.624	0.638	0.646	0.640
17	0.646	0.636	0.596	0.628	0.606	0.642	0.624	0.644	0.606	0.652	0.608	0.642	0.646
16	0.650	0.646	0.632	0.634	0.640	0.640	0.630	0.644	0.638	0.632	0.648	0.638	0.640
15	0.632	0.636	0.636	0.638	0.642	0.644	0.572	0.632	0.642	0.634	0.648	0.644	0.600
14	0.646	0.646	0.644	0.606	0.636	0.640	0.600	0.644	0.644	0.620	0.654	0.644	0.622
13	0.654	0.644	0.634	0.514	0.592	0.616	0.624	0.634	0.638	0.634	0.646	0.630	0.688
12	0.644	0.640	0.632	0.634	0.646	0.642	0.624	0.574	0.634	0.638	0.622	0.636	0.636
11	0.638	0.620	0.626	0.642	0.626	0.620	0.594	0.632	0.592	0.642	0.638	0.640	0.632
10	0.636	0.628	0.614	0.542	0.640	0.612	0.482	0.642	0.610	0.584	0.620	0.594	0.638
9	0.638	0.632	0.620	0.630	0.640	0.614	0.636	0.638	0.636	0.626	0.632	0.646	0.632
8	0.596	0.598	0.600	0.594	0.614	0.582	0.420	0.548	0.596	0.604	0.580	0.580	0.582
7	0.514	0.592	0.616	0.598	0.584	0.574	0.410	0.598	0.606	0.600	0.608	0.606	0.588
6	0.598	0.606	0.594	0.610	0.604	0.608	0.424	0.570	0.588	0.570	0.582	0.592	0.598
5	0.514	0.610	0.606	0.592	0.608	0.596	0.412	0.608	0.588	0.602	0.602	0.600	0.548
4	0.534	0.570	0.610	0.606	0.600	0.574	0.414	0.610	0.582	0.608	0.610	0.554	0.598
3	0.600	0.598	0.590	0.580	0.570	0.594	0.420	0.610	0.594	0.596	0.572	0.632	0.570
2	0.604	0.608	0.600	0.614	0.610	0.586	0.430	0.560	0.548	0.560	0.606	0.606	0.586
1	0.570	0.610	0.614	0.606	0.600	0.604	0.442	0.556	0.582	0.608	0.608	0.614	0.330

