CITY OF VANCOUVER

CITY CLERK'S DEPARTMENT
Access to Information & Privacy

File No.: 04-1000-20-2018-290

October 25, 2018

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 May 24, 2018 for:

1. **Internal and external documents/correspondence (including technical reports, emails, briefing notes, etc.), between Park Board staff, Park Board staff and Park Board Commissioners, Park Board staff and City of Vancouver Staff, and Park Board staff and external contractors/experts related to the following issues:**
   - **Nature and scope of the damage and wear and tear of the Harbour Green dock;**
   - **Specific cause(s) of this damage and wear and tear;**
   - **Reasons for immediate closure of the dock;**
   - **Assessment of the required maintenance and repairs;**
   - **Selection process of contractors to repair the dock; and**
   - **Estimated timelines for the repairs and maintenance.**

2. **All correspondence between the Park Board and the media on the Harbour Green dock damages, closure and repairs, including related internal Park Board communication on this.**

Date Range: April 6, 2018 to May 24, 2018.

All responsive records are attached. Some information in the records has been severed, (blacked out), under s.13(1), s.15(1)(l), s.21(1), and s.22(1) 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 you may ask the Information & Privacy Commissioner to review any matter related to the City's response to your request. The Act allows you 30 business days from the date you receive this notice to request a review 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 assigned to your request (#04-1000-20-2018-290); 2) a copy of this letter; 3) a copy of your original request for information sent to the City of Vancouver; and 4) detailed reasons or grounds on which you are seeking the review.

Please do not hesitate to contact the Freedom of Information Office at foi@vancouver.ca if you have any questions.

Yours truly,

Barbara J. Van Fraassen, BA
Director, Access to Information & Privacy

Barbara.vanfraassen@vancouver.ca
453 W. 12th Avenue Vancouver BC V5Y 1V4
Phone: 604 .873.7999
Fax: 604.873.7419

Encl.

:kt

From:	"Mack, Tiina" <tiina.mack@vancouver.ca>
To:	"Araujo, Sev" <sev.araujo@vancouver.ca>
Date:	5/11/2018 3:54:15 PM
Subject:	Accepted: Bowen Island Residents / Harbour Green Dock Confirmed

From:	"Mack, Tiina" <tiina.mack@vancouver.ca>
To:	"Wilton, Shauna" <shauna.wilton@vancouver.ca>
Date:	5/9/2018 10:37:01 AM
Subject:	Accepted: Discussion: Harbour Green Dock

From:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
To:	"Mack, Tiina" <tiina.mack@vancouver.ca>
Date:	4/27/2018 12:19:43 PM
Subject:	Accepted: harbour green dock board report

From:	"Mike Warren" <mwarren@iccmarine.com>
To:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date:	5/7/2018 10:11:13 AM
Subject:	FW: Harbour Green Public Dock Repairs
Attachments:	WA_ICC_Harbour Green_memo.docx.pdf

Ali,

Just a short note to follow up to see if you had any questions regarding our report and to ask what the schedule might be for moving forward?

Have a nice day.

Regards
Mike

Mike Warren
Business Development Manager

ICC Marine Services Ltd.
16 Fawcett Road, Suite 102
Coquitlam, BC Canada V3K 6X9

Office: 604.527.2446
Fax: 604.527.8894
Cell: 778.833.1171

mwarren@iccmarine.com
www.iccmarine.com

From: Mike Warren <mwarren@iccmarine.com>
Sent: Thursday, April 26, 2018 2:45 PM
To: ali.nayeri@vancouver.ca
Cc: Daniel Leonard - Westmar Advisors Inc. <dleonard@westmaradvisors.com>
Subject: Harbour Green Public Dock Repairs

Ali,

As promised please see attached our recommended options and cost estimates for the repair of the Harbour Green Public Dock.

If you have any questions, require further information or if Daniel or myself can be of assistance in any way at all, please do not hesitate to call.

Regards
Mike

Mike Warren
Business Development Manager

ICC Marine Services Ltd.
16 Fawcett Road, Suite 102
Coquitlam, BC Canada V3K 6X9

Office: 604.527.2446
Fax: 604.527.8894
Cell: 778.833.1171

mwarren@iccmarine.com
www.iccmarine.com

WESTMAR ADVISORS | ICC MARINE SERVICES

MEMORANDUM

Client:	**Vancouver Board of Parks & Recreation**	**Date:**	**April 26, 2018**
		Project No:	**2180031**
Project:	**Harbour Green Public Dock Repairs**		
Subject:	**Recommended Options and Costs**		
Attention:	**Ali Nayeri, P.Eng., Civil Engineer**		

Introduction

Westmar Advisors Inc. (Westmar) and ICC Marine Services (ICC) met with the Vancouver Board of Parks & Recreation (Park Board) on April 10, 2018 to discuss the current condition of the Harbour Green Public Dock. The Park Board requested that Westmar and ICC review available documentation and provide recommendations and high-level costs to repair and reopen the facility and potentially upgrade the facility to accept commercial operations such as the Bowen Island passenger ferry. This memorandum is not an exhaustive review of this facility and is intended to assist with an upcoming discussion on potential paths forward.

Background

The Harbour Green Public Dock was constructed in 2002 and consists of eight precast concrete floats that are held in place with fabricated steel mooring hoops around steel pipe piles and that are accessed by two 100 ft long aluminium ramps (see Photo No 1 and Figure No. 1 on the next page).

The site is relatively exposed to wind and waves from the east and the northeast. The floats were found to have too much movement with waves when they were initially installed and so stabilizers were added prior to the marine contractor demobilizing from site. These stabilizers

consist of light framed steel brackets that were attached to the sides of the floats and extend down to a wooden plank deck that is located below the influence of waves.

Photo No. 1: General arrangement view of Harbour Green Public Dock

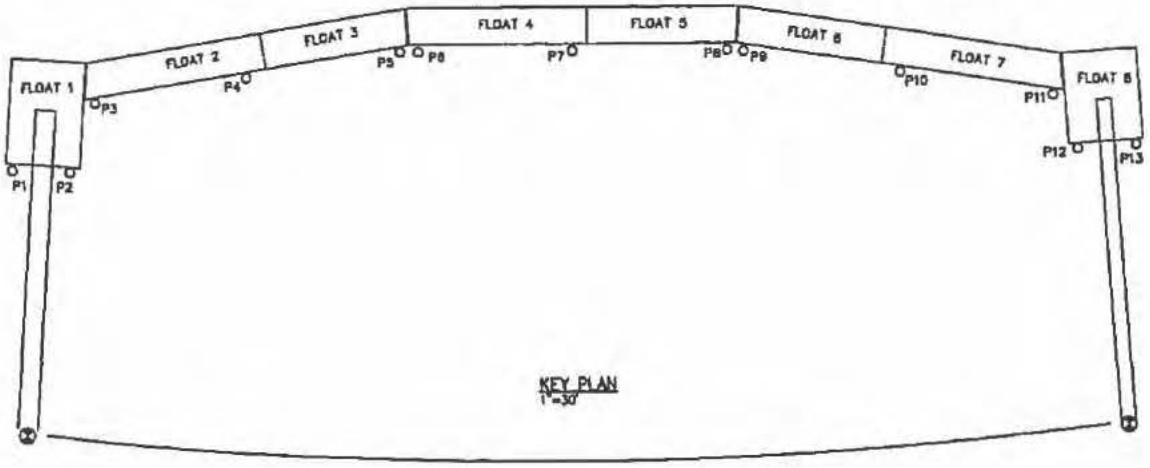


Figure No. 1: General arrangement plan view of Harbour Green Public Dock

Another result of the waves at the site was that the originally designed ultra-high molecular weight (UHMW) rubbing surfaces on the mooring brackets failed within two years after installation and pulled some of the mooring brackets out of the concrete floats. The likely

reason for the failures was that the friction was too high between the UHMW pads and the piles under the combination of vertical (sliding up and down piles) and horizontal (pressing side to side) from wave forces resulting in excessive wear and forces in the mooring hoops. Blue Water Systems was engaged by the Park Board to retrofit the existing brackets with rollers on three sides to reduce the friction sliding up and down piles. The rollers did not address the forces imposed in the mooring hoops from the side to side forces on the piles which, since 2005, has resulted in further pile hoop failures.

In 2017, the Park Board engaged Associated Engineering to complete a high-level condition assessment of the marine facility. The assessment highlighted the issues noted above to the mooring hoops and remaining UHMW rubbing pads as well as other minor issues such as damage to handrails and bull rails.

Westmar's and ICC's April 10, 2018 brief site visit identified further deficiencies related to the transitions between float numbers 1 and 8 and the middle floats. Excessive movements of the floats due to the degraded condition of the pile mooring hoops had allowed the galvanized steel transition plates to fall between concrete floats. The Park Board has temporarily remediated this situation by installing heavy rubber mats over the transition area that have been employed at other Park Board marine facilities.

During the April 10, 2018 site visit it was also noted that the vertical acceleration of the floats was noticeable in minimal waves. The scope of the Associated Engineering assessment did not include underwater components and so it is not possible at this time to assess the condition of the stabilizers and whether they are still effectively contributing to limit vertical motions.

It is our understanding that the Park Board has previously reached out to Blue Water Systems to discuss inspecting and maintaining the connections for the aluminium ramps but that this has not occurred. It is likely that these connections, including the rollers at the float end, require maintenance given the vertical accelerations of the floats.

The Park Board became aware of the deficiencies with the facility following the Associated Engineering assessment and also recently became aware of the wide number of commercial and naval users of the facility, which is beyond the public recreational users originally intended to exclusively use the facility. The Park Board, following closing the facility to all users, is now undertaking a review of the potential options to repair the facility and possibly upgrade the facility to allow the facility to safely accommodate other users.

Discussion

As noted on the previous pages, there are more than just maintenance issues to address on this facility. Two attempts have been made to develop a mooring hoop solution for the floats that have not been successful; this can be attributed to both the wave heights and float motions being larger than were originally anticipated. And there is documented evidence that vessels that are larger than the floats were originally designed for have visited the facility.

Float Moorings

The following figure shows a plan view of the originally installed mooring hoops with UHMW wear pads on all four sides of the piles and the photo below shows a mooring hoop with the modification installed in 2005 replacing UHMW pads on three sides with pairs of rollers.

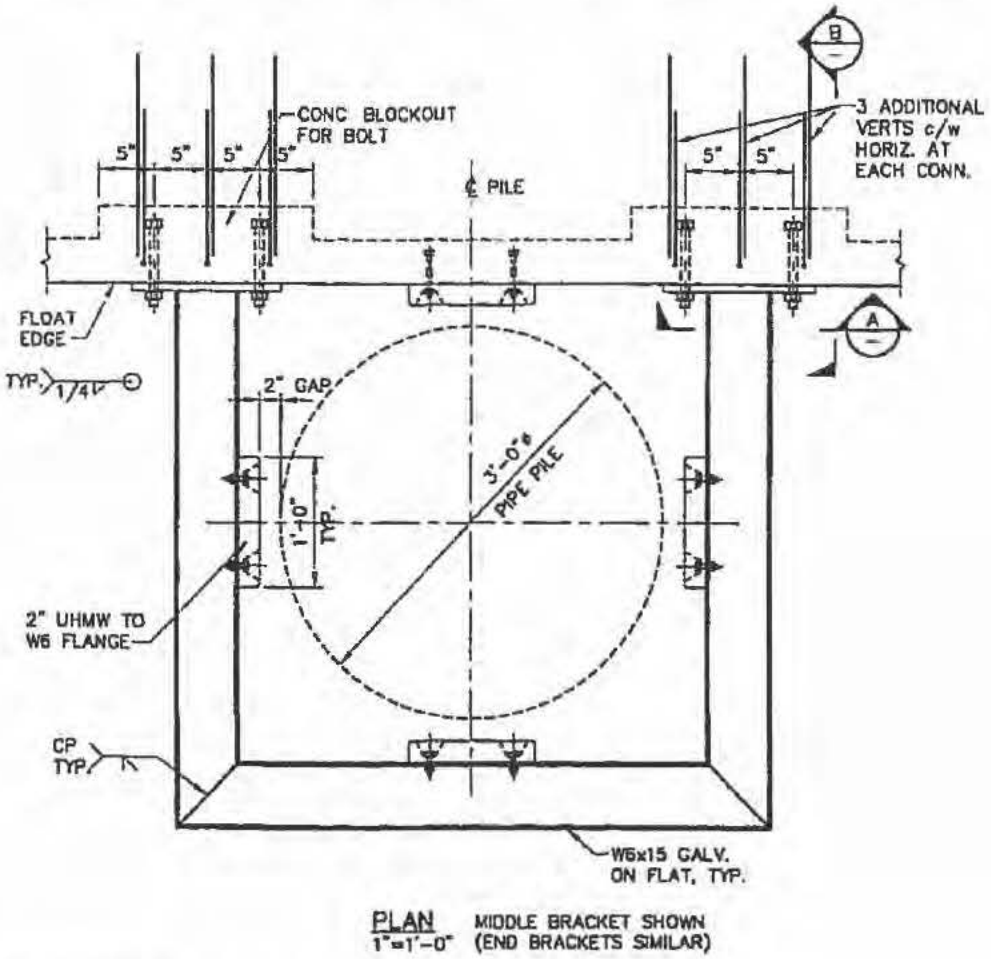


Figure No. 2: Originally installed mooring hoops.

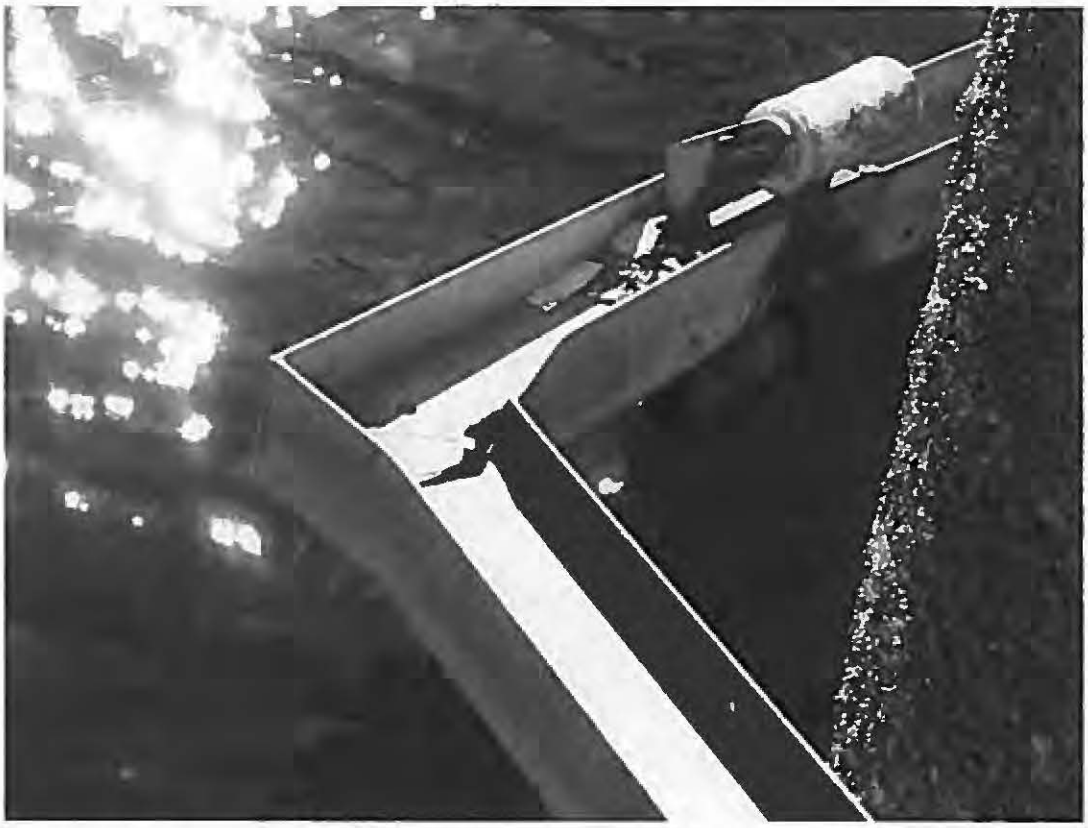
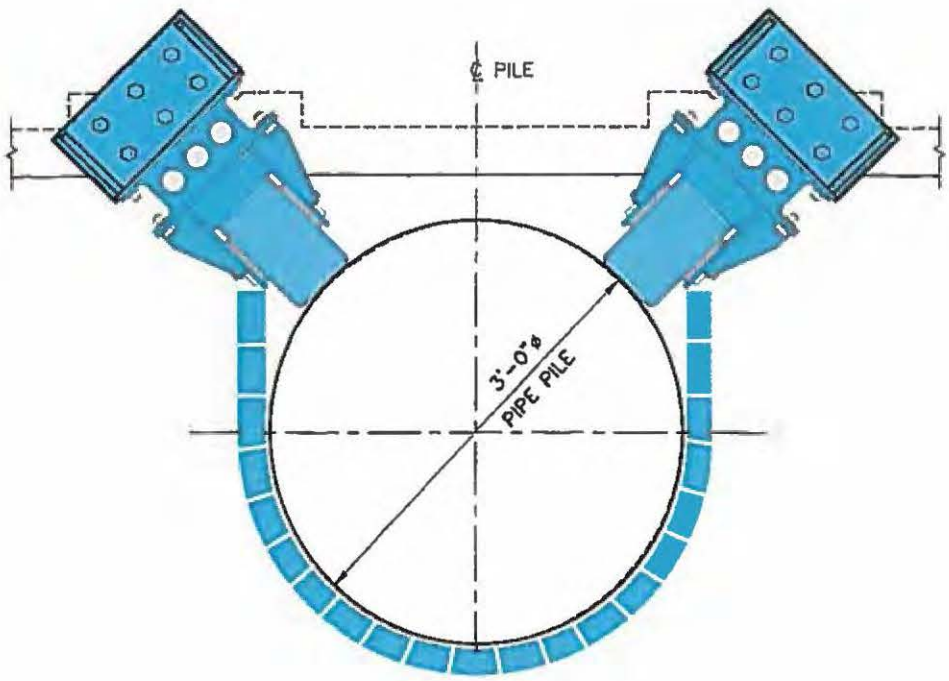


Photo No. 2: Modified mooring hoop with a pair of rollers replacing UHMW pad

A more robust mooring system that can accommodate the real wave conditions at the site and float vertical accelerations would likely reduce the overall wear and tear of the facility and associated maintenance costs going forward. The concept of rollers is appropriate to address vertical motions but it is clear that the current rollers on the existing mooring hoops are still imparting vertical loads into the steel hoops and causing them to fail the anchors into the floats. And the existing UHMW pads remaining on the floats are wearing out and resulting gaps allow for excessive horizontal motions of the floats.

A potential solution is a system of rollers between the float and the piles and a chain system with rollers that will keep the floats adjacent to the piles. A sketch with the potential solution is presented on the following page and photos of the individual components are provided for reference.

The energy absorption capacity of the roller fenders could also assist with allowing larger vessels than were originally anticipated to call at the facility by absorbing more berthing energy than the existing timber rubbing strips can. This is discussed further in the following section.



PLAN 1"=1'-0" MIDDLE BRACKET SHOWN (END BRACKETS SIMILAR)

Figure No. 3: Potential remedial solution for float mooring

Photo No. 3: Cushion roller fender

Photo No. 4: Chain pile guides with rollers

Vessel sizes

The original construction drawings indicate that the design vessel has a displacement of 15,000 lbs (6.8 tonnes) and an overall length of 35 ft (10.7 m). It is stated that the assumed vessel approach velocity is 1 ft per second (0.3 m/s), which relates to easy berthing geometry in an exposed metocean location (moderate wind and waves).

The floats have timber rub strips around the outside meaning that any dissipation of energy when a vessel berths against the floats must be taken by movement of the floats and horizontal displacement of the vertical piles in bending. It may be possible to accept larger vessels berthing at the facility if energy dissipation devices such as rubber fender elements are used to absorb energy. Other methods that are typically employed are to require larger vessels to approach with a lower velocity but this would be hard to enforce considering that most vessels using the facility only have stern propulsion, i.e. no side thrusters, and are not accompanied by tug boats.

The other limiting condition on vessel size is the capacity of the mooring cleats attached to the floats. The capacity of these cleats is not identified on the original drawings, only that 18" long cleats were used, but it is expected that these cleats can withstand a 5 tonne or 10 tonne line pull. A load rating can be performed to confirm the capacities of the cleats. Regardless of the actual capacity, these cleats are appropriate for smaller vessels that do not project high out of the water and would be pushed away from the floats by wind gusts towards the north.

The following photos show vessels that are known to have visited the facility with a note on whether the vessels exceed the original design vessel size.

Photo No. 5: Bowen Island Express (within original design criteria)

Photo No. 6: Coastal Clipper (exceeds original design criteria)

Photo No. 7: Coastal Runner (exceeds original design criteria)

Photo No. 8: Royal Canadian Navy vessels (exceeds original design criteria)

Cost Estimates

The following provides a high level, order-of-magnitude capital cost estimate for the repairs and upgrades based on the Associated Engineering's condition assessment report and our high level assessment. The estimate does not include any owner's costs or permitting costs, if required.

Table 1: Order-of-magnitude capital cost estimate

No.	Description	Units	Rate	Cost
1	Float 8 handrail repair	1	$1,500 ea.	$1,500
2	Float 1 handrail repair	1	$1,500 ea.	$1,500
3	Mooring pile 8 top plate repair	1	$600 ea.	$600
4	Floats 2 – 7 bull rail replacements allowance	30 m	$180/m	$5,400
5	New ladders	2	$5,500 ea.	$11,000
6	Replace mooring cleat	2	$500 ea.	$1,000
7	Tighten ramp grating clip	5	$25 ea.	$125
8	Ramp connection and bearing maintenance	2	$7,500 ea.	$15,000
9	Float pile mooring replacement	13	$6,500 ea.	$84,500
10	Allowance for float stabilizer repairs	1	$50,000	$50,000
Subtotal				**$170,625**
Condition assessment with underwater components				$12,000
Engineering and contingency (25%)				$42,656
Total (excluding taxes)				**$225,281**

Recommendations

Based on our review, we recommend the following next steps be undertaken by the Park Board:

- Engage a qualified consultant to complete an underwater condition assessment of the floats to look for cracks in the concrete and specifically focus on the condition of the stabilizers;
- Engage a qualified consultant or contractor to complete a condition assessment of the connections and bearings of the aluminium ramps (a contractor may be able to address any deficiencies at the time of the assessment while the ramps are temporarily supported);
- Complete an operational review to determine whether the facility should be upgraded to accept larger vessels than was originally designed for;
- Engage a qualified consultant or EPC team to design repairs and upgrades, assist with obtaining necessary permitting, and complete the work.

- If it is decided to form agreements with commercial marine operators to use the facility, engage with a maritime lawyer to address legal issues specific to this industry.

We trust that this memorandum will serve to assist with the Park Board's current discussions and review.

Please do not hesitate to contact us should you have any questions or require additional information.

Sincerely,

Daniel Leonard, MASc, PEng
Vice President
Westmar Advisors Inc.

Mike Warren
Business Development Manager
ICC Marine Services Ltd.

From: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
To: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date: 5/13/2018 7:28:34 PM
Subject: Fwd: Citizen Feedback-101011248406

Hi Ali,

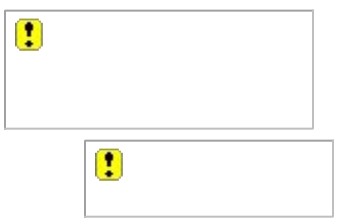
FYI

Sev

Please excuse the brevity of this email, it is being sent from my iPhone

Begin forwarded message:

> From: "311 Operations (Internal Use)" <311.Operations@vancouver.ca>
> Date: May 13, 2018 at 7:26:49 PM PDT
> To: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
> Subject: Citizen Feedback-101011248406
>
> Hello,
>
> Please review the following citizen feedback.
>
> Regards,
>
> Asha Sharda
> 3-1-1 Support Team



Citizen Feedback

Case number: 101011248406 Case created: 2018-05-13, 07:08:00 PM

Incident Location

Address: 1199 W CORDOVA ST, Vancouver,
Address2:
Location name: HARBOUR GREEN|HARBOUR GREEN PARK|HARBOUR GREEN PK|HARBOURGREENPARK|HARBOURGREENPK

Contact Details

Name: s.22(1)
Address: ,
Address2:
Phone: Email: s.22(1)
Alt. Phone: Preferred contact method: Either

Request Details

1.	Describe details (who, what, where, when, why):	We received a request through the VanConnect App from a citizen regarding the temporary fencing on the dock at Harbour Green Park. Apparently there are gaps in the fencing, so people are still parking their boats and accessing the dock through the gaps in the fencing at the end of the dock. Park Rangers attended and said there isn't anything more they can do to make it safe since it will just need some structural repair or possibly better fencing that will prevent people from doing this. If you require any further information, please contact us at 3-1-1 and please reference Case 11248327. Thank you.
2.	Type of feedback:	Complaint
3.	Feedback regarding:	City Department
4.	Department:	Parks
5.	Division or Branch Name:	Manager of Commercial Operations
6.	Were any other cases or service requests created as a result of this feedback?	Yes
7.	If Yes, provide case number(s) or other relevant details:	Original request was put through with VanConnect under Case 11248327
8.	(Don't ask, just record - did caller indicate they want a call back?):	No

Additional Details

Map and Photo

- no picture -

From: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
To: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
"Cowles, Chad" <Chad.Cowles@vancouver.ca>
"Keyzer, Rachel" <Rachel.Keyzer@vancouver.ca>
"Mack, Tiina" <tiina.mack@vancouver.ca>
"Normann, Howard" <howard.normann@vancouver.ca>
"Wilton, Shauna" <Shauna.Wilton@vancouver.ca>
Date: 5/13/2018 7:32:48 PM
Subject: Fwd: Publicstuff ~ Other park concern ~ Other park concern in

---

FYI

Sev

Please excuse the brevity of this email, it is being sent from my iPhone

Begin forwarded message:

> From: s.22(1)
> To: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
> Subject: Publicstuff ~ Other park concern ~ Other park concern in
>
> https://iframe.publicstuff.com/#?client_id=1085&request_id=4178352
>
> People continue to use the closed dock at Harbour Green as you can see from this photo taken today at 4.30... docking their boats and picking up passengers who simply climb through one of the many gaps in the fence (or simply remove the tape that has been put up across the gaps)
>
> Where are all the park rangers? In twelve years I have never seen one.


s.22(1)
s.22(1)

From:	"Foster, Ian" <Ian.Foster@vancouver.ca>
To:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date:	5/24/2018 5:11:43 PM
Subject:	Harbour green
Attachments:	ATT00001.txt

Sent from my iPhone

From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Doleman, Dane" <dane.doleman@vancouver.ca>
Date:	5/2/2018 8:08:08 PM
Subject:	Harbour Green Dock - Performance Specs & Drawings
Attachments:	Engineering and Public Works - Streets Structures Management - Structure Case Files - ENG - SED - STRUC - Seawall - CH - Coal ~ Shoreline Walkway (Bayshore , Coal Harbour and Harbour Green).tr5

Hi Dane,

I was wondering if you know who may have a copy of the performance specs and drawings used for the tender for the Harbour Green Dock that were prepared by Sandwell in late 1990s for Marathon? We've got the design-build drawings but they don't have any information about the vessel specs and general performance requirements. I also saw the files that were on VanDocs (link attached) which included the specs but not the tender/construction drawings (record drawings just reference IMFS set).

Many thanks,
Ali

From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Bone, Patricia" <patricia.bone@vancouver.ca>
Date:	5/15/2018 6:58:09 PM
Subject:	Harbour Green Dock - Signs on the entry gates
Attachments:	closure 4x3 copy-OL.EPS 2018_05_15_sign_locations.pdf

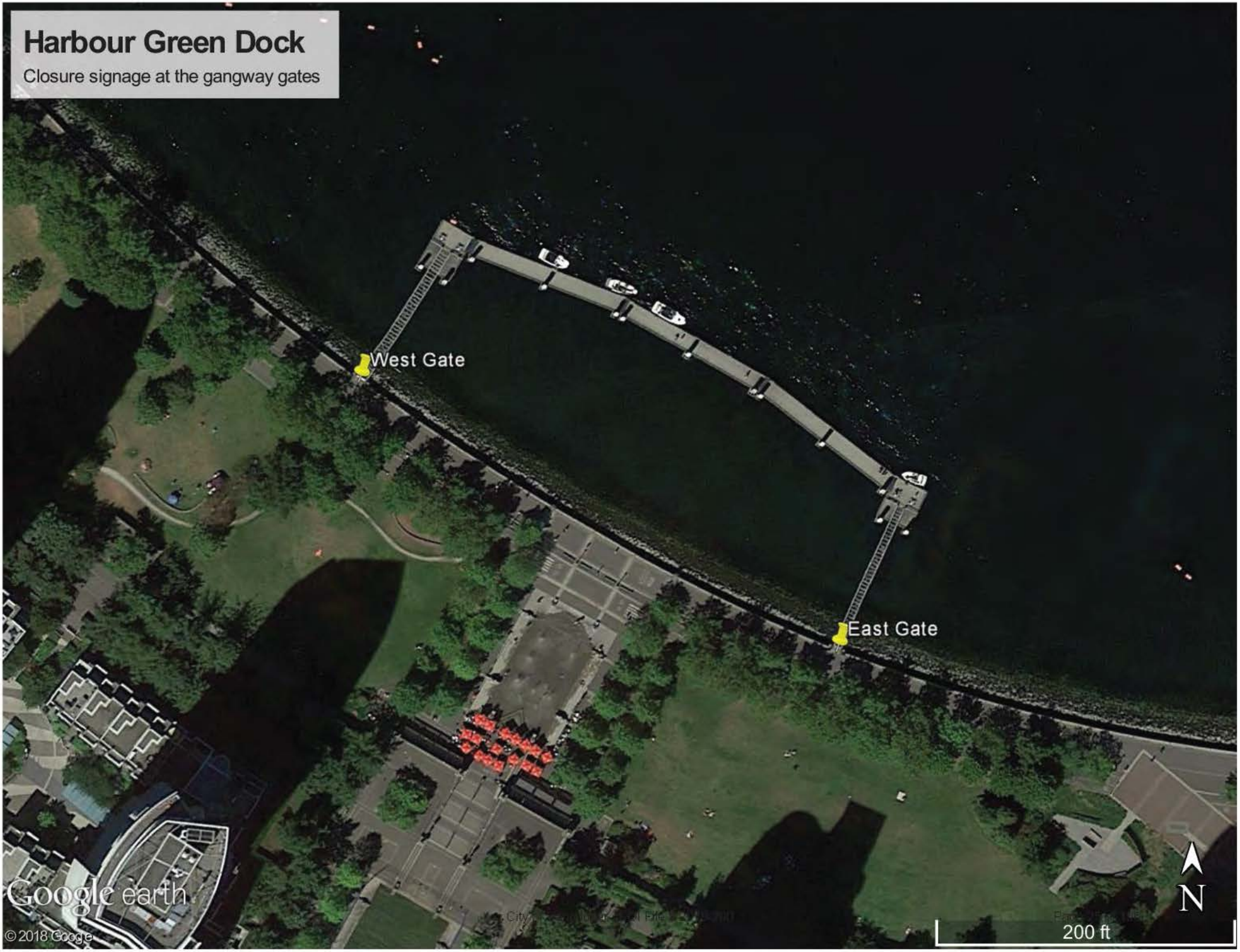
Hi Pat,

We continue to have problems with people accessing Harbour Green Dock. Ian's team are putting up additional fencing at both of the gates that lead to the dock to try and keep people off of the dock. I suspect that is going to happen later this week. It would be great if we could have one sign mounted on each fence facing the seawall pathway (2 signs total). I put in a work request a bit earlier.

I think you already have the graphics file, but I've attached it again for your reference.

The project WBS is CPP-00051-PB.

Thank you all for helping us with this situation!
Ali


Harbour Green Dock
Closure signage at the gangway gates
West Gate
East Gate
Google earth
© 2018 Google
N
200 ft

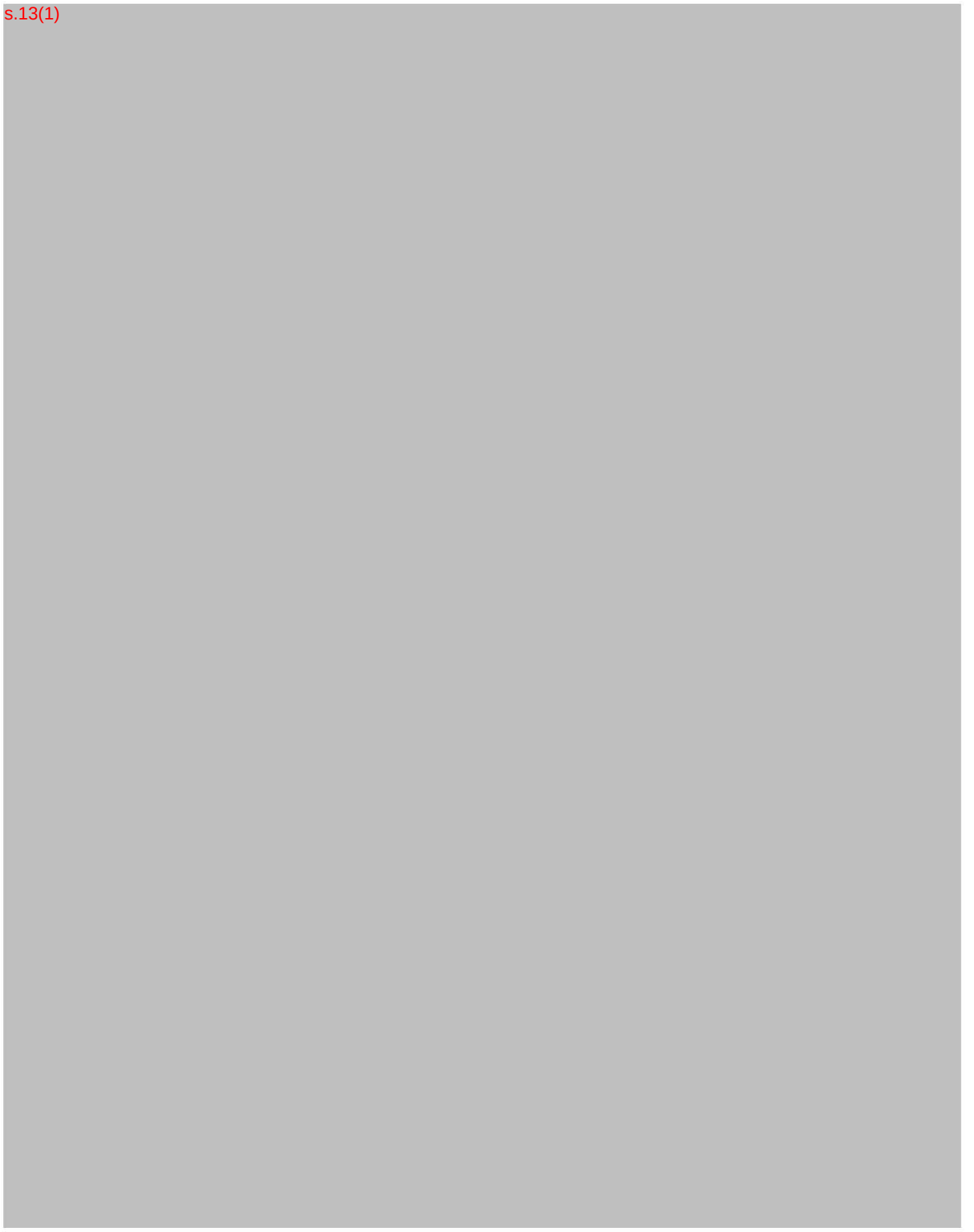
From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
Date:	5/23/2018 9:42:45 AM
Subject:	Harbour Green Dock
Attachments:	2018_05_22_harbour_green_update_draft.docx ATT00001.txt

Hi Sev,

Here is a draft of the information for the memo. Tiina hasn't had a chance to review. Feel free to edit and use whatever makes sense.

