

Hi All,

Please accept this meeting to review the BSC Asset Betterment AEQ requirements.

Thank you.

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From: [Manouchehrinia, Babak](#)
To: [Paterson, Bruce](#)
Subject: RE: BSC electrification project description
Date: April 04, 2022 11:12:54 AM
Attachments: [BSC Electrification Project BN - Rev5.docx](#)
[image001.png](#)

Hi Bruce,

I had a look at the document and updated it. Please have a look at it, and if it is fine, I can send it to the team.

One sentence that I was not sure to leave it there or not was about **ss. 13, 17**

Your thoughts?

Thanks,
Babak

Babak Manouchehrinia, Ph.D, EIT
Electrical Project Engineer
British Columbia Ferry Services Inc.
C: **ss. 15, 19**
bcferries.com



From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: Friday, April 1, 2022 3:42 PM
To: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: RE: BSC electrification project description

Babak.

As discussed this morning, please see the mark up of Rev.4, in particular dealing with **ss. 13, 17**
Please review, particularly with regard to the highlighted reference on switchboards, and other details that a consultant might need.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: **ss. 15, 19**
Fax: (250) 978-1166
bruce.paterson@bcferries.com

www.bcferrries.com

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From: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>

Sent: March 30, 2022 4:16 PM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>

Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>

Subject: RE: BSC electrification project description

That's right Bruce; we are still on the safe side as Stu's number is still higher than the diesel engine datasheet.

James, following up on our phone call, I have updated the document (Rev4) with energy analysis data. I have also added another work scope (Data collection) which is necessary for accurate energy analysis.

-Sam, do we have a budget for this task? Can we collect data this summer?

Thanks,
Babak

Babak Manouchehrinia, Ph.D, EIT
Electrical Project Engineer
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Rethink | Reduce | Reuse | Repair | Recycle

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Sent: Wednesday, March 30, 2022 1:36 PM

To: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>

Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>

Subject: RE: BSC electrification project description

Babak,

Just re-reading your e-mail. Your energy analysis is (probably) not inaccurate as it represents the

engine loading. ss. 13, 17

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Sent: March 30, 2022 11:50 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>
Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Subject: RE: BSC electrification project description

Thanks for the clarification Bruce.

Regarding engine power, it looks like I have a different number. From a note from Stu Wills (apparently retired now), I have this picture saying the engine is rated at ss. 13, 17

cid:image001.png@01D8443B.26950810

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Sent: Wednesday, March 30, 2022 11:14 AM
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Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Subject: RE: BSC electrification project description

Ok. Rev. 3.1 has the corrected engine power!

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Sent: March 30, 2022 11:11 AM

To: Adams, James W <James.Adams@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>

Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>

Subject: RE: BSC electrification project description

Hi James, see my comments below.

Sam, the updated document (Rev3) is attached.

Babak Manouchehrinia, Ph.D, EIT
Electrical Project Engineer
British Columbia Ferry Services Inc.
C: ss. 15, 19
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Rethink | Reduce | Reuse | Repair | Recycle

From: Adams, James W <James.Adams@bcferries.com>

Sent: Wednesday, March 30, 2022 10:07 AM

To: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>

Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>

Subject: RE: BSC electrification project description

Hi Babak,

Thanks – See attached and below for suggested edits. I've included Sam in the email string. He should provide comment as the PM for this project. Is the intent to keep this as an internal project definition document? I was hoping to send this document to a design consultant. It may be beneficial to assign responsibilities and input key milestone delivery dates.

In order to undertake the shore power analysis, can you let me now when the vessel energy analysis will be complete? The vessel energy analysis is finished on my side. ss. 13, 17

ss. 13, 17

Suggested Changes:

Scope:

- Should we update this section to include all project scope details? ss. 13, 17
It would be a long live document as soon as the project starts.

Requirements and Considerations:

- Item 5 – Should we clarify that the vessel ss. 13, 17
This was shown in Appendix A, but a good recommendation. I have added this.
- Item 11 – This has been changed to: ss. 13, 17
Updated

Deliverables – Project Definition

- Item 3 – This has been changed to: ss. 13, 17
Updated
 - a. ss. 13, 17

James, I noticed that you have removed the cable length from the document and replaced it with the distance between berths. I am not sure if this would be a useful number for the designer! For calculation of drum speed, he/she needs to know the length of the cable. BTW, I am not sure about the cable length as I got it from [Guinness World Record](#) ☺ (BCF needs to advertise more for this ferry)

Thanks,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Sent: March 30, 2022 9:44 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Adams, James W <James.Adams@bcferries.com>
Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Subject: RE: BSC electrification project description

Hi Bruce,

Thanks for the mark-up! I have a couple of questions:

- The highlighted part in the paragraph below is removed in your mark-up.

ss. 13, 17

[Redacted text block]

- ss. 13, 17

[Redacted text block]

James, I have attached the updated document for you.

Thanks,
Babak

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Sent: Tuesday, March 29, 2022 4:50 PM
To: Adams, James W <James.Adams@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Subject: RE: BSC electrification project description

That one is done!

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Subject: RE: BSC electrification project description

Thanks Bruce and Babak, I'll review shortly.

Bruce – don't forget about the Business Conduct and Fraud courses we need to take as well!

Regards,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922
james.adams@bcferries.com
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Thank Babak, attached is my mark-up. I have re-styled it as Project Definition document, covering the elements of the project definition phase.

Apologies for my keen response, procrastinating about continuing an on-line course on Incident Command...

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Subject: BSC electrification project description

Hello James and Bruce,

Please find the BSC electrification project description and high-level requirements attached. It is a draft version. Please have a look at it and add your comments. The list of deliverables might be long as I was not aware of the project timeline or budget. Feel free to adjust it as needed.

Thanks,
Babak

Babak Manouchehrinia, Ph.D, EIT
Electrical Project Engineer
Fleet Technical, Engineering
British Columbia Ferry Services Inc.
The Atrium
Suite 500-1321 Blanshard St., Victoria, BC V8W 0B7
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To: [Manouchehrinia, Babak](#); [Paterson, Bruce](#); [Amusan, Sam](#)
Cc: [McKinnon, Miles](#)
Subject: RE: BSC electrification project description
Date: March 30, 2022 11:54:11 AM

Hi Babak,

Thanks for your comments, please send me the vessel energy analysis when ready.

For the project scope section, I agree this should be **ss. 13, 17**

Also, keep in mind that we will have separate terminal and vessel consultants for this project. My plan is to submit the **ss. 13, 17** I'll update the project definition document to include the proposed terminal design deliverables before contracting PBX.

The overall cable length is 2140m but a portion of this is located above water. **ss. 13, 17**

Regards,

James Adams, P.Eng.
Project Manager, Terminal Construction
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T: 250-978-1317 **M:** **ss. 15, 19** **F:** 250-361-4922
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Updated
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Thanks,

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Bruce – don't forget about the Business Conduct and Fraud courses we need to take as well!

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Babak

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Electrical Project Engineer
Fleet Technical, Engineering
British Columbia Ferry Services Inc.
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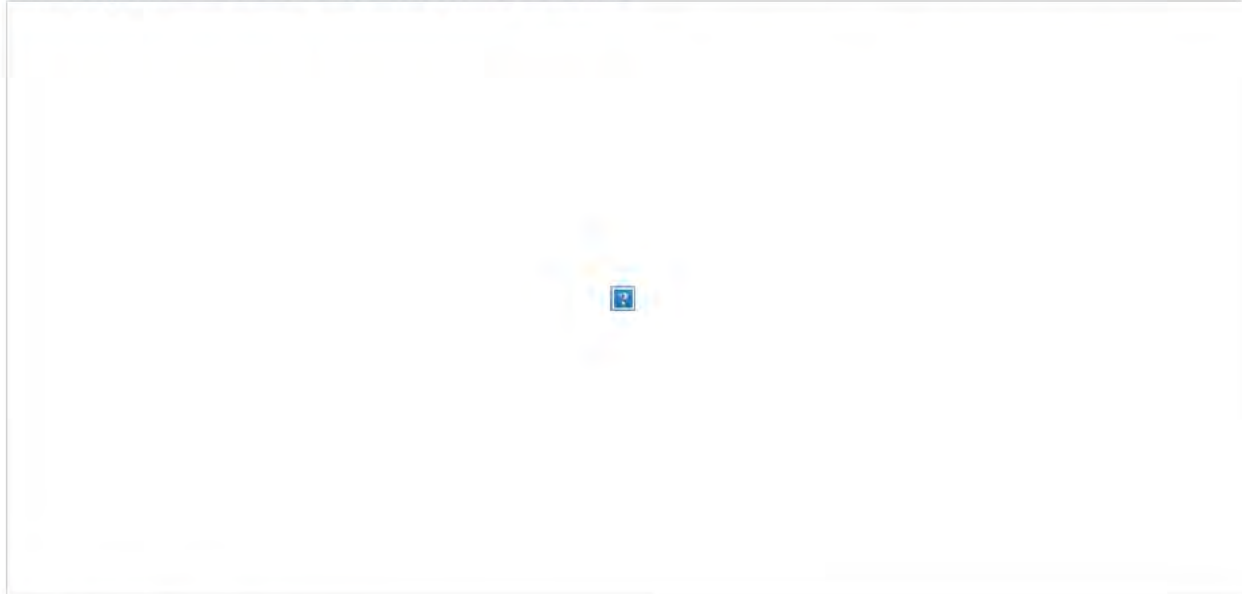
From: [Adams, James W](#)
To: [Kearney, Bob](#)
Cc: [Manouchehrinia, Babak](#); [Paterson, Bruce](#); [Tataryn, Noel](#)
Subject: RE: BSC expansion - Lightship and Deadweight increases.
Date: April 06, 2022 11:22:20 AM
Attachments: [image002.jpg](#)
[image003.jpg](#)

Hi Bob,

Ok thanks for the screen shot.

Can you please review the proposed changes to the sheave location with Bruce? I think this will be important to capture this information correctly in the DSA model.

The screen shot below shows the guide cables highlighted in yellow. The cables will need to run through the hull and the sheaves will need to be placed in-line with the drive sheave at the bow and stern.



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Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: **ss. 15, 19** F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: April 06, 2022 11:15 AM
To: Adams, James W <James.Adams@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

James,

Yes, the BSC_Widened.3dm file is the Rhino file for the BSC hull. A screen shot of the file:



- It does not include details of the sheave location.
- I am not aware of any decision to change the sheave location.
- **ss. 13, 17**

Bob Kearney, ASCT
Naval Architect
Engineering – Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 C: **ss. 15, 19**
bob.kearney@bcferries.com
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From: Adams, James W <James.Adams@bcferries.com>
Sent: Wednesday, April 06, 2022 10:39 AM
To: Kearney, Bob <Bob.Kearney@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

Hi Bob,

Thanks, can you please confirm this is the rhino file for the BSC hull? I don't have the software to open this.

I have a couple questions before issuing to DSA:

- Does this file include details on the revised placement of the guide sheaves located at the bow/stern of the vessel?
- Did we decide to update the sheave configuration to match the drive sheave?
- **ss. 13, 17**

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
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From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: April 04, 2022 3:47 PM
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Subject: RE: BSC expansion - Lightship and Deadweight increases.

James,

Attached is the hull geometry for the proposed widened BSC. **ss. 13, 17** .

Please let me know if this meets your requirements.

Thanks.

Bob Kearney, ASCT
Naval Architect
Engineering – Fleet Technical
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T: 250-978-2358 C: **ss. 15, 19**
bob.kearney@bcferries.com
bcferries.com

From: Adams, James W <James.Adams@bcferries.com>
Sent: Tuesday, March 29, 2022 2:37 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>; Kearney, Bob <Bob.Kearney@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

Hi Bruce,

As per pervious email, the autoturn study estimates the BSC has capacity for **ss. 13, 17** commercial vehicles.

Should we continue to use the **S** commercial vehicle estimate for the max displacement calculation noted in your email below? This will be used by the structural engineer and DSA for the hull analysis.

Also, please let me know if the rhino model of the hull is complete; this will be used by DSA for their dynamic analysis.

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: **ss. 15, 19** F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: March 15, 2022 3:55 PM
To: Adams, James W <James.Adams@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>; Kearney, Bob <Bob.Kearney@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: BSC expansion - Lightship and Deadweight increases.

Based on a load of **ss. 13, 17** (semis), I worked out the various weights and changes using the existing BSC stability booklet. From the response I provided to Joanne:

ss. 13, 17
[Redacted content]

Let me know if any of these numbers seem low.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: **ss. 15, 19**
Fax: (250) 978-1166
bruce.paterson@bcferries.com
www.bcferries.com
Safety and Operational Readiness

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From: [Adams James W](#)
To: [Paterson Bruce](#)
Subject: RE: BSC expansion - Lightship and Deadweight increases.
Date: April 06, 2022 3:12:56 PM
Attachments: [image001.jpg](#)
[image002.jpg](#)

Thanks Bruce.

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: 250-360-7672 F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 06, 2022 1:59 PM
To: Adams, James W <James.Adams@bcferries.com>; Kearney, Bob <Bob.Kearney@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

All,

Just to confirm that we intend to have the **ss. 13, 17**



Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: **ss. 15, 19**
Fax: (250) 978-1166
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www.bcferries.com
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From: Adams, James W <James.Adams@bcferries.com>
Sent: April 06, 2022 11:22 AM
To: Kearney, Bob <Bob.Kearney@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

Hi Bob,

Ok thanks for the screen shot.

Can you please review the proposed changes to the sheave location with Bruce? I think this will be important to capture this information correctly in the DSA model.

The screen shot below shows the guide cables highlighted in yellow. The cables will need to run through the hull and the sheaves will need to be placed in-line with the drive sheave at the bow and stern.

cid:image001.jpg@01D849BC.184E3ED0



James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: **ss. 15, 19** F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: April 06, 2022 11:15 AM
To: Adams, James W <James.Adams@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

James,

Yes, the BSC_Widened.3dm file is the Rhino file for the BSC hull. A screen shot of the file:

cid:image002.jpg@01D849BC.184E3ED0



- It does not include details of the sheave location.
- I am not aware of any decision to change the sheave location.
- **ss. 13, 17**

Bob Kearney, ASCT
Naval Architect
Engineering – Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 C: **ss. 15, 19**
bob.kearney@bcferries.com
bcferries.com

From: Adams, James W <James.Adams@bcferries.com>
Sent: Wednesday, April 06, 2022 10:39 AM
To: Kearney, Bob <Bob.Kearney@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

Hi Bob,

Thanks, can you please confirm this is the rhino file for the BSC hull? I don't have the software to open this.

I have a couple questions before issuing to DSA:

- Does this file include details on the revised placement of the guide sheaves located at the bow/stern of the vessel?
- Did we decide to update the sheave configuration to match the drive sheave?
- **ss. 13, 17**

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: **ss. 15, 19** F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: April 04, 2022 3:47 PM
To: Adams, James W <James.Adams@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

James,

Attached is the hull geometry for the proposed widened BSC. Proposed new width **ss. 13, 17**

Please let me know if this meets your requirements.

Thanks.

Bob Kearney, ASCT
Naval Architect
Engineering – Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 C: **ss. 15, 19**
bob.kearney@bcferries.com
bcferries.com

From: Adams, James W <James.Adams@bcferries.com>
Sent: Tuesday, March 29, 2022 2:37 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>; Kearney, Bob <Bob.Kearney@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: RE: BSC expansion - Lightship and Deadweight increases.

Hi Bruce,

As per previous email, the autoturn study estimates the BSC has capacity for **ss. 13, 17** commercial vehicles.

Should we continue to use the **S** commercial vehicle estimate for the max displacement calculation noted in your email below? This will be used by the structural engineer and DSA for the hull analysis.

Also, please let me know if the rhino model of the hull is complete; this will be used by DSA for their dynamic analysis.

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: 250-360-7672 F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: March 15, 2022 3:55 PM
To: Adams, James W <James.Adams@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>; Kearney, Bob <Bob.Kearney@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: BSC expansion - Lightship and Deadweight increases.

Based on a load of ^{SS 13, 17} (semis), I worked out the various weights and changes using the existing BSC stability booklet. From the response I provided to Joanne:

ss. 13, 17

A large rectangular area of the document is redacted with a solid grey fill, obscuring several lines of text.

Let me know if any of these numbers seem low.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell ^{ss. 15, 19}
Fax: (250) 978-1166
bruce.paterson@bcferries.com
www.bcferries.com
Safety and Operational Readiness

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From: [Wong, Isaac \(Pak Yu\)](#)
To: [Paterson, Bruce](#)
Cc: [Kearney, Bob](#); [McKinnon, Miles](#); [Doyle, Joanne](#)
Subject: RE: BSC, Expansion
Date: September 13, 2021 8:40:10 AM

Thanks for the information Bruce.

