



DEC 10 2015  
Memorandum

December 1, 2015

TO: Derek Case  
MS 47354

THRU: Julie Meredith / Tom Horkan  
NB 82-99

FROM: Dave Becher / Julia Mizuhata  
(425) 576-7045

SUBJECT: Contract 008066  
SR 520 Floating Bridge and Landings Project  
Federal Aid No.: BR-0520(047)  
Change Order No. 068 – FA-Additional Underwater Inspection & Design

Attached for review is Change Order No. 068, FA-Additional Underwater Inspection & Design for execution at the HQ Construction level.

**Description of Change:**

This WSDOT-Initiated Change addresses additional pontoon inspection operations on the cycle 1 Pontoons Furnished by the State (PFS) beyond those identified as part of 008066 Change Order No. 058R1, PFS Underwater Inspection & Design, and also reconciles the cost of the work to the actual total amount paid under the force account item created by Change Order No. 058R1.

Change Order No. 058R1 addressed additional pontoon inspection operations on the cycle 1 Pontoons Furnished by the State (PFS), Pontoons V and W. The inspection operations for these pontoons included the following:

- An inspection by divers of the keel slab and submerged sections of the exterior walls.
- A permanent video record of the inspection on DVD.
- A transcript identifying the cracks in the dive video.
- Exterior crack mapping for the keel slab and submerged sections of the exterior walls.
- For Pontoon V only, interior crack mapping for the keel slab, construction joints, and to the 7-ft. freeboard level of the interior cells sharing an exterior wall.
- For the both interior and exterior survey, identify and map all cracks greater than or equal to 0.006 inches in width, if possible.
- Examination of existing crack repairs to determine if the crack repair sealed the crack completely or if additional repairs are necessary.

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- Development and submittal of a crack repair plan for review and approval by WSDOT. The plan is to include repair options, recommendations on timing of repairs, and expected service life of each repair option.

Change Order No. 058R1 also indicated that WSDOT will determine the need for additional inspection operations following completion of the underwater and interior Pontoon inspection as addressed in the change order.

Construction requirements specified in Change Order No. 068 as a modification to Change Order No. 058R1 for additional crack mapping and pontoon inspection operation requirements for pontoons V and W include the following:

- Addition of the top deck and area above the submerged sections of the exterior walls for the exterior crack mapping of Pontoon V.
- Additional keel slab and exterior wall exterior crack mapping of Pontoon W as shown on page 6 of Change Order No. 068.
- A requirement for the Design-Builder to provide a preliminary assessment, as soon as available, in regards to a crack repair plan for the end wall of Pontoon V which will be joined to Pontoon W.

Change Order No. 068 also added Work involving pontoon inspection operations to be performed for type 1 longitudinal Pontoon U, and type 4 Supplemental Stability Pontoon (SSP) VNW and type 6 SSP VNE as follows:

- An inspection of the pontoon exterior surfaces for pontoons U, VNW and VNE performed by divers. Similar to the requirement for pontoons V and W, a permanent video record of the inspection to be provided to the State on DVD.
- Provide a transcript identifying the cracks in the dive video for Pontoon U.
- Exterior crack mapping of the keel slab, top deck, and the pontoon walls, both above and below the waterline, for Pontoon U, as identified on sheet 7 of Change Order No. 068, with the requirement that the crack mapping for Pontoon U be scheduled as soon as possible.
- Exterior crack mapping of the pontoon walls, both above and below the waterline, for pontoons VNW and VNE, with the requirement that the crack mapping take place after completion of the post-tensioning activities for Pontoon V.
- Identify and map all cracks greater than or equal to 0.006 inches in width, if possible.
- Existing crack repairs shall be examined to determine if the crack repair sealed the crack completely or if additional repair is necessary.

Change Order No. 068 also specified that:

- The Design-Builder shall not proceed with Pontoon V and W joining operations until exterior end wall and keel slab modifications have been fully determined.

And that,

- KGM shall develop means and methods that may be used for the modifications to take place to the end walls and keel slabs for the cycle 1 PFS. The means and methods are expected to include a coffer cell element to allow modifications to occur in a dry environment.

**Evolution of Change:**

The substructure of the new floating bridge constructed under the Evergreen Point Floating Bridge and Landings Project consists of 77 pontoons. Of the 77 pontoons, 33 are pontoons constructed under the SR 520, Pontoon Construction Design-Build Project in Aberdeen (Grays Harbor County), and identified in the Contract as pontoons furnished by the State (PFS), and 44 are pontoons provided by the Design-Builder (PPDB) constructed as part of the SR 520, Evergreen Point Floating Bridge and Landings (FB&L) Project.