Thanks,
Ali

s.13(1)



s.13(1)

Regards,
Ali

From:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
To:	"Wilton, Shauna" <Shauna.Wilton@vancouver.ca> "Mack, Tiina" <tiina.mack@vancouver.ca>
Date:	5/23/2018 5:52:55 PM
Subject:	Harbour Green Dock Board memo
Attachments:	Memo to Board Harbour Green May 23 2018 Draft.docx

Hi Shauna,

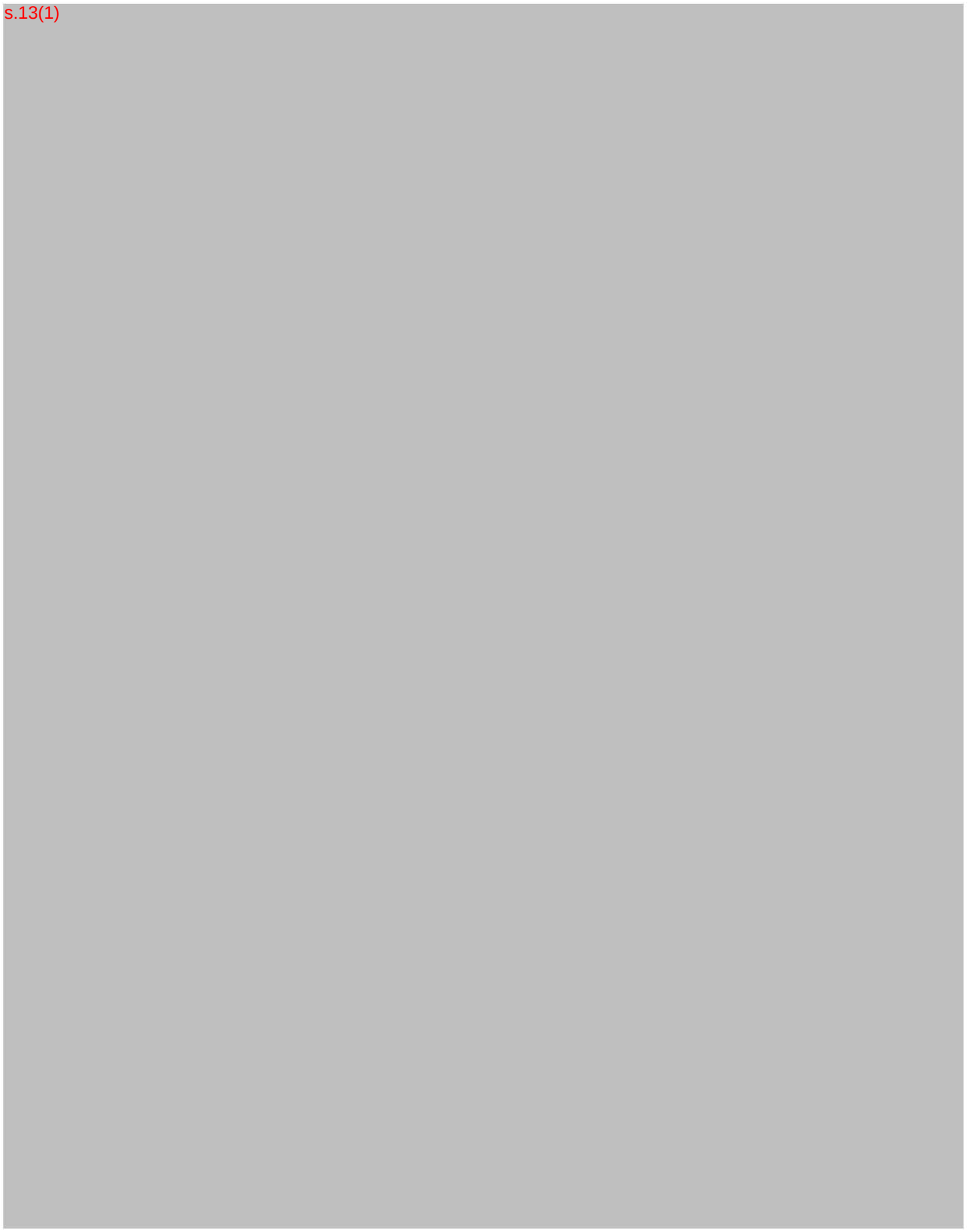
Attached is a draft memo to Board re dock.

I struggled a bit with next steps outlined in the second last paragraph

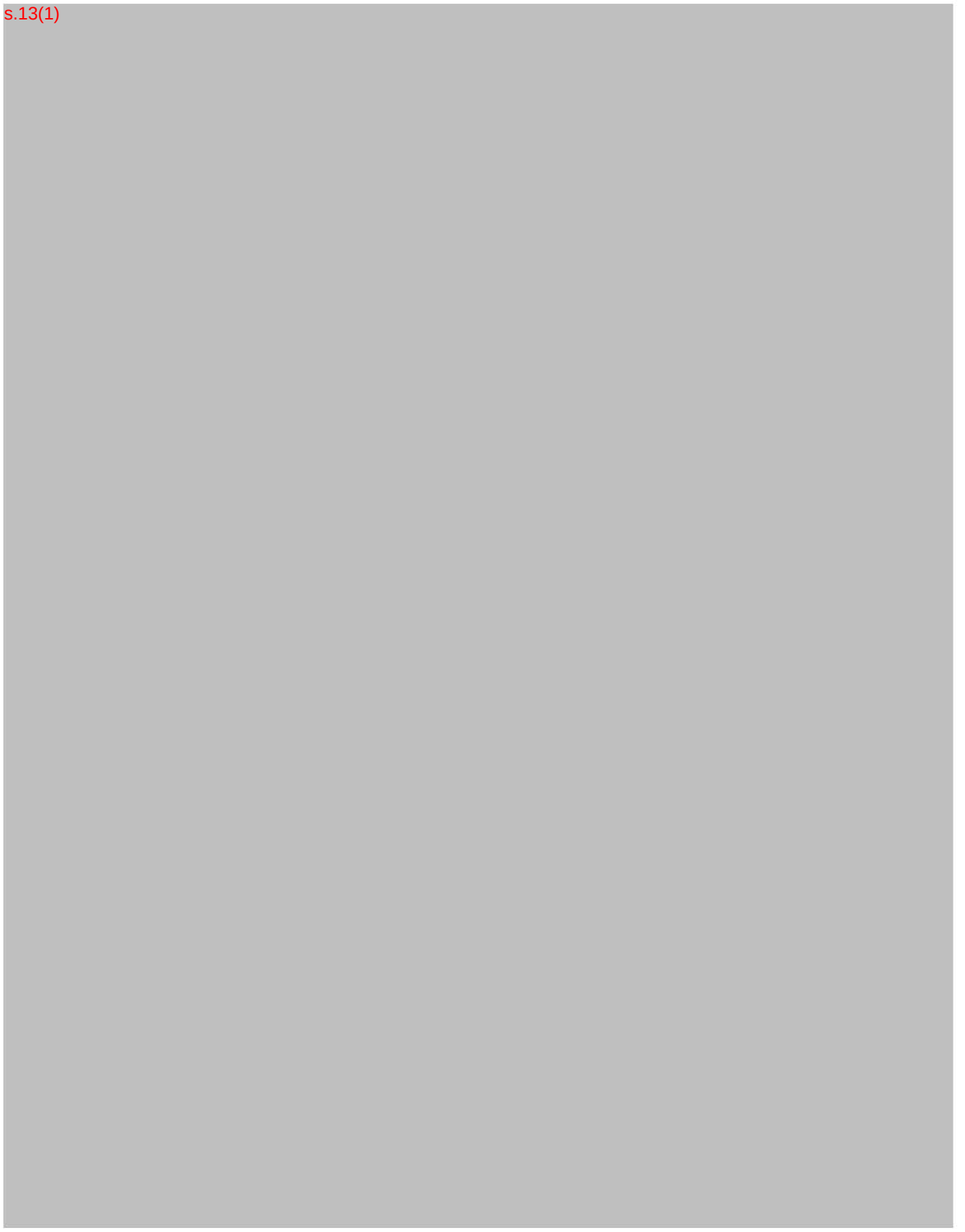
Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

s.13(1)

s.13(1)



s.13(1)



From:	"Mack, Tiina" <tiina.mack@vancouver.ca>
To:	"Araujo, Sev" <sev.araujo@vancouver.ca> "Nayeri, Ali" <ali.nayeri@vancouver.ca>
Date:	4/27/2018 12:01:41 PM
Subject:	harbour green dock board report

From:	"Mack, Tiina" <tiina.mack@vancouver.ca>
To:	"Araujo, Sev" <sev.araujo@vancouver.ca>
	"Nayeri, Ali" <ali.nayeri@vancouver.ca>
	"Mack, Tiina" <tiina.mack@vancouver.ca>
Date:	5/16/2018 3:49:39 PM
Subject:	harbour green dock presentation

s.15(1)(l)

Tiina Mack, Landscape Architect | Manager of Park Development
Vancouver Board of Parks and Recreation | 2099 Beach Avenue
t. 604.257.8471 tiina.mack@vancouver.ca

From:	PM.Notification@vancouver.ca
To:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date:	5/15/2018 8:03:02 PM
Subject:	PM Notification 10381393 created

Description: More closure signs at Harbour Green Dock
Notification: 10381393

Your work request has been received by the Work Control Centre and will be reviewed shortly.

Please keep this notification number for future reference. If you have any questions or do not receive a follow up within 72 hours, feel free to contact the Work Control Centre at 604-665-3456.

If this request is urgent please call the Work Control Centre, Monday to Friday, 7 am to 4:30 pm. Urgent requests outside of regular business hours (including weekends and holidays) should be submitted by calling Corporate Security at 604-873-7157.

This message was automatically generated. Please do not reply to this email.

From: "Mack, Tiina" <tiina.mack@vancouver.ca>
To: "Araujo, Sev" <sev.araujo@vancouver.ca>
Date: 4/27/2018 1:39:25 PM
Subject: RE: Board Report - Harbour Green

Yes, but we will need to pay someone to get real cost estimates, lets' talk next week

---

From: Araujo, Sev
Sent: Friday, April 27, 2018 12:57 PM
To: Mack, Tiina
Cc: Nayeri, Ali
Subject: RE: Board Report - Harbour Green

Hi Tiina,

Based on the attached email from February 6 and Memo to Board on February 8 from Malcolm (see paragraphs 5 & 6), we have assumed that you and Ali have been working on costing and associated work to upgrade docks for several types of commercial uses ... hopefully that is what you mean.

Please let me know if what is outlined in the memo if not what you mean

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Mack, Tiina
Sent: Friday, April 27, 2018 12:01 PM
To: Araujo, Sev
Cc: Nayeri, Ali
Subject: RE: Board Report - Harbour Green

Hi Sev,

All we can provide is a possible range, with a large contingency. To develop detailed costs will cost money. Also we don't know what order of vessel to plan for.

Why don't we get together next week to review our approach?

Ali was waiting on a third estimate, as he has one that is very high and one that is very low.

Cheers

Tiina

From: Araujo, Sev
Sent: Friday, April 27, 2018 11:59 AM
To: Kulchyski, Jessica
Cc: Mack, Tiina; Nayeri, Ali
Subject: RE: Board Report - Harbour Green

I cant produce anything without the information Tiina and Ali have bee working on in terms of costing.

Tiina?

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Kulchyski, Jessica
Sent: Thursday, April 26, 2018 2:07 PM
To: Araujo, Sev
Cc: Mack, Tiina; Nayeri, Ali
Subject: RE: Board Report - Harbour Green

Are you on track for June 2? We will need reports on May 22 by the end of the day.

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Sent: Thursday, April 26, 2018 11:04 AM
To: Kulchyski, Jessica
Cc: Mack, Tiina; Nayeri, Ali
Subject: Re: Board Report - Harbour Green

Won't be able to by May 14

Sev

Please excuse the brevity of this email, it is being sent from my iPhone

On Apr 26, 2018, at 9:32 AM, Kulchyski, Jessica <Jessica.Kulchyski@vancouver.ca> wrote:

For May 14?

From: Araujo, Sev
Sent: Wednesday, April 25, 2018 6:13 PM
To: Kulchyski, Jessica; Mack, Tiina; Nayeri, Ali
Subject: RE: Board Report - Harbour Green

Hi Jessica,

I am waiting on reports from consultants. Tiina and Ali will we be in a position to go to Board with costing for both the Pleasure Craft Rated and Commercial rated options?

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Kulchyski, Jessica
Sent: Wednesday, April 25, 2018 3:21 PM
To: Araujo, Sev
Subject: Board Report - Harbour Green

Hi Sev,

Just wanted to check to make sure you are on track for your June 4 Board report and presentation. Reports are due

no later than May 22 by the end of the day.

OR because you are amazing, if you could bump your report up for May 14 as we have had all of the planning/development reports drop off. We would need the report for May 1.

Let me know if its possible!
Thanks!

Jess

Tel: 604-257-8439
Jessica.Kulchyski@vancouver.ca
General Manager's Office
Vancouver Board of Parks and Recreation
2099 Beach Avenue
Vancouver, BC, V6G 1Z4

From:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
To:	"Mack, Tiina" <tiina.mack@vancouver.ca>
Date:	4/27/2018 12:57:26 PM
Subject:	RE: Board Report - Harbour Green
Attachments:	RE: Harbour Green Docks - Pilehoop replacement.msg Harbour Green Dock Closure.msg

Hi Tiina,

Based on the attached email from February 6 and Memo to Board on February 8 from Malcolm (see paragraphs 5 & 6), we have assumed that you and Ali have been working on costing and associated work to upgrade docks for several types of commercial uses … hopefully that is what you mean.

Please let me know if what is outlined in the memo if not what you mean

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Mack, Tiina
Sent: Friday, April 27, 2018 12:01 PM
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Cc: Nayeri, Ali
Subject: RE: Board Report - Harbour Green

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> **To:** Kulchyski, Jessica; Mack, Tiina; Nayeri, Ali
> **Subject:** RE: Board Report - Harbour Green
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> **Manager, Commercial Operations**
> Vancouver Park Board, City of Vancouver
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Jess

Tel: 604-257-8439
Jessica.Kulchyski@vancouver.ca
General Manager's Office
Vancouver Board of Parks and Recreation
2099 Beach Avenue
Vancouver, BC, V6G 1Z4

From: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
To: "Mack, Tiina" <tiina.mack@vancouver.ca>
"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date:
Subject: RE: Harbour Green Docks - Pilehoop replacement

From the emails it looks like an additional $50-$100; - provided we do not need to add piles. I have put it in the memo.

s.13(1)

s.13(1)

I am sure skys the limit but we should have some min and max commercial operations. I am happy to sit on the intial kick off meeting if you would like me to

Sev Araujo

Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Mack, Tiina
Sent: Tuesday, February 06, 2018 2:36 PM
To: Nayeri, Ali
Cc: Araujo, Sev

Subject: RE: Harbour Green Docks - Pilehoop replacement

Hi Ali,

On this, do we have an estimate of cost (design, administration and construction) to upgrade the dock to a commercial standard?

Is this something Associated Engineering can provide fairly quickly?

Sev is likely to prepare a Board report to outline our options and costs to obtain a decision.

Thank you

Tiina

From: Nayeri, Ali
Sent: Tuesday, February 06, 2018 12:19 PM
To: Araujo, Sev
Cc: Silva, Octavio; Mack, Tiina
Subject: FW: Harbour Green Docks - Pilehoop replacement

Hi Sev,

Here is the letter from AE. In light of all the issues and AE's recommendation, I think we should completely close off the dock since it is not possible to ensure compliance by commercial users.

Regards,

Ali

From: Mike Hanson [mailto:hansonm@ae.ca]
Sent: Tuesday, February 06, 2018 12:03 PM

To: Nayeri, Ali
Subject: RE: Harbour Green Docks - Pilehoop replacement

Thanks Ali, its difficult to tell for certain from our photos as well, where the brackets at the east landing were sitting previously.

Please find the letter attached as per your request. If you have any questions please don't hesitate to ask

Regards,

Mike Hanson, P.Eng.
Bridge Engineer
Associated Engineering (B.C.) Ltd.
#500 – 2889 East 12th Avenue, Vancouver, BC V5M 4T5
Tel: 604.293.1411 | Cel: 604.928.9853 | Direct: 236.317.2325

From: Nayeri, Ali [mailto:Ali.Nayeri@vancouver.ca]
Sent: Tuesday, February 06, 2018 9:23 AM
To: Mike Hanson <hansonm@ae.ca>
Subject: FW: Harbour Green Docks - Pilehoop replacement

Hi Mike,

I discussed this issue with Matt. His recollection is that the brackets on the east landing float were always lower. Unfortunately we don't have any baselines, so I can't say if it was like this or not. Regardless, I think we will need to do some rehabilitation work on the floats (especially concrete repairs).

I thought I should send you these photos as well. As a result of the large gaps around the piles, the floats are moving side to side, which means the gaps between them can increase and decrease quite significantly. Our fabrication shop had put in some brackets to support the rubber transition between the west landing float (float 1) and float 2. Those brackets are causing damage to the floats when they collide with each other.

Thanks,

Ali

From: Matt Tobias [mailto:matt@floatingstructures.com]
Sent: Saturday, February 03, 2018 11:03 AM
To: Nayeri, Ali
Subject: Re: Harbour Green Docks - Pilehoop replacement

Ali,

Pile 12 & 13, have been like that for quite sometime maybe even from the beginning, we can also address this when you get approval to move forward with the remediation

Cheers,

M

Sent from my iPhone

On Feb 2, 2018, at 4:51 PM, Nayeri, Ali <Ali.Nayeri@vancouver.ca> wrote:

Hi Matt,

I have provided your estimate to our management and I am just waiting to see how to proceed. In the meantime, I am a bit worried that conditions could get worse, so I try to visit there whenever I can. I was at the dock earlier today and noticed that the pile brackets 12 and 13 which are attached to the east landing float (float 8) are partially submerged in water. All other brackets are out of water (see attached photos). Unfortunately, I don’t have a baseline to compare to, but I was concerned that the float might either not be floating as high as it was intended to or was being prevented from moving up by something else.

Do you think this requires immediate investigation?

Thanks,

Ali

From: Nayeri, Ali
Sent: Friday, January 19, 2018 2:20 PM
To: 'Matt Tobias'
Subject: RE: Harbour Green Docks - Pilehoop replacement

Hi Matt,

I appreciate your quick responses to my questions. I am preparing a summary to discuss this with our senior management. This structure was not on our list of projects so with this information, we will need to figure out the funding piece.

I'll be in touch if we need more information.

Regards,

Ali

From: Matt Tobias [mailto:matt@floatingstructures.com]
Sent: Friday, January 19, 2018 11:55 AM
To: Nayeri, Ali
Subject: RE: Harbour Green Docks - Pilehoop replacement

Ali,

For our engineers to review new pilehoop design and provide shop drawings & engineering will be $2900. After design & engineering of the pilehoop it may cause us to update our pricing because of extras that are being recommended by the engineer?

Attached are the original engineering drawings for the project, you can see this dock was designed for 35ft vessel, although I would suspect that this was the original request not necessary the limits of the dock?

Regards,

Mathias Tobias

Senior Project Manager

imflogoIMFS International Marine Floatation Systems Inc.

9365 River Road, Delta, BC, Canada V4G 1B4

Tel (604)930-9903, (Ext. 2) Cell: 604-908-6889

Website <http://www.floatingstructures.com/> |Instagram <https://www.instagram.com/floatingstructures/?hl=en> |Linkedin <https://www.linkedin.com/in/mathias-tobias-19017510/> | Facebook <https://www.facebook.com/IMFS-International-Marine-Floatation-Systems-Inc-454054628018868/> |Pinterest <https://www.pinterest.com/floatingstruct/pins/>

From: Nayeri, Ali [mailto:Ali.Nayeri@vancouver.ca]
Sent: January-18-18 6:40 PM
To: Matt Tobias
Subject: RE: Harbour Green Docks - Pilehoop replacement

Hi Matt,

Thank you for preparing this budget proposal for us. I have the following questions:

a. The proposal states that the budget excludes engineering. Is additional engineering required for the repairs that you are proposing? If so, what would be the estimated cost of the engineering work.
b. How long will these repairs takes? I anticipate that there would be a need to close the dock during the repairs. As I had mentioned, there is a currently a ferry operation that uses the dock, so I need to give our management team a sense of the possible impact.
c. How long will the proposed repairs last? Is this a stop-gap measure or is this anticipated to resolve the issues?
d. Will these repairs allow the dock to continue to be used for commercial ferry operations? i.e. 8 scheduled docking/off-loading per day and average of 120 people loading/off-loading per day PLUS other non-scheduled commercial activity? If not what would that take / what is the issue preventing that?
e. What would be the largest vessel and weight allowable once repairs are done?
f. At the site meeting we discussed possibilities for dampening the motion of the floats in response to the waves in the inner harbour. I saw that you had included hard rubber sandwiched between the UHMW and the C channel for this. Will that last given the conditions there? Have you successfully used this design previously in similar conditions?
g. What are the expected maintenance requirements for the new pile brackets? Are there things that we could do to reduce the maintenance requirements?
h. Is there anything else that we can do to improve the resilience of the dock?

Thanks,

Ali

From: Matt Tobias [mailto:matt@floatingstructures.com]
Sent: Thursday, January 18, 2018 10:17 AM
To: Nayeri, Ali
Subject: Harbour Green Docks - Pilehoop replacement

Ali,

I apologize for the delay please see attached proposal for replacement of 13 pilehoops at Harbour Green Dock. Let me know if you have any questions or concerns?

Regards,

Mathias Tobias

Senior Project Manager

imflogoIMFS International Marine Floatation Systems Inc.

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<2018_02_02_pile_photos.pdf>

You may unsubscribe from Associated's electronic communications <mailto:unsubscribe@ae.ca?subject=Unsubscribe+from+AE+-+CASL> at any time.

From:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
To:	"Harper, Margo" <Margo.Harper@vancouver.ca> "Mack, Tiina" <tiina.mack@vancouver.ca> "Nayeri, Ali" <Ali.Nayeri@vancouver.ca> "Wojnarski, Daria" <Daria.Wojnarski@vancouver.ca>
Date:	
Subject:	Harbour Green Dock Closure
Attachments:	Memo to Board Harbour Green February 8 2018 Final.pdf

The following memo from Malcolm to the Board will be going out this afternoon re the closure of the Harbour Green Dock effective February 15.

Things to discuss at our meeting at 2

1) Public Messaging

2) Signage on dock

3) Timelines re scoping structure and costing associated with use conversion

Once the meeting is concluded and memo has gone out I will call the 2 commercial operators, Bowen Island Taxi and Pacific Ferries, and follow up with an email

Sev Araujo

Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: <mailto:Sev.Araujo@vancouver.ca> Sev.Araujo@vancouver.ca

VANCOUVER BOARD OF PARKS AND RECREATION

February 8, 2018

MEMO TO : Park Board Commissioners

FROM : Malcolm Bromley
General Manager, Vancouver Board of Parks and Recreation

SUBJECT : **Harbour Green Dock - update**

Dear Commissioners,

Further to my memo of November 1, 2017, the following is an update on the physical condition of the Harbour Green Dock and the viability of ongoing commercial services.

The dock was designed for, and historically restricted to, pleasure craft only with posted signage on the dock. Last summer we discovered two commercial operators running commuter and tour services from the dock as a result of public complaints. Pacific Ferries agreed to cease operations until a review of dock use was conducted by staff. Bowen Land and Sea Taxi, who was conducting commuter service, was given a temporary operating agreement until January 31, 2018. This was intended to provide time for a staff review to be completed and not disrupt the commuter service.

While the dock was originally meant to accommodate pleasure craft only, as a result of unregulated commercial activity over the years the infrastructure has prematurely degraded. In September 2017 an engineer specializing in dock infrastructure was retained to assess the condition of the dock and pilings and discovered long term capital and immediate maintenance issues requiring attention. Repairs were under taken in September and October to correct the maintenance concerns, and the long term capital requirements outlined by the engineer are being used to inform recommendations on the future leisure and commercial viability of the dock. Since the repairs, staff have visually inspected the dock on a monthly basis and recently discovered additional piling rings that have failed resulting in unsafe mooring conditions. A letter was received on February 5, 2018 from our third party engineer confirming this.

As the dock is not regularly patrolled, due to safety and liability concerns we must close the dock until such time it can be repaired. Bowen Land and Sea Taxi was going to be provided an extension to their temporary agreement, but given the safety and liability issues will now be asked to relocate their service to another dock by February 15, 2018.

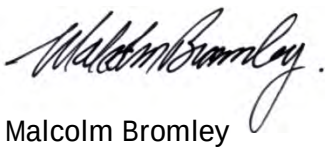
Repairs will be on hold until such time as a determination can be made as to the future permittable uses. It is estimated that $100,000 will be required to address the short and long term maintenance and capital issues which will allow for the continued restricted use of pleasure craft only. Staff are currently working with engineers to determine the additional improvement and costs required to allow both pleasure and commercial vessels to operate from the dock. It is estimated that this information will be available within 6 to 8 weeks. Taking costs into consideration, staff will come to the Board in Q2 with a recommendation to either maintain the current restricted use or to pursue the viability of changing the dock use to commercial use. If the latter is recommended and agreed to, please note public

consultation will be a part of the continued investigative process before coming back to the Board in Q3 with a final recommendation.

Dependent on the use, improvements to the dock can be designed and a contractor procured to undertake the repair work as early as Q4. In the interim, access to the dock from the park will restricted via the current gates at the top of the gangways and signage will be posted on the dock to advise boaters that the dock is temporarily closed.

In the interim should you have any questions, please feel free to contact me.

Regards,



Malcolm Bromley
General Manager - Vancouver Board of Parks and Recreation

/sa

From: "Mack, Tiina" <tiina.mack@vancouver.ca>
To: "Kulchyski, Jessica" <jessica.kulchyski@vancouver.ca>
"Araujo, Sev" <sev.araujo@vancouver.ca>
Date: 4/30/2018 1:25:36 PM
Subject: RE: Board Report - Harbour Green

We are going to review this, this week...

From: Kulchyski, Jessica
Sent: Monday, April 30, 2018 1:01 PM
To: Araujo, Sev
Cc: Mack, Tiina; Nayeri, Ali
Subject: RE: Board Report - Harbour Green

Tiina, Ali,

Do you know if this will be going forward on June 4?

Jess

From: Araujo, Sev
Sent: Friday, April 27, 2018 11:59 AM
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Tel: 604-257-8439
Jessica.Kulchyski@vancouver.ca
General Manager's Office
Vancouver Board of Parks and Recreation
2099 Beach Avenue
Vancouver, BC, V6G 1Z4

From:	"Dykstra, Justin" <Justin.Dykstra@vancouver.ca>
To:	"Embley, Erin" <Erin.Embley@vancouver.ca>
Date:	4/11/2018 3:57:30 PM
Subject:	RE: bute street dock

Hi Erin,

If he means the dock at Harbour Green Park that is one of Ali's projects.

JUSTIN DYKSTRA Senior Landscape Architect
VANCOUVER BOARD OF PARKS AND RECREATION | PLANNING AND OPERATIONS | PARK DEVELOPMENT
2099 Beach Avenue Vancouver BC V6G1Z4 | **T** 604.257.8403 | **M** 604.836.5842 | **E** justin.dykstra@vancouver.ca | **W** vancouver.ca

---

From: Embley, Erin
Sent: Wednesday, April 11, 2018 3:36 PM
To: Dykstra, Justin
Subject: FW: bute street dock

Hi Justin,
Do you know who I should put Brad in touch with regarding this project?
Thanks,
Erin

From: Brad Taipalus [mailto:director1@bcpilots.com]
Sent: Wednesday, April 11, 2018 10:16 AM
To: Embley, Erin
Subject: bute street dock

Erin,
This e-mail is regarding the status , timelines of work to be done on the Bute street dock
If you could get back to me or pass on the person in charge of the project
Thank you

Captain Brad Taipalus
British Columbia Coast Pilots
Director1@bcpilots.com
604-688-0291 ext. 310

From: "Silva, Octavio" <Octavio.Silva@vancouver.ca>
To: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date: 4/11/2018 9:51:07 PM
Subject: RE: Canadian Navy Vessel Specs

If we were to designate a portion of Harbour Green for commercial operations, then my initial thought is that you'd upgrade the dock to accommodate the categories of vessels and operations for which there is a business case (be it Park Board or third party operator). Vessels that fall within the engineering and load limits of the upgraded dock could use the facility; those that fall outside these parameters would not be eligible.

s.13(1)

Thanks,
Octavio

From: Araujo, Sev
Sent: Wednesday, April 11, 2018 7:19 PM
To: Silva, Octavio
Subject: Fwd: Canadian Navy Vessel Specs

Sev

Please excuse the brevity of this email, it is being sent from my iPhone

Begin forwarded message:

> **From:** "Araujo, Sev" <Sev.Araujo@vancouver.ca>
> **Date:** April 11, 2018 at 7:19:03 PM PDT
> **To:** "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
> **Subject: Re: Canadian Navy Vessel Specs**
>
> I don't think so and Octavio can confirm.
>
> Having said that we should know what it would cost to upgrade dock to accommodate this type of operation in case we get asked on June 4
>
> Sev
>
> Please excuse the brevity of this email, it is being sent from my iPhone
>
> On Apr 11, 2018, at 5:15 PM, Nayeri, Ali <Ali.Nayeri@vancouver.ca> wrote:
>
> > Thanks Sev.
> >
> > So we want to accommodate these types of vessels as well?
> >
> > The other parameter that we need from the operators is the windage area unloaded (ballast). Some vessels may not be that heavy, but if they are moored on windy days they can impart a large load on the dock.
> >
> > I have pictures of MV Brittania (Harbour Cruises & Events) trying to berth at the dock (attached). This is probably 100 ft. long and can carry up to 450 passengers. In addition the windage area is pretty big too. Does this type of vessel also fall within our commercial operations range?
> >
> > Thanks,
> > Ali
>
> ---
>
> **From:** Araujo, Sev
> **Sent:** Wednesday, April 11, 2018 4:10 PM
> **To:** Nayeri, Ali
> **Subject:** Canadian Navy Vessel Specs
>
> Hi Ali,
>
> As you start collecting specs, please add Canadian Navy I discovered last week has used the dock when they do Diver Training in False Creek/Coal Harbour
>
> Vessel is 80ft long and weighs 200 tons … yes 200 tons
>
> **Sev Araujo**
> **Manager, Commercial Operations**
> Vancouver Park Board, City of Vancouver
> o. 604 257 8436 / f. 604 257 8427
> Email: Sev.Araujo@vancouver.ca

From: "Silva, Octavio" <Octavio.Silva@vancouver.ca>
To: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date: 4/12/2018 11:39:37 AM
Subject: RE: Commercial Operators at Harbour Green

Not necessarily. My understanding is that at this stage, the objective is to compile the vessel specs for companies that have used the dock in the past or that could likely be interested in using the dock in the future (e.g. vessels in the Vancouver marketplace). I see that information informing what levels of investment would be required to handle different classes/sizes of vessels but that doesn't mean that we'd accommodate every vessel on the list.

Ultimately, our investment in the facility needs to be business case justified. So if there's no business case for investing beyond a certain vessel size/class envelope, then vessels exceeding that envelope would be excluded from using the dock.

Let me know if you have any questions/require additional information/or wish to discuss further.

Thanks,
Octavio

From: Nayeri, Ali
Sent: Thursday, April 12, 2018 9:21 AM
To: Silva, Octavio
Cc: Araujo, Sev; Jung, Jenny
Subject: RE: Commercial Operators at Harbour Green

Hi Octavio,

Some of the vessels that these companies operate are quite large. Fairweather Cruises and Events has some very large ships including MV Britannia on their list. Attached is a picture of Britannia berthing at the dock. Is the expectation that we accommodate this type of vessel?

Thanks,
Ali

From: Silva, Octavio
Sent: Wednesday, April 11, 2018 10:30 PM
To: Araujo, Sev; Jung, Jenny
Cc: Nayeri, Ali
Subject: RE: Commercial Operators at Harbour Green

Sev and Ali,

In addition to Pacific Ferries, Bowen Island Water Taxi and some of the other intermittent users (VPD Marine Squad, Port Metro Vancouver, Canadian Navy, tug companies, etc.) that have come to our attention in recent months (and which I believe will be on Sev's list), the following companies have expressed an interest in conducting commercial activities at Harbour Green Dock.

James Hodgson
Sunset Bay Yacht Group (tours)
604-689-1227
james@sunsetbaycharters.net

George Bartel
Cantrav Services (tours)
604-708-2550
gbartel@cantrav.com

Pat Miller or Jane Boddy
Fairweather Cruises and Events (tours)
604-438-4960
pat@fairweathercruises.com or jane@fairweathercruises.com

Alan McGillivray
Prince of Whales Tours (tours)
250-889-2009

Jason Bryan
WESTCOAST Sightseeing (tours and possibly transportation/commuters services)
604-451-1600 ext 401
jasonb@westcoastsightseeing.com

Once a consolidated list of know and interested users has been compiled, perhaps it could be circulated for review to ensure that we haven't missed any potential operators.

Unfortunately, I don't have the vessel specs for the aforementioned companies, and with 4/20 next Friday and several other time critical files on our respective desks, neither Jenny nor I have the capacity to track down this information for several weeks, so hopefully someone from your respective teams will be able to contact these companies to obtain this information.

In addition to the vessel specs, we should also compile a list of categories for potential operations, since not all activities are created equal and have different impacts (e.g. small vessel/high frequency, large vessel/low frequency, etc.).

That's all for now; let me know if you have any questions/require additional information.

Thanks,
Octavio

From: Araujo, Sev
Sent: Wednesday, April 11, 2018 4:07 PM
To: Silva, Octavio; Jung, Jenny
Cc: Nayeri, Ali
Subject: Commercial Operators at Harbour Green

Hi Octavio and Jenny,

Looks like Ali and I will be going to Board on June 4th re direction on dock.

Ali needs some specs for the consultant. I have reached out to the operators I am aware of and would like to know of who from the BDev side and Special Events side you think you would like open the dock up to and or continue with.

Ali needs the following info from your contacts within the next week or so

- Length of vessel
- Weight of vessel (loaded/unloaded)
- max passengers

The more specs you can provide the better.