Yours sincerely,
Isaac Wong, P.Eng.
T: 604-204-2286 **C:** [ss. 15, 19](#)

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: September 12, 2021 10:20 PM
To: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Cc: Kearney, Bob <Bob.Kearney@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Doyle, Joanne <Joanne.Doyle@bcferries.com>
Subject: RE: BSC, Expansion

Isaac,

A preliminary estimate indicates the hull resistance would increase [ss. 13, 17](#) based on the increase in wetted surface. But it is a very short run, so the key element is how quickly the ship accelerates, which is a function of the mass as well as the ramp rate of the propulsion system. Our preliminary estimates have the lightship increasing [ss. 13, 17](#), with an increase in deadweight [ss. 13, 17](#)

[ss. 13, 17](#)
Joanne
can model this issue in more detail.

[ss. 13, 17](#)

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
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From: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Sent: September 10, 2021 4:00 PM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Subject: BSC, Expansion

Hi Bruce,

Quick question. If we do the expansion alone first, can the existing propulsion system handle the additional capacity or there will need to be some work?

Thank you.

Isaac Wong, P.Eng., M.Eng., PMP
Project Manager, Fleet Project Management Office,
British Columbia Ferry Services Inc.
12800 Rice Mill Road, Richmond BC V6W 1A1
T: 604-204-2286 **C:** ss. 15, 19
Isaac.Wong@bcferries.com

From: [Wong, Isaac \(Pak Yu\)](#)
To: [Paterson, Bruce](#)
Cc: [Kearney, Bob](#); [McKinnon, Miles](#); [Doyle, Joanne](#)
Subject: RE: BSC, Expansion
Date: September 13, 2021 8:40:10 AM

Thanks for the information Bruce.

Yours sincerely,
Isaac Wong, P.Eng.
T: 604-204-2286 **C:** 604-209-8266

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: September 12, 2021 10:20 PM
To: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Cc: Kearney, Bob <Bob.Kearney@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Doyle, Joanne <Joanne.Doyle@bcferries.com>
Subject: RE: BSC, Expansion

Isaac,

A preliminary estimate indicates the hull resistance would increase by **ss. 13, 17** based on the increase in wetted surface. But it is a very short run, so the key element is how quickly the ship accelerates, which is a function of the mass as well as the ramp rate of the propulsion system. Our preliminary estimates have the lightship increasing by **ss. 13, 17** (exclusive of any changes to the propulsion system), with an increase in deadweight of **ss. 13, 17**

ss. 13, 17

Joanne

can model this issue in more detail.

ss. 13, 17

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: **ss. 15, 19**
Fax: (250) 978-1166
bruce.paterson@bcferries.com
www.bcferries.com
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From: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Sent: September 10, 2021 4:00 PM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Subject: BSC, Expansion

Hi Bruce,

Quick question. If we do the expansion alone first, can the existing propulsion system handle the additional capacity or there will need to be some work?

Thank you.

Isaac Wong, P.Eng., M.Eng., PMP
Project Manager, Fleet Project Management Office,
British Columbia Ferry Services Inc.
12800 Rice Mill Road, Richmond BC V6W 1A1
T: 604-204-2286 **C:** ss. 15, 19
Isaac.Wong@bcferries.com

From: [Stahuliak, Marian](#)
To: [Bajwa, Karan](#); [Adams, James W](#); [Seitz, Robert](#); [Vollmers, Tony](#)
Cc: [Jones, Stephen](#); [Paterson, Bruce](#); [Cota, Eduardo](#); [Cennon, Quentin](#)
Subject: RE: INCIDENT NOTIFICATION: 265143 - Baynes Sound Connector - (Route: 21) - Bullwheel Issue - Mechanical Failure - Main Engine Failure - Notification Level: 1 - 2022-07-26 0931
Date: July 26, 2022 3:08:27 PM

Thanks James,

In addition to the list you have provided here is a few additional action items related:

1) Vessel operators have stopped using dynamic brake system after second bolt failure (last week). This is to eliminate one external force on the bolts that may contribute to their premature failure

2) LRTM is planning on sending a team of techs tomorrow night to replace as many bolts as they currently have on hand.

ss. 13, 17

3) ss. 13, 17

4) In speaking with Quentin I suggested to put an ss. 13, 17

Thanks,

Marian Stahuliak
Engineering Superintendent-North Islands
British Columbia Ferry Services Inc.
680 Trans Canada Hwy., Nanaimo, British Columbia, V9S 5R1
T1: 250-716-7119 T2: 250-890-7882 C: ss. 15, 19
marian.stahuliak@bcferries.com
bcferries.com | [Facebook](#) | [Twitter](#)

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From: Bajwa, Karan <Karan.Bajwa@bcferries.com>
Sent: July 26, 2022 2:01 PM
To: Adams, James W <James.Adams@bcferries.com>; Seitz, Robert <Robert.Seitz@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>
Cc: Jones, Stephen <Stephen.Jones@bcferries.com>; Stahuliak, Marian

<Marian.Stahuliak@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Cota, Eduardo <Eduardo.Cota@bcferries.com>; Cennon, Quentin <Quentin.Cennon@bcferries.com>
Subject: RE: INCIDENT NOTIFICATION: 265143 - Baynes Sound Connector - (Route: 21) - Bullwheel Issue - Mechanical Failure - Main Engine Failure - Notification Level: 1 - 2022-07-26 0931

Thanks James and Rob. Sounds like you have it all in hand and a good plan to resolve this.

Regards
Karan

Karan S Bajwa
Director, Fleet Engineering

British Columbia Ferry Services Inc.
#1 Ferry Causeway. Delta, BC V4M 4G6
O: 604-948-3575 **C:** ss. 15, 19
karan.bajwa@bcferries.com
bcferries.com | [Facebook](#) | [Twitter](#)

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From: Adams, James W <James.Adams@bcferries.com>
Sent: July 26, 2022 12:56 PM
To: Seitz, Robert <Robert.Seitz@bcferries.com>; Bajwa, Karan <Karan.Bajwa@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>
Cc: Jones, Stephen <Stephen.Jones@bcferries.com>; Stahuliak, Marian <Marian.Stahuliak@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Cota, Eduardo <Eduardo.Cota@bcferries.com>; Cennon, Quentin <Quentin.Cennon@bcferries.com>
Subject: RE: INCIDENT NOTIFICATION: 265143 - Baynes Sound Connector - (Route: 21) - Bullwheel Issue - Mechanical Failure - Main Engine Failure - Notification Level: 1 - 2022-07-26 0931

All,

The Engineer who designed the bull wheel system is currently reviewing the issue. Here is a brief summary on next steps:

1. Replace all existing bolts as soon as possible. There is currently a shortage to replace all available bolts with the current specified bolt. The Engineer will confirm if bolt spec can be temporarily changed to a more readily available bolt. This may also include reducing the torque spec.
2. Check torque on existing bolts before replacement. This will determine if bolt torque remained in spec during use.
3. Conduct NDT on bolts removed from service for possible stress cracks.
4. Assess existing liners to confirm they are fully seated against the bull wheel using feeler gauges. The bolts will be subject to additional cyclical loading if liners do not make full contact with the wheel
5. Acuren to complete failure mode analysis on failed bolts

6. Engineer to finalize recommendations following outcome of failure mode analysis and site observations.

Other possible actions: Acuren may have an option to test in-service bolt strain/vibration to determine if loads are within spec.

Regards,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: **ss. 15, 19** F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Seitz, Robert <Robert.Seitz@bcferries.com>
Sent: July 26, 2022 11:49 AM
To: Bajwa, Karan <Karan.Bajwa@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>
Cc: Jones, Stephen <Stephen.Jones@bcferries.com>; Stahuliak, Marian <Marian.Stahuliak@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Cota, Eduardo <Eduardo.Cota@bcferries.com>; Adams, James W <James.Adams@bcferries.com>; Cennon, Quentin <Quentin.Cennon@bcferries.com>
Subject: RE: INCIDENT NOTIFICATION: 265143 - Baynes Sound Connector - (Route: 21) - Bullwheel Issue - Mechanical Failure - Main Engine Failure - Notification Level: 1 - 2022-07-26 0931

Hi Karan, these bolt issues have only surfaced since the new braking system was installed. I think we need to look at that.

Regards,
Rob

Rob Seitz, P.Eng
Director, Terminal Maintenance
British Columbia Ferry Services Inc.
T: 250-978-1268 C: **ss. 15, 19** F: 250-361-4922

From: Bajwa, Karan <Karan.Bajwa@bcferries.com>
Sent: July 26, 2022 9:49 AM
To: Vollmers, Tony <Tony.Vollmers@bcferries.com>
Cc: Jones, Stephen <Stephen.Jones@bcferries.com>; Seitz, Robert <Robert.Seitz@bcferries.com>; Stahuliak, Marian <Marian.Stahuliak@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Cota, Eduardo <Eduardo.Cota@bcferries.com>
Subject: FW: INCIDENT NOTIFICATION: 265143 - Baynes Sound Connector - (Route: 21) - Bullwheel Issue - Mechanical Failure - Main Engine Failure - Notification Level: 1 - 2022-07-26 0931

Hi Tony, This is the 4th bolt to break on this wheel within the past 6 weeks. Marian has details of this newly designed wheel and drive system that was installed a year ago. **ss. 13, 17**

ss. 13, 17

Can you help in finding a reliable

solution.

In the meantime, we look into replacing all bolts so we don't have these breakages one at a time.

I have copied Bruce to see if he has someone in FT that can help with this.

Regards

Karan

Karan S Bajwa
Director, Fleet Engineering

British Columbia Ferry Services Inc.
#1 Ferry Causeway. Delta, BC V4M 4G6
O: 604-948-3575 **C:** ss. 15, 19
karan.bajwa@bcferries.com
bcferries.com | [Facebook](#) | [Twitter](#)

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From: OSC iSail Notify Service <OSCiSailNotifyService@bcferries.com>

Sent: July 26, 2022 9:41 AM

To: BCF OSC Rt-21 <OSCRt21@bcferries.com>

Subject: INCIDENT NOTIFICATION: 265143 - Baynes Sound Connector - (Route: 21) - Bullwheel Issue - Mechanical Failure - Main Engine Failure - Notification Level: 1 - 2022-07-26 0931

Notification Level: 1

INCIDENT DETAILS:

Lead Operator reports a bolt has broken off the bullwheel. Terminal Maintenance has been advised and are on site at BUK waiting for the vessel's arrival. Vessel is currently transiting to BUK at reduced speed without traffic.

Terminal Manager advised. Service notice posted.

IMPACT TO OPERATIONS:

Holding in dock at BUK.

For more information, please access the following link:

[iSail Incident 265143](#)

Please use your network user ID to logon to iSail. For urgent matters regarding this incident, please contact the OSC at 1-877-858-1888

Regards,

Operations & Security Centre
British Columbia Ferry Services Inc.

Suite 500-1321 Blanshard St, Victoria, BC, V9A 6W9

T: 1-877-858-1888 **F:** 250-386-1652

osc@bcferries.com

bcferries.com | [Facebook](#) | [Twitter](#)

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{CMI: MCID219272}

From: [Doyle, Joanne](#)
To: [Paterson, Bruce](#)
Cc: [Wong, Isaac \(Pak Yu\)](#)
Subject: RE: Passenger Loads on the BSC
Date: April 15, 2021 9:24:01 AM

Thanks Bruce. Let me see what I can get out of the data.

I am not sure about a specific target to reduce shuttling **ss. 13, 17**

I will get back to you both early next week.

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 15, 2021 9:13 AM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Joanne,

Thanks for your response. Early next week is fine.

Regarding your final point, I responded to a request from Al de Koninck a few years ago about a general increase in capacity. I don't know if there was ever any detailed traffic analysis on the "right" increase in capacity, or a target for reducing the amount of time in "Shuttle Mode". If there is an opportunity to understand this from the data, perhaps we can better identify the ideal vessel size (or justify our current proposal).

ss. 13, 17

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: **ss. 15, 19**
Fax: (250) 978-1166
bruce.paterson@bcferries.com
www.bcferries.com
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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: April 15, 2021 7:22 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Good Morning Bruce,

I will pull some numbers together and get back to you Monday (I have Friday off). If you need sooner let me know.

ss. 13, 17
[Redacted]

Are we looking at different options for AEQ capacity expansion?

ss. 13, 17
[Redacted]

Thanks,
Joanne

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 14, 2021 4:14 PM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: Passenger Loads on the BSC

Joanne,

When we were scoping the proposed expansion of the BSC I was asked there would be any impact on passenger licence (and possibly lifesaving). ss. 13, 17

[Redacted]

Can we do some analysis on the peak loads on the BSC to assess what the average vehicle occupancy is; and the range of foot pax loads are seen (do we track the school kids?). Then I suppose we need to consider the crewing impact ss. 13, 17

Thanking you in advance.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.

Tel: (250) 978-1385

Cell: (ss. 15, 19)

Fax: (250) 978-1166

bruce.paterson@bcferries.com

www.bcferries.com

Safety and Operational Readiness

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From: [Doyle, Joanne](#)
To: [Paterson, Bruce](#)
Cc: [Wong, Isaac \(Pak Yu\)](#)
Subject: RE: Passenger Loads on the BSC
Date: April 20, 2021 8:33:03 AM
Attachments: [AEQ Demand Analysis F20.pdf](#)
[Passenger Demand Analysis F20.pdf](#)

Hi Bruce,

I took a slightly different view of the Route 21 data than I would other routes due to the additional shuttling that occurs during peak demand periods of the year. The approach I took was to combine all additional shuttling sailings with the closest scheduled sailing from the departure port – this pooled the demand to be on one of the 14-17 scheduled sailings. Hopefully it can help us identify the actual demand on peak days. To show the difference in approaches - I did look at the data both ways for the peak season (combining shuttling trips and then as provided).

Table 1. Passenger Demand, F20, Percentile Analysis

Percentile	All Sailings YR		Peak Season		Peak Season Combined	
	Buckley Bay	Denman West	Buckley Bay	Denman West	Buckley Bay	Denman West
0.85	86	81	112	100	125	111
0.9	96	89	121	108	142	126
0.95	111	101	130	118	206	171
0.98	127	116	139	127	247	210
Total Sailings	5838	5838	1300	1300	1152	1155

Note the Peak season combined –combines shuttle sailings with scheduled sailings

The attached file also shows the percentile analysis is for the Pass per AEQ which ranges between 3 to 5 depending on the percentile. This is consistent with other vessels of similar capacities, [ss. 13, 17](#)

Table 2. AEQ Demand, F20, Percentile Analysis

Percentile	All Sailings YR			Peak Season			Peak Season Combined		
	Buckley Bay	Denman West	Route	Buckley Bay	Denman West	Route	Buckley Bay	Denman West	Route
0.85	46	48	47	51	51	51	53	53	53
0.9	50	50	50	52	52	52	62	56	57
0.95	52	52	52	53	54	54	96	90	94
0.98	54	54	54	55	55	55	103	102	102
Total Sailings	5838	5838	11676	1300	1300	2600	1152	1155	2307

[ss. 13, 17](#)

[Redacted content]

The analysis so far doesn't take into consideration any growth. Historically (pre-pandemic) we were seeing growth:

- F20 grew just under 4% in AEQ from F19
- between F18 to F19 there was just over 3% growth in AEQ

The attached pdf has a bit more detail. Take a look and see what you think, let me know if you would like to discuss further.

If we understand what the limitation may be on shuttling (within the operating day) over the current service while still accommodating charging we may be able to show how the new vessel capacity will meet current and future demand.

When we have a 47 AEQ vessel on Rte 22 the demand will be showing up in higher volumes at peak periods of the day. **ss. 13, 17**

Thanks,
Joanne

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 15, 2021 9:13 AM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Joanne,

Thanks for your response. Early next week is fine.

Regarding your final point, I responded to a request from Al de Koninck a few years ago about a general increase in capacity. I don't know if there was ever any detailed traffic analysis on the "right" increase in capacity, or a target for reducing the amount of time in "Shuttle Mode". If there is an opportunity to understand this from the data, perhaps we can better identify the ideal vessel size (or justify our current proposal).

ss. 13, 17

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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: April 15, 2021 7:22 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Good Morning Bruce,

I will pull some numbers together and get back to you Monday (I have Friday off). If you need sooner let me know.

ss. 13, 17
[Redacted]

Are we looking at different options for AEQ capacity expansion?

ss. 13, 17
[Redacted]

Thanks,
Joanne

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 14, 2021 4:14 PM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: Passenger Loads on the BSC

Joanne,

When we were scoping the proposed expansion of the BSC I was asked there would be any impact on passenger licence (and possibly lifesaving). ss. 13, 17

[Redacted]

[Redacted]

[Redacted] Can we do some

analysis on the peak loads on the BSC to assess what the average vehicle occupancy is; and the range of foot pax loads are seen (do we track the school kids?). Then I suppose we need to consider the crewing impact **ss. 13, 17**

Thanking you in advance.

