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U. S. NAVY SALVAGE REPORT

FRANCIS SCOTT KEY BRIDGE COLLAPSE SALVAGE RESPONSE

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TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

FOREWORD

Under Title 33 of the Code of Federal Regulations, the US Army Corps of Engineer, as the Lead Federal Agency for Federal channels, can take emergency action to ensure Federal channels remain open and to restore navigation to those channels as necessary. In March 2024, using that authority, the Corps exercised an existing inter-service support agreement (ISSA) with NAVSEA, Supervisor of Salvage and Diving (SUPSALV), and requested SUPSALV provide salvage response to restore the Fort McHenry navigation channel. SUPSALV joined the Incident Command, serving as the Salvage Branch Lead under the Operations Section, and tasked Donjon, its ZONE A salvage contractor, and GPC, its Emergency Ship Salvage Material (ESSM) contractor, to assist as directed in operations to clear the navigation channel.

The success achieved by the entire Francis Scott Key Bridge Response team and SUPSALV's team in particular, was nothing short of superb. This report documents the team's outstanding contributions during the response. I extend my heartfelt appreciation for the exceptional work accomplished on the daunting challenge faced in responding to the bridge collapse. The dedication, skill, and teamwork demonstrated throughout this endeavor were nothing short of extraordinary.

The level of effort put forth to address the challenges and complexities of this project was evident from the outset. It is remarkable that the channel was partially reopened in under a month, a testament to the efficiency and expertise of everyone involved. SUPSALV should be proud of the important role they played in that effort. Achieving full port restoration in just 77 days is a milestone that speaks volumes about the commitment and capability of all who contributed so much to its success.

The SUPSALV team's specific contributions in our efforts to mobilize quickly, execute with precision, and maintain the highest standards of safety and quality is truly commendable. The seamless coordination and relentless drive to restore the bridge not only ensured minimal disruption to our community and commerce but also highlighted the strength and resilience of our infrastructure. The fact it was all completed without a single safety incident is more testimony to the team's expertise and professionalism.

This report is testament to the team's contributions towards this success. Make no mistake, the hard work and perseverance of the team made a significant impact to its overall success, and I am immensely proud for those contributions.

This report describes that effort.

S. M. SUAREZ

Chapter 1 - Executive Summary

Incident – In the early morning hours of 26 March an outbound Singapore-flagged container vessel, M/V DALI, struck the Francis Scott Key Bridge's pier 17 on the south side of the federal navigation channel. The allision resulted in the complete collapse of the steel truss portion of the bridge taking 8 bridge construction workers, approximately 16,000 tons of steel, and 10,000 tons of roadbed material into the river. Two of the workers who went into the river were rescued, but the remaining 6 lost their lives in this tragic incident.

Impact – The loss of the bridge severely restricted north to south movement of vehicles on the eastern seaboard and eliminated the primary hazardous material route through Baltimore. In addition, the collapse totally shutdown commercial marine traffic in and out of the port of Baltimore. The port handles more than 50 million tons of cargo annually and is the busiest port for automobile import and export in the US. The economic impact was immense, with a loss of $15-20M per day.

Tasking – Under Title 33 of the Code of Federal Regulations, the US Army Corps of Engineers as Lead Federal Agency for Federal channels, can take emergency action to restore navigation to these channels. Using that authority, the Corps exercised an existing inter-service support agreement (ISSA) with Naval Sea Systems Command (NAVSEA), Supervisor of Salvage and Diving (SUPSALV), and tasked SUPSALV to provide salvage response to restore the Fort McHenry navigation channel. SUPSALV joined the Incident Command, serving as the Salvage Branch Lead under the Operations Section, and tasked two of its emergency contractors - Donjon, its ZONE A salvage contractor and GPC, operator of SUPSALV's ESSM system - to conduct operations to clear the navigation channel.

Scope of problem – The grounded M/V DALI and the bridge debris that collapsed into the river posed a very significant challenge for the salvage team. The challenges were exacerbated by the limited visibility in the river restricting divers understanding of the underwater wreckage field, the enormous size of the bridge structure, the depth in which the wreckage was buried in the mud, and the bridge truss entanglements with suspension cabling and roadbed material.

Response of salvage teams – SUPSALV led the Donjon/ESSM team and coordinated with the vessel's salvors, Resolve Marine, and Maryland Transportation Authority's non-navigation channel response team, Skanska, to clear the debris and begin to open the channel for limited traffic, and eventually, full channel restoration on 10 June 2024. In just 77 days the operation went from a complete catastrophic port closure to a fully reopened port. It was a task that was initially estimated to be a 9–12-month project.

Accomplishments – The crews removed approximately 50,000 tons of steel and debris from the Patapsco River, cleared the silt and mud down to 60 feet, and conducted numerous surveys to ensure any buried steel was retrieved to enable future dredging operations to proceed without impact. SUPSALV's staff managed Federal channel clearance operations and coordinated all salvage efforts while responding to the Unified Command's queries keeping all stakeholders up to date. The result was a

channel fully reopened in 77 days from the time of collapse. The immense and dedicated effort of all involved was instrumental in the success of the operation. A timeline of major events is included in Appendix A.

Figure 1-1 A challenging lift of 'Section 0' requiring multiple cranes and separation of structure by torch cutting.

Chapter 2 - Introduction

This report documents the U.S. Navy Supervisor of Salvage response to the loss of the Francis Scott Key (FSK) Bridge over the Patapsco River southeast of Baltimore, Maryland. The FSK Bridge served as one of the major arteries connecting Washington, DC and points further south to Philadelphia and points further north, and the Patapsco River provides access to the port of Baltimore, as major shipping port on the east coast of the United States.

Figure 2-1 Francis Scott Key Bridge before the incident.

2-1 Introduction and Background

2-1.1 Incident

At approximately 1:30 a.m. EDT on March 26, 2024, a Singapore-flagged cargo ship named DALI lost power and collided with the Francis Scott Key Bridge in Baltimore, MD. The impact caused an immediate and total collapse of the trestle section of the bridge spans. Prior to the collision, the ship's crew and Pilots onboard DALI were able to give Maryland Transportation Authority (MDTA) staff a warning, allowing bridge personnel to shutdown traffic with enough time to prevent more significant loss of life by travelers approaching the Interstate 695 bridge. Unfortunately, 8 persons, part of a bridge work crew, were unable to evacuate the bridge prior to the DALI allision with pier 17. These workers were thrown into the Patapsco River when the collapse occurred. Two of the workers were recovered alive,

two deceased were recovered within days, and the remaining 4 victims were recovered by salvors over the course of the bridge salvage operation.

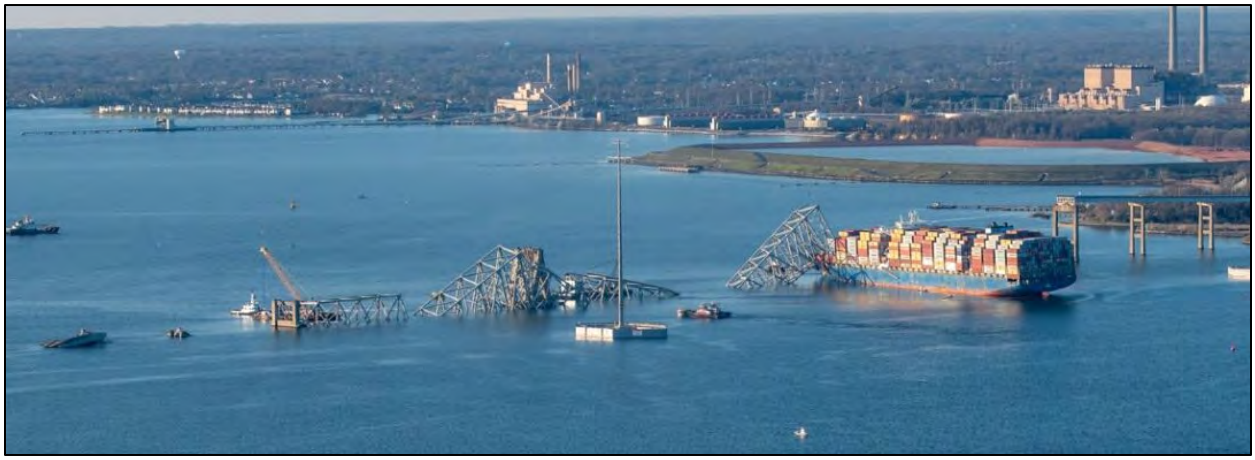


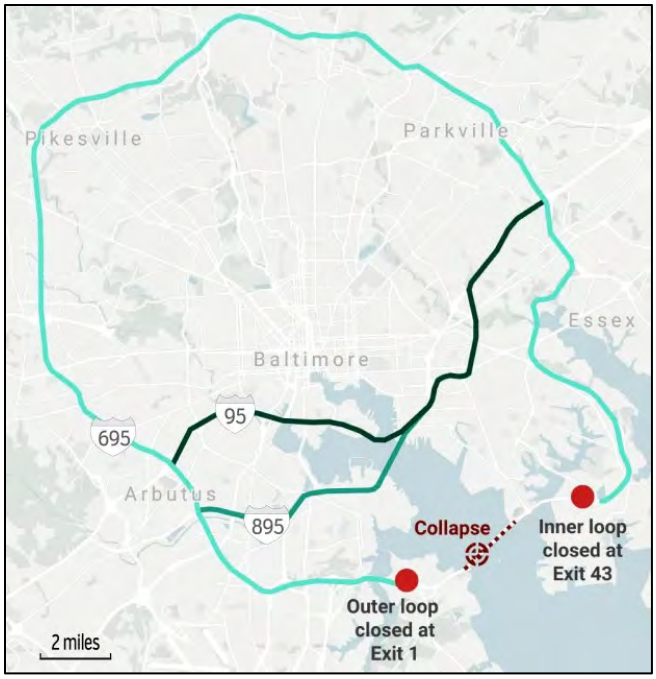
Figure 2-2 View of Francis Scott Key Bridge from the West following the incident.

2-1.2 Impact

The collapse of the Francis Scott Key Bridge dealt a severe blow not just to Baltimore and Marylanders, but to the nation. In 2023, 12.5 million vehicles traveled over the bridge, averaging over 34,000 automobiles a day – as part of their daily commute and traveling through the region and out of state. Following the collapse of the bridge, longer travel times, congested routes, and increased transportation costs impede on commuter's ability to reach work on time and in a cost-efficient manner. Businesses that depend on timely deliveries and shipments face logistical challenges, leading to delays in production and increased operating costs.

Two nearest alternative routes for traveling north and south, RT 95 and RT 895, are through tunnels under the river where hazardous goods cannot be carried. Therefore, commercial traffic carrying hazardous goods would need to travel surface streets through the city or take Rt 695 (Baltimore's Beltway) to the north and west of the city which is a significantly longer route. Unfortunately, SUPSALV's clearance of the bridge debris in the channel would have no impact on commuters and long-distance vehicular traffic issues.

The blocking of the shipping channel underneath the bridge resulted in the shutdown of all ship traffic to the Port of Baltimore, one of the top 20 ports in the United States by tonnage and number of containers handled. Baltimore is the 10th largest port for dry bulk and a major hub for the import and export of motorized vehicles, causing major economic implications for the local economy and supply chains across the country. Port activities generate roughly $3.3 billion in personal income and nearly $400 million in tax revenues annually. The sudden halt in port activities left thousands of workers unemployed; from dockworkers to truck drivers to logistics personnel, a significant loss of income and economic activity resulted in the area. Estimates suggesting a staggering loss of over $15 million per day to include direct losses from halted port operations, as well as indirect losses from disrupted supply chains and decreased consumer spending.



The impact of the bridge collapse to Baltimore's marine industry was the impetus for SUPSALV's involvement. As Figure 2-4 shows, all the major marine terminals on the Patapsco River are inside the Francis Scott Key Bridge. These terminals support the deepest draft vessels (50' deep). The Tradepoint Atlantic Terminal which is the lone terminal east of the bridge currently has 30' channel depths on the NW side and 42' controlling depth to the SE making it less suitable for deepest draft vessels.

Figure 2-3 Map of greater Baltimore with the Francis Scott Key Bridge shown in red dots.

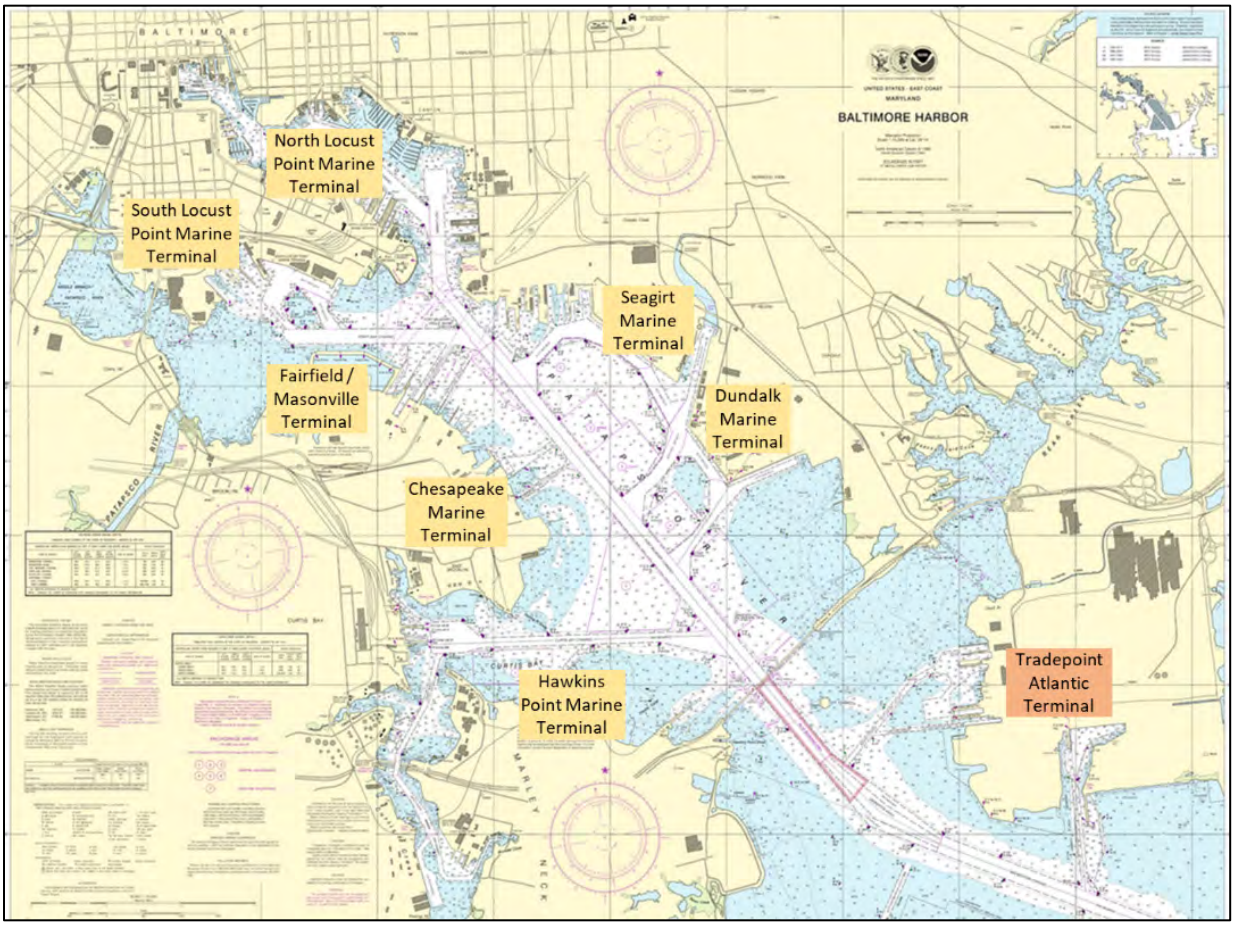


Figure 2-4 Baltimore's major commercial terminals inside the Francis Scott Key bridge.

2-1.3 Fallen Condition

DALI's impact to pier 17 collapsed the entire truss portion of the Francis Scott Key Bridge in addition to flat road spans to the north side of the truss. Bridge loss included Span 17 (southern portion), Span 18 (center navigation channel) and Span 19 (northern portion), as well as spans 20 – 22 (flat road spans) which were concrete and steel deck sections of the bridge further to the north.

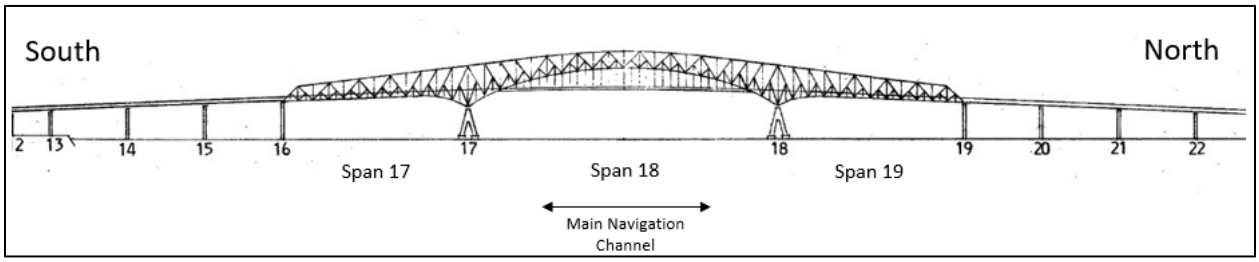


Figure 2-5 Bridge Span Identification.

Span 18 debris totally blocked the federal channel and was broken into multiple pieces. The most visible of these still laid across DALI's port side bow. That, and a significant portion of truss material and roadbed which laid on DALI's starboard bow, effectively pinned DALI to the riverbed and the surviving pieces of Pier 17.

For identification purposes, SUPSALV divided Span 18 truss into 5 damaged sections. Truss section 1 was the first target for SUPSALV's lifting efforts. It was a large truss section laying fully in the water near the north edge of the navigation channel. It was followed by truss sections 2, 3, and 4 working southward toward Dali. Truss 4 is what laid across Dali's bow. Truss 0 was entangled at the pier 18 bridge abutment just north of Truss 1. Specific portions of these truss sections were identified by the original bridge drawing frame numbers. Those frames ran from 1 through 45 and were spaced at 30' intervals. Frame 1 was at the south end and the north end of the bridge truss and ran toward the center which was frame 45. Frames 1- 25 covered span 17 and 19 while the center span contained frames on the south numbered 25 – 45 and on the north 25 – 45.

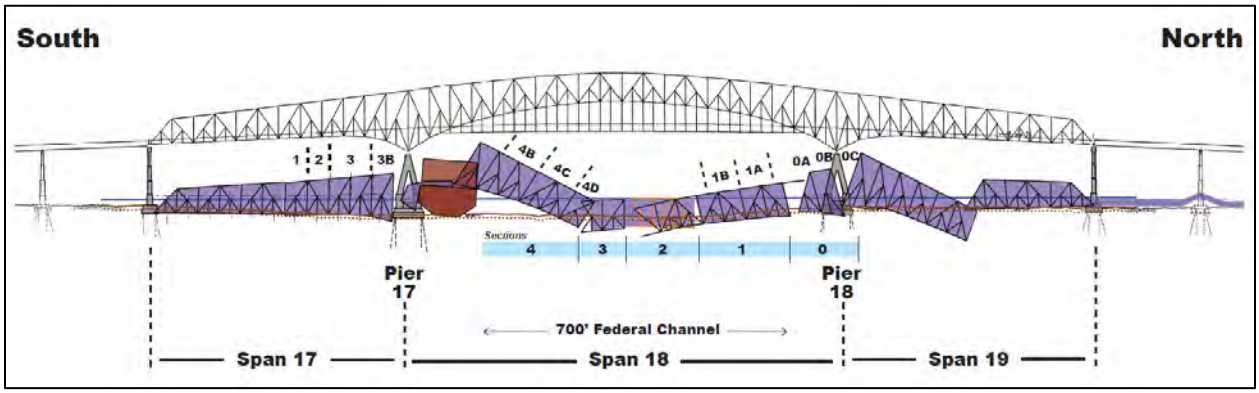
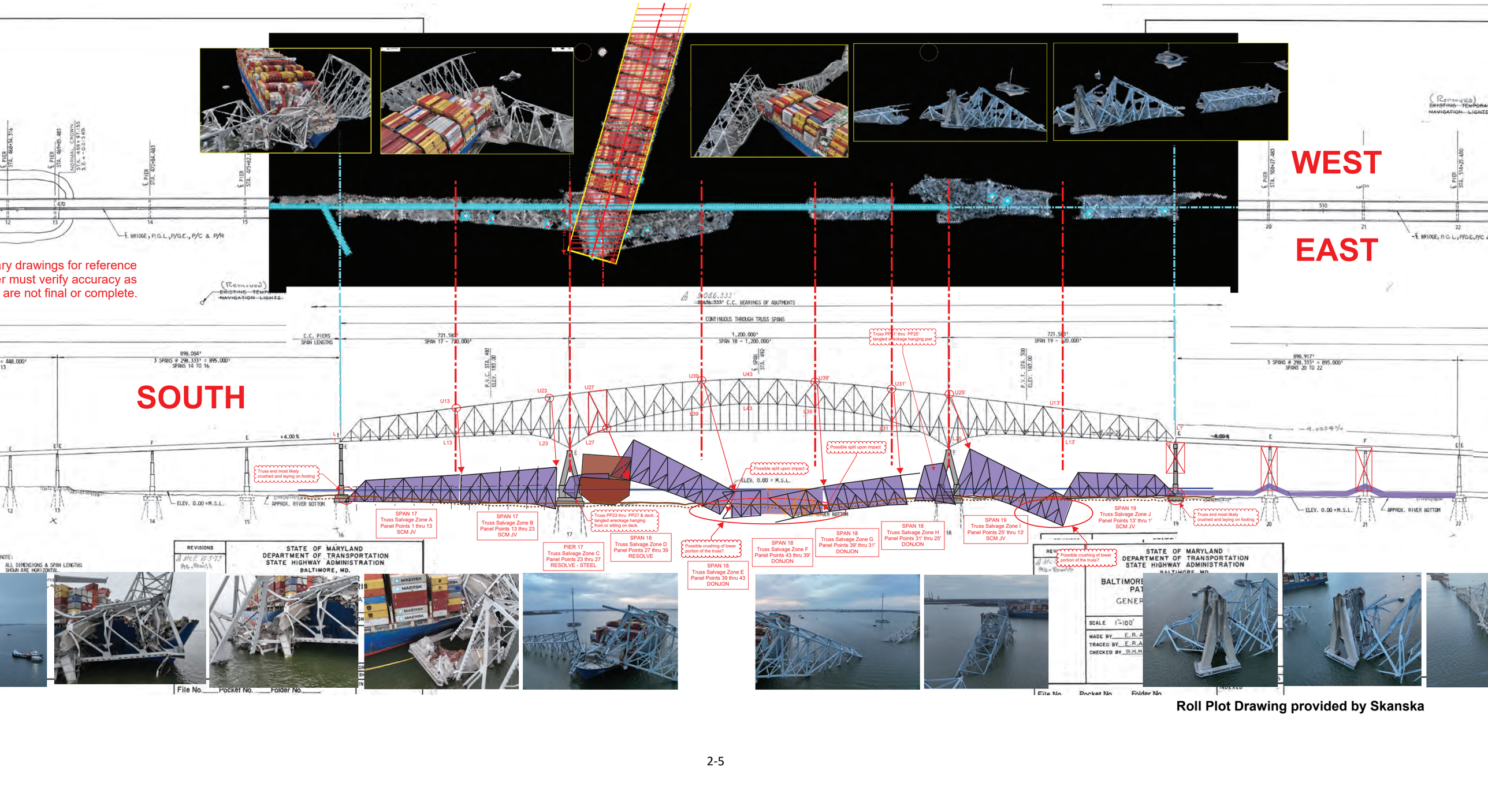


Figure 2-6 A drawing showing M/V Dali aground on pier 17, and an early assumption of where the truss sections lay in the three bridge central spans.

Francis Scott Key Bridge
Initial Assessment of Fallen Condition



ary drawings for reference
er must verify accuracy as
are not final or complete.

Roll Plot Drawing provided by Skanska

Chapter 3 - SUPSALV Tasking and Scope of Mission

3-1 Tasking Process

SUPSALV was almost immediately requested to support the response by the U.S. Army Corps of Engineers (USACE) Baltimore District. This chapter describes the process by which that request and subsequent tasking occurred and how SUPSALV came to be involved with the Key Bridge Response, including the funding processes and authorities who approved SUPSALV actions.

3-1.1 Initial Response

At approximately 5 am on 26 March 2024, SUPSALV's Director of Salvage Operations, Paul Hankins, received a call from United States Fleet Forces (USFF) informing him of the bridge collapse. He and CAPT Suarez (SUPSALV 00C) were in Norfolk, (Little Creek Naval Base) for Salvage Executive Steering Committee out briefs with Military Sealift Command and Naval Expeditionary Combat Command.

Both SUPSALV and Hankins proceeded to Fleet Forces Battle Watch location and met with USFF and NORTHCOM personnel to discuss what the Navy and the Fleet's role would be in the response. While the Fleet forces requirements were not clear at the time, SUPSALV knew their role could be significant given their standing Memoranda of Agreement (MOA) with USACE and USCG. Either of these organizations could, and likely would, issue a request for assistance.

SUPSALV contacted both USCG and USACE HQs to discuss SUPSALV's readiness to respond and assist as might be necessary. They received contact information for the local POCs in Baltimore and began making contact. Additionally, Hankins called Donjon telling them to begin planning to mobilize their suite of marine salvage assets.

While SUPSALV has a standing contract with Donjon as the Zone A (which includes the East Coast) salvage contractor, funding is necessary to place Donjon on task. While waiting on USACE tasking, SUPSALV considered using OM&N funds which they had on hand but was not yet on contract. Those funds, $1M, were destined for the Emergency Ship Salvage Material (ESSM) contract but not obligated because the 5-year ESSM contract was ending, and a new contract was expected to be issued in July. If necessary SUPSALV could set Donjon in motion with an Authorization to Proceed (ATP) from the Contracting Officer. SUPSALV also talked to VADM Downey (SEA 00) and the NAVSEA Comptroller about this. SUPSALV was told $500k of Command Reserve Funds was also available if immediate funding was needed.

By 3pm Tuesday, 26 March, SUPSALV leadership (Hankins) was headed to Baltimore where he met with USCG, USACE, and Maryland Department of Transportation (MDDOT) on the north side of the FSK Bridge at the Maryland Transportation Authority offices.

In Baltimore, SUPSALV educated the local USACE and USCG on how the USACE – SUPSALV MOA was used and how the funding process begins. SUPSALV noted that the process involved two components. The 7600A is the authorization document and the 7600B provides the accounting information. In May

2023 a standing 7600A was established for use between SUPSALV and USACE providing the foundation for rapid processing of funding requirements to support SUPSALV emergency response for wreck removal and dewatering support. This standing 7600A provided for a ceiling of $200M. Historically, the 7600A would take days to develop. The standing document greatly streamlined the process. With the 7600A in place, USACE was able to provide SUPSALV with $3M using the form 7600B within hours of their initial request. With this initial funding, SUPSALV placed $2.5M on Donjon contract and $0.5M on the ESSM (GPC) contract, immediately mobilizing both contractors.

Copies of the USACE 7600 Documents are included in Appendix B.

USACE asked for an initial estimate for the entire clearing of the federal channel, SUPSALV estimated $75M which was anticipating debris disposal charges.

3-1.2 SUPSALV Task

SUPSALV had initiated emergency tasking and began supporting the USACE based on an ATP and the funding documents discussed above, by 1800 26 March 2024. To make things official, a written request for support was sent by USACE to OPNAV N31 via email on 29 March. It read, in part: "The collapse of the Key Bridge in Baltimore harbor requires salvage assistance to clear the Federal Channel to reopen the port. The USACE does not have organic assets to remove this bridge. IAW REF A (MOA), request SUPSALV support to remove obstruction to clear the Baltimore Harbor Key Bridge Federal Channel of obstacles/obstructions."

CNO approval was provided on via message DTG P 011948Z APR 24. "Supervisor of Diving and Salvage (SEA 00C) is authorized to support USACE with Key Bridge Response in the Baltimore Harbor IAW ref A and B. SEA 00C is the supported USN Command and USACE is the supported overall commander. SEA 00C will maintain TACON of all contracted vessels. SEA 00C will be reimbursed through the Economy Act Agreement with the USACE."

On 19 April, a second delivery order was drafted to allow Donjon to expend additional funds to process displaced material (debris, steel and mud) at Sparrows Point. This USACE funded Delivery order provides funds that could ultimately be reimbursed to USACE by Maryland Department of Transportation.

The USACE is responsible for maintaining federal channels to include clearing obstructions in those channels IAW The River and Harbor Act of 1899 - 33 U.S.C. § 415. With the bridge debris blocking the channel, the USACE had a requirement to clear the channel. They used their longstanding MOA with SUPSALV to obtain wreck and debris removal support.

3-1.3 Funding

Initial funding of $3.0M was provided by USACE on the same day of the bridge collapse on 26 March. This immediate funding allowed SUPSALV to rapidly mobilize their East Coast Salvage Contractor with an emergency 'Authorization to Proceed' (ATP). This initial funding, although just a fraction of the total cost of the SUPSALV project, was crucial to the rapid response in the first days of the operation. Ultimately, the cost of SUPSALV's portion of the response was $65.0M, most of which was put on the Donjon contract (see Tables 3-1 and 3-2).

The rapid funding was possible through the establishment of a standing 7600A between SUPSALV and USACE in the previous year. The standing 7600A was a direct result of previous SUPSALV work for USACE that was delayed by several days due the steep learning curve required every time a new USACE District had to learn how to develop and staff a new 7600A (which essentially spells out authorizations and ceiling levels). This standing 7600A reduced funding processing time from days to hours, critical in the success of the rapid mobilization realized in this response.

On April 3, the USACE's provided $23M in additional funds and those funds were added to Donjon's task order as well as putting $200K put on ROH contract for administrative and documentation support. A second Donjon Delivery Order, 24F4D09, dated 8 May tasked Donjon to receive, process, and dispose of displaced materials associated with the salvage and removal of the Francis Scott Key Bridge. This effort was funded by an original DO and a single mod. Total funding was $17.0M (see Table 3-2). Total cost for the response is broken down in Table 3-1.

Table 3-1 Total SUPSALV Funding Received from USACE for the Recovery Task

Funding Purpose/Contract	Amount (dollars)
Donjon	47.0M
Donjon (Displaced Material)	17.0M
GPC	861K
ROH	85K
00C Travel	67K
Total funding from USACE	65.0M

Table 3-2 Donjon Funding supporting SUPSALV Recovery Task

Donjon Contract		
Delivery Order Number	Date	Amount
24F4006-00	26 March	$2.5M
24F4006-01	3 April	$22.6M
24F4006-02	13 May	$3.5M
24F4006-03	17 May	$7.4M
24F4006-04	28 June	$7.6M
24F4006-05	2 July	$3.4M
24F4009-00	8 May	$5.4M
24F4006-01	16 May	$11.6M
Total		$64.0M

3-1.4 Authorities and Challenges with SUPSALV Tasking

In the first week of the incident following initial mobilization, questions arose within Navy leadership regarding whether or not SUPSALV was properly tasked. Some persons within the OPNAV organization

were of the opinion that SUPSALV tasking should have flowed through a Defense Support to Civil Authorities (DSCA) process.

1. **Official tasking vs. Emergency response mobilization.** While SUPSALV was certain what their role was, the Inter-Service Support Agreement (ISSA) between the USACE and SUPSALV for providing support with wreck/marine debris removal and salvage operations was a dated document, more than ten years old. While the support offered in the ISSA was clear - providing guidelines to expedite USACE request for wreck/marine debris removal and salvage operations support by the USN Supervisor of Salvage and Diving (SUPSALV) - some felt that the ISSA was superseded by later DSCA instructions and procedures.
2. **Authorities.** From SUPSALV's perspective, the authorities that govern the capability to respond on USACE behalf is The River and Harbor Act of 1899 authorizing the Secretary of the Army to remove sunken vessels or similar obstructions from navigable waters of the United States. To support this requirement, citing the Economy Act (allowing the use of other Federal agency contractual capability) and the Salvage Facilities Act 10 U.S.C. § 7361-7364 (requiring SUPSALV to maintain salvage contracts with private industry), both parties, USACE and SUPSALV, entered into ISSA agreements standing since at least 1998.
3. **Use of Active Duty components in support of SUPSALV.** In addition to tasking authority, there was also some considered discussion on the ability of SUPSALV to access and use an active duty salvage capability. In the initial weeks following the incident, MDSU 2 was placed in a standby status while SUPSALV and others in Baltimore evaluated if there was a broader role for U.S. Navy divers. While that determination was being made, OPNAV N38 and Fleet Forces discussed the requirements necessary to put Fleet divers on-site. The principal concern was whether using Navy active-duty fleet divers would fall under DSCA authorities. Ultimately the general consensus was that use of Navy divers would have required DSCA approvals, but in the end this support was not required.
4. **Use of Naval Reservists in training capacity.** Related to the use of an active duty component, another concern developed around the lack of an official Echelon 1 to Echelon 1 Request for Support or Disaster Declaration (which would trigger a FEMA response making DSCA path easier). There was considerable discussion on whether the lack of a Declaration would preclude Naval Reservists from coming on official orders to support SUPSALV. Ultimately it was concluded individual Reservists could assist through orders on Annual Training (AT) or rescheduled drills for professional development.
5. **SUPSALV's role supporting the Unified Command.** There was significant discussion over SUPSALV's role in supporting the Unified Command. Concerns over SUPSALV's chain of command, the organization of the Unified Command, and SUPSALV's relationship to that organization received quite a bit of scrutiny. In fact, SUPSALV was supporting USACE through their request to OPNAV N31 and OPNAV N31's tasking of SUPSALV to provide that support. USACE, as the Lead Federal Agency (LFA) for maintaining Federal channels, was a member of the Unified Command, made up of the six primary stakeholders. The Unified Command was comprised of the U.S. Coast Guard, Army Corp of Engineers, Maryland Department of Transportation, Maryland Department of the Environment, Maryland State Police, and the

Responsible Party, represented by Witt-O'Brian's Ambipar. The Incident Command (IC) was in direct support of this six-pronged UC. Within the Incident Command structure, while officially supporting USACE, SUPSALV was placed into the role of Salvage Branch Head, responsible for coordination of the three salvage teams. There was some early discussion on whether the Coast Guard should submit a Request for Support (RFS) for SUPSALV to fill their role. There was a misperception that the USCG was 'in charge' of the UC. Once that nuance was clarified, no RFS was necessary to allow SUPSALV to work as originally organized.

Figure 3-1 ENS Culver (LNO) briefs CAPT Sal Suarez and staff on an upcoming press release.

Figure 3-2 SECNAV and NAVSEA personnel at FSK SUPSALV Command Center site.

Chapter 4 - Incident Command

4-1 Unified Command

Early in the response, the U.S. Coast Guard Captain of the Port established a Unified Command for the "Key Bridge Response 2024". The Unified Command was comprised of six members: (1) the USCG Captain of the Port (who was also the Federal On-Scene Coordinator; (2) USACE; (3) Maryland Department of Environment, (4) Maryland State Police, (5) Maryland Transit Authority and (6) the Responsible Party Rep (Witt-OBrians). The Unified Command led an Incident Command whose job it was to develop and execute an Incident Action Plan to achieve the objectives of the UC.

4-1.1 Incident Command

Consistent with the National Incident Management System (NIMS) Incident Command System (ICS), the Incident Command (IC) was set up to oversee the response. It was headquartered at the Maryland Cruise Terminal on East McComas Street in Baltimore. The terminal was an ideal location for the IC as the cruise ships could not enter port leaving the terminal unoccupied. It also provided easy access to the water for boat access to and from the bridge site.

Hundreds of personnel from multiple agencies including USCG, USACE, SUPSALV, National Oceanic and Atmospheric Administration (NOAA), MDOT, MD State and Baltimore Police, and MD Dept of Environment personnel were assigned to the Incident Command. Planning, Logistics, Finance, Operations, the Joint Information Command, and other staff functions of the IC operated from this location. Meetings within the IC generally began at 0630 and ran through 1730 daily. Witt O'Brien's Ambipar, the vessel's Qualified Individual, managed the IC and provided much of the administrative staffing to include badging, check in, check out, and food service.

Figure 4-1 The Maryland Cruise Terminal made an ideal location for the ICS.

The IC organization functioned around building Incident Action Plan (IAP) for each Operational Period. This plan included objectives, assignments, communication plans, and procedures. After the first couple days with single day Operational periods, a longer period of 7 days was selected as more reasonable to maintain control. An updated IAP was issued ensuring towards the end of each Operational Period to support the next OP. This kept the UC current as new developments and situations arose over the course of the response. A copy of the IAP Organization Chart is provided at Figure 4-2. The version shown was for the second operational period of the response. This organization remained very dynamic and was constantly expanding and contracting as the need arose for changing command and control oversight. The dynamism of the situation, necessitated dynamism in the command structure, which fortunately the ICS construct affords.

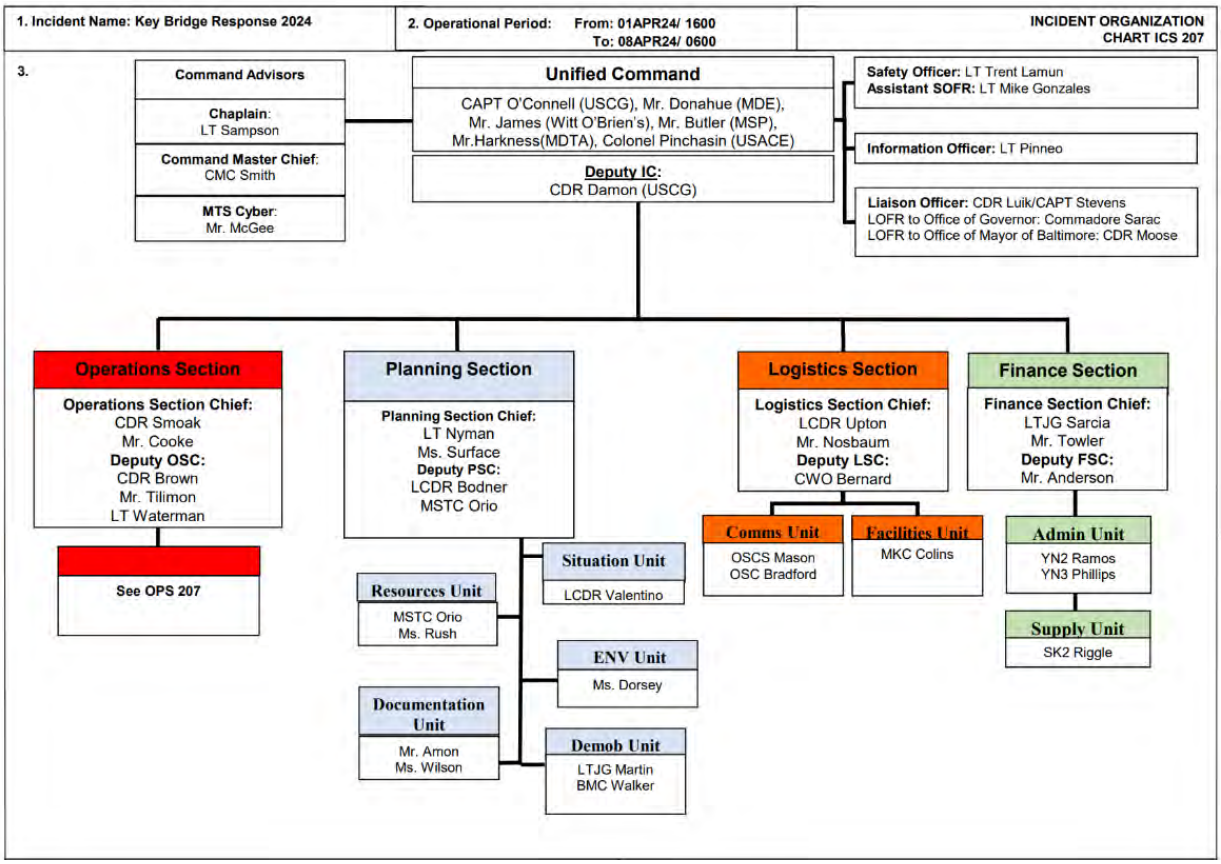


Figure 4-2 IAP Organization Chart (with Operations Section following on Figure 4-3)

4-1.2 Salvage Operation Branch

As stated in earlier sections, technically SUPSALV worked on behalf of the USACE. On the second day of the response, it was clear that this would be a salvage-centric response and furthermore, there were three distinct salvage operations going on. Without a clear coordinator of these efforts, the plan could easily descend into chaos if each salvage entity was pursuing their own unique goals and objectives without deconfliction or validation of those objectives. Paul Hankins recommended to USACE that the

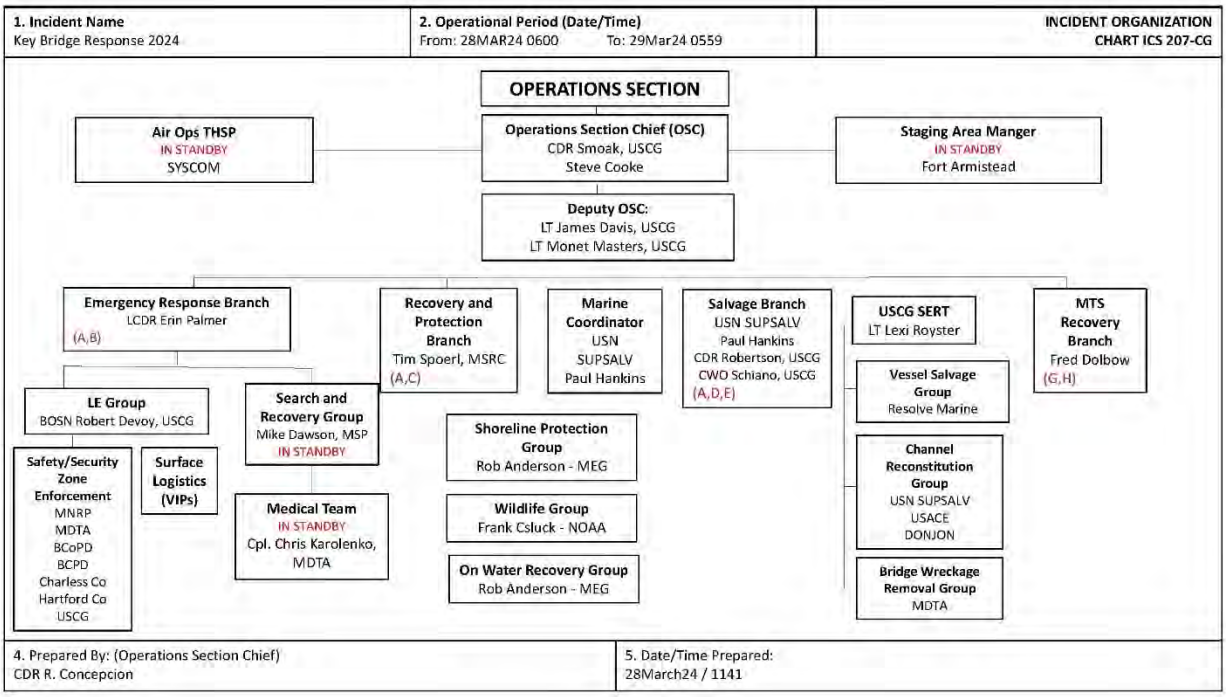


Figure 4-3 FSK Response Operations section organizational chart

UC assign SUPSALV to lead the salvage branch. Typically, in an IC, salvage is a component of the Operations Section but generally has a small role to play in the overall IC. This job would be different as nearly the entire focus would be on salvage operations. Both the Coast Guard Federal On-Scene Coordinator (FOSC) and the USACE lead agreed to this proposal and on day 3 SUPSALV began leading (coordinating) the overall salvage effort.

This also provided a single point of entry into the UC for salvage, preventing three different voices advocating a position to the UC. With SUPSALV given this coordination role for all salvage missions SUPSALV became that single salvage voice. It should be acknowledged that even though SUPSALV was only tasked with the clearing the main navigation channel by the USACE, and SUPSALV had no control over the contractual responsibilities of 2 of the 3 commercial salvors, this relationship became a critical reason for the success and transparency of the operation.

SUPSALV oversaw the coordination of three missions. In order of importance, those missions or objectives, were as follows:

- Primary mission – Federal channel clearance for USACE (SUPSALV tasked Donjon with clearing the main navigation channel debris)
- Secondary mission – Removing the M/V DALI ship from the grounded position adjacent to the South end of the main navigation channel. Commercial salvor, Resolve Marine, was identified as

Salvage lead in the Vessel Response Plan mandated by OPA 90[1]. Resolve worked for the vessel's owner represented by the Qualified Individual (QI) Witt Obrien's Ambipar

- Tertiary mission – Bridge wreckage removal outside the channel (MDTA had contracted with Skanska, a world-wide construction firm who had been recently operating on the Potomac River under a separate MDTA contract)

4-1.3 Joint Information Center

Another significant component of the Incident Command was the Joint Information Command (JIC). The JIC handled all relations with the press and external stakeholders. While the UC was the final authority on releasing information to the public relating to the bridge response, the Navy PAO chain wanted their concurrence as well. This complicated the review process significantly.

The initial Navy concurrence process started with the NAVSEA PAO, and included both Department of Navy Chief Information Officer (CHINFO) and Office of the Secretary of Defense (OSD). Due to the differing intent of publicly released information between the stakeholders, it was difficult for SUPSALV to publish Navy-related good news and successes coming out of this tragedy. Working with these Navy organizations was time consuming for the JIC and SUPSALV as well, who was pushing to have information released quickly without cumbersome approval processes. To prevent an undue burden, SUPSALV requested SEA 00D (NAVSEA PAO) to imbed a Liaison Naval Officer (LNO) at the Unified Command to manage the information flow and coordinate the Navy review process. To do this, SEA00D provided CHINFO a line of accounting and a Request for Service (RFS) for a LNO.

As a result, three public affairs personnel were assigned. ENS MacKenzey Culver and two photojournalists. This team greatly eased CAPT Suarez's public affairs tasks, which in the first several weeks of the response included up to twice daily press briefings. Having the CHINFO representative on-site eliminated that approval process. On 11 April, we were relieved of the requirement to coordinate and receive approval from OSD. This further streamlined the release process.

4-1.4 Routine within the IC

4.1.4.1 Salvage Team Meetings

To establish good coordination amongst a disparate group of three salvors, it was important to have good information flow between the teams. To accomplish that, SUPSALV established two daily meetings for the project managers and salvage masters from each of the teams. At 0630 and 1730 each day the combined salvage teams would meet to discuss progress and objectives for the next day.

SUPSALV's Director of Salvage, Paul Hankins, managed the meeting with each salvage contractor, typically the salvage master, providing the attendees their planned activities for the day. The meeting allowed coordination between the three contractor's efforts and provided visibility to USACE and USCG representatives.

[1] OPA90, the Oil Pollution Act of 1990, a part of the Clean Water Act, is a law passed after the Exxon Valdez spill of 1990 requiring oil pollution response and salvage response capability applicable to all vessels working in or transiting through U.S. waters. The Act requires detailed Vessel Response Plans (VRPs) identifying pre-contracted oil spill response providers and salvors.

The meetings became a key to the successful coordination and interaction between the teams. While most of the meetings' discussions were around reported progress and issues encountered during the day and their intentions for the following day, longer term coordination issues were also brought up. Sidebar conversations following the meeting led to synergy across the salvage responders. Another valuable secondary attribute was that USCG and USACE were provided an opportunity to relay useful information. For example, the required width and depth of the first temporary channel 35' x 280' was relayed during one of these afternoon meetings. Because April days were longer than March days, the salvage teams had longer daylight hours available, and they were being pulled off the water prematurely to make the afternoon meetings. To alleviate that issue, the meetings evolved to having a project manager from each salvage company present their progress report and plan for the following day, which allowed the salvage master to remain on-site, finishing up that day's work.

The teams were producing excellent results, and images from each day's activity were in high demand. To meet that demand, each contractor supporting one of the IC's priority tasks provided a 3-4 slide brief with their daily highlights and plans for the next 24 hours. These briefs were displayed at the meeting giving the attendees a better understanding of the situation on the water. SUPSALV also used these briefs to aid in populating the evening SITREP 'last 24 hours' and 'next 24 hours' sections for each Priority Task. SITREPS were issued every evening, providing internal and external POCs an organized and concise report on current and future operations. A sampling of key SITREPS is provided in Appendix C.

4-1.5 Unified Command Meetings

Following the morning Salvage meeting, Mr. Hankins or Mr. Brege would consolidate inputs received from the three salvage lines of effort into a short brief, and at 0800 they would participate in the UC Commanders Update meeting. Here SUPSALV would learn about other aspects of the IC and gain advance knowledge of VIP visitor schedules.

4.1.5.1 VIP Visits

From President Biden's visit on 5 April to almost routine daily visits by Baltimore's Mayor Brandon Scott and Maryland Governor, Wes Moore, the Unified Command and the wreck site were a stopping point for several distinguished visitors. A few other examples include:

5 April	President visits site and is briefed by response team
8 April	Met with Congressman John Sarbanes, U.S. House of Representatives (MD)
10 April	Provided an impromptu brief for Samantha Silverberg, Deputy Assistant to the President for Infrastructure Implementation; Mr. Michael Connor, Assistant Secretary of the Army (Civil Works); Major General Kimberly Colloton, Deputy Commanding General for Military and International Operations USACE; Brig. Gen. John P. Lloyd, U.S. Army Corps of Engineers North Atlantic Division; and Office of Management and Budget personnel.
11 April	Provided an impromptu brief to Maryland Governor Wes Moore and Major General William Graham, Deputy Chief of Engineers and Deputy Commanding General / Deputy Commanding General for Civil Works and Emergency Operations

19 April Site visit and tour on the river for Secretary of the Navy, Carlos Del Toro.

22 April Tour of channel site and Sparrows Point to LTG Spellmon (USACE Chief), including boarding crane barge Farrell.

16 May VADM Downey returned to the Unified Command to see the results of the demolition of Truss 4.

4.1.5.2 Focused Salvage Review

During the initial phases of the operation, the Unified Command asked SUPSALV to consider all options regarding methodologies and equipment that might be available around the world to accelerate the channel opening. To consider all options, SUPSALV reached out to the American Salvage Association (ASA) and International Salvage Union (ISU) for their perspectives on the task and possible avenues to consider in conducting the salvage. Mr. Mike Dean, Executive Director of the American Salvage Association and Mr. John Witte, President of the International Salvage Union met with CAPT Suarez and members of the Unified Command on 10 April to discuss other potential contingencies. While the resulting discussions did not yield additional or alternative solutions that had not already been considered, it showed to stakeholders the solidarity in which the salvage community was approaching the incident. In the end, both organization representatives agreed that the SUPSALV plans and resources on-site were the best that were reasonably available, and concurred that the recovery task was on track.

Figure 4-4 Mr. Michael Dean, Executive Director of the ASA, reviewing progress with Mr. Eric Brege, Salvage Manager, during the ASA/ISU review.

Chapter 5 - SUPSALV's Team

5-1 SUPSALV Staff

A comprehensive SUPSALV team remained on-site from March 28 to completion of the mission on 24 June. Supervisor of Salvage, CAPT Sal Suarez assembled an expert team of project managers, salvage, experts, and administrative support who were able to smoothly coordinate a large and diverse group of salvors. The team was charged with coordination of the actions of all three salvage efforts that included channel clearance, vessel removal, and out-of-channel bridge clearance. This role required a team that could easily move within the salvage groups. The core team initially consisted of CAPT Suarez; Paul Hankins, Director of Salvage Operations; Vince Jarecki, Naval Architect; and Eric Brege, Project Manager. Through the course of the operation the team expanded and contracted as events required. Appendix D is a complete list of the SUPSALV-related government personnel that participated in the response. Importantly, additional support included a rotation of Engineering Duty Officer (ED) Divers and members of the SUPSALV Reserve Unit. Their collective contribution to the operation was significant and the opportunity for professional development cannot be overstated.

Figure 5-1 April 23: SUPSALV team at the IC. From Left: D. Fegley, D. Neverosky, P. Hankins, E. Brege, A. Schacht

Once the full channel opening was imminent in mid-May, the team contracted to just one or two SUPSALV representatives who ensured the project was carried to completion and demobilization was properly and efficiently conducted. LCDR Alex Schacht and LT Matt Coleman led the team in these phases.

In addition to the government team, throughout the operation there was a large contractor support element. Contractor support included Donjon (Zone A salvage contract), GPC (ESSM contract) and ROH (administrative support contract).

5-2 Donjon Tasking

Donjon Marine is one of three salvage companies holding contracts with SUPSALV. These emergency salvage contracts are mandated under the Salvage Facilities Act and have been in place for over 50 years. SUPSALV has divided the world into three Zones (A-C) and the contracts are awarded by these regions. The contracts are generally 5-years in duration. Donjon holds the Zone A regional contract that covers the east coast. Accordingly, Donjon was tasked on 26 March to respond to the incident under SUPSALV direction. Delivery Order tasking read in part:

> "Donjon was to assist the Supervisor of Salvage and Diving (SUPSALV), USN by providing emergent pollution, salvage, and heavy lift support in response to the Baltimore Key Bridge Collapse. Support will include cranes, barges, disposal, and all other additional equipment and resources as directed by the on-scene SUPSALV representative".

It was highly fortunate that the incident was just a single day's voyage from Donjon's principal equipment depot in Newark, New Jersey. The major assets Donjon brought to the operation included the two heavy lift cranes: 1000-ton capacity CHESAPEAKE 1000 and the 450-ton capacity COLUMBIA NY. These two, plus additional lower capacity crane barges and dredges, a fleet of support tugs, transport barges, and specialized steel cutting equipment, established Donjon as a serious and capable contributor to the bridge recovery team.

Figure 5-2 April 22: Donjon vessels working together on truss section 0.

5-3 ESSM Tasking

On 27 March, SUPSALV's tasked their ESSM team to support the operation. Initial tasking read: "ESSM shall assist the Supervisor of Salvage and Diving (SUPSALV), USN, by providing Emergency Ship Salvage Material (ESSM), operators, and additional equipment and resources as directed by the on-scene

SUPSALV representative." As the operation progressed, specific ESSM equipment and operators were identified to support the Baltimore effort. Examples include the portable conference center, along with a generator and 20' workshop van, which was used at the cruise ship terminal as workspace for Donjon engineers and support staff. The team also utilized an ESSM 53' command trailer which began the operation at Ft. Armistead and later moved to Sparrows Point. Along with three ESSM boats and their operators, another very critical element of the ESSM response was the Coda Octopus Products Ltd. 3-D sonar imaging system. That system is discussed in detail in the Operations section of this report.

Figure 5-3 ESSM Expandable Conference Center van provided for use by Donjon engineers and planners at the rear of the Maryland Cruise ship Terminal. Also pictured is a 20' workshop and a generator.

5-4 ROH tasking

ROH Inc. is SUPSALV's Engineering, Technical, Professional and Administrative Support Services contractor who is seated alongside SUPSALV staff at the Washington Navy Yard. On 27 March, the Director of Salvage Operations tasked ROH to provide staff on-site at the IC to assist in setting up an effective work site, aid in assembling documents required by the IC, and to begin collecting and retaining documentation of key activities of the SUPSALV operation to support development of an official SUPSALV Salvage Report. ROH retained personal on-site for the first month and at key times over the remainder of the operation. A complete casefile and this report are the results of that assignment.

Figure 5-4 ESSM Boom Handling boats tied alongside a Donjon tug. Note the outboard vessel has CODA Octopus system boom mounted midships on its port side.

5-5 EDOs and Reserves

SUPSALV supplemented their own staff with a rotation of ED Divers and members of the SUPSALV Reserve Unit. These Naval Officers assisted SUPSALV by manning the Sparrows Point debris collection station collecting and coordinating debris drop off, and manning the ESSM boats overseeing CODA Octopus operations and personal transfers. They were given the opportunity to participate in the IC System which will be helpful for their professional development. For events of this magnitude, which are seldom, the organic ED Diver staff at SUPSALV is simply not enough from a personnel perspective. The support of ED Divers and reservists was, and continues to be, a unique and invaluable capability that SUPSALV brings to bear as necessary.

Chapter 6 - Operational Considerations

6-1 Port Closure Consequences

The USCG and USACE were under extreme pressure from city, State, and Federal officials to get open the port as fast and safely as possible. Every day marine terminals sat idle, and their employees were not working, the port was hemorrhaging economic vitality. It was estimated the losses due to the stopped economic activity amounted to $15-20M per day. Temporary channel openings to restore at least limited ship traffic to revive economic activity were needed as soon as possible.

As a result, the primary objective of the response became reopening of the channel. That reopening was done quickly and in stages as described in Table 6-1. The initial opening, to the north of the navigation channel was just 12' deep but it allowed barge traffic and other smaller sized vessels to pass in and out of the port. As progress was made clearing the channel, new temporary channels were announced, and larger vessels were allowed to pass through. These openings are outlined below along with the Marine Safety Information Bulletin (MSIB) that announced each one. The grey highlighted boxes were specifically Federal channel openings completed through SUPSALV and their contractor's efforts.

Table 6-1 Channel Openings

Date	Opening size	Effort / Location	MSIB
1 April	11' depth, 264-foot horizontal clearance, and vertical clearance of 95 feet	North side of river, Sollers Point Temporary Alternate Channel	5-25
2 April	14' depth, 280-foot horizontal clearance, and a vertical clearance of 124 feet	South end of bridge, Hawkins Point Temporary Alternate Channel	6-25
25 April	**35' depth, 400-foot horizontal clearance**	**North end of nav channel after clearing section 1 and 0**	**15-24**
21 May	**50' depth, 400-foot horizontal clearance**	**Main nav channel after refloating of DALI and clearing section 2 and part of section 3**	**49-24**
10 June	**50' depth, 700-foot horizontal clearance**	**Full restoration of Fort McHenry Navigation Channel following removal of truss 4 and clearing bottom debris to depth of 50'.**	**52-24**

6-2 Defining the Milestones

Less than a week into the operation, the Unified Command began asking the Salvage Branch how long it would take for a functional navigational channel to open. To get to that answer, the first task was to

establish milestones and objectives for the channel reopening. Four principal channel milestones were established around which all plans were crafted. These milestones were:

- Milestone 1: Temporary shallow draft channels North (12') and South (14') (Skanska and USCG)
- Milestone 2: First major milestone Preliminary Federal Channel 280 x 35 (Donjon)
- Milestone 3: Full depth channel for passage of largest vessels (400' x 50') (Donjon)
- Milestone 4: Final milestone re-open Full Federal Channel 700 x 50 width and depth (Resolve and Donjon)

6-2.1 Timeline Development

On 3 April the SUPSALV team reviewed the major tasks involved in clearing the channel and refloating DALI. They assembled best estimates of time to accomplish each major task and put them together for a rough timeline to complete the whole project. The draft was reviewed amongst the team and major milestones were then discussed with Resolve and Donjon project managers in the Unified Command.

That afternoon, during the 1730 Salvage Team meeting, Paul Hankins briefed the proposed timeline to the salvage team and asked for their concurrence. On 4 April there was agreement that the timeline was reasonable.

On 4 April, SUPSALV briefed the Unified Command on that initial milestone chart and in the evening SITREP SUPSALV indicated the preliminary schedule had been released by the Unified Command, which was then disseminated to public. The major milestones released by that schedule indicated that the preliminary Federal Channel (280 x 35) would be opened by late April and full channel opened by 30 May.

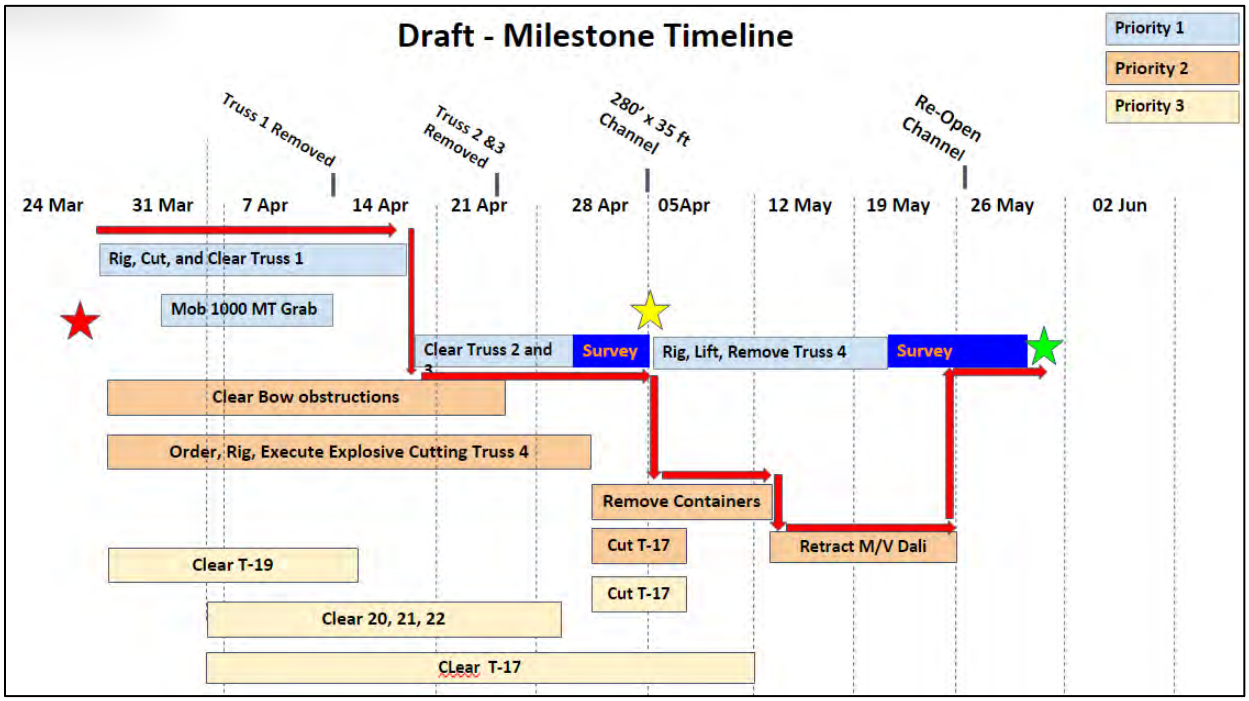


Figure 6-1 April 4 Milestone Chart.

Refinement of milestones were made on 17 April after successfully removing Section 1 and before SUPSALV realized they could obtain the 280-foot channel without addressing section 3. Figure 6-2, the 17 April chart, showed more granularity with the DALI portion of the tasks but still showed the Preliminary Channel opening at the end of April and the full channel by the end of May.

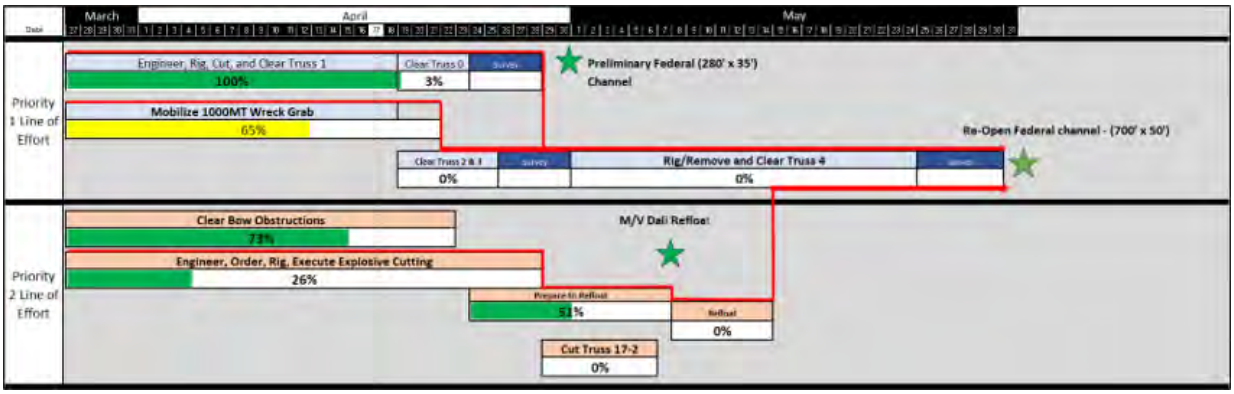


Figure 6-2 Milestone Chart depicting stated goals for bridge and channel clearance. This is the schedule that was published on 17 April.

Further internal updates were made, but the "published" dates for full channel opening remained at the end of May. While SUPSALV originally hoped to beat that date, the length of time it took to plan, approve, pre-cut, and install charges for demolition of Truss 4 were underestimated, and there was a desire to bank any progress made to compensate for potential delays.

6-3 The Nature of the Wreckage

The entire bridge fell into the water from Span 17 to Span 22. This included of course the entire bridge truss segment weighing in excess of 16,000 tons by itself. But, in addition to that truss was the entire roadbed that was suspended from that support structure. The roadbed consisted of asphalt, concrete, concrete rebar, and steel beam subdeck materials supporting the concrete roadbed structure. Finally, the hundreds of cables that suspended the roadbed from the truss proved to entangle the wreckage together on bottom. Because the roadbed of the bridge fell into the river in addition to the truss sections, a significant amount of effort was required to clear debris to obtain the 50' channel depth. A large portion of the debris was broken concrete and steel subdeck material, mixed with tangled bridge truss material, and in many cases buried in the mud. It's estimated that over 50,000 tons of displaced material including mud, broken steel, and road material were recovered.

6-4 Sparrows Point Offload Process

Skanska established a steel and debris offload and scrap processing site at a leased location on Sparrows Point in their role working for Maryland Department of Transportation (MDOT). SUPSALV directed Donjon to use the Skanska scrapping yard for the steel truss sections removed from the navigation channel. SUPSALV stationed a reservist or ED Diving officer at the yard to record all deliveries and document the receipt of steel from the Donjon, Resolve, and Skanska operations. It was important to track how much steel and other debris was being recovered to assist in any litigation or cost sharing that could occur downstream of the recovery efforts. The steel processing operation Skanska set up on the

Sparrows Point site became quite large and sophisticated. Hydraulic shears and torch cutting systems were used to process the steel down to the size required for transport to recycling centers. All steel was trucked to Smith Industries, a recycling yard.

Ultimately 59 lift tickets were processed over the two-month plus period. Several examples of steel receipts delivered to the Sparrows Point scrapping site are included in Appendix E. A summary of all material processed is also included at Appendix E.

Figure 6-3 April 21: Skanska scrapping yard at work on a section of truss.

6-5 Human Remains (HR) Recovery

Tragically, six people lost their lives in the bridge collapse. By the time the salvage crews began collecting debris from the riverbed, 2 of the 6 victims from the bridge collapse had been recovered from the wreckage site. The remaining four were missing and while their approximate locations had been estimated, there exact whereabouts were unknown. MD State Police divers had briefed SUPSALV and Donjon teams of the known vehicles that may be encountered during salvage operations that could contain victims. The salvors kept an eye out and eventually, the remaining 4 bodies were recovered. Initial response protocols dictated that when remains were encountered, all operations were halted and authorities from MD law enforcement recovered the remains. To avoid shutting down operations across three operations, an alternate response protocol was developed which isolated the recovered remains, respectfully placing the remains on a separate barge for authorities to complete their recovery response tasks. This allowed salvage operations to continue without major interruptions. The four missing victims were ultimately all recovered between the period 5 April and 7 May.

6-6 BG&E Gas Line and Overhead Power Line

The navigation chart showed an overhead power line about 700’ west of the bridge. It was at a height where the tallest cranes needed to watch their movement when under the line and when setting spuds. At the beginning of the operation, BG&E secured power on that line, giving the operators a safer

operating area. As the weather turned warmer and power requirements grew, the cable was reenergized. This mostly affected Resolve as they had crane movements astern of the DALI. Once a temporary channel was opened, the teams were able to move around the river with fewer restrictions and the issue became less of a concern.

A second utility issue to consider was the 24" BG&E gas pipeline that ran across the river about where the stern of DALI was. BG&E reported the pipeline was secured at both ends but still contained natural gas under pressure. They reported that if it was depressurized, they would have to decommission the pipeline. As the operation progressed, it was determined that leaving it filled with gas was too great of a concern and on 2 April, the decision was made to inert this section of pipeline.

Figure 6-4 June 3: Donjon's CHESAPEAKE 1000 delivering section 4-B to the processing yard.

6-7 Salvage Equipment Supporting the Clearance Operation

6-7.1 Donjon Salvage Equipment

Donjon brought a full complement of marine salvage equipment to the operation, including floating cranes, deck and hopper barges, and harbor and ocean-going tugboats. A complete list of Donjon material and operators at any given time was provided in their Daily Progress Reports (DPR). Appendix F has an example DPR from 1 May 2024. Of note was the inclusion of the 1000-ton rated crane barge CHESAPEAKE 1000, the largest derrick crane on the east coast. Her lifting capacity allowed for much larger sections of the bridge to be removed in a single engineered lift then otherwise would have been possible. This greatly reduced timelines to clear the major truss sections. The CHESAPEAKE 1000's capacity was utilized by both Skanska and Resolve at various points during the operation.

Steel processing equipment supporting the operation at the channel site included hydraulic shears, diamond wire saws and of course, oxyacetylene cutting torches. Also instrumental to the cleanup operations was the clam dredging and wreck grab tools brought to support clearing the riverbed. The largest of these devices was the wreck grab leased by Donjon. The wreck grab could lift 800 tons and weighed in excess of 160 tons hanging with no load. On 8 April, the grab was mobilized via barge from Galveston, TX. It arrived in Baltimore around midnight on 19 April and remained on-site until 24 June.

6-7.2 ESSM Equipment and Operators

NAVSEA SUPSALV maintains ESSM material at 4 CONUS bases and 4 overseas bases. This material is on standby for oil pollution response and fleet salvage operations. Additionally, material for supporting UWSH repairs and maintenance of Fleet diving operations is also maintained at the sites. For this salvage task, SUPSALV tasked ESSM to mobilize the systems found in table 6-2.

Table 6-2 ESSM Equipment brought to the FSK Recovery Effort

Quantity	Nomenclature	ESSM System No.
2	30’ Boom handling Boat	P03100
1	6-meter RHIB	P03300
2	Echoscope Sonar System (CODA Octopus)	S51100
1	Salvage Ship Van	S37100
1	Command Conference Center Van, Expandable	P19310
1	Diesel Generator	S12300
1	53’ Command Trailer	S19400

To operate the boats and maintain the equipment, 4 operators were mobilized to Baltimore for the duration of the operation. These systems and the subject matter expertise provided by the operators proved instrumental in allowing SUPSALV to efficiently conduct and monitor the salvage operations.

6-7.3 CODA Octopus Sonar System

The images and information produced by the 3D image scans from the CODA Octopus system were invaluable to planning and executing a rapid wreckage removal plan of action. These scans allowed much more precise detail about the wreckage disposition below the waterline allowing better planning for cuts and wreckage sectioning. This process would have taken significantly longer without the CODA Octopus system data and potentially necessitated the utilization of human divers in hazardous conditions.

The CODA Octopus systems were drawn from ESSM inventory. CODA Octopus consists of an Echoscope sonar system below the waterline and a Light Detection and Ranging (LIDAR) sensor above. Highly accurate location sensors/subscription allows integrating scans from one side of an object with scans previously conducted from the other side, to create a 3-D display. The resulting processed data can be viewed from any perspective.

One CODA Octopus system was mounted on an ESSM boom tending boat and the second was provided to the Donjon dive team to support more efficient survey operations. Our ESSM operators observed that smooth water allows training sonar closer to parallel, reducing the gap or interface between the air LIDAR imagery and the in-water sonar imagery.

Because this is a relatively new system to ESSM and new technology, SUPSALV tasked ESSM to mobilize a CODA Octopus Original Equipment Manufacturer (OEM) representative. Blair Cunningham was placed on-hire for the first portion of the operation. With his guidance, highly detailed scans of the debris field were provided which allowed SUPSALV and Donjon to make the key decision to place the wreck grab on-hire on 3 April. Mr. Cunningham's guidance gave ESSM operators an excellent training opportunity, which paid off throughout the duration of the operation. The unique contractual relationship that SUPSALV shares with GPC allowed rapid OEM support, at a critical time in the operations. Detailed utility and results of CODA Octopus operations is included in Section 7-1.

6-7.4 Common Operating Picture (COP)

The Coast Guard established a COP to provide a live view of the vessels on station. By default, most self-propelled commercial vessels carry Automatic Identification System (AIS) transponders which allow commercial vessel tracker services like Marine Traffic (website) to show the location of vessels world-wide and commercial vessels to "see" each other on plotters or radar screens. SUPSALV advocated for a salvage operations specific COP to allow salvors to coordinate amongst themselves within the very restricted operating environment around the bridge collapse location. To this end, and to improve the utility of the COP for the Unified Command, SUPSALV procured 50 AIS transponders from ORBCOMM, Inc. to install on vessels that did not already have AIS installed at the wreck site. These included crane barges, deck barges, crew boats, and the ESSM survey boats. Within the COP, a user could select an individual icon and obtain information about the vessel. More importantly, it allowed vessel operators and salvage masters to quickly see the laydown of vessel assets in the area and aided in the coordination of the movement of those vessels. The course and speed and an image of the vessel were provided to each transponder installed. The COP was also useful for tracking the commercial vessels approaching the temporary channel and for observing the location of marine authorities and USCG vessels.

Aiding the Salvage branch was a collective asset list where each salvage team listed the major equipment brought to the site to support the three missions. That list was updated daily and eventually incorporated the AIS installation status as those assets were displayed on the COP. A copy of the 17 May Salvage Asset list is provided in Appendix F.

Over the period of about 2 weeks, ESSM mechanics installed these transponders on the fleet of support assets. For vessels without 12v power readily available, small solar panels were incorporated in the installation package. Figure 6-5 shows a display of the COP on 16 April. Figure 6-6 is a picture of the ORBCOMM transponder and an example of the mounting on a CONEX box.

6-8 Engineering, Salvage Plans, and UC Approval

Each salvage company was required to submit salvage plans for specific tasks in their area of responsibility. For example, Resolve, responsible for the removal of Truss four from DALI, had plans for

the demolition and refloating of the M/V Dali. Donjon would submit lift plans prior to conducting each major lift operation (Section 1 Removal, Section 0 Removal, etc.) These plans were reviewed by SUPSALV's Naval Architect and Coast Guard SERT during their development phase. Once completed, they were submitted to the UC for their approval. Copies / samples of the major plans are included at Appendix H.