Thank you

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From:	"Wilton, Shauna" <Shauna.Wilton@vancouver.ca>
To:	"Mack, Tiina" <tiina.mack@vancouver.ca>
Date:	5/4/2018 1:41:16 PM
Subject:	RE: Discussion: Harbour Green Dock

Thanks Tiina. This is now on the Mayor's radar so we've been asked to address for council and commissioners asap. I think Sev is trying to get time before I'm off s.22(1)

-----Original Appointment-----
From: Mack, Tiina
Sent: Friday, May 04, 2018 11:00 AM
To: Wilton, Shauna
Subject: Tentative: Discussion: Harbour Green Dock
When: Wednesday, May 09, 2018 3:30 PM-4:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Park Board - Stanley District Meeting Room

Looks like there is an REFM/Directors meeting at this time, I can try to slip out to attend this one but can't guarantee it

From:	"Silva, Octavio" <Octavio.Silva@vancouver.ca>
To:	"Jason Bryant" <jasonb@westcoastsightseeing.com>
Date:	5/3/2018 3:35:40 PM
Subject:	RE: Harbour Green Dock - Letter of Interest

Hi Jason,

Sorry for the delay in getting back to you regarding the correspondence below.

At this time, we're in a bit of a holding pattern while we await the results of an engineering study which is being conducted to determine both the extent of the required repairs to ensure safe operation of the dock from a recreational boating perspective, as well as the needed/recommended investments to enable the dock to potentially accommodate commercial boating operations.

We will also be engaging our Board in the near future to update them on the asset, review issues/opportunities, and seek direction on whether they support further exploration of commercial operations at Harbour Green Dock. Clarity will also be sought from the Board on the steps that would need to be followed/executed to ensure appropriate stakeholder support, business viability assessment, and service delivery model identification.

Your interest in the Harbour Green Dock has been duly documented, however, I would suggest holding off on a meeting until the aforementioned steps have been completed. Once we have more information and direction, then we'd be happy to sit down and discuss potential opportunities involving this asset at that time.

Kind Regards,
Octavio

From: Jason Bryant [mailto:jasonb@westcoastsightseeing.com]
Sent: Wednesday, April 11, 2018 7:14 AM
To: Silva, Octavio
Cc: Robert Safrata
Subject: Harbour Green Dock - Letter of Interest

Hello Octavio,
I hope you had a great holiday.
Please find attached a letter from Robert regarding our interest to work with the Vancouver Park Board in the revitalization of the Harbour Green Dock.

Thank you for your time.
We look forward to hearing from you.

Jason
- - - - - - - - - - - - - - -
JASON BRYANT | Vice President, Sales + Marketing | WESTCOAST Sightseeing
jasonb@westcoastsightseeing.com | (604) 451-1600 ext 401 | WESTCOAST Sightseeing | Dinner in the Sky | SNOWBUS

From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Doleman, Dane" <dane.doleman@vancouver.ca>
Date:	5/3/2018 4:16:57 PM
Subject:	RE: Harbour Green Dock - Performance Specs & Drawings

Thanks Dane.
I am glad that you at least have the specs. We didn't even have that on our end!
Regards,
Ali

From: Doleman, Dane
Sent: Thursday, May 03, 2018 9:26 AM
To: Nayeri, Ali
Subject: RE: Harbour Green Dock - Performance Specs & Drawings

Ali,

Unfortunately whatever is contained within is all we have right now.

Regards,
Dane

From: Nayeri, Ali
Sent: Wednesday, May 02, 2018 8:08 PM
To: Doleman, Dane
Subject: Harbour Green Dock - Performance Specs & Drawings

Hi Dane,

I was wondering if you know who may have a copy of the performance specs and drawings used for the tender for the Harbour Green Dock that were prepared by Sandwell in late 1990s for Marathon? We've got the design-build drawings but they don't have any information about the vessel specs and general performance requirements. I also saw the files that were on VanDocs (link attached) which included the specs but not the tender/construction drawings (record drawings just reference IMFS set).

Many thanks,
Ali

From: "Mack, Tiina" <tiina.mack@vancouver.ca>
To: "Araujo, Sev" <sev.araujo@vancouver.ca>
"Nayeri, Ali" <ali.nayeri@vancouver.ca>
Date: 5/24/2018 8:55:51 AM
Subject: RE: Harbour Green Dock Board memo

Nicely said! Thanks for keeping me in the loop.

Cheers

Tiina

From: Araujo, Sev
Sent: Wednesday, May 23, 2018 5:53 PM
To: Wilton, Shauna; Mack, Tiina
Cc: Nayeri, Ali
Subject: Harbour Green Dock Board memo

Hi Shauna,

Attached is a draft memo to Board re dock.

I struggled a bit with next steps outlined in the second last paragraph

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Foster, Ian" <Ian.Foster@vancouver.ca>
Date:	5/24/2018 5:40:20 PM
Subject:	RE: Harbour Green Dock Fence

Thanks Ian, I'll let Sev and Shauna know. I'm sure people will try other means!
Appreciate you letting me know after hours ☺
Ali

From: Foster, Ian
Sent: Thursday, May 24, 2018 5:10 PM
To: Nayeri, Ali
Subject: Re: Harbour Green Dock Fence

Yes panels were added to the top of the float there were locked together as people undid the wires now you need bolt cutter to get in also sign shop installed new signs to the panels at the top of the ramp

Dwayne and manny will finish at vanier tomorrow morning

Sent from my iPhone

On May 24, 2018, at 4:08 PM, Nayeri, Ali <Ali.Nayeri@vancouver.ca> wrote:

> Hi Ian,
>
> I was wondering if you could give me an update on the Harbour Green Dock situation. Have your crew managed to install additional fencing at the entry gates? I wanted to follow-up with the sign shop, but thought I should confirm that the fence is up before asking that the signs be mounted.
>
> I was also wondering if Duane and Manny have managed to go back and finish the beach raft chain installs.
>
> I know your crew is incredibly busy and I appreciate the help ☺
>
> Thanks,
> Ali

From: "Foster, Ian" <Ian.Foster@vancouver.ca>
To: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date: 4/16/2018 1:55:37 PM
Subject: RE: Harbour Green Dock Fencing

Yes we will get that fixed for you Ali

Ian

From: Nayeri, Ali
Sent: Monday, April 16, 2018 12:58 PM
To: Foster, Ian
Cc: Lead Ranger
Subject: FW: Harbour Green Dock Fencing

Hi Ian,
The fence at Harbour Green has been cut again. Would your crew be able to fix it sometime this week?
Many thanks,
Ali

From: Keyzer, Rachel
Sent: Monday, April 16, 2018 12:54 PM
To: Nayeri, Ali
Cc: Lead Ranger
Subject: Harbour Green Dock Fencing

Hi Ali,

Just an FYI – the fencing at Harbour Green dock has been cut. Rangers will head there today and caution tape the area, but the fencing will need to be repaired/replaced.

Please let me know if you have any questions.

Rachel Keyzer | Lead Park Ranger| By-Law Enforcement Portfolio
Vancouver Board of Parks and Recreation <http://vancouver.ca/your-government/vancouver-board-of-parks-and-recreation.aspx> | 2099 Beach Avenue
t. 604.257.8528 | c. s.15(1)(l)
rachel.keyzer@vancouver.ca

information herein without permission.

From: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
Date: 5/18/2018 4:36:19 PM
Subject: RE: Harbour Green Dock Memo

Hi Sev,
I am working on it now and will review with Tiina on Tuesday.
Thanks,
Ali

From: Araujo, Sev
Sent: Friday, May 18, 2018 11:07 AM
To: Wilton, Shauna
Cc: Nayeri, Ali; Mack, Tiina
Subject: RE: Harbour Green Dock Memo

Ok I am working on my end as is Ali and Tiina.

Everyone goal would be to finalize to Shauna by Wednesday given Monday Stat.

Ali Tiina, Tuesday?

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Wilton, Shauna
Sent: Friday, May 18, 2018 9:49 AM
To: Araujo, Sev
Cc: Nayeri, Ali; Mack, Tiina
Subject: RE: Harbour Green Dock Memo

No same thing but want to get it out ASAP and include reference to this meeting.

Thanks,
Shauna

From: Araujo, Sev
Sent: Thursday, May 17, 2018 6:59 PM
To: Wilton, Shauna
Cc: Nayeri, Ali; Mack, Tiina
Subject: RE: Harbour Green Dock Memo

Is this over and above the memo that we are working on for the Board that replaces the June 14 presentation, ie an overview of yesterdays meeting?

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Wilton, Shauna
Sent: Thursday, May 17, 2018 4:15 PM
Sev
arbour Green Dock Memo

Hi Sev,

Knowing the electeds are about to get another round of communications from the Bowen Island group, can you draft a quick update memo to council/Park Board?

Thanks,
Shauna

Shauna Wilton | Deputy General Manager
Vancouver Park Board | 2099 Beach Avenue
t. 604.718.6248
shauna.wilton@vancouver.ca

From: "Mack, Tiina" <tiina.mack@vancouver.ca>
To: "Nayeri, Ali" <ali.nayeri@vancouver.ca>
Date: 5/28/2018 1:19:38 PM
Subject: RE: Harbour Green Park Dock

Thank for following up on this Ali, I think we have done all we can.

Hopefully Ian and the rangers can keep an eye on this and make repairs to the fencing and signage in place until we have further direction

Cheers

Tiina

From: Nayeri, Ali
Sent: Friday, May 25, 2018 7:35 PM
To: Araujo, Sev
Cc: Jung, Jenny; Collins, Tim; Koop, Donald; Mack, Tiina
Subject: RE: Harbour Green Park Dock

Hi Sev,

I was going to send you a couple of my own photos of the fences yesterday evening but never got around to it.

Ian was not able to do anything else on the water side to keep people from accessing the dock, so we had not option but to put up higher fencing at the entrances. Someone had tried to even remove this fence on Wed/Thu. So now the panels are chained together and to the entry fence for additional security. I hope that is okay.

Thanks,
Ali

From: Araujo, Sev
Sent: Friday, May 25, 2018 5:15 PM
To: Nayeri, Ali
Cc: Jung, Jenny; Collins, Tim; Koop, Donald
Subject: FW: Harbour Green Park Dock

Ali FYI

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Collins, Tim
Sent: Friday, May 25, 2018 4:43 PM
To: Araujo, Sev
Subject: Fwd: Harbour Green Park Dock

See the email stream below

Sent from my iPhone

Begin forwarded message:

From: "Jung, Jenny" <jenny.jung@vancouver.ca>
To: "Collins, Tim" <Tim.Collins@vancouver.ca>
Subject: FW: Harbour Green Park Dock

Is the fencing going to remain until July 1?

From: Dodich, Frank
Sent: Friday, May 25, 2018 3:11 PM
To: Jung, Jenny
Cc: Koop, Donald
Subject: Harbour Green Park Dock

Hi Jenny,

I was by Harbour Green Park and saw that the wharf now has fencing around the gates/ramps (see attached photos).

Is this fencing set to stay in place on July 1? If so we do not require the signs from the sign shop.

If the fencing is set to stay then it will have to be adjusted and secured with tie wraps as the steel wire poses a hazard to the public as it has been installed.

Please advise so we can cancel the sign order.

Frank

Frank Dodich| Manager, Special Event Public Safety
FASE | Engineering Services | City of Vancouver
t. 604.257.8748 | c. 604.404.0334
frank.dodich@vancouver.ca

From:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
To:	"Collins, Tim" <Tim.Collins@vancouver.ca>
	"Dejong, Uultsje" <Uultsje.Dejong@vancouver.ca>
Date:	5/4/2018 10:04:36 AM
Subject:	RE: Harbour Green Park Wharf

I Had run it by risk at the time and what we had was sufficient.

Having said that I would defer to Uultsje. If we pursue hoping we can find better wording. s.13(1)

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Collins, Tim
Sent: Friday, May 04, 2018 9:42 AM
To: Araujo, Sev
Cc: Nayeri, Ali
Subject: FW: HArbour Green Park Wharf

FYI – any comments

Tim Collins
604-257-8437

From: Jung, Jenny
Sent: Friday, May 04, 2018 9:41 AM
To: Dodich, Frank; Penton, Christopher; Collins, Tim
Subject: RE: HArbour Green Park Wharf

Hi Frank,
I will forward this request to Revenue Services. Please send the dimensions of the proposed signs when you have them.

Jenny

From: Dodich, Frank
Sent: Friday, May 04, 2018 9:28 AM
To: Jung, Jenny; Penton, Christopher
Subject: HArbour Green Park Wharf

Hi Jenny and Chris,

During our last Canada Day meeting Chris mentioned that Parks may engage Corporate Security to provide a guard at the Harbour Green Park Wharf.

After a site visit it was determined that the best course of action to protect the public and the City against risk may be to Provide two Coroplast signs, the width and height of the ramp, and secure one sign at each gate to the wharf.
The gates to the wharf are bolted and locked with a padlock. A sign installed at the top of each ramp, behind the gate, would not only be a written warning ("Danger – NO TRESPASSING") but also a physical barrier. If you ordered the signs, we could pick them up and have them installed.

Further, the dock is secured with fencing all around the dock. Should vessels moor to the dock, we can call on our marine resources to clear them.

Of course this would not relieve the Rangers from periodically checking the wharf.

Thoughts?

Frank

Frank Dodich| Manager, Special Event Public Safety
FASE | Engineering Services | City of Vancouver
t. 604.257.8748 | c. 604.404.0334
frank.dodich@vancouver.ca

From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Mike Warren" <mwarren@iccmarine.com>
Date:	5/7/2018 5:25:04 PM
Subject:	RE: Harbour Green Public Dock Repairs
Attachments:	Coal Harbour Development Phase 3 - Specifications - Sandwell.pdf

Hi Mike,

I just wanted to thank you and Daniel for such a well thought out memo. I really appreciate it. I've had a chance to review this with my manager and another one of my colleagues. We are planning to go to our board with some options and recommendations, so we were hoping to have a few details worked out this week. The intent is to give the board two choices:

1. Design and install new brackets that would work with the environmental conditions at the site and the original design vessel
2. Design and rehabilitate the entire dock so that it could accommodate larger taxi vessels. There is an understanding that there will have to be some sort of third party administrator for the commercial operations to make sure compliance.

I believe your memo covers the first option.

However, in your opinion, is it feasible to accommodate larger commercial vessels which currently exceed the original design criteria? What we are thinking is vessels of similar class as Pacific Ferries' Coastal Clipper (photo 6 in your memo). Could you also comment on the following:

- Is there a component which really limits how much further the dock can be pushed in terms of larger vessels? It seems the brackets were under designed from the very beginning and continue to be an issue. However, it seems we may have options in improving the design. But I suspect changes to the floats, piles or gangways is not going to be so simple/feasible.
- s.13(1) [redacted]
- Could you give a very rough estimate of the potential construction costs for an upgrade like this?

I managed to do a bit more digging and find Sandwell's specs for the dock (attached).

Thanks again,
Ali

From: Mike Warren [mailto:mwarren@iccmarine.com]
Sent: Monday, May 07, 2018 10:11 AM
To: Nayeri, Ali
Subject: FW: Harbour Green Public Dock Repairs

Ali,

Just a short note to follow up to see if you had any questions regarding our report and to ask what the schedule might be for moving forward?

Have a nice day.

Regards
Mike

Mike Warren

Business Development Manager

ICC Marine Services Ltd.
16 Fawcett Road, Suite 102
Coquitlam, BC Canada V3K 6X9

Office: 604.527.2446
Fax: 604.527.8894
Cell: 778.833.1171

mwarren@iccmarine.com
www.iccmarine.com

From: Mike Warren <mwarren@iccmarine.com>
Sent: Thursday, April 26, 2018 2:45 PM
To: ali.nayeri@vancouver.ca
Cc: Daniel Leonard - Westmar Advisors Inc. <dleonard@westmaradvisors.com>
Subject: Harbour Green Public Dock Repairs

Ali,

As promised please see attached our recommended options and cost estimates for the repair of the Harbour Green Public Dock.

If you have any questions, require further information or if Daniel or myself can be of assistance in any way at all, please do not hesitate to call.

Regards
Mike

Mike Warren
Business Development Manager

ICC Marine Services Ltd.
16 Fawcett Road, Suite 102
Coquitlam, BC Canada V3K 6X9

Office: 604.527.2446
Fax: 604.527.8894
Cell: 778.833.1171

mwarren@iccmarine.com
www.iccmarine.com

Sandwell

112606
June 2000

Marathon Developments Inc.
Vancouver, BC

Coal Harbour Development
Phase 3
Cordova Street Retaining Wall

Specifications

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 2 – SITEWORK

DIVISION 3 – CONCRETE

END OF SECTION

1. PROJECT INCEPTION

1.1 Setting Out

.1 The Contractor shall establish survey control from which all work shall be laid out as shown on the drawings.

.2 The Contractor shall locate other reference points and lines and take necessary action to prevent their destruction. He shall assume responsibility for all lines and elevations for work executed under the contract. He shall verify figures shown on drawings and assume responsibility for any error resulting from failure to exercise such precaution.

.3 At points where construction will cover or destroy any land subdivision monuments or property marks, the Contractor shall assume responsibility for their protection from disturbance until their positions have been referenced and shall not remove them until ordered to do so by the Engineer.

1.2 Documents Required

Maintain at job site, one copy each of following:

.1 Contract drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed shop drawings.
.5 Work order.
.6 Change orders.
.7 Other modifications to Contract.
.8 Field test reports.
.9 Project meeting minutes.
.10 Copy of approved detailed construction schedule.
.11 Manufacturers' installation and application instructions.
.12 Standards listed in Part 1 of Specification Sections under Reference Standards.

1.3 Minimum Standards

.1 In the absence of other standards specified in the Contract Documents, all work is to conform to, or exceed, the minimum standards of the Canadian Government Specifications Boards, the Canadian Standards Association, the American Society for Testing of Materials, and the National Building Code of Canada, whichever is applicable. Where more than one code will apply, the more stringent shall apply.

.2 All work to be done in accordance with Workers's Compensation Board regulations.

1.4 **Construction Facilities and Temporary Controls**

.1 Provide construction facilities and temporary controls in order to execute work expeditiously.

.2 Remove from site all such facilities and temporary controls after use and restore site to condition prior to construction.

1.5 **Permits and Royalties**

All permits and licenses required are the responsibility of the Contractor and shall be for the Contractor's account. The Contractor shall have the appropriate business license.

2. GENERAL PROJECT REQUIREMENTS

2.1 **Interference with Navigation**

.1 The Contractor shall obey all marine navigation and aviation regulations and conduct operations so as to interfere as little as possible with the use of channels, berthing spaces, fairways, passages and flight paths. Install and maintain any and all protection and aids to navigation as may be required by any properly constituted authority or by the Engineer. During the course of construction and cleanup, do not dispose of surplus, waste or demolished materials in navigable waters.

.2 A red aircraft navigation light, visible from all directions, shall be provided on top of all lift booms, cranes, etc. and maintained in good working order.

2.2 **Barriers, Light and Watching**

The Contractor shall provide all requisite barriers, fences, warning signs, lights and watching for the protection of persons and property on or adjacent to the site.

2.3 **Site Access**

.1 The Contractor shall maintain routes of travel, the Engineer being the sole judge as to what may be deemed reasonable:

.1 to and from existing site facilities
.2 to and from adjacent property owners.

.2 The Contractor shall erect and maintain barriers, fences, lights, warning devices, and other protective, devices as may be required for prevention of theft or damage of goods and protection of the public and workmen, or if so ordered by the Engineer.

2.4 **Engineer's Access**

The Contractor shall provide access to the work for the Engineer's inspectors and surveyors as required.

2.5 **Contractor's Site Office**

Provide office heated to 22°C, lighted 750 Lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table and telephone, pay telephone not acceptable.

2.6 **Engineer's Site Office**

Provide office for Engineer as directed by Engineer.

2.7 **Prevention of Water or Air Pollution**

The Contractor shall comply with Federal and Provincial laws, orders and regulations concerning the control and abatement of water or air pollution.

2.8 **Noise By-Law**

The Contractor shall comply with the requirements of any local or other Noise By-Laws.

2.9 **Adjacent Operations**

Contractor shall carry out the Work with minimal interference and disturbance to commercial operations and residences, marinas, float plane terminals, houseboats, hotels and restaurants, in close proximity to the construction site.

2.10 **Other Contractors on Site**

Independent contractors, including inspectors and testing agents, will be engaged by Owner or Engineer for purpose of inspecting and/or testing portions of Work or other work adjacent to or at the construction site. Contractor shall cooperate with these contractors and shall not interfere with their work.

3. PROJECT OPERATIONS

3.1 **Project Meetings**

.1 Schedule and administer project progress meetings throughout progress of work at call of Engineer.

.2 Provide physical space and make arrangements for meetings.

.3 Minutes of meeting will be recorded by the Engineer to include significant proceedings and decisions, with `action by' parties identified.

3.2 **Detailed Construction Schedule**

Contractor shall prepare and update the Detailed Construction Schedule in accordance with GC 21.3 Detailed Construction Schedule.

3.3 **Records**

.1 The Contractor shall maintain a detailed daily record of the progress of the Work including, but not restricted to the following major items:

.1 Weather conditions.
.2 Plant and workmen on site.
.3 Quantities and location of material delivered, stockpiled, excavated or placed, to, at or on the site.
.4 Details of plant production, location, productive hours, mechanical breakdowns and servicing, and weather downtime.

.2 Daily quantities of materials delivered, stockpiled, excavated or placed will be documented with weight scale tickets, barge displacement measurements or such other methods approved in advance and in writing, by the Engineer.

.3 The Engineer shall determine, in consultation with the Contractor, the format and detail required for the daily record.

.4 Furnish a weekly report, summarizing the information on the daily reports. Submit the weekly report to the Engineer on the first working day of every week.

3.4 **Quality Control**

.1 Independent Inspection/Testing Agencies will be engaged by Owner for purpose of inspecting and/or testing portions of Work.

.2 Give timely notice requesting inspection, as specified in GC27 - Inspection of the Work, if Work is designated for special tests, inspections or approvals by Engineer instructions, or law of Place of the Work.

.3 If Contractor covers, or permits to be covered, Work that has been designated for special tests, inspections or approvals, before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 When the Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.5 Remove waste materials and debris from site at regularly scheduled times and dispose of off-site. Do not burn waste materials on site.

.6 Leave work clean before inspection process commences.

3.5 **Soil Data and Existing Topography**

.1 The Contractor shall examine the site and the information shown on the drawings and shall decide for himself the nature of the materials to be encountered on the site.

.2 The Contractor shall promptly notify the Engineer of any subsurface conditions at the place of the work that may differ materially from those indicated in the Contract Documents.

.3 Neither the Engineer, Geotechnical Consultant or Designer can assume responsibility for the scope, accuracy, or interpretation of the soil investigation report, it is given only for estimating guidance.

3.6 **Utilities and Services**

.1 The Contractor shall be responsible for any damage to overhead, underwater or underground utilities or services caused by his operations and shall repair and make good the damage at his own expense. The City of Vancouver shall be notified of any repairs to City of Vancouver utilities and services; repairs to be approved by the City of Vancouver.

.2 The Contractor shall be responsible, unless otherwise agreed to by the Engineer, for all temporary or construction services and utilities, and first aid facilities.

3.7 **Existing Services and Utilities**

Before commencing Work, confirm location and extent of service lines in area of Work and notify Engineer of findings.

4. **PROJECT CLOSING**

4.1 **Cleaning**

.1 Keep construction site clean.

.2 Maintain streets within two blocks of construction site access clean and free of any material used for the purpose of the Work.

4.2 **Project Closeout**

.1 When the Work is Substantially Performed, remove surplus products, tools construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste materials and debris from site at regularly scheduled times or dispose of as directed by Engineer. Do not burn waste materials on site.

.3 Leave work clean before inspection process commences.

END OF SECTION

1. GENERAL

.1 The work to be performed under this Contract shall consist of furnishing all plant, tools, equipment, materials, supplies, and manufactured articles and furnishing all labour, transportation, and services, including fuel, power, water and essential communications, and performing all work, or other operations required for the fulfilment of the Contract in strict accordance with the Contract Documents. The work shall be complete, and all work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete and proper construction of the work in good faith shall be provided by the Contractor as though originally so indicated, at no increase in cost to the Owner.

2. WORK COVERED BY CONTRACT DOCUMENTS

.1 Work under this Contract includes the supply of material, equipment and labour for the construction of the Cordova Street retaining wall as described in the Contract Documents.

.2 Work items shall include where applicable clearing site and disposal of material and debris. The Work shall include but not be limited to the following items:

.1 **Mobilization and Demobilization**

.1 Transportation of all plant and equipment to the site including temporary buildings and set up of same on site.

.2 Provision of temporary services and all preparatory work required prior to commencing work on site.

.3 Costs of obtaining and maintaining bonds and insurance per General Conditions.

.4 Dismantle and ship out of all plant, equipment.

.5 Removal of temporary services and restoration of site.

.6 Clean up of site.

.2 **Excavation and Shoring**

.1 Excavation and shoring of fill and native materials.

.2 Dewatering.

.3 Stockpiling excavated material.

.4 Off site disposal of unsuitable and excess excavated materials.

.3 **MSE Retaining Wall Construction**

.1 Co-ordination/scheduling with Reinforced Earth Company Ltd. (RECO) the site delivery and offloading of all RECO supplied material necessary for the erection of the MSE retaining wall system, including site offloading and storage of all RECO supplied material.

.2 Co-ordination/scheduling with the CIP retaining wall contractor the backfilling for the CIP wall.

.3 Co-ordination/scheduling with the soils testing agency all inspections and tests for backfill.

.4 Construction of the MSE retaining wall system in accordance with the RECO drawings and specifications.

.5 Excavation and base preparation for the MSE retaining wall system, including installation of drainage along the swale and the construction of the swale.

.4 **CIP Retaining Wall Construction**

.1 Excavate to underside of concrete work slab.

.2 Prepare excavation for placement of work slab.

.3 Form wall foundation.

.4 Place reinforcement and embedments for wall foundation.

.5 Pour foundation concrete.

.6 Form and place reinforcement, blockouts, inserts and embedments for wall.

.7 Pour wall concrete.

.8 Supply and install water stops, water proof membranes, elastomeric pads, joint fillers and joint sealants.

.9 Supply and place backfill behind wall, including installation of perimeter drain.

3. **CONTRACT METHOD**

.1 The Work, hereunder will be constructed under a single lump sum contract.

4. WORK BY OTHERS

.1 The Contractor's attention is directed to the fact that work may be conducted at the site by other Contractors during the performance of the work under this Contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the work of such other contractor, and shall cooperate fully with such Contactors to provide continued safe access to their respective portions of the site, as required to perform work under their respective contracts.

.2 **Interference with Work on Utilities:** The Contractor shall cooperate fully with all utility forces of the Owner or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the work, and shall schedule of work so as to minimize interference with said relocation, altering, or other rearranging of facilities.

.3 **Concurrent Work by Other Contractors:** The Contractor's attention is directed to the fact that work will be conducted adjacent to the site by other Contractor's during the performance of the work of this Contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the work of such other contractors.

5. CONTRACTOR USE OF PROJECT SITE

.1 The Contractor's use of the project site shall be limited to its construction operations, including on-site storage of materials, on-site fabrication facilities, and field offices.

6. PROJECT MEETINGS

.1 **Preconstruction Conference:**

.1 Prior to the commencement of work at the site, a preconstruction conference will be held at a mutually agreed time and place which shall be attended by the Contractor's Project Manager, its superintendent, and its Subcontractors as the Contractor deems appropriate. Other attendees will be:

.1 Engineer and the Resident Project Representative.

.2 Representatives of Owner.

.3 Governmental representatives as appropriate.

.4 Others as requested by Contractor, Owner, or Engineer.

.2 The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures

for handling such matters established. The complete agenda will be furnished to the Contractor prior to the meeting date. However, the Contractor should be prepared to discuss all items relating to the Work, including:

.1 Status of Contractor's insurance and bonds.

.2 Contactor's tentative schedules.

.3 Transmittal, review and distribution of Contractor's submittals.

.4 Processing applications for payment.

.5 Maintaining record documents.

.6 Critical work sequencing.

.7 Field decisions and Change Orders.

.8 Use of project site, office and storage areas, security, housekeeping and Owner's needs.

.9 Major equipment deliveries and priorities.

.10 Contractor's assignments for safety and first aid.

.3 The Engineer will preside at the preconstruction conference and will arrange for keeping and distributing the minutes to all persons in attendance.

.2 **Progress Meetings:**

.1 The Contractor shall schedule and hold regular on-site progress meetings at least weekly and at other times as requested by Engineer or as required by progress of the work. The Contractor, Engineer, and all Subcontractors active on the site must attend each meeting. Contractor may at its discretion request attendance by representatives of its Suppliers, manufacturers, and other Subcontractors.

.2 The Engineer shall preside at the meetings and will arrange for keeping and distributing the minutes. The purpose of the meetings will be to review the progress of work, maintain coordination of efforts, discuss changes in scheduling, and resolve other problems which may develop. During each meeting, the Contractor is required to present any issues which may impact his work, with a view to resolve these issues expeditiously.

7. DEFINITIONS APPLICABLE TO TECHNICAL SPECIFICATIONS

.1 The following words have the meaning defined in the Technical Portions of the work:

Indicated - is a word used to direct the Contractor to information contained on the drawings or in the Specifications. Terms such as "shown", "noted", "scheduled", and "specified" also may be used to assist in locating information but no limitation of location is implied or intended.

Furnish - means to supply and deliver to the site, to unload and unpack ready for assembly, installation, testing, and start-up.

Install - defines operations at the site including assembly, erection, placing, anchoring, applying, shaping to dimension, finishing, curing, protecting, and cleaning, ready for the owner's use.

Provide - is defined as furnish and install, ready for the intended use.

Installer - a person or firm engaged by the Contractor or its subcontract or any subcontractor for the performance of installation, erection, or application work at the site. Installers must be expert in the operations they are engaged to perform.

END OF SECTION

1. GENERAL

1.1 General Instructions

.1 This section specifies general requirements and procedures for contractors submissions of shop drawings, and samples and to Engineer for review.

.2 Do not proceed with work until relevant submissions are reviewed by Engineer.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submissions.

.6 Notify Engineer, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer's review of submission, unless Engineer gives written acceptance of specific deviations.

.8 Make any changes in submissions which Engineer may require consistent with Contract Documents and resubmit as directed by Engineer.

.9 Notify Engineer, in writing, when resubmitting, of any revisions other than those requested by Engineer.

1.2 Submission Requirements

.1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.2 For any work designed by the Contractor, drawings shall be sealed by a professional engineer registered in the Province of British Columbia.

.3 Contractor shall submit sufficient copies of shop drawings to Engineer for review. Engineer shall retain four (4) copies for his use and return the rest to the Contractor. Engineer shall return reviewed shop drawings to Contractor within twenty (20) working days after their submission for review.

1.3 **Shop Drawings**

.1 Shop drawings: original drawings, or modified standard drawings provided by Contractor, to illustrate details of portions of Work, which are specific to project requirements.

.2 Cross-reference shop drawing information to applicable portions of Contract Documents.

1.4 **Samples**

.1 Where colour, pattern or texture is criterion, submit full range of samples.

.2 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

END OF SECTION

1. GENERAL

Provide construction photographs in accordance with procedures and submission requirements specified in this Section.

1.1 Progress Photographs

.1 Sizes: 100 x 125 mm.

.2 Finish: semi-matt colour with binding margin at one end.

.3 Paper: single weight, unmounted.

.4 Number of prints required: 3 sets.

.5 Identification: typewritten name and number of project and date of exposure on reverse side.

.6 Number of viewpoints: four. Locations of viewpoints determined by Engineer.

.7 Frequency: monthly with progress statement.

1.2 Final Photographs

.1 Sizes: 100 x 125 mm.

.2 Finish: semi-matt colour with binding margin at one end.

.3 Paper: single weight, mounted.

.4 Number of prints required: 3 sets.

.5 Identification: typewritten name and number of project and date of exposure reverse side.

.6 Number of viewpoints: Ten. Locations of viewpoints to be determined by Engineer.

1.3 Negatives

.1 Submit all negatives of coloured prints before final acceptance of project.

.2 Insert negatives in envelopes and identify with name and number of project. Indicate exposure dates and view points of each frame of 35 mm film strips.

1.4 Distribution of Photographs and Negatives

.1 One set of progress and final photographs and negatives to Engineer.

.2 One set of progress and final photographs to Owner: Marathon Developments Inc.

.3 One set of progress photographs, one set of final photographs and one set of final negatives to City of Vancouver.

END OF SECTION

1. GENERAL

1.1 Related Requirements Specified Elsewhere

Particular requirements for inspection and testing to be carried out by testing laboratory designated by Engineer are specified under various sections.

1.2 Appointment and Payment

.1 Owner will appoint services of testing laboratory except for the following:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
.2 Inspection and testing performed exclusively for Contractor's convenience.
.3 Tests specified to be carried out by Contractor under the supervision of Engineer.
.4 Tests specified to be carried out to verify that the Work is in accordance with the specifications.
.5 Additional tests specified in paragraph 1.2.2.

.2 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Engineer may require to verify acceptability of corrected work.

1.3 Contractor's Responsibilities

.1 Furnish labour and facilities to:

.1 Provide access to work to be inspected and tested.
.2 Facilitate inspections and tests.
.3 Make good work disturbed by inspection and test.

.2 Notify Engineer sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Engineer.

END OF SECTION

1. GENERAL

1.1 Construction Safety Measures

.1 Observe construction safety measures of National Building Code 1990 Part 8, Provincial Government, Workers'/Workmen's Compensation Board and municipal authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.

.2 Comply with requirements of FCC No. 30 1-Standard for Construction Operations, June 1982, issued by Fire Commissioner of Canada.

1.2 Overloading

Ensure no part of Work is subjected to loading that will endanger its safety or will cause permanent deformation.

1.3 Falsework

Design and construct falsework in accordance with CSA S269.1.

1.4 Scaffolding

Design and construct scaffolding in accordance with CSA S269.2M.

END OF SECTION

1. GENERAL

1.1 Fire Safety Plan

Contractors and their personnel shall be familiar with this section and its requirements.

1.2 Fire Department Briefing

The Engineer shall coordinate arrangements for the contractor to be briefed on Fire Safety at the pre-work conference by the City of Vancouver Fire Chief before any work is commenced.

1.3 Reporting Fires

.1 Know the location of nearest fire alarm box and telephone, including the emergency phone number.

.2 Report immediately all fire incidents to the City of Vancouver Fire Department as follows:

.1 Activate nearest fire alarm box, or
.2 Telephone.

.3 Person activating fire alarm box shall remain at the box to direct City of Vancouver Fire Department to scene of fire.

.4 When reporting a fire by telephone, give location of fire, name or number of building and be prepared to verify the location.

1.4 Interior and Exterior Fire Protection and Alarm Systems

.1 Fire protection and alarm systems shall not be:

.1 Obstructed
.2 Shut-off
.3 Left inactive at the end of a working day or shift without notification and authorization from the City of Vancouver Fire Chief or his representative.

.2 Fire hydrants, standpipes and hose systems shall not be used for other than fire fighting purposes unless authorized by the City of Vancouver Fire Chief.

1.5 Fire Extinguishers

The Contractor shall supply fire extinguishers, as scaled by the City of Vancouver Fire Chief, necessary to protect, in an emergency, the work in progress and the contractors physical plant on site.

1.6 **Blockage of Roadways**

The City of Vancouver Fire Chief shall be advised of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by the City of Vancouver Fire Chief and erecting of barricades.

1.7 **Smoking Precautions**

Although smoking is not permitted in hazardous areas, care must still be exercised in the use of smoking materials in non-restricted areas.

1.8 **Rubbish and Waste Materials**

.1 Rubbish and waste materials are to be kept to a minimum.

