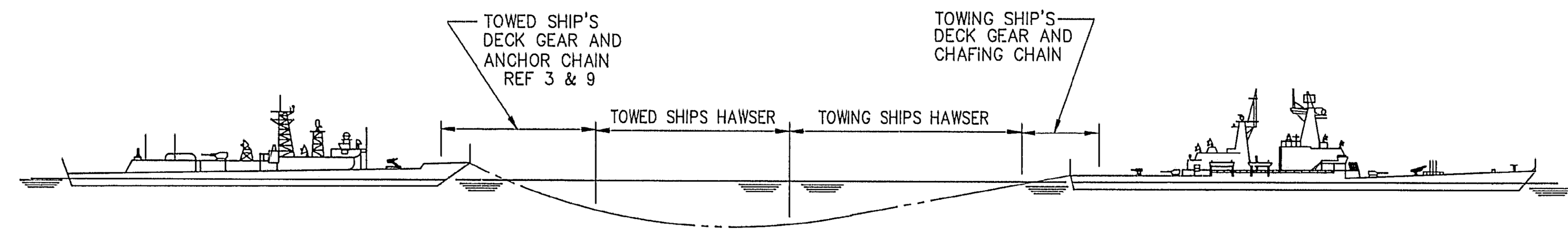


ZONE		REV	DESCRIPTION	DATE	APPROVED
ALL		A	1. SH COMPLETELY REDRAWN.		
1-A		A	2. CHGD "TYPE DWG" TO "STD DWG".		
1-A		A	3. CHGD NO SHEETS FROM 2 TO 3.		