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From: [Doyle, Joanne](#)
To: [Paterson, Bruce](#)
Cc: [Wong, Isaac \(Pak Yu\)](#); [McKinnon, Miles](#)
Subject: RE: Passenger Loads on the BSC
Date: April 27, 2021 8:11:26 AM

Good Morning Bruce,

Sorry for the late reply – still waiting on some information.

1. Yes there is some minor discrepancy btw AEQ and # of vehicles, but AEQ is the unit of measurement that we use and when speaking specifically about UH it does provide a conservative #. But it is the mix of recreation vehicles and service vehicles that really impact the loading of the vessel and these vehicle types travel during peak demand periods.

2. I have a meeting with AI today – I will get the shuttling protocols for you, I know we changed it up slightly during COVID so I will need to get the Pre-COVID and current practise.
 - a. The heat maps show the shuttle sailings demand at the time of day (approx.) they show up and by changing the vessel capacity shows how demand moves/stacks up (noting that there are very long lines on the Rte 22 side and when we have a larger vessel there the demand will be coming much quicker to Rte 21). The tricky thing with these tables are they are averages and when you have 10 Fridays in the peak and the prime mid-day sailings are averaging 90%+ then we know we are going to have a major problem when a larger ferry is on Rte 22.
 - b. I am not sure we need another category saying shuttling but we can make some assumptions and change the color coding to align – all sailings that average over ##% will likely have shuttling (based on the new capacity of ship) current capacity of ship we know that we provide almost 400 additional sailings in Shoulder/Peak (with 69% being in the peak).
 - c. **ss. 13, 17**

3. Passenger data is only separated btw Foot/Veh passenger at Buckley Bay so it more reliable to use the combined measure of total passengers. Yes the tables are combined Vehicle/Foot Passengers. The data is consistent with other vessels of similar capacity – from an AEQ perspective it is between the Quinsam 63 AEQ (400ppl) and the Capilano 87AEQ (457ppl).
 - a. Do you need me to be a part of the meetings with Fleet Ops?
 - b. Table below is outlines the Percentile Analysis Passenger/AEQ for all two port minor routes F16 to F20

**Passenger per AEQ - F16 to F20 two port minor routes
(no multi port)**

Percentile	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.98
MR F16-20	2.0	2.1	2.2	2.3	2.4	2.5	2.8	3.1	3.8

I hope this is helpful. If not maybe we should chat so I know exactly what it is you are looking for.

I will get back to you all once I meet with AI wrt shuttling protocol.

Thanks,
Joanne

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 20, 2021 3:30 PM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Joanne,

Thanks (again) for the great work. I've marked up the attachments with some comments/observations, some of which I will repeat:

(1) **ss. 13, 17**

[Redacted content]

(2) Do we have policy as when we initiate shuttle sailings? Is it based on certain number of cars in the holding compound (or outside waiting to enter)? If so, how many typically? Does this mean the heat maps need to have another category going from "overload" to "shuttle"?

(3) The Passenger demand is actually quite problematic if I have understood the tables correctly.

ss. 13, 17

[Redacted content]

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Sent: April 20, 2021 8:33 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: Passenger Loads on the BSC

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Based on F20 *peak season* demand if the new vessel capacity:

- [ss. 13, 17](#)

The analysis so far doesn't take into consideration any growth. Historically (pre-pandemic) we were seeing growth:

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Can we do some analysis on the peak loads on the BSC to assess what the average vehicle occupancy is; and the range of foot pax loads are seen (do we track the school kids?). Then I suppose we need to consider the crewing impact if say the licence did go to 300.

Thanking you in advance.

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From: [Adams, James W](#)
To: [Paterson, Bruce](#); [Kearney, Bob](#); [Manouchehrinia, Babak](#)
Cc: [McKinnon, Miles](#); [Vollmers, Tony](#); [Bae, Chanwoo](#)
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project
Date: February 04, 2022 3:58:25 PM

Thanks Bruce, when ready can Fleet Technical confirm the following details:

- **ss. 13, 17** [REDACTED]
- [REDACTED]
- [REDACTED]

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 **M:** **ss. 15, 19** **F:** 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: February 04, 2022 3:54 PM
To: Adams, James W <James.Adams@bcferries.com>; Kearney, Bob <Bob.Kearney@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>; Bae, Chanwoo <Chanwoo.Bae@bcferries.com>
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

James – I have a couple edits for Bob to do. Stand-by

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: **ss. 15, 19**
Fax: (250) 978-1166
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From: Adams, James W <James.Adams@bcferries.com>
Sent: February 04, 2022 3:20 PM
To: Kearney, Bob <Bob.Kearney@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>;

Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>; Bae, Chanwoo <Chanwoo.Bae@bcferries.com>
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

Hi Bob,

I don't have access to the Fleet Tech J-drive – could you please send me a copy of the GA?

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: February 04, 2022 3:12 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>; Bae, Chanwoo <Chanwoo.Bae@bcferries.com>; Adams, James W <James.Adams@bcferries.com>
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

Bruce,

I've placed "BSC General Arrangement - Widening RevA" into s. 15

ss. 13, 17

Bob Kearney, ASCT
Naval Architect
Engineering – Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 **C:** ss. 15, 19
bob.kearney@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: Thursday, February 03, 2022 11:24 AM
To: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Kearney, Bob <Bob.Kearney@bcferries.com>

Cc: McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>; Bae, Chanwoo <Chanwoo.Bae@bcferries.com>; Adams, James W <James.Adams@bcferries.com>

Subject: Reference Directory for Baynes Sound Connector Asset Betterment Project

I've dumped a number of reference files for the BSC Asset Betterment project to the following directory:

s. 15

There are main sub-directories with information on the capacity increase:

s. 15

@Bob – can you drop your work into the this sub-directory?

There is a another main subdirectory for the Electrification project.

@Babak – the reference trials information is located at:

s. 15

Note there is trials data from the 2015 acceptance trials. This is what the BSC was contracted to meet. ss. 13, 17

I've included a file that provides the details on the hydraulic motors, and there is a separate directory on the hydraulic system specs.

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Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
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From: [Kearney, Bob](#)
To: [Jones, Gary](#)
Cc: [Paterson, Bruce](#)
Subject: RE: Tunnel rollers
Date: June 06, 2022 2:16:44 PM
Attachments: [image001.jpg](#)
[image002.jpg](#)
[image003.jpg](#)
[image004.jpg](#)

Gary,

Thanks for these photos. Yes, a sketch would be great. Also, a simple bill of materials (atleast rollers and axles) would be very helpful.

Thanks.

Bob Kearney, ASCT
Naval Architect
Engineering – Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 **C:** ss. 15, 19
bob.kearney@bcferries.com
bcferries.com

From: Jones, Gary <Gary.Jones@bcferries.com>
Sent: Monday, June 06, 2022 10:24 AM
To: Kearney, Bob <Bob.Kearney@bcferries.com>
Subject: FW: Tunnel rollers

Hi Bob

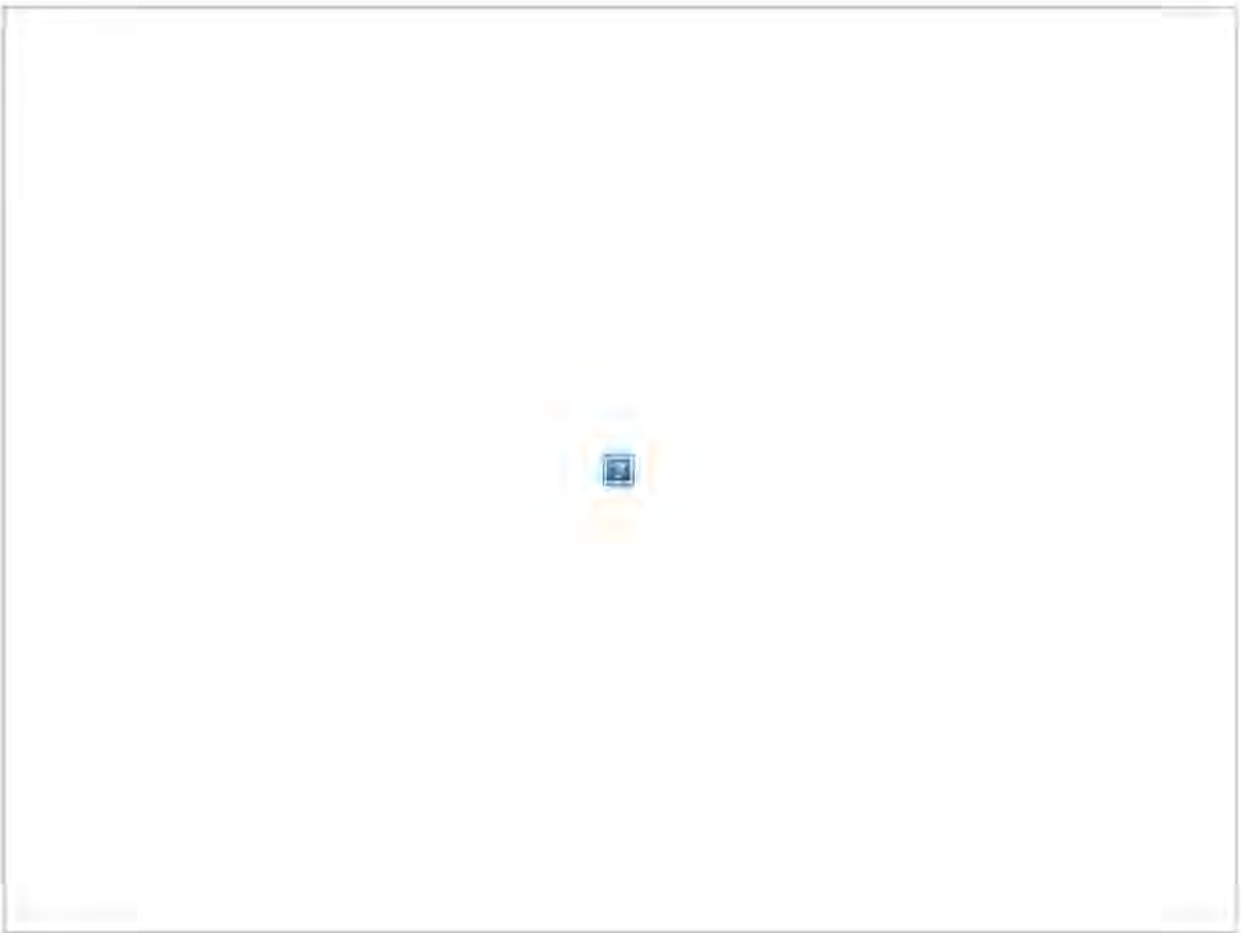
I've sent you pictures of the tunnel rollers in place and with rollers removed. I will create a drawing of the rollers and send off to you, I will need a bit of time because of the re-fit to sort some things out

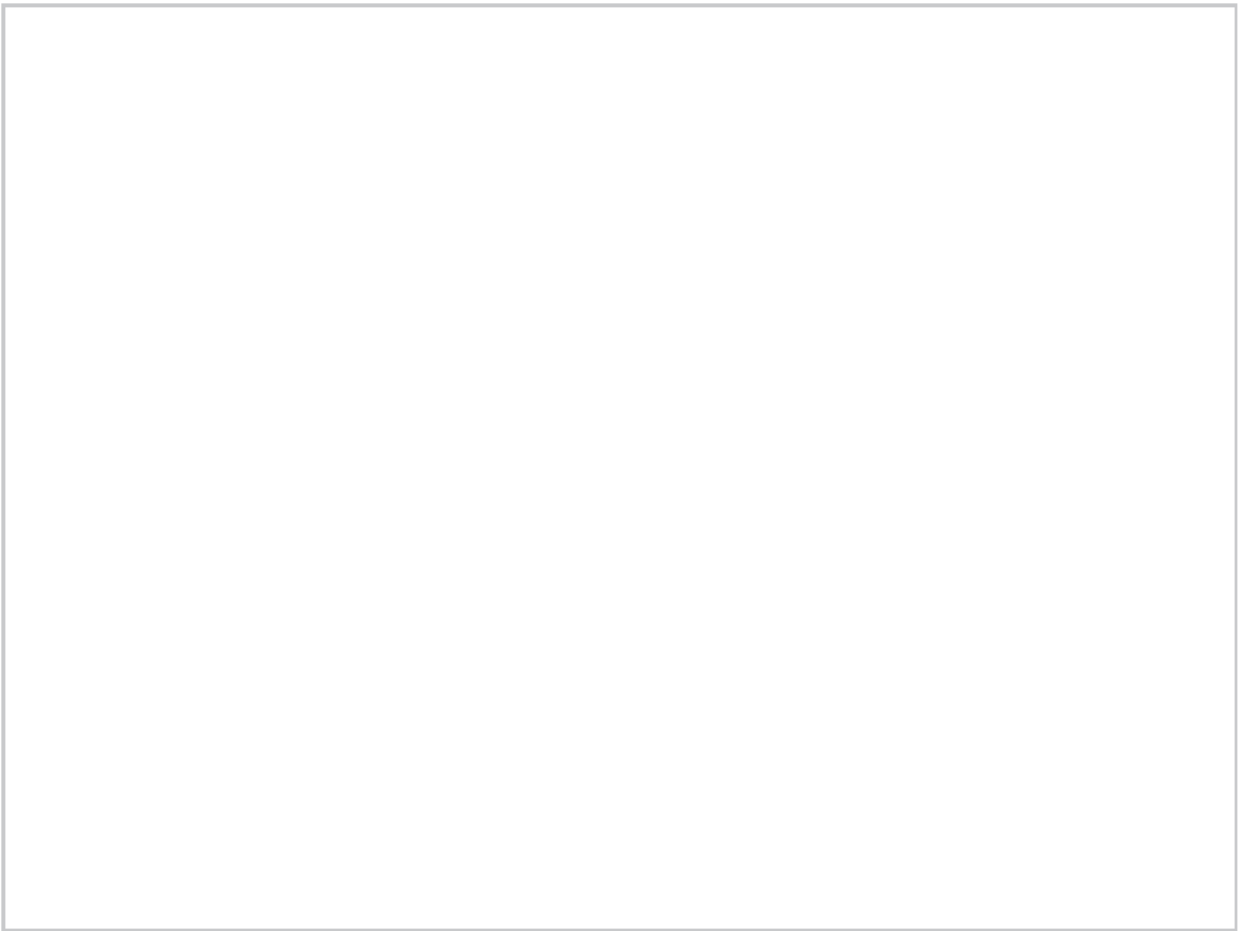
Hope this helps

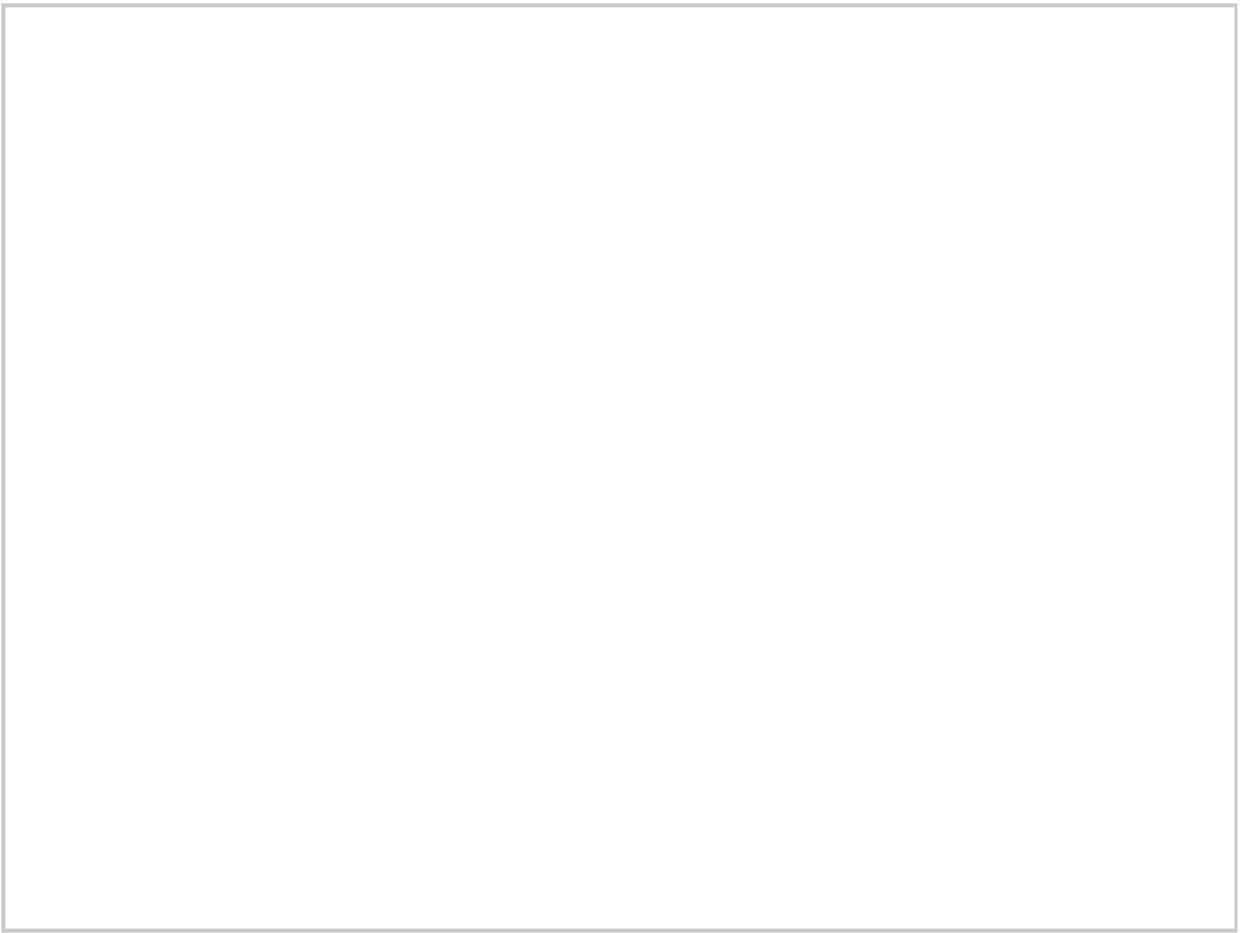
Gary Jones
Little River Terminal Maintenance
British Columbia Ferry Services Inc.
1300 Ellenor Road Comox, BC V9M 4B3
Gary.jones@bcferries.com
Office: 250-339-2229
Phone: 250-890-7851
Cell: ss. 15, 19