 Insert
 Doubler Plate
 CL row

	Insert
N/A	No Access

L45		
0.602	0.582	0.564
0.580	0.424	0.490
0.562	0.526	0.470
Average -		0.533

M45		
0.566	0.580	0.596
0.522	0.384	0.600
0.494	0.522	0.592
Average -		0.540

M46		
0.580	0.566	0.524
0.472	0.494	0.584
0.538	0.474	0.612
Average -		0.538

M47		
0.560	0.584	0.604
0.560	0.488	0.602
0.488	0.590	0.500
Average -		0.553

G49		
0.568	N/A	0.578
0.534	0.504	0.528
0.582	N/A	0.550
Average -		0.549

K48		
0.578	0.482	0.484
0.58	0.382	0.534
0.578	0.454	0.594
Average -		0.518

G50		
0.594	N/A	0.602
0.602	0.484	0.588
0.594	N/A	0.598
Average -		0.580

K49		
0.600	0.534	0.436
0.568	0.486	0.494
0.522	0.454	0.516
Average -		0.512

G41		
0.568	N/A	0.568
0.510	0.506	0.512
0.562	N/A	0.532
Average -		0.537

I41		
0.570	0.578	0.616
0.546	0.498	0.504
0.462	0.436	0.464
Average -		0.519

D43		
0.592	0.582	0.604
0.57	0.462	0.542
0.508	0.564	0.514
Average -		0.549

E43		
0.596	0.586	0.588
0.574	0.590	0.530
0.552	0.482	0.534
Average -		0.559

F43		
0.474	0.506	0.530
0.596	0.462	0.586
0.582	0.546	0.510
Average -		0.532

G43		
0.530	N/A	0.594
0.586	0.538	0.608
0.510	N/A	0.626
Average -		0.570

G44		
0.610	N/A	0.544
0.534	0.486	0.608
0.504	N/A	0.560
Average -		0.549

I46		
0.542	0.596	0.614
0.606	0.450	0.592
0.472	0.572	0.502
Average -		0.550

G47		
0.604	N/A	0.586
0.612	0.508	0.606
0.524	N/A	0.586
Average -		0.575

M42		
0.524	0.536	0.584
0.584	0.408	0.568
0.488	0.442	0.534
Average -		0.519

M44		
0.436	0.450	0.568
0.456	0.406	0.572
0.486	0.398	0.574
Average -		0.483

M43		
0.480	0.564	0.570
0.470	0.400	0.572
0.492	0.466	0.592
Average -		0.512

M34		
0.498	0.430	0.582
0.52	0.494	0.580
0.554	0.464	0.572
Average -		0.522

J35		
0.608	0.512	0.608
0.500	0.492	0.598
0.510	0.438	0.542
Average -		0.534

M35		
0.506	0.512	0.494
0.426	0.480	0.572
0.496	0.474	0.572
Average -		0.504

G35		
0.604	N/A	0.596
0.608	0.504	0.622
0.592	N/A	0.568
Average -		0.585

G36		
0.608	N/A	0.574
0.574	0.466	0.548
0.500	N/A	0.616
Average -		0.555

M36		
0.464	0.546	0.588
0.418	0.476	0.588
0.524	0.498	0.556
Average -		0.518

M38		
0.590	0.566	0.426
0.524	0.320	0.588
0.576	0.568	0.562
Average -		0.524

M37		
0.582	0.568	0.592
0.520	0.390	0.534
0.538	0.504	0.554
Average -		0.531

K39		
0.614	0.612	0.604
0.608	0.468	0.512
0.476	0.506	0.476
Average -		0.542

M39		
0.556	0.570	0.584
0.478	0.404	0.528
0.492	0.532	0.532
Average -		0.520

G38		
0.522	N/A	0.578
0.580	0.490	0.598
0.456	N/A	0.534
Average -		0.537

G39		
0.602	0.544	0.530
0.560	0.512	0.534
0.578	N/A	0.492
Average -		0.544

A31		
0.594	0.496	0.590
0.528	0.442	0.542
0.610	0.500	0.518
Average -		0.536

A30		
0.570	0.592	0.570
0.588	0.462	0.574
0.602	0.494	0.530
Average -		0.554

A28		
0.564	0.558	0.546
0.602	0.422	0.450
0.600	0.598	0.516
Average -		0.540

A27		
0.592	0.414	0.392
0.600	0.484	0.586
0.598	0.474	0.578
Average -		0.524

G10		
0.550	0.590	0.632
0.572	0.482	0.636
0.542	0.590	0.620
Average -		0.579

M1		
0.614	0.606	0.612
0.612	0.330	0.608
0.610	0.454	0.502
Average -		0.550

G25		
0.590	N/A	0.632
0.632	0.502	0.638
0.588	0.470	0.633
Average -		0.586

G26		
0.614	N/A	0.590
0.612	0.490	0.600