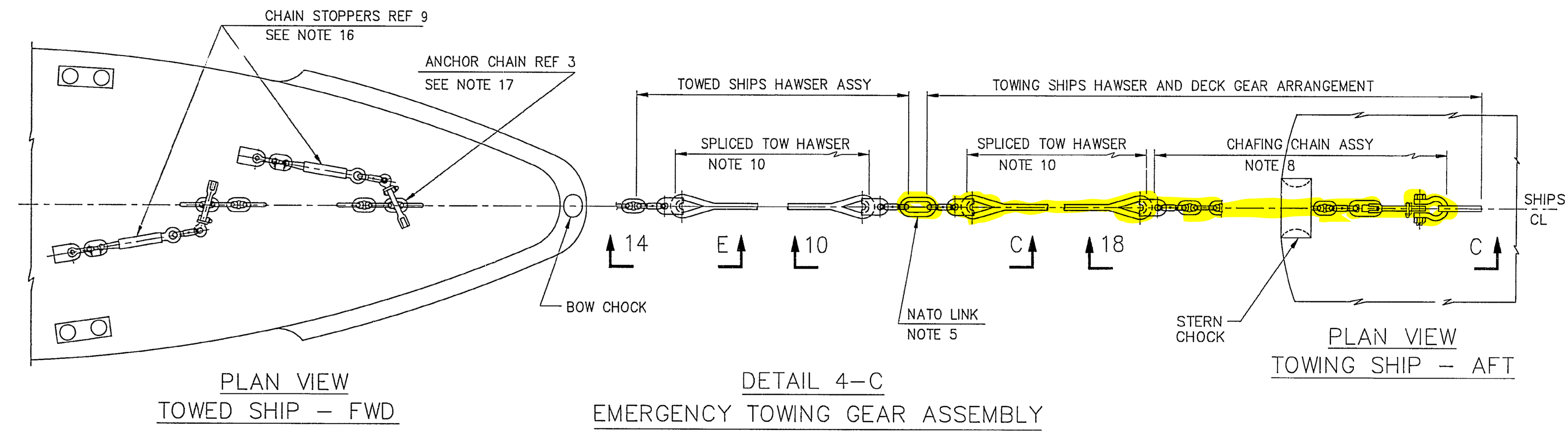
**GENERAL NOTES**

- THE PURPOSE OF THIS DRAWING IS TO DESCRIBE THE FITTINGS NECESSARY TO ASSEMBLE AN EMERGENCY TOWING GEAR HAWSER IN TWO CONFIGURATIONS, TOWING AND BEING TOWED UTILIZING THE NATO LINK.
- TO PROPERLY USE THIS DRAWING, FIRST DETERMINE THE SIZE OF SYNTHETIC FIBROUS ROPE AND ANCHOR CHAIN, AS DEFINED IN THE SHIPS DETAIL SPECIFICATIONS. THEN UTILIZE TABLE NOS 1, 1A, 2, 2A, AND 3 TO SELECT FITTINGS REQUIRED TO ASSEMBLE THE EMERGENCY TOWING GEAR IN THE TOWED OR BEING TOWED CONFIGURATIONS SHOWN IN DETAIL 4-C. IF TOWING THIMBLE, PC NO. 2, IS NOT AVAILABLE TOWING CONNECTOR, PC NO. 3, MAY BE USED AS AN ALTERNATE.
- FOR ATTACHING SHIPS TOWING HAWSER TO SHIPS ANCHOR CHAIN, SELECT FITTINGS FROM TABLE NO. 1. USE TABLE NO. 1.A WHEN ALTERNATE HAWSER FITTING (TOWING CONNECTOR, PC NO. 3) IS USED.
- FOR ATTACHING NATO LINK, PC NO. 17, TO SHIPS TOWING HAWSER, SELECT FITTING TABLE NO.2. USE TABLE NO. 2A WHEN ALTERNATE HAWSER FITTING (TOWING CONNECTOR, PC NO. 3) IS USED.
- FOR ATTACHING SHIPS TOWING HAWSER TO TOW PAD, SELECT CHAFING CHAIN AND APPENDAGES REQUIRED FROM TABLE NO. 3.
- THE TOWING RIG DEPICTED HEREIN IS DESIGNED TO ENABLE ANY SHIP IN THE FLEET TO TOW ANY OTHER SHIP IN AN EMERGENCY. FOR GUIDANCE, SEE NSTM 582 WHERE APPLICABLE TO THIS DRAWING.
- THIS DRAWING WAS REVISED FOR NEW SHIP DESIGN USING FLASH BUTT WELDED ANCHOR CHAIN, REF 3. HOWEVER, IT MAY BE USED AS GUIDANCE FOR UPGRADING EMERGENCY TOWING EQUIPMENT OR THE REPLACEMENT OF DAMAGED EQUIPMENT FOR SHIPS WITH DIE LOCK ANCHOR CHAIN.
- THE NATO STANDARD LINK, PC NO. 17, IS THE SAME SIZE (2 3/16 INCH DIA) FOR ALL SHIPS (EXCEPT FOR SUBMARINES AND MINESWEEPERS) IN ACCORDANCE WITH NATO SHIP-TO-SHIP TOWING (ATP 43). ALL NATO VESSELS ARE REQUIRED TO CARRY A NATO STANDARD TOWING LINK WHICH IS TO BE UTILIZED IN EMERGENCY TOWING SITUATIONS. THE SENDING SHIP SHALL PROVIDE THE NATO LINK.
- THE EMERGENCY TOWING HAWSER SHALL BE OF THE NON-ROTATING CONSTRUCTION, SINGLE BRAIDED, POLYESTER 12 STRAND IN ACCORDANCE WITH MIL-R-24750. PLAITED POLYESTER 8 STRAND IAW MIL-R-24730 OR DOUBLE BRAIDED POLYESTER IAW MIL-R-24677 MAY BE USED AS ALTERNATES.
- PELICAN HOOK, PC NO. 8, SHALL BE FABRICATED IN ACCORDANCE WITH PC 7 OF REF 9 AND MODIFIED AS SHOWN IN DETAIL 21-D.
- EMERGENCY TOWING CHAFING CHAIN, PC NO. 6, SHALL BE OF A LENGTH NECESSARY TO EXTEND A MINIMUM OF FOUR LINKS OUTBOARD OF THE STERN CHOCK.
- THE MINIMUM STERN CHOCK TO PELICAN HOOK CLEARANCE AS SHOWN IN DETAIL 18-C SHALL BE SIX TIMES THE CHAFING CHAIN WIRE DIAMETER OR 12 INCHES, WHICHEVER IS LARGER.
- FINAL LENGTH OF SPLICED TOW HAWSER, BEARING POINT TO BEARING POINT, RELAXED, TO BE DEPENDENT ON INITIAL LENGTH AS ORDERED. MINIMUM LENGTHS REQUIRED FOR EYE SPLICES ON EACH END, IN NO INSTANCE SHALL TOW HAWSERS, INITIALLY OR IF RESPLICED, BE LESS THAN 550 FEET FOR A NOMINAL 600 FOOT HAWSER, 825 FEET FOR A NOMINAL 900 FOOT HAWSER AND 1100 FEET FOR A NOMINAL 1200 FOOT HAWSER.
- TOW PAD, PC NO. 16, SHALL BE HEAT TREATED TO OBTAIN A TENSILE STRENGTH OF 130,000 PSI (BRINELL HARDNESS 270 TO 300).
- PELICAN HOOK, PC NO. 8 AND STRONGBACK, PC NO. 10 SHALL BE HEAT-TREATED TO OBTAIN A TENSILE STRENGTH OF 150,000 PSI (BRINELL HARDNESS 300 TO 340).
- EACH TOW HAWSER ASSEMBLY IN DETAIL 4-C SHALL CONSIST OF A SYNTHETIC FIBROUS ROPE, PC NO. 1 FITTED WITH TWO TOWING THIMBLES, PC NO. 2 (ONE EACH END) OR AS AN ALTERNATE TWO TOWING CONNECTORS, PC NO. 3.
- SAFETY ANCHOR SHACKLE, PC NO. 15 SHALL INCLUDE BOLT, NUT AND COTTER PIN.
- PEAR-SHAPED DETACHABLE LINK, PC NO. 5, HAS THE LINK OPENINGS DESIGNATED AS "A SIDE" AND "B SIDE" FOR CORRECT ORIENTATION OF THE LINK DURING INSTALLATION. IN TABLES NO. 1, 1A, 2, 2A & 3 LOCATION OF "A" OR "B" TO THE RIGHT OR LEFT OF THE LINK SIZE INDICATES THE POSITION OF THE LINK OPENING FOR FIT-UP TO THE FITTING SPECIFIED IN THE NEXT ADJACENT COLUMN.
- FOR THE SHIP BEING TOWED, ONE CHAIN STOPPER SHALL BE USED IF ITS PROOF LOAD EXCEEDS THE MAXIMUM BREAKING STRENGTH OF THE HAWSER, OTHERWISE USE TWO CHAIN STOPPERS.

GENERAL NOTES CONTINUED IN PANEL 5-B



**EMERGENCY TOWING ARRANGEMENT**



**PLAN VIEW TOWED SHIP - FWD**

**DETAIL 4-C EMERGENCY TOWING GEAR ASSEMBLY**

**PLAN VIEW TOWING SHIP - AFT**

**GENERAL NOTES CONTINUED**

17. TOWED SHIPS ANCHOR CHAIN SHALL BE BROKEN AT THE FIRST DETACHABLE LINK INBOARD OF THE SWIVEL.

9	CHAIN STOPPERS, FOR 3/4 TO 4 3/4 ANCHOR CHAIN ASSY & DETS	804-860000
8	LINK, NATO 2 3/16 DIA	803-5959315
7	LINK, DETACHABLE, PEAR SHAPED	803-6397316
6	LINKS, DETACHABLE, STANDARD AND HEAVY DUTY	803-860062
5	LINKS, DETACHABLE, HIGH STRENGTH	803-921790
4	LINKS, END, FOR 3/4 TO 4 3/4 ANCHOR CHAIN	803-6397315
3	CHAIN, FLASH BUTT WELDED, STUD LINK, ANCHOR, OUTBOARD SWIVEL SHOT	803-5959227
2	CONNECTOR, TOWING	803-6397406
1	THIMBLE, TOWING	803-6397321

NO	DRAWING TITLE	DWG NO
	REFERENCE DRAWING(S)	

NO	PC NO	DESCRIPTION	MATERIAL	MATL SPEC	REMARKS	REF DWG
1	17	LINK, NATO 2 3/16 DIA	ALY STL	REF 8	NOTE 5	8
1	16	PAD, TOW	ALY STL	ASTM A829 GR 4130	NOTE 11, DET 23-E	-
1	15	SHACKLE, SAFETY, ANCHOR	FGD STL	RR-C-271 TY IVA, GR B, CL 3	NOTE 14	-
AR	14	CHAIN, COIL, TWIST LINK	GALVS	REF 9	PC 13 OF REF 9	9
1	13	PIN, LOCKING	FGD ALY STL	REF 9	PC 12 OF REF 9	9
1	12	PIN, BAIL	FGD ALY STL	REF 9	PC 11 OF REF 9	9
1	11	BAIL	FGD ALY STL	REF 9	PC 10 OF REF 9	9
1	10	STRONGBACK	ALY STL	ASTM A322 GR 8640	NOTE 12, DET 23-B	-
1	9	PIN, HINGE	ALY STL	REF 9	PC 8 OF REF 9	9
1	8	HOOK, PELICAN	ALY STL	ASTM A829 GR 8640, COND AR	PC 7 REF 9, NOTE 7 & 12 DET 21-D	9
1	7	LINK, END	FGD ALY STL	REF 4		4
1	6	CHAIN, CHAFING, STUD LINK	LOW ALY STL	REF 3	NOTE 8	3
AR	5	LINK, PEAR SHAPED DETACHABLE	FGD ALY STL	REF 7	NOTE 15	7
AR	4	LINK, DETACHABLE	FGD ALY STL	REF 5, 6		5,6
-	3	CONNECTOR, TOWING	VARIOUS	REF 2	NOTE 2	2
2	2	THIMBLE, TOWING	CAST STL	REF 1	NOTE 2	1
1	1	ROPE, FIBROUS, TWELVE STRAND	SINGLE BRAIDED POLYESTER	MIL-R-24750	NOTES 6, & 10	-
NO REQ						