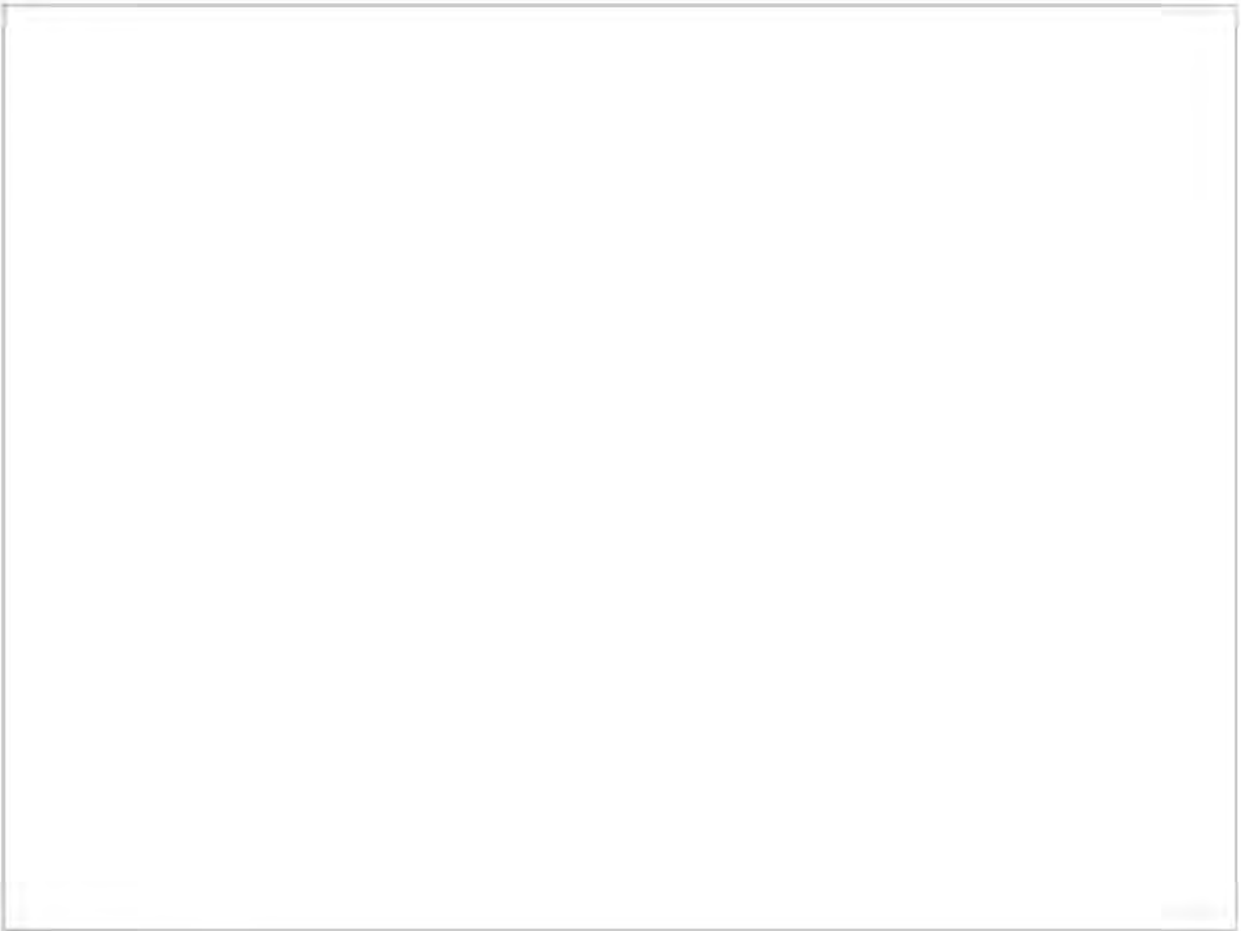
From: Hans Larose s. 22
Sent: June 02,2022 4:14 PM
To: Jones, Gary <Gary.Jones@bcferries.com>
Subject: [EXTERNAL] Tunnel rollers

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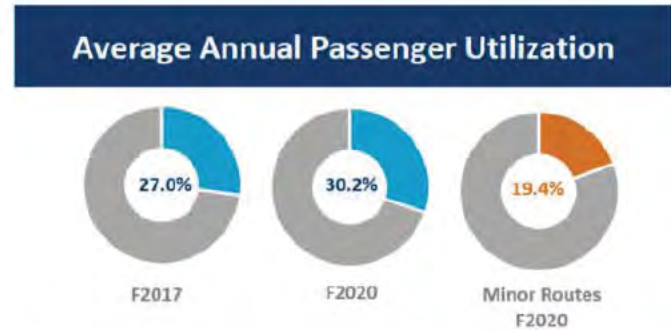
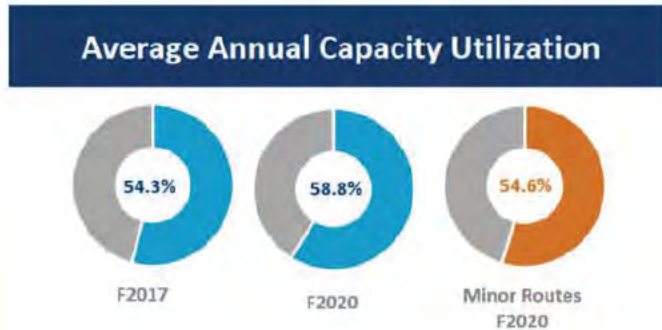


Sent from my iPhone

Service Overview Slides

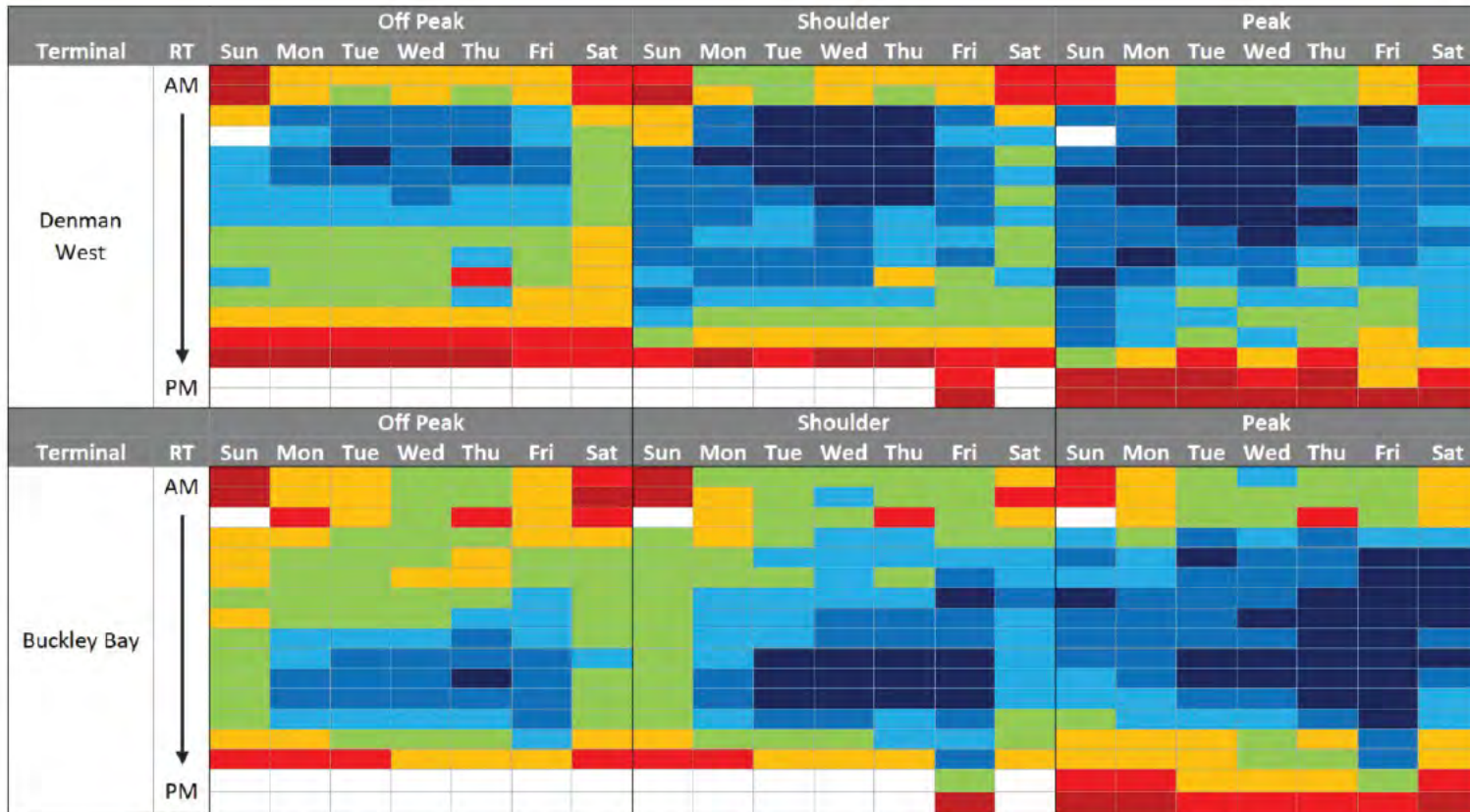
Excerpt from FAC discussions – Mar 2021

Route 21 – Service Overview

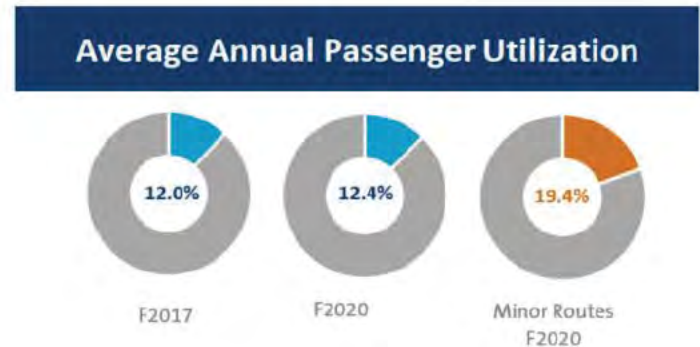
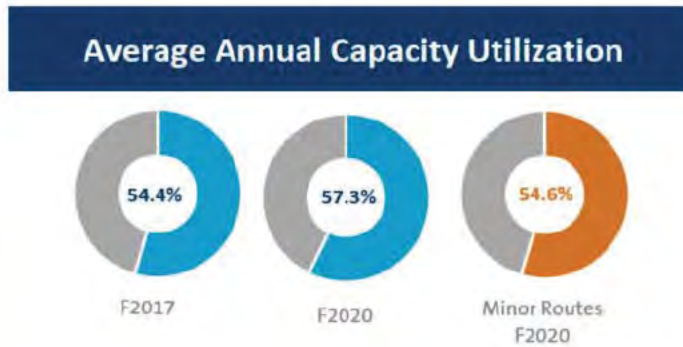


37.8% of Island Population are Seniors (2016 StatsCanada)
 In 2020, 24.8% of M-Th Passengers are Seniors up 3.8% from 2017