.2 The burning of rubbish is prohibited unless approved by the City of Vancouver Fire Chief.

.3 All rubbish shall be removed from the work site at the end of the work day or shift or as directed, by the City of Vancouver Fire Chief or the Engineer.

.4 Storage:

.1 Extreme care is required where it is necessary to store oily waste in work areas to ensure maximum possible cleanliness and safety.
.2 Greasy or oily rags or materials subject to spontaneous combustion shall be deposited and kept in receptacles in accordance with National Fire Code of Canada and removed as required in 9.6.

1.9 **Flammable Liquids**

.1 The handling, storage and use of flammable liquids are to be governed by the current National Fire Code of Canada.

.2 Flammable liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable liquids exceeding 45 litres for work purposes, requires the permission of the City of Vancouver Fire Chief.

.3 Transfer of flammable liquids is prohibited within buildings.

.4 Transfer of flammable liquids shall not be carried out in the vicinity of open flames or any type of heat-producing devices.

.5 Flammable liquids having a flash point below 38°C such as naphtha or gasoline shall not be used as solvents or cleaning agents.

.6 Flammable and combustible liquids, for disposal, shall be stored in receptacles in accordance with National Fire Code of Canada located in a safe ventilated area. Quantities are to be kept to a minimum and the Fire Department is to be notified when disposal is required.

1.10 **Hazardous Substances**

.1 If the work entails the use of any toxic or hazardous materials, chemicals and/or explosives, or otherwise creates a hazard to life, safety or health, work shall be in accordance with the National Fire Code of Canada.

.2 The City of Vancouver Fire Chief is to be advised, and a "Hot Work" permit issued in all cases involving welding, burning, hot creosoting or the use of blow torches and salamanders. Special precautions are necessary to safeguard life and property from damage by fire or explosives.

.3 Wherever work is being carried out in dangerous or hazardous areas involving the use of heat, fire watchers, equipped with sufficient fire extinguishers shall be provided. The determination of dangerous or hazardous areas along with the level of precaution necessary for Fire Watch shall be at the discretion of the City of Vancouver Fire Chief. Contractors are responsible for providing fire watch service for their work on a scale established and in conjunction with the City of Vancouver Fire Chief at the pre-work conference.

.4 Where flammable or combustible liquids, such as lacquers or urethanes are used, proper ventilation shall be assured and all sources of ignition are to be eliminated. The City of Vancouver Fire Chief is to be informed prior to and at the cessation of such work.

1.11 **Questions and/or Clarification**

Any questions or clarification on Fire Safety in addition to the above requirements shall be directed to and cleared through the City of Vancouver Fire Chief.

1.12 **Fire Inspections**

.1 The City of Vancouver Fire Chief shall be allowed unrestricted access to the work site.

.2 The Contractor shall co-operate with the City of Vancouver Fire Chief during routine inspections of the work site.

.3 The Contractor shall immediately remedy all unsafe situations identified by the City of Vancouver Fire Chief.

END OF SECTION

1. GENERAL

1.1 Fires

Fires and burning of rubbish on site not permitted.

1.2 Disposal of Wastes

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.3 Pollution Control

Control emissions from equipment to local authorities emission requirements.

END OF SECTION

1. GENERAL

1.1 General Guidelines

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.2 Store volatile waste in receptacles in accordance with National Fire Code of Canada, and remove from premises at end of each working day.

.3 Provide adequate ventilation during use of volatile or noxious substances.

1.2 Cleaning During Construction

.1 Provide on-site containers for collection of waste materials and debris.

.2 Dispose of waste materials and debris off Owner's property.

.3 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces.

1.3 Final Cleaning

.1 Remove grease, dirt, labels and other foreign materials from all areas of work.

.2 Remove debris and surplus materials.

END OF SECTION

1. GENERAL

1.1 Preparation

Engineer will provide two sets of white prints for record drawing purposes.

1.2 Record Drawings

.1 Maintain project record drawings and record accurately deviations from Contract documents.

.2 Mark changes in red.

.3 Record following information:

.1 Field changes of dimension and detail.
.2 Changes made by Change Order or Field Order.

.4 At completion of project and prior to final inspection, neatly transfer notations to second set and submit both sets to Engineer.

END OF SECTION

1. GENERAL

1.1 Related Work

Related sections of the work include:

Safety Requirements	Section 01545
Fire Safety Requirements	Section 01546
Bracing and Shoring	Section 02151
Rock Removal	Section 02202
Excavating, Trenching and Backfilling	Section 02223
Cast-in-place Concrete	Section 03300

2. PRODUCTS

Not applicable.

3. EXECUTION

3.1 Preparation

.1 Inspect site and verify with Engineer items designated for removal and items to remain.

.2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.

.3 Notify utility companies before starting demolition.

3.2 Removal and Disposal

.1 Remove all objects including fencing, vegetation, concrete curbs from the footprint area of the work. Dispose of all materials off site in safe manner unless otherwise directed by the Engineer.

.2 Do not disturb adjacent items designated to remain in place.

3.3 Asphaltic Concrete Pavement

In areas where granular fill will be placed, break up existing asphaltic concrete pavement into pieces no larger than 75 mm, or remove existing asphaltic concrete pavement from the site as directed by the Engineer.

3.4 Restoration

.1 Upon completion of work, remove debris, trim surfaces and leave work site clean.

.2 Reinstate areas and existing works outside areas of clearing to match condition of adjacent, undisturbed areas.

3.5 **Unidentified Underground Services**

.1 Notify Engineer immediately upon encountering underground services not identified on Drawings.

.2 Submit to Engineer for confirmation the locations of such services on a clear, properly scaled and dimensioned drawing.

END OF SECTION

1. GENERAL

1.1 Related Work

Related sections of the work include:

Site Clearing and Removal	Section 02070
Excavating, Trenching and Backfilling	Section 02223

This section of the Specifications is not necessarily complete in itself and must be read in conjunction with the other sections of the Contract Documents.

1.2 Definitions

.1 Bracing: temporary support installed in an excavation or structure to increase rigidity in both the longitudinal and transversal axes and thus to stabilize against deformations.

.2 Shoring: temporary support installed in an excavation or structure to relieve vertical and/or horizontal loads to permit alterations or repairs to the foundation or main supporting elements.

1.3 Shop Drawings

.1 Submit shop drawings including calculations, sealed as required in accordance with Section 01340 - Shop Drawings and Samples.

.2 Shop drawings to indicate shop and construction sequence and details.

1.4 Storage

Store materials in a dry area, supported off ground.

2. PRODUCTS

2.1 Materials

Use materials complying with CSA.

Structural steel members, connections, gusset plates, angles to:	CSA G40.21-M87
High tensile bolts to:	ASTM A325M-86

Welding materials to:
CSA W59-M1984

3. EXECUTION

3.1 Inspection

Before work is begun, inspect conditions upon which this work depends for damage and weakness and inform the Engineer in writing of conditions not discussed in the contract.

3.2 Preparation

Before shoring is begun, drain foundation and allow to dry. Prevent entry of water or drain continuously, as required.

3.3 Installation

.1 Erect structural steel work to CAN3-S16.1-M84 and CAN3-S136-M84.

.2 Weld to CSA W59-M1984.

.3 Obtain approval from Engineer before execution, if alteration to bracing of shoring system is found to be necessary.

3.4 Adjustment

Before making adjustments to work, obtain approach by Engineer.

3.5 Maintenance

Maintain effectiveness of system by making adjustments, replacing or repairing damaged and weakened elements of systems until final completion of project.

END OF SECTION

1. GENERAL

1.1 Related Work

Related sections of the work include:

Environmental Protection	Section 01560
Excavating, Trenching Backfilling	Section 02223

1.2 References

.1	ASTM D422-63	Particle-Size Analysis of Soils
.2	ASTM D1556-82	Density of Soil-in-Place by the Sand-Cone Method
.3	ASTM D1557-90	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10 lb (4.54 kg) Rammer and 18 in. (457 mm) Drop
.4	ASTM D2922-81	Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)

1.3 Site Conditions

.1 Examine subsurface investigation report.

.2 Known underground and surface utility lines and buried objects are as indicated on site plan.

.3 Refer to dewatering in Section 02223 - Excavating Trenching and Backfilling.

1.4 Protection

.1 Protect existing bench marks, surface or underground utility lines which are to remain. If damaged, restore to original condition unless specified otherwise.

.2 Maintain access roads to prevent accumulation of mud on roads.

2. PRODUCTS

2.1 Materials

.1 Fill material: In accordance with of Section 02223 - Excavating, Trenching and Backfilling, unless noted otherwise on the drawings.

3. EXECUTION

3.1 Grading

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Slope rough grade away from building 1:50 minimum.

.3 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.4 Begin filling in lowest part of area to be filled.

.5 Place fill in horizontal lifts not thicker than 300 mm loose thickness over the entire area to be filled at the level of each lift.

.6 Add moisture or dry fill as required for proper compaction.

.7 Compact each lift of fill and disturbed areas to corrected maximum dry density as follows prior to placement of subsequent lifts:

.1 95% under paved and walk areas.
.2 98% under footings.

.8 Do not disturb soil within branch spread of trees or shrubs to remain.

3.2 Testing

.1 Inspection and testing of soil compaction will be carried out by testing laboratory designated by City of Vancouver. Refer to Section 01410 - Testing Laboratory.

.2 All fill materials shall be tested for grain size in accordance with ASTM D422. One test shall be made for each type of fill.

.3 For each fill lift, one in-situ density test shall be carried out for every 10 metres of backfill length for trench or wall backfill and one test of fill surface shall be carried out on area fills.

.4 The frequencies of all testing shall be increased as directed by the Engineer if variability in material properties or compaction is suspected or is indicated by the test results.

3.3 Surplus Material

.1 Remove surplus material from site as directed by Engineer.

.2 Remove material unsuitable for fill, grading or landscaping from site as directed by Engineer.

.3 Material removed from site shall be disposed in a legal manner.

.4 Material suitable for future on-site use shall be stockpiled at a location designated by the Engineer.

END OF SECTION

1. GENERAL

1.1 Related Work

Related sections of the work include:

Site Clearing and Removal	Section 02070
Bracing and Shoring	Section 02151
Site Grading	Section 02210
Foundation Drains	Section 02411

1.2 References

American Society for Testing and Materials (ASTM)

ASTM-C117-90	Materials Finer than 75 micron (No. 200) Sieve in Mineral Aggregates by Washing
ASTM-C136-88	Sieve analysis of Fine and Coarse Aggregates
ASTM-D422-63	Particle-Size Analysis of Soils
ASTM-D1556-82	Density of Soil-in-Place by the Sand-Cone Method
ASTM-D1557-90	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 kg) Rammer and 18 in. (457 mm) Drop
ASTM-D2922-81	Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM-E11-87	Wire-Cloth Sieves for Testing Purposes

1.3 Definitions

.1 Rock excavation: excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders or rock fragments having individual volume in excess of 1.5 m^3.

.2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation, including dense tills, hardpan and partially cemented materials which can be ripped with a single tooth ripper on a 335 hp crawler tractor.

.3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.4 Excavation lines: the lines, grades and elevations shown within which no material may protrude and upon which payment will be based.

.5 Modified Proctor maximum dry density: the dry unit weight of the compacted material at its optimum moisture content as obtained in the laboratory following ASTM Test Procedure D1557 Method D latest revision.

1.4 **Protection of Existing Features**

.1 Existing buried utilities and structures:

.1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.2 Prior to commencing any excavation work, notify applicable Owner or authorities, establish location and state of use of buried utilities and structures. Clearly mark such locations to prevent disturbance during work.

.3 Confirm locations of buried utilities by careful test excavations.

.4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered. Obtain direction of Engineer before moving or otherwise disturbing utilities or structures.

.5 Record location of maintained, re-routed and abandoned underground lines.

.2 Existing structures and surface features:

.1 Prior to the start of the work, conduct with the Engineer, a condition survey of all existing buildings, readily identifiable points established on sensitive installations, trees and other plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.

.2 Protect existing structures and surface features which may be affected by work from damage while work is in progress and repair damage resulting from work.

1.5 **Shoring and Bracing**

.1 Contractor may elect to use shoring and bracing as an alternative to open trenching.

.2 Comply with Section 01545 - Safety Requirements and applicable local regulations.

.3 Engage services of qualified professional engineer who is registered in British Columbia to design and inspect shoring and bracing required for work.

.4 At least 2 weeks prior to commencing work, submit design and supporting data.

.5 Design and supporting data submitted to bear the stamp and signature of qualified professional engineer registered in British Columbia.

.6 Professional Engineer responsible for design of temporary structures to submit proof of insurance coverage for professional liability except where engineer is employee of contractor, in which case contractor shall submit proof that work by professional engineer is included in contractor's insurance coverage.

1.6 **Submittals**

.1 At least 2 weeks prior to commencing work, submit design of temporary works and supporting data, including design for temporary containment barriers to protect from intrusion of materials during cleaning, stripping, excavating, placement and compaction operations. Submit for review details of proposed dewatering methods, such as dikes or well points.

Design and supporting data submitted to bear the stamp and signature of a qualified Professional Engineer.

.2 Professional Engineer responsible for the design of temporary structures to submit proof of insurance coverage for professional liability except where engineer is the employee of the Contractor, in which case the Contractor is to submit proof that work by the contractor's Professional Engineer is included in the Contractor's insurance coverage.

.3 Submit daily records of any unusual occurrences such as slope failures, unstable ground, water problems, delays and accidents, and the location of each occurrence.

.4 Submit copies of reports to the Engineer of tests carried out on the Contractor's behalf to verify material properties and compaction densities.

2. PRODUCTS

2.1 General

Unless noted otherwise on the drawings, backfill materials shall be as defined in Clause 2.2.

2.2 Materials

.1 Gravel

Insert, tough, durable particles of rock, gravel, sand and fines capable of withstanding the deleterious effects of exposure to water, freeze-thaw, handling spreading and compacting. Particles shall be free from an excess of flat or elongated particles and from clay lumps, cementation, refuse, wood, organics, frozen material and other deleterious materials.

The material when tested in accordance with ASTM D422 shall have a gradation with defines a curve (% passing versus log sieve size) falling within the following limits.

Sieve Size (mm)	Percentage Passing by Weight
75	100
37.5	60 - 100
19	35 - 80
9.5	25 - 60
4.75	20 - 40
2.36	15 - 30
1.18	10 - 20
0.300	3 - 10
0.075	0 - 5

.2 Sand

Well graded pit run sand, free from organic material and other deleterious materials.

Sieve Size (mm)	% Passing
12.5	100
4.25	35-100
2.36	20-70
1.18	13-50
0.85	8-35
0.3	5-25
0.15	2-15
0.075	0-6

.3 Drain Rock:

.1 Drain rock shall be 18 mm clean rock with 0% passing a 10 mm sieve.

.2 Drain rock shall be completely encapsulated in an approved geotextile.

3. EXECUTION

3.6 Shoring and Bracing

.1 Construct temporary works to depths, heights, and locations as directed by Engineer.

.2 During backfill operation:

.4 Piping installation shall be approved by the Engineer prior to backfilling.

.5 Ensure foundation wall dampproofing has been inspected and accepted.

3.2 **Pipe Installation**

.1 Lay perforated pipe as indicated. Face perforation and coupling slots downward.

.2 Do not use shims to establish pipe slope.

.3 Use fittings recommended by manufacturer.

.4 Connect pipe to footing drain sump.

.5 Place drain rock bedding around pipe to a minimum 150 mm below pipe, 300 mm above pipe and a total of 500 mm wide.

.6 Encapsulate perforated pipe and drain gravel combination in filter cloth.

.7 Overlaps at all filter cloth joints shall be 200mm, minimum.

.8 Filter cloth shall be secured intermittently to prevent separation during subsequent filling and other operations.

.9 Cleanout shall be provided at locations shown on drains and/or at all changes in direction, at the start of all runs and at minimum of 15 metre intervals and shall be accessible for subsequent maintenance flushing.

3.3 **Excavation and Backfill**

.1 Unless otherwise specified in Section 02223 the excavation shall be to at least 150 mm below the bottom of the drain.

.2 Unless otherwise specified in Section 02223 backfill material above the bedding material and perforated drain pipe shall be drain rock.

.3 Drain rock shall be completely encapsulated in filter cloth.

END OF SECTION

1. GENERAL

1.1 Description of Work

The Work includes all materials, labour, equipment, services, supervision and tools for designing, supplying, installing, and removing formwork and falsework for all cast-in-place concrete work as shown on the Drawings and as described herein.

The Work shall include but not necessarily be limited to formwork and falsework for the following items and activities:

.1 Concrete wall and foundation for the Cordova Street retaining wall.

.2 Preparation of Shop Drawings for the Work.

1.2 Related Work

Related sections of the work include:

Concrete Reinforcement	Section 03200
Cast-In-Place Concrete	Section 03300

This section of the Specifications is not necessarily complete in itself and must be read in conjunction with the other sections of the Contract Documents.

1.3 Reference Standards

Unless specified otherwise, use the most current edition of the following standards:

Canadian Standards Association:

CAN/CSA A23.1-M90	Concrete Materials and Methods of Concrete Construction
CAN/CSA O86.1-M89	Engineering Design in Wood (Limit States Design)
CSA O121-M1978	Douglas Fir Plywood
CSA S269.1-1975	Falsework for Construction Purposes
CAN/CSA S269.3-M92	Concrete Formwork

1.4 Schedule of Work

Schedule all formwork installation with the Work described in other Sections of these Specifications to ensure that all blockouts and embedded items are properly incorporated into the Work prior to pouring concrete.

2. PRODUCTS

2.1 Materials

Use materials complying with CSA S269.3 and CSA A23.1 Clauses 11.3 and 28.4.

Formwork lumber:	plywood	CSA O121-M78
	Wood	CSA O86.1-M89
Falsework materials:		CSA S269.1
Form ties:		Use removable or snap-off metal form ties free of devices leaving holes larger than 25 mm diameter in concrete surface and designed to break off at least 20 mm from the exposed concrete surfaces. She-bolt ties may be used for forms restraining a high head of wet concrete.
Form liner:		Use a minimum of 19 mm medium density overlay plywood complying to CSA O121, steel or other pre-approved material.
Form release agent:		Use a pre-approved chemical form release agent which will not stain, penetrate or discolour the concrete. When the concrete surface is to receive a permanent finish coating, use a form release agent compatible with the coatings.
Form tape:		Use vinyl form tape for taping form joints in all areas of exposed concrete finish.

.1 Do not use forms having defects or damage from previous use.

.2 Do not use steel forms which have irregularities, dents, sags, rust, or material which would discolour the concrete.

.3 Do not use aluminum for form surfaces in contact with concrete.

3. EXECUTION

3.1 Erection

.1 Verify lines, levels, and work done by others before proceeding with formwork. Ensure dimensions agree with drawings. Report discrepancies to the Engineer.

.2 Obtain approval of Engineer before using earth forms.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Construct falsework in accordance with CSA S269.1.

.5 Design, fabricate, erect and use formwork in accordance with CSA S269.3.

.6 Construct forms to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1.

.7 Obtain permission of Engineer before framing openings in concrete slabs, beams, walls or columns that are not indicated on the engineering drawings.

.8 Align form joints and make watertight. Keep form joints to a minimum.

.9 Unless shown otherwise on the engineering drawings, use 25 mm chamfer strips on external corners of beams, joists, walls and columns.

.10 Form chases, slots, openings, drips, recesses, expansion and control joints, and install all inserts and embedded items as indicated.

.11 Line forms for exposed concrete surfaces. Do not stagger joints of form lining material. Align joints to obtain a uniform pattern.

.12 Clean formwork in accordance with CSA A23.1 before placing concrete.

.13 Remove falsework and formwork in accordance with CSA A23.1, Clause 11.3.5.

Leave formwork in place until concrete has attained sufficient strength to adequately support its own weight together with construction loads likely to be imposed.

When falsework removal times are not specified on the engineering drawings, and falsework and formwork are not supporting construction load, use the following minimum periods of support, providing concrete strengths have been verified by field cured test cylinders:

Sides of beams:	2 days
Walls and Columns:	3 days

Beam soffits, slabs, decks:	21 days (with construction loads) 14 days (without construction loads)
Footings and abutments:	2 days

Remove form ties carefully to avoid marking concrete and to allow for patching. Grout form tie holes to prevent rust staining.

.14 Re-use formwork and falsework, subject to the requirements of CSA A23.1, after adequate cleaning, provided that the faces have not been cracked or become roughened. Where the surfaces of the formwork have become cracked or roughened, trim and properly patch the surfaces to the satisfaction of the Engineer prior to reuse.

.15 Space form ties for exposed concrete work evenly in straight horizontal and vertical lines or as shown on the engineering drawings.

.16 Where proprietary fabricated formwork, shoring or scaffolding units are to be used, comply with the manufacturer's printed specifications for loading, installation and removal procedures. Keep a copy of these specifications on site at all times.

3.2 Clean-Up

As the work progresses, remove all debris and surplus material from the site.

END OF SECTION

1. GENERAL

1.1 Description of Work

The Work includes the furnishing of all materials, labour, equipment, and services for supplying and placing concrete reinforcement.

The Work shall include but not necessarily be limited to concrete reinforcement for the following items and activities:

.1 Concrete wall and foundation for the Cordova Street retaining wall.

.2 Preparation of Shop Drawings for the Work.

1.2 Related Work

Related sections of the work include:

Concrete Formwork	Section 03100
Cast-in-Place Concrete	Section 03300

This section of the Specifications is not necessarily complete in itself and must be read in conjunction with the other sections of the Contract Documents.

1.3 Reference Standards

Unless specified otherwise use the most current edition of the following standards:

Canadian Standards Association:

CAN/CSA A23.1-94	Concrete Materials and Methods of Concrete Construction
CSA A23.3-94	Design of Concrete Structures for Buildings
CSA G30.5-M83	Welded Steel Wire Fabric for Concrete Reinforcement
CSA G30.18-M92	Billet-Steel Bars for Concrete Reinforcement
CSA W186-M90	Welding of Reinforcing Bars in Reinforced Concrete Construction

American Concrete Institute:

ACI 315-80 (revised 1986)	Details and Detailing of Concrete Reinforcement

1.4 Source Quality Control

Submit two certified copies of mill test reports of steel supplied, showing physical and chemical analyses and yield strengths.

1.5 **Shop Drawings**

.1 Submit bar bending schedules in accordance with the above referenced standards.

.2 Clearly indicate bar sizes, spacing, location and quantities of reinforcement, supports, spacers and location of splices on bending schedules and placement drawings, with identifying code marks to permit correct placement.

.3 Design and detail bar bending radii, lap lengths and bar development lengths to CSA A23.3 unless otherwise specified on the Drawings. Provide Class B tension lap splices unless otherwise indicated.

1.6 **Schedule of Work**

Schedule installation of reinforcement for proper execution with work of other trades, including formwork and installation of embedded items.

1.7 **Substitutes**

Do not substitute different size bars without written approval of the Engineer.

1.8 **Manufacturer's Warranty**

Obtain manufacturer's warranty of reinforcing steel and wire fabric in accordance with General Conditions 20.5, and submit copy to Engineer.

2. **PRODUCTS**

2.1 **Materials**

Reinforcing Steel (including dowels):	Use billet steel Grade 400R deformed bars to CSA G30.18-M92 (unless indicated otherwise on the engineering drawings)
Welded Reinforcing Steel:	Use weldable billet steel Grade 400W deformed bars to CSA G30.18-M92 (unless indicated otherwise on the engineering drawings)
Welded Steel Wire Fabric:	Use grade 400 conforming to CSA G30.5-M83

.1 Use steel bearing identifying marks showing size and grade. Do not use bars which are not so marked.

.2 Do not use materials with loose scaly rust, dirt, oil, paint or other bond-breaking coatings.

2.2 **Fabrication**

.1 Fabricate reinforcement in accordance with CSA A23.1 unless noted otherwise on the engineering drawings.

.2 Obtain Engineer's approval for locations of reinforcement splices other than shown on placing engineering drawings.

.3 Upon approval of Engineer, weld reinforcement in accordance with CSA W186. Do not weld reinforcement at the bend in a bar.

.4 Ship bundles of bar reinforcement, clearly identified with weatherproof tags or markings, in accordance with bar bending details and lists.

.5 Store reinforcing steel above ground on platforms, skids or racks and protect from prolonged exposure to weather.

3. EXECUTION

3.1 **Field Bending**

.1 Do not field bend reinforcement except where indicated on the engineering drawings or authorized by the Engineer.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.2 **Placing Reinforcement**

.1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CSA A23.1.

.2 Provide the following minimum concrete protection covering for reinforcement (principal or ties) unless noted otherwise on the engineering drawings:

a. Where concrete surface is to be exposed to ground or weather and where concrete is:

Placed against ground	75 mm
Placed against formwork or lean mix concrete	50 mm

b. Where concrete surface will not be exposed to ground or weather:

Beams, columns, pads and piers	40 mm
Slabs and walls	20 mm
Slabs on grade (top steel)	50 mm

.3 Protect projecting dowels from damage and cold bending.

.4 Clean all reinforcing steel before placing concrete.

3.3 Inspection

Prior to placing concrete, obtain approval of the reinforcing steel and position from the Engineer. Provide 24 hours notice to the Engineer prior to placing of concrete.

END OF SECTION

1. GENERAL

1.1 Description of Work

The Work includes but is not necessarily limited to the furnishing of all materials, labour, equipment, and services for providing and placing cast-in-place concrete.

1.2 Related Work

Related sections of the Work include:

Concrete Formwork	Section 03100
Concrete Reinforcement	Section 03200

This section of the Specifications is not necessarily complete in itself and must be read in conjunction with the other sections of the Contract Documents.

1.3 Reference Standards

Unless specified otherwise use the most current edition of the following standards:

Canadian Standards Association:

CAN/CSA-A23.1-M90	Concrete Materials and Methods of Concrete Construction
CAN/CSA-A23.2-M90	Methods of Test for Concrete
CAN/CSA-A23.5-M86	Supplementary Cementing Materials
CAN3-A266.1-M78	Air Entraining Admixtures for Concrete
CAN3-A266.2-M78	Chemical Admixtures for Concrete
CAN3-A266.6-M85	Superplasticizing Admixtures for Concrete

American Society for Testing and Materials:

ASTM C 309 - 81	Liquid Membrane-Forming Compounds for Curing Concrete
ASTM D 1751 - 83	Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
ASTM C1202	Test Method for Electrical Indication of Concrete• s Ability to Resist Chloride Ion Penetration
ASTM D 4259-88	Standard Practice for Abrading Concrete

Keep a copy of these Standards on site for the duration of work.

1.4 Certificates

.1 Prior to commencing concrete work, submit to Engineer manufacturer's test data and certification by a qualified independent inspection and testing laboratory that the following materials will meet specified requirements:

Portland cement
Supplementary cementing materials
Grout
Admixtures
Aggregates
Water
Waterstops
Waterstop joints
Joint filler
Bonding Agents
Curing Compounds

.2 Provide certification that plant, equipment and materials to be used in concrete comply with requirements of CAN/CSA A23.1 and that mix design is adjusted to prevent alkali aggregate reactivity problems.

.3 Provide certification that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CAN/CSA A23.1. Submit test results from at least five separate sets of tests for each design mix proposed. Provide test certificates for strength, yield, air content, and slump of the proposed concrete mixes. Submit the proposed concrete mix design to the Engineer indicating material contents in weight per cubic meter of concrete.

The Engineer's review of mix designs is for general conformity with specified requirements only, and in no way mitigates the Contractor's obligation to provide concrete suitable for placing in the locations shown and meeting all specified requirements.

1.5 Schedule of Work

Schedule all concrete work with the Work described in other sections of these Specifications to ensure that all blockouts, reinforcement and embedded metal items are properly incorporated into the formwork prior to placing concrete.

1.6 Manufacturer's Warranty

Obtain manufacturer's warranty of cement, admixtures, membranes, joint sealants and joint fillers in accordance with General Conditions 20.5.

2. PRODUCTS

2.1 Materials

Cement	Use Type 20 Portland cement conforming to CAN/CSA-A5. Use the same type of cement throughout the work.
Supplementary cementing materials	Conform to CAN/CSA A23.5.
Water	Conform to CAN/CSA A23.1.
Aggregates	Conform to CAN/CSA A23.1, Clauses 5.3 and 5.4.
Air-entraining admixture	Conform to CAN3-A266.1
Chemical admixture	Conform to CAN3-A266.2
Superplasticizing admixture	Conform to CAN3-A266.6
Curing Compounds	Conform to ASTM C 309.
Joint Sealant	Polyurethane elastometric sealant, Sikaflex 2x NS/SL or approved equal with Sternson or approved backer rod.
Waterstop	Expandable bentonite based joint sealant. Waterstop RX by Volclay or approved equal.

Do not use admixtures containing calcium chloride.

2.2 Mix Proportions

.1 Design and proportion concrete mix to meet design strength requirements. Include consideration of weather, temperature, curing, shrinkage, and methods of concrete placement.

.2 Cast-in-place concrete: Proportion normal density concrete to CAN/CSA-A23.1, Clause 14 to give the following:

28 Day Compressive Strength (Mpa)	Class of Exposure	Nominal Max. Size of Coarse Aggregate (mm)	Slump at Point of Discharge (mm)	Air Content (%)	Concrete Density (kg/m^3)	Maximum Water/Cement Ratio
35	C-1	20	80	5 to 8	2300±150	0.4

.3 Certify that the plant, equipment, and all materials to be used in concrete comply with the requirements of CAN/CSA A23.1.

.4 Certify that mix proportions selected will produce concrete of specified quality and yield and that strength will comply with CAN/CSA A23.1, Clause 17.5.

.5 Obtain the approval of the Engineer before using chemical admixtures other than those specified.

3. EXECUTION

General

Do cast-in-place concrete work in accordance with CAN/CSA-A23.1.

3.1 Workmanship

.1 Provide 24 hours notice to the Engineer and obtain Engineer• s approval prior to placing of concrete.

.2 Place concrete in accordance with CAN/CSA-A23.1, Clause 19 and CAN/CSA S269.3, Clause 9.

.3 Ensure reinforcement and inserts are not disturbed during concrete placement.

.4 Before placing or curing concrete during adverse weather, obtain the Engineer's approval of the proposed method of protection.

.5 Maintain accurate records of poured concrete to indicate date, location of pour, quality, air temperature and test samples taken.

3.2 Embedded Metal, Waterstops and Openings

.1 Provide and install sleeves, ties, anchor bolts, pipe hangers, conduit, waterstops, precast concrete support angles, other inserts and openings as shown on the drawings. Obtain approval from the Engineer for sleeves, openings, etc., not indicated on structural drawings.

.2 Do not pass sleeves, ducts, pipes or other openings through walls, beams or columns, except where expressly detailed on structural drawings or approved by the Engineer.

.3 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of all modifications from the Engineer before placing of concrete.

.4 Check locations and sizes of sleeves, openings, etc., shown on structural drawings with architectural, mechanical and electrical drawings.

.5 Place anchor bolts for building structures to meet the following tolerances:

Bolts within a group	+/- 3 mm
Bolt group to adjacent bolt group	+/- 6 mm
Maximum accumulation between any two bolt groups	+/- 6 mm per 30 m, not to exceed +/- 25 mm.
Projection from designated surfaces	+/- 6 mm

Set out anchor bolts relative to column lines established by survey. For clarification of anchor bolt setting out tolerances, refer to Appendix D of the CISC Code of Standard Practice for Structural Steel.

Correct the placement of out-of-tolerance anchor bolts to the satisfaction of the Engineer.

.6 Set out support angles for precast concrete panels. Liaise with and follow shop drawings of precast supplier for locations of angles.

3.3 **Construction and Control Joints**

.1 Locate joints as indicated on the Drawings or as approved by the Engineer.

.2 If additional joints are required to suit construction, locate and design the joints to ensure that the strength and appearance of the structure are not impaired. Location of joints to be approved by the Engineer.

.3 Construction joints shall be wet abrasive blast cleaned to sound concrete to 6 mm profile in accordance with ASTM D4259.

.4 Provide control joints conforming to CAN/CSA-A23.1, Clause 20.2.

If saw cutting is used, prepare small test slabs from the same concrete pour to carry out trial saw cuts to determine the proper time for cutting the slab.

Fill control joints as shown in the standards.

.5 Fill joints at intersection of slab on grade and foundation walls and columns with specified sealant, finished flush with concrete surface.

3.4 Curing and Protection

.1 Cure and protect in accordance with CAN/CSA A23.1, Clause 21 and the special requirements for hot weather concreting and cold weather protection, Clauses 21.2.2 and 21.2.3.

.2 Do not use curing compounds on surfaces which will subsequently receive permanent protective coatings.

3.5 Finishing of Surfaces

.1 Finish all surfaces in accordance with CAN/CSA A23.1, Clause 24.

.2 Cure and finish the concrete to suit the intended use of the surface, in accordance with CAN/CSA A23.1.

.3 Grind exposed sharp edges of concrete.

3.6 Defective Concrete

.1 Remove defective concrete, blemishes and embedded debris and repair as directed by the Engineer.

3.7 Inspection and Testing

.1 Provide concrete sampling and quality control. Provide all tests at Contractor's cost.

.2 Obtain concrete samples for testing in accordance with CAN/CSA A23.2. Take three (3) test cylinders for each 100 cubic metres of concrete, or portions of each mix type of concrete or each separate type of structural element in any one day's pour.

Break one cylinder at the age of 7 days, at which time it should show a compressive strength of not less than 60% of the 28 day strength. If a slow setting mix is used, the 7 day compressive strength must be consistent with the characteristics of the mix.

Break a second cylinder at the age of 28 days. If this cylinder does not meet the required compressive strength, break a third cylinder at the age of 35 days. If this cylinder 35 day compressive strength is less than the required 28 day compressive strength, the Engineer may require the Contractor to remove and replace the section of concrete which fails to meet this required strength.

.3 When the frequency of testing stipulated above provides less than three tests for a given mix type of concrete, make tests from at least three randomly selected batches.

.4 Make, cure and test the cylinders in accordance with the requirements of CAN/CSA-A23.2.

.5 Identify and ship the cylinders as instructed by the Engineer.

.6 Make at least one air content determination and one slump test per day for each mix type of concrete placed.

.7 Ensure concrete conforms to the compressive test requirements contained in Clause 17.5 of CAN/CSA-A23.1. If unsatisfactory trends become evident in test results, take immediate action to correct the deficiency by adjusting the mix design. If improvement is not achieved, the Contractor may be required to carry out one or more of the following at his own expense.

- Non-destructive testing (Appendix 'A' CAN/CSA-A23.2)
- Accelerated curing of Test Cylinders
- Cores to be drilled from portions of the structure in question and tested in accordance with CAN/CSA-23.2 Clause 14c
- Such other tests as the Engineer may specify
- Removal and replacement of all defective concrete

3.8 **Clean-up**

.1 Remove all concrete spill or splash from finished surfaces before such spill or splash has hardened or set.

.2 Remove all surplus material, equipment and debris from the site on completion of the work. Leave the site left broom clean.

