CITY OF VANCOUVER

CITY CLERK'S DEPARTMENT
Access to Information & Privacy Division

File No.: 04-1000-20-2022-348

November 4, 2022

s.22(1)

Dear s.22(1)

Re: **Request for Access to Records under the Freedom of Information and Protection of Privacy Act (the "Act")**

I am responding to your request of June 29, 2022 under the ***Freedom of Information and Protection of Privacy Act (the Act)*** for:

> **Records regarding discussions of proposals and plans to remove the barge at Sunset Beach including quotes, proposals, consultations, and correspondence (excluding from the general public). Date range: November 21, 2021 to June 28, 2022.**

All responsive records are attached. Some information in the records has been severed, (blacked out), under s.13(1), s.14, s.15(1)(l), s.16(1), s.17(1), s.18, s.21(1), and s.22(3)(d) of the Act. You can read or download these sections here: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/96165_00

Under section 52 of the Act, and within 30 business days of receipt of this letter, you may ask the Information & Privacy Commissioner to review any matter related to the City's response to your FOI request by writing to: Office of the Information & Privacy Commissioner, info@oipc.bc.ca or by phoning 250-387-5629.

If you request a review, please provide the Commissioner's office with: 1) the request number (#04-1000-20-2022-348); 2) a copy of this letter; 3) a copy of your original request; and 4) detailed reasons why you are seeking the review.

Yours truly,

[Signed by Cobi Falconer]

Cobi Falconer, MAS, MLIS, CIPP/C
Director, Access to Information & Privacy
cobi.falconer@vancouver.ca
453 W. 12th Avenue Vancouver BC V5Y 1V4

If you have any questions, please email us at foi@vancouver.ca and we will respond to you as soon as possible. Or you can call the FOI Case Manager at 604-871-6584.

Encl. (Response Package)

:dl

From: Khella, Harry
To: Jesse Percy
Subject: Barge Removal - Barge Structural Assessment
Date: Tuesday, February 1, 2022 2:17:00 PM

Hi Jesse,

Would it be possible for you send across the structural/technical assessment of the barge please? This is for our records as I don't appear to have it.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Khella, Harry
To: Jesse Percy; ahart@coastclaims.com
Cc: Gandha, Amit; Chan, Elvis
Subject: English Bay Barge Removal - License Agreement
Date: Wednesday, April 13, 2022 4:22:00 PM
Attachments: insurance section for barge removal project section 4_Redacted.pdf

---

Hi Jesse,

I hope this message finds you well.

Before any works related to the barge deconstruction and removal can commence, a license agreement will be need to agreed between CoV and yourselves as prime contractor. With that in mind and in order to expedite discussions, please section 4 of the draft agreement that outlines some of the insurance requirements that CoV will need to review. If you could kindly send across these items, that would be most helpful.

I aim to share the full draft agreement for your review during the week of April 25th.

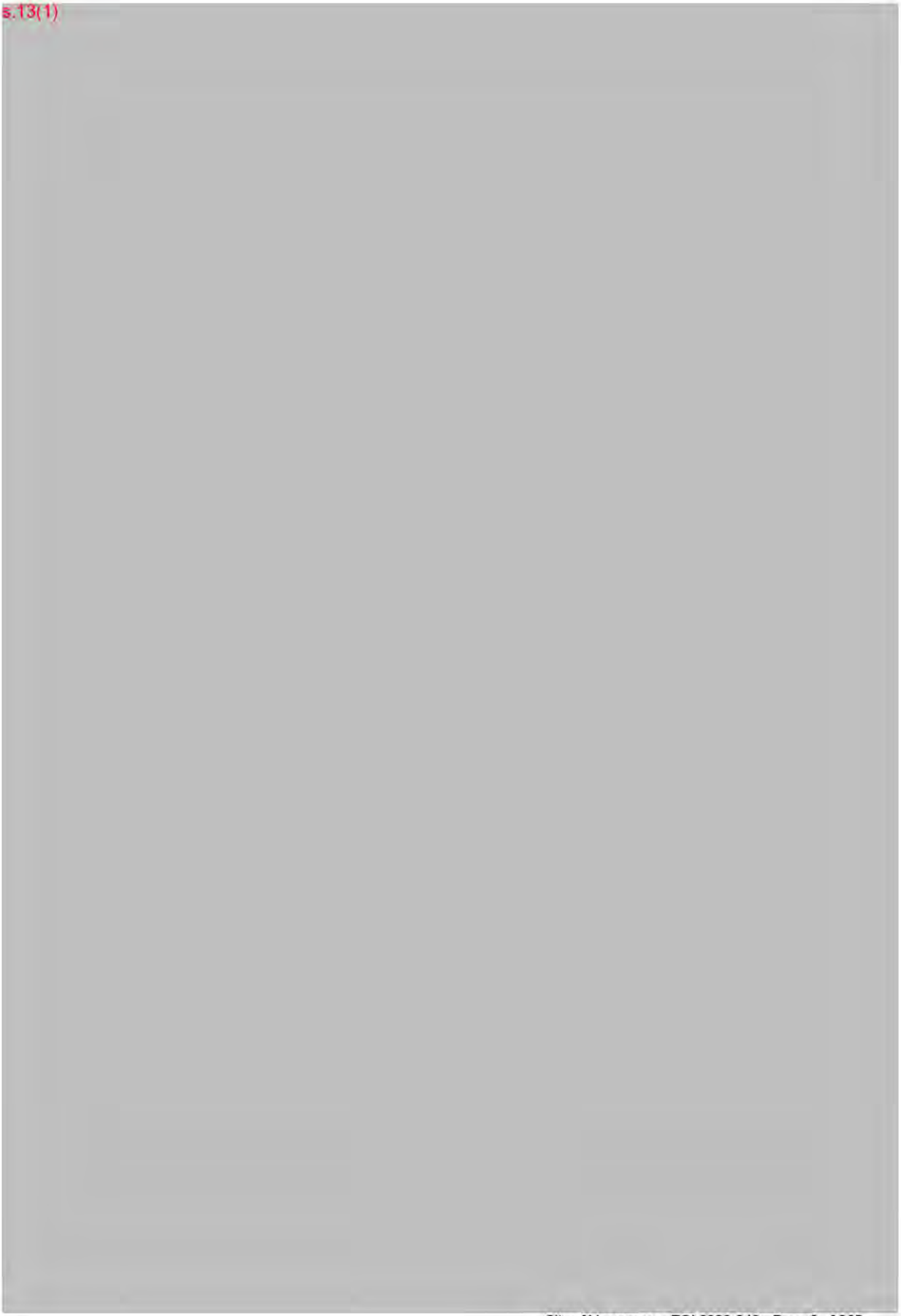
Please let me know if you have any questions.

Thanks,

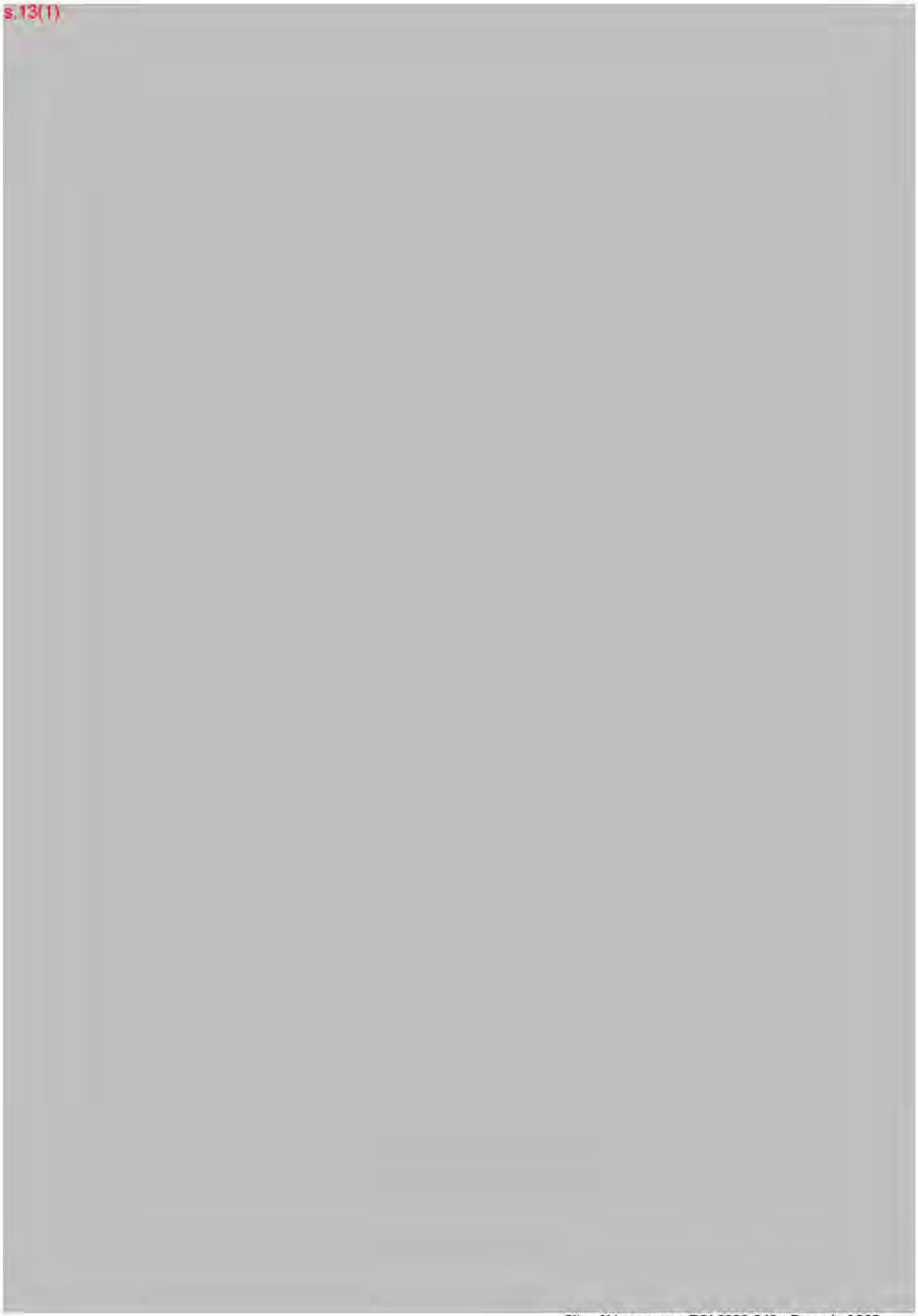
Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

s.13(1)



s.13(1)



From: Allan Hart
To: Chan, Elvis
Cc: Khella, Harry
Subject: [EXT] RE: Barge at English Bay.
Date: Thursday, April 21, 2022 2:15:29 PM
Attachments: image001.jpg

City of Vancouver security warning: Do not click on links or open attachments unless you were expecting the email and know the content is safe.

Thanks Elvis, I just left you a long winded VM.

Cheers

ALLAN HART, BBA, CIP, CRM

President
D 250-940-2173
T 250-386-3111 F 250-386-1473
5-2727 Quadra Street Victoria, BC V8T4E5
ahart@coastclaims.com www.coastclaims.com [coastclaims.com]

From: Chan, Elvis <Elvis.Chan@vancouver.ca>
Sent: Thursday, April 21, 2022 1:01 PM
To: Allan Hart <AHart@coastclaims.com>
Cc: Khella, Harry <Harry.Khella@vancouver.ca>
Subject: Barge at English Bay.

Hi Allan,

Let me know if you want to connect.

City Legal is drafting up an agreement to permit work on park land.

Thanks.

Elvis Chan, FCIP, CRM
Manager, Risk Financing and Loss Control
City of Vancouver
T: 604-829-4204
C: 604-760-4004

E: elvis.chan@vancouver.ca

From: Allan Hart
To: Khella, Harry; Jesse Percy
Cc: Michael D. Silva; Kim Wigmore
Subject: [EXT] RE: English Bay Barge Removal - License Agreement
Date: Thursday, April 21, 2022 12:52:22 PM
Attachments: image001.jpg

Good afternoon Harry, Underwriters have retained Michael Silva to assist with any contracts. I have copied him here and would suggest that from our end at least, he would be the one to participate in the meeting.

I'm happy to participate by phone as well if needed.

Kind regards
Allan

ALLAN HART, BBA, CIP, CRM

President
D 250-940-2173
T 250-386-3111 F 250-386-1473
5-2727 Quadra Street Victoria, BC V8T4E5
ahart@coastclaims.com www.coastclaims.com [coastclaims.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: Thursday, April 21, 2022 12:41 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Allan Hart <AHart@coastclaims.com>
Subject: RE: English Bay Barge Removal - License Agreement

Hi Jesse,

Further to this morning's meeting and as the license agreement is developed, please be advised that CoV is available to meet tomorrow at 2:30pm for a short meeting to ensure all parties are on the same page and to answer any questions.

Thanks,

Harry

From: Khella, Harry
Sent: Wednesday, April 13, 2022 4:23 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; 'ahart@coastclaims.com' <ahart@coastclaims.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Chan, Elvis <elvis.chan@vancouver.ca>
Subject: English Bay Barge Removal - License Agreement

Hi Jesse,

I hope this message finds you well.

Before any works related to the barge deconstruction and removal can commence, a license agreement will be need to agreed between CoV and yourselves as prime contractor. With that in mind and in order to expedite discussions, please section 4 of the draft agreement that outlines some of the insurance requirements that CoV will need to review. If you could kindly send across these items, that would be most helpful.

I aim to share the full draft agreement for your review during the week of April 25th.

Please let me know if you have any questions.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From:	Jesse Percy
To:	Khella, Harry; Todd Braconnier; Allan Hart; Ian Donald
Cc:	Jenn Wint; Ian Purvis; Gandha, Amit
Subject:	[EXT] RE: SMT-5000 Weekly Status Report - April 15, 2022
Date:	Wednesday, April 20, 2022 5:21:33 PM
Attachments:	322527_SMT5000_WeeklyStatus_20220415.pdf

All,

Please see the attached weekly status report for last week.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

VANCOUVER PILE DRIVING
MARINE GENERAL CONTRACTORS

WEEKLY PROJECT BRIEF

Project Name	SMT-5000 Salvage	**Project Number**	3-22-527
Owner	Sentry Marine Towing Ltd.	**Status Report Date**	Friday, April 15, 2022
Project Manager	Ian Purvis	**Project Director / Sponsor**	Jesse Percy
Superintendent / GF	TBD	**Project Engineer**	N/A

Status Summary

Safety Management:

- Draft Safety Plans are complete, pending finalization of project specific Safe work Procedures.
- Meeting with WorkSafeBC to review work procedures and safety plan was held on March 22, 2022. A site visit will be planned once mobilized to site.

s.16(1)

s.16(1), s.18

Planning:

- Lift calculations and different marine crane options to remove the barge in as large of pieces as possible are being finalized - Ongoing
- Cribbing design is nearing completion
- Seawall barrier option have been accepted by CoV. A site visit with the barrier supplier has identified two primary issues:
  1 – there is a tree that overhangs the pathway with low clearance. The low hanging branches would need to be pruned back, or the truck would need to transfer to the lower pathway. A structural analysis of the pathway for the fully loaded truck will need to be investigated. (Photo 1) CoV to prune trees along pathway to allow for truck access. *Pruning has been completed.*
  2 – The upper path (truck route) is showing signs of sub-grade failure. The 48 truck trips over the path are likely to cause further damage due to the substructure. (Photos 2 & 3) CoV to install pads to protect pathway during delivery and removal. *CoV noted that pads are not required. Due to subgrade condition, Project not responsible for further degradation of the pathway.*
  Note: Barrier install is scheduled for April 13/14 with fence installed April 18/19. TCP has been provided to CoV. CoV has given ok to proceed.
- *3 – On April 4, CoV raised the requirement for MetroVan to sign off on work due to force-main within Seawall. VanPile has contact MetroVan and submitted requested documentation. EXP is updated loading analysis to include MetroVan forcemain. This review has delayed the installation of the barriers. No impacts to the overall schedule are anticipated.*
- *CoV have suggested delaying barrier installation to May 2 to allow for MetroVan review and review/sign off of CoV Licencing Agreement. Licencing Agreement to be issued by April 25.*
- Jack-up barge legs have arrived in VanPile yard and testing will be completed in the coming weeks.

Communication:

- Ongoing – Weekly call to be coordinated by CoV – *Next Meeting April 27*

	• Public Notification Fliers - VanPile to draft letter -> CoV to coordinate distribution. Draft letter issued to CoV for review. *CoV provided comments, VanPile has returned final draft for review and approval.* • Project Signage – *Final draft recirculated to CoV for review and approval.*

PROJECT STATUS	CURRENT STATUS	COMMENTS
Overall	ON / AT RISK / OFF	Anticipated Start Date – May 2, 2022 – s.16(1)
Safety	ON / AT RISK / OFF	
Scope	ON / AT RISK / OFF	
Resources	ON / AT RISK / OFF	
Schedule	ON / AT RISK / OFF	Anticipated Start Date – May 2, 2022 – s.16(1)
Procurement / Subcontracts	ON / AT RISK / OFF	
Permits	ON / AT RISK / OFF	
Communications	ON / AT RISK / OFF	

RISKS, ISSUES AND OPPORTUNITIES			
Risks Identified	**Impact**	**Owner**	**Action Steps**
	L / M / H		
Issues	**Priority**	**Owner**	**Action Steps**
	L / M / H		
Opportunities	**Priority**	**Owner**	**Action Steps**
	L / M / H		

MILESTONE SUMMARY				
Task Name	**Current Status**	**Planned Date**	**Revised Date**	**Actual Date**
Pre-Condition Habitat Assessment	Complete	Jan 28, 2022		Jan 28, 2022
DFO Request for Review	Complete	Jan 28, 2022		Jan 28, 2022
WorkSafeBC Notice of Project	Complete	Feb 2, 2022		Feb 2, 2022
Seawall Loading Assessment	Complete	Feb 3, 2022		Feb 3, 2022
Hazardous Materials Assessment	Complete	Feb 11, 2022		Feb 11, 2022
s.16(1)	Complete	Feb 24, 2022		Feb 24, 2022
Work Plan Development	In Development	April 8, 2022	April 15, 2022	
Communications Plan	Draft Complete – Under Review	March 4, 2022		
Micro-Site	Complete – Live edits as needed	Feb 17, 2022		Feb 17, 2022
FAQ's	Draft Complete – Under Review	Feb 17, 2022		Feb 17, 2022
Mobilization & Scaffolding		May 9, 2022		
Pile Driving & Access		May 10, 2022		
Cribbing Installation – F Rake		May 11, 2022		
Bin Wall Removal		May 17, 2022		
Concrete Deck Removal		May 31, 2022		
Forward Rake Removal		May 31, 2022		
Stern Rake Removal		June 2, 2022		
Hull Demolition		June 9, 2022		
Debris Survey		July 5, 2022		
Pile Removal		July 5, 2022		
Demobilization		July 7, 2022		
Post-Condition Habitat Assessment		TBD – May 2023		

PHOTOS

Photo 1: Jack-up legs

Photo 2: Truck loaded with jacks

Photo 3: Jack, Side View

Photo 4: Jack, Bottom View

ATTACHMENTS

322527-SK-001_rip
322527-SK-002_rip
322527-SK-101_rip

From:	Ian Purvis
To:	Khella, Harry; Todd Braconnier; Allan Hart; Ian Donald
Cc:	Jenn Wint; Jesse Percy; Gandha, Amit
Subject:	[EXT] SMT-5000 Weekly Status Report - April 22, 2022
Date:	Friday, April 22, 2022 3:40:37 PM
Attachments:	322527_SMT5000_WeeklyStatus_20220422.pdf

All,

Please see attached Weekly Status Report dated April 22, 2022.

Thanks,

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [vanpile.com]

VANCOUVER PILE DRIVING
MARINE GENERAL CONTRACTORS

WEEKLY PROJECT BRIEF

Project Name	SMT-5000 Salvage	**Project Number**	3-22-527
Owner	Sentry Marine Towing Ltd.	**Status Report Date**	Friday, April 22, 2022
Project Manager	Ian Purvis	**Project Director / Sponsor**	Jesse Percy
Superintendent / GF	TBD	**Project Engineer**	N/A

Status Summary

Safety Management:

- Draft Safety Plans are complete, pending finalization of project specific Safe work Procedures.
- Meeting with WorkSafeBC to review work procedures and safety plan was held on March 22, 2022. A site visit will be planned once mobilized to site.

s.16(1)

s.16(1), s.18

Planning:

- Lift calculations and different marine crane options to remove the barge in as large of pieces as possible are being finalized - Ongoing
- Cribbing design is nearing completion
- Seawall barrier option have been accepted by CoV. A site visit with the barrier supplier has identified two primary issues:
  1 – there is a tree that overhangs the pathway with low clearance. *Pruning has been completed.*
  2 – The upper path (truck route) is showing signs of sub-grade failure. The 48 truck trips over the path are likely to cause further damage due to the substructure. (Photos 2 & 3) CoV to install pads to protect pathway during delivery and removal. *CoV noted that pads are not required. Due to subgrade condition, Project not responsible for further degradation of the pathway.*
  Note: Barrier install is scheduled for April 13/14 with fence installed April 18/19. TCP has been provided to CoV. CoV has given ok to proceed.
- *3* – On April 4, CoV raised the requirement for MetroVan to sign off on work due to force-main within Seawall. VanPile has contact MetroVan and submitted requested documentation. EXP is updated loading analysis to include MetroVan forcemain. This review has delayed the installation of the barriers. *Metro Van has not completed review, nor provided an update*
- CoV have suggested delaying barrier installation to May 2 to allow for MetroVan review and review/sign off of CoV Licencing Agreement. Licencing Agreement to be issued by April 25. *Draft (partial) Licensing Agreement is planned to be issued April 26. This will require delaying the start to May 9.*
- *Canadian Goose Eggs were found on the barge deck. Hatfield has requested City of Vancouver add Hatfield to the addling permit. If the project is not able to use the permit or eggs hatch a 30m buffer is needed until the birds leave the nest. Hatfield has confirmed there are no other nests present and have installed flagging to discourage other birds from nesting.*

**Danger Signage installed around perimeter of the barge and all pumps removed from holds.*

	Communication: • Ongoing – Weekly call to be coordinated by CoV – *Next Meeting April 27* • Public Notification Fliers - VanPile to draft letter -> CoV to coordinate distribution. Draft letter issued to CoV for review. *CoV provided comments, VanPile has returned final draft for review and approval.* • Project Signage – *Final draft recirculated to CoV for review and approval.*

PROJECT STATUS	CURRENT STATUS	COMMENTS
Overall	ON / AT RISK / OFF	Anticipated Start Date – May 9, 2022 – s.16(1)
Safety	ON / AT RISK / OFF	
Scope	ON / AT RISK / OFF	
Resources	ON / AT RISK / OFF	
Schedule	ON / AT RISK / OFF	Anticipated Start Date – May 9, 2022 – s.16(1)
Procurement / Subcontracts	ON / AT RISK / OFF	
Permits	ON / AT RISK / OFF	
Communications	ON / AT RISK / OFF	

RISKS, ISSUES AND OPPORTUNITIES			
Risks Identified	**Impact**	**Owner**	**Action Steps**
CoV Licensing Agreement	L / M / H	JP/IP	*Await issuance for review early next week.*
s.16(1)	L / M / H	JP/IP	s.16(1)
MetroVan Review	L / M / H	JP/IP	*Await response from Geotechnical submission.*
Issues	**Priority**	**Owner**	**Action Steps**
	L / M / H		
Opportunities	**Priority**	**Owner**	**Action Steps**
	L / M / H		

MILESTONE SUMMARY				
Task Name	**Current Status**	**Planned Date**	**Revised Date**	**Actual Date**
Pre-Condition Habitat Assessment	Complete	Jan 28, 2022		Jan 28, 2022
DFO Request for Review	Complete	Jan 28, 2022		Jan 28, 2022
WorkSafeBC Notice of Project	Complete	Feb 2, 2022		Feb 2, 2022
Seawall Loading Assessment	Complete	Feb 3, 2022		Feb 3, 2022
Hazardous Materials Assessment	Complete	Feb 11, 2022		Feb 11, 2022
s.16(1)	Complete	Feb 24, 2022		Feb 24, 2022
Work Plan Development	In Development	April 8, 2022	April 15, 2022	
Communications Plan	Draft Complete – Under Review	March 4, 2022		
Micro-Site	Complete – Live edits as needed	Feb 17, 2022		Feb 17, 2022
FAQ's	Draft Complete – Under Review	Feb 17, 2022		Feb 17, 2022
Site Fencing		May 9, 2022		
Mobilization & Scaffolding		May 16, 2022		
Pile Driving & Access		May 17, 2022		
Cribbing Installation – F Rake		May 18, 2022		
Bin Wall Removal		May 24, 2022		
Concrete Deck Removal		June 7, 2022		
Forward Rake Removal		June 7, 2022		
Stern Rake Removal		June 9, 2022		
Hull Demolition		June 16, 2022		
Debris Survey		July 12, 2022		
Pile Removal		July 12, 2022		
Demobilization		July 14, 2022		
Post-Condition Habitat Assessment		TBD – May 2023		

PHOTOS

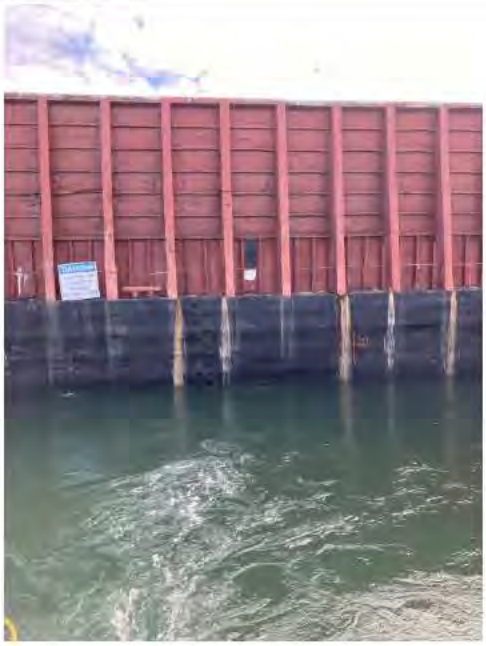


Photo 1: Jack-up legs

Photo 2: Truck loaded with jacks

N/A

Photo 3:

N/A

Photo 4:

ATTACHMENTS

From:	Jesse Percy
To:	Khella, Harry; Todd Braconnier; Allan Hart; Ian Donald
Cc:	Jenn Wint; Ian Purvis
Subject:	[EXT] SMT-5000 Weekly Status Report - March 10, 2022
Date:	Thursday, March 10, 2022 1:17:56 PM
Attachments:	322527_SMT5000_WeeklyStatus_20220310.pdf

All,

Please see the attached weekly status report.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

VANCOUVER PILE DRIVING
MARINE GENERAL CONTRACTORS

WEEKLY PROJECT BRIEF

Project Name	SMT-5000 Salvage	**Project Number**	3-22-527
Owner	Sentry Marine Towing Ltd.	**Status Report Date**	Thursday, March 3, 2022
Project Manager	Ian Purvis	**Project Director / Sponsor**	Jesse Percy
Superintendent / GF	TBD	**Project Engineer**	N/A

Status Summary

Safety Management:

- Draft Safety Plans are complete, pending finalization of project specific Safe work Procedures
- Meeting with WorkSafeBC to review work procedures and safety plan is scheduled for March 16, 2022

s.16(1)

s.16(1), s.18

Planning:

- Lift calculations and different marine crane options to remove the barge in as large of pieces as possible are being finalized - Ongoing
- Cribbing design is nearing completion
- Seawall barrier option have been accepted by CoV. A site visit with the barrier supplier has identified two primary issues:
  1 – there is a tree that overhangs the pathway with low clearance. The low hanging branches would need to be pruned back, or the truck would need to transfer to the lower pathway. A structural analysis of the pathway for the fully loaded truck will need to be investigated. (Photo 1)
  2 – The upper path (truck route) is showing signs of sub-grade failure. The 48 truck trips over the path are likely to cause further damage due to the substructure. (Photos 2 & 3)

Communication:

- Ongoing – Weekly call to be coordinated by CoV
- Public Notification Fliers
  - VanPile to draft letter -> CoV to coordinate distribution
- Project Signage – Draft to be send to CoV for review

VANCOUVER PILE DRIVING
MARINE GENERAL CONTRACTORS

WEEKLY PROJECT BRIEF

PROJECT STATUS	CURRENT STATUS	COMMENTS
Overall	ON / AT RISK / OFF	Start Date TBD - s.16(1) s.16(1)
Safety	ON / AT RISK / OFF	
Scope	ON / AT RISK / OFF	
Resources	ON / AT RISK / OFF	
Schedule	ON / AT RISK / OFF	s.16(1) Alternate workplan is being investigated
Procurement / Subcontracts	ON / AT RISK / OFF	
Permits	ON / AT RISK / OFF	
Communications	ON / AT RISK / OFF	

RISKS, ISSUES AND OPPORTUNITIES			
Risks Identified	**Impact**	**Owner**	**Action Steps**
Schedule impacted due to referral process.	L / M / H	JP/IP	s.16(1) Alternate workplan is being investigated
Issues	**Priority**	**Owner**	**Action Steps**
	L / M / H		
Opportunities	**Priority**	**Owner**	**Action Steps**
	L / M / H		

MILESTONE SUMMARY				
Task Name	**Current Status**	**Planned Date**	**Revised Date**	**Actual Date**
Pre-Condition Habitat Assessment	Complete	Jan 28, 2022		Jan 28, 2022
DFO Request for Review	Complete	Jan 28, 2022		Jan 28, 2022
WorkSafeBC Notice of Project	Complete	Feb 2, 2022		Feb 2, 2022
Seawall Loading Assessment	Complete	Feb 3, 2022		Feb 3, 2022
Hazardous Materials Assessment	Complete	Feb 11, 2022		Feb 11, 2022
s.16(1)	Complete	Feb 24, 2022		Feb 24, 2022
Work Plan Development	In Development	March 4, 2022	March 18, 2022	
Communications Plan	Draft Complete – Under Review	March 4, 2022		
Micro-Site	Complete – Live edits as needed	Feb 17, 2022		Feb 17, 2022
FAQ's	Draft Complete – Under Review	Feb 17, 2022		Feb 17, 2022
Mobilization	TBC	TBC		
Pile Driving & Access				
Cribbing Installation – F Rake				
Bin Wall Removal				
Concrete Deck Removal				
Forward Rake Removal				
Stern Rake Removal				
Hull Demolition				
Debris Survey				
Pile Removal				
Demobilization				
Post-Condition Habitat Assessment				

PHOTOS

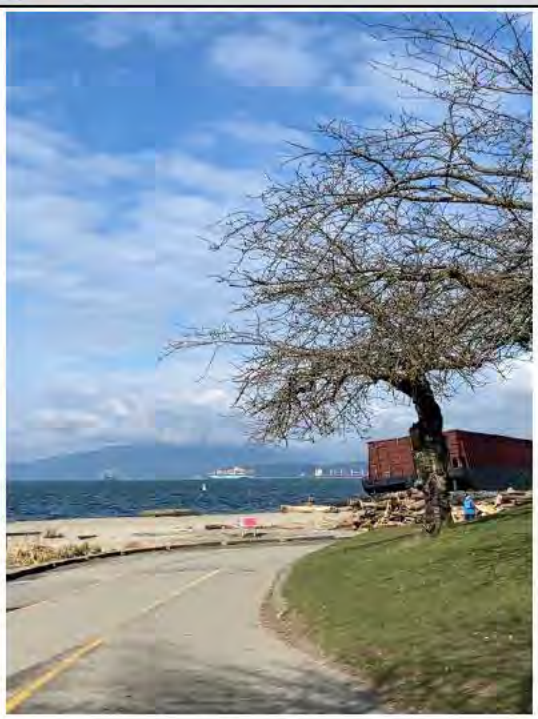


Photo 1: Low Hanging Tree

Photo 2: Path with subgrade failure

Photo 3: Path with subgrade failure

Photo 4: Pathway/Truck Route on Grass

ATTACHMENTS

s.16(1)

Jesse Percy

From: Squamish Connect s.15(1)(l)
Sent: March 10, 2022 3:03 AM
To: Jesse Percy
Subject: [EXTERNAL] [Squamish Connect] 2 Updates

1 comment on things you're watching

New Comment

Rachel Munger (Squamish Nation) posted a comment

Hi Jesse,

Thank you for submitting this referral. Our team has conducted a review of the file, and are OK for these works to proceed. Our archaeologist is satisfied with the Archaeological Management Plan
Squamish Nation requests that all mitigation and monitoring measures should be followed in Table 2 (section 7.0) of the Habitat Assessment Report.
SN also requests that all measures from Section 6.0 through section 11.0 of the Environmental Management Plan be met.

Thank you in advance for confirming receipt of this message. Please let me know if you have any further questions.
-Rachel

- PROJECT NAME

  SMT-5000 English Bay Barge Removal
- ISSUING AGENCY FILE NUMBER(S)

  322527
- REFERRAL ID

  960

View this Submission

1 referral's status was changed

Referral Submission Status Changed

Rachel Munger (Squamish Nation) changed the status of 322527 - SMT-5000 English Bay Barge Removal to awaiting decision

- PROJECT NAME

  SMT-5000 English Bay Barge Removal
- ISSUING AGENCY FILE NUMBER(S)

  322527
- ID

  960
- STATUS

  awaiting decision

View this on Squamish Connect

Ian Purvis

From: Jesse Percy
Sent: March 8, 2022 11:28 AM
To: Ian Purvis
Subject: Fwd: [EXTERNAL] TWN comments on barge removal at sunset beach
Attachments: TWN comments on Sunset Beach Barge Removal_7March2022.xlsx

Sent from my iPhone

Begin forwarded message:

> **From:** Brittany John <bjohn@twnation.ca>
> **Date:** March 8, 2022 at 11:01:26 AM PST
> **To:** Jesse Percy <jesse.percy@carlsoncg.com>
> **Cc:** Tsleil-Waututh Referrals <referrals@twnation.ca>, Fiona Hood <fhood@twnation.ca>, Sanya Pleshakov <spleshakov@twnation.ca>
> **Subject: [EXTERNAL] TWN comments on barge removal at sunset beach**
>
> Hello Jesse,
>
> Attached are TWN's initial comments on the barge removal project at Sunset Beach. Please note that this is not be the full extent of TWN's comments as we may continue to receive new information and further discussion may be required.
> I will send the initial referral fee invoice in the next couple days. As well, we will need to discuss when to invoice to cover the costs of TWN to review the entirety of the project.
> Thanks and we look forward to receiving the responses to our comments.
>
> Sincerely,
>
> Brittany John
> Consultation & Accommodation Manager – Referrals
> Treaty, Lands & Resources Department
> Tsleil-Waututh Nation
> 3178 Alder Court., North Vancouver, BC V7H 2V6
> bjohn@twnation.ca

TWN comments on SMT-5000 Barge Salvage
TWN 22-104
Vanpile 3-22-527

Document	Section, Page #	TWN comment
SMT-5000 Barge Salvage Marine Habitat Assessment Report (Jan 2022)	General	How will Sentry Marine Towing Ltd. ensure that an incident doesn't occur like this again?
	General	TWN requests an updated construction schedule detailing the 12-15 weeks of work.
	Section 2.0, pg. 3	TWN requires clarification of whom and when will it be decided that restoration may be required post-removal? TWN request to be a part of these discussions should offsetting be required.
	Table 2, pg. 16	At what underwater noise threshold will bubble curtains be deployed?
SMT-5000 Barge Salvage Environmental Management Plan (Jan 2022)	General	TWN requests to have a TWN environmental monitor also oversee the request, please reach out to monitors@twnation.ca to discuss availability.
	Section 5.0, pg. 6	TWN requests a copy of the DFO letter of advice, when can TWN expect to receive it?
	Section 6.2, pg. 10	TWN recommends a project contact be identified should local residents want to address noise complaints due to construction.
	Section 6.7, pg. 14	If silt curtains can't be used, what other methods will be applied should paint chips, cleaning products, etc. be seen to enter the aquatic environment?
	Section 11.2.1, pg. 29	TWN requests that adaptive management plans be applied should underwater noise reach 80% of the threshold, this would hopefully provide enough time to prevent exceedances of the threshold.
	Section 11.4, pg. 31	TWN requests to receive copies of the two reports: 1) bi-weekly environmental monitoring reports, 2) environmental incident reports

From:	Jesse Percy
To:	Khella, Harry
Cc:	Jenn Wint; Huculak, Shauna; Ian Purvis
Subject:	FW: [EXTERNAL] RE: English Bay Barge - Salvage Operation
Date:	Monday, February 7, 2022 11:51:35 AM

Good Morning Harry,

See below from TWN. Please let me know when you are free for a call to discuss.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Alessandria Testani <atestani@twnation.ca>
Sent: February 7, 2022 11:49 AM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jenn Wint <jenn@wintcommunications.com>; Huculak, Shauna <Shauna.Huculak@vancouver.ca>
Subject: [EXTERNAL] RE: English Bay Barge - Salvage Operation

Hello Jesse,

Shauna and the archaeology team at City of Vancouver can guide you on how to apply for a Cultural Heritage Inspection Permit which will provide you a formalized process to submit project information to Tsleil-Waututh Nation. Additionally, the Referrals department at the Nation should be contacted for submission of this project as a formal referral.

Respectfully,

Alessandria Testani, MA

she/her/hers
Cultural Heritage Resource Analyst
Archaeology and Cultural Heritage Program
Treaty, Lands & Resources Department
Tsleil-Waututh Nation / tə səlilwətaɬ xʷəlməxʷ
3178 Alder Court, North Vancouver, B.C. V7H 2V6
atestani@twnation.ca | archaeology@twnation.ca | (604) 356-0064

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: February 7, 2022 10:51 AM
To: archeology@twnation.ca; Alessandria Testani <atestani@twnation.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jenn Wint <jenn@wintcommunications.com>
Subject: FW: English Bay Barge - Salvage Operation

Good morning Alessandria,

We have been engaged as the General Contractor to complete the salvage works of the barge currently beached in English Bay and would like to set up a call with you to provide more information on project and answer any questions you may have. The City of Vancouver will also be reaching out to their primary contact at the Tsleil-Waututh Nation to provide some information.

Please let me know when you are available this week to schedule a call.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

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From: Khella, Harry
To: Jesse Percy
Cc: Gandha, Amit
Subject: RE: Barge Removal - Hold Time
Date: Thursday, April 28, 2022 1:08:00 PM

Hi Jesse,

Thanks for letting me know (or not) of the additional attendees on the call from Carlson. Can I have the contacts details of your attendees in case additional materials/info need to be provided.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Khella, Harry
Sent: Tuesday, April 26, 2022 5:08 PM
To: 'Jesse Percy' <Jesse.Percy@carlsoncg.com>
Subject: Barge Removal - Hold Time

Hi Jesse,

I am hopeful you can hold time on Thursday, April 28th (1-2pm) to review/answer any initial questions pertaining to the license agreement, which will be sent shortly. This works for all staff on the CoV side. if not, CoV would be grateful if VPDL prioritized this meeting.

Please include any attendees on your side as needed and let me know who they are.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From:	Khella, Harry
To:	Jesse Percy; Ian Purvis
Cc:	Gandha, Amit
Subject:	RE: English Bay Barge - Tree Pruning
Date:	Tuesday, March 15, 2022 6:21:00 PM
Attachments:	image001.gif image003.png

Hi Jesse,

Please see below. If you could kindly provide clarification, that would be great.

Cheers,

Harry

From: Gandha, Amit <Amit.Gandha@vancouver.ca>
Sent: Tuesday, March 15, 2022 5:59 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Subject: RE: English Bay Barge - Tree Pruning

Hello Harry,

We will have the tree pruned to provide clearance.

Could I get clarification on the barriers and fencing: If we have the barriers and fencing placed in the parking lot, can we utilize a smaller truck with hiab to move and locate the barriers? Looking to minimize weight and improve turning radius so as to reduce impacts to the pathway.

Thank you,

Amit Gandha| Director of Parks
Vancouver Park Board | 2099 Beach Avenue
t. 604-654-0781 | amit.gandha@vancouver.ca
pronouns: he/him/his

I am thankful to live, work, and play on the unceded, ancestral territories of the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), and sə́lilwətaʔɬ / sel̓íl̓witulh (Tsleil-Waututh) nations.

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Tuesday, March 15, 2022 2:17 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: [EXT] English Bay Barge - Tree Pruning

Hey Harry,

As per our discussion yesterday, please see attached file showing the locations of the trees that will need to be pruned back to allow the barrier truck access to the site. I am waiting for the dimensions of the truck and will forward when able, however I believe the truck height is 17' and the width is as wide as pathway. Additionally, it is understood that CoV Parks will install matts along the travel route to protect the path from the wheel loading of the trucks multiple return trips.

Please let me know if you have any questions.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

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T. +1 604.998.1075 C. +1 604.999.7757
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[can01.safelinks.protection.outlook.com]

From:	Khella, Harry
To:	Ian Purvis
Cc:	Jesse Percy
Subject:	RE: [EXTERNAL] Barge Removal - Addling
Date:	Thursday, April 21, 2022 2:05:00 PM

Thanks Ian, we will get back to you shortly.
Cheers,
Harry

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Thursday, April 21, 2022 1:56 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: FW: [EXTERNAL] Barge Removal - Addling

Harry,

Please see below correspondence from Hatfield related to the Addling permit. Can you please review and let us know if the CoV will be able to add us as a nominee? If not, we cannot obtain our own permit as we are not the landowner or lease holder.

Happy to get Hatfield on a call with the correct people on your side to discuss if required.

Thanks,
Ian

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [vanpile.com]

From: Marc VanderVeer <mvanderveer@hatfieldgroup.com>
Sent: April 21, 2022 1:33 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Emilia Mackowiak <emackowiak@hatfieldgroup.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal - Addling

Hi Ian,

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the nest, unless the removal is completed under a damage and danger permit issued to the landowner. Protection of the nest typically includes a no-activity buffer area (i.e., 30 metres around the nest) to prevent disturbance to the nesting goose which could lead to nest abandonment. Given the anticipated work schedule, the timeline for fledging of the goslings is likely to conflict.

I have been in discussion with the Canadian Wildlife Service (CWS; issuer of the damage and danger permit), and they confirmed the permit applicant must be the landowner, which in this case is the City of Vancouver. CWS clarified it is a simple process to add nominees to an existing permit, which can be completed via an email from the permit applicant to the permitting officer including details of the additional nominees. Can we request a call with the City of Vancouver to discuss whether adding "Employees of Hatfield Consultants" as nominees to the existing permit is an option? I understand in response to our previous request the City preferred we obtain our own permit. The initial request was in the context of parks employees doing the removal, however if Hatfield was added as a nominee the task could be completed by a Hatfield biologist.

Let me know if you would like to discuss.

Cheers,

Marc VanderVeer, BSc, PAg
Environmental Specialist
T: +1 604 926 3261 | **M:** +1 778 879 1191
Hatfield | Website [can01.safelinks.protection.outlook.com] | LinkedIn [can01.safelinks.protection.outlook.com]
Environmental and social scientists advancing sustainable development

From:	Khella, Harry
To:	Ian Purvis; Jesse Percy
Cc:	Gandha, Amit; Pottinger, Guy
Subject:	RE: [EXTERNAL] Barge Removal - Addling
Date:	Tuesday, April 26, 2022 2:34:00 PM

Ok, thanks. Our staff person undertaking this is available tomorrow morning at 7:30am as the tide is low at 11:00. Any issues with this?

Thanks,

Harry

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Tuesday, April 26, 2022 2:03 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Pottinger, Guy <guy.pottinger@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal - Addling

Harry,

Thank you for this. The nest is located at the forward doorway of the barge. The door is located at the approximate centerline of the bow wall.

We will ensure that a Vanpile representative is present to provide access and be present during the work. In addition, we may request Hatfield to attend.

As we have reduced the access from the shore to prevent unwanted climbers, we will need to access the vessel from the marine side. I will schedule a water taxi for pickup at any dock in Falsecreek or the Vancouver Harbour & standby while the work is underway. A high tide is required for access so it would be ideal to schedule the work in the morning (before 12) any day this week.

Please let me know what works best for the Park Board and I will make the arrangements for the water taxi.