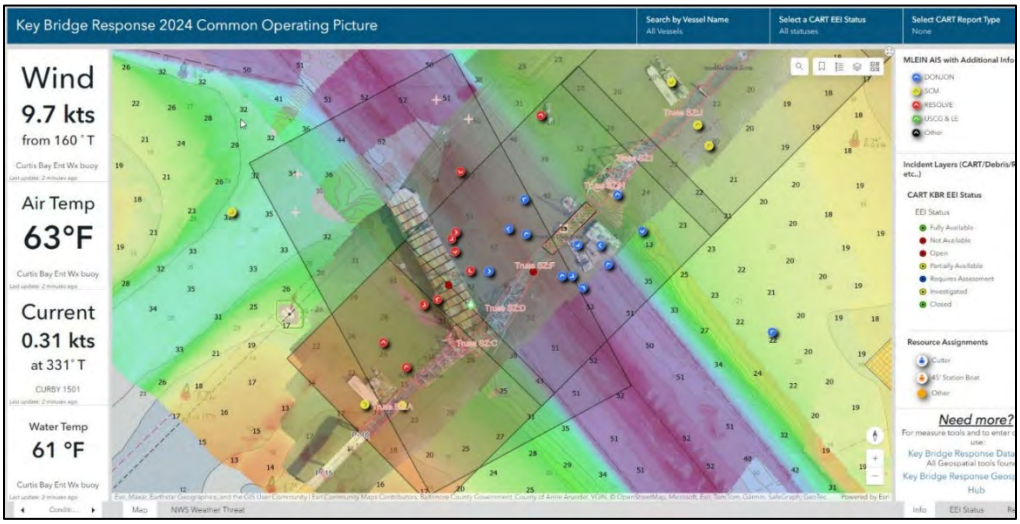


Figure 6-5 COP image from 16 April 2024. Resolve vessels in red, Donjon in blue and Skanska in yellow.

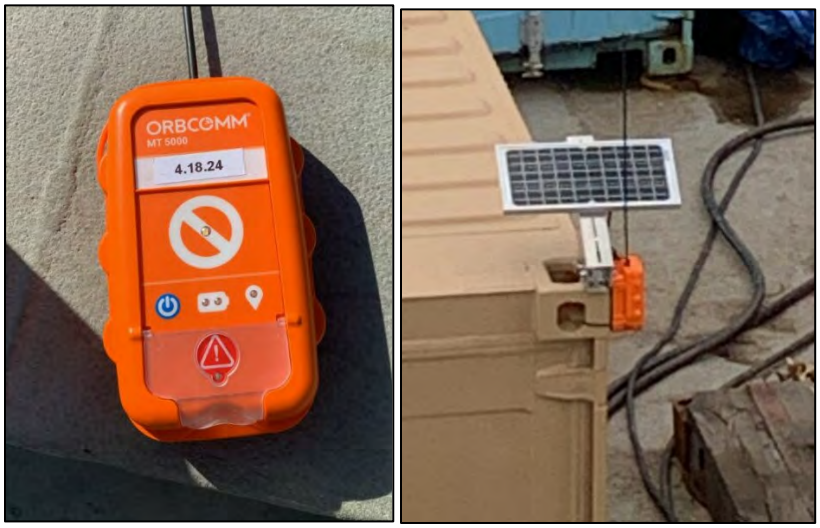
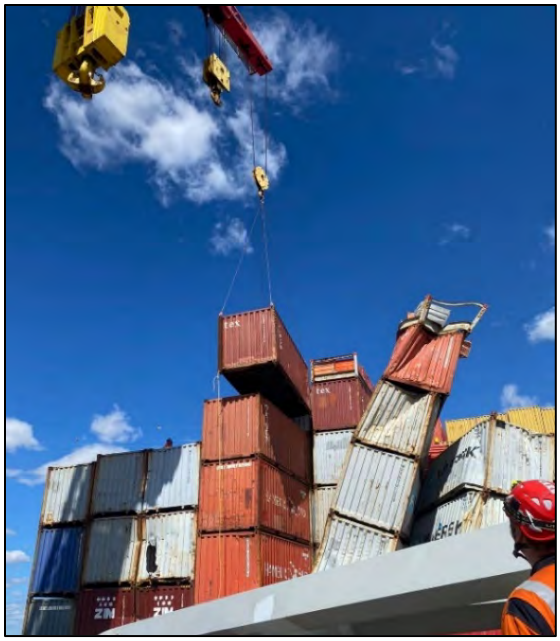


Figure 6-6 ORBCOMM AIS transmitter (closeup) and an AIS transmitter mounted along with a 25W solar panel providing a standalone solution for non-powered vessels.

6-9 Sharing and Retention of Data.

Navy computers connected to the Navy network using Nautical Virtual Desktop (NVD) and the installed WIFI (in the Unified Command) or hot spots allowed basic communication amongst our salvage team and with NAVSEA in Washington. Because there was a need to efficiently share material amongst the



Unified Command and three commercial salvage organizations, SUPSALV adopted use of the commercial application, Drop Box, to facilitate sharing and retention of documents. A Donjon documentation group developed an extensive folder structure and populated the folders with every daily report, each channel survey, and each salvage plan. On 1 April, we were informed that Department of Justice (Admiralty) had issued a Litigation Hold to all federal agencies involved in the bridge response. We informed our staff that we need to identify and preserve any Navy information, including emails, pertaining to the response.

Figure 6-7 Damaged container offload by Resolve Marine.

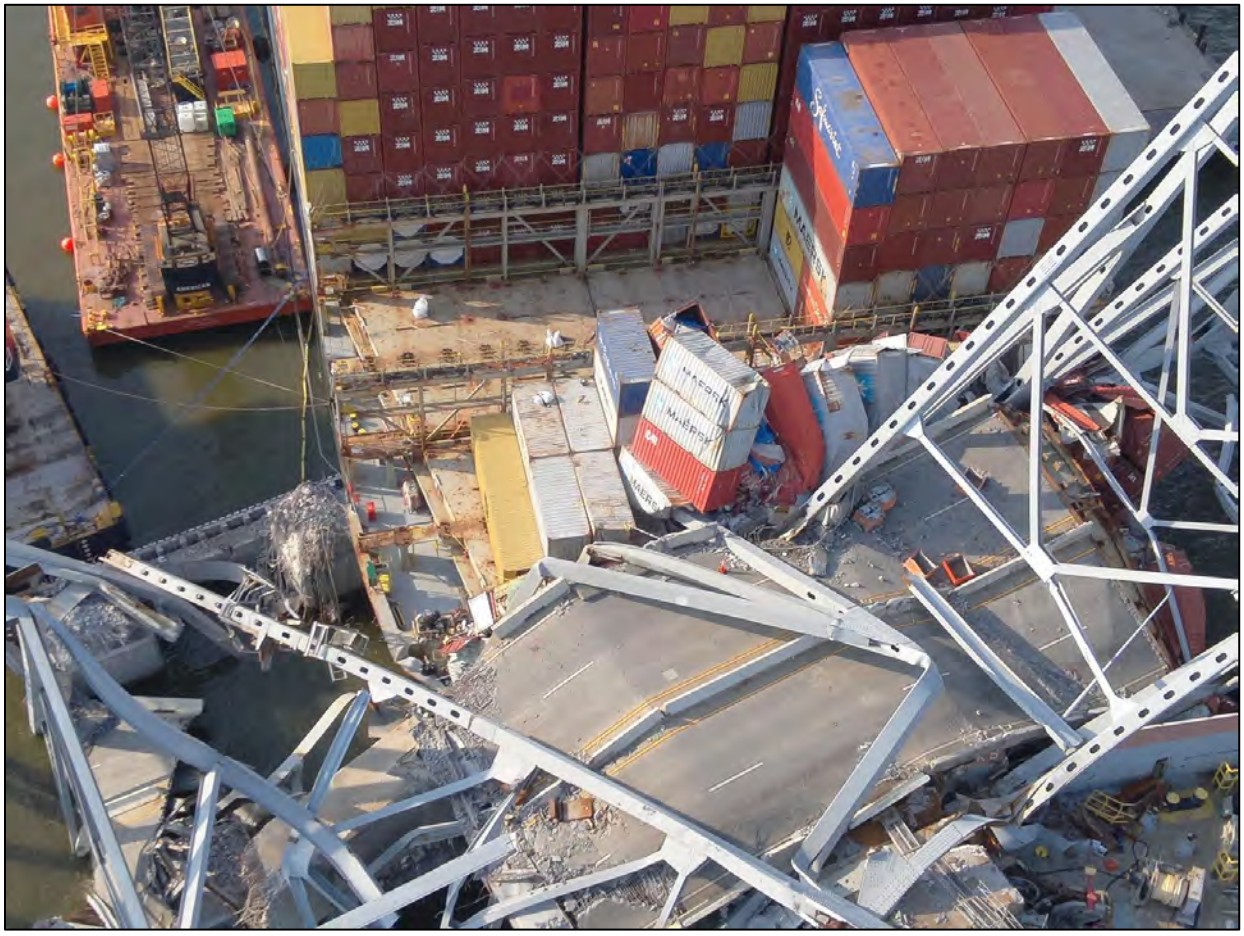


Figure 6-8 View from above of DALI bow area after collapse (Note the bridge roadbed).

Chapter 7 - Operations

The clearing of the Francis Scott Key bridge debris involved three separate salvage teams, each operating independently while closely coordinating together through the Incident Command to ensure the teams were not operating at cross purposes. From the start, the teams conducted this coordination with the Incident Command Center (ICC) at the Maryland Cruise Ship Terminal. Each team also maintained their own independent operational bases around the Patapsco River.

Sparrows Point, to the east, provided an expanse of pier space and industrial grounds which both Skanska and Donjon leveraged to support maintaining their vessels and the processing of materials removed from the bridge and riverbed. Most evenings, when the crews were off task, their vessels tied up at piers on this site.

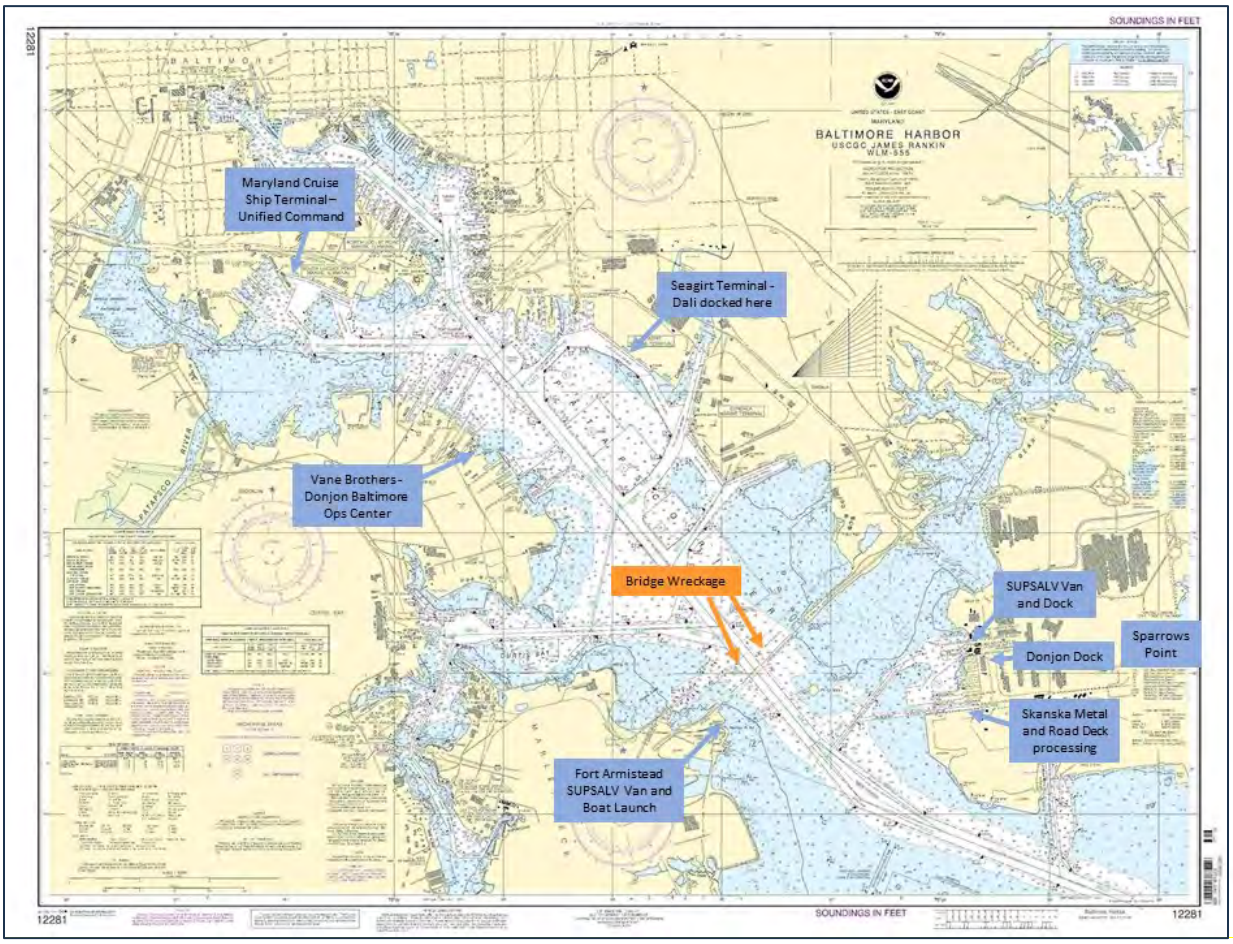


Figure 7-1 Port of Baltimore and points of interest to this operation.

Ft. Armistead to the south of the bridge is a waterfront park that the Unified Command used to stage an emergency response vehicle and an oil spill response team. SUPSALV launched their ESSM boats from a boat ramp at this location. Initially the ESSM 53' command trailer was located there giving the ESSM

boat operators, CODA Octopus operators, and the Dispatcher a workspace that was very proximate to the bridge wreckage location. It was approximately a 20-minute drive from the Cruise Ship Terminal which housed the ICC and Unified Command. On 23 April, the SUPSALV command trailer was moved to Sparrows Point, to be closer to the displaced material processing locations. ESSM boats continued to use the ramp at Ft. Armistead for boat launch and recovery. Traffic at both locations was controlled by Maryland Transit Authority (MTA) Police who kept the public out and recorded the names of people accessing the sites.

Figure 7-2 shows the channel, the shoals, the vessel DALI, the bridge trusses still visible from the air, and the rectangular work areas for each salvage effort. Area 4 to the south of the main channel and Area 2 to the north of the main channel are Skanska working areas. Area 5 is the Resolve area around DALI. Area 3, Donjon's, is the area under Truss 18. Blue V symbols are Donjon assets (barges, tugs, and cranes), yellow are Skanska vessels, and red are Resolve vessels. Blue + symbols represent stern and spring anchor positions holding M/V DALI in place. The colored tracking capability on the COP was provided by AIS transponders installed on the vessels and registered with the COP team.

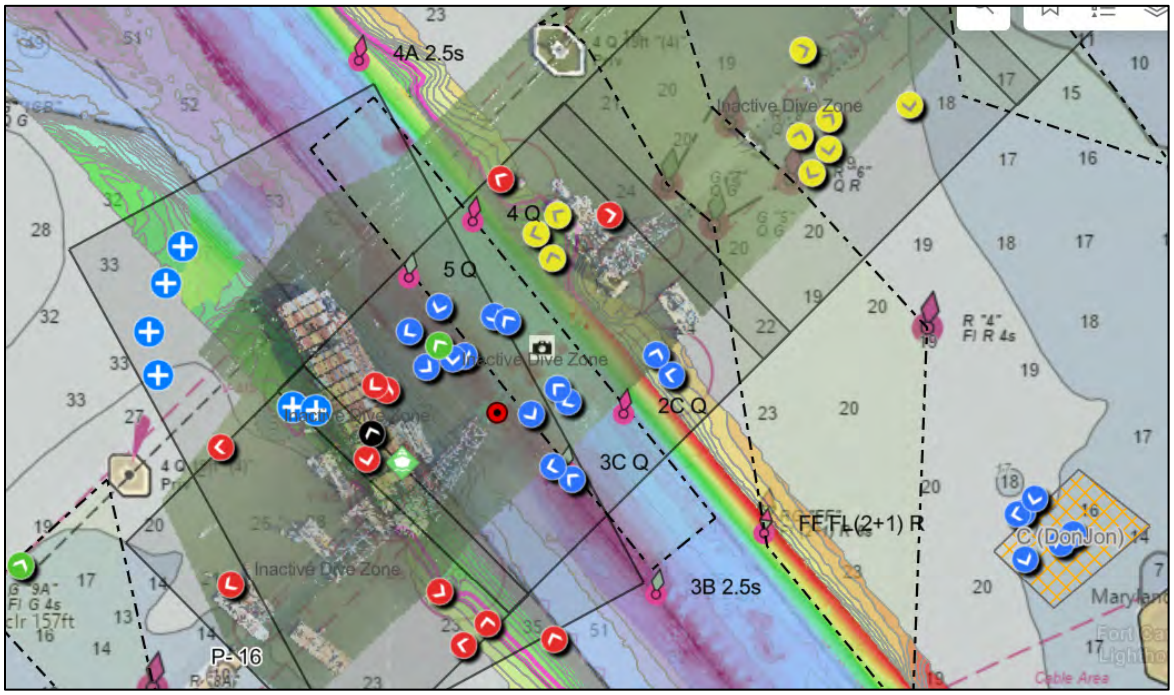


Figure 7-2 May 6: Common Operating Picture (COP) showing Skanska efforts near pier 18 and at spans 20 and 21, Donjon near span 18, and Resolve assets adjacent to DALI.

7-1 CODA Octopus Operations

SUPSALV's CODA Octopus system arrived on-site 31 March, along with the OEM representative Blair Cunningham. The team installed the system on the ESSM Boom Handling boat, a 30' inboard diesel and began by testing the system that day.

After satisfactory testing, the team conducted their first survey of the main navigation channel on 1 April. Because the visibility in the water was less than 2 feet, a diver survey of the wreckage was very

Figure 7-3 CODA Octopus sonar system mounted on an ESSM boat. Note GPS receivers on top, and the CODA Sonar, swung aft, out of the water for transiting.

difficult. On 2 April, the first CODA Octopus survey results were released, and a much clearer understanding of the task was provided to the salvage teams.

Figure 7-4 demonstrates the difference between what the team assumed was underwater between the visible portions of section 4 on the south side of the channel and the visible portions of section 1 on the north side of the main channel demonstrates the value of the CODA Octopus sonar system.

On the left is a blow up of the drawing Skanska assembled which depicted the assumed condition of the center channel. This shows truss sections, 4 on the left coming into the water from the bow of DALI, sections 3 and 2 in the middle, and section 1 on the right as it leaves the water and angles to the North. On the right is the first CODA Octopus survey imagery. It shows collapsed bridge truss material intermingled with the bridge roadbed. This accurate portrayal gave the salvage team the insight to use a wreck grab instead of diver-rigged individual truss sections to remove much of the bridge debris.

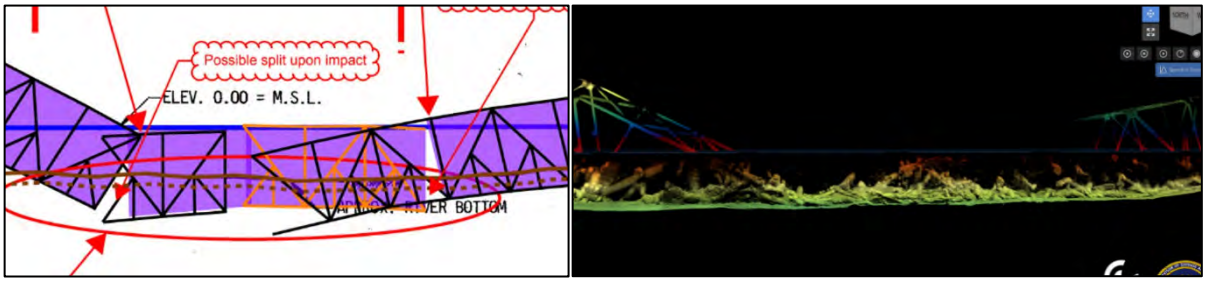


Figure 7-4 Assumed bridge debris from the start of the operation on left and actual CODA Octopus sonar imagery to right.

After removal of truss sections 1 and 0 the channel clearance team focused on deepening the main navigation channel. During this period, CODA Octopus was used to monitor progress of the channel clearance operations. The progress of the large wreck grab operated by CHESAPEAKE 1000 and the clam shell buckets operated from OYSTER BAY and DELAWARE BAY was enhanced by identifying specific high spots as they worked around Pier 18 and in the vicinity of Sections 0, 1, 2, and 3. Figure 7-6 shows a CODA Octopus image depicting a deep and smooth are of the channel with the few remaining high spots identified. The availability of highly accurate and near real time surveying equipment and the resulting data provided an unmatched ability to evaluate the near-real time status of the channel bottom. The capability greatly aided the salvage teams throughout the operation.

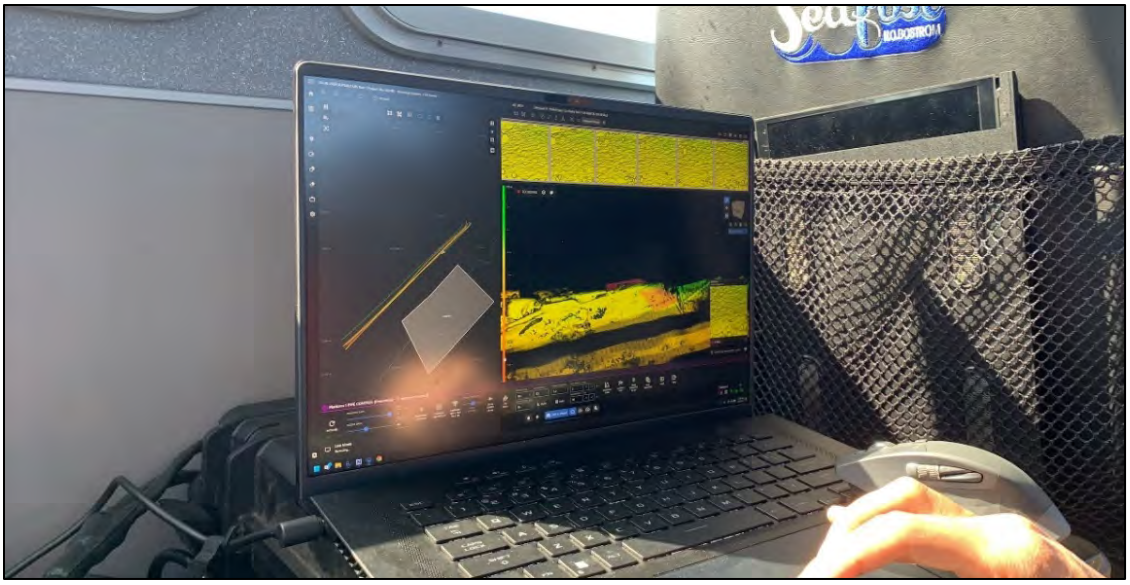


Figure 7-5 CODA Octopus Operator monitors a survey run from within the ESSM boom handling boat.

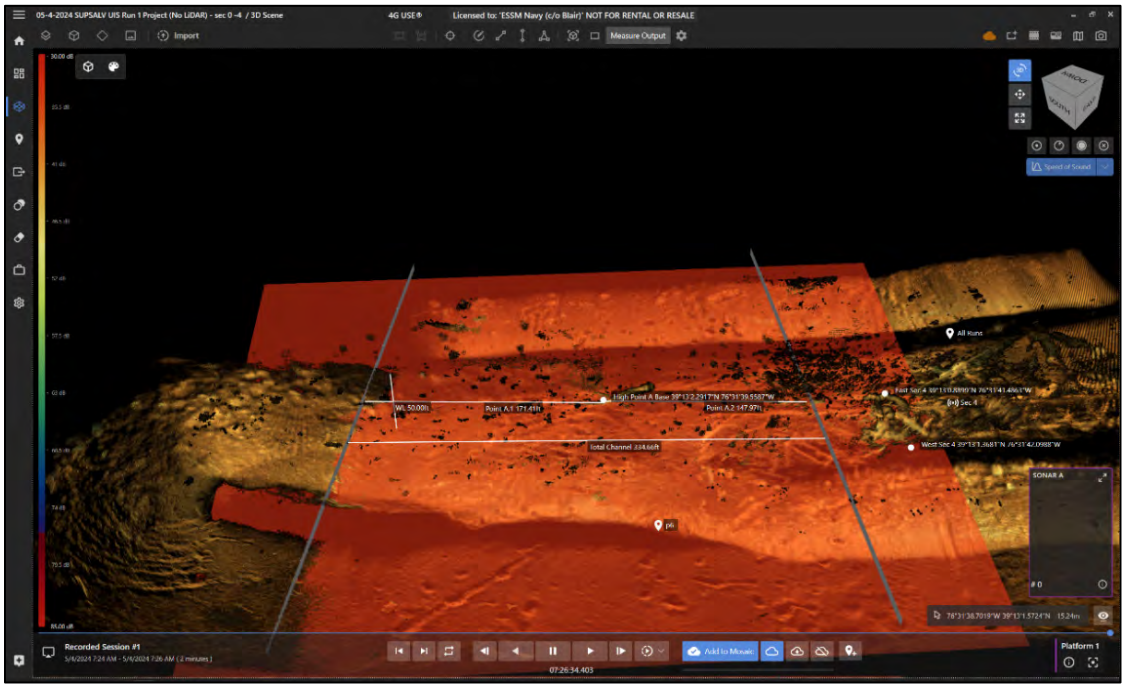


Figure 7-6 May 4: CODA Octopus survey of the initially cleared navigation channel.

7-2 Cutting Truss Sections

The bridge truss sections, after the collapse, were laying in very large sections often weighing over 1500 tons. Even the largest of cranes on-site were unable to lift them. Therefore, truss sections had to be cut into smaller pieces which could be lifted and transported 'on-the-hook' to Sparrows Point, or loaded

onto barges. Following extensive engineering analysis to determine weights and best cutting configurations to even the center of gravities, cut plans were established.

Several methods were used to cut the trusses. They included oxy-acetylene torch cutting, hydraulic shears, and diamond wire saw. Donjon, Skanska, and Resolve all individually brought these varying methods to the Patapsco River. Oxyacetylene cutting torches were a method to use, with the shortcoming that it put personnel directly adjacent to a component that could release unknown amounts of energy when cut, putting the operators in potential danger. Manual cutting was also time consuming and difficult to accomplish inside the truss sections out of reach of crane man baskets or manlifts. An alternative method was, using hydraulic shears that were either crane mounted or on the end of large excavators. They were able to cut smaller-gauge diagonal members in about 15 minutes. Given the dimensions of the upper and lower cords, often with thicknesses of 4-5 inches, shears were not able to fully separate the large sections of bridge truss.

Figure 7-7 Truss cutting methods – torch work on left and hydraulic shears on the right.

The third cutting method, the diamond wire saw, was able to cut through the extremely thick top and bottom cords. These hydraulically driven saws, see Figure 7-8, could be operated on or sub surface. In Figure 7-8, the cutting shears lie in the foreground and the diamond wire saw is the white object in the background. That cutting method can be used underwater and is a low temperature solution when flammables are an issue. Cutting through a major cord section was a process that would take several hours.

Figure 7-8 Left: Hydraulic cutting shears (foreground) and diamond wire saw on deck of the crane barge Farrell. Right: Diamond wire saw in use on the top cord of truss 0.

7-3 Trusses 0 and 1

The Unified Command identified opening the Preliminary Federal Channel (300ft x 35ft) to support reopening the port to an estimated 80% of traffic as the primary goal early-on. SUPSALV's early planning timeline identified 30 April as a target for have that initial channel cleared for temporary use. To obtain this midsize channel, SUPSALV committed to removing Truss 1 and Truss 0, and cleaning up the debris on the riverbed in those areas. Salvage plans were developed by Donjon engineers, reviewed, and approved by SUPSALV, and forwarded to the UC for final approval. An example of a truss cutting plan can be found in Appendix G.

A timeline graphic follows. It shows every Priority 1 and Priority 2 activity which lead to clearing of the federal channel. It also shows major milestones, surveys, and concurrent tasks.

Timeline of Key Events

Task Category

MARCH: 26 27 28 29 30 31
APRIL: 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
MAY: 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
JUNE: 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
JULY: 1 2 3 4 5 6 7 8 9

Events / Milestones

- Dali runs into Bridge
- USACE Task SUPSALV
- 1st CODA Survey
- Open 20' Deep Aux Channel
- Channel Survey
- Channel Survey
- Open 35' x 300' Channel
- Channel Survey
- CODA Survey Section 18
- Open 50 x 400' Channel
- Channel Survey
- Open 50 x 700' Channel
- Channel Survey
- Skanska Demob Steel Processing
- Donjon Complete Demob in Baltimore

Priority 1 Tasks

(Clear Federal Channel)

- Wreck Grab Arrives
- Clear High
- Mobilie Salvage Equipment
- Cut and Lift Section 1
- Cut and Lift Section 0
- Re-conf. Ches
- Clear High
- Wreck Grab IVO Section 0, 1, 2
- Re-conf. Ches
- Section 17 lifts (DALI Stbd Bow)
- Re-conf. Ches
- DWS Cut Secton
- Grab Ops DALI Port Bow
- Grab Ops Sect 2, 3
- Re-conf. Ches
- Cut & Lift Section 4
- Conduct Debris Removal
- Debris Removal & Dredge High Spots
- Dredge Ops
- Dredge and Grab Ops
- Displaced Material Processing Baltimore and Newark, NJ
- Displaced Material Processing Newark, NJ
- Thru 17 JUL

Priority 2 Tasks

(Remove M/V DALI)

- Survey DALI
- Clear Bow of Hazardous debris
- Develop Sect 4 Removal Plan
- Execute Section 4 removal
- Pre-Cut Section 4
- Lay Explosive Charges
- Demolition Section 4
- Clear DALI Bow of Hangers
- Refloat and Move DALI
- DALI Depart Baltimore

Clearing Truss 1 and Truss 0 would yield a channel about 300 feet wide between the debris covering truss 2 and 3 and the shallows/channel toe near the abutment at the north end of Span 18. The intent of this initial goal was to allow one way passage for vessels with tug escorts. To accomplish the clearing, Truss 1 was cut into two sections, referred to as 1A and 1B. Truss 1A was lifted on 14 April and Truss 1B, weighing 516 tons, was removed on 16 April. Following the removal of both components of Truss 1, the team moved north to Truss 0. Truss section 0-A was cleared on 19 April giving SUPSALV optimism that we could beat the original estimate of 30 April for the temporary channel. The crane barge OYSTER BAY was configured for clam shell digging and it worked for the next 3 days clearing the channel of debris. During the span of 3 days, April 20 – 22, Donjon worked to prepare and lift sections 0-B and 0-C.

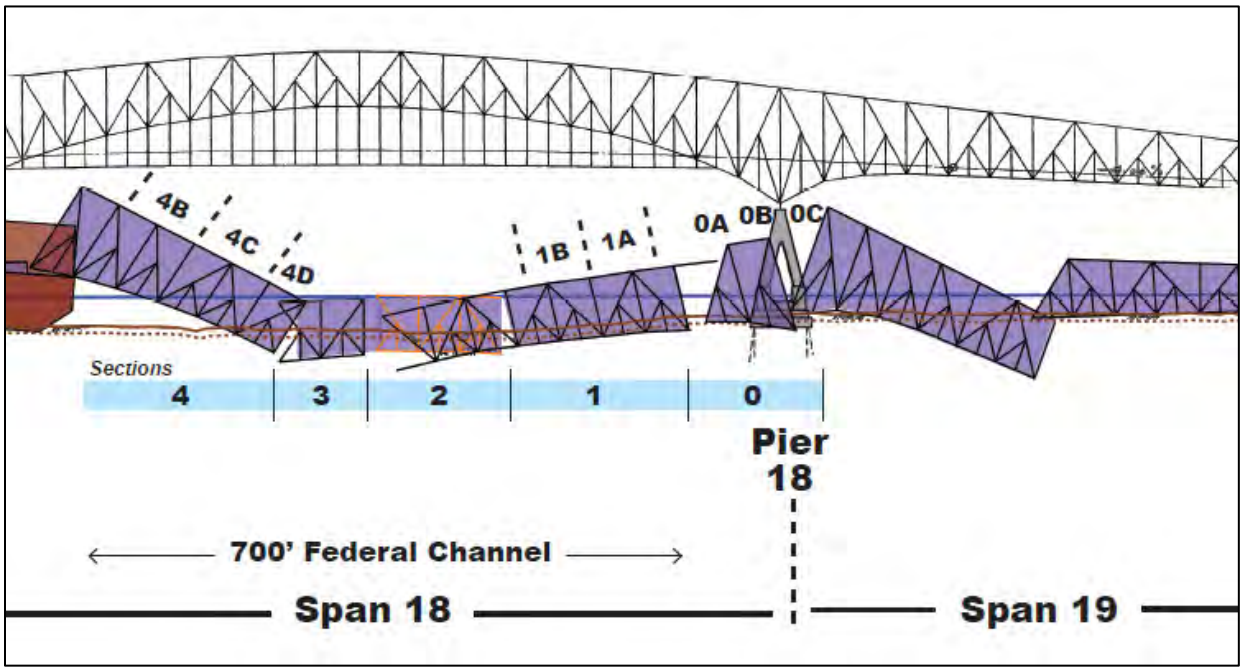


Figure 7-9 Section 1, and section 0, on the north end of the navigation channel were the first targets for the Donjon team.

After cutting interconnected pieces that were tangled with Span 19, Donjon attempted a dual lift with both CHESAPEAKE 1000 (1000 ton capacity) and COLUMBIA NY (450 ton capacity). Even with that lift capacity the section could not be moved. After further engineering analysis, the diamond wire saw was configured to cut the top cord of the truss to separate 0-B and 0-C. The saw cut about 7/8 of the way through the beam, but movement of the truss bound up the wire in the cut and broke the blade. As evening progressed, Donjon moved FARRELL 256 back to the west side of the truss and used FARRELL 256 to sheer several vertical members allowing CHESAPEAKE 1000 to alternatively lift and lower 0-B, creating bending stress near the top cord cut and successfully broke the nearly completed cut. That section finally cleared the water at about 0130 in the morning of April 23. It was recorded as weighing 560 Tons, the largest pick of the operation to that point. As CHESAPEAKE 1000 held 0-B up, COLUMBIA NY wrestled 0-C out of the water making the evening of 22 April a very productive night.

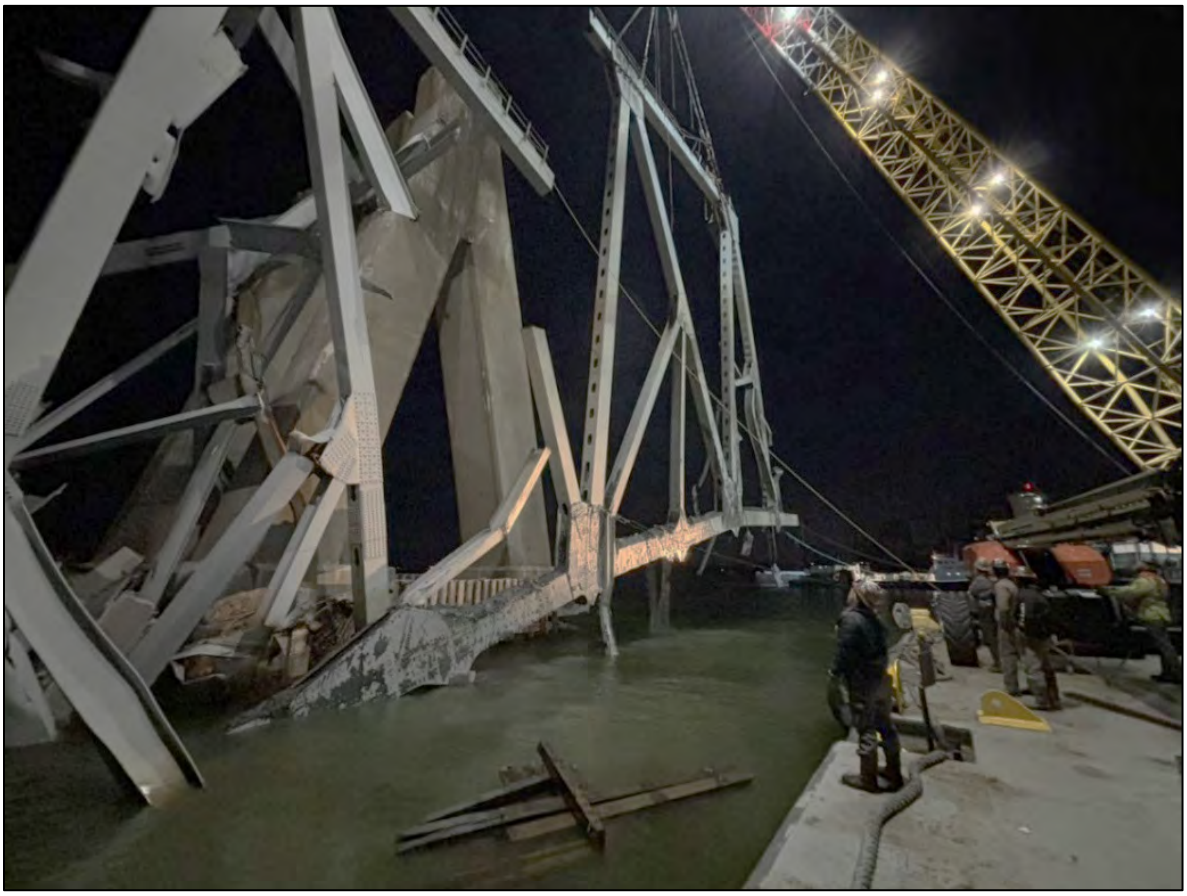


Figure 7-10 Truss section 0-B being pulled from the water at about 0130 on 23 April.

7-4 Temporary Channel Opening

It took much of the day on 23 April for CHESAPEAKE 1000 to carry truss section 0-B to Sparrows point and unload it. Because a few high spots had been identified in the temporary Navigation channel, OYSTER BAY had been tasked to work at clam shelling the channel that previous evening. A channel survey on 23 April revealed those high spots were still present. With Donjon exhausted by their two-shift effort, and the Navigation channel still needing attention, SUPSALV asked Skanska to use their new clamshell rig on barge Dale Pyatt. At midday, they moved it into position to begin digging for that material. At 1430 we were informed the Skanska clamshell rig was able to hook on to the debris but unable to pull it up. That afternoon the Skanska rig was able to pound the high spot flat and then worked the edge of pier 18 and pulled a large piece of roadbed steel overnight. A late day scan on 23 April revealed the channel was ready for traffic. Figure 7-12 shows the channel with a 38’ project depth, 3 feet deeper than the identified requirement.

On the Morning of 25 April, the 35 x 300 foot channel was open for use. A schedule of vessels who were going to pass was disseminated the day previous and the Unified Command was anxiously watching the schedule and monitoring DALI during the passage of these ships.

The first ship was BALSA 94, a 349' long by 63' beam break bulk carrier. She was outbound and was escorted by 2 Moran tugs approaching from the Ruckert Terminals. Her passage around 0930 was uneventful and was acknowledged by a cheer within the Unified Command. The second ship was larger than BALSA 94 at 608 feet and the third ship was the largest of all the ships scheduled for passage.

Figure 7-11 Crane barge Farrell's cutting shears used to separate truss 0 from the entanglements of the truss in span 19.

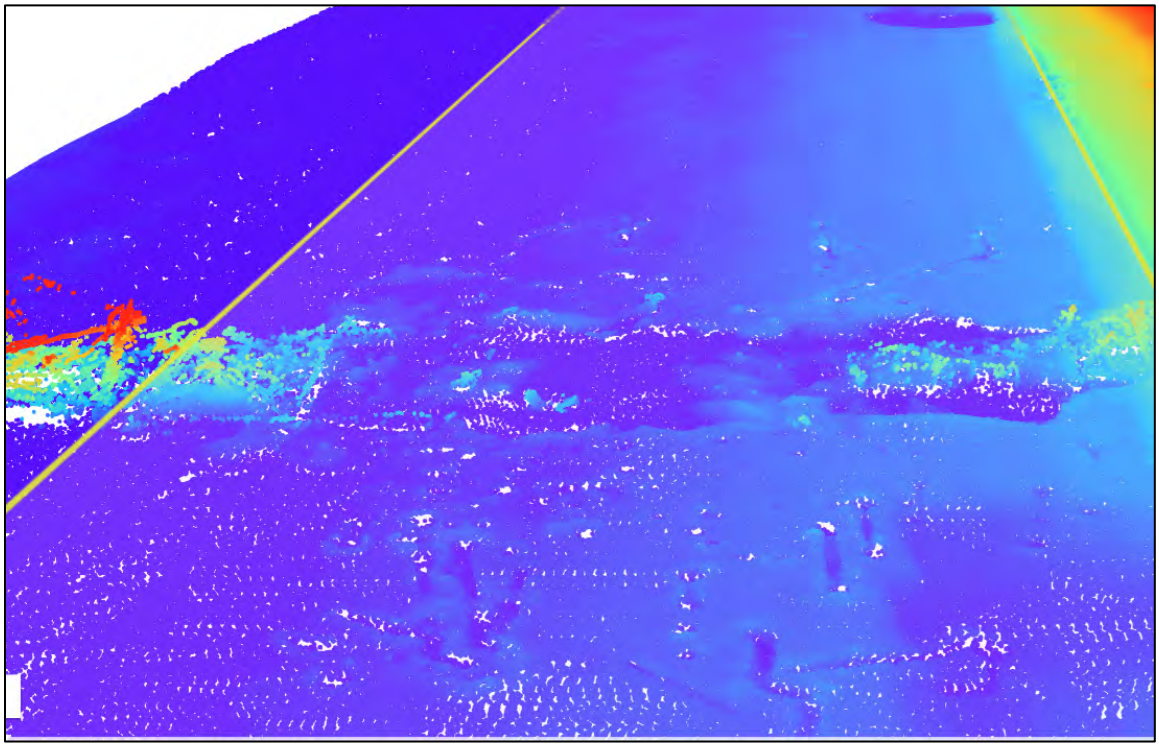


Figure 7-12 The survey shows the Fort McHenry limited access channel depths using 38 ft as the project depth (red soundings are shallower than 38 feet). This information was derived from the USACE survey conducted by CATLETT the morning of 24 APR.

Figure 7-13 Bulk carrier BALSA 94, the first ship to use the Preliminary Federal Channel, moves past the wreckage of the Francis Scott Key Bridge in Baltimore and the still stranded containership DALI April 25, 2024. Her passage represented the first commercial shipping traffic through the work area since the bridge collapse occurred.

The CARMEN, a 782 ft long and 108 ft wide Roll-on/Roll-off vessel, was scheduled for 1300 and would be a full test of the temporary channel.

Onboard the DALI, the Resolve team was monitoring the strain gages mounted to the truss section and the six mooring legs. Two tugs were made up to DALI and another on standby in the event there was unexpected movement of the ship. She had been ballasted down keeping her grounded and reducing the likelihood that she would move with the passing of the cargo vessels. As it turned out, the CARMIN passed with little to no measurable movement aboard DALI. In all subsequent ship movements for the rest of the operation there was little to no movement of DALI.

7-5 Wreck Grab Operations

After the temporary channel was opened during the period 25 – 30 April, the main navigation channel salvage team went to work with the wreck grab. This was a 1000-ton capacity hydraulically operated claw type grab mobilized aboard a barge and shipped from Galveston, TX. Mounted on CHESAPEAKE 1000, it had a net capacity of 800 tons (accounting for its weight and the lifting capacity of CHESAPEAKE 1000, making it the largest mechanism for lifting debris on-site).

On 30 April, after connecting and testing the wreck grab, CHESAPEAKE 1000 began working the debris in the vicinity of Pier 18 and where Section 0 had been. The extraordinary size and power of the hydraulically-operated grab allowed for faster and more effective operations with the large pieces encountered on the river bed. The CHESAPEAKE 1000 is a derrick crane and cannot move its boom. It therefore must be positioned with a tugboat and held in position with spuds, generally with an adjacent deck barge. Once debris was raised, a debris deck barge was pushed under the grab and the pick was lowered onto the barge. At the same time as grab operations, both OYSTER BAY and DELAWARE BAY operated clam shell dredges picking up the smaller remaining pieces of debris.

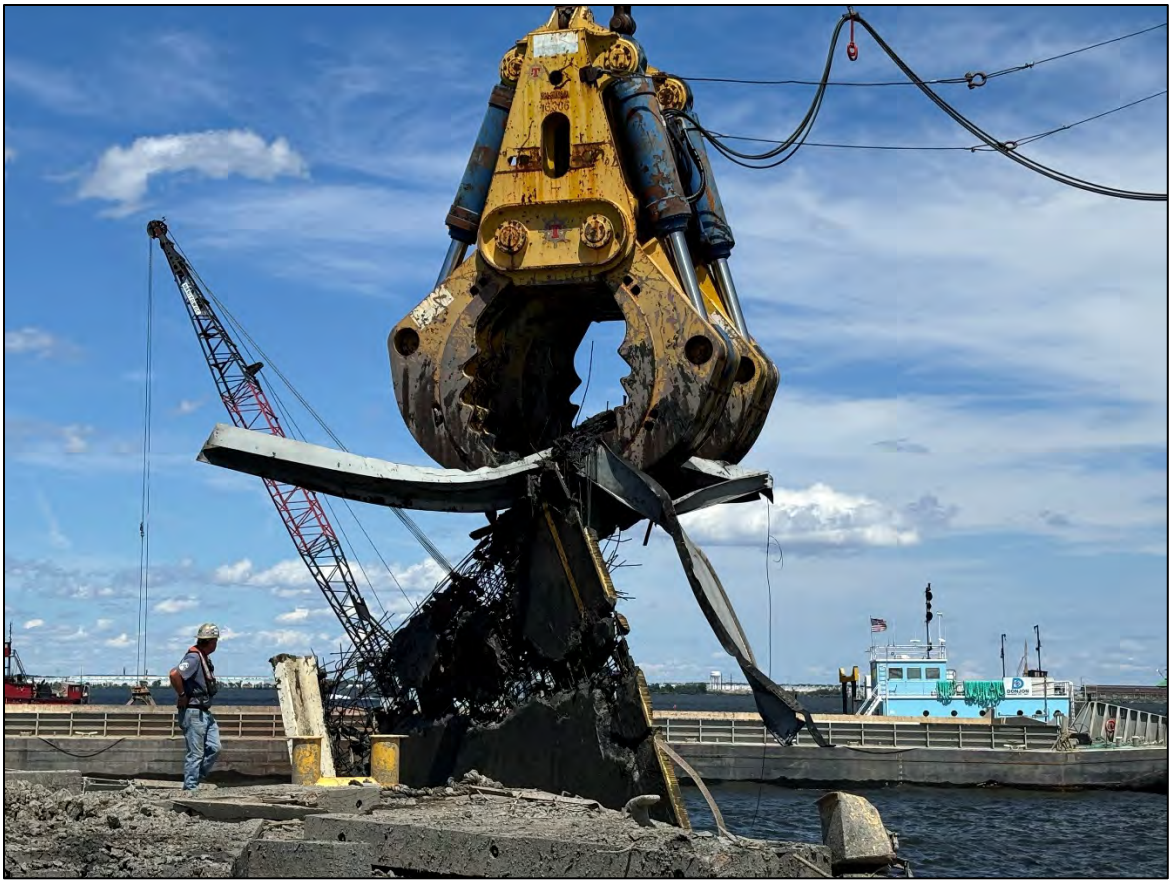


Figure 7-14 May 2: CHESAPEAKE 1000 raising the wreck grab from water clearing debris in the navigation channel.

Figure 7-15 May 5: Donjon cranes working the Federal Channel with Skanska operations adjacent to pier 18 in the background.

The grab and clam shell rigs were made more effective using the boat mounted CODA Octopus system, which directed the crane's rig to the high spots and ensure the grabs were positioned correctly to connect the bridge debris. The imagery was used live, with the CODA Octopus team speaking to the team on the barges. Figure 7-16 shows the sonar imagery of the wreck grab after closing onto a piece of debris and beginning to lift it from the river bottom.

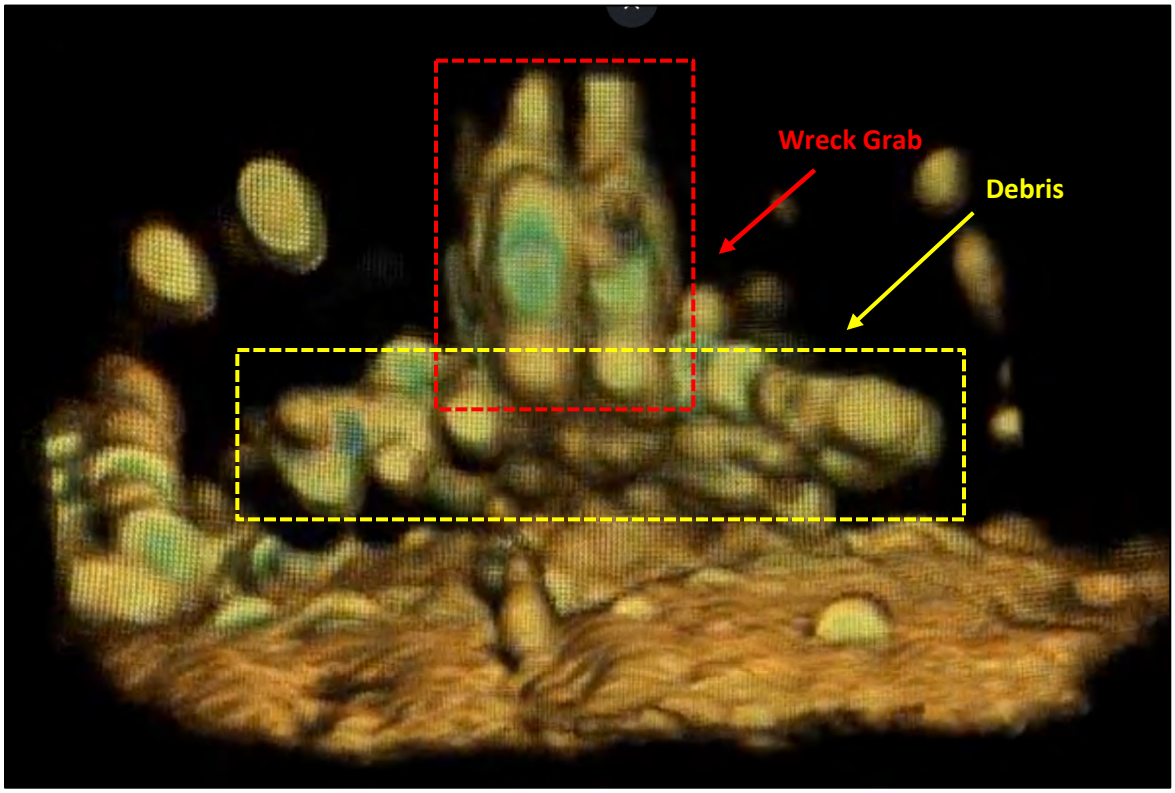


Figure 7-16 Screen shot of video from CODA Octopus used to guide the wreck grab to debris on the riverbed.

As a result of the efficiency of the wreck grab, the Coast Guard informed SUPSALV that they had a requirement for a wider, deeper draft channel for a couple of coal carriers to exit Baltimore on a not-to-interfere bases with the removal of truss 4. They determined that a 350 x 45 channel could be obtained. This would allow them to transit a vessel with a 106-foot beam that had a depth of 45'. The Coast Guard would conduct a final survey at 1900 Tuesday, 7 May, reset the markers to the wider width, and allow pilots to move a couple of these deeper draft high priority vessels. Survey Results, shared on 8 May are shown in Figure 7-17.

7-6 Freeing DALI from the Debris

While more detailed analysis and reporting is provided on removing Span 18's Truss 4 from DALI's port bow, the starboard side of DALI was also entangled in bridge debris. The following images show Resolve's efforts during the period 2 – 6 May. Figure 7-18 shows a detail of the entanglements. Figure 7-19 shows the bow after the large truss section from Span 17 had been removed, and Figure 7-20 shows the concrete column being cut with a diamond wire saw.

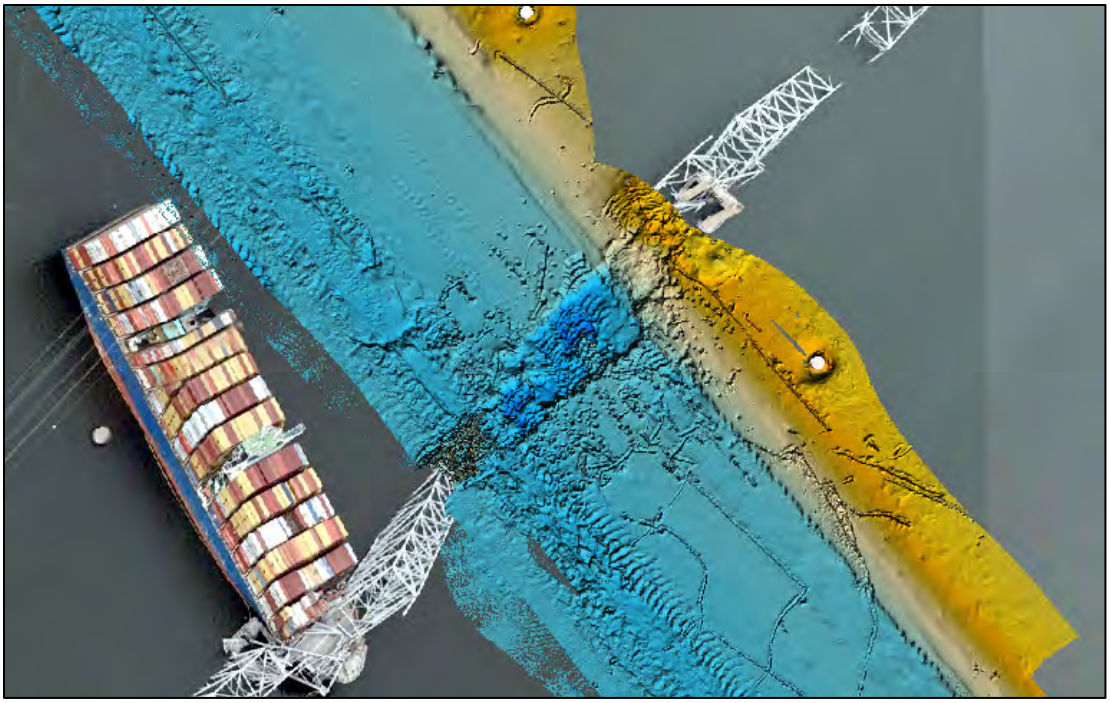


Figure 7-17 May 8: USACE survey of channel following grab ops IVO sections 0 and 1.

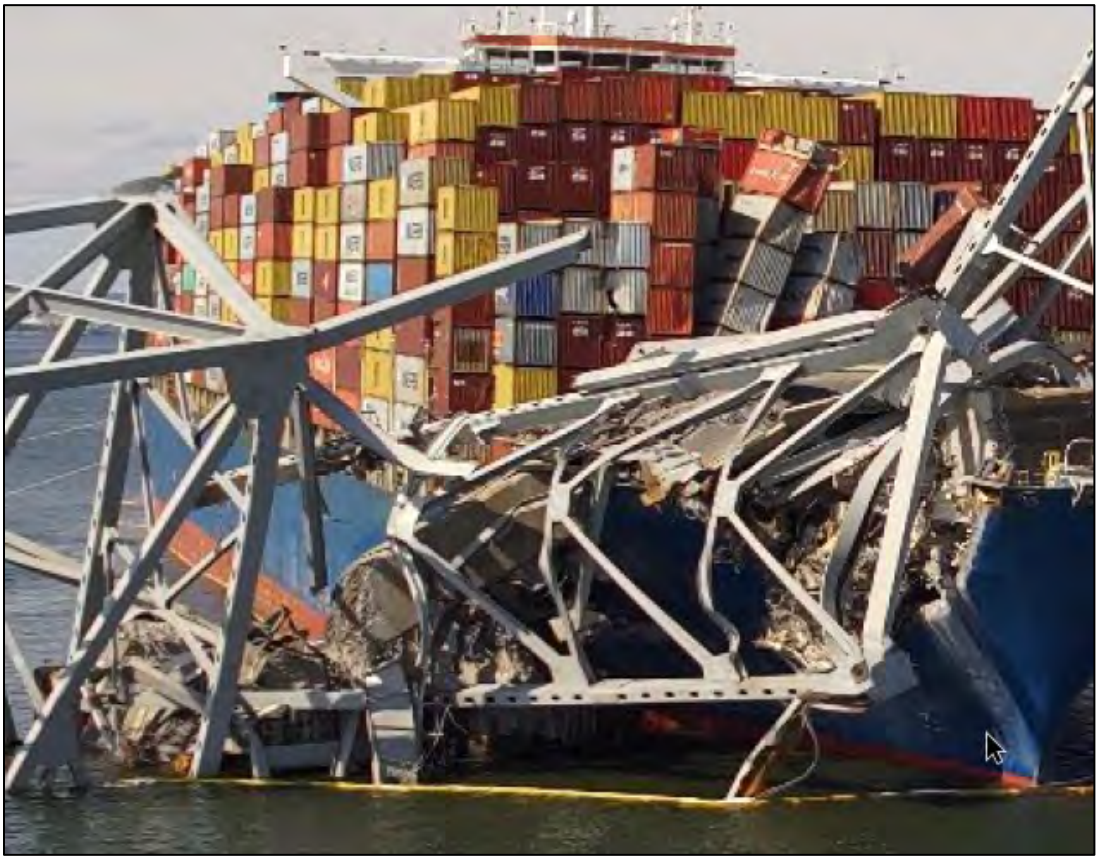


Figure 7-18 A view of M/V DALI's starboard bow with complicated debris entanglements.

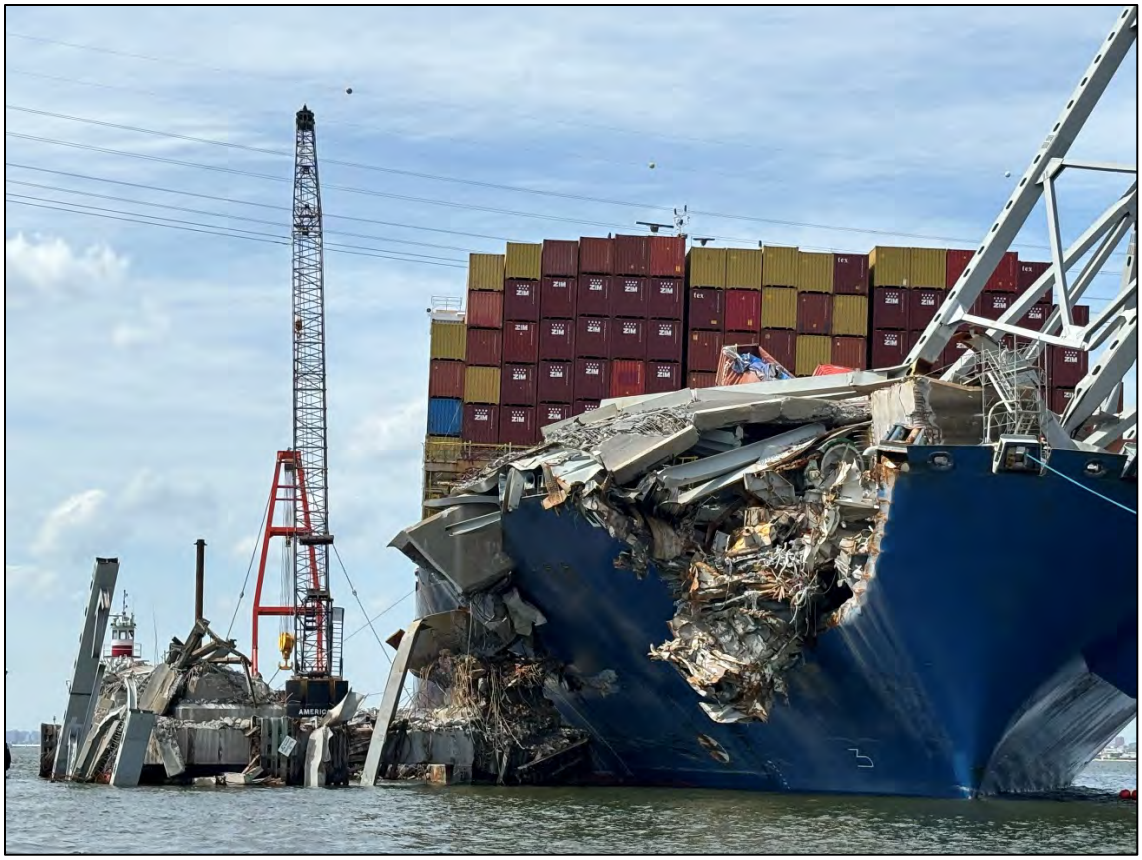


Figure 7-19 DALI's starboard bow after the large section of span 17 was removed.

Figure 7-20 Concrete pillar cutting using a diamond wire saw.

7-7 Cooperation and Interwoven Tasks

While preparations for demolition of Truss 4 continued, SUPSALV oversaw the deployment of assets to be best utilized in meeting project goals and milestones. On 7 May, Donjon returned CHESAPEAKE 1000 to Sparrows Point to derig the wreck grab and rig lifting equipment for preparation for lifting truss material in span 17. Skanska had precut truss section 17, and with COLUMBIA NY's support for rigging, CHESAPEAKE 1000 lifted 17A on 8 May and carried it to Sparrows Point for unloading and processing. May 8 – 10 continued clearing truss material in span 17 with CHESAPEAKE 1000 and COLUMBIA NY both conducting heavy lifts. These efforts are depicted in Figures 7-21 through 7-23.

Figure 7-21 May 8: CHESAPEAKE 1000 lifting truss section 17A from the water. This was a joint Donjon-Skanska effort while Resolve was finishing preparations for demolition of Truss 4.

Figure 7-22 May 8: Skanska cranes (red) and Donjon cranes (light blue) work together to cut and lift truss section 17-1 just south of M/V DALI. This operation was the result of the two salvage companies joint planning and preparations.

Figure 7-23 Truss 17 material remaining above the water at low tide after the teams made their lifts the week of 8 May.

7-8 Removing Truss 4 from DALI

As a result of the collision of the MV DALI with the Francis Scott Key Bridge on March 26th, a section of the main navigation channel bridge truss (referred to here as Section 4) was hanging off the port bow of the MV DALI. Resolve Marine required a safe solution to remove truss section 4. Due to the unstable orientation of Section 4, it was decided it would be necessary to demolish the structure through the implementation of a controlled explosive demolition. The use of shaped cutting charges to section the truss in its current orientation was the fastest, safest, and most predictable means for demolishing the extremely large, heavily damaged and stressed structure. Beginning in early April, Resolve began working with a team of industry-leading demolition experts to develop a demolition plan that would safely and quickly topple the damaged bridge section, and expedite the clearance of both bridge truss and vessel from the Fort McHenry Channel. With daily meetings, Resolve, Donjon, Controlled Demolition Inc., and SIGMA Engineering developed a plan to conduct the controlled explosive demolition. The demolition plan consisted of placing cutting charges on the portion of the bridge span resting against the port bow of the MV DALI. The planned placement would bring the span down to the riverbed and segment the truss nearest the ship into pieces. The plan was expected to leave the truss laying on the river bottom and would be cut where/if needed for subsequent lift by CHESAPEAKE 1000. Figure 7-24 shows the disposition of Section 4 on the port bow of DALI.

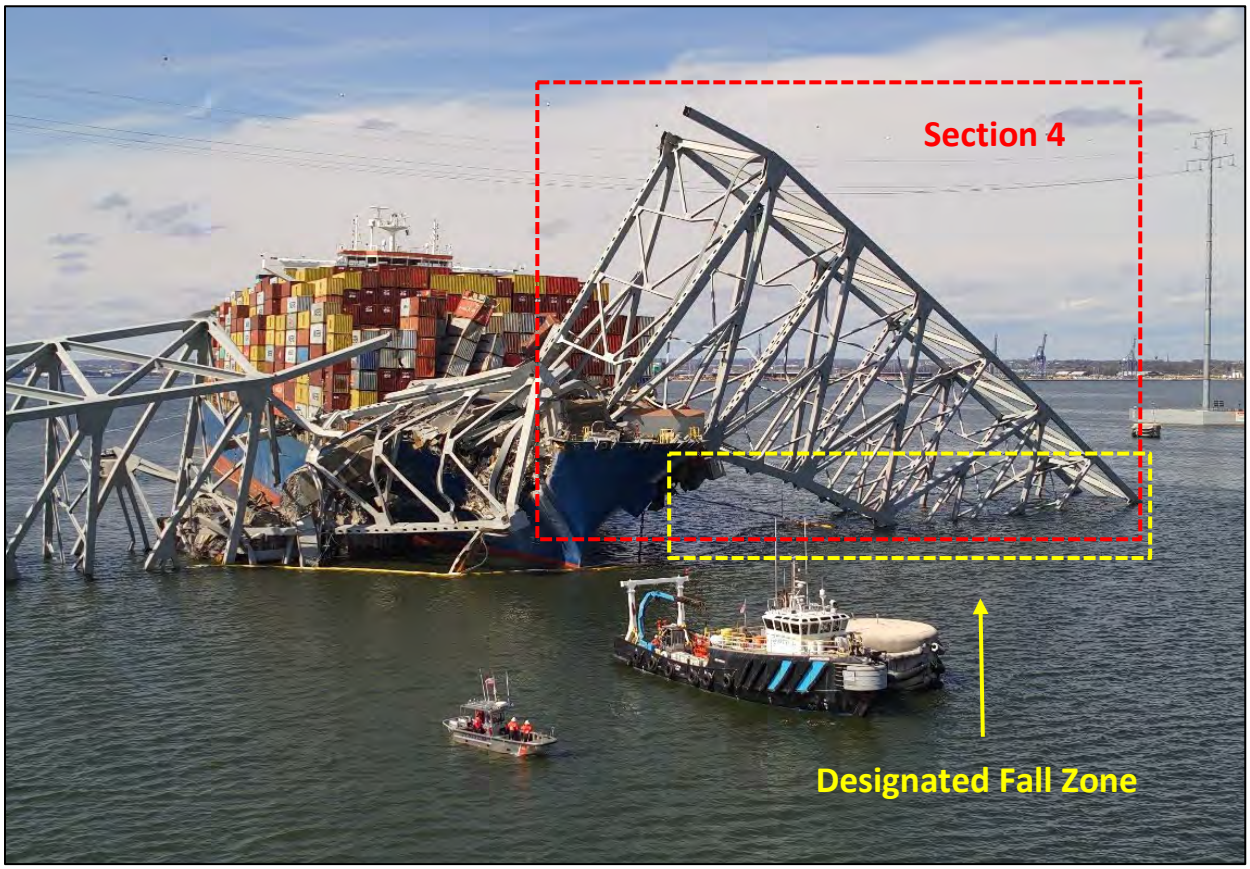


Figure 7-24 M/V DALI with bridge sections and road debris covering the bow.

The truss would be parted through- the use of controlled linear-shaped explosive charges and gravitational forces. Linear shaped charges were placed on designated critical support members only. Explosive charges provided the cutting effects only and allowed the gravitational loads and specified supports to control the direction of the fall within the designated fall zone.

Charges were specified, identified, ordered, shipped and brought to the site over the next few weeks. To place the charges, it was necessary to make 'precuts' and windows at prescribed locations before charges could be rigged. Utilizing man-lifts on barges and man-baskets from their cranes, Resolve placed their cutting teams net to the truss to make these precuts. Given the exaggerated heights of the truss section (over 200' from the water surface, and the relatively small deck barges on which the equipment was operating, these precuts could only be made in relatively fair conditions as wave/chop/wind impacted the manlifts. Adverse weather, ship traffic, and other delays drew this process out and although cuts began on 18 April, the final cut were not completed until 5 May.

Figure 7-25 Left: Example of a "hot" pre-cut made in a truss member to allow effective placement of explosive charges. Right: Manlift hoisting welder to top of Truss 4 during pre-cutting operations.

After pre-cuts were complete, Resolve began placing charges. As the timeline began expanding from charge placement delays, the Unified Command requested Resolve provide updates at 1300 each day, reporting status and plans for the demolition and eventual removal of Dali. Beginning May 6th, thirty-nine charges were placed over a 6-day period. Figures 7-26 and 7-27 show the shaped charges being staged on a man-lift and an installer placing the charges on a top cord of truss 4.

Figure 7-26 Shaped charges loaded onto manlift basket for placement at specified cuts.

Figure 7-27 Charges being placed during the week of 6 May.

7-8.1 Results of Section 4 Demolition

Operations on 12 May were scrapped due to instances of lightning strikes in the vicinity. The morning of 13 May saw several commercial vessels successfully passed through the expanded temporary channel, and by mid-afternoon work vessels were beginning to clear the area for the planned demolition scheduled for 5 pm. Donjon spudded down the crane barge FARRELL 256 near Fort Carroll, about 2,000 ft east of the bridge, acting as a command/observation platform by members of the Unified Command. Figure 7-28 shows the controlled detonation that occurred as scheduled on 23 May.

Figure 7-28 Section 4 Explosive Demolition.

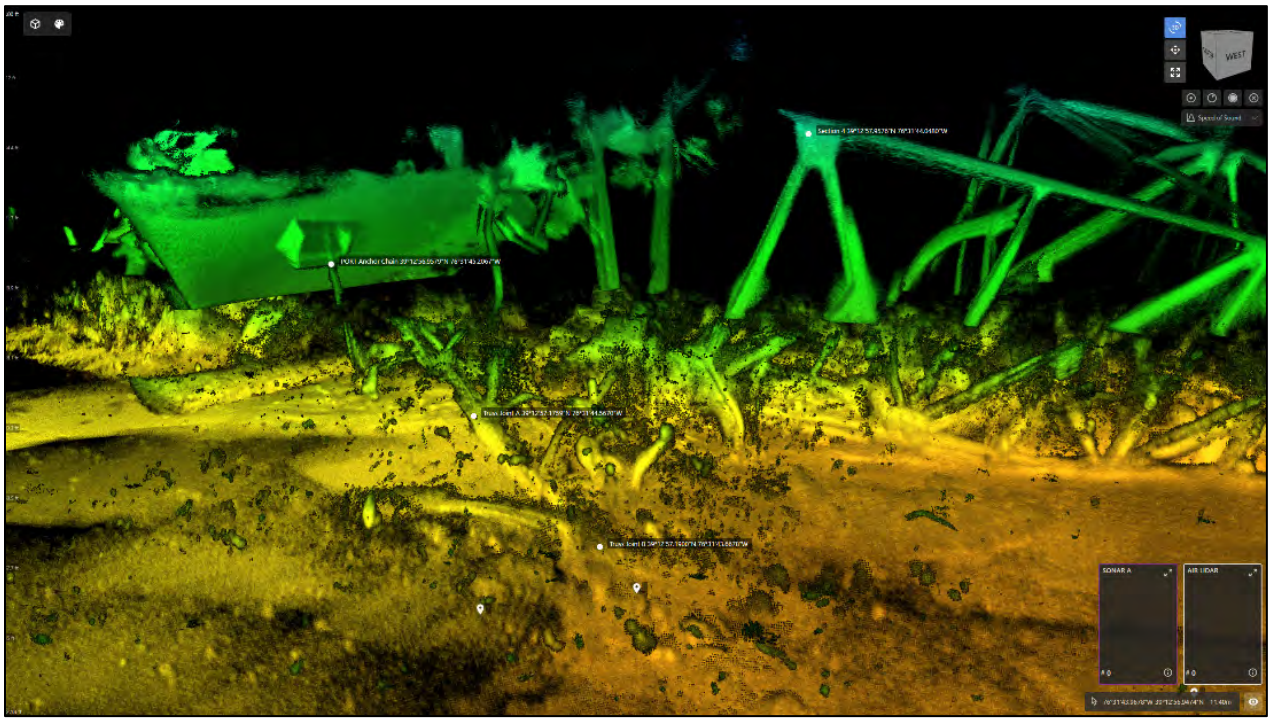


Figure 7-29 A screenshot of the CODA Octopus survey conducted immediately after the demolition. On the left is the bow of DALI with the anchor chain exiting the hull. To the right, scattered truss debris that the salvors would need to remove. The green imagery shows items above the water and yellow images are items within the water.

From the deck of FARRELL 256 it was difficult to see details of the results, but shortly after the “all clear” was sounded one ESSM boom handling boat configured for CODA Octopus surveys headed out to document the underwater results of the blast. Shortly afterwards a second ESSM boat carried a crew of Donjon and Resolve salvors to the scene to see and assess actual conditions of Section 4. Figure 7-29 shows the results of the CODA Octopus scan. Figure 7-30 shows the results of the shaped charge operation.

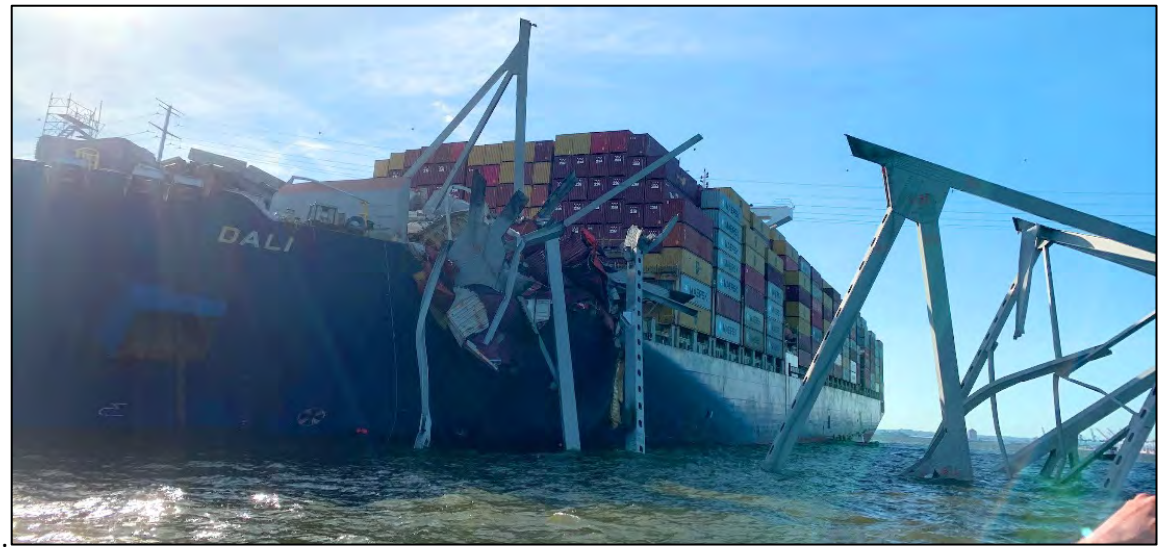


Figure 7-30 An above the waterline view of nearly the same perspective as the CODA Octopus imagery. Those "hangers" leaning up against the hull and still hanging off the bow would need to be removed before the ship could be pulled out of its grounded position.

7-8.2 Clearing Debris from Channel

The morning after the blast, teams were coming to terms with the amount of effort still required before M/V DALI could be moved. Resolve indicated that the “hangers” leaning up against the ship and hanging over the port bow rail would need to be cleared before they would put divers in the water to inspect the DALI port side river bottom, verifying no material is adjacent to the hull that could cause damage when shifting to port and then backing out. It was thought the vessel would come slightly to port because the starboard hull was hard against a concrete abutment. After that morning’s salvage meeting, the two salvage teams involved (Donjon and Resolve) met on their own to coordinate plans for that day’s activities.

That afternoon, Donjon’s team with CHESAPEAKE 1000 began to clear the long steel sections leaning against the ship. The piece the Wreck Grab initially latched onto was too long to place on the waiting barge, so CHESAPEAKE 1000 left its moor and carried the steel section to the Sparrows Point processing yard.