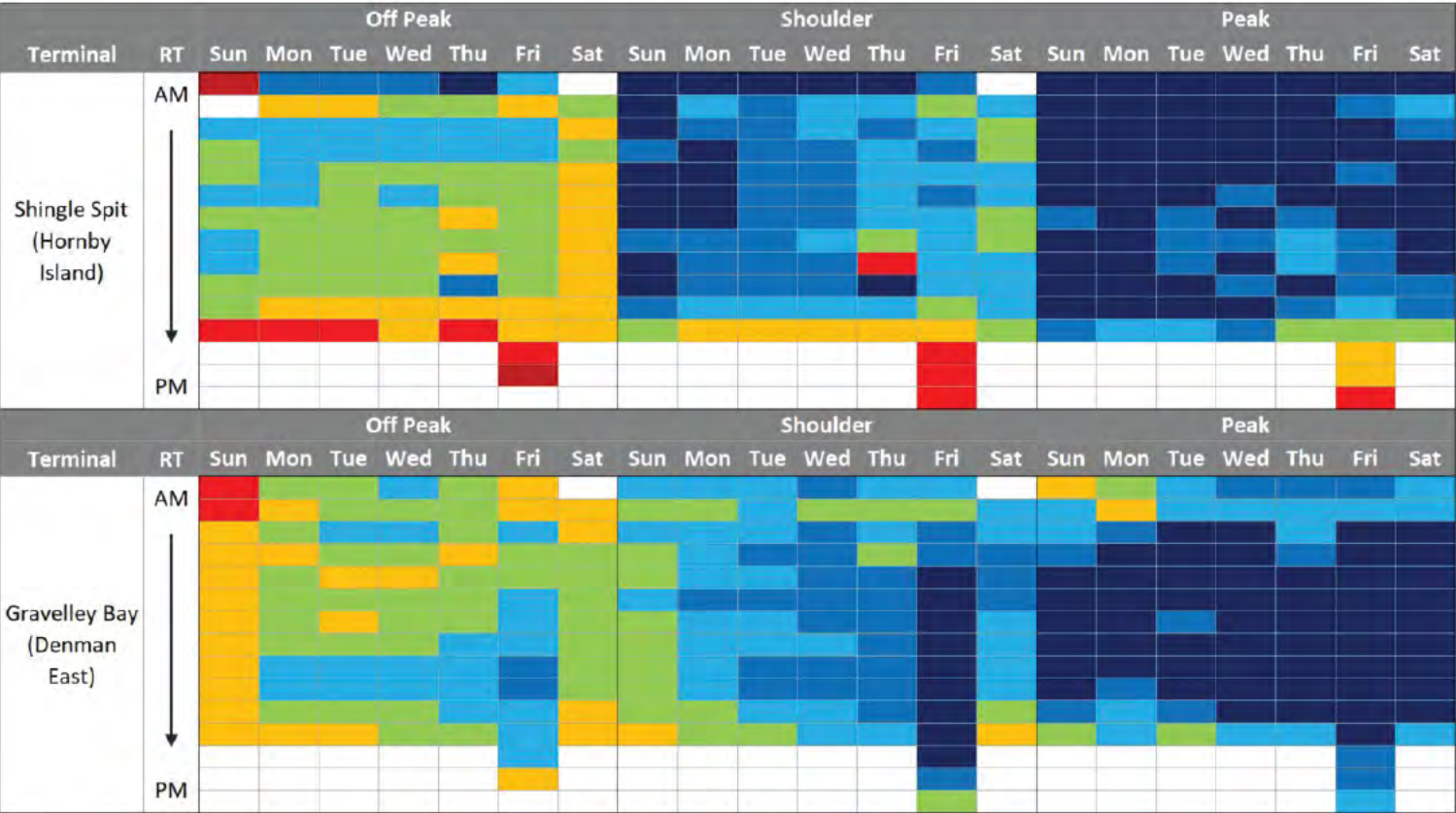
Route 21 Heat Map – F20



Route 22 – Service Overview

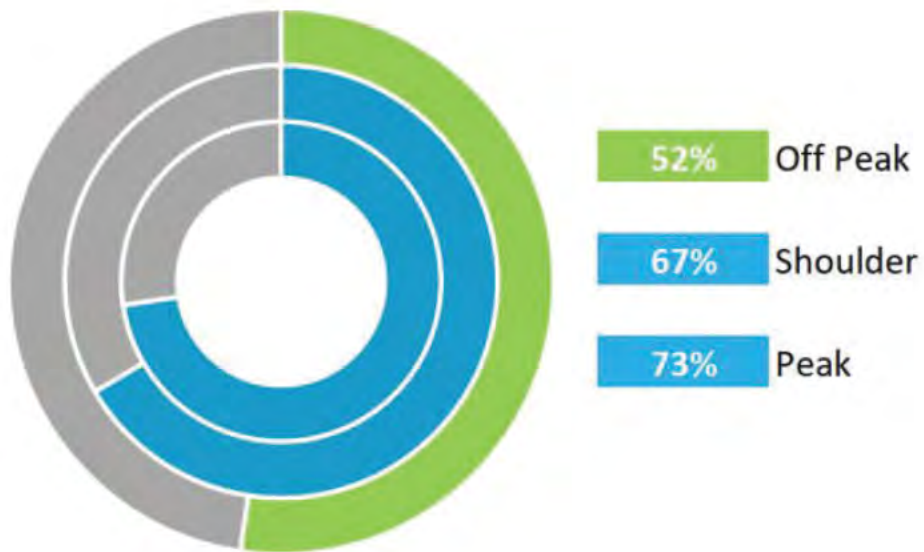


Route 22 Heat Map – F20



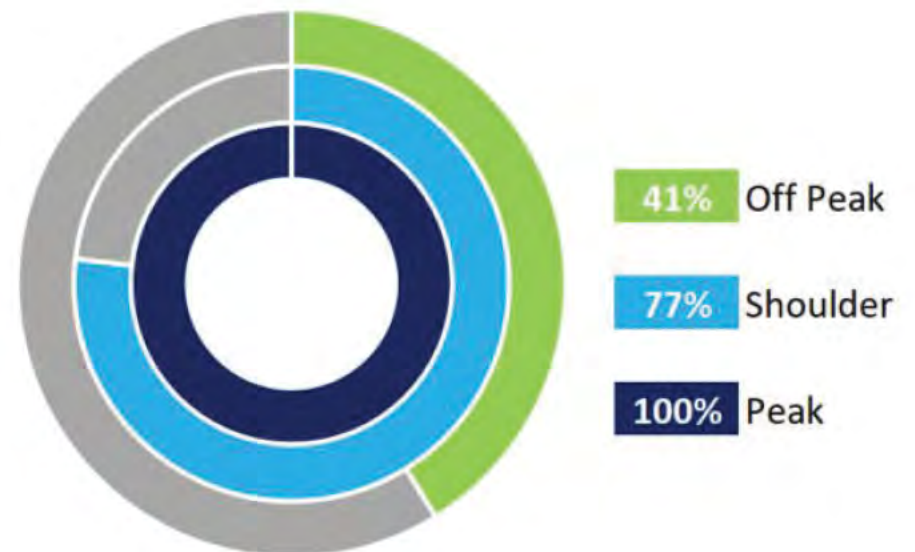
Average Capacity Utilization, by Season

Route 21



Return

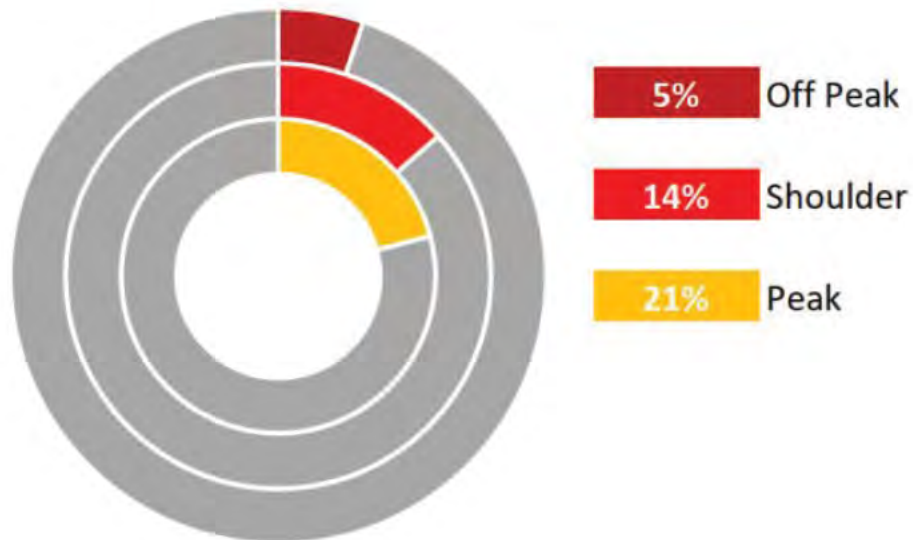
Route 22



Return

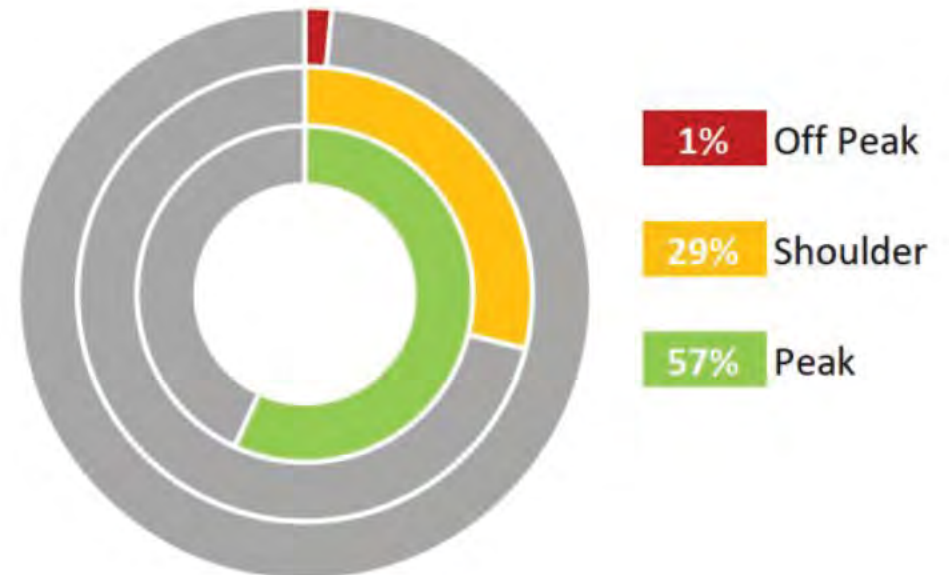
Percent Overloaded Sailings, by Season

Route 21



Return

Route 22



Return

Adams, James W

From: Adams, James W [s. 15](#)
Sent: Monday, March 22, 2021 5:49 PM
To: Wong, Isaac (Pak Yu)
Cc: Monrad, Eric (Eric.Monrad@bcferries.com); Seitz, Robert
Subject: RE: BSC - Asset Betterment_PIR (Baynes Sound Connector AEQ increase and electrification)

Hi Isaac,

Please find the attached PIR with suggested edits in green.

I've cc'd Eric Monrad on my response in case he has further suggestions. In terms of the AEQ increase, I think there should be a statement in the business need section how this aligns with the fleet and terminal master plans. The Buckley bay and DenW holding compounds have been carefully sized for 1 vessel's worth of vehicles. It will be important to study how the increased vessel AEQ may impact traffic flows at each

Attachments:

BSC - Asset Betterment_PIR_JA Edits.docx

(247 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Wednesday, March 24, 2021 6:38 AM
To: Monrad, Eric
Subject: RE: BSC - Asset Betterment_PIR (Baynes Sound Connector AEQ increase and electrification)

Hi Eric,

Thanks for taking the lead on this with Isaac.

Regards,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com<mailto:james.adams@bcferries.com>
bcferries.com<http://www.bcferries.com/>

From: Monrad, Eric <Eric.Monrad@bcferries.com>
Sent: March 23, 2021 2:04 PM
To: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Cc: Seitz, Robert <Robert.Seitz@bcferries.com>

Adams, James W

From: Adams, James W s. 15
Sent: Thursday, September 16, 2021 11:58 AM
To: Wong, Isaac (Pak Yu); McKinnon, Miles
Cc: Monrad, Eric (Eric.Monrad@bcferries.com)
Subject: RE: BSC, 92466, Pre-Imp Request

Hi Isaac,

This will not be enough time for Eric and I to complete our review. Eric is away this afternoon and will likely not get to the pre-imp request until Friday. It appears you are asking for Terminal Engineering support on these projects and it will be difficult to provide a commitment on resourcing/budget requirements if we do not have time to complete our review.

Here's a couple high level discussion points while I complete my review:

- How much support is Terminal Eng

Attachments:

RE: BSC - Asset Betterment_PIR (Baynes Sound Connector AEQ increase and electrification) (51 KB)

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Wednesday, January 26, 2022 1:30 PM
To: Adams, James W
Subject: RE: BSC - Modifications to the end bulwarks
Attachments: BUCK-XXX-SK001.pdf; BUCK-XXX-SK002.pdf

Hi James,

Here are a couple a sketches for review to make sure I am showing the information you wanted. Please mark up any revisions you want.

Thank You,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 – 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com | [Facebook](https://www.facebook.com/bcferries) | [Twitter](https://twitter.com/bcferries)

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From: Adams, James W <James.Adams@bcferries.com>
Sent: January 19, 2022 3:39 PM
To: Tataryn, Noel <Noel.Tataryn@bcferries.com>; Brookall, Gary <Gary.Brookall@bcferries.com>
Cc: Harney, Steven <Steven.Harney@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: RE: BSC - Modifications to the end bulwarks

Thanks Noel, please let me know if you have any questions.

Regards,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: January 19, 2022 1:12 PM

To: Adams, James W <James.Adams@bcferries.com>; Brookall, Gary <Gary.Brookall@bcferries.com>
Cc: Harney, Steven <Steven.Harney@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: RE: BSC - Modifications to the end bulwarks

Hi James,

Yes I have some to look at this. I will send copies for review when I am done.

Thank You,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 – 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com | [Facebook](https://www.facebook.com/bcferries) | [Twitter](https://twitter.com/bcferries)

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From: Adams, James W <James.Adams@bcferries.com>
Sent: January 19,2022 12:13 PM
To: Brookall, Gary <Gary.Brookall@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Cc: Harney, Steven <Steven.Harney@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: RE: BSC - Modifications to the end bulwarks

Thanks Gary.

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Brookall, Gary <Gary.Brookall@bcferries.com>
Sent: January 19, 2022 12:11 PM
To: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Cc: Harney, Steven <Steven.Harney@bcferries.com>; Adams, James W <James.Adams@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: RE: BSC - Modifications to the end bulwarks

Hi Noel,
Attached is the BSC GA, let me know if you need anything else.

Regards,

From: Adams, James W <James.Adams@bcferries.com>
Sent: January-19-22 11:58 AM
To: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Cc: Harney, Steven <Steven.Harney@bcferries.com>; Brookall, Gary <Gary.Brookall@bcferries.com>
Subject: FW: BSC - Modifications to the end bulwarks

Hi Noel,

Do you have time to support a Fleet Technical request to develop a couple sketches showing the interface of the apron and bulkwark on the Baynes Sound Connector? I suggest you develop the sketches based on 32-254-G101 (see screen shot in email string below). You'll need to use the latest BSC GA that shows details of the bulkwark and gates, as well as locations of the guide and drive sheaves. Please ask Gary for this.

I suggest we develop three sketches:

- Vessel at 0 deg angle, determine offset from berth CL when contact is made with apron.
- Vessel at 3 deg angle, determine offset from berth CL when contact is made with apron.
- Vessel at 7 deg angle, determine offset from berth CL when contact is made with apron.

These drawings will be used to modify the bulwark gates. The issue is detailed in the email string below.

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: January 19, 2022 11:48 AM
To: Adams, James W <James.Adams@bcferries.com>
Cc: Kearney, Bob <Bob.Kearney@bcferries.com>; Weigold, Andrew <Andrew.Weigold@bcferries.com>; Jones, Gary <Gary.Jones@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>
Subject: RE: BSC - Modifications to the end bulwarks

Thanks James, you are correct that there may have been an assumption that the vessel tracks up on the drive cable when we were doing the simulations. I agree with the approach you have proposed.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: ss. 15, 19
Fax: (250) 978-1166
bruce.paterson@bcferries.com
www.bcferries.com
Safety and Operational Readiness

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From: Adams, James W <James.Adams@bcferries.com>

Sent: January 19,2022 11:40 AM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Cc: Kearney, Bob <Bob.Kearney@bcferries.com>; Weigold, Andrew <Andrew.Weigold@bcferries.com>; Jones, Gary <Gary.Jones@bcferries.com>; Tataryn, Noel <Noel.Tataryn@bcferries.com>

Subject: RE: BSC - Modifications to the end bulwarks

Hi Bruce and Andy,

The screen show below shows a drawing from KFPP with the vessel at a 7.5 deg angle in an extreme storm. The apron overlap at CL slightly exceeds the minimum standard of 1.2m. We could draft a 10 deg angle, but this would not meet our overlap requirements, did you want to proceed anyway?

It was my understanding the apron/bulkwark interface issue is related to vessel lateral offset from berth centerline. In the drawing below, I believe an assumption was made the vessel tracks straight along the cables into the berth. However, I believe that in a heavy beam wind, the vessel does not track straight along the cables and the vessel contacts the berth at an offset from centerline, even with minimal yaw. This is because the guide sheaves are positioned too far from the bow to provide sufficient lateral restraint; most of the lateral restraint is taking up by the drive cable/sheave only, which is positioned closer to the bow of the vessel. The attached sketch shows the different locations of the guide and drive sheaves relative to the wing walls.

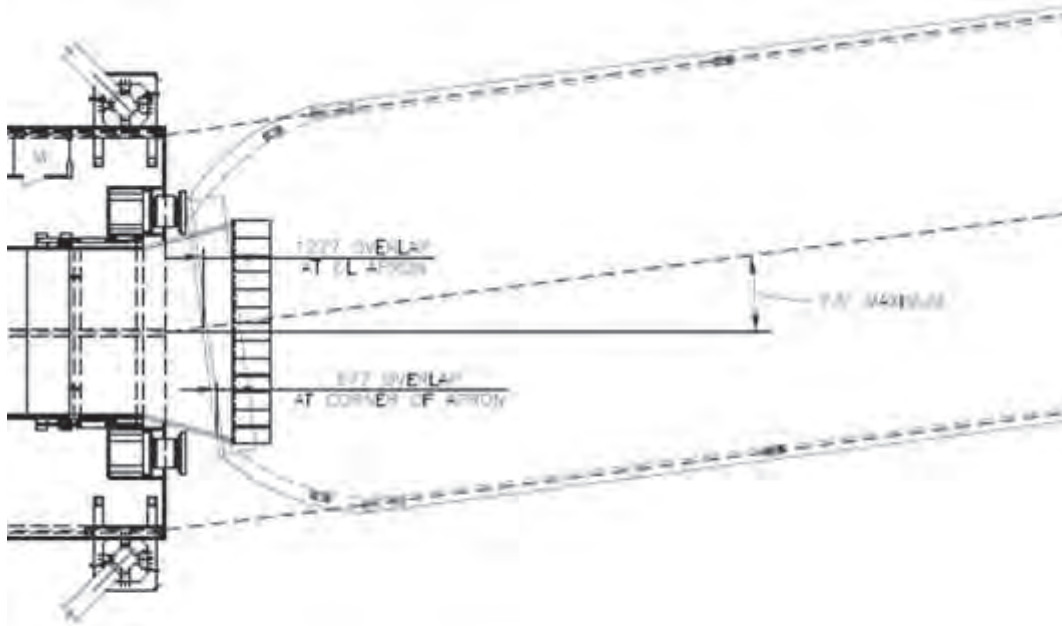
In the screen shot below, it does not clearly show the location bulkwark relative to the apron. I suggest we take a closer look at this by drafting various offsets using the latest BSC GA with details of the bulwark and applicable terminal drawings. I propose we draft several scenarios:

- Vessel at 0 deg angle, determine offset from berth CL when contact is made with apron.
- Vessel at 3 deg angle, determine offset from berth CL when contact is made with apron.
- Vessel at 7 deg angle, determine offset from berth CL when contact is made with apron.

Let me know what you think.