Thanks,
Ian

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [vanpile.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: April 26, 2022 1:56 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Pottinger, Guy <guy.pottinger@vancouver.ca>
Subject: FW: [EXTERNAL] Barge Removal - Addling

Hi Ian,

Thanks. In order to expedite this, the Park Board will undertake this this week. Please advise where exactly on the barge the nest is located and will someone from VanPile provide access/be present?

Please provide some date and time options for this week, and we can schedule.

Thanks,

Harry

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Sent: Thursday, April 21, 2022 1:56 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: FW: [EXTERNAL] Barge Removal - Addling

Harry,

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Happy to get Hatfield on a call with the correct people on your side to discuss if required.

Thanks,
Ian

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Sent: April 21, 2022 1:33 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>
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Subject: RE: [EXTERNAL] Barge Removal - Addling

Hi Ian,

Our wildlife biologist Mila made a visit to the Barge today to perform a pre-work bird survey and install bird deterrent flagging. Fortunately, Mila confirmed that the single Canada Goose nest previously identified by Vanpile is the only nest on the barge and no other signs of nesting were

observed. It is hard to tell how far along the eggs are, however based on the time of discovery we suspect it could be another few weeks before the eggs have hatched and goslings have fledged. Under the Migratory Birds Convention Act this nest cannot be disturbed until the goslings have left the nest, unless the removal is completed under a damage and danger permit issued to the landowner. Protection of the nest typically includes a no-activity buffer area (i.e., 30 metres around the nest) to prevent disturbance to the nesting goose which could lead to nest abandonment. Given the anticipated work schedule, the timeline for fledging of the goslings is likely to conflict.

I have been in discussion with the Canadian Wildlife Service (CWS; issuer of the damage and danger permit), and they confirmed the permit applicant must be the landowner, which in this case is the City of Vancouver. CWS clarified it is a simple process to add nominees to an existing permit, which can be completed via an email from the permit applicant to the permitting officer including details of the additional nominees. Can we request a call with the City of Vancouver to discuss whether adding "Employees of Hatfield Consultants" as nominees to the existing permit is an option? I understand in response to our previous request the City preferred we obtain our own permit. The initial request was in the context of parks employees doing the removal, however if Hatfield was added as a nominee the task could be completed by a Hatfield biologist.

Let me know if you would like to discuss.

Cheers,

Marc VanderVeer, BSc, PAg
Environmental Specialist
T: +1 604 926 3261 | **M:** +1 778 879 1191
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Environmental and social scientists advancing sustainable development

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From:	Ian Purvis
To:	Khella, Harry; Jesse Percy
Cc:	Gandha, Amit; Pottinger, Guy
Subject:	RE: [EXTERNAL] Barge Removal - Addling
Date:	Friday, April 29, 2022 10:48:52 AM

Morning Harry,

Yes the addling was completed. Thank you to Parks for assisting in the nest remove. We have also installed additional bird deterrent (razzle-dazzle) around the barge to deter any further nesting.

Regards,
Ian

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: April 29, 2022 10:42 AM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Pottinger, Guy <guy.pottinger@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal - Addling

Hi Ian,

Has the addling work been completed?

Thanks,

Harry

From: Khella, Harry
Sent: Tuesday, April 26, 2022 2:53 PM
To: Pottinger, Guy <guy.pottinger@vancouver.ca>; Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal - Addling

Thanks Ian and Guy. Our staff will be informed of the pick up time by Guy. Ziggy's contact details are 604-968-5942.

Please let me know if you have any questions and please confirm once the work has been completed.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Pottinger, Guy <guy.pottinger@vancouver.ca>
Sent: Tuesday, April 26, 2022 2:50 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal - Addling

We work in pairs so the pickup is for two, confirmed for 7:45 tomorrow. Ziggy and Steve.

Thanks Guy

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Tuesday, April 26, 2022 2:47 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Pottinger, Guy <guy.pottinger@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal - Addling

Thanks Harry.

I've confirmed the water taxi. They will collect from the Aquatic Center dock at 7:45 as they are running around from the Harbour.

Andrew Lee will be on-site to supervise from our side. He can be reached at s.15(1)(l)

Regards,
Ian

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

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To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
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landowner. Protection of the nest typically includes a no-activity buffer area (i.e., 30 metres around the nest) to prevent disturbance to the nesting goose which could lead to nest abandonment. Given the anticipated work schedule, the timeline for fledging of the goslings is likely to conflict.

I have been in discussion with the Canadian Wildlife Service (CWS; issuer of the damage and danger permit), and they confirmed the permit applicant must be the landowner, which in this case is the City of Vancouver. CWS clarified it is a simple process to add nominees to an existing permit, which can be completed via an email from the permit applicant to the permitting officer including details of the additional nominees. Can we request a call with the City of Vancouver to discuss whether adding "Employees of Hatfield Consultants" as nominees to the existing permit is an option? I understand in response to our previous request the City preferred we obtain our own permit. The initial request was in the context of parks employees doing the removal, however if Hatfield was added as a nominee the task could be completed by a Hatfield biologist.

Let me know if you would like to discuss.

Cheers,

Marc VanderVeer, BSc, PAg
Environmental Specialist
T: +1 604 926 3261 | **M:** +1 778 879 1191
Hatfield | Website [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] | LinkedIn [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]
Environmental and social scientists advancing sustainable development

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reproduction, disclosure or dissemination of its contents is strictly prohibited. If you are not the intended recipient, please notify the sender by replying to this message and then delete it from your system

From: Khella, Harry
To: Jesse Percy
Cc: Ian Purvis
Subject: RE: [EXTERNAL] Barge Removal - Barge Structural Assessment
Date: Thursday, February 3, 2022 11:51:00 AM
Attachments: English Bay Barge - Fencing, Signage and Truck Routes V2.pdf

---

Thanks for advising.

With regards to the alternate fencing proposal you provided last week, the team have reviewed it and would like you to stick to the original proposal per attached and agreed. The benches shown in the red clouded area will be removed today and I am hopeful of sending across the temporary ramp specs to you by tomorrow. One the ramp has been designed, please share with us for review. Please also let us know when the fencing may be expected on site.

Let me know what else you may need in the meantime.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Tuesday, February 01, 2022 2:45 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: Re: [EXTERNAL] Barge Removal - Barge Structural Assessment

Hi Harry

We do not have a copy of the structural assessment. This document is between the owner and the insurer at this time.

Do you have an update on the fencing/walkway and the requirement for consultation?

Thanks,

Jesse

Sent from my iPhone

> On Feb 1, 2022, at 2:17 PM, Khella, Harry <Harry.Khella@vancouver.ca> wrote:
>
> Hi Jesse,
>
> Would it be possible for you send across the structural/technical assessment of the barge please? This is for our records as I don't appear to have it.
>
> Thanks,
>
> Harry
>
> Harry Khella
> Manager, Strategic Business Advisory
> Business Planning and Project Support
> City of Vancouver
> T: 604 829 2087
> E: harry.khella@vancouver.ca
>
>

From:	Jesse Percy
To:	Khella, Harry
Subject:	RE: [EXTERNAL] Barge Removal - Check In
Date:	Friday, February 4, 2022 10:53:11 AM

11:30 is better for me. It's just one of those Fridays where there is very little time between meetings.

Cheers,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: February 4, 2022 10:51 AM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal - Check In

I can make 11am work if that's better for you?

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Friday, February 04, 2022 10:51 AM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal - Check In

Hey Harry,

11:30 works, but I will need to drop off at 11:50.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: February 4, 2022 10:45 AM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: [EXTERNAL] Barge Removal - Check In

Hi Jesse,

Happy Friday!

Are you available for a short 30 min meeting on the barge file sometime today (feels easier to chat than ping pong emails)? Maybe 11:30 if you're available?

Let me know what works.

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

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From: Khella, Harry
To: Ian Purvis
Cc: Gandha, Amit; Jesse Percy
Subject: RE: [EXTERNAL] Barge Removal - License Agreement
Date: Monday, April 25, 2022 4:58:00 PM

Thanks and appreciated Ian. This looks good. I will let you know if we need anything else.
Cheers.

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Monday, April 25, 2022 4:52 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal - License Agreement

Harry,

How detailed of an equipment list are you looking for? In general, we will have the following items on-site at some stage to complete the work.

1. Linkbelt 350x4 w/ Shear
2. Manitowoc 10,000 Crawler Crane (100T)
3. 50' x 80' Flexifloat S70 Jack-up Barge
4. Carlson #14 Derrick Barge w/ Manitowoc 999 Crawler Crane (275T)
5. Misc. workboats
6. Mercury XI Water Taxi
7. APE 200 Vibratory Hammer
8. Marine Barges (TBD)

Note, our subcontractor for the fencing install will use a Hiab truck but I am not sure the exact make and model.

The latest schedule update is the milestone dates from the most weekly status report.

MILESTONE SUMMARY				
Task Name	**Current Status**	**Planned Date**	**Revised Date**	**Actual Date**
Pre-Condition Habitat Assessment	Complete	Jan 28, 2022		Jan 28, 2022
DFO Request for Review	Complete	Jan 28, 2022		Jan 28, 2022
WorkSafeBC Notice of Project	Complete	Feb 2, 2022		Feb 2, 2022
Seawall Loading Assessment	Complete	Feb 3, 2022		Feb 3, 2022
Hazardous Materials Assessment	Complete	Feb 11, 2022		Feb 11, 2022

s.16(1)	Complete	Feb 24, 2022		Feb 24, 2022
Work Plan Development	In Development	April 8, 2022	April 15, 2022	
Communications Plan	Draft Complete – Under Review	March 4, 2022		
Micro-Site	Complete – Live edits as needed	Feb 17, 2022		Feb 17, 2022
FAQ's	Draft Complete – Under Review	Feb 17, 2022		Feb 17, 2022
Site Fencing		May 9, 2022		
Mobilization & Scaffolding		May 16, 2022		
Pile Driving & Access		May 17, 2022		
Cribbing Installation – F Rake		May 18, 2022		
Bin Wall Removal		May 24, 2022		
Concrete Deck Removal		June 7, 2022		
Forward Rake Removal		June 7, 2022		
Stern Rake Removal		June 9, 2022		
Hull Demolition		June 16, 2022		
Debris Survey		July 12, 2022		
Pile Removal		July 12, 2022		
Demobilization		July 14, 2022		
Post-Condition Habitat Assessment		TBD – May 2023		

Regards,
Ian

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: April 25, 2022 4:46 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal - License Agreement

Thanks. Could you also list all of the equipment to be used on site and include the latest schedule.

Thanks,

Harry

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Monday, April 25, 2022 4:14 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal - License Agreement

Harry,

Please see requested information below.

1. Project Description & Scope of Work

   During the severe weather event of November 15, 2021 the SMT-5000 (the "Barge") was believed to be at anchorage in Burrard Inlet when it unexpectedly broke free, ending up grounded parallel to the Seawall at Sunset Beach, English Bay shortly thereafter.

   The wreck site of the SMT-5000 is located at Sunset Beach, English Bay within the City of Vancouver adjacent to Beach Avenue, northwest of the Burrard Street Bridge. The site is located at the following coordinates, 49.281229, -123.141361. The seabed at this location is generally sandy, except at the three apparent rock formations and several scattered rock outcroppings.

   In general, the scope of work for the deconstruction of the barge is as follows:

   - Pre-construction habitat assessment;
   - Obtain regulatory permits;
   - s.16(1)
   - Develop required work plans;
   - Mobilization of crew, equipment and materials;
   - Install temporary pilings, access and site facilities;
   - Remove bin walls;
   - Remove concrete decking;
   - Deconstruct hull in-place;
   - Demobilization of crew, equipment and materials;
   - Steel recycling;
   - Post-construction habitat assessment; and
   - Post-impact archeological assessment.

   Attached for reference, I've included a presentation on the barge recovery method from February 23, 2022 along with the Marine Habitat Assessment, DFO Letter of Advice, Hazmat Survey and CEMP.

2. Legal Names

	Vancouver Pile Driving Ltd.

Prime Contractor	20 Brooksbank Avenue North Vancouver, BC Canada V7J 2B8
Vessel Owner	Sentry Marine Towing Ltd. 2003 Brothers Road Nanaimo, BC Canada V9X 1R8
Claims Adjuster	Coast Claims Suite 6 – 2727 Quadra Street Victoria, BC Canada V8T 4E5

Please let me know if you require additional information.

Regards,
Ian

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [vanpile.com] [can01.safelinks.protection.outlook.com]

From: "Khella, Harry" <Harry.Khella@vancouver.ca>
Date: April 25, 2022 at 3:05:54 PM PDT
To: Jesse Percy <jesse.percy@carlsoncg.com>
Cc: "Gandha, Amit" <Amit.Gandha@vancouver.ca>
Subject: [EXTERNAL] Barge Removal - License Agreement

Hi Jesse,

We are finalizing the license agreement and as agreed hopeful that you can provide the following info:

1) Description of project. I think I mentioned it would be good to use some of the

slides from the salvage presentation deck from the coordination call of Jan 31st as a basis for this request. Please add/update to this deck and send across including what the project actually is, equipment to be used (list), pictures of cribbing, project schedule etc.

2) List of legal names of Van Pile, parent company, barge owner, insurer, insurance adjuster and any others from your side.

We will send the drat license agreement tomorrow.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

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From: Khella, Harry
To: Jesse Percy
Subject: RE: [EXTERNAL] Barge Removal - Temporary Ramp Specs
Date: Friday, February 4, 2022 8:23:00 PM

Thanks. We'll need to find a compromise that works for both entities.

Enjoy your weekend,

Harry

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Friday, February 04, 2022 4:15 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal - Temporary Ramp Specs

Hey Harry,

Ok thanks. At first glance I don't think the yellow allignmetn is going to work due to the access requirements from shore, but we will evaluate.

Thanks,

Jesse

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: February 4, 2022 4:11 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal - Temporary Ramp Specs

Hi Jesse,

No, I checked and there are none.

Thanks,

Harry

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Friday, February 04, 2022 4:06 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal - Temporary Ramp Specs

Thanks,

Do you have any survey files for the area?

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

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T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
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From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: February 4, 2022 4:02 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: [EXTERNAL] Barge Removal - Temporary Ramp Specs

Hi Jesse,

Thanks for your patience as the Park Board looked into the temporary ramp specifications. Using your original option per attached, the team have marked up some edits to the fence line (shown in yellow) and outlined the temporary ramp specs below:

- Asphalt pathway
- New pathway to have positive drainage
- 2" (50mm) compacted asphalt with 2" road base underneath (PB staff to review detailed design)
- Max slope of pathway is 4.9%
- Cross slope of pathway min 2%
- Seamless transition between existing and new pathways (i.e. no tripping hazards)
- Min pathway width 1.8m (pathway shown at 2.5m)
- Site Preparation and Grading (01 89 13)
- Aggregates and Granular Materials (02 41 14)
- Painted Pavement Markings (32 17 23 13)
- The contractor will need to provide submittals for our review (the asphalt mix and the granular/road base material)
- Contractor will need to refer to VPB Design Specs (asphalt specs are on page 250) https://vancouver.ca/files/cov/VPB_Design_Standards_20150515.pdf [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

If you could kindly expedite the ramp design and provide us with a draft to review, I would be grateful.

Please let me know if you have any questions.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

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From: Jesse Percy
To: Khella, Harry
Cc: Domes, Krystyna; Tait, Godfrey; Guerette, Jeannine; Jenn Wint; Ian Purvis; Gandha, Amit
Subject: Re: [EXTERNAL] Canceled: Barge Removal - Project Team Regroup
Date: Wednesday, April 27, 2022 11:19:34 AM

Thanks Harry

Works for me.

Thanks

Jesse

Sent from my iPhone

> On Apr 27, 2022, at 11:11 AM, Khella, Harry <Harry.Khella@vancouver.ca> wrote:
>
> Hi All,
>
> Unless there are specific agenda items that VDPL would like to go through, I propose our scheduled meeting for today is stood down. Final PB/CoV sign off on the updated notification and signage products will be provided shortly.
>
> Thanks,
>
> Harry
>
>

From:	Ian Purvis
To:	Khella, Harry; Jesse Percy; Gursameer Singh
Cc:	Gandha, Amit
Subject:	Re: [EXTERNAL] RE: English Bay Barge - Barrier Truck Analysis
Date:	Tuesday, April 26, 2022 5:34:05 PM

Harry,

EXP is a geotechnical engineering firm so they can only provide the loads that will be applied to the sea wall, pipe and barriers. The record drawings for the Seawall provided the design criteria so we were able to assess and put in measures (such as the mats) to reduce the loads to within the allowable limits.

We have assessed the loads on the MetroVancouver force main but we cannot determine if the loading on the pipe is acceptable without knowing MetroVancouver's criteria.

I've followed up multiple times with MetroVancouver and have not yet received a response to our inquiry. I'll try again tomorrow.

Thanks,
Ian

Ian Purvis, P.Eng
Operations Manager, Vancouver Pile Driving Ltd.
M: 604-928-9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: Tuesday, April 26, 2022 4:58 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>; Gursameer Singh <gursameer.singh@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] RE: English Bay Barge - Barrier Truck Analysis

Ok.

s.22(1) - if EXP is not a structural engineer that cannot comment on the capacity of the pipe or loadings of the barriers and fencing on the seawall (and notwithstanding the signs off that VPDL is seeking on the forecemain from MetroVan), is a structural engineer/EOR providing sign off for the loadings to be placed the seawall? Have I missed this somewhere?

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver

T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Tuesday, April 26, 2022 4:08 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>; Gursameer Singh <gursameer.singh@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: Re: [EXTERNAL] RE: English Bay Barge - Barrier Truck Analysis

Hey Harry

EXP is not a structural engineer and cannot provide comment on capacity of pipe. This is something we need from metro van.

Jesse

Sent from my iPhone

> On Apr 26, 2022, at 4:01 PM, Khella, Harry <Harry.Khella@vancouver.ca> wrote:
>
> Hi Jesse,
>
> Thanks for updating, much appreciated.
>
> **1)** Our team looked at the updated report and whilst it provides the loading on the sewer forcemain pipe, it does not provide a confirmation of the ability of the pipe to support that load. I guess Metro Van's review will confirm this and this will be incorporated into the report.
>
> **2)** The loading analysis is still not addressed in the report. EXP's structural team should comment on this item.
>
> Thanks,
>
> Harry
>
> ---
>
> **From:** Jesse Percy <Jesse.Percy@carlsoncg.com>
> **Sent:** Tuesday, April 26, 2022 10:46 AM
> **To:** Khella, Harry <Harry.Khella@vancouver.ca>

Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>; Gursameer Singh <gursameer.singh@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] RE: English Bay Barge - Barrier Truck Analysis

Hi Harry,

Ian followed up with Metro Van again yesterday. Still no response. Please see attached updated memo from exp that has been provided to Metro Van.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

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jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: April 25, 2022 7:04 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>; Gursameer Singh <gursameer.singh@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: [EXTERNAL] RE: English Bay Barge - Barrier Truck Analysis

Hi Jesse,

1) Any update from Metro Van and/or any follow up?
2) Has EXP updated their loading analysis and updated their report – if so, can you share with us please, highlighting where the edits are in the report.

Thanks,

Harry

From: Khella, Harry
Sent: Monday, April 04, 2022 11:45 AM
To: 'Jesse Percy' <Jesse.Percy@carlsoncg.com>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>; Gursameer Singh <gursameer.singh@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: English Bay Barge - Barrier Truck Analysis

Thanks for the analysis Jesse. Upon review, here are some initial comments:

1) The load effect on the Metro Vancouver regional sewer forcemain is not addressed in this report. Has Metro Vancouver reviewed/commented on this?

2) The report discusses a global stability analysis of the seawall structure. However, there is no comment provided regarding the internal load effect and resistance of the reinforced concrete wall itself. CoV proposed you ask EXP to comment on this for all 3 analysis sections.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Friday, April 01, 2022 3:34 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>; Gursameer Singh <gursameer.singh@carlsoncg.com>
Subject: [EXT] English Bay Barge - Barrier Truck Analysis

Hey Harry,

s.22(1) Please see attached updated analysis for the seawall based on the barrier truck analysis.

Can we set up a meeting on Monday between 9:30 and 2:00 PM to catch up?

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
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jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
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From: Jesse Percy
To: Khella, Harry
Cc: Ian Purvis; Gandha, Amit
Subject: Re: [EXTERNAL] RE: English Bay Barge - Tree Pruning
Date: Tuesday, March 15, 2022 7:03:44 PM
Attachments: image003.png
image003.png

Hey Harry

Eagle West has confirmed 15' height, and will need the full with of the path to manoeuvre. (Path is 12' and they are 8' wide).

Thanks

Jesse

Sent from my iPhone

> On Mar 15, 2022, at 6:21 PM, Khella, Harry <Harry.Khella@vancouver.ca> wrote:
>
> Hi Jesse,
>
> Please see below. If you could kindly provide clarification, that would be great.
>
> Cheers,
>
> Harry
>
> ---
>
> **From:** Gandha, Amit <Amit.Gandha@vancouver.ca>
> **Sent:** Tuesday, March 15, 2022 5:59 PM
> **To:** Khella, Harry <Harry.Khella@vancouver.ca>
> **Subject:** RE: English Bay Barge - Tree Pruning
>
> Hello Harry,
>
> We will have the tree pruned to provide clearance.
>
> Could I get clarification on the barriers and fencing: If we have the barriers and fencing placed in the parking lot, can we utilize a smaller truck with hiab to move and locate the barriers? Looking to minimize weight and improve turning radius so as to reduce impacts to the pathway.
>
> Thank you,

<!--[if !vml]--> [can01.safelinks.protection.outlook.com]<!--[endif]-->**Amit Gandha | Director of Parks**
Vancouver Park Board [can01.safelinks.protection.outlook.com] | 2099 Beach Avenue
t. 604-654-0781 | amit.gandha@vancouver.ca
pronouns: he/him/his

I am thankful to live, work, and play on the unceded, ancestral territories of the xʷməθkʷəy̓əm (Musqueam [can01.safelinks.protection.outlook.com]), Sḵwx̱wú7mesh (Squamish [can01.safelinks.protection.outlook.com]), and səl̓ilwətaʔɬ / sel̓íl̓witulh (Tsleil-Waututh [can01.safelinks.protection.outlook.com]) nations.

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Tuesday, March 15, 2022 2:17 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: [EXT] English Bay Barge - Tree Pruning

Hey Harry,

As per our discussion yesterday, please see attached file showing the locations of the trees that will need to be pruned back to allow the barrier truck access to the site. I am waiting for the dimensions of the truck and will forward when able, however I believe the truck height is 17' and the width is as wide as pathway. Additionally, it is understood that CoV Parks will install matts along the travel route to protect the path from the wheel loading of the trucks multiple return trips.

Please let me know if you have any questions.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

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From: Khella, Harry
To: Jesse Percy; Ian Purvis
Cc: Gandha, Amit
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay
Date: Tuesday, February 1, 2022 5:04:00 PM

Hi Jesse,

-

Recommendation

s.13(1), s.16(1)

-

Context

s.13(1), s.18

s.16(1), s.18

s.16(1), s.18

Please let me know if you have any questions on the above and please confirm your next steps.

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Khella, Harry
Sent: Monday, January 31, 2022 4:28 PM
To: 'Jesse Percy' <Jesse.Percy@carlsoncg.com>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Hi Jesse,

I have been advised that if there are any archaeological or ground disturbance concerns, then the three Nations need to be consulted per Provincial law. I am seeking info on this from my Engineering colleagues as we have an established process for this for CoV projects, but was keen to understand if this has been considered and wanted to flag for your attention.

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Monday, January 31, 2022 4:21 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Hey Harry,

There have not been any discussions around an archeological assessment. Does the CoV think it is required? We would not be excavating any soil unless the pathway is constructed.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: January 31, 2022 4:17 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Thanks for confirming Jesse. Is an archeological assessment included in any of the many assessments underway?

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Monday, January 31, 2022 12:52 PM

To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: Re: [EXTERNAL] RE: SMT-5000 Aground English Bay

Hey Harry

No problem.

s.16(1) [redacted]

s.16(1) [redacted]

s.16(1) [redacted]

Jesse

Sent from my iPhone

> On Jan 31, 2022, at 12:30 PM, Khella, Harry <Harry.Khella@vancouver.ca> wrote:
>
> Hi Jesse,
>
> Thanks for this morning's update, super helpful.
>
> Just a quick clarification as it is important to our organization. s.16(1) [redacted]
>
> Cheers,
>
> Harry
>
> Harry Khella
> Manager, Strategic Business Advisory
> Business Planning and Project Support
> City of Vancouver
> T: 604 829 2087
> E: harry.khella@vancouver.ca
>
>

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Monday, January 31, 2022 9:42 AM
To: Sadoway, Shane <shane.sadoway@tc.gc.ca>; Ian Donald <IDonald@coastclaims.com>; 'Jason.Krott@portvancouver.com' <Jason.Krott@portvancouver.com>; Mangat, Paramjeet <paramjeet.mangat@tc.gc.ca>; 'Van der valk, Jason' <Jason.VanDerValk@dfo-mpo.gc.ca>; Hayne, Kris <Kristopher.Hayne@vancouver.ca>; 'Sean.Baxter@portvancouver.com' <Sean.Baxter@portvancouver.com>; Todd Braconnier <tcbroc@shaw.ca>; Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Wilson, John <John.Wilson@tc.gc.ca>; Brown, Catherine <catherine.brown@tc.gc.ca>; Allan Hart <AHart@coastclaims.com>; Roddan, George <george.roddan@tc.gc.ca>; Stevens, Daniel <Daniel.Stevens@vancouver.ca>; Steve.taylor@dfo-mpo.gc.ca; Napper, Jennifer <Jennifer.Napper@dfo-mpo.gc.ca>; Chris Mulder <cmulder@capilanomaritime.com>; mmulligan@capilanomaritime.com; Oliver, Gillian <Gillian.Oliver@dfo-mpo.gc.ca>; 'Steve Budd' <sentrymarinetowing@gmail.com>; Tait, Godfrey <Godfrey.Tait@vancouver.ca>; Guerette, Jeannine <Jeannine.Guerette@vancouver.ca>; Bruce.Logan@worksafebc.com; Ian Purvis <Ian.Purvis@carlsoncg.com>; mvanderveer@hatfieldgroup.com; Peterson, Darren <darren.peterson@vancouver.ca>; Downie, Alex <alex.downie@vancouver.ca>; Gandha, Amit <Amit.Gandha@vancouver.ca>; Hand, Sean <Sean.Hand@dfo-mpo.gc.ca>
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Thanks Shane,

Please see below for clarification s.16(1)

Jesse Percy ASct., PMP
Director, Design Build CHC

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[can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

From: Sadoway, Shane <shane.sadoway@tc.gc.ca>
Sent: January 31, 2022 9:36 AM
To: Ian Donald <IDonald@coastclaims.com>; 'Jason.Krott@portvancouver.com' <Jason.Krott@portvancouver.com>; Mangat, Paramjeet <paramjeet.mangat@tc.gc.ca>; 'Van der valk, Jason' <Jason.VanDerValk@dfo-mpo.gc.ca>; Hayne, Kris <Kristopher.Hayne@vancouver.ca>;

'Sean.Baxter@portvancouver.com' <Sean.Baxter@portvancouver.com>; Todd Braconnier <tcbroc@shaw.ca>; Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Wilson, John <John.Wilson@tc.gc.ca>; Brown, Catherine <catherine.brown@tc.gc.ca>; Allan Hart <AHart@coastclaims.com>; Roddan, George <george.roddan@tc.gc.ca>; Stevens, Daniel <Daniel.Stevens@vancouver.ca>; Steve.taylor@dfo-mpo.gc.ca; Napper, Jennifer <Jennifer.Napper@dfo-mpo.gc.ca>; Chris Mulder <cmulder@capilanomaritime.com>; mmulligan@capilanomaritime.com; Oliver, Gillian <Gillian.Oliver@dfo-mpo.gc.ca>; 'Steve Budd' <sentrymarinetowing@gmail.com>; Tait, Godfrey <Godfrey.Tait@vancouver.ca>; Guerette, Jeannine <Jeannine.Guerette@vancouver.ca>; Bruce.Logan@worksafebc.com; Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>; mvanderveer@hatfieldgroup.com; Peterson, Darren <darren.peterson@vancouver.ca>; Downie, Alex <alex.downie@vancouver.ca>; Gandha, Amit <Amit.Gandha@vancouver.ca>; Hand, Sean <Sean.Hand@dfo-mpo.gc.ca>
Subject: [EXTERNAL] RE: SMT-5000 Aground English Bay

Good day,

Thank you for participating in today's update on the barge recovery. Quick recap: the barge will be deconstructed onsite and this process is estimated to be 10-12 weeks.

Salvage team:

- Fence line proposed and vetted with City of Vancouver (COV)
- COV Parks still approving public access
- Hazard materials review due completion tomorrow
- DFO review moving quickly and was received today (see attached)
- Variety of plans/permits in progress
- Habitat assessment carried out
- The barge will be deconstructed on site
- Work
    - Install temp piles to secure the work
    - Remove bin walls
    - Remove chip debris
    - Remove concrete decking
    - Remove deck and some structural members
    - Remove fore and aft rakes
    - Remove from stbd side, pillars
    - All materials will be loaded onto another barge for removal
    - Work to be carried out during bylaw hours to mitigate noise impacts
    - May support with airbags
- s.16(1)

VFPA to assist in comms

COV:

- No issues

WorkSafe BC

- Timelines on Notice of Project?
    - Intent to have it out this week

CCG:

- No issues

Cheers

Capt. Shane Sadoway
Manager Port State Control, Compliance and Enforcement
Marine Safety & Security, Pacific Region, Vancouver
Gestionnaire, Inspection d'État du port et de Conformité et d'Application
Sécurité et sûreté maritime, Région du Pacifique, Vancouver
Transport Canada / Transports Canada
shane.sadoway@tc.gc.ca
Cell 587-338-7141

From:	Jesse Percy
To:	Khella, Harry; Ian Purvis
Subject:	RE: [EXTERNAL] RE: SMT-5000 Weekly Status Report - April 8, 2022
Date:	Wednesday, April 20, 2022 2:10:12 PM

Hey Harry,

I can make 10:00am work. I will see if our commercial group is available as well.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: April 20, 2022 2:00 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: RE: [EXTERNAL] RE: SMT-5000 Weekly Status Report - April 8, 2022

Hi Jesse,

Fair comments. I was trying to expedite the process so that you could view the insurance requirements early.

The agreement is being drafted and prior to it being shared, we'll need a short call. So are you available tomorrow at 10:30 for 30 mins? It might be useful to include your commercial/insurance person in the discussion as we'll be including our lawyer who is drafting the agreement.

Thanks,

Harry

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Wednesday, April 20, 2022 1:43 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: RE: [EXTERNAL] RE: SMT-5000 Weekly Status Report - April 8, 2022

Hey Harry,

We will issue a status report shortly.

Re: Insurance. I have provided the document to our commercial group and they had the comment below:

With only a couple pages of this draft agreement attached, we are missing some vital information. For example, the "Licensor" is to be added as additional insured but "Licensor" is not defined. And is VanPile the "Licensee"?

Can you share the complete document so we have the full context of what is being requested?

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

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jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: April 20, 2022 1:00 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: [EXTERNAL] RE: SMT-5000 Weekly Status Report - April 8, 2022

Hi Ian,

- Is there a status summary for April 14th please?
- Is there any update from Metro?

Hi Jesse,

- I will be setting up a check in meeting shortly. Does tomorrow at 10:30 for 30 mins work? It works for us.
- Do you have any questions regarding the insurance requirements sent across last Thursday?

Thanks,

Harry

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Saturday, April 09, 2022 10:04 AM
To: Todd Braconnier <tcbroc@shaw.ca>; Allan Hart <AHart@coastclaims.com>; Khella, Harry <Harry.Khella@vancouver.ca>; Ian Donald <IDonald@coastclaims.com>
Cc: Jenn Wint <jenn@wintcommunications.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: [EXT] SMT-5000 Weekly Status Report - April 8, 2022

All,

Please see attached Weekly Status Report for April 8, 2022.

Regards,
Ian

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [vanpile.com] [can01.safelinks.protection.outlook.com]
[can01.safelinks.protection.outlook.com]

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From:	Jesse Percy
To:	Khella, Harry
Cc:	Gandha, Amit; Ian Purvis
Subject:	RE: [EXTERNAL] RE: SMT-5000 Weekly Status Report - April 15, 2022
Date:	Wednesday, April 20, 2022 5:26:24 PM

Hey Harry,

Barriers/fencing is planned from May 2 to 5.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: April 20, 2022 5:26 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: [EXTERNAL] RE: SMT-5000 Weekly Status Report - April 15, 2022

Thanks Jesse.

Please let us know which days during w/c May 2nd barrier and fencing is planned given the deconstruction start date is slated for May 9th.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Wednesday, April 20, 2022 5:21 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Todd Braconnier <tcbroc@shaw.ca>; Allan Hart

<AHart@coastclaims.com>; Ian Donald <IDonald@coastclaims.com>
Cc: Jenn Wint <jenn@wintcommunications.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: [EXT] RE: SMT-5000 Weekly Status Report - April 15, 2022

All,

Please see the attached weekly status report for last week.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
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From: Khella, Harry
To: Ian Purvis
Cc: Jesse Percy
Subject: RE: SMT-5000 Weekly Status Report - April 8, 2022
Date: Wednesday, April 20, 2022 12:59:00 PM

Hi Ian,

- Is there a status summary for April 14th please?
- Is there any update from Metro?

Hi Jesse,

- I will be setting up a check in meeting shortly. Does tomorrow at 10:30 for 30 mins work? It works for us.
- Do you have any questions regarding the insurance requirements sent across last Thursday?

Thanks,

Harry

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Saturday, April 09, 2022 10:04 AM
To: Todd Braconnier <tcbroc@shaw.ca>; Allan Hart <AHart@coastclaims.com>; Khella, Harry <Harry.Khella@vancouver.ca>; Ian Donald <IDonald@coastclaims.com>
Cc: Jenn Wint <jenn@wintcommunications.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: [EXT] SMT-5000 Weekly Status Report - April 8, 2022

All,

Please see attached Weekly Status Report for April 8, 2022.

Regards,
Ian

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [vanpile.com]

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From:	tcbroc@shaw.ca
To:	Jesse Percy; Khella, Harry; Allan Hart; Ian Donald
Cc:	Jenn Wint; Ian Purvis; Gandha, Amit; Vanessa Hobden
Subject:	[EXT] Re: SMT-5000 Status Report - July 4, 2022
Date:	Wednesday, July 20, 2022 3:57:48 PM

YES.....

Get Outlook for Android [aka.ms]

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Wednesday, July 20, 2022 3:46:19 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Todd Braconnier <tcbroc@shaw.ca>; Allan Hart <AHart@coastclaims.com>; Ian Donald <IDonald@coastclaims.com>
Cc: Jenn Wint <jenn@wintcommunications.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>
Subject: RE: SMT-5000 Status Report - July 4, 2022

Good Afternoon,

We have now received the Sto:Lo Heritage Investigation Permit and are proceeding with the Monday, July 25 start.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Jesse Percy
Sent: July 20, 2022 11:03 AM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Todd Braconnier <tcbroc@shaw.ca>; Allan Hart <AHart@coastclaims.com>; Ian Donald <IDonald@coastclaims.com>
Cc: Jenn Wint <jenn@wintcommunications.com>; Ian Purvis <ian.purvis@carlsoncg.com>; Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden <vanessa.hobden@carlsoncg.com>
Subject: RE: SMT-5000 Status Report - July 4, 2022

Good Morning All,

s.16(1) The last item we are waiting for is the Sto:Lo Heritage Permit, which Musqueam Archaeology Department is following

up on today. As we anticipate receiving this permit is imminent, we are moving forward with plans to mobilize to site Monday Morning.

I will update you once we receive confirmation of the Sto:Lo permit.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Jesse Percy
Sent: July 18, 2022 5:04 PM
To: 'Khella, Harry' <Harry.Khella@vancouver.ca>; 'Todd Braconnier' <tcbroc@shaw.ca>; 'Allan Hart' <AHart@coastclaims.com>; 'Ian Donald' <IDonald@coastclaims.com>
Cc: 'Jenn Wint' <jenn@wintcommunications.com>; Ian Purvis <ian.purvis@carlsoncg.com>; 'Gandha, Amit' <Amit.Gandha@vancouver.ca>; Vanessa Hobden <vanessa.hobden@carlsoncg.com>
Subject: RE: SMT-5000 Status Report - July 4, 2022

All,

Please see the attached weekly status report up to July 18, 2022. s.16(1)
s.16(1)

We have contacted the referrals group to provide an update on the project. We are also waiting for the Sto:Lo Heritage Permit; however, I spoke with their Archeological group today and anticipate receiving the permit within the coming days.

We hope to start site prep work next week with the main mobilization of resources planned for August 2 (after the long weekend).

Please let me know if you have any questions.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
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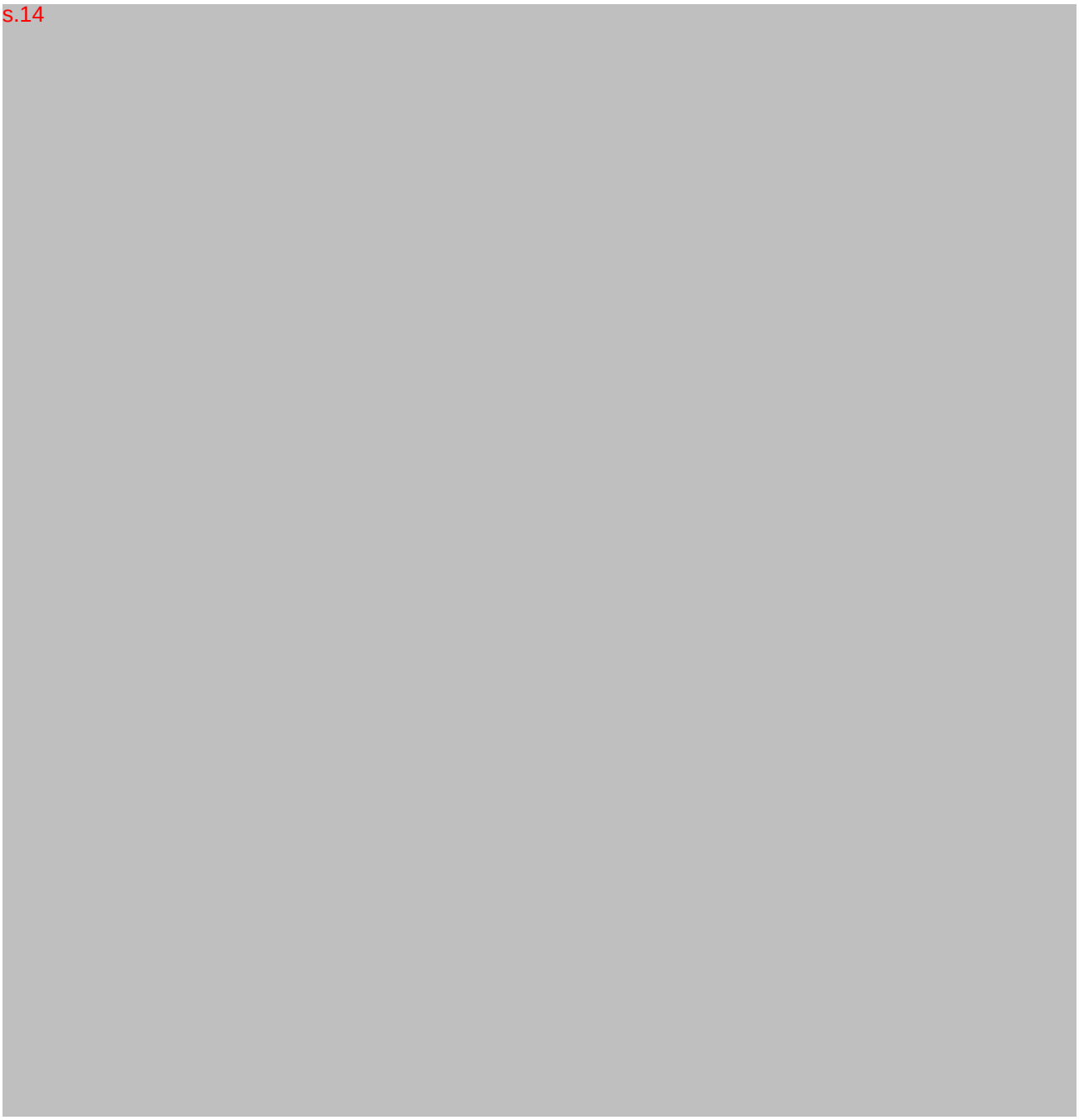
s.14


