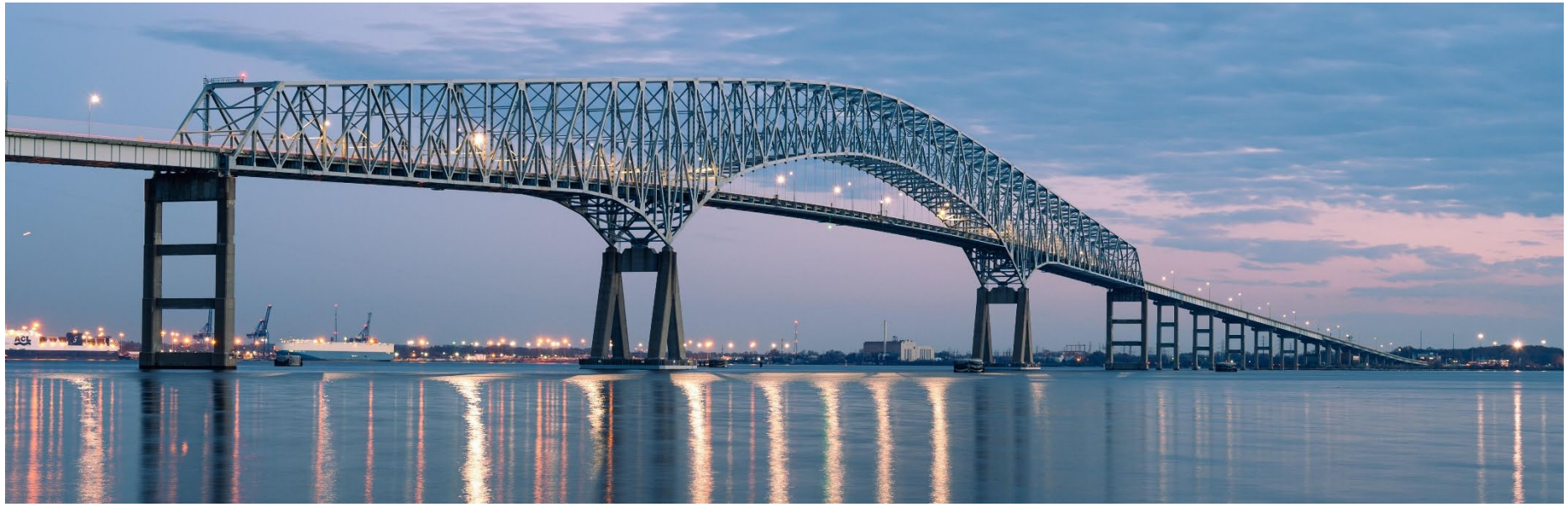
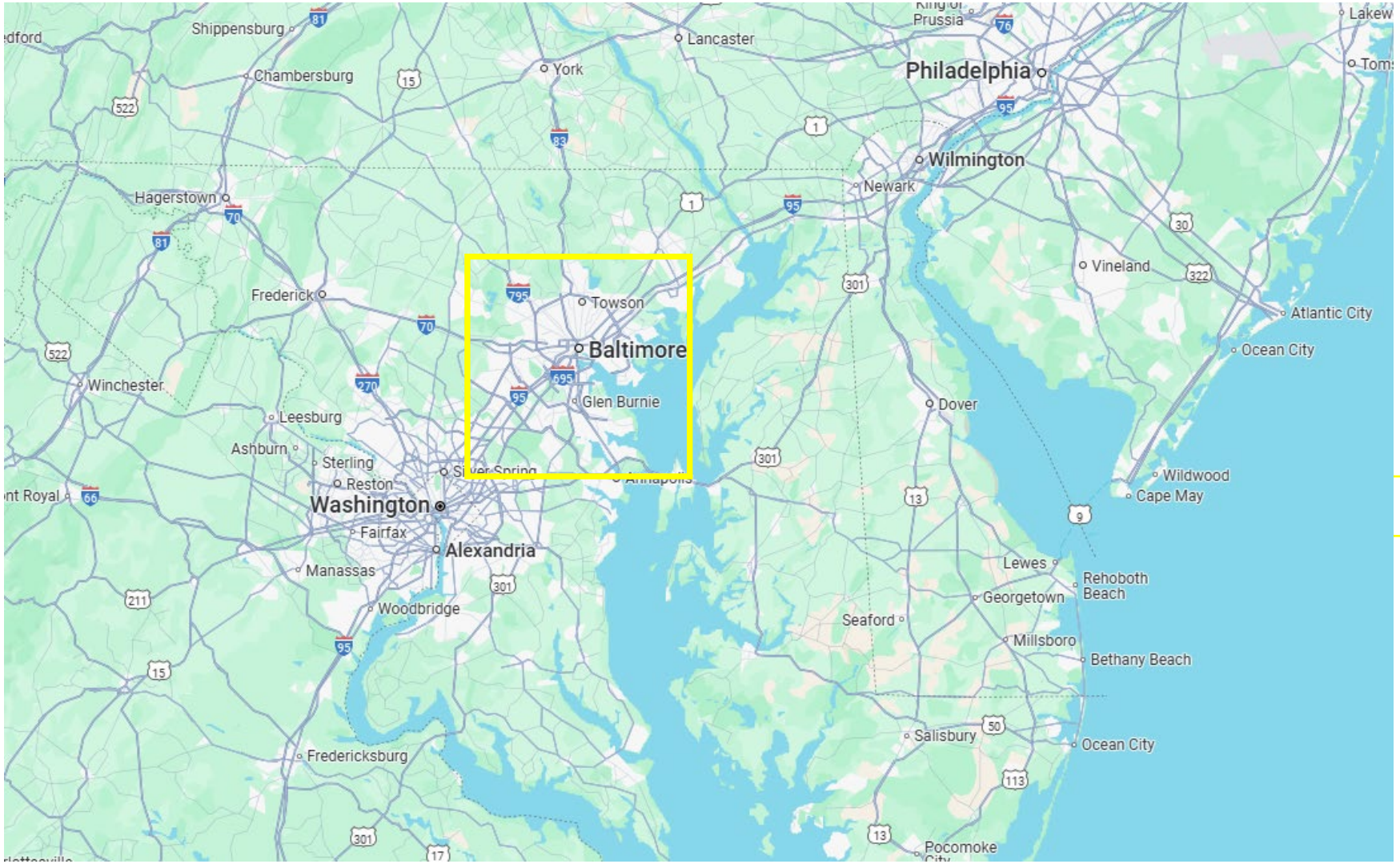
Navigating the Aftermath
Key Bridge Collapse Cleanup