Thanks,

James



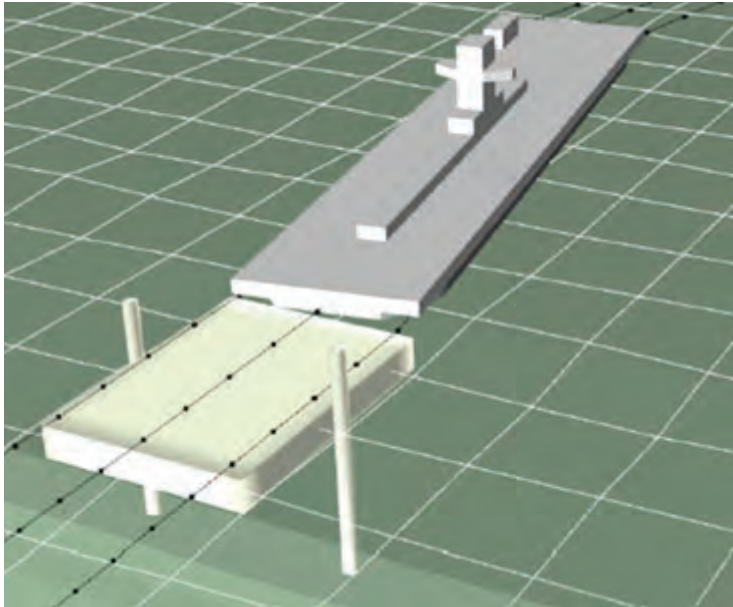
PLAN — EXTREME STORM CONDITIONS
T-280

James Adams, P.Eng.
 Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
 T: 250-978-1317 M: **ss. 15, 19** F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: January 19, 2022 10:38 AM
To: Adams, James W <James.Adams@bcferries.com>
Cc: Kearney, Bob <Bob.Kearney@bcferries.com>; Weigold, Andrew <Andrew.Weigold@bcferries.com>; Jones, Gary <Gary.Jones@bcferries.com>
Subject: RE: BSC - Modifications to the end bulwarks

James,

Based on the feedback from Andy, can you have one of the TE drafters develop a dock fit drawing where the BSC has taken an angle of 10 degrees to the berth with contact on one of the wing wall pads? Can we then identify the additional clearance needed to drop the ramp apron on the deck?



Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
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From: Weigold, Andrew <Andrew.Weigold@bcferries.com>
Sent: January 18, 2022 4:56 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Adams, James W <James.Adams@bcferries.com>; Jones, Gary <Gary.Jones@bcferries.com>
Cc: Kearney, Bob <Bob.Kearney@bcferries.com>
Subject: RE: BSC - Modifications to the end bulwarks

Sounds like a great idea Bruce. Do you need any input from flt ops?
I thing the angle is greater than 3 in dock, maybe more than 9 as tension drops.

Andy

Sent with BlackBerry Work
(www.blackberry.com)

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Date: Tuesday, Jan 18, 2022, 4:20 PM

To: Adams, James W <James.Adams@bcferries.com>, Jones, Gary <Gary.Jones@bcferries.com>, Weigold, Andrew <Andrew.Weigold@bcferries.com>
Cc: Kearney, Bob <Bob.Kearney@bcferries.com>
Subject: BSC - Modifications to the end bulwarks

James/Gary/Andy,

We have an active ECR (707) to move the guide cable sheaves forward. However, following the discussion the other day as part of the Asset Betterment, it may be prudent to evaluate widening the bulwark gate aperture to allow the ferry to take up more an angle to the ramp apron. The question is whether we have the necessary information to identify the angle that must be accommodated. I've reviewed the DSA reports from the initial design, which indicates a maximum angle of approach of abt 9 degrees (max. 3.2m off the dock) and a maximum yaw angle of about 3 degrees in dock. The modeling was based on the old cable and pre-tensions but it at least provides guidance.

If we can fix the bulwarks now, we can address guide cable issues as part of the capacity expansion. I foresee expanding the headlog slightly and running the guide cables through a fairlead system similar to that fitted to the drive cable.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: **ss. 15, 19**
Fax: (250) 978-1166
bruce.paterson@bcferries.com
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Safety and Operational Readiness

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From: Adams, James W <James.Adams@bcferries.com>
Sent: January 14, 2022 6:00 PM
To: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>
Subject: RE: BSC, 92264 / 92466, Kick off Meeting

Hi Isaac,

Thanks for the summarizing the meeting today. I've added a couple additional notes in red.

Have a good weekend,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 **M:** **ss. 15, 19** **F:** 250-361-4922
james.adams@bcferries.com

From: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Sent: January 14, 2022 4:59 PM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Vollmers, Tony <Tony.Vollmers@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>

Cc: Adams, James W <James.Adams@bcferries.com>

Subject: RE: BSC, 92264 / 92466, Kick off Meeting

Hi All,

Some notes from the meeting today. Thank you.

92466 BSC AEQ Increase

- Traffic flow study will be needed for the terminal, and it can be accomplished by Terminal Construction. JA: Vehicle auto-turn study to be included to assess vehicle access onto vessel and into third lane. ss. 13, 17
[Redacted]
- The above will require input from Fleet Deployment/Strategic Planning to confirm AEQ requirements.
- We should have a meet with Joanne D to find out the final AEQ requirement needed on the BSC.
- Bob has developed a preliminary structural arrangement. We have some ideas on the weight and capacity that can be provided for the wingwall energy study at the terminal. JA: Fleet technical to provide estimate on increased displacement in order to undertake capacity assessment
- If we need more than 20AEQ, lengthening of the ship may be required.
- The structural design will include ways to house the cable guide.
- Study on Cable Infrastructure should state the level of windage that the study is based on. The strength of the cable will be highly dependent on the windage level we use. JA: Further discussion with Fleet Technical needed to determine environmental criteria for capacity study; note that study will also include a review of the anchor systems on-shore.
- ss. 13, 17
[Redacted]
- JA: Objective of pre-implementation funds is to develop high-level options and cost estimates for a preliminary business case. ss. 13, 17
[Redacted]

92264 ss. 13, 17

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

- ss. 13, 17

Preliminary detailed business case in July 2022 will be more realistic. The benefit of a preliminary business case is that we can do a more detailed design before the detailed business case. ss. 13, 17

Thank you.

Best Regards,
Isaac Wong, P.Eng.
T: 604-204-2286 C: ss. 15, 19

-----Original Appointment-----

From: Wong, Isaac (Pak Yu)
Sent: January 07, 2022 4:41 PM
To: Wong, Isaac (Pak Yu); Paterson, Bruce; McKinnon, Miles; Vollmers, Tony; Manouchehrinia, Babak; Amusan, Sam
Cc: Adams, James W
Subject: BSC, 92264 / 92466, Kick off Meeting
When: January 14, 2022 11:00 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: WebEx

Hi All,

Please join this meeting to initiate the design work on the Baynes Sound Connector Electrification and AEQ Expansion.

Thank you.

Best Regards,
Isaac Wong, P.Eng., M.Eng., PMP
Project Manager, Fleet Project Management Office,
British Columbia Ferry Services Inc.
12800 Rice Mill Road, Richmond BC V6W 1A1
T: 604-204-2286 C: ss. 15, 19
Isaac.Wong@bcferries.com

-- Do not delete or change any of the following text. --

When it's time, join your Webex meeting here.

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s. 15

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Meeting password: s. 15

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+1-604-449-3026, s. 15 Canada Toll (Vancouver)

Join by phone

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You can also dial 173.243.2.68 and enter your meeting number.

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Dial s. 15 [.bcferries@lync.webex.com](#)

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Need help? Go to <https://help.webex.com>

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Wednesday, January 26, 2022 1:30 PM
To: Adams, James W
Subject: RE: BSC - Modifications to the end bulwarks

Hi James,

Here are a couple a sketches for review to make sure I am showing the information you wanted. Please mark up any revisions you want.

Thank You,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com<<http://www.bcferries.com/>> | Facebook<<https://www.facebook.com/pages/BC-Ferries/119019564797374>> | Twitter<<https://twitter.com/BC>>

Attachments:

BUCK-XXX-SK001.pdf	(807 KB)
BUCK-XXX-SK002.pdf	(790 KB)
image001.jpg	(20 KB)
image002.png	(96 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Friday, January 28, 2022 4:01 PM
To: Wong, Isaac (Pak Yu); Paterson, Bruce; McKinnon, Miles; Vollmers, Tony;
Manouchehrinia, Babak; Amusan, Sam
Subject: RE: BSC, 92264 / 92466, Kick off Meeting

Hi All,

Further to the meeting on Jan 14, please note that I will be managing the Terminal Construction aspects of these projects and look forward to working with you. I will be preparing a work plan/schedule next week to further assess the terminal deliverables and inputs required from other departments. For the AEQ increase project, the Project Owner has requested that we adhere to the F22 OpEx spend if possible. I should have a better understanding if this is possible after the schedule

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Monday, January 31, 2022 3:50 PM
To: Adams, James W
Subject: RE: BSC - Modifications to the end bulwarks

Hi James,

I think I got all the revisions you were looking for.

Thanks,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com<<http://www.bcferries.com/>> | Facebook<<https://www.facebook.com/pages/BC-Ferries/119019564797374>> | Twitter<<https://twitter.com/BCFerries>>

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Attachments:

BUCK-XXX-SK001.pdf	(838 KB)
BUCK-XXX-SK002.pdf	(838 KB)
BUCK-XXX-SK003.pdf	(839 KB)
image001.jpg	(20 KB)
image002.png	(96 KB)

Paterson, Bruce

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: Thursday, February 3, 2022 11:24 AM
To: Manouchehrinia, Babak; Kearney, Bob
Cc: McKinnon, Miles; Vollmers, Tony; Bae, Chanwoo; Adams, James W
Subject: Reference Directory for Baynes Sound Connector Asset Betterment Project

I've dumped a number of reference files for the BSC Asset Betterment project to the following directory:

s. 15



There are main sub-directories with information on the capacity increase:

s. 15



@Bob ? can you drop your work into the this sub-directory?

There is a another

Adams, James W

From: Adams, James W s. 15
Sent: Friday, February 4, 2022 4:12 PM
To: Tataryn, Noel (Noel.Tataryn@bcferries.com)
Subject: FW: Reference Directory for Baynes Sound Connector Asset Betterment Project

Hi Noel,

Fyi ? Fleet Technical is looking at an option to increase the AEQ on the BSC. They have added two additional lanes (one on each side the center casing). I'd like you to conduct an auto-turn study reviewing the various vehicles entering and exiting the vessel from the outer third lane.

Attached is the first draft. I'll send you the updated version with AutoCAD once fleet technical officially issues the concept to Terminal Construction.

Have a good weekend.

James

James Ad

Attachments:

BSC General Arrangement - Widening RevA.pdf

(1.3 MB)

Kearney, Bob

From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: Friday, February 4, 2022 3:25 PM
To: Adams, James W
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

James,

Attached.

Bob Kearney, ASCT
Naval Architect
Engineering ? Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 C: ss. 15, 19
bob.kearney@bcferries.com
bcferries.com<<http://www.bcferries.com/>>

From: Adams, James W <James.Adams@bcferries.com>
Sent: Friday, February 04, 2022 3:20 PM
To: Kearney, Bob <Bob.Kearney@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>;
Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Cc: McKinnon, Miles <

Attachments:

BSC General Arrangement - Widening RevA.pdf

(1.3 MB)

Kearney, Bob

From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: Friday, February 4, 2022 3:12 PM
To: Paterson, Bruce; Manouchehrinia, Babak
Cc: McKinnon, Miles; Vollmers, Tony; Bae, Chanwoo; Adams, James W
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

Bruce,

I've placed ?BSC General Arrangement - Widening RevA? into [s. 15](#)

Please note that positioning the AEQs onto the 5.3m wider deck [ss. 13, 17](#)

Bob Kearney, ASCT
Naval Architect
Engineering ? Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 C: [ss. 15, 19](#)
bob.k

Paterson, Bruce

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: Friday, February 4, 2022 3:54 PM
To: Adams, James W; Kearney, Bob; Manouchehrinia, Babak
Cc: McKinnon, Miles; Vollmers, Tony; Bae, Chanwoo
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

James ? I have a couple edits for Bob to do. Stand-by

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: ss. 15, 19
Fax: (250) 978-1166
bruce.paterson@bcferries.com<mailto:bruce.paterson@bcferries.com>
www.bcferries.com<http://www.bcferries.com/>
Safety and Operational Readiness

Notice:

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Paterson, Bruce

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: Sunday, February 6, 2022 10:30 PM
To: Adams, James W; Kearney, Bob
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

James,

Attached is a preliminary GA **ss. 13, 17**

[Redacted]

Can I ask that you/Noel check the fit of the deck plan as s

Attachments:

BSC General Arrangement - Widening RevA.dwg	(10.4 MB)
BSC General Arrangement - Widening RevA.pdf	(1.3 MB)

Amusan, Sam

From: Amusan, Sam <Sam.Amusan@bcferries.com>
Sent: Monday, February 7, 2022 2:43 PM
To: Adams, James W
Cc: Wong, Isaac (Pak Yu)
Subject: RE: BSC, 92264 / 92466, Kick off Meeting

Hi James,

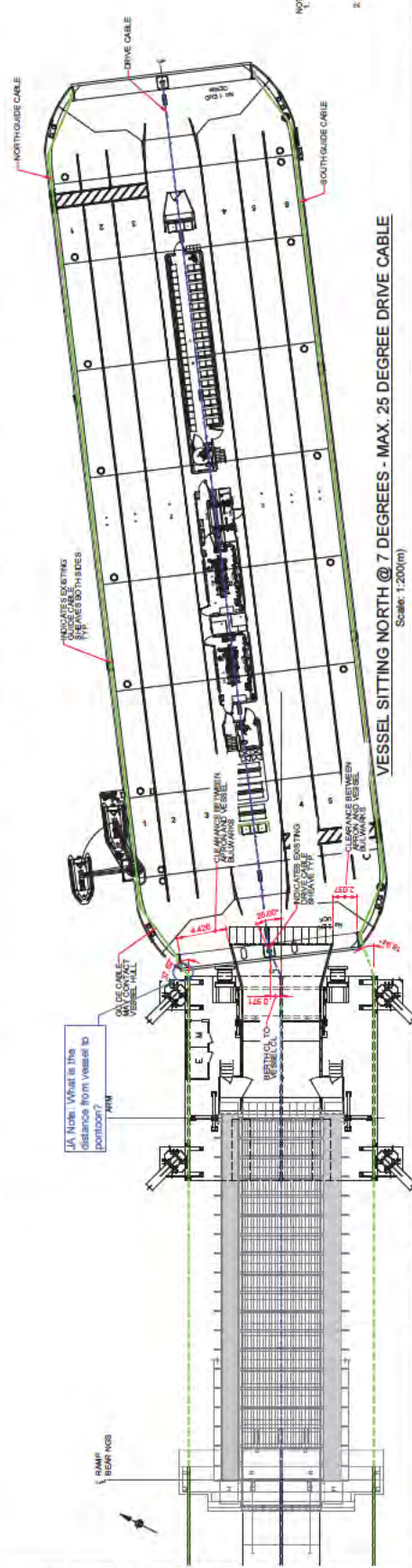
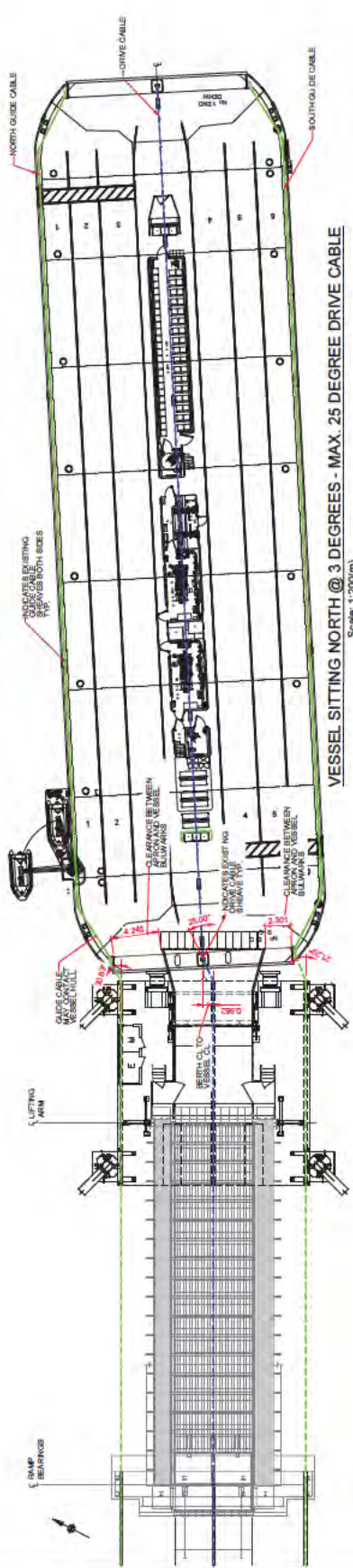
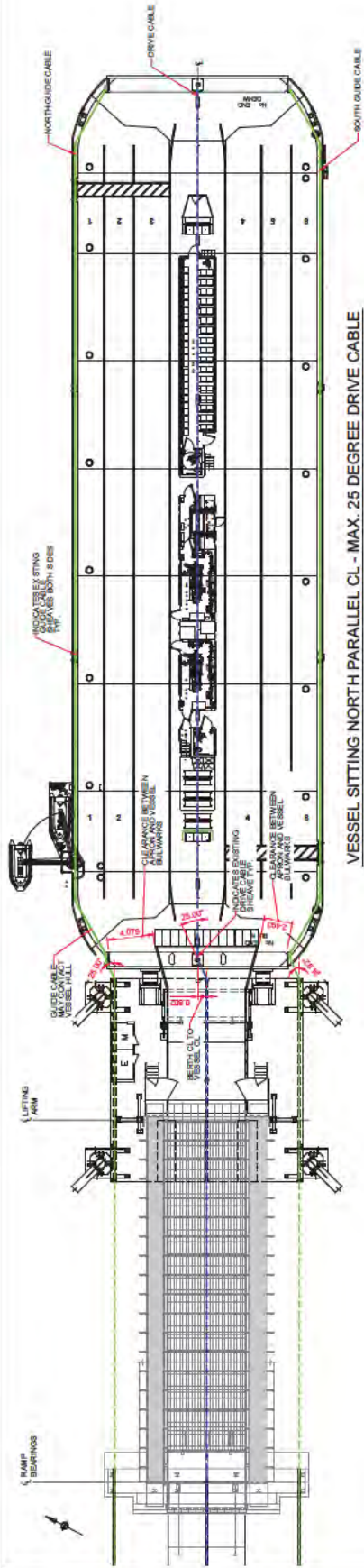
The project is setup in Cognos. If you don't mind, you can proceed to set up work-order.

