FRASER CROSSING
PROJECT CORP

Marine Users Working Group

Presented By: Fraser Crossing Partners and Transportation Investment Corporation

July 31, 2025

Welcome

- Review of June 26 Meeting Minutes
- Navigation Log
- Project Update
- River Monitoring Update
- Demolition Planning Update
- 4 Week Look-Ahead Schedule
- Roundtable Discussion
- Next Steps

Review of Meeting Minutes

June 26, 2025

Meeting Minutes – June 26, 2025

- FCP provided a Project update:
  - Progress of cantilever construction continues, with activities focused on SM-14 and the SMB14 (backspan).
  - Finishing works ongoing (pours of center barrier and side parapets, curves and gutters, and erecting light fixtures and fencing).
  - Cable stays erection and steel installation over the Fraser River ongoing.
  - Precast panel installation and concrete deck pours ongoing.
  - Cantilevered spans are completed on the New Westminster side.
- FCP provided a River Monitoring Update:
  - June 9, river monitoring were presented and compared with previous months: the results show some areas filling in and moving around, with infill and lower levels of water observed in the future navigational channel. Established thresholds continue to be monitored.
  - Post-construction surveys will be conducted to compare changes in the river after the project is completed.
- FCP provided a 4-week look-ahead:
  - SM 14 is currently being worked on within the administrative safety channel, with no interference to navigation, and the duration for each segment placement is about two to three weeks.
  - Future segment placements, including SM 15, 16, 17, 18, and 19, are scheduled, with no restrictions or interferences to navigation.
- Round Table:
  - Conal Kavanagh noted a discrepancy with the presentation slides that referenced interferences to navigation, while Russ had noted there would be no interferences associated with upcoming cantilever construction work. Russ advised that this was an error.

Navigation Log

Marine Occurrences as a Result of the Project

**No updates to report*

Project Update

Works in Progress

Project Update

S1 Tower and Cantilever Construction

Photo 1: Main span - cable stay – main span progress to North Approach

Photo 2: Concrete overlay main span to South Approach

Project Update

South Approach Girder/Deck Panels Installation

Photo 3: South Approach-end span- main span connection and cable stay installation ongoing

Photo 4: South Approach-end span deck panel installation and concrete overlay

Project Update

N1 Tower and North Approach

Photo 5: Ongoing girder and panel installation for the North Approach

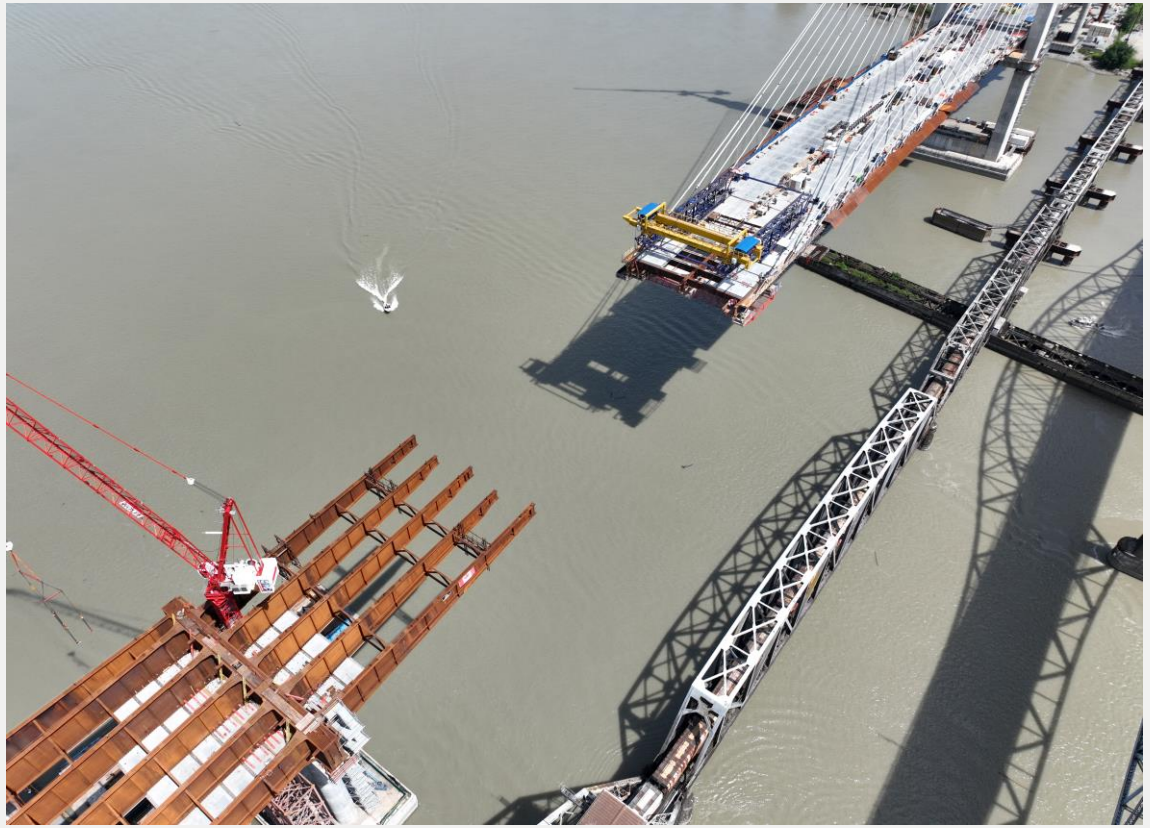
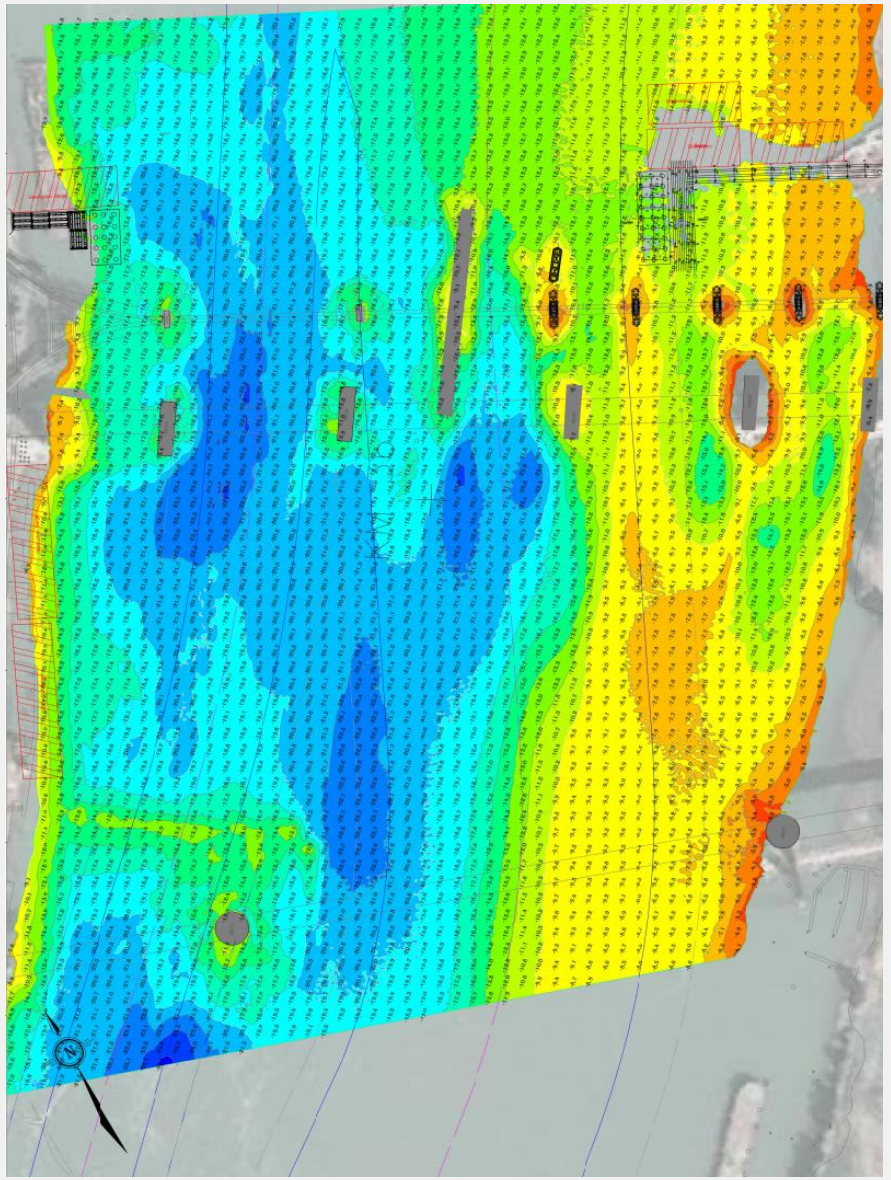


Photo 6: North Approach connection to main span ongoing

River Monitoring Update

Monitoring Results

Bathymetry Monitoring Survey Results –
July 7, 2025



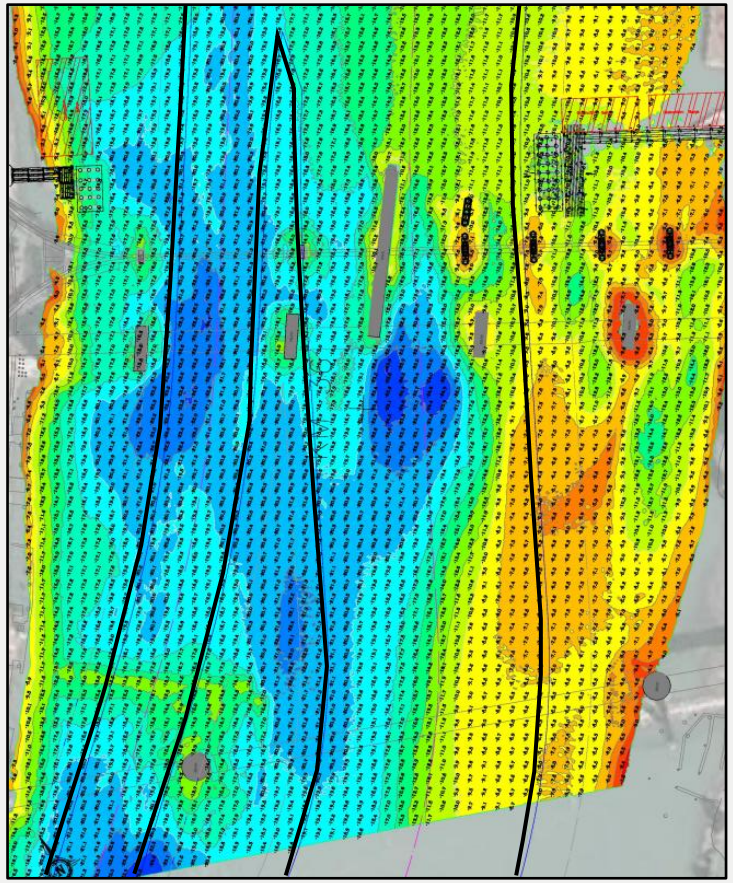
Elevations Table			
Number	Maximum Elevation	Minimum Elevation	Color
14	0.00	−2.00	
13	−2.00	−4.00	
12	−4.00	−6.00	
11	−6.00	−8.00	
10	−8.00	−10.00	
9	−10.00	−12.00	
8	−12.00	−14.00	
7	−14.00	−16.00	
6	−16.00	−18.00	
5	−18.00	−20.00	
4	−20.00	−22.00	
3	−22.00	−24.00	
2	−24.00	−26.00	
1	−26.00	−28.00	

Bathymetry Results:

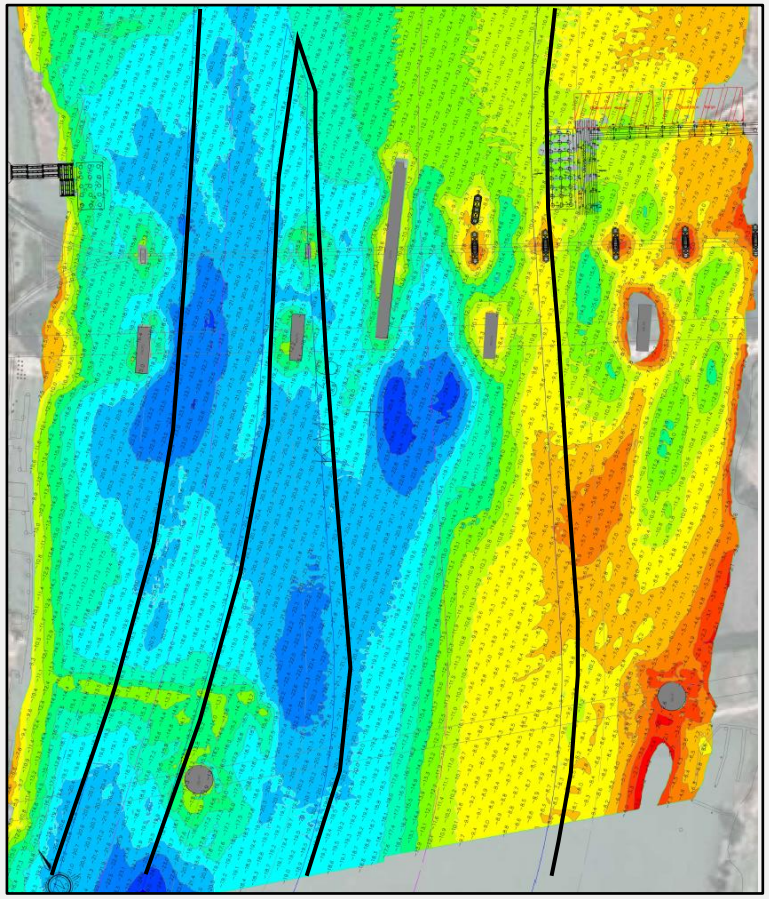
Comparison of Survey Results - Sep 2024 to Jul 2025

Elevations Table

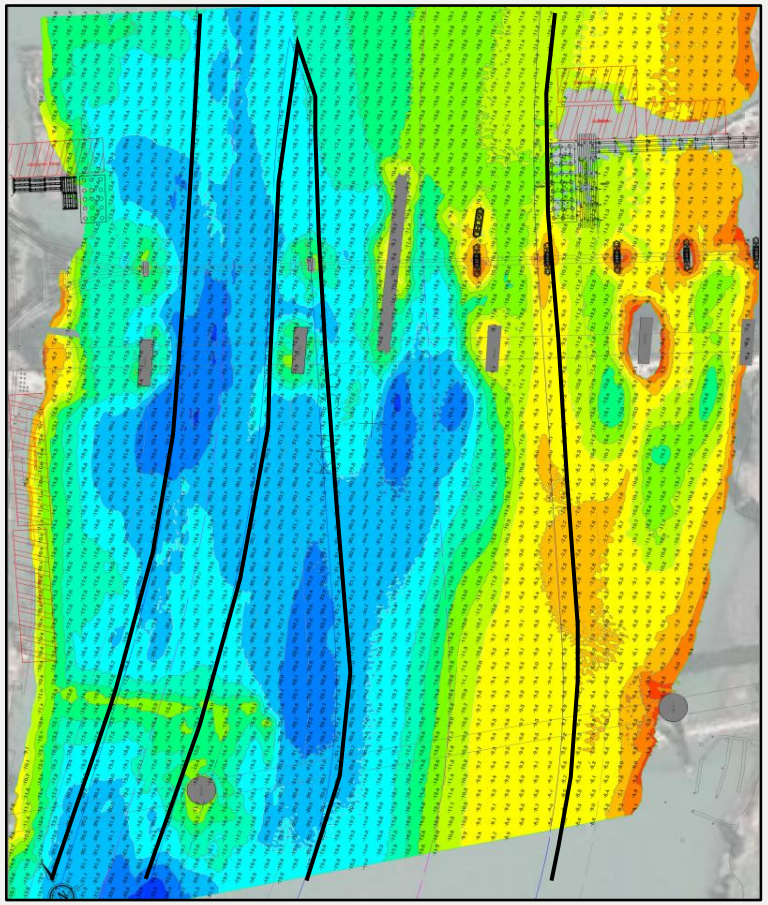
Number	Maximum Elevation	Minimum Elevation	Color
14	0.00	−2.00	
13	−2.00	−4.00	
12	−4.00	−6.00	
11	−6.00	−8.00	
10	−8.00	−10.00	
9	−10.00	−12.00	
8	−12.00	−14.00	
7	−14.00	−16.00	
6	−16.00	−18.00	
5	−18.00	−20.00	
4	−20.00	−22.00	
3	−22.00	−24.00	
2	−24.00	−26.00	
1	−26.00	−28.00	



September 23, 2024



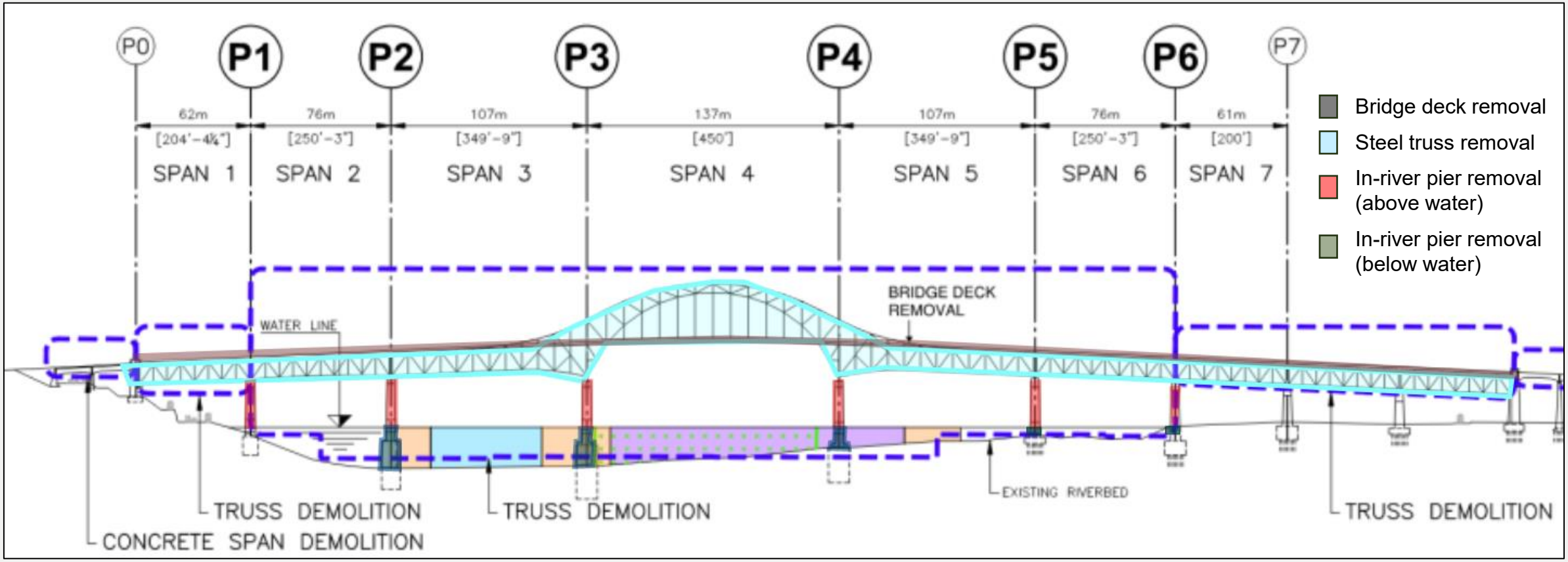
February 10, 2025



Jul7 7, 2025

Demolition Planning Update

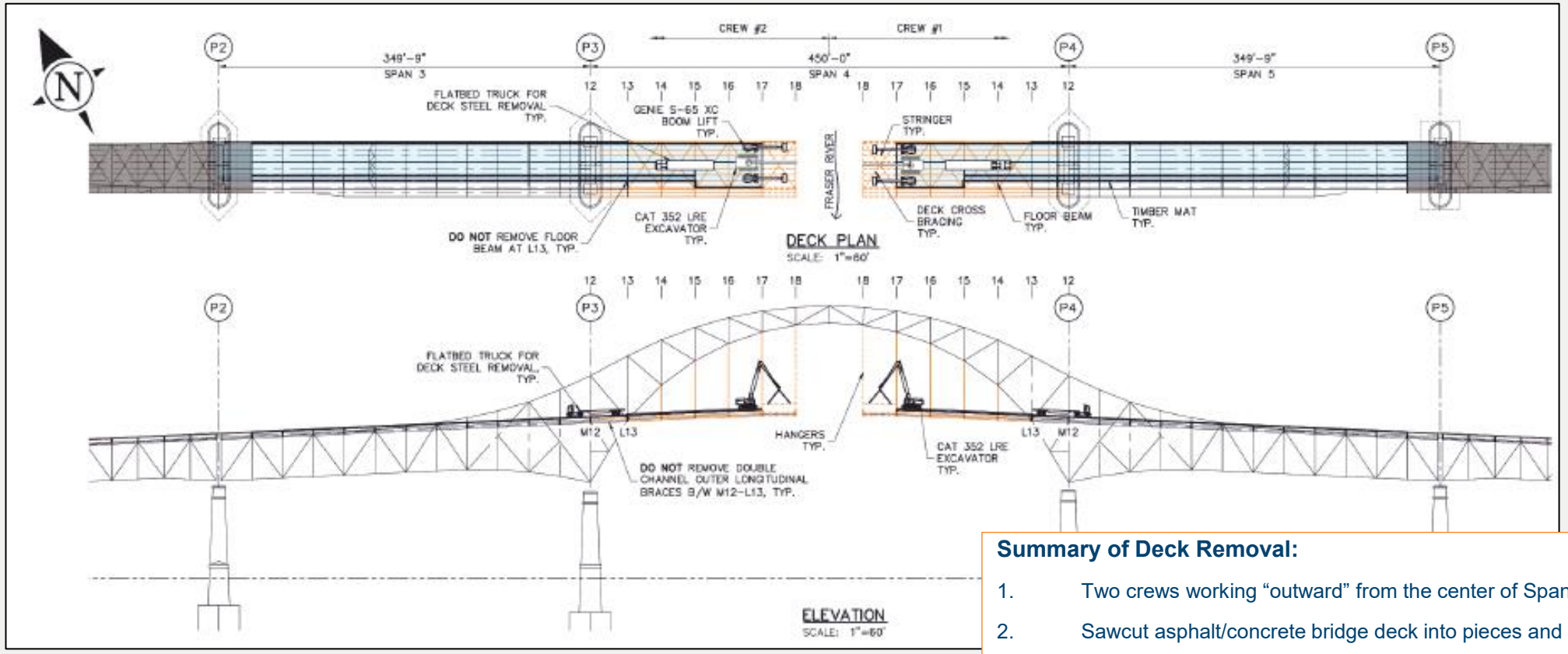
Demolition Plan



Demolition Planning

Bridge deck removal	Steel truss removal	In-river pier removal (above water)	In-river pier removal (below water)
• Methods remain the same (as per Marine Demolition Communication Plan R2 and Marine Demolition and Stage Plan R2)	• Steel truss (Span 4) removal via strand jacks and lowering span onto barge(s) (Jan 30/25 IMUWG/MUWG) • Similar lowering approach on remaining in-river spans (May 29/25 IMUWG/MUWG) • Updated methods limits the number of cuts and reduces interferences to navigation	• In-river pier removal via conventional demolition (P1 to P6) (Mar 27/25 IMUWG/MUWG) • Equipment positioned on flexi-float modular barge which surrounds the pier and contains the materials • Updated methods reduces duration of works	• Technical Evaluation of Removal Methods