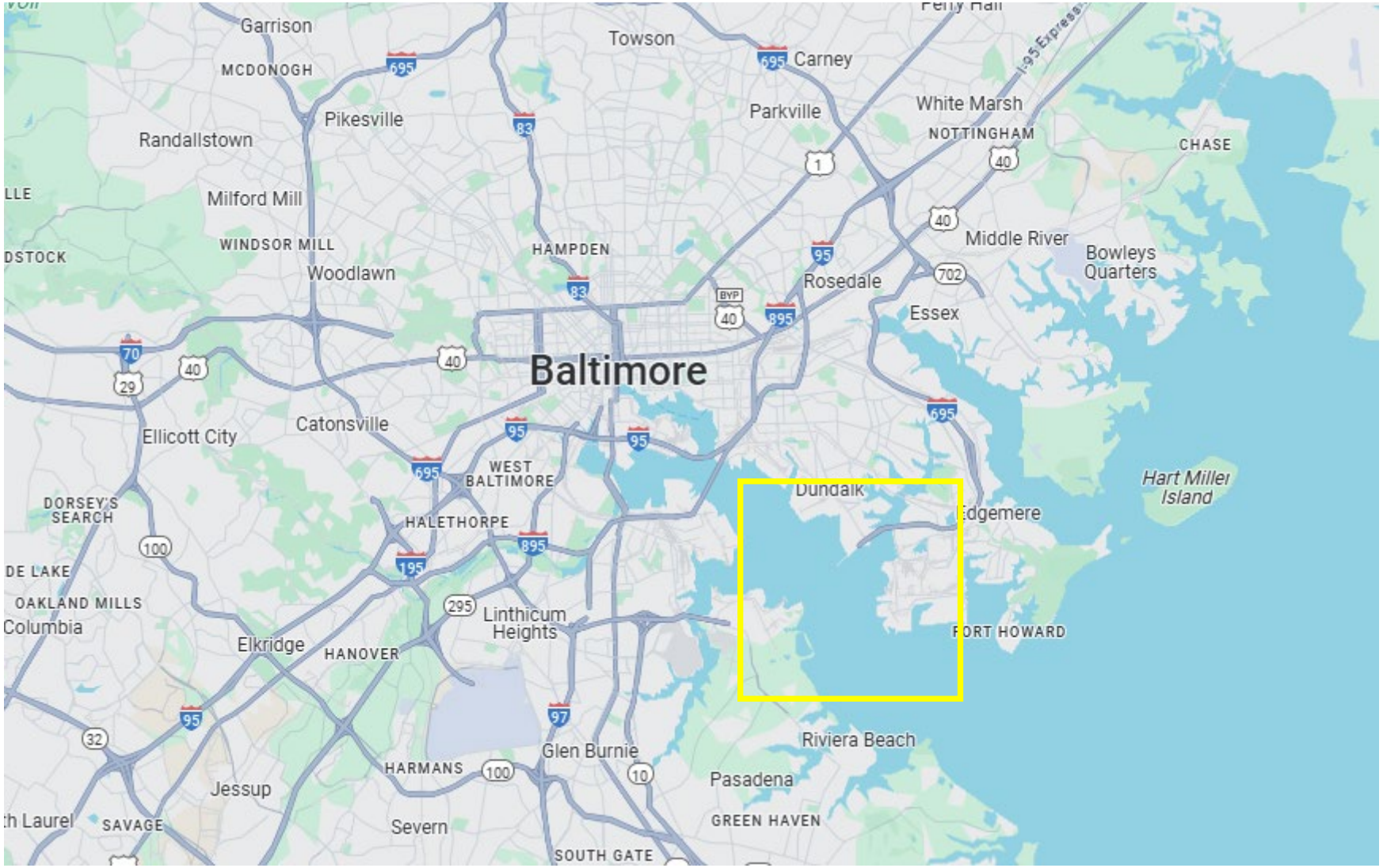
Steven Percassi, PE
Genesis Structures

Joe Knapp, PE
Genesis Structures

Bridge Location

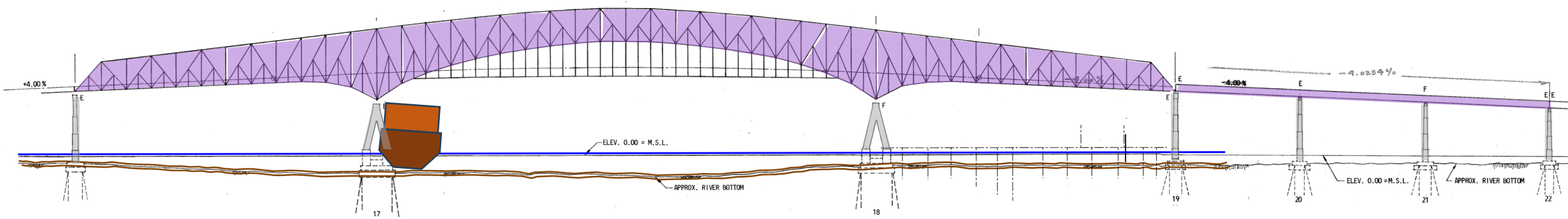


Bridge Location



Bridge Location & Other Key Locations

The Collapse



P16 P17 P18 P19 P20 P21 P22

Span 17
720ft

Span 18
1200ft

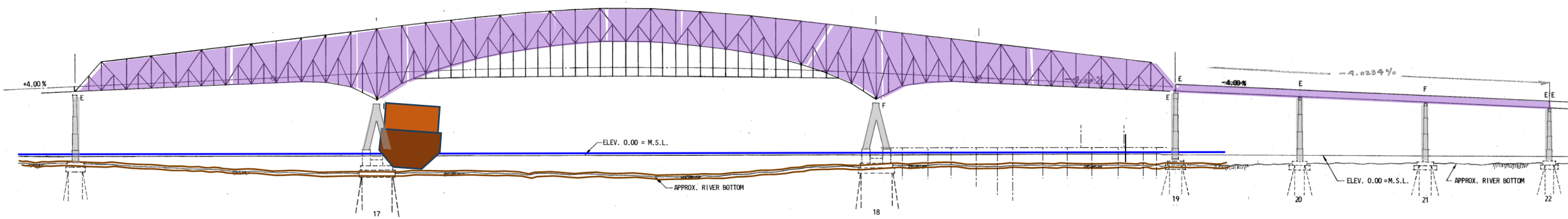
Span 19
720ft

Spans 20-22
3@300ft

West

East

The Collapse



P16 P17 P18 P19 P20 P21 P22

Span 17
720ft

Span 18
1200ft

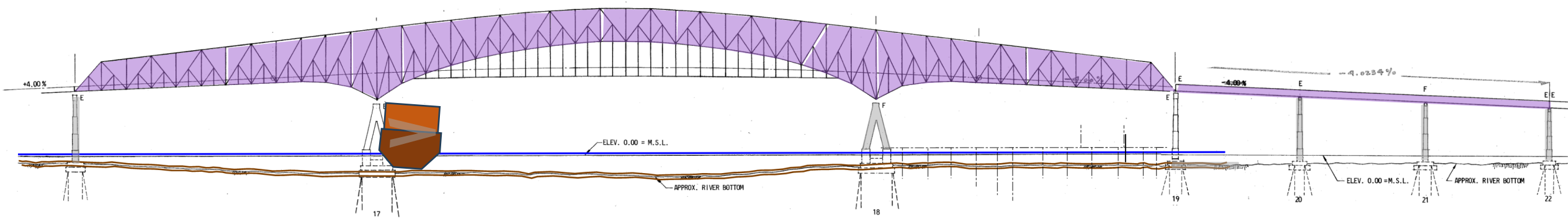
Span 19
720ft

Spans 20-22
3@300ft

West

East

The Collapse



P16 P17 P18 P19 P20 P21 P22

Span 17
720ft

Span 18
1200ft

Span 19
720ft

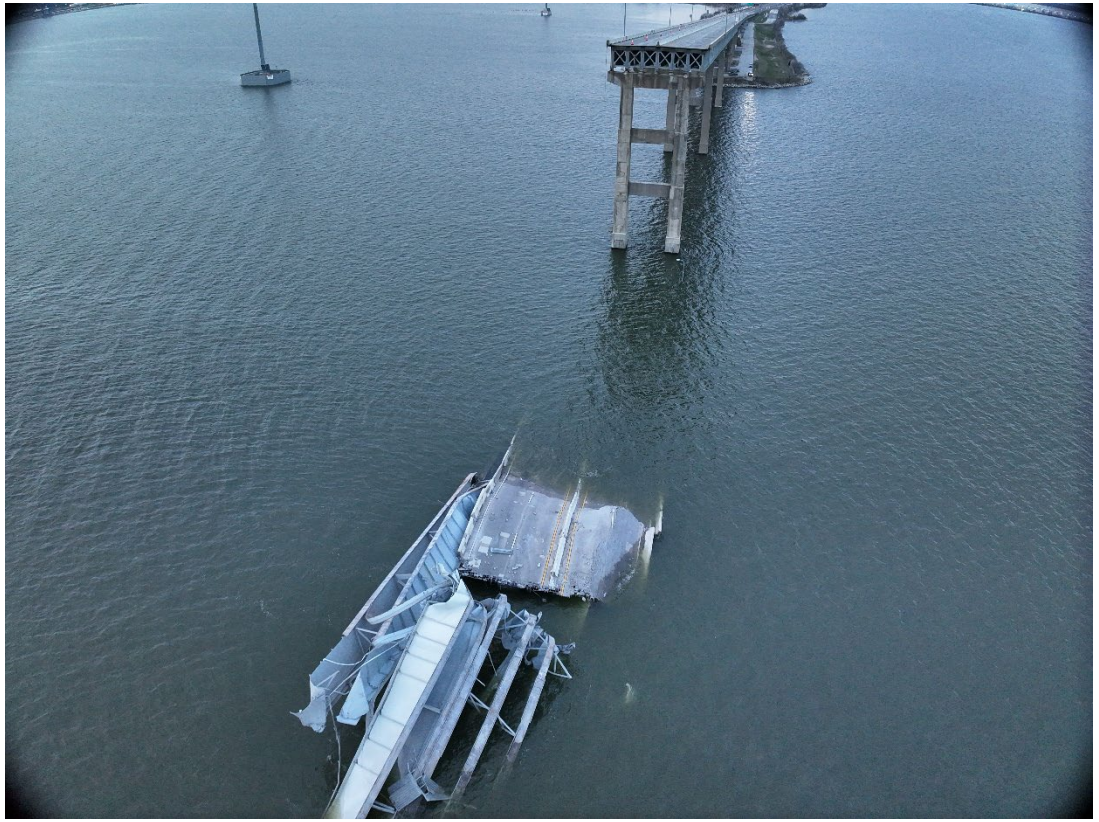
Spans 20-22
3@300ft

West

East

The Collapse

The Collapse



The Collapse

The Collapse

The Response Team

Approach Spans

SKANSKA

UNITED INFRASTRUCTURE GROUP

CASHMAN

GENESIS STRUCTURES

Seaward Marine Corporation

Main Channel

DONJON MARINE CO., INC.

Glosten

Approach Spans

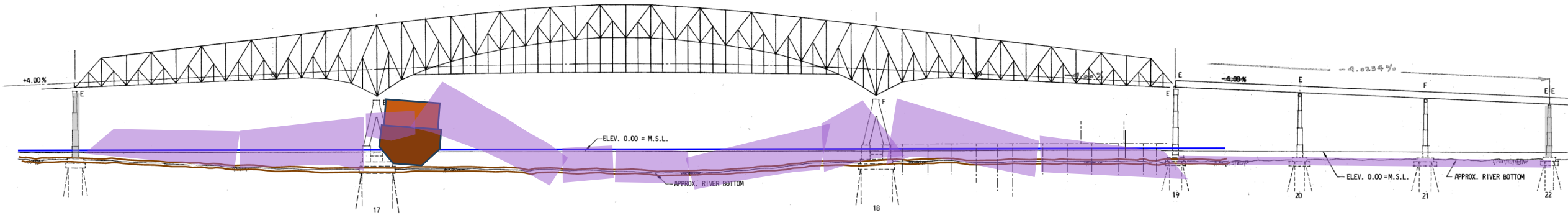
SKANSKA

UNITED INFRASTRUCTURE GROUP

CASHMAN

GENESIS STRUCTURES

Seaward Marine Corporation



KU

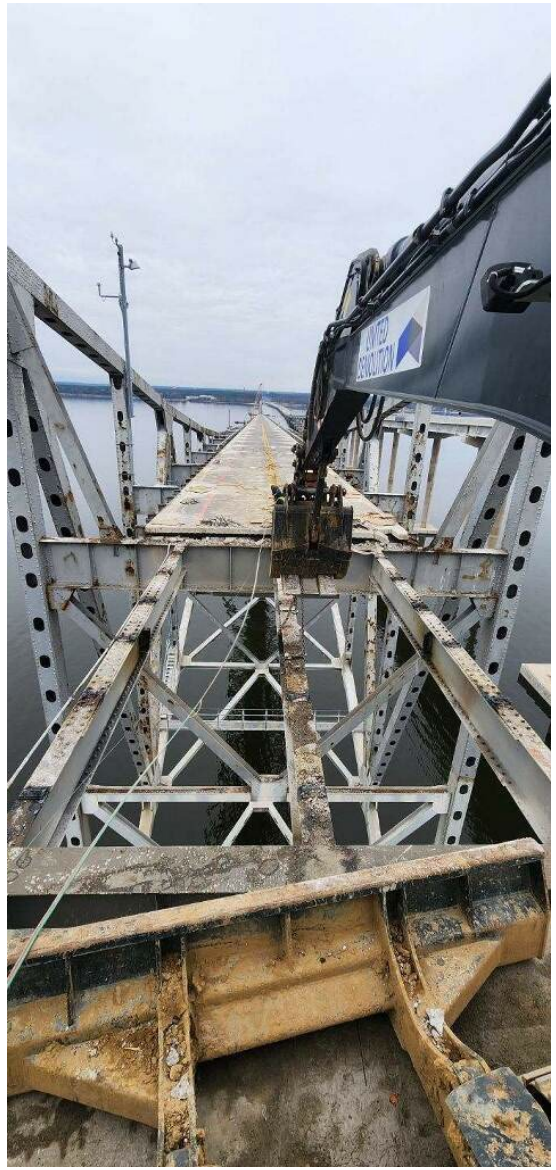
RESOLVE MARINE

The Dali

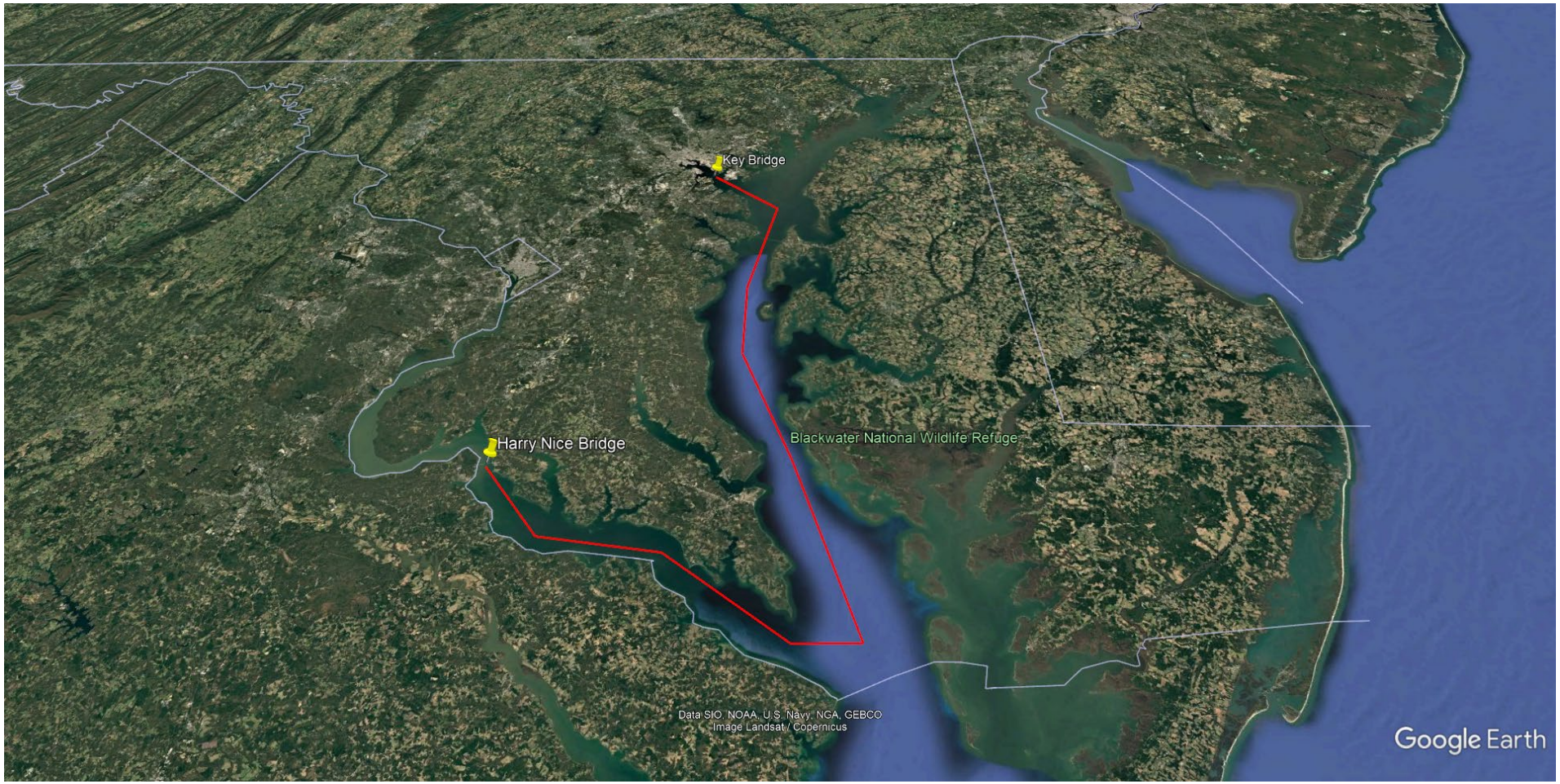
WEEKS

Why Skanska and United Demo?

Why Skanska and United Demo?

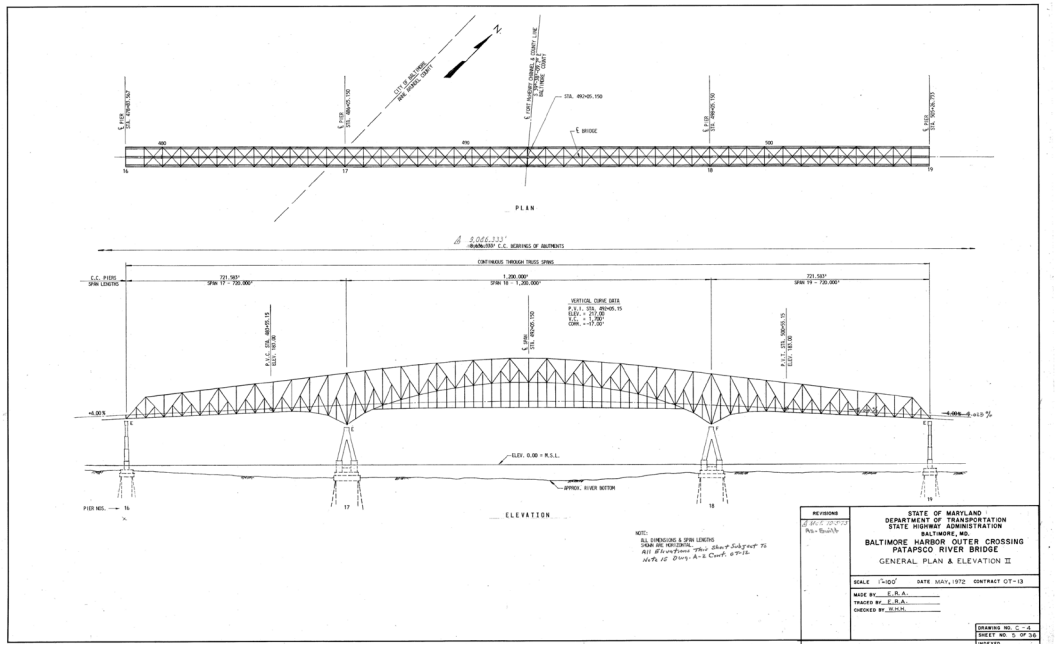


Why Skanska and United Demo?