For both (92264 / 92466) you can set up the tasks under 001.07.

Thanks,

Best regards,
Sam Amusan, P.Eng., PMP
Project Manager, Fleet Project Management Office
British Columbia Ferry Services Inc.
T: 604-204-2255 C: ss. 15, 19
Sam.amusan@bcferries.com
bcferries.com<<http://www.bcferries.com/>>

From: Adams, James W <James.Adams@bcferries.com>
Sent: February 07, 2022 9:57 AM
To:



NOTE: WITH THE PROPOSED WORK, MAX. 7 DEGREE DRIVE CABLE ANGLE TO VESSEL IS ALLOWED FOR FULL TOGGLE WITHIN THE DRIVE CABLE. DRINK CABLES FOR US BOTH SIDES. DRIVE CABLES FOR US BOTH SIDES. DRINK CABLES FOR US BOTH SIDES. DRINK CABLES FOR US BOTH SIDES. DRINK CABLES FOR US BOTH SIDES.

REVISIONS		BY	DATE	DESCRIPTION
NO.	DATE			

LIFTING ARM
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 VESSEL CL TO VESSEL
 CLEARANCE BETWEEN BLUWANS VESSEL
 DRIVE CABLE SITTING SHOWER IN
 CLEARANCE BETWEEN BLUWANS VESSEL
 INDICATES EXISTING DRIVE CABLES FOR US BOTH SIDES
 NORTH GUIDE CABLE
 DRIVE CABLE
 SOUTH GUIDE CABLE
 Scale: 1:200(m)

LIFTING ARM
 RAMP BEARINGS
 VESSEL CL TO VESSEL
 CLEARANCE BETWEEN BLUWANS VESSEL
 INDICATES EXISTING DRIVE CABLES FOR US BOTH SIDES
 NORTH GUIDE CABLE
 DRIVE CABLE
 SOUTH GUIDE CABLE
 Scale: 1:200(m)

LIFTING ARM
 RAMP BEARINGS
 VESSEL CL TO VESSEL
 CLEARANCE BETWEEN BLUWANS VESSEL
 INDICATES EXISTING DRIVE CABLES FOR US BOTH SIDES
 NORTH GUIDE CABLE
 DRIVE CABLE
 SOUTH GUIDE CABLE
 Scale: 1:200(m)

LIFTING ARM
 RAMP BEARINGS
 VESSEL CL TO VESSEL
 CLEARANCE BETWEEN BLUWANS VESSEL
 INDICATES EXISTING DRIVE CABLES FOR US BOTH SIDES
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 Scale: 1:200(m)

LIFTING ARM
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 Scale: 1:200(m)

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 Scale: 1:200(m)

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 CLEARANCE BETWEEN BLUWANS VESSEL
 INDICATES EXISTING DRIVE CABLES FOR US BOTH SIDES
 NORTH GUIDE CABLE
 DRIVE CABLE
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 Scale: 1:200(m)

LIFTING ARM
 RAMP BEARINGS
 VESSEL CL TO VESSEL
 CLEARANCE BETWEEN BLUWANS VESSEL
 INDICATES EXISTING DRIVE CABLES FOR US BOTH SIDES
 NORTH GUIDE CABLE
 DRIVE CABLE
 SOUTH GUIDE CABLE
 Scale: 1:200(m)

LIFTING ARM
 RAMP BEARINGS
 VESSEL CL TO VESSEL
 CLEARANCE BETWEEN BLUWANS VESSEL
 INDICATES EXISTING DRIVE CABLES FOR US BOTH SIDES
 NORTH GUIDE CABLE
 DRIVE CABLE
 SOUTH GUIDE CABLE
 Scale: 1:200(m)

BC Ferries
 British Columbia
 Ferry Services Inc.

DESIGN: []
 DRAWN: []
 CHECKED: []
 DATE: 2020/08/17
 SCALE: 1:200/08/17
 DCF FILE: BUCK-266-SK010
 PAGE 02 OF 18 JOB: 010

BUCKLEY BAY
 CABLE FERRY TERMINAL
 GEOMETRY CHECK - SHOWING MAXIMUM 25 DEGREE DRIVE CABLE ANGLE
 PLANS
 BUCK-266-SK010

REVISIONS
 FOR REVIEW AND COMMENTS
 DATE: []
 BY: []

REVISIONS
 DATE: []
 BY: []

REVISIONS
 DATE: []
 BY: []

REVISIONS
 DATE: []
 BY: []

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Wednesday, February 9, 2022 10:03 AM
To: Adams, James W
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

Hi James,

Here are the sketches for the proposed widened BSC. The only change I made was that there is no sketch showing the vessel 1.5m from berth. [ss. 13, 17](#)



Please let me know if you want any revisions made.

Thanks,

Noel Tataryn
Draughtspe


Attachments:

BUCK-266-SK004.pdf	(1.9 MB)
BUCK-266-SK005.pdf	(1.9 MB)
BUCK-266-SK006.pdf	(1.9 MB)

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Wednesday, February 9, 2022 10:27 AM
To: Adams, James W
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

I did note it on the drawings **ss. 13, 17**



Thank You,

Noel Ta

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Thursday, February 10, 2022 1:49 PM
To: Adams, James W
Subject: RE: Reference Directory for Baynes Sound Connector Asset Betterment Project

Hi James,

As mentioned here is the latest set of sketches.

Thanks,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com<<http://www.bcferries.com/>> | Facebook<<https://www.facebook.com/pages/BC-Ferries/119019564797374>> | Twitter<<https://twitter.com/BCFerries>>

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Attachments:

BUCK-266-SK007.pdf	(1.9 MB)
BUCK-266-SK008.pdf	(1.6 MB)
BUCK-266-SK009.pdf	(1.6 MB)
BUCK-266-SK010.pdf	(1.6 MB)
BUCK-266-SK011.pdf	(1.6 MB)
image001.png	(88 KB)
image003.jpg	(31 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Friday, February 11, 2022 2:47 PM
To: Sam Amusan (Sam.Amusan@bcferries.com)
Subject: FW: BSC Asset Betterment AEQ Increase - Terminal Electrical Infrastructure

Hi Sam,

I noticed I wasn't included in your email summarizing your meeting with fleet deployment. Can you please include me on emails moving forward.

Thanks,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com<mailto:james.adams@bcferries.com>
bcferries.com<http://www.bcferries.com/>

From: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Sent: February 1

Adams, James W

From: Adams, James W [s. 15](#)
Sent: Friday, February 11, 2022 8:29 AM
To: Bruce Paterson (Bruce.Paterson@bcferries.com)
Cc: Kearney, Bob; Sam Amusan (Sam.Amusan@bcferries.com)
Subject: FW: Reference Directory for Baynes Sound Connector Asset Betterment Project

Hi Bruce,

Further to my last email, see attached for additional sketches prepared by Noel showing the updated GA of the BSC/berth interface. I've added a couple comments in blue. [ss. 13, 17](#)

This will require further review.

Attachments:

BUCK-266-BSC Interface Sketches SK008 to SK011_JA Comments.pdf

(5.5 MB)

Adams, James W

From: Adams, James W s. 15
Sent: Tuesday, February 15, 2022 11:14 AM
To: Tataryn, Noel (Noel.Tataryn@bcferries.com)
Subject: FW: Berth Interface issues - Baynes Sound Connector Asset Betterment Project

Hi Noel,

Hope you had a s. 22

I reviewed the sketches with Bruce and have several comments noted in blue: ss. 13, 17

In Bruce's attached widening drawing Rev A2, he would like use to complete the auto turn study to review total AEQ and confirm whether the dead areas h

Attachments:

BSC General Arrangement - Widening RevA2mkup.pdf	(1.9 MB)
BUCK-266-BSC Interface Sketches SK008 to SK011_JA Comments.pdf	(5.5 MB)

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Friday, February 18, 2022 11:28 AM
To: Adams, James W
Subject: RE: Berth Interface issues - Baynes Sound Connector Asset Betterment Project

Hi James,

Here you go with note added.

Thanks,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com<<http://www.bcferries.com/>> | Facebook<<https://www.facebook.com/pages/BC-Ferries/119019564797374>> | Twitter<<https://twitter.com/BCFerries>>

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Attachments:

BUCK-266-SK008.pdf	(1.6 MB)
BUCK-266-SK009.pdf	(1.6 MB)
BUCK-266-SK010.pdf	(1.6 MB)
BUCK-266-SK011.pdf	(1.6 MB)

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Friday, February 18, 2022 8:51 AM
To: Adams, James W
Subject: RE: Berth Interface issues - Baynes Sound Connector Asset Betterment Project

Hi James,

Here are the plans with the revisions asked for. I am just waiting for fleet to send me the BCS CAD file and then I will start looking at the AutoTURN sketches, I should have those ready early next week once I receive the file.

Thanks,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com<<http://www.bcferries.com/>> | Facebook

Attachments:


BUCK-266-SK008.pdf	(1.6 MB)
BUCK-266-SK009.pdf	(1.6 MB)
BUCK-266-SK010.pdf	(1.6 MB)
BUCK-266-SK011.pdf	(1.6 MB)

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Wednesday, February 23, 2022 2:52 PM
To: Adams, James W
Subject: RE: Berth Interface issues - Baynes Sound Connector Asset Betterment Project

Hi James,

Here is the autoturn study using a passenger car and the largest allowable commercial vehicle. You
ss. 13, 17



Please let me know if you need further scenarios shown.

Thank You,

Noel Tataryn
Dr

Attachments:

BUCK-266-SK012.pdf

(1.6 MB)

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Wednesday, February 23, 2022 9:07 AM
To: Amusan, Sam; Adams, James W; Paterson, Bruce
Cc: Kearney, Bob
Subject: RE: BSC AFU Increase Project - Berth Interface

Bruce,

On the widened BSC drawing supplied by fleet you used a vehicle AEQ box of 2.6m X 5.34m, but our fleet master plan 2021 (linked below) on page 16 shows we are to use a 2.6m X 6.1m vehicle AEQ. So the stated vessel AEQ will need revising.

s. 15



Thanks,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.

Adams, James W

From: Adams, James W [s. 15](#)
Sent: Thursday, February 24, 2022 3:25 PM
To: Bruce Paterson (Bruce.Paterson@bcferries.com)
Cc: Kearney, Bob; Sam Amusan (Sam.Amusan@bcferries.com); Tataryn, Noel (Noel.Tataryn@bcferries.com)
Subject: FW: Berth Interface issues - Baynes Sound Connector Asset Betterment Project

Hi Bruce,

Please see attached and email below for the BSC auto turn study. [ss. 13, 17](#)

Attachments:

BUCK-266-SK012.pdf	(1.6 MB)
BUCK-266-SK013.pdf	(920 KB)
BSC General Arrangement - Widening RevA2mkup.pdf	(1.9 MB)

Adams, James W

From: Adams, James W s. 15
Sent: Thursday, February 24, 2022 8:30 AM
To: Tataryn, Noel
Subject: RE: Berth Interface issues - Baynes Sound Connector Asset Betterment Project

Hi Noel,

Thanks, these look great.

Can you determine the overall AEQ which will be set by the location of the first vehicles noted in the traffic study? I assume this will be mirrored on the opposite end as well?

Alternately you may need to record the vehicle distance from the stern in order for Bruce to determine overall AEQ

Thanks again,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F:

Adams, James W

From: Adams, James W [s. 15](#)
Sent: Thursday, February 24, 2022 2:46 PM
To: Tataryn, Noel
Cc: Kearney, Bob; Amusan, Sam; Paterson, Bruce
Subject: RE: BSC AFU Increase Project - Berth Interface

Hi Noel,

Thanks for pointing this out. The terminal network master plan also uses 6.1m spacing for calculating AEQ. The attached drawings of the Buckley and DenW holding compounds indicate AEQ is based on 7.0m vehicle spacing. Can you please re-calculate the AEQ at each terminal based on this updated standard? Please include both holding compound storage and pre-ticket approach.

It is also interesting to note that the Terminal Network Master Plan defines Buckley and DenW as staffed minor t

Attachments:

Pages from 32-254 Civil Record Set.pdf	(1.7 MB)
BUCK-266-SK013.pdf	(920 KB)

Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Thursday, February 24, 2022 9:03 AM
To: Adams, James W
Subject: RE: Berth Interface issues - Baynes Sound Connector Asset Betterment Project

Hi James,

Here is the AEQ sketch, I just had some stuff to clean up on it. And yes I would assume that the AEQ would be similar in the reverse direction as well.

Thanks,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com<<http://www.bcferries.com/>> | Facebook<<https://www.facebook.com/pages/BC-Ferries/119019564797374>> | Twitter<<https://twitter.com/bcferries>>

Attachments:

BUCK-266-SK013.pdf

(920 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Tuesday, March 1, 2022 4:12 PM
To: Doyle, Joanne
Subject: RE: BSC 92264 / 92466 Follow up Meeting

Terminal Construction did our own AEQ analysis based on the latest concept from Fleet Technical. We used the 6.1m spacing standard and achieved ~66 AEQ. I believe ss. 13, 17
I?d let Bruce confirm this.

I hope you have a really good time away! Certainly well deserved :)

Regards,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M

Attachments:

BUCK-266-SK013.pdf

(920 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Wednesday, March 2, 2022 11:50 AM
To: Adams, James W
Cc: Dean Steinke; Ryan Nicoll; Paterson, Bruce
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

Thanks again for the opportunity to assist with the Baynes Sound Connector again. I have attached a quote for the first portion of the proposed work we discussed last week. This includes bringing the original model up to 2022 standards and assessing the existing and proposed docking configur

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
BCFS-DSA-Estimate-22-014-RevA - Simulation of lateral offset with modified sheave location on Baynes Sound Connector.pdf	(389 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Thursday, March 3, 2022 3:22 PM
To: Sam Amusan (Sam.Amusan@bcferries.com)
Subject: BSC AEQ Increase

Hi Sam,

Further the meeting today, did you receive slides from Joanne and Peter regarding the AEQ analysis? Please provide a copy of this report.

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com<mailto:james.adams@bcferries.com>
bcferries.com<http://www.bcferries.com/>

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Adams, James W

From: Adams, James W [s. 15](#)
Sent: Thursday, March 3, 2022 11:11 AM
To: Tataryn, Noel (Noel.Tataryn@bcferries.com)
Subject: FW: BSC 92264 / 92466 Follow up Meeting

FYI ? latest deck plan shows [ss. 13, 17](#) . Good catch!

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: [ss. 15, 19](#) F: 250-361-4922
james.adams@bcferries.com<mailto:james.adams@bcferries.com>
bcferries.com<http://www.bcferries.com/>

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: March 03, 2022 10:20 AM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>; Adams, James W
<James.Adams@bcferries.com>; Amusan, Sam <Sa

Adams, James W

From: Adams, James W [s. 15](#)
Sent: Thursday, March 3, 2022 3:59 PM
To: Bruce Paterson (Bruce.Paterson@bcferries.com)
Cc: Kearney, Bob; Sam Amusan (Sam.Amusan@bcferries.com); Tataryn, Noel (Noel.Tataryn@bcferries.com)
Subject: RE: Berth Interface issues - Baynes Sound Connector Asset Betterment Project

Hi Bruce,

Further to the BSC AEQ meeting today, can you please advise if Noel should prepare a new ? commercial? auto-turn study?