The Contract as originally written specified that the PFS would be available to the Design-Builder in six cycles, with a no later than June 4, 2012 PFS availability date for cycle 1. The quantities and types of PFS available in the cycles were in accordance with the Design-Builder's approved Alternate Technical Concept (ATC) 10 – Rev. 2: Alternate Delivery Sequence of the PFS, which had been incorporated into the Proposal and therefore deemed, incorporated into the Contract. At the start of this Project in 2011, the Design-Builder submitted a request to change the casting sequence of the PFS under the pontoons construction project (PCP Contract). This request resulted in a change order under both the PCP and FB&L Contracts, resulting in the following quantities and types of PFS in cycle 1:

- 3 – Type 1 longitudinal pontoons (pontoons T, U, and V)
- 1 – Type 3a cross pontoon (pontoon W)
- 2 – Type 4/4a supplemental stability pontoons (SSPs VSW and VNW)

On May 11, 2012, after construction crews on the PCP Contract had completed post-tensioning on one of the three Type 1 longitudinal pontoon in cycle 1, unanticipated damage in the form of spalling and cracking was found. Post-tensioning of the other pontoons in the cycle was discontinued until the cause of the damage could be identified. The reviews at the time led to modifications to the remaining longitudinal pontoons and cross pontoon in cycle 1, and repairs to the damaged pontoon. As a result, the availability date of the cycle 1 PFS was pushed to August 2012, and delivery of the pontoons to Lake Washington did not start until that month.

On August 22, 2012, the WSDOT PEO was verbally notified by the Design-Builder, Kiewit/General/Manson (KGM), that while KGM was performing ballasting operations on pontoon V, one of the cycle 1 longitudinal pontoons, showed signs of water leaking

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and migrating through the interior bulkhead walls of the Pontoon. Moisture was also found on the inside of the end wall in Pontoon W during this time frame.

Discussions with KGM on addressing the situation began. These discussions were captured in writing in a WSDOT letter dated November 10, 2012, Serial Letter No. 0185, End Wall and Keel Slab Inspection and Crack Repair Design, to KGM to request that additional pontoon inspection operations and crack mapping of the cycle 1 PFS be performed. The focus of the inspection was on pontoons V and W. In addition to the inspection, WSDOT also requested that KGM develop a crack repair plan to address external cracking of the keel slab and exterior walls of the PFS. Due to the uncertainty of the work involved with the inspections, WSDOT proposed to pay for the Work identified in Serial Letter No. 0185 on a force account basis. Change Order No. 058R1 was initiated under this Contract to address this force account work, and resulted in the establishment of the force account item, "FA-PFS Add'l Underwater Insp/Repair".

The work on Change Order No. 058R1 began in November 2012. In this change order, we stated that "WSDOT will determine the need for additional inspection operations following completion of the underwater and interior Pontoon inspection as addressed by this change order". A copy of this change order is attached for reference.

As Change Order No. 058R1 work progressed, additional discussions regarding the situation with the pontoons continued to take place. On November 20, 2012, WSDOT sent Serial Letter No. 0197, Update to WSDOT Ltr 0185 and CO 58 – End Wall and Keel Slab Underwater Inspection and Crack Repair Design. This letter summarized in writing the discussions between WSDOT and KGM which resulted in a request for additional crack mapping on Pontoon V. The request included crack mapping above the submerged sections of the exterior walls and top deck of Pontoon V. The letter further indicated that this scope of work will be addressed under a new change order which will supplement or modify Change Order 58.

WSDOT also requested in Serial Letter No. 0197 that KGM provide a preliminary assessment, as soon as available, in regards to a crack repair plan for the end wall of Pontoon V which will be joined to Pontoon W. This assessment was requested so that WSDOT could determine if any repairs were required before the joining operation between pontoons V and W took place.

December 26, 2012, WSDOT sent Serial Letter No. 0229, pontoons T, U, VNW and VNE – End Wall and Keel Slab Underwater Inspection and Crack Repair Design. This letter was sent to KGM to document further discussions for additional crack mapping requested by WSDOT as follows:

- pontoons T and U: Complete keel slab, top deck and exterior wall crack mapping both above and below the waterline. The crack mapping was to be scheduled as

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soon as possible, with the crack mapping of Pontoon T to take place after it had been towed into Lake Washington. (Note – WSDOT later determined to perform crack mapping for Pontoon T in dry dock as opposed to using divers, and work associated with Pontoon T was addressed under a separate change order.)

