


PLAN HISTORY				
REV. NO	DATE	DESCRIPTION	REMARK	
0	2023.02.20	Prepared by outfitting design team		
(5) SHEETS WITH A COVER				
본 도면은 대한민국 정부의 “친환경중소형선박 기술역량 강화사업”의 일환으로 작성된 문서입니다.				
MANAGER	K. D. OK	DATE: 2023. 02. 20.	SCALE	
APPROVED	S. S. Shin	DWT 13,000 MT CLASS PRODUCT/CHEMICAL TANKER	NONE	
CHECKED	S. S. Shin	EQUIPMENT NUMBER CALCULATION	TEAM	
DRAWN	B. J. Sang		OUTFITTING DESIGN	
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EQUIPMENT NUMBER CALCULATION

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Project: DWT 13K P/C Tanker

1. SHIP'S INFORMATION

1) Ship's Type	:	DWT 13,000 MT Product / Chemical Tanker
2) Classification Society & Rule	:	ABS, Pt 3, Ch 5, Sec. 1 (January 2023)
3) Flag	:	TBD
4) Ship Builder	:	TBD

2. SHIP'S MAIN PARTICULARS

1) L.O.A. (Length Overall)	:	about	129.90	m
2) L.B.P. (Length Between Perpendiculars)	:		122.00	m
3) B (Moulded Breadth)	:		21.00	m
4) D (Depth)	:		11.80	m
5) ds (Scantling draft, Summer Load Waterline):			8.55	m
6) Δ (Moulded displacement @ ds)	:		17,600	ton

3. EQUIPMENT LENGTH

SLWL (Length of Water Line @ ds)	:	125.50	m
- 96% of SLWL	:	120.48	m
- 97% of SLWL	:	121.74	m
→ L (Equipment Length)	:	121.74	m

Note: The equipment length is the L.B.P but is not to be less than 96% nor greater than 97% of the extreme length on SLWL (measured from the forward end of the waterline).

4. EQUIPMENT NUMBER CALCULATION

$$\begin{aligned}
 EN &= \Delta^{\frac{2}{3}} + 2(Bh + S_{fun}) + 0.1A \\
 &= 17,600^{\frac{2}{3}} + 2 \times (21.00 \times 20.00 + 0) + 0.1 \times 754.65 \\
 &= 677 + 840 + 75 \\
 &= 1592
 \end{aligned}$$

Calculation table for "A" and "h":

No	Description	Length [m]	h (Effective height) [m]	A (Side area) [m ²]
01	Main hull (SLWL ~ Upp. DK)	121.74	3.25	395.66
02	Upp. DK ~ F'cle DK	9.62	3.00 (*)	28.86
03	Bulwark (Fore)			4.77
04	Bulwark (Aft)			9.83
05	Upp. DK ~ Poop DK	24.54	3.00	73.62
06	Poop DK ~ "A" DK	21.80	2.80	61.04
07	"A" DK ~ "B" DK	14.00	2.75	38.50
08	"B" DK ~ "C" DK	14.00	2.75	38.50
09	"C" DK ~ N.B DK	14.00	2.75	38.50
10	N.B DK ~ Comp. DK	12.60	2.70	34.02
11	Engine Casing	5.70	5.50 (*)	31.35
		Sum =	20.00	754.65
Note: 1. (*) marked values are ignored in effective height (h). 2. Sfun = 0 [m ²]				

5. MOORING LINE for Ships with $EN \leq 2,000$

- 1) For ships having the ratio $A/EN > 0.9$, the following number of lines should be added to the number of mooring lines as given table:

Ratio [A/EN]	Increase number of mooring line by
$0.9 < A/EN \leq 1.1$	1
$1.1 < A/EN \leq 1.2$	2
$1.2 < A/EN$	3

- 2) Ratio $[A/EN] = 755 / 1,592 = 0.47$

∴ Additional mooring lines: None



EQUIPMENT NUMBER CALCULATION

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Project: DWT 13K P/C Tanker

6. SUMMARY

Equipment Number (EN) = 1592 [Equipment Letter: U30 (1570 < EN ≤ 1,670)]