During the evening salvors’ meetings, SUPSALV acknowledged the limited progress of that day noting that only one large piece was removed. After hearing Resolves’ ideas for how the wreck grab could be employed to assist Resolve in clearing the bow of Dali, SUPSALV expressed concern with the extent of help Resolve needed. This would divert Donjon’s CHESAPEAKE 1000 and the wreck grab from their

principal priority, which was channel clearance. SUPSALV reiterated that Donjon's support of DALI bow offloading would be limited to what was necessary for them to get underway and to what Resolve could not accomplish with the equipment they had on hand. SUPSALV's priority was returning to work on the principal priority of clearing and opening the navigation channel, AKA Priority 1. The Coast Guard confirmed that evening that extending the width of the 300 x 50' deep channel to 400' wide would allow single file passage of the largest ships the port handles, thus opening the port to all traffic. SUPSALV indicated they would put CHESAPEAKE 1000 with the grab to work on the north end of Truss 4 as soon as possible to clear the channel to the 400' width.

Figure 7-31 Salvors from Donjon and Resolve met the morning of 14 May to plan actions needed to clear DALI from its grounded position.

Figure 7-32 Left: the first hanger being collected by Donjon's wreck grab. The salvors found it was too long to clear the water's surface, so they lowered it back to the riverbed. Right: the wreck grab lowered to the bottom, attempting to find a better purchase on the truss section with the ESSM boat operators broadcasting the CODA Octopus picture "live" on Microsoft Teams, guiding the grab to the best location.

7-9 Channel Widening

The week following the demolition continued with Donjon's wreck grab conducting a second day of heavy lifts off the port bow of DALI, clearing all hanging steel and leaning pieces next to the ship. On

Figure 7-33 The same truss piece, after repositioning the grab. This was transported directly to the Skanska steel processing yard as it was too long to lower to the barge deck.

Thursday 16 May, the third day after demolition, the grab was moved north to begin lifting on the edge of the 300' wide channel, working it toward widening it to 400'. This is the area that had been designated Section 3.

Dredge scars and non-debris related high spots were going to be smoothed over by a leased Donjon drag barge DANA. DANA was locally sourced and placed on-hire the week of 14 May. It was used to knock the high spots down after dredging operations were completed.

Wreck grab operations continued at the foot of Section 4. On some lifts, the debris was intermingled with Truss 4, could not be pulled free, and had to be dropped. Other lifts were successful and large pieces of steel were removed. At that point, a large shear broke the debris up into reasonable size pieces and cleared the deck for the next deposit, shown in Figure 7-37.

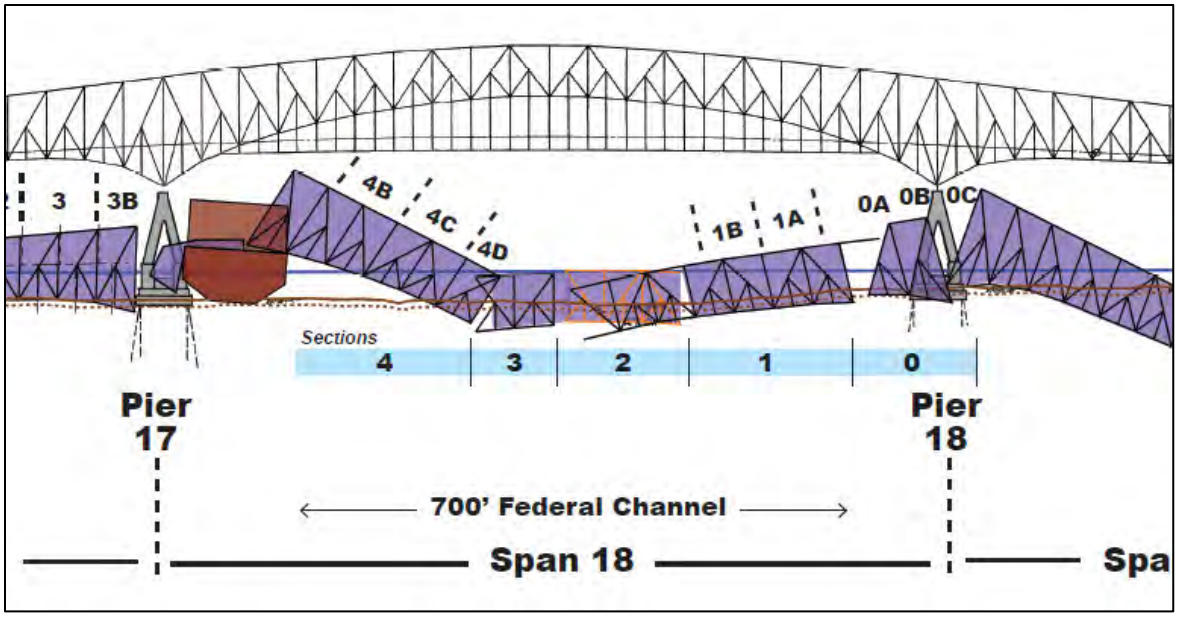


Figure 7-34 An update to the original planning drawing showing truss sections in the navigation channel. By 16 May, Section 1, 2, and 0 were removed and a 300 ft x 50 channel had been created. Donjon, with CHESAPEAKE 1000 and the wreck grab was working on Section 3 and Donjon engineers were working on the plans for Section 4.

Figure 7-35 May 16: Donjon equipment clearing the riverbed at the foot of Section 4.

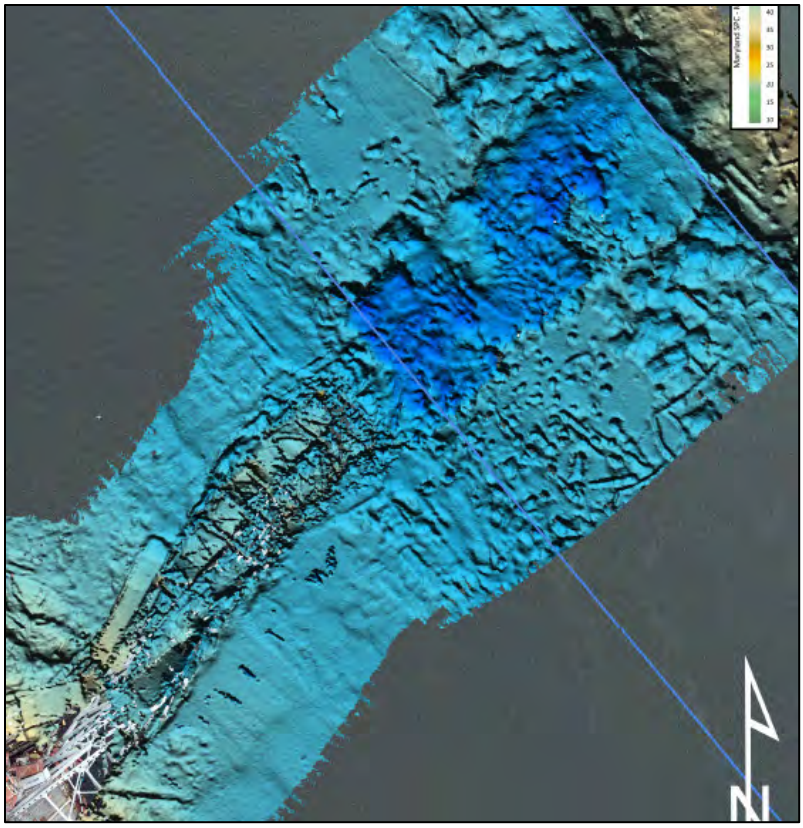


Figure 7-36 May 14: Donjon channel survey shows the deep existing navigation channel and the debris immediately to the south the area designed as Section 3 which, from the surface, appears at the foot of Section 4.

Figure 7-37 May 17: Deck crawler equipped with shears cutting and clearing steel deposited by the wreck grab.

7-10 Refloating of DALI

Reports from Resolve on 19 May indicated that DALI would be ready to be moved on Monday, 20 May. That afternoon, all anchors holding her in place were removed and two tugs were alongside. At 1800, Resolve completed a dive survey and reported no issues. At 0200 on the morning of 20 May, DALI began de-ballasting and three additional tugboats took their places alongside the ship. Refloat was scheduled for high tide at 0540 that morning. Dewatering continued with one tug gently pulling astern and 4 tugs managing the ship's lateral position. At 0650, movement was observed on the starboard bow where the ship had been nearly touching Pier 17. At 0655, the ship's horn sounded indicating the vessel was underway. Guided by the tugboats, DALI transited to the Seagirt Terminal and was docked at about 0940.

Resolve would coordinate with the Captain of the Port directly from this point on. Their intentions were to unload the bow of bridge material and get the ship ready for transiting to Norfolk where she would unload her cargo. Once removed from the site, DALI was no longer part of the effort to reopen the channel.

Figure 7-38 By 0700, DALI was pulled clear of Pier 17 and being pushed to the Seagirt Terminal.

7-11 Changes following Departure of DALI

Back at the Unified Command, with DALI departed, the Coast Guard immediately shifted focus to obtaining a full deepwater channel for ship traffic. They directed inquires at SUPSALV to report when that would be available. At that time, the channel markers were set for a 350 foot channel but significant progress widening the channel had been made at the foot of Section 4. At this point, the most recent survey dated 19 May indicated that 50' depth was available in most of the desired width of

400 feet, but a few high spots remained. The decision was made to retain the channel buoys at 350’ and give Donjon another day to continue clearing debris.

The other change in status after DALI’s refloating was the Unified Command/Incident Command structure would be reduced from a fully manned Incident Command to a smaller Incident Management Team (IMT) given the smaller focus required for the remaining objectives. The IMT would be led by the Coast Guard and operate out of the Coast Guard Yard at Hawkins Point Road (near Ft. Armstead). SUPSALV would operate out of the 53’ trailer at Sparrows Point. Morning sync meetings would continue with Skanska and Donjon attending at the trailer and USCG, USACE, and others joining on a Teams call.

Figure 7-39 May 19: The Diamond Wire Saw, suspended by Ferrall’s speed hook, and diver enter the water adjacent to the north end of Section 4. This top cord beam extended well into the channel, so Donjon cut the beam at frame 41.

Work continued 20 May with the goal of clearing enough debris adjacent to Truss 4 to allow the wider channel. Surveys were scheduled and all were awaiting news that the buoys could be shifted. NOAA was scheduled to conduct a survey after Donjon’s workday, and US Army Corps of Engineers would conduct their survey early the next morning.

By the end of 19 May, Donjon had made significant progress with CHESAPEAKE 1000 and the wreck grab. They had also deployed OYSTER BAY for bucket ops and FARRELL 256 continued shear and Diamond Wire Saw ops on Section 4. Figure 7-39 shows a diamond wire saw cut on a top cord that impinged into the navigation channel. After those efforts, an informal survey by Donjon showed sufficient progress had been made to feel confident the evening's NOAA survey and the next day's USACE survey would recommend setting the 400' x 50' channel.

7-12 Section 4 Planning

With DALI departed, the focus was on the remaining very visible section of truss in the main channel. In the weeks preceding Dali's departure, the Donjon engineering team had developed a plan for removing Section 4. As it was almost in inverse to the original Section 1 removal, Donjon knew what lay before them. Section 4 consisted of frames 29 – 43 and was approximately 420 feet long. The demolition event that removed Section 4 from the bow of DALI also segmented sections 27 – 31 leaving individual pieces in the water or leaning against Dali's bow. That left frames 31 – 43 to be removed. Figure 7-40 identifies the Truss sections as they existed while planning the lifts.

Frames 33 thru 36-1/2 and Frames 36-1/2 thru 40-1/2 were designated Subsections 4B and 4C respectively. They were to be removed in two engineered lifts by the CHESAPEAKE 1000. The remainder of Section 4, Frame 40-1/2 and further northward, was thought to be collapsed and was removed by enabling cuts made by the diamond wire saw (it was designated Subsection 4D). This allowed a full 400' width channel to be established. Subsection 4D was removed by the wreck grab.

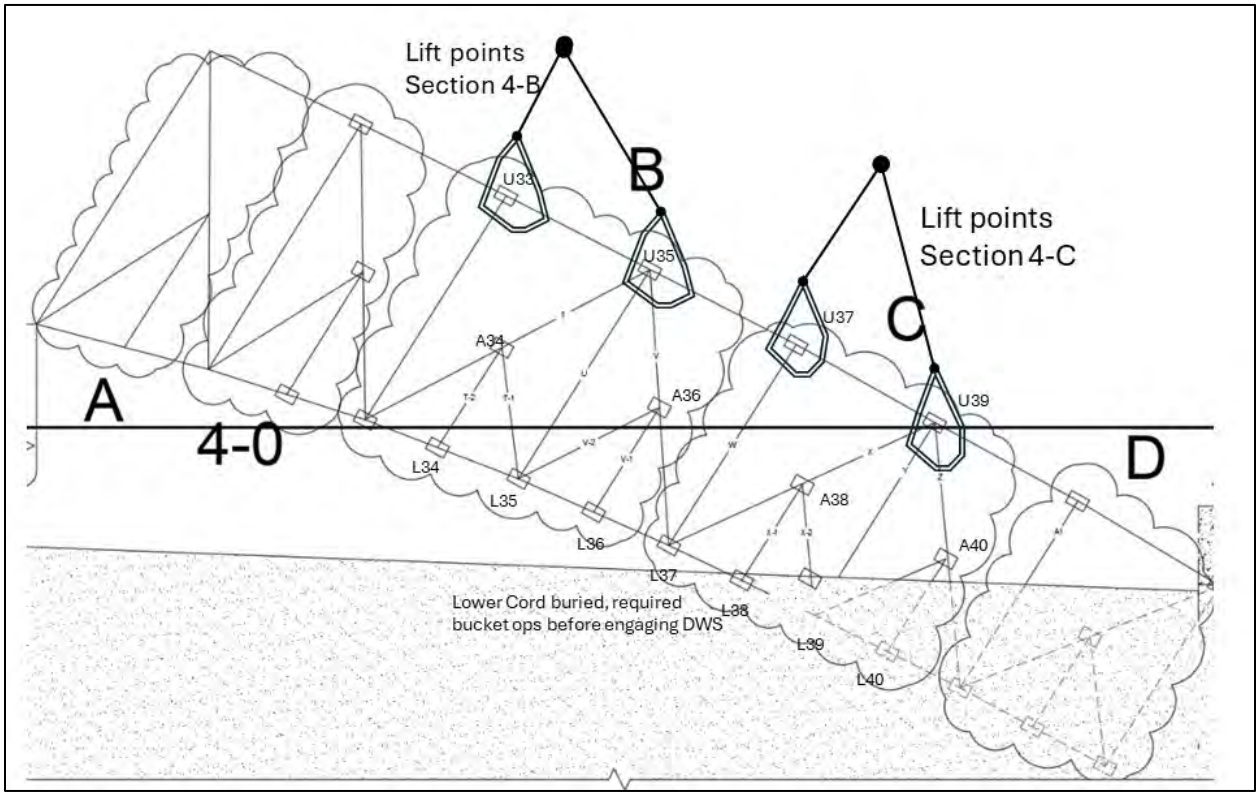


Figure 7-40 Drawing from Lift Plan shows truss 4 planned lifts.

As worked continued at Section 4, CHESAPEAKE 1000, aided by live-streamed CODA Octopus imagery continued removing steel from the riverbed and FARRELL 256 continued to prepare Section 4 for the engineered lifts. FARRELL 256 rigged 4-B for a lift and began diamond wire saw cuts separating 4-B from 4-C. Cuts were made between 35 and 37 on the top cord, diagonals, and bottom cord. Figure 7-41 shows an example of the top chord cutting.

Figure 7-41 Diamond Wire Saw cut IVO frame U37.

The bottom cord cuts were made more difficult since they were deeply buried in the mud and the Donjon divers encountered compacted roadbed over top of the cord. When bucket operations with OYSTER BAY failed to clear the bottom cord, CHESAPEAKE 1000 was brought in to begin lifting Section 4-B in an effort to break mud suction and clear that roadbed debris.

While CHESAPEAKE 1000 was lifting, it was clear there was still a connection to 4-C. As the lift progressed the ESSM boat outfitted with CODA Octopus provided imagery and communicated details to Donjon providing insight into what remained to be severed. As it turned out, the connections to the roadbed (steel cables) and truss framing needed to be cut to fully free 4-B from the remaining debris.

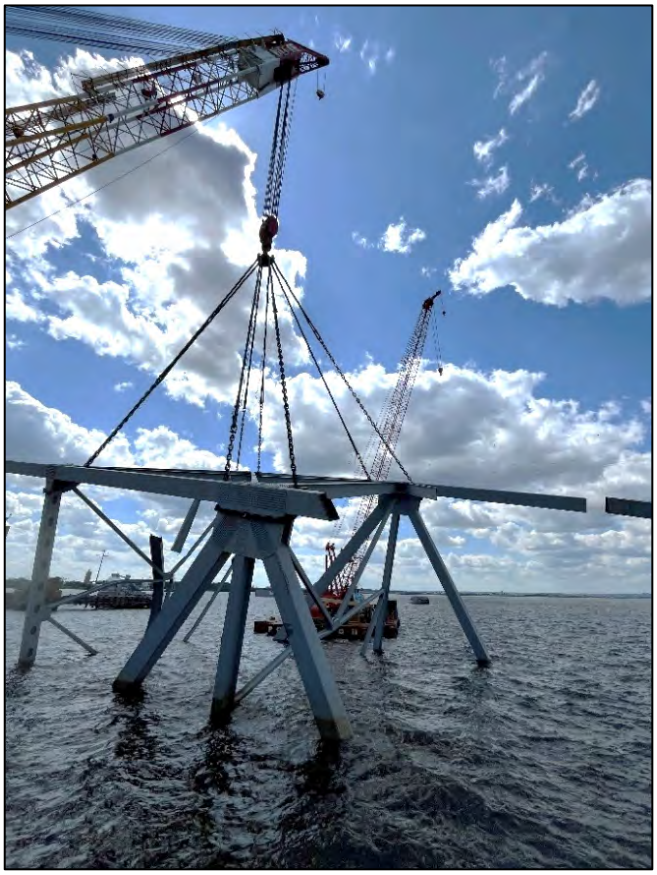


Figure 7-42 May 31: CHESAPEAKE 1000 lifting section 4-B breaking mud suction and determining what connections remained that required severing.

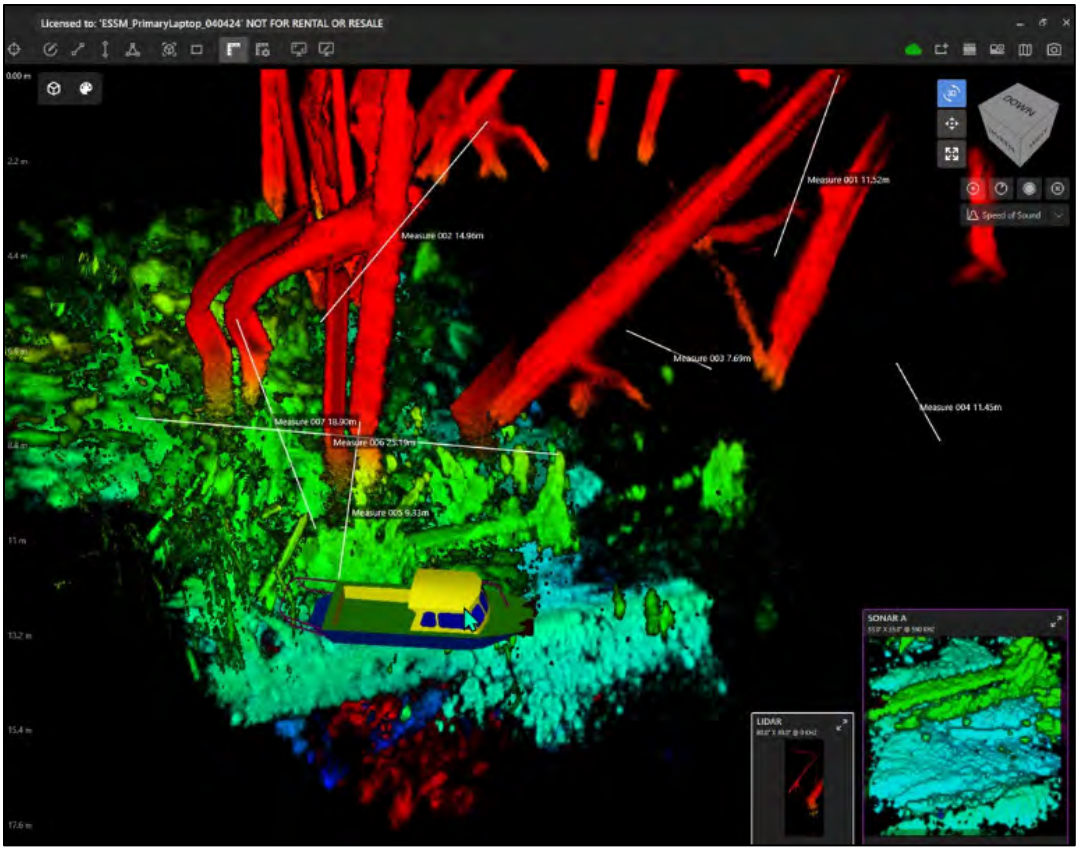


Figure 7-43 May 31: CODA Octopus imagery of truss 4-B as it was lifted from the mud. With this tool, specific connections to truss section 4-C were identified.

Figure 7-44 June 1: Torch work to clear remaining connections between Section 4-B from 4-C.

With final hangers cut free, CHESAPEAKE 1000 lifted Section 4-B clear of the water and transited back to Sparrows Point to begin unloading and processing. Skanska's crew sheared off the bottom of this section to allow CHESAPEAKE 1000 to complete the unloading. Meanwhile, COLUMBIA NY began to pre-rig section 4-C.

As soon as CHESAPEAKE 1000 had completed the unloading of section 4-B she returned to the site to rig into section 4-C for lifting. By the end of 4 June, after transporting Section 4-C to the Skanska processing site, the team had completed a significant milestone of clearing the Fort McHenry federal navigation channel of the last visible piece of bridge wreckage.

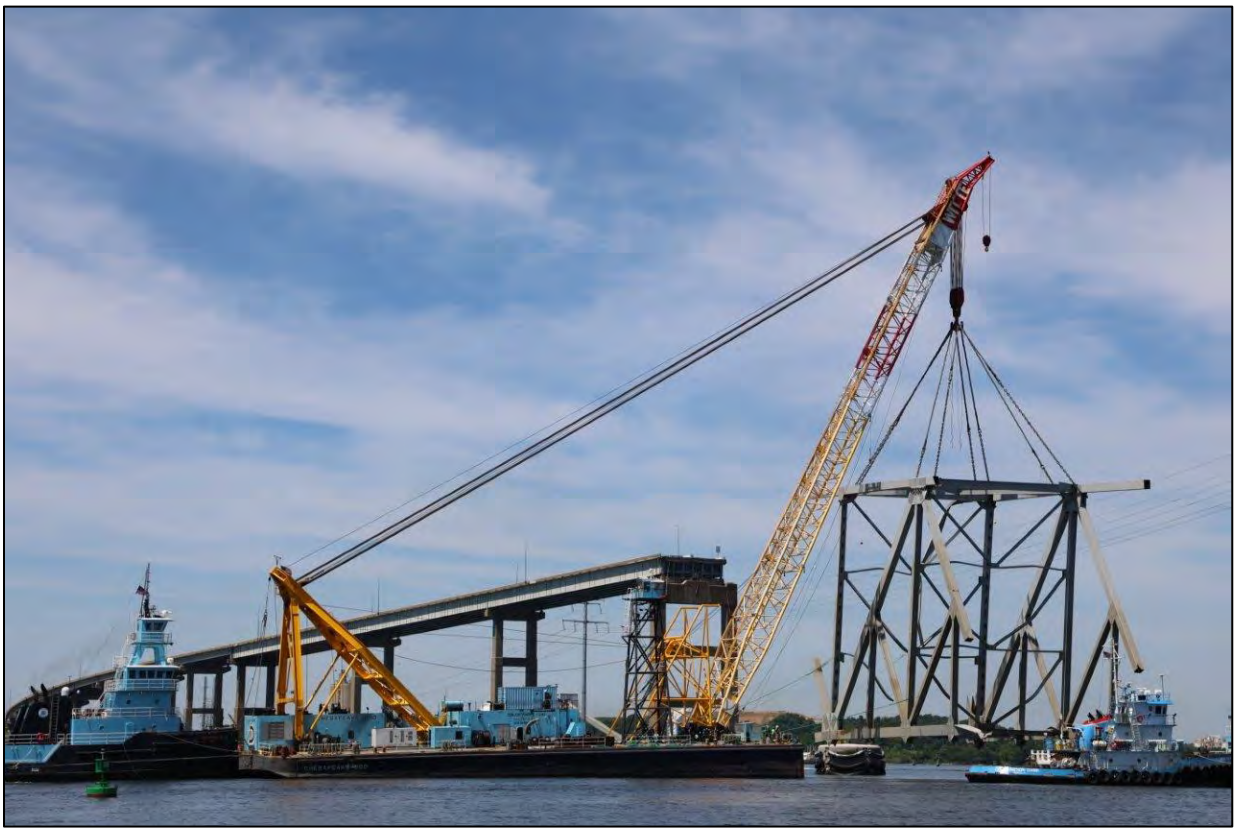


Figure 7-45 June 1: Section 4-B lifted and beginning transit back to Sparrows Point. This section of the bridge weighed in at 560 tons.

Chapter 8 - Displaced Material Removal and Processing

The process of clearing most debris from the channel included collecting and transporting steel truss members, steel roadbed base, concrete roadbed, and steel cables to the Sparrows Point processing center managed by Skanska. However, the Fort McHenry navigation channel has a controlling depth of 50 feet and to be confident all debris was removed, the two Donjon dredges, OYSTER BAY and DELAWARE BAY removed mud (with intermingled steel and road bed material) down to a depth of 60'. At 60' the bottom transitioned from largely mud to a solid clay layer and there was no evidence that any bridge wreckage penetrated the 60' clay layer. That mix of material recovered in the mud layer is what the project referred to as Displaced Material.

Initially tasked with developing a displaced material processing solution by the USACE, SUPSALV convened a meeting with State of Maryland Legal, Maryland Dept of Environment (DOE) and Maryland Dept of Transportation (MDOT) officials to determine the requirements and way forward. While DOE representatives were willing to support expedited permitting and provide design support for a Site Plan for holding and drying the displaced material at Sparrows Point, the ultimate relocation of the dried displaced material was to be provided by a third party.

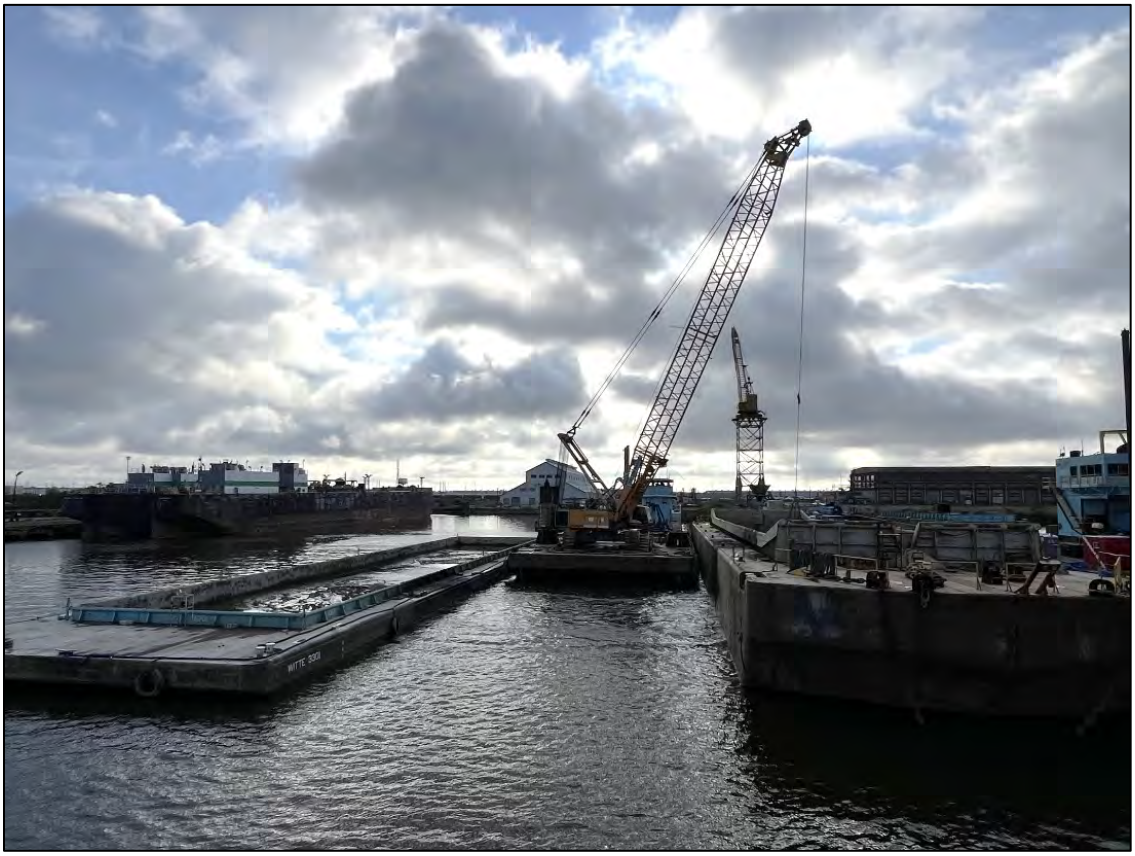


Figure 8-1 Transloading displaced material pierside between barges. River barge on left, ocean scow on the right. Mix of debris within the mud consisting of steel remnants and roadbed material.

The quoted price from that third party for processing of displaced material was in excess of $40M.This was largely the cost of 'building' a temporary processing site. A cheaper alternative, using an existing out-of-state processing site, reduced this cost to approximately $15M. After all parties agreed moving the displaced material out of state was worth the cost savings, the decision was made to process the material at Donjon's processing facility in Port Newark, NJ. That solution involved conducting the dredging with DELAWARE BAY and OYSTER BAY, depositing the dredged material into a series of small Donjon river scows, and then, still in the Patapsco River, transferring the mud to a load-line certificated ocean-going dump scows. Donjon's tugs, ATLANTIC ENTERPRISE, as an example, would pull the ocean going scows the 250 NM to Berth 36 at the Port Authority of Newark, NJ. 16 trips were completed over the period 12 May – 29 June. There, the material was combed for steel, mixed with Portland cement, dried in cube form, trucked to Kinsley, NJ and used to cap the Kinsley landfill site prior to installation of a solar field. Details of this Displaced Processing Plan can be found in Appendix G and a tally of the barge loads of material can be found in Appendix I.

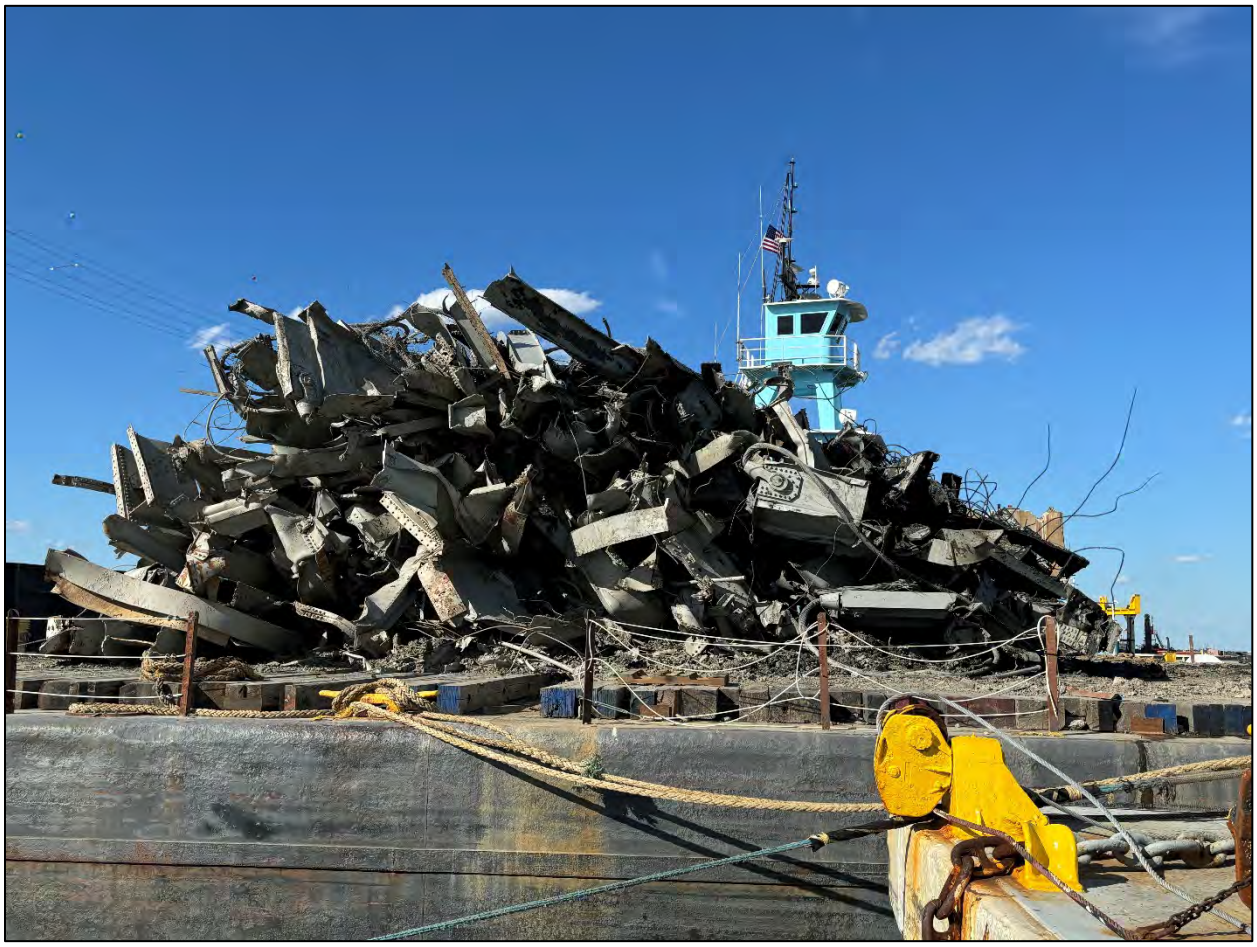


Figure 8-2 Barge being offloaded at Sparrows Point.

Chapter 9 - Final Channel Survey and Clean-up

After clearing Section 4-C on 4 June, Donjon conducted a survey of the area under Section 4 and determined a number of high spots remained which needed clearing. CHESAPEAKE 1000 began shifting back to wreck grab operations and the two dredging rigs, DELAWARE BAY and OYSTER BAY continued focusing on bucket ops at the south end of the federal channel, transferring displaced material to the river scows for further transfer to ocean-going barges. That displaced material process is described in Chapter 8.

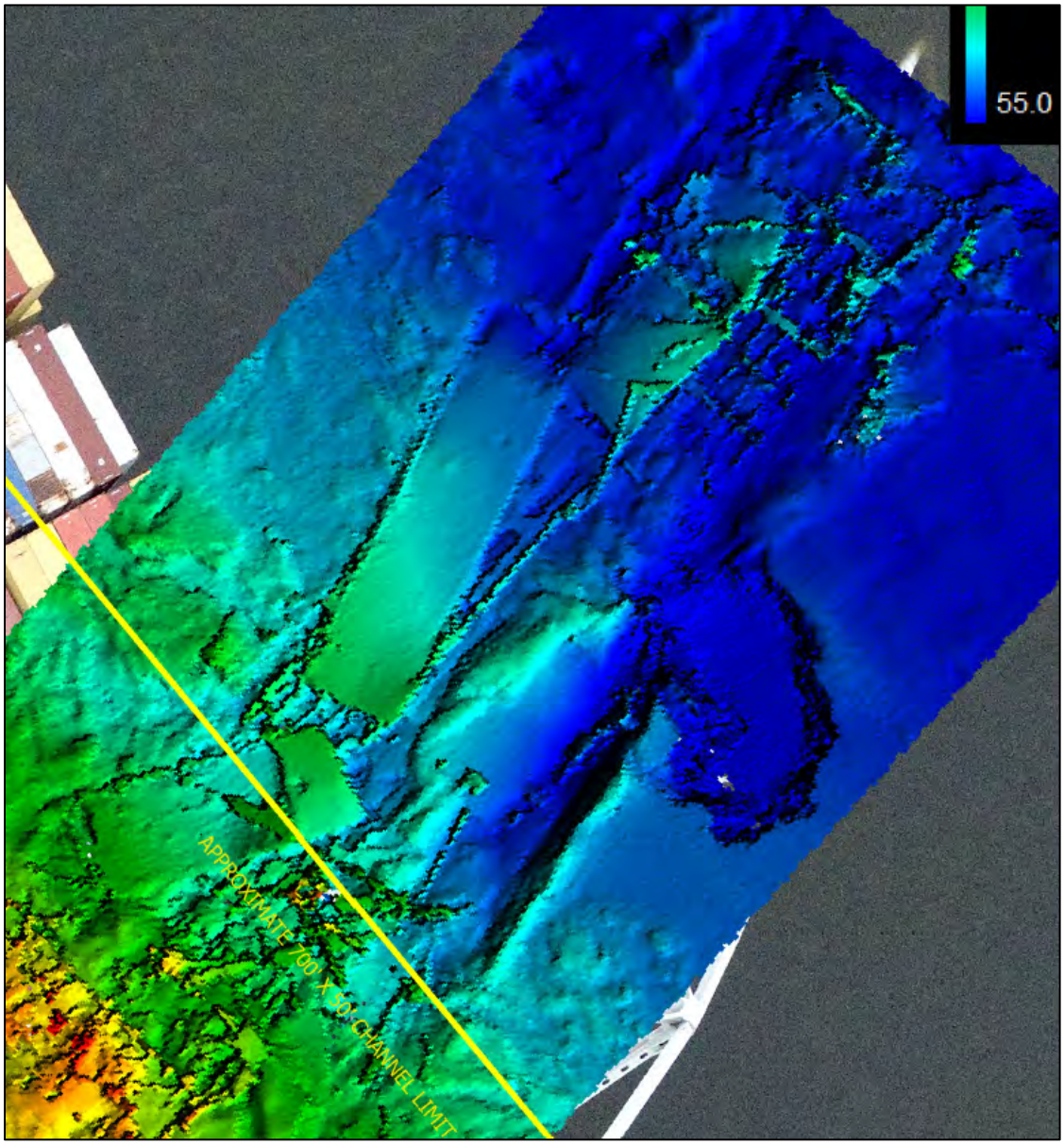


Figure 9-1 June 4: Scan results of the south end of the federal channel. Visible are multiple areas identified as roadbed and other debris which required removal.

The amended date for completing the 700’ x 50’ channel was 8 June, but the sheer volume of large debris on the bottom, delays between the removal of Section 4-C, and switching over to wreck grab operations proved that making the proposed date was impossible. DELAWARE BAY and OYSTER BAY were working on clearing and leveling the riverbed, but were unable to lift those large pieces of roadbed and steel that the survey indicated remained. A USACE survey was scheduled for 7 June, but was delayed. The team knew where the high spots and debris lay, and an additional survey wasn’t needed to confirm that. SUPSALV estimated the revised date for completing the channel clearing operations would be 10 June and indicated that Donjon would remain on-site following that milestone to finish leveling, running a magnetometer in search of buried steel, and pulling that steel to prevent future dredging projects from encountering bridge steel.

Meanwhile, during the period 6 – 10 June, all the Donjon’s digging and grabbing implements were at work in in south end of the 700’ channel. FARRELL 256 used its chopping beam to break up large pieces of roadbed and OYSTER BAY and DELAWARE BAY dredging rigs conducted bucketing ops, depositing debris into the river scows.

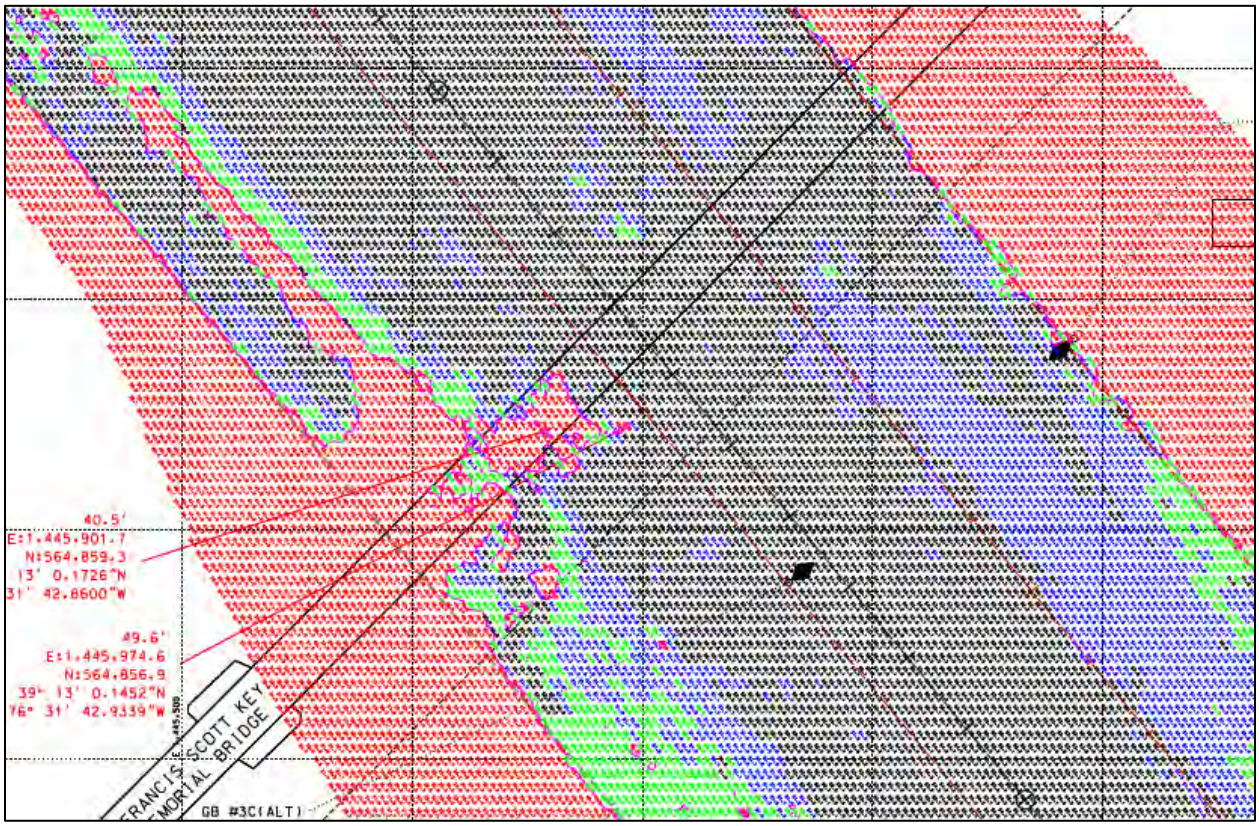


Figure 9-2 June 7: Multibeam survey showing high spots (in red) along the southern edge of the channel. The areas marked with green, blue, and black represent satisfactory depths.

Figure 9-3 June 8: An example of steel debris still on the riverbed collected by CHESAPEAKE 1000 and the wreck grab.

During 8 – 10 June, SUPSALV/Donjon team continued clearing operations and conducting multibeam and magnetometer surveys to identify and address high spots.

Donjon reported on the afternoon of the 10 June that the footprint of the bridge in range of the 700' federal channel was dug down to 60' depth, and 35' on either side (east – west) of the bridge footprint. Any miscellaneous steel as shown on the magnetometer survey, was considered not to be an issue to future dredge operations and could be left at or below the 60ft depth. Additionally, Donjon had ensured that all debris from the bridge collapse along the shoulders and side slopes were removed.

On the afternoon of 10 June, the USACE conducted a channel survey and after a review by Maryland Pilots, declared the full 700' x 50' channel clear and safe for marine traffic. Channel buoys were moved that evening to their original pre-collapse locations. The Coast Guard issued a Marine Safety Information Bulletin (MSIB) 052-24 which cancelled the restrictions of earlier bulletins and announced the channel had been fully restored to its original depth and horizontal clearance. A copy of this MSIB is included in Appendix J.

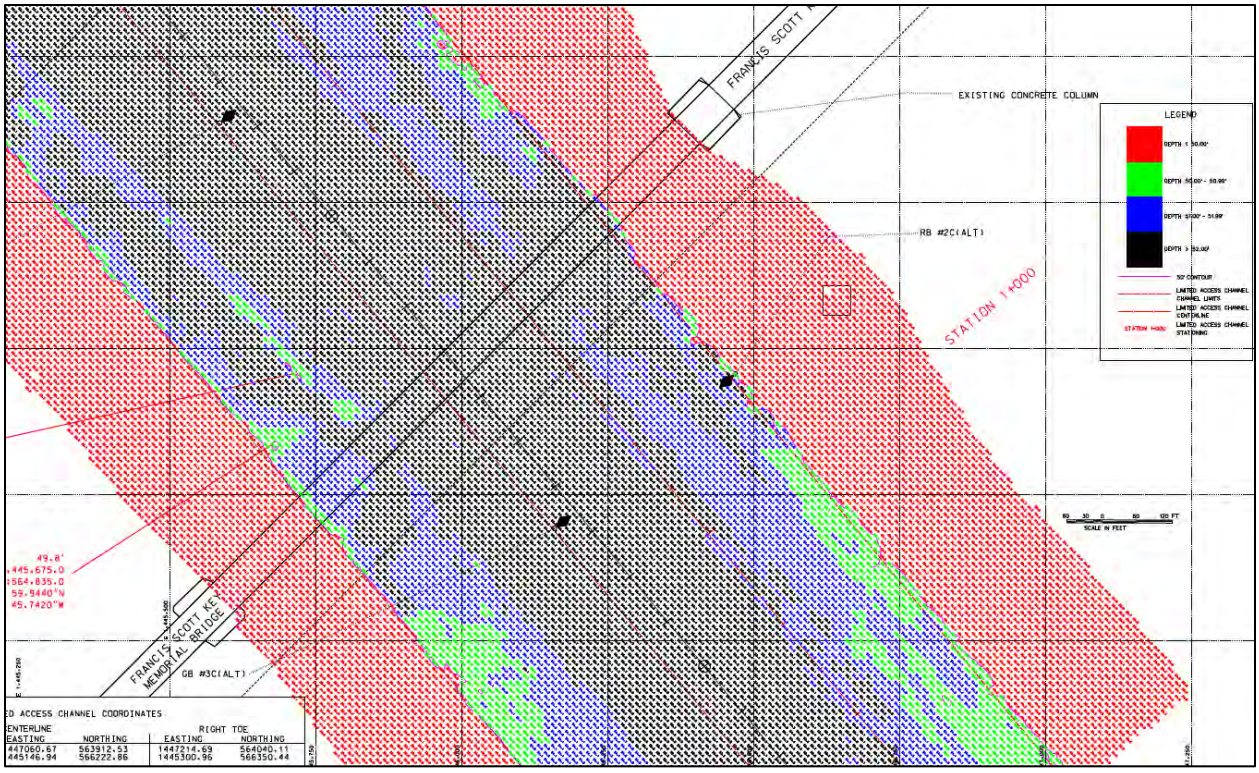


Figure 9-4 June 10: Survey confirms full depth across the 700' wide Fort McHenry channel.

Following the channel opening, SUPSALV described the coordination picture for vessels and channel maintenance operations. The plan identified a “no traffic” window from 0900 – 1400. During that period, Donjon was free to conduct bucket ops and CHESAPEAKE 1000 lifts in the Federal shipping channel. That meant, 30 minutes notice was required to ensure the maintenance crews had time to lift spuds and clear the area. If CHESAPEAKE 1000 was required for grab operations, the crews requested at least 60 minutes notice to allow Donjon to clear the area. The Sector Commander and Maryland Pilots conducted a sync on all planned inbound and outbound traffic each morning to give Donjon a heads up on what to expect that day. This window was critical for the continued rapid clearance operations as it ensured work would not stop to allow for commercial traffic to pass.

Bucket operations and grab operations continued through 24 June. Donjon conducted periodic multibeam and magnetometer surveys with Sea Explorer confirming complete collection of bridge debris. Figures 9-5 through 9-8 show multibeam surveys from 9, 14, 20 and 24 June and highlight the progression of the 60’ channel depths. Following magnetometer survey on the 20th, SUPSALV was able to determine no steel remained in the 700’ x 50’ federal channel (including 35’ either side of bridge footprint) down to 60’ depth. This was the final magnetometer survey and it signaled SUPSALV to direct Donjon to begin derigging the wreck grab and began preparations to return it and place it off-hire.

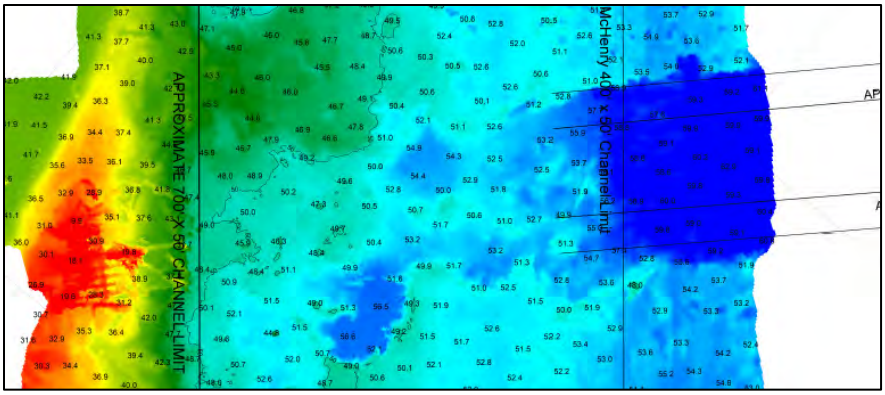


Figure 9-5 June 9: Survey (south end of navation channel)

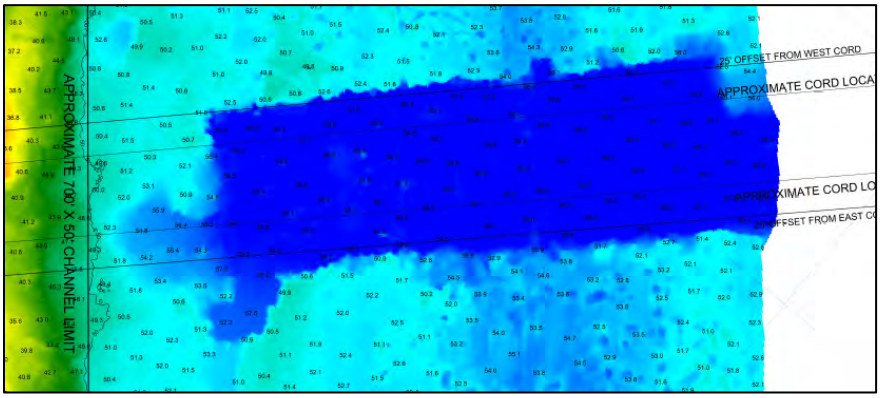


Figure 9-6 June 14: Survey (south end of navigation channel)

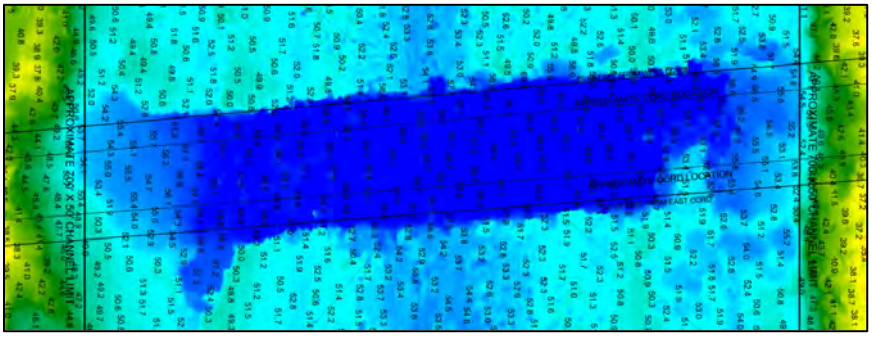


Figure 9-7 June 20: Multibeam survey showing cleared 700' navigation channel

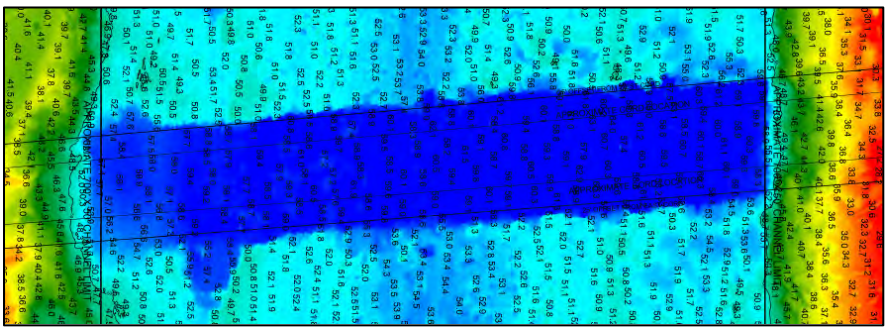


Figure 9-8 June 24: Survey of navigation channel (final survey)

Chapter 10 - Demobilization

Planning for the demobilization of Donjon equipment began in earnest in late May. The initial plan described the planned demobilization in phases following the confirmation of the fully restored 700' x 50' Federal channel opening. Assets were to be demobilized based on their on-scene need and best use case. It is important to note that the demobilization was conditions based vice time based. SUPSALV was explicit that they would not direct Donjon to demobilize just because a certain date was reached, but instead when conditions permitted. Key resources to be demobilized in each phase are shown below:

Phase I: (Start 11 JUN)
- Crew boats
- Some deck barges

Phase II: (16 JUN – 21 JUN)
- CHESAPEAKE 1000 and grab
- River barges

Phase III: (25 JUN – 30 JUN)
- All equipment located in Baltimore

Phase IV: (1 JUL – 15 JUL)
- All barges cleared from displaced material in Newark

As indicated, actual execution of the demobilization phases was based on the results of channel surveys. Once the 700' x 50' channel was opened, individual assets were evaluated for need. With the last major steel truss section removed in early June, no additional rigging of heavy sections was anticipated so COLUMBIA NY was released prior to the start of Phase 1. The dredging barges, OYSTER BAY and DELAWARE BAY continued to clear the channel to 60' while other equipment demobilization proceeded.

The final magnetometer survey on 20 June indicated there was no steel remaining that would need to be recovered with the wreck grab. This signaled the opportunity for CHESAPEAKE 1000 and the wreck grab to begin demobilizing. By 24 June, full channel depths to 60 feet was obtained completing all dredging requirements and those assets could begin to be demobilized. DELAWARE BAY began demobilizing 24 June while OYSTER BAY continued transloading displaced material to sea-going barges for shipment to Port Authority of Newark, NJ (see Figure 8-1). Several river scows and ocean scows were still required for the transloaded cargo for further transfer to New Jersey. That activity continued through 2 July. Afterwards, the efforts were directed solely toward demobilization of assets.

Each of the barges going off-hire required to be empty, and an off-hire survey conducted prior to return to their owners. SUPSALV meanwhile was monitoring equipment still on-hire, and expense reports to confirm costs were accurately reduced when appropriate.

Skanska, who was running the steel processing site at Sparrow's Point, was also was demobilizing. The last of the large sections of bridge truss material was received on 4 and 5 June and they announced they

would stop accepting bridge wreckage on 17 June. Resolve was completing the offload of remaining material on the bow of M/V DALI, still pierside at Seagirt Marine. Resolve was still using the Sparrows point site for disposal of that material. Skanska indicated the wind down would take a few weeks with their final receipt of debris on 16 June. The demobilization of heavy equipment and the final processing of unprepared lengths would be completed by 23 June. By 24 June, Skanska reported their Sparrows Point operation demobilization was complete and they were vacating the leased space at the yard.

Figure 10-1 Section 4A being lifted from channel by CHESAPEAKE 1000.

Figure 10-2 Roadbed material (rebar, concrete and steel) lifted from channel by OYSTER BAY.

Chapter 11 - Conclusion

The highly successful Federal response to the Francis Scott Key Bridge collapse was the result of highly talented salvage teams, insightful leadership, and dedication to the success of the operation. Beyond the unity and cohesiveness of the Unified Command overseeing the project, the success was largely attributable to the salvage organization managing the operation AND the tremendous commercial capability brought to bear to conduct the three-pronged salvage challenge. This specifically included (1) Donjon Marine clearing the Federal channel; (2) Resolve Marine refloating/removing the M/V DALI; and (3) Skanska AB removing bridge wreckage removal and processing steel for recycling. SUPSALV's coordination of these three independent efforts into a cohesive salvage response ensured their collective success. The removal of 50,000+ tons of wreckage and displaced material in under 77 days is testament to their capabilities. While a summary of many of the Lessons Learned are provided in Appendix K, overall the project was a resounding success.

Specific factors that led to the exceptional response and successful mission included:

- SUPSALV standing agreements with USACE – The Memorandum of Agreement that had been exercised routinely over the years for channel clearance and dewatering tasks. SUPSALV's familiarity with the process allowed them to quickly coach the local USACE leadership on issuing the task ensuring the response got off to a timely start.

- Standing Funding Authorization document (7600A) – The creation of a standing funding document, the first half of the two-part requirement (7600A and 7600B) was directly responsible for rapid funding transfer. Funds were transferred inside of 24-hours, a first under this ISA, due specifically to the fact the 7600A was already established.

- Immediate response capability – After securing tasking from the USACE, SUPSALV was immediately able to task Donjon and GPC to begin deployment of assets and personnel. This was due specifically to the emergency contracts it maintains under the auspices of the Salvage Facility Act.

- Highly responsive and capable contractors – Donjon needed no coaching to provide a fully responsive team and resources. They had been key respondents to many high visibility events including Hurricane Sandy response, Hurricane Katrina response, and numerous ship groundings and channel clearance tasks. They brought the right equipment, personnel, and dedication to meet the challenge. SUPSALV's ESSM team (a GPC contract) managed small boats, equipment, and CODA Octopus sonar tasks with aplomb.

- Very dedicated and capable SUPSALV staff – SUPSALV is a small organization. The salvage division only contains 9 personnel. Many of these people continued to focus on their primary missions: towing, deep ocean search and recovery and oil spill response so the subset dedicated to the FSK Bridge response was tight and focused. Led by CAPT Sal Suarez (SUPSALV) and Paul

Hankins (Director of Salvage Operations), the on-site salvage engineers and project managers dedicated months of effort, often including 12-18-hour days coordinating, resolving, and preparing for the day's events and results.

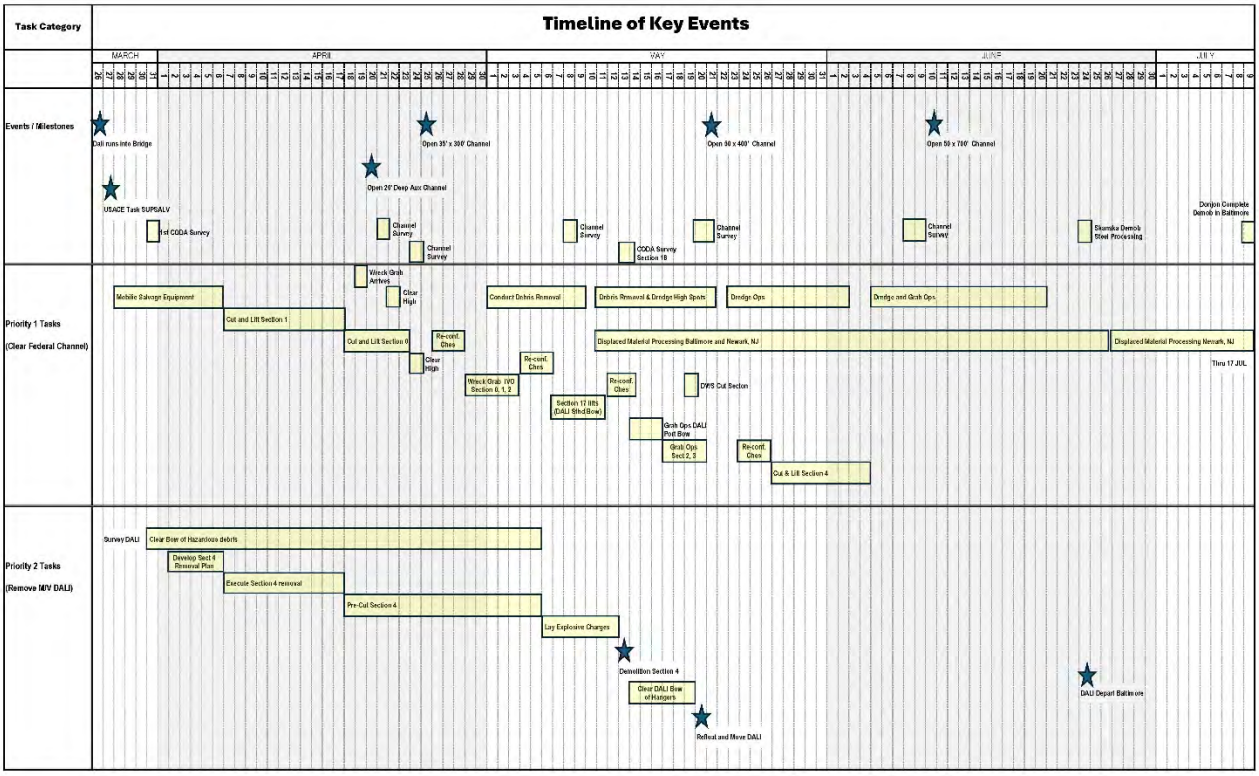
- Exceptional leadership and backing by the chain of command – SUPSALV's efforts were monitored and supported by their own Chain of Command - COMNAVSEA, VADM Downey, SECNAV, and CNO. In addition, the superb leadership from the Army Corp of Engineers (LGEN Spellmon, BGEN Lloyd, COL Pinchasin, and their staffs) kept the project focused, funded, and on task. Their interest and support allowed SUPSALV to successfully work cross-agency issues and short circuit sensitive matters. Additionally, MD Governor Wes Moore and the entire USCG/USACE/State of MD leadership team within the Unified Command were appreciative, supportive, and recognized the effort and expertise within the SUPSALV team.

- Associations with Industry allowed excellent coordination across lines of effort – SUPSALVs ability to coordinate with and oversee both Skanska's outside-the-channel efforts and Resolve's tasks of freeing M/V DALI made the overall project trajectory under the UC streamlined and more effective. The relationships developed and those previously established added to the spirit of unity and resulted in multiple occasions where a salvage team's efforts directly supported another's line of effort making success within the Unified Command the goal and the result.

The ultimate success of the mission was tempered by the loss of the six construction workers during the bridge's collapse. No response can offset that tragedy, but the focus, expertise, and success of the team is testament to the solidarity of the American worker and the spirit of our nation's "Can Do" attitude. The rebuilding of the Francis Scott Key Bridge is in planning at the time of this report's drafting, but there is little doubt that it will be a stunning marvel of engineering. Figure 11-1 shows M/V Dali passing through the collapse site on its way to Norfolk for unloading on 24 June. The milestone of M/V Dali's departure provides a moment of reflection that while the triumphs and tragedy of this event weigh heavily on the American heart, we can and must march on.

Figure 11-1 M/V DALI departed Baltimore on 24 June. This image shows the vessel, with tug escort, passing through the fully opened Federal Channel.

Appendix A
Timeline of Events



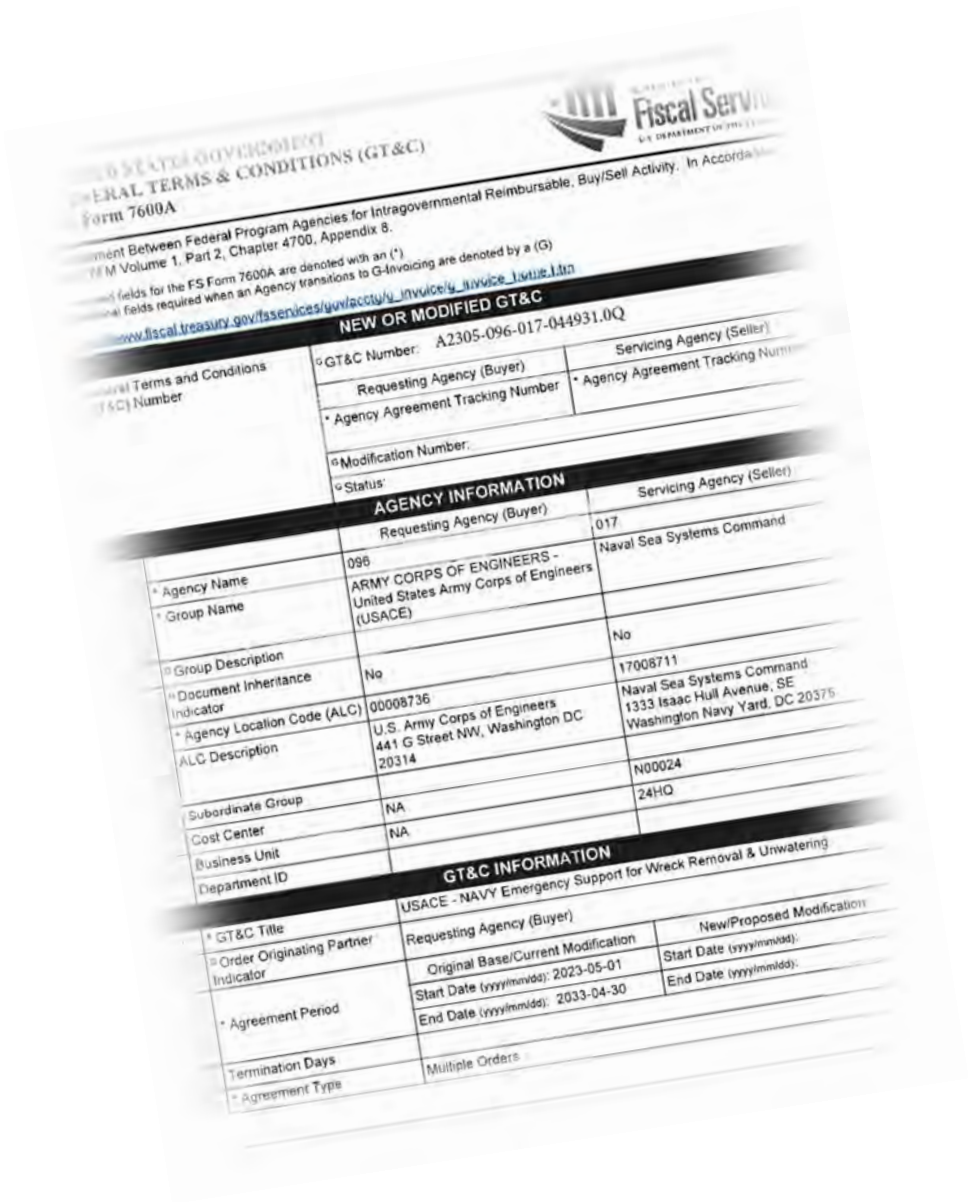
Timeline of Events

26 Mar	Dali Cargo ship ran into the Francis Scott Key Bridge causing a bridge collapse
27 Mar	Verbal tasking from USACE
27 Mar	SUPSALV tasks DonJon to begin mobilizing
28 Mar	Begin site Surveys, and Engineering assessments
28 Mar	Chesapeake (1000-ton lift capacity) arrives
29 Mar	Ferrell (160-ton capacity) and Oyster Bay (150-ton capacity) arrives
30 Mar	Begin Side-Scan survey operations
31 Mar	1st CODA Survey of Main Channel shows extensive Truss damage
1 Apr	Resolve engineers begin working cut plan for section 4.
30 Mar - 4 Apr	Skanska begin removal of wreckage (truss span components) in vicinity of Truss 19 for opening of alternate channel
3 Apr	First Milestone Chart accepted by U.C. shows temporary channel opening by end of April and full opening by end of May
3 Apr	2nd coda system operational on dive barge
5 Apr	Preliminary explosives cutting plan for section 4 approved
6 Apr	Columbia (400-ton capacity) arrives
7 Apr	Begin cutting/removal task Span 18 Section 1
11 Apr	DonJon cut Section 1 into 1A/1B
13 Apr	High Winds impacted the Water Ops
14 - 15 Apr	Rigged and lifted Section 1A
16 Apr	completed Section 0 survey
16 Apr	Lifted Truss 18, Section 1B into SKANSKA yard for cut, removed from CHESAPEAKE's hook
19 Apr	Rigged, completed cuts, and lifted Truss 18, Section 0A
20 Apr	Pre rigging Span 18, Truss 0-B and 0-C
23 Apr	Chesapeake and Columbia completed removal of Sections 0B and 0C
24 Apr	Cleared final high spots in Initial Channel
25 Apr	UC opened a 300ft by 35ft wide channel allowing passage of commercial traffic
29 Apr	Chesapeake 1000 begins Wreck Grab operations. Started east of Pier 18/Section 0

2 May	OYSTER BAY conducted debris removal at Pier 18/ Sections 0, 1, and 2
4 May	Completed current Grab ops with CHESAPEAKE 1000 south of Pier 18/ Sections 0, 1, 2
7 - 11 May	Chesapeake 1000 work with SKANSA to cut, rig, and lift Span 17 Truss adjacent to Dali's Starboard Bow
12 - 13 May	Chesapeake and Grab op-tested in preparations for post blast
13 May	Demolition of section 4 from Dali Bow
13 - 16 May	Clear wreckage adjacent to Dali bow
15 May	Demobilize ESSM classroom and Shop van from ICP
17 - 19 May	CHESAPEAKE and grab made numerous picks on Sections 2-3
19 May	Complete DWS cut clearing debris on north end of Section 4 to allow for wider channel
20 May	Dali Float off, Finish picking, dredging north end of Span 18, section 3.
21 May	NOAA Survey Confirmed 400' x 50' channel is clear; SUPSALV moved from the Maryland Cruise Ship Terminal to Sparrows Point Command Trailer
28 May - 4 Jun	Remove section 4
4 - 10 Jun	Wreck grab and bucket Ops clearing remainder of Federal Channel
10 Jun	USACE Survey for high spots
10 Jun	700' by 50' federal channel has been certified clear by USACE
11 Jun	Final channel grooming conducted
15 Jun	Donjon begins to demob in stages
18 Jun	ESSM Demob complete
20 Jun	Last day of wreck grab ops.
22 Jun	Skanska completed demobilization at Sparrows Point
24 Jun	M/V Dali depart Baltimore en route Norfolk, VA
24 Jun	Wreck grab (seafastening complete with towage certificate) departed for Galveston
24 Jun	Chesapeake 1000 depart Baltimore en route Newark
09 Jul	Donjon completed demobilization in Baltimore.
17 Jul	Transloading and processing of Displaced Materials is complete.

Appendix B

Tasking and Funding Samples



ERAL TERMS & CONDITIONS (GT&C)
Form 7600A

ment Between Federal Program Agencies for Intragovernmental Reimbursable, Buy/Sell Activity. In Accorda
M Volume 1, Part 2, Chapter 4700, Appendix 8.
d fields for the FS Form 7600A are denoted with an (*)
al fields required when an Agency transitions to G-Invoicing are denoted by a (G)
www.fiscal.treasury.gov/fsservices/gov/pcctg/g_invoice/g_invoice_home.htm

NEW OR MODIFIED GT&C

al Terms and Conditions (T&C) Number	GT&C Number: A2305-096-017-044931.0Q	
	Requesting Agency (Buyer)	Servicing Agency (Seller)
	* Agency Agreement Tracking Number	* Agency Agreement Tracking Num
	Modification Number:	
	Status:	

AGENCY INFORMATION

	Requesting Agency (Buyer)	Servicing Agency (Seller)
* Agency Name	096	017
* Group Name	ARMY CORPS OF ENGINEERS - United States Army Corps of Engineers (USACE)	Naval Sea Systems Command
Group Description		
Document Inheritance Indicator	No	No
* Agency Location Code (ALC)	00008736	17008711
ALC Description	U.S. Army Corps of Engineers 441 G Street NW, Washington DC 20314	Naval Sea Systems Command 1333 Isaac Hull Avenue, SE Washington Navy Yard, DC 20375
Subordinate Group		N00024
Cost Center	NA	24HQ
Business Unit	NA	
Department ID		

GT&C INFORMATION

* GT&C Title	USACE - NAVY Emergency Support for Wreck Removal & Unwatering	
Order Originating Partner Indicator	Requesting Agency (Buyer)	
	Original Base/Current Modification	New/Proposed Modification
* Agreement Period	Start Date (yyyy/mm/dd): 2023-05-01	Start Date (yyyy/mm/dd):
	End Date (yyyy/mm/dd): 2033-04-30	End Date (yyyy/mm/dd):
Termination Days		
* Agreement Type	Multiple Orders	

UNITED STATES GOVERNMENT
GENERAL TERMS & CONDITIONS (GT&C)
FS Form 7600A

BUREAU OF THE Fiscal Service
U.S. DEPARTMENT OF THE TREASURY

Agreement Between Federal Program Agencies for Intragovernmental Reimbursable, Buy/Sell Activity. In Accordance with TFM Volume 1, Part 2, Chapter 4700, Appendix 8.