s.14


s.14

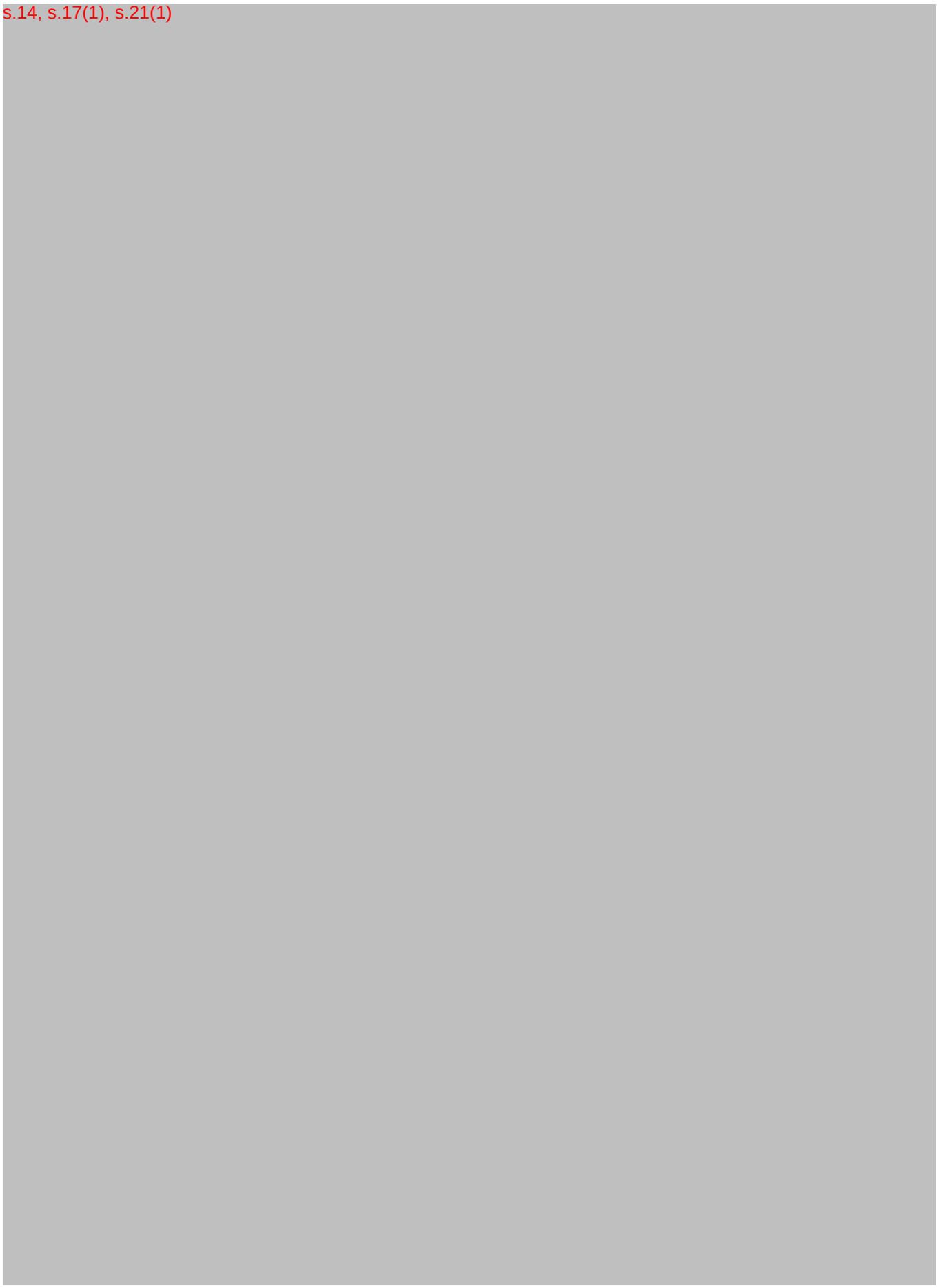
s.14



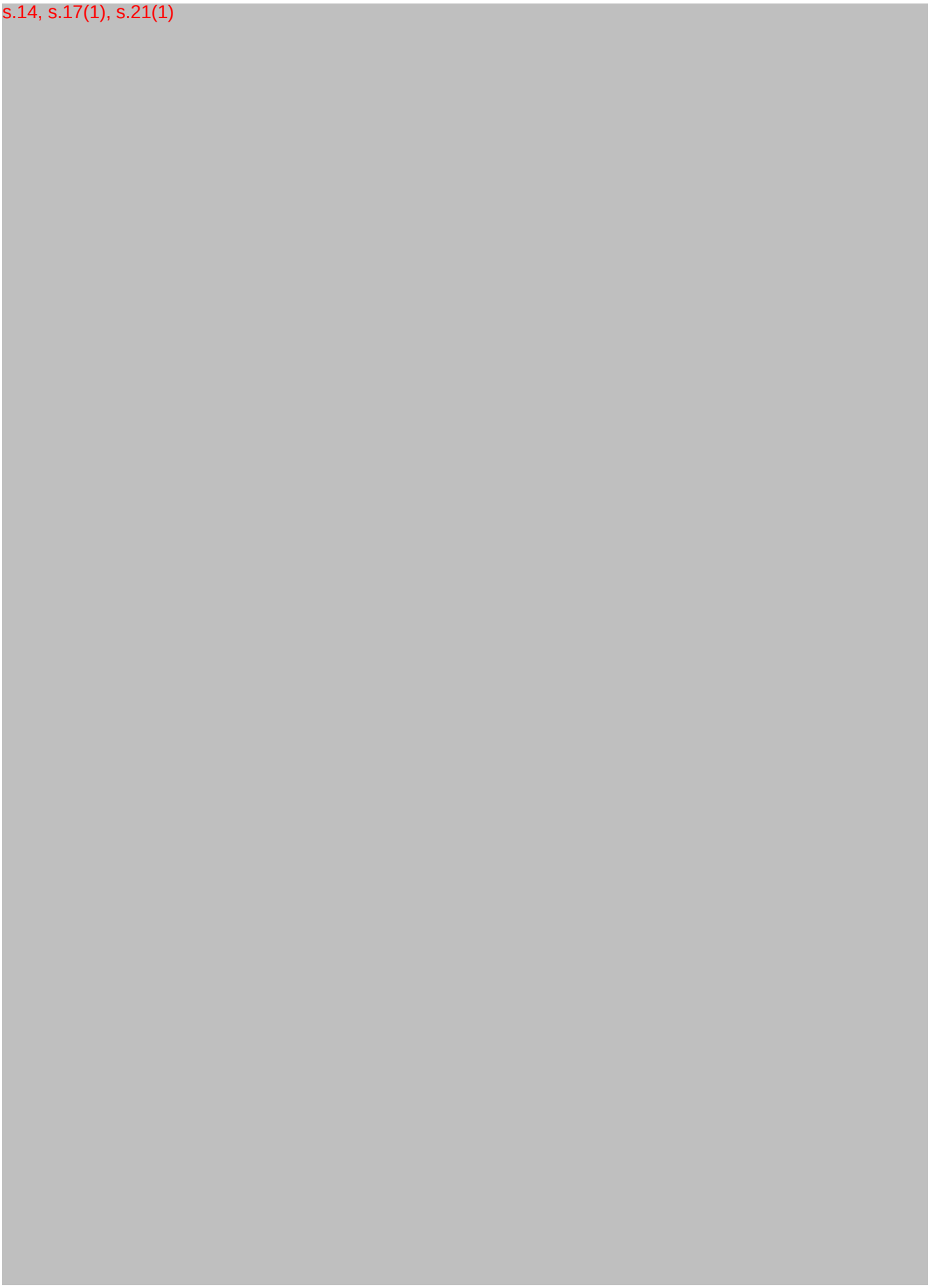
s.14

s.14

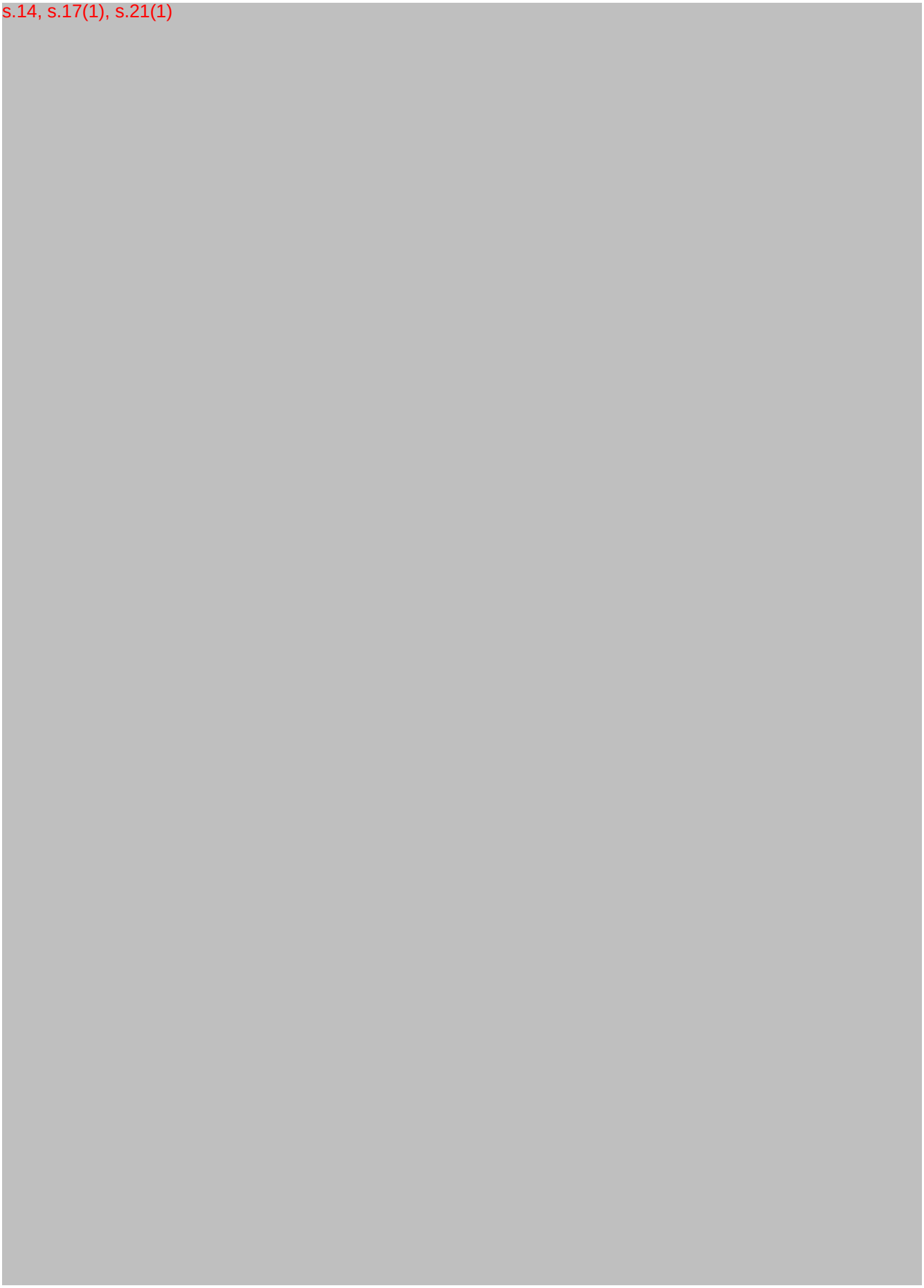
s.14, s.17(1), s.21(1)



s.14, s.17(1), s.21(1)



s.14, s.17(1), s.21(1)



s.14, s.17(1), s.21(1)

From: Khella, Harry
Sent: Tuesday, February 1, 2022 5:04 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Hi Jesse,

-
Recommendation
s.13(1), s.16(1)

-
Context
s.13(1), s.18

s.16(1), s.18

Please let me know if you have any questions on the above and please confirm your next steps.

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Khella, Harry
Sent: Monday, January 31, 2022 4:28 PM
To: 'Jesse Percy' <Jesse.Percy@carlsoncg.com>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Hi Jesse,

I have been advised that if there are any archaeological or ground disturbance concerns, then the three Nations need to be consulted per Provincial law. I am seeking info on this from my Engineering colleagues as we have an established process for this for CoV projects, but was keen to understand if this has been considered and wanted to flag for your attention.

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Monday, January 31, 2022 4:21 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>

Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Hey Harry,

There have not been any discussions around an archeological assessment. Does the CoV think it is required? We would not be excavating any soil unless the pathway is constructed.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com [can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: January 31, 2022 4:17 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Thanks for confirming Jesse. Is an archeological assessment included in any of the many assessments underway?

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Monday, January 31, 2022 12:52 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Ian Purvis <Ian.Purvis@carlsoncg.com>
Subject: Re: [EXTERNAL] RE: SMT-5000 Aground English Bay

Hey Harry

No problem.

s.16(1)

s.16(1)

s.16(1)

Jesse

Sent from my iPhone

> On Jan 31, 2022, at 12:30 PM, Khella, Harry <Harry.Khella@vancouver.ca> wrote:
>
> Hi Jesse,
>
> Thanks for this morning's update, super helpful.
>
> Just a quick clarification as it is important to our organization. s.16(1)
> s.16(1)
>
> Cheers,
>
> Harry
>
> Harry Khella
> Manager, Strategic Business Advisory
> Business Planning and Project Support
> City of Vancouver
> T: 604 829 2087
> E: harry.khella@vancouver.ca
>
> *WARNING: This e-mail transmission and any documents, files or previous e-mails attached to it, may contain confidential and/or proprietary information. If you are not the intended recipient or the person responsible for delivering it to the intended recipient, you are hereby notified that any disclosure, copying, distribution or use of any of the information contained in or attached to this transmission is STRICTLY PROHIBITED. If you have received this transmission in error, please immediately notify the sender by telephone at 604.829.2087 and destroy the original transmission and its attachments without reading them.*
>
> ---
>
> **From:** Jesse Percy <Jesse.Percy@carlsoncg.com>
> **Sent:** Monday, January 31, 2022 9:42 AM
> **To:** Sadoway, Shane <shane.sadoway@tc.gc.ca>; Ian Donald <IDonald@coastclaims.com>; 'Jason.Krott@portvancouver.com' <Jason.Krott@portvancouver.com>; Mangat, Paramjeet <paramjeet.mangat@tc.gc.ca>; 'Van der valk, Jason' <Jason.VanDerValk@dfo-mpo.gc.ca>; Hayne, Kris <Kristopher.Hayne@vancouver.ca>; 'Sean.Baxter@portvancouver.com' <Sean.Baxter@portvancouver.com>; Todd Braconnier <tcbroc@shaw.ca>; Khella, Harry <Harry.Khella@vancouver.ca>
> **Cc:** Wilson, John <John.Wilson@tc.gc.ca>; Brown, Catherine <catherine.brown@tc.gc.ca>; Allan Hart <AHart@coastclaims.com>; Roddan, George <george.roddan@tc.gc.ca>; Stevens, Daniel <Daniel.Stevens@vancouver.ca>; Steve.taylor@dfo-mpo.gc.ca; Napper, Jennifer <Jennifer.Napper@dfo-mpo.gc.ca>; Chris Mulder

<cmulder@capilanomaritime.com>; mmulligan@capilanomaritime.com; Oliver, Gillian <Gillian.Oliver@dfo-mpo.gc.ca>; 'Steve Budd' <sentrymarinetowing@gmail.com>; Tait, Godfrey <Godfrey.Tait@vancouver.ca>; Guerette, Jeannine <Jeannine.Guerette@vancouver.ca>; Bruce.Logan@worksafebc.com; Ian Purvis <Ian.Purvis@carlsoncg.com>; mvanderveer@hatfieldgroup.com; Peterson, Darren <darren.peterson@vancouver.ca>; Downie, Alex <alex.downie@vancouver.ca>; Gandha, Amit <Amit.Gandha@vancouver.ca>; Hand, Sean <Sean.Hand@dfo-mpo.gc.ca>
Subject: RE: [EXTERNAL] RE: SMT-5000 Aground English Bay

Thanks Shane,

Please see below for clarification s.16(1)

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
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[can01.safelinks.protection.outlook.com]

From: Sadoway, Shane <shane.sadoway@tc.gc.ca>
Sent: January 31, 2022 9:36 AM
To: Ian Donald <IDonald@coastclaims.com>; 'Jason.Krott@portvancouver.com' <Jason.Krott@portvancouver.com>; Mangat, Paramjeet <paramjeet.mangat@tc.gc.ca>; 'Van der valk, Jason' <Jason.VanDerValk@dfo-mpo.gc.ca>; Hayne, Kris <Kristopher.Hayne@vancouver.ca>; 'Sean.Baxter@portvancouver.com' <Sean.Baxter@portvancouver.com>; Todd Braconnier <tcbroc@shaw.ca>; Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Wilson, John <John.Wilson@tc.gc.ca>; Brown, Catherine <catherine.brown@tc.gc.ca>; Allan Hart <AHart@coastclaims.com>; Roddan, George <george.roddan@tc.gc.ca>; Stevens, Daniel <Daniel.Stevens@vancouver.ca>; Steve.taylor@dfo-mpo.gc.ca; Napper, Jennifer <Jennifer.Napper@dfo-mpo.gc.ca>; Chris Mulder <cmulder@capilanomaritime.com>; mmulligan@capilanomaritime.com; Oliver, Gillian <Gillian.Oliver@dfo-mpo.gc.ca>; 'Steve Budd' <sentrymarinetowing@gmail.com>; Tait, Godfrey <Godfrey.Tait@vancouver.ca>; Guerette, Jeannine <Jeannine.Guerette@vancouver.ca>; Bruce.Logan@worksafebc.com; Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>; mvanderveer@hatfieldgroup.com; Peterson, Darren <darren.peterson@vancouver.ca>; Downie, Alex <alex.downie@vancouver.ca>; Gandha, Amit <Amit.Gandha@vancouver.ca>; Hand, Sean <Sean.Hand@dfo-mpo.gc.ca>
Subject: [EXTERNAL] RE: SMT-5000 Aground English Bay

Good day,

Thank you for participating in today's update on the barge recovery. Quick recap: the barge will be deconstructed onsite and this process is estimated to be 10-12 weeks.

Salvage team:

- Fence line proposed and vetted with City of Vancouver (COV)
- COV Parks still approving public access
- Hazard materials review due completion tomorrow
- DFO review moving quickly and was received today (see attached)
- Variety of plans/permits in progress
- Habitat assessment carried out
- The barge will be deconstructed on site
- Work
    - Install temp piles to secure the work
    - Remove bin walls
    - Remove chip debris
    - Remove concrete decking
    - Remove deck and some structural members
    - Remove fore and aft rakes
    - Remove from stbd side, pillars
    - All materials will be loaded onto another barge for removal
    - Work to be carried out during bylaw hours to mitigate noise impacts
    - May support with airbags
- s.16(1)

VFPA to assist in comms

COV:

- No issues

WorkSafe BC

- Timelines on Notice of Project?
    - Intent to have it out this week

CCG:

- No issues

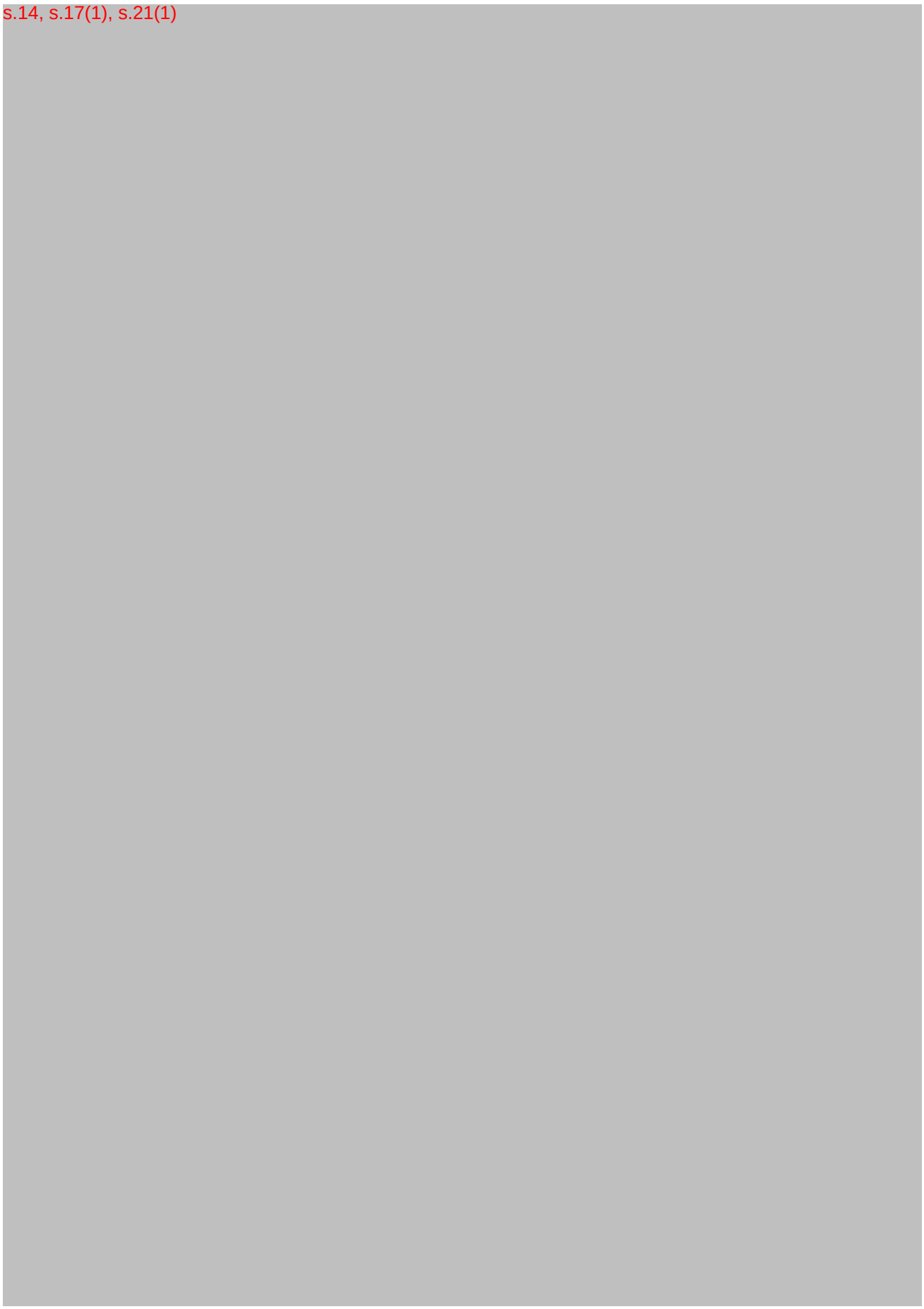
Cheers

Capt. Shane Sadoway
Manager Port State Control, Compliance and Enforcement
Marine Safety & Security, Pacific Region, Vancouver
Gestionnaire, Inspection d'État du port et de Conformité et d'Application
Sécurité et sûreté maritime, Région du Pacifique, Vancouver
Transport Canada / Transports Canada
shane.sadoway@tc.gc.ca
Cell 587-338-7141

s.14, s.17(1), s.21(1)

s.14, s.17(1), s.21(1)

s.14, s.17(1), s.21(1)



s.14, s.17(1), s.21(1)

SMT-5000 BARGE SALVAGE

ENVIRONMENTAL MANAGEMENT PLAN

January 2022

Hatfield

Prepared for:

Vancouver Pile Driving Ltd.

North Vancouver, British Columbia

Hatfield Consultants LLP

#200 - 850 Harbourside Drive
North Vancouver, British Columbia, Canada V7P 0A3
Tel: 1.604.926.3261 • Fax: 1.604.926.5389
www.hatfieldgroup.com

SMT-5000 BARGE SALVAGE

ENVIRONMENTAL MANAGEMENT PLAN

Prepared for:

VANCOUVER PILE DRIVING LTD.
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NORTH VANCOUVER, BC
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#200 - 850 HARBOURSIDE DRIVE
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CANADA V7P 0A3
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JANUARY 2022

PROJECT NUMBER
VERSION 1

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LIST OF ACRONYMS

COV	City of Vancouver
DFO	Fisheries and Oceans Canada
ECCC	Environment Climate Change Canada
EEP	Environmental Emergency Program
EM	Environmental Monitor
EMBC	Environmental Management BC
EMP	Environmental Management Plan
EZ	Exclusion Zone
MMO	Marine Mammal Observer
MMOP	Marine Mammal Observation Program
PPE	Personal Protective Equipment
QEP	Qualified Environmental Professional
SMT	Sentry Marine Towing
RFR	Request for Review
TC	Transport Canada

DISTRIBUTION LIST

The following individuals/firms have received this document:

Name	Firm	Hardcopies	Email	FTP
Jesse Percy	Vancouver Pile Driving Ltd.		✓	
Ian Purvis	Vancouver Pile Driving Ltd.		✓	
Fish and Fish Habitat Protection Program	Fisheries and Oceans Canada		✓	

AMENDMENT RECORD

This report has been issued and amended as follows:

Issue	Description	Date	Approved by	
1	First version of SMT-5000 Barge Salvage Project Environmental Management Plan	20220128		
			Stewart Wright Project Environmental Director	Marc VanderVeer Project Environmental Manager

1.0 INTRODUCTION

On November 15, 2021, a severe weather event in Vancouver BC, dislodged a chip transport barge (SMT-5000; the Barge) from its presumed anchorage in Burrard Inlet and pushed it towards shore. The combination of high winds and a high tide pushed the Barge onto the shoreline at Sunset Beach, English Bay, where it became grounded atop several boulder clusters parallel to the Seawall. Due to severe hull damage caused by the boulder clusters, the Barge has been deemed a total constructive loss and will be entirely deconstructed in situ (the Project). Vancouver Pile Driving Ltd. (Vanpile) has been retained as the prime marine contractor to salvage the barge.

This Environmental Management Plan (EMP) is the primary document to guide overall environmental management and protection practices to be implemented during the Project.

The purpose of the EMP is to provide information on how to avoid and mitigate potential adverse environmental effects identified and assessed through the Project review and permitting phase, including the Fisheries and Oceans (DFO) Request for Review (RFR) process under the *Fisheries Act* (FA), as defined in the applications and plans submitted to DFO.

This EMP will provide guidance to Vanpile and all sub-contractors required to complete Project works. Vanpile is ultimately responsible for ensuring all conditions of the Project permits and mitigation measures in the EMP are fulfilled.

2.0 PROJECT INFORMATION

2.1 SITE DESCRIPTION

The Project Site (the Site) is located at Sunset Beach, English Bay within the City of Vancouver (CoV). The Barge is located parallel to Beach Avenue and approximately 700 m northwest of the Burrard Street Bridge. The geographical coordinates are 49°16'53.30" North and 123° 8'29.70" West. A site overview is provided in Figure 1.

The Site is comprised mostly of sand, with boulders and cobbles in some areas. Boulder clusters were added to the shoreline to reduce beach scour at the toe of the seawall, and to increase the habitat complexity of the upper intertidal (WorleyParsons 2010). The stranded Barge rests approximately 24.4 m (80 ft) from the offshore face of the Seawall upon three visible boulder clusters. The Barge is grounded on the starboard side, set at 8 degrees list baseline, at the approximate level of a 1.68 m (5.5 ft) tide. The Barge is currently 0.45 m (1.5 ft) higher than required to float off the boulders undamaged.

Figure 1 Overview of the English Bay Barge.

Legend

- English Bay Barge
- Contours - 1m*
- Contours - 0.2m*

* contours referenced to Chart Datum

Data Sources:
a) English Bay Barge, Hatfield 2022.
b) Contours, Vancouver Pile Driving 2022.
c) Background, Aerial photo 7.5cm, 26 April 2018, Esri Online Service.

0 10 20 40 m

N

Scale: 1:1,800

Projection: NAD 1983 UTM Zone 10N

Hatfield

English Bay Barge Removal

K:\Data\Project\VPD11325-NVA_MXD\VPD11352_EnglishBayBarge_LocationMap_20220118_v0_1_AH.mxd

2.2 PROJECT COMPONENTS

Project works will include the following components:

- Mobilization of marine equipment (including temporary relocation of subtidal boulders and installation of temporary mooring pilings) and erection of land-based exclusion fencing;
- Removal of upper bin walls via cutting and shearing;
- Removal of 6” concrete deck slab via saw cutting and hoe-rams;
- Removal of lower bin walls, steel decking, structural members and complete disassembly; and
- De-mobilization and cleanup.

2.3 SALVAGE METHODS

Mobilization Activities

Prior to salvage activities, the temporary relocation of subtidal boulder clusters will be required to facilitate work barge access. Subtidal boulders will be temporarily moved aside using a clamshell bucket suspended from a barge-mounted crane. The boulders will be placed on the adjacent seabed in an area of similar tidal elevation and depth, and only the boulders required for barge access will be disturbed. No dredging or disturbance of the native seabed materials will be conducted. Following Project completion, the boulders will be replaced to their original location using the same methodology.

Two temporary steel pilings (36" diameter) will be installed on the offshore edge of the grounded barge to secure the barge for the duration of works. These pilings will be installed into sandy substrate using vibratory pile driving methods and will allow for securement of the barge to prevent barge movement as components are removed and the barge weight is reduced. During pile driving activities, hydroacoustic monitoring and Marine Mammal Observation (MMO) will be conducted as required based on measured sound levels (see Section 11.2).

Barge Salvage Activities

One engine exists on the Barge within an engine room located at the bow centreline. This engine will be disconnected, and all associated hydrocarbons removed and contained by a mechanic prior to removal from the Barge. Once removed, and all associated hydrocarbons contained, barge deconstruction works will proceed including the dismantling and removal of concrete decking, steel bin walls, steel decking, and the steel hull.

During concrete demolition, the lower bin walls will remain in place to facilitate containment and capture of storm water with potential to contain concrete fines. The concrete decking will be removed using concrete saws and small excavators/skid-steers with hoe-ram attachments used to break up the concrete. Sealed demolition bins will be filled with concrete and craned off the barge to a supporting materials scow.

The steel bin walls will be cut using cutting torches or hydraulic shears and lifted onto a support scow for transport. The steel decking and structural members will be removed using cutting torches or hydraulic shears and will be lifted to the supporting scow. Air bags will be used to elevate the final sections of the hull off of the substrate to allow for cutting. Cutting activities will be performed from the barge deck, foreshore areas, and may be required underwater via divers.

Once removed, barge components will be loaded onto the support barge via crane for transportation to an offsite facility for steel recycling.

Demobilization Activities

Following Barge removal, demobilization activities will include final site cleanup, equipment demobilization and the return of subtidal boulders to the original position.

2.4 PROJECT SCHEDULE

Table 1 Anticipated project schedule.

Task	Anticipated Dates
Mobilization	February 2022
Salvage	February – March 2022
De-mobilization	March 2022

Schedule subject to change.

3.0 CONTACTS AND RESPONSIBILITIES

3.1 KEY PROJECT ENVIRONMENTAL PERSONNEL

The Project environmental personnel include the following qualified environmental professionals (QEPs):

- Environmental Manager; and
- Environmental Monitor (EM).

Environmental personnel will have direct input into activities that have the potential for adverse effects on the environment. Environmental personnel will participate in team meetings as required, and they will monitor and report on salvage activities and the effectiveness of environmental control strategies and mitigation measures, with respect to Project environmental permits, environmental legislation and BMPs.

The EM shall have the authority to halt salvage activity and issue a Stop Work Order, if works fail to meet these environmental requirements, or are, in their professional judgment, representing significant or unacceptable risk to the environment. Recommendations to resume work shall be made once the causes leading to the Stop Work Order have been identified, addressed, controlled, and the environmental risks have been acceptably reduced or eliminated. Work will be allowed to resume once conditions detrimental to the environment have been rectified to the satisfaction of the EM and Vanpile.

3.2 VANPILE RESPONSIBILITIES

Vanpile shall be responsible for verifying that the Project is constructed in compliance with environmental legislation and regulations, permitting requirements and BMPs. Responsibilities of the Contractor (Vanpile) include:

- Review the Project EMP with their staff and sub-Contractors prior to commencing Site works;
- Comply with any agency permit, or licence issued for the Project as well as all other applicable federal, provincial and municipal laws, statutes, by-laws, regulations, orders and policies;
- Cooperate with the EM appointed for the work. They shall comply with written or verbal instructions with respect to conducting activities in compliance with the mitigation measures outlined in the EMP;
- Correct deficiencies and any non-compliance issues upon direction from the EM whether written or verbal. Corrections shall be made as soon as reasonably possible, ideally within 24 hours of directions; and
- Review this EMP and the applicable guidelines prior to the start of each Project phase or new activity.

Contact details for key Project personnel, are provided in Table 2.

Table 2 Project contacts.

Name	Company	Responsibility	Contact Information
Ian Purvis	Vancouver Pile Driving Ltd.	Project Manager	604-928-9450
Jesse Percy	Vancouver Pile Driving Ltd.	Project Director	604-999-7757
Kim Stanley	Vancouver Pile Driving Ltd.	Director, HSEQ	604-809-7800
Myles Murphy	Vancouver Pile Driving Ltd.	Manager, HSEQ	778-835-0237
TBD		Construction Safety Officer	
Marc VanderVeer	Hatfield	Environmental Manager	604-926-3261/ 778-879-1191
TBD	Hatfield	Environmental Monitor	
Todd Braconnier	TCB Marine Consulting Services	Salvage Master	604-375-0923
Conservation and Protection Field Supervisor for Lower Mainland / Squamish	Fisheries and Oceans Canada (DFO)		604-664-9250
Navigation Protection Program	Pacific Regional Office		604-775-8867

4.0 ENVIRONMENTAL AWARENESS AND TRAINING

4.1 ENVIRONMENTAL ORIENTATION

The pre-job orientation delivered to all salvage personnel as a pre-requisite to on-site work shall include the following environmental components:

- An overview of the EMP;
- Roles and responsibilities of personnel and relevant contact information;
- Site-specific environmental issues, regulatory requirements, environmental protection and mitigation measures; and
- Responsibilities, protocols, and relevant contact information in response to an accidental spill or other type of environmental emergency, including information specified by relevant standards, codes, or enactments.

4.2 PRE-TASK TALKS

Environmental awareness talks will be conducted on a regular basis to confirm workers are aware of sensitive sites and/or species, potential salvage-related effects of sensitive works, and the mitigation measures to be employed during works, as outlined in the EMP and Contractor's work procedures.

The EM will remain in contact with Vanpile crews to review site environmental constraints and any additional measures that may require implementing, such as wildlife observed, in-water environmental mitigations, or ongoing opportunities for corrective and/or preventive actions.

5.0 ENVIRONMENTAL OBLIGATIONS

All Project works will be completed in compliance with applicable legislation, guidelines and conditions, as outlined in Sections 5.1 and 5.2.

5.1 RELEVANT ENVIRONMENTAL LEGISLATION

Table 3 Relevant environmental legislation

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in Place/ Forthcoming; or Requirements Met
Federal			
Fisheries Act (FA – administered by DFO)	The FA is the main federal legislation providing protection for fish, fish habitat and water quality in Canada. Also, the FA also prohibits the deposit of deleterious substances to water frequented by fish.	The work involves works below the high-water mark and works with potential adverse effects on fish and fish habitat.	Letter of Advice - forthcoming

Table 3 (Cont'd.)

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in Place/ Forthcoming; or Requirements Met
Federal (Cont'd.)			
Canada Shipping Act, National Spill Response Protocol (– administered by Transport Canada)	The *Canada Shipping Act* is Transport Canada's regulatory framework surrounding marine pollution and its enforcement. In the case of a report of pollution in the water, including hydraulic oil or fuel spills, Canada operates under the National Spill Response Protocol, which specifies that the Canadian Coast Guard is responsible for spill response and recovery in the marine environment.	The Project has the potential for hydrocarbon spills English Bay.	A Spill Response Plan has been developed for the Project and is provided in Section 7.2 of this EMP.
Provincial			
Spill Reporting Regulations of the *Environmental Management Act* (EMA – administered by the Ministry of Environment)	The regulation establishes procedures for reporting the unauthorized release of substances into the environment as well as outlining details of reportable amounts for certain substances for sites having Provincial jurisdiction.	Substances (e.g., hydrocarbons) that may be harmful to the environment will be used during the construction period of the Project.	A Spill Response Plan has been developed for the construction phase of the Project and is provided in Section 7.2 of this EMP. All spills over the limits specified in the regulation will be reported.
BC *Heritage Conservation Act* (administered by the Ministry of Forests, Lands and Natural Resource Operations)	The Act facilitates the protection and conservation of heritage property in BC.	Works may result in minor temporary ground disturbance on the intertidal foreshore.	An Archaeological Resources Management Plan is provided in Section 9.0 of this EMP.
Regional			
Metro Vancouver Municipal Solid Waste and Recyclable Material Regulatory Bylaw #181, 1996	Metro Vancouver administers and enforces the disposal of solid waste and recyclables that are received at their transfer stations and landfills.	The Project will be generating solid waste and recyclables during construction.	To minimize the production of solid waste from construction, all waste will be segregated on site and recyclables (e.g., wood, metal, and organic waste) will be transported to an appropriate facility. A Waste Management Plan is provided in Section 10.0 of this EMP.

Table 3 (Cont'd.)

Act, Regulation or Bylaw	Description	Applicability	Approval or Permit in Place/ Forthcoming; or Requirements Met
Municipal			
City of Vancouver Noise Control By-law 6555	The Noise Control Bylaw regulates or prohibits the making of certain noises in the City and includes information on objectionable noises or sounds, exclusions, enforcement, penalty, and ticketing.	Construction equipment will be used during construction of the Project.	Noise levels from construction will be conducted in accordance with the CoV Noise Control Bylaw unless a Noise bylaw variance is obtained from the CoV. Mitigation measures to be implemented to minimize noise emissions resulting from Site activities are provided in Section 6.2 of this EMP.

5.2 ENVIRONMENTAL GUIDANCE DOCUMENTS AND BEST MANAGEMENT PRACTICES

The following list of guidance documents and BMPs relevant to Project works have been used in the preparation of this EMP. Regulatory agency policies, guidelines and documents are subject to change from time to time, and this list will be updated during any EMP updates to verify that the most up-to-date versions are being followed.

- A Best Practices Guide to Solid Waste Reduction (Canadian Construction Association, 2001);
- A Field Guide to Fuel Handling, Transportation and Storage (BC MOWLA, 2002);
- Ambient Water Quality Guidelines (Criteria) for Turbidity, Suspended and Benthic Sediment: Overview Report. BC Ministry of Environment and Parks, 2001;
- Best Management Practices for Pile Driving and Related Operations. Marine and Pile Driving Contractors Association. 2003;
- British Columbia Approved Water Quality Guidelines Summary Report (BC Ministry of Environment, 2016);
- British Columbia Hazardous Material Response Plan (BC Ministry of Environment, 2013a);
- British Columbia Inland Oil Spill Response Plan (BC Ministry of Environment, 2013b);
- British Columbia Noise Control Best Practices Guideline (BC Oil and Gas Committee 2009);
- Emergency Response Guidebook (CANUTEC, Transport Canada, 2016);

- Emergency Preparedness and Response (CAN/CSA Z731-03, R2014) (Canadian Standards Association, 2014);
- Fisheries and Fish Habitat Protection Policy Statement. Fisheries and Oceans Canada, 2019;
- Measures to Protect Fish and Fish Habitat, DFO, 2019;
- Projects Near Water: British Columbia Marine/Estuarine Timing Windows for the Protection of Fish and Fish Habitat. DFO, 2014; and
- Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. (National Ocean and Atmospheric Administration, Version 2.0, 2018).

6.0 MITIGATION MEASURES

The following plans and methodologies outlined in this EMP will be used to confirm that the Project works are proceeding in compliance with the most stringent of the BMPs, the performance requirements of PLA's, and listed environmental standards, guidelines and BMPs.

6.1 AIR QUALITY AND DUST

Air quality and dust management issues could potentially occur during concrete deck removal, bin wall removal and other Project salvage activities. Potential exposure pathways include dust from grinding, cutting and concrete activities and air emissions from machinery and equipment.

Dust-related issues will be limited in duration to working hours and further limited due to a large portion of works being conducted during the winter and spring months when weather conditions are typically wet. Impacts are expected to be low provided that appropriate mitigation measures are employed during the works.

The following mitigation measures shall be implemented to reduce dust and air emissions resulting from Site activities:

- Dust and odour emissions shall be controlled at the source where possible to contain and limit the release of particles to acceptable levels;
- Wetdown of concrete cutting and crushing activities shall be conducted as required to limit fugitive dust. Concrete cutting saws will be equipped with measure for dust suppression.
- No burning of waste or any other material shall take place at the Site;
- Mud and dirt track-out on the seawall shall be monitored. The track out of vehicles from the Site shall be managed to reduce the potential for the dispersion of material and debris as fugitive dust;
- All equipment, vehicles and stationary emission sources shall be well-maintained and used at optimal loads to minimize emissions. Any parts showing excessive signs of wear or malfunction shall be promptly repaired or replaced prior to mobilizing to the Project site. Electric equipment shall be used where practical;

- All equipment shall be fitted with standard emission control devices in compliance with federal, provincial, regional district, and municipal regulations and standards;
- Vehicle and equipment idling time shall be restricted and minimized during salvage to the greatest practical and safe extent. Employees shall be required to turn off vehicles or heavy equipment when not in use. Idle reduction initiatives shall be communicated and encouraged during Site orientations and health and safety, PTP and progress meetings; and
- Stationary emission sources (e.g., portable diesel generators, compressors, etc.) shall be used only as necessary and turned off when not in use. Wherever possible electric units shall be used.

6.2 NOISE AND VIBRATION

Project works at the Site will produce noise, with limited practical means of noise control. Noise management issues could potentially occur during the following construction activities:

- Site mobilization activities;
- Mobile equipment, machinery and vehicles operation;
- Pile driving activities;
- Breakup and removal of concrete;
- Cutting, grinding and shearing of steel Barge components; and
- Other activities that may result in the generation of noise emissions.

The following mitigation measures shall be implemented to minimize noise emissions resulting from Site activities:

- Salvage activities shall be limited to Monday to Friday between 07:30 and 20:00, and between 10:00 and 20:00 on Saturdays. No salvage actives shall occur on Sundays or statutory holidays unless otherwise permitted;
- All equipment shall be properly maintained to limit noise emissions to the extent practical and fitted with functioning exhaust and muffler systems. Machinery covers and equipment panels shall be well fitted and remain in place to muffle noise. Bolts and fasteners shall be tight to avoid rattling;
- Engines shall be turned off when not in use. Vehicle and equipment idling time shall be restricted and minimized;
- Where practical, noisy equipment shall be stationed as far away as possible from sensitive noise receivers or amplifiers (e.g., workers, offices). Salvage material shall be placed strategically or stored around noise sources to reduce the hazard to receivers;
- Noisy stationary equipment (e.g., compressors, pumps, etc.) shall be located and/or oriented to take advantage of any inherent noise shielding available from the natural terrain, or other large objects (e.g., equipment, buildings, material piles, etc.) and to reduce noise emissions from the Site;

- Machinery and equipment shall only be operated within specification and capacity (e.g., machines shall not be overloaded);
- Soft start procedures shall be implemented for in-water works including vibratory pile driving and boulder relocation; and
- Visual and hydrophone monitoring shall be conducted during pile driving activities to assess potential impacts on fish and marine mammals (refer to Section 11.0).

6.3 MACHINERY AND EQUIPMENT MANAGEMENT

Project work is anticipated to be completed using marine-based equipment staged on floating barges and equipment operated on the Barge itself. Some limited equipment operation may be required in intertidal areas during periods of low tide when equipment can remain in the dry.

The following mitigation measures shall be implemented to avoid or minimize impacts resulting from the operation and storage of equipment during the salvage:

- All equipment and machinery shall be maintained in good working order, free of leaks, excess oil and grease, invasive species, and noxious weeds;
- All equipment and machinery used on Site shall be inspected daily. Equipment maintenance shall be conducted at appropriate intervals to assess belts and hoses, fluid levels, and to identify mechanical defects or worn materials as applicable to each piece of machinery;
- All maintenance and refuelling activities of equipment shall be conducted on level ground on an impermeable barge deck, and in secondary containment capable of capturing any potential leaks or spills. Major equipment repairs shall occur offsite;
- No maintenance or refuelling of equipment is permitted on the intertidal foreshore;
- Barge-based equipment shall be refuelled with mitigations defined in the Spill Response Plan included in Section 7.2. This shall include the use of drip trays and sorbent pads when fuelling to prevent drips and spill to the marine environment;
- Where possible, equipment working over water shall utilize readily biodegradable hydraulic fluids. All equipment operating on the intertidal foreshore shall utilize readily biodegradable hydraulic fluids;
- Stationary equipment shall be operated on top of a drip tray, and drip trays shall have the capacity to contain any spills or leakage during set-up, operation and dismantling. Rainfall and hose connections/disconnections shall be taken into consideration when determining the required capacity of drip trays. Total capacity of drip trays shall be a minimum of 110% of potential spill volume;
- All equipment and drip trays shall be inspected after heavy rainfall to check that containment has not been compromised;
- The refuelling area(s) shall have a spill containment kit immediately accessible and Salvage personnel shall be knowledgeable in the use of the kit;

- Spill containment kits shall be readily accessible both on Site and on each piece of equipment in the event of a release of a deleterious substance to the environment;
- In the event of a fuel, oil or spill of other hazardous materials as a result of an equipment malfunction or collision, the steps outlined in the Spill Response Plan (Section 7.2) shall be followed to secure the Site prior to containment and clean-up of the spill;
- All members of the salvage team shall be trained in the use of spill containment equipment/items; and
- Light spill shall be reduced by pointing lights downward and placing task lighting as close to the work area as possible.

6.4 EROSION AND SEDIMENT CONTROL

The release of sediment and other deleterious substances into English Bay could potentially occur during Project works, leading to water quality, and fish and fish habitat concerns.

In the absence of adequate and functioning mitigation, activities that have the potential to cause adverse environmental impacts to water quality and fish and fish habitat due to the release of sediments or dust to nearby waterbodies include:

- Site mobilization, pile driving; and
- Break up and removal of concrete decking.

Mitigation measures are as follows:

- Surface water shall be diverted around disturbed salvage areas including crushed concrete and lay down areas (e.g., by installing temporary curbs or tarping);
- Paved areas (i.e., seawall) shall be kept free of track out and erodible materials;
- Stockpiled erodible materials (i.e., granular footpath gravels, crushed concrete) shall be contained within sealed bins, or tarped with poly when not in use to prevent erosion and the generation of sediment-laden water;
- Deck drains on the seaward (downslope) edge of the barge shall be blocked off during concrete removal activities to prevent discharge of turbid waters to English Bay. Sediment-laden waters shall be collected and contained for offsite disposal or treated on-site (to meet BC Water Quality Guidelines) prior to discharge to the marine environment. If required, these drains shall remain blocked through the duration of salvage works; and
- Turbidity shall be monitored in accordance with the Environmental Monitoring Plan (Section 11.0).

6.5 CONTAMINATED SEDIMENT/SOIL

The risk of potential impacts is deemed to be low and no contamination sources have been identified in the Project footprint. In the event contamination is encountered, Vanpile shall halt work, notify the EM and wait for further instruction. On direction from the EM, field assessments/screening shall be based on visual and olfactory observations, looking for the presence of free hydrocarbon product, sheens, staining, debris,

and/or hydrocarbon odours. If during field observations, suspect contamination is identified, a QEP shall further classify the material. Vanpile shall:

- Segregate any soils indicating evidence of contamination through odour, visible staining, or sheen, under the supervision of a QEP;
- Stockpile suspect material on polyethylene sheeting and cover from rain etc.; and
- Monitor stockpile to ensure no runoff or mixing of other materials.

The QEP shall oversee and/or perform the sampling design if required, sample acquisition, evaluate the sample results, submit any required notification to MOE, and records management.

6.6 VEGETATION AND WILDLIFE MANAGEMENT

Vegetation and wildlife management issues on the Site could potentially occur during machinery and equipment operations, transport of materials, and other Site activities. Potential effects on vegetation and wildlife include the following:

- Sensory disturbance of marine mammals and birds; and
- The unintended introduction or spreading of invasive plant species.