Deck Removal



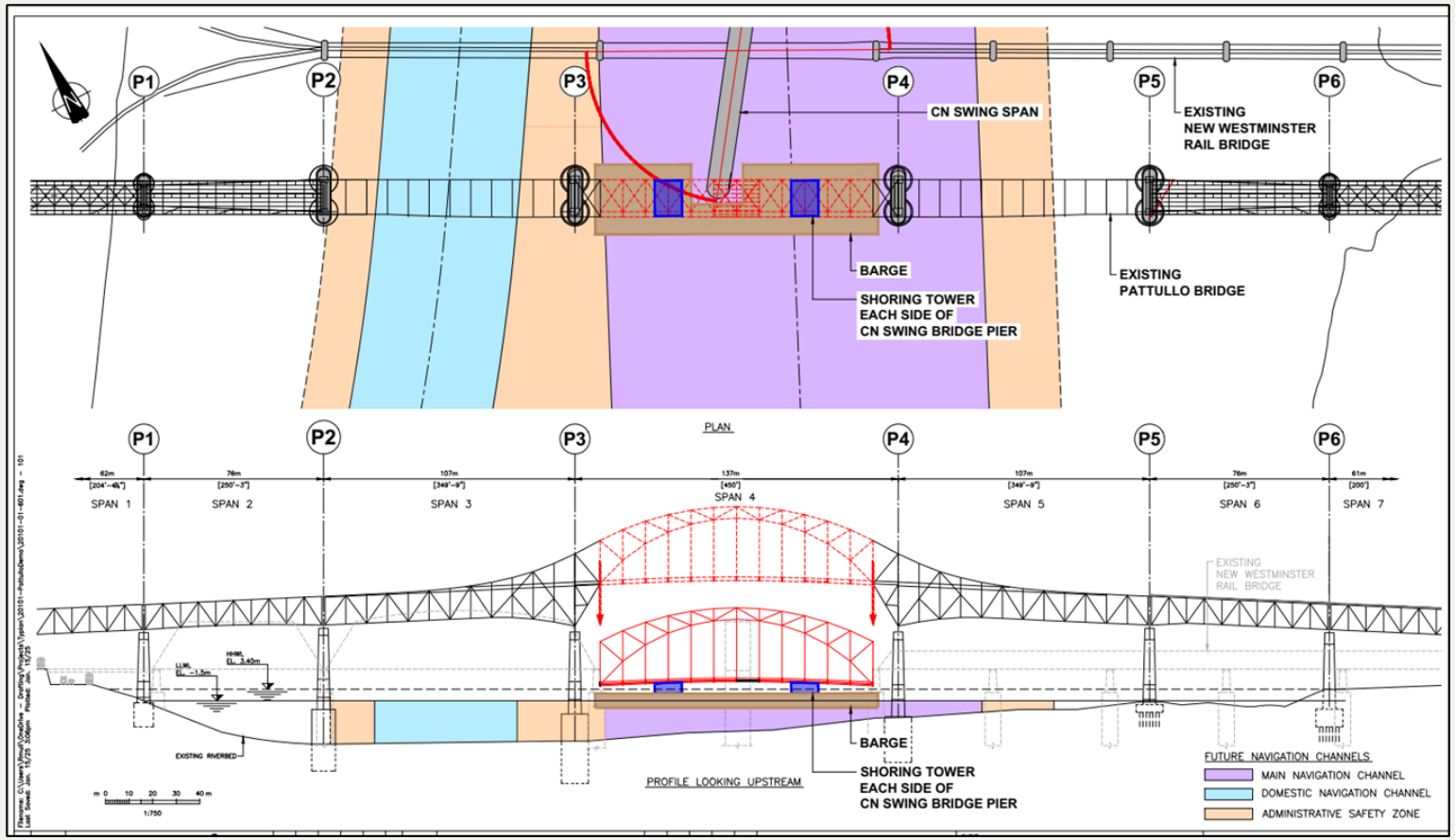
Summary of Deck Removal:

1. Two crews working “outward” from the center of Span 4
2. Sawcut asphalt/concrete bridge deck into pieces and lift on a flat bed truck
3. Cut and remove steel girders and cross braces
4. Removed material will be taken to “drop points” on either end of the bridge
5. Removed material will be taken to an offsite recycling facility

Steel Truss – Span 4 Removal

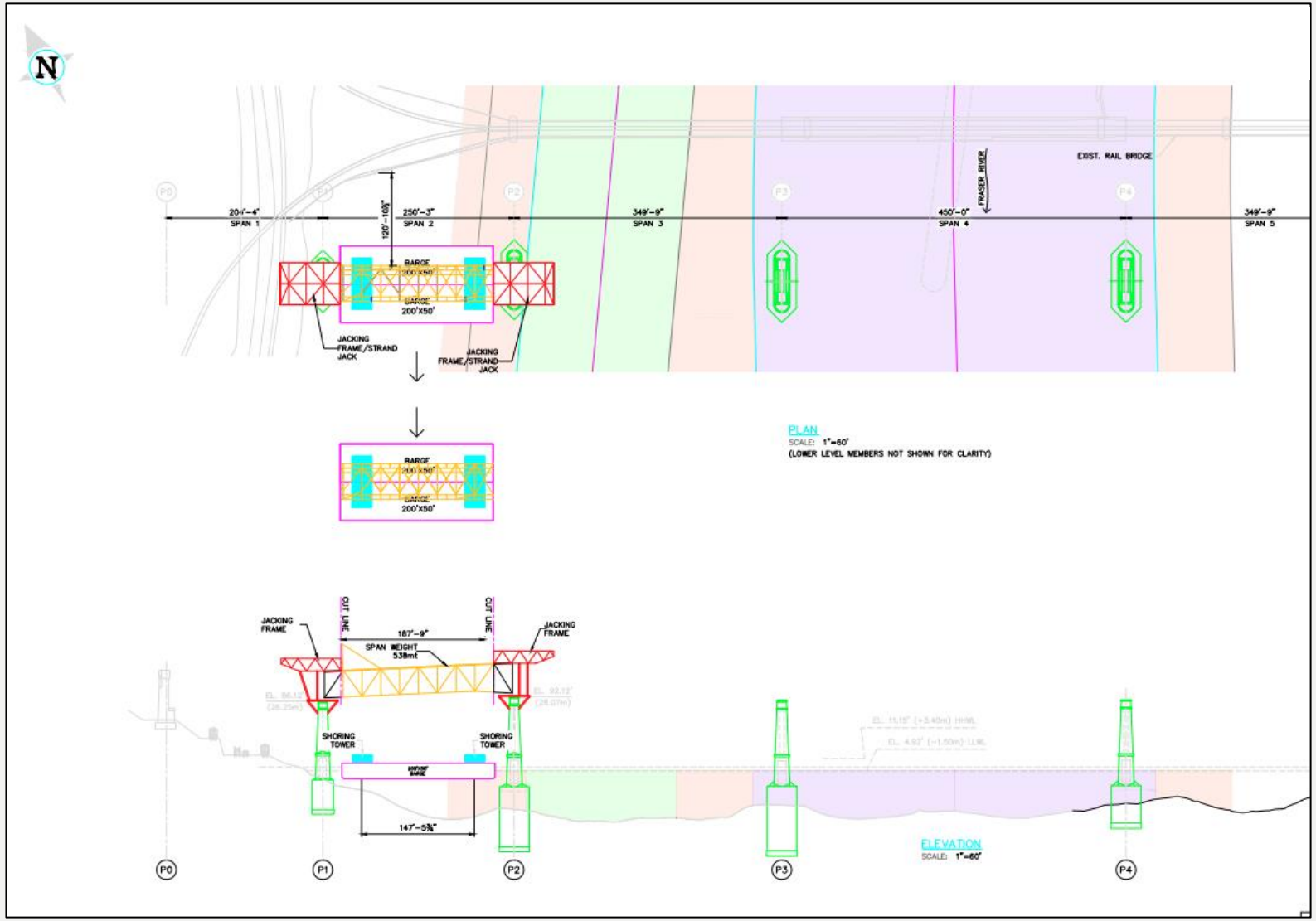
Summary of Removal:

1. Set up barge next to piers with shoring towers positioned on either side of a vertical member
2. Use strand jacks to lift up the span off the pier(s) bearings
3. Move barges with steel span away from piers
4. Lower steel span down onto barges
5. Send directly to recycling facility



Implications to Navigation: requires short term closure of main navigation channel (12-36 hrs)

Steel Truss – Span 2 Removal



Proposed Removal Methods:

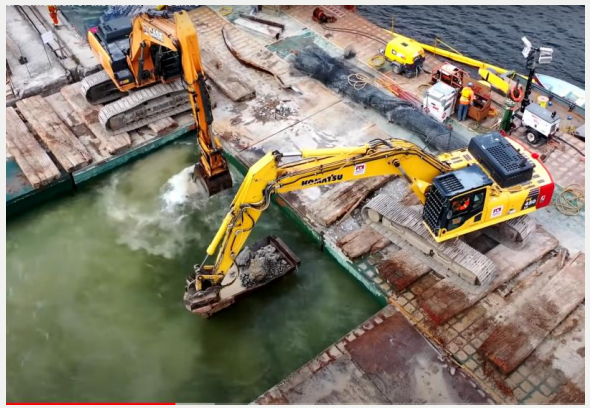
1. Install temporary struts and jacking frames, engage the strand jacks and cut the span
2. Set up barge next to piers with shoring towers positioned on either side of a vertical member
3. Using strand jacks, lower the span and place on barge
4. Move barge with span away from pier

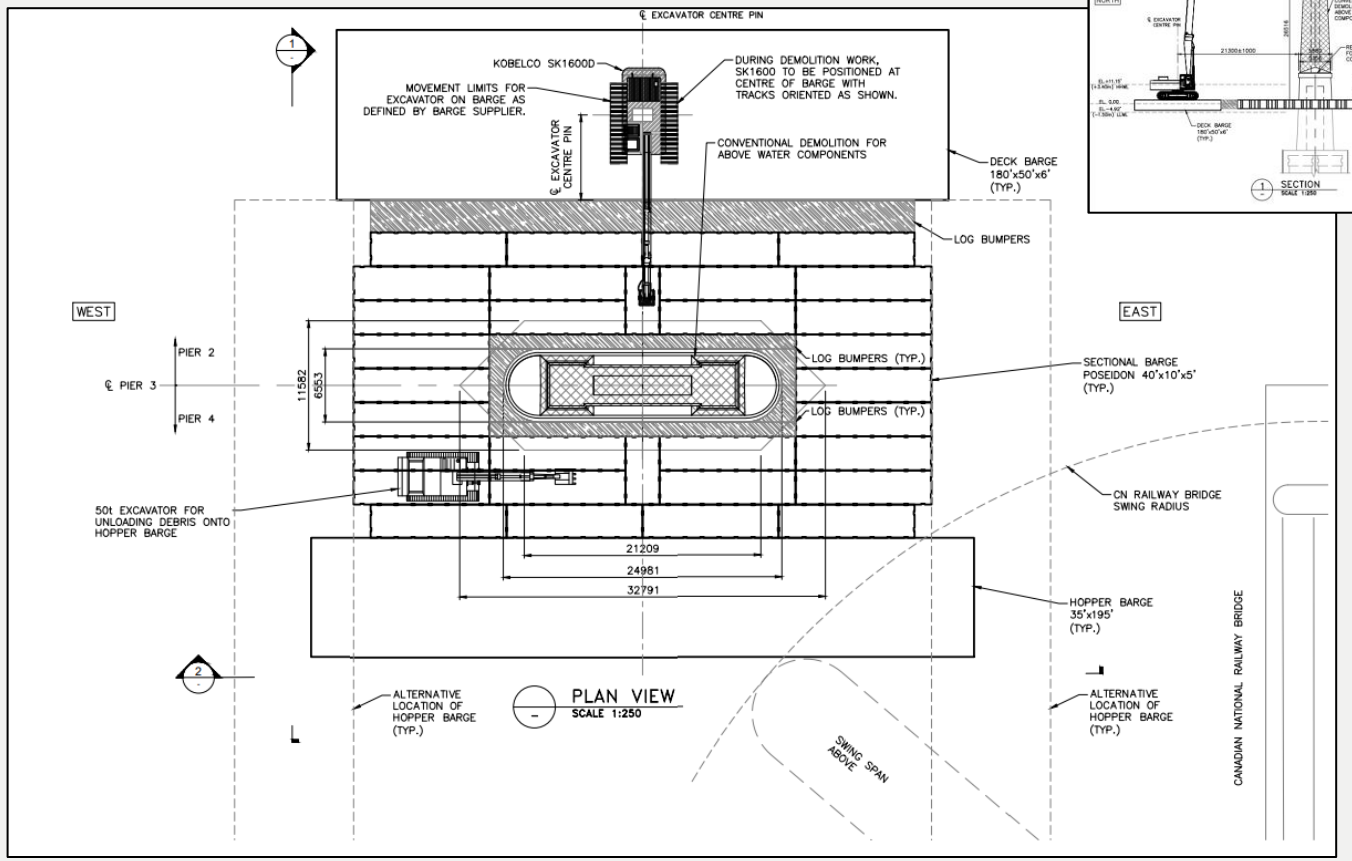
Implications to Navigation:

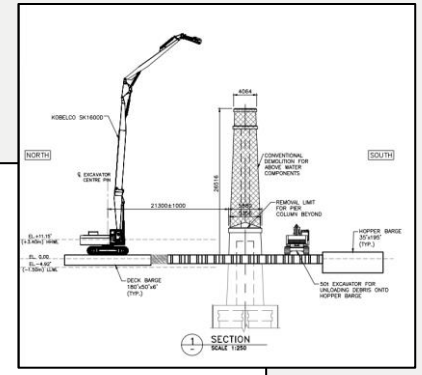
- Equipment sited outside of the domestic navigation channel; no restrictions to navigation
- Estimated duration of works: 4 weeks

In-River Pier Removal
Above Water

- Conventional demolition of the pier column involves use of boom-mounted hydraulically powered impact hammers, shears, and pulverizers to break apart the existing pier materials
- Equipment is positioned on flexi-float modular barge that surround the pier and contain demolition debris
- Material barge is positioned alongside with excavator(s) for offloading material
- Estimated duration of works: 1-2 wks/pier



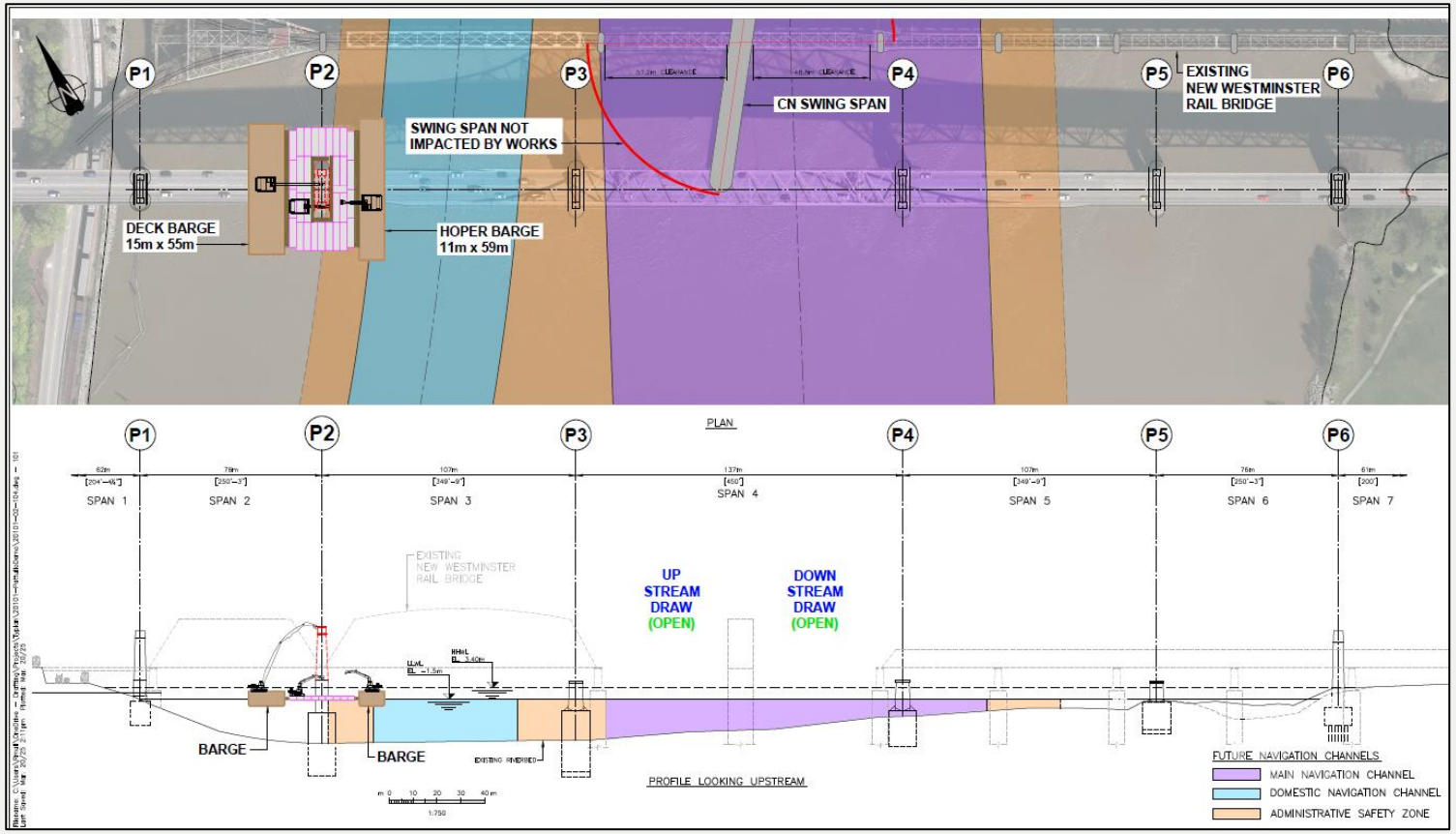


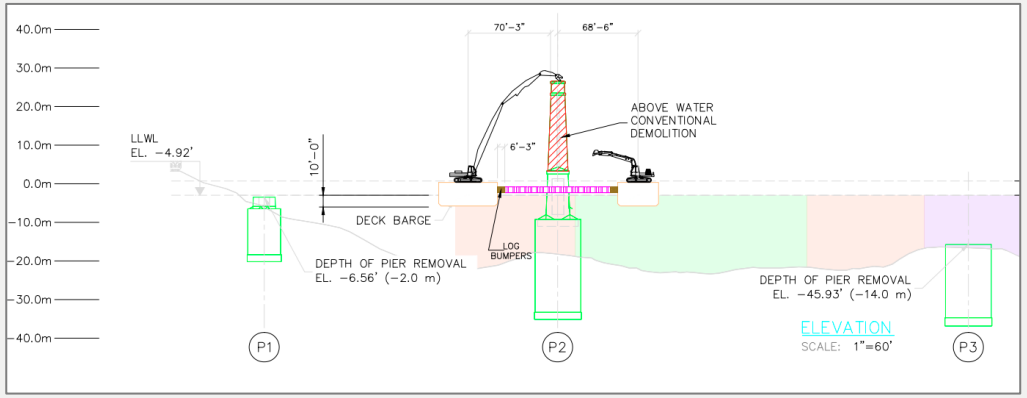


In-River Pier Removal (above water)

Pier P2:

- Equipment sited partially within the domestic channel
- Estimated duration of works: 2 weeks





In-River Pier Removal (Below Water)

Technical Evaluation

In-River Pier Removal (below water)

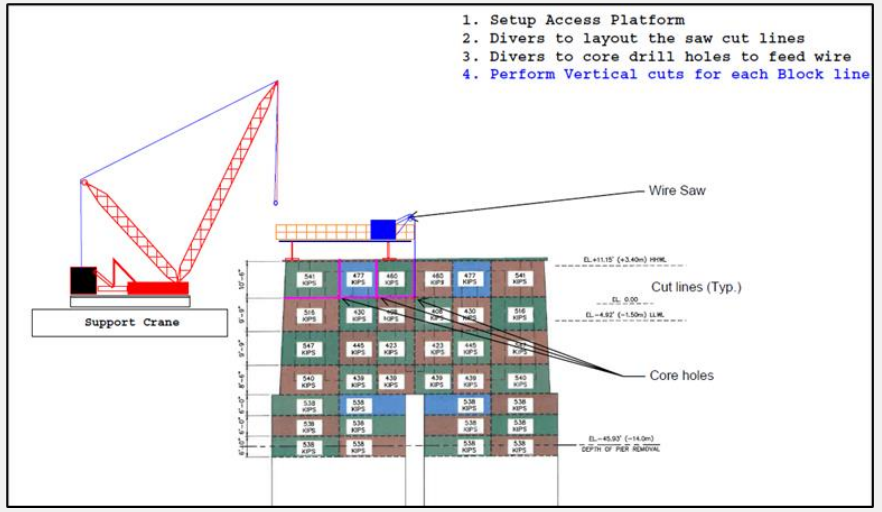
Scope of Technical Evaluation

- Evaluation included three (3) demolition methods:
  - wire saw cutting,
  - conventional demolition, and
  - controlled blasting.
- Also considered use of cofferdams and hybrid approaches to facilitate pier removal.
- Each method was assessed against three (3) key engineering criteria:

1. Technical Considerations	2. Safety Risks	3. Schedule Implications
• Feasibility and practicality of the method given the structure of the piers and river conditions	• Risks to workers, equipment, adjacent infrastructure and general public safety	• Duration of works affects schedule, which can have knock on effects to the other criteria and project components

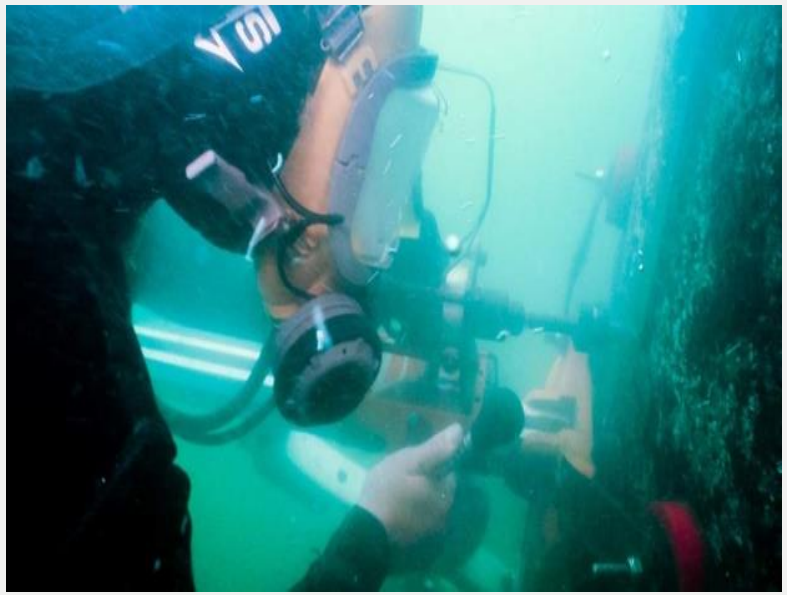
Wire Saw Cutting

Wire Saw Cutting – Setup Overview



Underwater wire saw cutting is highly intricate:

- Drilling: Divers core through pier walls to feed wire through
- Rigging: Pulleys installed at core holes to form a cutting circuit
- Power: Diamond wire driven by surface-mounted motor (barge or fixed platform)



Wire Saw Cutting

Summary of Technical Evaluation

Technical Considerations	Safety Risks	Schedule Implications

• Setup Complexity and Risk
  • Precision alignment
  • Core drilling setup (Diver time)
  • Voids and misalignment
  • Obstructions and malfunctions
  • Depth and drag forces
• Presence of Wood (polishes the wire)
• Subcontractor Feedback (3 of 5 did not want to bid)
	• Diver Safety
	  • Diver Dependence
	  • Limited visibility
	  • River conditions
	  • Operation risk
	  • Marine Traffic
		• Cut Volume and Complexity
		  • 10x more cuts for P2 to P4
		• Diver Involvement
		  • More cuts = more diver time
		  • Restricted Work windows
		  • Only work during slack time during the day
		• More cuts = More set-up time and crane lifts