Required fields for the FS Form 7600A are denoted with an (*)
Additional fields required when an Agency transitions to G-Invoicing are denoted by a (G)

https://www.fiscal.treasury.gov/fsservices/gov/acctg/g_invoice/g_invoice_home.htm

NEW OR MODIFIED GT&C		
General Terms and Conditions (GT&C) Number	[G] GT&C Number: A2305-096-017-044931.0Q	
	Requesting Agency (Buyer)	Servicing Agency (Seller)
	* Agency Agreement Tracking Number	* Agency Agreement Tracking Number
	[G] Modification Number:	
	[G] Status:	

AGENCY INFORMATION			
		Requesting Agency (Buyer)	Servicing Agency (Seller)
1.	* Agency Name	096	017
	* Group Name	ARMY CORPS OF ENGINEERS - United States Army Corps of Engineers (USACE)	Naval Sea Systems Command
	[G] Group Description		
	[G] Document Inheritance Indicator	No	No
	* Agency Location Code (ALC)	00008736	17008711
	ALC Description	U.S. Army Corps of Engineers 441 G Street NW, Washington DC 20314	Naval Sea Systems Command 1333 Isaac Hull Avenue, SE Washington Navy Yard, DC 20376
	Subordinate Group		
	Cost Center	NA	N00024
	Business Unit	NA	24HQ
	Department ID		

GT&C INFORMATION			
2.	* GT&C Title	USACE - NAVY Emergency Support for Wreck Removal & Unwatering	
3.	[G] Order Originating Partner Indicator	Requesting Agency (Buyer)	
		Original Base/Current Modification	New/Proposed Modification
4.	* Agreement Period	Start Date (yyyy/mm/dd): 2023-05-01	Start Date (yyyy/mm/dd):
		End Date (yyyy/mm/dd): 2033-04-30	End Date (yyyy/mm/dd):
5.	Termination Days		
6.	* Agreement Type	Multiple Orders	

7.	* Advance Payment Indicator	Are Advance Payments allowed for this GT&C? ◯ Yes ◉ No *If **Yes**, the Servicing Agency Advance Payment Authority Title and Citation are required upon creation of an Order against this GT&C.
8.	* Assisted Acquisition Indicator	Will this GT&C accommodate Assisted Acquisitions? ◉ Yes ◯ No *If **Yes**, the Servicing Agency provides acquisition support in awarding and managing contracts on behalf of the Requesting Agency's requirements for products or services. Lines 17 & 18 below for additional detail.
	ESTIMATED AGREEMENT AMOUNT	
9.	Total Direct Cost Amount	$200,000,000.00
	Total Overhead Fees and Charges Amount	$0.00
	* Total Estimated Amount	$200,000,000.00
	[G]Enforce Total Remaining Amount	Should G-Invoicing enforce the total value of orders to remain below the Total Amount on the GT&C? ◯ Yes ◉ No If **Yes**, G-Invoicing will not allow Order total to exceed the GT&C total.
	ADDITIONAL AGREEMENT INFORMATION	
10.	Explanation of Overhead Fees and Charges	NA
11.	Requesting Scope	SUPSALV will provide personnel and equipment to support USACE by surveying, removing and disposing of hazards to navigation, support flood operations and unwatering areas identified by USACE in the aftermath of an emergency. (Note: This is not a commitment. It is based upon SUPSALV's availability.)
12.	Requesting Roles	1) Develop draft orders, to include scope of work statements, using DD Form 448, Military Interdepartmental Purchase Request (MIPR) or FS Form 7600B as described in block 14. 2) Verify, prior to the execution of each order under this GT&C that the order complies with the requirements of the Economy Act (31 U.S.C. 1535) and, for orders involving assisted acquisitions, complete a Determinations and Findings document as described in block 14. 3) Certify, at the time of signature of an order, the availability of funds necessary to accomplish that order. 4) Ensure that only authorized USACE representatives sign orders.
13.	Servicing Roles	1) Provide USACE with ordered goods and services in accordance with the purpose, terms, and conditions of this GT&C and any specific requirements set forth in orders and implementing arrangements. 2) Ensure that only authorized Naval Sea Systems Command representatives sign orders. 3) Provide detailed periodic progress, financial and other reports to USACE as agreed to in an order. Financial reports shall include information on all funds received, obligated, and expended, and any forecasted obligations and expenditures.
14.	Restrictions	14.1. ORDERS. This GT&C does not document the obligation of funds between the Parties. Any obligation of funds in support of this GT&C will be accomplished by executing an order hereunder. Orders may be executed on either a DD Form 448 or FS Form 7600B until such time as the Department of Defense mandates

		the use of the FS Form 7600B. Following any such mandate, the parties shall use the FS Form 7600B exclusively. Regardless of format, all orders must contain a specific Statement of Work that clearly articulates the goods or services requested. 14.2. By executing an Economy Act order the Parties certify that the following requirements have been met: 1) USACE has determined that funds are available; 2) USACE has determined that the order is in the best interest of the United States Government; 3) The Naval Sea Systems Command has determined that it is able to provide or get by contract the ordered services and any goods related thereto; and 4) USACE has determined that the ordered services and any goods related thereto cannot be provided by contract as conveniently or economically by a commercial enterprise. 14.3. In addition to the above, when the provision of the ordered services or any goods related thereto under an order requires the Naval Sea Systems Command to perform a contract action on behalf of USACE, USACE must include the required Economy Act Determinations and Findings under FAR subpart 17.502-2 on each DD Form 448 or FS Form 7600B or provide separate written Determinations and Findings documents for each DD Form 448 or FS Form 7600B. 14.4. REVIEW OF AGREEMENT. This GT&C will be reviewed on or around the anniversary of its effective date annually for financial impacts; if there are substantial changes in resource requirements, the GT&C will be reviewed in its entirety. 14.5. MODIFICATION OF AGREEMENT. This GT&C may only be modified by the written agreement of the Parties, duly signed by their authorized representatives.	
15.	Assisted Acquisition Small Business Credit Clause	The Servicing Agency will allocate the socio-economic credit to the Requesting Agency for any contract actions it has executed on behalf of the Requesting Agency.	
16.	Disputes	Disputes related to this GT&C and any related Orders shall be resolved in accordance with instructions provided in the Treasury Financial Manual (TFM) Volume I, Part 2, Chapter 4700, Appendix 5; Intragovernmental Transaction (IGT) Guide, at http://tfm.fiscal.treasury.gov/content/tfm/v1/p2/c470.html	
17.	Requesting Assisted Acquisitions	USACE entities authorized to request acquisition assistance under this agreement include: USACE Divisions, Districts, Centers, Laboratories and Directorates.	
18.	Servicing Assisted Acquisitions	Naval Sea Systems Command (NAVSEA)	
19.	Requesting Clauses	Within 90 days of completing work under an order, the Naval Sea Systems Command shall conduct an accounting to determine the actual cost of the work. Within 30 days of completion of this accounting, the Naval Sea Systems Command shall return to USACE any funds in excess of the actual cost or USACE shall provide any additional funds necessary to cover the actual cost.	
20.	Servicing Clauses	NA	
		Requesting Agency (Buyer)	Servicing Agency (Seller)

21.	Agency Additional Information		

MODIFY GT&C

22.	Modification Date (yyyy/mm/dd):
	Brief explanation required for modifying this GT&C:

CLOSE GT&C

23.	Closing Date (yyyy/mm/dd):
	Brief explanation required for closing this GT&C:

REJECT GT&C

24.	Rejection Date (yyyy/mm/dd):
	Brief explanation required for rejecting this GT&C:

PREPARER INFORMATION

25.	* Preparer Name	Michael deMasi
	* Preparer Phone	409-370-7037
	* Preparer E-mail	michael.j.demasi@usace.army.mil

AGREEMENT APPROVALS

By signing this agreement, you authorize the General Terms and Conditions as stated, and that the scope of the work can be fulfilled. By signing, you agree to periodically review the terms and conditions of the agreement and make any necessary modifications to the GT&C and any affected Order(s).

		Requesting Initial Approval (required)	Servicing Initial Approval (required)
26.	* Approver's Name	Peter J. Rayna	Daniel Neverosky
	* Signature	Peter J. Rayna, P.E. Digitally signed by Peter J. Rayna, P.E. Date: 2023.05.10 10:27:28 -04'00'	NEVEROSKY.DANIEL.THOMAS.1038426830 Digitally signed by NEVEROSKY.DANIEL.THOMAS.1038426830 Date: 2023.05.19 08:39:59 -04'00'
	Title	Deputy Director, Contingency Operations	Deputy Supervisor of Salvage and Diving (SEA 00CB)
	* E-mail	peter.j.rayna@usace.army.mil	daniel.t.neverosky.civ@us.navy.mil
	* Phone	202-761-5902	202-781-0534
	Fax		
	* Date (yyyy/mm/dd)	2023-05-10	
		Requesting Final Approval (required)	Servicing Final Approval (required)
27.	* Approver's Name	Stephen L. Hill	CDR Christopher Kading
	* Signature	S Hill	Christopher Kading
	Title	Director of Contingency Operations, Chief, Office of Homeland Security	NAVSEA Deputy Comptroller
	* E-mail	stephen.hill@usace.army.mil	christopher.r.kading.mil@us.navy.mil
	* Phone	202-761-4601	202-781-2955

	Fax		
	* Date (yyyy/mm/dd)		

INCOMING FUNDING DOCUMENT ACCEPTANCE (FDA)

(NAVSEA POC)

1. Requestor's Name:	2. PROGRAM MANAGER/Tech Code:	3. Phone:
LENORA JONES	SUPSALV SEA 00C - 00C11B	202-781-3703
4. Date Rec'd by POC: 27 March 2024	5. Funding Document No: W81W3G40867960	6. Basic or Amendment #: 0
7. Navy ERP PR Number:	8. Description or Program Title: KEY BRIDGE COLLAPSE DEBRI REMOVAL	9. Project WBS: DR-090400.5012
10. Person Responsible (BFM):	11. Navy ERP Sales Order Number:	12: GT&C/MOA/MOU/DD1144#: A2305-096-017-044931

PLEASE EMAIL ACCEPTANCES. THANK YOU!
LENORA.S.JONES@NAVY.MIL / DENEEN.MONROE-STEWART@NAVY.MIL

RECOMMEND TECHNICAL ACCEPTANCE

	ACRN	Amount	Project ID	Receiving WBS Element (Internal to Navy ERP Only)
13. Reimbursable:	Contract - AA Travel - AA	$2,900,000.00 $100,000.00		
14. Direct Cite:	AA	$0.00		
15. Grand Total:	AA	$3,000,000.00		
16. For Direct Cite ONLY:	a. Contract Number: N0002418D4307,N0002419D4323, N0017819D8436, N0017422F3004		b. Pop Start Date:	c. Pop End Date:

*(Project ID = Project Definition Number) (RBE= Receiving WBS Element) (RBE should start with DR vice 1, 5, or 6) (If more ACRNs, attach 2nd page)

RECOMMEND NON ACCEPTANCE:

17. Reason for Rejection:

a) Activity unable to perform described work
b) Document forwarded to wrong command/plant
c) Funds not available for withdrawal
d) Line of Accounting is incorrect
e) Rejected at Sponsor's request
f) Type of document is inappropriate
g) Other -

RESPONSIBILITIES OF PROGRAM MANAGER AND/OR TECHNICAL POC:

1. A bona fide need (in this FY) exists for the effort requested, specifically in accordance with FMR Volume 11a, Chapter 3 *.
2. I understand that I have been given the authority to incur costs in the amount authorized herein.
3. I accept these funds subject to the laws, rules and regulations governing the use of the funding provided by this funding document. Specifically, in accordance with 31 U.S. Code, Section 1301(a)**, the funding provided will be used only for the purpose appropriated.
4. I acknowledge the need for accurate record keeping to prevent over-obligation of direct cite funds which could result in a statutory violation.
5. New obligations will only be authorized during the life of the appropriation.
6. I understand if the funding provided is FMS or from a Private Party an allowance must be made for surcharges relating to labor costs. (WCF activities only)
7. As the funds holder, I accept responsibility for completing the required Dormant Account Review Quarterly (DARQ).
8. Project orders must comply with the requirements outlined in FMR Vol. 11A, Chapter 2, and must meet the Financial Management Policy Manual (FMPM***) 51% rule.
9. 51% Rule Defined. The Project Order recipient, servicing agency, must incur costs of not less than 51% of the total costs attributable to rendering the work or services ordered. Total costs to render the work or services ordered include the costs of goods or services obtained from or provided by contractors. The term "in-house" includes the cost of all direct labor for government employees and associated support (e.g., material and supplies, travel, and minor equipment). This rule does not apply to Economy Act Orders.
10. All NON-DOD funding acceptance must be on a reimbursable basis.

* http://www.dod.mil/comptroller/fmr/
** http://uscode.house.gov/search/criteria.shtml
https://www.secnav.navy.mil/fmc/Documents/FINAL-FMPM.pdf

18. Program Manager and/or Technical POC (Name, Title and Signature):	19. Phone:
JONES.LENORA.S.1275051744 00C11B 03/27/2024	202-781-3703

20. Comptroller Technician:	21. Date Received:	22. Date Processed:

UNITED STATES GOVERNMENT ORDER FORM
FS FORM 7600B

BUREAU OF THE Fiscal Service
U.S. DEPARTMENT OF THE TREASURY

Agreement Between Federal Program Agencies for Intragovernmental Reimbursable, Buy/Sell Activity. In Accordance with TFM Volume 1, Part 2, Chapter 4700, Appendix 8.

Required fields for the FS Form 7600B are denoted with an (*)
Additional fields required when an Agency transitions to G-Invoicing are denoted by a (G)

https://www.fiscal.treasury.gov/g-invoice/

NEW OR MODIFIED ORDER			
1.	Order Number	[G] Order Number: W81W3G40867960	
		Requesting Agency (Buyer)	Servicing Agency (Seller)
		* Order Tracking Number W81W3G40867960	* Order Tracking Number W81W3G40867960
		[G] Modification Number: 0000	
		[G] Order Status: Pending Requesting Approval	
2.	[G] General Terms & Conditions (GT&C) Number (Associated with this Order): A2305-096-017-044931		
3.	*Order Date (yyyy-mm-dd):	2024-03-26	
PARTNER INFORMATION			
4.	*Assisted Acquisition Indicator	Yes	
	*Period of Performance	Original Base/Current Modification	New/Proposed Modification
5.		Start Date (yyyy-mm-dd): 2024-03-26	Start Date (yyyy-mm-dd):
		End Date (yyyy-mm-dd): 2024-12-31	End Date (yyyy-mm-dd):
		Requesting Agency (Buyer)	Servicing Agency (Seller)
6.	*Agency Location Code (ALC)	09600876	17008711
7.	*Agency Name	096	017
8.	*Group Name	USACE	24 NAVSEA HQ
9.	[G] Group Description	U.S. Army Corps of Engineers, Baltimore District 2 Hopkins Plaza, Baltimore, MD 21201U.S.	N00024
10.	Cost Center	W81W3G	240V0C0000
11.	Business Unit	N/A	24HQ
12.	Department ID	096	N/A
13.	Unique Entity Identifier (UEI)	068112791	WYRTTKM9NT58
14.	Funding Office Code (Buyer Only)	N/A	
15.	Funding Agency Code (Buyer Only)	N/A	

16.	Comments	***Unilateral modifications/revisions to this agreement that affect agreement terms (dates, amount funded) are not acceptable, all modifications/revisions that impact the agreement terms, other than administrative corrections or POC changes, must be signed by both parties.***See attached SOW	***Unilateral modifications/revisions to this agreement that affect agreement terms (dates, amount funded) are not acceptable, all modifications/revisions that impact the agreement terms, other than administrative corrections or POC changes, must be signed by both parties.***See attached SOW
AUTHORITY INFORMATION			
17.	*Statutory Authority Fund Type Code	Select One: Economy Act	
18.	Statutory Authority Fund Type Title	The Economy Act (31 U.S.C 1535 / FAR 17.5)	
19.	Statutory Authority Fund Type Citation	The Economy Act - See FAR 17.502-2 for citation	
		Requesting Agency (Buyer)	Servicing Agency (Seller)
20.	Program Authority Title	Economy Act	Economy Act
21.	Program Authority Citation	31 U.S.C. 1535/FAR 17.5	
ADVANCE INFORMATION (Required by Servicing Agency if there is an advance.)			
22.	Advance Revenue Recognition Methodology	Select One:	
23.	Advance Revenue Recognition Description (required if "Other")	N/A	
24.	Advance Payment Authority Title	N/A	
25.	Advance Payment Authority Citation	N/A	
		Original Base/Current Modification Total	New/Proposed Modification Total
26.	Total Advance Amount	$0.00	
27.	Advance Amount Funding Change for this Modification [Addition (+) or Reduction (-)]	$0.00	
28.	Total Modified Advance Amount	$0.00	
DELIVERY INFORMATION (Requesting Agency completes.)			
29.	*FOB Point	Select One: Source/Origin	
30.	Constructive Receipt Days	N/A (Calendar Days) *Required if Destination/Other is checked on line 29.	
31.	Acceptance Point	Select One: Source/Origin	
32.	Place of Acceptance	N/A	
33.	Inspection Point	Select One: Source/Origin	
34.	Place of Inspection	N/A	
ORDER BILLING (Servicing Agency completes.)			
35.	*Billing Frequency	Select One: MONTHLY	
36.	Billing Frequency Explanation		
ORDER BILLING (Requesting Agency completes.)			
37.	Priority Order Indicator	Yes	

38.	Capital Planning and Investment Control (CPIC)	False	
		Original Base/Current Modification Total	New/Proposed Modification Total
39.	*Total Order Amount	$3,000,000.00	
40.	Total Modification Amount		
41.	Total Modified Order Amount		
42.	Total Modified Advance Order Amount		
43.	Net Order Amount	$3,000,000.00	

LINE ITEMS (Additional Lines/Schedules may be added using the + button after Block 116)

		Original Base/Current Modification Total	New/Proposed Modification Total
44.	*Line Number	0001	
45.	G Order Line Status	ACTIVE	
46.	G Item Code		
47.	*Item Description	Naval Sea System Command mobilization to assist in the scoping and cost estimating of the debris removal from Baltimore Harbor 50FT federally authorized channel following the Key Bridge collapse See Scope of Work.	
48.	*Line Costs Unit of Measure (UOM)	LS	
49.	*Unit of Measure Description	Lump Sum	
50.	Total Line Costs	$3,000,000.00	
51.	Line Cost Funding Change for this Modification [Addition (+) or Reduction (-)]	$0.00	
52.	Total Modified Line Costs	$0.00	
53.	Order Line Advance Amount	$0.00	
54.	Order Line Advance Amount Funding Change for this Modification [Addition (+) or Reduction (-)]	$0.00	
55.	Total Modified Order Line Advance Amount	$0.00	
56.	Product/Service Identifier	N/A	
57.	*Capitalized Asset Indicator (Servicing Agency Only)	False	
58.	Item UID Required Indicator	False	
59.	*Type of Service Requirements	NON-SEVERABLE	

SCHEDULE SUMMARY (Additional Lines/Schedules may be added using the + button after Block 116)

		Original Base/Current Modification Total	New/Proposed Modification Total
60.	*Schedule Number	N/A	
61.	Advance Payment Indicator	False	

62.	*Cancel Status (Schedule)	ACTIVE	
63.	*Schedule Unit Cost/Price	$3,000,000.00	
64.	Schedule Unit Cost/Price Funding Change for this Modification [Addition (+) or Reduction (-)]	$0.00	
65.	Total Modification Schedule Unit Cost/Price	$0.00	
66.	*Order Schedule Quantity	1	
67.	Order Schedule Quantity Change for this Modification [Addition (+) or Reduction (-)]	0	
68.	Net Modification Order Schedule Quantity	1	
69.	Order Schedule Amount	$3,000,000.00	
70.	Order Schedule Amount Funding Change for this Modification [Addition (+) or Reduction (-)]	$0.00	
71.	Total Modified Order Schedule Amount	$0.00	

SCHEDULE FUNDING INFORMATION

		Requesting Agency (Buyer)								Servicing Agency (Seller)							
72.	*Agency Treasury Account Symbol (TAS)	SP	ATA	AID	BPOA	EPOA	A	MAIN	SUB	SP	ATA	AID	BPOA	EPOA	A	MAIN	SUB
				096			X	3123	000			017	2024	2024		1804	

73.	*Agency Business Event Type Code (BETC)	DISNGF	COLL
74.	Object Class Code	N/A	
75.	Additional Accounting Classification	TAS:096 X3123	1804
76.	*Bona Fide Need (Requesting Agency Only)	Services requested are a bona fide need of FY24. See 2024 Scope of Work for details on individual tasks and deliverables.	

STANDARD LINE OF ACCOUNTING (SLOA) INFORMATION (Accounting Flex Field Values)

To capture Agency Internal Accounting

		Requesting Agency (Buyer)	Servicing Agency (Seller)
77.	Accounting Classification Reference Number	N/A	N/A
78.	Reimbursable Flag	Reimbursable	Reimbursable
79.	Federal Award Identifier Number (FAIN)	N/A	N/A
80.	Unique Record Identifier (URI)	N/A	N/A
81.	Activity Address Code	N/A	N/A
82.	Budget Line Item	N/A	N/A
83.	Budget Fiscal Year	N/A	N/A
84.	Security Cooperation	N/A	N/A

85.	Security Cooperation Implementation Agency	N	N
86.	Security Cooperation Case Designator	N/A	N/A
87.	Security Cooperation Case Line Item Identifier	N/A	N/A
88.	Sub-Allocation	N/A	N/A
89.	Agency Accounting Identifier	N/A	17
90.	Funding Center Identifier	N/A	1804
91.	Cost Center Identifier	N/A	240V0C000
92.	Project Identifier	N/A	N/A
93.	Activity Identifier	N/A	N/A
94.	Disbursing Identifier	N/A	N/A
95.	Cost Element Code	N/A	N/A
96.	Work Order Number	N/A	N/A
97.	Functional Area	N/A	N/A
98.	Agency Security Cooperation Case Designator	N/A	N/A
99.	Parent Award Identifier (PAID)	N/A	N/A
100.	Procurement Instrument Identifier (PIID)	N/A	N/A
	SCHEDULE SHIPPING INFORMATION		
101.	Ship To Address Identifier	N/A	
102.	Ship To Agency Title	Invoice Address	
103.	Address 1		
104.	Address 2	N/A	
105.	Address 3	N/A	
106.	Ship To City		
107.	Ship To Postal Code		
108.	Ship To State	Maryland	
109.	Ship To Country Code		
110.	Ship To Location Description	N/A	
111.	Delivery/Shipping Information for Product Special Shipping Information	N/A	
112.	Delivery/Shipping POC Name	N/A	
113.	Delivery/Shipping Information for Product POC Title	N/A	
114.	Delivery/Shipping Information for Product POC E-mail Address	N/A	
115.	Delivery/Shipping Information for Product POC Telephone Number	N/A	

		Requesting Agency (Buyer)	Servicing Agency (Seller)
116.	Agency Additional Information		

MODIFY ORDER	
117.	Modification Date (yyyy-mm-dd):
118.	Brief explanation required for modifying this Order:
CLOSE ORDER	
119.	Closing Date (yyyy-mm-dd):
120.	Brief explanation required for closing this Order:
REJECT ORDER	
121.	Rejection Date (yyyy-mm-dd):
122.	Brief explanation required for rejecting this Order:

AGENCY POINT OF CONTACTS (POC)			
		Requesting Agency (Buyer)	Servicing Agency (Seller)
123.	*Agency POC Name	Eric Lindheimer	Paul Hankins
	*Agency POC E-mail	Eric.M.Lindheimer@usace.army.mil	paul.f.hankins.civ@us.navy.mil
	*Agency POC Phone No.	202-400-3236	202-781-2736
	Agency POC Fax No.		

AGREEMENT APROVALS

FUNDING OFFICIAL

The Funds Approving Officials, as identified by the Requesting Agency and Servicing Agency, certify that the funds are accurately cited and can be properly accounted for per the purposes set forth in the Order. The Requesting Agency Funding Official signs to obligate funds. The Servicing Agency Funding Official signs to start the work, and to bill, collect, and properly account for funds from the Requesting Agency, in accordance with the agreement.

		Requesting Agency (Buyer)	Servicing Agency (Seller)
124.	*Funding Official Name	Gregory E. Johnson	
	*Signature	HIGGINS.CHRISTOPHER.1395191752 Digitally signed by HIGGINS.CHRISTOPHER.1395191752 Date: 2024.03.26 22:27:42 -04'00'	
	Funding Official Title	Chief, Resource Management Office	
	*Funding Official E-mail	gregory.e.johnson@usace.army.mil	
	*Funding Official Phone No.	410-962-3890	
	Funding Official Fax No.		
	*Funding Official Date Signed (yyyy-mm-dd)	2024-03-26	

ACCEPTANCE OF MIPR

1. TO *(Requiring Activity Address)(Include ZIP Code)*	2. MIPR NUMBER	3. AMENDMENT NO.
OPERATIONS DIVISION CENAB-OP 2 HOPKINS PLAZA BALTIMORE, MD 21201	W81W3G40867960	
	4. DATE *(MIPR Signature Date)* 20210111	5. AMOUNT *(As Listed on the MIPR)* $40,000.00

6. The MIPR identified above is accepted and the items requested will be provided as follows: *(Check as Applicable)*

a. [X] ALL ITEMS WILL BE PROVIDED THROUGH REIMBURSEMENT *(Category I)*

b. [ ] ALL ITEMS WILL BE PROCURED BY THE DIRECT CITATION OF FUNDS *(Category II)*

c. [ ] ITEMS WILL BE PROVIDED BY BOTH CATEGORY I AND CATEGORY II AS INDICATED BELOW

d. [ ] THIS ACCEPTANCE, FOR CATEGORY I ITEMS, IS QUALIFIED BECAUSE OF ANTICIPATED CONTINGENCIES AS TO FINAL PRICE. CHANGES IN THIS ACCEPTANCE FIGURE WILL BE FURNISHED PERIODICALLY UPON DETERMINATION OF DEFINITIZED PRICES, BUT PRIOR TO SUBMISSION OF BILLINGS.

7. [ ] MIPR ITEM NUMBER(S) IDENTIFIED IN BLOCK 13, "REMARKS" IS NOT ACCEPTED (IS REJECTED) FOR THE REASONS INDICATED.

8. TO BE PROVIDED THROUGH REIMBURSEMENT CATEGORY I			9. TO BE PROCURED BY DIRECT CITATION OF FUNDS CATEGORY II		
ITEM NO. a.	QUANTITY b.	ESTIMATED PRICE c.	ITEM NO. a.	QUANTITY b.	ESTIMATED PRICE c.
AA	1	$3,000,000.00			
d. **TOTAL ESTIMATED PRICE**		$3,000,000.00	e. **TOTAL ESTIMATED PRICE**		$0.00

10. ANTICIPATED DATE OF OBLIGATION FOR CATEGORY II ITEMS	11. GRAND TOTAL ESTIMATED PRICE OF ALL ITEMS
	$300,000.00

12. FUNDS DATA *(Check if Applicable)*

a. [ ] ADDITIONAL FUNDS IN THE AMOUNT OF $ _____ ARE REQUIRED *(See justification in Block 13)*

b. [X] FUNDS IN THE AMOUNT OF $ _____ ARE NOT REQUIRED AND MAY BE WITHDRAWN

13. REMARKS

096 NA X 2024 3123 000 0000 E1 2024 08 2420 074955 2530 14K2LK 111 96181 00008736
WORK CAT CODE: 61110 WORK CAT ELEM CODE: D9000 CCS: 111

14. ACCEPTING ACTIVITY *(Complete Address)*	15. TYPED NAME AND TITLE OF AUTHORIZED OFFICIAL	
NAVAL SEA SYSTEM COMMAND SEA 00C 1333 ISAAC HULL AVE. SE WASHINGTON NAVY YARD WASHINGTON DC 20376	16. SIGNATURE	17. DATE

DD FORM 448-2, JUL 71 PREVIOUS EDITION WILL BE USED UNTIL EXHAUSTED. Adobe Designer 8.0

PROGRAM OFFICIAL

The Program Officials, as identified by the Requesting Agency and Servicing Agency, must ensure that the scope of work is properly defined and can be fulfilled for this Order. The Program Official may or may not be the Contracting Officer depending on each agency's IAA business process.

		Requesting Agency (Buyer)	Servicing Agency (Seller)
125.	*Program Official Name	For: COL Estee Pinchasin	Paul Hankins
	*Signature	Digitally signed by MORROW.DAVID.B.1231743444 Date: 2024.03.27 08:16:22 -04'00'	
	Program Official Title	Colonel, U.S. Army, Commander and District Engineer	Division Head, 00C2
	*Program Official E-mail	Estee.S.Pinchasin@usace.army.mil	paul.f.hankins.civ@us.navy.mil
	*Program Official Phone No.	410-962-4545	202-781-2736
	Program Official Fax No.	N/A	
	*Program Official Date Signed (yyyy-mm-dd)	2024-03-27	

AGENCY PREPARER INFORMATION

		Requesting Agency (Buyer)
126.	*Name	Christopher Higgins
	*Phone No.	410-962-3233
	*E-mail Address	Christopher.Higgins@usace.army.mil

MILITARY INTERDEPARTMENTAL PURCHASE REQUEST

1. Page 1 of 1

2. FSC	3. CONTROL SYMBOL NO.	4. DATE PREPARED	5. MIPR NUMBER	6. AMEND NO.
		26-MAR-2024	W81W3G40867960	000

7. TO: NAVAL SEA SYSTEMS COMMAND
1333 ISAAC HULL AVE,BLDG 197
WASHINGTON, DC 20376-1220

8. FROM: OPERATIONS DIVISION
CENAB-OP
2 HOPKINS PLAZA
BALTIMORE, MD 21201

9. ITEMS ☐ ARE ☐ ARE NOT INCLUDED IN THE INTERSERVICE SUPPLY SUPPORT PROGRAM AND REQUIRED INTERSERVICE SCREENING ☐ HAS ☐ HAS NOT BEEN ACCOMPLISHED

ITEM NO. a	DESCRIPTION (Federal stock number, nomenclature, specification and/or drawing No., etc.) b	QTY c	UNIT d	ESTIMATED UNIT PRICE e	ESTIMATED TOTAL PRICE f
1	Naval Sea System Command mobilization to assist in the scoping and cost estimating of the debris removal from Baltimore Harbor 50FT federally authorized channel following the Key Bridge collapse ACCTING CLASS: 096 NA X 2024 3123 000 0000 E1 2024 08 2420 074955 2530 14K2LK 111 96181 00008736 WORK CAT CODE: 61110 WORK CAT ELEM CODE: D9000 CCS: 111 INITIAL ACCTING CLASS: NA 08 074955 SRC ACCTING CLASS: NA LINE ITEM CURRENT UNOBLIG BAL AMT: $3,000,000.00		LS		$3,000,000.00

10. SEE ATTACHED PAGES FOR DELIVERY SCHEDULES, PRESERVATION AND PACKAGING INSTRUCTIONS, SHIPPING INSTRUCTIONS AND INSTRUCTIONS FOR DISTRIBUTION OF CONTRACTS AND RELATED DOCUMENTS.

11. GRAND TOTAL: $3,000,000.00

REMARKS:

THIS ORDER IS A DESIGNATED ECONOMY ACT ORDER

RETURN ONE SIGNED COPY OF ACCEPTANCE MARKED FINANCE & ACCOUNTING OFFICE.
Upon Acceptance of this Government Order the Performing Activity must include the full accounting classification data to include: Department Code: _____, Transfer Department Code: _____, Appropriation Fiscal Year: _____, Appropriation Symbol: _____, Appropriation Limitation: _____, Operating Agency: _____, Allotment Serial Number: _____ Fiscal Station Number: _____, and the account classification amount: _____.
Agency Location Code: _____

Please have the accepting official sign below and return to the FINANCIAL POC address. EXPIRATION DATE: 31-DEC-2024

RA TECHNICAL POC:	ERIC MARK LINDHEIMER	CENAB-OPT-N	202-400-3236	eric.m.lindheimer@usace.army.mil
RA FINANCIAL POC:	CHRISTOPHE HIGGINS	CENAB-OPO	4109623233	christopher.higgins@usace.army.mil

RA TECHNICAL POC ADDRESS: MANAGEMENT SUPPORT OFFICE
2 HOPKINS PLAZA
BALTIMORE, MD 21201

PA TECHNICAL POC: PAUL HANKINS - Paul.F.Hankins.civ@us.navy.mil
PA FINANCIAL POC: TINA BENDER - Tina.B.Bender.civ@us.navy.mil - 202-781-0862

*****DEPT 096 FUNDS - CANNOT BE ACCEPTED AS DIRECT FUND CITE*****

ACCEPTED ___ REIMBURSABLE _____ DATE: _____ TITLE: _____

12. TRANSPORTATION ALLOTMENT (Used if FOB Contractor's plant)

13. MAIL INVOICES TO (Payment will be made by)
USACE FINANCE CENTER (E1)
BALTIMORE DISTRICT (E1)
C/O USACE FINANCE CENTER
5722 INTEGRITY DRIVE
MILLINGTON, TN 38054-5005

14. FUNDS FOR PROCUREMENT ARE PROPERLY CHARGEABLE TO THE ALLOTMENTS SET FORTH ON THE LINE ITEM NOs ABOVE. THE AVAILABLE BALANCES OF WHICH ARE SUFFICIENT TO COVER THE ESTIMATED TOTAL PRICE.

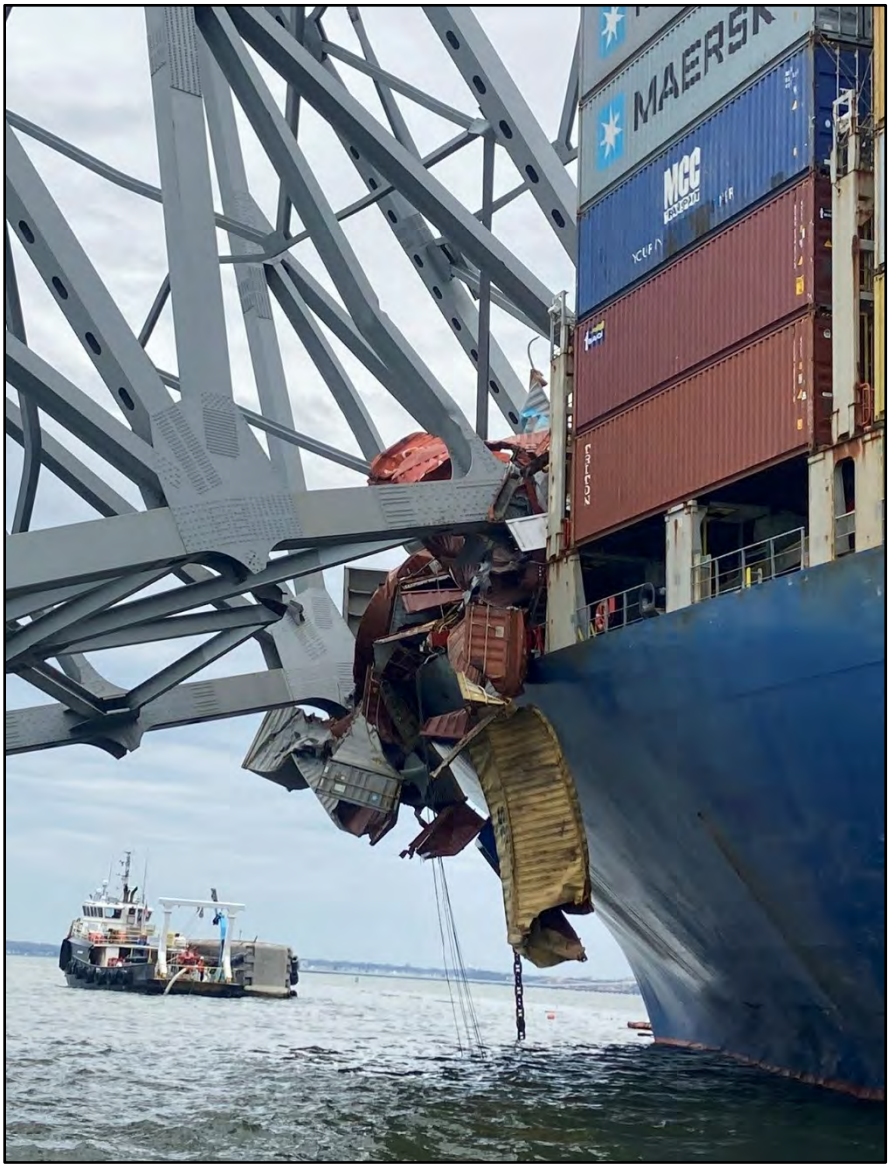
CYNTHIA R GEPPI
SUPERVISORY ACCOUNTANT
ELECTRONICALLY SIGNED BY 27-MAR-2024

15. AUTHORIZING OFFICER (Type name and title)	16. SIGNATURE	17. DATE
LACY E EVANS PROGRAM MANAGER	LACY E EVANS ELECTRONICALLY SIGNED BY	26-MAR-2024

DD Form 448

Appendix C

SITREPS Documenting Key Events



SUPSALV SITREPS (Key Events)

SITREP 001 – FRANCIS KEY BRIDGE COLLAPSE 26 MARCH 2024

NAVSEA Supervisor of Salvage (SUPSALV) was notified of bridge collapse 0530 26 Mar. Because SUPSALV was in NORVA on other business, SUPSALV attended USFF briefing on subject and provided USFF with overview of SUPSALV and contractor capabilities.

In early AM began coordination with USCG HQ (Marine Environmental Response) and US Army Corps of Engineers (USACE) HQ and their Commander and District Engineer of Baltimore District. SUPSALV has Interagency Memorandum of Agreements (MOA) with both organizations to provide emergency salvage services through SUPSALV Emergency Salvage contracts.

After extensive consultations with SUPSALV, USACE began formal process of requesting SUPSALV services through OPNAV N3, IAW MOA. SUPSALV role will be primarily to get harbor channel open to traffic while the vessel owners contracted salvor works on refloating the vessel. Funding was transferred to NAVSEA (SUPSALV) in anticipation of tasking in late afternoon. SUPSALV Contracting Officer issued Authorization to Proceed (ATP) in late PM.

SUPSALV attended afternoon/evening Unified Command meetings at USCG/USACE Incident Command Post at bridge site to begin coordination of assets and development of salvage plan. The general objectives of the Unified Command (after safety of life and search and rescue phases are complete) will be to get the channel reopened and remove the ship from the site (ship is currently hard aground).

SUPSALV contractors are mobilizing 1000-ton lift capacity derrick barge, 400-ton lift capacity revolving crane barge, and 160T revolving crane, with supporting vessels from Port Newark, NJ. ETA to Baltimore 36-40 hours after departure.

Details on response from today (from USACE):

Unified Command has been led by the Maryland Transportation Authority Police, who plans to hand off to the Coast Guard when search and rescue operations conclude this PM. As of this writing, two bodies have been recovered, 4 construction workers are unaccounted for. Sonar and remote operation/underwater vehicles to assess the safety and hazards under and around the bridge are in progress. The priority remains recovery operations while trying to determine the structural integrity of the damaged structure as it sits in the water comingled with the vessel.

Unified Command and USACE conducted briefing to the US Transportation Secretary, the Maryland Congressional Delegation including both Senators, all emphasizing the state and federal commitment from the President on down.

USACE responded to request for structural engineers to support ongoing assessments to enable deploying divers to the site. USACE bridge center of expertise personnel are standing by to support with reach-back. Two USACE vessels are on site to support the Coast Guard with recovery operations and to assist to clear channel debris.

USACE coordinated with the Navy SUPSALV, spinning up capabilities through the USACE interagency agreement with the Navy for heavy lift and salvage/debris removal and working lift asset availability. Official Request for Support being staffed.

Coordinating with USCG to plan the way ahead as we transition from a search and rescue/recovery operation to reconstituting the channel. Planning to support the USCG and jointly planning the deconstruction and massive debris removal mission with our state, federal and industry partners.

USCG District Commander on scene today. USACE Chief scheduled to be onsite Wednesday.

SITREP 005 Key Bridge Response 2024 30 MARCH 2024

BLUF – Removal of first section (one of multiple sections) 90% complete. Removal of this section will enable possible alternative limited-depth channel. Diving surveys in main channel and in waters surrounding vessel continue. Salvage plan development continues in earnest. Preparations for main channel lifting continue. USACE Chief Engineer toured site and was briefed by SUPSALV.

Key Points:

Lift of bridge wreckage commenced to open shallow draft alternate channel

NO CHANGE to C2 of the onsite Unified Command (UC)

NO CHANGE to oversight responsibilities. SUPSALV maintains oversight of three salvage LOEs:

- Primary focus - channel clearance for USACE
- Secondary focus - ship salvage (commercial salvor has lead for the ship's owner)
- Tertiary focus - wreckage removal outside the channel (Maryland Transportation Authority has lead)

Last 24 hours:

- Additional lift assets arrived on station (details below)
- Continue site surveys (dive and surface sidescan)
- Continue engineering assessments and salvage plans development for Priorities 1 and 2
- Continued to build-out the Salvage Branch organization
  - Created Common Operating Picture (COP) for all salvage LOEs
  - Personnel on station:
    - SUPSALV – 1 Mil, 3 Civ, 1 support contractor
    - CHINFO LNO – 1 Mil
    - Salvage Contractor (Donjon Marine) – approx. 120 personnel
    - ESSM Contractors (GPC) – 6 personnel
- Current status for SUPSALV contracted salvage vessels:
  - On station:
    - Survey vessel (side scan sonar capable)
    - Chesapeake 1000 (1000 ton lift capacity)
    - Ferrell 256 (160 ton capacity)
    - Oyster Bay (150 ton capacity)

- ETAs of additional lift assets:
  - Thirteen other vessels (tugs, survey, dive, and crew boats) – ETAs range between tonight and 01 APR
  - Columbia (400 ton capacity) – **DELAYED** due to maintenance issues, new ETA remains TBD

Next 24:

- Move Chesapeake 1000 and Oyster Bay into position to enable rigging.
- Continue removal of wreckage (truss span components) in vicinity of Truss 19 for potential opening of alternative channel
- Continue side-scan survey operations and engineering assessments to support salvage planning for bridge truss lifts
- Continue CODA 3D sonar surveys to develop and refine understanding of underwater wreckage profiles.
- Continue dive surveys
- Continue development of channel clearance plan
- Coordinate efforts of other salvage LOEs

Of note:

- Engineering Assessment and Site Surveys are underway but will likely take multiple days to a week IOT compile enough information across all LOEs to build the common information picture and best inform safety and salvage plans.
- Expectation management: The optics will be that there is a lot of equipment establishing a solid footprint with little/no operations while the team builds sufficient common operational picture to ensure safe execution of required salvage efforts.

SITREP #21 15 APRIL 2024

BLUF: We remain **ON TRACK** to meet 30 April target date to open initial channel (280ft wide by 35ft) and full channel reopening on 28 May. No critical path efforts behind schedule. Progress made (15 April) in the main channel. Rigged Truss 1B today; lifting planned for 16 April. 90% complete with Truss 1 removal. Initial Vessel Refloat Plan review and alterations in progress. Potential concerns regarding partially open channel with DALI still aground and being discussed internally. Truss 4 plan execution is in progress; setting and making pre-cuts for charge installation around 23 April. Truss section 17 upper chord removed. Bridge wreckage being processed successfully on land.

Next Key Event is opening the Preliminary Federal Channel (280ft x 35ft) to support reopening the port to an estimated 80% of traffic. Target date for this Key Event is 30 April – we remain **ON TRACK** to this Key Event. Next milestone supporting this key event is Truss 18 Section 1B lift, ECD 15 April followed by Truss 0 removal scheduled on 20/21 April.

Key Points:

- SUPSALV maintains oversight of three salvage LOEs for USACE:
  - Primary focus – Federal channel clearance for USACE (SUPSALV has lead)
  - Secondary focus – M/V Dali ship salvage (commercial salvor Resolve has lead for the ship's owner)

    - Tertiary focus – Bridge wreckage removal outside the channel (Maryland Transportation Authority has lead)
- Personnel on station:
    - SUPSALV – 4 Mil, 3 Civ, 1 support contractor
    - CHINFO LNO – 1 Mil
    - Salvage contractor (Donjon Marine) – approx. 130 personnel (vessel and salvage personnel)
    - ESSM contractors (GPC) – 3 personnel
- ETAs of additional lift assets:
    - Salvage Grab (800 ton capacity) – ETA approx. 20 APR

Last 24 hours:

Federal Channel (PRI 1):

- Section 1 removal on track, ECD 16 APR:
    - Pre-rigged Section 1B
    - Shifted assets in preparation for lift
    - Performed dive survey of Section 1B to verify ready for lift
- Continued debris removal; South end Section 1
- Continued installation of AIS transponders, ongoing 70% complete. ECD 18 APR
- Continued Section 0 removal plan and debris disposal plan; ECD 20/21 Apr

Vessel Refloating (PRI 2):

- Continued management of safe soybean removal operation
- Continued container removal, ECD 22 APR
- Prepped blast location, cut marking at each location
- Repaired double drum bow winch, worked on repairing bow thruster

Bridge Wreckage Removal (PRI 3):

- Made Pick #2 (upper chord) at Span 17
- Continued lower chord removal at Span 19A
- Continued girder removal at Pier 21
- Sparrow's Point Yard – continued processing steel and prepared to receive Section 1B

Next 24 hours

Federal Channel (PRI 1):

- Position Chesapeake 1000 to Section 1B in preparation for lift, ECD 16 APR
- Rig section 1B onto Chesapeake and conduct lift, offload at Sparrow's Point
- Continue installing AIS transponders, ECD 18 APR
- Start precuts and rigging for Truss 0.
- Developing Debris Disposal Plan for recovered mud disposal

Vessel Refloating (PRI 2):

- Continue management of safe soybean removal operation
- Continue container removal, ECD 22 APR
- Finalize equipment list and blast location preparation
- Continue working on bow thruster
- Continue refining Refloat Plan

Bridge Wreckage Removal (PRI 3):

- Continue bottom chord removal at Span 19A
- Continue girder removal at Pier 21
- Mobilize pick #2 from Span 17 to Sparrow's Point
- Sparrow's Point Yard – continue processing of Section 1A, receive Section 1B

Beyond next 24:

- Discussions continue on an additional debris processing site
- Continue to coordinate efforts of all salvage LOEs. Some 24 hour ops will occur while digging; grabbing and/or dredging
- Share tracking metrics for percentage of harbor clearance and salvage completion with UC

Of note:

- Executing plan for personnel coverage to ensure continuity of operations across SUPSALV efforts (i.e., operations within Federal channel and admin in support of oversight for UC). No assistance needed to push for additional personnel at this time, plan will be updated as required.
- Media: MC3 is creating a feature story about SUPSALV and the contracting partners working under them. It will be routed through CHINFO with a planned release this week

SITREP #30 24 APRIL 2024

BLUF: UC has finalized updated schedule, moving initial channel opening from 30 Apr to 25 Apr. A final high channel survey confirms sufficient depths for traffic. Testing of public channel by pilots conducted. Initial channel will be 300ft wide by 35ft. Plan to open channel to limited ship traffic for 3 days to get some ship traffic in and out of Baltimore. After 28 Apr, plan is to close channel to make preps to drop Truss 4. Full channel reopening still on track for 28 May. No critical path efforts behind schedule. Truss 18, Section 4 plan execution is in progress. Continue making pre-cuts for charge installation between May 1-5. Truss 17, 19 and 20 material removal continues. Bridge wreckage being processed successfully on land. Next Key Event is opening the Preliminary Federal Channel (300ft x 35ft) to support reopening the port to an estimated 80% of traffic during 24 – 28 April.

Key Points:

- SUPSALV maintains oversight of three salvage LOEs for USACE:
  - Primary focus – Federal channel clearance for USACE (SUPSALV has lead)
  - Secondary focus – M/V Dali ship salvage (commercial salvor Resolve has lead for the ship's owner)
  - Tertiary focus – Bridge wreckage removal outside the channel (Maryland Transportation Authority has lead)
- Personnel on station:
  - SUPSALV – 4 Mil, 3 Civ, 2 support contractors
  - CHINFO LNO – 3 Mil
  - Salvage contractor (Donjon Marine) – approx. 130 personnel (vessel and salvage personnel)

- ESSM contractors (GPC) – 4 personnel

Last 24 hours:

Federal Channel (PRI 1):

- Engineering on Skanska truss sections at Pier 18
- Bucketing high spots in Nav channel
- Move Farrell and Columbia to Pier 18. Rig and remove remaining bridge debris near truss 0, deliver to Sparrows Point
- Secure fenders to bridge abutment
- Prepare Delaware Bay dredge for operations

Vessel Refloating (PRI 2):

- Hazmat mitigation, working hazmat disposal plan.
- Section 4 removal – 82% complete on precuts, halted due to high winds at 1315. prepping cold cutter on barge 180, prepping conveyor belt for blast cover
- Vessel Restraining system – deployed 6 of 6 anchors
- Vessel Removal – added ballast water to No 1 and No. 2 voids stbd side

Bridge Wreckage Removal (PRI 3)

- Mob 4600 ringer and lima to Span 19 South for pick
- Sparrow's Point Yard – Offload Section 0-C, process steel from various locations, loadout steel for departure. Assemble 650 and 800 Excavators
- Continue processing material at Span 22
- Assist with obstruction removal at Span 18

Next 24 hours

Federal Channel (PRI 1):

- Engineering or Lifts for Skanska Sections (19 and or 17)
- Perform maintenance on equipment
- Potential offload barges 3301, 3302, 1406
- Continue displaced Materials permitting

Vessel Refloating (PRI 2):

- Safe removal of hazmat and combustibles.
- Continue container removal ops from Bay 10, 44 lifts remaining
- Section 4 removal – continue precuts. Commence removing truss sections from Stbd bow.
- Vessel Restraining system – final preparations for passing vessel traffic

Bridge Wreckage Removal (PRI 3):

- Continue to break concrete deck on south span of Truss 17, continue deck removal
- Mobilize 4600 Ringer and Lima 2400B to Span 19 for Pick 4A.
- Dale Pyatt and Lima to Span 21-22 for debris removal
- Continue processing and loading out steel at Sparrows Point.

Beyond next 24:

- UC finalizing messaging to announce opening initial channel (300' x 35') on 25 Apr for planned 4 day period to move traffic in and out of Baltimore. Expect public announcement 24 Apr. On 29 Apr, plan is to close channel to continue preps to explosively cut Truss 4 and remove DALI
- Socialize vessel traffic and prioritization plan (USCG responsibility)

- Sign lease agreements for processing site and continue development of additional debris (mud) processing site
- Continue to coordinate efforts of all salvage LOEs.

Of note:

- Executing plan for personnel coverage to ensure continuity of operations across SUPSALV efforts (i.e., operations within Federal channel and admin in support of oversight for UC). No assistance needed to push for additional personnel at this time, plan will be updated as required.

SITREP #56 20 MAY 2024

BLUF: M/V Dali refloated at approximately 0630 and transited to Seagirth Berth 1. USACE channel survey indicated 36 ft obstruction remained in channel on southwest edge of 400' channel. Donjon assets redeployed after Dali refloated to remove obstruction. Additional NOAA/USACE survey to be accomplished this evening. Unified Command structured response shifting to Incident Management Team (IMT) led by USCG. SUPSALV will continue to coordinate salvage response under new incident management framework with focused coordination between Donjon and Skanska for work in channel.

Key Points:

- SUPSALV shifting salvage oversight from three to two LOEs for USACE:
  - Primary focus – Federal channel clearance for USACE (SUPSALV has lead)
  - Secondary focus – Bridge wreckage removal outside the channel (Maryland Transportation Authority has lead)
- Personnel on station:
  - SUPSALV – 3 Mil, 4 Civ
  - Salvage contractor (Donjon Marine) – approx. 130 personnel (vessel and salvage personnel)
  - ESSM contractors (GPC) – 5 personnel

Last 24 hours:

Federal Channel (PRI 1):

- CHESAPEAKE and Grab made pick of Section 4 prior to transiting to Sparrows Point to offload Grab and JAMES.
- FARRELL used shear cuts and DSW to separate portions of Section 4 in anticipation of rigging and lift.
- OYSTER BAY conducted bucket ops to clear federal channel - validation with NOAA Survey evening (20 May).
- Section 4 surveys conducted with CODA and Donjon survey boats.

Bridge Wreckage Removal (PRI 2)

- Sparrows Point - Receive steel and downsize
- Span 17 - Mobilize LIMA, 1250 Excavator and DALE PYATT to remove debris
- Span 20: 1250 Excavator hammering pier 19 substructure
- Span 21: Trim exposed rebar with BALTIMORE

Next 24 hours

Federal Channel (PRI 1):

- Evening (20 May) NOAA Survey to validate 400' by 50' channel

- Evening (21 May) USACE Survey to confirm 400’ by 50’ channel
- Cut, rig and lift Section 4
- Continue Grab and debris pickup with CHESAPEAKE

Bridge Wreckage Removal (PRI 2):
- Span 17 - Dale Pyatt, ACD1250 and Lima continue to remove deck and chord
- Span 20 - ACD continue demolition of Pier 19 substructure
- Span 21 - Finish cutting exposed rebar
- Sparrows Point - Continue downsizing, processing yard material in preparation for loadout.

Dali Post Refloat: Coordinate with Resolve Marine/USCG as needed.

Beyond next 24:
- Truss 18 Section 4 cut, rig and lift
- Clear full 700’ federal channel and remove displaced material
- Survey as need

SITREP #75 08 JUNE 2024

BLUF: 700' by 50' federal channel expected to now be clear by evening 09 June. Multibeam and magnetometer surveys revealed high spots in channel that are currently being addressed. Donjon continued with grab and bucket ops to clear the 700’ by 50’ channel. Skanska continued to process material at Sparrows Point and conducted bucket ops IVO Pier 19. All LOEs remain on track.

Key Points:

- SUPSALV shifting salvage oversight from three to two LOEs for USACE:
    - Primary focus – Federal channel clearance for USACE (SUPSALV has lead)
    - Secondary focus – Bridge wreckage removal outside the channel (Maryland Transportation Authority has lead)
- Personnel on station:
    - SUPSALV – 2 MIL
    - Salvage contractor (Donjon Marine) – approx. 130 personnel (vessel and salvage personnel)
    - ESSM contractors (GPC) – 4 personnel

Last 24 hours:

Federal Channel (PRI 1)
- Conducted multibeam survey with Sea Explorer.
- Demobilize crane barge Columbia NY to be towed by tug Thomas D Witte – underway evening 08 Jun after completion of ops for Thomas D Witte on site.
- Continue bucket ops and debris removal with Oyster Bay into barges Witte 3302 (full) and DA Chambers.
- Continue grab ops with Chesapeake 1000 loading onto barge James.

- Continue transloading and processing displaced material at Donjon facility at Berth 36 Port Newark, NJ.
- Begin offload of displaced material from Witte 4003 barge (to be completed 10 Jun).
- Complete offload of displaced material from barge Kurt Schulte in Port Newark, NJ.
- Kurt Schulte returning to Baltimore with tug Atlantic Enterprise – ETA 2100/09 Jun.

Bridge Wreckage Removal (PRI 2)

- Sparrows Point - continue processing yard material and stockpiling.
- Sparrows Point – Finish MDTA material retention coupon cutting
- Span 19 – Lima continue pulverizing lower chord steel & Dale Pyatt removing debris

Next 24 hours:

Federal Channel (PRI 1)

- Conduct multibeam survey with Sea Explorer.
- Continue bucket ops and debris removal with Oyster Bay.
- Continue grab ops with Chesapeake 1000 or Delaware Bay bucket ops.
- Continue processing displaced material at Donjon facility at Berth 36 Port Newark, NJ.

Bridge Wreckage Removal (PRI 2)

- Sparrows Point - continue processing yard material and stockpiling.
- Sparrows Point – Downsizing steel on APL barge and LR1300 unloading at Zone A
- Span 19 – Lima continue pulverizing lower chord steel. Dale Pyatt removing debris.

Beyond Next 24:

- Clear full 700' federal channel and remove displaced material
- USACE to conduct survey on evening 09 June to verify the channel clearance and provide results to the Maryland Pilots Association
- Upon Maryland Pilots review and satisfaction, USCG to schedule subsequent buoy move
- Donjon Demob will begin in phases following the confirmation of the 700’ channel clearance. Assets will be demobilized on the basis of their continued use case on scene. Key resources listed below each phase. Schedule is as follows:
    - Phase I: Start 09 JUN; following confirmation of 700’ channel cleared
        - Crew boats
        - Some deck barges
    - Phase II: 14 JUN – 20 JUN
        - Chesapeake 1000 and grab
        - River barges
    - Phase III: 25 JUN – 30 JUN
        - All equipment located in Baltimore
    - Phase IV: TBD
        - All barges cleared from displaced material in Newark

Notes:

- All timelines and dates remain dynamic and conditions based.

SITREP #84 17 JUNE 2024

BLUF: Donjon continued bucket and grab operations to remove remaining material. Skanska continued to process material at Sparrows Point and conducted surveys of worksites. All LOEs remain on track.

Key Points:

- SUPSALV shifting salvage oversight from three to two LOEs for USACE:
  - Primary focus – Federal channel clearance for USACE (SUPSALV has lead)
  - Secondary focus – Bridge wreckage removal outside the channel (Maryland Transportation Authority has lead)
- Personnel on station:
  - SUPSALV – 1 MIL
  - Salvage contractor (Donjon Marine) – approx. 51personnel (vessel and salvage personnel)
  - ESSM contractors (GPC) – 4 personnel

Last 24 hours:

Federal Channel (PRI 1)

- Conducted multibeam survey with Sea Explorer.
- Meagan Ann delivered Pierson 777 crane barge to Pierson Construction.
- Continued bucket ops with Oyster Bay and Delaware Bay.
- Chopping beam recovered.
- Conducted off-hire survey for drag barge Dana 55.
- Continued to demobilize equipment and downsize Donjon footprint at Sparrows Pt.
- Casey Ann en route in ballast from Philadelphia – ETA Baltimore 2000/17 JUN.
- Atlantic Enterprise underway from Baltimore with MERC Shevlin – ETA Newark 0900/18 JUN.
- Continued processing displaced material at Donjon facility in Port Newark, NJ.
- Dredge Michigan began to transload displaced material from Kurt Schulte - in progress.
- Tug TBD will tow Kurt Schulte from Newark to Baltimore.
- Tug Thomas D Witte arrived in Newark, awaiting offloading.

Bridge Wreckage Removal (PRI 2)

- Sparrows Point – Continue processing yard material to unprepared lengths and stockpile
- Sparrows Point – Continue breaking down and demobilizing heavy equipment and misc. materials

Next 24 hours:

Federal Channel (PRI 1)

- Conduct multibeam and magnetometer survey with Sea Explorer.
- Continue bucket ops with Oyster Bay / Delaware Bay.
- Chesapeake 1000 on standby for grab ops.
- Upon completion of loading, Casey Ann and S. Tobin to get underway from Baltimore.
- Continue to demobilize equipment and downsize Donjon footprint at Sparrows Pt.
- Expecting quotes for cleaning river scows & disposal Yokohama fender.
- Continue processing displaced material at Donjon facility in Port Newark, NJ.
- Dredge Michigan to continue transloading displaced material from Kurt Schulte and Thomas D Witte.

Bridge Wreckage Removal (PRI 2)

- Sparrows Point – Continue processing yard material to unprepared lengths and loadout for recycling
- Sparrows Point – Continue breaking down and demobilizing heavy equipment and misc. materials

Beyond Next 24:

- **UPDATED:** Donjon Demob will begin in phases following the confirmation of the 700' channel clearance. Assets will be demobilized on the basis of their continued use case on scene. Key resources listed below each phase. Schedule is as follows:
    - Phase I: Started 10 JUN; following confirmation of 700' channel clearance
        - Crew boats
        - Some deck barges
    - Phase II: 16 JUN – 19 JUN
        - Barges and other equipment as they become no longer needed on site
    - Phase III: 16 JUN – 24 JUN
        - All equipment located in Baltimore
    - Phase IV: TBD
        - All barges cleared from displaced material in Newark

Notes:

- All timelines and dates remain dynamic and conditions based
- All sync meetings and products related to them have been discontinued. All personnel previously in receipt of meeting invite have been included on this SITREP to maintain SA
- SUPSALV onsite presence will be completely demobilized NLT EOD Monday, 17 JUN. Reps will remain in direct comms with all appropriate individuals and remain on call if an on-scene presence is required for any reason.

Appendix D

SUPSALV Related Personnel

Navy and Navy Managed Salvage Crew

Uniformed Navy

Name	Rank	Parrent Command
Anderson, Chris	LCDR	PNSY
Anderson, Travis	CDR	PEO SUBS
Carelli, Robert	LCDR	SUPSALV 00C5
Clark, Codi	LCDR	URC
Coleman, Matt	LCDR	NAVSEA 00C
Colgary, James	CDR	PMS 394
Culver, Mackenzie	ENS	NPASE / CHINFO LNO
Eller, Michael	LT	Reserves
Lee, Theodore	MC2	DMA
Mejias, Doug	LT	Reserves
Mohr, Hannah	MC2	DMA
Montgomery, Christine	MC2	DMA
Nielsen, Christopher	MC3	DMA
Pressel, Adam	LT	MIT
Ramseur, Joshua	LT	Reserves
Schacht, Alex	LCDR	SUPSALV 00C2
Showmaker, Jason	LT	NPASE / CHINFO LNO
Soma, Loren	LCDR	Reserves
Suarez, Sal	CAPT	NAVSEA 00C
Torosyan, Masis	LT	SRF Yokosuka
Walter, JR	LT	SSGC
West, Nicholas (Niko)	LTJG	NPASE / CHINFO LNO

Civilian Navy

Name	Rank	Parrent Command
Brege, Eric	Civ	SUPSALV 00C2
Hankins, Paul	Civ	SUPSALV 00C2
Jarecki, Vincent	Civ	SUPSALV 00C2
Neverosky, Daniel	Civ	SUPSALV 00C2
Bender, Tina	CIV	SUPSALV 00C1
Jones, Lenora	CIV	SUPSALV 00C11B

Contractor

Name	Company
Matt Page	GPC
Matt Worrell	GPC
Jim Thompson	GPC
Brian Kurtz	GPC
Logan Leverett	GPC
Heath Barnett	GPC
Jerry Hernandez	GPC
David Griggs	GPC
Paul Fosella	GPC
Kasen Martel	GPC
Robert Smith Jr.	GPC
Andrew Wong	GPC
Don Fegley	ROH
Kayla Gingras	ROH
Mary Savat	ROH
Alexis Matteson	ROH
Kelly Leizear	ROH

DONJON

Name			
Alexander, Dave	Edgar, Ken	Jones, Stewart	Reynolds, Jeremy A
Ayala, Jean	Ekimoglou, Nick	Kearns, Maclain	Roberts, Joseph
Baez, Joseph	Eller, Keith	Kennelly, Patrick J	Ronco, Austin W
Baker, William M	Eller, Lane	Kidwell, Thomas	Ross, Robert
Ballantyne, Jason	Ensman, Scott	Koziol, Alex	Rossman, Dylan
Baptista, Jason D	Farrell, Mike	Kratz, Billy	Roy, Mike
Barbalate, Aaron	Feld, Jeff	Kreter, Linda	Rubino, John
Barbar, Doug	Field Jr, Dennis	Kryssing, Raymond	Russo, Jeffrey
Bauer, Chris	Foley, Sean	Kudrow, David	Ruzzano, Frank
Beatty, Henry J	Foppen, Stan	Landy, Pat	Sabri, Hussam
Bianchi, Robyn	Foran, Paul	Law, Samuel	Sagat, Michael
Blue, Ricky	Fosler, Anthony	Leonhardt, Gregory M	Samons, John
Bogner, Kyle	Galvin, Robert	Loeser, Gregory	Scheppach, Douglas
Boulby, Evan	Garcia, Corey	Lordi, Dylan	Scherm, Ethan
Brack, Christopher T	Garcia, Ricardo	Lorenson, Gordon	Scott, Travis
Bradley, Wade	Garet, Paul G	Lott, Jordon	Selph, Austin
Breaux, Terry	Gaventa, Christopher	Luis Sangster	Selph, Austin
Britton, Bob	Gervasio, Anthony	Lynn, John	Shaw, Ivan
Brooks, Chase	Ghali, Ehab	Magaraci, Frank	Shaw, Ivan
Browne, Armand	Gibbs, Scott	Mannari, Dino J	Shultz, Jacob
Burrows, Joseph	Gilbert, Ryan	Martin Jr, Kenneth R	Sickler, Joe
Cabral, James T	Gleason, Parker V	Matthews, Scott	Silva, Eric
Cabral, Vaughn	Gomez, Caleb	Matton, Brendan C.	Simmons, Mike
Caffarelli, Cody	Grady, Robert E.	Mayani, Yuri	Skeleton, Andrew
Calandra, Antonio	Granger, Jason	McCabe, Michael	Slaughter, Jessica
Campos, Manny	Grotts, Nicholas	McGonigle, Jarred	Smith, Gary
Carter, Sherwin	Hale, Shawn	Minyo, John C	Smits, Michael
Castillo, Stephen	Haley, Brian	Montez, Ali	Snipes, Taylor
Chace, Eric P	Hall, Rocky	Morales, Jean	Sorrentino, Anthony V
Chambers, Jeff	Hallock Jr, Thomas	Moran, Dennis	Sousa, Manny
Chance, Henry	Harrell, Cody	Morgan, Ian	Sparks, David
Chen, Tomer	Hart, Donovan	Mysko, Steve	Springer, Steven
Chlodnicki, Pete	Hebert, Coleton	Naegele, William	Stankiewicz, Pawel
Cocca, Dan	Henault, Cody	Nelson, Bill	Stewart, Ty
Collins, Jay	Henry, Brian	Niederkorn, Ryan	Stickles, Bobby
Collins, Steve (Cuz)	Hensley, Chad	Nisbett, Orrien	Stone, Brian
Conlon, Mike	Herndon, Ronald	O'Connell, Glenn	Sutera, Alex
Conway, Neil	Herndon, Tracy	O'Leary, Cody	Tate, Frank
Costeira, Domingos A	Herodes, Aiden	Olson, Neil	Terrebonne, Dwayne
Coyne, Tommy	Herrera Hoyos, Carlos	Ortiz, Robert	Tervoort-Ter Haar, Sylvia
Crowe, Sean	Hess, Jason D	Palmer, Justin	Thomas, Tyler
Cruz, Harley	Hickey, Eric	Parsons, Frank	Thompson, Chris
Cruz, Nelson	Higgins, Liam	Partin, William	Thompson, Kevin M
Curley Jr, John D	Hill, John	Paulsen, Peter	Tomasino, Michael
Dady, Anthony	Hillborn, Mike	Pearl, Matthew R	Travis, Mike
David, Darrel	Himes, Clair	Peterson, Matthew	Van Hemmen, Rick
Davis, Kendall	Hinger, Andrew	Petrosino, Samantha	Velez, Anthony B
Davis, Kenneth	Hinman, Patrick	Phillips, Major L	Von Mosch, Mark
Davis, Roger	Ho, Brian	Pierce, John	Williamson, Tim
Delmaestro, Vinny	Hoff, Samuel	Pierson, Richard	Winnerling, Zac
Denbow, Danny	Holden III, Roy Lee	Portillo, Jaime	Witte, John
Devenney, Ryan	Holden, Roy	Pronk, Tim	Wyatt, Tom
Donadio, Christopher	Howdeshell, Timothy	Ramos, Jose	Yandoli, Brian
Doren, Michael	Huyck, Race	Randall, Calgary	Yow, Jeremy
Duplantis, Brent	Johansson, Lars-Erik	Rangel, Luis	Zygula, Krzyszof
Echevarria, Alex	Jones, Ken	Recinos, Christian	

Appendix E

Donjon Daily Progress Report (sample)

PROJECT NAME	:	Francis Scott Key Bridge	DPR NO.	:	37
PROJECT NO.	:	24-006	DATE	:	5/01/2024
CONTRACT FORM	:	US NAVY SUPSALV Contract N00024-18-D-4307			

DONJON MARINE COMPANY, INC.
100 Central Avenue, Hillside, New Jersey 07205 USA

A) GENERIC					
To Client	:	US NAVY SUPSALV	POC	:	Paul Hankins
E-mail Client	:	paul.f.hankins@navy.mil			
C.C.	:	eric.d.brege.civ@us.navy.mil			
DONJON MARINE Group	:	John Witte, Bill Kratz, Jr., Gordon Lorenson, Jeff Feld, Sean Crowe, Robyn Bianchi Steven Newes			
From Project Manager	:	Tim Williamson			
Location	:	Baltimore, MD			

B) FORECAST WEATHER ON LOCATION

Weather Synopsis **Tides: 06:56 (L) 13:14 (H) 20:41 (L)** **Sunrise: 6:08 AM** **Sunset: 7:57 PM**

Synopsis: Good day. A broad area of **LOW PRESSURE** centered over Long Island will track SE'ward to 38N/60W by 02/00z before merging with a **STORM** offshore SE'rn Newfoundland.

A broad ridge of **HIGH PRESSURE** will develop NE'ward from the Tennessee Valley through New England by 01/12z. **HIGH PRESSURE** will become centered within the ridge over Cape Cod by 02/00z. This **HIGH PRESSURE** will shift SE'ward from Cape Cod through the 02nd.

A moderate **LOW** over Wisconsin by 01/12z will track E'ward through W'rn New England t be centered over N'rn Vermont by 02/12z. The **LOW** will then quickly weaken and dissipate as it drifts S'ward into Massachusetts through 02/18z, with **HIGH PRESSURE** ridging building S'ward from Quebec in its wake to be across New England by 03/12z.

Heavy Weather/Tropical Concerns: None at this time. Please note that the first 72 hrs of seas forecast is for the location of the bridge, while available data beyond 72hrs represents most open waters near Cape Henry.

Warnings/Tropical

None Expected Next 48Hours.

Forecast Valid	Wind (knots) Direction	Surface	50M	Seas (meters) Direction	Sig	Max	Per	Primary Wave Type	Vis (nm)	Sky Conditions	Precip Total (inch/mm)	Air Temp (F/C) Current (kts)
Wed 01/02LT 01/06z	NW	6G13	10G17	W	0.1	0.1	3	SEA	13	MOSTLY CLOUDY ISOLATED SHWRS/SQUALLS	0.05 / 1	67° / 19° NNW @ 0.1
Wed 01/04LT 01/08z	NNW	8G14	10G17	W	0.1	0.1	3	SEA	13	CLOUDY	0 / 0	65° / 18° NNW @ 0.1
Wed 01/05LT 01/09z	NNW	9G16	11G16	W	0.1	0.1	3	SEA	13	MOSTLY CLOUDY	0 / 0	64° / 18° NNW @ 0.1
Wed 01/06LT 01/10z	N	8G15	11G16	W	0.1	0.1	3	SEA	13	CLEAR	0 / 0	63° / 17° NNW @ 0.1
Wed 01/07LT 01/11z	N	5G9	11G16	W	0.1	0.1	3	SEA	13	PARTLY CLOUDY	0 / 0	63° / 17° N @ 0.1
Wed 01/08LT 01/12z	NNW	5G9	7G15	W	0.1	0.1	3	SEA	13	CLEAR	0 / 0	63° / 17° NNE @ 0.1
Wed 01/09LT 01/13z	N	5G11	7G15	W	0.1	0.1	3	SEA	13	CLEAR	0 / 0	64° / 18° ENE @ 0.1
Wed 01/10LT 01/14z	N	4G9	7G15	W	0.1	0.1	3	SEA	13	CLEAR	0 / 0	66° / 19° E @ 0.1
Wed 01/11LT 01/15z	NNE	3G7	5G8	W	0.1	0.1	3	SEA	13	CLEAR	0 / 0	67° / 19° E @ 0.1
Wed 01/12LT 01/16z	ENE	3G6	5G8	W	0.1	0.1	3	SEA	13	CLEAR	0 / 0	68° / 20° ENE / WEAK
Wed 01/13LT 01/17z	E	4G7	5G8	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	69° / 21° NE @ 0.1
Wed 01/14LT 01/18z	ESE	5G8	6G7	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	71° / 22° NNE @ 0.1
Wed 01/15LT 01/19z	SE	5G8	6G7	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	72° / 22° N @ 0.1
Wed 01/16LT 01/20z	SE	3G6	3G5	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	73° / 23° NNW @ 0.1
Wed 01/17LT 01/21z	ESE	1G4	4G5	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	74° / 23° WNW @ 0.1
Wed 01/18LT 01/22z	N	1G4	4G5	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	75° / 24° SW @ 0.1
Wed 01/19LT 01/23z	WNW	2G5	4G5	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	75° / 24° SSW @ 0.1
Wed 01/20LT 02/00z	W	3G6	7G8	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	75° / 24° SSW @ 0.2
Wed 01/21LT 02/01z	WSW	4G7	7G8	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	74° / 23° S @ 0.2
Wed 01/22LT 02/02z	SW	5G8	7G8	W	0.1	0.2	3	SEA	13	CLEAR	0 / 0	73° / 23° S @ 0.2

C) SUMMARY OPERATIONAL ACTIVITIES

From	To	Description activity
0001	0700	Tug Meagan Ann standby Farrell 256 barge at west side of Pier 18 at Key Bridge.
0001	0700	Tug Thomas D. Witte standby Farrell 256 and material barge James at Key Bridge.
0001	1540	Tug Shannon Dann standby east Fort Carroll mooring.
0001	0730	Tug Douglas J. standby Chesapeake 1000 at Key Bridge.
0001	0640	Tug Brian Nicholas standby Delaware Bay & Chesapeake 1000 at east side of Key Bridge.
0001	0800	Tug Carol standby material barge James at Key Bridge.
0600		Sea Explorer, Jaws, Sea Responder, Delta Escape, Point Comfort getting underway to Sparrows Pt.
0630		Unified Command – Donjon Team members attend Salvage Section Briefing.
0640	1540	Tug Brian Nicholas tended Chesapeake 1000 at Key Bridge.
0700	1600	Tug Thomas D Witte tended material barge James, reposition barge as directed.

0700	1600	Tug Meagan Ann tended Farrell 256.
0700		Toolbox and safety talk - Lightning Strikes.
0730	1620	Tug Douglas J tended dredge Oyster Bay at Key Bridge.
0800	1500	Tug Carol tended material barge James at Key Bridge.
0800		Commence debris removal by bucket ops with the dredge Oyster Bay.
0800		Commence grab ops with Chesapeake.
0830		Shifted Chesapeake 1000 and Farrell south.
1430		HR recovered and placed on deck of the James barge. Salvage branch lead and Maryland State Police notified. Barge James to be shifted to Skanska yard for regulatory authorities to conduct investigation in accordance with established protocols.
1500	2400	Tug Carol shifted to dredge Delaware Bay, then tended as directed at Key Bridge.
1530		Secured grab ops, shifting Chesapeake 1000 east and south of the channel to support survey ops.
1540	1600	Tug Brian Nicholas assisted tug Shannon Dann shifting Chesapeake 1000 out of the main channel.
1540	2400	Tug Shannon Dann shifted from Ft Carroll mooring to dredge Delaware Bay, then standby dredge at Key Bridge.
1600	1700	Tug Thomas D Witte shifted material barge James from Key Bridge to Skanska's yard.
1600	1720	Tug Brian Nicholas shifted dredge Oyster Bay and Witte 3302 barge out of the main channel to support survey ops.
1720	2400	Tug Brian Nicholas standby Oyster Bay and Witte 3302 barge at Key Bridge.
1600		Shifted Farrell 256 to the south in order to make room for channel survey (west side of channel).
1600	2400	Tug Meagan Ann standby Farrell 256 at Key Bridge.
1620	2400	Tug Douglas J assisted with shifting material barge James from Key Bridge to Skanska's yard, then standby the barge.
1700	1900	Tug Thomas D Witte tended material barge James at Skanska's yard.
1700		Secured debris removal via bucket ops for the day.
1715		Shifted Oyster Bay as directed.
1800		Secured site work for the day. Crews return ashore.
1900	2400	Tug Thomas D Witte standby material barge James at Skanska's yard.
0630	1830	Donjon Dispatcher managing vessel traffic for the Salvage Branch to / from Key Bridge site in coordination with the USCG On Scene Coordinator (OSC) and in accordance with project requirements.
0630	1730	Sea Explorer: Crew transport, conduct survey ops, safety standby.
0630	1830	Jaws: crew transport, serve as safety boat.
0001	2400	Sea Defender: No ops, standby Vane Brother's yard.
0630	1845	Sea Responder: crew transport, safety standby, supply runs.
0620	1750	Delta Escape: Crew transport.
0600	1705	Point Comfort: Crew transport.

Sparrow's Point activities:

1. Conduct toolbox safety meeting.
2. Taylor Oil delivered lube oils for Chesapeake 1000.
3. Completed welding mat clips on Atlantic Trader barge.
4. Clean Witte 1411 barge deck, dispose of trash.
5. Procure and pick up ice chests for crew drinking water.

Fort Carroll mooring overnight:

1. Barge JMC 121 and JMC 184 spudded down at Ft Carroll mooring locations East A, West C.
    a. Barges moored to JMC 121 West C overnight: Witte 5001.
    b. Barges moored to JMC 184 East A overnight: Witte 3301, Witte 1401, Witte 1406.
    c. Tugs tending barges at Ft. Carroll mooring overnight: None

Skanska Yard mooring overnight: Material barge James.