0.618	N/A	0.602
Average -		0.589

G31		
0.486	0.574	0.560
0.544	0.484	0.602
0.574	N/A	0.500
Average -		0.541

M27		
0.594	0.584	0.570
0.530	0.486	0.576
0.486	0.512	0.588
Average -		0.547

M31		
0.472	0.426	0.530
0.594	0.410	0.544
0.548	0.420	0.596
Average -		0.504

M33		
0.486	0.420	0.528
0.480	0.400	0.552
0.470	0.571	0.574
Average -		0.498

A63		
0.576	0.556	0.612
0.608	0.426	0.610
0.604	0.506	0.614
Average -		0.568

D58		
0.602	0.604	0.614
0.598	0.402	0.528
0.610	0.510	0.574
Average -		0.560

A60		
0.614	0.606	0.610
0.608	0.494	0.610
0.604	0.506	0.614
Average -		0.585

J56		
0.580	0.590	0.600
0.588	0.436	0.574
0.574	0.572	0.578
Average -		0.566

A56		
0.604	0.602	0.476
0.616	0.450	0.432
0.598	0.566	0.614
Average -		0.551

M53		
0.608	0.600	0.594
0.606	0.430	0.538
0.602	0.360	0.592
Average -		0.548

K52		
0.596	0.594	0.568
0.600	0.472	0.550
0.574	0.472	0.460
Average -		0.543

M52		
0.508	0.580	0.572
0.394	0.486	0.566
0.570	0.584	0.516
Average -		0.531

G51		
0.502	N/A	0.516
0.594	0.502	0.546
0.602	N/A	0.568
Average -		0.547

G52		
0.604	0.508	0.560
0.598	0.502	0.580
0.558	N/A	0.576
Average -		0.561

A52		
0.582	0.610	0.528
0.582	0.498	0.370
0.372	0.388	0.508
Average -		0.493

B52		
0.59	0.586	0.586
0.436	0.490	0.430
0.582	0.560	0.518
Average -		0.531

C52		
0.600	0.573	0.596
0.480	0.438	0.372
0.568	0.600	0.604
Average -		0.537

A47		
0.582	0.598	0.610
0.580	0.396	0.542
0.582	0.636	0.634
Average -		0.573

A51		
0.538	0.580	0.408
0.500	0.572	0.584
0.588	0.428	0.516
Average -		0.524

A46		
0.600	0.564	0.600
0.590	0.488	0.510
0.600	0.580	0.550
Average -		0.565

B51		
0.564	0.574	0.588
0.598	0.462	0.580
0.55	0.5	0.474
Average -		0.543

B44		
0.570	0.604	0.604
0.568	0.304	0.554
0.590	0.480	0.506
Average -		0.531

A50		
0.590	0.592	0.596
0.578	0.434	0.602
0.570	0.414	0.540
Average -		0.546

A43		
0.606	0.588	0.578
0.584	0.442	0.460
0.594	0.608	0.476
Average -		0.548

A49		
0.566	0.570	0.594
0.518	0.382	0.408
0.372	0.466	0.462
Average -		0.482

A42		
0.606	0.586	0.508
0.570	0.472	0.400
0.55	0.462	0.508
Average -		0.518

A48		
0.576	0.580	0.578
0.506	0.336	0.540
0.484	0.510	0.550
Average -		0.518

A41		
0.600	0.468	0.476
0.516	0.374	0.364
0.550	0.494	0.466
Average -		0.479

B41		
0.462	0.522	0.426
0.370	0.402	0.398
0.444	0.592	0.508
Average -		0.458

A40		
0.580	0.558	0.590
0.460	0.498	0.460
0.514	0.480	0.488
Average -		0.514

A39		
0.582	0.584	0.596
0.542	0.416	0.526
0.568	0.522	0.500
Average -		0.537

C39		
0.558	0.600	0.578
0.580	0.506	0.504
0.478	0.546	0.300
Average -		0.517

D39		
0.568	0.592	0.598
0.496	0.486	0.586
0.500	0.502	0.478
Average -		0.534

E39		
0.602	0.608	0.530
0.600	0.480	0.568
0.560	0.504	0.566
Average -		0.558

A38		
0.586	0.484	0.592
0.592	0.366	0.484
0.560	0.374	0.440
Average -		0.498

B37		
0.51	0.476	0.476
0.500	0.48	0.552
0.534	0.572	0.534
Average -		0.515

A37		
0.578	0.476	0.564
0.588	0.422	0.434
0.574	0.460	0.468
Average -		0.507

C37		
0.532	0.562	0.598
0.516	0.474	0.564
0.558	0.594	0.560
Average -		0.551

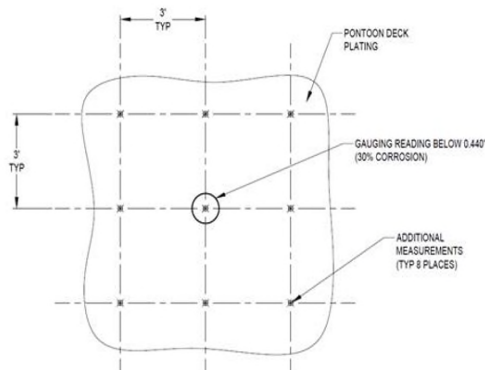
A36		
0.566	0.578	0.596
0.512	0.450	0.450
0.502	0.406	0.488
Average -		0.505