END OF SECTION

From: "Daniel Leonard" <dleonard@westmaradvisors.com>
To: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
"Mike Warren" <mwarren@iccmarine.com>
Date: 4/12/2018 12:56:51 PM
Subject: RE: Harbour Green Public Dock Repairs

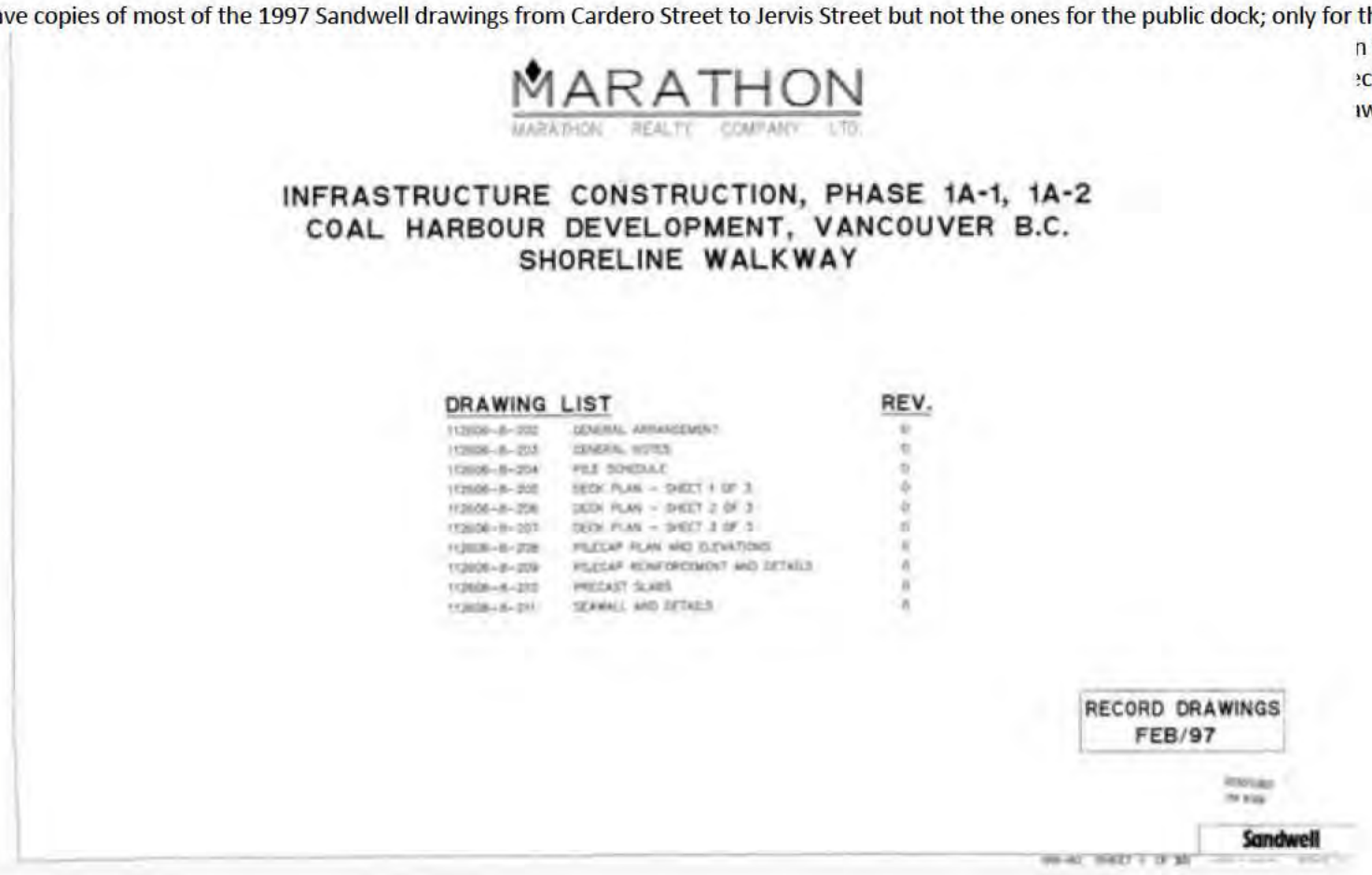
Hello Ali,

As Mike noted, it was very nice to meet with you this week.

I have gone through my notes and have pieced the following timeline together:

- Westmar was hired by Marathon in 1995 to plan the waterfront portion of the Coal Harbour development including a wind and wave study.
- Sandwell (now Ausenco) was hired by Marathon to complete the detailed design of the waterfront portion and record drawings were issued in 1997. I believe that Sandwell issued a performance drawing and specification for the Harbour Green public dock area and the All-Span/IMF/Blue Water drawings were created by the design-build contractor.
- The rubbing points on the mooring piles started to fail almost immediately and in 2005 Blue Water was hired to retrofit the mooring brackets with the rollers that you see now. This is where I was confused because I engaged with Blue Water about this retrofit while I was designing the temporary seaplane dock next to the public dock.

I have copies of most of the 1997 Sandwell drawings from Cardero Street to Jervis Street but not the ones for the public dock; only for the seawall and piled deck n the City of Vancouver ecification drawings for the awings; the float portion of


MARATHON
MARATHON REALTY COMPANY LTD.

INFRASTRUCTURE CONSTRUCTION, PHASE 1A-1, 1A-2
COAL HARBOUR DEVELOPMENT, VANCOUVER B.C.
SHORELINE WALKWAY

DRAWING LIST REV.

RECORD DRAWINGS
FEB/97

Sandwell

I have a call into Blue Water to see if they can confirm that they have the final 2005 retrofit drawings and I will likely pass them along to you to provide drawings.

In the meantime, I will put together some thoughts to address the two approaches that you need to consider and get back to you soon.

Best regards,
Daniel

Daniel Leonard, P.Eng.
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British Columbia, Canada V7M 3E9
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From: Nayeri, Ali <Ali.Nayeri@vancouver.ca>
Sent: April 11, 2018 4:07 PM
To: Mike Warren <mwarren@iccmarine.com>
Cc: Daniel Leonard <dleonard@westmaradvisors.com>
Subject: RE: Harbour Green Public Dock Repairs

Hi Mike,

Thank you both for meeting with me yesterday afternoon.

Please find attached the condition assessment report completed by Associated Engineering. I have also attached a copy of the record drawings from IMFS.

As discussed, we have been asked to consider two approaches:

i. repair the dock to restore its original function (recreational use) with some possible upgrades to improve resilience and decrease ongoing maintenance requirements; or

ii. repair the dock with the intent to allow commercial operations at the dock (including any safety/compliance upgrades + potential cost for legal consulting) in addition to upgrades to improve resilience and decrease ongoing maintenance requirements

We are going to be reporting to our board on the potential costs of each approach so that we can get guidance on which direction to follow. I would be thankful if you could get back to me as soon as possible with your thoughts.

In the meantime, we are trying to solicit from the commercial operators that have expressed interest in using this space specifications for their vessels so that we can compare them to the performance spec. That is why I was wondering if you are able to send us a copy of the drawings and specs.

I was also wondering if Daniel could guide us on what type of vessel information are most important to allowing you to cost potential upgrade costs so that we are getting the right information.

Many thanks,
Ali

Ali Nayeri | Park Development | Board of Parks & Recreation
2099 Beach Avenue, Vancouver, BC V6G 1Z4
Tel: 604-257-8461 | Cell: 604-353-1896
Email: ali.nayeri@vancouver.ca

From: Mike Warren [mailto:mwarren@iccmarine.com]
Sent: Wednesday, April 11, 2018 1:02 PM
To: Nayeri, Ali
Cc: Daniel Leonard - Westmar Advisors Inc.
Subject: Harbour Green Public Dock Repairs

Ali,

It was a pleasure meeting you and we do appreciate the time you afforded Daniel and myself during our site visit yesterday.

We look forward to receiving further documents as discussed after which we will come back to you with some budgetary cost estimates on how to proceed with repairing the facility back to original condition as well as an option for upgrading the facility for potential commercial use.

In the interim, if you have any questions, require further information of if we can be of assistance in any way, please do not hesitate to call.

Regards
Mike

Mike Warren
Business Development Manager

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From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Mike Warren" <mwarren@iccmarine.com>
Date:	4/11/2018 4:07:12 PM
Subject:	RE: Harbour Green Public Dock Repairs
Attachments:	harbour_green_dock_2017_report.pdf harbour_green_dock_2018_photos.pdf harbour_green_dock_drawings.pdf

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I was also wondering if Daniel could guide us on what type of vessel information are most important to allowing you to cost potential upgrade costs so that we are getting the right information.

Many thanks,
Ali

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2099 Beach Avenue, Vancouver, BC V6G 1Z4
Tel: 604-257-8461 | Cell: 604-353-1896
Email: ali.nayeri@vancouver.ca

From: Mike Warren [mailto:mwarren@iccmarine.com]
Sent: Wednesday, April 11, 2018 1:02 PM
To: Nayeri, Ali
Cc: Daniel Leonard - Westmar Advisors Inc.
Subject: Harbour Green Public Dock Repairs

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We look forward to receiving further documents as discussed after which we will come back to you with some budgetary cost estimates on how to proceed with repairing the facility back to original condition as well as an option for upgrading the facility for potential commercial use.

In the interim, if you have any questions, require further information of if we can be of assistance in any way, please do not hesitate to call.

Regards
Mike

Mike Warren
Business Development Manager

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September 12, 2017
File: 20162282.00.E.05.00

Ali Nayeri

City of Vancouver
453 West 12th Avenue
Vancouver, BC V5Y 1V4

Re: DETAILED INSPECTION OF HARBOUR GREEN DOCK

Dear Ms. Nayeri:

The **Vancouver Board of Parks and Recreation** (Park Board) retained **Associated Engineering** (AE) to perform a detailed inspection of Harbour Green Dock. The dock was inspected by **Natalya Kucherenko, EIT**, and **Niall McPherson, EIT** on August 24th, 2017. This report presents the results of our inspection and assessment of the structure.

The dock is located at the Harbour Green Park and is comprised of eight precast concrete floats, secured in place with steel pipe piles and brackets. Each float secured in one or two locations and moves independently. The rubber fender blocks installed at the interface between floats protect the floats from the potential damage from adjacent floats. The dock is accessible via two independent aluminum truss ramps. It is our understanding that the dock is used by both commercial and recreational vessels, and intended for short-term mooring.

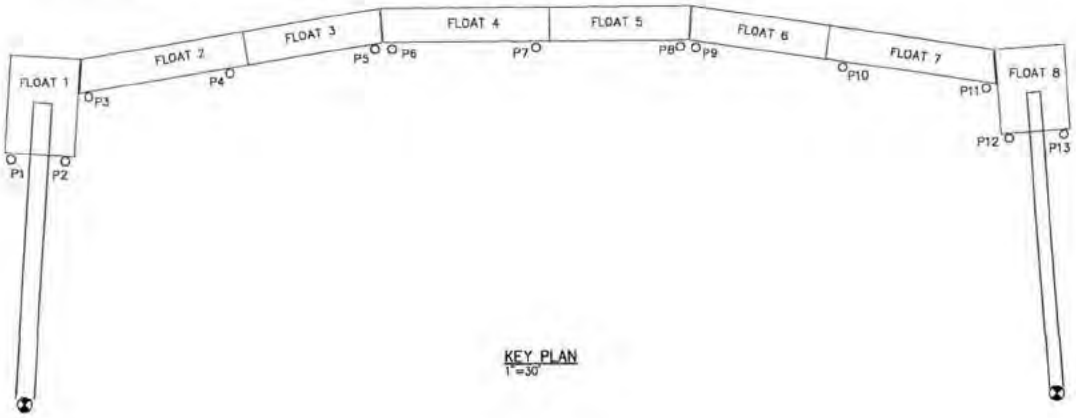


Figure 1
Harbour Green Dock – Key Plan

Based on our inspection, the dock is in poor condition with numerous safety related issues and structural deficiencies. Table 1 summarizes all observed safety related issues and provides recommendations for

repair. We recommend that any safety related issues are addressed immediately to limit any public liability exposure.

Table 1
Safety Related Issues

Location	Defect / Recommendation	Photo
1.1 East Railing, Float 8	Missing top handrail	
	Fractured midrail section	

Location	Defect / Recommendation	Photo
	Loose bolts at the north base plate	
	Recommendation: Replace or repair railing section.	
1.2 Mooring pile P8	The disconnected and displaced steel plate pile-cap presents a potential falling hazard to pedestrians	
	Recommendation: Remove the plate to address immediate risk, reattach when time permits. Check pile cap welds on remaining piles. Remove/ repair any loose plates or plates with compromised welds.	

Location	Defect / Recommendation	Photo
1.3 West Railing, Float 1	Broken and disconnected post	
		
	Recommendation: Repair broken section of railing.	
1.4 Bullrail, Floats 2-7	Broken and displaced 2m long section of timber bullrail	

Location	Defect / Recommendation	Photo
	Bullrail is in poor condition and has missing washers in multiple locations, and damaged sections along its length	
	Missing washer (typical)	
	Damage to bullrail appears to be primarily caused by vessels mooring directly to the bull rail and not to the mooring cleats. Several boats were observed mooring to the bullrail during the inspection.	

Location	Defect / Recommendation	Photo
	Sections of bullrail that were removed during transition rubber pads replacement works	
	Recommendation: Replace missing or broken sections of the bullrail, repair damaged sections. Consider adding signage to encourage mooring to cleats, rather than to bullrails.	
1.5 Floats, Public safety equipment	Safety ladders were not installed as per original design drawings. We recommend the Park Board consider making the following safety improvements: • Install lifting safety ladders such that the maximum water distance between ladders is 30 m. The lifting ladders shall be free of the water when lifted and extend 1m minimum below the water surface when deployed. They shall be suitable for inadvertent swimmers to access the ladder and egress the water. The bull rail openings should be reconfigured to allow access to the float from the safety ladders. • Life Rings: Safety life rings complete with stand and throw rope shall be provided at three locations along the main dock walkway.	

In addition to the safety related defects we also observed numerous structural deficiencies that should be repaired. We recommend that Park Board addressed these structural deficiencies within 12 month to limit further deterioration that will result from the damaged or missing components.

Table 2
Structural Deficiencies

Location	Defect / Recommendation	Photo
2.1 Pile P9, Float 6	Connection of steel bracket to concrete float 6 has failed	
	Bolts have sheared	
	Bracket is fractured	

Location	Defect / Recommendation	Photo
	Recommendation: Replace bracket as per original design. Float 6 has secured in place only to Pile 9; to prevent severe damage to the float 6 and adjacent floats 5 and 7 due to uncontrolled movement we recommend the bracket to be replaced within 12 month period.	
2.2 Floats 1 to 8	2 inch UHMW (Ultra-high molecular weight polyethylene) pads and timber rubrails in locations of the mooring wells are heavily worn or have failed. As the result, continuous contact of the piles to the float causing damage to the side face of the concrete floats. Further damage to the concrete may compromise the float structure	
	Pile rubbing against the concrete float	
	Recommendation: Replace and/or reinstall UMHW pads and timber rubrails where necessary. These sacrificial pads shall be checked on an annual basis and replaced as required. Alternatively, consider redesigning mooring brackets to more robust so they can better withstand cyclic movement of the floats and limit uncontrolled float movement.	

Location	Defect / Recommendation	Photo
2.3 Floats 4 and 5	Two failed mooring cleats	
	Recommendation: Replace two mooring cleats. To prevent further damage to mooring cleats and bullrail, we recommend to install warning signs suggesting an allowable range of vessels with specified length and Dead Weight Tonnage (DWT) to use the dock, and forbidding mooring directly to the bullrail	
2.4 Pile P6	Loose bolts and one missing nut and washer on the connection of steel bracket around pile P6 to concrete float	
	Recommendation: Replace existing nuts with locknuts to prevent them from falling off the bolts caused by the cyclic nature of the float movement.	

Location	Defect / Recommendation	Photo
2.5 East and West Ramps	One loose grating clip on the east ramp and four loose and one missing grating clips on the west ramp	
	Recommendation: Install missing clip and tighten all loose clips on the grating.	

We trust this letter provides sufficient information for the City's maintenance and planning decisions. Should you have any further questions or concerns please don't hesitate to contact us.

Yours truly,

Prepared by:

Natalya Kuchernko, EIT
Structural Engineer

Reviewed by

Mike Hanson, P.Eng.
Project Manager

NK/MK/mc

Harbour Green Dock - Pile Brackets Update

overview_01

pile_01

Harbour Green Dock - Pile Brackets Update

pile_02

pile_03

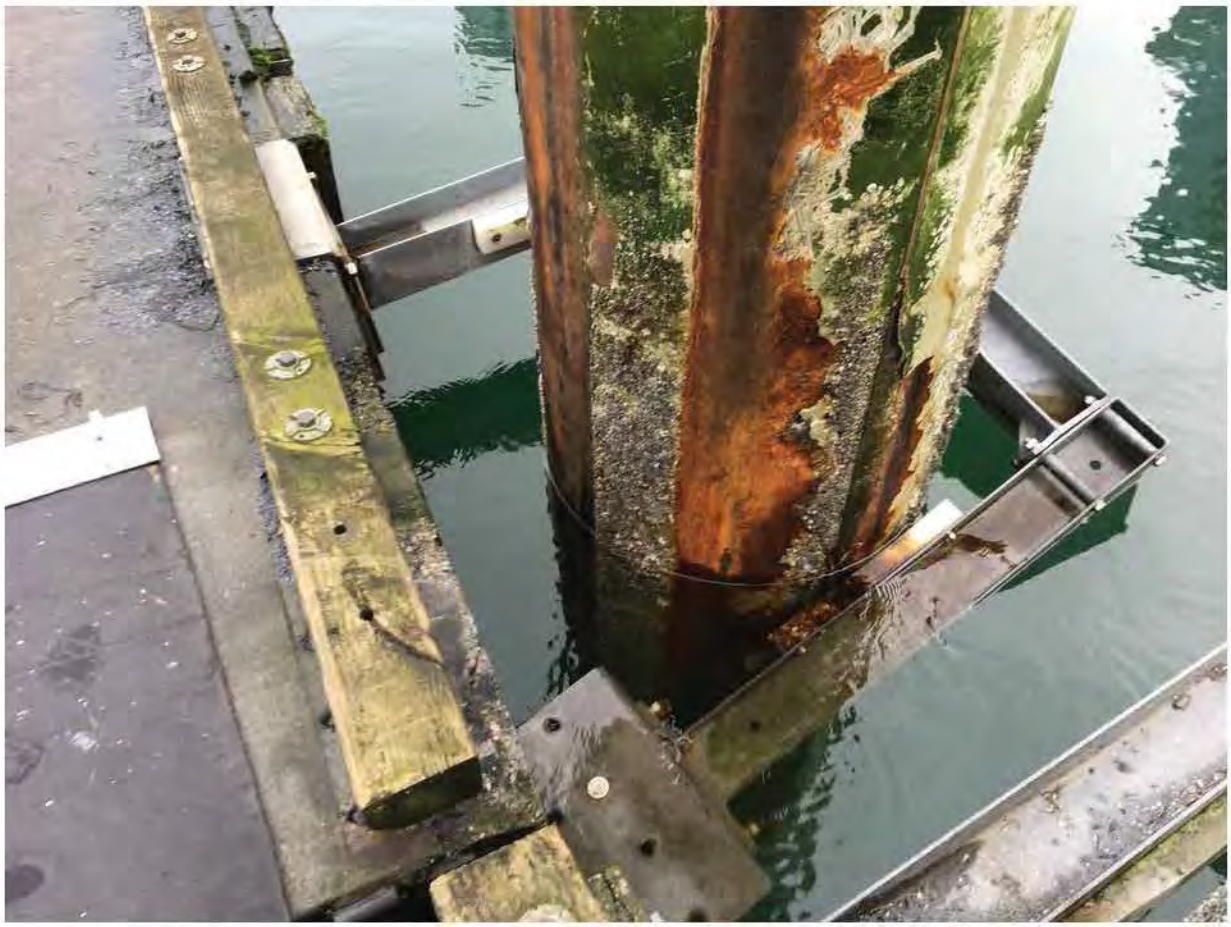
Harbour Green Dock - Pile Brackets Update

pile_04

pile_05

Harbour Green Dock - Pile Brackets Update

pile_05_and_06



pile_06_view_1

Harbour Green Dock - Pile Brackets Update

pile_06_view_2

pile_07

Harbour Green Dock - Pile Brackets Update

pile_08

pile_08_and_09

Harbour Green Dock - Pile Brackets Update

pile_09_view_1

pile_09_view_2

Harbour Green Dock - Pile Brackets Update

pile_10

pile_11

Harbour Green Dock - Pile Brackets Update

pile_12_view_1

pile_12_view_2

Harbour Green Dock - Pile Brackets Update

pile_13_view_1

pile_13_view_2

INTERNATIONAL MARINE FLOATATION SYSTEMS HARBOUR GREEN FLOATING WALKWAY

DRAWING LIST	
DWG. NO.	DRAWING TITLE
G1	GENERAL ARRANGEMENT
G2	GENERAL NOTES AND SPECIFICATIONS
S1	TYPICAL FLOAT DETAILS SH. 1
S2	TYPICAL FLOAT DETAILS SH. 2
S3	TYPICAL FLOAT DETAILS SH. 3
S4	TYPICAL FLOAT – PILE BRACKET DETAILS
S5	TYPICAL END FLOAT DETAILS

ISSUED FOR APPROVAL
ALL–SPAN ENGINEERING
MAY 1, 2001

AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

ALL-SPAN ENGINEERING & CONSTRUCTION LTD.
#201 – 7198 VANTAGE WAY
DELTA, B.C. V4G 1K7
PH: (604) 940–2212 FAX. (604) 940–1516

GENERAL NOTES AND SPECIFICATIONS

1.0 DESIGN LOADS

Dead Loads – Includes framing, walers, utilities, etc.
Uniformly Distributed Load = 30 lbs/ft
Ramp Dead Load = 8270 lbs Float End
Minimum Calculated Freeboard under Dead Load = 19.0" (483mm)

Live Loads – Uniformly Distributed Loads 100 psf (4.8 kPa)
Concentrated Load 1000 lbs (4.5 kN) over 3'x3 square area
Line Load at 3' from edge of Float 10000 lbs (45 kN)
Min Calculated Freeboard under Dead and Live Load = 11.59" (295mm)
Min Average Freeboard Required = 2" (50mm)
Ground Snow Load 37.6 psf (1.8 kPa)
Ss = 33.5 psf (1.6 kPa)
Sr = 4.2 psf (0.2 kPa)
Min. Calculated Freeboard under Dead + Snow Load = 12" (300mm)

The concrete floats have been designed for the wave and wind loads as specified in the design criteria

Wave Conditions – Design Significant Wind Wave ht. 5.0 ft (1.5m)
Peak Period = 4.0 seconds
Incident Wave Direction = 30° to float ⊥
Horizontal Wave Load = 170 plf (2.5kN/m)

Wind Conditions – 1/30 yr hourly Wind Pressure
q 1/30 = 9.2 psf (0.44 kPa)
Equivalent Blockage Area. 1.5m high along entire length of float
Average Drag Coefficient: 2.0

Impact Loading – 35' (10.7m) long vessel with 15000 lbs (6.8 tonnes) and minimum Perpendicular Impact Velocity = 0.3 m/s

Pile Bracket Horizontal Live Loads – Max. 12.4 kips (55kN)

2.0 DESIGN CALCULATION NOTES

2.1 Design Codes and References:

a) CSA–A23.3 Design of Concrete Structures
b) CSA–O86.1 Engineering Design in Wood
c) CSA–S16.1 Limit State Design of Steel Structures
d) Design of Marine Facilities for Berthing, Mooring and Repair of Vessels, J.W. Caythwaite, 1990
e) Marinas and Small Craft Harbors, B.O. Tobiasson and R.C. Kollmeyer, 1991

2.2 Load Factors: Dead Loads 1.25
Live Loads (including wind, waves, snow and impact loads) 1.5

2.3 Assumed Structural Properties:

Concrete: Strength at lifting f'c=4350 psi (30 MPa)
Min. 28 day strength f'c=5800 psi (40 MPa)
Reinforcing Bars Min. yield strength fy=60 ksi (400 MPa)
Structural Steel Min. yield strength fy=44 ksi (300 MPa)
Min. ult tensile fu=65 ksi (450 MPa)
Bolts – ASTM A307 Min. yield strength fy=36 ksi (248 MPa)
Min. ult. tensile fu=60 ksi (414 MPa)
P.T. Strand Min ultimate tensile fu=270 ksi (1860 MPa)
Assumed density of sea water 63.96 pcf (1025 kg/m3)

3.0 MATERIAL SPECIFICATIONS

3.1 Concrete

Concrete to conform to the latest edition of CSA–A23.4, CSA–A23.1 and the Contract Specifications Minimum compressive strength at 28 days to be 5800 psi (40 MPa). Minimum strength at lifting of the floats is to be 4350 psi (30 MPa)

Aggregate shall conform to CSA–A23.1, maximum aggregate size to be 3/8" (10mm) Concrete to be air–entrained from 4 to 7% and to be tested in accordance with CSA–A23.2 Maximum water/cement ratio to be 0.4. Exposure class to be C–1.

Concrete mix designs are to be submitted to the design engineer and owner for approval prior to fabrication

Concrete is to be vibrated internally and/or externally to ensure a smooth dense finish. No cold joints will be accepted in the float

Forms are to be steel lined and have smooth, true surfaces Any rough edges, form marks, or defects such as protruding fins shall be cleaned, ground smooth or patched.

Concrete testing is to be carried out by certified personnel, conforming to CSA–A23.2. Concrete cylinders are to be taken and tested in accordance with CSA–A23.2 for each day's production.

Entrained air tests to be taken daily from the same material samples used for the compressive test cylinders. All test results are to be forwarded to the owner and design engineer.

3.2 Reinforcing Steel

Reinforcing steel is to conform to CAN/CSA–G30.18, Grade 400.

3.3 Bolts

Bolts to conform to ASTM A307, minimum yield fy=36 ksi (248 MPa), ultimate tensile strength fu=60 ksi (414 MPa)

All bolts and hardware to be galvanized conforming to ASTM A153.

3.4 Expanded Polystyrene (EPS) Core

The closed cell expanded polystyrene core is to meet Federal Specification C–578–85 and ASTM D–1621, Water absorption to be less than 2% by volume in accordance with ASTM C272.

The EPS is to have a density between 0.95 and 1.10 pcf.

The EPS core is to be held in a true position during the casting operation with an allowable variation of 1/8" from the dimensions shown on the shop drawings.

EPS billets shall have a dimension tolerance of ±1/8"

Individual foam pieces will be retained in place to ensure that the core stays in place during pouring of the concrete, float installation and while in service.

3.5 Connectors

All walers are to be non–structural and are to be securely fastened to the floats using galvanized bolts and washers.

No connecting device shall protrude beyond the walers into the berthing area. Any device protruding above the surface of the deck shall have a low, rounded profile.

3.6 Timber

All sawn timber to conform to Coast Doug. Fir #2 or better, pressure treated with water–borne preservatives.

Timber is to be incised and pressure treated according to CSA O80 specifications to a net dry salt retention of not less than 0.60 pounds per cubic foot (6 kg/m3) of ACA (ammoniacal copper arsenate) in the assay zone

Timber components are to be cut to length, drilled, dapped, and shaped as much as practical before pressure treating. Any field fabrication or damage is to be repaired. Bolt holes are to be 1/8" oversized except as otherwise noted Each piece of lumber is to be stamped with a grade mark The stamp shall identify the grading and the certification and shall be an indentation mark or equivalent so the mark will be legible after pressure treatment

3.7 Structural Steel

All structural steel shall conform to CSA G40.21, minimum yield strength fy=44 ksi (44W) (300 MPa), minimum tensile strength fu= 65 ksi (450 MPa)

All steel is to be hot–dip galvanized according to CSA G164, min. zinc coating of 600 kg/m2

Welding shall conform to CSA W59M

3.8 UHMW

UHMW (ultra–high molecular weight polyethylene) shall be 100% cross–linked UV–stabilized with properties as listed in the contract specifications

3.9 Post–Tensioning

Refer to Drawing 01024–S1 for post–tensioning notes.

4.0 DECK FINISH

Float deck surfaces are to be steel–trowelled with a broom finish applied transversely to the walking deck. The fabricator is to ensure an even and consistent broomed finish is achieved on all deck surfaces.

All top edges are to have a 1/2" tooled radius with a minimum 1 1/2" wide smooth hard steel finished shiner strip.

5.0 SURFACE DEFECTS

Refer to contract specifications.

Rock pockets and/or honeycombing exceeding 1/2" in diameter and/or 3/8" deep are to be patched with an approved non–shrink grout of a colour similar to the cured concrete. Any pockets that expose the reinforcing steel shall be chipped out, cleaned and filled with an approved epoxy–patching compound.

6.0 SERVICEABILITY

Once installed, the walking surface of the floats shall be level and flush with adjacent floats. Design/shop drawings are to be referred to for crown dimensions on floats required to prevent water pooling on the surface.

Differential elevation between adjacent float units shall not exceed 3/8"

S. B. Y. MAWANI PROFESSIONAL ENGINEER COLUMBIA

DATE	30/04/01		
SCALE	AS NOTED		
DRAWN BY	R.W.		
DESIGN BY	S.M.		
CHECKED BY	D.M.		
APPROVED			
PROJECT No.	01024	REV	A
DRAWING No.	G2		

REV.	DESCRIPTION	DD/MM/YY
A	ISSUED FOR APPROVAL	01/05/01
B		
C		
D		
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F		

CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS
PROJECT: HARBOUR GREEN FLOATING WALKWAY
DRAWING TITLE: GENERAL NOTES AND SPECIFICATIONS

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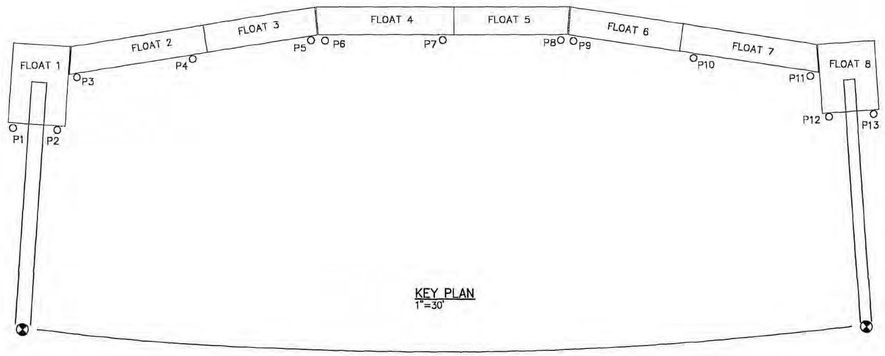

KEY PLAN
1"=30'

NOTES:
1. FOR GENERAL NOTES, SEE DWG. 01024–G2.

S. B. Y. MAWANI PROFESSIONAL ENGINEER COLUMBIA

AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

ISSUED FOR APPROVAL
ALL–SPAN ENGINEERING
MAY 1, 2001

DATE	05/04/01		
SCALE	AS NOTED		
DRAWN BY	R.W.		
DESIGN BY	S.M.		
CHECKED BY	D.M.		
APPROVED			
PROJECT No.	01024	REV	A
DRAWING No.	G1		

REV.	DESCRIPTION	DD/MM/YY
A	ISSUED FOR APPROVAL	01/05/01
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C		
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CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS
PROJECT: HARBOUR GREEN FLOATING WALKWAY
DRAWING TITLE: GENERAL ARRANGEMENT

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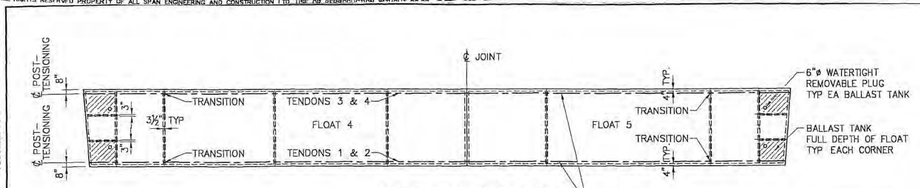
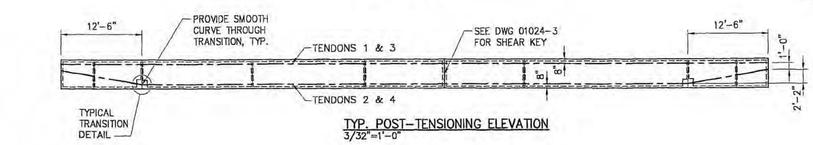


TYP. POST–TENSIONING PLAN
3/32"=1'–0"

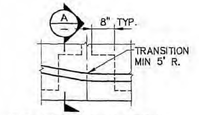
FOR DIMENSIONS, SEE IMFS SHOP DWGS

2 1/2" P.T. DUCT FOR 4–0.6"ø STRANDS, TOP & BOT.

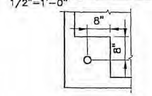
UTILITIES NOT SHOWN FOR CLARITY



TYP. POST–TENSIONING ELEVATION
3/32"=1'–0"



TYP TRANSITION DETAIL
1/2"=1'–0"



SECTION A
1/2"=1'–0"

JACKING SEQUENCE
TENDONS TO BE STRESSED FROM ONE END.

STAGE	TENDON	TENDON LOAD AS % OF JACKING LOAD
1	1	20
2	2	40
3	3	20
4	4	40
5	1	60
6	2	80
7	3	60
8	4	80
9	1	100
10	2	100
11	3	100
12	4	100

NOTES:
1. POST–TENSIONING STRANDS ARE TO BE 0.6"ø 7–WIRE UNCOATED LOW–RELAXATION STRANDS – GRADE 270 ksi (1860 MPa) EACH DUCT TO HAVE 4 STRANDS.
2. DUCT SIZE TO BE 2 3/16" I.D., 2 1/2" O.D.
3. JACKING STRESS IS TO BE 0.75 fpu = 203 ksi.
4. ANCHORAGES TO BE FREYSSINET 4K15 ANCHORAGES FOR 4–0.6"ø STRANDS OR APPROVED EQUAL.
5. CONCRETE IS TO ATTAIN THE MIN. COMPRESSIVE STRESS OF 5800 psi (40 MPa) PRIOR TO STRESSING.
6. ALL P.T. DUCTS SHALL BE PRESSURE GROUTED WITH SIKA INTRAPLAST TYPE 'N' GROUT OR APPROVED EQUIVALENT COMPOUND WITHIN 24 HRS AFTER COMPLETION OF STRESSING. MIN. GROUT STRENGTH SHALL BE 5800 psi (40 MPa) AT 28 DAYS. A MINIMUM OF 2 GALLONS OF GROUT SHALL BE FLUSHED THROUGH THE END VENT BEFORE TYING OFF. INTERMEDIATE VENT TUBES SHALL BE PROVIDED IF REQUIRED TO ENSURE COMPLETE GROUTING (CONFIRM WITH P.T. SUPPLIER).