**PART LIST (FOR ONE EMER TOW HAWSER ASSY)**

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SIGNATURE		DEPARTMENT OF THE NAVY	
PREPARED	R. JAMESON	WASHINGTON, D.C. 20362-5101	
CHECKED	G. PRENTICE	NAVAL SEA SYSTEMS COMMAND	
HD ENGR	D. PETTIT	GEAR, EMERGENCY TOWING ASSY	
NAVY APPROVAL		5 INCH THRU 14 INCH CRCMF	
PROJ ENGR	G. PRENTICE	SYNTHETIC ROPE TOWING HAWSER	
BR HD	D. PETTIT		
DIV. DIR	A. CHARONSKI	SCALE: NONE	MASS (WEIGHT)
SUBGRP DIR	L. BRECKNER	SIZE	CAGE CODE
PREP ACTIVITY	E. SANDERS	F 80064	803
APPD FOR COMNAVSEA		DATE	DRAWING NO.
		4-74	4759441
			REV
			A

DRAWING NO. 803-4759441 SHEET 1 OF 3

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
ALL	A	1. SH COMPLETELY REDRAWN		

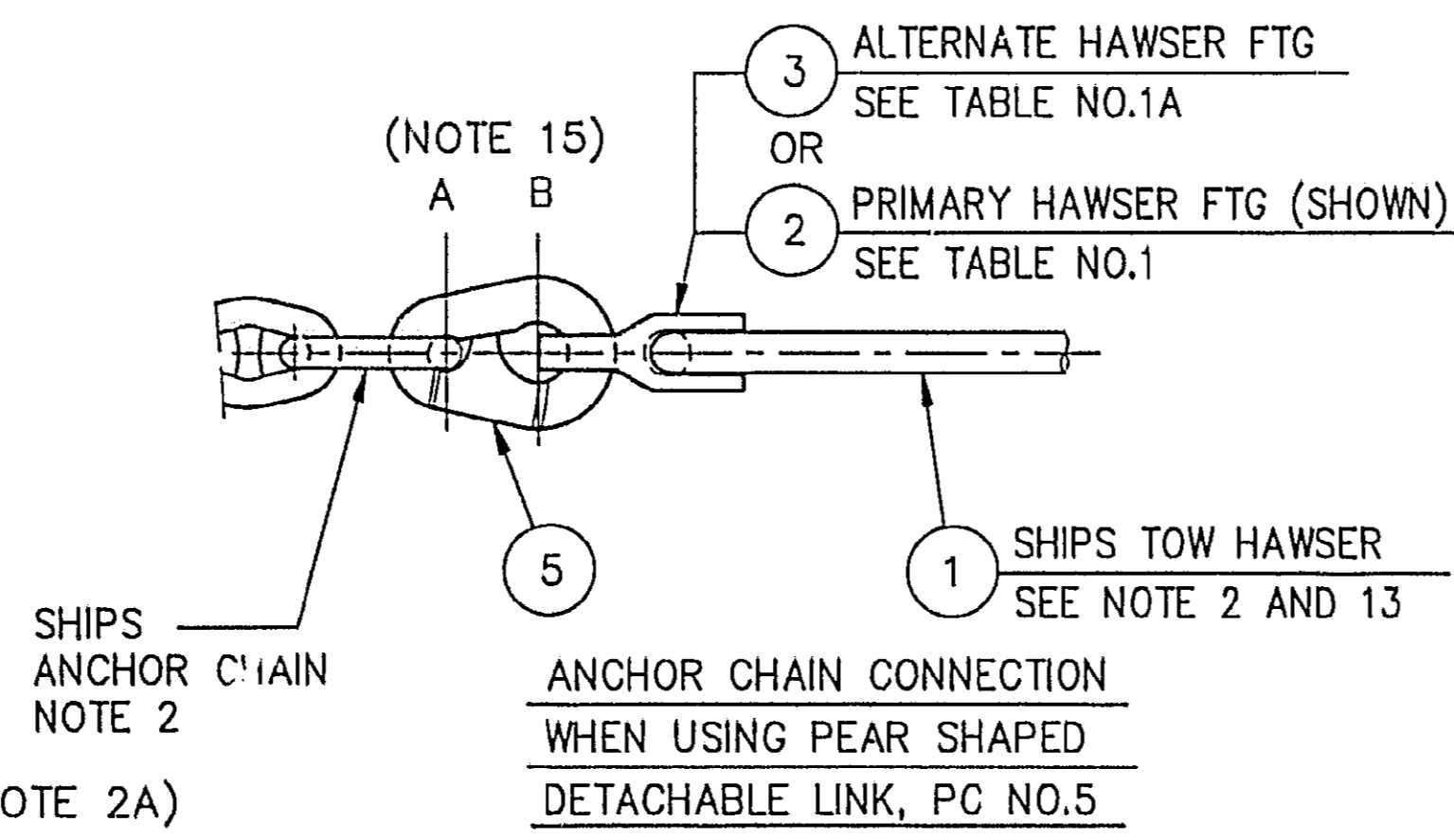
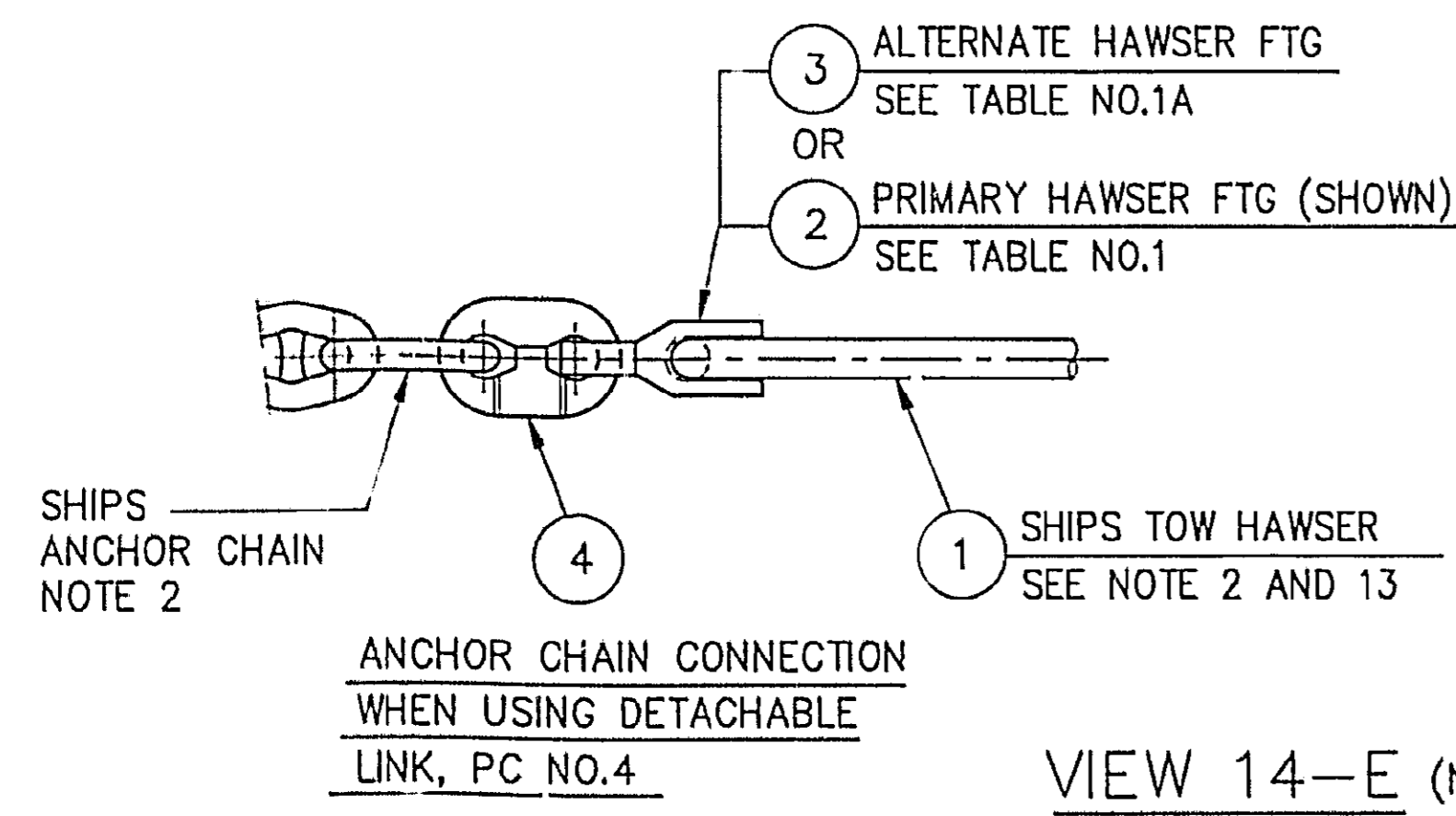