- Pontoons VNW and VNE: The entire area of the exterior pontoon surface available for inspection both above and below the waterline. The crack mapping for these pontoons was to take place after completion of the post-tensioning activities for Pontoon V.

All other construction requirements related to the permanent videos, video transcription, crack mapping, existing crack repairs and the crack repair plan were to be performed as described in Change Order No. 058R1.

The original intent for the crack mapping associated with Pontoons T, U, VNW and VNE was for the work to be addressed under a separate change order, and approvals were obtained on this basis. Similar to the situation with the crack mapping associated with Pontoons V and W, in order to expedite the work and due to the uncertainty in the amount of crack mapping involved, WSDOT advised KGM that the work would be compensated on a force account basis in accordance with General Provisions Section 1-09.6. Our estimated amount at the time, similar to Change Order No. 058R1, was \$500,000. The operations associated with this work were expected to begin the week of January 14, 2013.

January 4, 2013, WSDOT sent Serial Letter 0237, Pontoon Furnished by the State (PFS) Cycle 1 Repair Decisions, as a follow-up to a conference call between WSDOT and KGM that had taken place January 2, 2013. This conference call discussed the status of the engineering analysis of the potential end wall and keel slab repair options for Cycle 1 PFS. Based on the information resulting from the call, WSDOT provided the following direction:

- Pontoon V and W joining operations shall not proceed until exterior end wall and keel slab modifications have been finally determined. WSDOT anticipated working with KGM on a final modification plan to address issues with the end walls and keel slabs.
- KGM shall begin developing means and methods that may be used for the modifications to take place to the end walls and keel slabs for Cycle 1 Pontoons from Aberdeen. WSDOT anticipated the modifications would include epoxy injection of cracks and/or the installation of carbon fiber plastic membrane as recommended by the KGM's engineering consultant. The means and methods were assumed to include a coffer cell element to allow modifications to occur in a dry environment.
- Since one of the elements discussed was an external post tensioning pontoon modification for Cycle 1 pontoons, WSDOT would assess the transverse

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external post tensioning and WSDOT would develop the design should the modification be deemed prudent and provide direction separately.

March 8, 2013 in an e-mail from WSDOT to KGM, WSDOT requested additional mapping and video of the Pontoon W keel slab to be included in the crack mapping work to be performed.

The crack mapping and development of the crack repair plan needed to occur as quickly as possible so that WSDOT could provide direction to the Design-Builder in order to mitigate time and cost impacts. Extensive discussions regarding repair options took place with the Design-Builder, SR 520 Program management, and HQ Construction based on the information from the crack mapping throughout the process.

Attachment A provides a final listing of the work covered by the FA Bid Item created under Change Order 58R1.

Approvals obtained for this change order include:

- Project Engineer Approval by Dave Becher, January 13, 2013
- Region Approval by Tom Horkan, original approval January 16, 2013; updated approval July 6, 2015
- HQ Construction Approval by Mark Gaines, January 14, 2013; reaffirmation of approval for scope of work and final cost reconciliation by Derek Case, July 29, 2015
- FHWA Approval by Randy Everett, January 14, 2013; updated approval by Anthony Sarhan, July 31, 2015
- Funding Concurrence for initially estimated value of \$500K provided by, Alan Chan, February 22, 2013; concurrence for reconciled value of \$2.27M provided by Janet Buoy, November 12, 2015

**Entitlement:**

The additional inspection and work associated with this change order is considered to be added work in accordance with General Provisions Section 1-04.4(1) WSDOT-Initiated Change, and therefore, the Design-Builder is due an equitable adjustment for an increase in Contract Price.

**Change Order Cost:**

A force account item, "CO#58 FA – PFS Add'l Underwater Insp/Repair Plan" had been established under Change Order 058R1 to provide reimbursement for the additional pontoon inspection operations. The payment item had been setup in this manner because it was difficult to quantify the amount of effort involved to inspect the pontoons and perform the crack mapping in order to develop the crack repair plan.

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Although the initial intent was to establish a new force account item to address the additional inspection and crack mapping covered under Change Order No. 068, the same force account item established under Change Order No. 058R1 was used to provide reimbursement to the Design-Builder for this change order as opposed to the establishment of a new item as the scope of work addressed in both change orders were considered similar.