A35		
0.540	0.484	0.522
0.528	0.400	0.558
0.516	0.496	0.496
Average -		0.504

	A	B	C	D	E	F	G	H	I	J	K	L	M
65	0.528	0.534	0.596	0.564	0.634	0.530	0.622	0.698	0.580	0.610	0.618	0.596	0.633
64	0.530	0.674	0.614	0.544	0.694	0.690	0.636	0.696	0.692	0.614	0.622	0.620	0.632
63	0.568	0.614	0.606	0.618	0.618	0.610	0.610	0.614	0.612	0.606	0.544	0.620	0.632
62	0.574	0.608	0.618	0.592	0.610	0.608	0.606	0.548	0.616	0.620	0.614	0.612	0.628
61	0.586	0.612	0.606	0.616	0.624	0.620	0.538	0.616	0.614	0.614	0.612	0.614	0.608
60	0.585	0.606	0.618	0.616	0.619	0.618	0.590	0.612	0.614	0.614	0.608	0.608	0.602
59	0.630	0.610	0.620	0.624	0.616	0.614	0.584	0.612	0.622	0.750	0.612	0.604	0.586
58	0.602	0.596	0.619	0.560	0.610	0.614	0.542	0.604	0.612	0.572	0.614	0.606	0.594
57	0.548	0.548	0.614	0.602	0.586	0.600	0.560	0.566	0.574	0.574	0.614	0.586	0.546
56	0.551	0.614	0.610	0.442	0.612	0.612	0.520	0.580	0.592	0.566	0.612	0.606	0.606
55	0.616	0.612	0.594	0.614	0.616	0.592	0.508	0.604	0.608	0.586	0.612	0.606	0.602
54	0.606	0.614	0.602	0.622	0.598	0.602	0.580	0.584	0.580	0.618	0.618	0.610	0.598
53	0.534	0.602	0.604	0.582	0.602	0.612	0.538	0.560	0.584	0.612	0.614	0.600	0.548
52	0.493	0.531	0.537	0.560	0.460	0.552	0.561	0.604	0.598	0.578	0.543	0.566	0.531
51	0.524	0.543	0.600	0.592	0.560	0.594	0.547	0.572	0.564	0.564	0.538	0.530	0.532
50	0.546	0.592	0.602	0.592	0.598	0.542	0.580	0.534	0.588	0.606	0.556	0.580	0.534
49	0.482	0.574	0.544	0.596	0.604	0.512	0.549	0.576	0.600	0.502	0.512	0.538	0.552
48	0.518	0.590	0.534	0.534	0.594	0.600	0.504	0.604	0.552	0.574	0.518	0.584	0.520
47	0.573	0.588	0.516	0.582	0.532	0.594	0.508	0.604	0.586	0.606	0.592	0.562	0.553
46	0.565	0.570	0.590	0.590	0.608	0.604	0.522	0.610	0.55	0.574	0.548	0.572	0.538
45	0.574	0.588	0.596	0.616	0.602	0.610	0.518	0.606	0.582	0.582	0.604	0.533	0.54
44	0.610	0.531	0.570	0.534	0.534	0.528	0.549	0.610	0.57	0.538	0.642	0.562	0.483
43	0.548	0.504	0.592	0.549	0.559	0.532	0.570	0.614	0.592	0.542	0.560	0.570	0.512
42	0.518	0.506	0.580	0.480	0.602	0.554	0.590	0.608	0.534	0.572	0.576	0.564	0.519
41	0.479	0.458	0.530	0.612	0.516	0.552	0.537	0.586	0.519	0.520	0.576	0.570	0.520
40	0.514	0.502	0.542	0.600	0.554	0.554	0.548	0.570	0.604	0.604	0.572	0.584	0.512
39	0.537	0.588	0.517	0.534	0.558	0.542	0.544	0.530	0.596	0.556	0.542	0.588	0.520
38	0.498	0.604	0.558	0.528	0.592	0.610	0.537	0.516	0.606	0.536	0.580	0.590	0.524
37	0.507	0.515	0.551	0.610	0.598	0.594	0.538	0.584	0.609	0.540	0.614.0	0.600	0.531
36	0.505	0.560	0.560	0.598	0.614	0.606	0.555	0.610	0.608	0.562	0.562	0.590	0.518
35	0.504	0.546	0.610	0.618	0.600	0.614	0.585	0.566	0.564	0.534	0.566	0.544	0.504
34	0.544	0.580	0.582	0.560	0.600	0.578	0.558	0.578	0.594	0.546	0.528	0.570	0.522
33	0.558	0.588	0.546	0.616	0.606	0.596	0.554	0.604	0.596	0.566	0.526	0.534	0.498
32	0.506	0.580	0.600	0.606	0.610	0.596	0.526	0.590	0.592	0.534	0.504	0.534	0.548
31	0.536	0.600	0.574	0.528	0.564	0.524	0.541	0.608	0.538	0.560	0.578	0.588	0.504
30	0.554	0.586	0.552	0.606	0.574	0.568	0.690	0.604	0.596	0.548	0.584	0.588	0.568
29	0.530	0.532	0.604	0.604	0.570	0.596	0.546	0.612	0.614	0.524	0.564	0.570	0.514
28	0.540	0.578	0.606	0.604	0.624	0.606	0.556	0.618	0.570	0.518	0.534	0.588	0.550
27	0.524	0.572	0.588	0.622	0.620	0.618	0.588	0.622	0.604	0.610	0.590	0.546	0.547
26	0.522	0.618	0.620	0.606	0.618	0.626	0.589	0.612	0.598	0.610	0.582	0.588	0.514
25	0.638	0.644	0.638	0.610	0.630	0.646	0.586	0.644	0.544	0.614	0.532	0.616	0.600
24	0.636	0.632	0.642	0.552	0.606	0.646	0.644	0.636	0.588	0.536	0.636	0.644	0.644
23	0.640	0.644	0.640	0.636	0.646	0.642	0.568	0.642	0.530	0.624	0.636	0.646	0.604
22	0.640	0.646	0.632	0.632	0.644	0.646	0.642	0.636	0.640	0.638	0.638	0.642	0.632
21	0.638	0.640	0.638	0.592	0.646	0.646	0.636	0.632	0.606	0.558	0.616	0.646	0.642
20	0.638	0.632	0.632	0.642	0.648	0.644	0.638	0.644	0.634	0.634	0.642	0.648	0.640
19	0.638	0.640	0.638	0.636	0.646	0.612	0.638	0.642	0.642	0.638	0.640	0.642	0.640
18	0.638	0.640	0.630	0.622	0.648	0.638	0.636	0.638	0.642	0.624	0.638	0.646	0.640
17	0.646	0.636	0.596	0.628	0.606	0.642	0.624	0.644	0.606	0.652	0.608	0.642	0.646
16	0.650	0.646	0.632	0.634	0.640	0.640	0.630	0.644	0.638	0.632	0.648	0.638	0.640
15	0.632	0.636	0.636	0.638	0.642	0.644	0.572	0.632	0.642	0.634	0.648	0.644	0.600
14	0.646	0.646	0.644	0.606	0.636	0.640	0.600	0.644	0.644	0.620	0.654	0.644	0.622
13	0.654	0.644	0.634	0.514	0.592	0.616	0.624	0.634	0.638	0.634	0.646	0.630	0.688
12	0.644	0.640	0.632	0.634	0.646	0.642	0.624	0.574	0.634	0.638	0.622	0.636	0.636
11	0.638	0.620	0.626	0.642	0.626	0.620	0.594	0.632	0.592	0.642	0.638	0.640	0.632
10	0.636	0.628	0.614	0.542	0.640	0.612	0.579	0.642	0.610	0.584	0.620	0.594	0.638
9	0.638	0.632	0.620	0.630	0.640	0.614	0.636	0.638	0.636	0.626	0.632	0.646	0.632
8	0.596	0.598	0.600	0.594	0.614	0.582	0.420	0.548	0.596	0.604	0.580	0.580	0.582
7	0.514	0.592	0.616	0.598	0.584	0.574	0.410	0.598	0.606	0.600	0.608	0.606	0.588
6	0.598	0.606	0.594	0.610	0.604	0.608	0.424	0.570	0.588	0.570	0.582	0.592	0.598
5	0.514	0.610	0.606	0.592	0.608	0.596	0.412	0.608	0.588	0.602	0.602	0.600	0.548
4	0.534	0.570	0.610	0.606	0.600	0.574	0.414	0.610	0.582	0.608	0.610	0.554	0.598
3	0.600	0.598	0.590	0.580	0.570	0.594	0.420	0.610	0.594	0.596	0.572	0.632	0.570
2	0.604	0.608	0.600	0.614	0.610	0.586	0.430	0.560	0.548	0.560	0.606	0.606	0.586
1	0.570	0.610	0.614	0.606	0.600	0.604	0.442	0.556	0.582	0.608	0.608	0.614	0.550