The following mitigation measures are recommended to avoid or mitigate potential negative impacts to wildlife and vegetation during salvage-related activities:

- Should a rare or sensitive species be identified at the Site at any time during the Project, the EM should be notified immediately for further direction;
- Riparian vegetation in foreshore areas shall be delineated prior to works in consultation with the EM. Riparian vegetation shall not be disturbed during works conducted on the intertidal foreshore;
- Woody debris and wrack on the intertidal foreshore shall be side cast to an area of similar elevation prior to works on the intertidal foreshore;
- Pile driving activities shall be monitored according to Section 11.0 to avoid sensory impacts to fish and marine mammals;
- Pre-work Site orientation shall include details on how to report incidental wildlife observations. Such observations shall be used by the EM to address Site-specific mitigation needs;
- All food, food waste, fuels, oils and lubricants, and other attractants shall be stored in sealed containers that are inaccessible to wildlife, and secured to prevent overtopping;
- Food waste shall not be mixed with salvage waste; and
- If bird nests are encountered during works, the nest shall not be disturbed, and the EM notified immediately.

6.7 FISH AND FISH HABITAT PROTECTION

The Site is located within English Bay, which is the principle aquatic receptor.

Activities that have the potential to cause adverse affects on water quality and fish and fish habitat include:

- Site mobilization activities, including installation of temporary piles and relocation of subtidal boulders;
- Salvage activities;
- Handling, transfer and storage of debris and salvage waste; and
- Other activities that could potentially result in the introduction of deleterious substances into English Bay (e.g., accidental spills of petroleum-based products).

The following mitigation measures shall be implemented to avoid adverse effects to fish and fish habitat:

- In-water works conducted outside of the local fisheries least-risk period of August 16 through February 28 inclusive, shall be reviewed in consultation with DFO prior to works;
- The DFO Fish and Fish Habitat Protection Program for the Pacific Region shall be advised at least ten (10) days in advance of the start of the in-water physical works (refer to contact details in Section 3.0);
- Barges or other vessels used during salvage shall not be permitted to ground on the foreshore or seabed or otherwise disturb the foreshore or seabed (e.g., disturbance as a result of vessel propeller wash). Appropriate use of spuds to secure barges is acceptable;
- Boulder relocation shall ensure boulders are relocated to an adjacent location of similar tidal elevation and water depth, and boulders are placed on seabed rather than dropped from height;
- All cutting of the Barge shall be conducted in a manner so that structures and waste materials fall inside the barge. Steel cuttings shall be contained to the greatest extent using suspended drop cloths and physical barriers deployed above water level and affixed to the Barge. Torch cutting shall blow steel debris inward towards the Barge deck for capture. Hull cutting in the intertidal zone shall occur during low tides with drop cloths deployed to collect cuttings and removed prior to tidal inundation.
- All other debris and waste materials resulting from the Project shall be contained in the immediate working area and shall be removed as soon as possible; Any steel debris and waste material that enters the marine environment shall be removed by means of a diver or other non-intrusive method;
- Deleterious substances shall be prevented from entering English Bay at all times during the salvage. Water quality monitoring during salvage activities shall be conducted in accordance with the Environmental Monitoring Plan (Section 11.0);
- Paint chips, cleaning products, coatings or other potentially deleterious materials shall be prohibited from entering the aquatic environment. Removed paint and other hazardous residues shall be 100% contained, where possible; and

- Following Barge removal magnets shall be used across the Project footprint to reclaim any residual steel cuttings.

6.7.1 Working on the Beach

Project activities will take place across the intertidal zone and foreshore of Sunset Beach. The Project has been designed to minimize equipment operation on the beach, with the majority of works taking place directly from a support vessel and on the Barge itself. When works on the beach are required for final hull removal, the additional mitigation to protect the beach environment include:

- Works in the intertidal involving the operation of equipment (i.e., excavators etc.) on the beach shall be conducted in the dry during low tide. Adequate time shall be allowed to complete daily works and remove equipment from the beach prior to tidal inundation;
- Salvage debris and steel cuttings shall not be deposited on the beach, drop cloths and containment trays shall be placed beneath each activity with potential to deposit salvage debris on the beach. All materials removed from the Barge are to be transported directly to contained storage on the Barge;
- Silt curtain use within intertidal areas is not recommended due to the risk of fish stranding during tide cycles;
- If woody debris and/or seaweed wrack is encountered in the work area, these materials shall be temporarily side cast in an area of similar beach elevation prior to works;
- Portable equipment operating within 30 m of English bay (e.g., pumps, generators, etc.) will be operated on top of a drip tray, and drip trays will have the capacity to contain any spills or leakage during set-up, operation and dismantling. Rainfall and hose connections/disconnections should be taken into consideration when determining the required capacity of drip trays;
- Spill kits containing aquatic booms and other appropriate absorbent materials, as listed in the Emergency Response Plan, shall be present in immediate proximity to works on the intertidal foreshore;
- Machinery shall be maintained in a leak-free state, free of excess oil and grease and immediately remove any leaking machinery within 30 m of any watercourse or waterbody;
- Equipment storage is not permitted within the intertidal foreshore, all equipment and salvage materials shall be removed from the intertidal foreshore each day prior to tidal inundation; and
- Care shall be taken to prevent the retention of isolated seawater during tidal recession (i.e., within hull voids or beach depressions created by operating equipment). Following cutting and exposure of the Barge hull, drains shall be cut at Barge low points on the seaward edge (in consultation with the EM) to allow passive draining of tidal flows and prevent fish stranding within hull compartments. Any depressions in beach substrates resulting from equipment operation shall be returned to grade using native beach substrates prior to tidal inundation.

6.8 CONCRETE REMOVAL

During Project works, the concrete decking of the Barge will be removed. The risk of accidental release of concrete fines to the marine environment is considered low as bin walls will remain in place providing a physical barrier between the works and the marine environment.

The following mitigation measures shall be implemented to prevent and minimize the potential for adverse effects on the environment during concrete removal. The EM shall be onsite to monitor concrete works conducted adjacent to the marine environment and confirm the below mitigations have been implemented:

- Concrete cutting shall take preference over crushing, where possible. Works shall be staged and conducted in a way to minimize the crushing of concrete and release of concrete fines;
- Concrete saw cutting activities shall utilize dust suppression systems and shall reclaim cutting slurries (i.e., wet vacuum);
- Cuttings shall be cleaned up at the end of each working day to prevent stormwater contact; and
- Sediment-laden water resulting from concrete demolition activities shall be captured and contained for offsite removal or onsite treatment (to meet BCWQG's) prior to discharge to the marine environment.

6.9 SEVERE WEATHER

The following mitigation measures are recommended to avoid or reduce the potential for environmental emergencies as a result of equipment operation and salvage activities during severe weather. Vanpile shall be responsible for monitoring weather forecasts, and responding appropriately for the protection and safety of Project equipment, personnel and the environment.

- Personnel, tools, equipment, and supplies shall be made safe and secure in advance of incoming severe weather. At all times, the work site shall remain tidy and prepared for securement in the event of approaching severe weather;
- Exposed hazardous materials (including materials with the potential to result in sedimentation) shall be protected with tarpaulins or temporary sheeting;
- Higher risk activities (i.e., hoisting over water, concrete demolition) may be delayed as required; and
- During and/or immediately after severe weather, Vanpile shall inspect all facilities and work areas for damage and repairs made prior to recommencing works.

7.0 EMERGENCY RESPONSE

7.1 EMERGENCY COMMUNICATION

Clear and rapid communication is essential when dealing with emergencies. Contact information for response or reporting of accidents or environmental emergencies is provided in Table 4.

Table 4 Emergency contact numbers.

Nature of Incident/Emergency	Authority / Company Name	Contact	Timeframe
Emergency Services	Emergency Services	911	Immediately
	RCMP	911/604-985-1311	Immediately
	St Paul's Hospital	604-806-9090	As Required
	Local Fire Department-Vancouver Fire Hall 6	911/604-665-6006	As Required
	Ambulance	911	Immediately, as required
All Incidents (Including Spills > 1 L)	Environmental Monitor – Hatfield Consultants	TBD	Immediately
All Reportable Incidents under any Environmental Law or Permit	Environmental Monitor – Hatfield Consultants	TBD	Immediately
	Environmental Manager – Hatfield Consultants	778-879-1191	Within 24 hours
	Vanpile – Ian Purvis Jesse Percy	604-928-9450 604-999-7757	Immediately
	VFPA Operations Centre	604-665-9086	Within 24 hours
Reportable Spills under EMA	Environmental Management BC (EMBC)/ Environmental Emergency Program (EEP)	1-800-663-3456	Immediately
Spills to Water	EMBC	1-800-663-3456	Immediately
Spills to Water Causing/Having Potential to Cause Serious Harm to Fish	Fisheries and Oceans Canada	1-866-845-6776	Within 24 hours
Spills to Marine Environment	Canadian Coast Guard (Marine Pollution)	1-800-889-8852	Immediately
Third Party Spill Clean Up	West Coast Marine Response Corporation (WCMRC)	604-294-6001	Immediately, as required
Spills of Dangerous Goods in Transport	EMBC	1-800-663-3456	Immediately
	RCMP	911	Immediately
	Canadian Transport Emergency Centre (CANUTEC)	613-996-6666 or *666 on a cell phone	Immediately
	Employer/Person in Control of the Dangerous Goods	TBD	Immediately

7.2 SPILL RESPONSE PROCEDURES

Spill prevention and response procedures shall vary based on the quantity, type and location of the substance and/or spill. Spills of flammable liquids, hydrocarbons and oils >100 L are reportable to EMBC. Reportable volumes to EMBC under the *Environmental Management Act* (EMA) and/or the *TDG Act* for various substances are outlined in Table 5. Spills may result from ruptures or malfunctions of diesel or oil storage tanks used during salvage, leaking equipment, and other sources.

Spill response procedures shall include:

7.2.1 For Spills ≥ 5 L and Spills of Any Volume Reportable Under EMA

- Making the areas safe:
    - Verify personal, public, electrical and environmental safety;
    - Wear appropriate personal protective equipment (PPE);
    - Never rush in, always determine the product spilled before taking action;
    - Warn people in the immediate vicinity;
    - Be aware of wind direction; and
    - Verify no ignition sources if spill is a flammable material.
- Call for assistance from co-workers / Supervisor / Safety Department.
- Stopping the Flow (where possible and safe to do so):
    - Act quickly to reduce the risk of environmental impacts;
    - Close valves, shut off pumps, or plug holes and leaks;
    - Utilize all available resources to initially contain the spill (i.e., spill kits, excavators or any material, equipment or tool that can safely contribute to containment efforts); and
    - Stop the flow or the spill at its source.
- Securing the Area:
    - Limit access to the spill area; and
    - Prevent unauthorized entry onto the Site by securing and marking the area to limit exposure to pedestrians, including workers, and vehicle traffic.
- Containing the Spill:
    - Prevent spilled material from entering drainage structures;
    - Use spill-absorbent material to contain the spill, or if that is not possible and the spill volume exceeds the capacity of the spill kit, use native soil, sandbags, straw bales, etc.;
    - If necessary, use a dyke or any other method to prevent any discharge on Site;

- A temporary sump may be employed to contain or direct spilled liquids if groundwater is not present;
- Make every effort to minimize contamination; and
- Take soil or water samples for laboratory testing.

- Notifying/Reporting:
  - Notify the EM immediately (provide spill details);
  - If a reportable spill has occurred the EM or Environmental Manager or a designate shall call EMBC at 1-800-663-3456 (24 Hour);
  - Any incident involving the spillage of oil or petroleum lubricating products into the marine environment shall be reported immediately to the Canadian Coast Guard and EMBC. Any large incidents / Level 3 incidents shall also be reported to the 24-hour Spill Reporting Center of the Western Canada Marine Response Corporation (WCMRC). Reporting to WCMRC shall be the responsibility of Vanpile's Project Manager, or designate, operating in consultation with Vanpile's General Manager and / or EH&S Manager;
  - When reporting a spill, the caller shall be prepared to provide the dispatcher with the following information as accurately as possible:
    - Location and time of the spill;
    - Type and quantity of the substance spilled;
    - Cause and effect of the spill;
    - Details of action taken or proposed;
    - Description of the spill location and surrounding area;
    - Names of agencies/responders on scene; and
    - Names of other persons or other agencies advised or to be advised concerning the spill;
  - EM or Environmental Manager or a designate notify Vanpile immediately;
  - Provide necessary spill details to other external agencies as required;
  - Complete an Environmental Incident Report; and
  - For spills >100 L or reaching English Bay, contact back-up commercial spill clean-up companies and local fire response teams, as required.

- Cleaning-Up:
  - The EM and the Contractor shall coordinate spill cleanup;
  - Additional assistance on clean-up procedures and residue sampling shall be available from the EM, as required;
  - Cleanup the affected area, including confirmatory testing on the cleaned area;

- Remove the impact/debris and decontaminate any equipment or tools used in the cleanup;
- Dispose of waste materials at an approved disposal site in compliance with the BC EMA, HW Regulation and *BC Waste Management Act*;
- Dispose of all material used in clean-up (e.g., used sorbents, oil containment materials, etc.) in accordance with the above regulatory requirements; and
- Treat and dispose of contaminated material in compliance with the BC EMA, CSR and HW Regulation.

For Spills to Land < 5L that are Non-Reportable under EMA

For spills of any volume, notify the EM. The EM shall monitor Site cleanup of minor leaks and spills of oil, grease and hydraulic fluids that are greater than 5 L in size. Further guidance for cleanup may be provided by the Environmental Manager, as required. Remove contaminants by implementing the following measures:

- Remove the impact/debris and decontaminate any equipment or tools used in the cleanup;
- Cleanup the affected area, including confirmatory testing on the cleaned area; and
- Dispose of waste materials at an approved disposal site.

Spills to Water

In the unlikely event of spills that were to enter English Bay, the following mitigation measures are recommended:

- The EM, the Environmental Manager and the Vanpile Project Manager (for spills of oil or petroleum lubricating products) shall be notified immediately;
- Aquatic booms shall be used to contain any fuels, oils or other surfactants at the source of the spill;
- The spill area shall be lined with absorbent padding to absorb contaminants from the water surface, as practical; and
- The steps outlined in Section 7.2.1 above shall be followed.

7.2.2 Spill and Incident Reporting

Spills are reportable to EMBC under the EMA Spill Reporting Regulation and/or the TDG Act, as outlined in Table 5. Spills of hazardous substances of any volume to a water body are also reportable to EMBC. A body of water includes both marine and fresh bodies of water. The requirement to report a spill of a harmful substance of any quantity also includes those that enter a ditch that is not self-contained and connects to a body of water.

Spills of any volume to fish-bearing waters must also be reported to DFO. Vanpile will report any reportable spill to relevant outside agencies. The following information shall be provided to Vanpile:

- Type and quantity of substance spilled;
- Location, type of environment and time of the spill;

- Details of the area surrounding spill (possible sensitive habitats, shoreline, weather, tides, current
- direction, substrate type);
- Cause and effect of the spill;
- Details of actions taken to contain the spill;
- Details of possible anticipated actions; and
- Name of agencies notified, on the scene and times of arrival.

For any reportable spill, Vanpile will be notified as soon as possible. Contact numbers for spill reporting can be found in Table 4. For all spills of any volume to land or water, the EM must be notified immediately of the spill and any actions taken to contain the spill. The EM should be on-site for spill cleanup where practicable.

A detailed environmental report will be filed with Provincial and/or Federal government and regulatory agencies as required by the BC Spill Reporting Regulation and Federal regulations, following cleanup of an environmental incident that warrants contact with government. Table 5 identifies hazardous substances and quantities reportable under EMBC:

Table 5 Hazardous substance and quantities reportable to EMBC under the BC *Environmental Management Act* and/or the *TDG Act*.

	Substance Spilled	Specified Amount
1	Class 1, Explosives as defined in section 2.9 of the Federal Regulations	Any quantity that could pose a danger to public safety or 50 kg
2	Class 2.1, Flammable Gases, other than natural gas, as defined in section 2.14 (a) of the Federal Regulations	10 kg
3	Class 2.2 Non-Flammable and Non-Toxic Gases as defined in section 2.14 (b) of the Federal Regulations	10 kg
4	Class 2.3, Toxic Gases as defined in section 2.14 (c) of the Federal Regulations	5 kg
5	Class 3, Flammable Liquids as defined in section 2.18 of the Federal Regulations	100 L
6	Class 4, Flammable Solids as defined in section 2.20 of the Federal Regulations	25 kg
7	Class 5.1, Oxidizing Substances as defined in section 2.24 (a) of the Federal Regulations	50 kg or 50 L
8	Class 5.2, Organic Peroxides as defined in section 2.24 (b) of the Federal Regulations	1 kg or 1 L
9	Class 6.1, Toxic Substances as defined in section 2.27 (a) of the Federal Regulations	5 kg or 5 L
10	Class 6.2, Infectious Substances as defined in section 2.27 (b) of the Federal Regulations	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment

Table 5 (Cont'd.)

	Substance Spilled	Specified Amount
11	Class 7, Radioactive Materials as defined in section 2.37 of the Federal Regulations	Any quantity that could pose a danger to public safety and an emission level greater than the emission level established in section 20 of the "Packaging and Transport of Nuclear Substances Regulations"
12	Class 8, Corrosives as defined in section 2.40 of the Federal Regulations	5 kg or 5 L
13	Class 9, Miscellaneous Products, Substances or Organisms as defined in section 2.43 of the Federal Regulations	25 kg or 25 L
14	Waste containing dioxin as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
15	Leachable toxic waste as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
16	Waste containing polycyclic aromatic hydrocarbons as defined in section 1 of the hazardous Waste Regulation	5 kg or 5 L
17	Waste asbestos as defined in section 1 of the Hazardous Waste Regulation	50 kg
18	Waste oil as defined in section 1 of the Hazardous Waste Regulation	100 L
19	Waste containing a pest control product as defined in section 1 of the Hazardous Waste Regulation	5 kg or 5 L
20	PCB Wastes as defined in section 1 of the Hazardous Waste Regulation	25 kg or 25 L
21	Waste containing tetrachloroethylene as defined in section 1 of the Hazardous Waste Regulation	50 kg or 50 L
22	Biomedical waste as defined in section 1 of the Hazardous Waste Regulation	1 kg or 1 L, or less if the waste poses a danger to public safety or the environment
23	A hazardous waste as defined in section 1 of the Hazardous Waste Regulation and not covered under items 1 – 22	25 kg or 25 L
24	A substance, not covered by items 1 to 23, that can cause pollution	200 kg or 200 L
25	Natural gas	10 kg, if there is a breakage in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release of natural gas

An Environmental Incident Report shall be generated for any of the following. An environmental incident report template is provided in Appendix A2.

- Spills reportable to EMBC;
- Spills of any amount to water (surface or ground water) or any spill with the potential to introduce a harmful substance to the aquatic environment;
- Spills on land greater than 5 L or with a surface area greater than 1 m^2 and/or deeper than 300 mm, or any release of a hazardous substance that could cause contamination of the Site or any lands or waters in the vicinity of the Site;
- Any incident that poses a safety or health risk, including but not limited to vehicle collisions and fire;
- Any repetitive occurrence (i.e., an occurrence of 2 times or greater);
- Any occurrence involving more than 1 piece of machinery;
- Adverse publicity with respect to the environment;
- Alteration or damage to archaeological resources; and
- External reporting requirements derived from a Project approval condition, especially if attached to a non-routine or unexpected event.

A list of emergency contacts is outlined in Table 4.

8.0 FUEL MANAGEMENT

Improper storage, use and/or handling of fuels and other hazardous materials have the potential to:

- Pose threats to human health and safety;
- Introduce deleterious substances and/or contaminants into previously uncontaminated soils, vegetated areas, surface waters, and/or groundwater;
- Cause changes to ecosystems through improper storage or disposal of hazardous or solid waste; and
- Pose threats to wildlife through creating attractants and habituation or accidental poisoning.

The following mitigation measures shall be implemented to protect the receiving environment from salvage-related fuels and products on Site:

- All fuel dispensers shall be designed to meet the statutory regulations and recommended practices described in *A Field Guide to Fuel Handling, Transportation and Storage* (BC MOWLAP, 2002);
- Refuelling will only occur on impermeable barge decks and overtop a secondary containment drip tray with spill materials immediately available;

- While refuelling, all operators shall stay with the fuel nozzle. Ignition shall be turned off while the vehicle, equipment or machinery is being refuelled. The operator shall immediately shut off the source if a spill occurs.
- Fuel storage tanks shall include secondary containment capable of containing 110% of the volume of the largest tank. Containment areas shall be designed so that containment shall remain effective in all weather conditions. Precipitation shall be prevented from accumulating within fuel containment areas. Tanks shall be physically protected from collision;
- All fuel storage tanks shall be CSA approved and shall comply with the statutory regulations and recommended practices described in *A Field Guide to Fuel Handling, Transportation and Storage* (BC MOWLAP, 2002);
- All necessary equipment to clean and mitigate spills, including fire prevention equipment, shall be stored in or near the storage area;
- Fuel and chemical storage locations shall be inspected daily for leaks, spills, and obvious abnormal conditions. Any leakage shall be repaired immediately;
- Smoking shall be prohibited in and around explosive, oxidizing, reactive or flammable hazardous materials handling areas;
- Fire-fighting equipment shall be kept at oxidizing, reactive or flammable hazardous substance handling areas;
- Containers for the transportation of fuel shall be labelled to communicate the hazard the material represents, made of a material that is compatible with the transported fuel, and in good condition;
- Transport containers shall be properly secured and sufficiently spaced to allow safe access and handling of containers; and
- All fuels, oils, lubricants and other petrochemical products should be contained to spill trays and protected from the elements.

9.0 ARCHAEOLOGICAL RESOURCES MANAGEMENT

The project takes place on English Bay beach, which has been constructed in recent history from non-native fill. Works do not include dredging or ground disturbance, therefore the likelihood of discovery of previously undiscovered archaeological resources is extremely low.

In the event that suspected archaeological materials are encountered during the salvage, the following chance-find procedure is recommended:

- Immediately stop any activities that might disturb the archaeological resource or the site in which it is contained;
- Do not move or otherwise disturb the artifacts or other remains present at the Site;
- Stake or flag-off the Site to prevent additional disturbances;

- Immediately notify the EM and Vanpile Project Manager.
- The EM or Vanpile will immediately contact Project Archaeological contacts:
    - *Archeological Contacts to be determined.*
- Vanpile will also notify other Indigenous communities, as required.
- The EM shall provide details and photographs of the suspected find to an archaeological professional, who will make a preliminary assessment of the find;
- An Archaeology Chance Find Recovery Form shall be completed by the person who identified the potential heritage resources, or by the EM or Project Manager. The completed form will be maintained on file in the Project's administrative office, and will contain the following basic information:
    - Date (when the find was encountered);
    - Observer (name of the person recording the information about the find);
    - Find location (detailed enough so that it can be located again; Global Positioning System (GPS) coordinates if possible);
    - Type of find (e.g., type of archaeological discovery: stone, bone, wood, etc.);
    - Description of the obvious disturbance to the find (by equipment, etc.); and
    - Photographs.
- Should suspected human remains be discovered, procedures shall follow the Archaeology Branch Policy Statement "Found Human Remains" (Archaeology Branch, 1999). Local law enforcement shall also be informed in the event of found human remains; and
- Once the find is evaluated and mitigated to the satisfaction of the regulatory authorities and the Site has been cleared, construction activities may recommence.

Additional Best Management Practices for Cultural and Archaeological Resources are available from the CoV Park Board online at: Park-Development-Standards-BMP-Cultural-and-Archaeological-Resources-VPB.pdf (vancouver.ca)

10.0 WASTE MANAGEMENT

Project works are anticipated to generate predominantly steel and concrete materials that will be recycled. Small volumes of hazardous and non-hazardous wastes will be generated resulting from Project activities, including:

- Organic debris;
- Garbage (e.g., waste food, paper and other garbage produced by Site workers);

- Waste petroleum products (engine oils, lubricants, filters, etc.) from machinery and equipment;
- Batteries and battery fluid;
- Oily rags or sorbents containing flammable liquids;
- Organic and inorganic contaminants;
- Concrete and cementitious materials; and
- Paints and related chemicals.

Improper storage, handling and management of wastes have the potential to:

- Pose threats to human health and safety;
- Pose threats to wildlife through creating attractants and habituation or accidental poisoning; and
- Introduce deleterious substances and/or contaminants into previously uncontaminated upland.

10.1 MITIGATION MEASURES

The following mitigation measures are recommended when dealing with wastes generated on Site:

General

- Salvage wastes shall be reused or recycled where practical and as appropriate;
- Vanpile shall adhere to all applicable legislation with respect to the handling, transportation, and/or disposal of all materials related to this Project (waste or otherwise). These regulations may include (but not be limited to) the BC Hazardous Waste Regulations, Spill Reporting Regulations, Workers Compensation Board Regulations, TDG Regulations, etc.;
- Specific locations for waste collection and sorting shall be identified before the start of salvage and communicated to employees in the pre-work environmental orientation training session;
- Outdoor refuse containers shall always remain sealed except when filling or emptying and are to be secured to prevent overtopping. Any refuse containers that are damaged or leaking shall be repaired or replaced. The feeding of wildlife shall be prohibited on Site;
- All tools, equipment and waste shall be stored in the appropriate locations at the end of each day;
- Waste material shall be stored in a manner that is secure and protected from the elements;
- No burning of wastes shall be conducted on Site; and
- All temporary sanitary facilities for the Project period shall be self-contained and secured to prevent overtopping. Portable sanitary facilities shall be self-contained and protected from damage resulting from salvage activities, vandalism, or environmental factors. Sanitary facilities shall be regularly maintained by an approved operator for disposal (i.e., vac truck) off-Site. The use of supplied washroom facilities is mandatory for all Project personnel.

Non-Hazardous Waste

Project works will generate non-hazardous waste. The following mitigation measures are recommended to reduce the potential for releases of non-hazardous waste materials to the environment:

- Littering shall be prohibited on Site. Measures shall be implemented to prevent and control littering;
- All recyclable or compostable materials shall be collected separately from general waste;
- Cigarette butts shall be discarded in an appropriate receptacle in designated smoking areas and not be left or buried on the Site;
- Regular disposal or recycling shall be carried out at a frequency sufficient to prevent accumulating large quantities of waste. All solid waste shall be handled in accordance with applicable municipal, provincial and federal regulations and disposed of at an authorized receiving facility. All materials shall be transported in accordance with the *TDG Act,* TDG Regulations and the BC EMA HW Regulation;
- Records of the volumes and dates of delivery of all Site material sent to each disposal location must be maintained on Site; and
- Waste materials generated that do not pose a risk to contamination of the Site shall be recycled where possible. Waste materials generated on Site that are non-hazardous and cannot be reused on Site shall be recycled at an approved facility, where practicable.

Hazardous Waste

Project works will generate hazardous waste, including waste oils, chemical wastes and used absorbent materials and filters. The following mitigation measures shall be implemented to reduce the potential for releases of hazardous waste materials to the environment:

- The engine on board the Barge shall be drained of all waste fluids to be contained and disposed of appropriately prior to removal;
- Workers handling hazardous wastes shall be appropriately trained in their handling, storage and disposal. Training records for those involved with the handling and transportation of hazardous waste shall be kept at the Site office;
- Hazardous wastes must be managed, transported, labelled, stored, and disposed of according to the EMA HW Regulation via licensed transportation and disposal facilities;
- Hazardous wastes shall be kept segregated from non-hazardous wastes and stored and transported in a manner that prevents incompatible materials from being mixed. Wastes contaminated with flammable liquid shall not be mixed with wastes contaminated with oil;
- Each container or area used to store hazardous waste shall be clearly labelled as containing hazardous waste and shall be equipped with adequate secondary containment. Hazardous waste containers shall be kept closed at all times except when being filled or emptied;

- Hazardous waste storage areas shall be checked weekly and a corresponding inspection log shall be kept in the Site office;
- All hydrocarbon products and other hazardous wastes potentially present during Site activities shall be identified and the associated WHMIS and SDS made available to all salvage team members;
- All hazardous waste containers shall be labelled and stored in accordance with all requirements of the BC EMA and *Workers Compensation Act* (WHMIS SDS labelling requirements);
- Waste rags and sorbents shall be stored in containers with self-closing lids, with the bottom of the container raised and vented;
- If necessary, hazardous waste shall be temporarily stored in designated, secure areas with secondary containment and protected from the weather; and
- Spills of hazardous materials shall be cleaned-up and immediately reported to the EM and to appropriate regulatory agencies in accordance with the EMA and the Spill Response Plan (Section 7.2).

11.0 ENVIRONMENTAL MONITORING

Primary measures to verify protection of English Bay shall be acoustic and turbidity monitoring during in-water works and visual inspection of the Site to review conformance with this EMP. Monitoring will confirm the adequacy of mitigation measures used during Project works and shall be conducted by an EM operating under the direct supervision of the Environmental Manager (QEP). The EM shall also act as the Marine Mammal Observer (MMO) for the Project and shall be suitably qualified for the role through previous experience monitoring hydroacoustic levels and conducting marine mammal monitoring on comparable marine projects.

11.1 ON-SITE ENVIRONMENTAL MONITORING

An EM will be on-site to oversee environmental aspects of the Project and to verify compliance with the EMP is being achieved. The EM will maintain contact with the Vanpile Supervisor and will be available for emergency response, monitoring, and associated sampling requirements.

11.2 ACOUSTIC MONITORING AND MARINE MAMMAL OBSERVATION

Temporary pile installation may generate underwater noise with the potential to affect marine mammals and fish. All pile driving taking place within the marine environment and be conducted using vibratory pile driving methods.

11.2.1 Monitoring of Underwater Noise

To monitor the effectiveness of sound attenuating mitigations, the EM shall utilize a calibrated hydrophone to monitor underwater noise in-situ throughout the duration of pile driving, during this time a marine mammal exclusion zone (EZ) will be established based on acoustic monitoring results.

During pile driving, the hydrophone will be placed 10 meters (m) from the point of pile driving to ensure a maximum peak SPL of 206 dB re 1 µPa. Exceeding this value will require a temporary cessation of pile driving works, and the use of further sound attenuating mitigations (e.g., bubble curtains). The hydrophone shall be capable of monitoring underwater acoustics in real-time to allow for immediate action in the event of a sound threshold exceedance.

In addition, hydrophone monitoring will be conducted at various distances from the pile to determine the distance from pile driving at which underwater noise falls below the root mean square SPL of 160 dB re 1 µPa (i.e., the point of sound attenuation). This will define the EZ for marine mammal monitoring.

11.2.2 Marine Mammal Observation

During pile driving works, the EM shall undertake Marine Mammal Observation of the EZ as required. Works requiring marine mammal observation shall occur only during hours when there is sufficient light for the EM to conduct marine mammal observations at the defined EZ. During pile driving, the EM shall record any sightings of marine mammals inside and outside the EZ. Observations made by the EM shall include taxa, numbers, and behaviour.

EZ's shall be monitored by the EM at all times during pile driving activities. Any marine mammals observed within the EZ will trigger a temporary cessation of works.

The protocols listed below shall be followed:

1. The EM shall monitor the EZ for 30-minutes before the beginning of pile driving (or restarting after a 30-minute cessation of works). Pile driving will not be initiated unless marine mammals observed within the EZ are seen leaving, or none have been observed inside the EZ during the observation period;
2. If visibility is such that the EM is unable to effectively monitor for marine mammals within the EZ (e.g., in darkness or heavy fog), the EM may delay the start of in-water works until visibility improves. Upon improvement of visibility, the EM shall monitor the EZ for marine mammals, as per point 1;
3. The beginning of pile driving (or restarting after a 30-minute cessation of works) shall include a slow start technique, gradually increasing hammer strikes in both intensity and frequency. This process is intended to allow any marine mammals in the vicinity time to vacate the area; and
4. Upon detection of underwater noise greater than thresholds stated in Section 11.2, pile driving will temporarily halt, and additional mitigation measures will be considered in consultation with the EM.

The EM will be properly equipped to observe the entirety of the EZ and conduct acoustic hydrophone monitoring. The EM shall maintain contact with the Vanpile Supervisor at all times, in order to communicate any necessary modifications to work procedures (e.g., temporary cessations of works, bubble curtain modifications, etc.). The exact location of the EZ will be centred on concurrent pile driving, and thus its location will shift with works.

11.3 WATER QUALITY MONITORING

Water quality monitoring may be required upon the identification of any visual turbidity plumes resulting from works. Water quality monitoring shall be conducted by the EM and include a combination of visual

observations and in-situ water quality measurements. Visual inspection of in-water works shall be conducted throughout the Project footprint to monitor for any increases in turbidity associated with Project works. In-situ water quality profiles and sampling of treated water discharge (if required) shall be conducted using a water quality multimeter (e.g., YSI) capable of measuring turbidity and pH. For in-situ monitoring, measurements shall be collected at three depths in the water column; at near-surface, mid-column and near-bottom locations to a maximum depth of 20 m. Data shall be uploaded daily to Project records. The water quality multimeter shall be calibrated as per manufacturer's specifications, and all calibration data shall be included with Project records.

11.3.1 Frequency and Location of In-Situ Measurements

In situ water quality monitoring may be required during boulder relocation works, concrete demolition, or hull deconstruction if elevated turbidity is observed by the EM. During other in-water works where turbidity suspension is observed, water quality measurements shall be taken hourly at a compliance point located 30 m downstream of the works, at an exact location determined by the EM. Samples shall be collected at locations and frequencies listed in Table 6. Exact sampling locations shall be contingent upon salvage activities and marine conditions. Water quality performance criteria, as they apply to all in-water works, shall be primarily focused on turbidity and will be evaluated at an appropriately located compliance point. Incidental water quality parameters (i.e., pH, temperature) will also be collected and maintained in Project records. Samples shall be taken at 1-hour intervals during in-water works where turbidity suspension is observed. This frequency may be increased at the discretion of the EM (e.g., upon observation of a turbidity plume or subsequent to a major rainfall event).

Table 6 Sampling frequency and turbidity performance criteria for in-situ profiles.

Project Activity	Location of Compliance Point Sampling Station[1]	Sampling Frequency During Works	Performance Criteria	Notes
Works Resulting in Visual Turbidity	30 m downstream of works	Hourly	≤ 5 NTU above background if background ≤ 50 NTU **OR** ≤ 10% above background if background > 50 NTU	Exact location to be determined by EM based on salvage activity and field conditions

[1] 3 depths per station – near-surface, mid-column, and near-bottom

In-situ profiles will also be collected from a reference (background) station to identify background conditions, such that changes over background can be established, and to assess sources of potential influence at the ambient point. Two reference stations will be established approximately 500 m east and west of the Site. However, only the reference station located "up current" of the Site will be sampled during each sampling event. This will result in one reference area being sampled during each sampling event, dependent on local tides and currents.

In the event that monitoring identifies a non-compliance event (i.e., results exceed water criteria at the compliance point), the EM shall take the following actions:

- Confirm the source and/or cause of the exceedance (i.e., visible observation of a turbidity plume and its source);
- Should the exceedance be the result of in-water works, the Vanpile Supervisor shall be notified, and BMPs/mitigations adjusted;
- Increase frequency of turbidity monitoring; and
- Should exceedances at the compliance point persist, in-water works shall be halted until work methods have been reviewed and additional mitigations applied in consultation with the EM.

11.4 ENVIRONMENTAL REPORTING

Environmental reports will include:

- Bi-weekly Environmental Monitoring Reports;
- Environmental Incident Reports.

A bi-weekly environmental monitoring report shall be prepared for the duration of the Project. Environmental monitoring reports will be submitted to Vanpile within fourteen days after the end of each reporting period. Environmental monitoring reports will include, at a minimum, the following information:

- Name(s) of EM(s);
- Period covered by report;
- Date report submitted;
- Report recipient(s);
- Contractor(s) undertaking work during the reporting period;
- Overall weather conditions during the reporting period;
- Description, photos and status of Project work activities;
- List of meetings and any other material communications (both those that occurred during the reporting period and any that are scheduled or anticipated in future reporting periods) and a summary of key issues discussed or expected to be discussed;
- A summary of environmental incidents that may have occurred during the reporting period;
- A description of outstanding environmental issues and/or non-compliance with environmental laws, permits or other environmental obligations and corrective actions taken or that will be taken, and a schedule for such actions;

- Any issues or concerns raised by the EM and measures taken or that will be taken to address those issues or concerns;
- A summary of environmental monitoring data collected, and all results received during the reporting period, including acoustic and turbidity sampling; and
- An organized checklist or table of key mitigation requirements of the EMP – including those of DFO– to verify implementation and effectiveness at the relevant stages of the project. See Weekly Environmental Inspection Checklist in Appendix A3.

12.0 REFERENCES

BC Marine and Pile Driving Contractors Association and Fisheries and Oceans Canada. 2003. Best Management Practices for Pile Driving and Related Operations.

[BC MOE] BC Ministry of Environment and Parks. 2001. Ambient Water Quality Guidelines (Criteria) for Turbidity, Suspended and Benthic Sediment: Overview Report.

BC MOE. 2005. Hazardous Waste Legislation Guide.

BC MOE. 2013a. British Columbia Hazardous Material Response Plan.

BC MOE. 2013b. British Columbia Inland Oil Spill Response Plan.

BC MOE. 2015. Approved Water Quality Guidelines: Aquatic Life, Wildlife & Available from: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf.

[BC MOWLAP] BC Ministry of Water, Land and Air Protection. 2002. A Field Guide to Fuel Handling, Transportation and Storage.

Canadian Construction Association. 2001. A Best Practices Guide to Solid Waste Reduction.

Canadian Standards Association. 2014. Emergency Preparedness and Response (CAN/CSA Z731-03, R2014).

Canadian Water Quality Guidelines for the Protection of Aquatic Life. Available from: http://ceqg-rcqe.ccme.ca/en/index.html;

DFO. 2019a. Fisheries Protection Policy Statement. Available from: https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.html;

DFO. 2019b. Measures to Avoid Causing Harm to Fish and Fish Habitat. Available from: https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html.

[CANUTEC] Transport Canada. 2012. 2012 Emergency Response Guidebook.