The change order provides a reconciliation of the total actual force account cost. However, the engineer's estimate provided with this change order justification package reflects the original estimated amount at the time approvals were initially obtained and direction was provided to the Design-Builder to perform the crack mapping for Pontoons T, U, VNE and VNW. Backup documentation for actual payments made are available upon request.

**Contract Time:**

There is no change in Contract Time as a result of this change order.

**Attachments:**

- Change Order 068 for execution
- Change Order No. 068 Checklist
- Engineer's Estimate
- Approval Documentation
- Change Order No. 058R1
- WSDOT Letters 0185, 0197, 0229, 0237
- 03/08/2013 WSDOT to KGM Email
- Attachment A

DPB:jm  
Attachment  
PCO 177b  
cc: Julie Schurman, NB82-230  
PW CO 068 / folder

**WASHINGTON STATE  
DEPARTMENT OF TRANSPORTATION  
CHANGE ORDER**

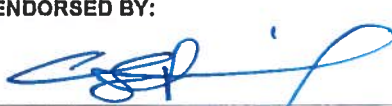
DATE: 06/25/15  
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CONTRACT NO: 008066 FEDERAL AID NO: BR-0520 (047)  
 CONTRACT TITLE: SR 520 / I-5 TO MEDINA - EVERGREEN POINT FLOATING  
 CHANGE ORDER NO: 68 FA-ADDTL UNDRWIR INSP & DGN

PRIME CONTRACTOR: SW0106139 KIEWIT/GENERAL/MANSON, A JOINT  
 33455 6TH AVE S  
 FEDERAL WAY WA 98003-6335

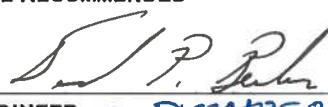
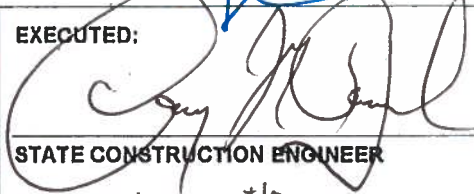
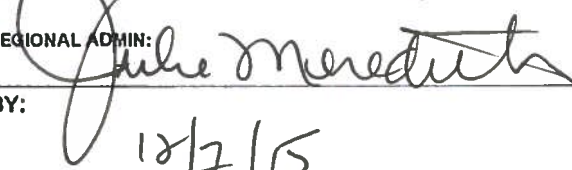
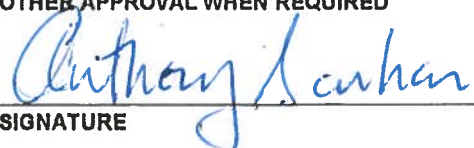
Ordered by Engineer under the terms of Section 1-04.4 of the Standard Specifications

Change proposed by Contractor

ENDORSED BY:  <hr/> CONTRACTOR DATE <u>7/6/15</u>	SURETY CONSENT: <hr/> ATTORNEY IN FACT <hr/> DATE
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ORIGINAL CONTRACT AMOUNT: 586,561,000.00  
 CURRENT CONTRACT AMOUNT: 755,431,995.00  
 ESTIMATED NET CHANGE THIS ORDER: 2,273,982.93  
 ESTIMATED CONTRACT TOTAL AFTER CHANGE: 757,705,977.93

Approval Required:  Region  Olympia Service Center  Local Agency

<input checked="" type="checkbox"/> APPROVAL RECOMMENDED <input type="checkbox"/> EXECUTED  PROJECT ENGINEER — <u>Director of Construction</u> DATE <u>December 4, 2015</u>	EXECUTED:  STATE CONSTRUCTION ENGINEER DATE <u>December 11<sup>th</sup> 2015</u>
<input checked="" type="checkbox"/> APPROVAL RECOMMENDED <input type="checkbox"/> EXECUTED REGIONAL ADMIN:  BY: <u>12/7/15</u> DATE	OTHER APPROVAL WHEN REQUIRED  SIGNATURE <u>12/11/15</u> DATE REPRESENTING <u>FHWA</u>



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All work, materials, and measurements to be in accordance with the provisions of the Standard Specifications and Special Provisions for the type of construction involved.

This contract is revised as follows:

The first paragraph above is revised to read:

All work, materials, and measurements to be in accordance with the request for proposal (RFP) and the contract documents for this project.