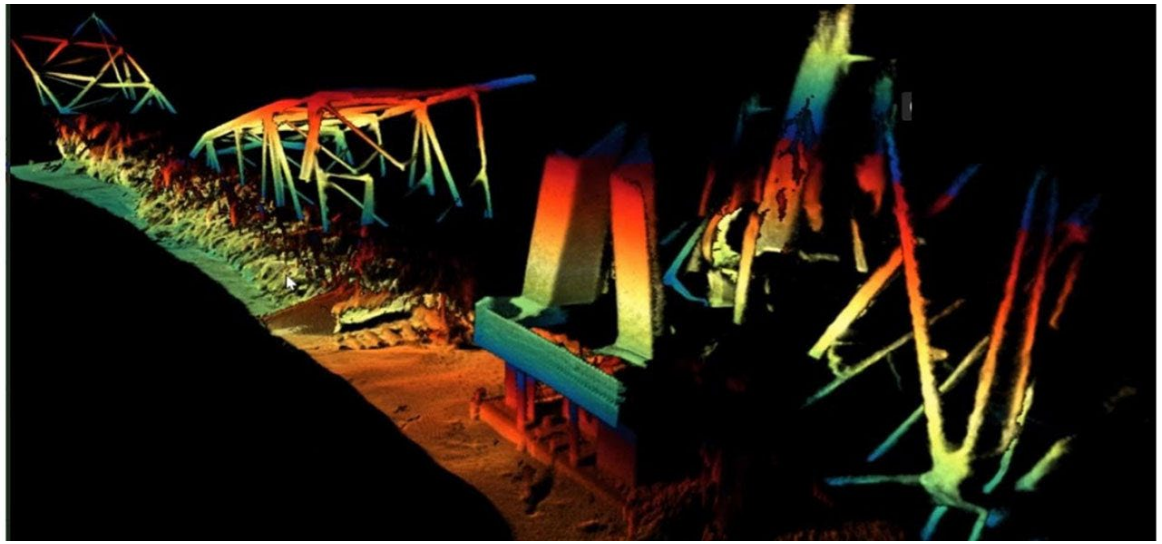


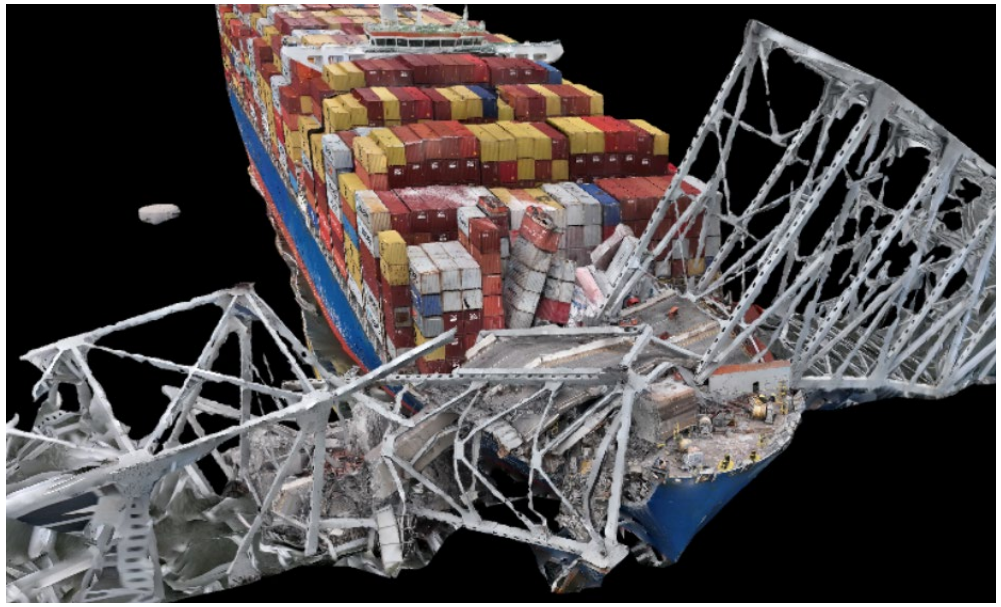
Why Genesis Structures?