S. B. Y. MAWANI PROFESSIONAL ENGINEER COLUMBIA

AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

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ALL–SPAN ENGINEERING
MAY 1, 2001

DATE	05/04/01		
SCALE	AS NOTED		
DRAWN BY	R.W.		
DESIGN BY	S.M.		
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APPROVED			
PROJECT No.	01024	REV	A
DRAWING No.	S1		

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A	ISSUED FOR APPROVAL	01/05/01
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CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS
PROJECT: HARBOUR GREEN FLOATING WALKWAY
DRAWING TITLE: TYPICAL FLOAT DETAILS – SH. 1

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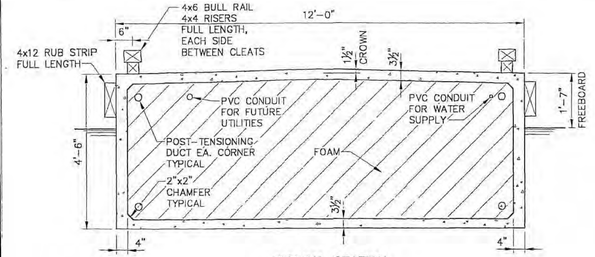
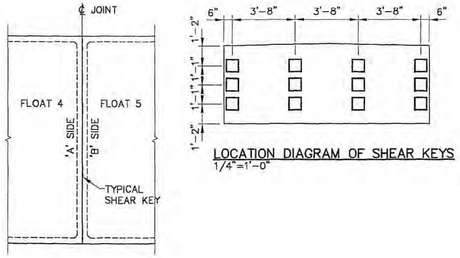
Checked: Date: /

Size	Drawing Number	Rev.
A1	375.027	

A1 375.027

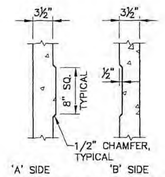


TYPICAL SECTION
1/2"=1'-0"



PLAN AT JOINT
1/4"=1'-0"

LOCATION DIAGRAM OF SHEAR KEYS
1/4"=1'-0"



SHEAR KEY CONN. SECTION
1"=1'-0"

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ALL-SPAN ENGINEERING
MAY 1, 2001

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REV	DESCRIPTION	DD/MM/YY
A	ISSUED FOR APPROVAL	01/05/01
B		
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DATE 09/04/01
SCALE AS NOTED
DRAWN BY R.W.
DESIGN BY S.M.
CHECKED BY D.M.
APPROVED
PROJECT No 01024 REV A
DRAWING No S2

CLIENT INTERNATIONAL MARINE FLOATATION SYSTEMS
PROJECT HARBOUR GREEN FLOATING WALKWAY
DRAWING TITLE TYPICAL FLOAT DETAILS – SH. 2

ALL-SPAN
ENGINEERING & CONSTRUCTION LTD.
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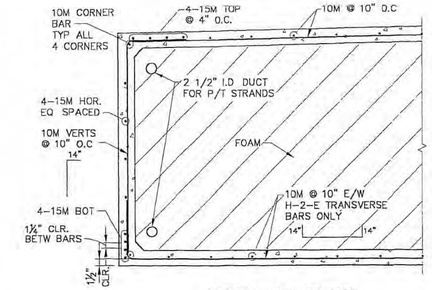
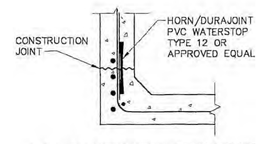
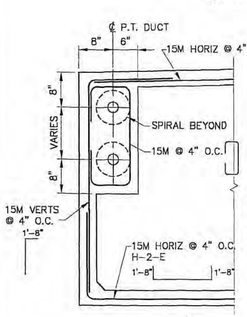


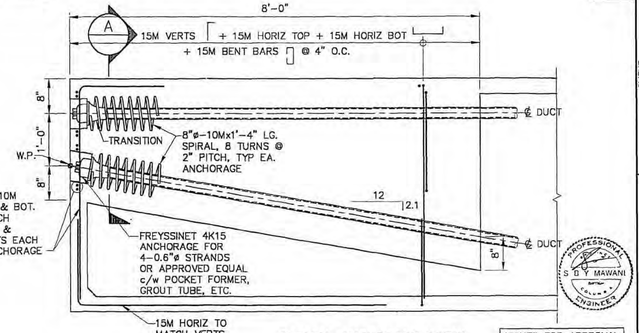
TYPICAL WALL SECTION
3/4"=1'-0"



TYP. CONSTRUCTION JOINT DETAIL
1 1/2"=1'-0"



SECTION (A)
3/4"=1'-0"



TYPICAL ANCHORAGE DETAIL
3/4"=1'-0"

ISSUED FOR APPROVAL
ALL-SPAN ENGINEERING
MAY 1, 2001

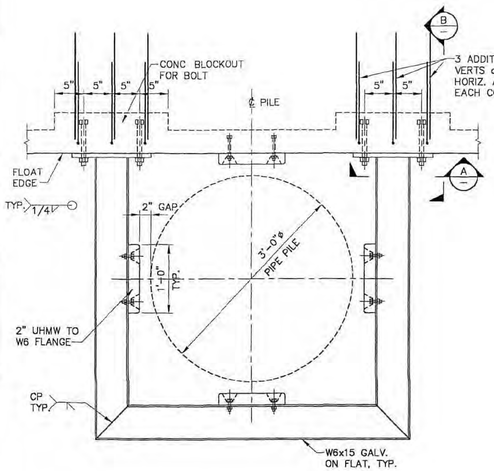
AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

REV	DESCRIPTION	DD/MM/YY
A	ISSUED FOR APPROVAL	01/05/01
B		
C		
D		
E		
F		

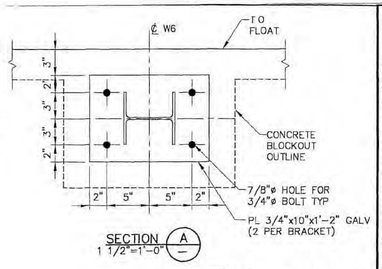
DATE 09/04/01
SCALE AS NOTED
DRAWN BY R.W.
DESIGN BY S.M.
CHECKED BY D.M.
APPROVED
PROJECT No 01024 REV A
DRAWING No S3

CLIENT INTERNATIONAL MARINE FLOATATION SYSTEMS
PROJECT HARBOUR GREEN FLOATING WALKWAY
DRAWING TITLE TYPICAL FLOAT DETAILS – SH. 3

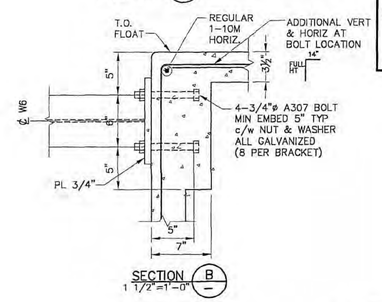
ALL-SPAN
ENGINEERING & CONSTRUCTION LTD.
#201 – 7198 VANTAGE WAY V4G 1K7
DELTA, B.C.
E-MAIL: ALLSPAN@PLANETEER.COM
PH: (604) 940-2212 FAX: (604) 940-1516



PLAN MIDDLE BRACKET SHOWN (END BRACKETS SIMILAR)
1"=1'-0"



SECTION (A)
1 1/2"=1'-0"



SECTION (B)
1 1/2"=1'-0"

ISSUED FOR APPROVAL
ALL-SPAN ENGINEERING
MAY 1, 2001

AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

REV	DESCRIPTION	DD/MM/YY
A	ISSUED FOR APPROVAL	01/05/01
B		
C		
D		
E		
F		

DATE 10/04/01
SCALE AS NOTED
DRAWN BY R.W.
DESIGN BY S.M.
CHECKED BY D.M.
APPROVED
PROJECT No 01024 REV A
DRAWING No S4

CLIENT INTERNATIONAL MARINE FLOATATION SYSTEMS
PROJECT HARBOUR GREEN FLOATING WALKWAY
DRAWING TITLE TYPICAL FLOAT DETAILS

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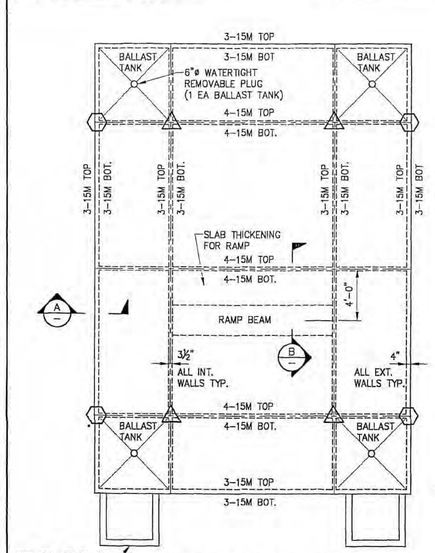
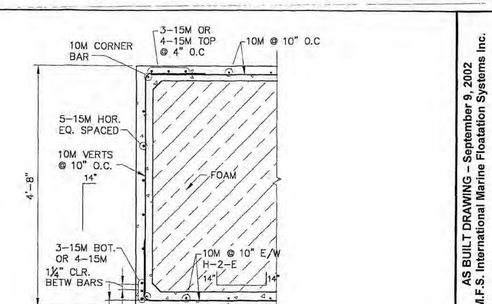
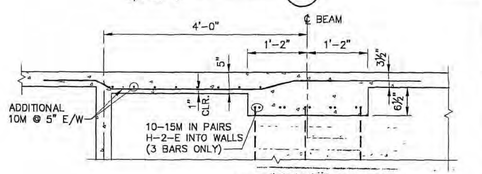


SEE DWG. 01024–S4 FOR PILE BRACKET DETAILS

TYP. END FLOAT PLAN FLOAT 1 SHOWN (FLOAT B SIMILAR)
3/16"=1'-0"



TYPICAL WALL SECTION (A)
3/4"=1'-0"



SECTION (B)
3/4"=1'-0"

NOTES:
FOR DIMENSIONS, SEE IMFS SHOP DWGS.
△ – LIFT POINTS
⬡ – TRANSFER/LAUNCH POINTS
MAX. ANTICIPATED JACK LOAD = 182.8 kN (20.5 TONS)

ISSUED FOR APPROVAL
ALL-SPAN ENGINEERING
MAY 1, 2001

AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

REV	DESCRIPTION	DD/MM/YY
A	ISSUED FOR APPROVAL	01/05/01
B		
C		
D		
E		
F		

DATE 11/04/01
SCALE AS NOTED
DRAWN BY R.W.
DESIGN BY S.M.
CHECKED BY D.M.
APPROVED
PROJECT No 01024 REV B
DRAWING No S5

CLIENT INTERNATIONAL MARINE FLOATATION SYSTEMS
PROJECT HARBOUR GREEN FLOATING WALKWAY
DRAWING TITLE TYPICAL END FLOAT DETAILS

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Checked: Date:

Size	Drawing Number	Rev.
A1	375.027	

INTERNATIONAL MARINE FLOATATION SYSTEMS

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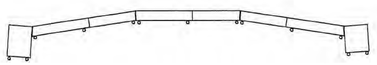
Tel (604) 946-4544 Fax: (604) 946-6796
WWW . FLOATINGHOMES . COM

MARATHON DEVELOPMENTS INC.

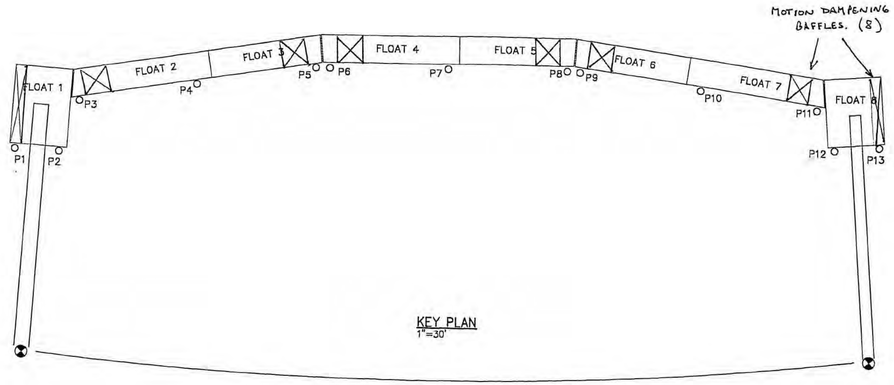
HARBOUR GREEN



DRAWING NO.	TITLE
01-190-01	FLOAT #1
01-190-02	FLOAT #2
01-190-03	FLOAT #3
01-190-04	FLOAT #4
01-190-05	FLOAT #5
01-190-06	FLOAT #6
01-190-07	FLOAT #7
01-190-08	FLOAT #8
01-190-09	PILE HOOP DETAIL
01-190-10	GENERAL DETAILS
01-190-11	INTERFACE DETAILS
01-190-12	CLEAT DETAIL

ISSUED FOR APPROVAL(REVIEW)
IMFS MAY 2, 2001

AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.



KEY PLAN
1"=30'

NOTES:
1. FOR GENERAL NOTES, SEE DWG. 01024-02

S. B. Y. MAWANI — PROFESSIONAL ENGINEER

AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

ISSUED FOR APPROVAL
ALL-SPAN ENGINEERING
MAY 1, 2001

	DATE	08/04/01
	SCALE	AS NOTED
F	DRAWN BY	R.W.
E	DESIGN BY	S.M.
D	CHECKED BY	D.M.
C	APPROVED	
B	PROJECT No.	01024
A	ISSUED FOR APPROVAL (REVIEW)	

CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS
PROJECT: HARBOUR GREEN FLOATING WALKWAY
DRAWING TITLE: GENERAL

ALL-SPAN ENGINEERING & CONSTRUCTION LTD.
#201 – 7198 VANTAGE WAY
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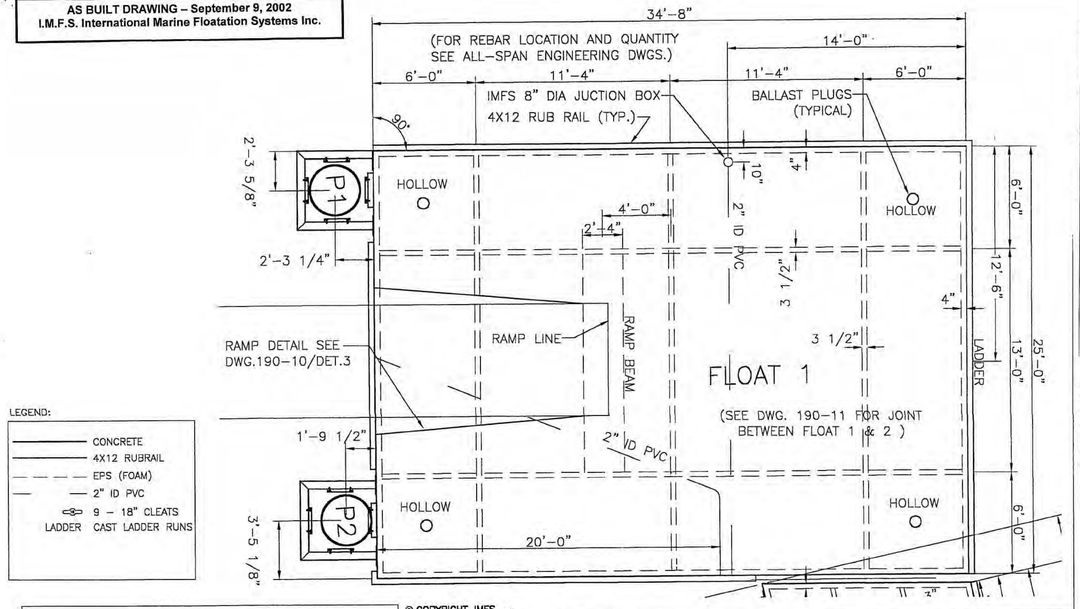
AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.



LEGEND:
- CONCRETE
- 4X12 RUBRAIL
- EPS (FOAM)
- 2" ID PVC
- 9 – 18" CLEATS
- LADDER CAST LADDER RUNS

KEY PLAN

REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

INTERNATIONAL MARINE FLOATATION SYSTEMS
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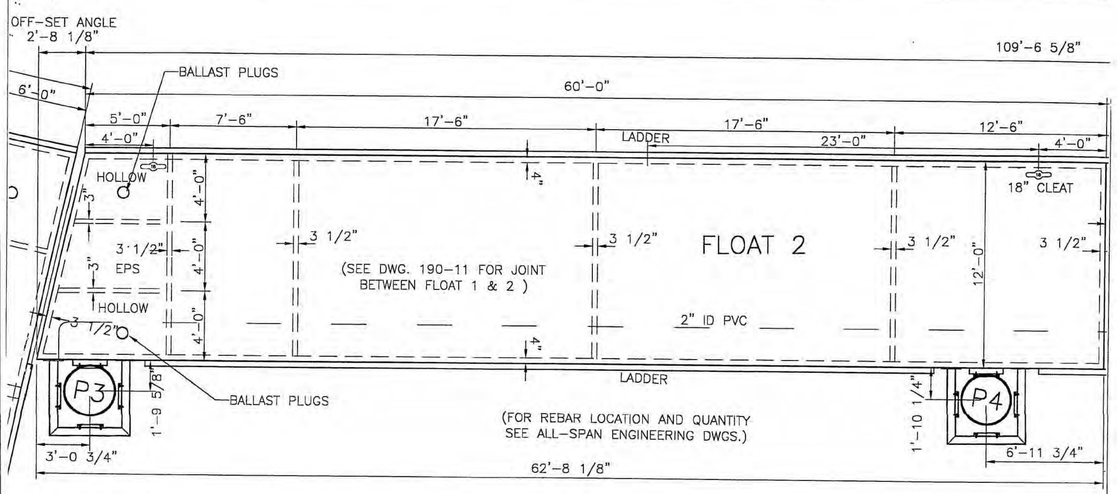
Float #1	
Drawn by: M.TOBIAS	Date: March 16/01
Designed: –	Scale: 1/4"=1'-0"
Project: Harbour Green	DWG No. 01-190-01

OFF-SET ANGLE
2'-8 1/8"



KEY PLAN

REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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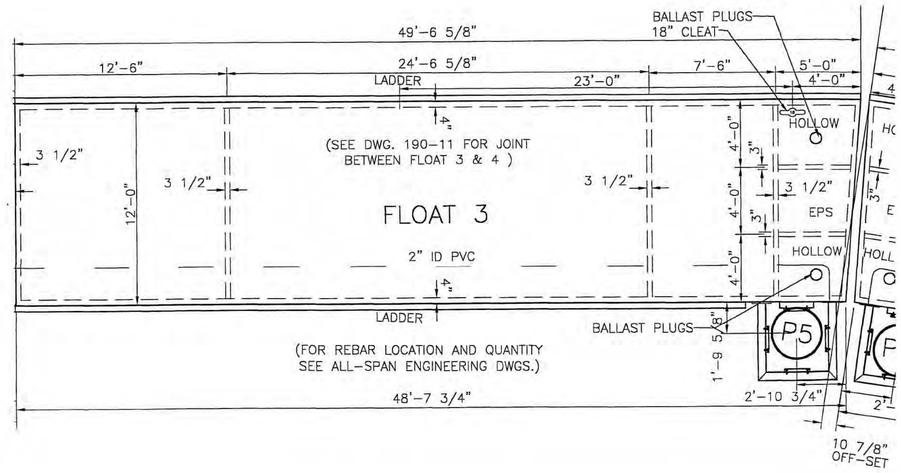
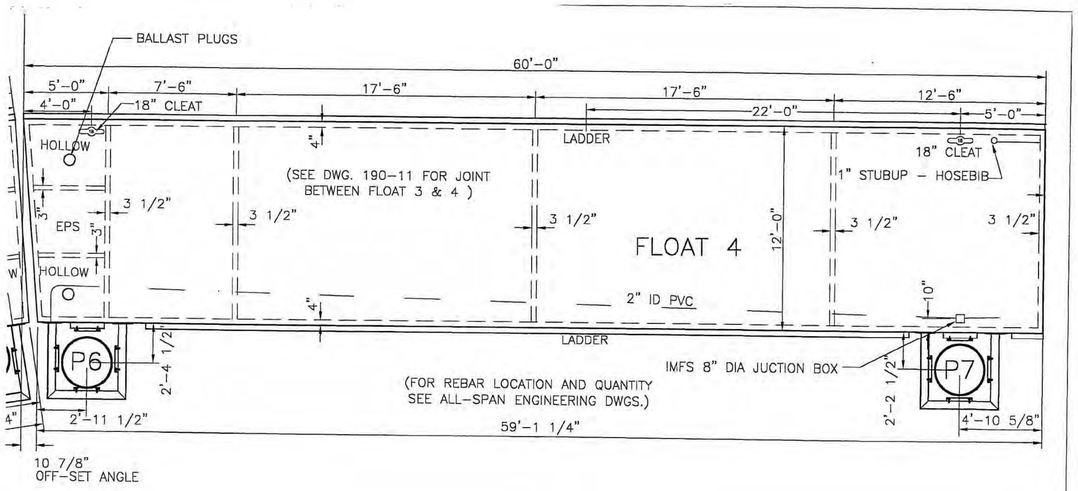
AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

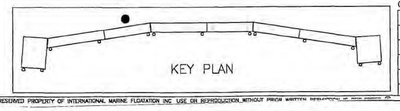
Float #2	
Drawn by: M.Tobias	Date: Mar 28/01
Designed: –	Scale: 1/4"=1'-0"
Project: Harbour Green	DWG No. 01-190-02
Checked:	Date:

Size	Drawing Number	Rev.
A1	375.027	3

A1 375.027







AS BUILT DRAWING – September 9, 2002
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REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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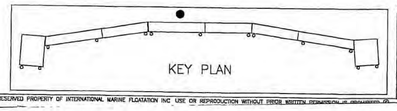
Float #3	
Drawn by: M.Tobias	Date: Mar 18/01
Designed: –	Scale: 1/4"=1'-0"
Project: Harbour Green	DWG No. 01-190-03



AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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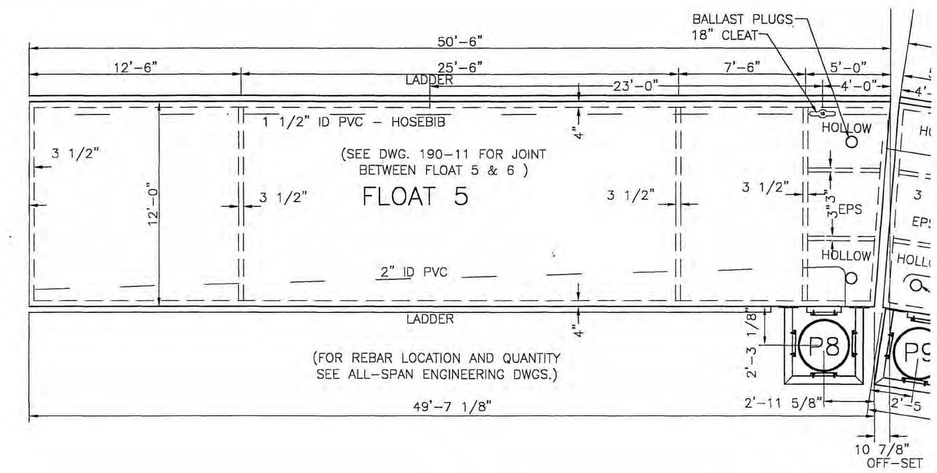
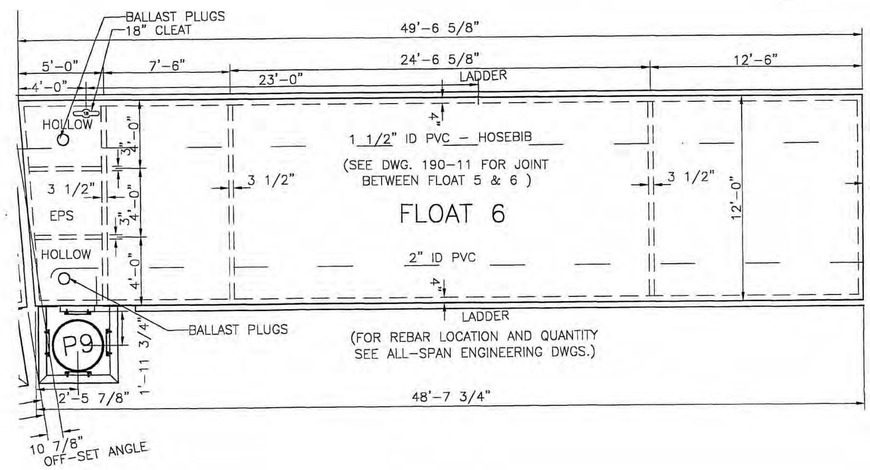
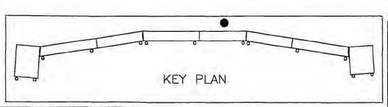
FLOAT #4	
Drawn by: M.TOBIAS	Date: –
Designed: –	Scale: 1/4"=1'-0"
Project: Harbour Green	DWG No. 01-190-04







AS BUILT DRAWING – September 9, 2002
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REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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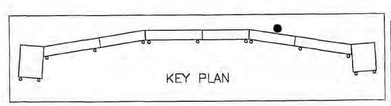
FLOAT #5	
Drawn by: M.TOBIAS	Date: –
Designed: –	Scale: 1/4"=1'-0"
Project: Harbour Green	DWG No. 01-190-05



REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

INTERNATIONAL MARINE FLOATATION SYSTEMS
3473 RIVER ROAD WEST, DELTA B C V4K 3N2 CANADA
Tel (604) 946-4544 Fax: (604) 946-6796
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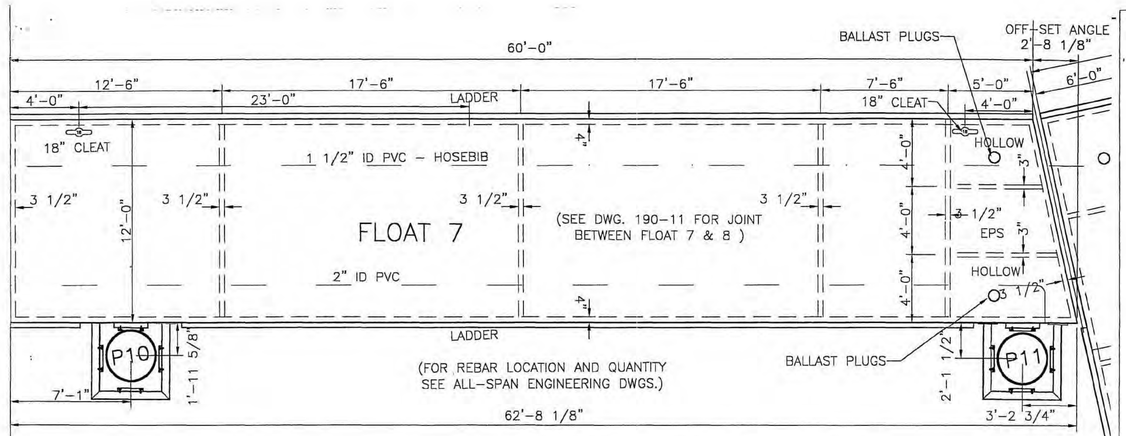
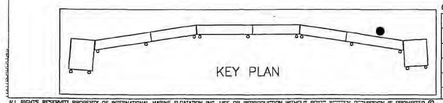
FLOAT #6	
Drawn by: M.TOBIAS	Date: –
Designed: –	Scale: 1/4"=1'-0"
Project: Harbour Green	DWG No. 01-190-06

Checked:	Date:	4

Size	Drawing Number	Rev.
A1	375.027	

A1 375.027





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I.M.F.S. International Marine Floatation Systems Inc.

REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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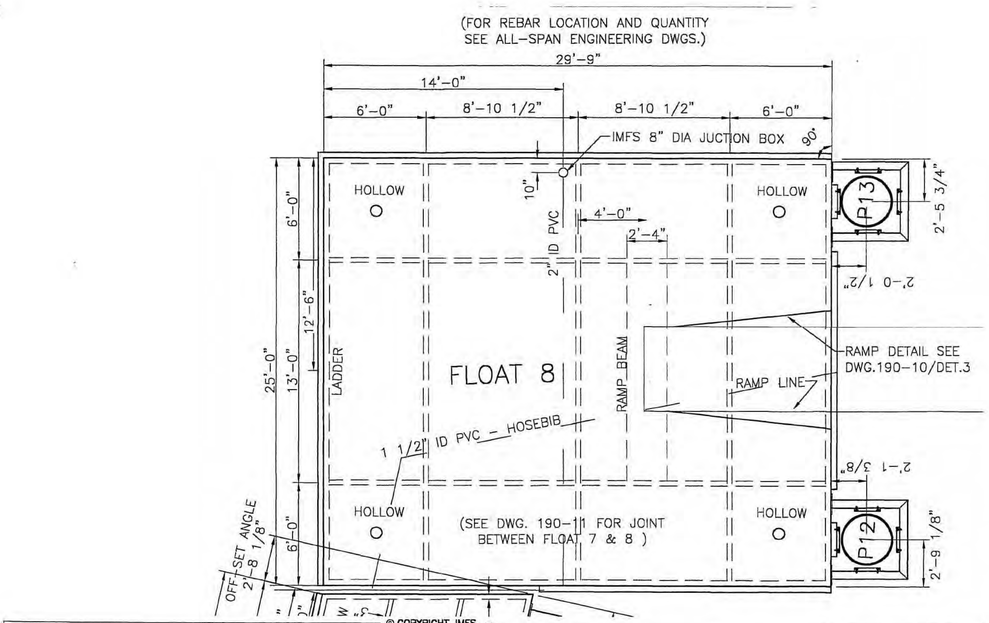
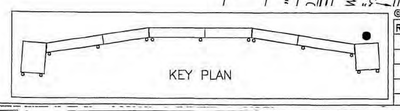
FLOAT #7	
Drawn by: M.TOBIAS	Date: –
Designed: –	Scale: 1/4"=1'-0"
Project: Harbour Green	DWG No. 01-190-07





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I.M.F.S. International Marine Floatation Systems Inc.

REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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Tel (604) 946-4544 Fax (604) 946-6796
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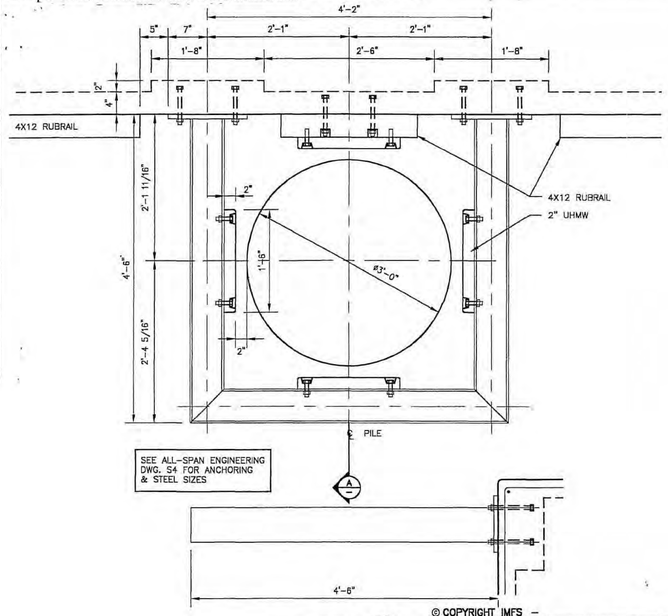
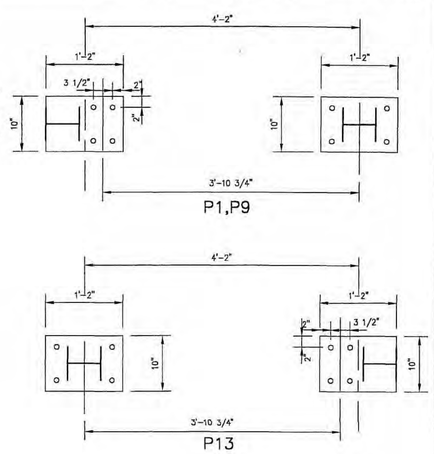
Float #8	
Drawn by: M.TOBIAS	Date: March 16/01
Designed: –	Scale: 1/4"=1'-0"
Project: Harbour Green	DWG No. 01-190-08



SECTION (A)
P1 THRU P13



AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

REV	DESCRIPTION	DATE
A	FOR REVIEW	MAY 2/01

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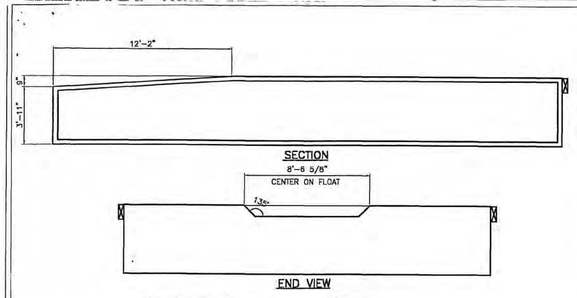
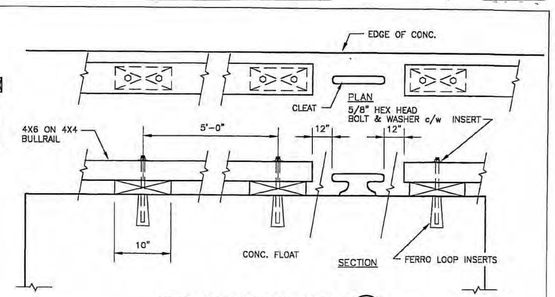
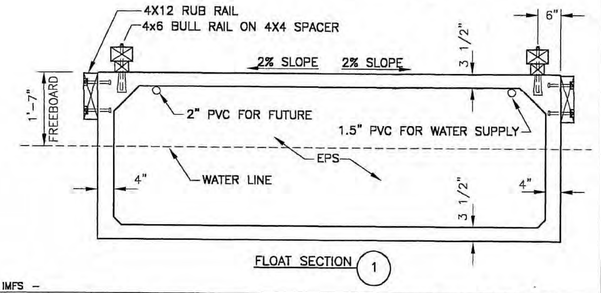
PILE HOOP DETAIL	
Drawn by: M.TOBIAS	Date: April 5/01
Designed: –	Scale: 1"=1'-0"
Project: Harbour Green	DWG No. 01-190-09



LANDING FLOAT
TYPICAL FOR FLOATS 1 & 8 (3)



CLEAT AND BULLRAIL DETAIL (2)



FLOAT SECTION (1)

AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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Tel (604) 946-4544 Fax (604) 946-6796
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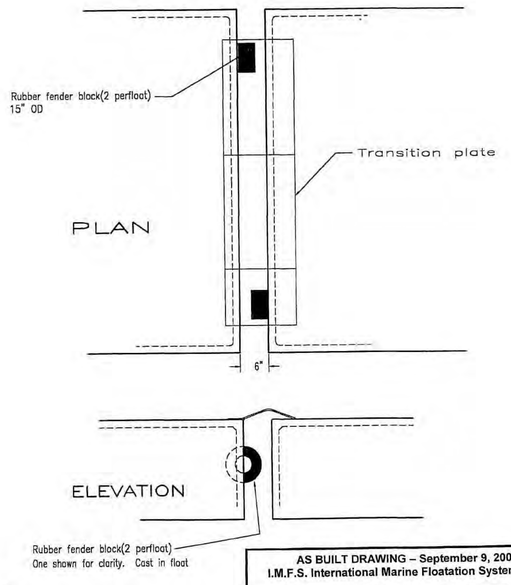
General Details	
Drawn by: M.Tobias	Date: Mar 30/01
Designed: –	Scale:
Project: Harbour Green	DWG No. 01-190-10

Checked: Date: 5

Size	Drawing Number	Rev.
A1	375.027	



REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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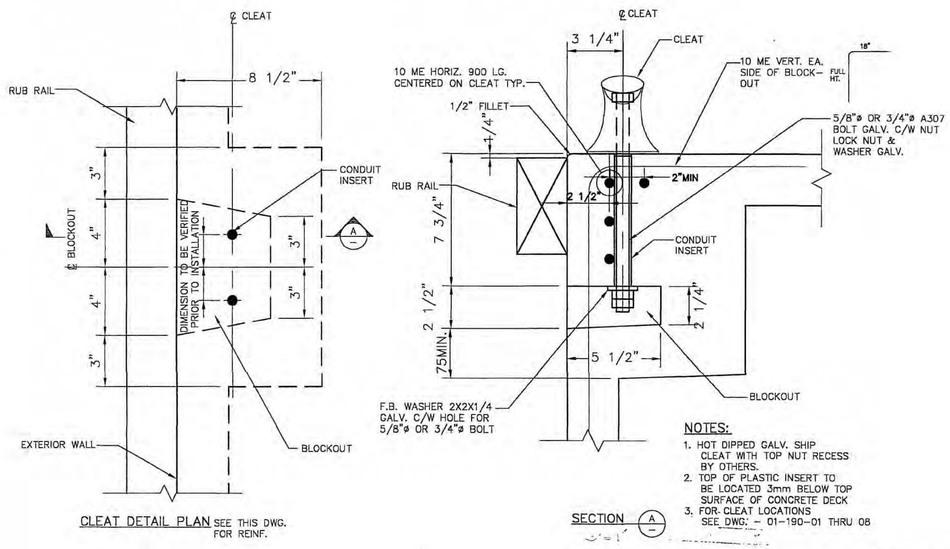
AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems Inc.