Description:

This is a WSDOT-Initiated Change in accordance with General Provisions Section 1-04.4(1). This change order supplements 008066 Change Order No. 058R1 which addresses additional pontoon inspection operations on the cycle 1 Pontoons Furnished by the State (PFS).

Under Construction Requirements of 008066 Change Order No. 058R1, after the bulleted item:

"\* Exterior crack mapping for the keel slab and submerged sections of the exterior walls for Pontoons V and W as shown on sheets 5 and 6."

the following additional crack mapping requirements shall be inserted:

"\* Exterior crack mapping for Pontoon V shall also include the top deck and area above the submerged sections of the exterior walls.

\* Exterior crack mapping for Pontoon W shall also include the keel slab and exterior walls of the area shown on 6 of 7 of 008066 Change Order No. 068."

After the bulleted item:

"\* Existing crack repairs shall be examined to determine if the crack repair sealed the crack completely or if additional repair is necessary."

the following pontoon inspection operation requirements shall be inserted:

"\* The Design-Builder shall provide a preliminary assessment, as soon as available, in regards to a crack repair plan for the end wall of Pontoon V which will be joined to Pontoon W.

The Design-Builder shall perform the following Work for type 1 longitudinal Pontoon U, and type 4 SSP VNW and type 6 SSP VNE:

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- \* An inspection of the pontoon exterior surfaces for Pontoons U, VNW and VNE shall be performed by divers. No representatives from Ben C. Gerwick, Inc. Consulting Engineers are required to be on-site during the dive operations. A permanent video record of the inspection shall be provided to the State on DVD. This Work shall also be in addition to the underwater inspection and videos to be provided to the State as required by other sections of the Contract.
- \* Provide a transcript identifying the cracks in the dive video.
- \* Exterior crack mapping of the keel slab, top deck, and the pontoon walls, both above and below the waterline, for Pontoon U, as identified on sheet 7 and 7 of this change order; 008066 Change Order No. 068. Crack mapping for Pontoon U shall be scheduled as soon as possible.
- \* Exterior crack mapping of the pontoon walls, both above and below the waterline, shall be performed for Pontoons VNW and VNE. The crack mapping shall take place after completion of the post-tensioning activities for Pontoon V.
- \* A representative from Ben C. Gerwick Inc. Consulting Engineers shall not be required.
- \* Identify and map all cracks greater than or equal to 0.006 inches in width, if possible.
- \* Existing crack repairs shall be examined to determine if the crack repair sealed the crack completely or if additional repair is necessary."

After the bulleted item:

"\* Expected service life of each repair option."

insert the following:

"The Design-Builder shall not proceed with Pontoon V and W joining operations until exterior end wall and keel slab modifications have been fully determined.

KGM shall develop means and methods that may be used for the modifications to take place to the end walls and keel slabs for the cycle 1 PFS. The means and methods are expected to include a coffer cell element to allow modifications to occur in a dry environment."

Payment:

The State will reimburse the Design-Builder for the Work associated with the additional pontoon inspection operations, and development and submittal of the crack repair plan, by force account in accordance with General Provisions Section 1-09.6 under the existing force account item, "CO#58 FA-PFS Add'l

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Underwater Insp/Repair Plan".

The value of this change order shall be \$2,273,982.93. This will result in a total value of \$2,773,982.93 for the existing force account item "CO#58 FA-PFS Add'l Underwater Insp/Repair Plan".

Time:

There shall be no increase in Contract Time as a result of this change order. Contract Time impacts related to the additional pontoon inspection operations on the cycle 1 PFS specified in 008066 Change Order No. 058R1 and this change order are considered to be resolved under 008066 Change Order No. 142.