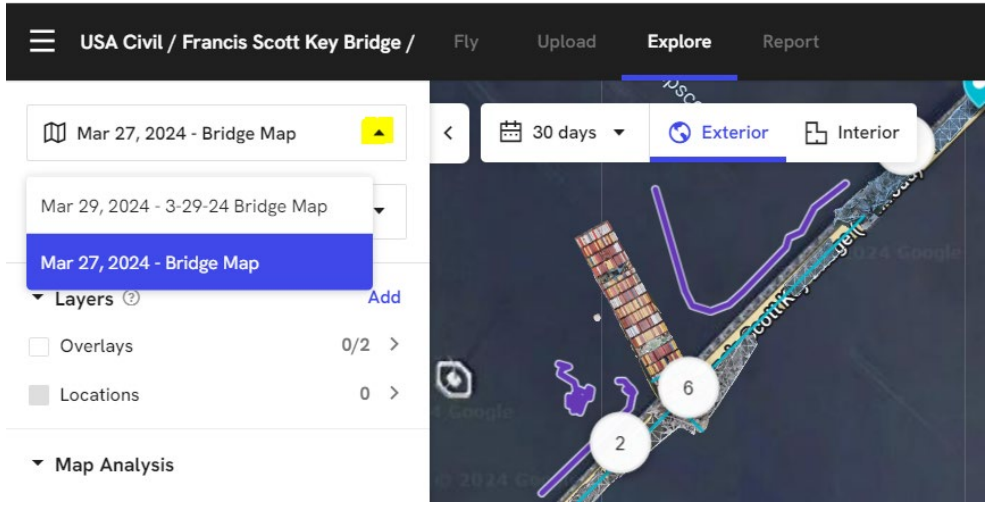
Gathering Data



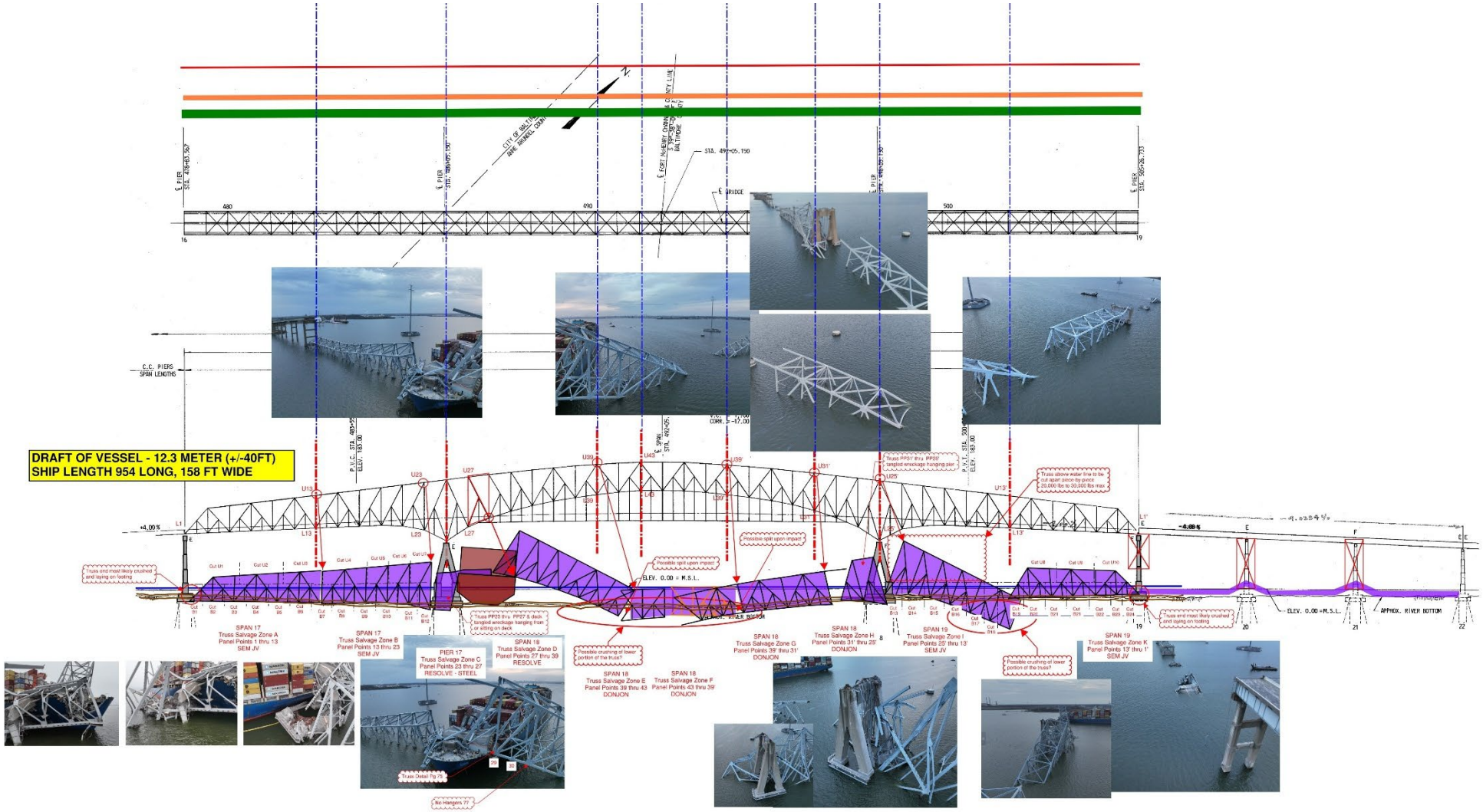
Gathering Data



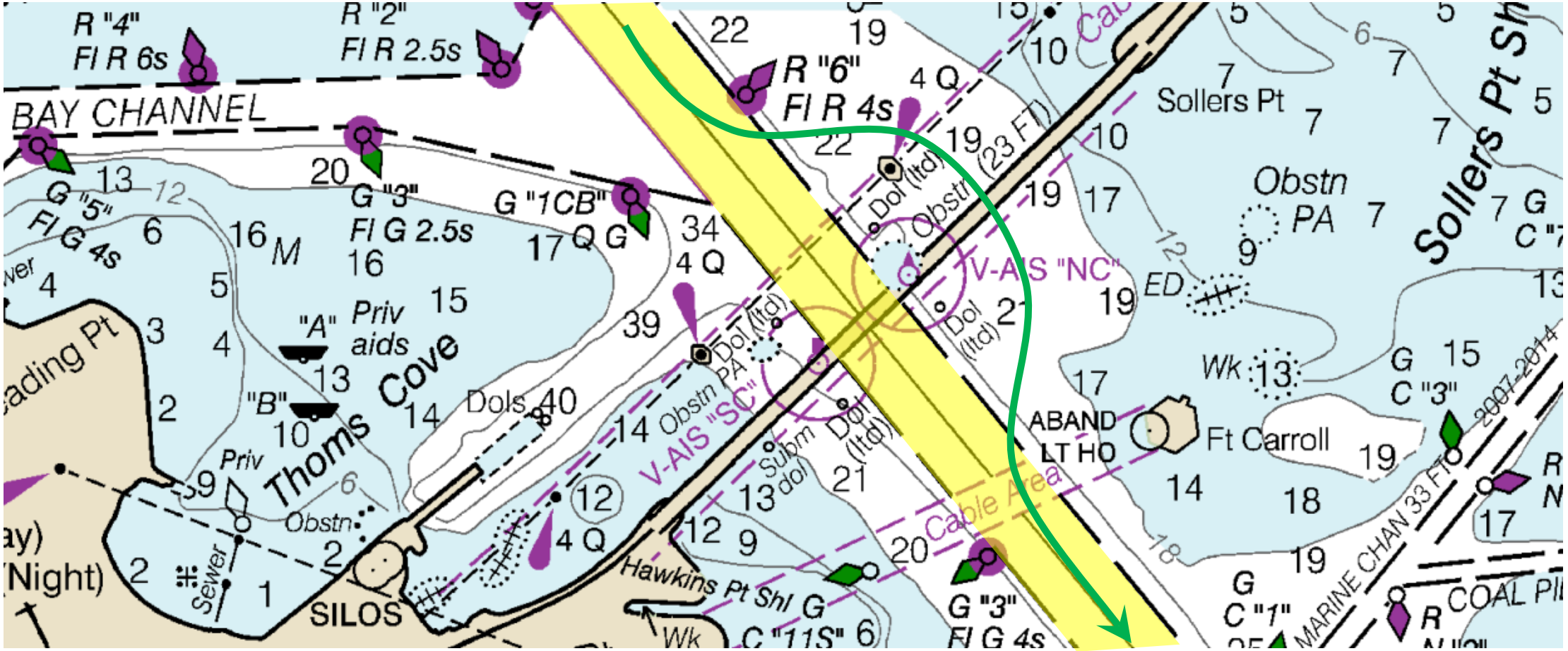


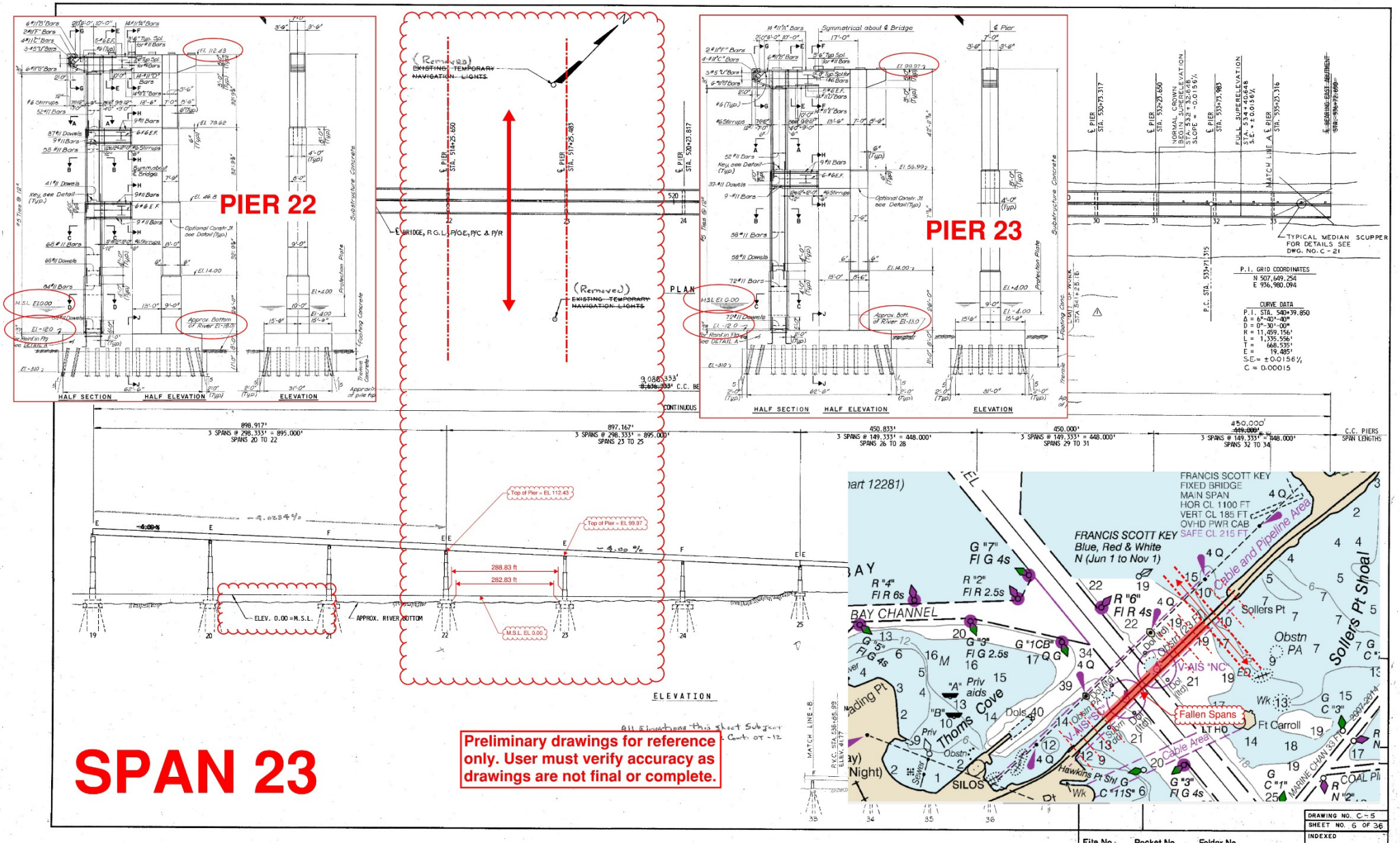


Assessing the Damage



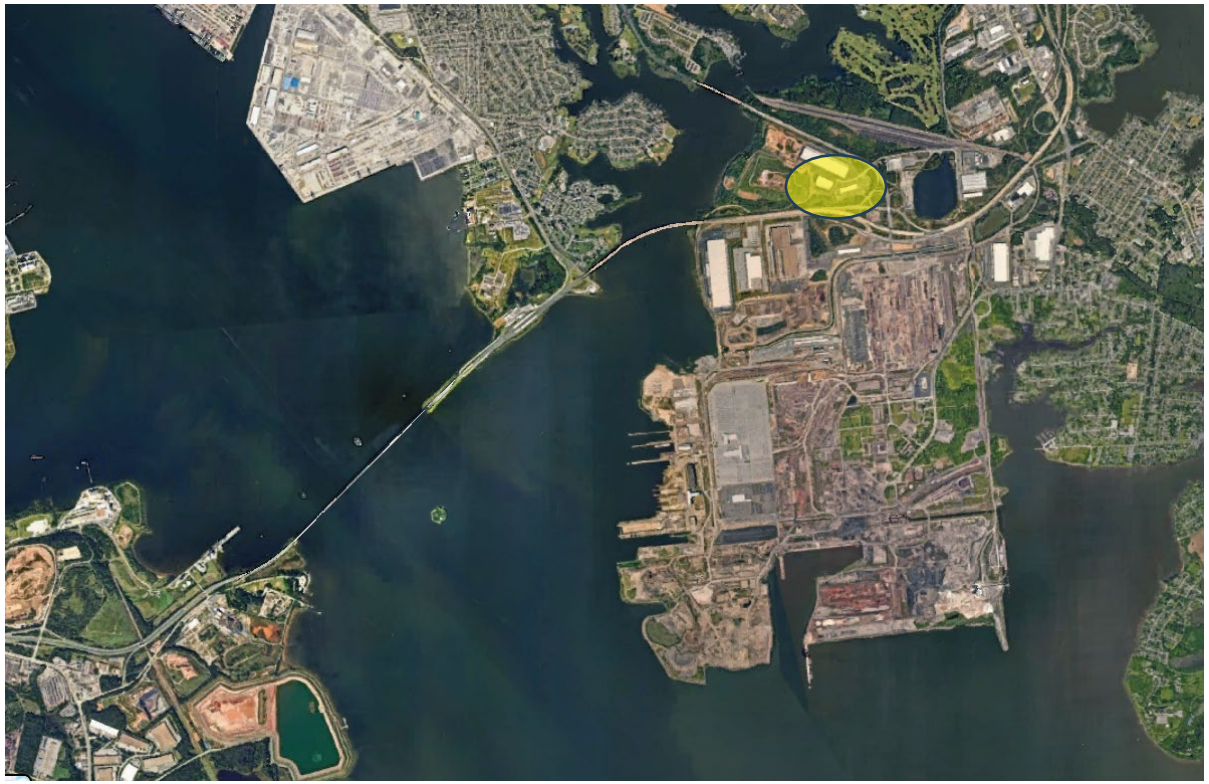
Clearing a Channel



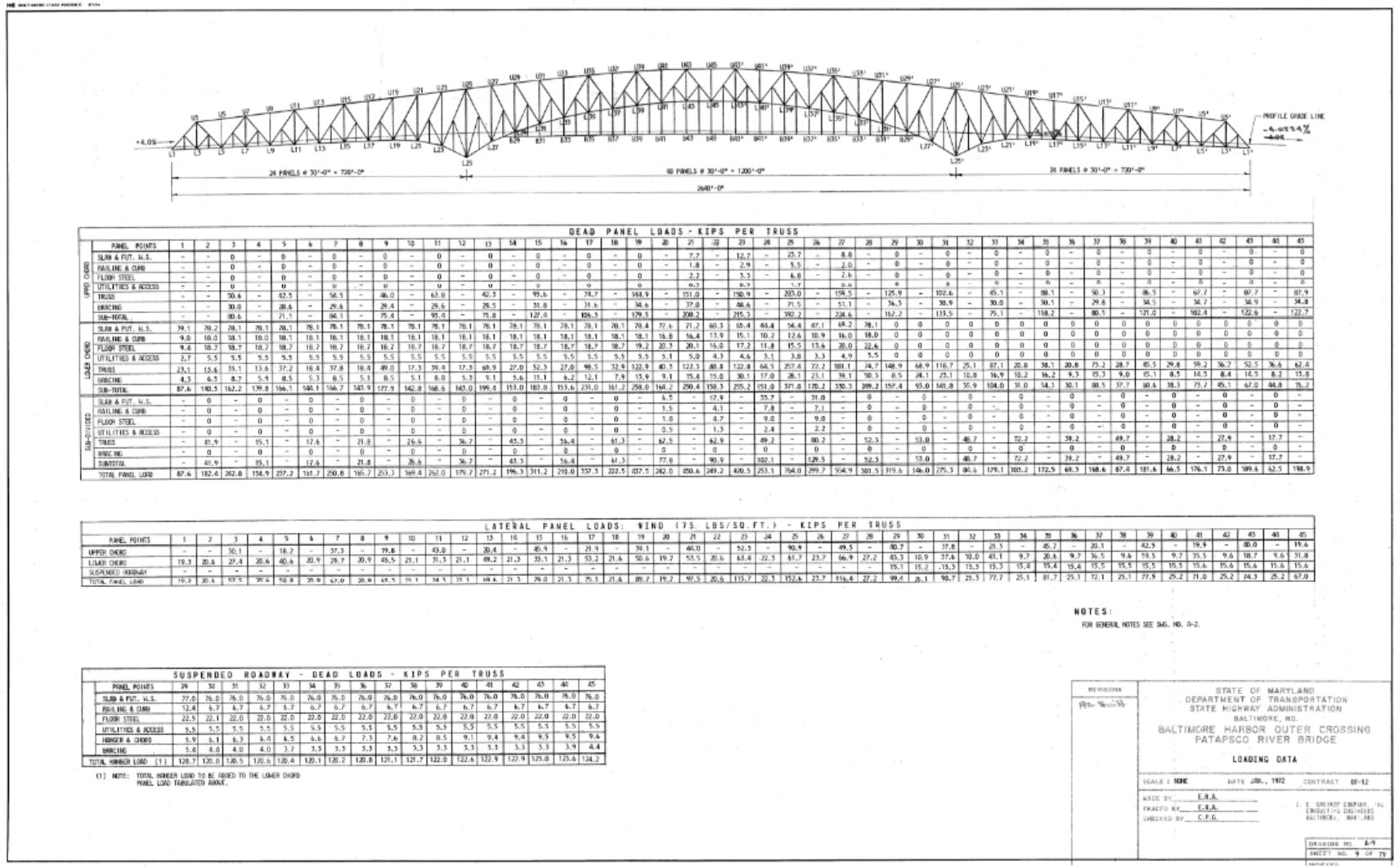


Preliminary drawings for reference only. User must verify accuracy as drawings are not final or complete.

Developing the Salvage Plan



Developing the Salvage Plan



DEAD PANEL LOADS - KIPS PER TRUSS

	PANEL POINTS	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	33	34	35	36	37	38	39	40	41	42	43	44	45
UPPER CHORD	SLAB & FUT. W.S.	-	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	7.7	-	12.7	-	23.7	-	8.8	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
	RAILING & CURB	-	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1.8	-	2.9	-	5.5	-	2.0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
	FLOOR STEEL	-	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	2.2	-	3.3	-	6.8	-	2.6	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
	UTILITIES & ACCESS	-	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0.3	-	0.9	-	1.7	-	0.6	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0
	TRUSS	-	-	30.6	-	42.5	-	56.5	-	46.0	-	63.8	-	42.5	-	95.6	-	74.7	-	148.9	-	151.0	-	150.9	-	283.0	-	159.5	-	125.9	-	102.6	-	45.1	-	88.1	-	50.3	-	86.5	-	67.7	-	87.7	-	87.9
	BRACING	-	-	30.0	-	28.6	-	29.6	-	29.4	-	29.6	-	29.5	-	30.8	-	31.6	-	34.6	-	37.0	-	46.6	-	71.5	-	51.1	-	36.5	-	30.9	-	30.0	-	30.1	-	29.8	-	34.5	-	32.7	-	34.9	-	34.8
	SUB-TOTAL	-	-	80.6	-	71.1	-	88.1	-	75.4	-	93.4	-	71.8	-	127.4	-	106.3	-	179.5	-	208.2	-	215.3	-	392.2	-	224.6	-	162.2	-	133.5	-	75.1	-	118.2	-	80.1	-	121.0	-	102.4	-	122.6	-	122.7
LOWER CHORD	SLAB & FUT. W.S.	39.1	78.2	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.4	77.6	71.2	60.5	65.4	44.4	54.4	67.1	69.2	78.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RAILING & CURB	9.0	18.0	18.1	18.0	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.8	16.4	13.9	15.1	10.2	12.6	10.9	16.0	18.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	FLOOR STEEL	9.4	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	19.2	20.3	20.1	16.0	17.2	11.8	15.5	15.6	20.0	22.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	UTILITIES & ACCESS	2.7	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.1	5.0	4.3	4.6	3.1	3.8	3.3	4.9	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TRUSS	23.1	13.6	35.1	13.6	37.2	18.4	37.8	18.4	49.0	17.3	39.4	17.5	69.9	27.0	52.3	27.0	98.5	32.9	122.9	80.3	122.3	80.8	122.8	64.5	257.6	72.2	181.1	74.7	148.9	68.9	118.7	25.1	87.1	20.8	38.1	20.8	75.2	28.7	65.5	29.8	59.2	36.7	52.5	36.6	62.4
	BRACING	8.3	6.5	8.7	5.9	8.5	5.3	8.5	5.1	8.0	5.3	9.1	5.6	11.1	6.2	12.1	7.9	13.9	9.1	15.6	15.0	30.1	17.0	28.1	23.1	34.1	10.5	8.5	24.1	25.1	10.8	16.9	10.2	16.2	9.5	15.3	9.0	15.1	8.5	14.5	8.4	14.5	8.2	13.8
	SUB-TOTAL	87.6	140.5	162.2	139.8	166.1	166.1	166.7	143.9	177.9	142.8	168.6	143.0	199.4	153.0	183.8	153.6	230.0	161.2	258.0	164.2	250.4	158.3	255.2	151.0	371.8	170.2	330.3	209.2	157.4	93.0	161.8	35.9	104.0	30.0	54.3	30.1	90.5	37.7	80.6	38.3	73.7	45.1	67.0	44.8	76.2
SUB-DIVIDED	SLAB & FUT. W.S.	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	6.5	-	17.9	-	33.7	-	31.0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	RAILING & CURB	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1.5	-	4.1	-	7.8	-	7.1	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	FLOOR STEEL	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1.0	-	8.7	-	9.0	-	9.0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	UTILITIES & ACCESS	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0.5	-	1.3	-	2.4	-	2.2	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	TRUSS	-	61.9	-	15.1	-	17.6	-	21.8	-	26.6	-	36.7	-	45.5	-	56.8	-	61.3	-	62.5	-	62.9	-	89.2	-	80.2	-	52.5	-	53.0	-	48.7	-	72.2	-	39.2	-	69.7	-	28.2	-	27.9	-	37.7	-
	BRACING	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
	SUBTOTAL	-	61.9	-	15.1	-	17.6	-	21.8	-	26.6	-	36.7	-	45.5	-	56.8	-	61.3	-	77.8	-	90.9	-	132.1	-	129.5	-	52.3	-	53.0	-	48.7	-	72.2	-	39.2	-	69.7	-	28.2	-	27.9	-	37.7	-
	TOTAL PANEL LOAD	87.6	182.4	262.8	154.9	237.2	181.7	250.8	165.7	253.3	169.4	262.0	179.7	271.2	196.3	311.2	210.0	337.5	222.5	437.5	242.0	450.6	249.2	470.5	253.1	764.0	299.7	564.9	301.5	319.6	146.0	275.3	80.6	179.1	105.2	172.5	69.3	168.6	87.4	181.6	86.5	176.1	73.0	189.6	82.5	198.9

LATERAL PANEL LOADS: WIND (75 LBS/SQ.FT.) - KIPS PER TRUSS

PANEL POINTS	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	33	34	35	36	37	38	39	40	41	42	43	44	45
UPPER CHORD	-	-	30.1	-	18.2	-	37.3	-	79.8	-	63.0	-	20.4	-	45.9	-	21.9	-	59.1	-	46.0	-	52.3	-	90.9	-	49.5	-	40.7	-	37.8	-	29.3	-	45.7	-	20.1	-	42.9	-	19.9	-	80.0	-	19.6
LOWER CHORD	19.3	20.6	27.4	20.6	40.6	20.9	29.7	20.9	45.5	29.1	31.3	21.1	89.2	21.3	33.1	21.3	53.2	21.6	50.6	19.7	53.5	20.6	63.4	22.5	61.7	23.7	66.9	27.2	43.3	10.9	37.6	10.0	48.1	9.7	20.6	9.7	36.5	9.6	19.5	9.7	35.5	9.6	18.7	9.6	31.8
SUSPENDED ROADWAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.1	15.2	-15.3	15.3	15.3	15.4	15.4	15.4	15.5	15.5	15.5	15.5	15.6	15.6	15.6	15.6	15.6
TOTAL PANEL LOAD	19.3	20.6	57.5	20.6	58.8	20.9	67.0	20.9	125.3	29.1	94.3	21.1	109.6	21.3	79.0	21.3	75.1	21.6	109.7	19.7	99.5	20.6	115.7	22.5	152.6	23.7	116.4	27.2	99.4	26.1	90.7	25.3	77.7	25.1	81.7	25.1	72.1	25.1	77.9	25.2	71.0	25.2	94.3	25.2	67.0

NOTES:
FOR GENERAL NOTES SEE DWG. NO. 0-2.