Insert
 Doubler Plate
 CL row

Bolded Results indicate that an average reading is displayed. (Using 9 point method as shown in diagram)



Heger Dry Dock, Inc.

BUILDER FDD, Keel Line Loading Capacity (2022)

[Enclosure 3 - HEGER's Pontoon Deck Analysis](#)

HEGER DRY DOCK, Inc.

HOPKINTON, MASSACHUSETTS

Client : **NASSCO - San Diego**
 Subject : **UT Measurements - 2022**

Date: **2/9/2022**

Measurements as Surveyed by NASSCO - January 2022

UT ID ---->	Strengthened Design Section								NASSCO Section																Original Design Section							
	Tank 6 AFT			Tank 6 FWD					Tank 5B AFT				Tank 5B FWD				Tank 5A								Tank 5							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Frame	5	10	15	20	25	30	35	40	41-4	41-8.50	41-13.25	41-18	41-23	41-27.75	41-32.5	41-37.25	41-42	41-47	41-51.75	41-56.5	41-61.25	41-66	41-71	41-75.75	41.50	47.00	52	57	62	67	72	77
A - 40' Off CL	0.570	0.604	0.600	0.534	0.514	0.598	0.514	0.596	0.638	0.636	0.638	0.644	0.654	0.646	0.632	0.650	0.646	0.638	0.638	0.638	0.638	0.640	0.640	0.636	0.638	0.522	0.524	0.540	0.530	0.554	0.536	0.506
B - 32' Off CL	0.610	0.608	0.598	0.570	0.610	0.606	0.592	0.598	0.632	0.628	0.620	0.640	0.644	0.646	0.636	0.646	0.636	0.640	0.640	0.632	0.640	0.646	0.644	0.632	0.644	0.618	0.572	0.578	0.532	0.586	0.600	0.580
C - 24' Off CL	0.614	0.600	0.590	0.610	0.606	0.594	0.616	0.600	0.620	0.614	0.626	0.632	0.634	0.644	0.636	0.632	0.596	0.630	0.638	0.632	0.638	0.632	0.640	0.642	0.638	0.620	0.588	0.606	0.604	0.552	0.574	0.600
D - 16' Off CL	0.606	0.614	0.580	0.606	0.592	0.610	0.598	0.594	0.630	0.542	0.642	0.634	0.514	0.606	0.638	0.634	0.628	0.622	0.636	0.642	0.592	0.632	0.636	0.552	0.610	0.606	0.622	0.604	0.604	0.606	0.528	0.606
E - 8' Off CL	0.600	0.610	0.570	0.600	0.608	0.604	0.584	0.614	0.640	0.640	0.626	0.646	0.592	0.636	0.642	0.640	0.606	0.648	0.646	0.648	0.646	0.644	0.646	0.606	0.630	0.618	0.620	0.624	0.570	0.574	0.564	0.610
F - 4' Off CL	0.604	0.586	0.594	0.574	0.596	0.608	0.574	0.582	0.614	0.612	0.620	0.642	0.616	0.640	0.644	0.640	0.642	0.638	0.612	0.644	0.646	0.646	0.642	0.646	0.646	0.626	0.618	0.606	0.596	0.568	0.524	0.596
G - CL									0.636	0.576	0.594	0.624	0.624	0.600	0.572	0.630	0.624	0.636	0.638	0.638	0.636	0.642	0.568	0.644	0.586	0.589	0.588	0.556	0.546	0.690	0.541	0.526
H - 4' Off CL	0.556	0.560	0.610	0.610	0.608	0.570	0.598	0.548	0.638	0.642	0.632	0.574	0.634	0.644	0.632	0.644	0.644	0.638	0.642	0.644	0.632	0.636	0.642	0.636	0.644	0.612	0.622	0.618	0.612	0.604	0.608	0.590
I - 8' Off CL	0.582	0.548	0.594	0.582	0.588	0.588	0.606	0.596	0.636	0.610	0.592	0.634	0.638	0.644	0.642	0.638	0.606	0.642	0.642	0.634	0.606	0.640	0.530	0.588	0.544	0.598	0.604	0.570	0.614	0.596	0.538	0.592
J - 16' Off CL	0.608	0.560	0.596	0.608	0.602	0.570	0.600	0.604	0.626	0.584	0.642	0.638	0.634	0.620	0.634	0.632	0.652	0.624	0.638	0.634	0.558	0.638	0.624	0.536	0.614	0.610	0.610	0.518	0.524	0.548	0.560	0.534
K - 24' Off CL	0.608	0.606	0.572	0.610	0.602	0.582	0.608	0.580	0.632	0.620	0.638	0.622	0.646	0.654	0.648	0.648	0.608	0.638	0.640	0.642	0.616	0.638	0.636	0.636	0.532	0.582	0.590	0.534	0.564	0.584	0.578	0.504
L - 32' Off CL	0.614	0.606	0.632	0.554	0.600	0.592	0.606	0.580	0.646	0.594	0.640	0.636	0.630	0.644	0.644	0.638	0.642	0.646	0.642	0.648	0.646	0.642	0.644	0.616	0.588	0.546	0.588	0.570	0.588	0.588	0.534	
M - 40' Off CL	0.550	0.586	0.570	0.598	0.548	0.598	0.588	0.528	0.632	0.638	0.632	0.636	0.688	0.622	0.600	0.640	0.646	0.640	0.640	0.640	0.642	0.632	0.604	0.644	0.600	0.514	0.547	0.550	0.514	0.568	0.504	0.548