Piers	P1	P2	P3	P4	P5	P6	Total
# of weeks (up to 7 days/wk)	4	64	39	45	9	7	167

Conventional Demolition

Overview of Method

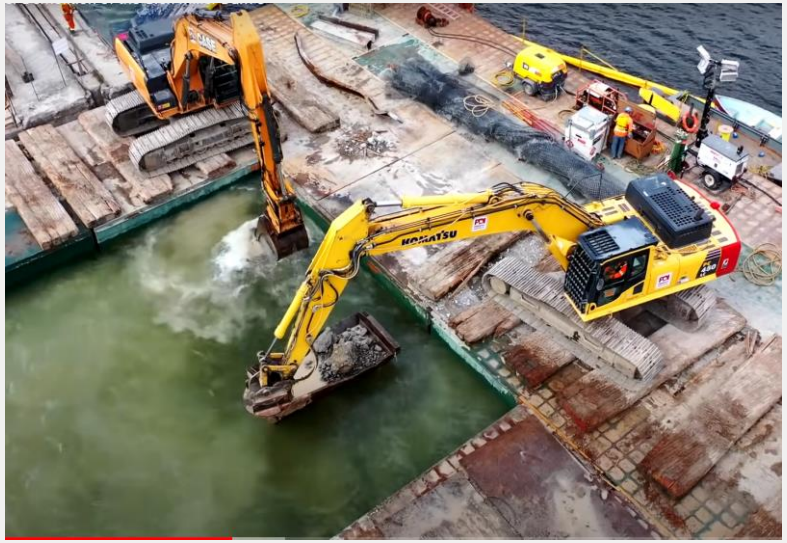
- Uses hydraulic hammers, shears, and pulverizers on boom-mounted equipment
- Sequence: Demolish concrete → Shear rebar → Excavate and remove debris

Equipment Setup

- Positioned on flexi-float barges beside pier
- Material barges placed nearby for offloading

Operation Sequence

- Implements swapped out based on material type (e.g., pulverizer for concrete, shears for rebar)
- Operations alternate between breaking structure and clearing debris



Equipment positioned on flexi-float

Convention Demolition

Summary of Technical Evaluation

Technical Considerations	Safety Risks	Schedule Implications

• Depth Constraints
  • Equipment has 12 m (40 ft) reach, but only effective to 6 m (20 ft)
• River Force Reduce Precision
• Hydrostatic Pressure Effects on Equipment
• Equipment limitations for Piers P2 to P4
	• Visibility Challenges
	• Fractured Material Hazards
	• Risk of Hydraulic Leak
	• Platform Stability
	• Diver Safety
	  • Divers needed mainly for inspection and cleanup confirmation
		• Effects of Depth on Productivity
		  • Physically can't reach depths at piers P2, P3, and P4
		• Coordination Delays
		  • Alternating between breaking and cleanup adds time
		• Underwater work slowed by:
		  • Restricted boom movement
		  • Water drag
		  • Reduced precision

Piers	P1	P2	P3	P4	P5	P6	Total
Total Weeks	4	28	27	29	5	4	97

Controlled Blasting

Overview of Method:

Blast Design:

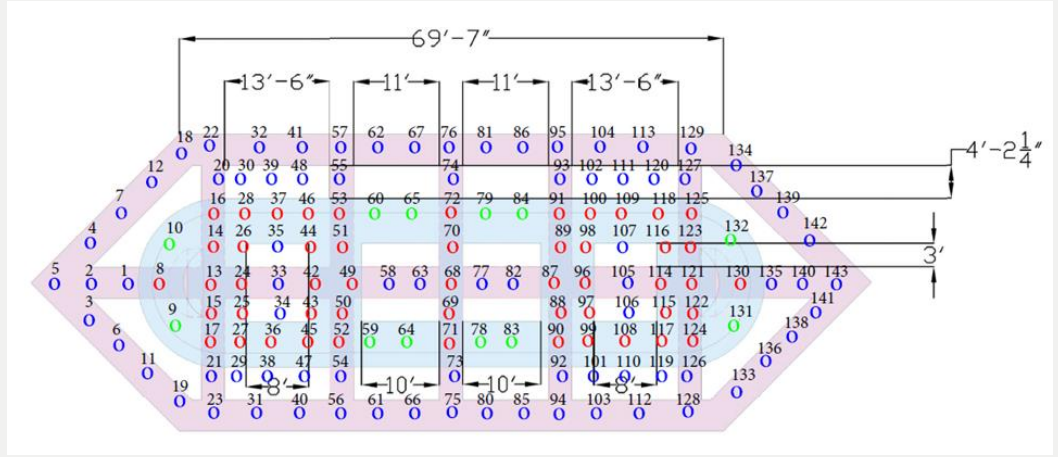
Strategic explosive placement reduces peak pressures and vibrations while achieving the desired fragmentation.

- Designs account for internal voids, timber caissons and hydrostatic conditions.
- Explosives promote internal collapse, limiting debris spread.
- Electronic detonators provide precise sequencing, timing, and charge control.

Drilling and placement of explosives:

- Explosives are installed via top-down drilling from a rig positioned above water at all times.
- A drill rig with self-contained dust-controlled system bores into the caisson walls and voids to precise depths.

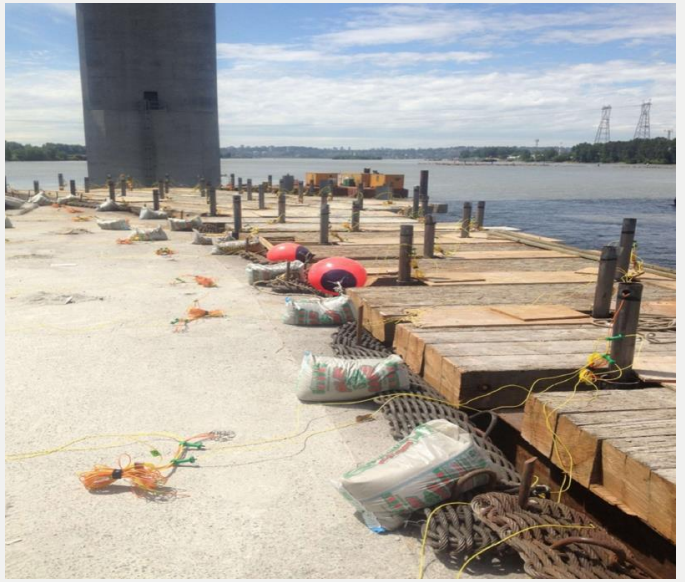
Typical arrangement of drilling holes for placing explosives



Example blast design (Pier P3)

Controlled Blasting

Blast mats in position prior to detonation.



Installation of Blast Mats:

- Blast mats are placed to contain the blast, prevent flying debris, and suppress dust.
- Full coverage of the pier top is required for containment.

Blast Attenuation System (BAS):

- BAS (bubble curtain) deployed around the pier to reduce underwater pressure resulting from the blast.

Post Blast Clean Up:

Following the blast, debris is removed using:

- Specialized excavators (for shallow piers) or crane-mounted clamshell buckets (for deeper piers)
- Concrete, rebar, and timber are lifted to meet the required cut-off level.
- Bathymetric surveys to be conducted pre- and post-blast clean-up to confirm material removed to required elevation.

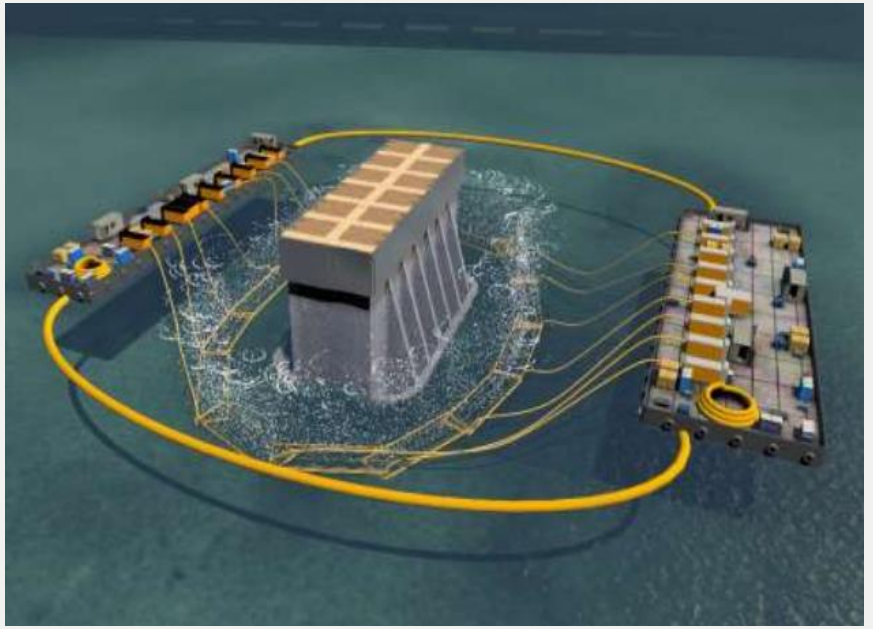


Illustration of bubble curtain (BAS) system deployment around pier.

Controlled Blasting

Summary of Technical Evaluation

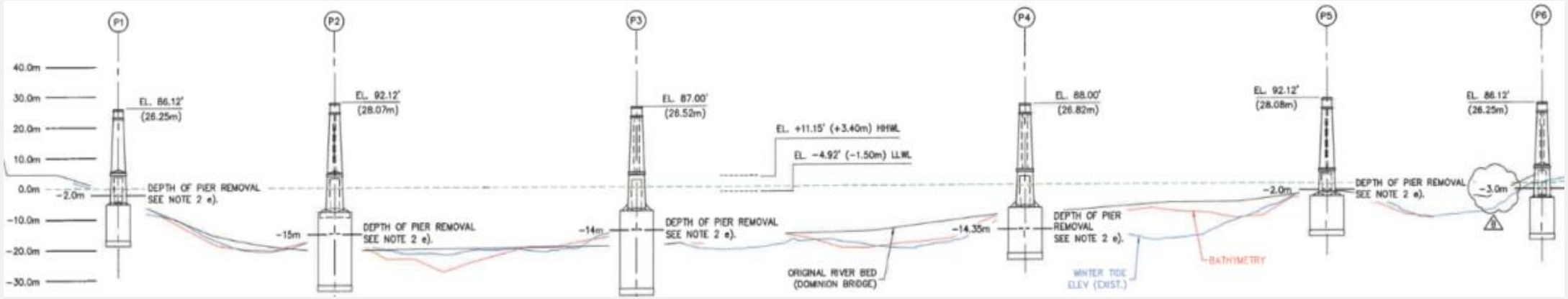
Technical Considerations	Safety Risks	Schedule Implications

• Adaptability to Depth
  • Effective at all depths
• Debris Containment
  • Controlled fragmentation to minimize dispersal
• Surface-only Operation
	• Transportation, Storage and Handling of Explosives
	• Risk of Unexploded Charge
	• Blast Impact Zone
	  • Specific to the public and marine traffic
	• Vibration Impacts
	• Diver Risks
	  • limited exposure risk
		• Expedited Timelines
		  • All pier removals completed within less than one year.
		• Simplified Operations:
		  • Post-blast cleanup is a focused and continuous effort, unlike the stop-start nature of conventional demolition.