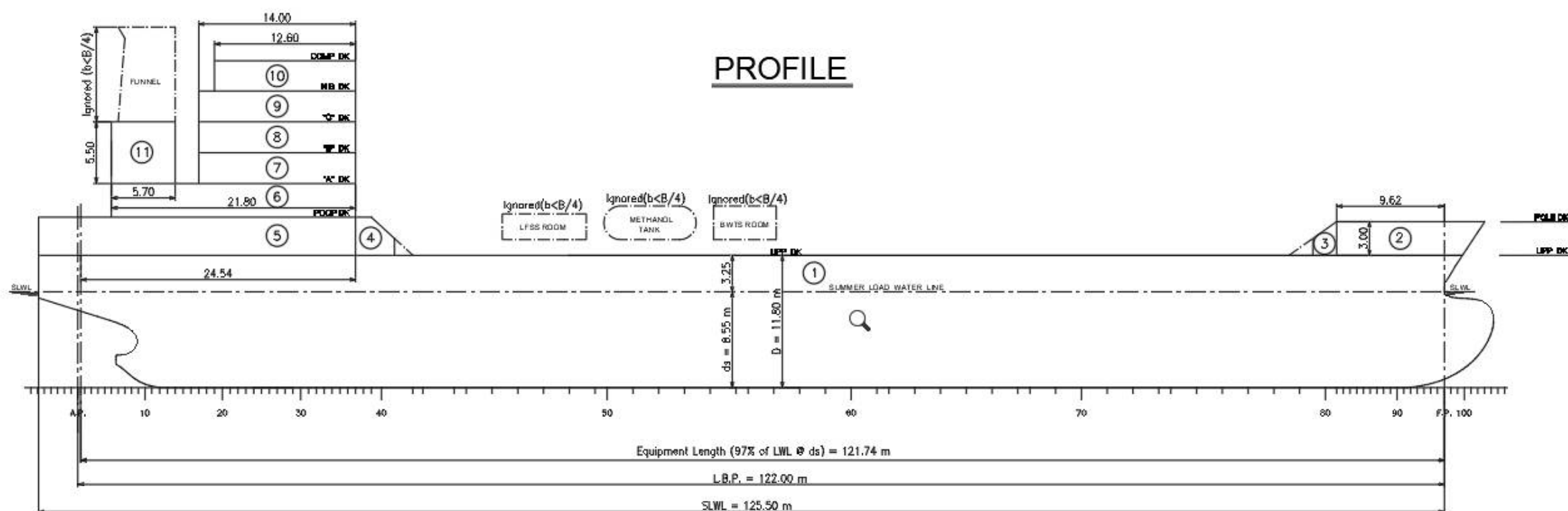
Stockless bower anchors	Number		2
	Mass per anchor [kg]		4,890 kg
	Mass per HHP anchor [kg]		3,667.5 kg
Stud link chain cables for bower anchors	Total Length [m]		550 m
	Diameter [mm]	Grade 1	Ø 70 mm
		Grade 2	Ø 62 mm
		Grade 3	Ø 54 mm
Tow line	Min. Length per line [m]		220 m
	MBL _{SD} [kN]		941 kN
Mooring line	Number		5
	Min. Length per line [m]		190 m
	MBL _{SD} [kN]		362 kN

Actual Equipment [Reference]:

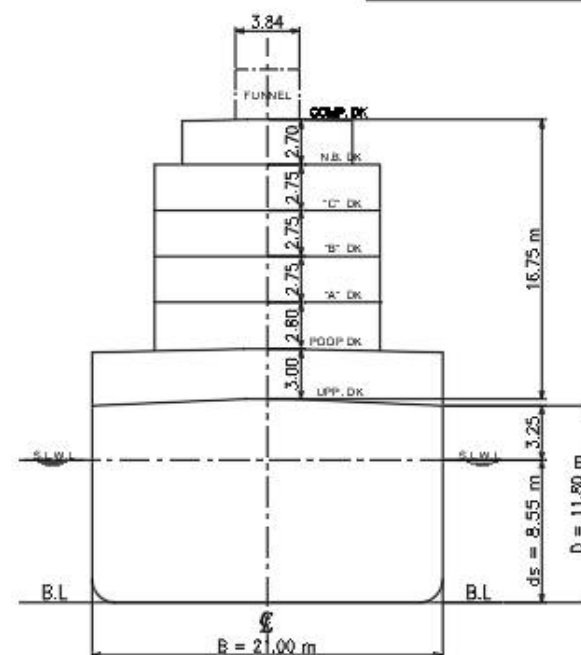
Stockless bower anchor	Type	High Holding Power
	Number X Mass per anchor	2 x 3,667.5 kg
Stud link chain cables for bower anchor	Total Length [m]	550 m
	Grade X Diameter [mm]	3 X Ø 54 mm
Tow line	Type	IWRC (6x37)
	MBL X Length per line	941 kN X 220 m
Mooring line	Type	UHMPE, Ø 40 mm
	Number X MBL X Length per line	8 X 362 kN X 190 m

Note:

1. Specifications of Actual Equipment described above are for reference only, but shall be decided at the detailed design stage.
2. MBL : Minimum Breaking Load
3. MBL_{SD} : Ship Design Minimum Breaking Load



FRONT VIEW



$$h(\text{Effective height}) = 3,25 + 16,75 = 20,00 \text{ m}$$

PRINCIPAL PARTICULARS

LENGTH	(O.A)	Approx. 129.90 m
LENGTH	(B.P)	122.00 m
BREADTH	(MLD.)	21.00 m
DEPTH	(MLD.)	11.80 m
DRAFT	(DESIGN)	8.55 m
DRAFT	(SCANTLING)	8.55 m