TABLE NO.1

ANCHOR CHAIN CONN TO TOWING THIMBLE, PC NO. 2

ANCHOR CHAIN REF 3 SIZE (IN)	DETACHABLE LINK PC NO 4 SIZE (IN)	PEAR SHAPED DETACHABLE LINK PC NO 5 SIZE (NO)*	TOWING THIMBLE PC NO 2 SIZE	HAWSER ROPE PC NO 1 SIZE (CRCMF)
1 1/4, 1 3/8	1 3/8	—	5 - 5 1/2	5, 5 1/2
1 1/2	1 1/2	—		
5/8	5/8	—		
1 1/2, 1 5/8	1 5/8	—	6-7	6, 6 1/2, 7
1 3/4	1 3/4	—		
7/8	7/8	—		
2	2	—	7 1/2 - 9	7 1/2, 8, 9
2 1/8, 2 1/4, 2 3/8	2 3/8	—		
7/8, 2	—	A NO.5 B		
2 1/8	2 1/8	—	10	10
2 1/4	2 1/4	—		
2 3/8	2 3/8	—		
2 1/2, 2 5/8	2 1/2	—	11,12	11,12
2 7/8, 3, 3 1/8	—	B NO.6 A		
2 5/8	2 3/4 HD	—		
2 7/8 - 3 1/4	2 7/8	—	13,14	13,14
3 3/8 - 3 3/4	—	B NO.7 A		
3, 3 1/8	—	A NO.7 B		
3 1/4	3 1/4	—	13,14	13,14
3 3/8	3 3/8	—		
3 1/2, 3 5/8, 3 3/4	3 1/2 HD	—		
3 7/8, 4	3 1/2 HD	—		

TABLE NO.1A

ANCHOR CHAIN CONN TO TOWING CONNECTOR, PC NO. 3

ANCHOR CHAIN REF 3 SIZE (IN)	DETACHABLE LINK PC NO 4 SIZE (IN)	PEAR SHAPED DETACHABLE LINK PC NO 5 SIZE (NO)*	TOWING CONNECTOR PC NO 3 SIZE	HAWSER ROPE PC NO 1 SIZE (CRCMF)
1 1/4, 1 3/8, 1 1/2	—	NO.4 A (NOTE 15) B	5 - 5 1/2	5, 5 1/2
1 5/8	1 5/8	—		
1 1/2	—	A NO.4 B	6-7	6, 6 1/2, 7
1 5/8, 1 3/4	—	A NO.5 B		
1 7/8	1 7/8	—		
2	2	—	7 1/2 - 9	7 1/2, 8, 9
2 1/8	2 1/8	—		
2 1/4	2 1/4	—		
2 3/8	2 3/8	—	10	10
1 7/8, 2	—	A NO.5 B		
2 1/8, 2 1/4	—	A NO.6 B		
2 3/8	2 3/8	—	11,12	11,12
2 1/2	2 1/2	—		
2 5/8	2 5/8	—		
2 1/8, 2 1/4, 2 3/8	—	A NO.6 B	13,14	13,14
2 1/2, 2 5/8	—	A NO.7 B		
2 3/4	2 3/4 HD	—		
2 7/8	2 7/8	—	13,14	13,14
3	3 HD	—		
3 1/8	3 1/8	—		
2 5/8 - 3 1/8	—	A NO.7 B	13,14	13,14
3 1/4	3 1/4	—		
3 3/8	3 3/8	—		
3 1/2, 3 5/8	3 1/2	—	13,14	13,14
3 3/4	3 3/4	—		
3, 3 1/8, 3 1/4	—	A NO.7 B		
3 3/8, 3 1/2, 3 5/8	3 1/2 HD	—		
3 3/4, 3 7/8, 4	3 3/4	—		