General Comments:

1. Utility BGE reports there will be no additional pipeline surveys until the MV DALI has been refloated and moved.
2. AIS Transponder installations will continue as needed. 59 MT 5000 units installed on project vessels as of today. Orbcomm installer will depart on Friday 03 May and will not be relieved. Orbcomm is looking for a local marine electronics company to support additional installs or repairs.

Displaced Materials Processing updates:

1. Continue revising and updating disposal process for displaced materials in order to maximize efficiencies.
2. TPA lease contract for displaced materials processing under review. On hire survey to be conducted prior to completing contract.
3. Republic Services arrangements for processing displaced material in progress.
4. Additional displaced material sample submitted for testing.

Engineering Notes:

1. Commence 0525.
2. Review & answer technical emails.
3. Discussed operations & plans with Staff.
4. Toolbox Talk – Falling Objects.
5. Miscellaneous engineering items & housekeeping.
6. Conducted engineering site survey.
7. Recalibrated CODA, performed surveys in support of ops.
8. Conduct scow surveys for drafts & loads.
9. Modified displaced material disposal plan.
10. Updated engineering staff schedule.
11. Secured 1945.

Planning & Administration:

1. Attend 0630 & 1730 salvage meetings, 0800 Situation brief.
2. Update DPRs, KBR Asset List, DPR Overview, daily brief for SUPSALV and UC Situation brief, Personnel Assets Equipment spreadsheet, photos labeled & uploaded to JIC.
3. Work with Orbcomm, SUPSALV and ESSM to determine AIS install plan moving forward.
4. Assist USACE PAO to identify project Salvage plans for the day.
5. Assist USACE with displaced material photo's in barges for internal visibility.
6. Assist RESL to identify and quantify project personnel (provide contacts for Skanska & Resolve).
7. Update document control register.
8. Reconcile barge tonnages with Navarc.
9. Update and verify AIS tracking spreadsheet.

Bridge Section/Debris Weights Removed: 1A- 450 Tons, 1B- 515 Tons, 0A- 330 Tons, 0B - 475 Tons, 0C- 155 Tons 21 April: Witte 1401 barge – 150 Tons 27 April: Witte 3302 barge – 820 Tons 28 April: Witte 3301 barge – 250 Tons 29 April: Witte 1406 barge – 160 Tons
Barges awaiting discharge: None

D) OPERATIONS PLANNED FOR NEXT 24 HRS

No.	Operations planned
1	Continue monitoring AIS transponders on KB response project vessels.
2	Continue Grab ops with Chesapeake 1000 south of pier 18, using Delaware Bay as spud barge.
3	Farrell 256 and material barge James to receive bridge materials and debris from Grab ops via Chesapeake 1000.
4	Dredge Oyster Bay continues debris removal by bucket.
5	Continue revising and updating disposal process for displaced materials in order to maximize efficiencies.
6	Key Bridge Section 4 Removal Plan 2024-05-01 Rev 00B1 routed by SUPSALV to U.C. for review & approval.
7	Continue surveys and Coda Scans to support debris removal ops.

E) CONTRACTUAL MILESTONES

Date	Description Milestone
3/26/2024	ATP received from US NAVY SUPSALV.
3/27/2024	Delivery Order Executed
4/23/2024	1900 hours - Suspend channel clearance ops, with main channel cleared to 35 ft controlling depth by 300 ft wide, allowing for 3 ft under keel clearance for all traffic passing through the Limited Access Channel.

F) CRAFT ON HIRE (@24:00)

no.	Name	Type	Tasks - location	Total days on hire	On hire	Off hire
1	Cashman JMC 121 Spud barge w/ 4100 Ringer JMS35	Cashman	Crane barge - Sections	29	4/2	
2	Cashman JMC 184 Spud barge	Cashman	Mooring Barges / Hopper scows	28	4/3	
3	Crew boat Delta Escape	Chesapeake Diving	Crew tender	23	4/8	
4	Tug Shannon Dann	Dann Ocean Towing	Tug	27	4/4	
5	Crane Barge - Chessy 1000	Donjon Marine	Crane barge - Sections	36	3/26	
6	Crane Barge - Columbia	Donjon Marine	Crane barge - Sections	25		

7	Crane Barge - Farrell	Donjon Marine	Crane barge + Dive support	35	3/27	
8	Spud Barge - Oyster Bay	Donjon Marine	Crane/Dredge barge	35	3/27	
9	Delaware Bay	Donjon Marine	Crane/Dredge barge	11	4/20	
10	JAWS	Donjon Marine	Crew tender	36	3/26	
11	Safe Boat - Sea Defender	Donjon Marine	Crew/Safeboat	36	3/26	
12	Safe Boat - Sea Responder	Donjon Marine	Crew/Safeboat	29	4/2	
13	Deck Barge - 1406	Donjon Marine	Debris deck barge	35	3/27	
14	Deck Barge- Witte 1401	Donjon Marine	Debris deck barge	26	4/5	
15	Deck Barge- Sue P.1.	Donjon Marine	Debris deck barge (HR)	26	4/5	
16	Deck Barge - 5001	Donjon Marine	Debris deck barge (mats)	35	3/27	
17	Deck Barge - 1411	Donjon Marine	Dive barge Phoenix	35	3/27	
18	Tug - Atlantic Enterprise	Donjon Marine	Grab Towing	21		
19	Witte 3301	Donjon Marine	Hopper scow	22	4/9	
20	Witte 3302	Donjon Marine	Hopper scow	22	4/9	
21	Witte 2802	Donjon Marine	Hopper scow	0		
22	Survey boat - Sea Explorer	Donjon Marine	Survey ops	36	3/26	
23	Tug - Meagan Ann	Donjon Marine	Tug	35	3/27	
24	Tug - Thomas D Witte	Donjon Marine	Tug	35	3/27	
25	Tug - Brian Nicholas	Donjon Marine	Tug	33	3/29	
26	Tug - Douglas J	Donjon Marine	Tug	26	4/5	
27	Tug - J Arnold Witte	Donjon Marine	Tug	3		
28	Tug- Sarah Ann	Donjon Marine	Tug	2		
29	Tug- Paul Andrew	Donjon Marine	Tug	1		
30	Tug- Emily Ann	Donjon Marine	Tug	10		
31	Tug - Atlantic Salvor	Donjon Marine	Tug (Newark)	17		
32	Flat Bottom Boat	Donjon Marine	Utility boat	26	4/5	
33	HG 106	Haugland Barges	Hopper scow	21	4/10	
34	HG 112	Haugland Barges	Hopper scow	21	4/10	
35	HG 201	Haugland Barges	Hopper scow	21	4/10	
36	HG 202	Haugland Barges	Hopper scow	21	4/10	
37	HG 203	Haugland Barges	Hopper scow			
38	HG 204	Haugland Barges	Hopper scow			
39	HG 209	Haugland Barges	Hopper scow	21	4/10	
40	HG 210	Haugland Barges	Hopper scow	21	4/10	
41	Deck Barge - James	Hughes	Debris deck barge	26	4/5	
42	Pt Comfort Crew Boat McAllister	Mc Allister	Crew tender	30	4/1	
43	Deck barge - Atlantic Trader	Mc Allister	Debris deck barge	18	4/13	
44	Tug - Mark Moran	Mc Allister	Tug	1		
45	Tug - Northstar Integrity	Northstar	Tug	1		

46	Pierson Spud Barge w/ Manitowac 777	RA Pierson	Crane barge - Sections	28	4/3	
47	Deck Barge - Pierson w/ Komatsu	RA Pierson	Excavator+Shears barge	32	3/30	
48	Canal Barge CBC 2762	Tradewind Towing	Grab Barge	28	4/3	
49	Tug Carol	Tradewind Towing	Tug / Grab Towing	28	4/3	
	not on site / underway					
	barge is full					
	barge in progress					
Total Floating assets today		37				
Note: Total days are number of days on site overall. An actual on hire date indicates that this asset is currently on site.						

G) EQUIPMENT ON HIRE (@24:00)

no.	Description	Company	Quantity	On hire	Off hire
1	20-yard container	A.C.E Rolloff	1	3/28	
2	Ace Roll-off Dumpster	A.C.E Rolloff	1	3/28	
3	02 Bottles	Airgas	20	4/9	
4	Gas bottles - propelyne	Airgas	x	4/7	
5	235 Amp Welding Machine w/ 100' Ground & 200' lead	Airgas - Red-D-Arc	1	4/6	
6	235 Amp Welding Machine w/ 100' Ground & 200' lead	Airgas - Red-D-Arc	1	4/12	
7	Skid Steer	Carter Machinery	1	4/12	
8	10 Yard dumpster (Scrap Metal)	Crouser	1	4/25	
9	Blueview LIDAR survey set incl transponders	Donjon Marine	1	4/6	
10	Chopping Beam	Donjon Marine	1	3/26	
11	Communications Pkg	Donjon Marine	2	3/26	
12	Cutting Gear	Donjon Marine	2		
13	Damage Stability Software	Donjon Marine	2	3/27	
14	Dive Container	Donjon Marine	1	3/26	
15	Donjon Truck #1	Donjon Marine	1	3/28	
16	Donjon Truck #10	Donjon Marine	1	3/26	
17	Donjon Truck #3	Donjon Marine	1	4/2	
18	Donjon Truck #35	Donjon Marine	1	3/27	
19	Donjon Truck #4	Donjon Marine	1	3/27	
20	Fuel Cube	Donjon Marine	2	3/26	
21	Generator 100 KW diesel	Donjon Marine	1	3/26	
22	Generator 30KW diesel	Donjon Marine	2	3/26	
23	Hot water	Donjon Marine	1	3/26	

24	Mesotech	Donjon Marine	1	3/26	
25	Office Container	Donjon Marine	1	3/26	
26	Rigging Pkg - Heavy	Donjon Marine	2	3/26	
27	Rigging Pkg - Light	Donjon Marine	1	3/26	
28	Shallow Water Dive Spread	Donjon Marine	1	3/26	
29	Storage Container - 20'	Donjon Marine	1	3/26	
30	Suburban	Donjon Marine	2	3/29	
31	Tool Package	Donjon Marine	2	3/26	
32	Topside welding/cutting Gear	Donjon Marine	3	3/26	
33	U/W Welding/Burning Pkg	Donjon Marine	2	3/26	
34	Van	Donjon Marine	1	4/1	
35	VHF Radios	Donjon Marine	19	3/26	
36	Welder - Miller Trailblazer 325	Donjon Marine	3	3/26	
37	4 ton grapple	Donjon Marine	1	4/16	
38	Lincoln MIG Suitcase Welder	Donjon marine	1	4/17	
39	Tool and supply container	Donjon Marine	1	3/26	
40	Container Rigging 10'	Donjon Marine	1	3/26	
41	Container Salvage 20'	Donjon Marine	1	3/26	
42	Container Dive Blue 20'	Donjon Marine	1	3/26	
43	Fuel Cube	Donjon Marine	2	3/26	
44	Generator Cat XQ 100kw	Donjon Marine	1	3/26	
45	Generator 40kW	Donjon Marine	1	3/26	
46	Generator 30kW	Donjon Marine	1	3/26	
47	Sonar Hammerhead box 1,2,3	Donjon Marine	1	3/26	
48	Starlink System	Donjon Marine	2	3/26	
49	UW Burn Weld Box #2	Donjon Marine	1	3/26	
50	Broco UW Burning Rig	Donjon Marine	1	3/26	
51	Topside Welding Box	Donjon Marine	1	3/26	
52	Topside Burning Package	Donjon Marine	1	3/26	
53	Welder - Miller Trailblazer 325	Donjon Marine	1	3/26	
54	Welder - Miller Bobcat 250 diesel	Donjon Marine	1	3/26	
55	Jaws trailer	Donjon Marine	1	3/26	
56	Safeboat trailer	Donjon Marine	1	3/26	
57	Dive helmet	Donjon Marine	3	3/26	
58	Dive hot water unit	Donjon Marine	1	3/26	
59	Divers umbilical	Donjon Marine	3	3/26	
60	Dive air compressor	Donjon Marine	2	3/26	
61	Chopping beam (small)	Donjon Marine	1	3/26	
62	Bucket hard digging	Donjon Marine	1	3/26	
63	Dive volume tank	Donjon Marine	1	3/26	
64	Volume tank rack	Donjon Marine	1	3/26	
65	Assorted Lashing Basket	Donjon Marine	1	3/26	

66	Container / Office Bunk 20'	Donjon Marine	1	3/26	
67	Dive Light & Video cable	Donjon Marine	1	3/26	
68	Sea Explorer+ Surveyboat trailer	Donjon Marine	2	3/26	
69	Rental Car	Enterprise	1	4/4	
70	Gulfstream Sheers w/Operator	Gulfstream	1	3/29	
71	Rigging Package (chain, shackles, kenterlinks etc)	Holloway	1	4/12	
72	Diesel Pump	Sunbelt Rentals	1		
73	Gangway 20'	Sunbelt Rentals	1	4/23	
74	Gangway 10'	Sunbelt Rentals	1	4/7	
75	Gangway 8'	Sunbelt Rentals	1	4/6	
76	Manlift 80'	Sunbelt Rentals	1	4/13	
77	T&T 1000T Grab	T&T	1	4/3	
78	Crane Mats 20'x4' x12" - 80 mats	Totem Mats	80	4/3	
79	Man basket	United Crane & Rigging	1	4/3	
80	Man basket	United Crane & Rigging	1	4/5	
81	RT50 Land Crane	United Crane & Rigging	1	4/3	
82	1-1/2X50 FIREHOSE	United Rentals	6	4/5	
83	2.5 X 50 FIREHOSE	United Rentals	12	4/5	
84	20' Conex Side opening doors	United Rentals	1	4/8	
85	4" QC 90 BEND	United Rentals	6	4/5	
86	75 kW Generator	United Rentals	2		4/30
87	BOOM 135' TELESCOPIC WITH JIB 4WD	United Rentals	1	4/5	
88	BOOM 150' TELESCOPIC 4WD	United Rentals	1	3/29	
89	BOOM 150' TELESCOPIC 4WD	United Rentals	1	3/29	
90	BOOM 84-86' TELESCOPIC 4WD	United Rentals	1	3/29	
91	BUTTERFLY VALVES	United Rentals	1	4/5	
92	CABLE 4/0 AWG 400 AMP 50' CAM	United Rentals	20	4/1	
93	CABLE 6/4 50 AMP 50'	United Rentals	1	3/30	
94	CABLE BANDED 5 WIRE 50'	United Rentals	1	3/30	
95	CABLE TAIL 4/0 MCAM BARE END	United Rentals	10	4/1	
96	ELEVATOR FIT PORTABLE RESTROOM	United Rentals	2	3/29	
97	FORKLIFT VARIABLE REACH 10000# 50'-74'	United Rentals	1	4/3	
98	FORKLIFT VARIABLE REACH 10000# 50'-74'	United Rentals	1	3/28	
99	GENERATOR 125-149 KVA TIER 4	United Rentals	1		
100	GENERATOR 125-149 KVA TIER 4	United Rentals	1		
101	GENERATOR 50-59 KVA TIER 4	United Rentals	1	3/30	
102	GLO/OFFICE CONTAINER 8X20X8'6"	United Rentals	1	3/30	
103	HIGH RISE PORTABLE RESTROOM	United Rentals	5	4/3	
104	HOSE 4X50 RUBBER DISCHARGE - QC	United Rentals	44	4/5	
105	LIGHT TOWER,0-3KW LED VERT MAST	United Rentals	1	4/1	
106	LIGHT TOWER,4-7KW LED VERT MAST	United Rentals	1	4/1	

107	MAT POLYETHYLENE 4' X 8' GROUND COVER	United Rentals	4	4/4	
108	MESSAGE BOARD SOLAR	United Rentals	1	4/4	
109	MESSAGE BOARD SOLAR	United Rentals	2	4/29	
110	MISCELLANEOUS BULK INVENTORY EQUIPMENT (potable water)	United Rentals	1	4/5	
111	MISCELLANEOUS BULK INVENTORY EQUIPMENT (potable water)	United Rentals	1	4/9	
112	MISCELLANEOUS BULK INVENTORY EQUIPMENT (potable water)	United Rentals	1	4/12	
113	Pallet Jack	United Rentals	1	4/9	
114	Portajohns	United Rentals	2	4/8	
115	SERVICE - HIGH RISE 1X WEEKLY	United Rentals	5	4/2	
116	SERVICE - HIGH RISE 1X WEEKLY	United Rentals	2	3/29	
117	SUCTION/DISCHARGE MANIFOLD	United Rentals	1	4/5	
118	TANK FUEL DOUBLE WALL 1000-1250 GAL	United Rentals	1		5/1
119	TANK FUEL DOUBLE WALL 1000-1250 GAL	United Rentals	1		5/1
120	TANK FUEL DOUBLE WALL 1000-1250 GAL	United Rentals	1		5/1
121	TANK FUEL DOUBLE WALL 500-550 GAL W/PUMP	United Rentals	1	3/30	
122	TRUCK PU 3/4 TON 4X4 XL CREW CAB GAS	United Rentals	1	3/31	
123	TRUCK PU 3/4 TON 4X4 XL CREW CAB GAS	United Rentals	1	3/31	
124	TRUCK PU 3/4 TON 4X4 XL CREW CAB GAS	United Rentals	1	4/29	
125	51'x4' Drive over land ramps	United Rentals	1	4/9	
126	30'x4' Drive over land ramps	United Rentals	1	4/5	
127	Crane Mats 20'x4' x12" - 150 mats	Viking Mats	150	4/2	
128	Crane Mats 20'x4' x12" - 150 mats	Yak Mats	150	4/4	
	Rigging Package (chain, shackles, kenterlinks etc)	Purchased	1	NA	
	Torch package 3/4 +gas and accessories (propane)	Purchased			

H) PERSONNEL

no.	Name	Position	Company	Total days on hire	On hire	Off hire
1	Baez, Joseph	Salvage Rigger	Donjon Marine	25	4/7	
2	Barbar, Doug	Salvage Rigger	Donjon Marine	34	3/29	
3	Bauer, Chris	Salvage Rigger	Donjon Marine	30		
4	Bianchi, Robyn	Asst. Salvage Master	Donjon Marine	36	4/28	
5	Bradley, Wade	Captain	Donjon Marine	34	3/29	
6	Browne, Armand	Salvage Rigger	Donjon Marine	12	4/20	
7	Calandra, Antonio	Salvage Rigger	Donjon Marine	4		
8	Campos, Manny	Salvage Rigger	Donjon Marine	6		
9	Chlodnicki, Pete	Salvage Rigger	Donjon Marine	34	3/29	

10	Cocca, Dan	Logistics	Donjon Marine	36	3/27	
11	Collins, Jay	Safety Officer	Donjon Marine	31	4/1	
12	Conlin, Mike	Salvage Rigger	Donjon Marine	34	3/29	
13	Coyne, Tommy	Salvage Rigger	Donjon Marine	2		
14	Crowe, Sean	Salvage Master	Donjon Marine	37	3/26	
15	Delmaestro, Vinny	Salvage Foreman	Donjon Marine	35	3/28	
16	Edgar, Ken	Naval Architect	Donjon Marine	36	3/27	
17	Feld, Jeff	Logistics/Finance	Donjon Marine	35	3/28	
18	Foran, Paul	Planning	Donjon Marine	36	3/27	
19	Galvin, Robert	Operator	Donjon Marine	16		
20	Gibbs, Scott	Salvage Rigger	Donjon Marine	36	3/27	
21	Hale, Shawn	Salvage Rigger	Donjon Marine	28	4/4	
22	Haley, Brian	Salvage Rigger	Donjon Marine	27	4/5	
23	Henry, Brian	Safety Officer	Donjon Marine	31	4/1	
24	Herodes, Aiden	Captain Defender	Donjon Marine	8		
25	Hickey, Eric	Salvage Foreman	Donjon Marine	35	3/28	
26	Himes, Clair	Marine Mechanic	Donjon Marine	17	4/15	
27	Holden, Roy	Captain	Donjon Marine	23	4/18	
28	Jones, Stewart	Captain	Donjon Marine	1	5/1	
29	Kidwell, Thomas	Salvage Engineer	Donjon Marine	26		
30	Kratz, Billy	Salvage Master	Donjon Marine	35	4/29	
31	Kreter, Linda	Planning/Documentation	Donjon Marine	35	3/28	
32	Landy, Pat	Logistics/Finance	Donjon Marine	35	3/28	
33	Lorenson, Gordon	Asst. Salvage Master	Donjon Marine	37	3/26	
34	Magaraci, Frank	Logistics	Donjon Marine	32	3/31	
35	Mannari, Dino	Captain	Donjon Marine	25		5/1
36	Mayani, Yuri	Crane Operator	Donjon Marine	4	4/28	
37	Moran, Dennis	Salvage Rigger	Donjon Marine	34	3/29	
38	Morgan, Ian	Salvage Engineer	Donjon Marine	35	3/28	
39	Naegele, William	Salvage Rigger	Donjon Marine	25		
40	Nisbett, Orrien	Rigger	Donjon Marine	2		
41	Paulsen, Peter	Dispatch	Donjon Marine	10		
42	Petrosino, Samantha	Salvage Rigger	Donjon Marine	28		
43	Pierce, John	Logistics/Finance	Donjon Marine	29	4/15	
44	Ruzzano, Frank	Salvage Rigger	Donjon Marine	25	4/7	
45	Sabri, Hussam	Salvage Rigger	Donjon Marine	35	3/28	
46	Shultz, Jacob	Salvage Rigger	Donjon Marine	36		5/1
47	Sousa, Manny	Salvage Rigger	Donjon Marine	35	3/28	
48	Springer, Steven	Salvage Foreman	Donjon Marine	31	4/1	
49	Stankiewicz, Pawel	Salvage Foreman	Donjon Marine	22		
50	Tate, Frank	Salvage Rigger	Donjon Marine	32	4/22	

51	Tervoort - Ter Haar, Sylvia	Salvage Master, Planning	Donjon Marine	22		
52	Thomas, Tyler	Salvage Rigger	Donjon Marine	25	4/7	
53	Thompson, Chris	Salvage Rigger	Donjon Marine	34	3/29	
54	Williamson, Tim	Project Manager	Donjon Marine	37	3/26	
55	Witte, John	Project Manager	Donjon Marine	5		
56	Yandoli, Brian	Salvage Foreman	Donjon Marine	34	4/28	
57	Mysko, Steve	Delaware crew	Donjon Marine	12	4/20	
58	Parsons, Frank	Delaware crew	Donjon Marine	10	4/22	
59	Palmer, Justin	Delaware crew	Donjon Marine	11	4/21	
60	Collins, Steve (Cuz)	Dredge Superintendent	Donjon Marine	3		
61	McCabe, Michael	Logistics	Donjon Marine	2		
62	Britton, Bob	Welder	Donjon Shipbuilding	8		
63	Herrera Hoyos, Carlos	Welder	Donjon Shipbuilding	16	4/16	
64	Simmons, Mike	Welder	Donjon Shipbuilding	8		
65	Stewart, Ty	Welder	Donjon Shipbuilding	16	4/16	
66	Granger, Jason	Surveyor	Fugro	34	4/15	
67	Koziol, Alex	Naval Architect	Glosten Engineering	24	4/25	
68	Roy, Mike	Naval Architect	Glosten Engineering	28		
69	Davis, Roger	GSI Shears Operator	GSI Shear	14		
70	Duplantis, Brent	GSI Shears Operator	GSI Shear	29		
71	Gomez, Caleb	GSI Shears Operator	GSI Shear	16		
72	Scott, Travis	GSI Shears Operator	GSI Shear	14		
73	Chen, Tomer	Naval Architect	Martin, Ottaway	25		
74	Van Hemmen, Rick	Naval Architect	Martin, Ottaway	3		
75	Farrell, Mike	Diver	Northeast Diving Services	10	4/22	
76	Cruz, Harley	AIS Transmitter Installer	OrbComm	13	4/25	
77	Luis Sangster	AIS Transmitter Installer	OrbComm	7		
78	Ramos, Jose	AIS Transmitter Installer	OrbComm	19		
79	Breaux, Terry	Dive Supervisor	Phoenix Intl Diving	18		
80	Castillo, Stephen	Diver	Phoenix Intl Diving	13		
81	Garcia, Corey	Diver	Phoenix Intl Diving	18		
82	Gilbert, Ryan	Diver	Phoenix Intl Diving	29		
83	Jones, Ken	Diver	Phoenix Intl Diving	18		
84	Lott, Jordon	Diver	Phoenix Intl Diving	18		
85	Recinos, Christian	Diver	Phoenix Intl Diving	18		
86	Smith, Gary	Diver	Phoenix Intl Diving	29		
87	Travis, Mike	Diver	Phoenix Intl Diving	18		
88	Von Mosch, Mark	Diver	Phoenix Intl Diving	18		
89	Gaventa, Christopher	Pierson crew	Pierson	15	4/29	

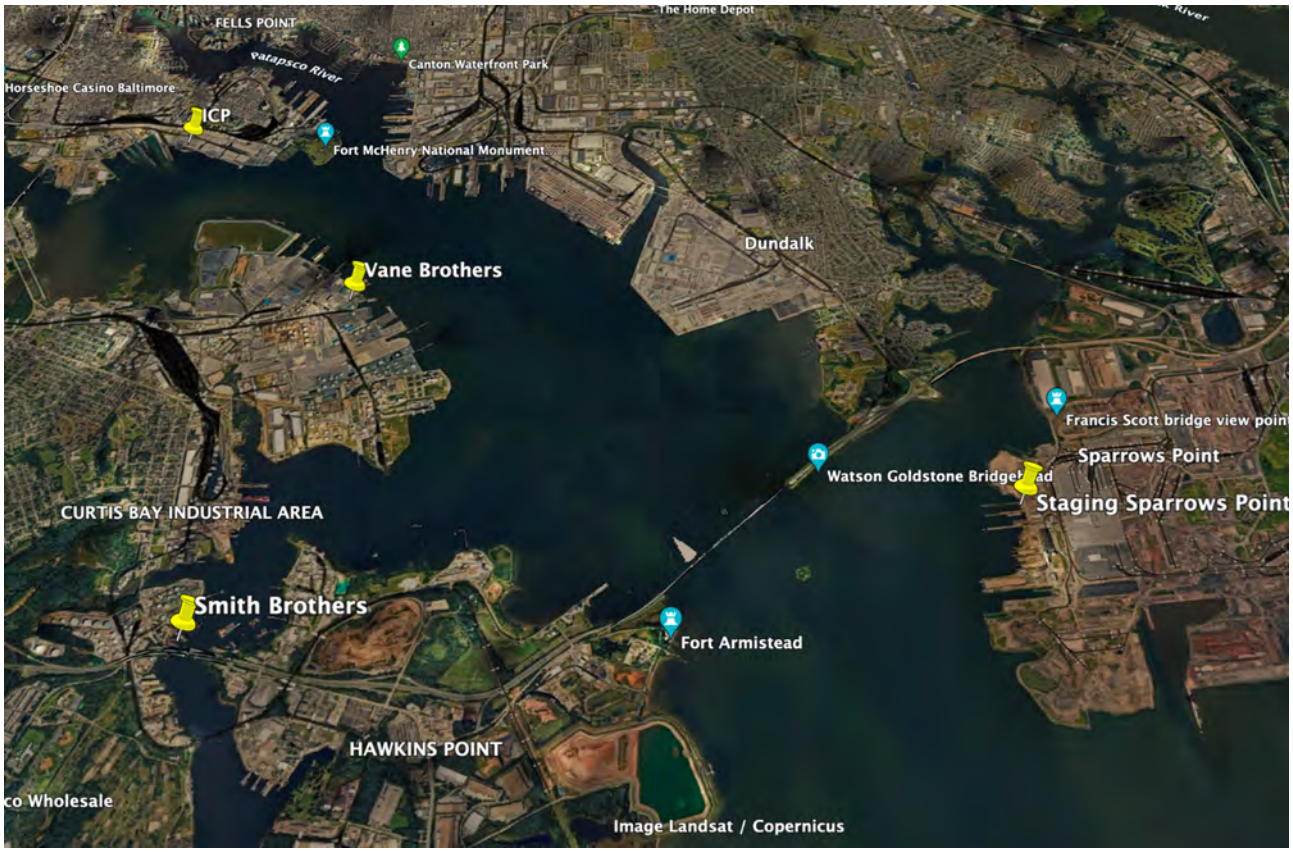
90	Cruz, Nelson	Pierson crew	Pierson	1		
91	Eller, Lane	Pierson crew	Pierson	17	4/16	
92	Rangel, Luis	Pierson crew	Pierson	17	4/16	
93	David, Darrel	Pierson crew	Pierson	17	4/16	
94	Alexander, Dave	Pierson crew	Pierson	16	5/1	
95	Barbalate, Aaron	Pierson crew	Pierson	16	4/26	
96	Nelson, Bill	Pierson crew	Pierson	17	4/16	
97	Ekimoglou, Nick	Pierson crew	Pierson	2		
98	Garcia, Ricardo	Pierson Crew	Pierson	1		
99	Pierson, Richard	Superintendent	Pierson	1		
100	Chambers, Jeff	Pierson crew	Pierson	5		
101	Bogner, Kyle	Superintendent	Pierson	2		
102	Hinman, Patrick	Technician	Pierson	1		
103	Ballantyne, Jason	Diver	Randive	7	4/25	
104	Boulby, Evan	Diver	Randive	17		
105	Conway, Neil	Diver	Randive	17		
106	Hill, John	Diver	Randive	23	4/29	
107	Lordi, Dylan	Diver	Randive	14		
108	Niederkorn, Ryan	Diver	Randive	12		
109	O'Connell, Glenn	Diver	Randive	17	4/29	
110	Ross, Robert	Dive Supervisor	Randive	21		
111	Rossman, Dylan	Diver	Randive	12		
112	Smits, Michael	Dive Supervisor	Randive	13	4/29	
113	Sutera, Alex	Diver	Randive	3	4/29	
114	Winnerling, Zach	Dive Supervisor	Randive	20		
115	Hensley, Chad	Surveyor	Survey By the Bay	19		
116	Foppen, Stan	Grab technician	T&T (TGS Grab Services)	15	4/17	
117	Pronk, Tim	Grab technician	T&T (TGS Grab Services)	15	4/17	
	Total Personnel today		63			

Note: Total days are number of days on site overall. An actual on hire date indicates that this person is currently on site.

I) WHARFAGE

no.	Name	Position / Location	Company
1	Smith Brothers	Berthing Wharfage	Smith Brothers
2	Tradepoint Atlantic	Sparrows Pt docks & logistics	Tradepoint Atlantic
3	Vane Brothers	Berthing Wharfage	Vane Brothers

4	Sparrows Pt TPA	Navy small boat landing	Tradepoint Atlantic



J) OPERATIONAL CONSIDERATIONS (DONJON)

No.	Description
1.	Possibility of discovering HR while removing bridge sections and debris.
2.	Displaced Material disposal location.
3.	Possibility of munitions found during debris removal.
4.	Additional bridge & roadway structural debris after conclusion of blast operations.

K) APPROVAL & SIGNATURE

DONJON MARINE REPRESENTATIVE	
Name	Position
Timothy Williamson	Project Manager
Signature	Electronic

CLIENT REPRESENTATIVE	
Name	
Paul F Hankins	
Signature	Electronic, no signature

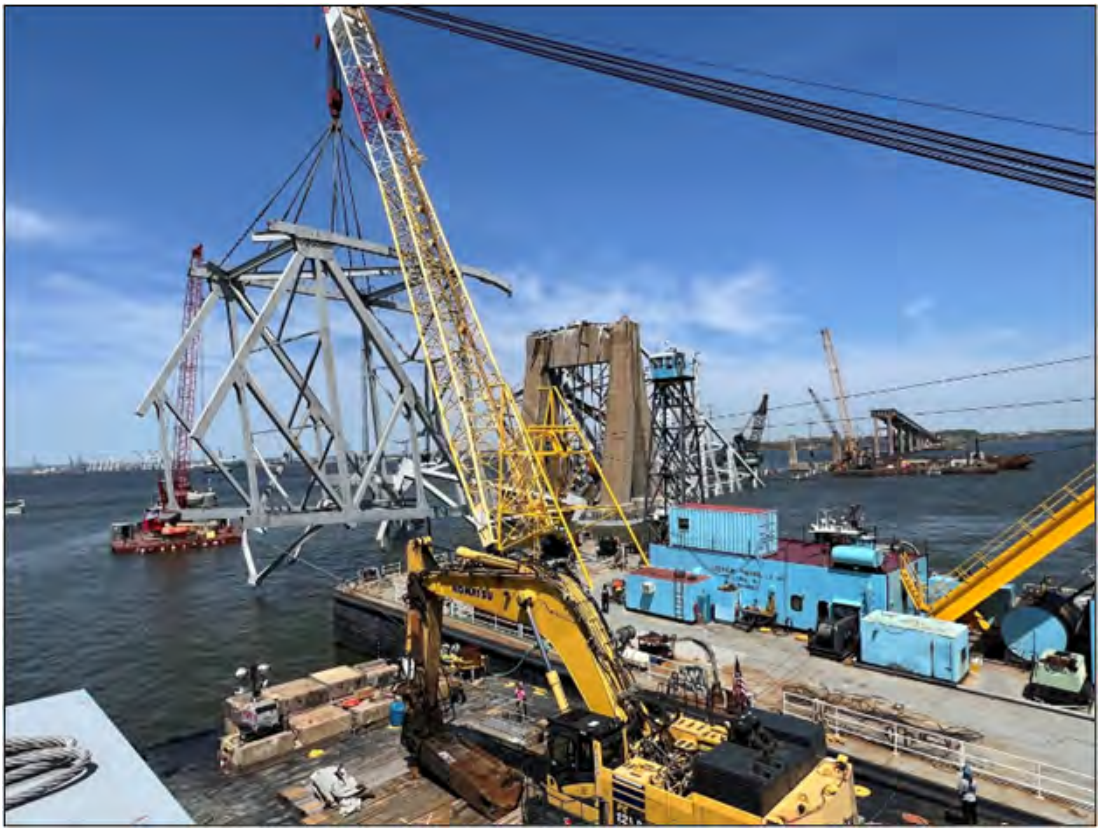
Figure 1 – Debris removal via bucket ops with dredge Oyster Bay transferring debris to Witte 3302 barge.

Figure 2 – Chesapeake 1000 lifts large bridge debris and transfers to material barge James.

Figure 3 – Chesapeake 1000 with another large bridge piece lifted by "Gus" the 1000 ton grab.

Appendix F

Key Bridge Collective Salvage Asset List (Sample) and AIS Installation List



Key Bridge Asset List

Salvage Equipment/Waterborne Assets			As of 17 May / 1600					
Company	**Asset Type**	**Asset Name**	**Capacity/Details**	**Location**	**AIS MMSI Install**	**Vessel Equipped**	**Install Date**	**Notes**
Donjon Marine	Floating Crane	Chesapeake 1000	1000 ton / 256' Boom	Sparrows Pt	873370033		23-Apr	
Donjon Marine	Floating Crane	Columbia NY		On scene	873370029		4-May	
Donjon Marine	Floating Crane	Farrell 256	160 ton / 140' Boom w/DWS	Sparrows Pt	873370094		11-Apr	
Donjon Marine	Floating Crane	Oyster Bay	120' Boom w/ bucket	Sparrows Pt		368091280	NA	
Donjon Marine	Floating Crane	Delaware Bay	225' x 54' / Liebherr HS 895HD	On scene		367128570	NA	
Donjon Marine	Floating Crane	JMC 121	Manitowoc 4100 / 130' Boom	Fort Carroll	873370070		11-Apr	W Ft Carroll Mooring (C)
Donjon Marine	Floating Crane	777 Crane Barge	Manitowoc 777 / 80'x60' / 80' Spuds	Sparrows Pt	873370066		18-Apr	
Donjon Marine	Barge	CBC 2762	276' x 55' / 3500 lbs	Sparrows Pt	873360038		24-Apr	
Donjon Marine	Barge	Witte 5001	240' x 72'	Sparrows Pt	873360023		20-Apr	
Donjon Marine	Barge	Witte 1411	165' x 43.5' (spuds)	Sparrows Pt	873370031		18-Apr	Spud Barge Mooring
Donjon Marine	Barge	Witte 1406	165' x 43.5'	Sparrows Pt	873350016		16-Apr	
Donjon Marine	Barge	Witte 1401	165' x 43.5'	Sparrows Pt	873370069		12-Apr	
Donjon Marine	Barge	Sue P 1	165' x 43.5'	Sparrows Pt	873370047		23-Apr	
Donjon Marine	Barge	Pierson 552	120' x 60' / 80' spuds / 1250 excavator	Sparrows Pt			24-Apr	Sparrows Pt Mooring
Donjon Marine	Barge	James	Hughes / 260' x 80' / 2000 lbs	Ft. Carroll	873370016		11-Apr	
Donjon Marine	Barge	JMC 184	180' x 54' Spud	Ft. Carroll	873370020		18-Apr	E Ft Carroll Mooring (A)
Donjon Marine	Barge	Atlantic Trader	Deck barge LOA 300ft, Bm 72ft	Sparrows Pt	873370059		23-Apr	
Donjon Marine	Barge	Witte 3301	250' x 54'	Ft. Carroll	873370038		12-Apr	
Donjon Marine	Barge	Witte 3302	250' x 54'	Ft. Carroll	873370093		12-Apr	
Donjon Marine	Barge	HG 106	200' x 35' x 12'	Ft. Carroll	873370062		19-Apr	
Donjon Marine	Barge	HG 112	200' x 35' x 12'	Ft. Carroll	873360045		19-Apr	
Donjon Marine	Barge	HG 201	195' x 35' x 13'	Ft. Carroll	873370073		19-Apr	
Donjon Marine	Barge	HG 202	200' x 35' x 12'	Ft. Carroll	873360074		19-Apr	
Donjon Marine	Barge	HG 203	195' x 35' x 13'	Sparrows Pt	873370090		4-May	
Donjon Marine	Barge	HG 204	195' x 35' x 13'	Sparrows Pt	873360065		4-May	
Donjon Marine	Barge	HG 209	195' x 35' x 13'	Ft. Carroll	873370018		19-Apr	
Donjon Marine	Barge	HG 210	195' x 35' x 13'	Ft. Carroll	873360076		19-Apr	
Donjon Marine	Barge	MERC Shevlin	Dump Scow	Newark				
Donjon Marine	Barge	Kurt Schulte	Dump Scow	Sparrows Pt				
Donjon Marine	Barge	S Tobin	ABS Hopper	Sparrows Pt				
Donjon Marine	Barge	Dana 55	Drag Barge	Sparrows Pt	873360077		17-May	
Donjon Marine	Tug	Ezra Sol	6000 HP	On Scene		368337530	NA	
Donjon Marine	Tug	Meagan Ann	2250 HP	On scene		367373630	NA	
Donjon Marine	Tug	Brian Nicholas	1450 HP	On scene		367351520	NA	
Donjon Marine	Tug	Shannon Dann	2400 HP / Dann Ocean	On scene		338533000	NA	
Donjon Marine	Tug	Carol	2000 HP / Tradewinds	On scene		367594260	NA	
Donjon Marine	Survey Vessel	Sea Explorer	Side Scan Sonar	On Scene	873370103		9-Apr	
Donjon Marine	Crew Boat	Jaws		On scene	873370032		9-Apr	
Donjon Marine	Crew Boat	Sea Defender		Vane	873370068		21-Apr	
Donjon Marine	Crew Boat	Point Comfort	McAllister	On scene		367734530	NA	
Donjon Marine	Crew Boat	Delta Escape	Cape Henry Launch	On scene		368117790	NA	
Donjon Marine	Crew Boat	Sea Responder		Vane	873360100		9-Apr	
Resolve Marine	Floating Crane	RMG-400	Resolve 400	On Scene	873370053		15-Apr	
Resolve Marine	Floating Crane	WEEKS-533		On Scene	873360079		10-Apr	
Resolve Marine	Deck Barge	NS-140	Northstar-140	On Scene	873350015		10-Apr	
Resolve Marine	Deck Barge	WEEKS-297	Material barge	On Scene	873370013		20-Apr	
Resolve Marine	Deck Barge	HUGHES-180		On Scene	873370051		24-Apr	
Resolve Marine	Deck Barge	HUGHES-866		On Scene	873370078		23-Apr	
Resolve Marine	Tug	NS 10	Northstar	On Scene		367396490	NA	
Resolve Marine	Tug	Patricia Jean	2800 HP / Stasinos	On Scene		367563240	NA	
Resolve Marine	Tug	Neptune	2400 HP / Dann Ocean	On Scene		368542000	NA	
Resolve Marine	Tug	Bridget McAllister	5080 HP	McAllister		367576060	NA	
Resolve Marine	Tug	Eric McAllister	5150 HP	McAllister		367636710	NA	
Resolve Marine	Tug	Vicki M McAllister	4650 HP	On Scene		366828620	NA	
Resolve Marine	Tug	Kendall J Hebert	4200 HP	On Scene		367567990	NA	
Resolve Marine	Tug	Rising Sun		On Scene		366258310	NA	
Resolve Marine	Tug	Bering Dawn		On Scene		367428690	NA	
Resolve Marine	Crew Boat	WillKate		Vane		367756370	NA	
Resolve Marine	Crew Boat	Warhorse II	Chesapeake Marine	On Scene		338373846	NA	
Resolve Marine	Crew Boat	NS Interceptor	Northstar	On Scene		368142310	NA	
Resolve Marine	Crew Boat	NS Instigator	Northstar	On Scene		368192920	10-Apr	
Resolve Marine	Crew Boat	Nantasket		On Scene	873370079		9-Apr	
Resolve Marine	Crew Boat	Supplier	Chesapeake Marine	On Scene		338461544	NA	
SCM	Floating Crane	KS 6007	330 ton	On Scene	873370057		23-Apr	
SCM	Floating Crane	Cape May	Lima 2400b	On Scene	873360040		20-Apr	
SCM	Floating Crane	Baltimore	140 x 70 McLean	On Scene	873360046		15-Apr	
SCM	Dredge	Dale Pyatt	Cashman	On Scene		367766220	NA	
SCM	Deck Barge	JMC 190	195' x 60'	Sparrows Pt	873370060		26-Apr	
SCM	Barge	JMC 191	195' x 60'	On Scene	873360033		25-Apr	
SCM	Deck Barge	JMC 232	125' x 48' SPUD	Sparrows Pt	873370035		14-Apr	
SCM	Barge	JMC 74	240ft deck barge - ACD Company	On Scene	873370061		24-Apr	
SCM	Deck Barge	DA Chambers		Fort Carroll	873370058		27-Apr	
SCM	Deck Barge	CJ Welch		Sparrows Pt	873350011		29-Apr	

Key Bridge Asset List

Company	Asset Type	Asset Name	Capacity/Details	Location	AIS MMSI Install	Vessel Equipped	Install Date	Notes
SCM	Spud Barge	KS 5524	W/ Excavator - ACD Company	Mooring	873370074		11-Apr	Mooring (B)
SCM	Spud Barge	KS 5201	W/ Excavator - ACD Company	On Scene	873370087		18-Apr	
SCM	Barge	APL 57		On Scene	873360012		11-May	
SCM	Tug	Katan	3900 HP	On Scene		367706270	NA	
SCM	Tug	Vicki M		On Scene		367399340	NA	
SCM	Tug	Seaward 23	1000 hp	On Scene	873360019		1-May	
SCM	Tug	Miss Ila		On Scene		367766260	NA	
SCM	Crew Boat	Emily B Casey III		On Scene	873370089		14-Apr	
SCM	Dive Boat	Seaward 25	33' dive boat	On Scene	873370039		9-Apr	
SCM	Survey Boat	ACD SB-6	Sea Fix	On Scene	873360044		16-Apr	
SCM	Survey Boat	Cape Elizabeth		On Scene		367474640	NA	
SCM	Crew Boat	Linda S Casey II		On Scene	873370064		14-Apr	
MSRC	Spill Response	Relentless		On Scene		368077660		
MSRC	Spill Response	Fury		On Scene		368354320		
Miller Environmenta	Spill Response	Charles W. Miller		Curtis Bay	873360043		9-Apr	
Miller Environmenta	Spill Response	ESRA	24 ft Crew Boat	Curtis Bay	873370028		9-Apr	

Total AIS Present	85
Total MT5000 installed	55
Vessels still requiring AIS	0

Appendix G

Sample Salvage and Removal Plans

1. **Section '0' Removal Plan**
2. **Section '4' Removal Plan**
3. **Displaced Material Processing Plan**
4. **Selected Portion of Section 4 Demolition Plan***
5. **Selected Portion of Vessel Refloat Plan***

plans used with permission from Resolve Marine

DONJON MARINE CO., INC.

100 Central Avenue
Hillside, New Jersey 07205-2033 USA

DONJON MARINE KEY BRIDGE SECTION 0 REMOVAL

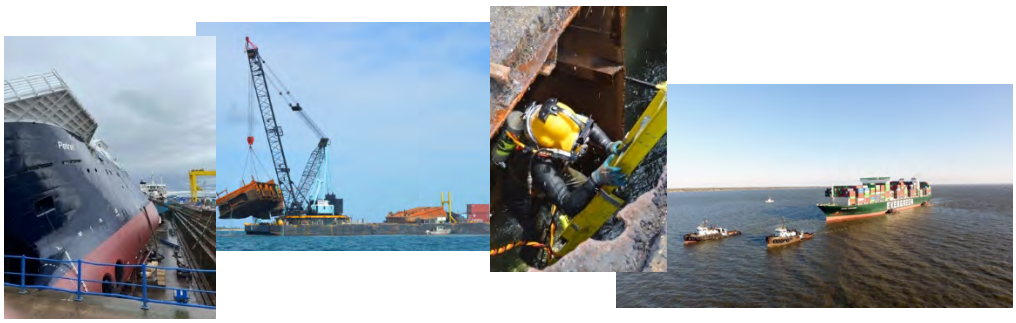
DOCUMENT NUMBER: 24-006-003

PROJECT NAME: KEY BRIDGE CHANNEL CLEARING

PROJECT NUMBER: 24-006

CLIENT NAME: US NAVY SUPSALV

CLIENT REFERENCE: 23F4DO3



DOCUMENT CONTROL

Revision Status

Rev	Issue Date	Reason for Issue	Prepared	Checked	Approved
00A	17-04-2024	Submitted to Salvage Team for review			
00A2	18-04-2024	Updated with UC comments			

DONJON MARINE CO., INC.

100 Central Avenue
Hillside, New Jersey 07205-2033 USA

General Document Data	
Document Title:	DONJON MARINE Key Bridge Section 0 Removal
Document Number:	24-006-003
Project Name:	KEY BRIDGE CHANNEL CLEARANCE
Project Number:	24-006
Client Name:	US NAVY SUPSALV

Revision Status A		
Revision Number:	PLAN 2024-04-17 REV A2	
Revision Date:	18-APR-2024	
Approval Status:	Submitted to Salvage Branch Lead for review	
Prepared By:	Tim Williamson	Role: Project Manager
Reviewed By:	William Kratz, Jr.	Role: Salvage Master
Interdisciplinary Check:	Ken Edgar	Role: Senior Naval Architect
Approved By:	Paul Hankins	Role: Salvage Branch Lead

Change Log		
Revision	**Section**	**Change**

DONJON MARINE CO., INC.

100 Central Avenue
Hillside, New Jersey 07205-2033 USA

TABLE OF CONTENTS

1. GENERAL

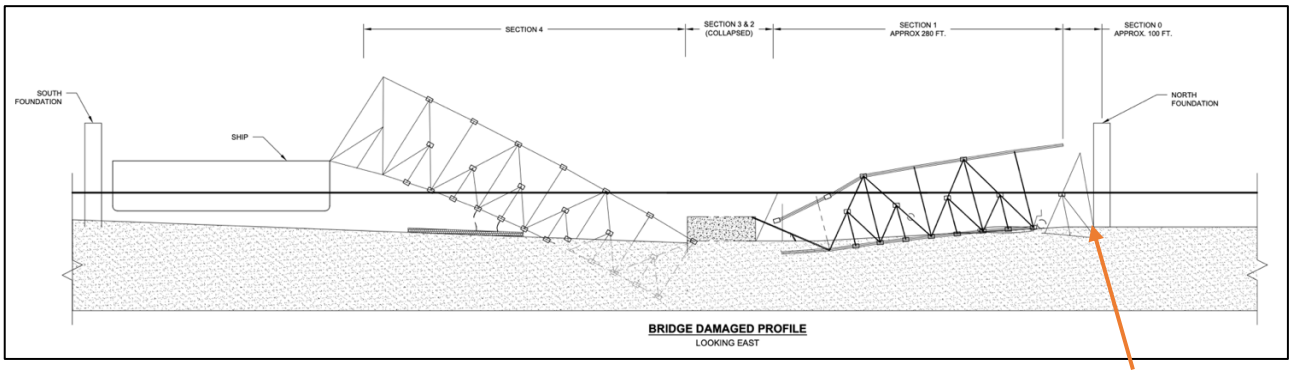
1.1. INTRODUCTION

The purpose of this Plan is to illustrate the protocols and methodology that will be used to remove the Key Bridge Section 0, South of Pier 18, and transport the Section to the disposal site. This plan will be coordinated in conjunction with Skanska in terms of their responsibility to remove the Section of the bridge north of Pier 18. Section 0 will be removed in the order of Subsection A, B, then C. After each section is removed this plan will be reevaluated.

The main channel (center) span of the Key Bridge is blocking the main navigation channel. At the time of submitting this plan, Section 0 blocks part of the northern-most portion of the main navigation channel in way of Pier 18.

Section 0 is the most northern Section; this Section is the focus of Donjon Marine's current removal efforts.

1.1.1. LOCATION ILLUSTRATION



1.2. PLAN VIEW SECTION 0

Figure 1: Plan view of Section 0

1.3. CURRENT CONDITION

Based on the recent surveys to date, the South end of Section 0 at about Bents/Panels 31-1/2N (Upper & Lower Chords) is confirmed to be completely severed from the adjacent Section 1 to the South on both the West and East sides. As of submittal of this report, Section 1 has been removed. There is loose debris that may have to be recovered prior to recovery of the Section/Subsections.

Refer to the illustration within the next section.

Figure 2: Section 0, with general subsection notations, as viewed from Southwest to Northeast

1.4. SECTION 0 CODA VIEW

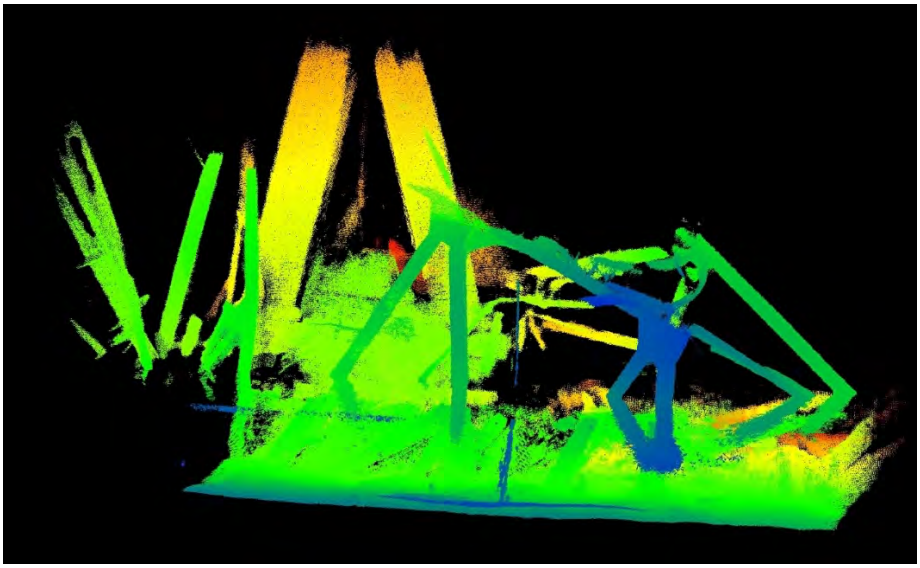
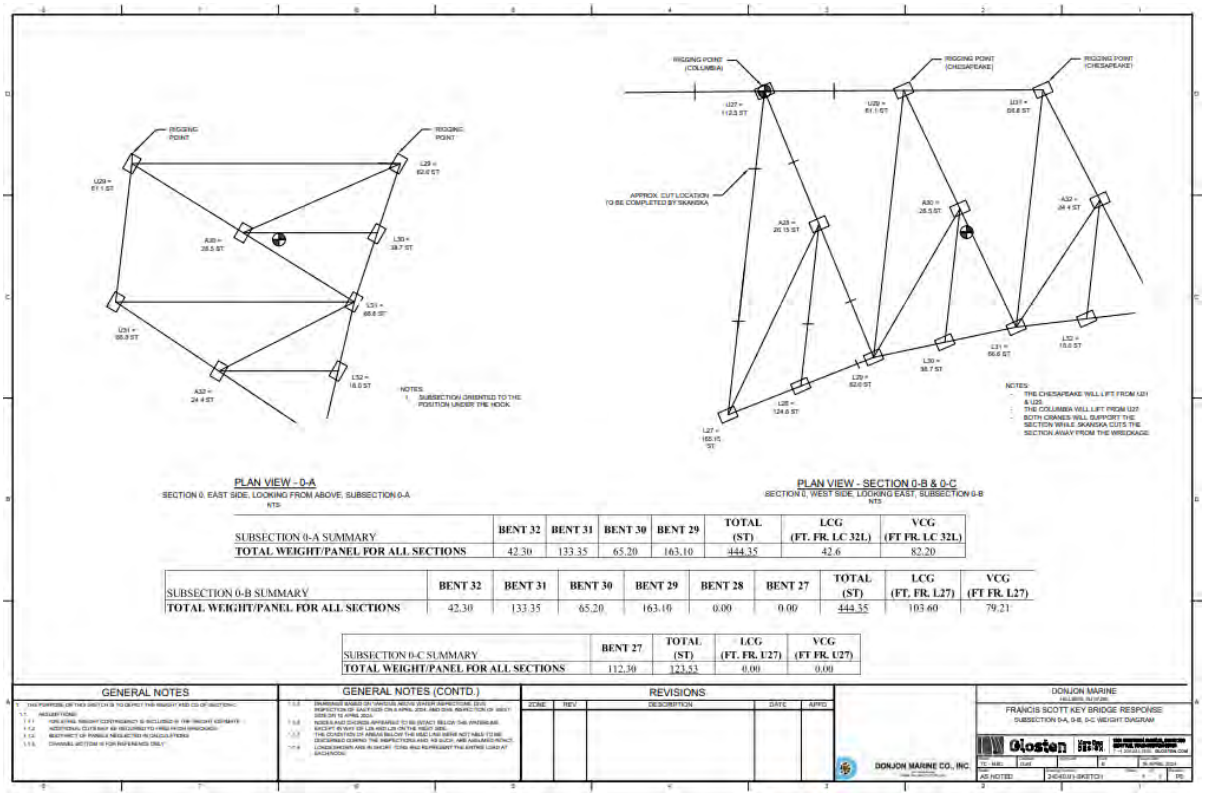


Figure 3: CODA imagery of Section 0 as viewed from West to East

1.5. SECTION 0 ILLUSTRATION



SUBSECTION 0-A SUMMARY	BENT 32	BENT 31	BENT 30	BENT 29	TOTAL (ST)	LCG (FT. FR. LC 32L)	VCG (FT FR. LC 32L)
TOTAL WEIGHT/PANEL FOR ALL SECTIONS	42.30	133.35	65.20	163.10	444.35	42.6	82.20

SUBSECTION 0-B SUMMARY	BENT 32	BENT 31	BENT 30	BENT 29	BENT 28	BENT 27	TOTAL (ST)	LCG (FT, FR, L27)	VCG (FT FR, L27)
TOTAL WEIGHT/PANEL FOR ALL SECTIONS	42.30	133.35	65.20	163.10	0.00	0.00	444.35	103.60	79.21

SUBSECTION 0-C SUMMARY	BENT 27	TOTAL (ST)	LCG (FT. FR, U27)	VCG (FT FR, U27)
TOTAL WEIGHT/PANEL FOR ALL SECTIONS	112.30	123.53	0.00	0.00

Figure 4: Weight diagram of Section 0 and associated subsections

2. METHODOLOGY

The preliminary methodology for Section 0 removal is summarized below.

Note: this plan is dynamic and may be revised as a result of conditions found in the field and subsequent to any of the steps noted below.

1. Ensure that debris & interference at the South end of Section 0 has been removed.
2. If possible, pre-rig Subsections 0-A, 0-B, and 0-C for lifting at Bent U29 on the East side, L29 on the East side, U31 on the West side, U29N on the West side, and U27 on the West side. Cutting to be performed while Chesapeake and Columbia lift/hold it.
3. Rig Subsection 0-A at bent U29 and L29 East for lifting with the CHESAPEAKE 1000.
4. Cut the lateral bracing between U29N East and U29N West and U31 West.
5. Raise Subsection 0-A with the CHESAPEAKE 1000 and carry on the hook to the disposal site. Timber-matted barges will be standing by for support as necessary.
6. Rig the lift of Subsection 0-B with the CHESAPEAKE 1000 at U31 West and U29 West.
7. Rig the COLUMBIA for lifting/holding at U27 West.
8. Cut the following steel members on the West side (order of cuts to be determined based on conditions noted in the field): (Cuts will be performed while rigged)
    - Upper member between U29 and U27
    - Diagonal member between A28 and L29
    - Vertical member between A28 and L28
    - Diagonal member between A28 and L27
    - Lower member between L29 and L28
    - Diagonal member between U27 and A28
    - Vertical member between U27 and L27
9. Lift Subsection 0-B with the CHESAPEAKE 1000 and carry on the hook to the disposal site. Timber-matted barges will be standing by for support as necessary.
10. Cut cross bracing between U27 West and U27 East.
11. Lift Subsection 0-C with the COLUMBIA and carry on the hook to the disposal site. Timber-matted barges will be standing by for support as necessary.

2.1. SECTIONAL CUT LOCATIONS

The exact location of the cuts to separate Section 0 into Subsections 0-A, 0-B, and 0-C is based on several factors:

a) Overall weight of the Subsection;
b) Location of the Longitudinal Center of Gravity (LCG) of the Subsection;
c) Location and strength of rigging locations;
d) Confirmation of the ability to get the Center of Lift (CoL) over the LCG;
e) Size, number, and location of cuts to be made on the Subsection;

Currently the approximate locations of the cuts are as noted above. These locations will be revised as necessary based on conditions found in the field and published within subsequent Plan revisions as detailed surveys and calculations are completed.

The weight estimates for Subsections are detailed in the following sections of the plan.

2.2. SECTION 0-A, 0-B, & 0-C WEIGHT ESTIMATES & CGS

SECTION 0 WEIGHT ESTIMATES									
REV:	17-Apr								
CHECKED BY:	MJR								
APPROVED BY:	KE								
	SINGLE TRUSS, NOT CONNECTED TRANSVERSELY								
				SECTION 0-A					
	BENTS	32N	31N	30N	29N				
	OTHER/MISC. (KIPS/TRUSS)	0.00	0.00	0.00	0.00				
	TRUSS (KIPS/TRUSS)	0.00	102.60	0.00	125.90				
	BRACING (KIPS/TRUSS)	0.00	30.90	0.00	36.30				
UPR CHORD	TOTAL UPPER CHORD/SIDE (KIPS)	0.00	133.50	0.00	162.20				
	TOTAL UPPER CHORD/SIDE (ST)	0.00	66.75	0.00	81.10				
	BENTS	32N	31N	30N	29N				
	OTHER/MISC. (KIPS/TRUSS)	0.00	0.00	0.00	0.00				
	TRUSS (KIPS/TRUSS)	25.10	118.70	68.90	148.90				
	BRACING (KIPS/TRUSS)	10.80	14.50	8.50	15.10				
LWR CHORD	TOTAL LOWER CHORD/SIDE (KIPS)	35.90	133.20	77.40	164.00				
	TOTAL LOWER CHORD/SIDE (ST)	17.95	66.60	38.70	82.00				
	BENTS	32N	31N	30N	29N				
	OTHER/MISC. (KIPS/TRUSS)	0.00	0.00	0.00	0.00				
	TRUSS (KIPS/TRUSS)	48.70	0.00	53.00	0.00				
	BRACING	0.00	0.00	0.00	0.00				
SUB-DEVIDED	TOTAL SUB-DEVIDED/SIDE (KIPS)	48.70	0.00	53.00	0.00				
	TOTAL SUB-DEVIDED/SIDE (ST)	24.35	0.00	26.50	0.00				
							Steel Contingency	0.10	
		UPPER	LOWER	SUBDIV.	SUSP.				
	Total Weight / panel from all sections - [ST]	147.85	205.25	50.85	0.00	444.35	CG'S ARE CALCULATED IN RHINO. ON FILE		

Figure 5: Weights and CGs for Section 0-A

SECTION 0 WEIGHT ESTIMATES									
REV:	17-Apr								
CHECKED BY:	MJR								
APPROVED BY:	KE								
	SINGLE TRUSS, NOT CONNECTED TRANSVERSELY								
				SECTION 0-B					
	BENTS	32N	31N	30N	29N				
	OTHER/MISC. (KIPS/TRUSS)	0.00	0.00	0.00	0.00				
	TRUSS (KIPS/TRUSS)	0.00	102.60	0.00	125.90				
	BRACING (KIPS/TRUSS)	0.00	30.90	0.00	36.30				
UPR CHORD	TOTAL UPPER CHORD/SIDE (KIPS)	0.00	133.50	0.00	162.20				
	TOTAL UPPER CHORD/SIDE (ST)	0.00	66.75	0.00	81.10				
	BENTS	32N	31N	30N	29N				
	OTHER/MISC. (KIPS/TRUSS)	0.00	0.00	0.00	0.00				
	TRUSS (KIPS/TRUSS)	25.10	118.70	68.90	148.90				
	BRACING (KIPS/TRUSS)	10.80	14.50	8.50	15.10				
LWR CHORD	TOTAL LOWER CHORD/SIDE (KIPS)	35.90	133.20	77.40	164.00				
	TOTAL LOWER CHORD/SIDE (ST)	17.95	66.60	38.70	82.00				
	BENTS	32N	31N	30N	29N				
	OTHER/MISC. (KIPS/TRUSS)	0.00	0.00	0.00	0.00				
	TRUSS (KIPS/TRUSS)	48.70	0.00	53.00	0.00				
	BRACING	0.00	0.00	0.00	0.00				
SUB-DEVIDED	TOTAL SUB-DEVIDED/SIDE (KIPS)	48.70	0.00	53.00	0.00				
	TOTAL SUB-DEVIDED/SIDE (ST)	24.35	0.00	26.50	0.00				
						Steel weight contingency		0.10	
		UPPER	LOWER	SUBDIV.					
	Total Weight / panel from all sections - [ST]	147.85	205.25	50.85	444.35	CG'S ARE CALCULATED IN RHINO, ON FILE			

Figure 6: Weights and CGs for Section 0-B

SECTION 0 WEIGHT ESTIMATES					
REV:	16-Apr				
CHECKED BY:	MJR				
APPROVED BY:	KE				
	SINGLE GUSSET/LIFTING POINT				
		SECTION 0-C			
	BENTS	27N			
	OTHER/MISC. (KIPS/TRUSS)	14.00			
	TRUSS (KIPS/TRUSS)	159.50			
	BRACING (KIPS/TRUSS)	51.10			
UPR CHORD	TOTAL UPPER CHORD/SIDE (KIPS)	224.60			
	TOTAL UPPER CHORD/SIDE (ST)	112.30			
			0.10		
	Total Weight / panel from all sections - [ST]	123.53			

Figure 7: Weights and CGs for Section 0-C

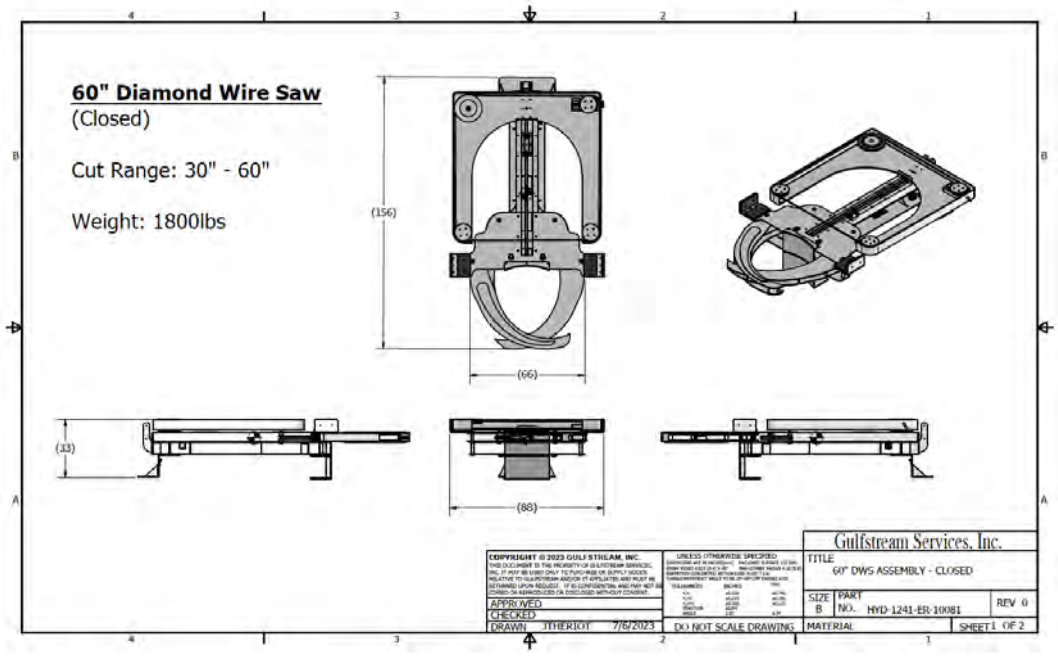
2.3. CUTTING METHODOLOGY

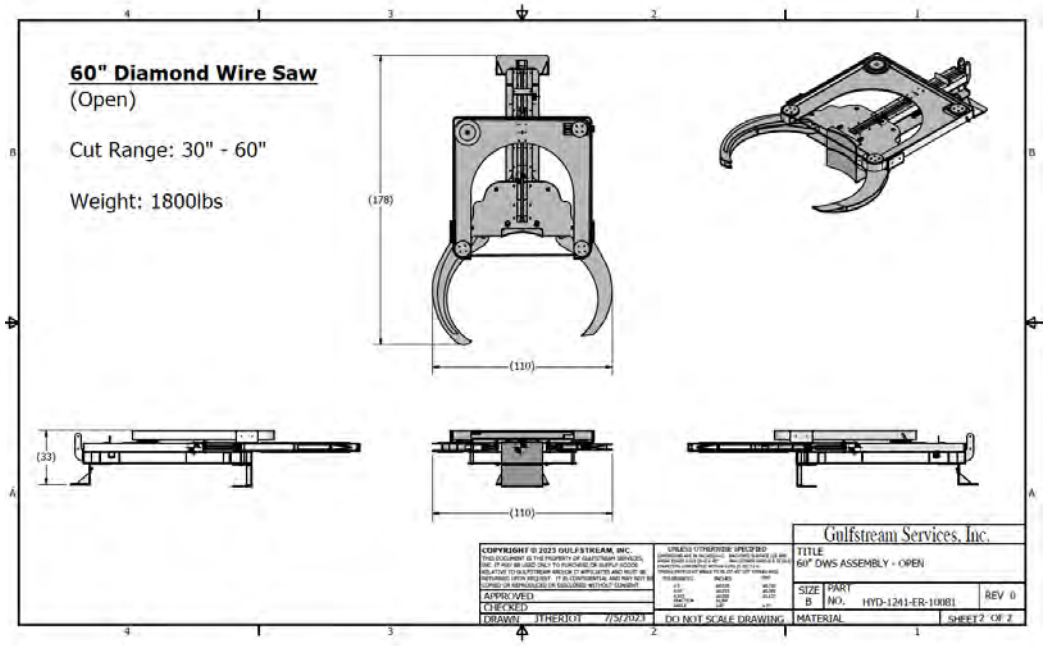
In general, the cuts will be made using hydraulic shears, as seen below:

Maximum Cut (in)	30
Lifting Weight (lbs)	40,000
Length (in)	210
Width (in)	93
Height (in)	52
Maximum Working Depth (ft)	7,800

2.4. ALTERNATIVE CUTTING METHODS

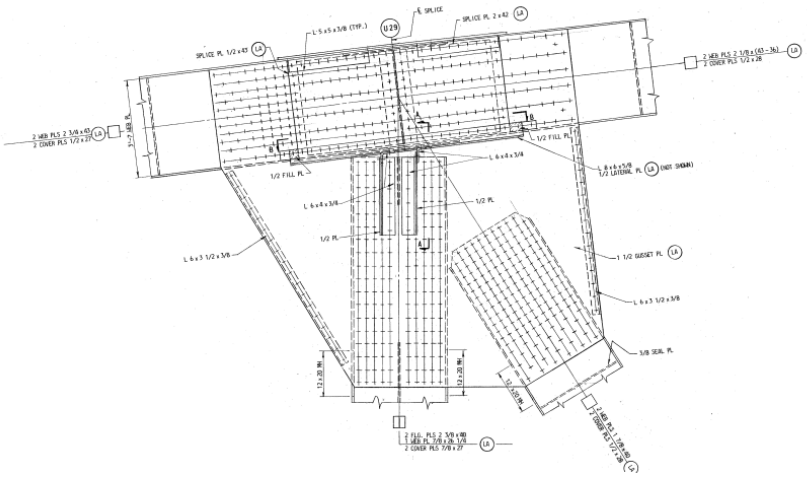
Alternative cutting methods utilizing Diamond Wire Saws and conventional diver underwater burning are also available. A 60-inch Diamond Wire Saw is illustrated below:





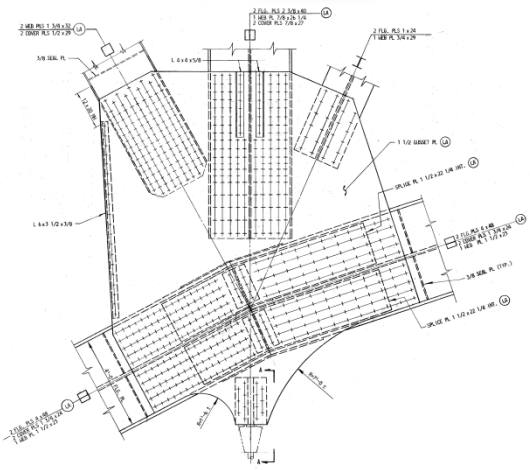
2.5. UPPER CHORD AND DIAGONAL DIMENSION AT U27

The size of the Upper Chord varies throughout the length of the bridge. The portion of the upper chord to potentially be cut is constructed of (2) x 2-3/4" x 43" Web Plates, and (2) x 1/2" x 27" Cover Plates. The Diagonal Chord is constructed of (2) x 1-3/4" x 32" Web Plates and (2) x 1/2" x 29" Cover Plates. The Vertical member is generally constructed of (2) x 2-3/8" x 46" Flange Plates, (1) x 7/8" x 26-1/4" Web Plates, and (2) x 7/8" x 27" Cover Plates.



2.6. LOWER CHORD AND DIAGONAL DIMENSION AT L29

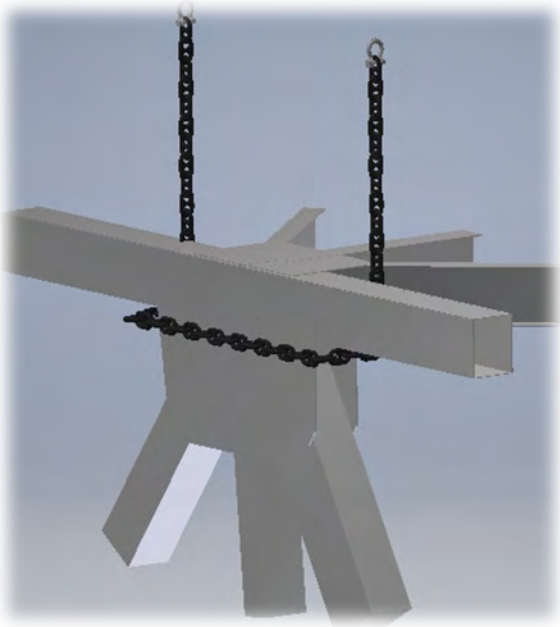
The size of the Lower Chord varies throughout the length of the bridge. The largest 'box' member of the lower chord that may potentially be cut is constructed of (2) x 4" x 48" Flanges, (2) x 1-3/4" x 24" Cover Plates, and (1) x 1-½" x 23" Web Plates. In way of the potential cut, the Diagonal Chord is constructed of (2) x 1-3/4" x 32" Web Plates and (2) x 1/2" x 29" Cover Plates.



3. RIGGING

3.1. GENERAL RIGGING DIAGRAM(S)

The below illustration provides a general depiction of how chains will be rigged around each node. These images are for reference only. The actual rigging plan will follow that which is noted below and will be revised as necessary based on determinations in the field.



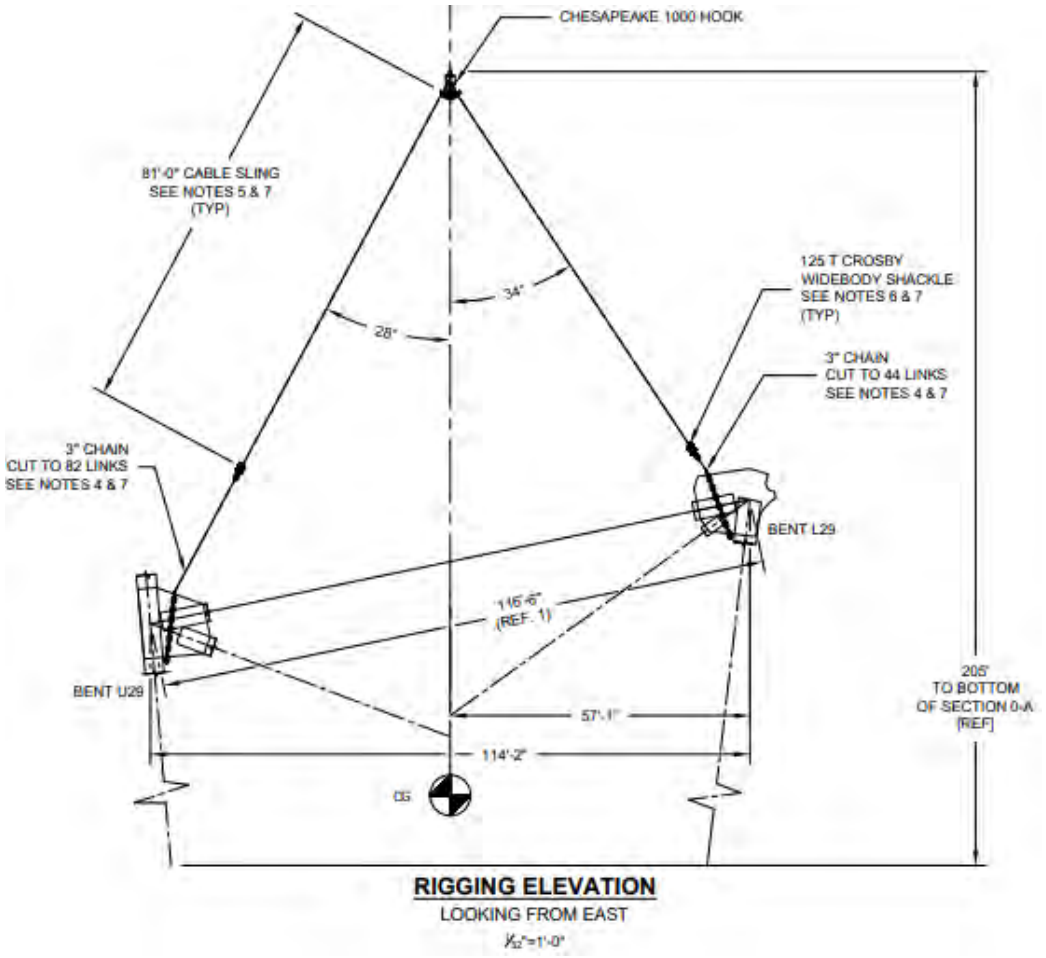
SUBSECTION 0-A

Rigging for the Section 0-A lift will be executed by passing 3" Grade 4 Stud Link chain about nodes U29N and L29N. Each bitter end of chain will connect to the bite of an 81' synthetic round sling (SWL 300 ST). The eye of each of the four slings will be placed over one of the horns on the CHESAPEAKE 1000's block.