APPENDICES

Appendix A1

DFO Letter of Advice

Placeholder – Letter of Advice not yet received

Appendix A2

Environmental Incident Report Template

Spill Report

Date of Spill:	**Estimated Time of Spill:**	**File No.**
Date of Report:	**Location of Spill:**	**Type of Activity:**
Contact Information of Person Reporting the Spill		
Name:	**Tel:**	**Firm:**
Contact Information of Person Involved in the Spill (if different from above)		
Name:	**Tel:**	**Firm:**
Type of Material Released:	**Estimated Quantity Spilled:**	**Evacuation Required (Circle one): Yes No**

What was affected? (Write Y, N or maybe)

Soil _____ **Surface Water**_____

Groundwater _____ **Air** _____ **Other**

Cause of Spill:

Spill Response Completed (Describe)

Containment:

Clean up or recovery:

Disposal of Spilled or Contaminated Materials:

Proposed Measures to Prevent Recurrence:

Names of Persons/Agencies Advised:

Signed by: _____**Role/Authority:** _____

Appendix A3

Weekly Environmental Inspection Checklist

Hatfield Environmental Monitoring Inspection Checklist

SMT-5000 Barge Salvage Project

Dates on site _____

Time on site _____

Weather conditions _____

Name of monitor(s) _____

Weekly salvage activities:

Item #	Inspection items	Compliant (y/n/na)							Comments
		<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	
Air Quality and Dust									
1	Dust and odor emissions are controlled at the source where possible	-	-	-	-	-	-	-	
2	Wetdown of concrete cutting and crushing activities are conducted as required to limit fugitive dust.	-	-	-	-	-	-	-	
3	The track out of vehicles from the Site is managed to reduce the potential for the dispersion of material and debris as fugitive dust	-	-	-	-	-	-	-	
4	All equipment, vehicles and stationary emission sources are well-maintained and used at optimal loads to minimize emissions. Any parts showing excessive signs of wear or malfunction are promptly repaired or replaced prior to mobilizing to the Project site.	-	-	-	-	-	-	-	
5	All equipment fitted with standard emission control devices in compliance with federal, provincial, regional district, and municipal regulations and standards	-	-	-	-	-	-	-	
6	Vehicle and equipment idling time is minimized during salvage to the greatest practical and safe extent. Employees turn off vehicles or heavy equipment when not in use. Idle reduction initiatives are communicated and encouraged during Site orientations and health and safety, PTP and progress meetings	-	-	-	-	-	-	-	
7	Stationary emission sources only used when required and are turned off when not in use. Wherever possible electric units are used.	-	-	-	-	-	-	-	

Item #	Inspection items	Compliant (y/n/na)							Comments
		<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	
Noise and Vibration									
8	All equipment properly maintained to limit noise emissions to the extent practical and fitted with functioning exhaust and muffler systems.	-	-	-	-	-	-	-	
9	Engines turned off when not in use. Vehicle and equipment idling time restricted and minimized	-	-	-	-	-	-	-	
10	Where practical, noisy equipment stationed as far away as possible from sensitive noise receivers or amplifiers (e.g., workers, offices). Salvage material placed strategically or stored around noise sources to reduce the hazard to receivers	-	-	-	-	-	-	-	
11	Noisy stationary equipment (e.g., compressors, pumps, etc.) located and/or oriented to take advantage of any inherent noise shielding available from the natural terrain, or other large objects (e.g., equipment, buildings, material piles, etc.) and to reduce noise emissions from the Site	-	-	-	-	-	-	-	
12	Machinery and equipment only operated within specification and capacity (e.g., machines are not overloaded)	-	-	-	-	-	-	-	
13	Soft start procedures implemented for in-water works including vibratory pile driving and boulder relocation	-	-	-	-	-	-	-	
Machinery and Equipment Management									
14	All equipment and machinery maintained in good working order, free of leaks, excess oil and grease, invasive species, and noxious weeds	-	-	-	-	-	-	-	
15	All equipment and machinery used on Site inspected daily. Equipment maintenance conducted at appropriate intervals to assess belts and hoses, fluid levels, and to identify mechanical defects or worn materials	-	-	-	-	-	-	-	
16	All maintenance and refuelling activities of equipment conducted on level ground on an impermeable barge deck, and in secondary containment capable of capturing any potential leaks or spills. Major equipment repairs occur offsite	-	-	-	-	-	-	-	
17	Barge-based equipment refuelled with mitigations defined in the Spill Response Plan included in EMP Section 7.2. This includes the use of drip trays and sorbent pads when fuelling to prevent drips and spill to the marine environment	-	-	-	-	-	-	-	
18	Where possible, equipment working over water utilize readily biodegradable hydraulic fluids. All equipment operating on the intertidal foreshore utilize readily biodegradable hydraulic fluids	-	-	-	-	-	-	-	

Item #	Inspection items	Compliant (y/n/na)							Comments
		<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	
Erosion and Sediment Control									
19	Surface water is diverted around disturbed salvage areas including crushed concrete and lay down areas (e.g., by installing temporary curbs or tarping)	-	-	-	-	-	-	-	
20	Paved areas (i.e., seawall) are kept free of track out and erodible materials	-	-	-	-	-	-	-	
Erosion and Sediment Control (Cont'd.)									
21	Stockpiled erodible materials (i.e., granular footpath gravels, crushed concrete) are contained within sealed bins, or tarped with poly when not in use to prevent erosion and the generation of sediment-laden water	-	-	-	-	-	-	-	
22	Deck drains on the seaward (downslope) edge of the barge are blocked off during concrete removal activities to prevent discharge of turbid waters to English Bay. Sediment-laden waters are collected and contained for offsite disposal or treated on-site (to meet BC Water Quality Guidelines) prior to discharge to the marine environment..	-	-	-	-	-	-	-	
23	In-situ turbidity monitoring conducted at EM discretion (based on visual observation) does not exceed BCWQG	-	-	-	-	-	-	-	
Vegetation and Wildlife Management									
24	EM notified if any rare or sensitive species are identified on site or nearby Project works	-	-	-	-	-	-	-	
25	Marine mammal observation conducted during pile driving works	-	-	-	-	-	-	-	
26	Activities ceased if there is risk to physical harm to a marine mammal, and resume when there is no longer a risk	-	-	-	-	-	-	-	
27	Riparian vegetation in foreshore areas is delineated prior to works. Riparian vegetation is not disturbed during works conducted on the intertidal foreshore	-	-	-	-	-	-	-	
28	Woody debris and wrack on the intertidal foreshore is side cast to an area of similar elevation prior to works on the intertidal foreshore	-	-	-	-	-	-	-	
29	Pre-work Site orientation includes details on how to report incidental wildlife observations. Any observations are used by the EM to address site-specific mitigation.	-	-	-	-	-	-	-	

Item #	Inspection items	Compliant (y/n/na)							Comments
		<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	
Vegetation and Wildlife Management (Cont'd.)									
30	All food, food waste, fuels, oils and lubricants, and other attractants are stored in sealed containers that are inaccessible to wildlife, and secured to prevent overtopping	-	-	-	-	-	-	-	
31	Food waste is not mixed with Salvage waste								
32	Any bird nests encountered are not disturbed and the EM is notified immediately	-	-	-	-	-	-	-	
Fish and Fish Habitat Protection									
33	Barges or other vessels used during salvage do not ground on the foreshore or seabed or otherwise disturb the foreshore or seabed (e.g., disturbance as a result of vessel propeller wash). Appropriate use of spuds to secure barges is acceptable	-	-	-	-	-	-	-	
34	Boulder relocation ensures that boulders are relocated to an adjacent location of similar tidal elevation and water depth, and boulders are placed on seabed rather than dropped from height	-	-	-	-	-	-	-	
35	Torch cutting blows steel debris inward towards the Barge deck for capture.	-	-	-	-	-	-	-	
36	Steel cuttings are contained to the greatest extent using suspended drop cloths and physical barriers deployed above water level and affixed to the Barge. Hull cutting in the intertidal zone occurs during low tides with drop cloths deployed to collect cuttings and are removed prior to tidal inundation	-	-	-	-	-	-	-	
37	Paint chips, cleaning products, coatings or other potentially deleterious materials are prohibited from entering the aquatic environment.	-	-	-	-	-	-	-	
38	Following Barge removal magnets are used across the Project footprint to reclaim any residual steel cuttings	-	-	-	-	-	-	-	
Working on the Beach									
39	Works in the intertidal involving the operation of equipment (i.e., excavators etc.) on the beach are conducted in the dry during low tide. Equipment is removed prior to tidal inundation	-	-	-	-	-	-	-	
40	Salvage debris and steel cuttings are deposited on the beach, drop cloths and containment trays are placed beneath each activity with potential to deposit Salvage debris on the beach. All materials removed from the Barge are to be transported directly to contained storage on the Barge	-	-	-	-	-	-	-	

Item #	Inspection items	Compliant (y/n/na)							Comments
		<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	
Working on the Beach (Cont'd.)									
41	Portable equipment operating within 30 m of English bay (e.g., pumps, generators, etc.) are operated on top of a drip tray which have capacity to contain any spills or leakage during set-up, operation and dismantling, including rainfall and hose connections/disconnections considerations	-	-	-	-	-	-	-	
42	Spill kits containing aquatic booms and other appropriate absorbent materials, as listed in the Emergency Response Plan, are present in immediate proximity to all works on the intertidal foreshore	-	-	-	-	-	-	-	
43	Machines are maintained in a leak-free state, free of excess oil and grease and any leaking machinery is immediately repaired or removed.	-	-	-	-	-	-	-	
44	Equipment not stored within the intertidal foreshore and is removed from the intertidal foreshore prior to tidal inundation	-	-	-	-	-	-	-	
Concrete Works and Grouting Management									
45	Proper housekeeping and isolation is followed to iminimize spill potential from demolition equipment	-	-	-	-	-	-	-	
46	Appropriate spill cleanup materials readily available and easily accessible. Contractors made aware of the materials required to clean up a concrete spilll	-	-	-	-	-	-	-	
47	Concrete cutting takes preference over crushing, where possible. Works staged and conducted in a way to minimize the crushing of concrete and release of concrete fines.	-	-	-	-	-	-	-	
48	Concrete saw cutting activities utilize dust suppression systems and reclaim cutting slurries (i.e., wet vacuum)	-	-	-	-	-	-	-	
49	Sediment-laden water resulting from concrete demolition activities captured and contained for offsite removal or onsite treatment prior to discharge to the marine environment	-	-	-	-	-	-	-	
Severe Weather									
50	Weather forecasts are regularly monitored and incoming severe weather warnings reviewed	-	-	-	-	-	-	-	
51	Work site is tidy and prepared for securement at all times. Personnel, tools, equipment, and supplies made safe and secure in advance of incoming severe weather.	-	-	-	-	-	-	-	

Item #	Inspection items	Compliant (y/n/na)							Comments
		<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	
Severe Weather (Cont'd.)									
52	Exposed hazardous materials (including materials with the potential to result in sedimentation) are protected with tarpaulins or temporary sheeting	-	-	-	-	-	-	-	
53	Higher risk activities (i.e., hoisting over water, concrete demolition) delayed as required	-	-	-	-	-	-	-	
54	All facilities and work areas are inspected for damage during and/or after severe weather and repairs made prior to recommencing works	-	-	-	-	-	-	-	
Emergency Response									
55	All spills are to be reported to the EM and the Vanpile Project and Environmental Representatives	-	-	-	-	-	-	-	
56	Emergency Spill Response Plan is communicated to all site personnel and appropriate training is provided	-	-	-	-	-	-	-	
57	Safety Data Sheets for all hazardous materials are kept and maintained on site, and are made available on request	-	-	-	-	-	-	-	
58	Spill Response Hazard Assessments are available for all hazardous materials on site identified as a potential spill concern	-	-	-	-	-	-	-	
59	All hazardous materials are appropriately labelled, stored, contained and disposed of off-site	-	-	-	-	-	-	-	
60	Site environmental reporting and emergency contact list with up-to-date contact details and emergency response procedures is posted at Site office(s)	-	-	-	-	-	-	-	
61	Appropriate spill kit made available in a convenient location near the water during all works	-	-	-	-	-	-	-	
Fuel Management									
62	Refuelling only occurs on impermeable barge decks and overtop a secondary containment drip tray with spill materials immediately available	-	-	-	-	-	-	-	
63	All operators stay with the fuel nozzle during refuelling and ignition is turned off	-	-	-	-	-	-	-	
64	Fuel storage tanks include secondary containment capable of containing 110% of the volume of the largest tank and designed to be effective in all weather conditions.	-	-	-	-	-	-	-	
65	Equipment necessary to clean and mitigate spills is kept near the storage area.	-	-	-	-	-	-	-	
66	No spills or leaks identified at fuel and chemical storage locations, nor in storage containers, hoses and nozzles	-	-	-	-	-	-	-	

Item #	Inspection items	Compliant (y/n/na)							Comments
		<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	<Date>	
Archaeological Resource Management									
67	Any encounters of archaeological material is reported to EM and/or project supervisor immediately, the chance find procedure followed	-	-	-	-	-	-	-	
68	Any sites with encounters of archaeological should be flagged to prevent additional disturbances	-	-	-	-	-	-	-	
Waste Management									
69	Salvage waste reused or recycled where possible	-	-	-	-	-	-	-	
70	All outdoor refuse containers remain sealed to prevent wildlife entry	-	-	-	-	-	-	-	
71	Waste material stored in a manner that is secure and protected from the elements in undamaged containers	-	-	-	-	-	-	-	
72	No burning of wastes occurs on site	-	-	-	-	-	-	-	
73	All temporary sanitary facilities for the Project period are self-contained, regularly maintained and secured to prevent overtopping and damage from Salvage activities, vandalism or environmental factors	-	-	-	-	-	-	-	
Other									
74									
75									

Non-conformances or action items identified
NA

Close-out of previous non-conformances and action items			
Date	**Non-conformance**	**Corrective actions to be implemented**	**Close-out (Y/N)**
	Signed:		

ORCA Health and Safety Consulting Inc.
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Nanaimo, B.C. V9R 4W9
Office 250.751.4295
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HAZARDOUS MATERIALS SURVEY REPORT

Barge STM5000 – English Bay Stranding

Prepared for:

Vancouver Pile-Driving Ltd.

February 2022

Project No. 1230.2

1.0 Introduction:

This report presents the results of the hazardous materials survey conducted on barge STM 5000 located off Vanier Park (English Bay) in North Vancouver, BC, by ORCA Health & Safety. The field work was conducted by Paul Johnston (EPA-AHERA Building Inspector #13-0406, Certified Lead Risk Assessor #CLR13-0005) and Michael Holownia, (EPA-AHERA Building Inspector #3508-17-C18-28856). The purpose of this investigation is to identify and quantify hazardous building materials as described in Sections 5.0 and 6.0 of this report, and to assess related occupational health and environmental hazards potentially presented during breaking. All work was conducted in accordance with the requirements of various guidelines and regulations as listed in Section 3.1.

1.1 Summary of Findings

The following Table 1.1 summarizes hazardous materials present on the ship:

Table 1.1 – Summary of Hazardous Materials

Material Type	Location(s)	Report Section
Asbestos	None Found	5.0 & 6.0
Lead	Throughout hull & bulwarks	5.0 & 6.0
Other Heavy Metals	Presumed underwater hull, copper, zinc	5.0 & 6.0
PCBs	None Found	5.0 & 6.0
Petroleum	Diesel oil, POL & Hydraulic fluid	5.0 & 6.0
Hazardous Products	None Found	5.0 & 6.0
Ozone-Depleting	None Found	5.0 & 6.0
Radioactive	None Found	5.0 & 6.0
Biohazard	None Found	5.0 & 6.0

All of these materials must be removed or contained prior to general demolition or commencement of construction work. General Risk Assessments and recommendations for handling and disposal are discussed in Sections 5.0 & 6.0 of this report.

2.0 Scope of Report

An assessment was conducted on one structure located on the site. The scope of research for this report was limited to:

- a review of available information respecting the history and uses of the building.
- a visual reconnaissance and inspection of the ship;
- collection of four samples for Asbestos analysis;
- screening of thirty-seven paint samples for Lead content via XRF;

3.0 Vessel Information and Disposition

Please see appended specification sheet (Annex 'A').

DWT	LOA	Hull	Beam	Draft	HP
3770 ST	251'	Steel	52'	11.2' (Laden)	Non-powered

3.1 Historical Ownership

Please see appended specification sheet (Annex 'A').

No other historical or current vessel registration information was made available

3.1 References

The following legislation, policies, guidelines, and regulations were used in support of the Environmental Assessment:

- Canadian Environmental Assessment Act (CEAA)
- Canadian Environmental Protection Act (CEPA)
- Fisheries Act (FA)
- Hazardous Products Act
- British Columbia Occupational Health and Safety Regulations
- CCME Guideline for the Management of Polychlorinated Biphenyls (PCB) wastes.

4.0 Vessel Survey

We attended the site on February 1st, 2022. The purpose of this visit was to:

- conduct a visual reconnaissance.
- obtain samples of suspect materials for laboratory analysis;
- complete an XRF survey of the hull, deck, and bulwarks;
- obtain photo documentation.

Exterior and accessible internal areas were visually inspected. At the time of our inspection the ship was stranded off Vanier Park (English Bay) in North Vancouver, and in poor condition, with the hull reported as breached in at least three areas. The underwater hull and internal voids were not accessible and not inspected. The above waterline hull, deck and bulwarks were inspected and sampled. As such, our inspection can be characterized as 'semi-intrusive' in nature.

5.0 Survey Results

5.1 Anti-fouling & Corrosion Inhibiting Coatings

Limited visual inspection the underwater hull supports a conclusion that a cuprous oxide anti-fouling was applied to the hull and that the coating remains active. Documentary evidence was not available confirming the presence or absence of any previous use of other types of anti-fouling coatings.

5.2 Above Waterline Exterior and Interior Paints

The vessels exterior paint system is in generally fair condition. Some loose and flaking paint is present in isolated areas. These areas will require remediation prior to disposal. Analysis of representative paint samples suggests that the primers and coatings originally used on exterior deck and bulkhead applications were lead-based.

Subsequent re-painting and/or painting of repaired areas of the upper hull and bulwarks appears to have employed low-Lead or Lead-free coatings, resulting in highly variable measured concentrations of Lead throughout.

Voids were not entered, but were observed from the deck hatches, and interior surfaces appear to be primer-coated only, or bare steel.

5.3 Asbestos

Four samples were taken from various suspect materials. The laboratory analysis results of the samples taken during the inspection are provided in Annex B. Results are described in the following table:

Material	Location	Asbestos Content
Concrete deck screed	Forward	None
Concrete deck screed	Midship	None
Concrete deck screed	Aft	None
Door Gasket	Forward machinery space door	None

5.4 Compressed Gases

CO_2 storage cylinders for fire suppression are absent. HP and LP air storage reservoirs are similarly absent.

5.5 Volatile Organic Compounds (Adhesives, Solvents, Etc.)

No volatile organic compounds (VOCs) were observed.

5.6 Petroleum, Oil and Lubricants (POL)

Residual hydrocarbons including POL in the engine oil pan, pump casings and piping systems will require remediation. Remediation can be accomplished through complete equipment/system removal.

5.7 Metals (Copper, Lead, Mercury, etc.)

Thirty-seven samples of exterior and interior paint systems were taken to ascertain the presence of entrained metals. Concentrations of Lead above 90 ppm were detected in some areas (refer to Annex C) which are attributable to the primers and top-coats used historically.

The presence of Lead in the vessel's paint systems is considered to pose a moderate to high risk to workers during breaking.

5.8 Polychlorinated Biphenyls (PCBs)

No suspect PCB-containing materials were observed. No documentary evidence indicating the presence or absence of PCBs was available at the time of the inspection. No other likely sources of PCBs were identified visually during the inspection.

5.8 Fungicides and Pesticides

None present by visual inspection.

5.9 Mould Accumulations

None present by visual inspection.

6.0 Compartment and Equipment-Specific Observations

Note: The Risk Assessment provided here is general in nature. Further risk assessment based on the specific material(s), area(s) and proposed method(s) of remediation must be obtained before proceeding with remediation.

6.1 Decks and Floor Coverings

Screed on the decks is concrete over steel.

6.2 Structural and Non-structural Tanks

Two tanks are present in the Bow Machinery space. These are described in the following Sections 6.3 and 6.7. The remediation measures described applicable to specific tanks are based on tank capacities and assumed or observed residual contents at the time of the inspection.

6.3 Fuel Tanks

The fuel tank will require complete emptying, and removal.

Tank Description	Contents	Quantity Remaining
Auxiliary Tank, 100± USG	Diesel Oil	Unknown

6.4 Potable Water Tanks & System

Potable water tanks are not present aboard.

6.5 Piping Systems

Piping systems used for the transfer of hydrocarbons will require removal where practicable. Short piping sections (i.e. through bulkhead spool pieces) may be remediated in situ so long as all traces of residual hydrocarbons can be removed. Manual and automatic control valves, gauges and instruments require removal prior to disposal.

6.6 HP and LP Air Systems.

None present by visual inspection.

6.7 Hydraulic Systems.

Removal/remediation requirements per Cranes, Winches, Windlasses and Deck Machinery.

Tank Description	Contents	Quantity Remaining
Hydraulic Fluid Tank, 100± USG	Unknown	Unknown

6.8 Fire Suppression Systems.

None present by visual inspection.

6.9 Seawater Systems

Except where non-ferrous, copper-based piping has been used, sea water system piping does not require removal or remediation. Manual and automatic control valves, gauges and instruments require removal prior to disposal.

6.10 Electrical Wiring

None present by visual inspection.

6.11 Cranes, Winches, Windlasses and Deck Machinery

The foredeck windlass including associated, integral motors, pumps, piping and wiring will require removal prior to disposal.

6.12 Engine Room

The Bow Winch Machinery space will require removal of equipment and subsequent remediation prior to disposal. The following equipment and systems will require complete removal prior to disposal:

Auxiliary Engine	Exhaust Pipes
Hydraulic power packs	Fuel oil service
Transmissions, bearings, and shafting	Wiring and piping systems

6.15 Bilge Throughout

None present by visual inspection.

6.16 Debris & Refuse Throughout

None present by visual inspection.

7.0 Risk Assessment and Hazard Management

7.1 Lead-Containing Materials: Although Lead content may be reported as <90 ppm, any level of Lead in these materials may present a significant exposure risk to workers, depending on the type and condition of the material(s) & upon the method(s) of removal and handling. If work disturbing Lead-containing materials is undertaken, a Risk Assessment, Exposure Control Plan and related Safe Work Procedures will be required to ensure exposure is kept to levels 'As Low as Reasonably Achievable'. (Occupational safety hazard – Moderate-High)

Dry stripping of coatings (ie. abrasive blasting or grinding), or destructive removal of ceramic tile or similar materials should be avoided where possible. (Occupational safety hazard–Moderate to High)

Respecting Lead, Arsenic, Mercury, and other heavy metals, please note that the local landfill authority may require additional Toxicity Characteristic Leaching Procedure (TCLP) data before accepting material as 'Non-Hazardous Waste' as defined by the BC Hazardous Waste Regulations.

7.2 Other Hazardous Materials: All other hazardous materials in Sections 5.0 and 6.0 will require removal followed by decontamination of the affected compartment(s) before breaking commences. (Occupational safety hazard – Low to Moderate)

7.3 Confined Spaces:

All voids are confined spaces, and as such if entered other than during submerged diving operations, must be governed by documentation including appropriate hazard assessment(s), safe entry procedures and rescue plans. (Occupational safety hazard – Moderate to High)

7.4 Additional Regulatory Requirements (as required):

7.4.1 Notice of Project: As required by Section 20.2 of the Occupational Health and Safety (OHS) Regulation (B.C. Reg. 296/97), a Notice of Project must be filed with WorkSafe BC at least 48 hours prior to commencement of work.

This can be completed online at: https://online.worksafebc.com/anonymous/NOP/default.asp

Supporting documentation for the NOP must include: (1) this Hazardous Materials Survey Report (2) site-specific Risk Assessments; (3) Safe Work Procedures (SWP's) for the proposed work as described in Part 6 of the Regulation; and (4) a site Lead Exposure Control Plan (LECP).

7.4.2 Confirmation Letter: As required by Section 20.112 (8) of the BC OHS Regulations, a Confirmation Letter completed by a 'Qualified Person' may be required to certify proper removal or containment and final disposition of hazardous waste.

8.0 Report Use and Limitations

In preparing this report ORCA Health & Safety reviewed historical records, conducted interviews with certain private and public officials, and conducted an on-site visual inspection of the property. We examined and relied upon documents referenced in the report and have relied on oral statements made by certain individuals but we have not conducted an independent examination of the facts contained in referenced materials and statements.

ORCA Health & Safety assumes the genuineness of the documents and that the information provided in documents or statements is true and accurate.

ORCA Health & Safety has prepared this report in a professional manner, using that level of skill and care normally exercised for similar projects under similar conditions by reputable and competent consultants and in accordance with our normal terms and conditions.

ORCA Environmental Health & Safety shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time the report was prepared.

We also note that the facts and conditions referenced in this report may change over time and the conclusions and recommendations set forth here are applicable only to the facts and conditions as described at the time of this report.

The methods employed for collection and analysis of samples are those of the American Conference of Governmental Industrial Hygienists (ACGIH), the National Institute for Occupational Safety and Health (NIOSH), provincial WCB, and/or other accepted scientific practices.

The data and commentary presented herein reflects these standards, however no other warranty is offered or implied respecting the acceptance of this report by any Regulatory authority.

Conclusions and recommendations were made within the operative constraints of the scope, budget, and schedule for this project. We believe the conclusions stated herein to be factual, but no guarantee is made or implied.

We accept no responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report, or for damages suffered by any third party resulting from use of the Report without our express written permission.

8.1 Professional Statement

ORCA Health & Safety Ltd. certifies that the persons signing this statement have demonstrable relevant experience, are 'qualified persons' as defined under BC OHSR Section 6.1 and are familiar with the work carried out on the site.

9.0 Closure

We thank you for the opportunity to be of service. Should you have any questions, or require further information, please contact the undersigned at (250) 756-0355.

Yours truly,

ORCA HEALTH & SAFETY LTD.

Inspected by:

Michael Holownia,

EPA-AHERA Building Inspector #3508-17-C18-28856

Inspected & Reviewed by:

Paul Johnston, D. Tech., RIHT

EPA-AHERA Building Inspector #13-0406
Certified Lead Risk Assessor #CLR13-0005

ANNEX 'A'

BARANOF

VESSEL SHEET

OFFICIAL #: 513049 ABS #: 6807963 LR / IMO #:

FOSS

VESSEL DESCRIPTION	
VESSEL TYPE	Chip Barge
SERVICE	Columbia/Snake River, Coastwise
CARGO TYPE	Chips
CALL SIGN	N/A
HAIL PORT	Portland, OR
OLD NAMES	Foss 275
DATE BUILT	Feb 1968
REBUILT	1987
BUILDER	Zidell Explorations, Inc., Portland, OR

CARGO CAPACITY	
CAPACITY #1	1,650 BDUs
CAPACITY #2	
CAPACITY #3	
CAPACITY #4	

OTHER CAPACITY	
USABLE DECK AREA	251' x 52' x 22'
MAX DECK LOAD	760 lbs. PSF
FUEL	
HYDRAULIC	
LUBE	
BALLAST	

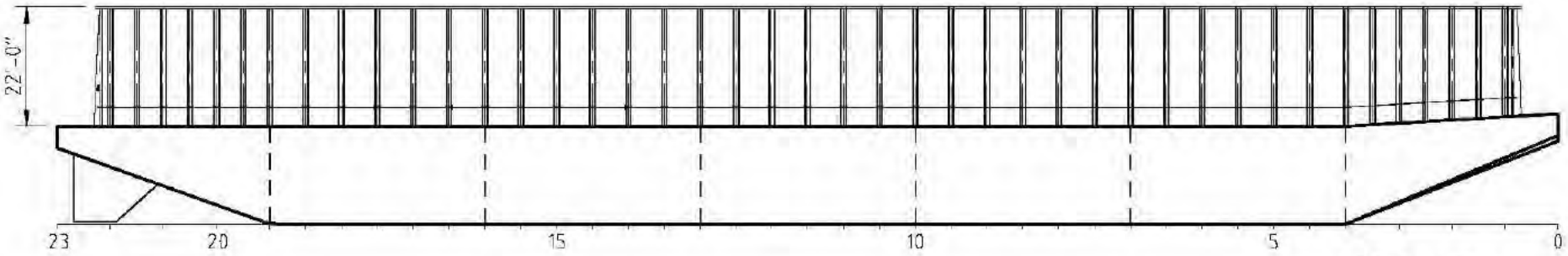
REMARKS
Converted to bin barge in 1987. Paper tube is located stern
Deck to port of the water tight door on the outside of the
Bin wall. Max Draft w/ chips is 11.5'

MACHINERY	
PUMP ENG #1	
PUMP #1	
PUMP ENG #2	
PUMP #2	
AUX	3-71 GMC Winch w/ hyd bridle and retrieval system in place
PUMP #3	
BLST PUMP ENG	
DK CRANE #2	
DK CRANE #1	
OTHER MACH	Hydraulic winch for bridle retrieval
HOSE CONNECTIONS	

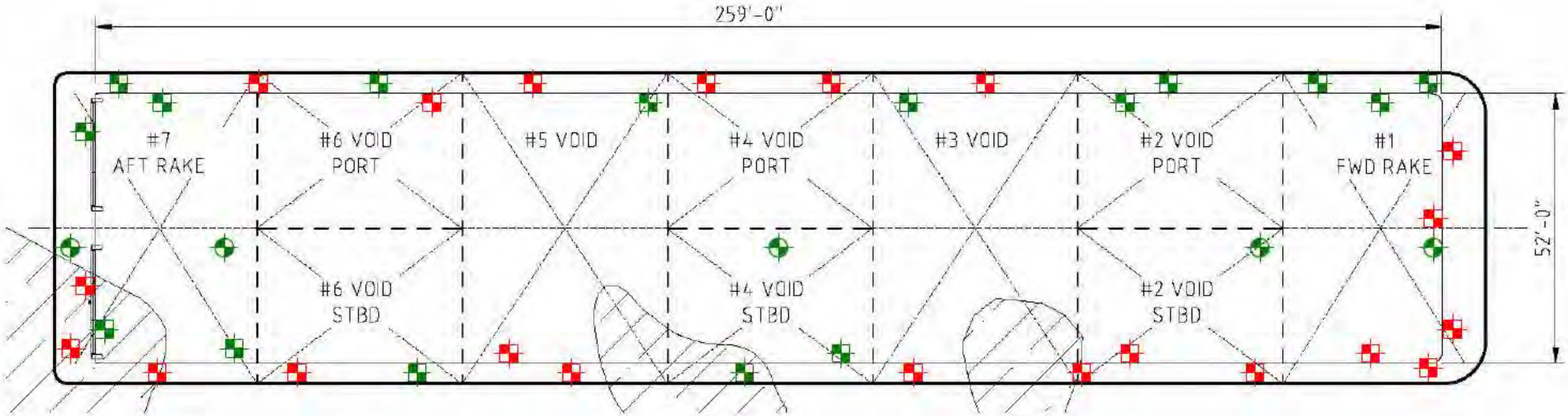
TANK BARGE / TANK CAPACITIES (BBLS @ 95% FULL)			
CARGO TANKS	PORT	CENTER	STARBOARD
FORE TANKS			
#1			
#2			
#3			
#4			
#5			
#6			
#7			
#8			
AFTER PEAK			

REGULATORY	
ABS LL	Y
ABS CL	N
USCG INSP	Y
REGISTRY	Y
COASTWISE	Y
TITLE XI	N
CCF	N

DIMENSIONS	
REG. GT.	2,406
REG. NT.	2,406
ITC GR TONS	
ITC NT TONS	
REGULAT. GT	
REGULAT. NT	
DRAFT MIN	3.7'
DRAFT MAX	11.5'
REG. LENGTH	276'
REG. BREADTH	60'
REG. DEPTH	17'
LOA	276'
MAX BREADTH	
MAX HEIGHT	
DISPLACEMENT	5,140 ST
DEADWEIGHT	3,770 ST



PROFILE VIEW



ASBESTOS SAMPLE POSITIVE | LEAD SAMPLE POSITIVE

ASBESTOS SAMPLE NEGATIVE | LEAD SAMPLE NEGATIVE

ORCA Health & Safety — Nanaimo, B. C. Canada

TITLE

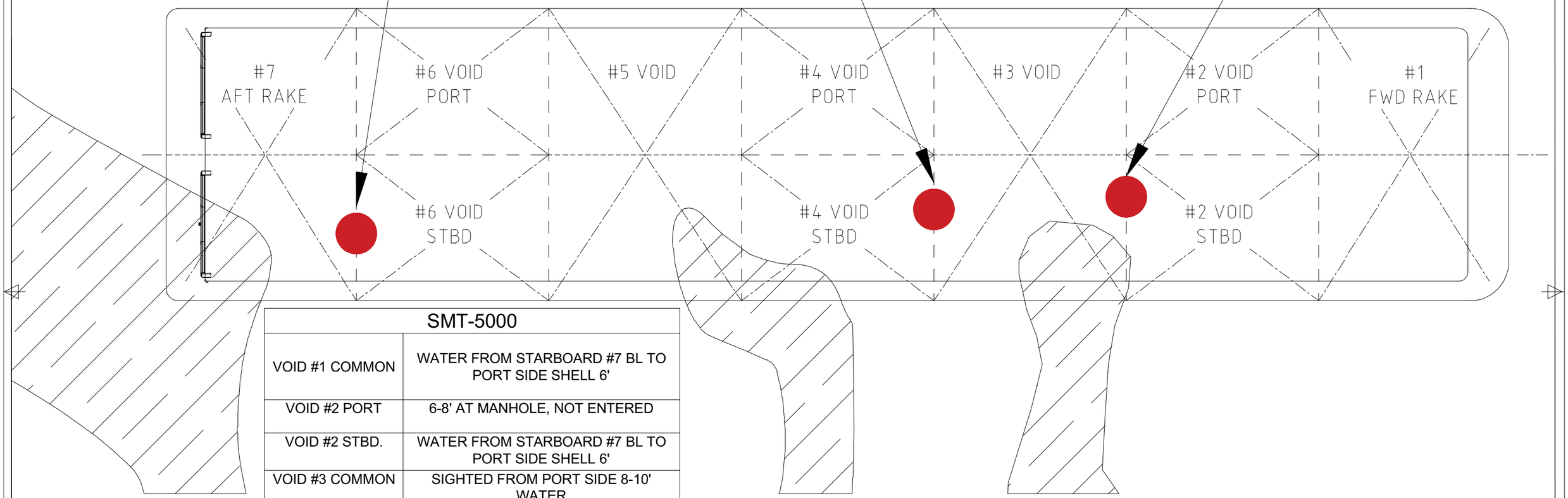
BARGE STM5000 (ENGLISH BAY STRANDING)

PROJECT NO.	DWG NO	DATE	REV
1230.2	1230.2 -1	2022-02-11	0
SCALE NTS	DRAWN WPJ	SHEET 1 OF 1	

STARBOARD AFT RAKE:
HOLED ON BOTTOM SHELL AT
BULHEAD FRAME #19
AT #5-6 BL OVER 2'

STARBOARD #4:
HOLED ON BULKHEAD
AND BOTTOM AT #8-10
BL.

STARBOARD #3:
HOLED ON BULKHEAD
AND BOTTOM AT #11-12
BL.AND BOTTOM PLATE



SMT-5000	
VOID #1 COMMON	WATER FROM STARBOARD #7 BL TO PORT SIDE SHELL 6'
VOID #2 PORT	6-8' AT MANHOLE, NOT ENTERED
VOID #2 STBD.	WATER FROM STARBOARD #7 BL TO PORT SIDE SHELL 6'
VOID #3 COMMON	SIGHTED FROM PORT SIDE 8-10' WATER
VOID #4 PORT	6-8' AT MANHOLE, NOT ENTERED
VOID #4 STBD	WATERTIGHT BULKHEAD WATER INGRESS AT #8 BL, 8' WATER AT CL BULKHEAD
VOID #5 COMMON	SIGHTED FROM PORT SIDE 8-10' WATER
VOID #6 PORT	6-8' AT MANHOLE, NOT ENTERED
VOID #6 STBD	WATER ENTERING AT AFT BULKHEAD AT #5-6 BL
VOID #7 COMMON	WATER ENTERING AT AFT BULKHEAD AT #5-6 BL

NOTES:
VOIDS TO BE CONFIRMED AREAS WHEN WATER REMOVED
SURVEY OF BOTTOM CONDUCTED OUTBOARD OF SMT-5000
VANPILE DERRICK ON-SITE WEDNESDAY, PORT OUTBOARD.

ALL DIMENSIONS IN INCHES

Designed	Checked by	Approved by - date	Sheet ANSI-B	Date	Scale
TGB MARINE CONSULTING SERVICES			REFERENCE SMT-5000		

ANNEX 'B'

Lewkowich Engineering Associates Ltd.

Bulk Asbestos Certificate of Analysis

Project #: E0400-144 **Client: Orca Health and Safety Consulting Inc.** **Site Address: SMT 5000 (ACM) CME Nanaimo (WE Ricker)** **Sampled By: Client**

Analyzed in accordance with NIOSH 9002 Asbestos (Bulk) by PLM

(Note: Estimated Limit of Detection (LOD) is <1% asbestos)

Legend:

ND Not Detected

Lab Sample #	Sample Description	Location	Phase Description	Phase %	Asbestos Type	Asbestos %	Other Material Type	Other Material	Analyst
E0400-144-1	Gasket	Engine Room	Rust Mix	1	NO	ND	Non-Fibrous	100	LC
		Door	Dakr Gry Mix- Pliable	99	NO	ND	Non-Fibrous	100	LC
E0400-144-2	Screed	Main Deck Mid Ship	Cementitous - Lt Grey/Dk Aggregate	100	NO	ND	Non-Fibrous	100	LC
E0400-144-3	Screed	Main Deck	Brown Mix	2	NO	ND	Non-Fibrous	100	LC
		Stern	Cementitous - Lt Grey/Dk Aggregate	98	NO	ND	Non-Fibrous	100	LC
E0400-144-4	Screed	Outside Stern	Cementitous - Grey/Grey Aggregate	100	NO	ND	Non-Fibrous	100	LC
E0400-144-5	Screed	Main Deck Bow	Cementitous - Lt Grey/Grey + Dk Aggregate	100	NO	ND	Non-Fibrous	100	LC

ANNEX 'C'

Field Portable XRF Certificate of Analysis

Project #:	1230.2	Client: Vancouver Pile Driving	Site Address:	STM5000 Barge (English Bay)	In-situ	X
					Ex-situ	

Analyzed in accordance with analytical methods adapted from EPA Method 6200 and ASTM F2853-10

Note: HPA defines lead based paint (LBP) as coating exceeding 90 ppm (0.009%) Lead content by weight

Legend:

POSITIVE Lead-content (> LOD for XRF) ``

ND Lead Content < Limit of Detection

Test #	Sample Description	Location	Date	Time	Element	Lead Content	Remarks	Analyst
2	Stbd Upper Hull Exterior Red	See appanded drawing	2022-01-31	15:49:00	Lead	POSITIVE	90 - 600 ppm	PJ
3	Stbd Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:10:00	Lead	POSITIVE	90 - 600 ppm	PJ
4	Stbd Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:11:00	Lead	POSITIVE	90 - 600 ppm	PJ
5	Stbd Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:11:00	Lead	ND	Non Detect	PJ
6	Stbd Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:12:00	Lead	POSITIVE	90 - 600 ppm	PJ
7	Stbd Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:13:00	Lead	ND	Non Detect	PJ
8	Stbd Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:14:00	Lead	POSITIVE	90 - 600 ppm	PJ
9	Stbd Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:14:00	Lead	POSITIVE	90 - 600 ppm	PJ
10	Stbd Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:15:00	Lead	POSITIVE	< 90 ppm	PJ
11	Stern Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:16:00	Lead	ND	Non Detect	PJ
12	Stern Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:16:00	Lead	POSITIVE	< 90 ppm	PJ
13	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:17:00	Lead	ND	Non Detect	PJ
14	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:17:00	Lead	POSITIVE	90 - 600 ppm	PJ
15	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:18:00	Lead	ND	Non Detect	PJ
16	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:18:00	Lead	POSITIVE	90 - 600 ppm	PJ
17	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:19:00	Lead	POSITIVE	90 - 600 ppm	PJ
18	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:19:00	Lead	POSITIVE	< 90 ppm	PJ
19	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:20:00	Lead	POSITIVE	< 90 ppm	PJ
20	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:21:00	Lead	ND	Non Detect	PJ
21	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:21:00	Lead	ND	Non Detect	PJ
22	Port Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:22:00	Lead	ND	Non Detect	PJ
23	Bow Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:22:00	Lead	POSITIVE	90 - 600 ppm	PJ
24	Bow Upper Hull Exterior Red	See appanded drawing	2022-02-01	10:23:00	Lead	POSITIVE	90 - 600 ppm	PJ
25	Engine Compartment White	See appanded drawing	2022-02-01	10:24:00	Lead	POSITIVE	< 90 ppm	PJ
26	Aft Deck Black	See appanded drawing	2022-02-01	10:25:00	Lead	POSITIVE	< 90 ppm	PJ
27	Stern Upper Hull Interior Black	See appanded drawing	2022-02-01	10:25:00	Lead	ND	Non Detect	PJ
28	Stbd Upper Hull Interior Black	See appanded drawing	2022-02-01	10:26:00	Lead	ND	Non Detect	PJ
29	Stbd Upper Hull Interior Black	See appanded drawing	2022-02-01	10:28:00	Lead	POSITIVE	< 90 ppm	PJ
30	Stbd Upper Hull Interior Black	See appanded drawing	2022-02-01	10:30:00	Lead	ND	Non Detect	PJ

Project #:	1230.2	Client: Vancouver Pile Driving	Site Address:	STM5000 Barge (English Bay)	In-situ	X
					Ex-situ	

Test #	Sample Description	Location	Date	Time	Element	Lead Content	Remarks	Analyst
31	Stbd Upper Hull Interior Black	See appanded drawing	2022-02-01	10:31:00	Lead	ND	Non Detect	PJ
32	Stbd Upper Hull Interior Black	See appanded drawing	2022-02-01	10:32:00	Lead	ND	Non Detect	PJ
33	Port Upper Hull Interior Black	See appanded drawing	2022-02-01	10:33:00	Lead	ND	Non Detect	PJ
34	Port Upper Hull Interior Black	See appanded drawing	2022-02-01	10:33:00	Lead	ND	Non Detect	PJ
35	Port Upper Hull Interior Black	See appanded drawing	2022-02-01	10:34:00	Lead	ND	Non Detect	PJ
36	Port Upper Hull Interior Black	See appanded drawing	2022-02-01	10:35:00	Lead	ND	Non Detect	PJ
37	Port Upper Hull Interior Black	See appanded drawing	2022-02-01	10:35:00	Lead	POSITIVE	90 - 600 ppm	PJ
38	Port Upper Hull Interior Black	See appanded drawing	2022-02-01	10:36:00	Lead	ND	Non Detect	PJ

Instrument Thermo Niton XL3T	Calibration Check	Date	2022-01-31	Time	15:49:00	PASS	PJ

SMT-5000 BARGE SALVAGE
MARINE HABITAT ASSESSMENT REPORT

January 2022

Hatfield

Prepared for:

Vancouver Pile Driving Ltd.

North Vancouver, British Columbia

Hatfield Consultants LLP

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SMT-5000 BARGE SALVAGE

MARINE HABITAT ASSESSMENT REPORT

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JANUARY 2022

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VERSION 1.0

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LIST OF ACRONYMS

BC	British Columbia
BMP	Best Management Practices
CD	Chart Datum
CDC	Conservation Data Centre
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EMP	Environmental Management Plan
EZ	Exclusion Zone
HADD	Harmful Alteration, Disruption and Destruction
SARA	*Species at Risk Act*

DISTRIBUTION LIST

The following individuals/firms have received this document:

Name	Firm	Hardcopies	Email	FTP
Jesse Percy	Vancouver Pile Driving Ltd.		✓	
Ian Purvis	Vancouver Pile Driving Ltd.		✓	
Fish and Fish Habitat Protection Program	Fisheries and Oceans Canada		✓	

AMENDMENT RECORD

This report has been issued and amended as follows:

Issue	Description	Date	Approved by	
1	First version of Marine Habitat Assessment Report	20220128		
			Stewart Wright Project Director	Megan Vaughan R.P.Bio, Marine Biologist

1.0 INTRODUCTION

Hatfield Consultants (Hatfield) has been retained by Vancouver Pile Driving Ltd. (Vanpile) for environmental management and regulatory support associated with the removal of the SMT-5000 (the Barge); a chip barge owned by Sentry Marine Towing, from Sunset Beach in English Bay, Vancouver, British Columbia (BC). On November 15, 2021, the Barge became grounded on Sunset Beach when it broke free from an anchorage in Burrard Inlet during a severe weather event. The removal of the Barge from the beach (the Project) is required to ensure there will be no risk to public safety, property, and the environment.

Hatfield has completed this marine Habitat Assessment to support a Fisheries and Oceans Canada (DFO) Request for Review under the *Fisheries Act* and the *Species at Risk Act* (SARA). The Habitat Assessment includes a desktop review of existing studies and marine environmental data for the defined Study Area; and the results of marine field surveys completed on January 19 and 24, 2022.

Based on the data reviewed and collected, Hatfield has assessed the value of the habitat with the potential to be affected by Project works. Hatfield has assessed the potential for the death of fish and Harmful Alteration, Disruption and Destruction (HADD) and defined avoidance and mitigation measures for the Project. This includes inputs to the Barge removal methods, Best Management Practices (BMPs), environmental monitoring and mitigation measures to be implemented during the Barge removal.

2.0 PROJECT OVERVIEW

The Barge is positioned on top of several man-made boulder clusters in the intertidal zone, approximately 24 m from the offshore face of the seawall (Figure 1). The boulders have led to irreparable damage and the Barge has been deemed a total constructive loss and not seaworthy for transport. The proposed plan is to deconstruct the Barge *in situ* and transport the components to an appropriate facility for steel recycling. Project components will include temporary subtidal boulder relocation for marine equipment access, barge salvage and removal from site.

Prior to salvage activities, two to three temporary steel pilings (36" diameter) will be installed on the offshore edge of the Barge. These pilings will be installed into sandy substrate using vibratory pile driving methods, and will allow for securement of the barge to prevent movement as components are removed and the weight of the Barge is reduced.

Salvage works will involve the removal of concrete decking, steel bin walls, steel decking, and the steel hull. One small engine exists within an engine room located at the bow centreline of the Barge. This engine and all associated hydrocarbons will be removed by a mechanic prior to disassembly works. The concrete decking will be removed using concrete saws and a small excavator/skid-steer with a hoe-ram used to break-up the concrete. Sealed demolition bins will be filled with concrete and craned off of the Barge to a supporting materials scow. During concrete demolition, the lower bin walls will remain in place to facilitate containment and capture of stormwater containing concrete fines.

The bin walls will then be cut by using cutting torches or hydraulic shears, and lifted onto a support scow for transport. The steel decking and structural members will be removed using cutting torches or hydraulic shears and will be lifted to the supporting scow. Air bags will be used to elevate the final sections of the hull off of the substrate to allow for cutting.

Barge demolition works will include the following components:

- Installation of exclusion fencing on the seawall;
- Mobilization of required marine and salvage equipment to site;
- Installation of temporary moorage pilings (36” x 0.750” WT), temporary access float pilings, and access gangways;
- Removal of concrete decking;
- Removal of bin walls;
- Removal of steel decking and structural members, including forward and aft rakes, pillars, and starboard voids;
- Installation of airbags to lift remaining Barge hull above the waterline;
- Removal of port voids;
- Debris survey using crane magnet to sweep beach for debris at low tide;
- Removal of temporary mooring piles, demobilization of salvage equipment and exclusion fencing; and
- Transport materials barge for scrap recycling.

Project works will be followed by a post-construction habitat survey to assess the condition of the habitat at the wreck site and inform potential restoration activities, if required.

Figure 1 Diagram of the Barge wreck site.

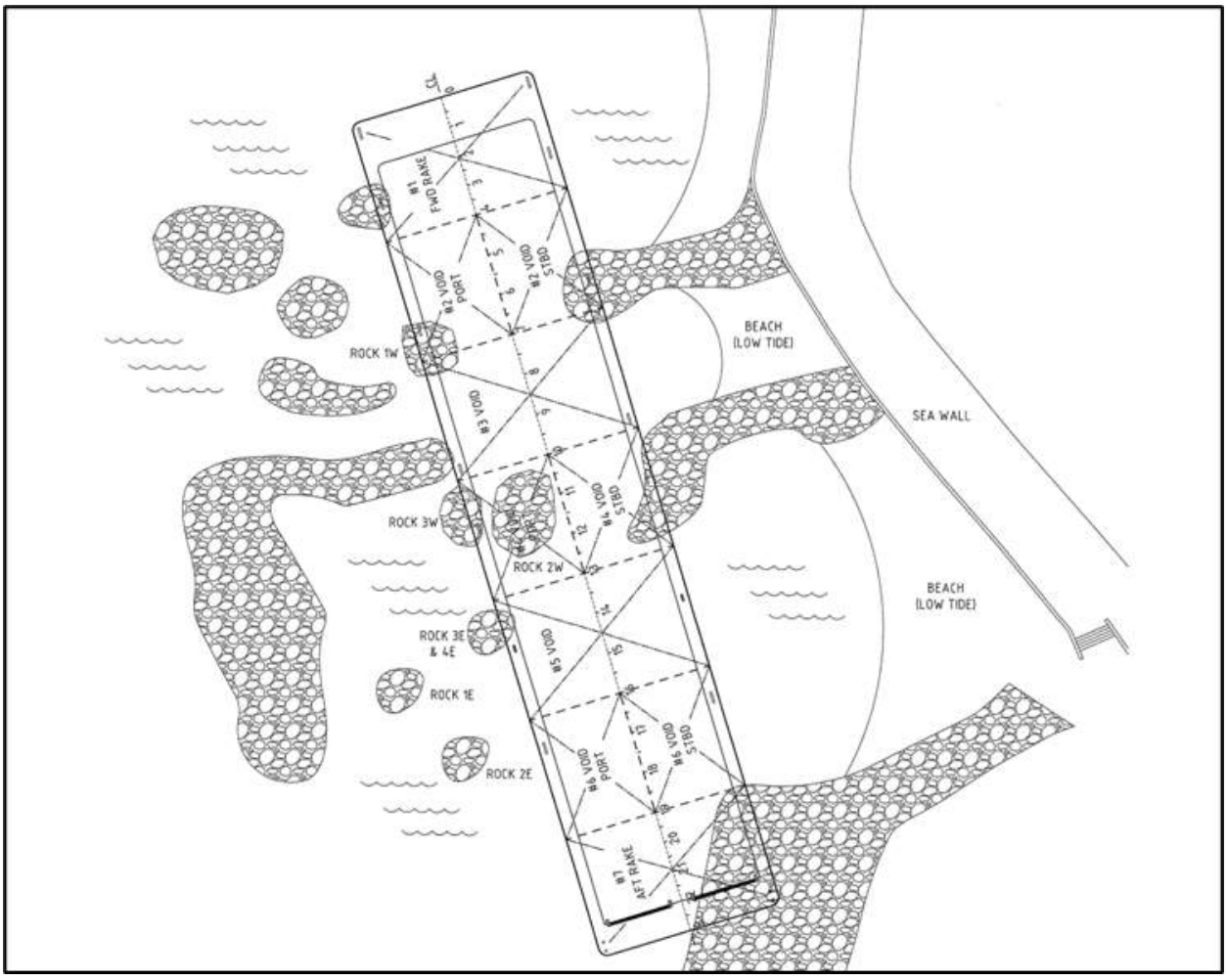


Image credit: Vancouver Pile Driving (2021)

2.1 PROJECT SCHEDULE

Project works are expected to begin in February 2022. The Project completion date has yet to be determined, but it is anticipated in-water works will occur partially outside the DFO Least Risk Window for Burrard Inlet (August 16 - February 28). On-site work will be undertaken from 07:00 to 20:00 Monday to Friday, excluding recognized statutory holidays.