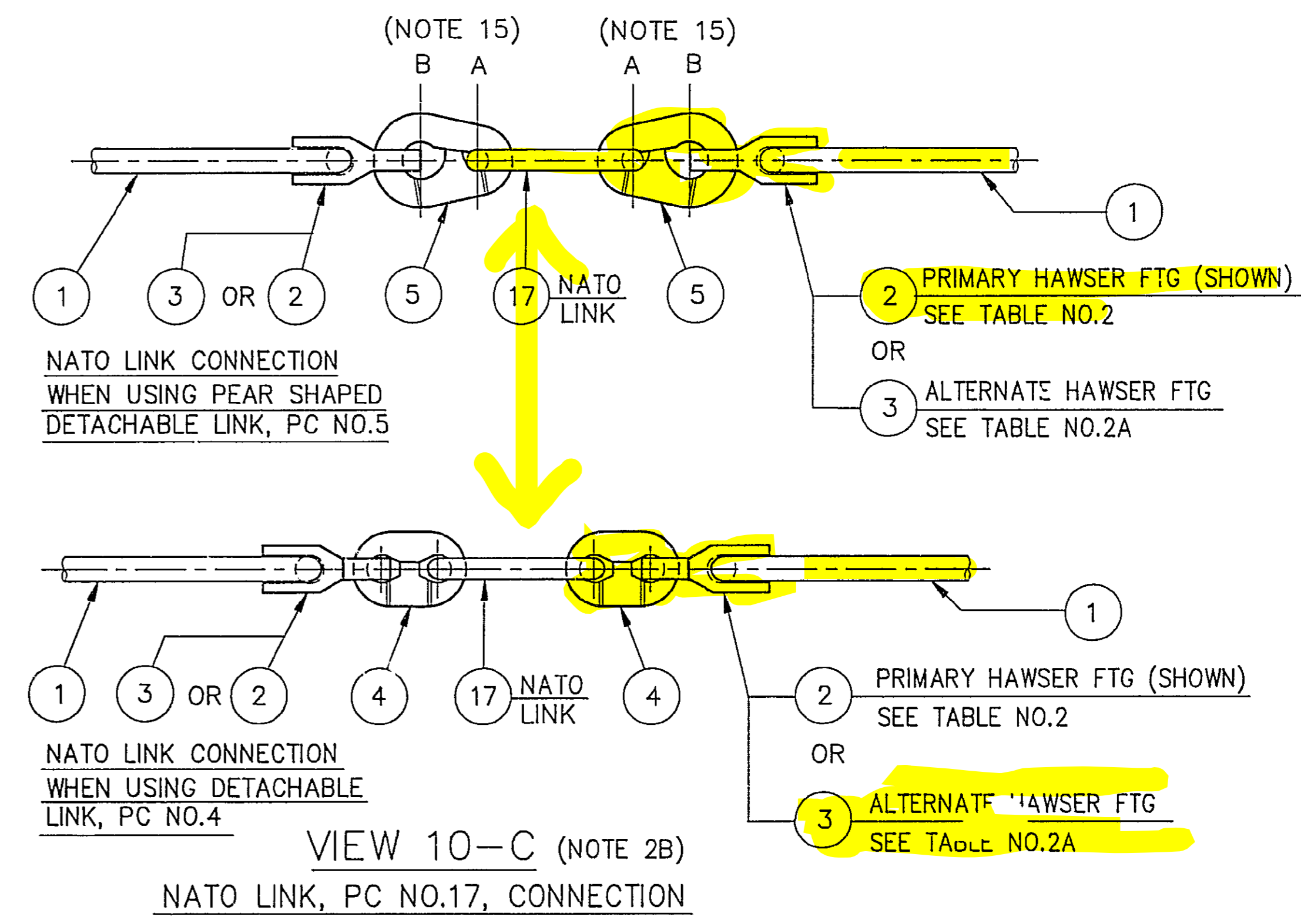


TABLE NO.2

NATO LINK, PC NO.17, CONN TO TOWING THIMBLE, PC NO. 2

HAWSER ROPE PC NO 1 SIZE (CRCMF)	TOWING THIMBLE PC NO 2 SIZE	DETACHABLE LINK PC NO 4 SIZE (IN)	PEAR-SHAPED DETACHABLE LINK PC NO 5 SIZE (NO)*	NATO LINK PC NO 17 NOTE 5 SIZE (IN)
5, 5 1/2	5 - 5 1/2	—	NO.4 A (NOTE 15) B	2 3/16
6, 6 1/2, 7	6-7	—	A NO.5 B	
7 1/2, 8, 9	7 1/2 - 9	2 1/4	—	
10	10	2 1/4	—	
11,12	11,12	2 3/4 HD	—	
13,14	13,14	—	B NO.7 A	

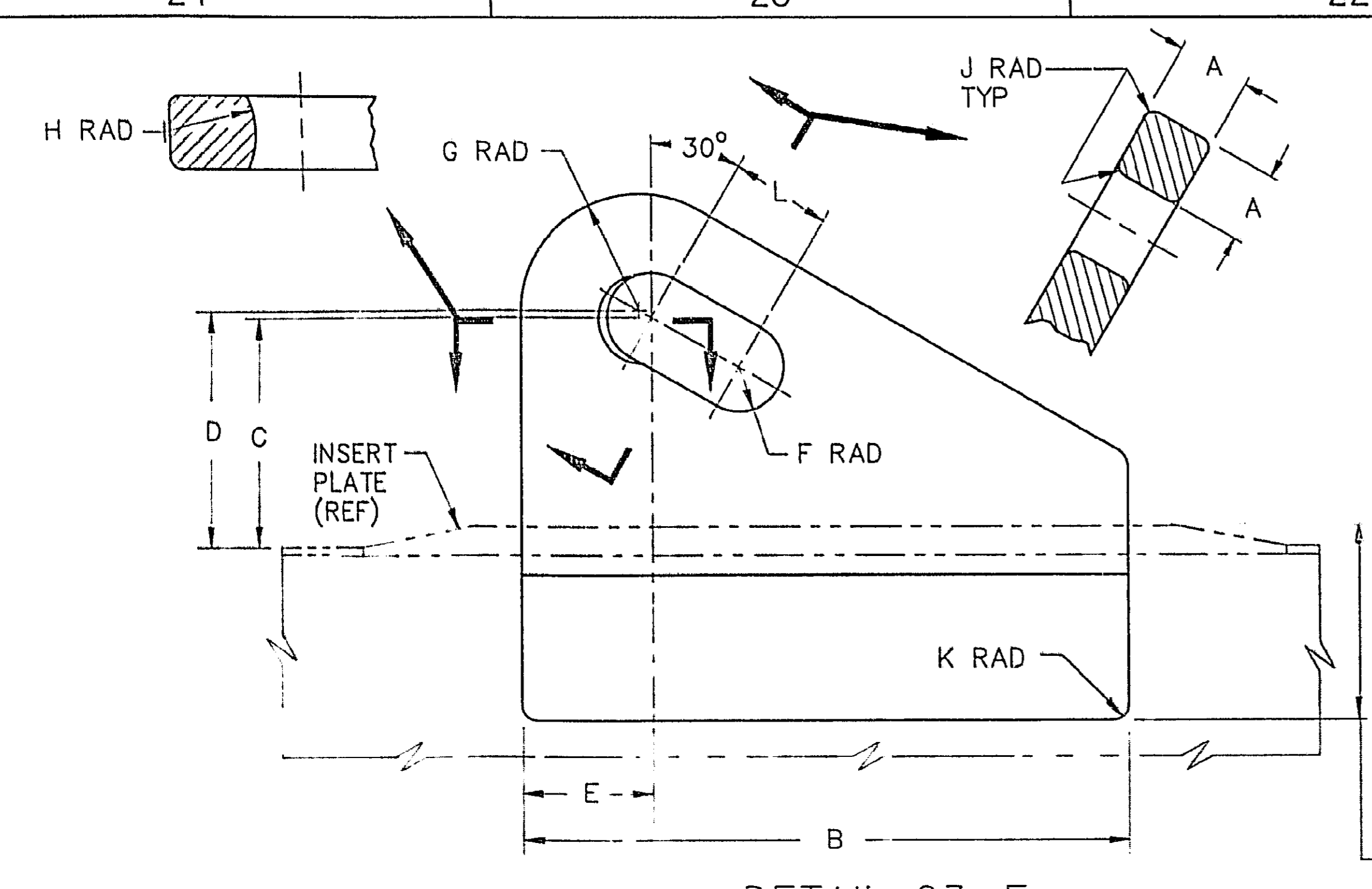
TABLE NO.2A

NATO LINK, PC NO.17, CONN TO TOWING CONNECTOR, PC NO. 3

HAWSER ROPE PC NO 1 SIZE (CRCMF)	TOWING CONNECTOR PC NO 3 SIZE	DETACHABLE LINK PC NO 4 SIZE (IN)	PEAR-SHAPED DETACHABLE LINK PC NO 5 SIZE (NO)*	NATO LINK PC NO 17 NOTE 5 SIZE (IN)
5, 5 1/2	5 - 5 1/2	2 1/4	—	2 3/16
6, 6 1/2, 7	6-7	—	NO.5 A (NOTE 15) B	
7 1/2, 8, 9	7 1/2 - 9	2 3/8	—	
10	10	—	B NO.6 A	
11,12	11,12	—	B NO.7 A	
13,14	13,14	—	B NO.7 A	