The 3" chain will not be basketed about just the Chord; rather it will be rigged to catch each Chord on either side of the Diagonals, and the diagonal themselves.

The chain between the bitter end and node U29N will be cut to 82 links, and the chain between the opposing bitter end and node L29N will be cut to 44 links. The lengths of chain will be adjusted to accommodate both the number of chain links needed to pass about the nodes, as well as maintaining the lift to be as close to the CGs as reasonably possible.

Each node and area of rigging will have been surveyed by an engineer for structural soundness and fit prior to rigging.



RIGGING ELEVATION
LOOKING FROM EAST
1/32"=1'-0"

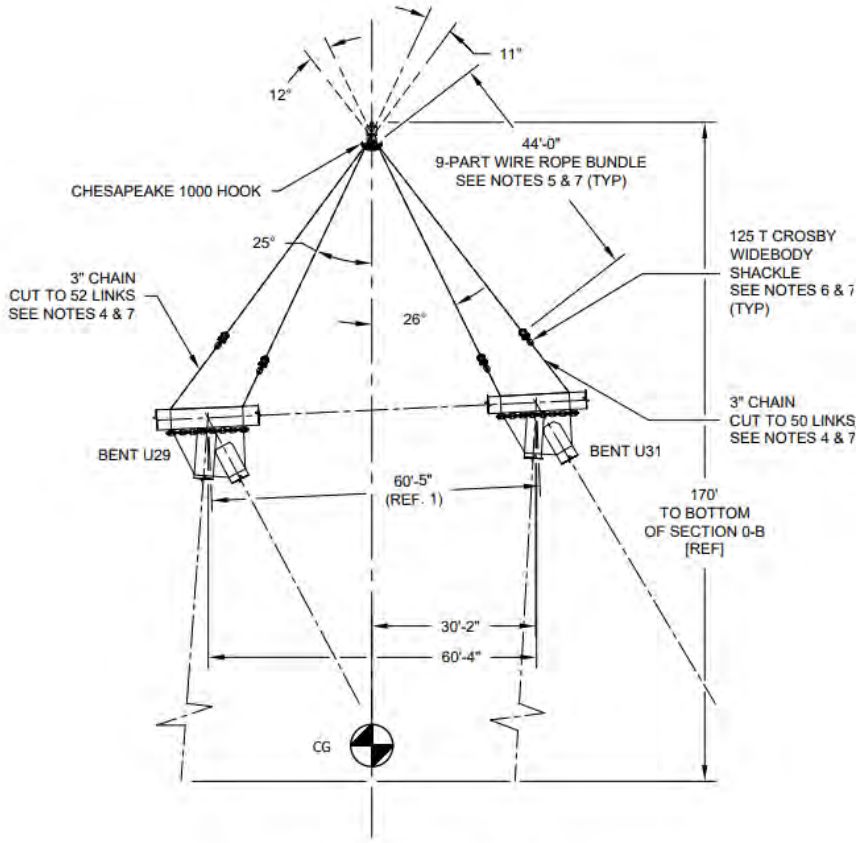
SUBSECTION 0-B

Rigging for the Section 0-B lift will be executed by passing 3" Grade 4 Stud Link chain about nodes U29N and U31N. Each bitter end of chain will connect to the bite of a 44', 9-part wire rope bundle (SWL 220 ST). The eye of each of the four slings will be placed over one of the horns on the CHESAPEAKE 1000's block.

The 3" chain will not be basketed about just the Chord; rather it will be rigged to catch each Chord on either side of the Diagonals, and the diagonal themselves.

The chain between the bitter end and node U29N will be cut to 52 links, and the chain between the opposing bitter end and node U31N will be cut to 50 links. The lengths of chain will be adjusted to accommodate both the number of chain links needed to pass about the nodes, as well as maintaining the lift to be as close to the CGs as reasonably possible.

Each node and area of rigging will have been surveyed by an engineer for structural soundness and fit prior to rigging.



RIGGING ELEVATION 0-B
LOOKING FROM WEST
1/32"=1'-0"

SUBSECTION 0-C

Rigging for the Section 0-C lift will be executed by passing 3" Grade 4 Stud Link chain cut to 42 links about node U27N. Each bitter end of chain will connect to the bite of a 44', 9-part wire rope bundle (SWL 220 ST). The eye of each of the four slings will be placed over one of the horns on the Columbia CHESAPEAKE 1000's block.

The 3" chain will not be basketed about just the Chord; rather it will be rigged to catch each Chord on either side of the Diagonals, and the diagonal themselves.

The lengths of chain will be adjusted to accommodate both the number of chain links needed to pass about the node, as well as maintaining the lift to be as close to the CGs as reasonably possible.

The node and rigging area will have been surveyed by an engineer for structural soundness and fit prior to rigging.

The following graphics depicts the concept, and subsequent drawings show the Rigging Arrangement for the three Subsections.

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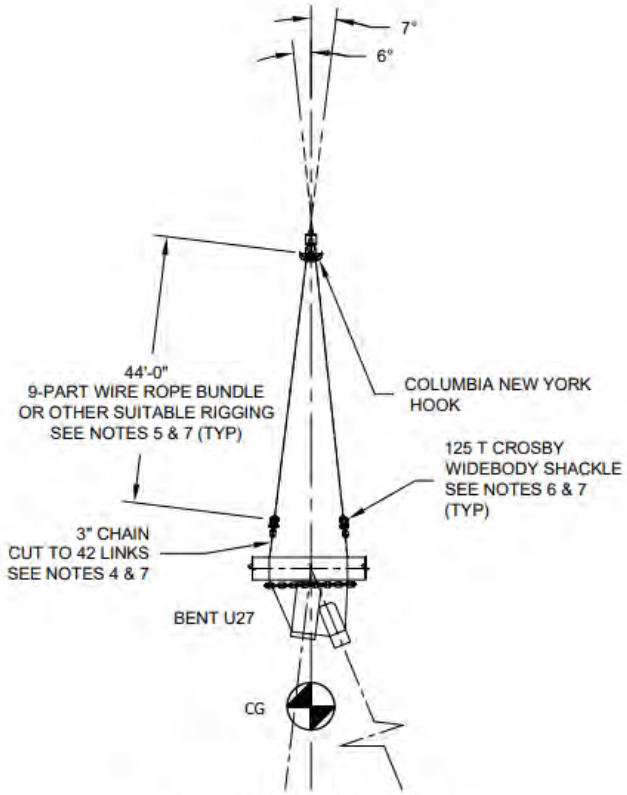

RIGGING ELEVATION 0-C

LOOKING FROM WEST

1/32"=1'-0"

4. MOORING, LOADOUT, SECUREMENT AND ADDITIONAL DATA

4.1. CB CHESAPEAKE 1000 AND CB COLUMBIA

The CB COLUMBIA (Subsection 0-C) and the CHESAPEAKE 1000 (Subsection 0-A & Subsection 0-B) will be moored alongside the Section by way of spud barges. The barges will be tended by a Donjon Marine assist tugs for the duration of the Section 0 lifts.

The Subsections will be carried to the Sparrows Point disposal site while on the hook of the crane barges CHESAPEAKE 1000 / COLUMBIA.

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DONJON MARINE KEY BRIDGE SECTION 4 REMOVAL

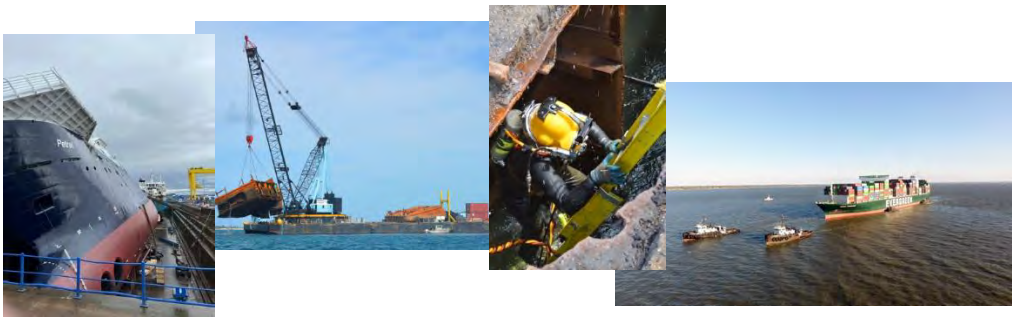
DOCUMENT NUMBER: 24-006-007

PROJECT NAME: KEY BRIDGE CHANNEL CLEARING

PROJECT NUMBER: 24-006

CLIENT NAME: US NAVY SUPSALV

CLIENT REFERENCE: 23F4DO3



DOCUMENT CONTROL

Revision Status

Rev	Issue Date	Reason for Issue	Prepared	Checked	Approved
00A	27-04-2024	Submitted to Salvage Team for review	JKE	AK	
00B	01-05-2024	Incorporated UC Comments	JKE	AK	
00C	01-05-2024	Approved by Operations Branch	JKE	AK	VJ
00D	18-05-2024	Add technical info and diagrams	MR	TW	

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General Document Data	
Document Title:	DONJON MARINE Key Bridge Section 4 Removal
Document Number:	24-006-007
Project Name:	KEY BRIDGE CHANNEL CLEARANCE
Project Number:	24-006
Client Name:	US NAVY SUPSALV

Revision Status A		
Revision Number:	PLAN 2024-04-17 REV 00D	
Revision Date:	18 May 2024	
Approval Status:	Submitted to Salvage Branch Lead for review	
Prepared By:	Tim Williamson	Role: Project Manager
Reviewed By:	William Kratz, Jr.	Role: Salvage Master
Interdisciplinary Check:	Ken Edgar	Role: Senior Naval Architect
Approved By:	Paul Hankins	Role: Salvage Branch Lead

Change Log		
Revision	**Section**	**Change**

DONJON MARINE CO., INC.

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Hillside, New Jersey 07205-2033 USA

TABLE OF CONTENTS

1. GENERAL

1.1. INTRODUCTION

The purpose of this plan is to illustrate the protocols and methodology that will be used to remove the Key Bridge section 4, north of Pier 17, and transport the section to the disposal site. This plan will be executed conjunction with M/V DALI removal operations. Section 4 will be removed in the order of asymmetrical pieces Subsection 4-0, Subsection 4-A, and 4-B. After each Subsection is removed this plan will be reevaluated.

The main channel (center) span of the Key Bridge is blocking the main navigation channel. At the time of submitting this plan, Section 4 blocks part of the southern-most portion of the main navigation channel between Piers 17 and 18.

Section 4 is the southern most section in the main channel; this section is the focus of Donjon Marine's efforts to restore the main channel to the configuration prior to the bridge collapse.

1.1.1. LOCATION ILLUSTRATION

Figure 1: Section 4 Overview

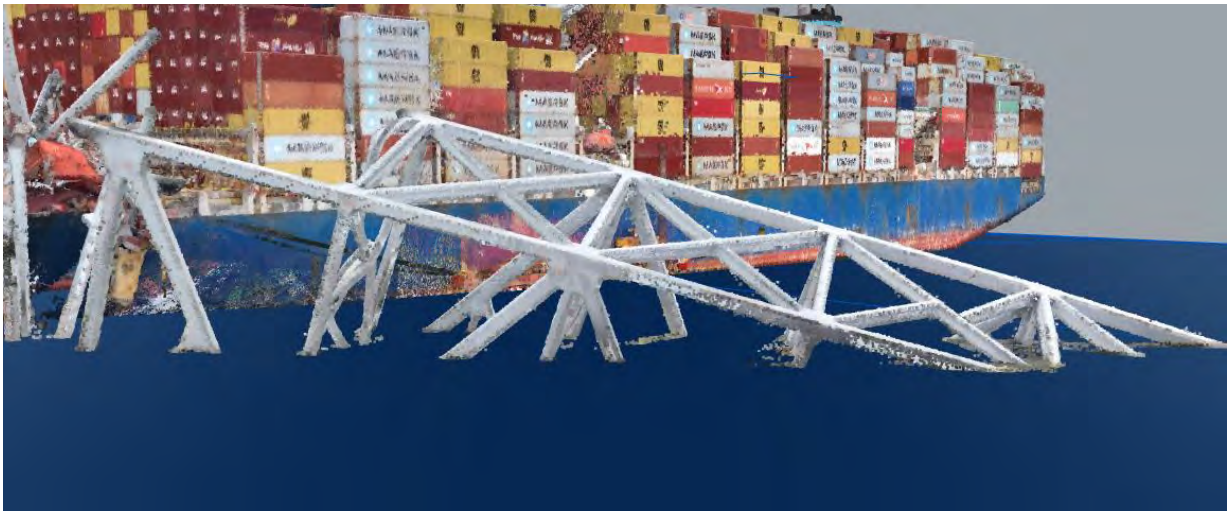


Figure 2: Elevation of Section 4, East Side LKG West

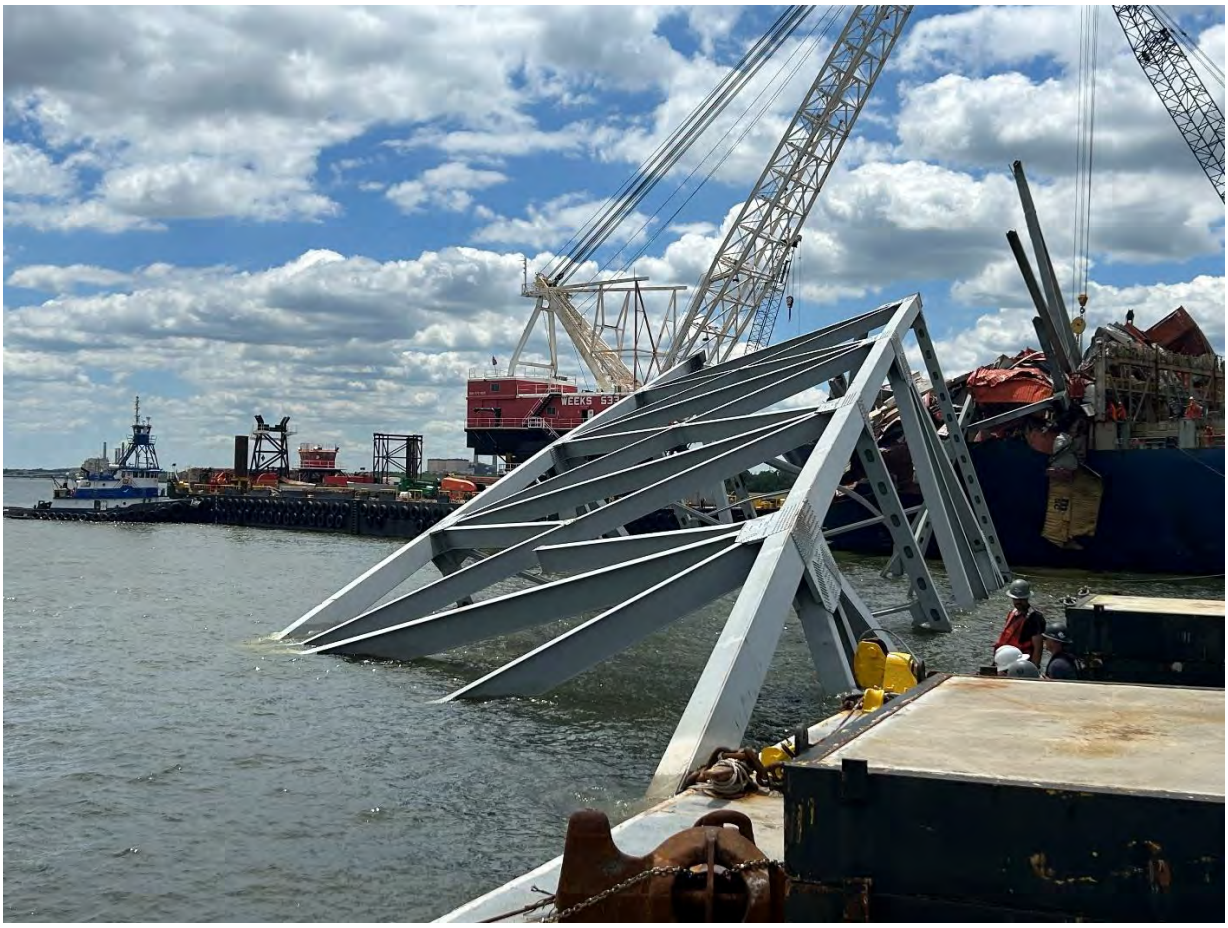


Figure 3: Photo of Section 4 LKG from North-West

1.2. CURRENT CONDITION

To facilitate the removal of the *M/V DALI* from the Channel, the portion of the bridge truss between bents 27 and 31 has been severed explosively and allowed to drop to the riverbed. This has left bents 31 thru 43 intact. All bridge wires to the suspended road deck may not have been cut.

The portion of the bridge dropped by the fracturing (Bents 27S thru 31S/33S) is designated subsection 4A and has been removed by the large Grab onboard the CHESAPEAKE 1000. Bents 33 thru 36-1/2 and Bents 36-1/2 thru 40-1/2 are designated Subsections 4B and 4C respectively; to be removed in two-engineered lifts by the CHESAPEAKE 1000. The remainder of Section 4, Bent 40-1/2 and north, is thought to be collapsed, it is designated Subsection 4D and will be removed by the Grab.

Refer to the illustration within the next section.

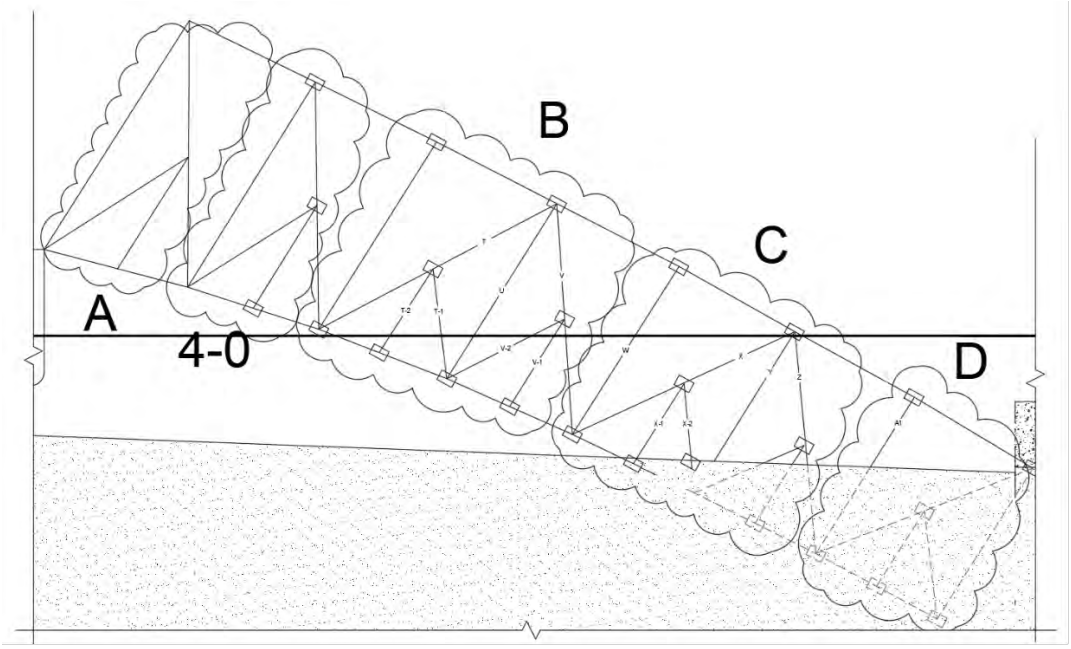


Figure 4: Section 4 subsections, LKG from East

2. METHODOLOGY

The methodology for Section 4 removal is summarized below.

Note: this plan is dynamic and may be revised as a result of conditions found in the field and subsequent to any of the steps noted below.

1. Survey the Section post explosive fracturing,
2. Cut the upper chord, lower chord, and diagonal between 33SE and 32SE to 'square-up' the Subsection 4-0 in way of Eastern Chords,
3. Pre-rig Subsection 4B for lifting at Bents U33S and U35S,
4. Cut Subsection 4B from the rest of Section 4 to the north at about Bent 36-1/2S.
5. Remove Subsection 4B with the CHESAPEAKE 1000 and carry to the disposal area,
6. Pre-rig Subsection 4C for lifting at Bents U37S and U39S,
7. Cut Subsection 4C from Subsection 4D to the north at about Bent 40-1/2S.
8. Remove Subsection 4C with the CHESAPEAKE 1000 and carry to the disposal area,
9. The CHESAPEAKE 1000 will be reconfigured with the large Grab,
10. Remove the remains of Subsections 4A and 4D, placing the debris atop matted material barges,
11. The loaded barges will transit to the disposal area for discharge.

2.1. SECTIONAL CUT LOCATIONS

The exact location of the cuts to separate Section 4 into Subsections 40 through 4D is based on several factors:

a) Overall weight of the Subsection;
b) The results of the explosive fracturing,
c) The break-up of the Bridge and Deck at Subsection 4D,
d) Location of the Longitudinal Center of Gravity (LCG) of the Subsection;
e) Location and strength of rigging locations;
f) Confirmation of the ability to get the Center of Lift (CoL) over the LCG;
g) Size, number, and location of cuts to be made on the Subsection;

Currently the approximate locations of the cuts are as noted above. These locations will be revised as necessary based on conditions found in the field and published within subsequent Plan revisions as detailed surveys and calculations are completed.

The weight estimates for the Subsections are detailed in the following sections of the plan.

2.2. SECTION 4-0, 4-B & 4-C WEIGHT ESTIMATES & CGS

The asymmetrical portion, Subsection 4-0, of the bridge on the eastern side will be removed by cutting it at about Bent 32-1/2; this piece is estimated to weigh 182-ST.

Figure 5: Section 4-0 Weight Diagram

Section 4-B will be cut approximately at node 32-1/2 and node 36-1/2. This piece is estimated to weigh 578 ST.

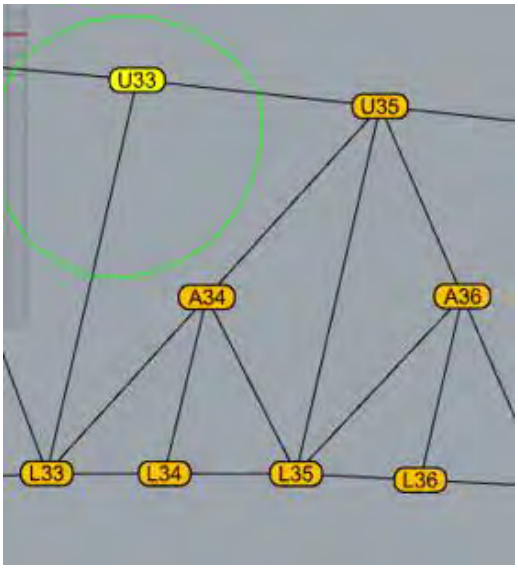


Figure 6: Section 4-B Weight Diagram

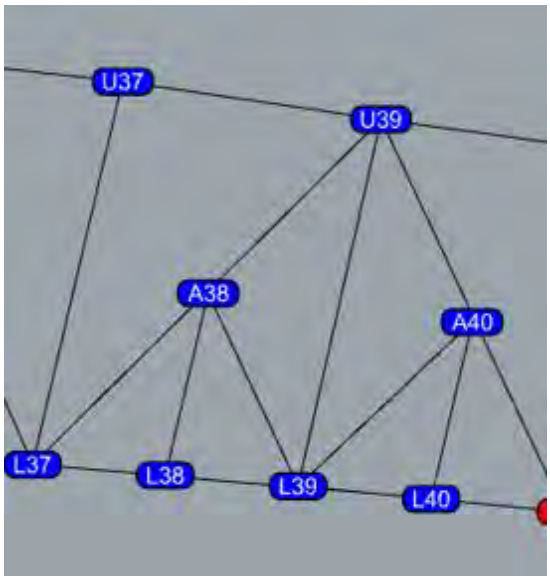


Figure 7: Section 4-C Weight Diagram

Detailed weight estimate and center of gravity diagrams for the subsections 4-0, A, and B will be submitted as supplemental appendices to this salvage plan.

2.3. CUTTING METHODOLOGY

In general, the cuts will be made using hydraulic shears, as seen below:

Maximum Cut (in)	30
Lifting Weight (lbs)	40,000
Length (in)	210
Width (in)	93
Height (in)	52
Maximum Working Depth (ft)	7,800

Figure 8: Cutting Shears

2.4. ALTERNATIVE CUTTING METHODS

Alternative cutting methods utilizing Diamond Wire Saws and conventional diver underwater burning are also available. A 60-inch Diamond Wire Saw is illustrated below:

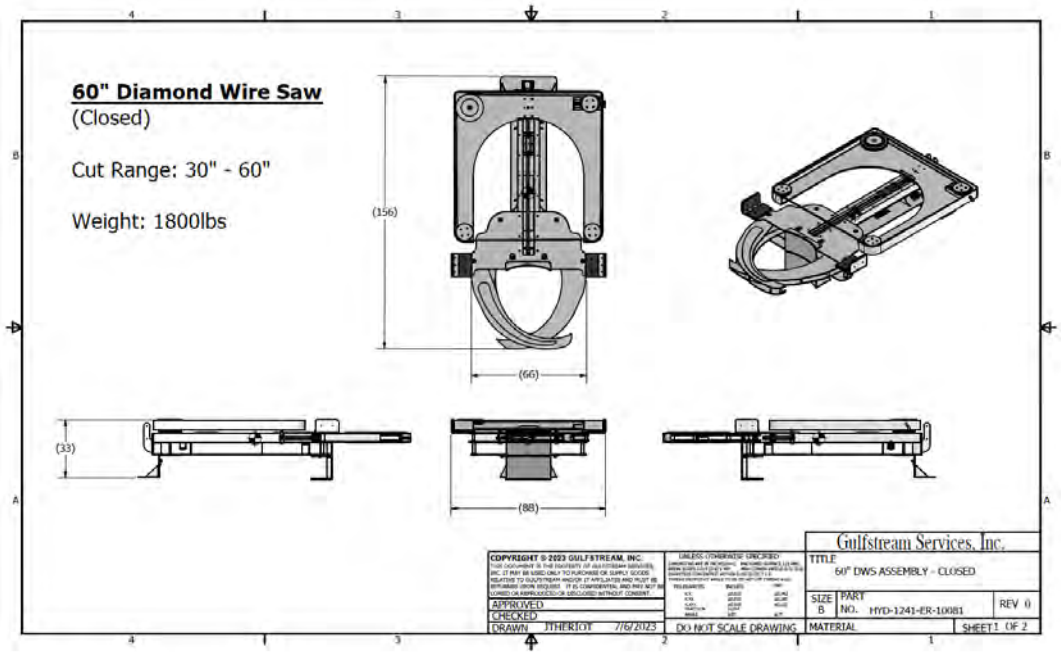


Figure 9: Diamond Wire Saw

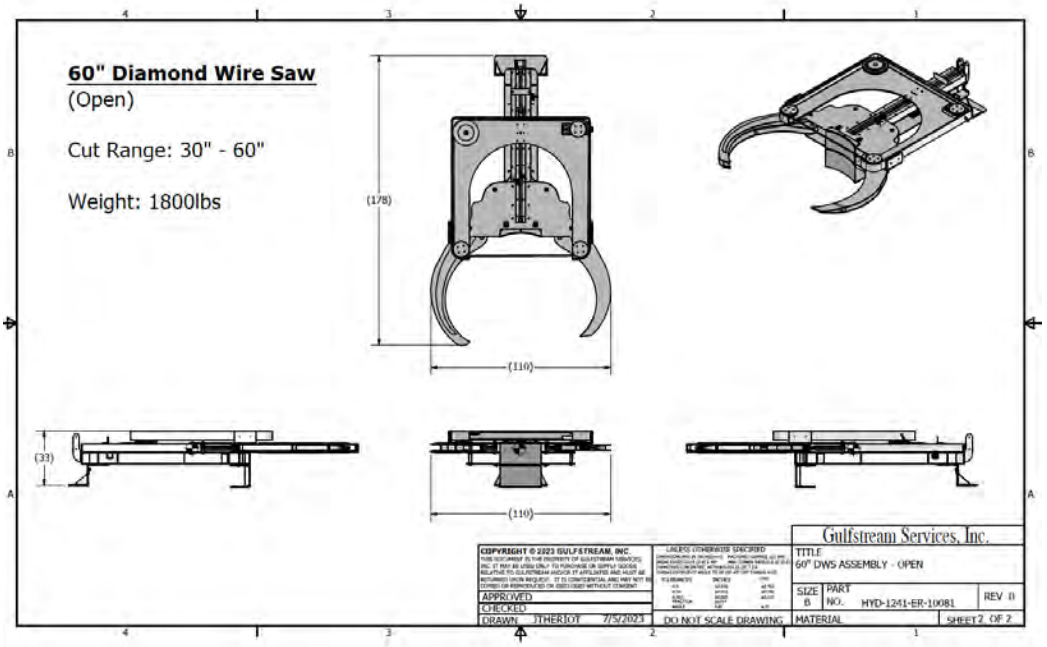


Figure 10: Diamond Wire Saw

2.5. DIMENSIONS AND NODES AT U33 AND U37

The Nodes at the Lift Poins U33 and U37 are of similar in construction; the graphic below shows Node U33.

The size of the bridge scantlings; and thus, the weight varies throughout the length of the Bridge. The portion of the upper chord at Bent 36-1/2 to potentially be cut is constructed of (2) x 1-3/8” x 36” Web Plates, and (2) x 7/8” x 29” Cover Plates. There are no Diagonal Chord at the Upper Nodes.

The portion of the lower chord at Bent 36-1/2 to potentially be cut is constructed of (2) x 1-1/4” x 43” Web Plates, and (2) x 11/16” x 30” Cover Plates. The Diagonal is generally constructed of (2) x 2” x 32” Web Plates, (2) x 1/2” x 28” Cover Plates.

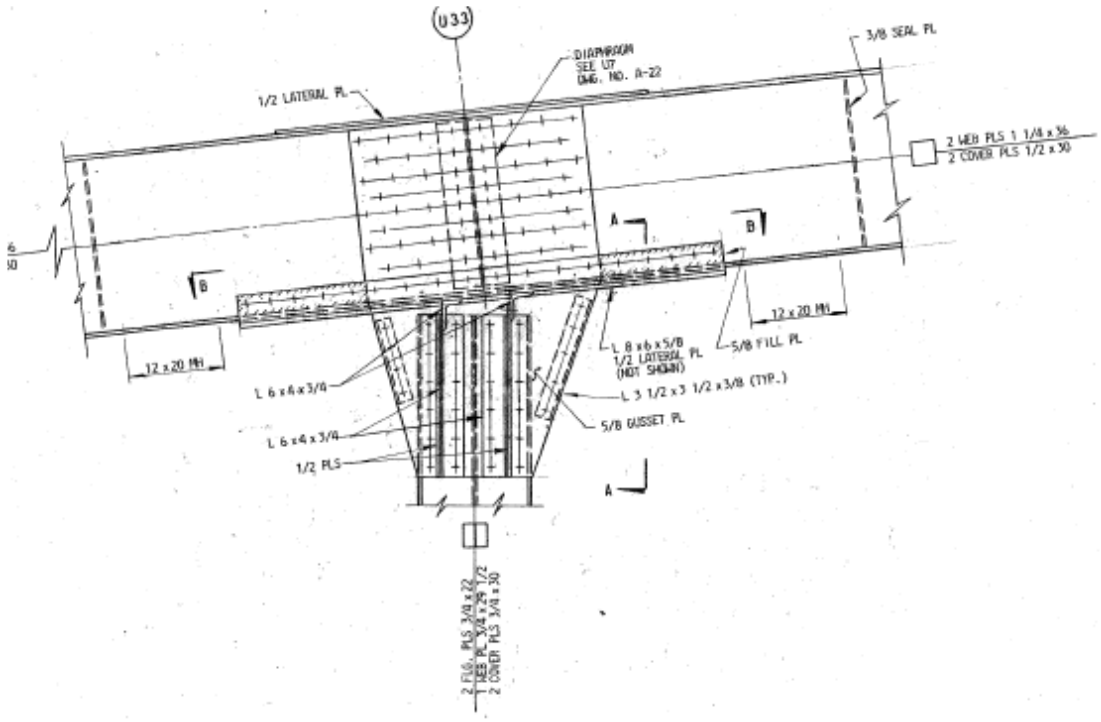


Figure 11: Node 33 & 37

2.6. DIMENSIONS AND NODES AT U35 AND U39

The nodes at the lift points U35 and U39 are of similar in construction; the graphic below shows Node U39.

The portion of the upper chord at bent 36-1/2 to potentially be cut is constructed of (2) x 2-7/16” x 43” Webs, (2) x 7/8” x 27” Cover Plates. There are no diagonal chord at the upper nodes.

The portion of the lower chord at bent 40-1/2 to potentially be cut is constructed of (2) x 2-3/8” x 43” web plates, and (2) x 1/2” x 27” cover plates. The diagonal is generally constructed of (2) x 1-1/2” x 25” web plates, (2) x 1/2” x 29” cover plates.

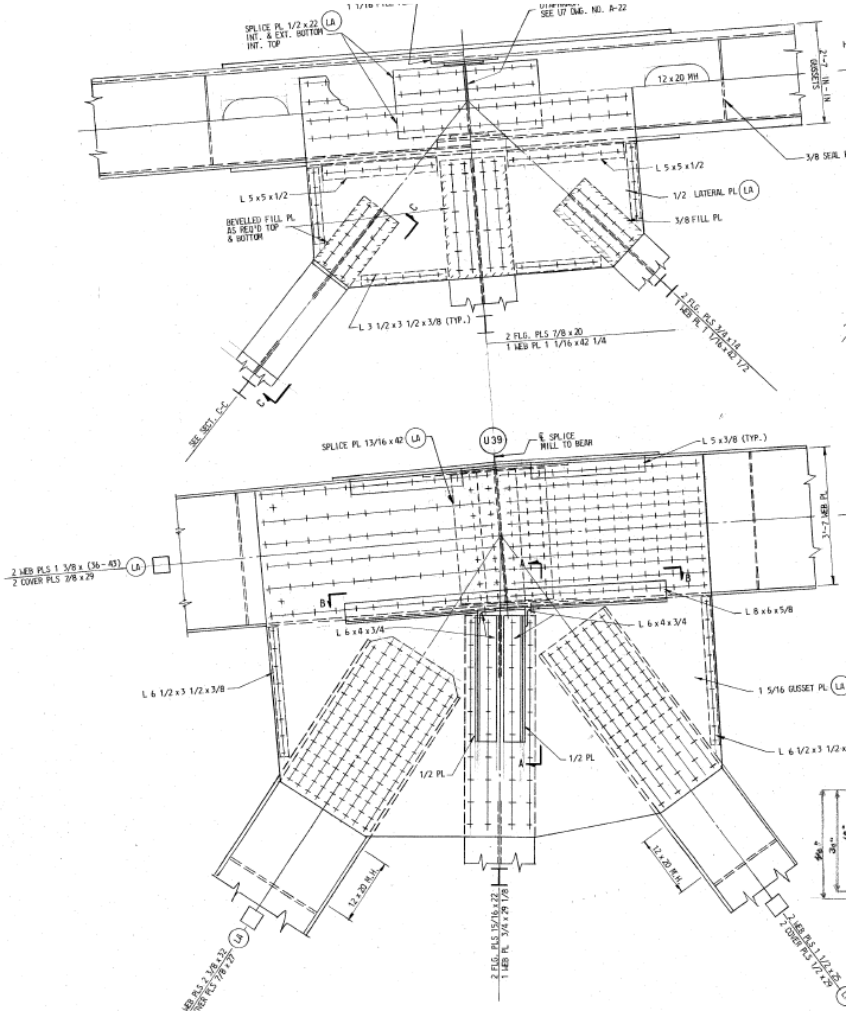
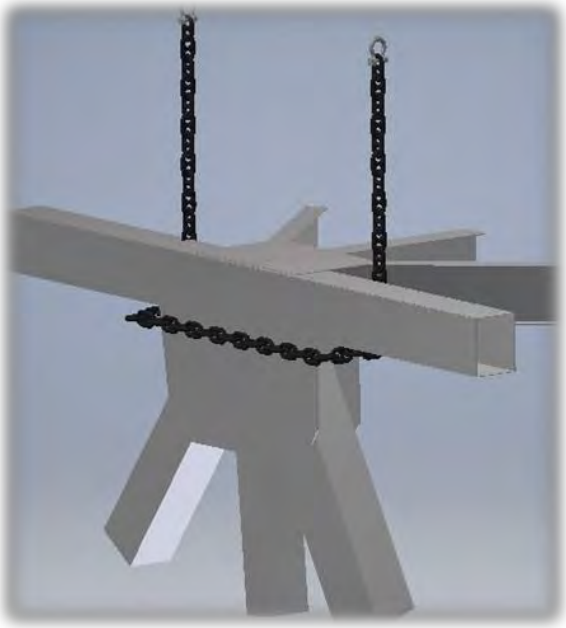


Figure 12: Nodes 35 & 39

3. RIGGING

3.1. GENERAL RIGGING DIAGRAM(S)

The below illustration provides a general depiction of how chains will be rigged around each node. These images are for reference only. The actual rigging plan will follow that which is noted above and be revised as necessary based on necessary determinations in the field.



SUBSECTION 0-A

Rigging for the Section 4-0 lift will be executed by passing 3” Grade 4 Stud Link chain about node U31S. Each bitter end of chain will connect to the bite of an 81’ synthetic round sling (SWL 300 ST). The eye of each of the two slings will be placed over one of the horns on the COLUMBIA’s/CHESAPEAKE 1000’s block.

The 3” chain will not be basketed about just the Chord; rather it will be rigged to catch the Chord on either side of the Diagonals, and the diagonal themselves.

The node and area of rigging will have been surveyed by an engineer for structural soundness and fit prior to rigging.

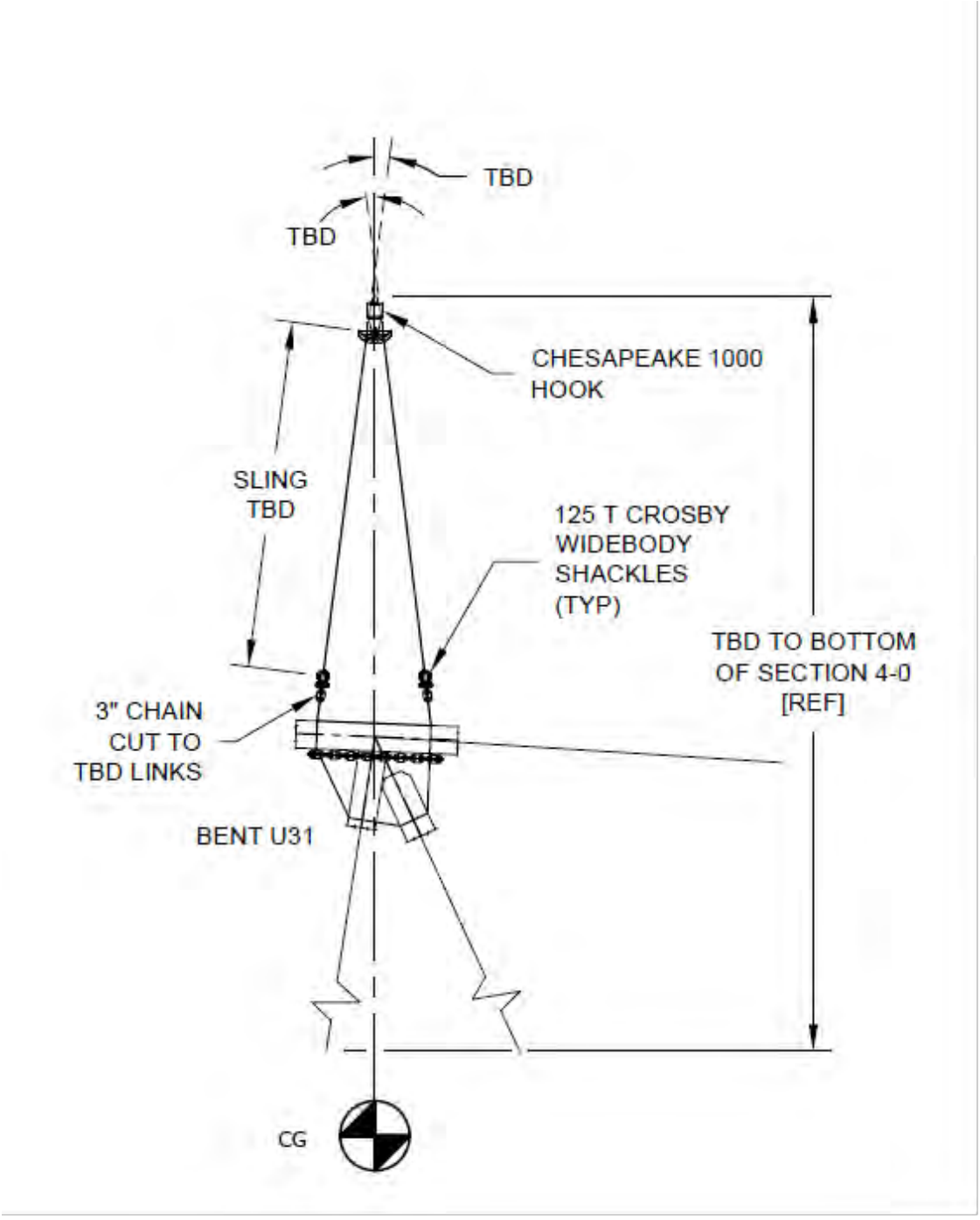


Figure 13: Subsection 4-0 Rigging

SUBSECTION 4B and 4C

Rigging for the Subsections 4B and 4C lifts will be executed by passing 3" Grade 4 Stud Link chain about nodes U33S and U35S as well as U37S and U39S respectively. Each bitter end of chain will connect to the bite of a 44', 9-part wire rope bundle (SWL 220 ST). The eye of each of the four slings will be placed over one of the horns on the CHESAPEAKE 1000's block.

The 3" chain will not be basketed about just the Chord; rather it will be rigged to catch each Chord on either side of the Diagonals, and the diagonal themselves.

The chain between the bitter end and node is shown on the following drawings. The lengths of chain will be adjusted to accommodate both the number of chain links needed to pass about the nodes, as well as maintaining the lift to be as close to the CGs and Subsection in its as found plane as reasonably possible.

It should be noted, the chain lengths will be finalized after the explosive fracture in as much as the as found plane will most probably change.

Each node and area of rigging will have been surveyed by an engineer for structural soundness and fit prior to rigging.

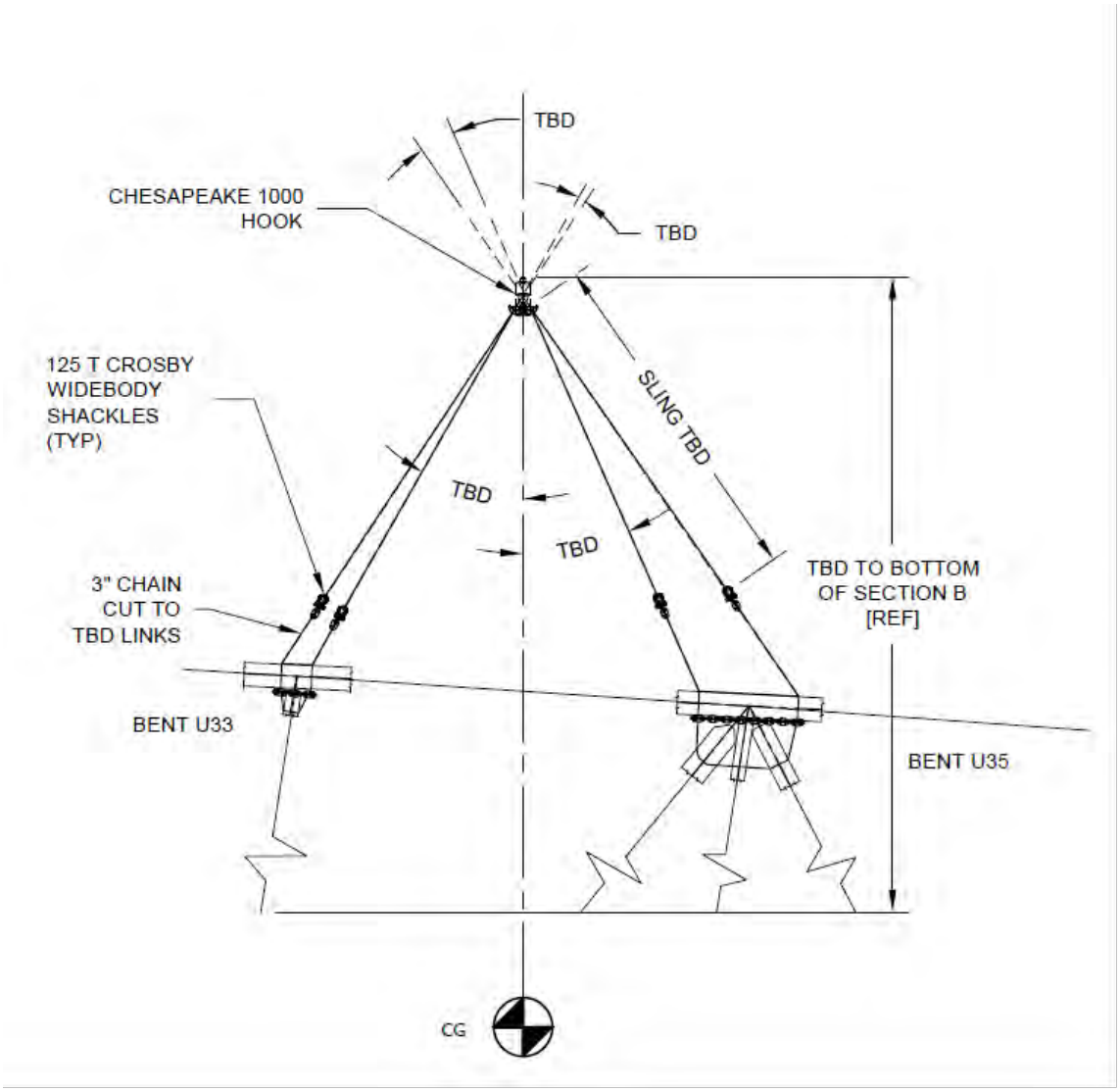


Figure 14: Subsection 4B & 4C Rigging

Detailed rigging arrangements will be provided as an appendices to this salvage plan.

SUBSECTIONS 4A AND 4D

Subsections 4A and 4D will be recovered by the CHESAPEAKE 1000 and the Grab.

The following image depicts the concept

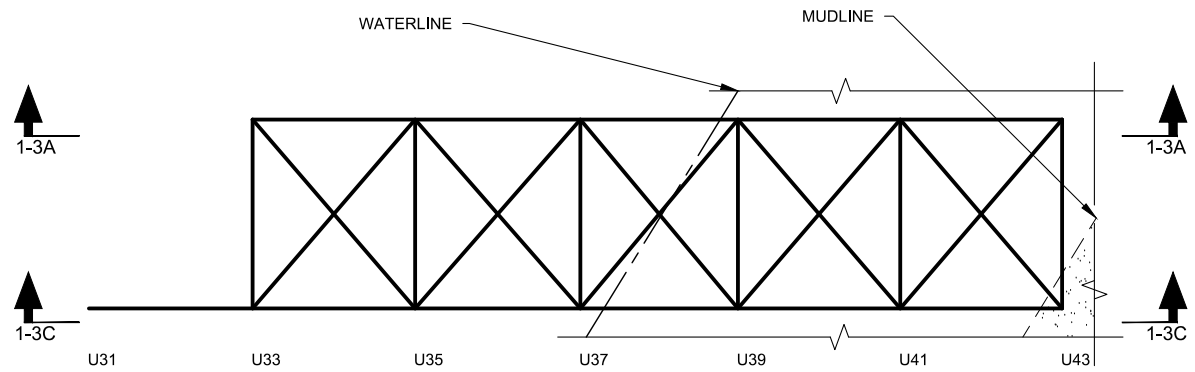
Figure 15: Chesapeake 1000 working with the Grab

4. MOORING, LOADOUT, SECUREMENT AND ADDITIONAL DATA

4.1. CB CHESAPEAKE 1000 AND CB COLUMBIA

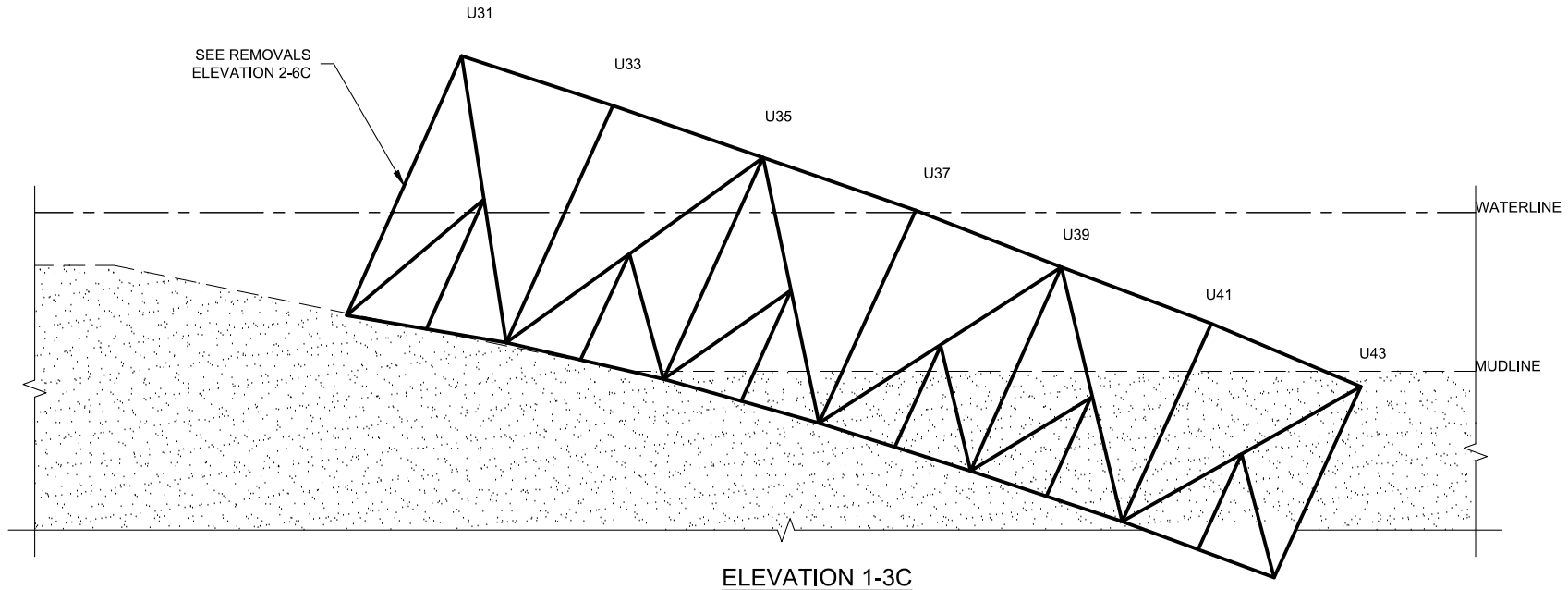
The CB COLUMBIA (Subsection 4-0) and the CHESAPEAKE 1000 (all other Subsections) will be moored alongside the Section by way of spud barges. The barges will be tended by a Donjon Marine assist tugs for the duration of the Section 4 lifts.

The Subsections will be carried to the Sparrows Point disposal site while on the hook of the crane barges CHESAPEAKE 1000 / COLUMBIA.



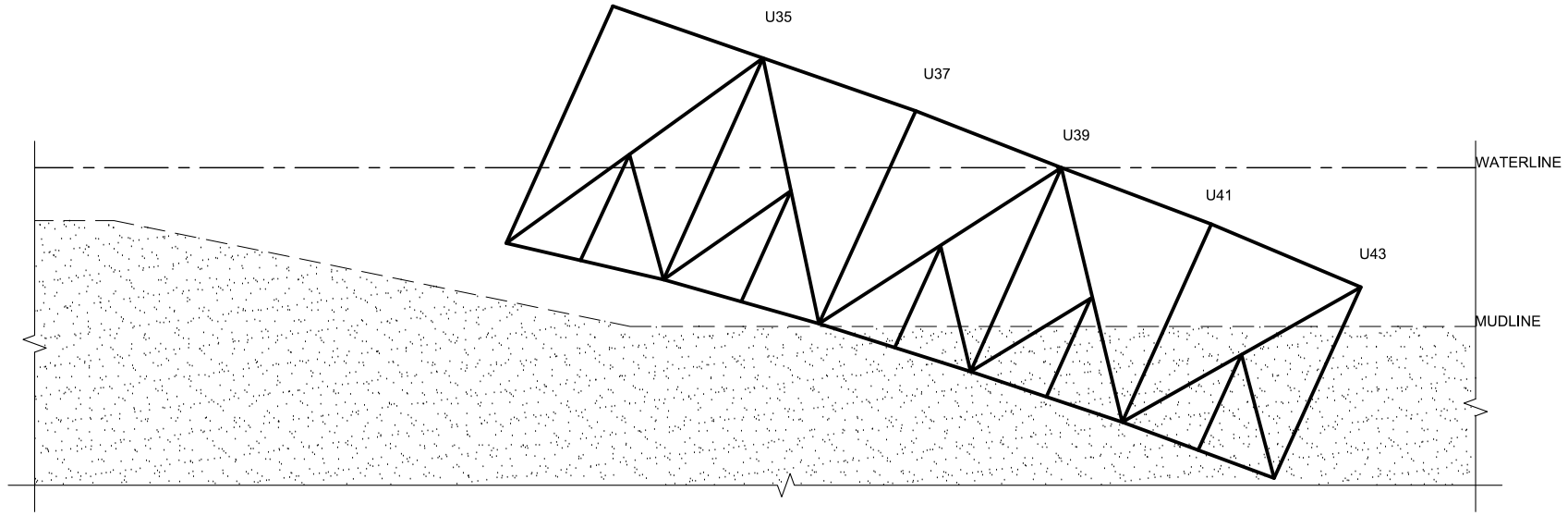
PLAN 1-7B

UPPER CHORD & LATERAL BRACING
LOOKING FROM ABOVE
NTS



ELEVATION 1-3C

EAST TRUSS, LOOKING WEST
NTS



ELEVATION 1-3A

WEST TRUSS, LOOKING EAST
NTS

GENERAL NOTES

1. THE PURPOSE OF THIS SKETCH IS TO DEPICT THE WEIGHT AND CG OF EACH SUBSECTION OF THE FALLEN SECTION 4 OF SPAN 18 OF THE FRANCIS SCOTT KEY BRIDGE.

1.1. ASSUMPTIONS:

1.1.1. 10% MARGIN ON WEIGHT INCLUDED TO ACCOUNT FOR POTENTIAL FOR ROAD DECK WEIGHT.

1.1.2. BUOYANCY OF SUB SECTIONS NEGLECTED IN CALCULATIONS.

1.1.3. VCG WITHOUT ROADWAY WAS USED TO REMAIN CONSERVATIVE.

GENERAL NOTES (CONTD.)

1.1.1. TCG ASSUMED TO BE IN THE CENTER BETWEEN SPANS.

1.1.2. LOADS SHOWN IN ST, ARE WHOLE LOADS FOR SECTIONS.

2. ALL LOADS ARE FROM BRIDGE DRAWING A-9, LOADING DATA.

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPD
ALL	P0	INITIAL REVISION		

DONJON MARINE CO., INC.
100 Central Avenue
Hillsdale, New Jersey 07205-2033 USA

DONJON MARINE
HILLSDIE, NJ

FRANCIS SCOTT KEY BRIDGE RESPONSE
SPAN 18 - SECTION 4
CONDITION

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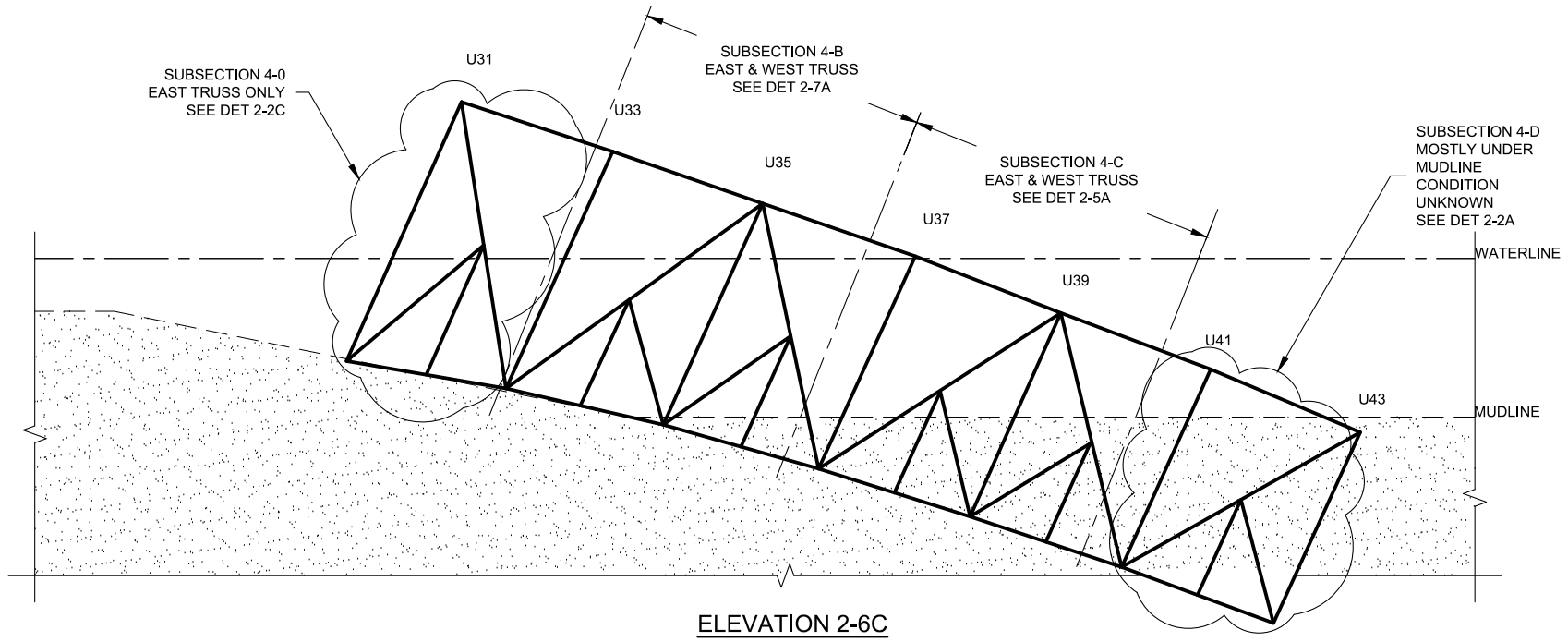
1201 WESTERN AVENUE, SUITE 200
SEATTLE, WASHINGTON 98101
T +1 206.624.7850 GLOSTEN.COM

Drawn	Checked	Approved	Size	Issue Date
AK	MJR	-	B	17 MAY 2024

Scale	Drawing Number	Sheet	of	Revision
AS NOTED	24040.01-SKETCH	1	2	P0

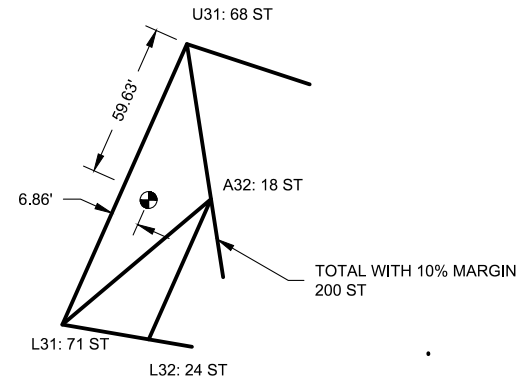


ELEVATION 2-6C

REMOVALS

EAST TRUSS, LOOKING WEST

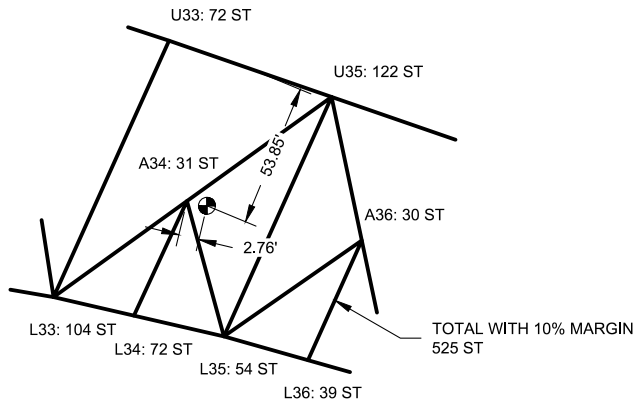
NTS



DETAIL 2-2C

SUBSECTION 4-0

NTS



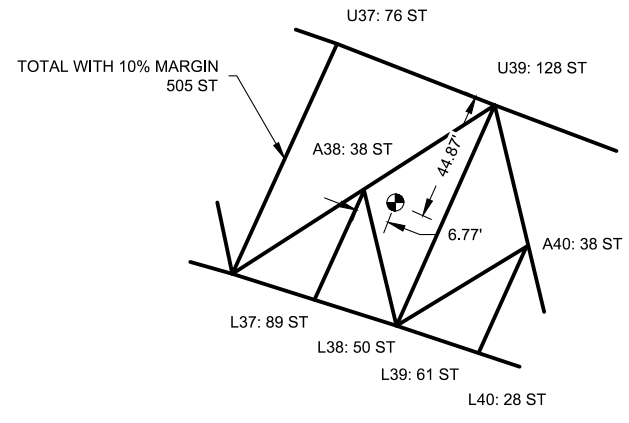
DETAIL 2-7A

SUBSECTION 4-B

EAST TRUSS, LOOKING WEST

WEST TRUSS SIMILAR & OPPOSITE

NTS



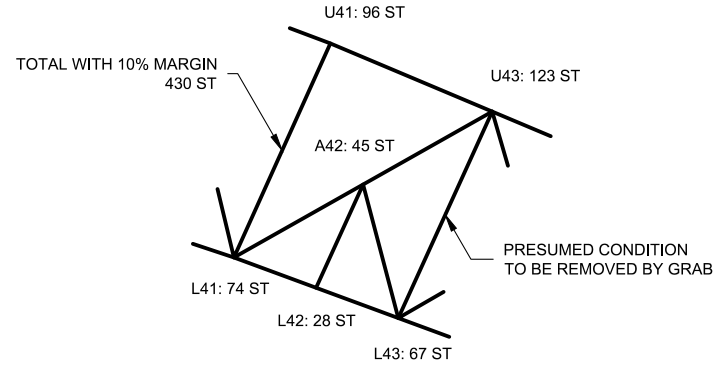
DETAIL 2-5A

SUBSECTION 4-C

EAST TRUSS, LOOKING WEST

WEST TRUSS SIMILAR & OPPOSITE

NTS



DETAIL 2-2A

SUBSECTION 4-D

EAST TRUSS, LOOKING WEST

WEST TRUSS SIMILAR & OPPOSITE

NTS

DONJON MARINE

HILLSDIE, NJ

FRANCIS SCOTT KEY BRIDGE RESPONSE

SPAN 18 - SECTION 4

REMOVALS

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DONJON MARINE CO., INC. 100 Central Avenue Hillsdale, New Jersey 07205-2010 USA

Drawn	Checked	Approved	Size	Issue Date
AK	MJR	-	B	17 MAY 2024

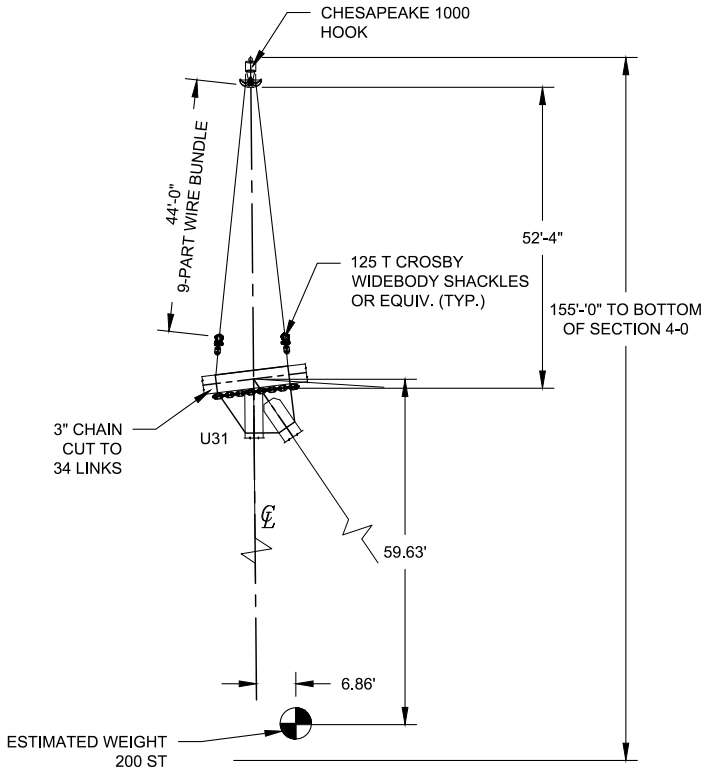
Scale	Drawing Number	Sheet	of	Revision
AS NOTED	24040.01-SKETCH	2	2	P0

GENERAL NOTES

1. THE INTENT OF THIS DRAWING IS TO SHOW A PRELIMINARY RIGGING ARRANGEMENT FOR SECTION 4-0, 4-B, & 4-C OF THE FRANCIS SCOTT KEY BRIDGE.
2. PRIMARY DIMENSIONS ARE ENGLISH.
3. CHAIN IS TO BE 3" GRADE 4 STUD LINK CHAIN.
4. BUNDLES ARE 9-PART (1-3/4"), 90 FT LONG WITH A SWL OF 220-ST VERTICAL.
5. SHACKLES ARE TO BE 125 T, CROSBY WIDEBODY SHACKLES OR EQUIVALENT.

REFERENCES

1. J. E. GREINER, BALTIMORE HARBOR OUTER CROSSING PATAPSCO RIVER BRIDGE, DWG. NO. OT-12-A, JANUARY 1972, REV. AS-BUILT.
2. DONJON MARINE, SECTION 4 WEIGHT DIAGRAM, SKETCH, MAY 2024.



RIGGING ELEVATION

LOOKING FROM EAST

1/32"=1'-0"

DONJON MARINE
HILLSIDE, NJ

DONJON MARINE CO., INC.

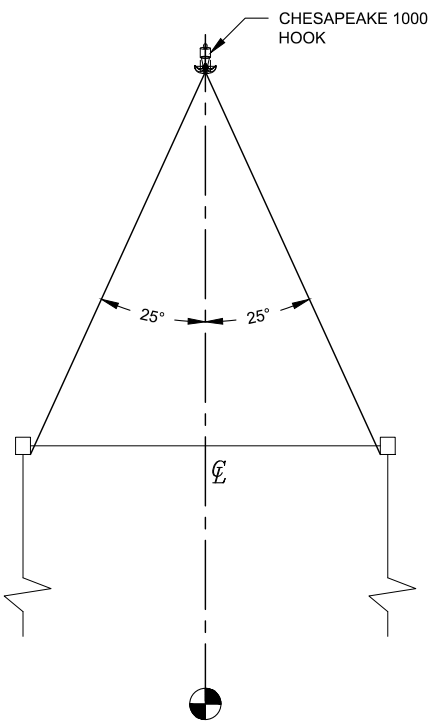
Glosten More than DESIGN.

1201 WESTERN AVENUE, SUITE 200
SEATTLE, WASHINGTON 98101
T +1 206.624.7850 GLOSTEN.COM

FRANCIS SCOTT KEY BRIDGE RESPONSE
SECTION 4
SUBSECTION 4-0 RIGGING

Drawn	Checked	Approved	Size	Issue Date
MJR	AK	MJR	A	2024/05/17

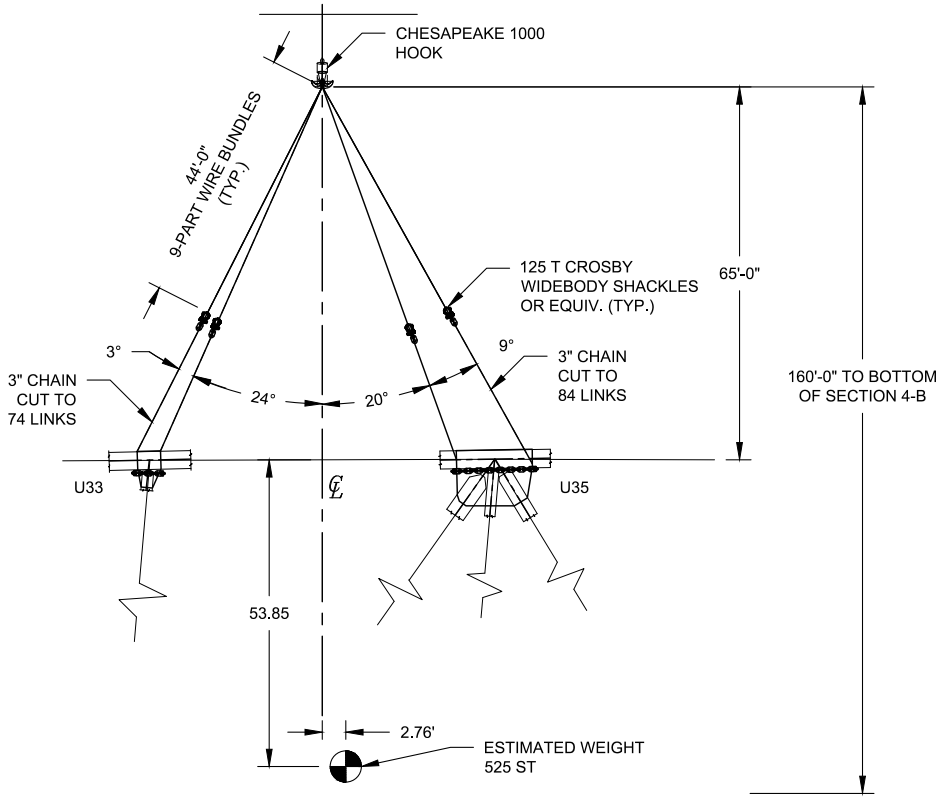
Scale	Drawing Number	Sheet	of	Revision
AS NOTED	24040.01-SKETCH	1	3	P0



RIGGING SECTION

LOOKING FROM SOUTH

1/32"=1'-0"



RIGGING ELEVATION

LOOKING FROM EAST

1/32"=1'-0"

DONJON MARINE
HILLSIDE, NJ

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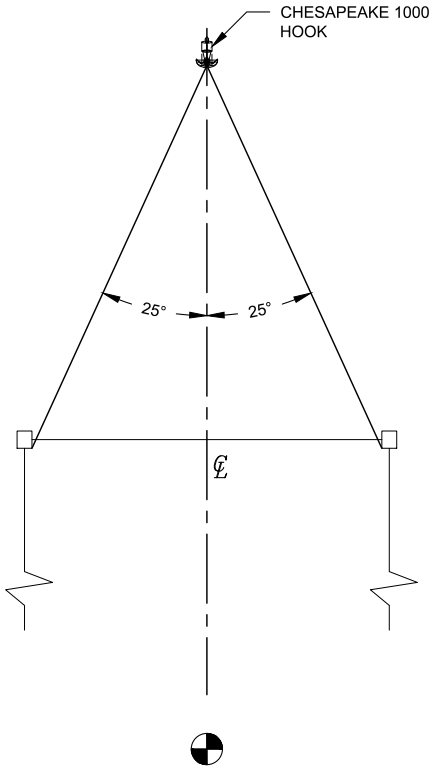
FRANCIS SCOTT KEY BRIDGE RESPONSE
SECTION 4
SUBSECTION 4-B RIGGING

Drawn	Checked	Approved	Size	Issue Date
MJR	AK	MJR	A	2024/05/17

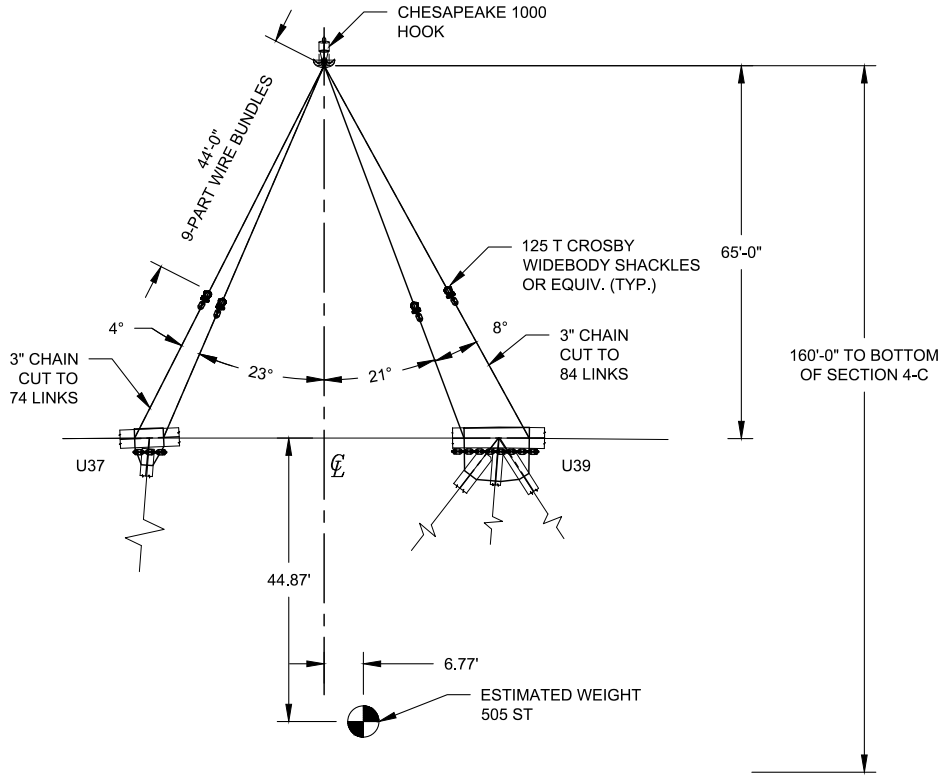
Scale	Drawing Number	Sheet	of	Revision
AS NOTED	24040.01-SKETCH	2	3	P0



RIGGING SECTION

LOOKING FROM SOUTH

1/32"=1'-0"



RIGGING ELEVATION

LOOKING FROM EAST

1/32"=1'-0"

DONJON MARINE
HILLSIDE, NJ

DONJON MARINE CO., INC.