3.0 STUDY AREA

The Barge is located at approximately 49°16'52.66"N, 123°8'29.85"W and is within lands managed by the City of Vancouver. The Study Area has been defined to encompass the Project works and potential environmental effects (Figure 2).

Figure 2 Overview of Study Area.

Legend

- Study Area
- English Bay Barge
- Contours - 1m*
- Contours - 0.2m*

* contours referenced to Chart Datum

Data Sources:
a) English Bay Barge and Study Area, Hatfield 2022.
b) Contours, Vancouver Pile Driving 2022.
c) Background, Aerial photo 7.5cm, 26 April 2018, Esri Online Service.

0 10 20 40 m

Scale: 1:1,800

Projection: NAD 1983 UTM Zone 10N

N

Hatfield

English Bay Barge Removal

K:\Data\Project\VPD11325-NVA_MXD\VPD11352_EnglishBayBarge_OverviewMap_20220127_v0_2_TD.mxd

4.0 ASSESSMENT METHODOLOGY

4.1 DESKTOP REVIEW

A desktop review of existing publicly available information was conducted for the Study Area and the surrounding English Bay and Burrard Inlet Outer Harbour to inform and support the subsequent field assessment. The information was assembled to characterize known marine habitat features, potential species presence, and potential migratory, refuge, or spawning areas, including species-at-risk and wildlife of potential conservation concern.

Data sources reviewed and evaluated and/or information collected for relevance to this assessment included:

- BC Conservation Data Centre (CDC):
    - BC Species & Ecosystems Explorer: http://a100.gov.bc.ca/pub/eswp/
    - CDC iMap: http://maps.gov.bc.ca/ess/hm/cdc/
- BC Fish Inventories Data Queries (FIDQ): http://a100.gov.bc.ca/pub/fidq/welcome.do
- Electronic Atlas of the Flora of British Columbia: Algae identification: http://ibis.geog.ubc.ca/biodiversity/eflora/algae.html
- DFO New Salmon Escapement Database System: https://open.canada.ca/data/en/dataset/c48669a3-045b-400d-b730-48aafe8c5ee6
- DFO Pacific Herring Spawning Records – Strait of Georgia: http://www.pac.dfo-mpo.gc.ca/science/species-especes/pelagic-pelagique/herring-hareng/herspawn/sog_map-eng.html
- DFO Pacific Ocean, Aquatic Species at Risk Map: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html
- DFO Pacific Ocean, Project Near Water: http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html.
- DFO Rockfish Conservation Areas: https://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/rca-acs/index-eng.html
- FREMP-BIEAP Habitat Atlas: https://www.cmnbc.ca/atlasgallery/fremp-bieap-habitat-atlas/;
- Important Bird Areas, including great blue heron colony areas: https://www.ibacanada.com/mapviewer.jsp?lang=EN
- Sensitive Habitat Information Mapping: https://cmnbc.ca/atlas_gallery/shim-sensitive-habitat-inventory-and-mapping
- FREMP-BIEAP Habitat Atlas: https://www.cmnbc.ca/atlasgallery/fremp-bieap-habitat-atlas/
- Species at Risk Registry: The public registry for Species at Risk in Canada: http://www.sararegistry.gc.ca/sar/index/default_e.cfm
- Wild Ocean Whale Society, Whales and Dolphins BC – Sighting map: https://whalesanddolphinsbc.com/latest_sightings/

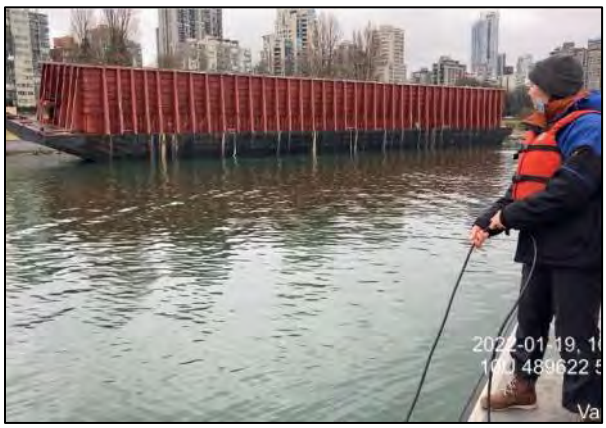
4.2 SURVEY METHODS

Field-based habitat surveys were undertaken to build on the desktop review and assess and characterize the marine environment potentially affected by Barge salvage activities. The habitat surveys consisted of a boat-based subtidal video survey, conducted at high-tide on January 19, and a land-based intertidal survey, conducted at low-tide on January 24.

The subtidal survey was conducted from a vessel at high tide using a towed underwater camera system (Figure 3A). The survey was completed from a commercial water taxi vessel owned and operated by Mercury Transport Inc. The field team completed three video survey transects parallel to the shoreline along the seaward side of the Barge, recording the survey path with a GPS track. The survey video was analyzed to characterize the substrate, assess the quality of fish habitat, and determine the distribution and abundance of fish, algae and macroinvertebrates, if present.

The intertidal survey was undertaken on foot at low tide (Figure 3B). The field team conducted a visual assessment and collected geo-referenced photographs of the intertidal environment. The results of the survey were used to characterize the substrate, assess the quality of fish habitat, and determine the distribution and abundance of fish, algae, macroinvertebrates and riparian habitat. Incidental observations of marine mammals and birds were also recorded.

Figure 3 Habitat survey methodology.



A) Underwater towed video survey

B) Intertidal survey

5.0 ASSESSMENT RESULTS

5.1 HISTORY OF THE STUDY AREA

The Sunset Beach Park portion of the seawall was first constructed in 1959 to connect Stanley Park with False Creek. Structural failure of the timber construction in this area lead to reconstruction work in 2011 using concrete. A marine habitat assessment was conducted prior to the seawall reconstruction work, and in the assessment it was noted that there was an opportunity for enhancing or remediating habitat alterations that occurred from the original seawall construction. It was proposed that the complexity of the upper intertidal habitat could be increased through the addition of boulder clusters which would also help reduce beach scour at the toe of the seawall by dissipating some of the wave energy before reaching the seawall (WorleyParsons 2010). Boulder clusters and the approximate location of the barge are shown in Figure 4.

Figure 4 View of Sunset Beach on July 23, 2017 (ShoreZone 2017) and approximate location of Barge (blue).

5.2 PHYSICAL CONDITIONS

The Study Area is bounded to the north by the seawall in English Bay. The Barge is grounded on boulders in the intertidal zone approximately 24 m from the seawall (Figure 5A). On the shoreward side of the Barge, boulders and woody debris lie over sandy substrate, as seen in Figure 5B taken at a low tide of +1.8 m CD. The substrate in the subtidal zone consists mostly of sand, with clusters of cobble, gravel, and boulder in varying proportions, as well as shell hash, algal wrack, and wood debris (Figure 6). Within the Study Area, riparian, intertidal, and subtidal habitats were assessed, and the elevation ranged from approximately + 4.0 m Chart Datum (CD), to approximately - 1.5 m CD.

Figure 5 View of the Barge.

A) Seaward port side at high tide.

B) Shoreward starboard side at low tide.

Figure 6 **Representative photos of substrate types within the Study Area.**

Legend

- Approximate Photo Locations
- Study Area
- English Bay Barge
- Transects
- Contours - 1m*
- Contours - 0.2m*

* contours referenced to Chart Datum

0 250 500 m

Scale: 1:25,000

Projection: NAD 1983 UTM Zone 10N

N

Hatfield

English Bay Barge Removal

K:\Data\Project\VPD11325-NV\A_MXD\VPD11352_EnglishBayBarge_Habitat_Assessment_20220127_v0_2_TD.mxd

Photo 1 - Intertidal sand and boulder habitat. Photo taken looking South.

Photo 2 - Intertidal sand and boulder habitat. Photo taken looking North.

Photo 3 - Sand on Transect 1.

Photo 4 - Boulders on Transect 1.

Photo 5 - Cobbles on Transect 2.

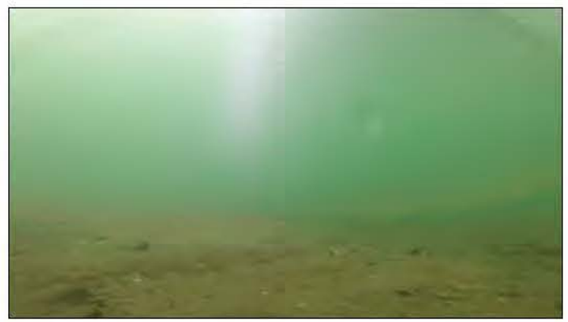


Photo 6 - Sand on Transect 3.

5.3 RIPARIAN HABITAT

On the shoreward side of the Barge, there is a patch of riparian habitat of approximately 7 m^2 in an elevated area that contains dunegrass (*Leymus mollis*; Figure 7A) and young cottonwood trees (*Populus trichocarpa*; Figure 7B). Outside of this area no additional riparian habitat was observed.

Figure 7 Riparian habitat between the Barge and seawall.

A) Patches of Dunegrass located near the stern of the barge.

B) Cottonwood trees near the seawall, at the stern of the barge.

5.4 FISH

The BC Ecosystem Explorer, BC CDC, Fisheries Information Summary System Habitat Wizard, and Sensitive Habitat Information Mapping were reviewed to identify other potential fish species that could occur in the Study Area. Several marine and anadromous fish species have the potential to occur in English Bay, and therefore in the Study Area, including: kelp greenling (*Hexagrammos decagrammus*), lingcod (*Ophiodon elongates*), striped seaperch (*Embiotoca lateralis*), Pacific sand lance (*Ammodytes hexapterus*), pile perch (*Rhacochilus vacca*), rock sole (*Lepidpsetta* sp.), shiner perch (*Cymatogaster accipenserinus*), bay pipefish (*Syngnathus leptorhynchus*), and whitespotted greenling (*Hexagrammos stellen*).

Although there is no estuarine habitat in English Bay, marine habitat in English Bay may be used for migration by seven salmonid species: Chinook (*Oncorhynchus tshawytscha*), chum (*Oncorhynchus keta*), coho (*Oncorhynchus kisutch*), pink (*Oncorhynchus gorbuscha*), sockeye (*Oncorhynchus nerka*), steelhead (*Oncorhynchus mykiss*), and cutthroat trout (*Oncorhynchus clarki*) (Levings et al. 2004). Juvenile salmon may use nearshore areas during the spring and summer months (Levy 1997) and originate from spawning streams in the Burrard Inlet and the Fraser River (Naito and Hwang 2000).

No fish were observed during the habitat assessment.

5.5 ALGAE AND INVERTEBRATES

In the marine and intertidal environments, algae and invertebrates are often attached to hard substrates such as cobbles or boulders. Algae provide habitat, food, shelter and nursery environments for fish, invertebrates, and some epiphytic algae. Their biomass also provides oxygen through primary productivity to nearshore food webs (Bates 2004). Marine invertebrates are an integral part of the ecosystem and fill a

wide range of ecological roles from providing prey for fish and other invertebrates to filtering organic matter and nutrients from the water column.

In the lower intertidal and shallow subtidal portions of the Study Area, several species of algae were observed attached to boulders, including sea lettuce (*Ulva* sp.; Figure 8A), rockweed (*Fucus distichus;* Figure 8B), red bladed algae (e.g., *Porphyra* sp.), red filamentous algae.

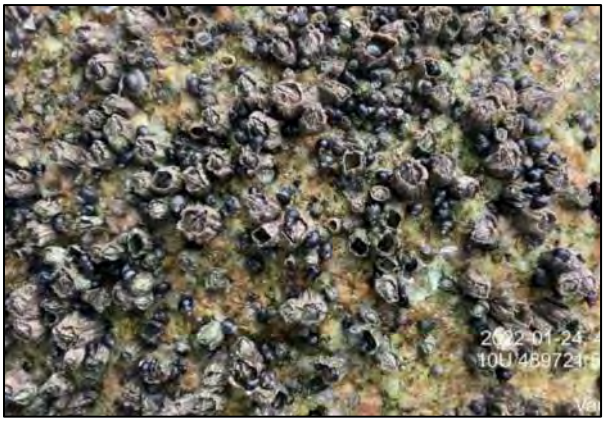
Marine invertebrates in the Study Area included blue mussels (*Mytilus* sp.), barnacles (*Balanus glandula*), periwinkle snails (*Littorina* spp.), non-native Pacific oysters (*Crassostrea gigas*), and varnish clams (*Nuttallia obscurata*). A single Dungeness crab (*Metacarcinus magister*; Figure 9) and a single shrimp were also observed in the subtidal environment.

Figure 8 Representative photos of invertebrates and algae in the Study Area observed during the intertidal survey.

A) Sea lettuce and mussels

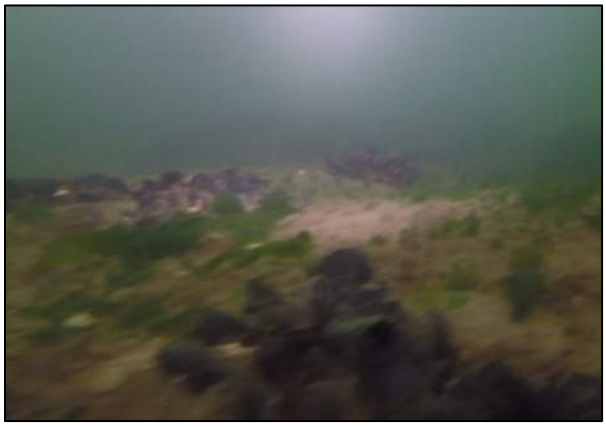
B) Rockweed and mussels

C) Pacific oyster

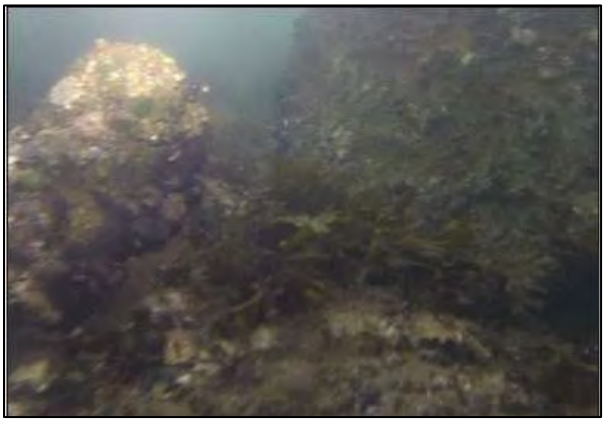


D) Barnacles and periwinkle snails

Figure 9 Representative photos of invertebrates and algae in the Study Area observed during the subtidal video survey.

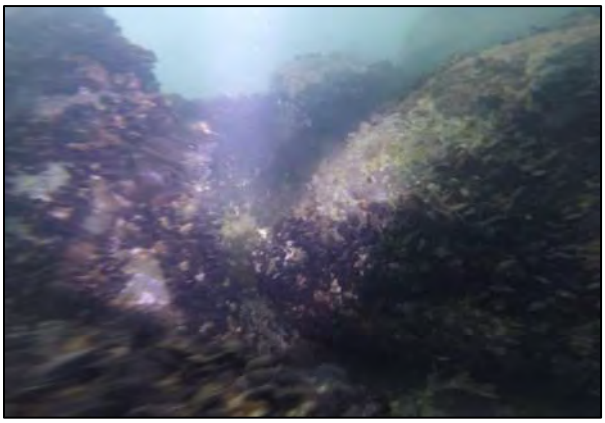


A) Sea lettuce



B) Rockweed

C) Dungeness crab



D) Mussels

5.6 MARINE MAMMALS

A number of marine mammal species have been observed in English Bay, and therefore have the potential to occur in the Study Area, including Stellar sea lions (*Eumetopias jubatus*), California sea lions (*Zalophus californianus*), harbour porpoises (*Phocoena phocoena*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), killer whales (*Orcinus orca*), grey whales (*Eschrichtius robustus*), and humpback whales (*Megaptera novaeanfliae*) (Wild Ocean Whale Society 2021). Cetaceans are unlikely to occur in the Study Area due to the shallow depths. Pacific harbour seals (*Phoca vitulina richardsi)* are common in English Bay and have the potential to occur in the Study Area. Harbour seals are not considered at risk by COSEWIC and have no status under SARA (Government of Canada 2021).

No marine mammals were observed in the Study Area during the field survey.

5.7 BIRDS

The Study Area is located within the Important Bird Area (IBA) of English Bay, Burrard Inlet & Howe Sound. This IBA was designated for three species at the global level: western grebe, Barrow's goldeneye and surf scoter; and one species at the national level: great blue heron (IBA Canada 2021).

Bird species observed during the field survey include bald eagles (*Haliaeetus leucocephalus*), black oystercatchers (*Haematopus bachmani*; Figure 10A), Barrow's goldeneye ducks (*Bucephala islandica;* Figure 10B), mallard ducks (*Anas platyrhynchos*), glaucous-winged gulls (*Larus glaucescens*), northwestern crows (*Corvus caurinus*), cormorants (*Phalacrocorax* sp.), and Canada geese (*Branta canadensis*).

Figure 10 Representative photos of seabirds in or near the Study Area observed during the intertidal survey.

A) Oystercatchers

B) Barrow's goldeneye

5.8 AQUATIC SPECIES AT RISK

Species at risk are identified by both provincial and federal governments following ranking systems. The provincial ranking system applies to species that have been assessed by the Conservation Data Centre (CDC). The federal ranking system applies to species that have been assessed by COSEWIC. The CDC and COSEWIC publish lists of species at risk. The DFO aquatic species at risk maps were reviewed to identify potential aquatic species at risk within the vicinity of the Study Area. Aquatic species at risk that could potentially be found within a 1 km radius of the Project area are summarized in Table 1.

Most of the species in Table 1 typically inhabit waters deeper than the Study Area. Based on depth, habitat characteristics present in the Study Area, and known ranges of various at-risk species, the only species with the potential to occur in the Study Area is the stellar sea lion (*E. jubatus*). However, stellar sea lions are infrequent visitors to Burrard Inlet (TWN 2017) and given the limited number of fish observed and the high volume of vessels it is unlikely that stellar sea lions would be present in the Study Area. Based on depth alone, the northern abalone (*H. kamtschatkana*) could potentially be found within the Study Area, however, they inhabit exposed or semi-exposed rocky shorelines (COSEWIC 2009) and are extremely rare due to overharvesting. Abalone require a stable substrate, such as bedrock or large boulders while loose sediment such as cobbles and silt are generally not suitable habitat.

Although the ranges for these species at risk overlap with the Project Area, there is no 'critical habitat' for any aquatic species at risk found within 1 km of the Study Area (DFO 2019a).

Table 1 Listed aquatic species with the potential to occur within 1 km of the Project Area.

Scientific Name	Common Name	BC List[1]	SARA Status[2]	COSEWIC Status[3]
Cetorhinus maximus	Basking Shark	-	Endangered	Endangered
Dermochelys coriacea	Leatherback Sea Turtle	Red	Endangered	Endangered
Eschrichtius robustus	Grey Whale	Blue	Special Concern	Special Concern / Endangered
Eumetopias jubatus	Steller Sea Lion	Blue	Special Concern	Special Concern
Galeorhinus galeus	Tope	-	Special Concern	Special Concern
Haliotis kamtschatkana	Northern Abalone	Red	Endangered	Endangered
Hexanchus griseus	Bluntnose Sixgill Shark	-	Special Concern	Special Concern
Megaptera novaeangliae	Humpback Whale	Blue	Special Concern	Special Concern
Orcinus orca	Killer Whale (Transient population)	Red	Threatened	Threatened
Orcinus orca	Killer Whale (Southern Resident population)	Red	Endangered	Endangered
Phocoena vomerina	Harbour Porpoise	Blue	Special Concern	Special Concern
Sebastes ruberrimus	Yelloweye Rockfish	-	Special Concern	Special Concern
Sebastes sp. type I	Rougheye Rockfish type I	-	Special Concern	Special Concern
Sebastes sp. type II	Rougheye Rockfish type II	-	Special Concern	Special Concern
Sebastolobus altivelis	Longspine Thornyhead	-	Special Concern	Special Concern

[1] BC List: Red = species that are extirpated, endangered, or threatened; Blue = species that are of special concern.

[2] Schedule 1 of SARA is the official list of species at risk in Canada. It includes species that are extirpated, endangered, threatened, and of special concern; however, the general prohibitions do not apply to species of special concern.

[3] COSEWIC is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction. It includes species that are extirpated, endangered, threatened, and of special concern.

6.0 POTENTIAL IMPACTS

This section provides a screening-level identification and review of potential adverse biophysical effects due to the activities. All the listed potential impacts are related to Barge salvage activities.

Potential salvage-related impacts include:

- Temporary and short-term impacts to water quality through disturbance of sediment;
- Impacts to water quality through accidental spills (e.g., fuel and oil for machinery) or increased debris (e.g., steel cuttings) during works;
- Temporary and short-term changes in habitat use by fish or marine mammals due to increased noise and light, relocation of boulders, and movement of the Barge; and
- Accidental mortality of fish or wildlife through direct contact.

7.0 AVOIDANCE AND MITIGATION MEASURES

This section outlines recommended avoidance and mitigation measures to be incorporated in the design and planning of the barge removal, including BMPs and other mitigations that will be implemented during Project works. A brief introductory summary of the activities, potential effects of those activities and the recommended mitigation measures is provided in Table 2. Full mitigation and monitoring requirements are outlined in the Environmental Management Plan (EMP).

Table 2 Summary of activities, potential effects, and proposed mitigations.

Activity	Potential Effect	Mitigation and Monitoring
Vibratory pile driving	Increased underwater noise for fish and marine mammals	▪ Conduct Environmental Monitoring; ▪ Conduct hydroacoustic monitoring; ▪ Conduct Marine Mammal Observation; ▪ Implement soft start procedures; ▪ Follow suggested timing / least risk window; and ▪ Use bubble curtain (if required based on sound levels).
	Increased turbidity in the water column affecting fish and invertebrates	▪ Conduct Environmental Monitoring; ▪ Conduct water quality monitoring; ▪ Follow suggested timing / least risk window; and ▪ Follow ESC BMP's.
Temporarily relocating boulders	Impacts to encrusting organisms on the boulders	▪ Temporarily relocate boulders to a similar water depth.
	Direct contact of boulders with fish and marine mammals	▪ Follow BMPs for boulder relocation including placing boulders on seabed (i.e. not dropping from any height).
	Increased turbidity in the water column affecting fish and invertebrates	▪ Conduct Environmental Monitoring; ▪ Follow suggested timing / least risk window; and ▪ Conduct water quality monitoring.
Barge deconstruction	Increased debris (e.g., steel cuttings, concrete pieces) in the marine environment	▪ Barge bin walls shall be maintained during concrete removal activities for containment; ▪ Suspended drop cloths and physical barriers shall be used to catch debris; ▪ Torch cutting should blow steel debris inwards, towards barge deck; and ▪ Following barge removal, magnets shall be used across the Project footprint to reclaim any residual steel cuttings.
Using land-based construction equipment	Damage to riparian habitat	▪ Follow spill management plan; ▪ Avoid disturbing riparian habitat; and ▪ Follow vegetation management plan if riparian habitat cannot be avoided.
Operating heavy machinery in and near water	Leaks and spills impacting aquatic or terrestrial life and habitat	▪ Follow spill management plan.
	Direct contact with aquatic life and aquatic habitat	▪ Conduct Marine Mammal Observation; ▪ Implement soft start procedures; and ▪ Follow BMPs for spud placement and movement.

8.0 POTENTIAL FOR DEATH OF FISH AND HADD

The *Fisheries Act* requires that Project works, undertakings or activities avoid causing;

- The death of fish by means other than fishing; and
- Harmful Alteration, Disruption and Destruction (HADD) unless authorized by the Minister of DFO.

HADD is interpreted as "any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes of fish" (DFO 2019b).

Fish habitat is defined in subsection 2(1) of the Fisheries Act to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include but are not limited to spawning grounds and nursery, rearing, food supply and migration areas. DFO interprets HADD as any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes of fish (DFO 2019b).

The barge, in its current position, is occupying marine habitat on the seabed and in the water column, so the priority is to remove it and, if necessary, restore the habitat beneath it. If the measures proposed in the EMP are implemented and followed, Hatfield is of the opinion that the Project is unlikely to directly or indirectly result in HADD or death of fish.

9.0 SUMMARY AND CONCLUSIONS

Vanpile intends to remove the Barge that became grounded on Sunset Beach in English Bay, BC. The removal of the Barge involves disassembling the Barge *in situ* and transporting the components to an appropriate facility for steel recycling. Hatfield has conducted a subtidal video survey and intertidal habitat assessment of the area with the potential to be impacted by the salvage activities. There are certain activities such as, but not limited to, pile driving, relocation of boulders, and cutting of the barge, that have the potential to affect fish and fish habitat. Hatfield has developed mitigations and monitoring recommendations in the Project EMP related to the proposed construction activities. If the mitigation and monitoring requirements outlined in the EMP are implemented and followed, Hatfield is of the opinion that the Project is unlikely to directly or indirectly result in HADD or death of fish. The habitat beneath the barge will be assessed after the Barge has been removed and recommendations about potential restoration of habitat will then be provided.

10.0 REFERENCES

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Memorandum

Date:	April 12, 2022	**Reference No.:**	VAN-22002561-A0
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Prepared By/Email:	Jason Lee, M.Eng, E.I.T.	jason.lee@exp.com	
Project Name:	English Bay Barge-Seawall Loading Analysis SMT5000 at Sunset Beach in English Bay, Vancouver, BC		
Subject:	Seawall Stability Analysis for Salvage Plan – Revision 3		
Distribution/Email:	Jesse Percy, ASct, PMP Carlson Construction Group Inc.	jesse.percy@carlsoncg.com	

As requested, EXP Services Inc. ("EXP") has updated the seawall stability analysis based on the proposed salvage plan provided by Vancouver Pile Driving Ltd. ("VPD") for the SMT5000 barge at Sunset Beach in English Bay. EXP issued a seawall stability analysis memorandum on February 3, 2022, Revision 1 on March 29, 2022, and Revision 2 on March 31, 2022, which are superceded by this memorandum. As provided by VPA via email on March 18, 2022, the revised analysis in the Revision 1 memorandum considered new information on equipment to be delivered and set up of a barrier along the top of the seawall and the weight of the barrier. As further information was received from VPA regarding the concrete barrier and crane pad via email on March 30, 2022, the seawall stability analysis and recommendations were revised as presented in the Revision 2 memorandum. As the City reviewed and requested via email on April 4, 2022, this memorandum includes estimated vertical pressures on the Metro Vancouver regional sewer forcemain by equipment and estimated lateral pressures on the seawall.

The analysis was conducted using the details shown in the record drawing provided by VPD (January 22, 2022), as attached in Appendix B. Note that assessment of the forcemain pipe structural integrity is beyond the scope of this memo.

1. BACKGROUND INFORMATION

It is understood that VPD is assisting in the development of a salvage plan for the SMT5000 at Sunset Beach in English Bay and has been in discussions with the Vancouver Parks Board to utilize the seawall for landside equipment operation and storage. The location of the site (49.281625°,-123.141455°) is shown in the attached Site Location sketch in Appendix A.

The City provided VPD with the record drawings and asked that specific load cases be confirmed. From the record drawings, it is understood that the seawall was reconstructed in 2010 for a design load of a "Park Board Maintenance Truck" with front and rear axle loads at 16kN and 28kN, respectively (~4,500 kg GVW).

As part of the salvage plan, VPD requested EXP to assess the load cases for the following equipment:

- 48' tandem axle trailer and tractor;
- Air Compressor (Assume tandem axle trailer, working weight 4,800 kg w/ fuel);
- Boom Lift (Genie S-85 or S-125);
- Forklift (JLG 1043 or similar, 10,000lb capacity);
- Truck-mounted crane (Hiab): and,
- Concrete barrier on the top of the Seawall

The primary loading zone would be bounded by the blue line as denoted on the attached Site Location sketch in Appendix A provided by VPD. It is expected that all equipment would need access to and from the designated load zone.

EXP's scope of seawall stability analysis included the following:

- Site visit to review existing site conditions;
- Review of record drawings and ground condition;
- Calculation of load cases; and,
- Conduct external stability analysis for three sections: overturning, sliding, and bearing capacity (considering eccentricity).

2. SEAWALL DETAILS AND GROUND CONDITION

The existing seawall and backfill detail in the record drawings were reviewed, combined with a site reconnaissance on January 31, 2022. Based on the review of surficial geology maps, the seawall is likely underlain by dense glacial deposit; however, as this portion of the seawall is located beyond the original shoreline, some fill and recent sand deposit are expected above the glacial till.

Note that the record drawings show that a 1067mm diameter Metro Vancouver regional sewer forcemain passes through the proposed zone for equipment operation and storage below the seawall path. The sewer forcemain along Section-1 is embedded in the seawall and encased in concrete. At the locations of the seawall path along Section-2 and Section-3, the forcemain is not concrete encased and buried at a minimum of 1m depth, with the centreline set back approximately 2.7m to 9.3m from the back of the seawall. As noted earlier, the structural assessment of this forcemain is beyond the scope of this memorandum.

The zone for equipment operation and storage would be located within the paved Stanley Park Seawall Path, stretching southeast to northwest from STA.1-015 to 1+090. Details of the pavement for Section 1 were not provided but are expected to be relatively thin as it was designed for light maintenance vehicles only. For zones represented by Section-2 and Section-3, the pavement section appears to consist of 75mm asphalt, 100mm base and 300mm subbase, which is designed for light vehicle load with a maximum axle load of 28kN.

Record drawings indicate that a replacement wall consisting of a cast-in-place seawall was constructed along the path from STA.1+000 to 1+090 in 2010.

Based on the anticipated ground condition and wall geometry, the wall was subdivided into three (3) sections for analysis purposes, as shown in Appendix B, Drawing No.09189-00-MA-DAL-1006.

The seawall details and ground condition for each section are described as follows:

- **Section-1 (STA.1-015 to 1+000, L=15m)**

  The seawall along Section-1 is an approximately 2.4m high concrete cantilever retaining wall. This wall was original and not part of the Section-2 and Section-3 reconstruction in 2010. A 1067mm diameter Metro Vancouver regional sewer forcemain is embedded within the concrete seawall. The wall retains an approximate 2.2m height of fill while the front portion was embedded below about 1.5m to 1.8m of sand, resulting in an exposed height of about 0.6m to 0.9m. The typical seawall section for Section-1 is shown in Appendix B, Drawing No.09189-00-MA-DAL-1005.

- **Section-2 (STA.1+000 to 1+050, L=50m)**

  The seawall for Section-2 is an approximately 2.2m high L-shaped cantilever wall with a 2.5m wide footing, as shown in Appendix B, Drawing Nos.09189-00-MA-DAL-1006, 1008, and 1015. According to the record drawing section details, a 0.4m thickness of 10MPa slurry concrete was placed beneath the seawall footing in order to raise the grade for the cast-in-place seawall segments and was observed at the toe of the footing during EXP's site reconnaissance. Also, a minimum 1m thickness of riprap was planned to be placed on the seawall footing; however, it was found to be absent during the site visit (see photos in Appendix C).

- **Section-3 (STA.1-050 to 1+090, L=40m)**

  The seawall for Section-3 is a cast-in-place L-shaped cantilever wall. The wall heights varied from about 2.5m to 3.2m from STA.1+050 to STA.1+060 and are about 3.2m from STA.1+060 to STA.1+090. The width of the wall footing is consistently 2.5m along the entire Section-3. The section details are presented in Appendix B, Drawing Nos.09189-00-MA-DAL-1006, 1008, and 1015. During the EXP's site visit, a minimum 0.8m thickness of riprap was observed on the footing, as shown in site photos in Appendix C.

The Stanley Park Seawall asphalt path of approximately 3m to 6.5m wide stretches southeast to northwest behind the seawall. The seawall path along Section-1 is about 3m wide, while the path along Section-2 and Section 3 was widened to 6.5m wide during the construction in 2010.

Soil parameters for the seawall stability analysis were estimated based on the record drawings, site review, and surficial geology. The soil parameters are summarized in the table below.

Table 1: Soil Parameters for Seawall Stability Analysis

Type	Unit Weight (kN/m^3)	Friction Angle (°)	Cohesion (kPa)
Sand/Gravel (Fill)	20	38	0
Sand - Subgrade Level	19	34	0
Riprap	22	40	0

3. EQUIPMENT LOADS

Under the scenario that VPD is assessing, EXP estimated the equipment loads for the seawall stability analysis based on a review of equipment specifications from manufacturing companies and working conditions.

Estimated loads for the proposed equipment for the salvage plan are summarized as follows:

- **48' Tandem Axle Trailer and Tractor**

  Typical 48' tandem axle trailers have a 1.2m distance between two tandem axles, while tandem axles are about 3m wide for spread tandem trailers (equivalent to a single axle). Based on the axle distances, line load was considered for typical tandem axle trailers, and point load was considered for a single axle load for spread tandem trailers. "BC Commercial Transport Regulations" specified a maximum of 17,000kg for a tandem axle load of trailers and a maximum of 9,100kg for a single axle load. As a result, the estimated maximum equipment loads for a 48' tandem axle and single axle trailer are shown below:

  - Point Load (Single axle load): 9.1 × 9.81 / 2 = 44.6kN
  - Line Load (Tandem axle load): 17 × 9.81 / 4 / 1.2 = 34.8kN/m

- **Air Compressor (on Tandem Axle Trailer, Working Weight 4,800 kg w/fuel)**

  Load for an air compressor on a tandem axle trailer was calculated as a line load, considering a minimum axle distance of 1m in the following:

  - Line Load (Tandem axle load): 4.8 × 9.81 / 4 / 1.0 = 23.5kN/m

- **Boom Lift (S-125)**

  The proposed boom lift, S-125, has a self-weight of 20,248kg and a lift capacity of 227kg. Manufacture companies do not provide axle loads for boom lifts as axle loads vary depending on the working conditions and body angles. The standard tire for the boom lift is 445/65 D22.5, with a maximum load of 9,030kg. A load for the boom lift was calculated as a point load, assuming that 85% of the maximum tire load will be generated in the critical case. Note that the tires are foam-filled rather than air-filled.

  - Point Load (Tire Load): 9.03 × 9.81 × 85% = 75.3kN

- **Forklift (JLG 1043, 10,000lb capacity)**

  The proposed forklift, JLG 1043, has an operating weight of 11,900kg. The load ratio of the front axle for typical forklifts ranges from 80% to 90% in the critical case. A load for the proposed forklift was calculated as a point load, assuming that 85% of the operating weight will concentrate on the front axle in the critical case.

  - Point Load (Single axle Load): 11.9 × 9.81 × 85% / 2 = 49.6kN

- **Truck-mounted Crane (Hiab)**

  The proposed truck-mounted crane, Hiab, will be used to deliver and set up a concrete barrier along the top of the seawall. It has a single axle for steering and tridem axles for driving. A maximum of 24,000kg for the tridem axle load and a maximum of 9,100kg for the single axle load were provided by VPD. Based on the axle distance of 1.2m, line load was considered for the tandem axles, and point load was considered for a single axle. However, a significant load will be transferred to outriggers during unloading and setting up the concrete barrier. According to the suggestion from VPD, the maximum load on the outrigger for analysis is 53,954lbs (24,473kg) in mid-span. EXP considered a 2.4m-long by at least 1m wide or 3m-long by at least 1m wide pad would be used at the outrigger to distribute the load. As a result, the estimated maximum equipment loads for a truck-mount crane are shown below:

  - Point Load (Single axle load): 9.1 × 9.81 / 2 = 44.6kN
  - Line Load (Tridem axle load): 24 × 9.81 / 6 / 1.2 = 32.7kN/m
  - Line Load (Outrigger, 2.4m-long pad): 24.473 x 9.81 / 2.4 = 100kN/m
  - Line Load (Outrigger, 3m-long pad): 24.473 x 9.81 / 3 = 80kN/m

Based on the results of the load estimation presented above, the governing load cases are the point load of 75kN from the boom lift and the line load of 34.8kN/m from the tandem trailer and are used in the seawall stability analysis. However, in the event of setting up the barrier along the top of the seawall, the governing load case is the line load of 100kN/m or 80kN/m from the outrigger of the truck-mounted crane.

EXP was informed by VPD that a 0.69m(H) x 0.56m(W) of concrete barrier will be set up at a distance of 0.5m for Section-1 and 2.0m for Section-2 and Section-3 from the back of the seawall. An approximate 450kg/m of the weight for the barrier was considered in the seawall stability analysis.

It should be considered in the seawall stability analysis that the seawall will be imposed by lateral earth pressure from the backfill soil and lateral pressure by equipment loads and the barrier weight. The maximum temporary lateral pressures on the seawall for each section are presented in Appendix D, Temporary Lateral Pressure Diagram.

4. CONCLUSION AND RECOMMENDATIONS

The seawall stability analysis was conducted in terms of sliding, overturning, and bearing capacity, considering the equipment operating and storage plan with the estimated equipment loads and the

barrier weight. The analyzed section geometry for the three (3) sections was obtained from the record drawings provided by VPD and EXP's observations made during the site visit.

As a conclusion for maintaining acceptable seawall stability, considering equipment loads and the barrier weight, the tires should be setback from the back of the seawall at a minimum distance of 2.0m for the zone represented by Section-2 and a minimum distance of 1.0m for zones represented by Sections-1 and Section-3. Details are presented below with a reference "EGBC Guideline - Retaining Wall Design (Ver 1.0, November 19, 2019)" for generally accepted minimum factors of safety:

- For stability against overturning, all three sections meet the typically acceptable minimum factor of safety of 2.0 for static conditions when the tires are located at a minimum distance of 1m from the back face of the seawall. For stability against sliding, Section-1 and Section-3 meet the generally accepted factors of safety of 1.5 for static conditions and 1.3 for transient conditions. However, for Section-2, the tires need to be set back from the back of the seawall at a minimum distance of 2.0m to meet acceptable factors of safety, considering the equipment loads and the concrete barrier weight.
- The contact pressures at the base of the seawall footing were estimated to be 55 kPa, after considering vertical equipment loads and eccentricity. As the soil below the seawall footings is inferred to consist of loose to compact sand, it meets the generally accepted minimum factor of safety 2.0 for bearing capacity.
- Based on the results of stability analysis, the equipment should be set back a minimum of 1.0m from the seawall for Section-1 and Section-3. For Section-2, EXP recommends that the proposed equipment be set back a minimum of 2.0m from the seawall.

It is pointed out that during the stage of setting up concrete barriers along the top of the seawall, a significant load on the outrigger of the truck-mounted crane is expected. EXP recommends using a 2.4m-long or 3m-long pad with a sufficient load capacity and a minimum 1m width to distribute the load on the outrigger to the longitudinal direction of the seawall. As the stability analysis results indicate, despite the use of the pad, the outrigger of the crane should be set back to sufficient distances to meet the generally accepted factor of safety of 1.3 for transient conditions. When a 2.4m-long crane pad is used, the outrigger should be set back at minimum distances of 1.0m, 4.5m, and 3.0m from the back of the seawall for Section-1, Section-2, and Section-3, respectively. In the case of using a 3m-long pad, the outrigger should be set back at minimum distances of 1.0m, 4.0m, and 2.5m from the back of the seawall for Section-1, Section-2, and Section-3, respectively.

The Metro Vancouver regional sewer forcemain passes through the proposed zone for equipment operation and storage along the seawall path. Along Section-2 and Section-3, The sewer forcemain is buried at a minimum of 1m depth. Maximum vertical pressure on the sewer forcemain by equipment was estimated as 43kPa. The sewer forcemain at Section-1 is embedded in the seawall and encased in concrete. The top of the concrete cover is approximately 0.4m below the road grade, and the maximum vertical pressure on the concrete cover by equipment was estimated as 142kPa. The stability of the sewer forcemain should be reviewed and confirmed by a structural engineer or utility designer.

As the existing seawall path was not designed for heavy wheel loads, the use of solid steel plates is recommended to reduce asphalt damage when the axle load is higher than that specified in the record drawings.

5. CLOSURE

Attached is our "Interpretation & Use of Study and Report." These instructions form an integral part of this memorandum and must be included with any copies of this memorandum.

Should you have any questions regarding any aspect of the above-noted, please do not hesitate to contact the undersigned.

Submitted by:

EXP Services Inc.

Jason Lee, M.Eng., E.I.T.
Junior Geotechnical Engineer

Reviewed by:

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2022-04-12

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Senior Geotechnical Engineering

Attachments: Interpretation & Use of Study and Report
Appendix A: Site Location Sketch
Appendix B: Record Drawings of Seawall
Appendix C: Site Photos
Appendix D: Temporary Lateral Pressure Diagram

PERMIT TO PRACTICE
EXP SERVICES INC.
RR SIGNATURE: _____
RR EGBC ID: 16440 DATE: 2022-04-12
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INTERPRETATION & USE OF STUDY AND REPORT

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering consulting practices in this area. No other warranty, expressed or implied, is made. Engineering studies and reports do not include environmental consulting unless specifically stated in the engineering report.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF THE REPORT

The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorise only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorised use of the Report.

5. INTERPRETATION OF THE REPORT

a. Nature and Exactness of Descriptions: Classification and identification of soils, rocks, geological units, contaminant materials, building envelopment assessments, and engineering estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations, or building envelope descriptions, utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarising such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b. Reliance on Provided information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to us. We have relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, we cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

c. To avoid misunderstandings, EXP Services Inc. (EXP) should be retained to work with the other design professionals to explain relevant engineering findings and to review their plans, drawings, and specifications relative to engineering issues pertaining to consulting services provided by EXP. Further, EXP should be retained to provide field reviews during the construction, consistent with building codes guidelines and generally accepted practices. Where applicable, the field services recommended for the project are the minimum necessary to ascertain that the Contractor's work is being carried out in general conformity with EXP's recommendations. Any reduction from the level of services normally recommended will result in EXP providing qualified opinions regarding adequacy of the work.

6. ALTERNATE REPORT FORMAT

When EXP submits both electronic file and hard copies of reports, drawings and other documents and deliverables (EXP's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EXP shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EXP shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EXP's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EXP. The Client warrants that EXP's instruments of professional service will be used only and exactly as submitted by EXP.