Interface Details	
Drawn by: LGMcC	Date: April 17/98
Designed: –	Scale: NTS
Project: Harbour Green	DWG No. 01–190–11



NOTES:
1. HOT DIPPED GALV. SHIP CLEAT WITH TOP NUT RECESS BY OTHERS.
2. TOP OF PLASTIC INSERT TO BE LOCATED 3mm BELOW TOP SURFACE OF CONCRETE DECK
3. FOR CLEAT LOCATIONS SEE DWG: – 01–190–01 THRU 08

REV	DESCRIPTION	DATE
A	ISSUED FOR REVIEW	MAY 2/01

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AS BUILT DRAWING – September 9, 2002
I.M.F.S. International Marine Floatation Systems In

Cleat Detail	
Drawn by: M.Tobias	Date: May 1
Designed: –	Scale: 3"=1
Project: Harbour Green	DWG No. 01–190–

	Revision	Date	By	Ck.

Board of Parks and Recreation
City of Vancouver
2099 Beach Ave.
Vancouver B.C.
V6G 1Z4
Phone (604) 257-8400
Facsimile (604) 257-8365

Approval :
Planning
Operations
Recreation
Income Ops.
General Manager

Project

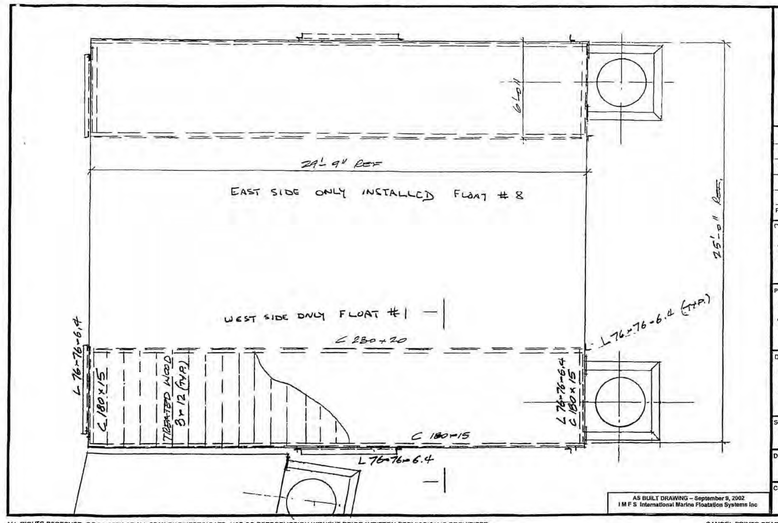
Drawing

Scale

Design : Date :
Drawn : Date :
Checked : Date : 6

Size	Drawing Number	Rev.
A1	375.027	

A1 375.027



ALL-SPAN
ENGINEERING & CONSTRUCTION LTD
Suite 201, 7198 Vantage Way
Delta BC V4G 1K7
Phone (604) 940-2212
Fax: (604) 940-1516

REV	D.M.Y	DESCRIPTION
E		
D		
C		
B		
A		

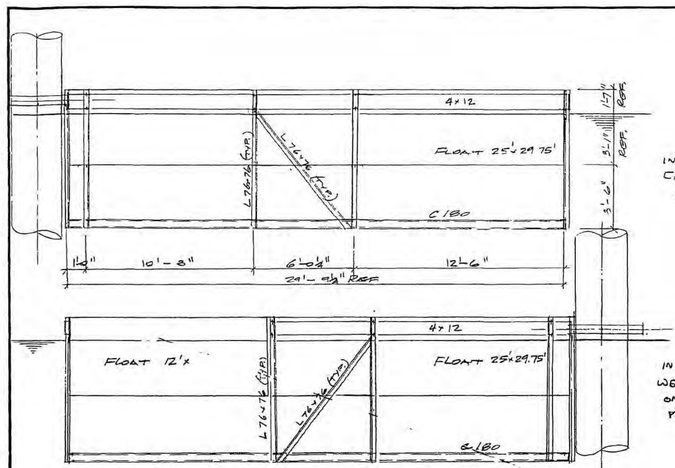
CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS

PROJECT TITLE: HARBOUR GREEN FLOATING WALKWAY.

DRAWING TITLE: FLOAT B, PLAN OF FLOAT STABILIZER

SCALE	DATE
1/4"=1'0"	APR 23,02
DESIGN: TD	PROJECT No: 01-24
CHECKED: DM	DWG No: 1015 REV

AS BUILT DRAWING – September 9, 2002
I M P S International Marine Floatation Systems Inc



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Suite 201, 7198 Vantage Way
Delta, BC V4G 1K7
Phone (604) 940-2212
Fax. (604) 940-1516

REV	D.M.Y	DESCRIPTION
F		
D		
C		
B		
A		

CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS

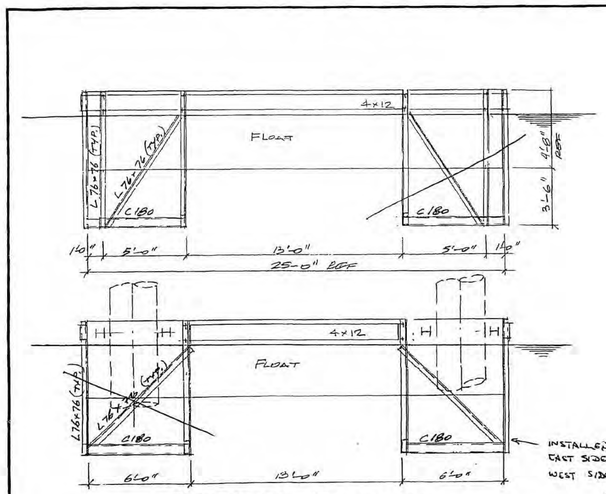
PROJECT TITLE: HARBOUR GREEN FLOATING WALKWAY.

DRAWING TITLE: FLOAT B & STABILIZER, LONGITUDINAL ELEVATION

SCALE	DATE
1/4"=1'0"	APR. 23,02
DESIGN: TD	PROJECT No: 01-24
CHECKED: DM	DWG No: 1025 REV

AS BUILT DRAWING – September 9, 2002
I M P S International Marine Floatation Systems Inc

CANCEL PRINTS BEARING PREVIOUS LETTER



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Suite 201, 7198 Vantage Way
Delta, BC V4G 1K7
Phone (604) 940-2212
Fax (604) 940-1516

REV	D.M.Y	DESCRIPTION
E		
D		
C		
B		
A		

CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS

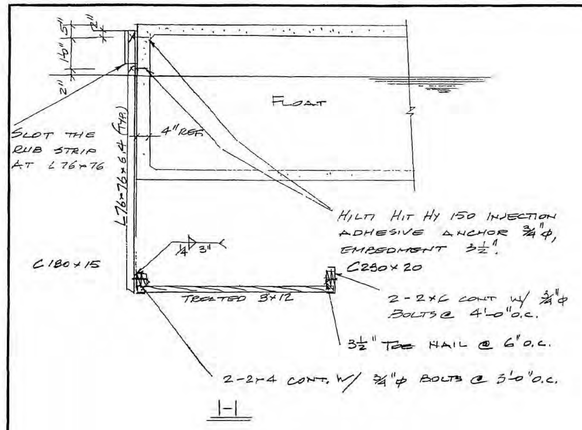
PROJECT TITLE: HARBOUR GREEN FLOATING WALKWAY

DRAWING TITLE: FLOAT #B STABILIZER, TRANSVERSE ELEVATIONS

SCALE	DATE
1/4"=1'0"	APR. 23,02
DESIGN: TD	PROJECT No: 01-24
CHECKED: DM	DWG No: 1035 REV

AS BUILT DRAWING – September 9, 2002
I M P S International Marine Floatation Systems Inc

CANCEL PRINTS BEARING PREVIOUS LETTER



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ENGINEERING & CONSTRUCTION LTD
Suite 201, 7198 Vantage Way
Delta, BC V4G 1K7
Phone (604) 940-2212
Fax (604) 940-1516

REV	D.M.Y	DESCRIPTION
E		
D		
C		
B		
A		

CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS

PROJECT TITLE: HARBOUR GREEN FLOATING WALKWAY,

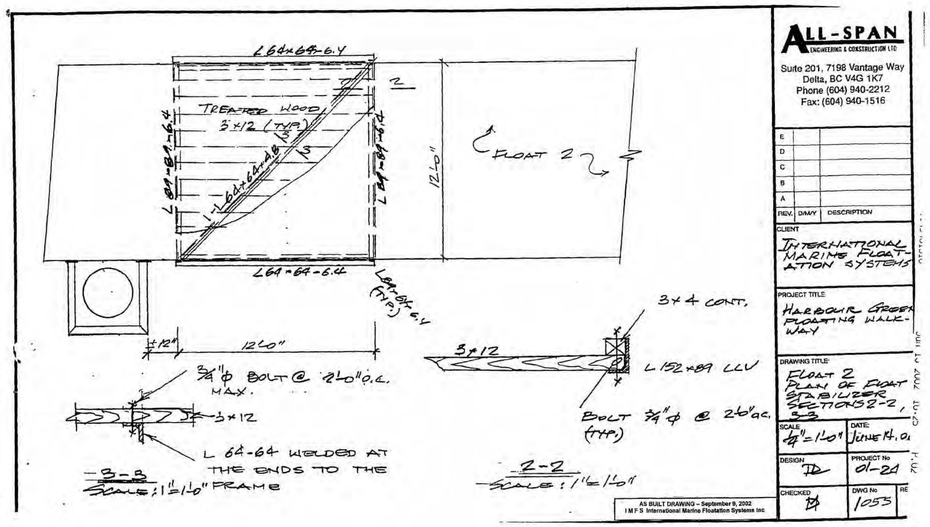
DRAWING TITLE: FLOAT #B SECTION 1-1

SCALE	DATE
1/2"=1'0"	APR.23,02
DESIGN: TD	PROJECT No: 01-24
CHECKED: DM	DWG No: 1045 REV

AS BUILT DRAWING – September 9, 2002
I M P S International Marine Floatation Systems Inc

CANCEL PRINTS BEARING PREVIOUS LETTER

Scale		
Design:	Date:	
Drawn:	Date:	
Checked:	Date:	7
Size: A1	Drawing Number: 375.027	Rev.



ALL-SPAN ENGINEERING & CONSTRUCTION LTD
Suite 201, 7198 Vantage Way
Delta, BC V4G 1K7
Phone (604) 940-2212
Fax: (604) 940-1516

REV.	DMY	DESCRIPTION
E		
D		
C		
B		
A		

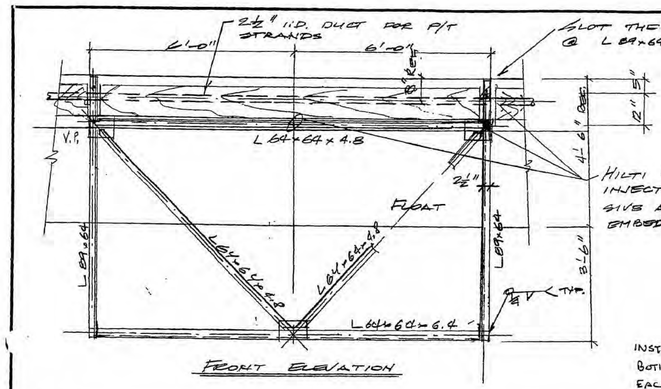
CLIENT: INTERNATIONAL MARINE FLOATATION SYSTEMS

PROJECT TITLE: HARBOUR GREEN FLOATING WALK-WAY

DRAWING TITLE: FLOAT 2 PLAN OF FLOAT STABILIZER SECTIONS 2-2, 3-3

SCALE	DATE
1/4"=1'-0"	JUNE 14.01
DESIGN: JD	PROJECT No: 01-24
CHECKED: RM	DWG No: 1053 RE:

AS BUILT DRAWING – September 9, 2002
I M F S International Marine Floatation Systems Inc



INSTALLED BOTH ENDS OF EACH FLOAT PAIR #2/3 #4/5 #6/7

NOTE:
1. BEFORE DRILLING FOR HILTI BOLTS VERIFY THE LOCATION OF P/T & REINFORCEMENT. DO NOT DAMAGE EXISTING P/T OR REINFORCEMENT.
2. FOR ANCHORAGE ABOVE THE WATER USE HILTI RE 500 ¾"ϕ.
3. LUMBER GRADE: #2 OR BETTER - DOUGLAS FIR.
4. STRUCTURAL STEEL: TO CAN/CSA-G40.21 GRADE 300W.

ALL-SPAN ENGINEERING & CONSTRUCTION LTD
Suite 201, 7198 Vantage Way
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Phone (604) 940-2212
Fax: (604) 940-1516

REV.	DMY	DESCRIPTION
E		
D		
C		
B		
A		

CLIENT: INTERNATIONAL MARINE FLOAT-ATION SYSTEMS

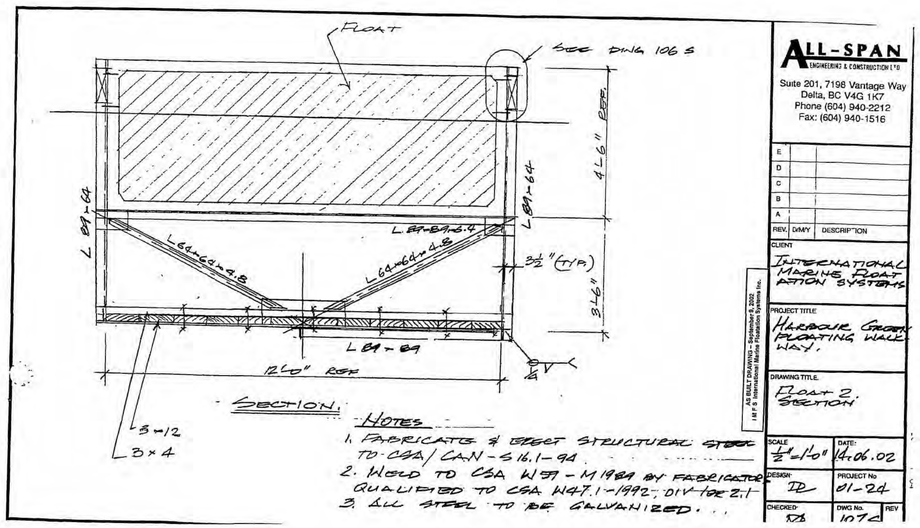
PROJECT TITLE: HARBOUR GREEN FLOATING WALK WAY

DRAWING TITLE: FLOAT 2 FRONT OR BACK ELEVATION

SCALE	DATE
1"=1'-0"	14.06.02
DESIGN: JD	PROJECT No: 01-24
CHECKED: RM	DWG No: 106 S RE:

AS BUILT DRAWING – September 9, 2002
I M F S International Marine Floatation Systems Inc

CANCEL PRINTS BEARING PREVIOUS LETTER



NOTES
1. FABRICATE & ERECT STRUCTURAL STEEL TO CSA/CAN-S16.1-94.
2. WELD TO CSA W59-M1989 BY FABRICATOR QUALIFIED TO CSA W47.1-1992; DIV 1 OR 2.1
3. ALL STEEL TO BE GALVANIZED.

ALL-SPAN ENGINEERING & CONSTRUCTION LTD
Suite 201, 7198 Vantage Way
Delta, BC V4G 1K7
Phone (604) 940-2212
Fax: (604) 940-1516

REV.	DMY	DESCRIPTION
E		
D		
C		
B		
A		

CLIENT: INTERNATIONAL MARINE FLOAT-ATION SYSTEMS

PROJECT TITLE: HARBOUR GREEN FLOATING WALK WAY.

DRAWING TITLE: FLOAT 2. SECTION

SCALE	DATE
1"=1'-0"	14.06.02
DESIGN: JD	PROJECT No: 01-24
CHECKED: RM	DWG No: 107 S REV

AS BUILT DRAWING – September 9, 2002
I M F S International Marine Floatation Systems Inc.

	Revision	Date	By	Ck.

Board of Parks and Recreation
City of Vancouver
2099 Beach Ave.
Vancouver B.C.
V6G 1Z4
Phone (604) 257-8400
Facsimile (604) 257-8365

Approval:
Planning
Operations
Recreation
Income Ops.
General Manager

Project

Drawing

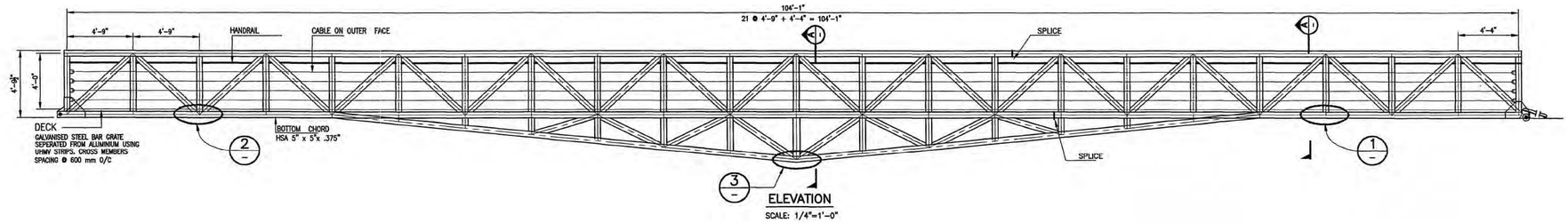
Scale

Design: Date:
Drawn: Date:
Checked: Date:

Size	Drawing Number	Rev.
A1	375.027	

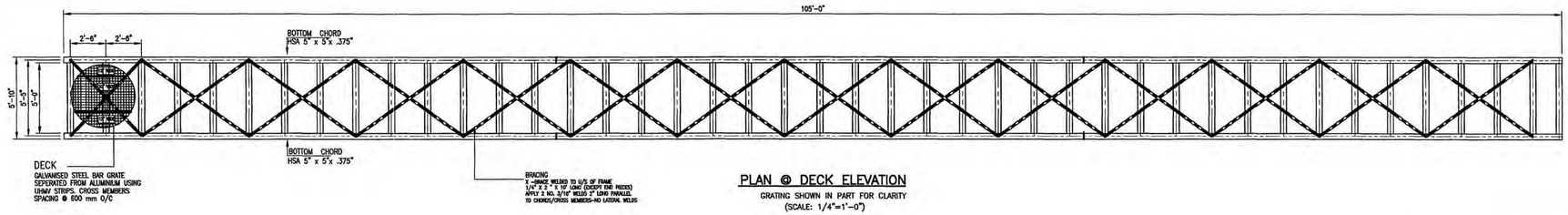
A1 375.027

HW-83044



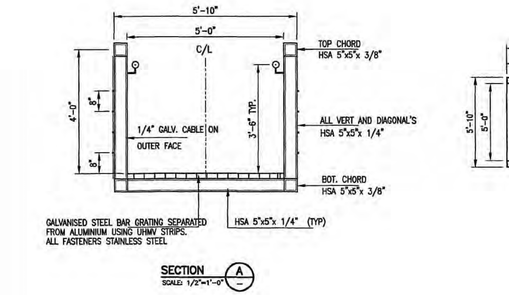
ELEVATION

SCALE: 1/4"=1'-0"



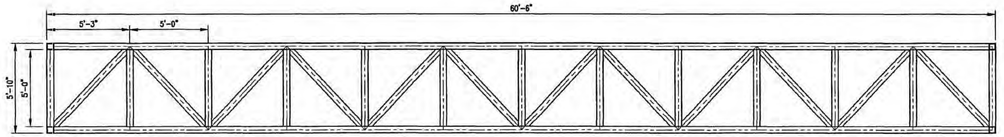
PLAN @ DECK ELEVATION

GRATING SHOWN IN PART FOR CLARITY
(SCALE: 1/4"=1'-0")



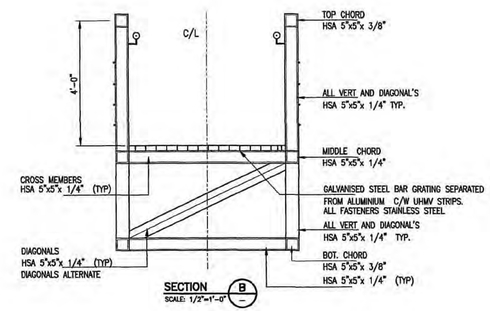
SECTION A

SCALE: 1/2"=1'-0"



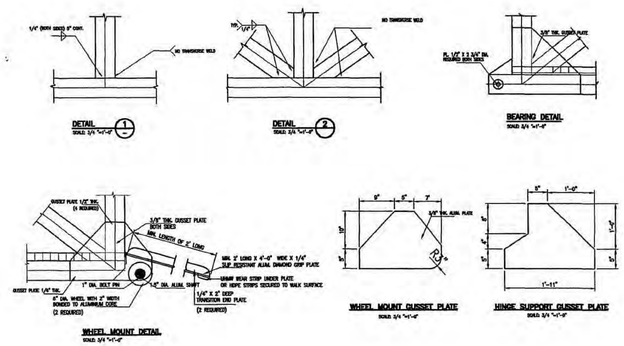
PLAN @ BOTTOM FRAME

(SCALE: 1/4"=1'-0")



SECTION B

SCALE: 1/2"=1'-0"



GENERAL NOTES:

LOCATION:

THE RAMP WILL BE LOCATED AT COAL HARBOUR, VANCOUVER, BRITISH COLUMBIA.

LOADING:

DEAD LOAD INCLUDES WEIGHT OF RAMP, DECKING, HANDRAILS, SIDE PANELS, ETC.
DEAD LOAD ESTIMATED @ 1.0 kPa.
LOAD DUE TO SERVICES TAKEN AS 0.75 kN/m.
UNIFORM LIVE LOAD = 4.8 kPa.
CONCENTRATED POINT LOAD OF 2.3 kN.
WIND LOAD AS PER NBC 1995 (1/30 YEAR RETURN)
SNOW LOAD AS PER NBC 1995.

REFERENCES:

CSA CAN3-S157-M83 STRENGTH DESIGN IN ALUMINIUM
CSA W48 SERIES WELDING MATERIALS

MATERIALS:

ALLOYS TO CONFORM TO CSA HA SERIES - M80. TUBE TO BE HSA 5"x5" AND 6061-T6 ALLOY. PLATES TO BE 6061-T6 ALLOY U.N.O.

MINIMUM WALL THICKNESS OF STRUCTURAL ALUMINIUM SHALL BE 4.8mm.
WELDS WIRE TO HA.6.4043.

WELDING WIRE TO HA.6.4043 OR AS SPECIFIED IN CSA CAN3-S157

WELDS WHERE NOT SHOWN TO DEVELOP FULL STRENGTH OF SECTION.

PERFORMANCE:

RAMP CAMBERED UP 50 mm FOR DEAD LOAD DEFLECTION
LIVE LOAD DEFLECTION LIMITED TO L/240

FABRICATION:

JOINT PREPARATION AND COMPLETED WELDS TO BE VISUALLY INSPECTED FOR CONFORMANCE
FABRICATION TO BE IN ACCORDANCE WITH CSA CAN3-S157
NO INTERMITTENT WELDS ARE USED IN FABRICATION. REMOVE AND REPLACE WELDS NOT ACCEPTABLE.
FABRICATE AND WELD WITH MINIMAL DISTORTION. FILE AND GRIND WELDS SMOOTH AND FLUSH.

EMBED DETAIL:

FOR EMBED PLATES FOR SUPPORT REFER TO EMBED DRAWING.

MOUNT WHEEL:

BLUEWATER TO FORWARD NYLON WHEEL SPECIFICATIONS AS REQUIRED BY ENGINEER

DWG NO	REFERENCE	REF NO

DWG NO	REFERENCE	REF NO

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE
2	AS-BUILT	HKR	KSR	05/APR/2002
1	CABLES ADDED	HKR	KSR	05/APR/2001
0	ISSUED FOR REVIEW	HKR	KSR	22/NOV/2000

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE

CAD FILE

EAST RAMP (1500 WIDE)
COAL HARBOUR
MARATHON REALTY

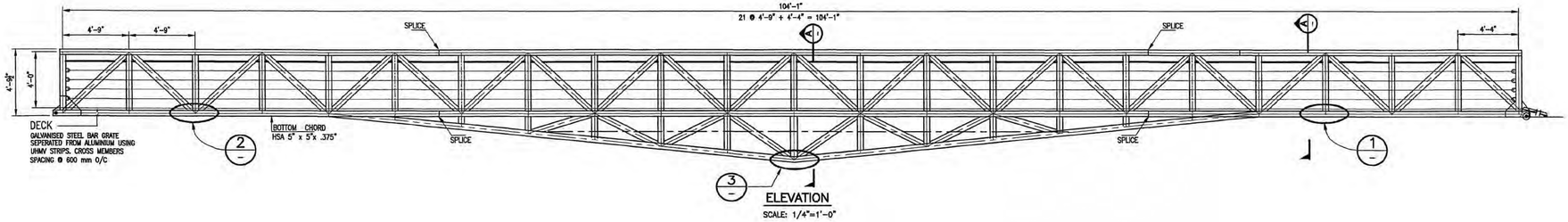
SCALE	AS NOTED
DRAWN	HKR
DESIGN	KSR

BLUE WATER SYSTEMS LTD.
9320 RIVER RD. DELTA B.C. Canada, V3M 5A2 Fax (604) 583-9998 Tel. (604) 583-9999

DWG NO	REV
MRAMP-15	2

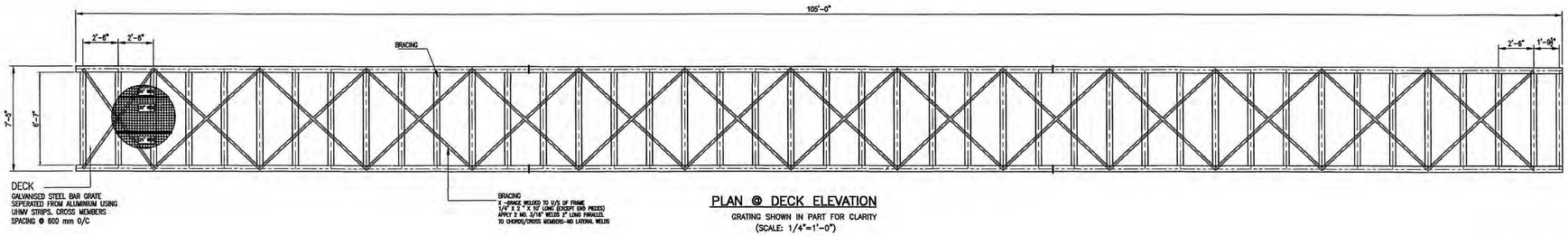
375.029 A1

A1 375.029



ELEVATION

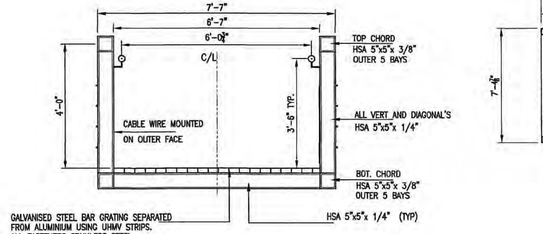
SCALE: 1/4"=1'-0"



PLAN @ DECK ELEVATION

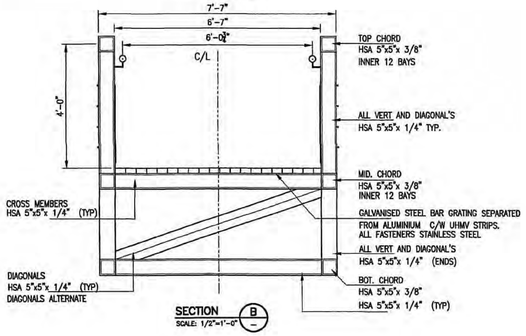
GRATING SHOWN IN PART FOR CLARITY

(SCALE: 1/4"=1'-0")



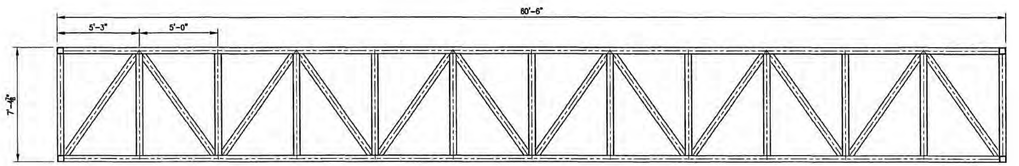
SECTION A

SCALE: 1/2"=1'-0"



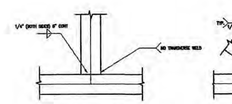
SECTION B

SCALE: 1/2"=1'-0"

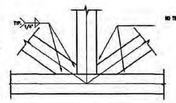


PLAN @ BOTTOM FRAME

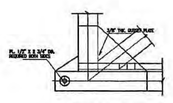
(SCALE: 1/4"=1'-0")



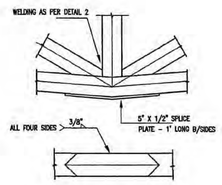
DETAIL 1



DETAIL 2

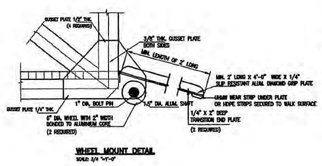


BEARING DETAIL

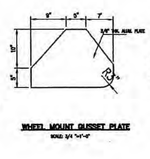


SPLICE DETAIL

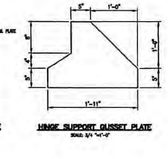
(SCALE: 3/4"=1'-0")



WHEEL MOUNT DETAIL



WHEEL MOUNT GUSSET PLATE



HINGE SUPPORT GUSSET PLATE

GENERAL NOTES:

LOCATION:

THE RAMP WILL BE LOCATED AT COAL HARBOUR, VANCOUVER, BRITISH COLUMBIA.

LOADING:

DEAD LOAD INCLUDES WEIGHT OF RAMP, DECKING, HANDRAILS, SIDE PANELS, ETC.
DEAD LOAD ESTIMATED @ 1.0 kPa.
LOAD DUE TO SERVICES TAKEN AS 0.75 kN/m.
UNIFORM LIVE LOAD = 4.8 kPa.
CONCENTRATED POINT LOAD OF 2.3 kN.
WIND LOAD AS PER NBC 1995 (1/30 YEAR RETURN)
SNOW LOAD AS PER NBC 1995.

REFERENCES:

CSA CAN3-S157-M83 STRENGTH DESIGN IN ALUMINIUM
CSA W48 SERIES WELDING MATERIALS

MATERIALS:

ALLOYS TO CONFORM TO CSA HA SERIES – M80. TUBE TO BE HSA 6"x6" AND 6061-T6 ALLOY. PLATES TO BE 6061-T6 ALLOY U.N.O.
MINIMUM WALL THICKNESS OF STRUCTURAL ALUMINUM SHALL BE 4.8mm.
WELDS WIRE TO HA.6.4043.
WELDING WIRE TO HA.6.4043 OR AS SPECIFIED IN CSA CAN3-S157
WELDS WHERE NOT SHOWN TO DEVELOP FULL STRENGTH OF SECTION.

PERFORMANCE:

RAMP CAMBERED UP 50 mm FOR DEAD LOAD DEFLECTION
LIVE LOAD DEFLECTION LIMITED TO L/240

FABRICATION:

JOINT PREPARATION AND COMPLETED WELDS TO BE VISUALLY INSPECTED FOR CONFORMANCE
FABRICATION TO BE IN ACCORDANCE WITH CSA CAN3-S157
NO INTERMITTENT WELDS ARE USED IN FABRICATION. REMOVE AND REPLACE WELDS NOT ACCEPTABLE.
FABRICATE AND WELD WITH MINIMAL DISTORTION. FILE AND GRIND WELDS SMOOTH AND FLUSH.

EMBED DETAIL:

FOR EMBED PLATES FOR SUPPORT REFER TO EMBED DRAWING.

MOUNT WHEEL:

BLUEWATER TO FORWARD NYLON WHEEL SPECIFICATIONS AS REQUIRED BY ENGINEER

DWG NO	REFERENCE	REF NO

DWG NO	REFERENCE	REF NO

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE

REVISION	DESCRIPTION	DRAWN	CHECKED	DATE
2	AS BUILT	HKR	KSR	09/08/2001
1	CABLES ADDED	HKR	KSR	5/APR/2001
0	ISSUED FOR REVIEW	HKR	KSR	22/NOV/2000

CAD FILE

WEST RAMP (2000 WIDE)
COAL HARBOUR
MARATHON REALTY

SCALE	AS NOTED
DRAWN	HKR
DESIGN	KSR

BLUE WATER SYSTEMS LTD.
9320 RIVER RD. DELTA B.C. Canada, V3M 5A2 Fax (604) 583-9998 Tel: (604) 583-9999

DWG NO MRAMP-20 REV 2

From: "Mike Warren" <mwarren@iccmarine.com>
To: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date: 5/8/2018 9:23:37 AM
Subject: RE: Harbour Green Public Dock Repairs

Ali,

As per your request please see our comments below in red.

Please do not hesitate to contact us if you have any further questions.

Have a nice day,

Regards
Mike/Daniel

To: Mike Warren <mwarren@iccmarine.com>
Cc: Daniel Leonard - Westmar Advisors Inc. <dleonard@westmaradvisors.com>
Subject: RE: Harbour Green Public Dock Repairs

Hi Mike,

I just wanted to thank you and Daniel for such a well thought out memo. I really appreciate it. I've had a chance to review this with my manager and another one of my colleagues. We are planning to go to our board with some options and recommendations, so we were hoping to have a few details worked out this week. The intent is to give the board two choices:

1. Design and install new brackets that would work with the environmental conditions at the site and the original design vessel
2. Design and rehabilitate the entire dock so that it could accommodate larger taxi vessels. There is an understanding that there will have to be some sort of third party administrator for the commercial operations to make sure compliance.

I believe your memo covers the first option. Yes. Our suggested solution is targeted towards the existing environmental conditions and the original design vessel.