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FRANCIS SCOTT KEY BRIDGE RESPONSE
SECTION 4
SUBSECTION 4-C RIGGING

Drawn	Checked	Approved	Size	Issue Date
MJR	AK	MJR	A	2024/05/17

Scale	Drawing Number	Sheet	of	Revision
AS NOTED	24040.01-SKETCH	3	3	P0

DONJON MARINE CO., INC.

100 Central Avenue
Hillside, New Jersey 07205-2033 USA

DONJON MARINE FRANCIS SCOTT KEY BRIDGE DISPLACED MATERIAL PROCESSING PLAN 2024-05-20 REV A5

DOCUMENT NUMBER: 24-006-005

PROJECT NAME: FRANCIS SCOTT KEY BRIDGE CHANNEL CLEARING

PROJECT NUMBER: 24-006

CLIENT NAME: US NAVY SUPSALV

CLIENT REFERENCE: 23F4DO3

DONJON MARINE CO., INC.

100 Central Avenue
Hillside, New Jersey 07205-2033 USA

DOCUMENT CONTROL

Revision Status

Rev	Issue Date	Reason for Issue	Prepared	Checked	Approved
A	16-APR-2024	Issued for Internal Review. Approved by Salvage Unit Leader	ST	TW	
A3	06-May-2024	Revised Disposal Plan for Port Newark, NJ	BH		
A4	08-May-2024	Revised Disposal Plan for Port Newark, NJ	BH	PF/TW	
A5	20-May-2024	Revised Disposal Plan for Port Newark, NJ	BH	PF/TW	

DONJON MARINE CO., INC.

100 Central Avenue
Hillside, New Jersey 07205-2033 USA

General Document Data		
Document Title:	DONJON MARINE Francis Scott Key Bridge Displaced Material Processing Plan 2024-05-20 Rev A5	
Document Number:	24-006-005	
Project Name:	FRANCIS SCOTT KEY BRIDGE CHANNEL CLEARING	
Project Number:	24-006	
Client Name:	US NAVY SUPSALV	
Revision Status		
Revision Number:	Rev. A5	
Revision Date:	20-May-2024	
Approval Status:	Submitted to Salvage Branch Lead for review	
Prepared By:	Brian Henry	Role: Assistant Project Manager
Reviewed By:	Timothy Williamson	Role: Project Manager
Interdisciplinary Check:	Paul Foran	Role: Documentation
Approved By:	Paul Hankins	Role: Salvage Branch Lead

Change Log		
Revision	**Section**	**Change**

DONJON MARINE CO., INC.

100 Central Avenue
Hillside, New Jersey 07205-2033 USA

TABLE OF CONTENTS

1 GENERAL

1.1 INTRODUCTION

The purpose of this plan is to illustrate the protocols and methodology that will be used to process the incoming displaced material from the Key Bridge collapse site to the Donjon processing site at Berth 36, Port Newark, NJ. For the purposes of this document, the material to be processed will be referred to as 'displaced material', ordinarily referred to as "mud". The displaced material to be processed is the result of obstruction removal operations conducted by Donjon Marine in way of the FSKB collapse, while restoring the main federal channel between the main bridge piers which constitute span 18.

All displaced material will be processed by and under the supervision of Donjon Marine at our facility at berth 36, in Port Newark, New Jersey.

1.2 DISPLACED MATERIALS TO BERTH 36, NEW JERSEY

Port Newark is the most efficient and cost-effective location to process the displaced material. Located at berth 36 in Port Newark, the permitted processing plant is well equipped to process the displaced material recovered during the Channel Clearance operations. The area consists of approximately 3 acres at a quayside and is fully prepared for processing the materials.

Figure 1 Oversight Processing @ Berth 36, New Jersey

2 PROCESSING METHODOLOGY

Donjon Marine will be using mechanical buckets to conduct obstruction removal in and around the vicinity of the FSKB Federal Channel. Mechanical bucketing will be performed with a series of 75' cuts. Obstruction removal will be performed with hard digging buckets to the allowable depth required by Navy SupSalv specs. As each scow is loaded, it will be replaced with a lite scow. Each loaded scow will be towed to TPA to be transloaded into ABS Classed Dump Scows or ABS Classed Hopper Scows. Once the dump scows or hopper scows are loaded, they will be towed directly to Donjon's processing plant located at Berth 36 in Port Newark, NJ.

2.1 GENERAL PROCESS HANDLING DISPLACED MATERIAL

The process for handling the displaced material will be as follows:

1. Processing operations will be in accordance with the Water Front Development permit. Each scow will be raked to remove debris. Debris encountered will be placed into pre-positioned roll-off boxes at berths 36 and 32. Donjon will transport the loaded roll off boxes to a permitted landfill facility for certified weights and disposal at a permitted solid waste facility.

2. Each barge, upon completion of debris removal, will be advanced under the cement delivery system for addition of cement and appropriate mixing of the dredged material. Each barge, designated by name, date and barge load number, will be measured to determine the volume of dredged material in the barge prior to cement addition. This will be used to determine the appropriate volume of cement required for processing.

3. The remaining displaced material kept in the hopper scow will then be processed with 7-8% Portland cement while still inside the barge, and subsequently mixed with a Cat 385 excavator equipped with a hydraulic mixing head (Cut Sheet of the mixing head is below). The excavator will mix the Portland cement and displaced material until the mixture thickens, solidifies and cures.

4. At the conclusion of the cement addition and mixing operation, the barge will be towed to a holding area and allowed to cure for approximately 24 hours. Each barge will be off-loaded by a five cubic yard clamshell after allowing sufficient time for curing. Barges will be offloaded into the stockpile area or directly into tri-axle trucks. Material will be tracked as applicable depending upon the offloading location.

5. The material will then be offloaded into dump trucks at the facility using an off loader equipped with a 5 CY hydraulic clamshell. The offloaded material will be trucked to permitted disposal sites in accordance with all applicable permits and Authorized Use Determination (AUD).

6. The treated material will be managed at one of the New Jersey or Pennsylvania sites, in accordance with the respective Acceptable Use Determination and Beneficial Use Determination stipulations for the project.

7. Donjon Marine has performed numerous projects for the USACE and PANYNJ within the New York and New Jersey Harbor system. The processing facility has treated and placed over 10,000,000 cubic yards of dredge material at upland sites since its opening, utilizing the same system and a similar array of upland sites outlined for this project.

Figure 2 Grapple on Excavator assist mixing mud/concrete Specs: 7'4" Wide X 6'6" long with 12" spaces.

Figure 3 Example set-up @ Donjon New Jersey site

Cement Chute – Barge is brought by tug under chute and Portland cement is added.

Figure 4 Mixture of displaced materials and Portland cement is placed in piles to dry out the moisture

HEALTH, SAFETY AND ENVIRONMENTAL ASPECTS

The operations to be carried out will be executed under the Donjon Marine Safety Management protocols, as detailed in the Donjon Marine Health and Safety Plan.

Examples of Safety considerations in the Health and Safety Plan include, but are not limited to the following:

1. Appropriate Personal Protective Equipment (PPE) will be worn by all personnel involved in the operations.
2. Personal Floating Devices (PFD's) will be donned when working on or near water.

3 (FLOATING) ASSETS & EQUIPMENT

The management for the processing of all materials will be under Donjon Marine. All floating assets (vessels) and equipment to be used during the handling, transporting, offloading and processing of displaced materials will be under the authority of senior Donjon management, including Project Manager, Salvage Master, Facility Manager, Safety Officer and others.

3.1 FLOATING (LIFTING) ASSETS & BUCKETS

The barges and hopper scows will be tended by Donjon Marine tugs for the duration of all operations. The operation is further assisted by survey crews and safety boats.

A sample list of floating assets (debris barges and hopper scows) will be updated as necessary during the project.

3.1.1 EXCAVATOR & MIXING UNIT

Figure 5 Cat 375 excavator fitted with Mixing Unit

4 ATTACHMENTS

4.1 SAMPLING ANALYSIS INCORPORTATED BY REFERENCE

Baltimore Harbor sediment sampling 2018

— Sender —
Name: PAYSON.ANDREW.WALTER
Organization: USARMY
Email Address: andrew.w.payson@usace.army.mil

— Files —
Name: FY17 Baltimore Harbor Sediment Evaluation Final.pdf
Size: 7347455
SHA-256 Checksum: 072C067D048B810B69E5E430812EAE5DF63131CB49F1941EFE1D2C9E3283F1B3
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Name: FY17 Baltimore Harbor - Appendix C - Part 1.pdf
Size: 651650756
SHA-256 Checksum: F50C784753AADE02F3F0ED4267855A194F539861FE3B9D92A02F41C9E786783E
Content Type: application/pdf

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Size: 927138638
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Content Type: application/pdf

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Content Type: application/pdf

Name: FY17 Baltimore Harbor - Appendix D - Effluent Elutriate Lab Reports.pdf
Size: 607516727
SHA-256 Checksum: C28BF1293CEB8273BA5184F234BB27651B2C3A33F591100F954BA0DE2C2667B5
Content Type: application/pdf

4.2 USACE REQUIREMENTS LETTER 20 MAY 2024

NAVY SUPSALV

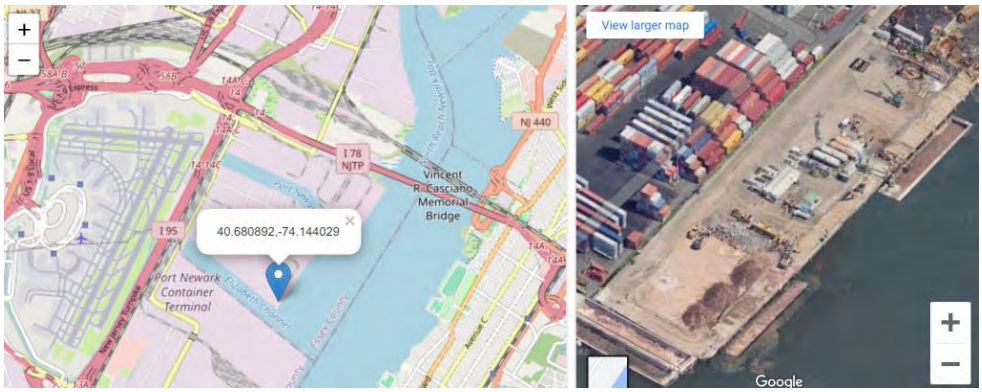
Information on NJ Processing Site

Francis Scott Key Bridge – Channel Clearing

From: May, Kristina K CIV USARMY CENAB (USA) <Kristina.K.May@usace.army.mil>
Sent: Monday, May 20, 2024 10:49 AM

Thanks for the information on the NJ processing site. Some of the information I need was not included in the packet you sent. Can you please provide the following:

- I understand that DonJon operates the site. Who owns the site?
- The route that will be taken to get to the NJ site.
- Short description of sediment and erosion controls that will be used at the site (e.g., silt screen).
- Copies of all necessary approvals for use of the NJ site (erosion and sediment control, stormwater approvals, etc.).
- Need more info on the scow transition at TPA. Where is this taking place and a brief description on how it's conducted.



Address

Calcutta St. Port Newark, N.J. located along the Newark Bay

Owner of Site

Berth 36 is owned by the Port Authority of NY & NJ. Donjon leases the subject property from the Port Authority on a long term basis.

Tug Boat Route to the Donjon Marine Processing Plant

Sparrow Point to B36 Port Newark

Total distance: 250 NM

Description of Sediment & Erosion Control

The material is Processed (ie mixed with cement) within the cargo compartment of the barge that the material is contained in so there is no chance of losing material while still contained in the material barge. Once the material is "bulked" (ie mixed with cement), with the use of hydraulic excavators, the material is then removed from the barge while dockside and placed onto a 200' X 150' cement berm area for loadout to trucks. Erosion control at Berth 36 is managed on a fully bermed concrete pad with catch basins, Bayshore has similar controls and the Kinsley's site has a leachate collection system, and fully bermed facility with an engineered storm water management system. No silk screens are required by permit based upon this approved methodology.

Transloading of displaced material at Sparrows Point

The majority of displaced material that is recovered during the clearing of the Federal Channel at Key Bridge is loaded from the hard digging bucket directly into ABS Classed Dump Scows or ABS Classed Hopper Scows in order to be towed to the Donjon facility in Port Newark, NJ for processing. This methodology does not require transloading from one scow to another.

During the early stages of the channel clearing using hard buckets, the ABS Classed scows were not yet available. Donjon loaded displaced material into river scows in order to expedite the channel clearing, thus helping the Port of Baltimore to reopen and allow larger vessels to generate commerce for the port.

Transloading of the river scows is accomplished using the hard digging bucket. Both loaded river scow and ABS Classed hopper scow are moored close alongside, side shell to side shell. This methodology allows for the direct transfer of displaced material from one barge to the other. In the event any small quantity of displaced material is released from the bucket while being transloaded, the material is recovered using a handheld shovel by the Donjon crew and is then dumped into the ABS scow.

4.3 DONJON AUD COVER LETTER 09 MAY 2024

DONJON MARINE CO., INC.
100 CENTRAL AVENUE
HILLSIDE, NEW JERSEY 07205 U.S.A.

May 9, 2024

Gary Nickerson
New Jersey Department of Environmental Protection
Division of Dredge Sediment Technology
501 East State Street
Trenton, New Jersey 08625

Re: Baltimore Key Bridge Response Dredge Sediment Management

Dear Mr. Nickerson,

Donjon Marine Co., Inc. (Donjon) has been tasked with the management of the sediment involved with the response for the above referenced project. Please find an Acceptable Use Determination request attached along with a conditional letter of acceptance from the Kinsley's Landfill placement site.

Sampling commenced Monday and is expected to continue through this week. Data is being generated on a daily basis. Dioxin samples are expected to report next week. Sediment will be transported from the Baltimore site commencing tomorrow, with expected delivery this weekend of the first barge.

If you have any questions, please contact me at (908) 964-8812.

Sincerely,

Kerri K. Mullins

4.4 ACCEPTABLE USE DETERMINATION REQUEST

Acceptable Use Determination Request

Introduction

Donjon Marine Co., Inc. (Donjon) has been chosen to process displaced material that is recovered during Federal Channel clearing at the Key Bridge project site, Baltimore, Md. Donjon is requesting the approval of the utilization of the following facilities and placement locations for the processed displaced material from the project:

Donjon Marine Co., Inc. Dredge Material Processing Facility Berth 36 Port Newark, New Jersey 5,000 cubic yards/day	Kinsley's Landfill, Inc. 2025 Delsea Dr. Sewell, New Jersey 70,000 cubic yards for this project 2,000 cubic yards/day

a) *Photocopies of documents as evidence of all authorizations and permits for siting, construction and operation of the acceptable use project, and evidence of conformance with, or applications for authorizations from, all local, regional, State or Federal requirements of any governmental agency, or other body with jurisdiction over any aspect of the proposed project. If all such evidence of authorizations and permits has not been obtained then evidence of applicable correspondence and records of preapplication meetings and other such evidence as shall document the securing of the necessary permits and authorizations shall be submitted:*

Each of these sites is fully permitted and will be operational for the receipt of processed displaced material for the duration of the project period.

b) A description of the geographical location of the acceptable use project, identifying the name of the municipality in which the acceptable use project is located and the street address of the project;

Kinsley's is the site of a former operating landfill transitioning into a solar farm.

c) A copy of the tax map showing the lot and block number of the acceptable use project site(s) and of all adjoining properties;

The tax map for each site is included in the facility's permits on file with the Department.

d) A description of the current use of the acceptable use project site(s) and of all the adjoining properties;

Kinsley's is gradually transitioning from landfill operations to a solar farm.

e) Three copies of a site plan where the displaced *material, admixtures and product are managed or used plotted on a USGS topographic map. The site plan map shall be prepared, signed, and sealed by a licensed New Jersey professional engineer or surveyor.*

Site plans are included in the facility's respective permits.

f) A description of the type(s) and number of any containers that will be used for the project and the type and means of storage and staging of the containers;

Donjon does not anticipate the use of any containers for the project for containment of processed displaced material. Additives, Portland cement, will be stored in cement blimps, i.e. over-sized cement tankers attached to the Donjon cement delivery system. The bag house will provide particulate controls during the receipt and transfer of displaced materials.

g) A description of any treatment or processing of the displaced material, admixtures and product at the acceptable use project;

Donjon plans to utilize Type II or I/II Portland cement to treat the displaced material. Donjon will treat each barge or scow with a minimum of 8%, by volume, Portland cement. The final product is a soil-like material suitable for structural fill or capping purposes. Donjon's process involves performing the addition in the scow, versus an on-shore pug mill. The processed material may be off-loaded as a pourable fill or allowed to cure to the point that the material is a soil-like consistency. The product demonstrates excellent treatment performance based upon the analytical results of the multiple extraction procedures.

The product follows normal cement chemistry properties and as such gains strength for about 28 days after processing. The product performs the best when it is placed and graded and left undisturbed to finish curing. A more detailed description of the treatment process is included in the existing treatment permit.

h) A copy of the deed of record establishing ownership of the acceptable use project property or, if the applicant is a person other than the landowner, a legal agreement (for example, a lease) to use the real property for the purpose of operating the acceptable use project; and

These documents are included in the respective facilities' permits.

i) A description of any past or ongoing regulatory activity at the acceptable use project.

There are no regulatory activities in progress at this time at the site.

3. The schedule for initiation and completion of the acceptable use project.

Donjon anticipates performing the recovery and processing operations over a period of two months. Operations are currently anticipated to commence during May of 2024.

Delivery of displaced material is anticipated to commence within two days of completion of loading from the Key Bridge site. Hopper barges of this displaced material will be treated, offloaded and trucked to the permitted site on a barge by barge basis. Operations are anticipated to require approximately 2 months and will be executed consecutively.

4. A thorough description of the destination of all admixtures, products or wastes that will be moved from the site of use, the purpose for such disposition, and copies of any State or other authorizations, or applications for those authorizations, required for receipt or use of such materials at the disposition site.

Donjon will process the displaced material in Port Newark with a minimum of 8% Portland cement. Donjon does not utilize other admixtures. At this point, the material will be utilized for fill purposes at the Kinsley's Landfill site.

5. The Department may specify and require additional information from the applicant in order to ensure that the proposed acceptable use and all activities related to that use will meet the requirements of the AUD.

Donjon will supply any additional information required.

Operating Conditions

1. Any control provisions, including institutional controls such as, but not limited to, a Declaration of Environmental Restriction (DER), and engineering controls as necessary to protect human health and the environment.

Kingsley would utilize the material for capping the top and slopes of the landfill prior to solar panel installation, a portion of the site has already transitioned to solar fields.

2. Specific operational requirements including; hours of operation, truck routing, dust control provisions, noise limitations.

The Kingsley site would operate six days per week based upon landfill hours of operation.

All transport routes utilize highways and commercial truck routes to each location.

Dust control will be maintained through the use of a water truck at the site. Roadway tracking issues will be managed through the use of a tracking pad, as well as, the use of a street sweeper if needed.

There are no noise limitations at these sites.

3. Production criteria including admixture quality determination procedures, admixture quality limitations and blending ratios, and quality control procedures and criteria.

Donjon owns or has chartered the barges and scows which will be utilized to process the displaced material. Each barge's individual hopper dimensions have each been calculated. The Donjon NAVARC has developed specific hydrostatic tables for each barge, which will be used to determine the accurate volume of displaced material loaded into each barge.

The operator calculates the time each section must remain under the delivery spout. The delivery system operates between 75 and 150 tons per hour. The following example describes the process from beginning to end:

At the Port Newark facility, Donjon will rake the scow to remove any debris. Any recovered debris will be placed into roll-off boxes staged in a containment area on the pier for management as solid waste.

After debris removal, the displaced material will advance for additive application. This involves the addition of 8% Portland cement, by volume, into the scow. The material is delivered via a screw conveyor through a metered flow rate providing steady delivery and accurate additive rates. Each section of the scow is clearly marked to facilitate the appropriate volume per section is applied. A high speed mixing head disperses the cement throughout the displaced material creating a homogenous blend of additives within the displaced material.

The processed scow of displaced material will then be allowed to cure for approximately 24 hours, or as needed, prior to off-loading. This provides better handling characteristics for the material. Off-loading will occur at the Berth 36 permitted facility. The material will either be placed into a stockpile and then into tri-axle trucks or directly into tri-axle trucks for transport to the designated sites. Truck flow into this facility is limited to 100 truckloads maximum and is also weather dependent, i.e. not open if raining or just after rain events.

Prior to exiting Berth 36, each truck will have its tires and body decontaminated. This will prevent tracking of the material onto public roadways. Each truck will receive a bill of lading. This bill of lading will be utilized at the landfill to record each truck received and its placement location at the site.

4. Product application criteria such as depth of application, application conditions, maintenance, soil erosion and sediment control requirements, and site condition monitoring provision.

All sites will have silt fencing installed around the perimeter in accordance with their respective soil erosion control plans. This is inspected daily to determine that the fencing is performing as intended. Additional barrier material may also be installed if required.

Processed displaced material is anticipated to be placed into stockpiles or surcharge areas at the site. The stockpiling operation will be performed by excavators and dozers.

5. Any other requirements and limitations for use of admixtures, products or other materials, and operation of the acceptable use project as shall be determined by the Department on a case-by-case basis.

At this point in time, Donjon anticipates utilizing Portland cement as the only admixture for the treatment of the displaced material. Should other additives be considered, these will be submitted to the NJDEP for approval prior to utilization.

4.5 CONDITIONAL LETTER OF ACCEPTANCE KINSEY LANDFILL 06 MAY 2024

TETRA TECH

May 6, 2024

Ms. Kerri Mullins
Donjon Marine Co., Inc.
100 Central Avenue
Hillside, NJ 07205

Re: Kinsley's Landfill, Inc. Candidate Regrade Material – Conditional Acceptance
Rebco Contracting Corp./Donjon Marine Co., Inc. – Baltimore Bridge Collapse Dredge

Dear Gary:

Cornerstone Environmental Group, LLC (Cornerstone) – A Tetra Tech Company has prepared this letter on behalf of Kinsley's Landfill, Inc. (KLI) for the conditional acceptance and use of dredge material from the Rebco Contracting Corp./ Donjon Marine Co., Inc. for the Baltimore Bridge Collapse Dredge project. KLI is approved to accept materials for regrading activities at the landfill in accordance with KLI's Material Acceptance Protocol (MAP), which has been approved by the New Jersey Department of Environmental Protection (NJDEP).

Cornerstone reviewed the historical analytical data prepared by EA Engineering, Science, and Technology Inc. (EA) which summarizes the analytical results for the analysis performed on one (1) sample of candidate dredge material located in the Fort McHenry Channel provided by Rebco Contracting Corp./ Donjon Marine Co., Inc. for the Baltimore Bridge Collapse Dredge project. The sample was collected between April 23, 2018 and April 24, 2018 and the EA project number for the analysis is FTM19-COMP-SED.

Cornerstone has reviewed the analytical report to compare the concentration of the analyzed constituent parameters with approved parameters as defined by the New Jersey Soil Remediation Standards, NJAC 7:26D for Residential Soil Remediation Standard (RSRS) and Non-Residential Soil Remediation Standard (NRSRS).

As a result of our review based on the analytical results provided, we have determined that the compounds listed under NJAC 7:26D were found to be below the NRSRS. In accordance with the NJDEP – approved MAP prepared for KLI, the historical analytical sample meets Non-Residential standards.

As a condition of this acceptance, and prior to final acceptance into KLI, recent analytical results including all constituents listed under NJAC 7:26D meeting the RSRS or NRSRS, physical testing for grain size, standard proctor and permeability, a material acceptance form (MAF) and an acceptable use determination (AUD) must be completed and provided to Cornerstone prior to delivery to KLI. A site inspection must also be completed by Cornerstone prior to delivery to KLI. In addition, the dredge material must be structurally stabilized or amended off site prior to delivery and must arrive at KLI in a compactable state in accordance with the MAP criteria.

The quantity of dredge material for the Baltimore Bridge Collapse Site project is approximately 70,000 cubic yards. The sampling frequency for dredge projects is as approved by NJDEP through their issuance of an AUD. Contingent upon the conditions of this acceptance, KLI may accept the quantity of material that will be established by the AUD, estimated to be 70,000 cubic yards.

TETRA TECH
100 Crystal Run Road, Suite 101, Middletown, NY 10941
Tel 877.294.9070 Fax 877.845.1456 tetratech.com

Ms. Kerri Mullins
May 6, 2024

Sincerely,

CORNERSTONE ENVIRONMENTAL GROUP, LLC – A TETRA TECH COMPANY

Daryl R. O'Dell, P.E.
Client Manager

cc: Gary DeFranco – Kinsley's Landfill, Inc.

4.6 BAY SHORE RECYCLING PROPOSAL 07 MAY 2024

BAYSHORE
Your recycling solution.

Phone: 732-738-6000 • Fax: 732-738-9150
www.bayshorerecycling.com • sales@bayshorerecycling.com

To:	Kerri Mullins	**From:**	Al Ludwig
Company:	Donjon Marine Co., Inc. 100 Central Avenue Hillside, New Jersey 07205	**Date:**	May 7, 2024
Phone:	908.964.8812	**Email:**	kerri.mullins@donjon.com

Job Name: Baltimore Key Bridge Response – Processed Dredge Material Offload, Storage & Transfer

Bayshore Recycling Corp (Bayshore) is pleased to provide the following proposal to offload barges for storage of Processed Dredged Material (PDM) originating from the Baltimore Key Bridge Response Project. Bayshore will utilize clamshell buckets or similar equipment to offload 50,000 to 70,000 CY of PDM. Bayshore proposes to transfer the PDM from barges into tri-axle dump trucks, when possible for direct load-and-go to the designated upland disposal facility. When direct load is not possible, Bayshore proposes to off-load PDM into Yukes to transfer the PDM to the facility's designated PDM Storage Area where the dredged material will be stockpiled until the upland disposal facility is able to receive the material. Upland disposal facility approval will be obtained by Donjon, and scheduling and off-site trucking will be coordinated by Donjon and communicated to Bayshore. Scheduling to be communicated by 1pm the day before loading/trucking is needed. Depending on the upland disposal site logistics and scheduling, PDM may be stockpiled at Bayshore in the designated PDM Storage Area as allowed by NJDEP.

RESPONSIBILITY OF DONJON MARINE:

- Dewater/decant and amend/process the dredged material in accordance with NJDEP Permits prior to acceptance;
- Provide Bayshore with copies of the applicable permits (AUD, Army Corps., etc.) to facilitate the work;
- Remove all debris to be managed as solid waste prior to acceptance at Bayshore;
- Facilitate approval to the upland disposal facility and update AUD as necessary; provide Bayshore with copies of approvals;
- Provide the tugboat and barge for transporting processed dredged material to Bayshore's Waterfront Facility;
- Provide third party surveyor (MIL) for each barge prior to offloading, and subsequent to offloading for barge quantities to be shared with Bayshore. As agreed, Bayshore will add 10% to the volume of the MIL Survey when billing, to account for the cement. Delays in initial survey may impact offloading schedule;
- Communication of project scheduling, barge arrivals and upland disposal facility scheduling per occurrence and any changes should be communicated as soon as possible;
- Provide a Certificate of Insurance naming BRC and its affiliates as additionally insured.
- Provide trucking for the transfer of PDM from the Storage Area to the approved upland disposal facility for PDM. Trucking should be maximized as allowed by the upland disposal facility, and to minimize time stockpiled at Bayshore;

RESPONSIBILITY OF BAYSHORE RECYCLING CORP:

- Provide necessary machinery for offloading and stockpiling of processed dredged material within the designated PDM Storage Area; Bayshore will offload barges which we understand will be received sporadically, Monday through Saturday, subsequent to MIL survey.
- Provide designated PDM Storage Area in accordance with DEP approval; PDM stockpiled within the storage area will be labeled and segregated from all other materials and/or projects.

BAYSHORE
Your recycling solution.
Phone: 732-738-6000 • Fax: 732-738-9150
www.bayshorerecycling.com • sales@bayshorerecycling.com

- Provide necessary machinery for the loading of PDM into trucks for transfer to the upland disposal facility.
- Provide a Certificate of Insurance naming Donjon Marine Co., Inc. as additionally insured.

COST OF SERVICES:

Barge Offloading, transfer to PDM Storage Area, Loadout:	$25.00 per CYD (based on MIL onboard survey)
Cleaning (broom swept) of Barge if required:	$3,000.00 per barge
Solid Waste Disposal of Debris:	$120.00 per ton
Transportation of Debris:	$400.00 per load

Please note that an Acceptable Use Determination (AUD) issued by the NJDEP will be required prior to receiving dredged material. Project acceptance and costs are subject to schedule availability, approval and acceptance of the Dredged Material at the intended upland disposal site. This quote is valid through 2024. Payment Terms are Net 30 Days from date of invoice.

Thank you for this opportunity to present this proposal. If you have any questions, please feel free to contact me or Jennifer Solewski at 732-738-6000. Prices agreed to and accepted by:

Al Ludwig	**Thomas Witte / Kerri Mullins**
Bayshore Recycling Corp	**Donjon Marine Co., Inc.**

A signed copy of this document must be accompanied by a Tax Exempt Certificate (if applicable) and returned to our Sales Office prior to starting this project. If a Tax Exempt Certificate is not provided, New Jersey sales tax will be invoiced (if applicable) and can not be refunded by Bayshore Recycling Corp. Payment terms and conditions will be determined prior to the start of the project. If credit is required, a credit application package must be completed and approved prior to the start of the project. Availability of material is based on project start date. It is the responsibility of the company requesting this quote to perform any analytical or structural pre-approval testing prior to receiving any material. Recycled products, due to asphalt content, may or may not meet the NJ Residential Standards. Please specify in advance if the NJ Residential Certifications are required. Once material is delivered it becomes the client's property. Any material that is not listed on this price quote will be given to the customer as list price unless otherwise agreed upon. In the event that this contract is referred to an attorney for the collection or for the recovery of any payment due under this contract or for the breach of any provision of this contract, the client agrees to pay Bayshore Recycling Corp its reasonable counsel fees and cost of collection, whether or not legal action is instituted. Client further agrees that if a judgment is entered in any action, the amount of such fees shall form a part of such judgment in addition to any fees allowed by statute or rule of the court. This quotation is based on state and federal regulations presently in effect. Transportation will be provided with non-union, non-prevailing wages and prices are good for 30 days. Should the state or federal government revise the relevant regulations, Bayshore Recycling Corp reserves the right to amend its proposal. By counter signature, written purchase order or other method of authorization to proceed, the customer agrees to all terms and conditions as noted herein. Sales tax (if applicable) not included. Additionally, the customer agrees to pay a 1.5% interest charge on all invoices past 30 days. Thank you for the opportunity to present this proposal.

4.7 ACCEPTABLE USE DETERMINATION DONJON PROCESSING FACILITY

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Office of Dredging and Sediment Technology
P.O. Box 028
Trenton, NJ 08625
(609) 292-1250
FAX (609) 777-1914

JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

Ms. Kerrie Mullins
Donjon Marine Company, Inc.
1250 Liberty Avenue
Hillside, NJ 07206

June 30, 2008

RE: Acceptable Use Determination for Donjon Marine Processing Facility

Dear Ms. Mullins:

This is in response to a letter, dated March 14, 2008, written by Kenneth L. Woodruff and Associates on behalf of Donjon Marine Company, Inc. in which a renewal of the Acceptable Use Determination (AUD) issued for the operation of the dredged material processing facility was requested. The March 14, 2008 letter also requested a 5- year extension of the Waterfront Development Permit/Acceptable Use Determination issued in May 2003. However, it is not necessary to extend the WFD permit since the construction activities authorized by the existing permit have been completed, no new development is proposed at this time which would require a new WFD permit pursuant to N.J.A.C. 7:7-2.3. Therefore, this letter serves to provide Donjon Marine Company, Inc. with a stand-alone operating AUD for the facility. The conditions for operation of the facility are as follows:

ACCEPTABLE USE DETERMINATION (AUD)

1. This AUD is issued to allow for the off-loading and processing of dredged material at the subject site provided all conditions included herein are met. No dredged material may be processed at this site unless that dredged material has received a Waterfront Development Permit and/or an Acceptable Use Determination, or a written waiver from these requirements. Dredged material processed at this site shall be blended with the approved add mixtures at the ratio specified in the AUD for the specific dredged material.

2. No dredged material shall be off-loaded and/or processed at this facility unless an AUD has been issued for the acceptable use site if it located in the State of New Jersey.

3. This AUD only authorizes the use of Portland Cement as the additive at this facility. If the facility proposes to use a different admixture other than Portland Cement, the permittee shall submit an application to modify this AUD, and receive written authorization from the Department, prior to use of the new additive. That application must include all relevant information found in the Department's dredging technical manual, and any subsequent amendments thereto including but not limited to: the source of additives, Material Data Safety Sheets, etc.

4. A spill plate shall be installed during the off-loading of material from the dredge scow to the storage area. The spill plate shall remain in place during the entire off-loading process.

5. Unprocessed or processed dredged material may also be off-loaded at the Metals Management Dredge Material Transfer Facility located at Berth 30/32 (DEP File #0714-01-0004.1). Conditions related to this facility's operation are included in the existing permit.

6. A maximum of **14,000** cubic yards of dredged material may be stored at this site at any one time other than material stored in barges. Stored dredged material shall be kept sufficiently wet to avoid the release of fugitive dust. Any visible loss of fugitive dust from this facility may be considered a violation of this condition and permit.

7. Upon anticipated cessation of dredged material off-loading for any period of time in excess of seven days, the permittee shall undertake clean up of the site in accordance with the procedure outlined in the Operation and Management Plan that currently existing for the facility.

8. The dredged material processing facility shall maintain daily records noting the transportation vehicle identification number (truck and scow), material quantity, source and destination for all dredged material and admixtures entering and leaving the facility. The permittee shall submit a semi-annual report that details this information to the Department.

9. Donjon Marine shall comply with the conditions specified in the Operation and Management (O&M) Plan for the facility.

10. Any major accidental release of dredged material, add mixture or processed dredged material shall be immediately reported to the DEP Emergency Response 24-Hour Hotline at (609) 292-7172. The report must specify the type of substance discharged, estimated quantity, nature of the discharge, location of the discharge, any action being taken to mitigate the discharge and any other information the Department may request at the time of notification.

11. The Department reserves the right to revise or terminate this authorization at any time as a response to any: complaints, violations of this authorization or its conditions, any violation of any related permit and their conditions and / or failure to comply with the Department's Acceptable Use Criteria for the end use site.

If you have any questions regarding the above, please feel free to contact me at (609) 292-8838.

Sincerely,

Suzanne U. Dietrick, Chief
Office of Dredging and Sediment Technology
Site Remediation Program

C: Mr. Kenneth Woodruff
Kenneth Woodruff and Associates
182 Walton Drive
P.O. Box 42
Morrisville, PA 19067

4.8 AUD APPROVAL FOR OUT OF STATE MATERIAL 10 MAY 2024

State of New Jersey

PHILIP D. MURPHY
Governor

TAHESHA L. WAY
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Watershed & Land Management Program
Mail Code 501-02A
P.O. Box 420
Trenton, New Jersey 08625-0420
www.nj.gov/dep/landuse

SHAWN M. LATOURETTE
Commissioner

May 10, 2024

Kerri K. Mullins
Donjon Marine Co., Inc.
100 Central Avenue
Hillside, New Jersey 07205

RE: Out-of-State Acceptable Use Determination
File and Activity No.: 9999-18-0002.1 DRG240001
Applicant: Donjon Marine Co Inc.
Project: Baltimore Key Bridge Response Sediment Management

Dear Ms. Mullins:

This letter is forwarded in response to your request, dated May 9, 2024, for an Out-of-State Acceptable Use Determination (AUD) for the above project. Approximately 50,000 to 70,000 cubic yards of sediment from the Baltimore Key Bridge Response project are proposed to be processed at the Donjon Marine Co., Inc Facility in Newark, with offloading and staging at the Donjon facility and/or the Bayshore Recycling Corp facility in Keasbey, NJ. Final placement of said material is proposed at Kinsley's Landfill, Inc.

Due to the nature of the project, sediment will be characterized in-situ with other material being sampled in barges. As a complete sediment data package for the entire project is not available, material can only be authorized on a per-barge basis. The Department has reviewed preliminary sediment data from 6 barges presented in the AUD application, representing approximately 11,000 cubic yards of material. It is understood that additional dioxin data will be provided as it becomes available. The AUD is hereby issued and is subject to the following conditions:

Acceptable Use Determination

1. The 11,000 cubic yards of non-HARS suitable material from the Baltimore Key Bridge Response, in barges HG209, HG203, HG210, 1406, 3301, 3302 shall be processed using a minimum of 8% Portland Cement at the designated processing facility consistent with the testing of the material as required by the upland placement site.

2. Prior to offsite placement of the 11,000 of cubic yards of material from the project, Donjon shall provide (1) dioxin analysis from the above referenced barges to ODST via email, (2) an updated letter of acceptance from Kinsley's Landfill, Inc, for said material, and (3) receive written approval from this office confirming suitability for placement at the Kinsley site.

3. The identified processing facility for material shall comply with all conditions imposed in the WFD/AUD and any subsequent modifications or renewals thereto for the dredged material processing facility.

4. This permit conditionally authorizes the placement of approximately 11,000 cubic yards of non-HARS suitable material from this project at the following upland placement site:

Kingsley Landfill

The designated contractor shall comply with all conditions specified in the July 2015 Material Acceptance Plan, and the July 1, 2014, Sanitary Landfill Major Disruption Approval (Facility PI#133551), and any amendments thereto.

The permittee, or the designated contractor, is responsible for any additional sampling/analyses of the dredged material as required by the landfill approvals and authorizations.

5. The designated contractor shall comply with all conditions imposed in the May 6, 2024, letter of acceptance from Daryl R. O'Dell of Cornerstone Environmental Group, LLC on behalf of Kinsley Landfill.

6. Material that does not meet the material acceptance criteria for the Kingsley Landfill may be placed at the Waste Management facility in Fairless Hills, PA, provided that a letter of acceptance is provided to this office and written approval for said placement is received.

7. The identified processing facility for the non-HARS suitable material shall comply with all conditions imposed in the WFD/AUD and any subsequent modifications or renewals thereto for the dredged material processing facility.

8. All trucks used to transport processed dredged material to the above referenced placement sites shall be tarped pursuant to the applicable State DOT requirements or applicable regulatory agency requirements.

9. If the designated contractor elects to place the dredged material from this project at an alternate location, written authorization must be obtained from the Office of Dredging and Sediment Technology prior to the transport of any dredged material to said alternate use location. Any alternate placement site must obtain all required state, local and federal permits before the Office would grant a modification of this permit to transport dredged material to the alternate location.

If you have any questions regarding this letter, please feel free to contact me at Gary.Nickerson@dep.nj.gov.

Sincerely Digitally signed by Gary Nickerson Date: 2024.05.10 16:41:57 -04'00'

Gary Nickerson
Office of Dredging and Sediment Technology
Land Resource Protection

4.9 2023 NJ RENEWAL CERTIFICATE OPERATE CONTROL APPARATUS

PERMIT/CERTIFICATE

State of New Jersey

Department of Environmental Protection

Environmental Regulation
Division of Air Quality
Air Quality Permitting Element
Mail Code 401-02
P.O. Box 420
Trenton, NJ 08625-0420

Certificate to Operate Control Apparatus and/or Equipment

Facility ID: 08045
Facility Name: DONJON MARINE CO INC

Mailing Address:
100 CENTRAL AVE
Hillside , NJ 07205

Plant Location:
STARBOARD ST
BERTH 36
Port Newark , NJ 07114

County:
Essex

Location Description:

Permit ID: PCP 090002
Permit Type: Modification

Status: Renewed
Status Date: 06/11/2023

Effective: 06/02/2009
Expiration: 06/16/2028

Designation of Equipment: Cement Trans
Equipment Description: Pneumatic Conveying System

Designation of Equipment: Screw Conv.
Equipment Description: Screw Conveyor

Designation of Equipment: Mixer
Equipment Description: Mixer

Certificate to Operate Control Apparatus and/or Equipment

This five year certificate is being issued under the authority of Chapter 106, P.L. 1967 N.J.S.A.26:2C-9.2. The possession of this document does not relieve you from the obligation of complying with all provisions of the New Jersey Administrative Code, Title 7, Chapter 27.

In addition to the facility specific requirements listed in this permit, the facility must comply with all applicable rules and requirements as well as the information contained in the approved permit. The facility must also comply with any applicable requirements of the N.J.A.C. 7:27-8.1 et. Seq. and other state rules summarized in the General Provisions for Preconstruction Permits, www.state.nj.us/dep/aqpp/applying.html

Pursuant to N.J.A.C. 7:27-8.13(b), the department may modify the conditions of approval of this certificate at the time of renewal or at any time when the certificate is in force, if deemed necessary to protect human health, welfare or the environment.

You may also be subject to fees for services that are performed by the Department in accordance with the conditions of approval of this permit and 7:27-8.13(e). If you fail to pay a fee, the Department may assess civil administrative penalties and/or revoke this certificate.

In accordance with N.J.S.A. 54:4-3.56 to 3.58, you may be entitled to an exemption from municipal property taxation if your control device is taxed and is considered to be an air pollution control device. A tax exemption application may be obtained at www.state.nj.us/dep/aqpp/downloads/forms/TaxExemptionForm2.pdf.

In accordance with N.J.A.C. 7:27-8.3(d), you shall make this certificate readily available for inspection on the operating premises.

Addendum 5B
Section 4 Demolition Plan

MV DALI

Job: 24-EN09		Revision: 0			Date: 4/10/2024
REVISION LIST					
Rev.	Revised Section(s)	Revision Promoter	Approved By	Revision Reason	Revision Date
00	Initial issue	RSF		-	

CONFIDENTIALITY NOTICE

The information provided by Resolve Marine in this Project Proposal (including without limitation all drawings, graphs, charts, financial, technical, operational, commercial, staff, management and other information, data, and know-how) ("Confidential Information"), which is directly or indirectly and in whatever form (including without limitation written, oral and electronic forms) disclosed by Resolve Marine to the Recipient or its Representatives ("Recipient") shall be treated as confidential. By accepting this Confidential Information, Recipient warrants that it shall treat the Confidential Information as confidential. The Confidential Information shall only be disclosed by Recipient on a strict need-to-know basis for purposes directly related to the subject Project and this Confidentiality Notice will accompany all such disclosures, and Recipient remains entirely responsible for proper compliance. Recipient acknowledges that any breach of this Notice may cause serious harm to Resolve Marine, for which Resolve Marine is entitled to seek injunctive or other equitable relief as well as monetary damages and the legal costs of enforcement.

1 INTRODUCTION

Due to the allision of the MV DALI with Francis Scott Key Bridge on March 26th, a section of bridge spanning from approximately Panel 39 to Panel 27 (referred to as Section 4) is partially supported by the bow of the MV DALI in way of hold #1 forward. RESOLVE Marine is contracted by the vessel owners, to clear the roadway debris from the bow and shift the vessel to a safe berth for further salvage work.

Due to the unstable orientation of SECTION 4 of the Francis Scott Key Bridge, it has been decided it will be necessary to demolish the structure through the implementation of a controlled explosive demolition plan. The use of cutting shape charges to section the bridge in its current orientation is the fastest, safest, and most predictable means for demolishing the heavily damaged and distorted truss structure.

Resolve Marine working with a team of industry leading demolition experts to develop a demolition program that will safely and quickly topple the damaged bridge section and expedite the clearance of both bridge truss and vessel from the Fort McHenry Channel.

The demolition plan being developed in conjunction with Resolve's demolition contractor Controlled Demolition Inc and SIGMA Engineering consists of placing cutting charges on the portion of the bridge span resting against the port bow of the MV DALI. The planned placement will bring the span down to the river bed and segment the truss into pieces that are of a size that can be lifted with the cranes currently on location. No further cutting of the span should be required after the toppling of the span.

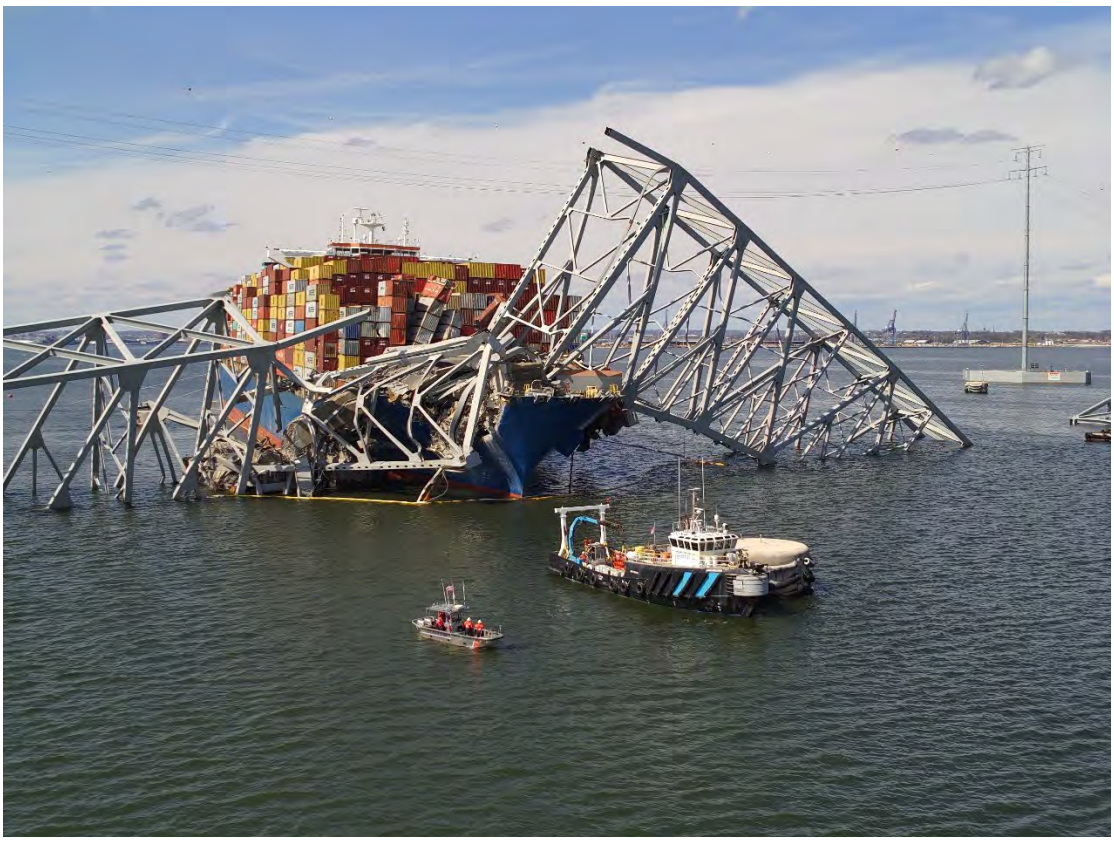
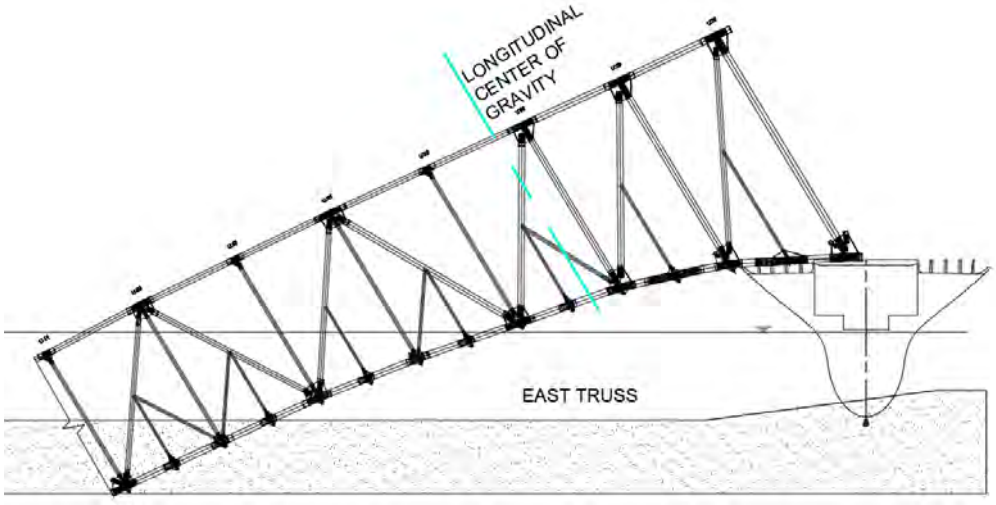


Figure 3-1 MV DALI with Section 4 (span on right side of image)

1.1 CURRENT CONDITION

Based on surveys onsite and the provided construction drawings of the span, it is thought that the bridge section from Panel 27 to 40 is resting on the bow of the vessel. It is estimated the weight of this section is 2,710 tons. This weight does not include the suspended road way, but does include the roadway on the bow of the MV DALI. A complicating factor to the removal of span is that the ship side of the span (Panel 27) is significantly heavier than the end resting on the river bed (panel 39 end). This means to remove the above water portion with available cranes onsite the span must be cut into smaller pieces. The required extensive cutting would be challenging using traditional cutting equipment but can be quickly accomplished with the use of explosive demolition with only slightly increased preparation time. The following figure depicts the current span orientation with the estimated longitudinal CoG highlighted.



The full extent of structural damage to the span is not known. Visually it can be seen several of the lateral braces have buckled and are compromised along with several of the vertical supports. Any removal method implemented must consider the numerous unknowns relating to load carrying capacity of members used for supporting or lifting the structure. At any point during planning, preparation, lifting, or demolition the condition of the span can further degrade. The planned methodology is adaptable to changing conditions.

Figure 3-2 Buckled Lateral Support at Panel 29

1.2 KEY RESOURCE PARTNERS

Resolve Marine has developed a team of industry leading demolition experts to assist in the successful removal of SECTION 4 from the MV DALI. Resolve has a strong working relationship with these companies and has successfully completed similar scopes of work in the past, and have confidence in their ability to deliver results.

- Controlled Demolition, Inc. – A leading demolition company having imploded and demolished thousands of structures including some of the most complex demolitions undertaken such as the Kingdome in Seattle and JL Hudson Building in Detroit.
- SIGMA Engineering – Sigma's diverse portfolio of consulting services includes engineered demolition, bridge design, construction engineering, land development, and transportation planning and design.
- VGO, Inc - VGO provides a variety of Testing, Inspection, and Failure Analysis services. They specialize in combining aspects of each of these services synergistically to solve engineering problems.

The above organizations were all key players working with RESOLVE in the safe and successful emergency demolition of the damaged Tappan Zee Bridge east anchor span in 2019.

2 METHOD STATEMENT

The primary goal for the demolition of Section 4 of the Francis Scott Key Bridge is to remove the truss structure safely, and in the most expedient means practical. The proposed solution is the safest means for demolition of the structure because it requires no personnel to be on or in the vicinity of the structure when the stored energy in the damaged members is released. Any other means of demolition requires personnel to be within close proximity to the structure when the critical support members are cut. This significantly increases the risk to personnel in the event the structure does not behave or react as expected during dismantling.

RESOLVE intends to place cutting shape charges across multiple sections of the bridge truss to both collapse the bridge span and cut it into sections that can then be rapidly removed from site. It is planned that after demolition all sections of the bridge above water will be within the capacity of the onsite cranes for immediate removal.

The total number of cuts that need to be is approximately 102. Each cut will require multiple charges therefore the total number of charges will be more than 300.

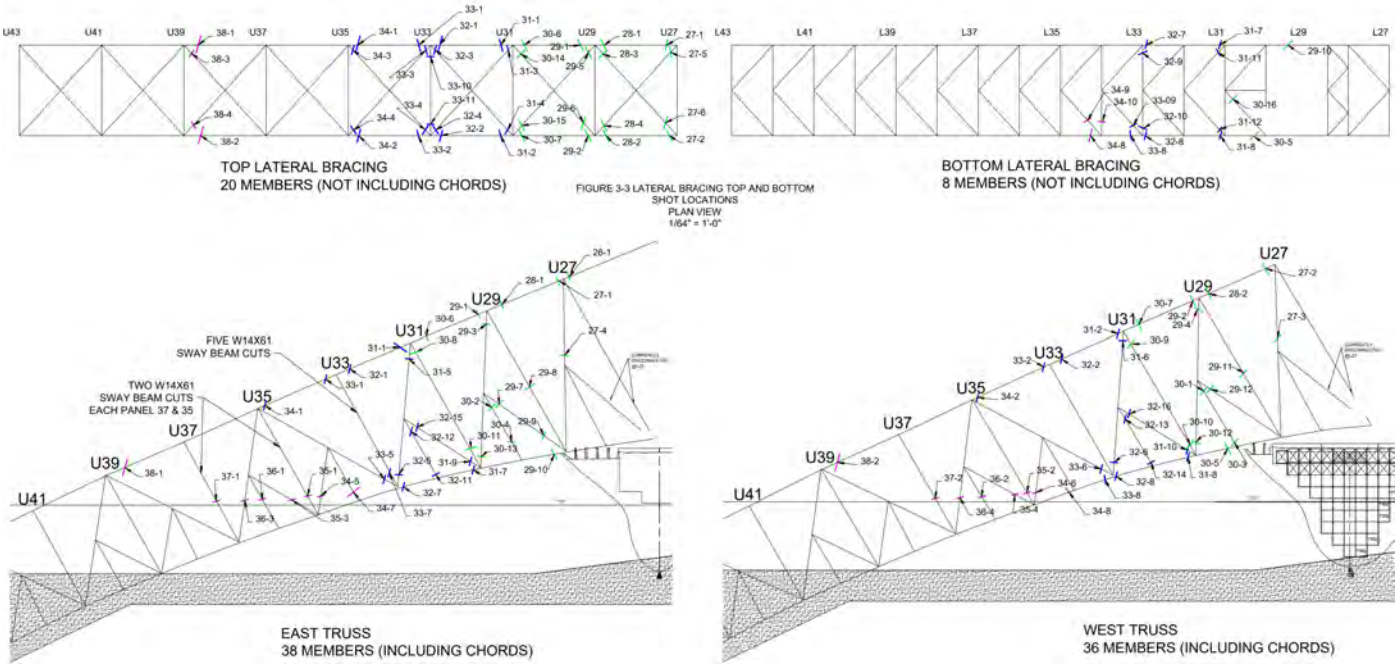


Figure 3: Cut Locations Showing 102 Cut Locations

The demolition plan is designed to segment the bridge in three distinct areas, the southern end above the ship, the northern end where the truss goes below the water, and the middle portion between the two.

At the middle section the blast plan is designed to completely disassemble all members of the truss connecting the northern and southern ends. Each truss member will be cut at both ends. After detonation, each beam will individually fall away into the river. This is done to ensure complete separation with 100% certainty.

The southern end of the truss above the ship will be sectioned into as small of pieces as possible but considering the proximity to the vessel and cargo, there are limits to where charges can be placed. However, the cut sequence is designed to ensure that all elevated pieces of steel are toppled allowing for safer and more rapid removal post blasting.

The northern end of the truss will be cut just above the water line allowing for the Chesapeake 1000 to come in and remove that section in one piece post demolition.

The following figure highlights the 3 areas discussed above.

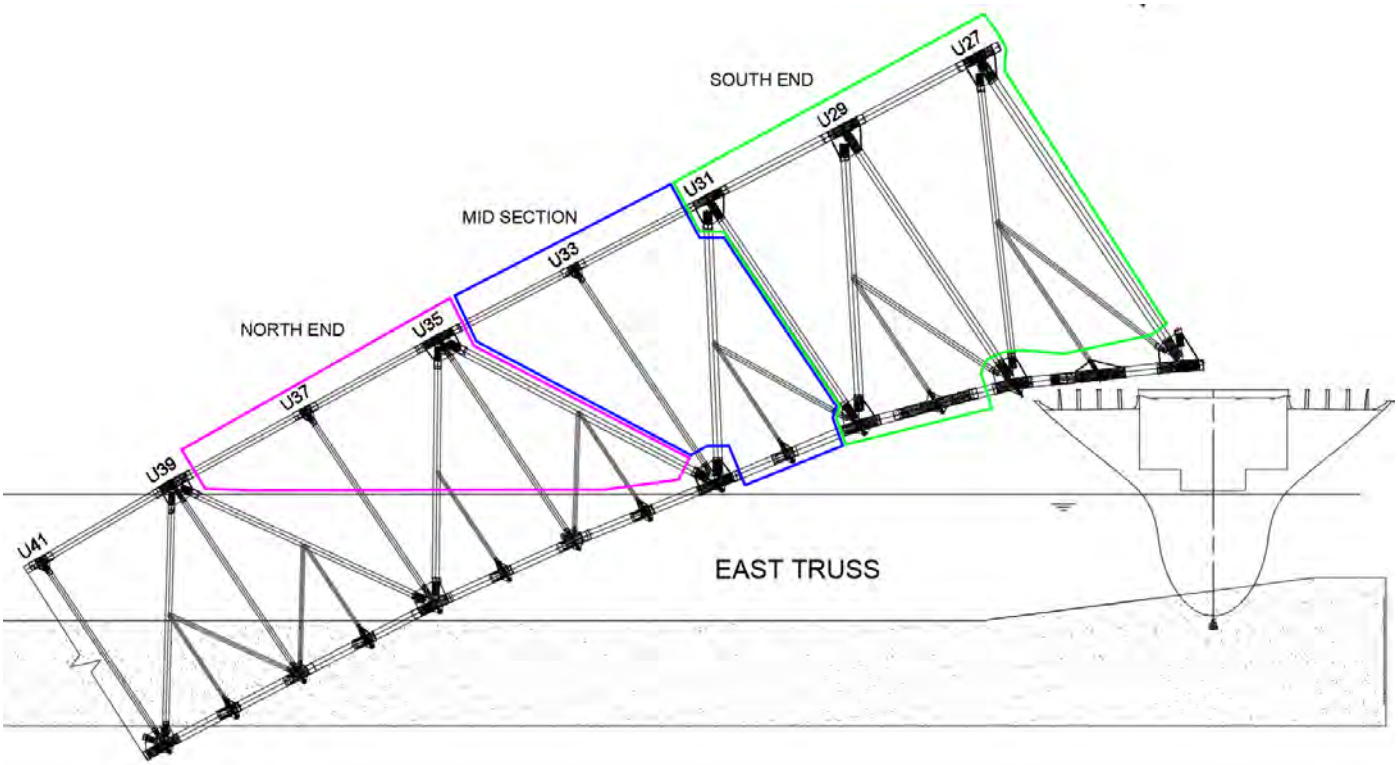


Figure 3-4 Section 4 of Span with Three Sections Annotated

2.1 OPERATION SEQUENCE

The demolition of SECTION 4 requires approximately two weeks of preparatory work prior to execution. The demolition will be conducted in the following steps:

1) Finalization of Cut Sequence

The final cut locations need to be reviewed and approved by relevant parties, including internal to the demolition team and external approval from regulatory authorities. Due to the expedited timeline, both reviews are occurring concurrently potentially resulting in the possibility of further modifications to the blast plan from what is presented within this document.

Part of the finalization process, is for the engineering team to determine allowable precutting locations to facilitate installation of charges.

2) Precutting of Truss Members

To facilitate best placement of charges the SIGMA engineering team is analyzing what if any precutting can be conducted on the truss. This will reduce the likelihood any failures in severing the beams during detonation (aka 'misfire'). If deemed acceptable the team will mark out on the truss, which plates and where the members can be cut back providing improved access for charge placement and reducing overall quantity of shapes required for demolition. The precutting team will work from man-baskets and man-lifts placed on RESOLVE's barges.

3) Loading and Cover of Charges

Once precutting is completed, the team will place all shape charges on the truss and cover them with heavy conveyor belting that will serve as a shock absorber for any debris discharged during detonation. This reduces the radius and effect of flying debris. The load and cover team will work from man-baskets and man-lifts placed on RESOLVE's barges along with designated magazines for the safe storage of explosive material. See CDI's Preliminary Blasting Plan for details on safe storage, handling, and utilization of explosive materials.

4) Demolition of the Span

Once all charges are loaded and covered on the span, the demolition can be executed. CDI's Blasting Plan will detail all aspects relating to safety procedures, blast radius, and over pressure precautions. It is currently anticipated that the demolition team will work off the stern of the MV DALI. This would put the team at approximately 900' away from the nearest charge and provides the team a strong barrier of the ship's hull and container stacks.

Other operations onsite will need to be temporarily halted during the demolition. The precise timing of the work stand down is to be determined, but should be within the range of 2-4 hours to allow for final checks, detonation, and then the all-clear release to resume work.

At time of detonation RESOLVE will have in place a fire team to respond to any incident relating to the ship or cargo. As a precaution RESOLVE will lay fire blankets over susceptible cargo and can create a water curtain with fire pumps to further reduce the likelihood of heated materials from reaching any flammable cargo. At completion of detonation the fire team will inspect the bow of the vessel and confirm there are no fire hazards.

2.2 MOBILIZATION

Equipment and personnel will be mobilized to commence precutting operations from April 12th. The primary floating assets are onsite currently, some additional personnel access equipment will be mobilized to site, such as the manlifts.

Mobilization of blasting materials will commence once the shapes are produced by the supplier Energetic Systems, LLC. Procedure for transportation, storage, and handling of blasting materials is detailed by CDI's Blasting Plan.

The plan development team is currently onsite, and additional personnel or equipment required for the preparatory work will be mobilized as needed.

2.3 SIMULTANEOUS OPERATIONS

Due to the nature of the response to the collapse of the Franics Scott Ket Bridge, multiple salvage and response operations will be ongoing simultaneously. Operations will be closely coordinated through the ICS to ensure safety of operations are not compromised for any of the various organizations working onsite.

Due to the requirement for personnel access to the truss during the precutting and loading, any other ongoing works to or around the truss will have to be conducted in manner so as not to adversely affect the safety of personnel on the span. The priority operation in the event of simultaneous operations will be determined on a case-by-case basis. Operational protocols, including sim-ops, during loading of blasting material will be defined by CDI's plans and procedures.

During loading and covering of the charges no hot work will be allowed within 50' of the charges per federal regulations. Currently it is not intended for RESOLVE to conduct any hot work on the truss or bow of the MV DALI during loading operations. RESOLVE will coordinate with the other response organizations to understand and deconflict any issues with their ongoing operations while explosive materials are actively onsite.

2.4 STRUCTURE MONITORING

To provide a level of understanding in the condition of the structure at time of operations, available surveying and monitoring equipment will be implemented prior to and during access. VGO has installed a suite of sensors that provide real time data showing the orientation and movements of the truss structure. This sensor suite is being expanded to include real time stress monitoring of critically loaded members to allow for the safe access for the demolition team to perform the preparatory work required for the demolition of the structure.

The structure monitoring team will review the data in real time at all times personnel are on the span or within the collapse zone. They will maintain direct communication with the team and will alert them of any changes in sensor readings outside of nominal conditions.

RESOLVE has contracted Sigma Engineering to provide consultation on structural stability of the damaged bridge span. The onsite engineer will work closely with both VGO and CDI to determine available strength of truss members, acceptable locations for precutting, and provide guidance on critical failure modes for VGO monitoring.

2.5 WEATHER LIMITS

If weather onsite exceeds the following limits, equipment installation will cease until weather is within allowable limit:

1) Maximum allowable wind speed for man basket access: 20 mph
2) Maximum allowable wind speed for man lift access: 20 mph
3) Lightening less than 5 miles distance and 30 minutes since last strike.
4) Minimum temperature: N/A
5) Additional Criteria: N/A

Operation Supervisor retains authority to cease operations for weather or any other factor he feels creates unsafe working conditions. All personnel involved in the operation have 'Stop Work' authority, to call for a temporary halt in activity to allow for a safety review of work conditions between workers, operation manager, and safety officer.

2.6 MANNED ACCESS

Manned access on the truss will only occur in line with approved work plans. Onsite Salvage Master or Operations Foreman must be aware of any personnel working directly on or adjacent the truss, and must be notified when personnel cease operations on location. It is planned that all access can be conducted from either man-lifts or man-baskets.

Prior to access all personnel involved in the operation must be briefed on the planned operation including, operational sequence, established lines of communication, and emergency response plans including emergency egress plan.

2.7 EMERGENCY EGRESS PLAN

Prior to manned access to the structure, personnel will review emergency escape procedures.

In the event of an emergency personnel working from the barges will be evacuated from the barges by dedicated crew boats standing by the vessels.

Personnel should only be working from the man-lifts or man-basket, it is not planned to have any personnel transfer from the man-lift to the structure. Standby personnel will be on the man-lift barge to operate the man-

lift from the ground control in the event the workers in the manlift are incapacitated or otherwise unable to operate the lift.

In the event of an emergency situation, man baskets or man-lifts should be swung away from the truss as quickly as safely possible.

See site layout drawings for addition equipment positioning details.

2.8 FALL RESCUE

In the event a worker falls from the structure, manlift, or man-basket, and is suspended needing rescue, the standby manlift operator will take control of the man lift and either control it to rescue the suspended worker or bring the lift back to the barge allowing the standby operator to board the man-lift and then conduct the rescue. The planned 185' man-lifts will be able to reach the full height of the truss and will be able to provide rescue to personnel trapped at any location on the truss.

Additional man-baskets are available on RESOLVE barges and can be utilized with any available crane to conduct a rescue if required.

2.9 EXPLOSIVE HANDLING AND OPERATIONS

Full details of procedures and plans relating to the safe handling, transport, and utilization of explosive charges can be found in CDI's Blast Plan. The following information is provided as a high-level summary for general reference.

- Explosive materials will only be transported to site once the demolition team is ready to begin installation of the materials on the bridge. Transportation and Storage will all be inline with Federal, State, and local regulations.
- Material will be stored on each loading barge in appropriate magazines inline with federal regulations. 24hour security will be onboard each loading barge.
- The planned initiation system is entirely non-electrical. There is no restriction on the use of radios or other electronics during the preparation or blasting of the truss.
- CDI will provide safety zone requirements for the safe detonation of the charges. During detonation CDI will provide overpressure and seismographic monitoring in line with federal requirements. Preliminary planning indicates a 140db exclusion zone of 3,100' if 8ms delays between 150lbs of charges is utilized, and a 140db exclusion zone of 4,000 feet required for single detonation of full load.

2.10 VESSEL STABILITY AND STRUCTURE

During all phases of work, the stability and safety of the vessel is continuously monitored by RESOLVE's Salvage team including onboard Salvage Master and Naval Architect. The team is currently modeling the effects of the immediate release of the weight of the bridge span and how it affects the ground reaction and stability of the vessel. A ballast plan is being developed to ensure the vessel remains safely aground at all times. As a redundant measure, mooring lines will be run out from the bow to the pier 17 foundation to ensure the vessel remains in position after demolition of the span.

The integrity of the bow structure of the vessel is being considered as well. With the planned demolition cut lines it is expected the majority of debris and members will fall away from the vessel and land in the river. Most members that do fall on the vessel will land on the existing concrete road deck posing limited threat to the vessel. Further refinement of the cutlines may be implemented to further reduce risks associated with falling steel.

Figure 3-5 Orientation of Upper Members in Relation to MV DALI

3 PROJECT SCHEDULE

It projected that SECTION 4 of the Francis Scott Key Bridge can be demolished between the dates of March 23rd and May 1st. Currently RESOLVE is anticipating the following dates for project milestones

- Order Blasting Materials: 4/8/2024 (Complete)
- Commence Precutting of Truss: 4-6 days (weather dependent)
- Receive Blasting Materials: 4/18/2024
- Commence Installation of Materials: 4/19/2024
- Complete Preparatory Works: 5-7 Days
- Demolition of Section 4: 4/23/2024 – 5/1/2024 (weather dependent)

The largest driver in project schedule is the weather risk and resulting downtime from strong winds. Relatively calm winds are required for personnel to access the structure and conduct the work. Currently strong winds are predicted from Thursday April 11th through Sunday April 14th. If heavy winds and rain continue through next week the window for demolition may delay until 1st week of May.

4 PERSONNEL AND EQUIPMENT

The following personnel and equipment are tentatively identified for execution of the demolition plan. Resource lists will be expanded or contracted as required for safe and efficient execution of the work scope.

4.1 PERSONNEL

Designation	Quantity	Company
Salvage Master	1	Resolve Marine
Naval Architect	1	Resolve Marine
Structural Engineer	1	Sigma Engineering
Stability Monitoring Tech	1	VGO
Demolition Manager	1	CDI
Demolition Foreman	1	CDI
Demolition Technician	6	CDI
Crane Operator	2	RESOLVE
Salvage Technician	6	RESOLVE
Security Guard	2	TBD
Boat Operator	2	Resolve
Lead Fire Fighter	1	Resolve
Fire Fighter	4	Resolve

4.2 EQUIPMENT SPREAD

Item	Quantity	Source
Blasting Materials	As Req’d	CDI
Crane Barge	2	Resolve
185’ Man Lift	2	United Rentals
Magazine	2	CDI/Resolve
Cover Material	As Req’d	Resolve
Safety Boat	2	Resolve
Fire Pump	1	Resolve
Fire Protection Materials	As Req’d	Resolve

CONTROLLED DEMOLITION INCORPORATED

13401 STILL HAVEN COURT / PHOENIX, MARYLAND 21131 / PHONE: 410.667.6610 / FAX: 410.667.6624

CDI@CONTROLLED-DEMOLITION.COM / WWW.CONTROLLED-DEMOLITION.COM

PRELIMINARY BLASTING PLAN

FOR THE:

KEY BRIDGE TRUSS SEGMENTATION
TO FREE THE MV DALI VESSEL FOR SALVAGE

LOCATED OVER THE:

PATAPSCO RIVER, MARYLAND

PREPARED AT THE REQUEST OF:

RESOLVE MARINE
3301 SE 14 AVENUE
FORT LAUDERDALE, FLORIDA 33316

PREPARED:

APRIL 10, 2024

I. BACKGROUND

In the early morning hours on March 26, 2024, the MV Dali container ship was leaving the Port of Baltimore and heading towards the 1.6-mile-long Francis Scott Key Bridge. At approximately 1:25 AM, the MV Dali started to experience mechanical failure, causing the vessel to lose power twice. The vessel issued a mayday call saying that a collision might be possible. At 1:27 AM, the MV Dali struck the Francis Scott Key Bridge's southern channel span pier going 8 knots (9mph), causing the entire 2,640' long continuous truss to fall into the Patapsco River below, and a portion of the bridge truss pier cap and deck to fall on the bow of the MV Dali vessel. The MV Dali is grounded on the bottom of the river, adjacent to the bridge pier.

II. INTENT

Controlled Demolition, Inc. (CDI) was called to the Key Bridge collapse Command Center by Resolve Marine (Resolve) on April 5, 2024, to assume the role of their specialty explosives subcontractor to assist them with design of, preparation for, and then execution of the explosives segmentation of bridge truss elements to free the MV Dali for salvage. After CDI inspected the collapsed bridge debris from the MV Dali bow on April 9, 2024, CDI continued discussions with Resolve on explosives segmentation methods that could assist Donjon Marine Co., Inc. (Donjon) and other team members in clearing bridge debris from the MV Dali container ship.

CDI's explosives segmentation of the fallen truss sections will allow for a more efficient, time saving, and safer demolition operation as compared to conventional/mechanical segmentation methods.

III. STRUCTURAL ANALYSIS

CDI's Operations Manager, Thom Doud, and our Structural Bridge Engineer, Joe Farre, Principal of Sigma Engineering Solutions (Sigma), have reviewed the original plans of the structure, reviewed the segmentation locations shown on Resolve Marine Group Drawing #24-EN03-3-005, Revision I (attached as Exhibit A), which have been generated by Resolve, Donjon, and other team members. A cut-by-cut analysis is being made by Sigma in consideration of the original design at the bridge and of CDI's/Sigma's observation of bowing, buckling and twisting of members as a result of the initial fall of the structure onto the deck of the MV Dali, and the twisting of the truss as a result of the continued motion of the MV Dali after initial truss impact.

The design of pre-burning to be performed at each truss element segmentation point will first address safety of CDI torchmen performing pre-burning on energized truss elements as noted above. CDI/Sigma will advise Resolve if there are any safety issues in pre-burning for shaped charge placement at proposed segmentation points that will require further analysis by the team moving forward.

A more detailed analysis is being performed on those truss element segmentation points positioned above the bow of the MV Dali where flammable materials are known to exist. CDI/Sigma will work with Resolve to determine what "cold-cutting" will need to be performed in that area to avoid "hot-cutting" byproducts which might create risk of fire in the aforementioned flammable materials.

In the event that hot-cutting cannot be achieved due to risk of fire and cold-cutting cannot be performed due to limited structural access, CDI will use linear shaped charges to cut the maximum amount of truss element cross-sectional area at that point to facilitate subsequent operations by Donjon and other team members.

IV. EXPLOSIVES APPLICATION DESIGN

Explosives application by CDI will be designed with a Factor of Safety (FOS) above stated explosives manufacturer's performance specifications. Multiple shaped charge cuts will be made on separation-critical truss members to provide 100% redundancy of truss element severance. CDI's scope is to ensure separation of the bridge truss cantilevered off of the bottom/resting on the bow of the MV Dali while segmenting as many truss elements as safely possible to facilitate post-blast debris removal by team members.

At this time, the Resolve/Donjon team are hoping to retain a portion of the bridge truss on the bow of the vessel following explosives separation so that the materials can be removed from the bow in a controlled fashion "in the dry," rather than having to retrieve same from below water level. That plan and possible tethering solutions to keep the truss debris on the bow are presently under development by Resolve.

A fully non-electric initiation system will be used to avoid concerns for radio frequency energy emanating from the various marine radios in use around the Key Bridge collapse site and to mitigate risk associated with stray current, lightning, and other possible electrical current sources.

CDI's non-electric initiation system will have 100% redundancy to ensure completion initiation of explosives charges.

V. EXPLOSIVES DEMOLITION PREPARATION

General procedures used in preparation for explosives placement will be as follows after further review by CDI and Sigma with structural monitoring assistance by VGO.

A. CDI's torchmen will complete precision torch cutting (hot-cutting) on members per CDI's engineered design for the subsequent placement of explosives and burning operations. Pre-burning operations are expected to start at the low end of the eastern truss, away from the vessel, to permit completion of pre-burning in that area which represents the greatest risk to CDI personnel given the tilt of the truss to the east. Pre-burning operations will continue toward the south on the east truss. Pre-burning will then be performed in the same fashion and direction on the west truss, following completion of east truss pre-burning.

B. As explosives loading is completed by CDI's crew, at-source protection consisting of single or multiple layers of conveyer belting will be placed as at-source protection over shaped charges to mitigate fly of copper sheathing from the shaped charges resulting from the detonation. The number of belt layers will be determined by charge size and placement.

All pre-burning operations will be performed out of manlifts off the deck of barges adjacent to the east and west trusses or out of crane baskets handled by cranes on those barges. CDI understands that the project sustained wind velocity limit for manlift and crane basket operations is 20 mph and that gusts will be handled by supervisors in the field with regard to safety.

Note: Once all materials are in hand and the design engineering functions are completed, it is likely that wind velocity will determine the number of "working days" and the overall schedule as to when the truss can be prepared, loaded, covered, and explosively segmented by CDI.

CDI has agreed to adopt the current project-specific 5-mile lightning strike shutdown distance when storms are moving toward the project site.