The Client recognizes and agrees that electronic files submitted by EXP have been prepared and submitted using specific software and hardware systems. EXP makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

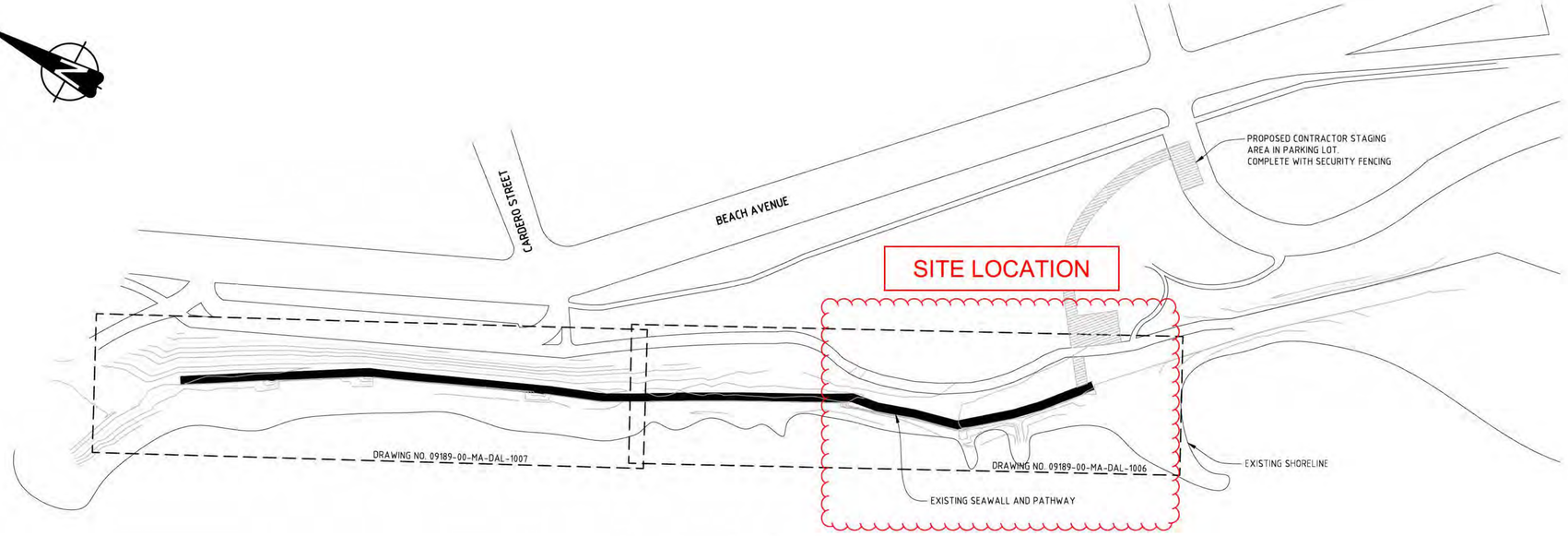
Appendix A –
Site Location Sketch

SITE LOCATION SKETCH

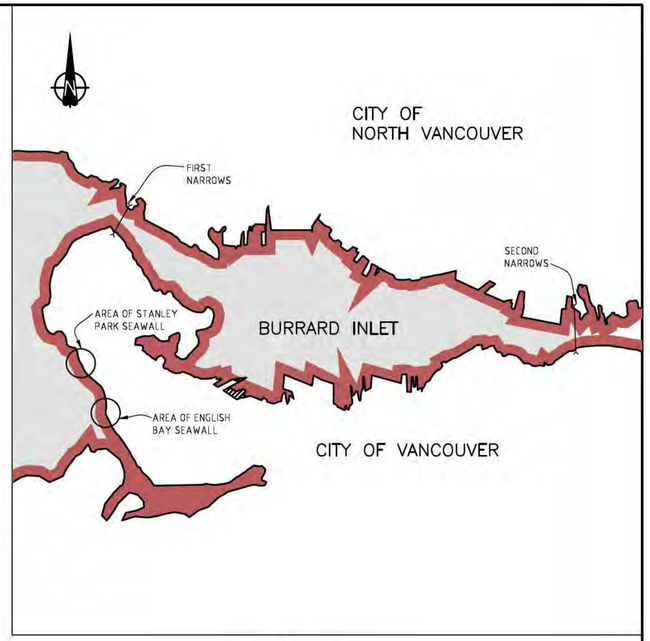
(EQUIQMENT OPERATION AND STORAGE ZONE)

Provided by Carlson Construction Group Inc. (January 22, 2022)

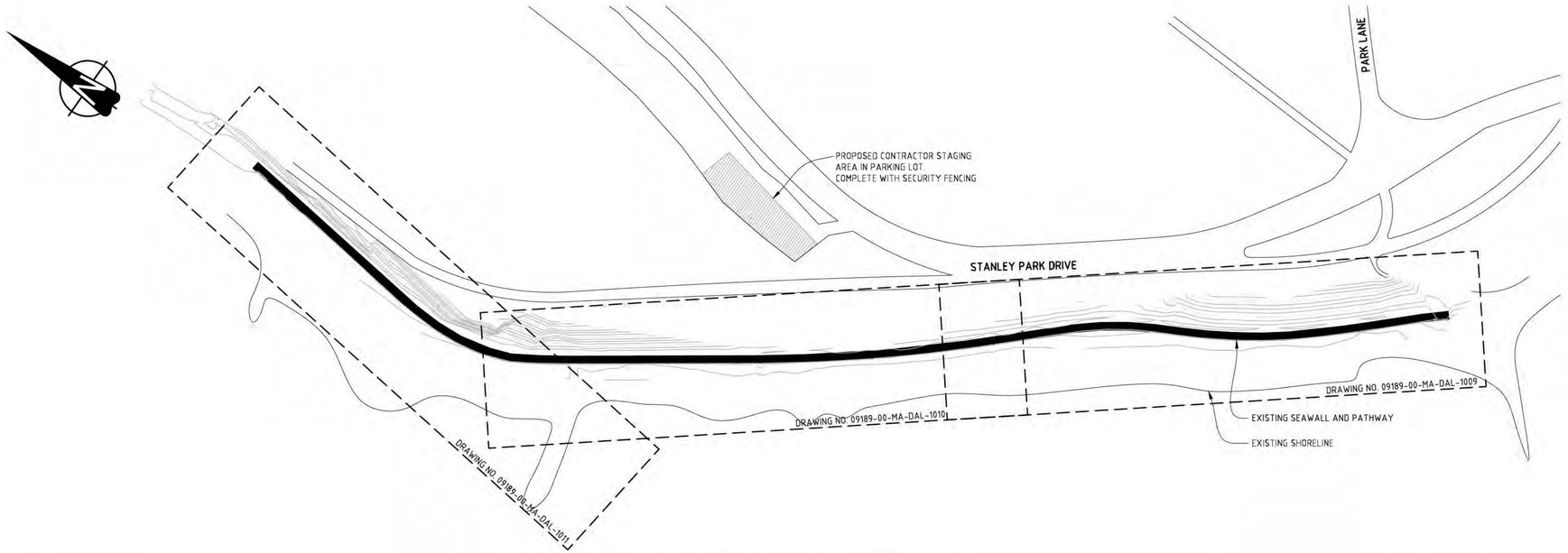
Appendix B –
Record Drawings of Seawall



PLAN - ENGLISH BAY SEAWALL
1:750



KEY PLAN
NTS



PLAN - STANLEY PARK SEAWALL
1:750

m 0 10 20 30 40 m
1:750

NOTES:

FOR GENERAL NOTES, SEE DWG. 09189-00-MA-DAL-1001.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF. DRAWING No	REFERENCE DRAWING TITLE
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B	07-JUNE-10	ISSUED FOR TENDER	CH	-	FEW	DEL	DEL	-		
A	31-MAY-10	ISSUED FOR CLIENT REVIEW	CH	-	FEW	DEL	DEL	-		

O SHEET | SCALE | SHOWN

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WORLEYPARSONS PROJECT No
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STANLEY PARK AND ENGLISH BAY SEAWALL RECONSTRUCTION KEY PLAN AND EXISTING SITE PLAN

DRG No 09189-00-MA-DAL-1002 | REV 1

LOCATION: P:\2009\09189 - STANLEY PARK SEAWALL\MARINE\09189-00-MA-DAL-1002.DWG
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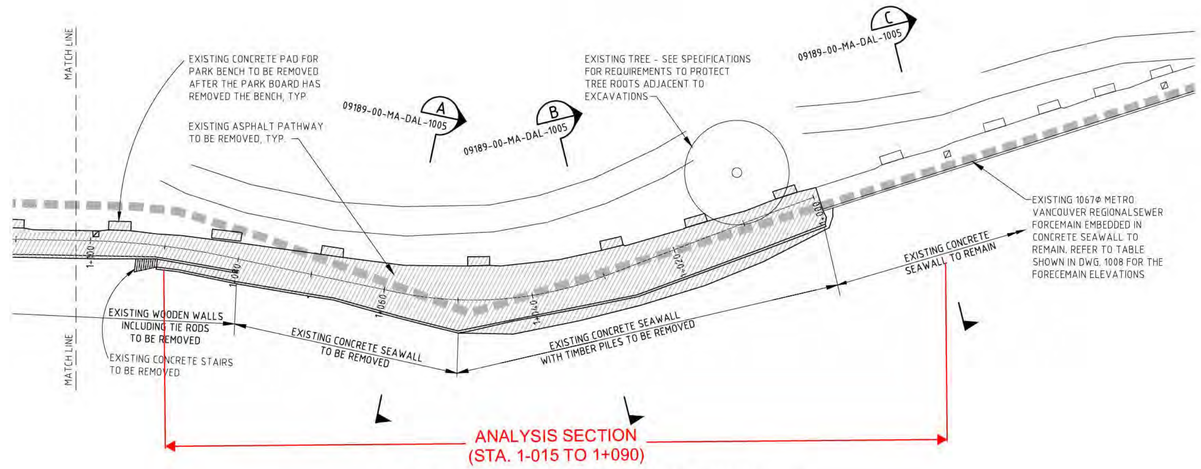
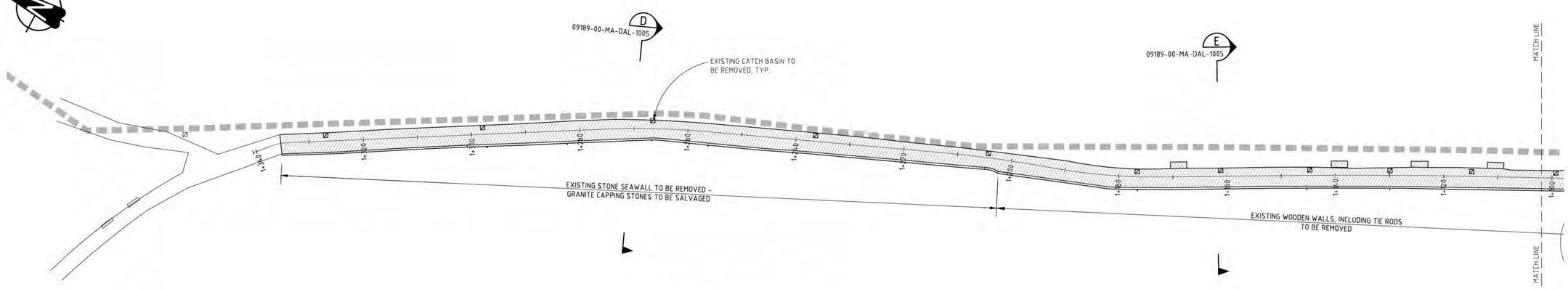


PART PLAN - ENGLISH BAY SEAWALL STA. 1+000 TO 1+100

1:400



PART PLAN - ENGLISH BAY SEAWALL STA. 1+100 TO 1+340

1:400

m 0 5 10 15 20 m

1:400

NOTES:

1. FOR GENERAL NOTES, SEE DWG. 09189-00-MA-DAL-1001.

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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B	07-JUNE-10	ISSUED FOR TENDER	CH	-	FEW	DEL	DEL	-	SF-1054-2	WEST END INTERCEPTOR NO.2 BEACH SECTION PLAN AND PROFILE
A	31-MAY-10	ISSUED FOR CLIENT REVIEW	CH	-	FEW	DEL	DEL	-	SF-1054-1	WEST END INTERCEPTOR NO.2 BEACH SECTION PLAN AND PROFILE

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STANLEY PARK AND ENGLISH BAY SEAWALL RECONSTRUCTION
EXISTING ENGLISH BAY SEAWALL STRUCTURE AND DEMOLITION

DRG No 09189-00-MA-DAL-1003 | REV 1

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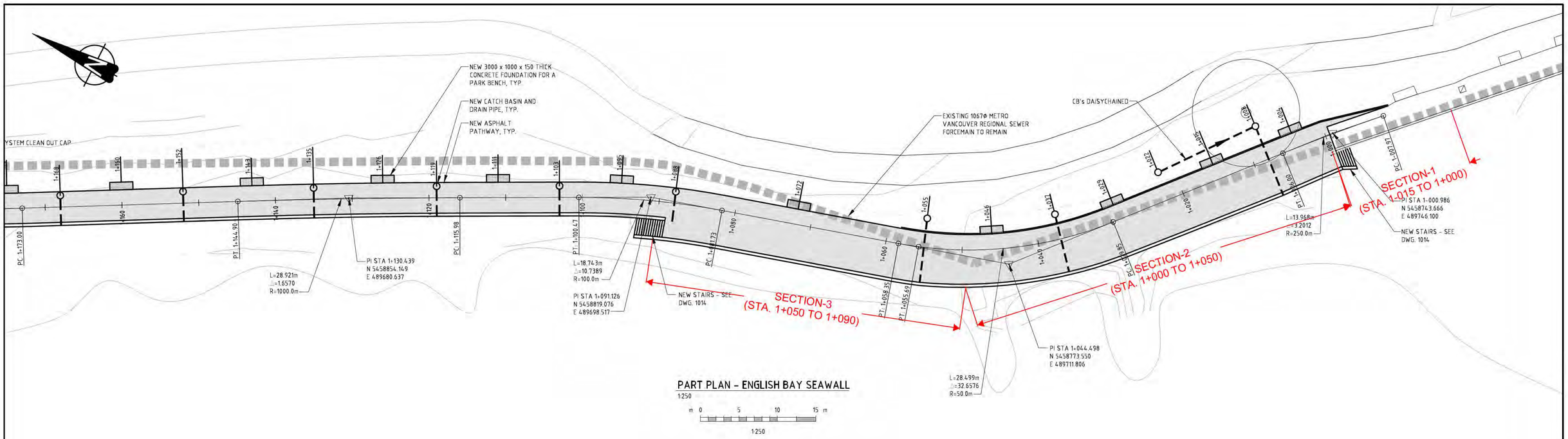
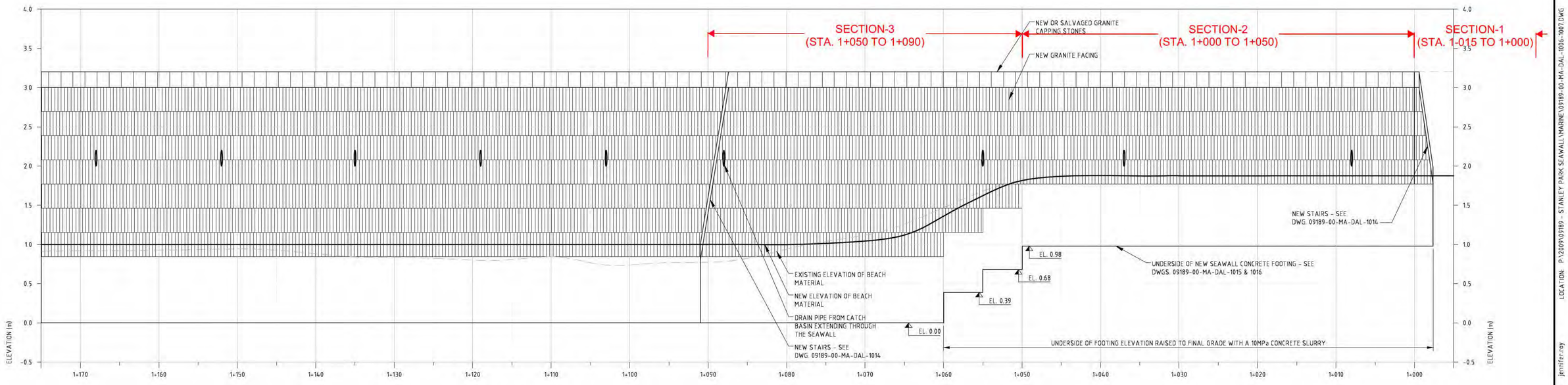


PART PLAN - ENGLISH BAY SEAWALL

1:250

m 0 5 10 15 m

1:250



ELEVATION - ENGLISH BAY SEAWALL

H 1:250 V 1:25

NOTES:

1. FOR GENERAL NOTES, SEE DWG. 09189-00-MA-DAL-1001

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF. DRAWING No	REFERENCE DRAWING TITLE
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B	7-JUNE-10	ISSUED FOR TENDER	CH	-	FEW	DEL	DEL	-		
A	31-MAY-10	ISSUED FOR CLIENT REVIEW	CH	-	FEW	DEL	DEL	-		

D SHEET | SCALE SHOWN

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STANLEY PARK AND ENGLISH BAY SEAWALL RECONSTRUCTION
ENGLISH BAY SEAWALL
PART PLAN & ELEVATION - SHEET 1

DRG No 09189-00-MA-DAL-1006 | REV 1

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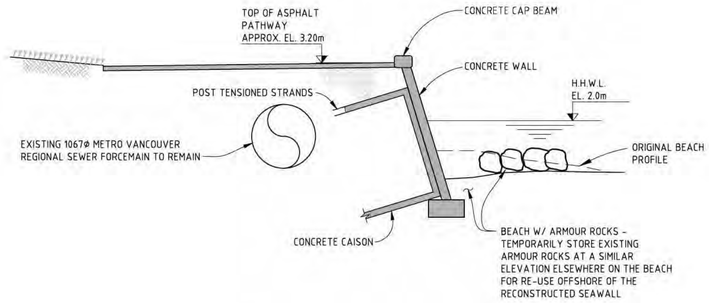
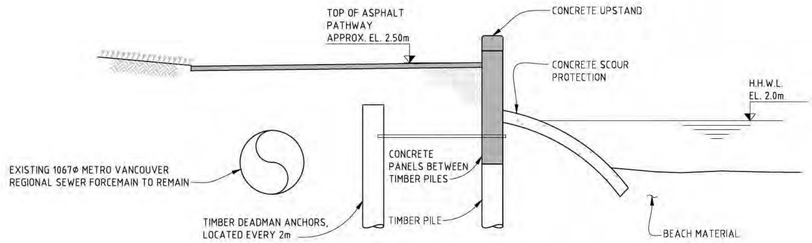
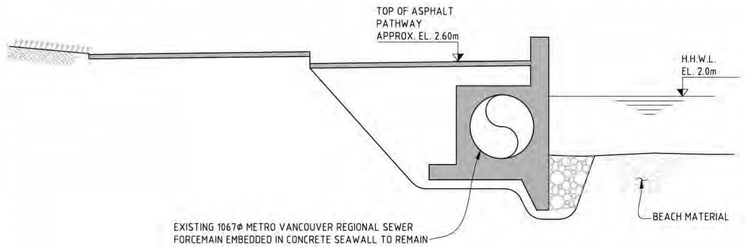


SECTION A EXISTING CONCRETE SEAWALL ARRANGEMENT
1:50 09189-00-MA-DAL-0003



SECTION B EXISTING CONCRETE SEAWALL ARRANGEMENT
1:50 09189-00-MA-DAL-0003

SECTION-1 (STA. 1-015 TO 1+000)



SECTION C EXISTING CONCRETE SEAWALL ARRANGEMENT
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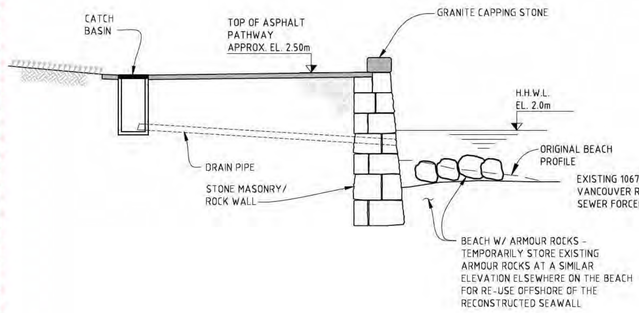
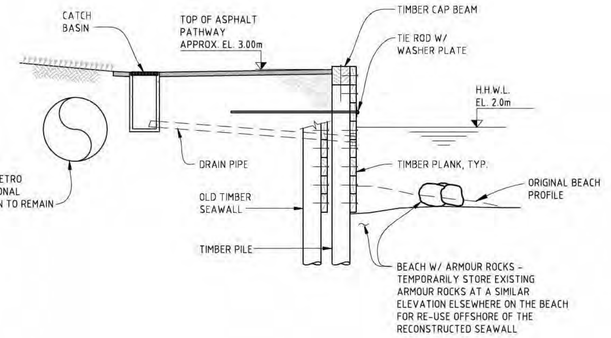


SECTION D EXISTING STONE MASONRY SEAWALL ARRANGEMENT
1:50 09189-00-MA-DAL-0003, 0004



SECTION E EXISTING TIMBER SEAWALL ARRANGEMENT
1:50 09189-00-MA-DAL-0003

NOTES:

1. FOR GENERAL NOTES, SEE DWG. 09189-00-MA-DAL-1001.
2. FOR EXISTING SOIL PROFILES, SEE GOLDER ASSOCIATES LTD. REPORT DATED MAY 6 2010

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B	07-JUNE-10	ISSUED FOR TENDER	CH	-	FEW	DEL	DEL	-	SF-1054-2	WEST END INTERCEPTOR NO.2 BEACH SECTION PLAN AND PROFILE
A	31-MAY-10	ISSUED FOR CLIENT REVIEW	CH	-	FEW	DEL	DEL	-	SF-1054-1	WEST END INTERCEPTOR NO.2 BEACH SECTION PLAN AND PROFILE

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WORLEYPARSONS PROJECT No
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STANLEY PARK AND ENGLISH BAY SEAWALL RECONSTRUCTION
EXISTING SEAWALL STRUCTURE SECTIONS

DRG No 09189-00-MA-DAL-1005 | REV 1

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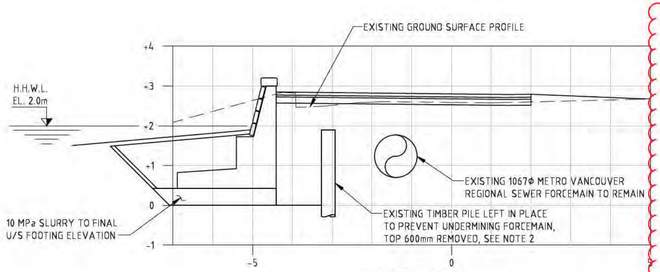
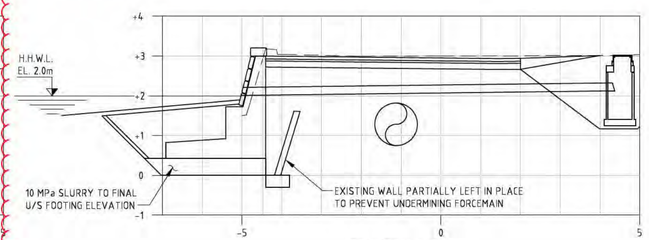
SECTION-2 (STA. 1+000 TO 1+050)

SECTION-3 (STA. 1+050 TO 1+090)



STATION 1+000
1:75



STATION 1+050
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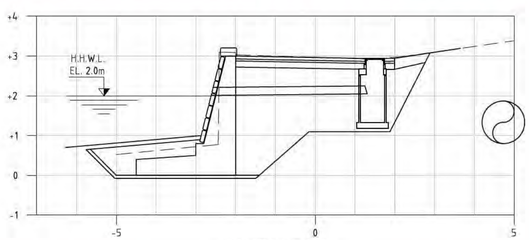

STATION 1+100
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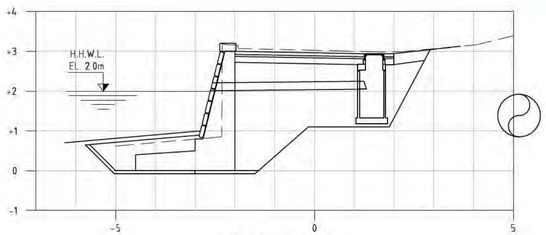

STATION 1+150
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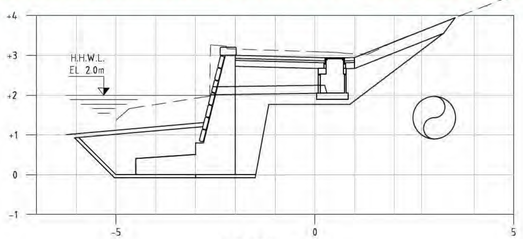

STATION 1+200
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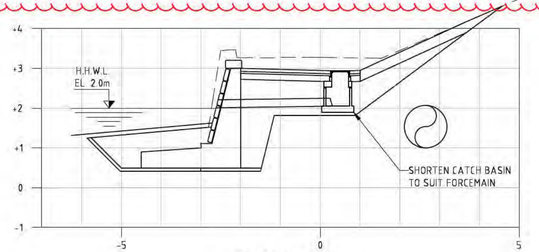

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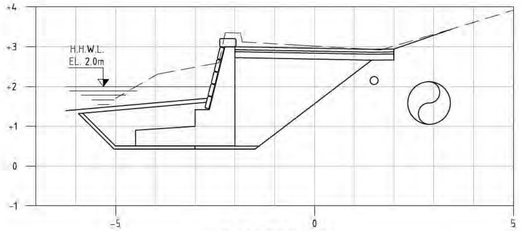

STATION 1+300
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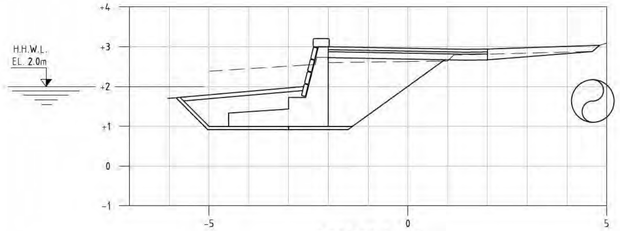

STATION 1+341
1:75

EXISTING 1067Ø METRO VANCOUVER REGIONAL SEWER FORECEMAIN ELEVATIONS

POINT	STATION	NORTHING	EASTING	ELEVATION
STA #1	1+000	5458743.699	489743.906	1.755
STA #2	1+050	5458778.938	489709.801	1.800
STA #3	1+107	5458836.366	489694.224	1.864
STA #4	1+207	5458921.411	489650.608	1.921
STA #5	1+289	5458999.722	489614.795	2.038
STA #6	1+308	5459015.278	489605.846	2.080
STA #7	1+335	5459039.638	489591.755	2.144
TH #137	N/A	5458815.763	489714.856	4.930
TH #138	N/A	5458926.899	489656.230	6.715
TH #139	N/A	5459008.677	489623.191	6.575
V1037	N/A	5458779.194	489854.499	10.598
V1038	N/A	5458853.018	489780.121	10.356
V3859	N/A	5459088.474	489603.125	7.696
V6301	N/A	5458939.433	489670.572	8.921

NOTES:

1. FOR GENERAL NOTES, SEE DWG. 09189-00-MA-DAL-1001.
2. TREAT TOPS OF ALL EXISTING TIMBER PILES WITH TWO COATS OF HOT CREOSOTE OIL AND ONE COAT OF APPROVED MASTIC, AT LEAST 6mm THICK. IN ADDITION, TOPS OF ALL PILES SHALL BE COVERED WITH A SHEET OF 22 GAUGE ANNEALED CORROSION RESISTANT ALUMINUM CUT 150mm LARGER THAN THE DIAMETER OF THE PILE TOP. THE OVERHANGING EDGES SHALL BE CRIMPED AND TURNED DOWN AND SECURED TO THE PILES WITH 8 ALUMINUM ROOFING NAILS. THE SHEET SHALL NOT BE CUT TO FACILITATE INSTALLATION.

ELEVATIONS - ENGLISH BAY SEAWALL
H 1:250 V 1:25

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF. DRAWING No	REFERENCE DRAWING TITLE
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0	20-JULY-10	ISSUED FOR CONSTRUCTION	CH	RDR	DEL	CPT	-	-		
B	07-JUNE-10	ISSUED FOR TENDER	CH	-	FEW	DEL	DEL	-		
A	31-MAY-10	ISSUED FOR CLIENT REVIEW	CH	-	FEW	DEL	DEL	-		

D SHEET | SCALE 1:75

OneWay to zero harm

WORLEYPARSONS PROJECT No
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STANLEY PARK AND ENGLISH BAY
SEAWALL RECONSTRUCTION
ENGLISH BAY SEAWALL
CROSS SECTIONS

DRG No 09189-00-MA-DAL-1008 | REV 1

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USER NAME: jennifer.roy
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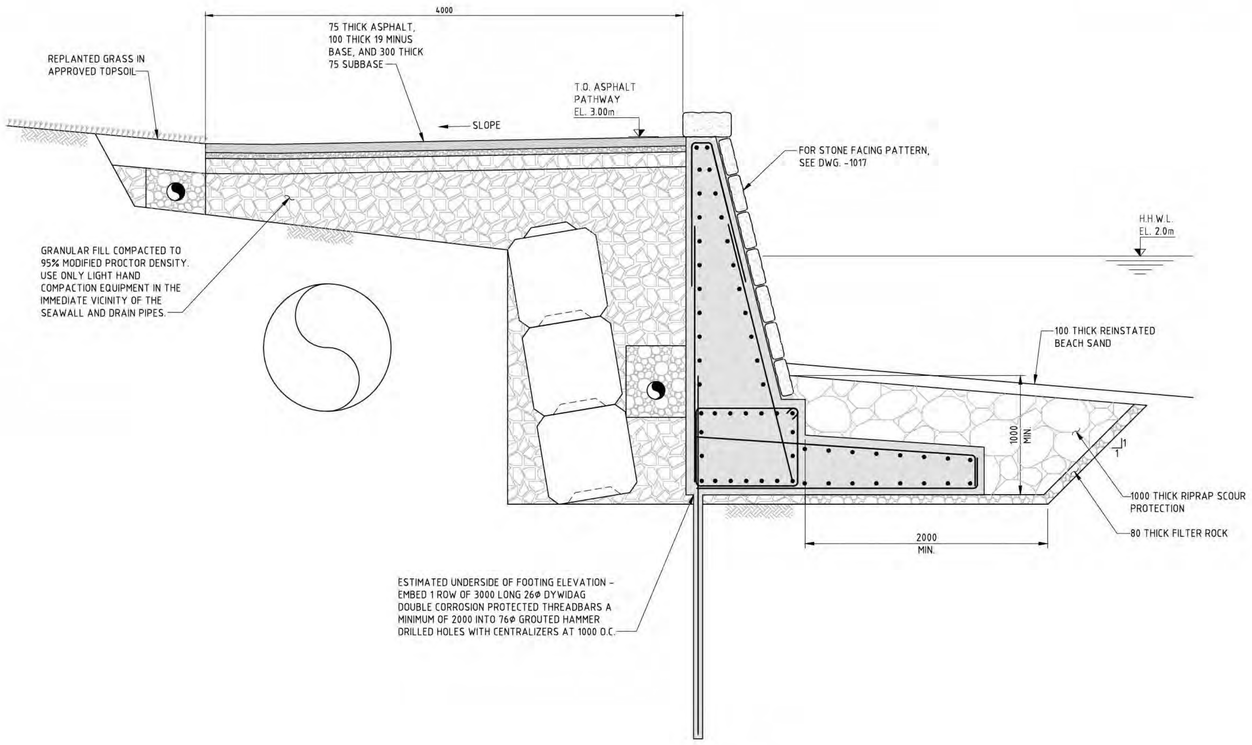
SAVE DATE & TIME: 27/7/2011 2:57:27 PM

SECTION-2 & 3 (STA. 1+000 TO 1+090)



TYPICAL SECTION - RECONSTRUCTED CAST-IN-PLACE CONCRETE SEAWALL AND FOOTING

1:50

NOTE: THIS DETAIL APPLICABLE TO STATIONS 1+000 THROUGH 1+199 AND 1+308 THROUGH 1+339

NOTES:

1. FOR GENERAL NOTES, SEE DWG 09189-00-MA-DAL-1001

REV	DATE (DD-MMM-YY)	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
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STANLEY PARK AND ENGLISH BAY
SEAWALL RECONSTRUCTION
SEAWALL DETAILS
SHEET 3

DRG No 09189-00-MA-DAL-1015 | REV 0

LOCATION: P:\2009\09189 - STANLEY PARK SEAWALL\MARINE\09189-00-MA-DAL-1015.DWG
USER NAME: Jennifer.roy
PLOT DATE & TIME: 28/7/2011 9:33:07 AM
SAVE DATE & TIME: 28/7/2011 9:32:48 AM

Appendix C – Site Photos

SITE PHOTOS

Seawall (Section-1)

Seawall Path (Section-1)

SITE PHOTOS

Seawall (Section-2)

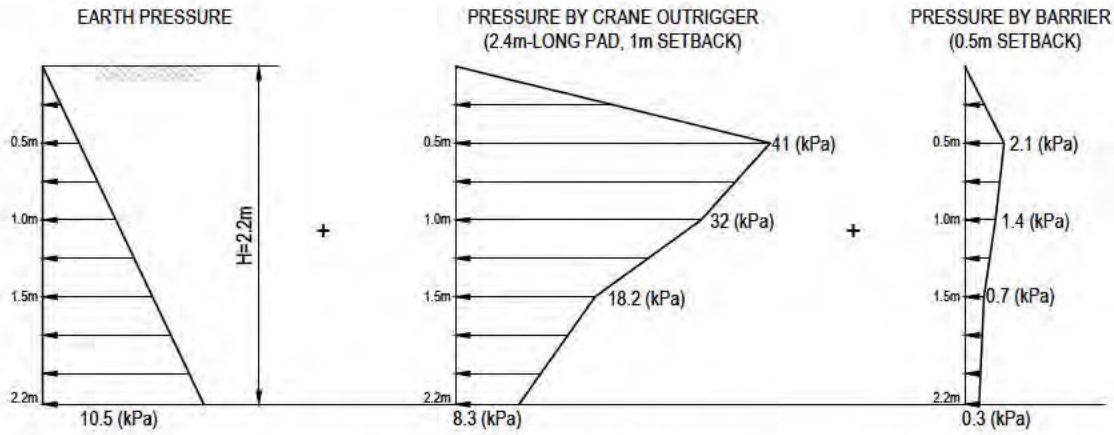
Seawall Path (Section-2)

SITE PHOTOS

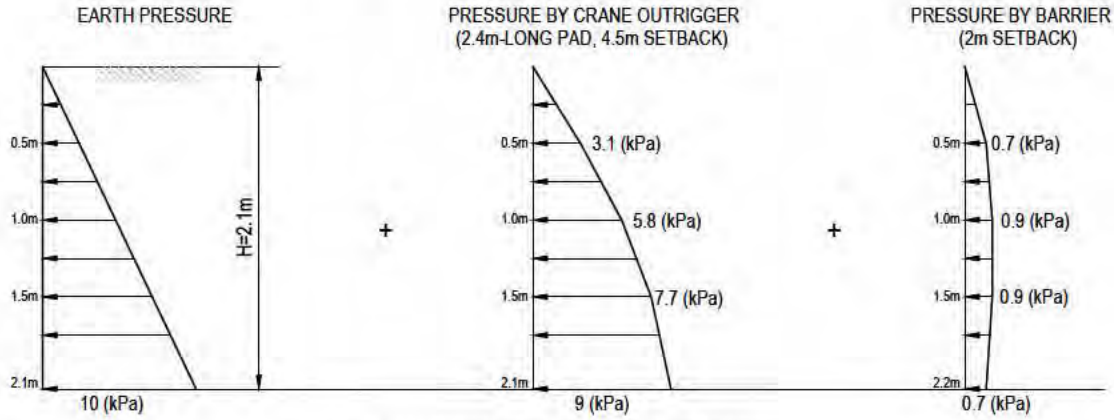
Seawall (Section-3)

Seawall Path (Section-3)

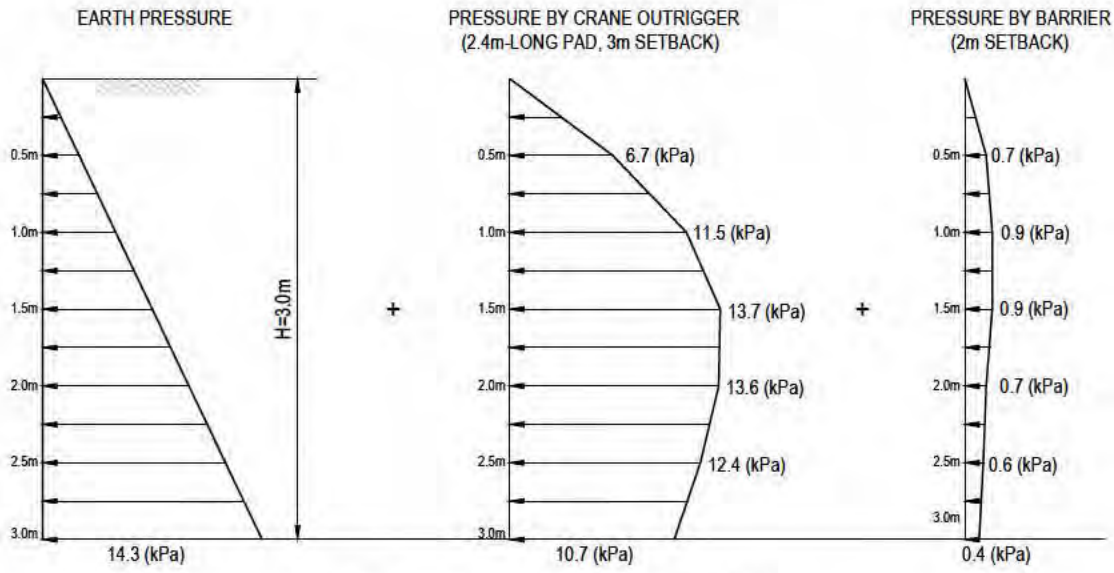
Appendix D –
Temporary Lateral Pressure Diagram



TEMPORARY PRESSURE ON SEAWALL (SECTION-1)



TEMPORARY PRESSURE ON SEAWALL (SECTION-2)



TEMPORARY PRESSURE ON SEAWALL (SECTION-3)

CLIENT: VANCOUVER PILE DRIVING LTD.				TITLE: ENGLISH BAY SEAWALL TEMPORARY LATERAL PRESSURE		
PROJECT: ENGLISH BAY BARGE - SEAWALL LOADING ANALYSIS SMT5000, VANCOUVER, BC						
PROJECT NO. VAN-22002561-A0	DFTR. JL	DSGN. JL	CHK. KSH	DATE 2022-04-05	SCALE: NTS	DWG NO.

Worley Canada Services Ltd.

Suite 200, 2930 Virtual Way
Vancouver, BC V5M 0A5
CANADA

Tel: 604-298-1616

advisian.com

9 March 2022

Our Ref: 317086-42307

City of Vancouver (Vancouver Board of Parks and Recreation)
2099 Beach Avenue
Vancouver, BC
V6G 1Z4 Canada

Attention: Andrew Seeton, Project Manager

Dear Mr. Seeton:

2022 VISUAL INSPECTION OF THE ENGLISH BAY BARGE SITE PLAN PRIOR TO BARGE DEMOLITION

1 Introduction

At the request of the Vancouver Board of Parks and Recreation (VPB), Worley Canada Services Ltd., operating as Advisian, completed a visual inspection of the shoreline surrounding the English Bay Barge including assessment of the English Bay seawall and adjacent pedestrian paths for undermining, damage, and/or deterioration on February 24, 2022.

2 Scope

The purpose of this inspection was to create a record of existing conditions along the English Bay seawall as consequence of the barge impact resulting from the November 2021 storm. It is Advisian's understanding that the barge owner has employed a marine contractor to partially demolish the barge to facilitate its removal.

The scope of work for the inspection includes a visual survey of the offshore and onshore paths, the adjacent landscape, the relevant portion of the English Bay seawall and shoreline, as well as the three groynes currently supporting the stranded barge. A subsequent inspection will determine if the barge salvage activities have resulted in any undue damages to VPB assets.

An aerial view denoting the inspected area is presented in Figure 2-1. The reference system adopted to describe the findings considers project north perpendicular to the English Bay seawall line and toward the onshore. General views of the barge are shown in Photos 1 to 3 in Attachment 1, along with photos of the various findings.

Figure 2-1 Location of Visual Inspection at English Bay Barge

3 Inspection Findings

The seawall and upland park area are generally in a serviceable condition with minor localized deterioration of the paving and landscaping due to weather erosion and increased vehicle traffic in the area. The beach did not display any signs of increased or varied erosion, though the positioning of the barge has resulted in damage and deformation to all three groynes shown in Figure 2-1.

Table 3-1 presents the inspection findings at English Bay along with their approximate locations prior to salvaging the barge. A digital camera GPS (OLYMPUS TG-6) recorded geographic coordinates provided along with the photographs with limited accuracy. These coordinates are intended to roughly locate the findings within the general area outlined in Table 3-1.

Table 3-1 Inspection Findings at the English Bay Barge Prior to Demolition

Northing	Easting	Area	Finding
49.281647	-123.141378	Inshore Path	Typical asphalt cracking along path (Photos 4 and 5).
49.281433	-123.141117	Between Paths	Tire tracks on landscaping between inshore and offshore paths (Photos 6 and 7).
49.281750	-123.141378	Embankment Between Paths	Embankment erosion approximately 10 m long (Photo 8).
49.281795	-123.141578	Embankment Between Paths	Embankment erosion between west seawall stairs and concrete pad to the east, approximately 10 m long (Photo 9).

Northing	Easting	Area	Finding
49.281289	-123.140880	Offshore Path	Edge of pavement failure at north edge of offshore path, approximately 0.5 m wide by 1 m long (Photo 10).
49.281289	-123.140706	Offshore Path	Cracking along north edge of offshore path pavement approximately 10 m long (Photo 11).
49.281744	-123.141505	Offshore Path	Scour along north edge of offshore path approximately 10 m long (Photo 12).
49.282089	-123.141661	West Seawall Stairs	Displaced capstone at bottom of west access stairs (Photo 13).
49.281511	-123.141458	Seawall	Toe of seawall beginning to undermine with approximately 25 mm deep gap (Photo 14).
49.281653	-123.141911	Shoreline	Rocks supporting barge have typically developed stress cracks (Photos 15 and 16).
49.281653	-123.141911	West Groyne	Assumed offshore end of groyne demolished by barge (Photos 17 and 18).
49.281567	-123.141656	West Groyne	Significant timber debris washed up on inshore end of groyne, typical finding across groynes and along shoreline (Photo 19).
49.281697	-123.141633	West Groyne	Inshore end stepped and stones displaced eastward due to barge impact (Photo 20).
49.281183	-123.141561	Centre Groyne	Assumed offshore end of groyne demolished by barge (Photo 21).
49.281467	-123.141486	Centre Groyne	Inshore end stepped and stones displaced eastward due to barge impact (Photo 22).
49.281147	-123.141269	East Groyne	Slight step in west corner of groyne due to barge impact (Photo 23). Starboard rudder of barge has dug into groyne causing a 1 m gap south of rudder (Photos 24 and 25).
49.281186	-123.141561	East Groyne	Offshore end of groyne appears to have had limited disturbance (Photo 26). Timber debris scattered atop and east of groyne (Photo 27).

Due to the presence of the barge, the full extent of the groynes could not be inspected, and it is unclear where the groynes terminate. Offshore findings in the above table are described based on their position relative to the groynes but finding locations may need to be revised after the barge is removed. Of note, the stress fractures on the stones supporting the barge may result in sufficient degradation such that the stones no longer meet the design sizing if the rocks are in fact the offshore extent of the groynes.

4 Conclusion

We trust that this document provides a sufficiently detailed description of the current site conditions of the English Bay shoreline as a result of the barge impact prior to the proposed removal of the vessel. These findings will be compared to a subsequent visual inspection of the same area upon the complete removal of the barge to determine the impact of the demolition work on the City's infrastructure.

Please do not hesitate to contact the undersigned if you have any questions regarding this assessment.