\* NOTE:  
PEAR SHAPED DETACHABLE LINK NO./ SIZE (INCHES)  
NO. 4 - 1 1/4 HS, 1 1/2 HS  
NO. 5 - 1 5/8 HS, 1 3/4 HS, 2  
NO. 6 - 2 1/8, 2 3/8  
NO. 7 - 2 1/2, 3 1/8, 2 3/4 HD, 3 HD

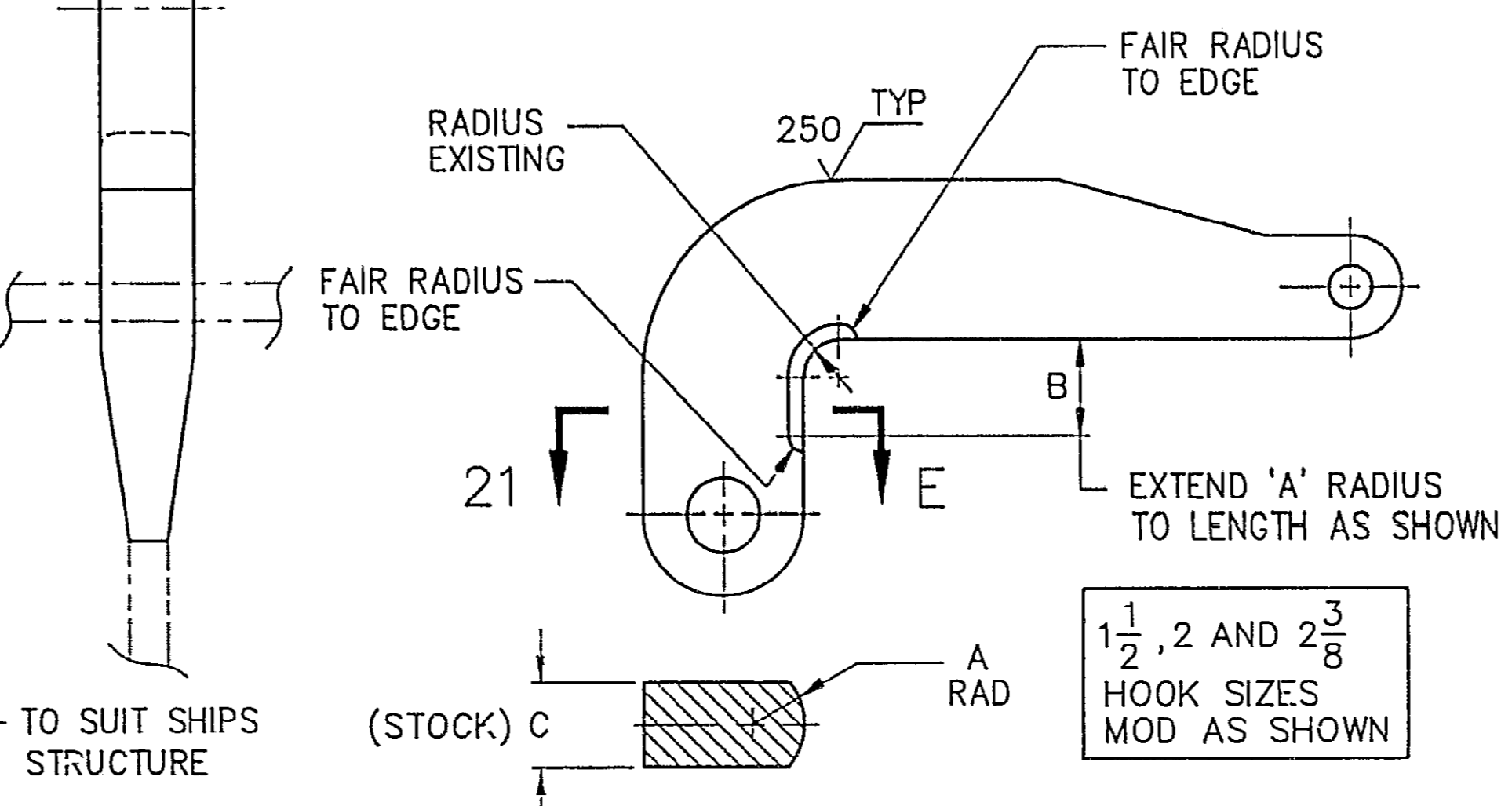
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
ALL	A	THIS SH ADDED		