UT ID ---->	Original Design Section																																
	Tank 4								Tank 3								Tank 2 AFT				Tank 2 FWD				Tank 1 AFT				Tank 1 FWD				
	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Frame	82	87	92	97	102	107	112	117	122	127	132	137	142	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242
A - 40' Off CL	0.558	0.544	0.504	0.505	0.507	0.498	0.537	0.514	0.479	0.518	0.548	0.610	0.574	0.565	0.573	0.518	0.482	0.546	0.524	0.493	0.534	0.606	0.616	0.551	0.548	0.602	0.630	0.585	0.586	0.574	0.568	0.530	0.528
B - 32' Off CL	0.588	0.580	0.546	0.560	0.515	0.604	0.588	0.502	0.458	0.506	0.504	0.531	0.588	0.570	0.588	0.590	0.574	0.592	0.543	0.531	0.602	0.614	0.612	0.614	0.548	0.596	0.610	0.606	0.612	0.608	0.614	0.674	0.534
C - 24' Off CL	0.546	0.582	0.610	0.560	0.551	0.558	0.517	0.542	0.530	0.580	0.592	0.570	0.596	0.590	0.516	0.534	0.544	0.602	0.600	0.537	0.604	0.602	0.594	0.610	0.614	0.619	0.620	0.618	0.606	0.618	0.606	0.614	0.596
D - 16' Off CL	0.616	0.560	0.618	0.598	0.610	0.528	0.534	0.600	0.612	0.480	0.549	0.534	0.616	0.590	0.582	0.534	0.596	0.592	0.592	0.560	0.582	0.622	0.614	0.442	0.602	0.560	0.624	0.616	0.616	0.592	0.618	0.544	0.564
E - 8' Off CL	0.606	0.600	0.600	0.614	0.598	0.592	0.558	0.554	0.516	0.602	0.559	0.534	0.602	0.608	0.532	0.594	0.604	0.598	0.560	0.460	0.602	0.598	0.616	0.612	0.586	0.610	0.616	0.619	0.624	0.610	0.618	0.694	0.634
F - 4' Off CL	0.596	0.578	0.614	0.606	0.594	0.610	0.542	0.554	0.552	0.554	0.532	0.528	0.610	0.604	0.594	0.600	0.512	0.542	0.594	0.552	0.612	0.602	0.592	0.612	0.600	0.614	0.614	0.618	0.620	0.608	0.610	0.690	0.530
G - CL	0.554	0.558	0.585	0.555	0.538	0.537	0.544	0.548	0.537	0.590	0.570	0.549	0.518	0.522	0.575	0.504	0.549	0.580	0.547	0.561	0.538	0.580	0.508	0.520	0.560	0.542	0.584	0.590	0.538	0.606	0.610	0.636	0.622
H - 4' Off CL	0.604	0.578	0.566	0.610	0.584	0.516	0.530	0.570	0.586	0.608	0.614	0.610	0.606	0.610	0.604	0.604	0.576	0.534	0.572	0.604	0.560	0.584	0.604	0.580	0.566	0.604	0.612	0.612	0.616	0.548	0.614	0.696	0.698
I - 8' Off CL	0.596	0.594	0.564	0.608	0.609	0.606	0.596	0.604	0.519	0.534	0.592	0.570	0.582	0.550	0.586	0.552	0.600	0.588	0.564	0.598	0.584	0.580	0.608	0.592	0.574	0.612	0.622	0.614	0.614	0.616	0.612	0.692	0.580
J - 16' Off CL	0.566	0.546	0.534	0.562	0.540	0.536	0.556	0.604	0.520	0.572	0.542	0.538	0.582	0.574	0.606	0.574	0.502	0.606	0.564	0.578	0.612	0.618	0.586	0.566	0.574	0.572	0.750	0.614	0.614	0.620	0.606	0.614	0.610
K - 24' Off CL	0.526	0.528	0.566	0.562	0.614	0.580	0.542	0.572	0.576	0.576	0.560	0.642	0.604	0.548	0.592	0.518	0.512	0.556	0.538	0.543	0.614	0.618	0.612	0.612	0.614	0.614	0.612	0.608	0.612	0.614	0.544	0.622	0.618
L - 32' Off CL	0.534	0.570	0.544	0.590	0.600	0.590	0.588	0.584	0.570	0.564	0.570	0.562	0.533	0.572	0.562	0.584	0.538	0.580	0.530	0.566	0.600	0.610	0.606	0.606	0.586	0.606	0.604	0.608	0.614	0.612	0.620	0.620	0.596
M - 40' Off CL	0.498	0.522	0.504	0.518	0.531	0.524	0.520	0.512	0.520	0.519	0.512	0.483	0.540	0.538	0.553	0.520	0.552	0.534	0.532	0.531	0.548	0.598	0.602	0.606	0.546	0.594	0.586	0.602	0.608	0.628	0.632	0.632	0.633