SUSPENDED ROADWAY - DEAD LOADS - KIPS PER TRUSS

PANEL POINTS	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
SLAB & FUT. W.S.	77.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0	76.0
RAILING & CURB	12.4	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
FLOOR STEEL	22.5	22.1	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
UTILITIES & ACCESS	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
HANGER & CHORD	5.9	6.1	6.3	6.0	6.5	6.6	6.7	7.3	7.6	8.2	8.5	9.1	9.4	9.4	9.5	9.5	9.6
BRACING	5.6	4.6	4.0	4.0	3.7	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.9	4.4
TOTAL HANGER LOAD (1)	128.7	120.8	120.5	120.6	120.4	120.1	120.2	120.8	121.1	121.7	122.0	122.6	122.9	122.9	123.0	125.6	124.2

(1) NOTE: TOTAL HANGER LOAD TO BE ADDED TO THE LOWER CHORD PANEL LOAD TABULATED ABOVE.

REVISIONS

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
BALTIMORE, MD.
BALTIMORE HARBOR OUTER CROSSING
PATAPSCO RIVER BRIDGE

LOADING DATA

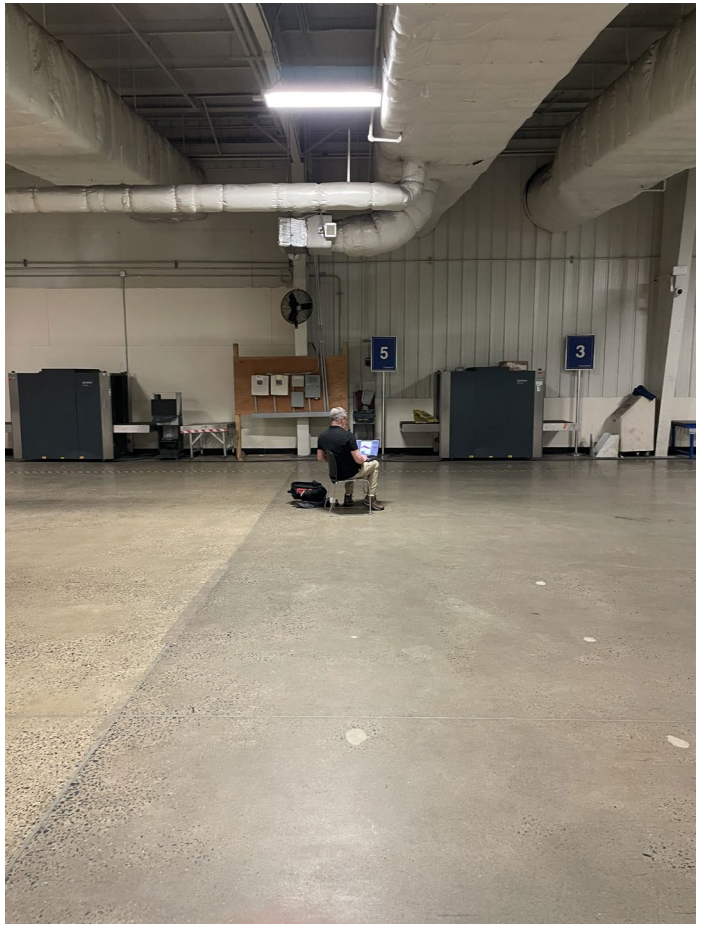
SCALE : NONE DATE JUNE, 1972 CONTRACT DE-12

MADE BY E.R.A.
TRACED BY E.R.A.
CHECKED BY C.P.G.

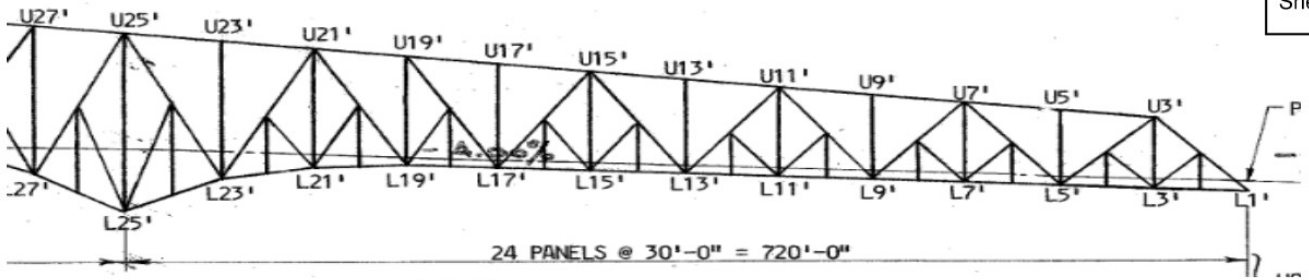
J. E. GREINER COMPANY, INC.
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

DRAWING NO. 6-9
SHEET NO. 9 OF 79

Developing the Salvage Plan



PICK WEIGHTS SHOWN FOR SPAN 19
TRUSS SPAN IS SYMMETRICAL
SPAN 17 PICK WEIGHT SIMILIAR



		LOAD PER TRUSS (KIPS)																							
	PANEL POINT	25'	24'	23'	22'	21'	20'	19'	18'	17'	16'	15'	14'	13'	12'	11'	10'	9'	8'	7'	6'	5'	4'	3'	2'	1'
UPPER	SLAB	23.7		12.7		7.7																				
	RAILING	5.5		2.9		1.8																				
	FLOOR STL	6.8		3.3		2.2																				
	UTIL	1.7		0.9		0.5																				
	TRUSS	283.		150.9		151.		144.9		74.7		95.6		42.3		63.8		46.		54.5		42.5		50.6		
	BRACING	71.5		44.6		37.		34.6		31.6		31.8		29.5		29.6		29.4		29.6		28.6		30.		
	SUBTOTAL	392.2		215.3		200.2		179.5		106.3		127.4		71.8		93.4		75.4		84.1		71.1		80.6		
LOWER	SLAB	54.4	44.4	65.4	60.3	71.2	72.6	78.4	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	78.1	39.1
	RAILING	12.6	10.2	15.1	13.9	16.4	16.8	18.1	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	9.
	FLOOR STL	15.5	11.8	17.2	16.	20.1	20.3	19.2	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	9.4
	UTIL	3.8	3.1	4.6	4.3	5.	5.1	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	2.7
	TRUSS	257.4	64.5	122.8	48.8	122.3	40.3	122.9	32.9	98.5	27.	52.3	27.	69.9	17.3	39.4	17.3	49.	18.4	37.8	18.4	37.2	13.6	33.1	13.6	23.1
	BRACING	28.1	17.	30.1	15.	15.4	9.1	13.9	7.9	12.1	6.2	11.1	5.6	9.1	5.3	8.8	5.1	8.5	5.1	8.5	5.3	8.5	5.9	8.7	6.5	4.3
	SUBTOTAL	371.8	151.	255.2	158.3	250.4	164.2	258.	161.1	230.9	153.5	183.7	152.9	199.3	142.9	168.5	142.7	177.8	143.8	166.6	144.	166.	139.8	162.1	140.4	87.6
SUB. DIVIDED	SLAB		33.7		17.9		6.5																			
	RAILING		7.8		4.1		1.5																			
	FLOOR STL		9.		4.7		1.8																			
	UTIL		2.4		1.3		0.5																			
	TRUSS		49.2		62.9		67.5		61.3		56.4		43.3		36.7		26.6		21.8		17.6		15.1		41.9	
	BRACING																									
	SUBTOTAL		102.1		90.9		77.8		61.3		56.4		43.3		36.7		26.6		21.8		17.6		15.1		41.9	
SUSPENDED ROADWAY	SLAB																									
	RAILING																									
	FLOOR STL																									
	UTIL																									
	HANGER/CHORD																									
	BRACING																									
	SUBTOTAL																									
	TOTAL	764.0	253.1	470.5	249.2	450.6	242.0	437.5	222.4	337.2	209.9	311.1	196.2	271.1	179.6	261.9	169.3	253.2	165.6	250.7	161.6	237.1	154.9	242.7	182.3	87.6
	STEEL SUPERSTRUCTURE	640.0	130.7	348.4	126.7	325.7	116.9	316.3	102.1	216.9	89.6	190.8	75.9	150.8	59.3	141.6	49.0	132.9	45.3	130.4	41.3	116.8	34.6	122.4	62.0	27.4
	DECK (INCL FLOORBEAM/STRING)	124.0	122.4	122.1	122.5	124.9	125.1	121.2	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	120.3	60.2

	APPROX PICK WTS (KIP)																									
PANEL POINT	25'	24'	23'	22'	21'	20'	19'	18'	17'	16'	15'	14'	13'	12'	11'	10'	9'	8'	7'	6'	5'	4'	3'	2'	1'
TOP (BOTH TRUSSES)															187			319				303			
TOP (SINGLE TRUSS)	355		196		188		180		106		127		72		93										

	APPROX PICK WTS (STONS)																									
PANEL POINT	25'	24'	23'	22'	21'	20'	19'	18'	17'	16'	15'	14'	13'	12'	11'	10'	9'	8'	7'	6'	5'	4'	3'	2'	1'
TOP (BOTH TRUSSES)															93			160				152			
TOP (SINGLE TRUSS)	177		98		94		90		53		64		36		47										

Panel Point weight reported as represented in the exsiting plan sheet, WITHOUT any added detail factor, silt weight, or suction factor

135.5 STON WITH L27-U25 AND U26-U25 AND 20FT OF U25-L25 MEMBERS REMOVED

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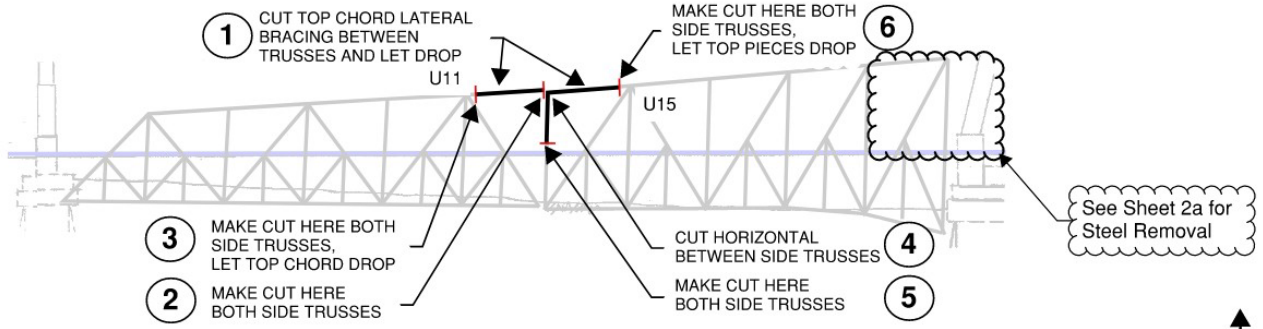
TRUSS SEGMENT PICK WEIGHTS

(All TONS REPORTED ARE SHORT TONS)

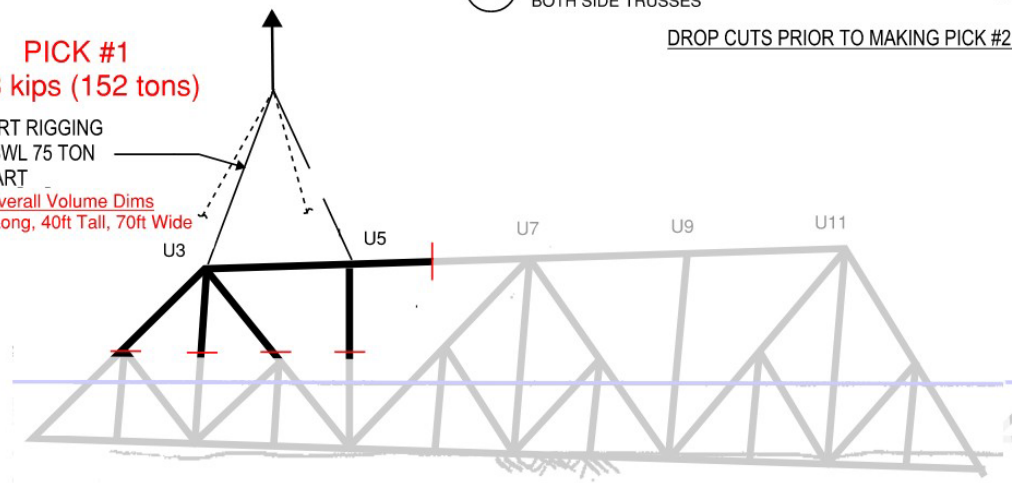


DROP CUTS PRIOR TO MAKING PICK #2 & #3

PICK #1
303 kips (152 tons)

(4) PART RIGGING
MIN. SWL 75 TON
EA. PART

Overall Volume Dims
120ft Long, 40ft Tall, 70ft Wide

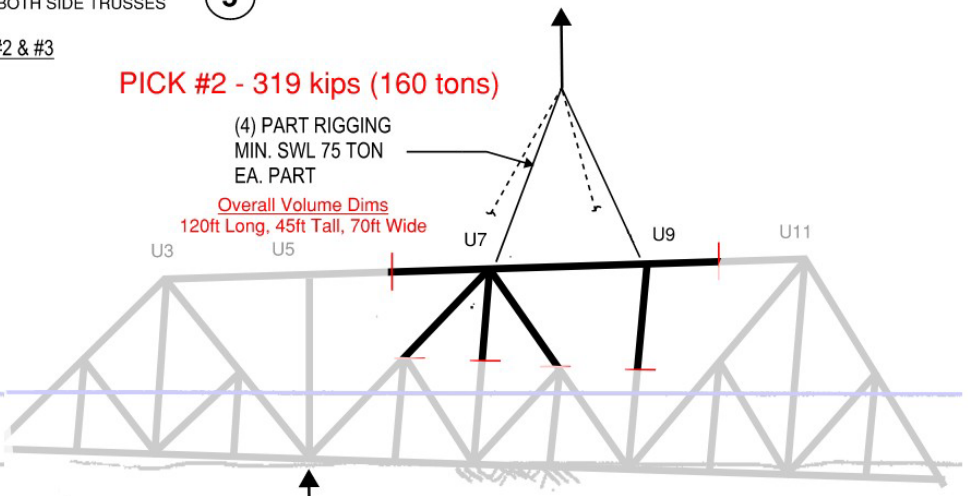


PICK DETAIL 1

PICK #2 - 319 kips (160 tons)

(4) PART RIGGING
MIN. SWL 75 TON
EA. PART

Overall Volume Dims
120ft Long, 45ft Tall, 70ft Wide



PICK DETAIL 2

PICK SEQUENCE:

MAKE CUTS AND DROP MEMBERS BETWEEN U23 AND U25 PER SHEET 2A OF 11

MAKE PICK #1
NOTE: PICK #1 COULD BE SEQUENCED AHEAD OF WORK SHOWN ON SHEET 2A. COORD DEMO WORK WITH WORK ON BOW OF SHIP

CUT AND DROP MEMBERS BETWEEN U11 AND U15

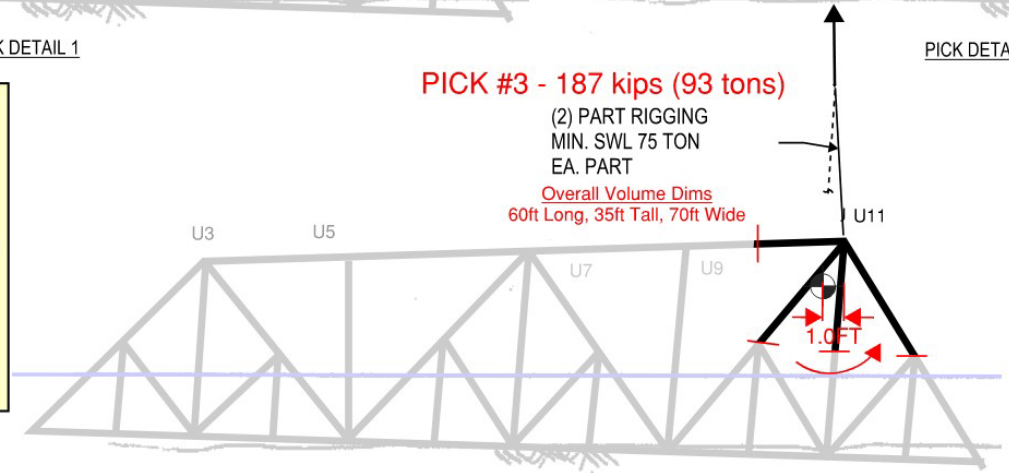
MAKE PICK #2

MAKE PICK #3

PICK #3 - 187 kips (93 tons)

(2) PART RIGGING
MIN. SWL 75 TON
EA. PART

Overall Volume Dims
60ft Long, 35ft Tall, 70ft Wide



PICK DETAIL 3

See Sheet 6 thru 10 for rigging options to Truss Panel Points

TRUSS SEGMENT PICKS

(All TONS REPORTED ARE SHORT TONS)

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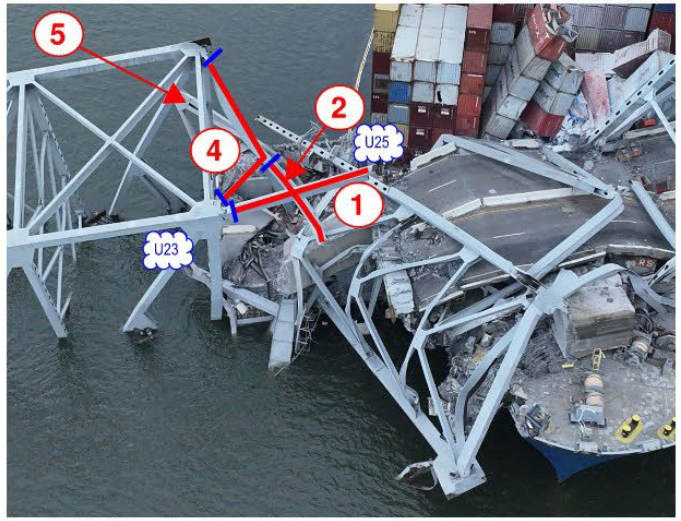
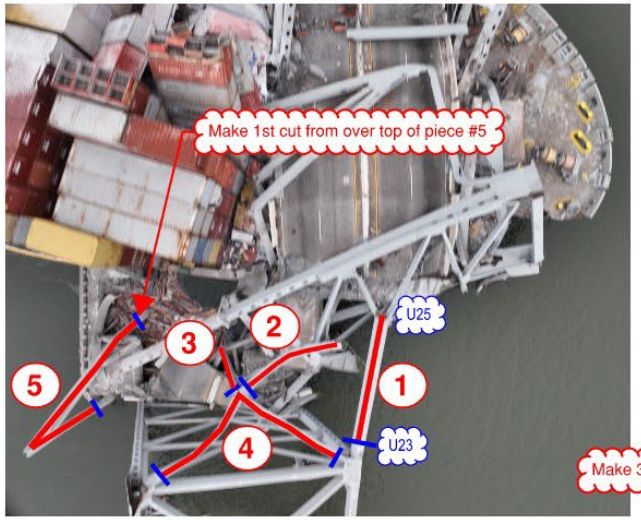
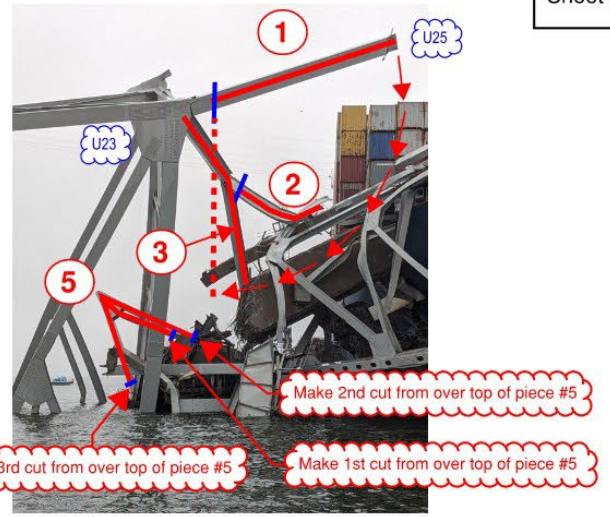


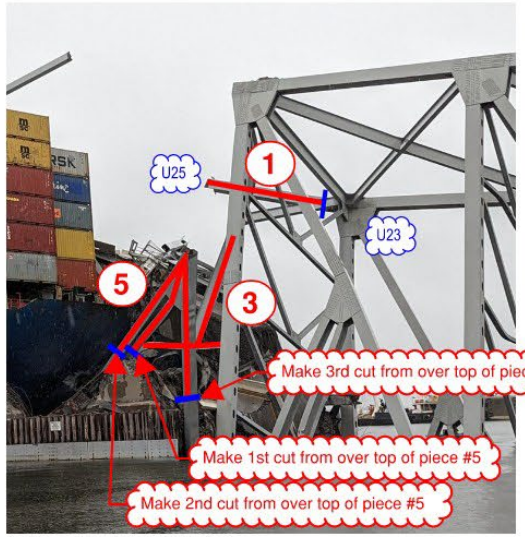
LOOKING WEST FROM DRONE



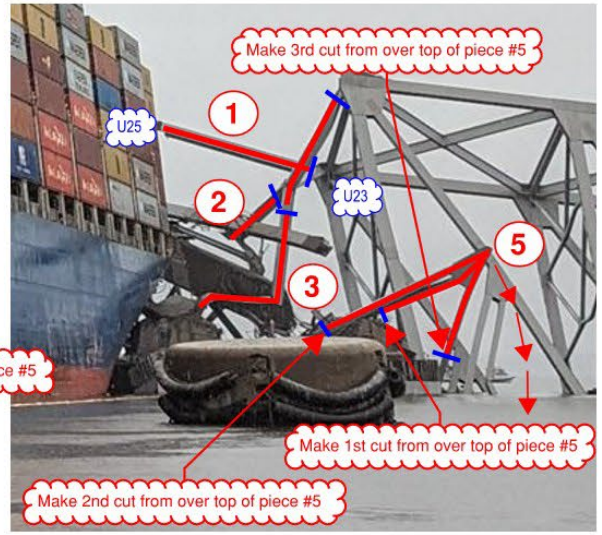
LOOKING DOWN FROM DRONE



LOOKING WEST FROM CREW BOAT



LOOKING EAST FROM CREW BOAT



LOOKING EAST FROM CREW BOAT

REMOVAL SEQEUNCE NOTES:

PRIOR TO MAKING ANY UPPER CHORD PICKS BTWN U3 AND U13

1) REMOVE TOP CHORD U23 TO U25
   * CUT PIECE APPROXIMATELY 2FT FROM GUSSET PLATE
   * CUT INSIDE (WEST) WEB LEAVING 4" AT BOTTOM
   * CUT TOP FLANGE
   * CUT OUTSIDE (EAST) WEB
   * ALLOW PIECE TO SWING DOWN TO VERTICAL
   * CUT BOTTOM FLANGE AND ALLOW TO DROP
   * ANTICIPATED PIECE WEIGHT = 65,000 LBS
2) REMOVE LATERAL BRACE PIECE
   * CUT PIECE AT NODE AND LET DROP
3) REMOVE LATERAL BRACE PIECE
   * CUT PIECE AT NODE AND LET DROP
4) REMOVE LATERAL BRACE PIECE
   * CUT PIECE AT NODE AND LET DROP

PRIOR TO MAKING ANY UPPER CHORD PICKS BTWN U13 AND U23

5) REMOVE TRUSS SUB-MEMBERS
   * MAKE 1ST CUT WHERE SHOWN.
   * IF PIECE DOES NOT FALL, MAKE 2ND CUT
   * MAKE 3RD CUT

DEMOLITION CONTRACTOR MAY ADJUST SUGGESTED CUT SEQEUNCE AND CUT LOCATIONS SHOWN BASED ON SAFETY OF WORKERS MAKING CUTS. ALL CUTS SHALL BE MADE FROM A POSITION OPPOSITE THE ANTICIPATED FALL DIRECTION. GOAL IS TO CUT AND DROP HIGHEST PIECES FIRST AND WORK DOWN TO LOWER PIECES TO COMPLETE ABOVE WATER SEPARATION OF SPAN 17 FROM SPAN 18

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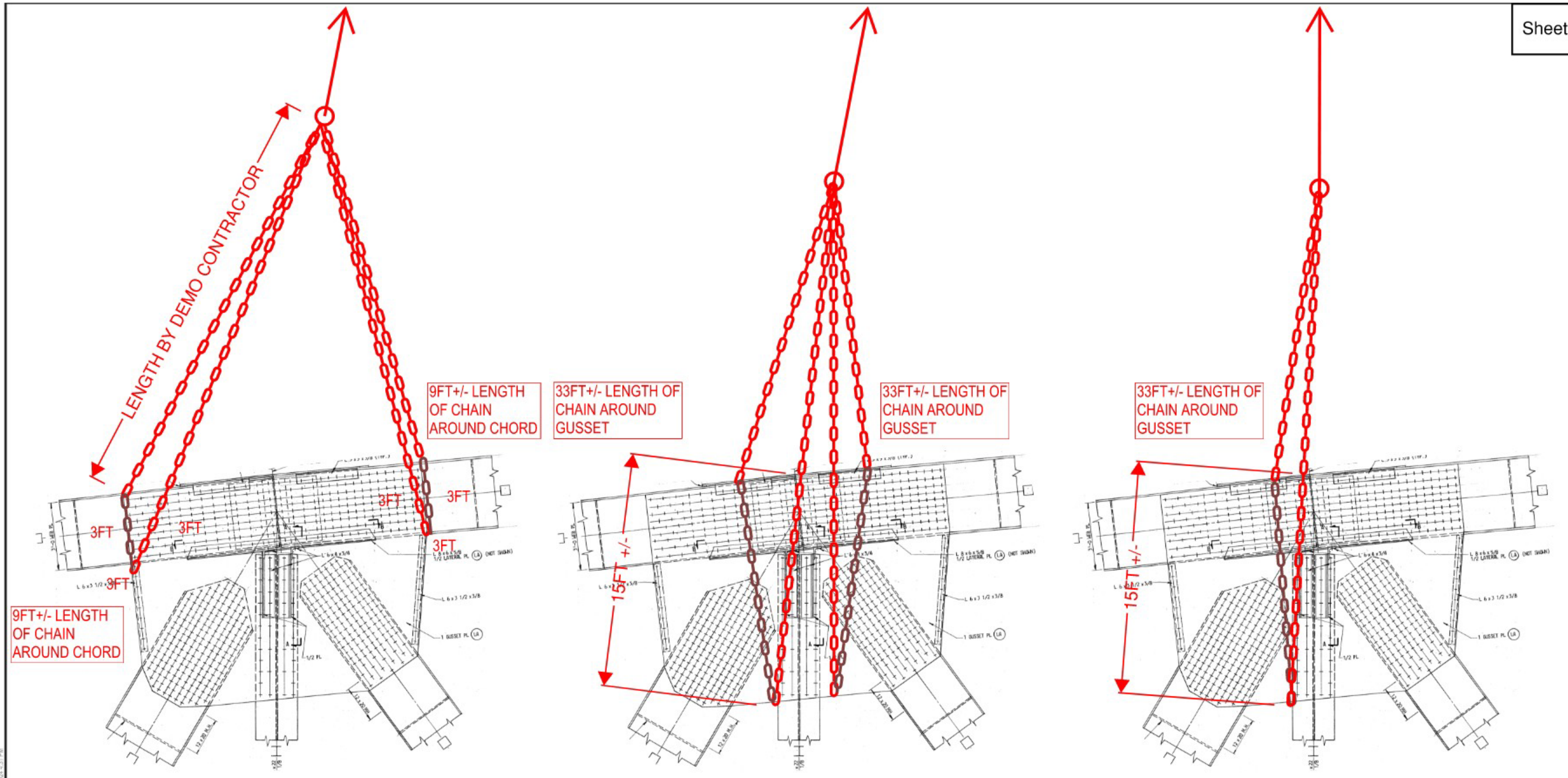
RED: REMOVE PIECE BY PIECE
GREEN: LEAVE IN PLACE, HOIST WITH U5'-U3' PICK
BLUE: TORCH CUT

U23 TO U25 DEMO

Sheet 6 of 11



DOUBLE CHAIN BASKET OPTIONS
1.25" GR 100 CHAIN
82 KIP (41 TON) VERT, 164 KIP (82 TON) BASKET
328 KIP (164 TON) DOUBLE BASKET CAPACITY

DOUBLE CHAIN BASKET OPTIONS
1.25" GR 100 CHAIN
82 KIP (41 TON) VERT, 164 KIP (82 TON) BASKET
328 KIP (164 TON) DOUBLE BASKET CAPACITY

SINGLE CHAIN BASKET OPTION
1.25" GR 100 CHAIN
82 KIP (41 TON) VERT, 164 KIP (82 TON) BASKET
164 KIP (82 TON) SINGLE BASKET CAPACITY

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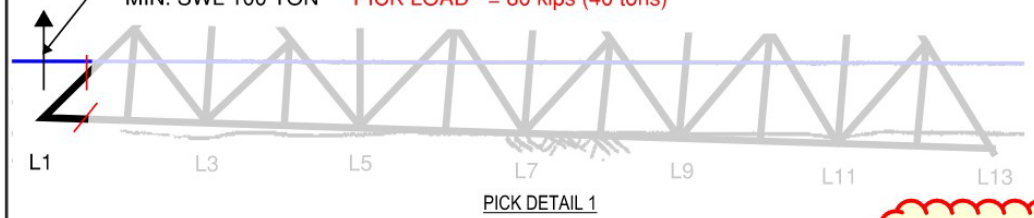
Note: Demolition Contractor's shall not choke the chains around the panel point. If there is concern about chain slipping , double wrap chord member is allowed.