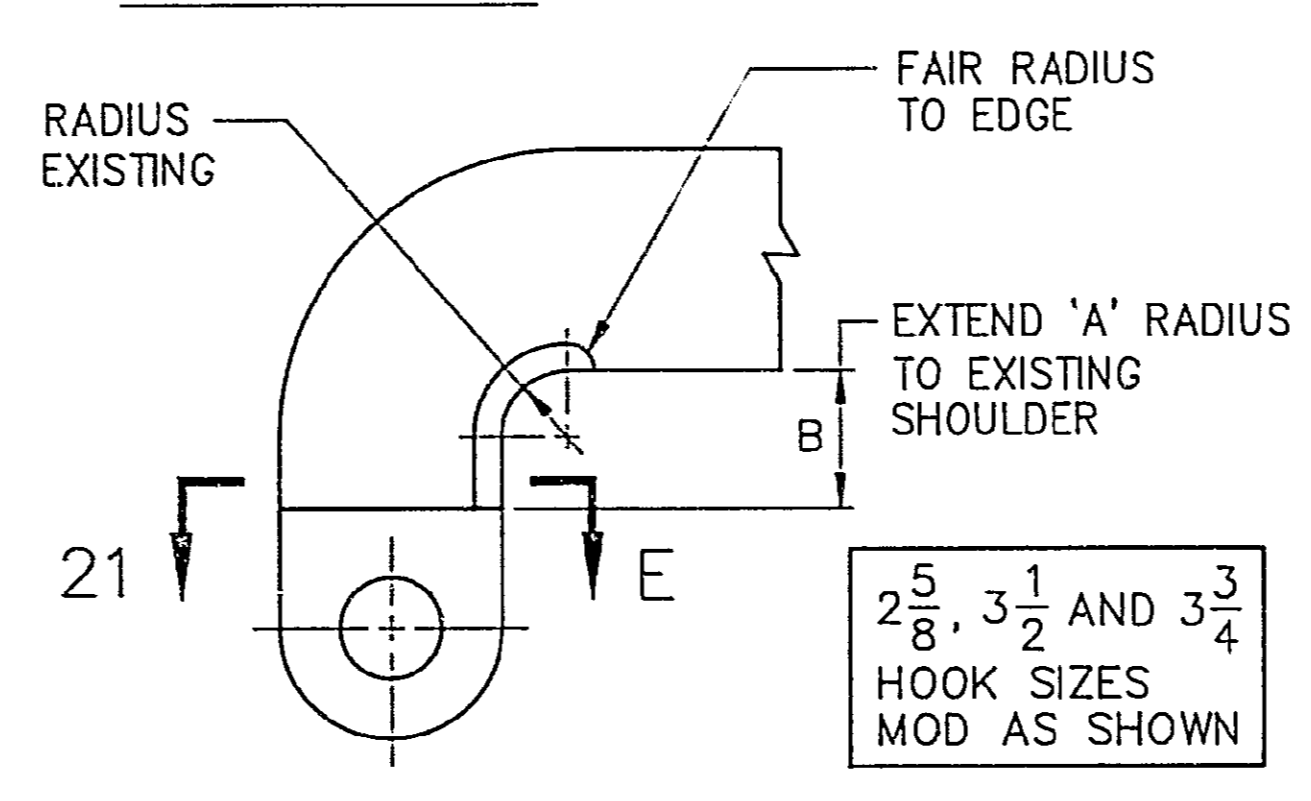
DETAIL 23-E  
16 TOW PAD

TABLE NO. 6

HAWSER ROPE SIZE	TOW PAD (PC NO. 16)										
	A	B	C	D	E	F	G	H	J	K	L
5, 5 1/2	1 1/2	11 1/2	4	4 3/16	2 13/16	15 1/16	2 7/16	1	1 1/4	1 1/2	2 1/8
6-7	2	18 5/16	7 1/2	7 3/4	3 11/16	1 1/4	3 1/4	1 1/2	1 1/4	1 1/2	3
7 1/2 -9	2 1/2	21	8	8 1/4	4 1/2	1 9/16	4 1/16	2	3/8	1 1/2	3 1/2
10	2 3/4	22 1/2	8 1/2	8 3/4	4 15/16	1 3/4	4 1/2	2	3/8	5/8	3 3/4
11,12	3 1/8	25	9 1/4	9 1/2	5 11/16	2 1/8	5 1/4	2 1/2	3/8	3/4	4 1/2
13,14	3 1/2	26 1/4	9 1/2	9 3/4	6 1/4	2 5/16	5 13/16	3 1/4	1/2	3/4	5 1/4



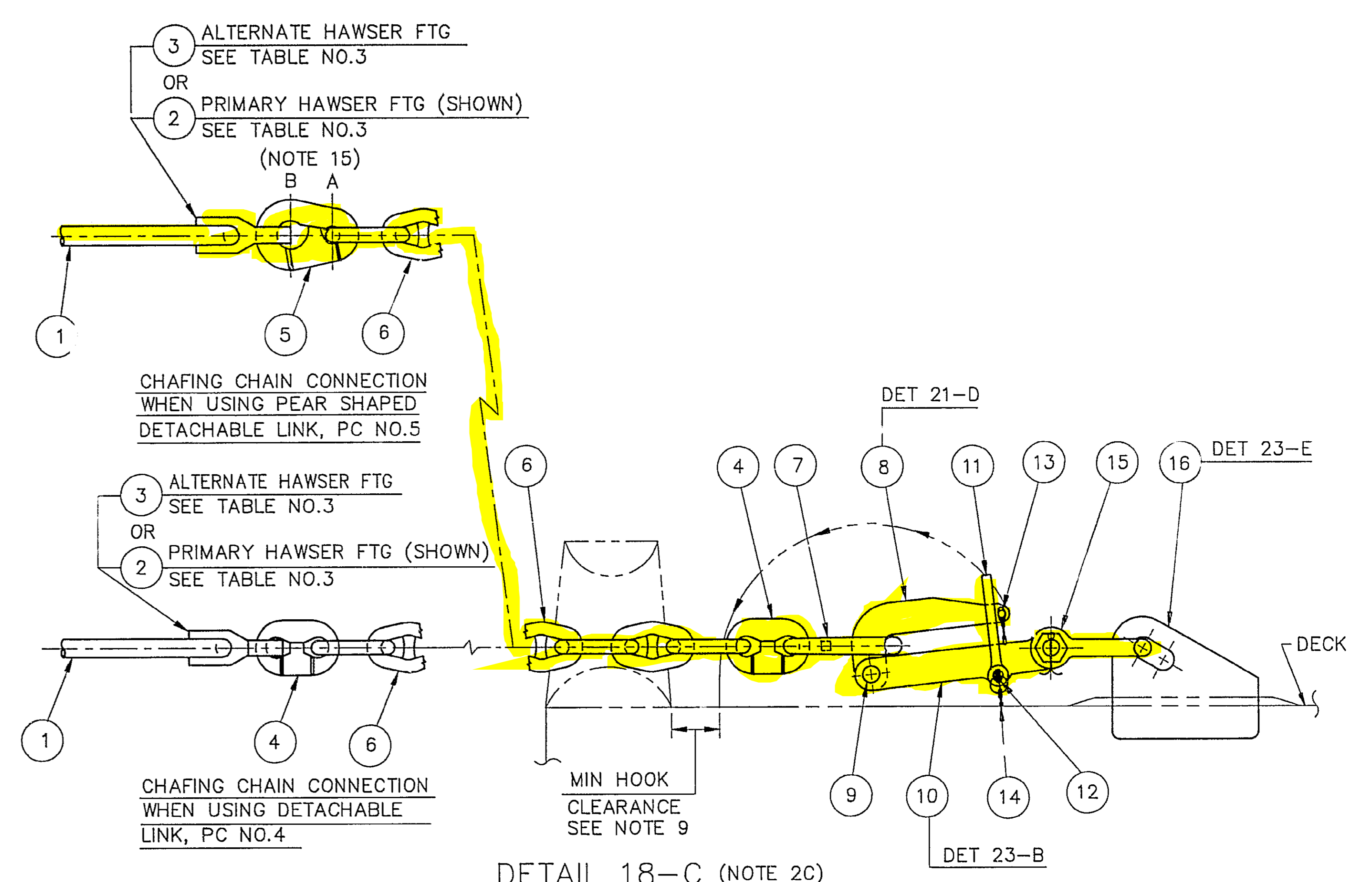
SECT 21-E



DETAIL 21-D  
8 PELICAN HOOK (NOTE 7)  
FOR INFO NOT SHOWN SEE REF 9

TABLE NO. 4

HAWSER ROPE SIZE	PELICAN HOOK, REF 9 SIZE (IN)	PELICAN HOOK (PC NO.8)		
		A	B	C
5, 5 1/2	1 1/2	3/4	1 3/4	1 1/2
6-7	2	1	2 7/16	1 3/4 (REF 9)
7 1/2 -9	2 3/8	1 3/8	2 9/16	2 1/4 (REF 9)
10	2 5/8	1 3/4	2 7/8	2 1/2 (REF 9)
11,12	3 1/2	2	3 3/8	3 (REF 9)
13,14	3 3/4	2 1/4	4 1/4	3 1/2 (REF 9)