Piers	P1	P2	P3	P4	P5	P6	Total
Total Weeks	4	5	5	5	4	4	27

Summary of Technical Evaluation

Pier Specific Recommendations

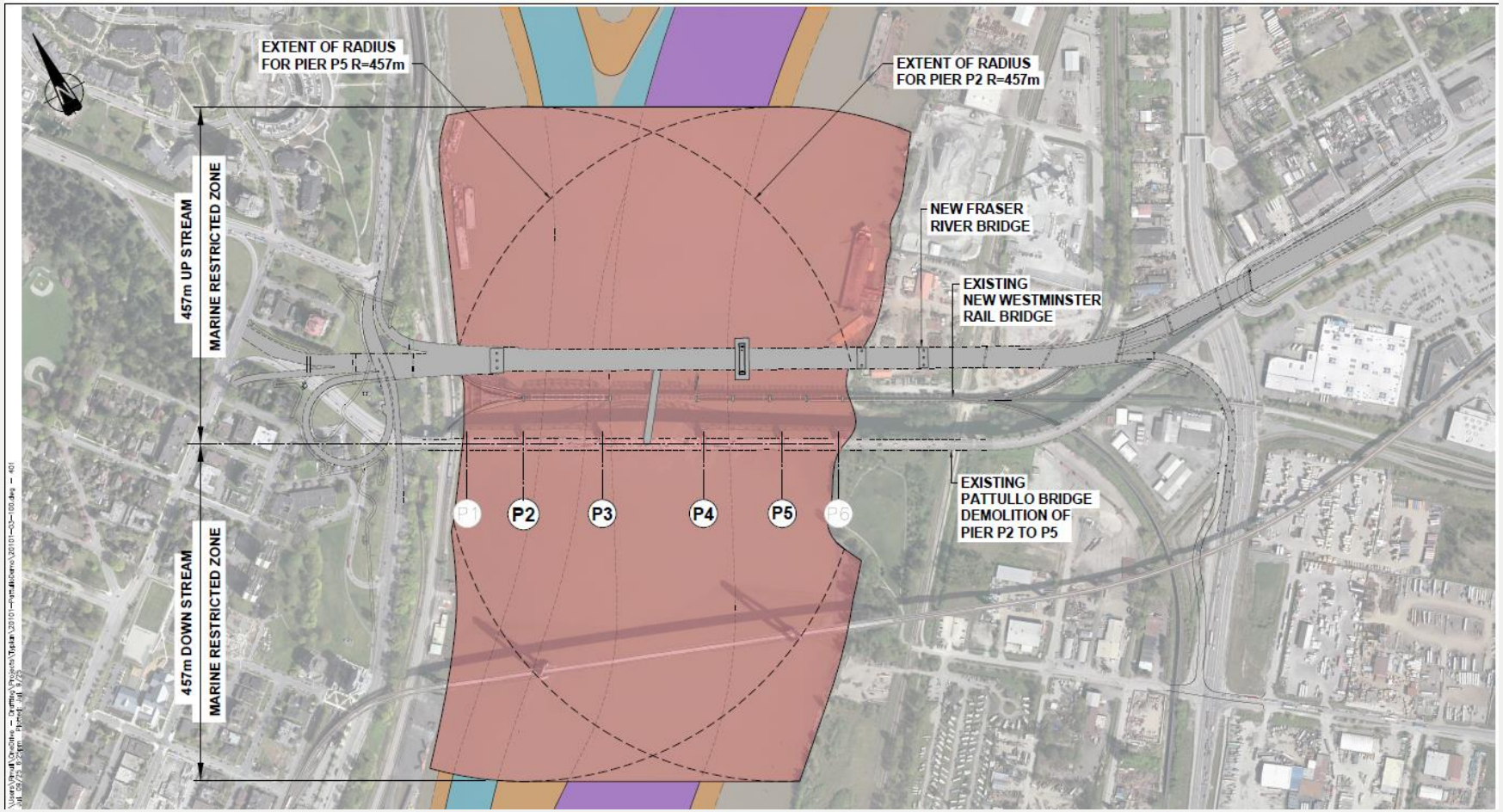


Pier P1	Pier P2	Pier P3	Pier P4	Pier P5	Pier P6
Conventional demolition	Controlled blasting	Controlled blasting	Controlled blasting	Controlled blasting or conventional demolition	Conventional demolition

Controlled Blasting

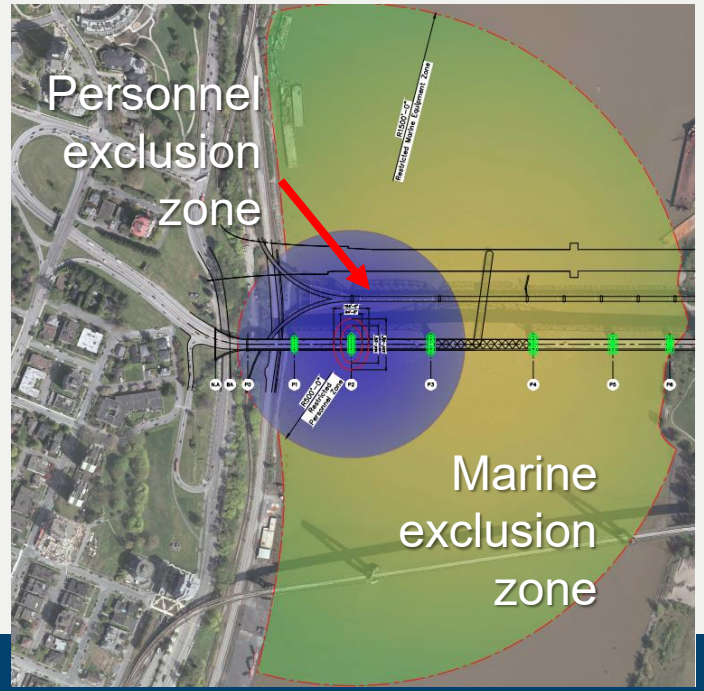
Marine Safety Exclusion Zone

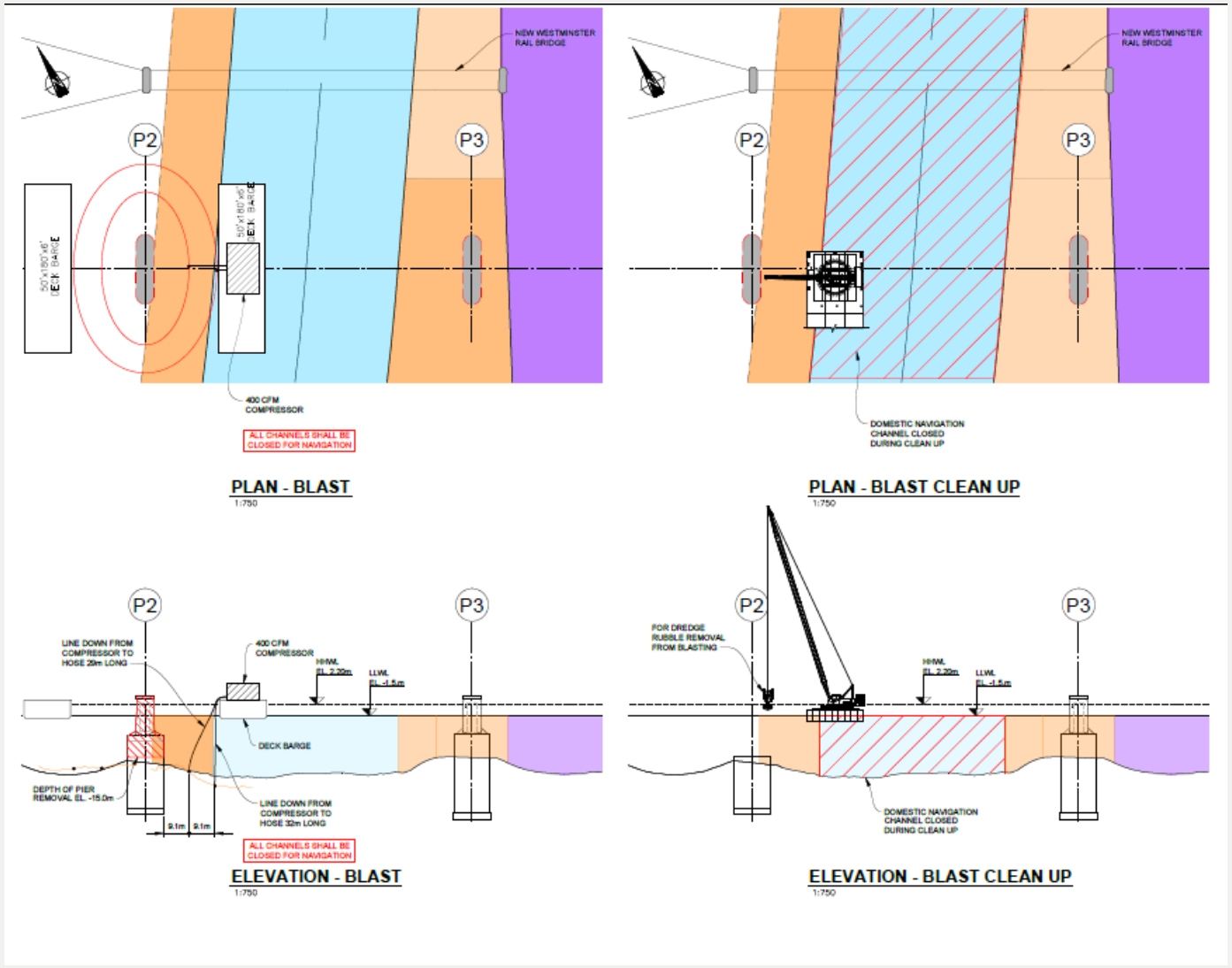
- Controlled blasting requires the following safety exclusion zones:
  - 450 m (1500 ft) marine traffic safety zone enforced by safety boats
  - 75 m (250 ft) radius cleared of all personnel and secured by guards
- Requires a full closure of the navigation channel for each blast event (approx. 2-4 hrs)



Controlled Blasting – Pier P2

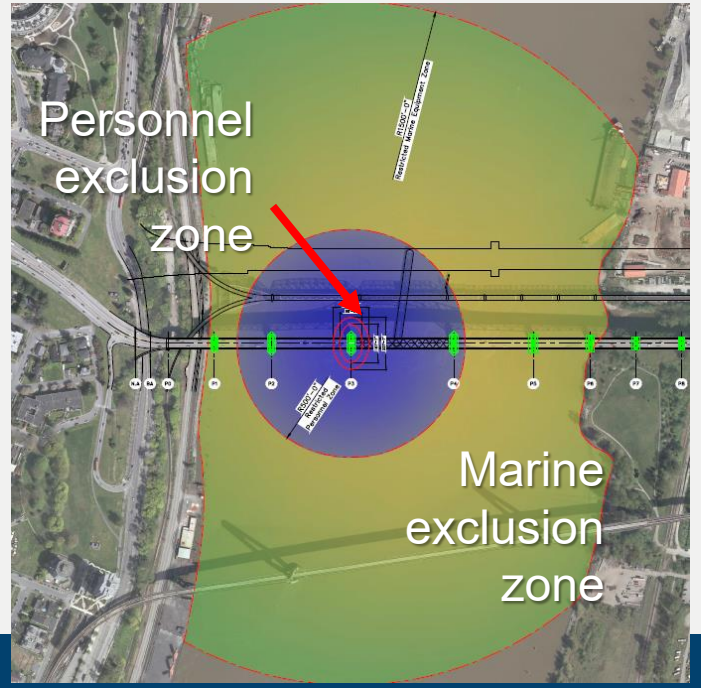
- Drilling and placement of explosives (1-2 wks); no interference to navigation
- Controlled blast (blast occurs in < 3 seconds; up to 4 hr closure of navigation channel to complete pre-blast clearance procedures)
- Post blast clean up (2 wks); restriction in domestic channel