HEGER DRY DOCK, Inc.

HOPKINTON, MASSACHUSETTS

Client : **NASSCO - San Diego**
 Subject : **UT Measurements - 2022**

Date: **2/9/2022**

HEGER Analysis of Gauging Results

UT ID ---->	Strengthened Design Section								NASSCO Section												Original Design Section											
	Tank 6 AFT			Tank 6 FWD					Tank 5B AFT				Tank 5B FWD				Tank 5A								Tank 5							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Frame	5	10	15	20	25	30	35	40	41-4	41-8.50	41-13.25	41-18	41-23	41-27.75	41-32.5	41-37.25	41-42	41-47	41-51.75	41-56.5	41-61.25	41-66	41-71	41-75.75	41.50	47.00	52	57	62	67	72	77
A - 40' Off CL	10%	4%	5%	15%	18%	5%	18%	5%	-1%	-1%	-1%	-2%	-4%	-3%	0%	-3%	-3%	-1%	-1%	-1%	-1%	-2%	-2%	-1%	-1%	17%	17%	14%	16%	12%	15%	20%
B - 32' Off CL	3%	3%	5%	10%	3%	4%	6%	5%	0%	0%	2%	-2%	-2%	-3%	-1%	-3%	-1%	-2%	-2%	0%	-2%	-3%	-2%	0%	-2%	2%	9%	8%	16%	7%	5%	8%
C - 24' Off CL	3%	5%	6%	3%	4%	6%	2%	5%	2%	3%	1%	0%	-1%	-2%	-1%	0%	5%	0%	-1%	0%	-1%	0%	-2%	-2%	-1%	2%	7%	4%	4%	12%	9%	5%
D - 16' Off CL	4%	3%	8%	4%	6%	3%	5%	6%	0%	14%	-2%	-1%	18%	4%	-1%	-1%	0%	1%	-1%	-2%	6%	0%	-1%	12%	3%	4%	1%	4%	4%	4%	16%	4%
E - 8' Off CL	5%	3%	10%	5%	3%	4%	7%	3%	-2%	-2%	1%	-3%	6%	-1%	-2%	-2%	4%	-3%	-3%	-3%	-3%	-2%	-3%	4%	0%	2%	2%	1%	10%	9%	10%	3%
F - 4' Off CL	4%	7%	6%	9%	5%	3%	9%	8%	3%	3%	2%	-2%	2%	-2%	-2%	-2%	-2%	-1%	3%	-2%	-3%	-3%	-2%	-3%	-3%	1%	2%	4%	5%	10%	17%	5%
G - CL									-1%	9%	6%	1%	1%	5%	9%	0%	1%	-1%	-1%	-1%	-1%	-2%	10%	-2%	7%	6%	7%	12%	13%	-10%	14%	16%
H - 4' Off CL	12%	11%	3%	3%	3%	10%	5%	13%	-1%	-2%	0%	9%	-1%	-2%	0%	-2%	-2%	-1%	-2%	-2%	0%	-1%	-2%	-1%	-2%	3%	1%	2%	3%	4%	3%	6%
I - 8' Off CL	8%	13%	6%	8%	7%	7%	4%	5%	-1%	3%	6%	-1%	-1%	-2%	-2%	-1%	4%	-2%	-2%	-1%	4%	-2%	16%	7%	14%	5%	4%	10%	3%	5%	15%	6%
J - 16' Off CL	3%	11%	5%	3%	4%	10%	5%	4%	1%	7%	-2%	-1%	-1%	2%	-1%	0%	-4%	1%	-1%	-1%	11%	-1%	1%	15%	3%	3%	3%	18%	17%	13%	11%	15%
K - 24' Off CL	3%	4%	9%	3%	4%	8%	3%	8%	0%	2%	-1%	1%	-3%	-4%	-3%	-3%	3%	-1%	-2%	-2%	2%	-1%	-1%	-1%	16%	8%	6%	15%	10%	7%	8%	20%
L - 32' Off CL	3%	4%	0%	12%	5%	6%	4%	8%	-3%	6%	-2%	-1%	0%	-2%	-2%	-1%	-2%	-3%	-2%	-3%	-3%	-2%	-3%	-2%	2%	7%	13%	7%	10%	7%	7%	15%
M - 40' Off CL	13%	7%	10%	5%	13%	5%	7%	16%	0%	-1%	0%	-1%	-9%	1%	5%	-2%	-3%	-2%	-2%	-2%	-2%	0%	4%	-2%	5%	18%	13%	13%	18%	10%	20%	13%