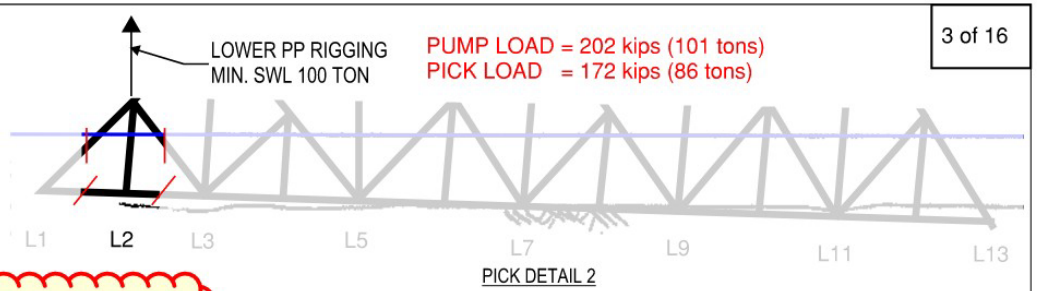
UPPER CHORD RIGGING DETAILS

(All TONS REPORTED ARE SHORT TONS)

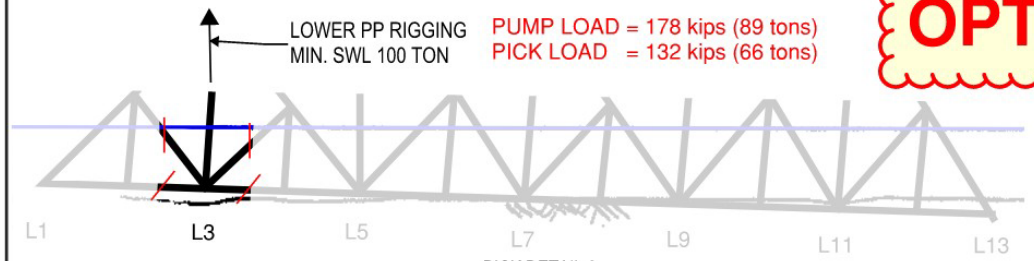
OPTION B



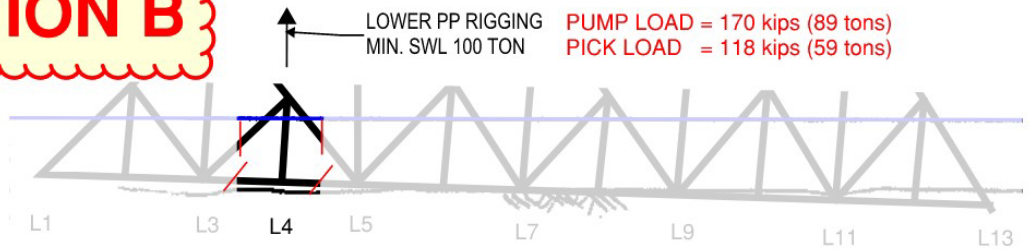
PICK DETAIL 1



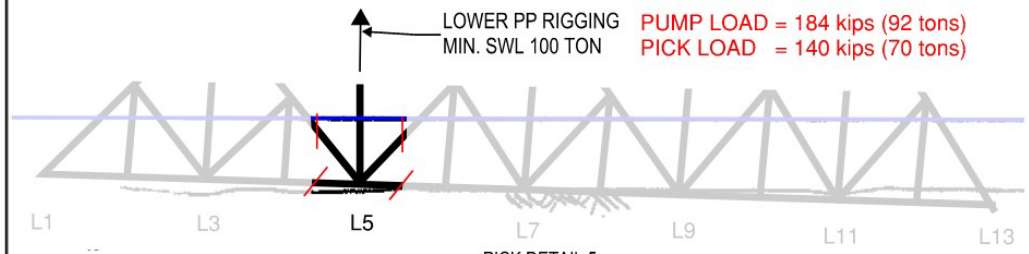
PICK DETAIL 2



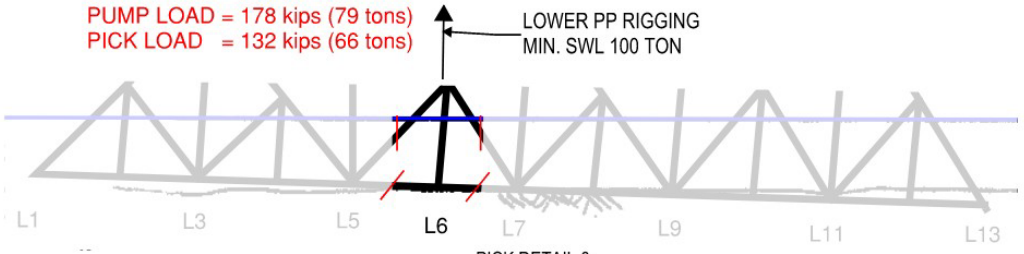
PICK DETAIL 3



PICK DETAIL 4

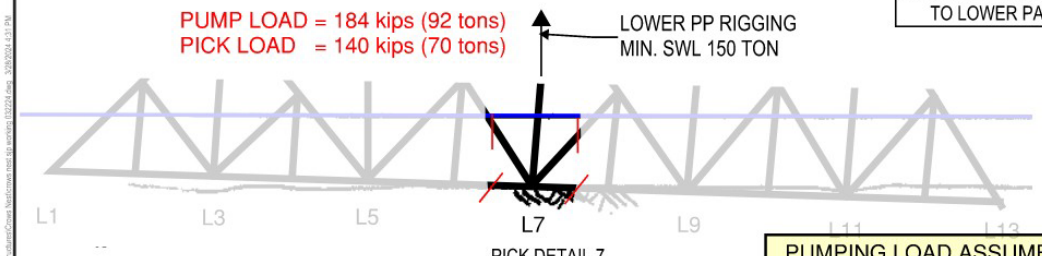


PICK DETAIL 5

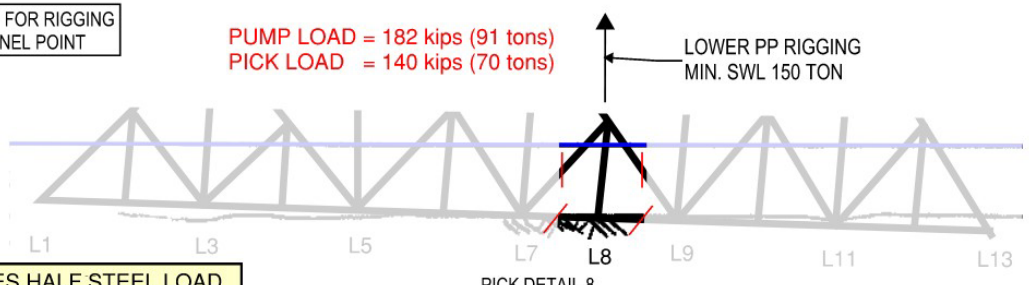


PICK DETAIL 6

SEE SHEET 10&11 FOR RIGGING TO LOWER PANEL POINT



PICK DETAIL 7



PICK DETAIL 8

PUMPING LOAD ASSUMES HALF STEEL LOAD PLUS HALF THE DECK DEBRIS LOAD

PICK LOAD ASSUMES NO DECK LOAD, BOTH SIDE TRUSSES AND FLOORBEAM

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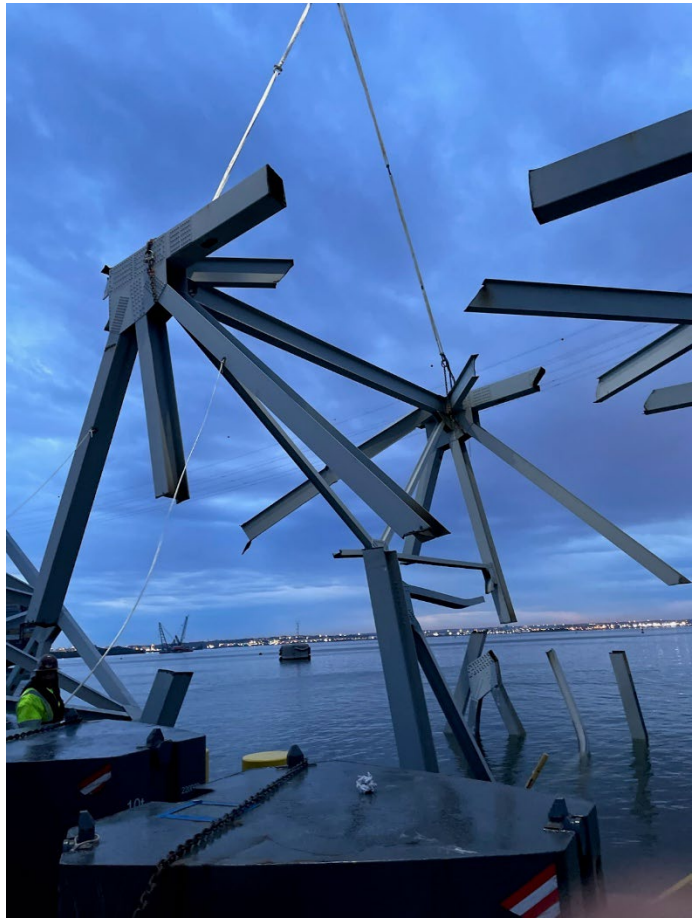
TRUSS SEGMENT PICKS

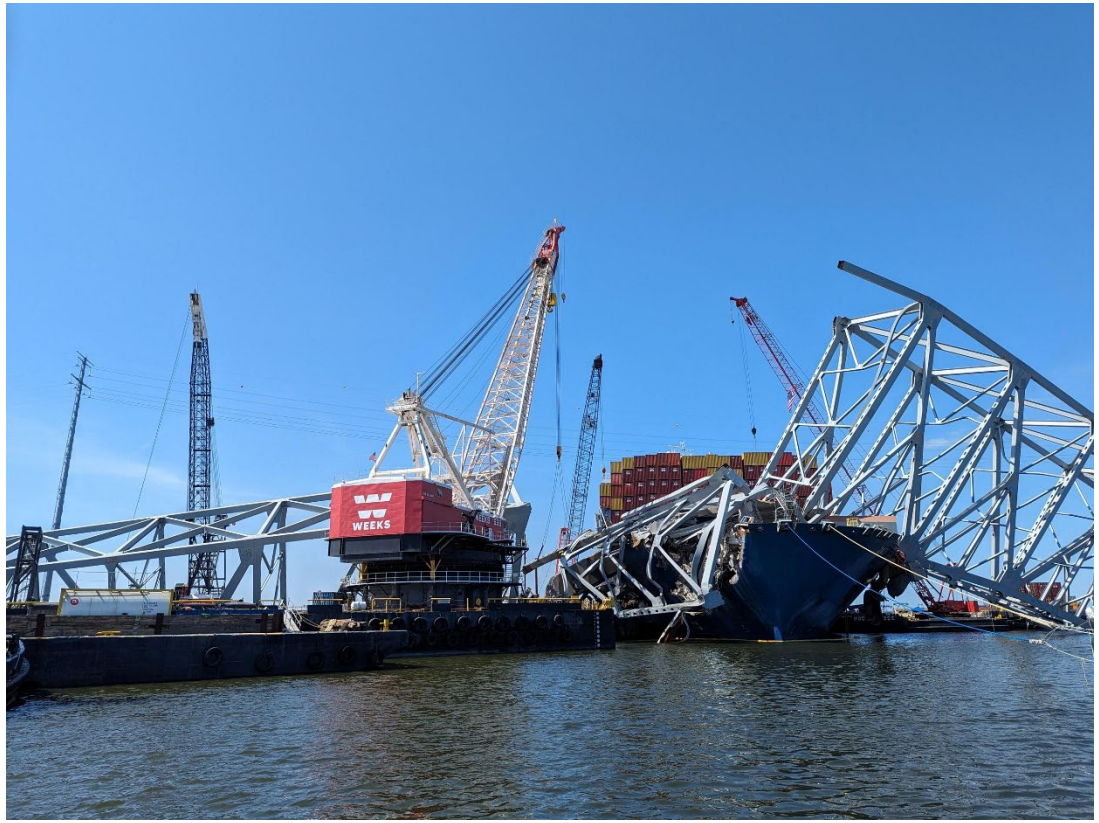
(ALL TONS ARE REPORTED AS SHORT TONS)