Prepared by:

Amr Farag, E.I.T.
Marine Structural Engineer
Ports & Marine

Reviewed by:

Andre Dratwa, P.Eng.
Marine Structural Engineer
Ports & Marine

Transport, Infrastructure & Logistics
Advisian | North America West & Gulf Coast

Enc

cc Osvaldo Mote, Advisian

Disclaimer

This Document represents the work of Advisian performed to recognized engineering principles and practices appropriate for the terms of reference provided by Advisian's contractual Customer, City of Vancouver (Vancouver Board of Parks and Recreation) (the "Customer"). This Document may not be relied upon for detailed implementation or any other purpose not specifically identified within this Document. This Document is confidential and prepared solely for the use of the Customer. Neither Advisian, its sub consultants nor their respective employees assume any liability for any reason, including, but not limited to, negligence, to any party other than the Customer for any information or representation herein. The extent of any warranty or guarantee of this Document or the information contained therein in favour of the Customer is limited to the warranty or guarantee, if any, contained in the contract between the Customer and Advisian.

Attachment 1 Photographs

Attachment 1 - Photographs

Photo 1 *General Arrangement - westward view of English Bay Barge site from inshore path.*

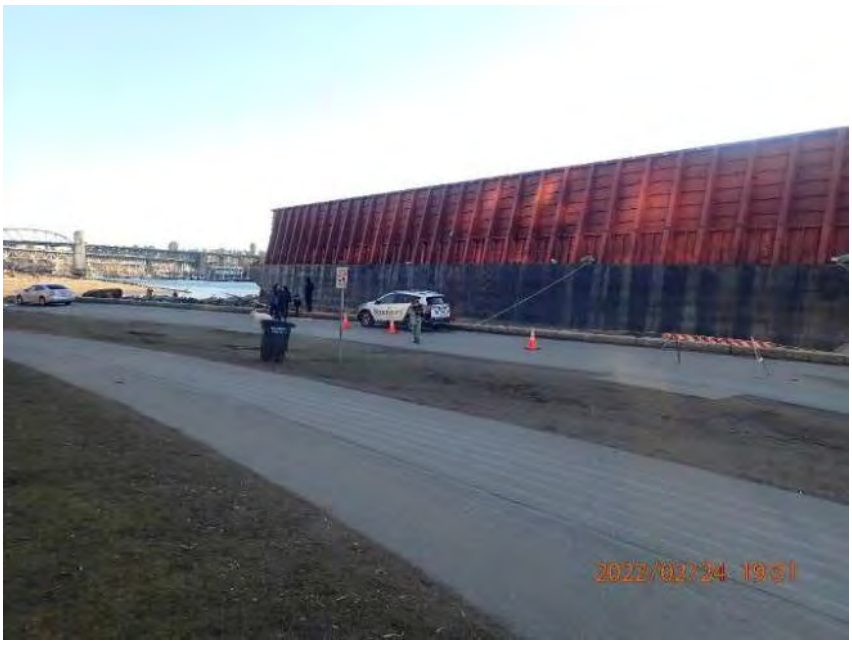


Photo 2 *General Arrangement - eastward view of English Bay Barge site from inshore path.*

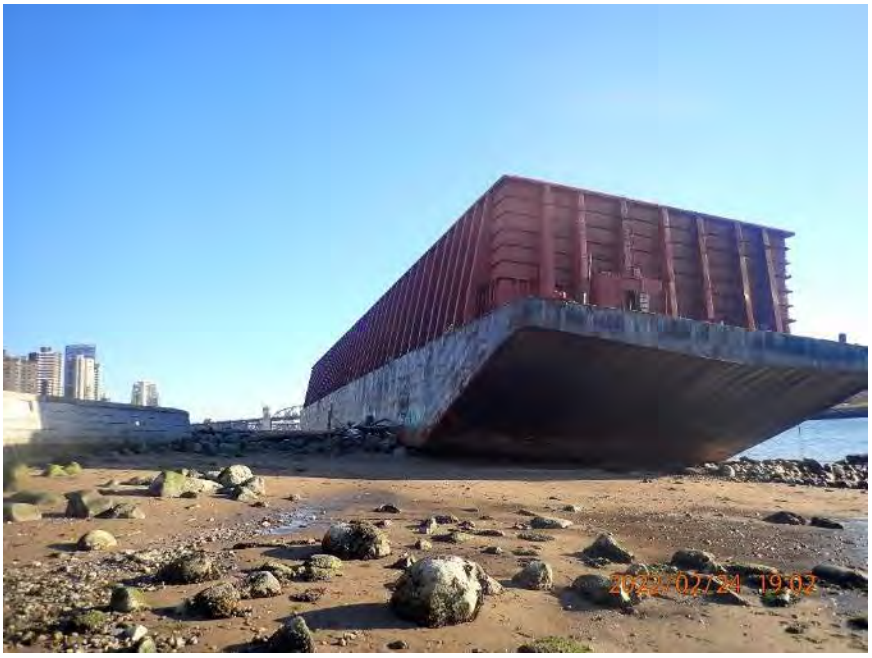


Photo 3 *General Arrangement - eastward view of English Bay Barge site from shore.*

Photo 4 *Inshore Path - typical localized asphalt cracking along path.*

Photo 5 *Inshore Path - typical localized asphalt cracking along path.*

Photo 6 *Between Paths - tire tracks on landscaping between inshore and offshore paths, westward view.*

Photo 7 *Between Paths - tire tracks on landscaping between inshore and offshore paths, eastward view.*

Photo 8 *Between Paths - area of embankment erosion approximately 10 m long, westward view.*

Photo 9 *Between Paths - area of embankment erosion between west stairs and concrete pad to the east, approximately 10 m long.*

Photo 10 *Offshore Path - asphalt failure along north edge of offshore path pavement, approximately 0.5 m wide by 1 m long.*

Photo 11 *Offshore Path - cracking along north edge of offshore path pavement approximately 10 m long.*

Photo 12 *Offshore Path - scouring along north edge of offshore path approximately 10 m long.*

Photo 13 *West Seawall Stairs - displaced capstone at bottom of stairs.*

Photo 14 *Seawall - toe of offshore end of wall beginning to undermine by approximately 25 mm between west and centre groyne.*

Photo 15 West Groyne - typical fractured rock under barge, offshore end.

Photo 16 West Groyne - typical fractured rock under barge, west end.

Photo 17 *West Groyne - assumed offshore end of groyne demolished by barge, eastward view south of barge.*

Photo 18 *West Groyne - assumed offshore end of groyne demolished by barge, westward view south of barge.*

Photo 19 *West Groyne - significant timber debris washed up on inshore end of groyne, southeastward view.*

Photo 20 *West Groyne - inshore end of groyne stepped due to barge, westward view.*

Photo 21 *Centre Groyne - assumed offshore end of groyne demolished by barge, eastward view south of barge.*

Photo 22 *Centre Groyne - inshore end of groyne stepped due to barge, southward view.*

Photo 23 *East Groyne - inshore end of groyne stepped due to barge, eastward view.*

Photo 24 *East Groyne - starboard rudder of barge has dug into groyne, southward view.*

Photo 25 *East Groyne - starboard rudder of barge has dug into groyne with approximately 1 m gap south of rudder, westward view.*

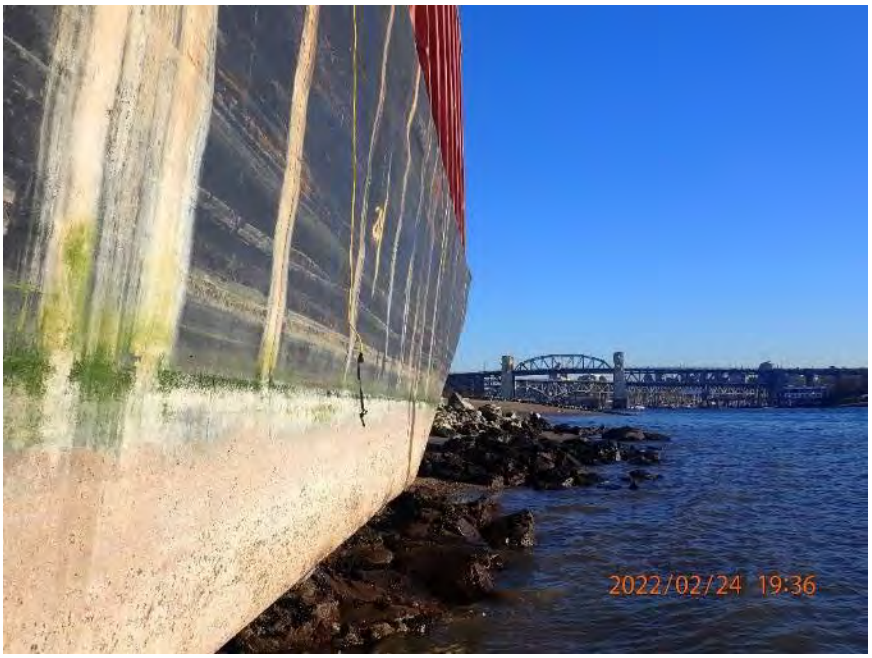


Photo 26 *East Groyne - groyne rocks remain present at offshore end, eastward view south of barge.*

Photo 27 *East Groyne - typical timber debris washed up east of groyne, southward view.*

January 31, 2022

Our file *Notre référence*
22-HPAC-00070

Vancouver Pile Driving Ltd.
ATTENTION: Ian Purvis
20 Brooksbank Ave
North Vancouver, BC V7J 2B8

Via email: Ian.Purvis@carlsoncg.com

Dear Ian Purvis:

Subject: Barge Removal, English Bay, Vancouver – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on January 24, 2022. We understand that you propose to removed the grounded barge in English Bay which will include:

- Installation and removal of 3 temporary steel pilings (36" diameter) on the offshore edge of the grounded barge; and
- Deconstruction of the grounded vessel in situ and removal of the barge components to an appropriate facility for steel recycling.

We understand the following aquatic species listed under the *Species at Risk Act* may use the area in the vicinity of where your proposal is to be located:

- Leatherback Sea Turtle, Southern Resident Killer Whale listed as Endangered
- Transient Killer Whale, Grey Whale, Humpback Whale listed s Threatened
- Steller Sea Lion, Harbour Porpoise listed as Special Concern.

Our review considered the following information:

- Request for Review Package received on January 24, 2022 and supporting information received on January 28, 2022.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*.

The aforementioned outcomes are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- The Program understands that the project completion date has yet to be determined, but it is anticipated in-water works will occur partially outside the DFO Least Risk Window for Burrard Inlet (August 16 - February 28). Please be aware that the likelihood of encountering fish during sensitive life stages is higher outside of the window of least risk. Therefore, if works are to occur outside the window, the Program recommends the following;
    - Take steps to complete the project in a timely manner that would minimize the amount of work required outside the recommended timing windows to minimize the risk of the works contravening the *Fisheries Act* prohibitions.
- Ensure a Qualified Environmental Professional (QEP) is on site for all works. The QEP is required to conduct environmental monitoring during all project activities that may result in potential negative effects to fish and fish habitat and monitor for compliance with regulations and to ensure contractors are using the appropriate implementation of environmental best management practices.
- Given the range of potential spawning times for the forage fish species expected to utilize the area, there is no definitive “reduced risk work window” within which works can proceed without risk. If forage fish spawn or spawning behaviour is observed, works should cease and only recommence under the direction of the QEP.
- Works in the intertidal are not to result in the trapping or stranding of fish. Any rutting caused by machine access should be graded smooth prior to leaving the site each day and if necessary, swamp mats (or similar) should be used to prevent rutting and compaction of the intertidal zone.
- Conduct works during daylight hours and weather conditions that permit visual observations of fish and marine mammals.
- Minimize the duration of in-water works.
- Ensure vessels are not operating in shallow water causing direct physical impacts to the seabed and fish habitat from prop scour.
- Water-based equipment is not to ground upon the seabed except for the use of anchors or spuds needed to keep the water-based equipment in place.
- Equipment is to be operated from the floating working barge, with the exception of a small excavator or bobcat to assist with the deconstruction.

- Minimize movements/ repositioning of barge(s) and subsequent spudding down and anchoring to minimize direct physical disturbance to the seabed.
- No spudding down or anchoring is to occur in sensitive fish habitats such as eelgrass beds and kelp beds.
- Establish a 500 m cetacean exclusion zone around the project site prior to vibratory pile installation.
- Monitor for cetaceans within the exclusion zone for at least 30 minutes prior to the start of vibratory pile driving. If a cetacean enters the exclusion zone, temporarily suspend vibratory pile driving until the individual has left the exclusion zone or has not been sighted for 30 minutes.
- If there is a risk to a marine mammal from direct contact, temporarily suspend works until the individual has left the area or has not been sighted for 30 minutes.
- Develop and implement a debris management plan (containment and removal) for barge removal activities to prevent materials and debris (e.g., treated wood fragments, sawdust, cuttings, lead/zinc-based paint, etc.) from entering the marine environment.
- An appropriate sediment control plan should be developed and implemented to minimize sedimentation of the aquatic environment during all phases of the work, undertaking or activity.
- Conduct water quality monitoring during pile installation to confirm that turbidity levels in the water column outside the immediate vicinity of the works are below approved water quality guidelines. If water quality guideline exceedances are detected, stop work and implement additional mitigation measures (e.g., slow work, install a sediment curtain, etc.) to minimize sedimentation.
- Develop and implement a spill prevention and response plan to avoid a spill of deleterious substances into the marine environment. Ensure appropriate gear (e.g., floating containment booms, absorbent pads, etc.) is onsite in the event that creosote or other deleterious substances are released into the water during vibratory pile removal or installation. Onsite personnel should also be trained in spill prevention, containment and cleanup procedures.
- Ensure equipment is in good working condition and free of leaks prior to conducting works in or near fish habitat.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal is not likely to result in the contravention of the above mentioned prohibitions and requirements.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, the *Species at Risk Act* and the *Aquatic Invasive Species Regulations.*

It is also your Duty to Notify DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to the DFO-Pacific Observe, Record and Report phone line at 1-800-465-4336 or by email at DFO.ORR-ONS.MPO@dfo-mpo.gc.ca.

Please notify the Program by email at sara.jossul@dfo-mpo.gc.ca at least 10 days before starting your project, ensuring your file number and appropriate on-site contact information is included. We recommend that a copy of this letter be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

Please note that the advice provided in this letter will remain valid for a period of 1 year from the date of issuance. If you plan to execute your proposal after the expiry of this letter, we recommend that you contact the Program to ensure that the advice remains up-to-date and accurate. Furthermore, the validity of the advice is also subject to there being no change in the relevant aquatic environment, including any legal protection orders or designations, during the 1 year period.

If you have any questions with the content of this letter, please contact Sara Jossul by email at sara.jossul@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Sincerely,

Vance Mercer
A/ Section Head
Fish and Fish Habitat Protection Program

c.c.: Marc VanderVeer, Hatfield Consultants, mvanderveer@hatfieldgroup.com

From: Ian Purvis
To: Khella, Harry
Cc: Jesse Percy; Gandha, Amit
Subject: Fwd: [EXTERNAL] RE: English Bay Barge - Metro Vancouver Sanitary Forcemain
Date: Friday, April 8, 2022 8:33:34 AM
Attachments: image002.png
image003.png

Harry,

See response from Metro Vancouver below.

I've spoken with Will on the phone this morning and he has confirmed that he is not the correct contact for this forcemain. He did commit to checking internally and came back with the response below.

We will submit the requested documents this morning and hope to expedite the turnaround time.

At this stage, it looks like we may have to delay the installation of the barriers by at least a week. This likely means that the barriers and fencing will not be in place for the potential 420 event.

Will continue to update as we hear back from Metro Vancouver.

Thanks,

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [vanpile.com]

From: William Bailie <William.Bailie@metrovancouver.org>
Sent: Friday, April 8, 2022 7:54 AM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Jesse Percy <Jesse.Percy@carlsoncg.com>; Jaswant Ranu <Jaswant.Ranu@metrovancouver.org>
Subject: [EXTERNAL] RE: English Bay Barge - Metro Vancouver Sanitary Forcemain

Hi, Ian

Before proceeding, please go to the MetroVancouver webpage and follow the procedures laid out here: Welcome - Request Drawings to Locate Underground Facilities (metrovancouver.org) [can01.safelinks.protection.outlook.com]

s.16(1)
s.16(1) I understand that in addition to the MV mains in the area, there are also City of Vancouver mains that you will need to locate and protect.

Good luck!

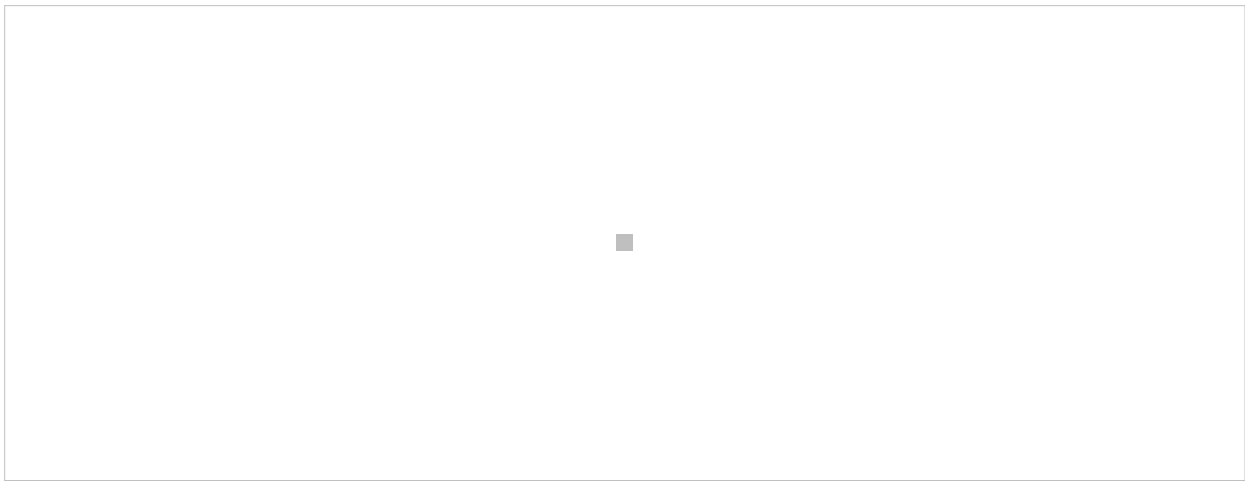
William Bailie, P.Eng
Senior Project Engineer, Engineering, Design and Construction
Liquid Waste Services
t. 236-466-5958
Metro Vancouver [can01.safelinks.protection.outlook.com]

From: Ian Purvis [mailto:Ian.Purvis@carlsoncg.com]
Sent: Thursday, April 7, 2022 3:54 PM
To: William Bailie <William.Bailie@metrovancouver.org>
Cc: Jesse Percy <Jesse.Percy@carlsoncg.com>
Subject: English Bay Barge - Metro Vancouver Sanitary Forcemain

William,

Vancouver Pile Driving Ltd. has been engaged as the general contractor responsible for the removal of the English Bay Barge.

In order to establish site controls, we have planned to install concrete barriers along the edge of the seawall as shown on the below. Installation of these barriers will require the use of a hiab truck and EXP has completed a loading analysis (attached) for the pathway and seawall along the route. At the request of CoV we are revising the analysis to include loading pressures for the sewer forcemain. We will share a copy of the updated report with you when available, however are you able to provide us with what would be considered the allowable loading of this pipe? Does Metro Vancouver require any additional measures be put in place?



Attached for reference are the as-built drawings for the Seawall and the traffic control plan outlining our planned haul route from the Sunset Beach Concession parking lot.

Please feel free to give me a call to discuss further. We are aiming to complete the installation of the barriers on April 13/14.

Thanks,

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [can01.safelinks.protection.outlook.com]

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From:	Gandha, Amit
To:	Khella, Harry; Schwebs, Saul
Cc:	Lau, Kevin
Subject:	RE: Barge Removal - Demolition Permit?
Date:	Monday, February 7, 2022 3:49:10 PM
Attachments:	image001.gif image002.png

Thanks Saul,

That is great information to know….

Thank you,

Amit Gandha| **Director of Parks**
Vancouver Park Board | 2099 Beach Avenue
t. 604-654-0781 | amit.gandha@vancouver.ca
pronouns: he/him/his

I am thankful to live, work, and play on the unceded, ancestral territories of the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), and sə́lilwətaʔɬ / sel̓íl̓witulh (Tsleil-Waututh) nations.

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: Monday, February 07, 2022 3:12 PM
To: Schwebs, Saul <Saul.Schwebs@vancouver.ca>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Lau, Kevin <Kevin.Lau@vancouver.ca>
Subject: RE: Barge Removal - Demolition Permit?

Thanks for confirming Saul, much appreciated.

Cheers,

Harry

From: Schwebs, Saul <Saul.Schwebs@vancouver.ca>
Sent: Monday, February 07, 2022 12:50 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Lau, Kevin <Kevin.Lau@vancouver.ca>
Subject: RE: Barge Removal - Demolition Permit?

Hi Harry,

The barge does not fall under the purview of the Vancouver Building Bylaw. Therefore, a demolition permit is not required for its deconstruction and removal.

Thank you for reaching out.

Saul Schwebs Architect AIBC

CBO and Director of Building Policy, Inspections & Bylaw Services

Development, Building and Licensing
City of Vancouver

O: 604.873.7040
M: s.15(1)(l)

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: Monday, February 7, 2022 10:39 AM
To: Schwebs, Saul <Saul.Schwebs@vancouver.ca>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: Barge Removal - Demolition Permit?

Hi Saul,

I hope this message finds you well.

I am coordinating the PB response to the barge removal at Sunset Beach. Whilst the Park Board is a stakeholder in this process along with other agencies, it is not leading or responsible for the barge removal. Some headlines below:

- The barge will be deconstructed onsite by the prime contractor (Vancouver Pile Driving) appointed by the owner's insurance firm.
- The barge will be deconstructed in sections on the barge itself with the debris transported away by sea transport.
- Deconstruction will take approximately ~10 – 12 weeks and a detailed project plan is being developed by the prime contractor.
- Fisheries and Oceans Canada (DFO) have issued their offshore permit with several conditions for the contractor to observe.
- The prime contractor is undertaking several assessments including environmental, habitat, sea wall structure (signed off by an EOR), HAZMAT and archeological which are a precursor to any work being undertaken. These assessments are underway and will be shared with the Park Board for review once completed.
- The Park Board has initiated its own shoreline and seawall analysis, which will inform what, if any, remediation may be required.
- CoV Legal have been engaged to develop a license agreement between Park Board and the contractors.
- Aside from reviewing the assessments, the Park Board have advised that they do not require any permits for this work unless there was a request by the Coast Guard or VPD to have an abandoned vessel towed to the marinas pending salvage. This has not been requested.
- Slide 2 from the attached deck shows the location of the barge.

With all this mind, I would be grateful if you could you please kindly confirm if a demolition permit under the Vancouver Building Bylaw is required?

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Gandha, Amit
To: Khella, Harry; Peterson, Darren
Subject: RE: English Bay Barge - Power Supply
Date: Tuesday, February 8, 2022 1:14:47 PM

Nothing in the vicinity. We wouldn't have anything with sufficient amperage as well.

Thank you,

Amit Gandha| Director of Parks
Vancouver Park Board | 2099 Beach Avenue
t. 604-654-0781 | amit.gandha@vancouver.ca
pronouns: he/him/his

I am thankful to live, work, and play on the unceded, ancestral territories of the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), and səl̓ilwətaʔɬ / sel̓íl̓witulh (Tsleil-Waututh) nations.

-----Original Message-----
From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: Tuesday, February 08, 2022 1:10 PM
To: Gandha, Amit <Amit.Gandha@vancouver.ca>; Peterson, Darren <darren.peterson@vancouver.ca>
Subject: FW: English Bay Barge - Power Supply

Hi Amit/Darren,

Any ideas on power supply?

Thanks

-----Original Message-----
From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Tuesday, February 08, 2022 1:07 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>
Subject: [EXT] English Bay Barge - Power Supply

Hey Harry

Is there a power supply nearby that we could use to minimize generator use?

Thanks

Jesse

Sent from my iPhone

it from your system

From:	Ian Purvis
To:	Khella, Harry; Jesse Percy
Cc:	Gandha, Amit; Jenn Wint
Subject:	RE: [EXTERNAL] Barge Removal
Date:	Friday, July 8, 2022 6:17:30 AM
Attachments:	image001.jpg image002.jpg

Yes s.22(3)(d)

The guards must now be outside the entire shift unless they are on their break and will no longer use the vehicle as shelter during the day shift. At night the guard is permitted to use the vehicle as shelter but must remain alert.

s.15(1)(l) . They must complete the appropriate TrackTik report for every patrol.

Any attempts to climb the barge, vandalize, or trespass on the barge are to be immediately reported via a TrackTik Security Occurrence Report. These are then reported to VanPile through the security supervisor.

Thanks,
Ian

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: July 7, 2022 4:20 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>
Subject: RE: [EXTERNAL] Barge Removal

Perfect, thanks for closing the loop. Is there a clear security and incident protocol in place between Securiguard and VP?

Thanks,

Harry

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Thursday, July 7, 2022 4:14 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>
Subject: RE: [EXTERNAL] Barge Removal

Harry,

Barrier and fencing installation is complete. The rope was removed and we've had a meeting with the

Security provider to address the incident.

Thanks,

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: July 7, 2022 4:12 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>
Subject: RE: [EXTERNAL] Barge Removal

Please confirm barrier and fencing installation has been completed?

Thanks,

Harry

From: Khella, Harry
Sent: Wednesday, July 6, 2022 9:41 AM
To: 'Ian Purvis' <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>
Subject: RE: [EXTERNAL] Barge Removal

Hi Ian,

1. Just closing the loop on this – is barrier and fencing installation complete?
2. Has the loose rope that is hanging off the barge been removed: https://www.vancouverisawesome.com/local-news/video-shirtless-man-climbs-into-english-bay-barge-vancouver-bc-5551109 [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Monday, July 4, 2022 5:11 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal

Flaggers and water truck will be on-site for 0800. We hope to complete by 1400.

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: July 4, 2022 5:06 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal

Thanks for the update Ian and the pictures, much appreciated. Please proceed with the completion of the installation of the barriers and fencing for tomorrow. Please let me know what time you anticipate on starting and ending.

Thanks,

Harry

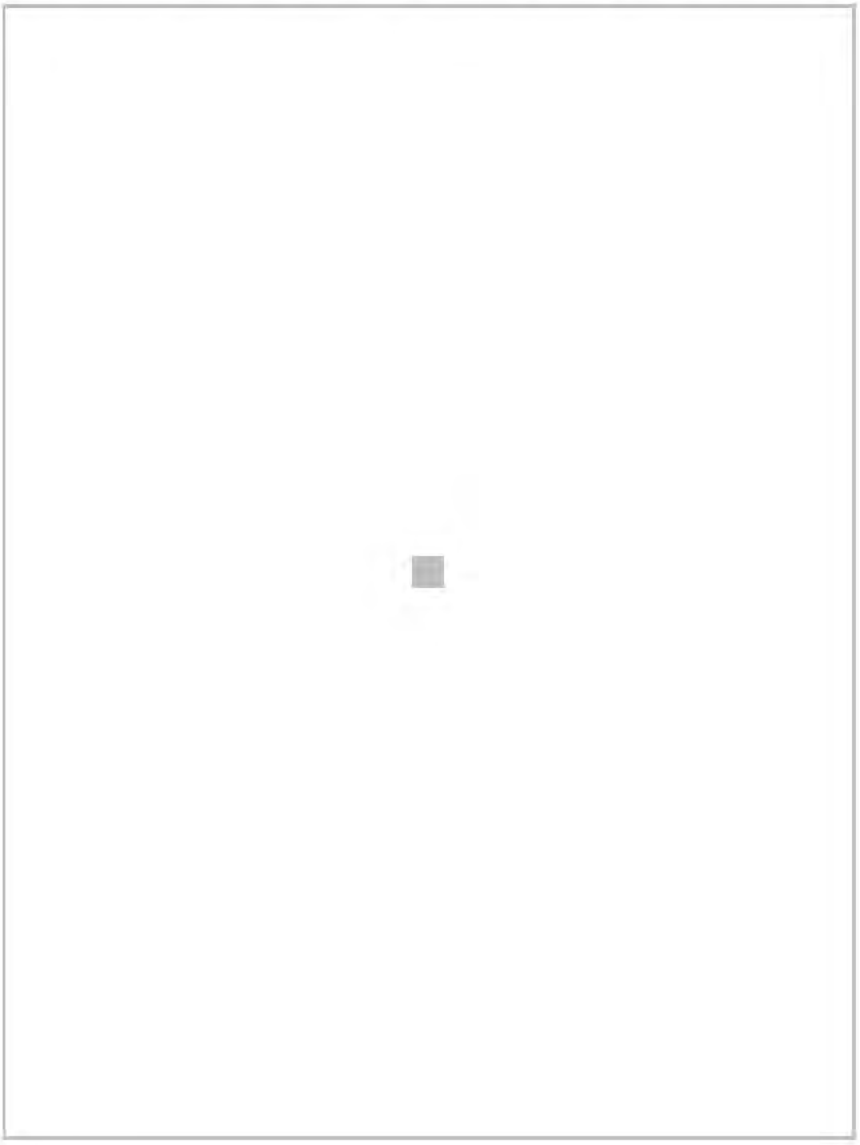
Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

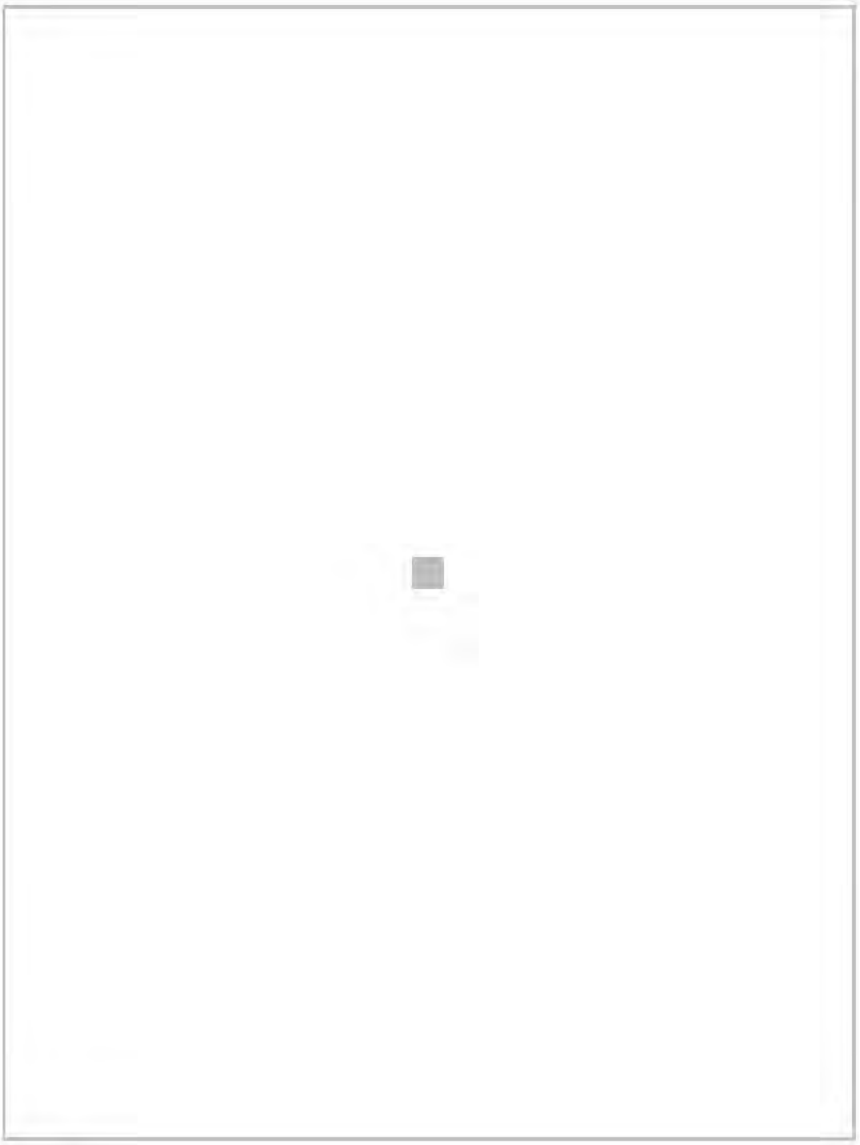
From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Monday, July 4, 2022 6:07 AM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal

Good Morning Harry,

Thank you for the help on Thursday. We were able to get all our fencing and most of the barriers in place.

The remaining barriers, along with the small and large water trucks to complete the barrier willing are scheduled to return Tuesday. Flaggers will be on-site for the duration of the works.





Thanks,
Ian

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: June 30, 2022 8:48 AM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal

Hi Ian,

Access should not be restricted – we are making calls. I'll feedback in a moment.

Thanks,

Harry

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Thursday, June 30, 2022 8:45 AM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Jenn Wint <jenn@wintcommunications.com>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal

Harry,

We have our General Foreman on-site this morning and we are running into significant interface issues as our sites overlap and the fencing is restricting access to our work area. The production manager who is in charge of setting up will not let us bring our trucks into the concession lot for staging and the upper lot has been fenced off and closed. Until we receive direction from the Parks Board, we will be on standby as we cannot progress.

Thanks,
Ian

Ian Purvis, P.Eng
Operations Manager

Vancouver Pile Driving Ltd.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.986.5911 M. +1 604.928.9450

ian.purvis@carlsoncg.com | www.vanpile.com [vanpile.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: June 29, 2022 8:56 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Hi Ian,

The PB will not have any flaggers operating on the seawall to support the installation of the fencing for the barge. For the Symphony project, this work has been contracted out and should not impinge upon your work as the work sites do not overlap.

Amit, feel free to let me know if I have missed anything?

Thanks,

Harry

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Wednesday, June 29, 2022 10:10 AM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Harry,

It is our intent to install the fencing and water barriers on Thursday but I anticipate that we will need the entire shift to complete. The most time consuming activity will be the installation of water in the barriers because of the restrictions we have on vehicle access which was my reason for requesting options to potentially expedite this by finding a closer source of water.

Will PB also have flaggers operating on the Seawall for the installation of the fencing? Is there any coordination required on this item between ourselves the PB installation team? This is the first we are hearing about this event so is their any coordination required between our security and the organizers of the event?

Regards,
Ian

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: June 29, 2022 10:00 AM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Hi Ian,

Given the late stage request, VP will have to use the permit you already have. Please note fencing the PB is in the process of erecting fencing to support the Symphony at Sunset event for this weekend. We'll need VP to be prompt in its timings in the errection of the fencing at the barge.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Ian Purvis <Ian.Purvis@carlsoncg.com>
Sent: Wednesday, June 29, 2022 6:13 AM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Harry,

Is there a water supply point nearby that we could use to fill our water truck for the barriers? The closest fill station is in River District and we will otherwise have to request a CoV permit for a hydrant.

Thanks,
Ian

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: June 28, 2022 11:20 PM
To: Ian Purvis <Ian.Purvis@carlsoncg.com>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Hi Ian,

Thanks for letting us know, much appreciated. If there are any other changes, please do let us know. As confirmed with VP, the comms rollout (signs, letters and media release) will be rolled out tomorrow.

Thanks,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Ian Purvis <Ian.Purvis@carlsoncg.com>

Sent: Tuesday, June 28, 2022 3:05 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Jesse Percy <Jesse.Percy@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Harry,

All is setup for Thursday. The flaggers had to cancel for tomorrow but we are confirmed to have flaggers, fencing and barriers on-site at 0900 Thursday.

Sorry for the late notice, I've been scrambling to reschedule the other vendors and wanted to have confirmation before we proceeded.

Thanks,
Ian

Ian Purvis, P.Eng

T. +1 604.986.5911 M. +1 604.928.9450

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: June 28, 2022 10:03 AM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Hi Jesse,

We would like to align the rollout of the signage with the barrier and fencing installation – what time is your contractor expected to start tomorrow?

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Khella, Harry
Sent: Thursday, June 16, 2022 2:11 PM
To: 'Jesse Percy' <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden

<Vanessa.Hobden@carlsoncg.com>; Li, David <David.Li@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Thanks.

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Thursday, June 16, 2022 1:28 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>; Li, David <David.Li@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Hi Harry,

We have had to push the barrier installation one week. The barriers and fencing will be installed on June 29th.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: June 9, 2022 5:49 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>; Li, David <David.Li@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Thanks. Please keep me updated.

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Thursday, June 9, 2022 5:18 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>; Li, David <David.Li@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Hey Harry,

We have been working with the supplier to pull together the required quantity. The current anticipated date is June 22 to have them installed. We will update if there are any changes.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
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[can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: June 9, 2022 2:58 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>; Li, David <David.Li@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Hi Jesse,

Could you send me an update on the request below please?

Thanks,

Harry

From: Khella, Harry
Sent: Friday, June 3, 2022 12:26 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>; Li, David <David.Li@vancouver.ca>
Subject: RE: [EXTERNAL] Barge Removal

Thanks.

s.14, s.17(1), s.21(1)
s.14, s.17(1), s.21(1) please arrange for the fencing and barrier installation to proceed without delay. Once you have a date from your barrier and fencing provider, please let me know so we can advance this.

Thanks

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support
City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Friday, June 3, 2022 11:43 AM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>; Vanessa Hobden <Vanessa.Hobden@carlsoncg.com>
Subject: RE: [EXTERNAL] Barge Removal

Hey Harry,

Please see below for responses to your questions. Let me know if you need anything else.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
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[can01.safelinks.protection.outlook.com] [can01.safelinks.protection.outlook.com]
[can01.safelinks.protection.outlook.com]

From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: June 1, 2022 2:26 PM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: [EXTERNAL] Barge Removal

Hi Jesse,

I hope you're well.

s.14, s.17(1), s.21(1)
s.14, s.17(1), s.21(1) See below some questions I have:

- s.14, s.17(1), s.21(1) there is an opportunity to advance the preparation at the site. Given the use of water filled barriers, how soon can VP install the barriers and fencing with the safety protocols agreed in place? We can install the barriers with +/- 1 week notice to coordinate. If we have certainty on the start date, we can confirm with the insurer that installing 2-3 weeks in advance of work starting is acceptable.
- How much lead time does VP need to mobilize and start the actual deconstruction work? We will need two weeks to mobilize resources.
- What is the ballpark cost to dismantle and remove the barge? Our current estimate is +/-$2.4M
- Is the deconstruction work still slated to take 12-15 weeks? Yes, current duration is anticipated to be 12-15 weeks, however we will try to accelerate once onsite.

Cheers,

Harry

Harry Khella
Manager, Strategic Business Advisory
Business Planning and Project Support

City of Vancouver
T: 604 829 2087
E: harry.khella@vancouver.ca

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From:	Khella, Harry
To:	Jesse Percy; Ian Purvis
Cc:	Gandha, Amit
Subject:	RE: [EXTERNAL] RE: Barge Removal - Status Update
Date:	Friday, April 1, 2022 4:07:00 PM

Thanks for sharing this. CoV have reviewed and are ok with the controls that are indicated.

Thanks,

Harry

From: Jesse Percy <Jesse.Percy@carlsoncg.com>
Sent: Tuesday, March 29, 2022 3:08 PM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] RE: Barge Removal - Status Update

Hi Harry/Amit,

See attached traffic control plan showing the proposed signs and traffic control personnel for the barrier delivery. Please let us know if there is anything else we need to proceed with the work on Monday.

Thanks,

Jesse Percy ASct., PMP
Director, Design Build CHC

Carlson Construction Group Inc.
20 Brooksbank Avenue, North Vancouver, BC V7J 2B8
T. +1 604.998.1075 C. +1 604.999.7757
jesse.percy@CarlsonCG.com | www.CarlsonConstructionGroup.com
[can01.safelinks.protection.outlook.com]

From: Jesse Percy
Sent: March 29, 2022 9:34 AM
To: Khella, Harry <Harry.Khella@vancouver.ca>; Ian Purvis <ian.purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: RE: [EXTERNAL] RE: Barge Removal - Status Update

Good Morning Harry,

s.22(1) Unfortunately Thursday is full for me. I believe Ian may be able to make the afternoon work. As we are nearing the start of some site works I'd like to confirm the following is ok to proceed as planned:

- Barrier installation – April 4 & 5

    - Has the City completed the pruning?
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No other works will take place on-site at this time. We are looking at a start in late April, so finalizing the signage and letter for distribution will be important.

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From: Khella, Harry <Harry.Khella@vancouver.ca>
Sent: March 29, 2022 9:15 AM
To: Jesse Percy <Jesse.Percy@carlsoncg.com>; Ian Purvis <Ian.Purvis@carlsoncg.com>
Cc: Gandha, Amit <Amit.Gandha@vancouver.ca>
Subject: [EXTERNAL] RE: Barge Removal - Status Update

Hi Folks,

I hope you're well. I am back s.22(1) so will push the check in below to later in the week. Are you available on Thurs, March 31st at 10am or 10:30 for 30 mins?

Thanks,

Harry

-----Original Appointment-----
From: Khella, Harry
Sent: Monday, March 07, 2022 12:51 PM
To: Khella, Harry; Jesse Percy; Ian Purvis; Gandha, Amit
Subject: Barge Removal - Status Update
When: Tuesday, March 29, 2022 10:00 AM-10:30 AM (UTC-08:00) Pacific Time (US & Canada).
Where: WebEx

As head towards Spring Break, please let me know if this project check in works for you.

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Meeting password: s.15(1)(l)

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Join by phone
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1-855-699-3239 CANADA/US TOLL FREE
Global call-in numbers [can01.safelinks.protection.outlook.com] | Toll-free calling restrictions [can01.safelinks.protection.outlook.com]

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PLEASE NOTE: This message, including any attachments, may include privileged,

From:	Jesse Percy
To:	Khella, Harry; Ian Purvis
Cc:	Gandha, Amit
Subject:	RE: [EXTERNAL] RE: Barge Removal - Status Update
Date:	Tuesday, March 29, 2022 3:07:59 PM
Attachments:	1204 Beach Ave - Seawall - 322527-011 - 11.15 - DWG001.pdf

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UNIVERSAL
TMP DEPARTMENT

Date: March 29, 2022 **Author:** Marley Futerko 604-444-3732 Ext. 337 BCCSA#1090619 **Project:** 322527-011
The Universal Group: 9770 199A St Langley, BC V1M 2X7 **Office:** 604-444-3799 **Fig:** 11.15
Dwg: 001

Comments:

Carlson Construction
Ian Purvis 604.928.9450

City of Vancouver
Job location: Seawall - 1204 Beach Ave
Closure description: Sidewalk Closure
Job description: Concrete Barriers on the Seawall
Tentative date and hours: TBD
Traffic Plan based on a 50 km/h speed zone
Traffic specifications based on the Traffic Management Manual for Work on Roadways 2020

Notes:
- **Plan was prepared in accordance with MoTI TMM 2020, and WCB Part 18**
- **Client has been notified of the Part 18 amendment & it is their responsibility to ensure site compliance.**
- **Plan must be reviewed if there are any changes to the findings of risk assessment (provided), or after one year. Whichever, occurs first.**
- **Should the escape route illustrated become no longer viable, the traffic control onsite to note change in position on FLRA.**
- **Implementation of the closure to follow the process outlined in the Brief Duration safe operating procedure.**
- **Advanced Warning Sign distances may be shortened due to urban block length.**
- **3.5m lane width to be maintained.**
- **TCP to assist construction vehicles ingress/ egress and pedestrians as needed.**
- **TCP to identify & illustrate escape route once on site.**

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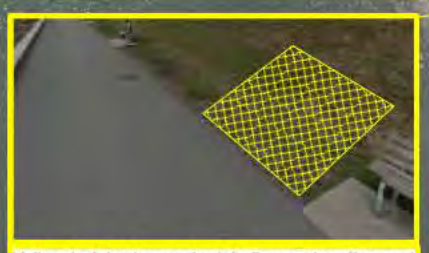
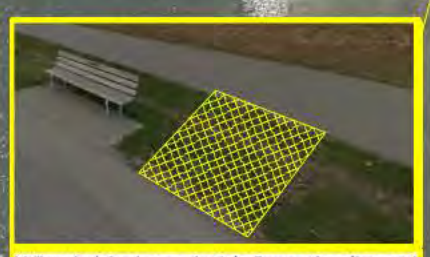


Yellow hatched area depicts flagger location and escape route.



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Beach Ave
Seawall
Beach Ave
Bute St
Truck Staging Area

Plan Scale
1 : 1775 (1cm = 18m)

Legend

- Barricade
- Crosswalk Closed - Custom Sign
- Flagger
- Flagger Escape Route
- Onsite Haul Route
- Sidewalk Closed #C-202
- Truck Egress
- Truck Ingress
- Work Area