However, in your opinion, is it feasible to accommodate larger commercial vessels which currently exceed the original design criteria? Yes. It is likely the facility could accept larger vessels. The current fendering system is timber and absorbs very little energy, i.e. close to the full berthing energy is currently transferred into the floats and mooring piles. Replacing the existing fendering with new fendering that can dissipate energy without transferring greater loads into the floats and mooring piles is an option. Please see below for a potential fendering solution. What we are thinking is vessels of similar class as Pacific Ferries' Coastal Clipper (photo 6 in your memo). Could you also comment on the following:

- Is there a component which really limits how much further the dock can be pushed in terms of larger vessels? It seems the brackets were under designed from the very beginning and continue to be an issue. However, it seems we may have options in improving the design. But I suspect changes to the floats, piles or gangways is not going to be so simple/feasible. It is likely the limiting component of the facility to withstand larger vessels is the float structure acting in bending with a vessel impact at the midpoint but this will need to be checked. As noted above, hopefully it may be possible to dissipate energy so the loads are not increased with the larger targeted vessel.

- What would be the cost of engineering for these larger vessels? Are we looking at something in the same range of $45k for engineering plus $12k for underwater assessment? The engineering costs will be more because a greater level of assessment of the existing structures will be required to change the original design criteria and attach the new type of fendering system. We suggest increasing the engineering allowance to $60k.

- Could you give a very rough estimate of the potential construction costs for an upgrade like this? A rough estimate is

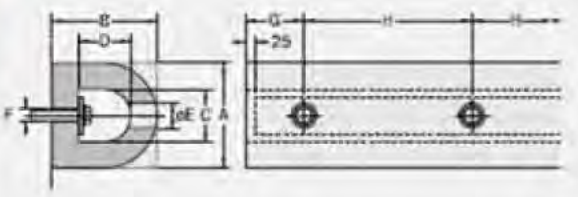
another $50k for new fendering. If further energy absorption is necessary to avoid overloading piles, this could be accommodated with softer rubber in the new proposed roller fenders for minimal cost.

I managed to do a bit more digging and find Sandwell's specs for the dock (attached).

PERFORMANCE

FENDER SIZE	D		D	
	E	R	E	R
80	0.9	82		
100	1.4	77	2.7	156
125	2.2	97		
150	3.2	115	6.4	206
165			7.4	224
200	5.7	153	11.3	275
250	8.9	191	17.6	343
300	12.9	230	25.5	412
350	17.6	268	34.3	471
380	20.9	292		
400	23.0	306	45.2	589
500	35.9	383	70.7	736

Values are per meter (Units: kNm, kN)



Thanks again,
Ali

Mike Warren
Business Development Manager

ICC MARINE SERVICES

ICC Marine Services Ltd.
16 Fawcett Road, Suite 102
Coquitlam, BC Canada V3K 6X9

Office: 604.527.2446
Fax: 604.527.8894
Cell: 778.833.1171

mwarren@iccmarine.com
www.iccmarine.com

From: Nayeri, Ali <Ali.Nayeri@vancouver.ca>
Sent: Monday, May 7, 2018 5:25 PM
To: Mike Warren <mwarren@iccmarine.com>
Cc: Daniel Leonard - Westmar Advisors Inc. <dleonard@westmaradvisors.com>
Subject: RE: Harbour Green Public Dock Repairs

Hi Mike,

I just wanted to thank you and Daniel for such a well thought out memo. I really appreciate it. I've had a chance to review this with my manager and another one of my colleagues. We are planning to go to our board with some options and recommendations, so we were hoping to have a few details worked out this week. The intent is to give the board two choices:

1. Design and install new brackets that would work with the environmental conditions at the site and the original design vessel
2. Design and rehabilitate the entire dock so that it could accommodate larger taxi vessels. There is an understanding that there will have to be some sort of third party administrator for the commercial operations to make sure compliance.

I believe your memo covers the first option.

However, in your opinion, is it feasible to accommodate larger commercial vessels which currently exceed the original design criteria? What we are thinking is vessels of similar class as Pacific Ferries' Coastal Clipper (photo 6 in your memo). Could you also comment on the following:

- Is there a component which really limits how much further the dock can be pushed in terms of larger vessels? It seems the brackets were under designed from the very beginning and continue to be an issue. However, it seems we may have options in improving the design. But I suspect changes to the floats, piles or gangways is not going to be so simple/feasible.

- What would be the cost of engineering for these larger vessels? Are we looking at something in the same range of $45k for engineering plus $12k for underwater assessment?

- Could you give a very rough estimate of the potential construction costs for an upgrade like this?

I managed to do a bit more digging and find Sandwell's specs for the dock (attached).

Thanks again,
Ali

From: Mike Warren [mailto:mwarren@iccmarine.com]
Sent: Monday, May 07, 2018 10:11 AM
To: Nayeri, Ali
Subject: FW: Harbour Green Public Dock Repairs

Ali,

Just a short note to follow up to see if you had any questions regarding our report and to ask what the schedule might be for moving forward?

Have a nice day.

Regards
Mike

Mike Warren
Business Development Manager
ICC MARINE SERVICES
An Investment Group Company

ICC Marine Services Ltd.
16 Fawcett Road, Suite 102
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Office: 604.527.2446

Fax: 604.527.8894
Cell: 778.833.1171

mwarren@iccmarine.com
www.iccmarine.com

From: Mike Warren <mwarren@iccmarine.com>
Sent: Thursday, April 26, 2018 2:45 PM
To: ali.nayeri@vancouver.ca
Cc: Daniel Leonard - Westmar Advisors Inc. <dleonard@westmaradvisors.com>
Subject: Harbour Green Public Dock Repairs

Ali,

As promised please see attached our recommended options and cost estimates for the repair of the Harbour Green Public Dock.

If you have any questions, require further information or if Daniel or myself can be of assistance in any way at all, please do not hesitate to call.

Regards
Mike

Mike Warren
Business Development Manager

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Fax: 604.527.8894
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mwarren@iccmarine.com
www.iccmarine.com

From: "Mack, Tiina" <tiina.mack@vancouver.ca>
To: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
"Wilton, Shauna" <Shauna.Wilton@vancouver.ca>
Date: 5/11/2018 1:30:51 PM
Subject: RE: Meeting with Bowen Island residents May 23 alternate date

Ali and I are off site on May 23rd in Coquitlam on a team tour, we could be back for a dinner time meeting...

-----Original Message-----
From: Araujo, Sev
Sent: Friday, May 11, 2018 12:19 PM
To: Mack, Tiina; Wilton, Shauna
Cc: Nayeri, Ali
Subject: RE: Meeting with Bowen Island residents May 23 alternate date

They have come back that if they have to make 16 works they will, but have asked if 23, also works

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

-----Original Message-----
From: Mack, Tiina
Sent: Thursday, May 10, 2018 7:30 PM
To: Araujo, Sev
Cc: Nayeri, Ali
Subject: Meeting with Bowen Island residents

Hi Sev,

I'm not available Tuesday May 15th or Thursday May 17th in the late afternoon/evening due to s.22(1)

I hope we can do this meeting on Wednesday of next week so I can attend and give Ali a night off.

I will update my calendar availability.

Thanks Sev

Tiina

Sent from my iPhone

From: "Bromley, Malcolm" <Malcolm.Bromley@vancouver.ca>
To: "Gerald Sieben" s.22(1)
Date: 5/8/2018 1:06:21 PM
Subject: Re: Please Repair Harbour Green Public Dock

Thanks Gerry. The dock was never designed for commercial heavy vessel use. This resulted in the damage. There is obviously a need for transit from Bowen Island but our mandate is recreational use.

We are trying to resolve the situation and find appropriate ways to support all needs.
We intend on consulting with you and your Association to map out the best path forward. I appreciate your group's longstanding commitment to the neighbourhood and waterfront.

Malcolm Bromley
General Manager - Vancouver Park Board

On May 8, 2018, at 12:33 PM, Gerald Sieben s.22(1) wrote:

Dear Mr. Araujo
On Saturday My wife and I attended the Jane's walk of Coal Harbour that was led by former CofV co-chief planner Larry Beasley. As we walked along, Larry Beasley reviewed how each aspect of the Coal Harbour Official Development Plan (CHODP) came to realization. Truly the achievements of the master plan for the neighbourhood with its businesses, residences, views and beautiful parks and water access are
something that our city is rightly proud of. When we reached the Harbour Green dock, Larry discovered the large padlock and closure sign. He was clearly emotionally upset and said as much.

Coal Harbour residents, pleasure boat operators, office workers, tourists and many Vancouverites use this iconic dock extensively as an extension of the sea wall especially in Spring, Summer and Fall. The dock is an important part of the CHOPD as it invites walkers and boaters to intimately access the actual land water interface of Coal Harbour. The dock is the highlight of Harbour Green Park. It should also be noted that the dock is also one of the few small vessel water access points in the downtown in the event of the necessity for emergency evacuation. I note that even though the dock is closed it still needed to be used on an emergency basis for small boats in distress. I photographed one such event at the now closed dock today.

I should mention that I head the Community Relations and Park Advocacy Committee of the Coal Harbour Residents Association. Over the years the CHRA has been heavily involved with all aspects of improving the quality of life in our community. We have worked cooperatively with the City and Vancouver Board of Parks and Recreation on many issues including sea wall and traffic safety, green spaces preservation and mitigating impacts of major projects.

Recently on behalf of the CHRA, I have made several calls to the C of V and to my dismay I learned that the Harbour Green Public Dock will continue to be closed for repairs and that the closure will be extensive. I was told that heavy commercial users of the docks had caused damage. I see that several "angle iron" securing brackets are bent and several pilings require repair.

Over the years members of our committee have informed the "Park Board" of the unauthorized use by large vessels. We had initially been told that the warranty and integrity of the dock required limitation to smaller vessels. On most occasions the larger vessels were required to move. But on several occasions we were told by C of V and Park Board officials that special short time use permissions for heavy vessels have been granted for special events at the convention centre. Once our CHRA president was told by a city official that there was no problem with accommodating larger vessels (we knew that was not correct... I taken have photos of these kinds of occasional misuses as well as photos of proper uses of this popular facility by small vessels and seawall and Park users).

<image1.jpeg>

Common Event: Small Vessels Appropriately Use Popular HG Dock

<image1.jpeg>

Example of fairly rare event: occasional large vessel at HG Public Dock ...some commercial boats said they were given permission for Convention Centre event? Larger vessels are an obvious concern.

<image1.jpeg>

Example of rare event: large new tug on display at HG Public Dock during convention centre trade show.

While the inappropriate occasional use of Harbour Green Public Dock by large vessels is a concern, as a Coal Harbour resident who lives near the dock and who has witnessed some recent winter storm and wave events, I would conjecture that these storms were contributory.

Is the the “Park Board” able to inform the CHRA and the general public that this popular dock will be repaired in a timely way? It has been closed to the public since last February. The CHRA appreciates the hard work of the Vancouver Park Board to maintain our amazing parks. Please let us know if we can be of assistance in helping to expedite the repairs to this popular facility in Harbour Green Park which Jim Lowden referred to as “Vancouver’s front yard that welcomes all British Columbians and the world”. It would be wonderful if these repairs could be completed by Canada Day.

Gerald Sieben
Chair Community Relations and Parks Advocacy Committee
Coal Residents Association


BURRARD QUEEN


BURRARD QUEEN


BURRARD QUEEN

From: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To: "Araujo, Sev" <sev.araujo@vancouver.ca>
Date: 5/14/2018 12:30:41 PM
Subject: RE: Publicstuff ~ Other park concern ~ Other park concern in

Hi Sev,

I spoke with Ian this morning and given that the floats move quite a bit, the fencing cannot continue across the floats (i.e. there will be some small gaps). Ian plans to install higher fences at both of the gangways and wrap them around the gangway to make it really difficult to get on and off the dock from the seawall. We will be installing large "Dock Closed" signs on the fencing as well. Hopefully that would deter most people from using the dock.

Many thanks,
Ali

From: Wilton, Shauna
Sent: Monday, May 14, 2018 11:28 AM
To: Nayeri, Ali
Cc: Araujo, Sev; Mack, Tiina; Normann, Howard
Subject: RE: Publicstuff ~ Other park concern ~ Other park concern in

Thanks Ali. Please keep us updated. s.13(1)
s.13(1)

From: Nayeri, Ali
Sent: Monday, May 14, 2018 10:00 AM
To: Cowles, Chad
Cc: Araujo, Sev; Keyzer, Rachel; Mack, Tiina; Normann, Howard; Wilton, Shauna; Foster, Ian
Subject: RE: Publicstuff ~ Other park concern ~ Other park concern in

Thanks Chad.

Structures shop has been maintaining the fence regularly. But it seems there are still people who are determined to access the dock and do so by cutting the fence. I am meeting with Ian later this morning. I'll see if there is anything else that can be done other than monitoring and putting in repair requests whenever the fence is compromised.

Thanks,
Ali

From: Cowles, Chad
Sent: Monday, May 14, 2018 7:35 AM
To: Araujo, Sev; Nayeri, Ali; Keyzer, Rachel; Mack, Tiina; Normann, Howard; Wilton, Shauna
Subject: RE: Publicstuff ~ Other park concern ~ Other park concern in

Good morning Sev,

Assuming that those gaps do not have an intended purpose, I can submit a request for Structures to repair the fence.

Chad Cowles
Superintendent of City-wide Services
Vancouver Park Board

"All Aces"

From: Araujo, Sev
Sent: Sunday, May 13, 2018 7:33 PM
To: Nayeri, Ali; Cowles, Chad; Keyzer, Rachel; Mack, Tiina; Normann, Howard; Wilton, Shauna
Subject: Fwd: Publicstuff ~ Other park concern ~ Other park concern in

FYI

Sev

Please excuse the brevity of this email, it is being sent from my iPhone

Begin forwarded message:

From: s.22(1)
To: "Araujo, Sev" <Sev.Araujo@vancouver.ca>
Subject: Publicstuff ~ Other park concern ~ Other park concern in

https://iframe.publicstuff.com/#?client_id=1085&request_id=4178352

People continue to use the closed dock at Harbour Green as you can see from this photo taken today at 4.30... docking their boats and picking up passengers who simply climb through one of the many gaps in the fence (or simply remove the tape that has been put up across the gaps)

Where are all the park rangers? In twelve years I have never seen one.

From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Foster, Ian" <Ian.Foster@vancouver.ca>
Date:	5/15/2018 6:51:55 PM
Subject:	RE: Publicstuff ~ Other park concern ~ Other park concern in

Thanks Ian for coming up with another solution. Let's see if this will keep people off.

I went by there yesterday evening and noticed that the gangway is suspended by a pinned link and moves quite a bit with the waves. So I think we should avoid attaching our high fence to it and instead either bolt it down on the seawall or attach it to the existing gate structure. I'm pretty sure that is what you had in mind but thought I mention it anyway.

I've put in a request for two dock closed signs to the sign shop that would be mounted on these new fences. I had thought we had put some signs on these gates, but I didn't see anything except the old laminated 11x17 we got on there in February.

Many thanks for keeping an eye on this,
Ali

From: Foster, Ian
Sent: Monday, May 14, 2018 10:03 AM
To: Nayeri, Ali
Subject: RE: Publicstuff ~ Other park concern ~ Other park concern in

Ali , we need to add fence to the top of the walkway to stop people from climbing over the short rail

Ian

From: Nayeri, Ali
Sent: Monday, May 14, 2018 10:00 AM
To: Cowles, Chad
Cc: Araujo, Sev; Keyzer, Rachel; Mack, Tiina; Normann, Howard; Wilton, Shauna; Foster, Ian
Subject: RE: Publicstuff ~ Other park concern ~ Other park concern in

Thanks Chad.

Structures shop has been maintaining the fence regularly. But it seems there are still people who are determined to access the dock and do so by cutting the fence. I am meeting with Ian later this morning. I'll see if there is anything else that can be done other than monitoring and putting in repair requests whenever the fence is compromised.

Thanks,
Ali

From: Cowles, Chad
Sent: Monday, May 14, 2018 7:35 AM
To: Araujo, Sev; Nayeri, Ali; Keyzer, Rachel; Mack, Tiina; Normann, Howard; Wilton, Shauna
Subject: RE: Publicstuff ~ Other park concern ~ Other park concern in

Good morning Sev,

Assuming that those gaps do not have an intended purpose, I can submit a request for Structures to repair the fence.

Chad Cowles
Superintendent of City-wide Services
Vancouver Park Board

"All Aces"

From: Araujo, Sev
Sent: Sunday, May 13, 2018 7:33 PM
To: Nayeri, Ali; Cowles, Chad; Keyzer, Rachel; Mack, Tiina; Normann, Howard; Wilton, Shauna
Subject: Fwd: Publicstuff ~ Other park concern ~ Other park concern in

FYI

Sev

Please excuse the brevity of this email, it is being sent from my iPhone

Begin forwarded message:

> **From:** s.22(1)
> **To:** "Araujo, Sev" <Sev.Araujo@vancouver.ca>
> **Subject: Publicstuff ~ Other park concern ~ Other park concern in**
>
> https://iframe.publicstuff.com/#?client_id=1085&request_id=4178352
>
> People continue to use the closed dock at Harbour Green as you can see from this photo taken today at 4.30... docking their boats and picking up passengers who simply climb through one of the many gaps in the fence (or simply remove the tape that has been put up across the gaps)
>
> Where are all the park rangers? In twelve years I have never seen one.

From: "Meena Venkataraman" <meve@cowi.com>
To: "Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date: 4/18/2018 9:42:26 AM
Subject: RE: Small Inspection/Review Projects

Hi Ali,

I had a chat with Sara and she is of the following opinion on the matter of the docks:

- As a first step, it is probably worth it to have a site inspection to take stock of the docks including the piles.
- Then conduct a structural analysis (including a wave study) and do a design check with the original design criteria. This will then confirm to the City the following:
  - A) Are the brackets originally under designed (wave and/or vessel); or
  - B) Is the cause of the brackets failure because of bigger vessels (not wave, just vessel).
- If the brackets were originally under designed, then they would likely need to be upgraded at the higher cost. But if the brackets were designed well originally, then they would just need to be replaced at the lower cost to serve its original intent (service pleasure crafts)
- Based on one of the above two scenarios A) or B), the engineering and upgrade cost for use of the docks by commercial crafts will likely differ.

For the first step – to conduct an inspection and take stock of the docks, present a report with recommendations and estimate for the next steps - the City may be looking at roughly s.21(1)

Please let us know if you have further questions.

Regards,
Meena

COWI'S NORTH VANCOUVER OFFICE
HAS MOVED TO:
138 13th Street East
Suite 400
North Vancouver, BC V7L 0E5
Main office phone number: 604-986-1222
COWI

From: Nayeri, Ali [mailto:Ali.Nayeri@vancouver.ca]
Sent: Friday, April 13, 2018 5:59 PM
To: Meena Venkataraman <meve@cowi.com>
Subject: RE: Small Inspection/Review Projects

Hi Meena,

Many thanks for this information. I am going to touch base with the responsible group and see what would be the next steps.

As for Harbour Green Dock, we received two budget estimates from local marine contractors. Both assume replacement of all 13 brackets with larger steel sections and new UHMW pads:

- Estimate 1: s.21(1) to replace all 13 brackets
- Estimate 2: s.21(1) o replace all 13 brackets (priced for replacing W6x15 with W6x25)

The estimates don't include any engineering design costs as well as assessment of the piles or other components of the docks.

There is some damage to the concrete floats which will require proper patching and repairs (not included in the estimates). However, there doesn't appear to be any major issues with the floats so far.

Thanks,
Ali

From: Meena Venkataraman [mailto:meve@cowi.com]
Sent: Thursday, April 12, 2018 5:50 PM
To: Nayeri, Ali
Subject: RE: Small Inspection/Review Projects

Hi Ali,

Apologies for the delay in getting back to you. I have some numbers for you for Stanley Park Tunnel and Service Pit Trestle.

- Stanley Park Tunnel – We think that this should be done in multiple phases, mainly because this structure has never been inspected before and it would be too premature to put together an estimate for an assessment till we take the pulse of the structure.
  - Visual inspection, preliminary assessment of the structure, recommendations for the next steps, cost estimate for the next steps, report with recommendations - s.21(1)
  - Preliminary materials assessment - s.21(1)
  - Detailed materials assessment (including coring and testing) prior to detailed structures assessment - s.21(1)

- Stanley Park Locomotive Service Pit Trestle – Similar to the tunnel, we recommend that the structural assessment be carried out in multiple steps
  - Visual inspection, preliminary assessment of the structure, recommendations for the next steps, cost estimate for the next steps, report with recommendations - s.21(1)

Please let me know if you have questions about the above estimate.

Also, once you send us the two estimates from the contractors for the marine structure, we will try to review that for you at our end.

Regards,

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Direct: +1 778 382 7228

COWI

From: Meena Venkataraman
Sent: Monday, April 09, 2018 12:15 PM
To: 'Nayeri, Ali' <Ali.Nayeri@vancouver.ca>
Subject: RE: Small Inspection/Review Projects

Hi Ali,

Thanks for the clarifications. I will get back to you ASAP.

Regards,
Meena

Best regards,

Meena Venkataraman, MS, PEng, PE
Senior Bridge Engineer – Group Lead
Direct: +1 778 382 7228

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HAS MOVED TO:
138 13th Street East
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North Vancouver, BC V7L 0E5
Main office phone number: 604-986-1222

From: Nayeri, Ali [mailto:Ali.Nayeri@vancouver.ca]
Sent: Friday, April 06, 2018 7:02 PM
To: Meena Venkataraman <meve@cowi.com>
Subject: RE: Small Inspection/Review Projects

Hi Meena,

Sorry for the delay. I've been dealing with various other projects all day!

- The expectations around preparation are basically what you require to make sure the work you do is compliant with safe work practices. I anticipate that the work on the reservoir would require some kind of confined space access since there are limited access points. The other structures may be less of an issue, but we would rely on you to make those determinations.
- In terms of reporting, these would be treated as separate projects, so we would need separate output. The requirements for each are a bit different. For Stanley Park Miniature Railway, I would think a memo with the methodology, findings and recommendations should be sufficient. For VanDusen and Harbour Green, are more detailed report would be needed to address all the requirements.
- The objective of each project (as I understand them) is a bit different:
  - Miniature Train: review the structures and determine if there are structural deficiencies (damage, code compliance, etc.) and provide recommendations along with cost estimate and timelines. This is not part of an ongoing inventory work, so I don't foresee a need to establish a rating system.
  - VanDusen Reservoir: the objective is to determine the feasibility of pursuing the idea of water storage on site. We need to understand what is the condition of the structure and what is the level of effort involved to address deficiencies to use it for that purpose. Again, this is a more structure specific assessment and does not necessarily need a rating system since we are not comparing it to other structures or alternative site.
  - Harbour Green Dock: we know that the pile brackets have failed and that there is excessive movement of floats even under normal wave conditions. The objective here is to review the existing design and propose ways of making the structure more resilient and also allow commercial operations to be officially licensed through the Park Board. AE used a DRU rating system when they did their overall assessment of our bridge and marine assets. We don't necessarily need to compare or update that at this point since this is more of a design/retrofit exercise.
- As you said, I think some material testing is needed for VanDusen Reservoir (I believe it was recommended by Earth Tech). I think we would want to put in an allowance for the miniature railway tunnel and determine at the time of inspection if it is really necessary.

I hope I've answered all your questions. Let me know if you need further clarification.

Many thanks,

Ali

From: Meena Venkataraman [mailto:meve@cowi.com]
Sent: Friday, April 06, 2018 11:50 AM
To: Nayeri, Ali
Subject: RE: Small Inspection/Review Projects

Hi Ali,

Thanks for the response. A few more questions before I send you figures to consider. Could you please give us an idea of how significant are the preparation requirements for these structures regarding safety, permitting, and training. And also the expected reporting requirements for each structure – do they have to be four individual full blown reports? And what type of structure rating requirements do we adopt? For CoV bridge structures, we have a system in place and we don't generate full blown reports for the structures with an Executive Summary. They are a two page summary of the status of the bridge with short and long term maintenance, repair and monitoring recommendations.

Would the City require materials testing as part of the assessments for these structures? Potentially the reservoir structure might need this, but I am trying to understand the expectations for the tunnel structure in the miniature train system.

Please feel free to call me if that is more convenient. My direct line is noted below.

Regards,
Meena

Best regards,

COWI'S NORTH VANCOUVER OFFICE
HAS MOVED TO:
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North Vancouver, BC V7L 0E5
Main office phone number: 604-986-1222

From: Nayeri, Ali [mailto:Ali.Nayeri@vancouver.ca]
Sent: Thursday, April 05, 2018 7:47 PM
To: Meena Venkataraman <meve@cowi.com>
Subject: RE: Small Inspection/Review Projects

Hi Meena,
My responses are in red below.
Thanks,
Ali

From: Meena Venkataraman [mailto:meve@cowi.com]
Sent: Thursday, April 05, 2018 3:38 PM
To: Nayeri, Ali
Subject: RE: Small Inspection/Review Projects

Hi Ali,

A couple of follow-up questions:

- Do you foresee the need for any traffic management towards the inspection of any of these structures? No, all structures are within park lands and in areas where traffic is limited to pedestrians. If you are planning to bring

any vehicles on site, we will of course want to have spotters for safety.

- Will the City provide the equipment necessary to conduct the inspections such as ladders and genie lifts if required? No, you would be required to provide any equipment you need to complete the inspections.

Thanks
Meena

Best regards,

Meena Venkataraman, MS, PEng, PE
Senior Bridge Engineer – Group Lead
Direct: +1 778 382 7228

COWI'S NORTH VANCOUVER OFFICE
HAS MOVED TO:
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North Vancouver, BC V7L 0E5
Main office phone number: 604-986-1222

From: Nayeri, Ali [mailto:Ali.Nayeri@vancouver.ca]
Sent: Wednesday, April 04, 2018 6:49 PM
To: Meena Venkataraman <meve@cowi.com>
Subject: Small Inspection/Review Projects

Hi Meena,

Further to our conversation earlier, please find attached some preliminary information about the following projects:

- Stanley Park Miniature Railway Inspection: Park operations team has been asked to undertake an inspection of a tunnel structure (120' concrete tunnel) as well as a the service pit for the miniature train locomotive. The inspection will include evaluation of current condition of the structure and outline structural deficiencies along with a cost estimate and timeline for repairs. Construction drawings are attached.

- VanDusen Gardens/Shaughnessy Reservoir Inspection: Park planning is working on a scheme to reduce potable water use at our parks. They have been exploring the possibility of using well water for irrigation and are looking at various options for storing water for use on site. An abandoned reservoir is located on the west end of the site. The structure was reviewed in 2004 as a part of a preliminary study. Park Board is interested in carrying out a more detailed inspection of the reservoir to determine extant structural condition, structural deficiencies, and feasibility to retrofit and reuse the reservoir to store water for irrigation of the botanical gardens. Excerpts from Earth Tech's 2004 report are attached.

- Harbour Green Dock Rehabilitation: Harbour Green Dock is located in Coal Harbour and is accessible from the seawall at Harbour Green Park. The structure has been having some issues in the last few years which resulted in an assessment of the structure in 2017. Based on the continued deterioration of the structure and concern for safety of users, Park Board closed the dock in February 2018. The dock was designed for use by pleasure craft. However, over the years, a number of commercial water taxi/ferry operators have setup operations at the dock. It is believed that the commercial operations have contributed to the premature deterioration of the dock. Park Board is interested in exploring possible upgrades to the design of the dock to make it more resilient as well as suitable for use for commercial operation. Construction drawings for the dock as well as the condition assessment report are attached.

I would appreciate it if you could review the documents and let me know if you are interested in any of these projects.

Thanks Meena ☺
Ali

From:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
To:	"Pacific Ferries" <pacificferries@gmail.com>
Date:	4/11/2018 4:31:52 PM
Subject:	RE: Specs for vessel

Sorry meant <30 ft up to 15,000lbs

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Araujo, Sev
Sent: Wednesday, April 11, 2018 4:26 PM
To: 'Pacific Ferries'
Cc: Nayeri, Ali
Subject: RE: Specs for vessel

Thank you for the quick turnaround Ihab.

Unfortunately not this summer.

We will be tentatively going to the Board in June for direction on whether to keep the dock for Pleasure Craft only (< 30 & 5,000lbs) or allow Commercial vessels also. I will keep you posted on the date

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From: Pacific Ferries [mailto:pacificferries@gmail.com]
Sent: Wednesday, April 11, 2018 4:02 PM
To: Araujo, Sev
Cc: Nayeri, Ali
Subject: Re: Specs for vessel

Hi Sev, good to hear from you again.
Please find the reply to your questions in Red below each one.

Ihab Shaker
C: 778 231 7872

www.pacificferries.ca

Like us on Facebook @Pacificferries
Give us a Review on TripAdvisor

On Wed, Apr 11, 2018 at 3:48 PM, Araujo, Sev <Sev.Araujo@vancouver.ca> wrote:
Hello Ihab,

Can you provide us with the specs of the largest vessel you use for commuting

- Length of vessel
60 ft. long .

> - Weight of vessel (loaded/unloaded)

14,000 Ib light and 20,000 Ib. loaded

> - max passengers

60 passengers

> The more specs you can provide the better.

The above is my largest and biggest vessel however, I have 3 other vessels that are all much smaller the lighter.

Any chance we can do something for this summer?

> Thank you,
>
> Sev
>
> **Sev Araujo**
> **Manager, Commercial Operations**
> Vancouver Park Board, City of Vancouver
> o. 604 257 8436 / f. 604 257 8427
> Email: Sev.Araujo@vancouver.ca

From:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
To:	"Brad Taipalus \(Director1@bcpilots.com\)" <Director1@bcpilots.com>
Date:	4/11/2018 4:02:38 PM
Subject:	Size of Vessel

Hello Brad,

We spoke in February regarding your use of the Harbour Green Dock which is rated for small pleasure craft only.

Can you provide us with the specs of the largest vessel you have used, or potentially would use, at Harbour Green Dock if it was approved for Commercial Use

- Length of vessel
- Weight of vessel (loaded/unloaded)
- max passengers

The more specs you can provide the better.

Thank you,

Sev

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From:	"Araujo, Sev" <Sev.Araujo@vancouver.ca>
To:	"Mike Shannon \(bowentaxi@gmail.com" <bowentaxi@gmail.com>
Date:	4/11/2018 3:47:15 PM
Subject:	Specs for vessel

Hi Mike,

Can you provide us with the specs of the largest vessel you use for commuting

- Length of vessel
- Weight of vessel (loaded/unloaded)
- max passengers

The more specs you can provide the better.

Thanks,

Sev

Sev Araujo
Manager, Commercial Operations
Vancouver Park Board, City of Vancouver
o. 604 257 8436 / f. 604 257 8427
Email: Sev.Araujo@vancouver.ca

From:	SAPPMWrkRq@vancouver.ca
To:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
Date:	5/15/2018 6:33:24 PM
Subject:	Work Request Form confirmation submission

Work Request Form

Thank you for submitting your work request.
You will be notified when this request is received by the Work Control Centre.
If you have any questions, please contact the Work Control Centre at 604-665-3456.

Summary of your request:

Requested by:	City Employee
Name:	Ali Nayeri
Phone:	604.257.8461
Email:	ali.nayeri@vancouver.ca
Department:	Parks Board - Park Development
Location:	The signs would be posted on fencing that will go up at both gates to the dock. A location map to follow in separate email.
Subject:	More closure signs at Harbour Green Dock
Description:	Ian is putting up more fencing at the gates to the dock to prevent people from accessing the dock. We will need 2 new signs to be mounted on the fences. Details to follow in email. Project WBS CPP-00051-PB

From:	"Nayeri, Ali" <Ali.Nayeri@vancouver.ca>
To:	"Mack, Tiina" <tiina.mack@vancouver.ca>
Date:	5/22/2018 6:16:56 PM
Subject:	Write up for Harbour Green Dock
Attachments:	2018_05_22_harbour_green_update_draft.docx

Hi Tiina,

I was planning to send this to you earlier once I had a chance to review it, but things just got in the way. I wanted to run it by you before sending it to Sev. I know it is too long to be used as is, but since I don't know what Sev has already included, I thought I would provide him with a bit more so that he can pick and choose what to include.

Thanks,
Ali

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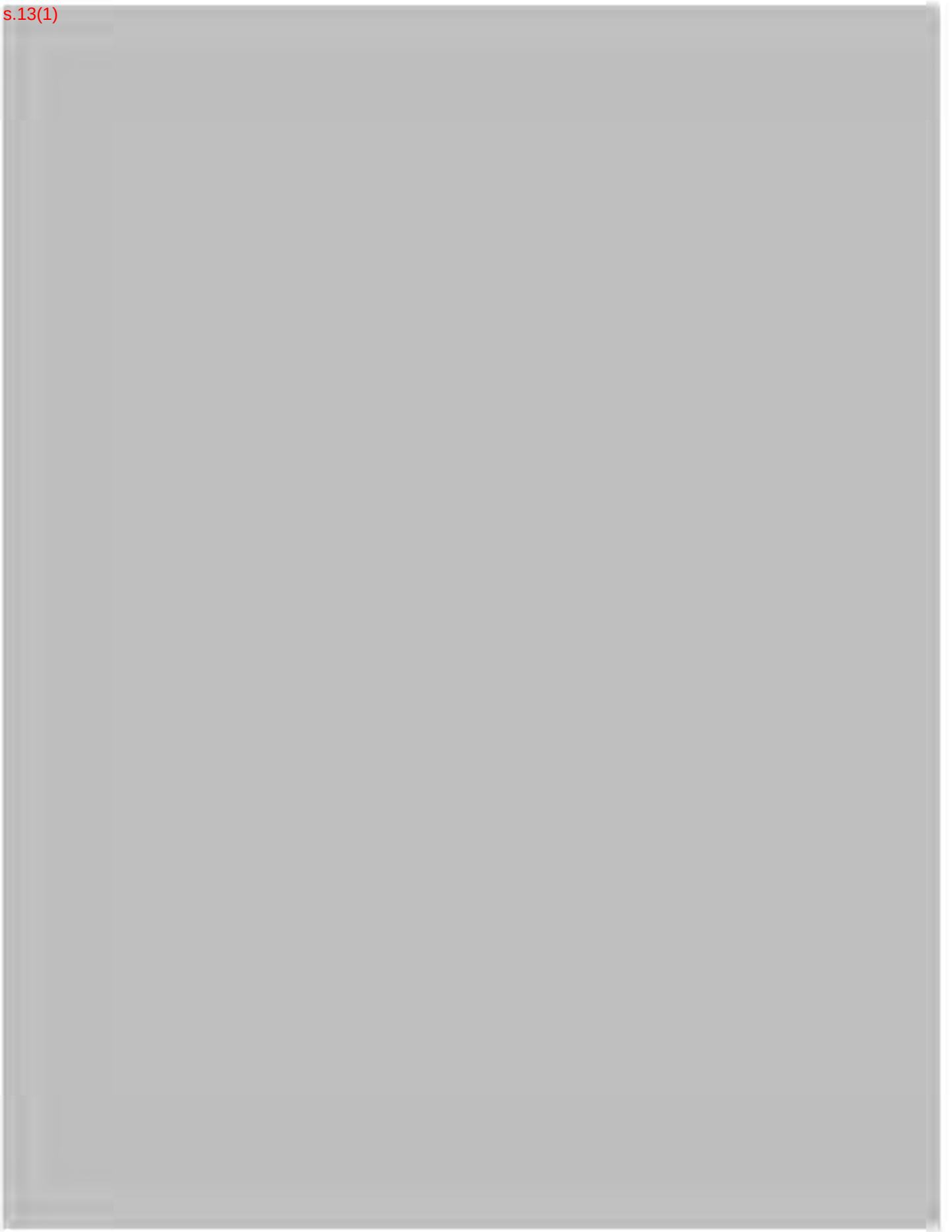

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