UT ID ---->	Original Design Section																																
	Tank 4								Tank 3								Tank 2 AFT				Tank 2 FWD				Tank 1 AFT				Tank 1 FWD				
	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Frame	82	87	92	97	102	107	112	117	122	127	132	137	142	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	242
A - 40' Off CL	11%	14%	20%	20%	20%	21%	15%	18%	24%	18%	13%	3%	9%	10%	9%	18%	23%	13%	17%	22%	15%	4%	2%	13%	13%	4%	0%	7%	7%	9%	10%	16%	16%
B - 32' Off CL	7%	8%	13%	11%	18%	4%	7%	20%	27%	20%	20%	16%	7%	10%	7%	6%	9%	6%	14%	16%	4%	3%	3%	3%	13%	5%	3%	4%	3%	3%	3%	-7%	15%
C - 24' Off CL	13%	8%	3%	11%	13%	11%	18%	14%	16%	8%	6%	10%	5%	6%	18%	15%	14%	4%	5%	15%	4%	4%	6%	3%	3%	2%	2%	4%	4%	2%	4%	3%	5%
D - 16' Off CL	2%	11%	2%	5%	3%	16%	15%	5%	3%	24%	13%	15%	2%	6%	8%	15%	5%	6%	6%	11%	8%	1%	3%	30%	4%	11%	1%	2%	2%	6%	2%	14%	10%
E - 8' Off CL	4%	5%	5%	3%	5%	6%	11%	12%	18%	4%	11%	15%	4%	3%	16%	6%	4%	5%	11%	27%	4%	5%	2%	3%	7%	3%	2%	2%	1%	3%	2%	-10%	-1%
F - 4' Off CL	5%	8%	3%	4%	6%	3%	14%	12%	12%	12%	16%	16%	3%	4%	6%	5%	19%	14%	6%	12%	3%	4%	6%	3%	5%	3%	3%	2%	2%	3%	3%	-10%	16%
G - CL	12%	11%	7%	12%	15%	15%	14%	13%	15%	6%	10%	13%	18%	17%	9%	20%	13%	8%	13%	11%	15%	8%	19%	17%	11%	14%	7%	6%	15%	4%	3%	-1%	1%
H - 4' Off CL	4%	8%	10%	3%	7%	18%	16%	10%	7%	3%	3%	3%	4%	3%	4%	4%	9%	15%	9%	4%	11%	7%	4%	8%	10%	4%	3%	3%	2%	13%	3%	-10%	-11%
I - 8' Off CL	5%	6%	10%	3%	3%	4%	5%	4%	18%	15%	6%	10%	8%	13%	7%	12%	5%	7%	10%	5%	7%	8%	3%	6%	9%	3%	1%	3%	3%	2%	3%	-10%	8%
J - 16' Off CL	10%	13%	15%	11%	14%	15%	12%	4%	17%	9%	14%	15%	8%	9%	4%	9%	20%	4%	10%	8%	3%	2%	7%	10%	9%	9%	-19%	3%	3%	2%	4%	3%	3%
K - 24' Off CL	16%	16%	10%	11%	3%	8%	14%	9%	9%	9%	11%	-2%	4%	13%	6%	18%	19%	12%	15%	14%	3%	2%	3%	3%	3%	3%	3%	3%	3%	3%	14%	1%	2%
L - 32' Off CL	15%	10%	14%	6%	5%	6%	7%	7%	10%	10%	10%	11%	15%	9%	11%	7%	15%	8%	16%	10%	5%	3%	4%	4%	7%	4%	4%	3%	3%	3%	2%	2%	5%
M - 40' Off CL	21%	17%	20%	18%	16%	17%	17%	19%	17%	18%	19%	23%	14%	15%	12%	17%	12%	15%	16%	16%	13%	5%	4%	4%	13%	6%	7%	4%	3%	0%	0%	0%	0%

TANK -->	2022 UT Results											
	Strengthened		NASSCO Plug			Original Section						
	6 AFT	6 FWD	5B AFT	5B FWD	5A	5	4	3	2 AFT	2FWD	1 AFT	1 FWD
Average	0.590-in		0.630-in			0.578-in						
Percent Wasted	6%		0%			8%						
NSTM 100 Corrosion (2-years, Cat D)	0.026-in		0.026-in			0.026-in						
Corrected UT Measurement	0.564-in		0.604-in			0.552-in						
Percent Wasted	10%		4%			12%						
Keel Line Capacity (LT/ft)	67.4		75.3			60.0						