Salvage Operations

Salvage Operations



Salvage Operations

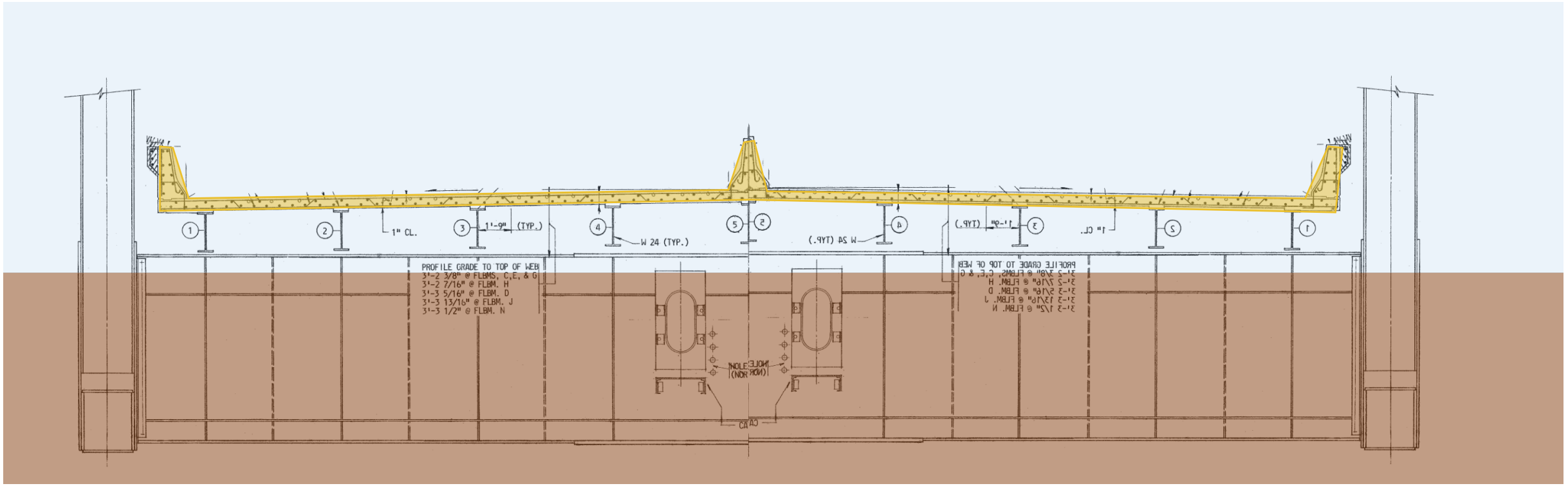


Salvage Operations

Salvage Operations

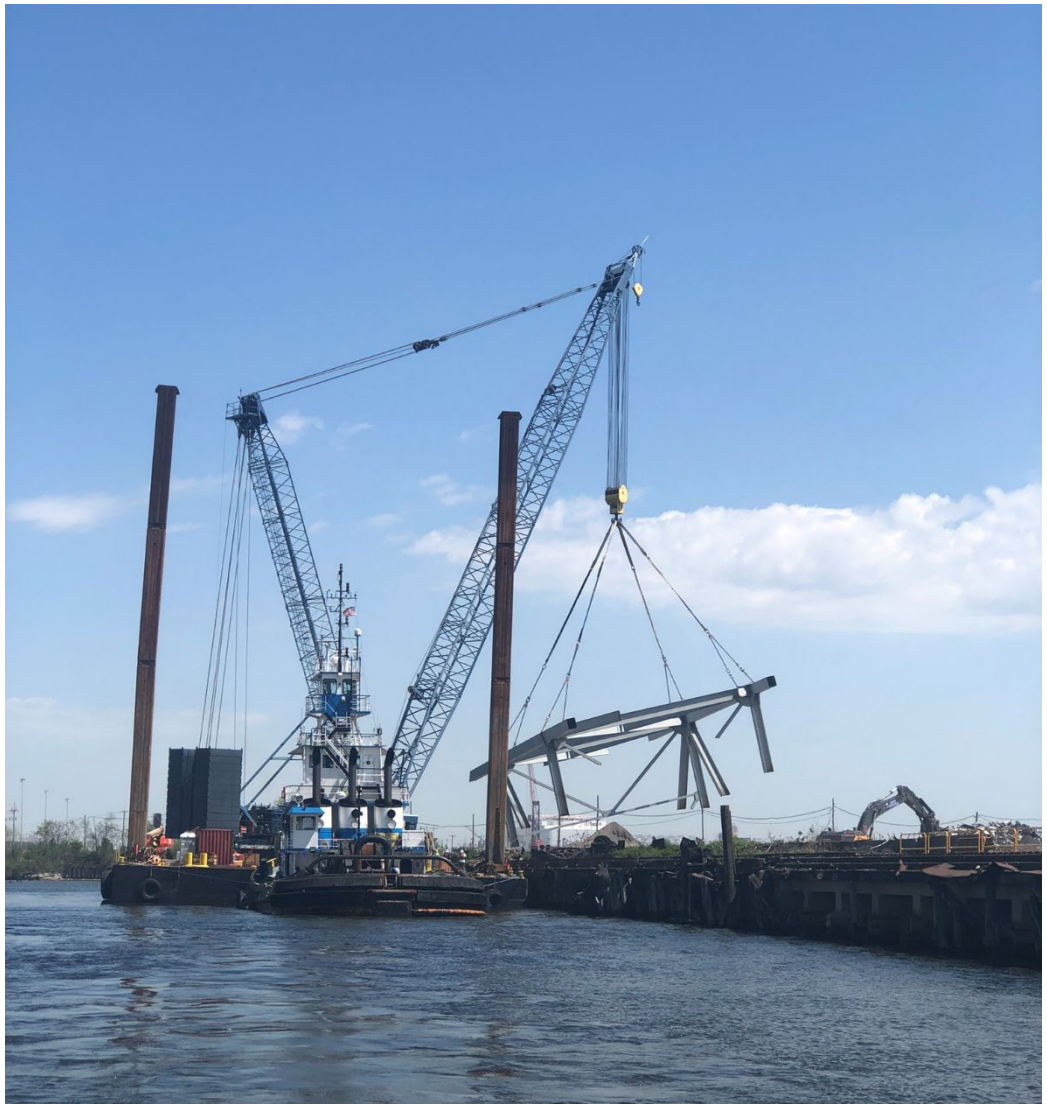
Salvage Operations

Salvage Operations

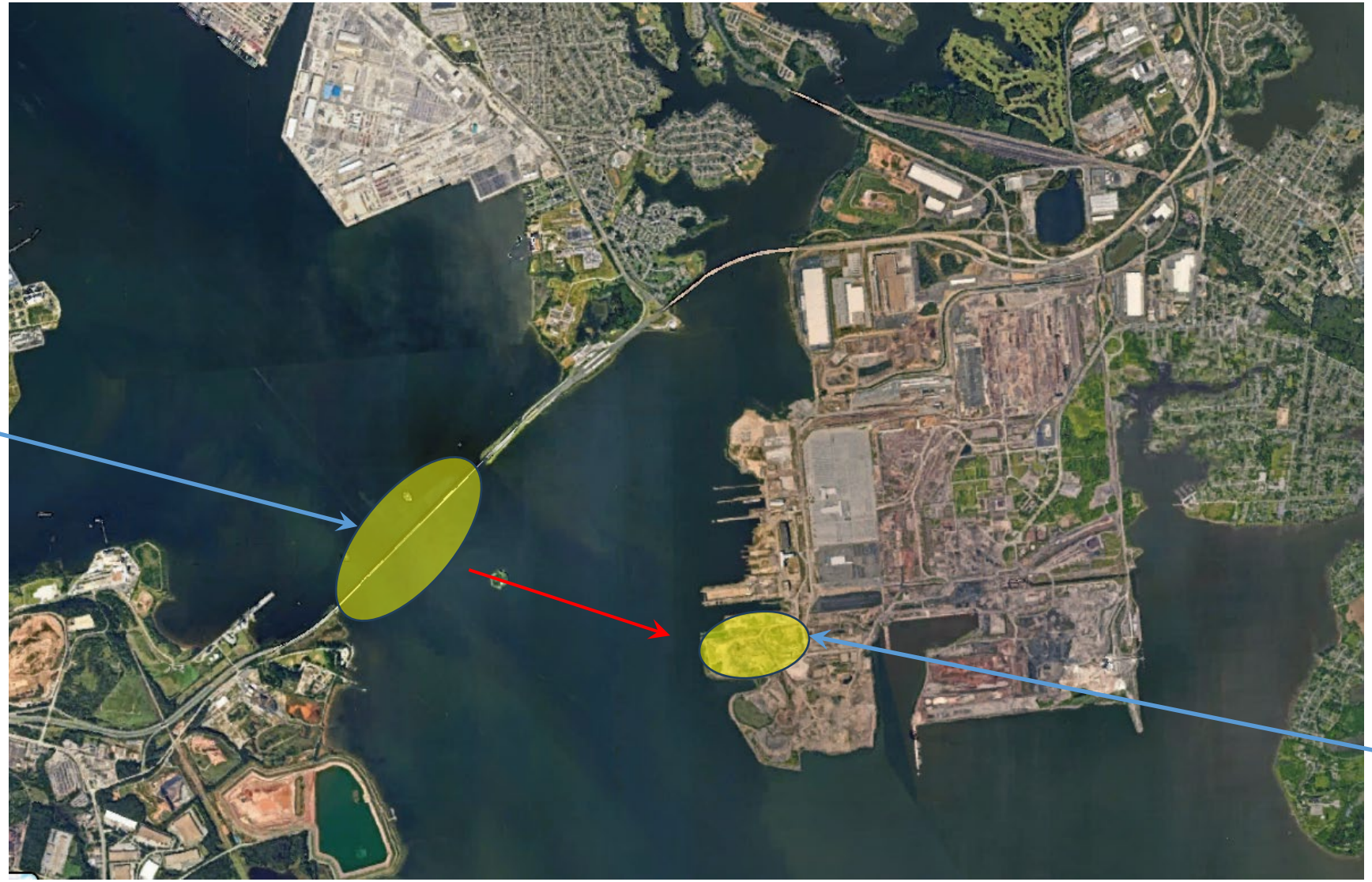


Salvage Operations

Salvage Operations

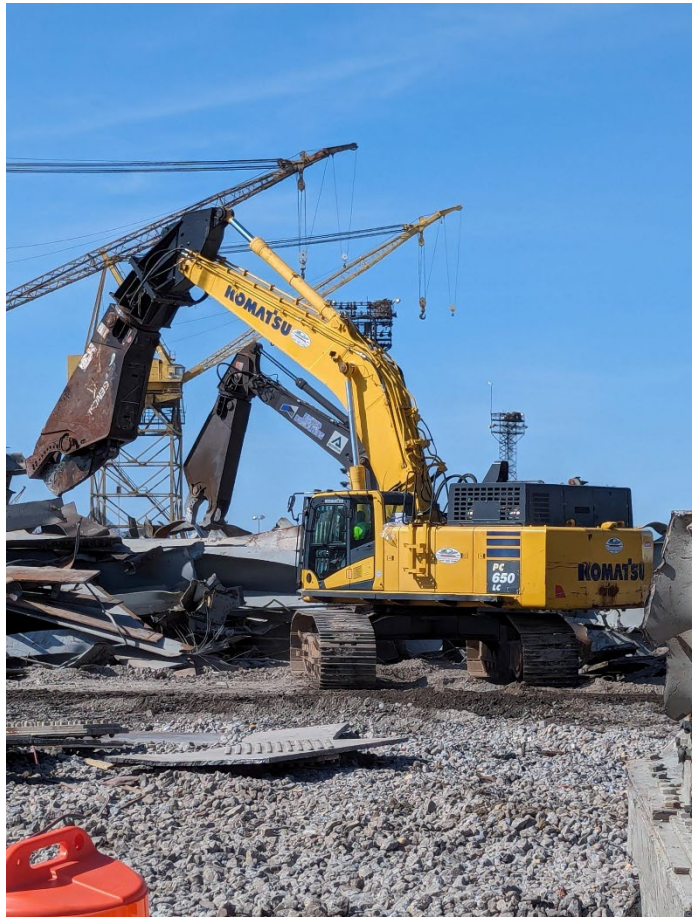


Salvage Operations



Demo Processing Yard

Demo Processing Yard



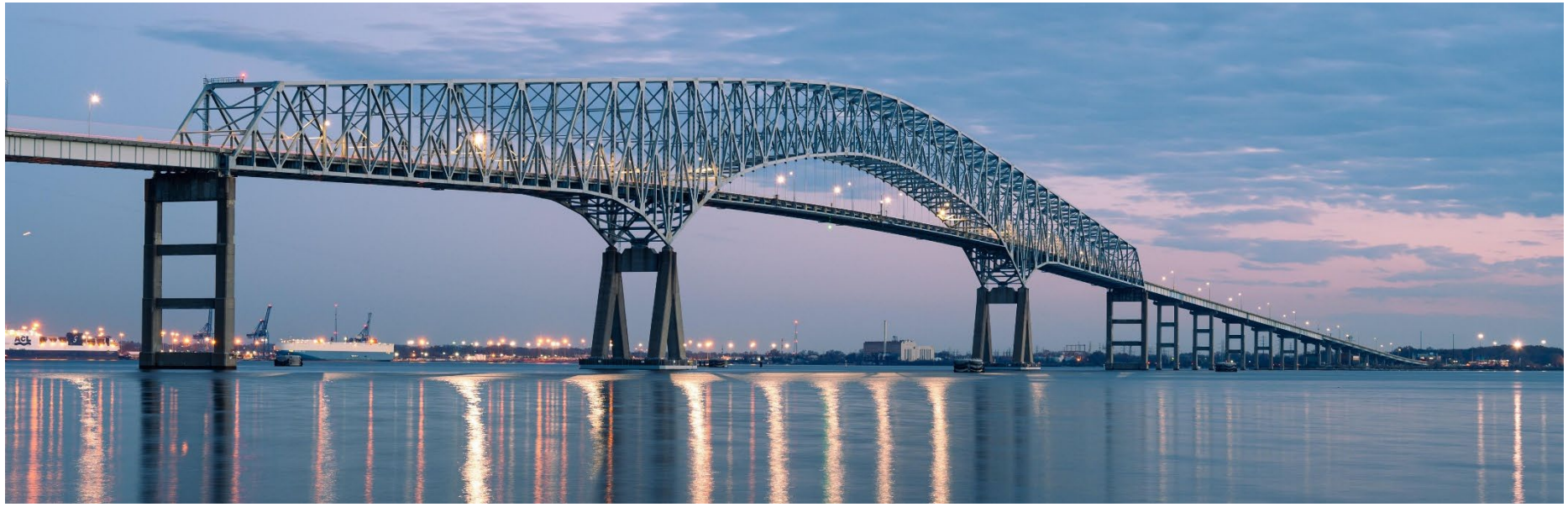
The Numbers

- Span 17+18+19
  - Almost 3,000 ft of bridge
  - 30,000 tons total
    - 16,000 tons of steel superstructure
- Spans 20-23
  - 900 ft of bridge
  - 6,000 tons total
  - 3,000 tons steel
- Approx. 50 vessels were used to perform the salvage operation

Dates

- March 26th Bridge collapse
- March 27th Team assembles, including Genesis
- April 1st First alt channel opened for demolition vessels
- April 7th Second alt channel opened for deeper vessel traffic thru Span 19
- May 13th Explosive demo to help free the Dali
- May 17th Last day of Genesis Support on site
- May 20th Dali pulled back to port
- June 10th Full open channel

Navigating the Aftermath
Key Bridge Collapse Cleanup



Steven Percassi, PE
Genesis Structures

Joe Knapp, PE
Genesis Structures


ARTISTIC DAYTIME VIEW OF CABLE STAYED SPAN WITH DOWNTOWN BALTIMORE BEYOND
KEY BRIDGE REBUILD