**WASHINGTON STATE  
DEPARTMENT OF TRANSPORTATION  
CHANGE ORDER**

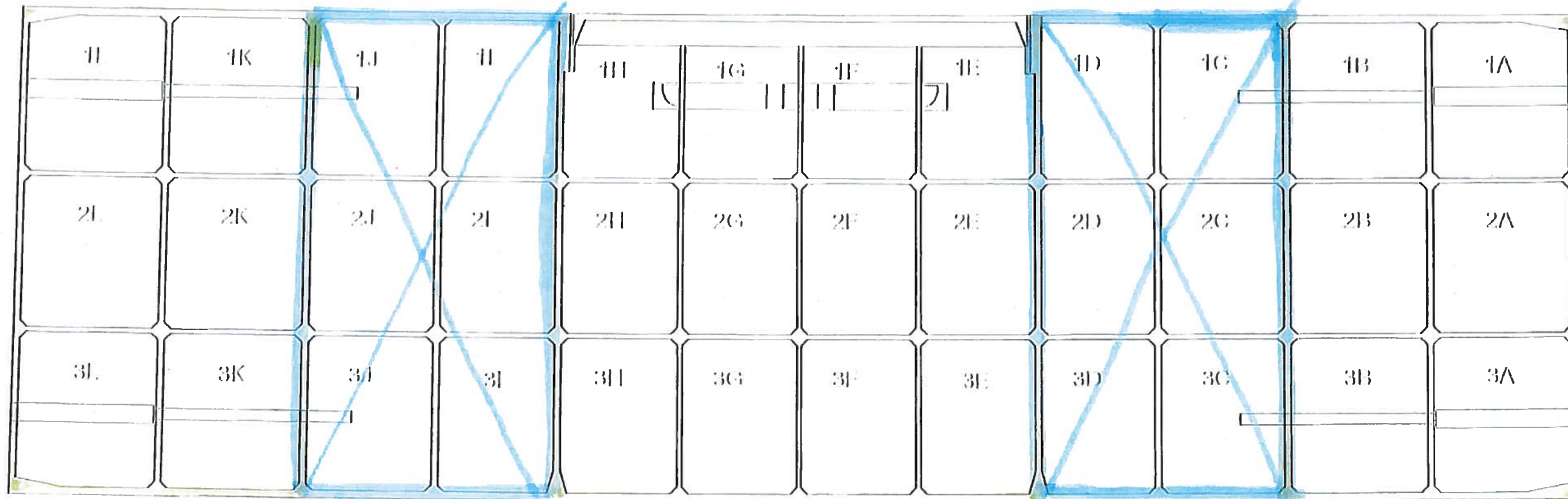
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CONTRACT NO: 008066				CHANGE ORDER NO: 68			
ITEM NO	GROUP NO	STD ITEM	ITEM DESCRIPTION	UNIT MEASURE	UNIT PRICE	EST QTY CHANGE	EST AMT CHANGE

0012	01		CO#58 FA-PPS ADD'L UNDERWATER INSP/REPAIR	EST.	0.00	0.00	2,273,982.93
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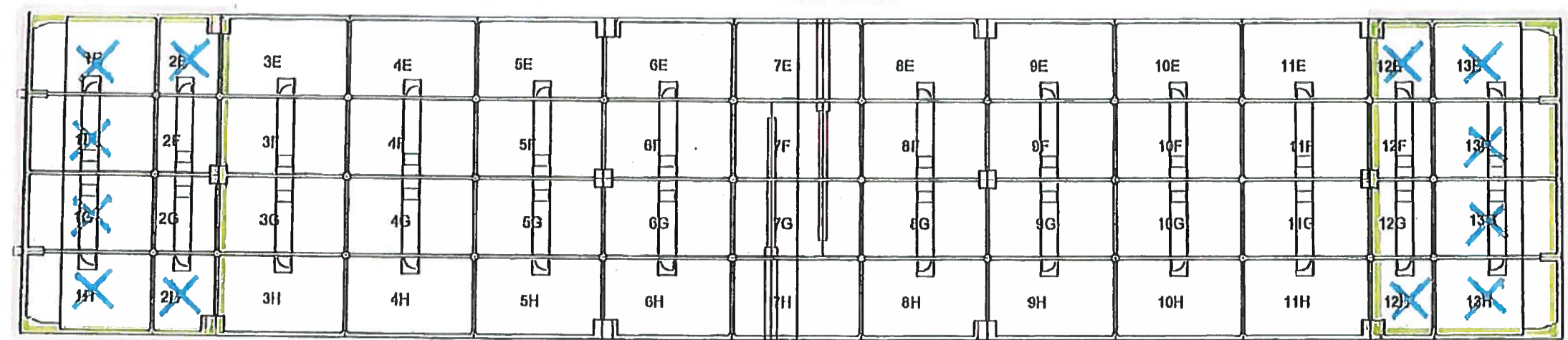
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2,273,982.93  
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### "W" PONTOON



 Limits of underwater keel slab and exterior wall inspection

"U" PONTOON



-  Interior cells inspection
-  Limits of underwater keel slab inspection
-  Exterior wall inspection