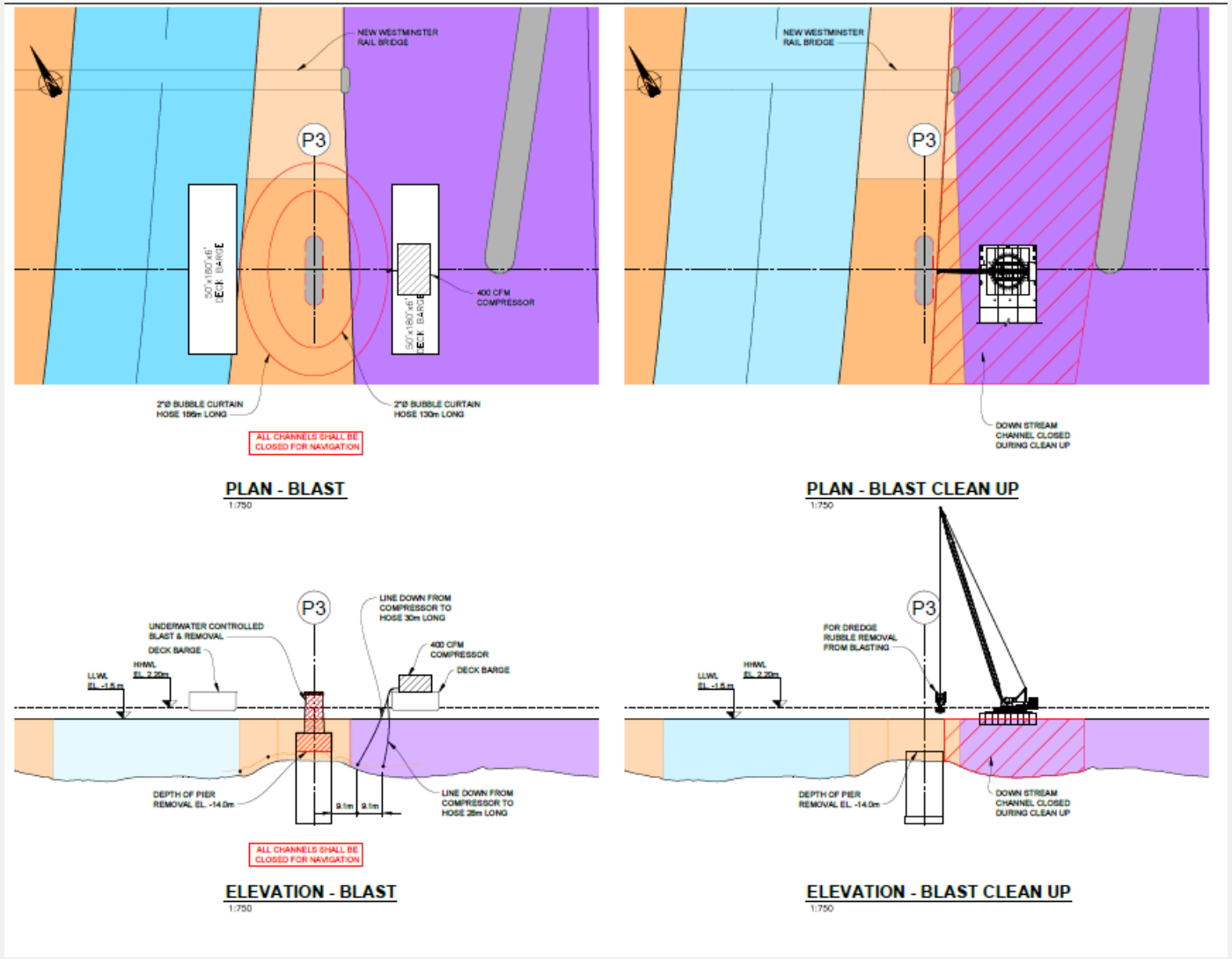




Controlled Blasting – Pier P3

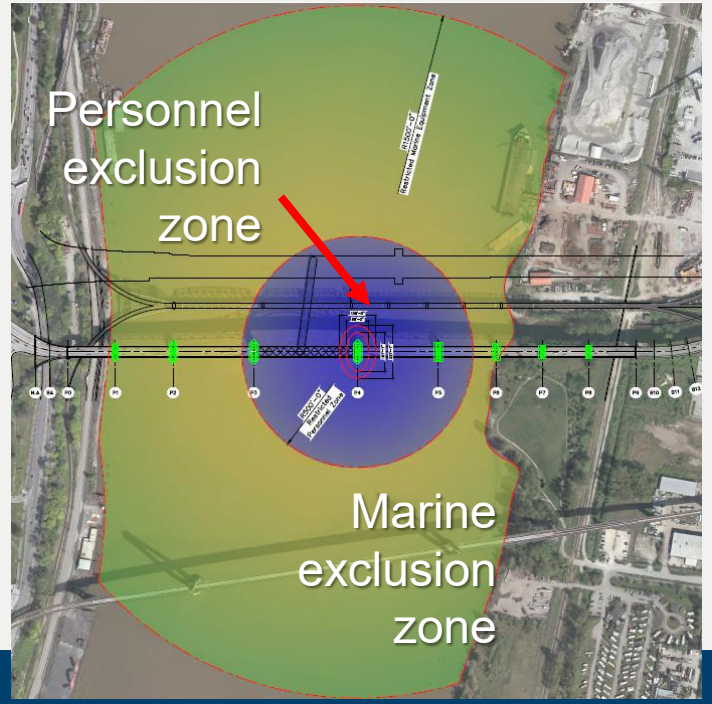
- Drilling and placement of explosives (1-2wks); no interference to navigation
- Controlled blast (blast occurs in < 3 seconds; up to 4 hr closure of navigation channel to complete pre-blast clearance procedures)
- Post blast clean up (2 wks); restriction in downstream draw

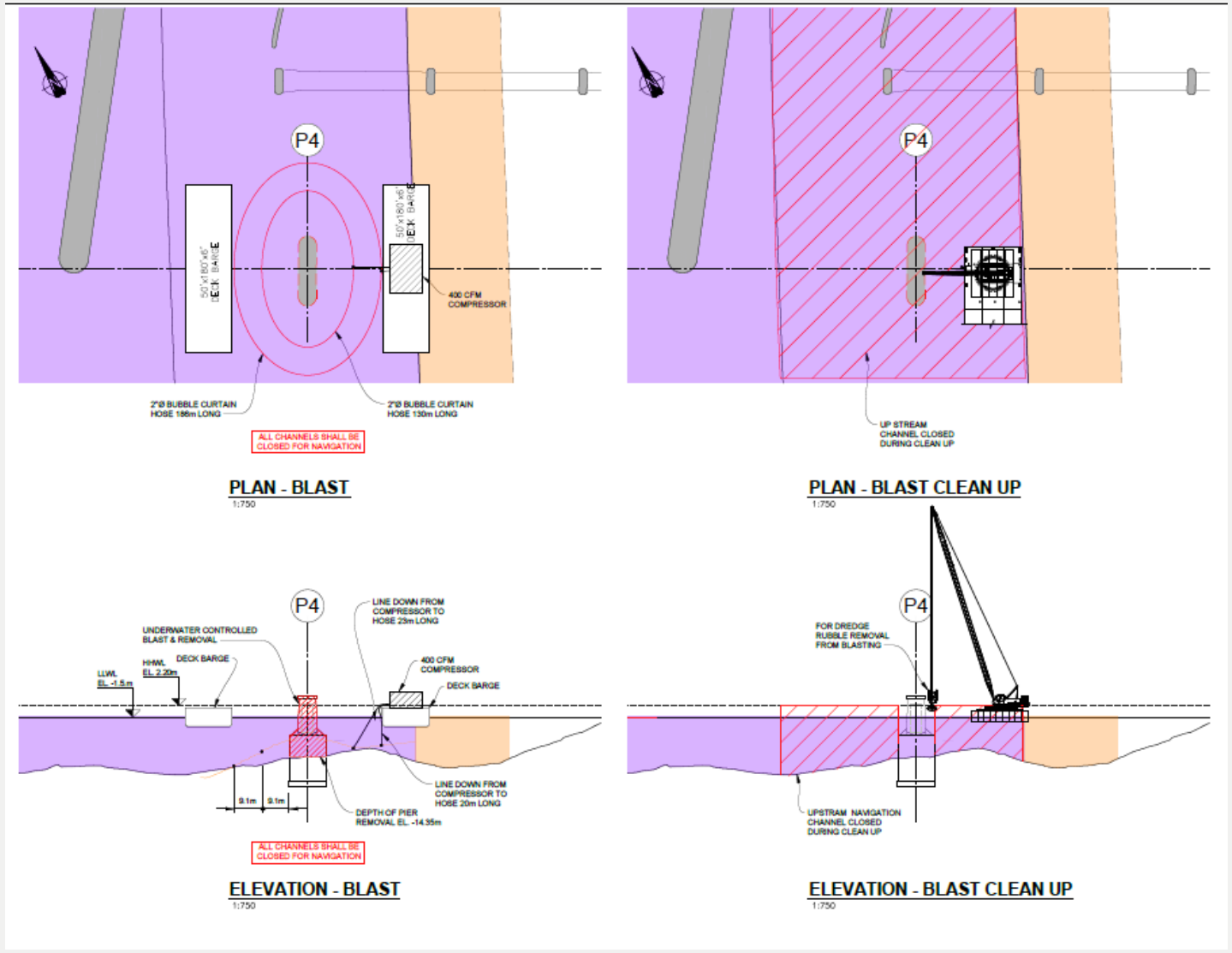




Controlled Blasting – Pier P4

- Drilling and placement of explosives (1-2 wks); no interference to navigation
- Controlled blast (blast occurs in < 3 seconds; up to 4 hr closure of navigation channel to complete pre-blast clearance procedures)
- Post blast clean up (2 wks); restriction in upstream draw





Demolition Works – Above & Within Fraser River

Anticipated Schedule*

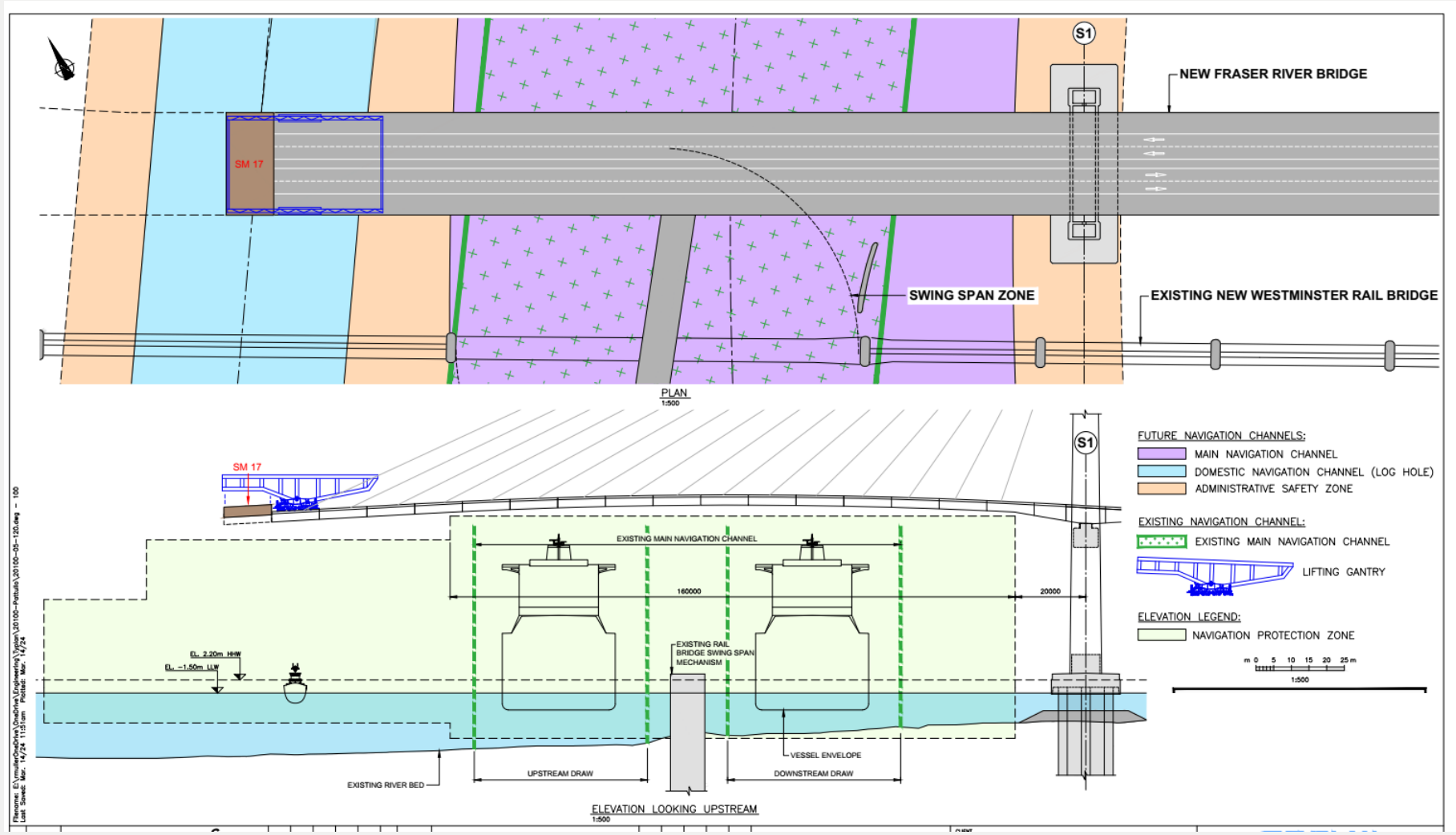
Activity	Location	Timeframe
Bridge deck removal	Main span, working from centre outwards	Jan – Mar 2026
Superstructure removal	Spans P0-P9	Feb – Jul 2026
In-river pier removal (above)	Piers P1-P6	Jul – Sep 2026
In-river pier removal (below water)	Piers P1, P5, P6 (conventional)	Sep – Oct 2026
	Piers P2, P3, P4 (blasting)	Oct 2026 – Jan 2027

*Note: *Schedule is subject to consultation with First Nations and other relevant parties, and acceptance of applicable permits and environmental management plans. (e.g., Canadian Navigable Waters Act Approval, Water Sustainability Act Approval, Fisheries Act Authorization)*