VI. QUANTITY & TYPE OF EXPLOSIVES

The following types and preliminary quantities of explosives were utilized to fell the trusses:

A. 4,000 gr/ft; 3,200 gr/ft; and 2,000 gr/ft, 1200 gr/ft, and 900 gr/ft copper clad linear shaped charges manufactured by Accurate Energetic Systems of McEwen, Tennessee were used for steel cutting. The total Net Explosives Weight (NEW) of RDX explosives in shaped charges, under the current cut plan shown on Exhibit A, is approximately 350 lb. Use of delays to reduce the pounds detonated per delay will be a function of truss design/structural condition.

B. Dyno Nobel Unimax dynamite may be used as "kick-charges" to displace separation-critical portions of bridge elements under CDI's blasting plan.

C. Dyno Nobel, short period, non-electric MS detonators having a MS "0" and/or MS 25 delays and millisecond surface connectors may be used to initiate the explosives charges.

D. 18 grain per foot detonating cord manufactured by Dyno Nobel will be used with the non-electric caps and connectors which created a multiply redundant initiation system.

E. P3 Boosters, manufactured by Accurate Energetic Solutions, will be used as direct initiators for shaped charges. 80-grain detonating cord will be added to these boosters to create non-electric shaped charge initiation devices.

F. Non-electric starter line caps will be used to initiate the fully non-electric detonation system.

Note: Reference explosives technical data sheets attached as Exhibit B.

At this time, based on the Resolve cut drawing attached as Exhibit A, it is expected that the total weight of explosives detonated on the project will be approximately 350 lbs with explosives being placed and detonated at locations shown on that drawing. Where structural design and actual truss conditions permit, CDI will install 9 millisecond delays in the overall truss segmentation initiation system to mitigate peak air overpressure from explosives detonation.

The decision whether to use or not use delays in the initiation system will be made by CDI to primarily ensure complete initiation of all explosives and secondarily to mitigate potential consequences of peak air overpressure levels.

VII. LICENSING & PERMITTING

CDI holds the current Maryland Explosive Dealer's License-Users Only and a Federal ATF Permit required for explosives handling operations on this project. CDI contacted Anne Arundel County Fire Marshal's Office and was informed that no Anne Arundel Blasting Permit would be required. Reference CDI licenses attached as Exhibit C.

VIII. EXPLOSIVES TRANSPORTATION AND STORAGE

A. Explosives transport will be performed in accordance with DOT 49 CFR, parts 171-180, NFPA 495, Explosives Material Code, USCG and other applicable regulations.

B. Explosives will be delivered to the site prior to the scheduled start of explosives loading operations in CDI's DOT-compliant explosives transportation vehicle.

C. Such explosives delivery to the magazines mounted on the barge shall be coordinated with the USCG, Resolve, and any local governing authorities in accordance with applicable regulations.

D. While explosives are on site, they will be stored in ATF-compliant Type 2 explosives magazines and inventoried in accordance with ATF (CFR 27, 555.218-555.224), NFPA (495, Explosives Materials Code) and other applicable regulations.

E. During the time of explosives loading and segmentation operations, the site will be guarded by dedicated security through Resolve or the UC.

IX. LOADING PROCEDURE

The explosive charges will be assembled and placed by CDI's licensed/trained professionals in accordance with CDI's engineered plan, the manufacture's recommendations, and in accordance with guidelines established by the Institute of Makers of Explosives (IME) and OSHA Regulations.

All explosive charges and redundant initiation systems placed by CDI will be triple checked by CDI's Maryland-licensed Blaster-in-Charge and at least one other licensed CDI Blaster prior to detonation to ensure design-compliant positioning.

X. NOTIFICATIONS

The Key Bridge Unified Command (UC) will be notified of the explosives transport, storage, and handling operations schedule by Resolve in accordance with Contractor and Community Outreach Program in place on the project. The Traffic Control and Exclusion Zone, noted on CDI Drawing #24131-EZ, attached as Exhibit F, radii have been calculated based on historic fly of debris, peak overpressure calculations performed by CDI and in accordance with OSHA Regulations regarding exposure of unprotected personnel to impact noise.

XI. EXPLOSIVES SEQUENCE

The explosives charges placed on the bridge will be detonated sequentially on an instantaneous delayed basis by use of internal delay type non-electric blasting caps. If used, the delayed blasting caps serve to mitigate peak overpressure generated by the detonation.

The blast sequence will be initiated at the primary separation panel between U-29 and U-31, and will progress to the north and south, either instantaneously or on a 9 MS delayed basis, using internal delay, non-electric detonators and bi-directional non-electric MS connectors. Delays will only be used if the truss configuration and structural condition permit.

XII. INITIATION SYSTEM

All explosives will be initiated by a fully non-electric initiation system. The use of a non-electric system is safer than the use of electric blasting caps in that the concern about premature initiation due to radio frequency or extraneous electricity is generally eliminated.

The initiation system will be designed and assembled in accordance with the guidelines recommended by the explosives manufacturer and the Institute of Makers of Explosives (IME). The entire initiation system is fully redundant with a 100%+ Factor of Directional Safety (FODS) and will be triple checked by multiple CDI blasters and technicians prior to the actual detonation.

Just prior to the initiation, CDI will attach two (2) non-electric starter lines with integral blasting caps to the non-el system.

XIII. EXPLOSIVES LOADING & HANDLING OPERATIONS

A. CDI expects explosives loading operations to take up to six (6) "working days" prior to the scheduled implosion. Loading will be scheduled based on wind/weather forecasts.

B. All explosives and at-source protection over same will be placed by CDI blasters and full time employees.

C. Explosives handling will be performed in accordance with industry guidelines, standards and applicable regulations, OSHA 29 CFR 1926 900-914, NFPA 495, Institute of Makers of Explosives (IME).

D. CDI does not expect the blasting operation to pose a meaningful risk to the MV Dali or cargo that remains on board at the time of the detonation.

XIV. PROTECTION OF IMPROVEMENTS TO REMAIN

Given the location of the MV Dali in the Patapsco River, the only improvement to be protected would be the MV Dali itself, and CDI does not expect any physical protection to be required for its cargo or the MV Dali itself, possibly other than minor protection to the windows in the bridge depending on the quantity of explosives ultimately detonated by CDI, per 8ms delay, in consideration of truss configuration and safety of operations.

There are no adjacent above-grade improvements to be protected that could possibly be impacted by CDI's operations.

The utilities which are buried approximately 10' below the bottom, under 50' of water, in the utility right-of-way 200' to 250' from the Key Bridge will not be impacted by these truss segmentation operations whatsoever.

Resolve is currently assessing what fire prevention methods need to be installed over flammable materials presently exposed at the bow of the MV Dali. Such preventative measures will be carried out and Resolve advises that they can lay down a fire suppression system over those flammable materials during the explosives detonation itself. The details of this suppression system are under development.

XV. FIRING AND MISFIRING PROCEDURES

A. Firing Procedures

1. Prior to the introduction of the non-el starter lines to the initiation harness, a predetermined area will be cleared of selected vessels, spectators and personnel not directly involved with the blasting operation. This exact Exclusion Zone will be defined following preparations and site meetings. Such an Exclusion Zone is based on personal safety with respect to air blast and the possibility for fly of debris.

2. Once verification has been acknowledged that the area is clear, CDI will attach the blasting caps and run the explosives firing lines to a firing position on the MV Dali at a safe distance from the explosives being detonated. The firing position and MV Dali crew will be located at an area to be determined on the vessel.

3. After multiple accountability clearances, CDI will commence a mutually agreed countdown procedure.

4. Following the successful segmentation/separation of the structure from the vessel, the CDI Blaster-in-Charge on the vessel will inspect the results to assure that all the explosives have properly detonated. The exclusion area will be controlled by Resolve and stakeholders until CDI designates all is clear in accordance with applicable regulations.

B. Misfire Procedures

In the event of a misfire, OSHA Regulations per 29 CFR 1926.911 will be adhered to as follows:

1. Personnel will be kept outside of the area for thirty (30) minutes following a misfire per NFPA 495 Explosive Material Code Regulations.

2. The Blaster-in-Charge, who is a CDI "OSHA-Competent Person," shall, in cooperation with Resolve personnel, provide proper safeguards for excluding all employees from any potential danger zones.

3. No other work shall be performed except that necessary to remove the hazard of the misfire and only those employees necessary to do that work shall remain in the danger zone.

4. No aggressive attempt shall be made to extract any pinched explosives from a misfired position; an initiation system or a new primer shall be installed and the hole re-blasted. If re-firing of the misfired hole presents a hazard, the explosives may be removed by washing them out with water.

5. Should undetonated explosives be encountered, the product will be loaded back onto the Type 2 magazines on the support barges for transport to off-site magazine facilities.

XVI. VIBRATION/AIR OVERPRESSURE MONITORING

Seven (7), 3-component, Instantel MiniMate Plus seismographs (reference technical data sheets attached as Exhibit D) will be placed around the blasting area by CDI to measure vibration and air overpressure generated by implosion operations. One (1) seismograph will be placed on the MV Dali vessel, three (3) units will be placed on the northern Sollers Point approach in a linear array, and three (3) units will be placed on the southern Hawkins Point approach in a linear array. See attached CDI Drawing #24131-VM, attached as Exhibit E.

Vibration/air overpressure records from the blast will be furnished to Resolve in a standard written report within approximately 72 hours of the event.

XVII. SEQUENCE OF EVENTS

The following is a preliminary sequence of events for the day of the blasting:

Based on weather conditions and safety, the following times are preliminary. (D = Detonation Time):

D – 1 Day:	Set up barricades and secure the Exclusion Zone (reference CDI Drawing #24131-EZ, attached as Exhibit F).
D – 4 hrs:	CDI would check and perform final hook-ups of initiation system circuitry for explosives operations. A Command Post would be established at a predetermined location. In attendance at the Command Post would be representatives of local authoritative parties, Resolve and CDI (actual command post attendees would be determined after site meetings with local authorities).
D – 3 hrs:	Seismographs would be set up.
D – 2 hrs:	Personnel to be evacuated from vessels shall return to shore.
D – 1 hr:	Persons to shelter on their vessels shall be in position.
D – 30 min:	A preliminary check of the Exclusion Zone would be made by CDI and Resolve.
D – 15 min:	Resolve will initiate fire suppression systems on the bow of the MV Dali. Exclusion Zone to be totally closed and area to be checked.
D – 5 min:	Confirm that the Exclusion Zone is clear.
D – 1 min:	Sound a 10-second blast signal on vessel horns indicating 1-minute to blast.
D – 10 sec:	Sound three (3), 1-second blasts on vessel horns. An audible countdown ("10, 9, 8...") over CDI's radios would be performed.
Detonation:	Explosives felling of the bridge span debris.
D + 5 min:	CDI and Resolve will inspect the demolition area to confirm all explosives have been detonated and to issue an "all clear."

XVIII. CONDITIONS FOLLOWING THE IMPLOSION

The bridge elements in the truss separation panel between U-29 and U-31 will fall into the water four (4) seconds after initiation of the charges. Under the present plan, the Resolve team and Donjon hope to retain a portion of the truss on the bow of the MV Dali to facilitate "day" segmentation and removal of same. That plan is presently under development.

After the detonation, CDI's blaster-in-charge and Resolve will inspect the site to confirm explosives detonation. Resolve will inspect the disposition of steel bridge elements/debris and issue the "All Clear." Immediately following the "All Clear," Resolve's crews would begin debris stabilization/downsizing and truss element rigging operations.

Addendum 6B

MV Dali – Vessel Refloat Plan

Job: 24EN09		Revision: 02			Date: 4/19/2024
REVISION LIST					
Rev.	Revised Section(s)	Revision Promoter	Approved By	Revision Reason	Revision Date
00	Initial issue	RSF	SMM	-	04/05/2024
02	Updated	RSF	SMM	Detailing various sections	04/19/2024

1 INTRODUCTION

The salvage team intends to refloat MV DALI once the bridge spans leaning on her bow have been removed. The refloat operation will be done by removing ballast and maneuvering the vessel with the assistance of port tugs on high water. Once refloated the vessel will be brought alongside the designated berth for further debris removal operations. After refloating regular soundings of all spaces will be performed to ensure watertightness.

It is Resolve's intention to refloat the vessel by reducing her displacement by removing ballast water. Resolve intends to "float" the casualty in a controlled manner rather than applying excessive pulling forces by tugs to minimize further damage to the casualty and surrounding structures.

2 PREPARATIONS

2.1 BALLAST

The casualty will have been ballasted down prior to bridge removal in order to ensure sufficient ground reaction at high water. This is to ensure that the vessel remains stable until the salvage team is ready to refloat the vessel.

2.2 PORT BOW

2.2.1 Under waterline

Underwater inspection to be done on the debris and structures on starboard side of casualty's bow, to determine if there are any structures interfering with the refloat. Any structures that are found during this inspection will be evaluated to determine the best course of action to ensure minimal interference during refloat. This may include having to remove them.

The bow thruster and surrounding area will be inspected for debris that could be sucked up into the tunnel when it is used during refloat.

2.2.2 Above waterline

Steel and concrete structures connecting starboard bow to the bridge pillar to be removed or severed prior to refloat.

2.3 POST BLAST INSPECTION

After the bridge section has been removed, the forward area will be inspected to ensure there are no fire hazards or loose debris.

The sections blown from the bow will be inspected for any interference during refloat operations.

The bow thruster tunnel and surrounding areas will also be inspected to ensure that nothing is impeding the use of the bow thruster.

2.4 OVERHANGING DEBRIS

Prior to commencing the refloat operation, any overhanging containers and debris will be removed or secured as best as possible to minimize any debris falling overboard during refloat and transit.

2.5 BOW THRUSTER

The casualty's bow thruster cabling is severed in the starboard passageway. Engineers are working on sourcing materials to reestablish the connection. Using the bow thruster will be a large benefit to maneuvering the vessel from the bow during refloat. While the bow thruster is not essential to the operation, the inability to use the bow thruster will increase the complexity of the refloat operation.

2.6 ANCHOR REMOVAL

2.6.1 Ships' anchor

The casualty's starboard anchor chain is completely disconnected. The casualty's port side anchor was let go during the incident. The port anchor is still connected, although the anchor winch is damaged beyond repair. Prior to refloating a buoy will be connected to the portside anchor chain and the anchor chain will be cut and let go from the forecastle deck. The anchor chain will be recovered at a later stage.

2.6.2 Resolve Anchors

Prior to the refloat operation the additional four anchors placed by Resolve on the stern of the casualty will be picked up by crane barge and disconnected from the casualty's mooring lines. The additional mooring line on the starboard side of the casualty connected to the concrete dolphin will also be removed.

2.7 OILBOOM

The containment boom currently around the casualty will have to be removed prior to refloat. This is to avoid the possibility of fouling a propeller on the casualty or one of the tugs during refloat.

2.8 PREPARATION OF MOORING LINES

Mooring lines will be prepared for docking at the berth that the ship will head to after refloating. Additional mooring lines will be staged on the forecastle mooring deck. The casualty has spare mooring ropes currently stored in the bosun locker and additional ropes will have to be landed on the forecastle by crane barge. The casualty has spare mooring ropes currently stored in the bosun locker and additional ropes will have to be landed on the forecastle by crane barge.

Mooring lines for spring lines will be prepared on the designated berth.

2.9 NAVAL ARCHITECTURE CALCULATIONS

Hydrostatic calculations have been completed using the General Hydrostatics software from Creative Systems, Inc. (GHS Version 17.64). This software has been used for over 30 years in the salvage and wreck removal industry to deal with flooded compartments, ground reaction and other situations typically found in salvage and wreck removal projects. The software is approved by all the international class societies and most government regulatory bodies. It is approved by the USCG and is used by the USCG SERT Team for these types of situations.

A three-dimensional model of the subject Vessel has been created. The model has been used to recreate the loading condition that the Vessel was reported to be in at the time of the incident. The hydrostatic values from the GHS model over a range of applicable drafts have been compared against the values in the Class-approved stability booklet. A GHS Lightship Condition for the Vessel was compared with that given in the class-approved

Trim & Stability Booklet. The model is considered to be close enough for the preliminary calculations that have been done. The model will be refined as we go along.

A GHS run file has been developed. The file produces the following output, the detailed calculations are in appendix A.

Program	GHS 19.12								
Vessel	MV DALI								
Geometry File	DALI.GF2								
Author	PR	* Lowest tide is 0.0m							
Date	45400	Highest tide is 0.6m on 7 May 2024							
Time	1015	On 19 April tides are running 0.65m higher than							
Run	R18	predicted							
Stage	**Current Condition**			**Bay 10 Cleared**		**Bridge Blown**		**Refloat**	**Arrival**
	0	1	2	3	4	5	6	7	8
Tide (m) *	0.32	0.55	0.00	0.00	0.60	0.00	0.60	0.60	0.60
Bridge Weight (mt)	4500	4500	4500	4500	4500	3000	3000	3000	3000
Total Weight (mt)	118477	118478	118478	117621	118577	117077	117077	115473	105380
Fwd Draft (m)	14.60	14.90	14.20	14.20	14.90	14.20	14.80	14.40	11.500
Mid Draft (m)	12.60	12.70	12.30	12.30	12.70	12.30	12.70	12.60	11.600
Aft Draft (m)	10.30	10.30	10.10	10.20	10.30	10.30	10.30	10.60	11.600
Trim (°)	-0.90	-1.00	-0.90	-0.90	-1.00	-0.80	-1.00	-0.80	0.00
Heel (°)	-2.10	-2.20	-2.00	-2.00	-1.90	-2.00	-1.60	-1.30	0.00
Ground Reaction (mt)	3262.34	1756.69	6184.12	5259.11	1715.21	4510.81	337.61	0.00	0.00
LCR (m from midships, -fwd)	-68.30	-107.70	-39.10	-32.80	-116.00	-24.70	-60.70	0.00	0.00
TCR (m from centreline, -port)	-1.60	-1.70	-1.10	0.70	0.90	0.90	8.70	0.00	0.00
Specific Gravity	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001
GMt (m)	75.62	15.19	125.01	117.18	9.90	97.14	14.71	4.15	2.81
VOID_FP	0%	0%	0%	0%	0%	0%	0%	0%	0%
VOID_BT	0%	0%	0%	0%	0%	0%	0%	0%	0%
VOID_1_P	60%	60%	60%	60%	90%	90%	90%	90%	90%
VOID_1_S	74%	74%	74%	74%	90%	90%	90%	90%	90%
VOID_2_P	0%	0%	0%	0%	0%	0%	0%	0%	0%
VOID_2_S	0%	0%	0%	0%	0%	0%	0%	0%	0%
VOID_3_P	0%	0%	0%	0%	0%	0%	0%	0%	0%
VOID_3_S	0%	0%	0%	0%	0%	0%	0%	0%	0%
VOID_AP	0%	0%	0%	0%	0%	0%	0%	0%	0%
WBT_1_C	100%	100%	100%	100%	100%	100%	100%	75%	5%
WBT_2_P	99%	99%	99%	99%	99%	99%	99%	60%	5%
WBT_2_S	99%	99%	99%	99%	99%	99%	99%	60%	5%
WBT_3_P	98%	98%	98%	98%	98%	98%	98%	98%	5%
WBT_3_S	98%	98%	98%	98%	98%	98%	98%	98%	5%
DB_4_P	100%	100%	100%	100%	100%	100%	100%	100%	5%
DB_4_S	100%	100%	100%	100%	100%	100%	100%	100%	5%
DB_5_P	44%	44%	44%	44%	44%	44%	44%	44%	5%
DB_5_S	44%	44%	44%	44%	44%	44%	44%	44%	5%
DB_6_P	1%	1%	1%	1%	1%	1%	1%	1%	5%
DB_6_S	1%	1%	1%	1%	1%	1%	1%	1%	5%
WBT_4_P	49%	49%	49%	49%	49%	49%	49%	49%	33%
WBT_4_S	53%	53%	53%	53%	53%	53%	53%	53%	68%
WBT_5_P	80%	80%	80%	80%	80%	80%	80%	80%	5%
WBT_5_S	80%	80%	80%	80%	80%	80%	80%	80%	5%
WBT_6_P	0%	0%	0%	0%	0%	0%	0%	0%	5%
WBT_6_S	0%	0%	0%	0%	0%	0%	0%	0%	5%
WBT_7_P	2%	2%	2%	2%	2%	2%	2%	2%	85%
WBT_7_S	2%	2%	2%	2%	2%	2%	2%	2%	85%
FW_P	8%	8%	8%	8%	8%	8%	8%	8%	8%
FW_S	74%	74%	74%	74%	74%	74%	74%	74%	74%

Table 2-1 Hydrostatic calculation results

The following assumptions were used for the calculations:

- This waterplane upon which this condition is based is updated with daily fore, mid and aft drafts.
- The specific gravity of the sea water is 1.005. The specific gravity is being measured to see if/how it changes and this will be updated accordingly.
- Bathymetric data and dive surveys have determined the grounded area on which the vessel sits. This area of contact has been modelled in GHS using 11 ground points.
- There is no damage below the current waterline and no internal compartments are flooded.
- The weight of the Key Bridge structure currently on the bow is estimated to be 4500 mt. It is assumed that this will be reduced by 1000 mt when the bridge is blown. We continue to refine these numbers.
- No changes have been made for containers that have been relocated, damaged or lost in the forward bays.
- 39 containers have been removed from Bay 6 by the salvage crew and these are accounted for in the model. This will be reflected in the calculations as containers are removed. The current plan is to remove all the containers from Bay 10.
- Ballast will be added to the #1 Void compartments port and starboard to keep the casualty aground during container removal and when the bridge is blown.
- Calculations show that after the bridge section is blown, the vessel can be refloated on the next appropriate high water.
- #1 WBT center and #2 WBT port and starboard tanks are currently full. These tanks will be de-ballasted as necessary for the refloat. The current calculations shown in Figure 1 show that the vessel will refloat with these tanks pumped down to 50% each.

3 REFLOAT

3.1 DEBALLASTING

Deballasting of the tanks will be done using the casualty's ballast system, it is the intention to utilize the casualty's ballast water treatment system for ballasting operations.

Step 1	Deballast double bottom tank no.1 center
Step 2	Deballast Double bottom tank no.2 port and starboard
Step 3 (contingency)	Deballast Void no1 port and starboard
Step 4 (contingency)	Deballast Double bottom tank no.3 port and starboard

Table 3-1 Ballast sequence

The refloat sequence may be updated or altered as the operation develops.

3.2 MACHINERY

3.2.1 Main engine

The casualty's main engine will be put on standby during the refloat operation, to be used in case required during the refloat.

3.2.2 Bow Thruster

The salvage team intends on having the bow thruster on standby during the refloat operation if it is working. There is a risk of the bow thruster sucking debris or material into the tunnel while it is on the side of the channel and therefore care will be taken to use it only when necessary and ideally after the ship has begun to move into deeper water. This action will be taken at the discretion of the salvage master during time of refloat.

3.2.3 Tug Configuration

During the refloat operation 4 harbor tugs will be engaged to control the casualty. 2 tugs will be connected on the stern of the casualty, 1 tug will be stationed at the port shoulder and one on the starboard shoulder.

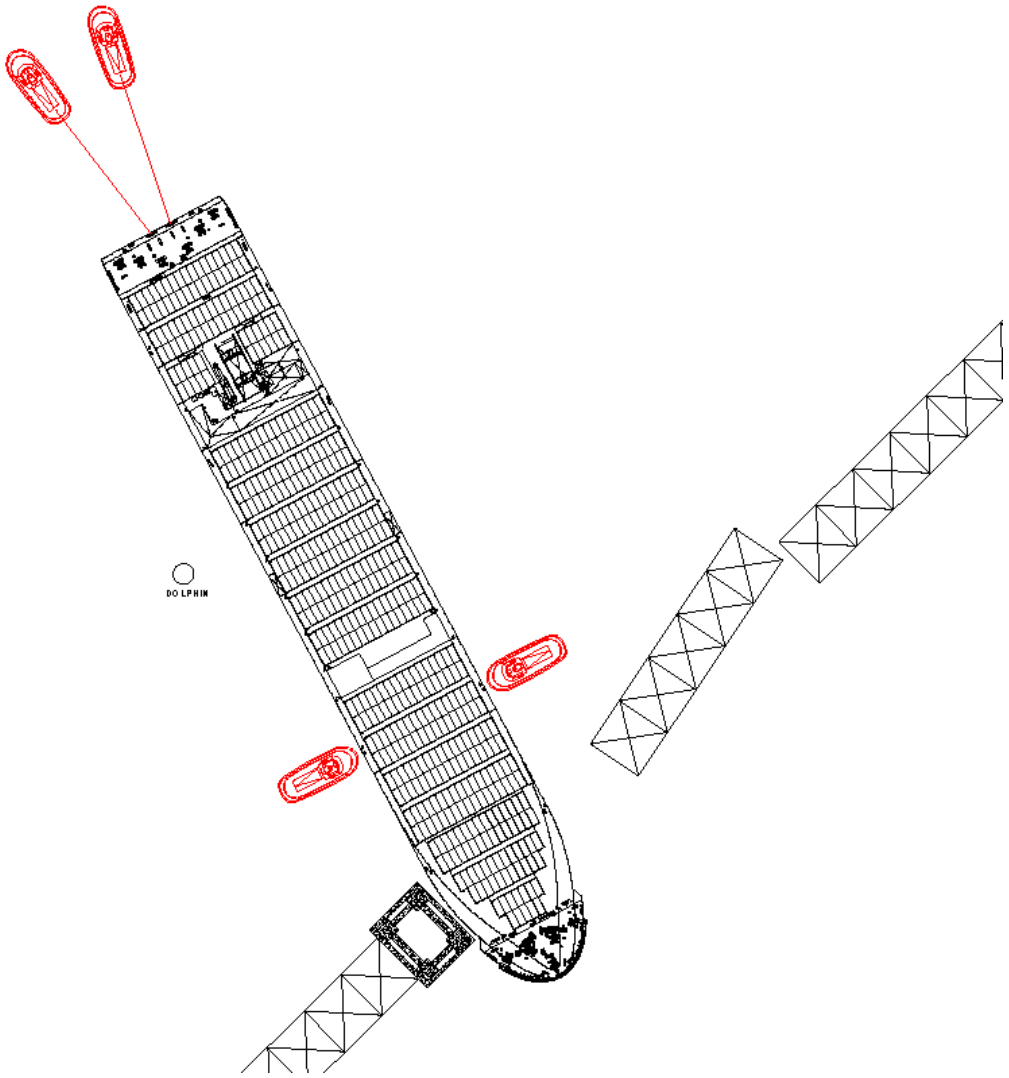


Figure 3-1 tug arrangement during refloats.

Once the vessel is refloated one of the tugs will be moved to forward and connected through the bull nose. In this configuration the vessel can be brought portside alongside the designated berth.

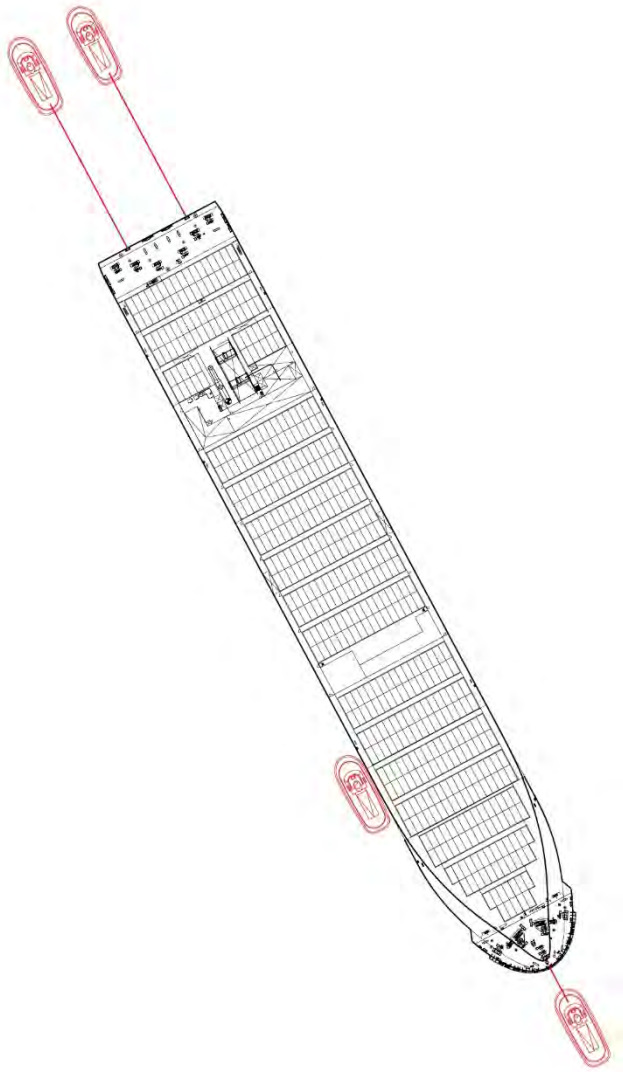


Figure 3-2 Tug arrangement during transit.

3.3 COMMUNICATION

The salvage master will be on the bridge of the casualty in overall charge of the refloat operation. Once the casualty regains buoyancy and is afloat the pilot takes over casualty's movement.

A pilot will be engaged during the refloat operation to communicate with the harbor tugs.

The salvage naval architect will be in the ballast control room together with casualty's chief officer to control ballasting operations.

3.4 WEATHER LIMITS

Winds forecasted less than 15knots for 24 hrs.

No Lighting forecasted for 24hrs.

3.5 TIMELINE

The intention is to refloat the casualty on a high tide following the removal of the bridge span. Once the bridge span is removed and confirmed clear, the salvage team will commence the deballasting sequence in order to have the deballasting completed 2 hours prior to the highwater.

Tugs will be connected and standby once the deballasting sequence is started.

3.6 OTHER TRAFFIC

A 1.0 nautical mile exclusion zone around the current position of the casualty and a 0.25 nautical mile exclusion zone around the anticipated route towards the designated berth should be in place during the refloat operation. No other operations should be conducted in the vicinity of the casualty.

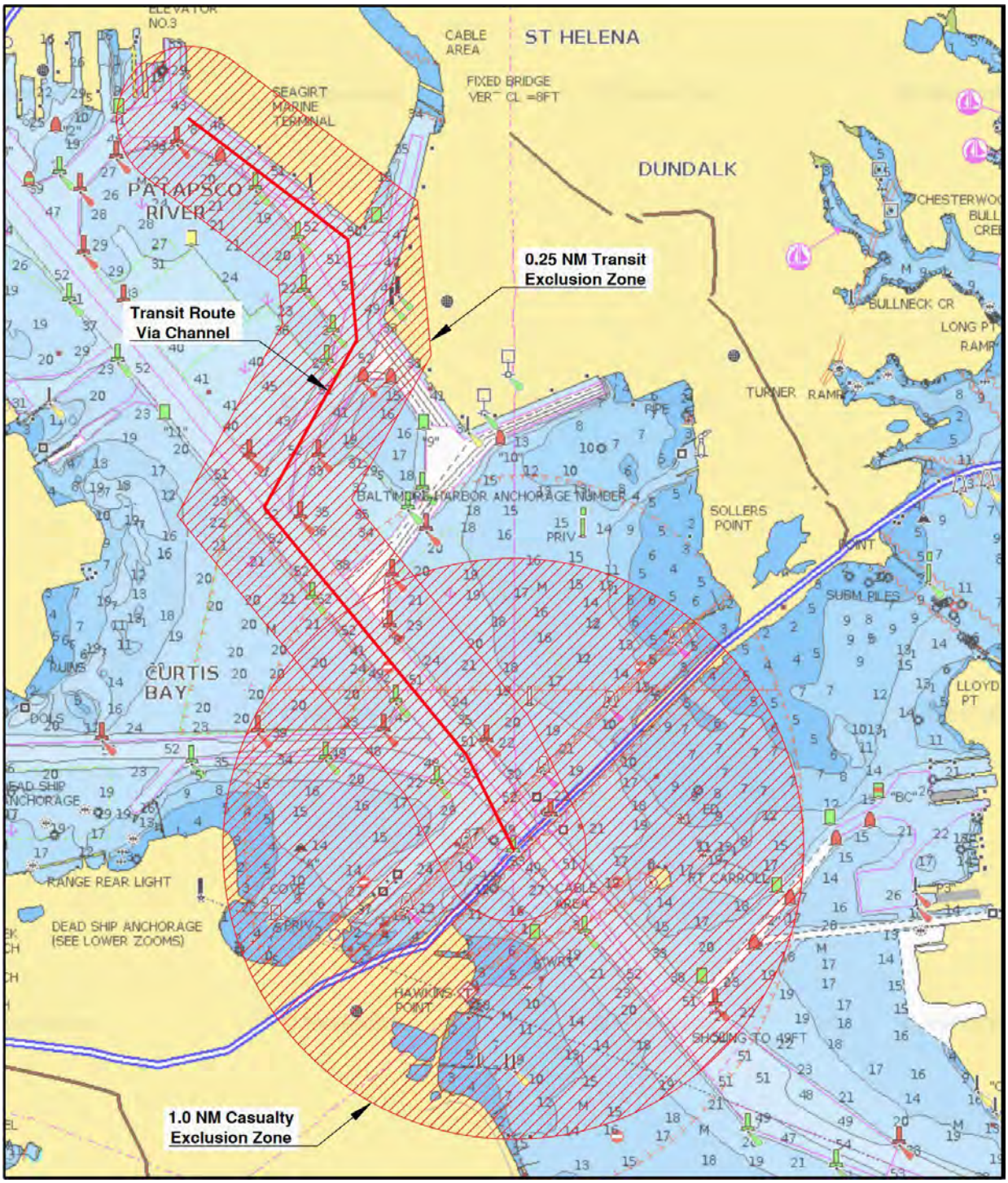


Figure 3-3 Proposed exclusion zone.

4 POST REFLOAT

4.1 SOUNDING

The post refloat casualty's crew will sound all tanks to confirm watertightness. The crew will continue to sound all tanks every 2 hours for the 6 hours following refloat to confirm no changes.

4.2 DEBALLASTING

The draft after refloat can be controlled by additional ballasting or internal transfer. The draft will be reduced in such a way that there is sufficient under keel clearance for the designated berth. Depending on the actual drafts at the time of refloat the casualty will have to be held in place in the channel at a safe distance from the grounding site, to allow for the deballasting to take place, prior to transiting to berth.

4.3 TRANSIT TO BERTH

Under guidance of the pilot and assisted by the tugs the casualty will transit towards the designated berth.

4.4 MOORING ALONGSIDE

The casualty will be moored portside alongside the berth.

The aft mooring station is fully operational and will be used to give out the stern lines.

On the forward mooring station, the lines will be tensioned using the capstan of winch M3 on portside, stopped off and made fast on their respective bits as per mooring configuration below.

Once all the mooring lines are made fast, the tugs and pilot will be let go.

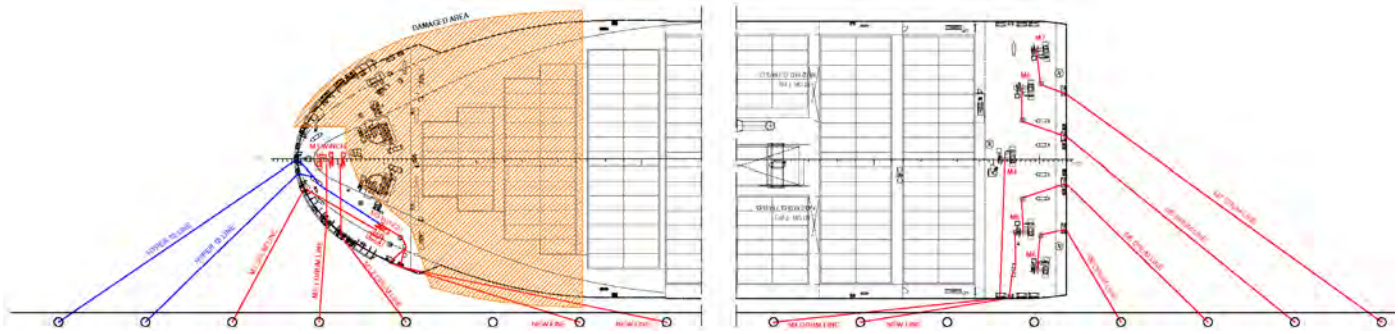


Figure 4-1 Mooring arrangement.

5 CONTINGENCY PLANNING

5.1 UNCONTROLLED REFLOAT DURING BRIDGE DEMOLITION

There is a possibility of an uncontrolled refloat during the demolition of the bridge span in case the weight removed from the casualty is higher than anticipated.

5.1.1 Preventive measures

- Bridge demolition to take place during low tide in order to increase ground reaction.
- Additional ballast as per hydrostatic calculations
- Casualty's anchor cut prior to bridge demolition.
- 4x Resolve anchors recovered from casualty's stern.

5.1.2 Reactionary measures

- 4 tugs and pilot to be on standby during bridge demolition, tugs to be standing by in sheltered position on starboard quarter of casualty.
- Salvage team onboard casualty.

5.2 UNCONTROLLED REFLOAT DURING HIGH TIDE FOLLOWING BRIDGE DEMOLITION

5.2.1 Preventive measures

- Additional ballast as per hydrostatic calculations
- Casualty's anchor cut prior to bridge demolition.
- 4x Resolve anchors recovered from casualty's stern.

5.2.2 Reactionary measures

- 4 tugs and pilot to be on standby during high tide following bridge demolition.
- Salvage team onboard casualty.

5.3 UNSUCCESSFUL REFLOAT ATTEMPT DUE TOO HIGH DISPLACEMENT

5.3.1 Preventive measures

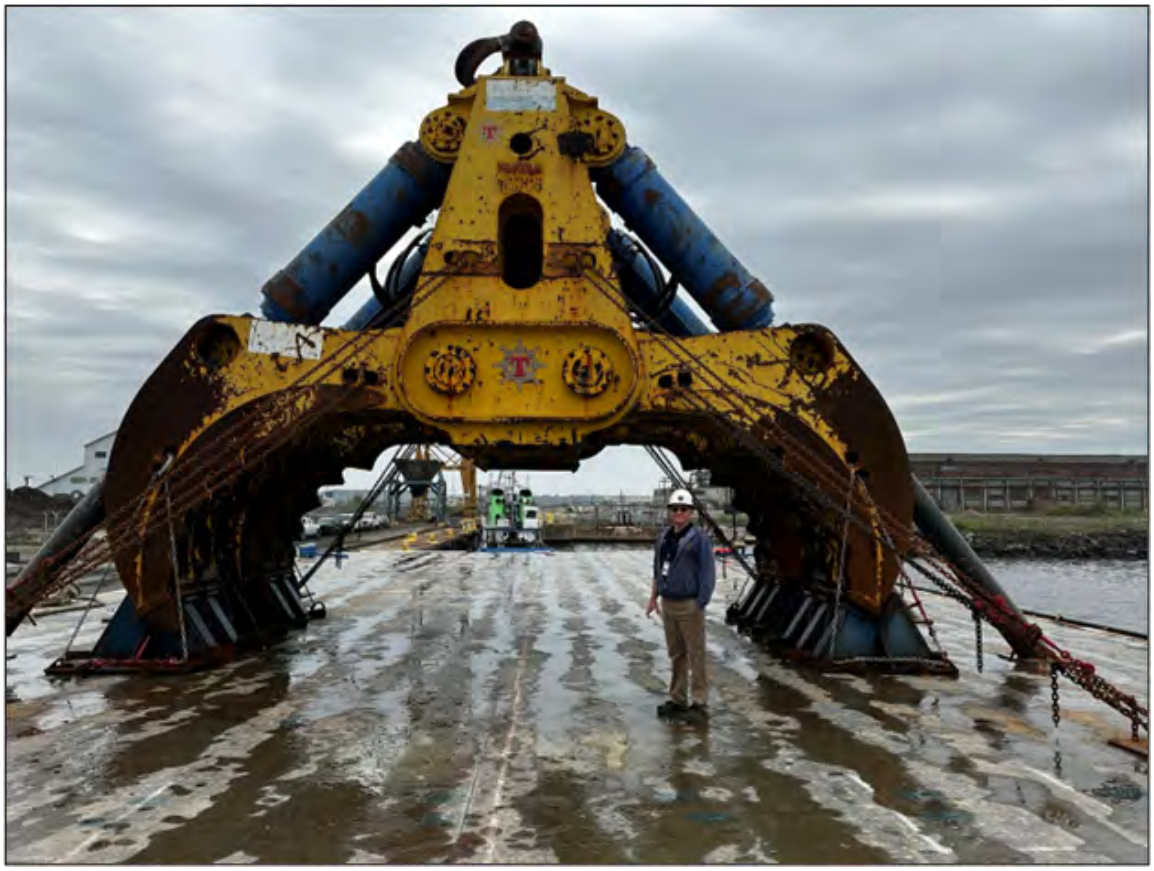
- Hydrostatic calculations

5.3.2 Reactionary measures

- Remove additional ballast from casualty Void1 portside and starboard side.
- Salvage team onboard casualty.

Appendix H

Steel Offload Summary and Example Ticket



Steel Offload Ticket Tracker

Serial #	Bridge Location	Section	Weight (Ton)	Salvor
104092024	19	1,2,3	367	United Demolition
204092024	17	1	155	United Demolition
304092024	18	1A	440	DonJon
404102024	17	3	60	United Demonlition
504142024	19	BL 1-4	927	United Demonlition
604152024	19	BL 5	378	United Demolition
704172024	19	BL 6	461	United Demolition
804152024	17	2	143	United Demolition
904162024	18	1B	515	DonJon
1004212024	18	0A	330	DonJon
1104232024	18	0B	475	DonJon
1204232024	18	0C	120	DonJon
1304242024	18	0D	105	DonJon
1404222024	18	BL 1-4	171	DonJon
1504212024	17	BL 7	461	United Demolition
1604232024	18	BL 8	284	United Demolition
1704272024	18	BL 2	348	DonJon
1804272024	18	BL 9	470	United Demolition
1904282024	21	BL 10	276	United Demolition
2004282024	18	BL 3	127	DonJon
2104282024	18	BL 18	170	DonJon
2204292024	21	BL 12	221	United Demolition
2304302024	21	BL 11	276	United Demolition
V104072024	Attenuator Truck	BL M118	1 (Load)	United Demolition
V204272024	F750	BL 3302	2 (Loads)	DonJon
V304282024	Nissan	BL 191	1 (Loads)	United Demolition
2405022024	18	U25 - L25	0	Resolve
2505052024	18	BL 5	683	DonJon
2605062024	22	BL 15	1151	United Demolition
2705062024	22	BL 14	682	United Demolition
2805072024	22	BL 13	1106	United Demolition
2905082024	17	U21 - U23	310	DonJon
3005102024	17	U17 - U19	310	United Demolition
3105092024	19	Top Truss	232	DonJon
3205112024	21	BL 17	1235	United Demolition
3305112024	17	U15	65	United Demolition
3405112024	17	U15	38	United Demolition
3505112024	19	U21	86	United Demolition
3605152024	19	U19, U21	190	United Demolition
3705142024	18	Dali Section	140	DonJon
3805172024	19	U24	1067	United Demolition
3905202024	18	BL 6	800	Donjon
4005202024	18	Dali Section	133	Resolve
4105202024	18	Dali Section	100	Donjon
4205212024	19	BL 19	755.53	United Demolition
4305182024	17	BL 20	800.42	United Demolition
4405212024	19	BL 21	245.25	United Demolition
4505282024	18	BL 1	248.5	Resolve
4605242024	18	Section 4-0	130	Donjon
4705302024	18	BL 2	41.05	Resolve
4805302024	18	BL 3	23.75	Resolve
4905262024	19	BL 22	1260.63	United Demolition
5006032024	19	BL 24	1507.28	United Demolition
5106012024	17	BL 23	607.21	United Demolition
5206042024	17	BL 25	607.21	United Demolition
5306012024	18	Section 4-B	480	Donjon
5406042024	18	Section 4-C	420	Donjon
5506062024	18	BL 4	32.75	Resolve
5606062024	18	BL 5	119	Resolve
5706172024	17	BL 7	982.8	Donjon
5806132024	17	BL 26	2192.4	United Demolition
5901162024	18	BL 6	384.1	Resolve
Total:			26443	

Appendix I

Displaced Material Removal Summary

Processing

DATE	Barge #	Volume (yd^3) (estimate)	Cement Added (The only known)	Total Volume	Offload Date
1-Jun-24	2303	1660	200	1860	3-Jun-24
1-Jun-24	2301	1632	196	1828	3-Jun-24
3-Jun-24	2304	1744	191	1935	4-Jun-24
3-Jun-24	2302	1651	198	1849	4-Jun-24
4-Jun-24	2305	1641	164	1805	5-Jun-24
4-Jun-24	2303	1594	159	1753	5-Jun-24
5-Jun-24	2301	1464	161	1625	6-Jun-24
8-Jun-24	2302	1632	195	1827	10-Jun-23
8-Jun-24	2305	1688	203	1891	10-Jun-24
10-Jun-24	2303	1296	143	1439	17-Jun-24
12-Jun-24	2305	1772	213	1985	14-Jun-24
13-Jun-24	2302	1156	127	1283	17-Jun-24
16-Jun-24	2301	1642	198	1840	19-Jun-24
19-Jun-24	2305	1530	168	1698	20-Jun-24
19-Jun-24	2304	1669	175	1844	21-Jun-24
20-Jun-24	2303	1492	164	1656	24-Jun-24
21-Jun-24	2302	1417	171	1588	22-Jun-24
21-Jun-24	2301	1539	169	1708	26-Jun-24
22-Jun-24	2305	1502	121	1623	27-Jun-23
22-Jun-24	2802	1810	145	1955	26-Jun-24
24-Jun-24	2302	1432	143	1575	27-Jun-24
25-Jun-24	2304	1586	159	1745	28-Jun-24
25-Jun-24	2303	1613	161	1774	28-Jun-24
26-Jun-24	DJ 113	776	78	854	27-Jun-24
28-Jun-24	2301	1604	193	1797	1-Jul-24
1-Jul-24	2802	1838	184	2022	2-Jul-24
2-Jul-24	2304	1706	171	1877	8-Jul-24
2-Jul-24	2305	1604	160	1764	8-Jul-24
2-Jul-24	2302	1566	157	1723	9-Jul-24
3-Jul-24	2301	1734	156	1890	9-Jul-24
5-Jul-24	2303	1670	150	1820	10-Jul-24
9-Jul-24	3301	2716	210	2926	11-Jul-24
10-Jul-24	2802	1335	147	1482	11-Jul-24
11-Jul-24	2305	1533	168	1701	15-Jul-24
12-Jul-24	DJ 113	693	63	756	15-Jul-24
17-Jul-24	DJ 147	402	48	450	17-Jul-24
TOTAL COMBINED QUANTITY (estimated volume)		**55,339**	**5,809**	**61,148**	

Bayshore Processing Site
Berth 36
Donjon Scrapyard

Steel Debris Removed from Mud

Date	Quantity (lbs)
JUNE	94200
JULY	148260

Appendix J

Marine Safety Information Bulletins MSIB 43 (300’), 49 (400’), 52 (700’)

1. **MSIB 036-24 (Safety Zone)**
2. **MSIB dtd 1 Apr (Temp alternate channel)**
3. **MSIB dtd 25 Apr (4th Temp channel)**
4. **MSIB 43-24 (300' wide channel)**
5. **MSIB 49-24 (400' wide channel)**
6. **MSIB 52-24 (700' wide channel)**

U.S. Coast Guard Sector Maryland-NCR

2401 HAWKINS POINT ROAD, BLDG 70
BALTIMORE, MD 21226-1791
Phone: (410) 576-2525
,

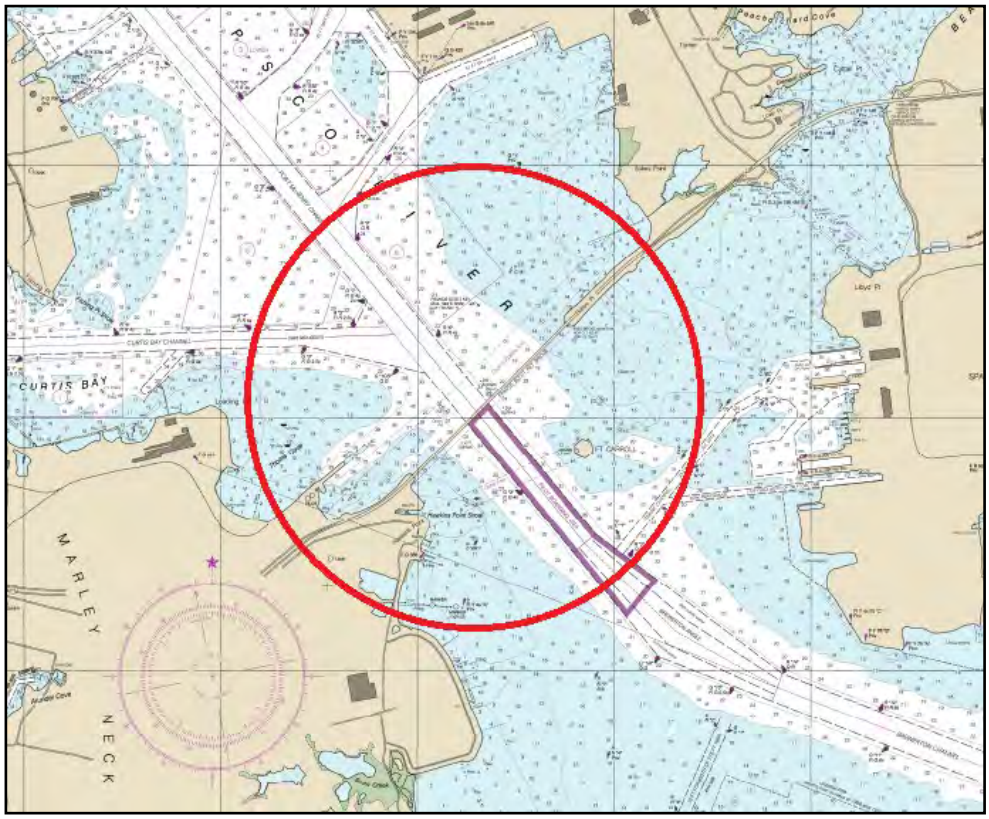
MARINE SAFETY INFORMATION BULLETIN 036-24

March 26, 2024

Port of Baltimore Safety Zone – Francis Scott Key Bridge Marine Casualty

Effective immediately a safety zone is established for all navigable waters of the Chesapeake Bay within a 2000-yard radius of the Francis Scott Key Bridge. The 948-foot Singapore-flagged vessel DALI struck the Francis Scott Key Bridge on March 26, 2024.

The safety zone is intended to protect personnel, vessels, and the marine environment in these navigable waters. No vessel or person will be permitted to enter the safety zone without obtaining permission from the COTP or a designated representative. The COTP is currently issuing a Broadcast Notice to Mariners (BNM) via VHF-FM marine channel 16. Mariners are requested to monitor the VHF channel 16 for the latest information.



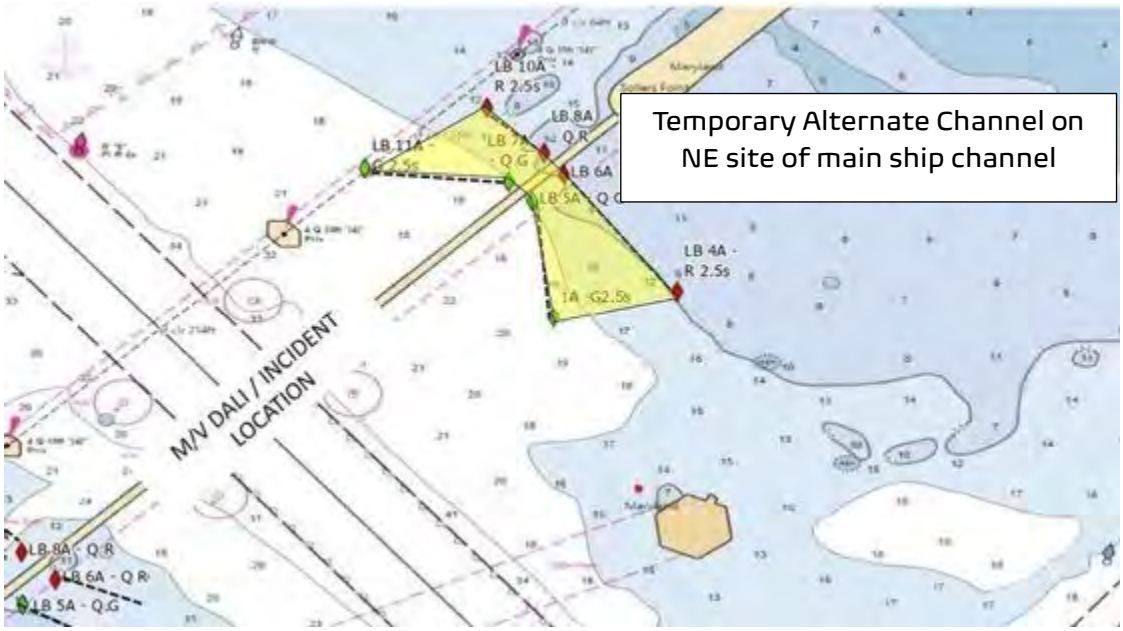
You may not enter the safety zone described above unless authorized by the COTP or the COTP's designated representative. To seek permission to enter, contact the COTP or the COTP's representative by telephone at (410) 576–2525 or on Marine Band Radio VHF–FM channel 16 (156.8 MHz). Those in the safety zone must comply with all lawful orders or directions given to them by the COTP or the COTP's designated representative. The U.S. Coast Guard may be assisted in the patrol and enforcement of the safety zone by Federal, State, and local agencies.

If you have any questions regarding the contents of this bulletin, please contact the Command Center at (410) 576-2525, or via email at d05-smb-sectormd-ncr-scc@uscg.mil.

#

U.S. Coast Guard Sector Maryland-NCR
2401 HAWKINS POINT ROAD, BLDG 70
BALTIMORE, MD 21226-1791
MTSRecoveryMDNCR@uscg.mil

MARINE SAFETY INFORMATION BULLETIN
1 April 2024
Port of Baltimore Safety Zone – Key Bridge Response 2024



The Captain of the Port (COPT) established the temporary alternate channel near Sollers Point for commercially-essential vessels. The temporary channel is on the northeast side of the main ship channel in the vicinity of the Francis Scott Key Bridge. This action is part of a phased approach to opening the main federal channel.

This new temporary channel is marked with government-lighted aids to navigation. It will be limited for transit at the discretion of the COTP and during daylight hours only. This temporary channel has a controlling depth of 11 feet, a 264-foot horizontal clearance, and vertical clearance of 95 feet.
The current 2,000-yard safety zone around the Francis Scott Key Bridge remains in effect and is intended to protect personnel, vessels, and the marine environment. Members of the public may not enter the safety zone unless authorized by the COTP or designated representative. Those in the safety zone must comply with all lawful orders or directions given to them by the COTP or designated representative.

The COTP issued a Broadcast Notice to Mariners (BNM) via VHF-FM marine channel 16. Mariners are requested to monitor channel 16 for the latest information.

A Debris Reporting Hotline has been established. If the public encounters any debris from the incident, please contact +1 (410) 205-6625

U.S. Coast Guard Sector Maryland-NCR
2401 HAWKINS POINT ROAD, BLDG 70
BALTIMORE, MD 21226-1791
MTSRecoveryMDNCR@uscg.mil

MARINE SAFETY INFORMATION BULLETIN
25 April 2024
Port of Baltimore Safety Zone – Key Bridge Response 2024

BALTIMORE – The Captain of the Port established a fourth channel, the Fort McHenry Limited Access Channel, which will run the length of the northeast side of the federal channel, and provide additional access to commercially essential traffic.

The Limited Access Deep Draft Channel, has a controlling depth of 35 feet, a 300-foot horizontal clearance, and a vertical clearance of 214 feet, and will facilitate some larger deep draft vessels, large marine tugs, and MARAD vessels through the Port of Baltimore. Infographic courtesy of Key Bridge Response 2024 Unified Command.

The limited access deep draft channel has a controlling depth of a minimum of 35 feet, a 300-foot horizontal clearance, and a vertical clearance of 214 feet. Additional restrictions for transits are outlined in MSIB 043-24, including weather limitations which may impact the transit window.

Starting Monday, April 29, operations to remove the M/V DALI will require suspension of transits through the Fort McHenry Limited Access Channel. Once deemed safe, the channel will reopen for commercial traffic.

The current 2,000-yard safety zone around the Francis Scott Key Bridge remains in effect and is intended to protect personnel, vessels, and the marine environment. No vessel or person will be permitted to enter the safety zone without obtaining permission from the COTP or a designated representative.

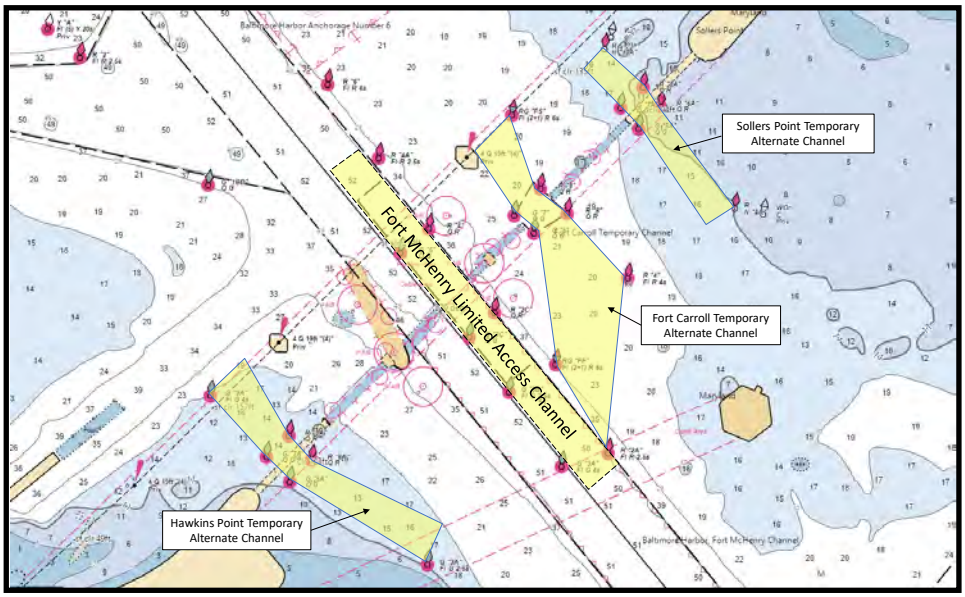
U.S. Coast Guard Sector Maryland-NCR

2401 HAWKINS POINT ROAD, BLDG 70
BALTIMORE, MD 21226-1791
MTSRecoveryMDNCR@uscg.mil

MARINE SAFETY INFORMATION BULLETIN 049-24
May 21, 2024

Port of Baltimore Safety Zone – Francis Scott Key Bridge
Fort McHenry Limited Access Channel and Temporary Alternate Channels

**** This cancels MSIBs 036-24 and 048-24 ****



Fort McHenry Limited Access Channel: Following the successful refloat and removal of the M/V DALI, the Captain of the Port (COTP) opened the Fort McHenry Limited Access Channel to commercial vessel traffic for 24-hour availability. This channel now has a depth of 50 feet, 400-foot horizontal clearance, and vertical clearance of 214 feet due to the adjacent BG&E powerlines.

Deep draft vessels still require a Maryland State Pilot and two escort tugs. The Maryland Pilots will impose a 3 ft under keel clearance (UKC) requirement. For container ships greater than a 1,000 ft in length and over 125 ft in beam, transits will be limited to winds being less than 15 knots; all other vessel transits will be limited to winds being less than 20 knots per Weather Forecast for 39.22N 76.54W.

Deep draft traffic has priority use of this channel. Tug and barge traffic should make maximum use of the three Temporary Alternate Channels. Any use of the Fort McHenry Limited Access Channel by non-deep draft commercial vessels should be deconflicted with the Maryland Pilots at (410) 342-6013.

Temporary Alternate Channels:

Fort Carroll Temporary Alternate Channel is open 24-hours daily to non-deep draft commercial vessels with a controlling depth of 20 ft, a 300-ft horizontal clearance, and vertical clearance of 135 ft.

Hawkins Point Temporary Alternate Channel is open 24-hours daily to non-deep draft commercial vessels with a controlling depth of 14 ft, a 280-ft horizontal clearance, and vertical clearance of 124 ft.

Sollers Point Temporary Alternate Channel is open 24-hours daily to all traffic, to include recreational vessels, with a controlling depth of 11 ft, a 264-ft horizontal clearance, and vertical clearance of 95 ft.

The most current U.S. Army Corps of Engineers hydrographic survey data is available on the internet at eHydro.

U.S. Coast Guard Sector Maryland-NCR

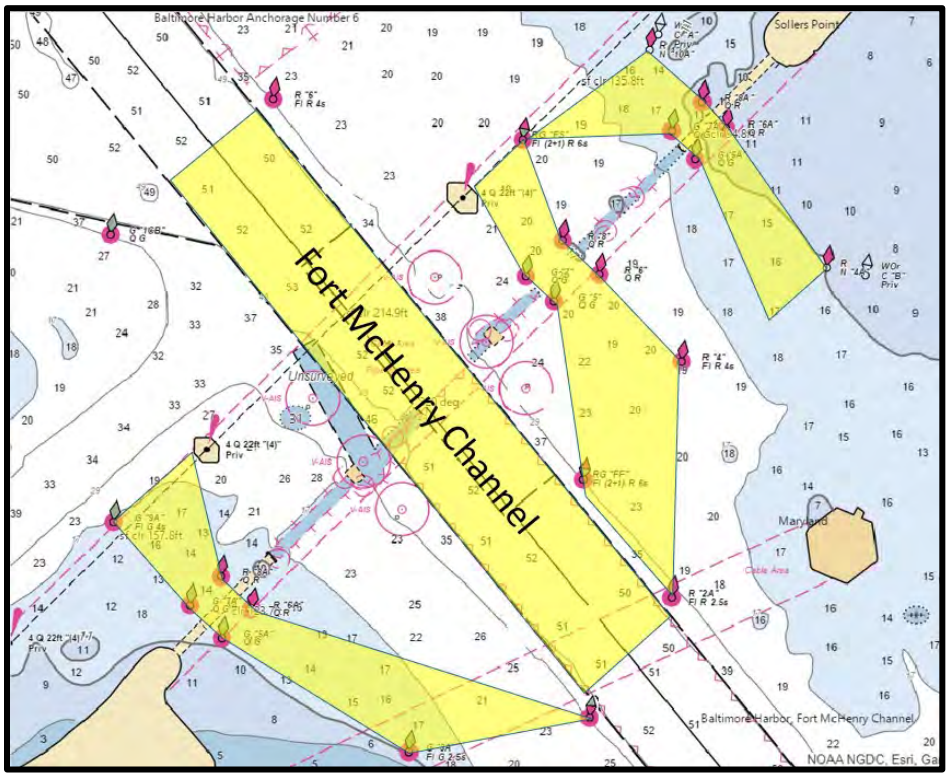
2401 HAWKINS POINT ROAD, BLDG 70
BALTIMORE, MD 21226-1791
MTSRecoveryMDNCR@uscg.mil

MARINE SAFETY INFORMATION BULLETIN 052-24
June 10, 2024

Port of Baltimore Safety Zone – Francis Scott Key Bridge
Fort McHenry Channel and Temporary Alternate Channels

**** This cancels MSIB 050-24 ****

Fort McHenry Channel: The Captain of the Port (COTP) has reopened the Fort McHenry Channel to commercial vessel traffic for 24-hour availability. This channel has been fully restored to its original depth of 50 ft, 700-ft horizontal clearance, and a vertical clearance of 214 ft due to the adjacent BG&E powerlines.



Deep draft vessels still require a Maryland State Pilot and one escort tug, and the Temporary Alternate Channels remain open and available for use until approximately June 30th, the conclusion of all on water salvage and survey operations relating to the Key Bridge Response.

Temporary Alternate Channels:

Fort Carroll Temporary Alternate Channel remains open 24-hours daily to non-deep draft commercial vessels with a controlling depth of 20 ft, a 300-ft horizontal clearance, and vertical clearance of 135 ft.

Hawkins Point Temporary Alternate Channel remains open 24-hours daily to non-deep draft commercial vessels with a controlling depth of 14 ft, a 280-ft horizontal clearance, and vertical clearance of 124 ft.

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The most current U.S. Army Corps of Engineers hydrographic survey data is available on the internet at eHydro.

Appendix K
Lessons Learned

Lessons Learned

Tasking

1. The project was broken down into the three priority areas described in this report greatly facilitated coordinated execution of the operation.
2. In addition to these three priorities, Skanska was also tasked with receiving and processing all steel and concrete debris from the collapse for all 3,540-feet of bridge collapse. A single processing site greatly facilitated efficiencies.
3. There were challenges integrating three salvage organizations onto a single project. It helped that three distinct lines of effort were established, and priorities could be set from the start that allow rational resource management decisions down the road.

Command and Control

1. **Incident Command System (ICS) and Unified Command (UC) Knowledge**: There was a sometimes a lack of experience and understanding of the ICS and UC structures among some personnel, leading to communication bypasses and potential management conflicts. This is understandable as numerous organizations come together under one banner to execute this response. To mitigate this, it is recommended that supervisors receive training to at least the IC 300 level and key UC personnel to the IC 400 level to ensure smooth operations and stronger adherence to proper communication channels.
2. **Many Decision-Makers**: It was common for many decisions to be made independently without adequate communication, causing inefficiencies and occasional disruptions. Clearer definition of roles and responsibilities would streamline decision-making processes and prevent overlaps.
3. **Collaboration.** On March 26 when Skanska arrived it was unclear what their scope was going to be. Skanska commenced engineering that day for all sections of the bridge. The first meeting at Unified Command for Skanska was held on March 27. This was the first time that Skanska was made aware that three salvage teams would be working on the project, and it was a useful meeting to understand the division of responsibilities. The next morning on March 28 the salvage team held an engineering meeting, where Skanska was able to bring the other salvage contractors up-to-speed with the structure and commence sharing our data to help drive the project.
4. **Communication.**
    a. Daily update meetings were held (typically 6:30am and 5:30pm, seven days a week). These were informative to the wider stakeholders group. When the salvage team commenced smaller group meetings among only the salvers and SUPSALV, it enabled the team to talk more freely and work closer and better.

b. Daily high-level progress reports and photos were provided for the daily update meetings and were good records at a high level of work performed on that day.

c. Communication among the salvage teams for deliveries to the processing yard was overall good.

5. **Inter-Organizational Collaboration**: While two of the primary operating entities (Donjon Marine and Skanska) worked seamlessly together, there were challenges with other entities, which struggled with timely and accurate information sharing. Future projects should emphasize the importance of transparent and efficient communication across all involved parties to avoid misunderstandings and delays.

6. **Team Integration and Morale**: Overall, the project benefited from a dedicated and motivated team. However, fostering increased integration and teamwork between field operations and shoreside management could reduce disconnects and enhance overall project success. Encouraging honest feedback and a culture of continuous improvement can help identify and address any operational gaps.

Administration

1. **Coordination between Contractor and Government.** Skanska's field team included a combination of project management staff, construction management staff, field supervision, administrative staff to keep track of quantities, cost, schedule progress and controls. The State also provided a full complement of field inspectors to track and audit all aspects of the State-led work. Collaboratively, these teams served to improve project efficiencies.

2. **Workspaces and Communication**: The decision to house technical staff in a dedicated facility contributed to effective communication and high-quality deliverables. Ensuring an environment that promotes unobstructed communication and access to necessary resources is critical for operational efficiency.

3. **Tracking and Asset Management**: Proper tracking of orders and material/equipment locations was occasionally lacking, leading to confusion and inefficiencies. Implementing a more robust system for tracking assets and orders would help prevent loss and duplication of efforts.

Activation/Mobilization of Contractor Equipment and Personnel

1. **Local assets.** Skanska equipment was on the scene beginning on Day 1. As a bridge contractor local to the area, they understood immediately the equipment that was locally available and would be required to expedite the project. This allowed us to begin deploying equipment within hours of being called from Maryland and Virginia.

2. **Mobilization and Equipment**: The mobilization of key equipment, such as the Grab, could have been expedited by using a Utility Boat instead of a towed deck barge, despite the higher transport costs. Early anticipation and arrangement of critical items with long lead times

improved overall logistics, but more foresight in recognizing equipment needs could have further reduced timelines.

3. **Personnel Activation.** The morning of the event, Skanska made strategic calls to expedite the recovery effort. Key engineers were deployed to the project that day from Kansas City and began work on Day 1. This was highly critical to understanding how the structure was laying in the river, and to begin calculating the weight of the structure. This was critical information so our workplans could be tailored to the condition.
4. **Early Mobilization.** Key members of the Contracting team all arrived on Day 1. Project Management team. Field supervisors. Drone team. Dive team. Rapid mobilization is critical. Especially on the engineering, assessment and planning side. Not all salvage operations are the same, and Skanska's recent work on the demolition of a similar truss structure and bridges across the US provided Skanska with advanced knowledge and information that supported all of the teams and helped to drive the project schedule.

Utilization of Personnel

1. The contractors had the right blend of staff with demonstrated experience to expedite and drive the project. This included fulltime on-site safety professionals to conduct our nationwide safety program. Field Engineers were appropriately assigned to the varying operations, and executive leadership with long tenures at the respective companies were engaged from day one until the end to ensure work was performed safely, was well communicated to the stakeholders and their clients, and completed in the fastest manner possible.

Safety Management

1. **Safety Culture and Compliance**: Donjon Marine's safety program emphasized upper management's support, effective workplace communication, focused hazard-specific programs, supervisor involvement, and continuous safety measurement and correction. Reinforcement of a strong safety culture through continuous training, accountability, and open communication is crucial for future operations.
2. **Dynamic Safety Planning**: Given the inherently dangerous nature of salvage operations, there is a need to revisit and potentially revise safety plans to be more adaptive, akin to the operational flexibility of emergency response teams, rather than adhering strictly to static safety procedures.

Salvage Operations

1. Starlink provided high speed internet connection and was used on the 53' command trailer and the ESSM boom handling boat that served as the CODA survey vessel.

2. CODA survey gear proved to be extremely useful for both nearly immediate snapshots of underwater debris and for post processed full detail survey data. It, coupled with the LIDAR provided a clear picture of the above and below the water conditions.
3. CODA was, in conjunction with Starlink, able to live stream imagery to the salvors managing grab operations via Teams live meetings providing the salvors a safe and effective way to position their grab.
4. The COP technology proved useful, however took a long time to get installed on all vessels. Having all those transponders and solar panels allow tracking and management of on the water assets. The transponders installed on units were uninstalled, retained and will be stored at the ESSM warehouse for future use.
5. Coordination for vessels entering and exiting the work area with the USCG was well executed.
6. Skanska's approach to focus on the hierarchy of controls and eliminate as much of the underwater dive operations and underwater cutting was a real success.
    a. Elimination – delivery of large truss sections to the processing yard on the hook.
    b. Substitution – underwater cold cutting vs diver cutting.
    c. Engineering controls – every truss lift & cut pre-engineered by on-site engineer.
7. The planning and organization that went into the processing yard was exemplary. This yard was leased on the day of the event, and then later increased from 3.5 acres to 10 acres as Unified Command directed that all steel be processed at this location. The yard was well laid out, delineation for personnel separate from equipment lanes. Fully fenced. Appropriate signage. One way traffic throughout the work zone. Clear separation of the field offices and the processing yard.
8. Benefit was realized from utilizing a 56 yard clamshell bucket and the salvage grab, as opposed to smaller buckets that would have increased the duration for dredging and debris removal.

Demobilization

Skanska met weekly throughout the project with a focused meeting on equipment utilization and the development of a demobilization plan. As the third priority in the project, Skanska was required to stand down on advancing its work several times throughout the project to allow for higher priority actions to advance, so the demobilization plan was a dynamic and fluid situation. Towards the end of the project the demobilization meeting increased to twice weekly with daily conversations taking place in addition to the standing meetings. Equipment was removed swiftly and effectively.

Summary

The Recovery project was a significant endeavor, and its success can be attributed to several key factors:

1. **Comprehensive Planning:** Detailed planning and a thorough understanding of the project scope were crucial. This involved assessing the bridge's condition, defining clear objectives, and developing a robust recovery strategy.
2. **Stakeholder Engagement:** Engaging with all relevant stakeholders, including local government agencies, federal agencies, and environmental groups, ensured that the project addressed various concerns and requirements. Effective communication and collaboration helped build support and address potential issues early on.
3. **Resource Allocation:** Brining the right equipment resources for the task at hand and mobilizing 130 personnel of various skillsets to undertake this take in 48 hours.
4. **Expertise and Experience:** The involvement of experienced engineers, project managers, and construction teams played a vital role. Their expertise in bridge salvage projects helped navigate technical challenges and implement best practices.
5. **Innovative Solutions:** Employing innovative techniques and technologies contributed to the project's success. This included the use of construction methods, and project management tools to enhance efficiency and effectiveness.
6. **Environmental Considerations:** Addressing environmental impacts and complying with regulations ahead of being asked were important. Implementing environmental control measures and ensuring sustainable practices helped gain regulatory approval and stakeholder support.
7. **Risk Management:** Identifying potential risks and developing mitigation strategies helped manage uncertainties. This proactive approach allowed the project team to address issues promptly and keep the project on track.
8. **Timely Communication**: Regular updates and transparent communication with all stakeholders kept everyone informed about the project's progress. This helped manage expectations and facilitated timely decision-making

These factors combined to ensure the successful completion of the Francis Scott Key Bridge Recovery project, meeting its objectives and contributing to the overall project reliability and safety of the recovery operations.

Appendix L
List of Acronyms

List of Acronyms

AIS	Automatic Identification System
ASA	American Salvage Association
AT	Annual Training
ATP	Authorization to Proceed
BG&E	Baltimore Gas & Electric
CHINFO	Department of Navy Chief Information Officer
CNO	Chief of Naval Operations
COC	Chain of Command
CONUS	Contiguous United States
COP	Common Operating Picture
DPR	Daily Progress Report (Contractor's daily report documenting that day's events)
ED	Engineering Duty Officer
ESSM	Emergency Ship Salvage Material
FSK	Francis Scott Key Bridge
IAP	Incident Action Plan
IAW	In accordance with
IC	Incident Command
ICS	Incident Command System
ICS	Incident Command System
IMT	Incident Management Team
ISSA	In-Service Support Agreement
ISU	International Salvage Union
JIC	Joint Information Command
LIDAR	Light Detection and Ranging
LMO	Liaison Officer
MDDOT	Maryland Department of Transportation
MDTA	Maryland Transportation Authority
MOA	Memoranda of Agreement

MSIB	Marine Safety Information Bulletin
MSIB	Marine Safety Information Bulletin
NMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NORTHCOM	U.S. Northern Command
NVD	Nautical Virtual Desktop
OM&N	Operations & Maintenance Navy
OSD	Office of the Secretary of Defense
RFS	Request for Service
SEA 00D	NAVSEA PAO
SERT	(Coast Guard) Salvage Engineering Response Team
SMFF	Salvage and Marine Firefighting (provider)
SUPSALV	Supervisor of Salvage and Diving
TACON	Tactical Control
UC	Unified Command
USACE	U.S. Army Corps of Engineers
USCG	United States Coast Guard
USFF	United States Fleet Forces
USN	United States Navy
UWSH	Underwater Ship Husbandry