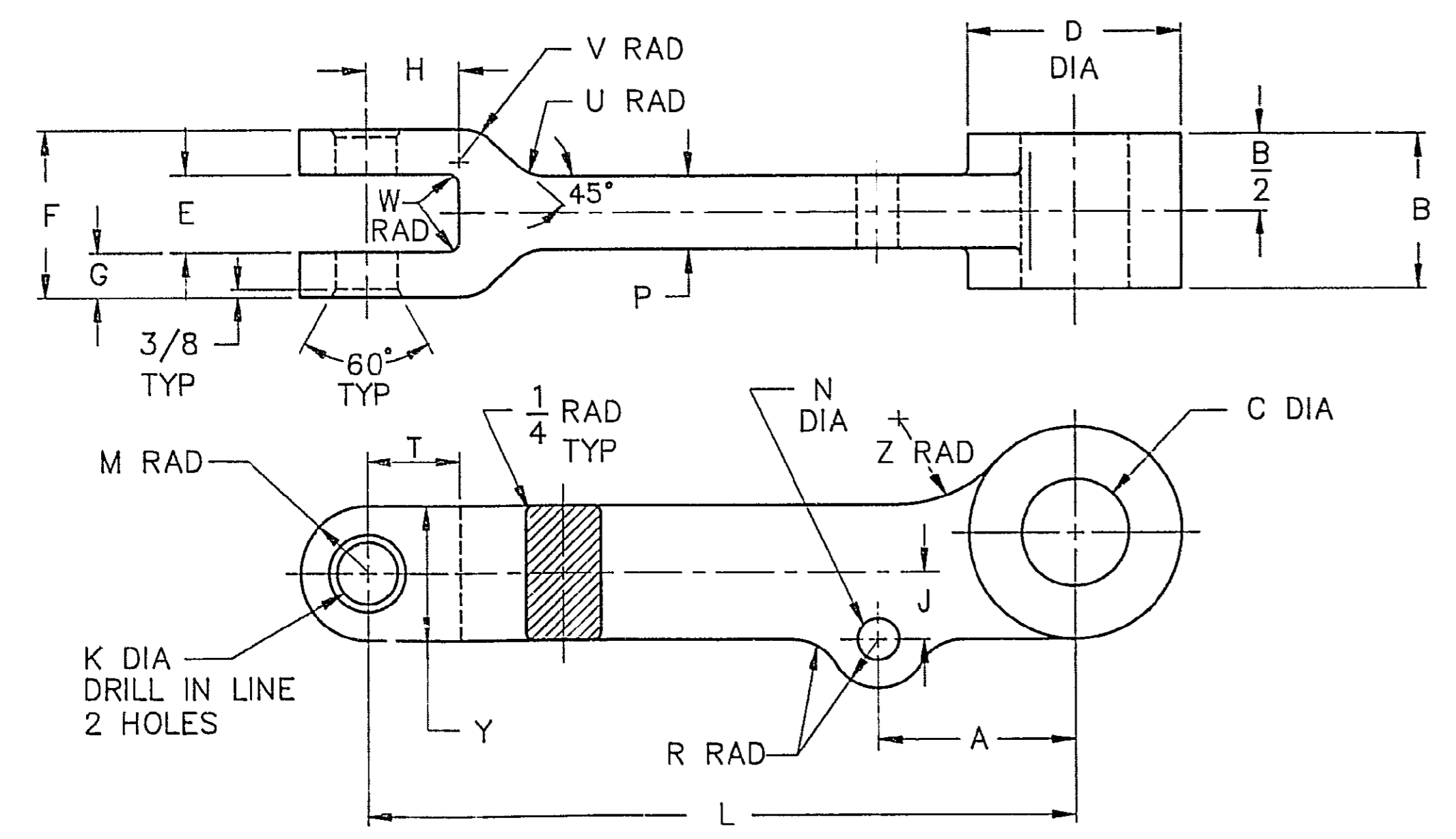


DETAIL 18-C (NOTE 2C)  
CHAFING CHAIN ASSY AND DECK GEAR CONNECTIONS  
TO TOWING SHIPS HAWSER ASSY

TABLE NO. 3 TOWING HAWSER AND CHAFING CHAIN CONNECTIONS

HAWSER ROPE PC NO. 1 SIZE	TOWING THIMBLE PC NO. 2 SIZE	TOWING CONNECTOR PC NO. 3 SIZE	DETACHABLE LINK PC NO. 4 SIZE (IN)	PEAR-SHAPED DETACHABLE PC NO. 5 SIZE (NO.) *	CHAFING CHAIN PC NO. 6 SIZE (IN)	DETACHABLE LINK PC NO. 4 SIZE (IN)	END LINK PC NO. 7 SIZE (IN)	PELICAN HOOK TABLE NO. 4 SIZE (IN)	ANCHOR SHACKLE PC NO. 15 SIZE (IN)	TOW PAD TABLE NO. 6 SIZE
5, 5 1/2	5, 5 1/2	—	1 3/8	—	1 1/4	1 1/4	1 1/4	5, 5 1/2 (1 1/2)	1 1/2	5, 5 1/2
6-7	6-7	—	—	NO. 4 B (NOTE 15) A	1 1/2	1 1/2	1 1/2	6-7 (2)	2	6-7
7 1/2, 8, 9	7 1/2 -9	—	—	NO. 5 B A	2	2	2	7 1/2 -9 (2 3/8)	2 1/2	7 1/2 -9
10	10	—	2 1/4	—	2 1/4	2 1/4	2 1/4	10 (2 5/8)	3	10
11,12	11,12	—	2 3/4 HD	—	2 3/4	2 3/4 HD	2 3/4	11,12 (3 1/2)	3 1/2	11,12
13,14	13,14	—	—	NO. 7 B A	3	3 HD	3	13,14 (3 3/4)	4	13,14

\* SEE NOTE ON SHEET 2, PANEL 12-A



DETAIL 23-B  
10 STRONGBACK

TABLE NO. 5

HAWSER ROPE SIZE	STRONGBACK (PC NO 10)																				
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	Y	Z
5, 5 1/2	4	2 3/16	1 3/4	3 3/4	1 9/16	3 5/16	7/8	2	1 1/2	1 17/32	14 1/2	1 1/2	29 3/32	1 7/16	1	1 13/16	1 1/2	1	5/16	3	1 7/8
6-7	5	3 1/16	2 13/32	5 1/4	1 7/8	3 7/8	1	2 1/8	1 11/16	1 21/32	17	1 11/16	1 1/32	1 3/4	1 1/8	2	1 7/16	1	5/16	3 3/8	2 5/8
7 1/2 -9	5 1/4	3 15/16	2 29/32	6 1/4	2 3/8	5 1/8	1 3/8	2 7/8	2 1/16	1 29/32	20 3/4	2 1/16	1 9/32	2 1/4	1 1/2	2 3/8	1 3/16	1 1/8	5/16	4 1/8	3 1/8
10	6	4 13/16	3 13/32	6 3/4	2	4 3/4	1 3/8	3 1/8	2 1/4	2 1/32	24	2 1/4	1 13/32	2 9/16	1 1/2	2 3/4	2	1	3/8	4 1/2	3 3/8
11,12	8	5 7/16	3 29/32	8 1/2	2 5/8	5 5/8	1 1/2	3	2 7/8	2 17/32	28 1/4	2 3/4	1 21/32	3	1 3/4	3	2	2	3/8	5 1/2	4 1/4
13,14	8 3/4	6 3/16	4 13/32	9 1/2	3 1/8	6 5/8	1 3/4	4	3 1/8	3 5/32	29 3/4	3	1 15/16	3 1/2	2	3 1/4	2	2	3/8	6	4 3/4