4-Week Look-Ahead / Construction Staging

Construction Staging – Cantilever Construction

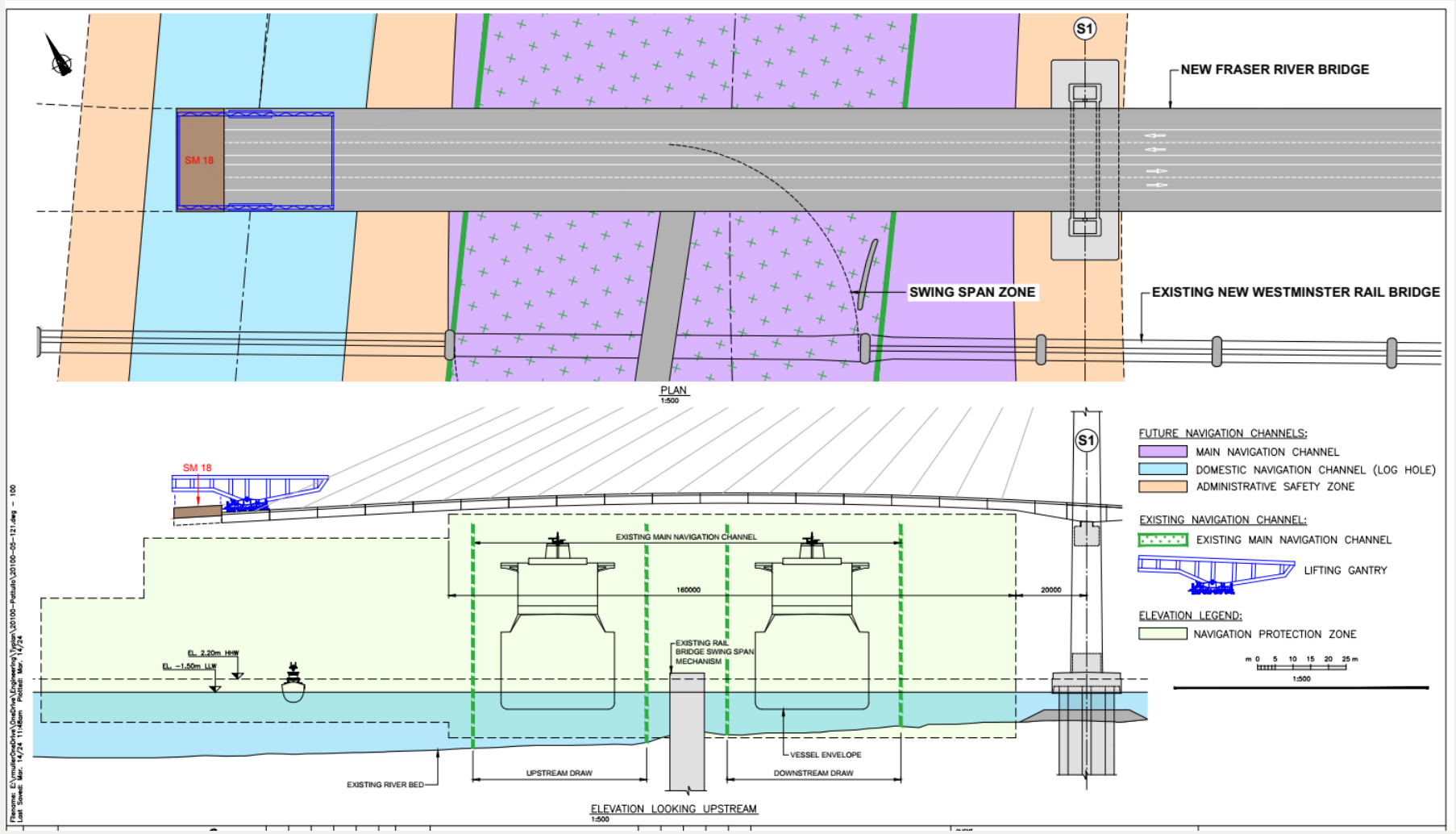
Segment SM-017



- Starting Jul 26
- 2-3 week duration
- No interference to navigation

Construction Staging – Cantilever Construction

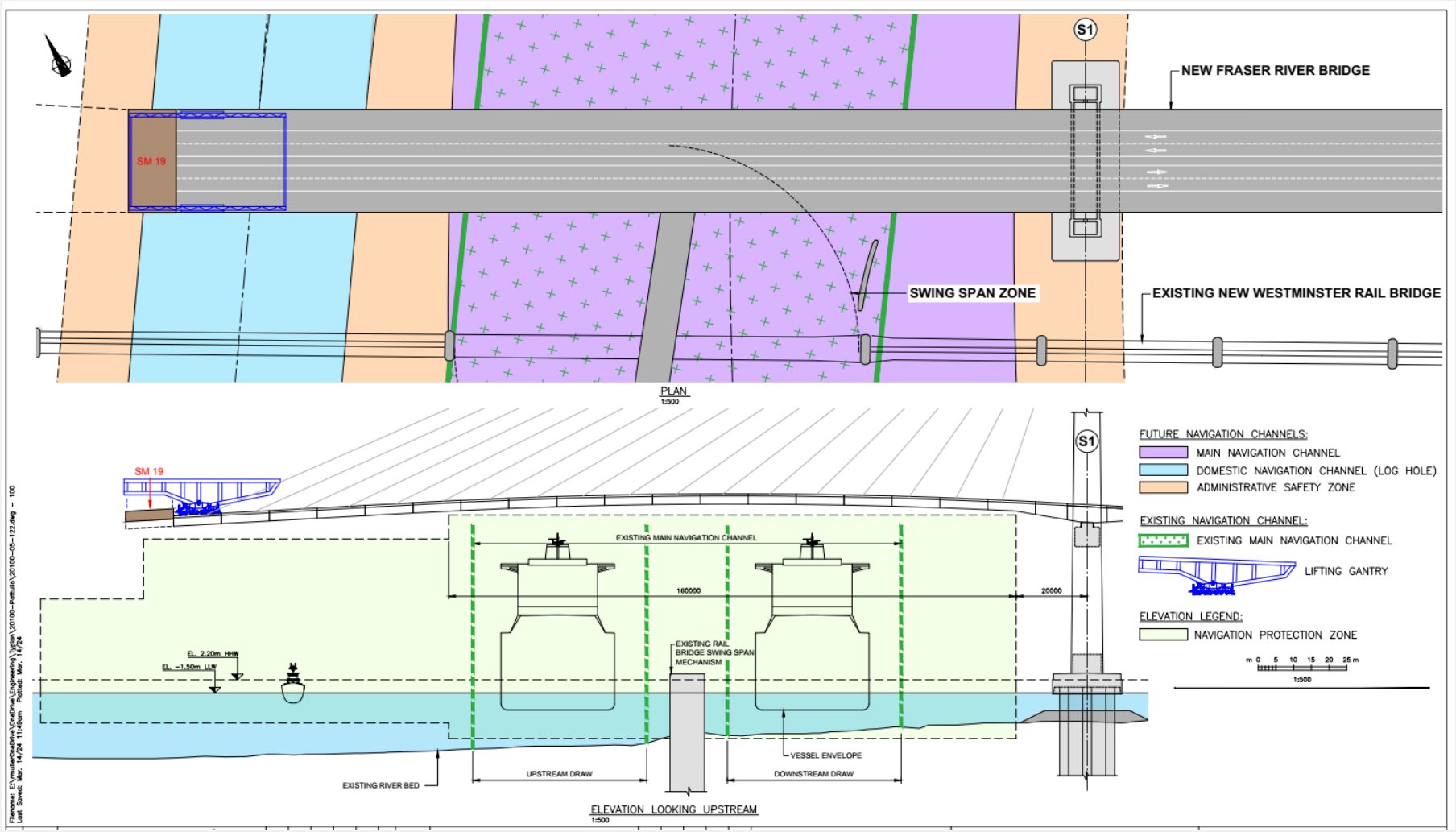
Segment SM-018



- Starting Aug 10
- 2-3 week duration
- No interference to navigation

Construction Staging – Cantilever Construction

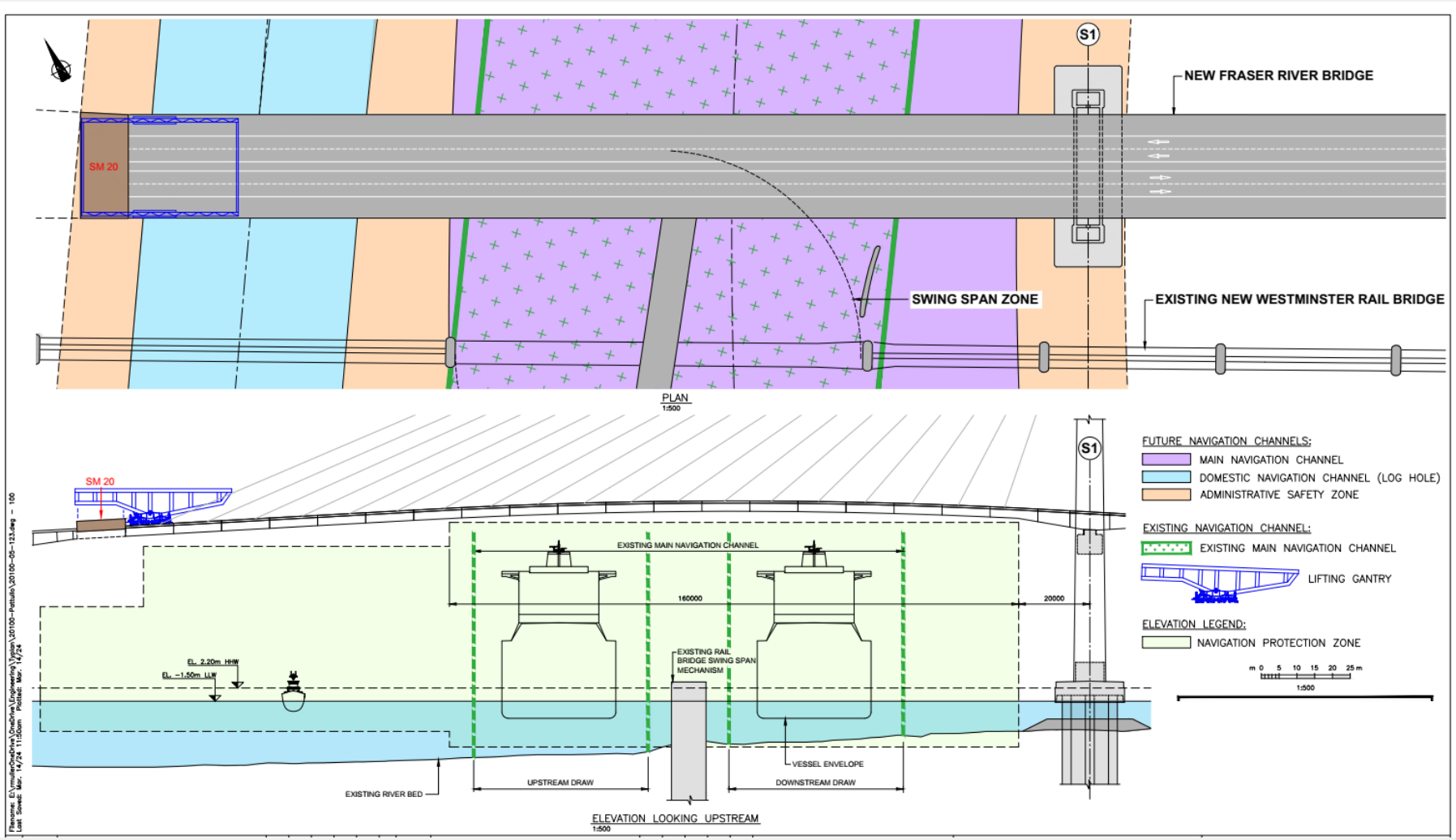
Segment SM-019



- Starting Aug 22
- 2-3 week duration
- No interference to navigation

Construction Staging – Cantilever Construction

Segment SM-020



- Starting Sep 3
- 2-3 week duration
- No interference to navigation

Next Steps

Ongoing NAVWARNs to be provided

Next Marine Users Working Group:

- September 2025 (TBD)