Please advise if the following assumptions are correct:

- [ss. 13, 17](#)

Attachments:

BUCK-266-SK012.pdf	(1.6 MB)
BUCK-266-SK013.pdf	(920 KB)

Paterson, Bruce

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: Thursday, March 3, 2022 11:27 AM
To: Adams, James W; Tataryn, Noel
Cc: Kearney, Bob
Subject: RE: BSC 92264 / 92466 Follow up Meeting

I think Noel has the most current GA with the correct AEQ. Can you send that back to us to update the ACAD drawing.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: ss. 15, 19
Fax: (250) 978-1166
bruce.paterson@bcferries.com<mailto:bruce.paterson@bcferries.com>
www.bcferries.com<http://www.bcferries.com/>
Safety and Operational Readiness

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Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Thursday, March 3, 2022 11:33 AM
To: Paterson, Bruce; Adams, James W
Cc: Kearney, Bob
Subject: RE: BSC 92264 / 92466 Follow up Meeting

Here is the CAD file with my vessel AEQ sketch.

Thanks,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.C. V8W 0B7
T: 250-978-1696
Noel.tataryn@bcferries.com
bcferries.com<<http://www.bcferries.com/>> | Facebook<<https://www.facebook.com/pages/BC-Ferries/119019564797374>> | Twitter<<https://twitter.com/BCFerries>>

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Attachments:

BUCK-266-SK008-SK013.dwg

(10.8 MB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Friday, March 4, 2022 9:39 AM
To: Adams, James W
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

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Hi James,

Have you had a chance to review the proposed quote for the first section of the analysis?

Do you have a timeline for this work?

Cheers,

Colin

On Wed, Mar 2, 2022 at 11:49 AM Colin Wilson
<colin.wilson@dsaocean.com<mailto:colin.wilson@dsaocean.com>> wrote:
Hi James,

Thanks aga

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)

Adams, James W

From: Adams, James W [s. 15](#)
Sent: Friday, March 4, 2022 4:38 PM
To: Colin Wilson
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Hi Colin,

Sorry for the delayed response, I'll be looking at your quote first thing Monday.

There may be a delay awarding the work since fleet technical has not confirmed the final vessel size yet. I'll hope to provide this information within 1 to 2 weeks.

Thanks and have a good weekend.

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: 250-360-7672 F: 250-361-4922
james.adams@bcferries.com<[mailto:james.ad](mailto:james.adams@bcferries.com)

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Thursday, March 10, 2022 3:33 PM
To: Adams, James W
Subject: [EXTERNAL] Bayne's Sound Connector modification feasibility study

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

Attached is a quote for the analysis of the discussed modifications to the Bayne's Sound Connector in relation to the cabling requirements and stationkeeping.

Please let me know if you have any questions.

Cheers,

Colin
--

[<https://lh4.googleusercontent.com/GnMHLGJnAiV1dacLkV>]

Attachments:

BCFS-DSA-Estimate-22-015-RevA - Dynamic simulation to assess feasibility of widened Baynes Sound Connector.pdf (368 KB)

Adams, James W

From: Adams, James W [s. 15](#)
Sent: Tuesday, March 29, 2022 12:17 PM
To: Paterson, Bruce; Doyle, Joanne; Simpson, Peter
Cc: Amusan, Sam; Wong, Isaac (Pak Yu); Emma McWalter
(Emma.McWalter@bcferries.com)
Subject: RE: BSC Asset Betterment - Capacity proposals

Hi Everyone,

Further to our meeting last week regarding the BSC expansion, please find the attached two drawings and notes below:

? SK013 rev B ? [ss. 13, 17](#)

? SK014 Rev A - [ss. 13, 17](#)

Attachments:

BUCK-266-SK013b.pdf	(912 KB)
BUCK-266-SK014a.pdf	(1.4 MB)

Paterson, Bruce

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: Tuesday, March 29, 2022 12:55 PM
To: Adams, James W; Doyle, Joanne; Simpson, Peter
Cc: Amusan, Sam; Wong, Isaac (Pak Yu); McWalter, Emma
Subject: RE: BSC Asset Betterment - Capacity proposals

James,

Thanks for this. I think the capacities are defensible, which is important for the business case. No issues from me.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: ss. 15, 19
Fax: (250) 978-1166
bruce.paterson@bcferries.com
www.bcferries.com
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From: Adams, James W <James.Adams@bcferries.com>
Sent: March 29, 2022 12:17 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Doyle, Joanne <Joanne.Doyle@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>
Cc: Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>; McWalter, Emma <Emma.McWalter@bcferries.com>
Subject: RE: BSC Asset Betterment - Capacity proposals

Hi Everyone,

Further to our meeting last week regarding the BSC expansion, please find the attached two drawings and notes below:

- SK013 rev B - ss. 13, 17

- SK014 Rev A - ss. 13, 17

The initial objective was to develop a layout that achieves ss. 13, 17. Is this sufficient or should we explore other options?

Please let me know if you have any suggestions/questions with the autoturn study.

Thanks,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: **ss. 15, 19** F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: March 15, 2022 3:30 PM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>
Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: BSC Asset Betterment - Capacity proposals

Joanne/Peter,

My clarifications in **red** in the text below.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: **ss. 15, 19**
Fax: (250) 978-1166
bruce.paterson@bcferries.com
www.bcferries.com
Safety and Operational Readiness

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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: March 15, 2022 1:38 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>
Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: BSC Asset Betterment - Capacity proposals

Hi Bruce & All,

Thank you very much for this summary, missing the last meeting I wondered where we left it.

Item #3 – Vessel Capacity

ss. 13, 17



ss. 13, 17

Item #4 – Commercial capacity

ss. 13, 17

A couple other questions I have include:

- ss. 13, 17

Peter – any other factors we should be considering for the capacity of the vessel or either of the projects

ss. 13, 17

Thanks,
Joanne

Joanne Doyle
Manager, Fleet Strategic Planning
Strategy & Community Engagement
British Columbia Ferry Services Inc.
The Atrium
Suite 500, 1321 Blanshard St., Victoria, BC V8W 0B7

T: 250-978-1322 C: **ss. 15, 19** F: 250-388-9599

Joanne.doyle@bcferries.com

bcferries.com | [Facebook](#) | [Twitter](#)

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From: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Sent: March 14, 2022 9:45 PM

To: Doyle, Joanne <Joanne.Doyle@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>

Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Subject: BSC Asset Betterment - Capacity proposals

Joanne/Peter,

I am following up our recent meetings on the BSC capacity expansion, re. items to follow up:

Item #3 – Heat Maps (AEQ Capacity). **ss. 13, 17**

The heat maps indicate we could need capacity in 12 years if there is unbridled growth in traffic, or much longer if growth is lower or is capped. **ss. 13, 17**

Item #5 – Commercial Capacity. **ss. 13, 17**

Does this make sense, or are there other factors to consider?

Bruce Paterson, P.Eng, M.Eng

Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.

Tel: (250) 978-1385

Cell: **ss. 15, 19**

Fax: (250) 978-1166

bruce.paterson@bcferries.com

www.bcferries.com

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Simpson, Peter

From: Simpson, Peter <Peter.Simpson@bcferries.com>
Sent: Tuesday, March 29, 2022 1:41 PM
To: Paterson, Bruce; Adams, James W; Doyle, Joanne
Cc: Amusan, Sam; Wong, Isaac (Pak Yu); McWalter, Emma
Subject: RE: BSC Asset Betterment - Capacity proposals

I agree with Bruce. No issues from me.

Peter Simpson
Director, Fleet Operations Strategy
Strategy and Community Engagement
British Columbia Ferry Services Inc.
T: 250-978-1163 C: ss. 15, 19
peter.simpson@bcferries.com
bcferries.com

Notice:

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From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: March 29, 2022 12:55 PM
To: Adams, James W <James.Adams@bcferries.com>; Doyle, Joanne <Joanne.Doyle@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>
Cc: Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>; McWalter, Emma <Emma.McWalter@bcferries.com>
Subject: RE: BSC Asset Betterment - Capacity proposals

James,

Thanks for this. I think the capacities are defensible, which is important for the business case. No issues from me.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: ss. 15, 19
Fax: (250) 978-1166
bruce.paterson@bcferries.com
www.bcferries.com
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From: Adams, James W <James.Adams@bcferries.com>

Sent: March 29, 2022 12:17 PM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Doyle, Joanne <Joanne.Doyle@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>

Cc: Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>; McWalter, Emma <Emma.McWalter@bcferries.com>

Subject: RE: BSC Asset Betterment - Capacity proposals

Hi Everyone,

Further to our meeting last week regarding the BSC expansion, please find the attached two drawings and notes below:

- SK013 rev B - ss. 13, 17

- SK014 Rev A - ss. 13, 17

The initial objective was to develop a layout that achieves ss. 13, 17
Is this sufficient or should we explore other options?

Please let me know if you have any suggestions/questions with the autoturn study.

Thanks,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Sent: March 15, 2022 3:30 PM

To: Doyle, Joanne <Joanne.Doyle@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>

Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Subject: RE: BSC Asset Betterment - Capacity proposals

Joanne/Peter,

My clarifications in red in the text below.

Bruce Paterson, P.Eng, M.Eng

Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.

Tel: (250) 978-1385

Cell: ss. 15, 19

Fax: (250) 978-1166

bruce.paterson@bcferries.com

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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>

Sent: March 15, 2022 1:38 PM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>

Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Subject: RE: BSC Asset Betterment - Capacity proposals

Hi Bruce & All,

Thank you very much for this summary, missing the last meeting I wondered where we left it.

Item #3 – Vessel Capacity

I think if in the business case we outline the analysis and identify the duration of time/based on growth then the

ss. 13, 17

[Redacted]

[Redacted]

Item #4 – Commercial capacity

ss. 13, 17

[Redacted]

[Redacted]

[Redacted]

A couple other questions I have include:

- ss. 13, 17

[Redacted]

ss. 13, 17

Peter – any other factors we should be considering for the capacity of the vessel or either of the projects

ss. 13, 17 ?

Thanks,
Joanne

Joanne Doyle
Manager, Fleet Strategic Planning
Strategy & Community Engagement
British Columbia Ferry Services Inc.
The Atrium
Suite 500, 1321 Blanshard St., Victoria, BC V8W 0B7
T: 250-978-1322 C: ss. 15, 19 F: 250-388-9599
Joanne.doyle@bcferries.com
bcferries.com | [Facebook](#) | [Twitter](#)

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Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: BSC Asset Betterment - Capacity proposals

Joanne/Peter,

I am following up on our recent meetings on the BSC capacity expansion, re. items to follow up:

Item #3 – Heat Maps (AEQ Capacity). ss. 13, 17

The heat maps indicate we could need capacity in 12 years if there is unbridled growth in traffic, or much longer if growth is lower or is capped. ss. 13, 17

Item #5 – Commercial Capacity. ss. 13, 17

Does this make sense, or are there other factors to consider?

Bruce Paterson, P.Eng, M.Eng

Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.

Tel: (250) 978-1385

Cell: ss. 15, 19

Fax: (250) 978-1166

bruce.paterson@bcferries.com

www.bcferries.com

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Tataryn, Noel

From: Tataryn, Noel <Noel.Tataryn@bcferries.com>
Sent: Tuesday, March 29, 2022 10:35 AM
To: Adams, James W
Subject: RE: BSC expansion - Lightship and Deadweight increases.

Hi James,

Here is the updated drawing SK013 showing a passenger car [ss. 13, 17](#) And also a new drawing SK014 that shows the WB-20 with an [ss. 13, 17](#) [ss. 13, 17](#)

Thank You,

Noel Tataryn
Draughtsperson
Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 ? 1321 Blanshard Street Victoria, B.C.

Attachments:

BUCK-266-SK013b.pdf	(910 KB)
BUCK-266-SK014a.pdf	(1.4 MB)

Adams, James W

From: Adams, James W s. 15
Sent: Friday, March 4, 2022 4:38 PM
To: Colin Wilson
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Hi Colin,

Sorry for the delayed response, I'll be looking at your quote first thing Monday.

There may be a delay awarding the work since fleet technical has not confirmed the final vessel size yet. I'll hope to provide this information within 1 to 2 weeks.

Thanks and have a good weekend.

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com<mailto:james.ad

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Kearney, Bob

From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: Monday, April 4, 2022 3:47 PM
To: Adams, James W
Cc: Manouchehrinia, Babak; Paterson, Bruce; Tataryn, Noel
Subject: RE: BSC expansion - Lightship and Deadweight increases.

James,

Attached is the hull geometry for the proposed widened BSC. Proposed new width **ss. 13, 17**

Please let me know if this meets your requirements.

Thanks.

Bob Kearney, ASCT
Naval Architect
Engineering ? Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 C: **ss. 15, 19**
bob.kearney@bcferries.com
bcferries.com<<http://www.bcferries.com/>>

From: Adams, James W <James.Adams@bcferries.com>
Sent: Tuesday, March 29, 2022 2:37 PM
To: Paterson, Bruce <Bruce.Pater

Attachments:

BSC_Widened.3dm

(93 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Wednesday, April 6, 2022 11:22 AM
To: Adams, James W
Subject: Re: [EXTERNAL] Bayne's Sound Connector modification feasibility study

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Sounds good James, thanks for the update.

C

On Wed, Apr 6, 2022 at 10:41 AM Adams, James W
<James.Adams@bcferries.com<mailto:James.Adams@bcferries.com>> wrote:
Hi Colin,

My apologies for the slow reply. Fleet Technical is getting close to completing the rhino model of the revised BSC hull confi

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Wednesday, April 6, 2022 10:42 AM
To: Colin Wilson
Subject: RE: [EXTERNAL] Bayne's Sound Connector modification feasibility study

Hi Colin,

My apologies for the slow reply. Fleet Technical is getting close to completing the rhino model of the revised BSC hull configuration for the dynamic analysis.

I'll reach out to you shortly to discuss next steps.

Regards,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com<mailto:james.adams@bcferries.com>
bcferries.com<http://www.bcferries.com>

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)

Kearney, Bob

From: Kearney, Bob <Bob.Kearney@bcferries.com>
Sent: Wednesday, April 6, 2022 11:15 AM
To: Adams, James W
Cc: Manouchehrinia, Babak; Paterson, Bruce; Tataryn, Noel
Subject: RE: BSC expansion - Lightship and Deadweight increases.

James,

Yes, the BSC_Widened.3dm file is the Rhino file for the BSC hull. A screen shot of the file:

[cid:image001.jpg@01D849A7.8233D270]

- It does not include details of the sheave location.
- I am not aware of any decision to change the sheave location.
- **ss. 13, 17**

Bob Kearney, ASCT
Naval Architect
Engineering ? Fleet Technical
British Columbia Ferry Services Inc.
T: 250-978-2358 C: **ss. 15, 19**
bo

Attachments:

image001.jpg

(7 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Thursday, April 7, 2022 3:07 PM
To: Adams, James W
Cc: Dean Steinke; Paterson, Bruce
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

I have attached the updated quote 22-015 (RevB) that added the clarification comments you supplied and based on our discussion today. Note that the hours and price remain the same.

Regarding quote 22-014, we will revisit it and set specific environmental load cases which will steer the sc

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)
BCFS-DSA-Estimate-22-015-RevB - Dynamic simulation to assess feasibility of widened Baynes Sound Connector.pdf	(373 KB)

Adams, James W

From: Adams, James W [s. 15](#)
Sent: Thursday, April 7, 2022 2:38 PM
To: Colin Wilson
Cc: Dean Steinke; Ryan Nicoll; Paterson, Bruce
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Hi Colin,

Thanks for the call today regarding proposal estimates 22-014 & 22-015.

With regards to the attached proposal estimate 22-014 related to the berthing analysis with the original hull, pricing is more than anticipated. [ss. 13, 17](#)

Attachments:

BCFS-DSA-Estimate-22-014-RevA - Simulation of lateral offset with modified sheave location on Baynes Sound Connector.pdf	(393 KB)
image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Friday, April 8, 2022 4:12 PM
To: Adams, James W
Cc: Dean Steinke; Paterson, Bruce
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

I have attached and updated the Quote 22-014 to focus on the 1 in 100 year beam storm conditions.

Let me know if you have any questions!

Cheers,

Colin

On Thu, Apr 7, 2022 at 3:55 PM Adams, James W
<James.Adams@bcferries.com<mailto:James.Adams@bcferries.com>> wrote:
Hi Colin,

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)
BCFS-DSA-Estimate-22-014-RevB - Simulation of lateral offset with modified sheave location on Baynes Sound Connector.pdf	(387 KB)

Adams, James W

From: Adams, James W ^{s. 15}
Sent: Friday, April 8, 2022 4:29 PM
To: Colin Wilson
Cc: Dean Steinke; Paterson, Bruce
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Hi Colin,

Many thanks for updating the quotation. We will review and will let you know if we have any questions.

Unfortunately DSA is no longer a vendor in our purchasing database. I've asked purchasing department to add you as a vendor again but this could take some time.

Can you confirm the legal name and address is as follows:

Dynamic Systems Analysis Ltd.

201 ? 754 Broughton Street
Victoria, BC
V8W 1E1

Also, Who is the contact for setting up payment details?

Thanks,

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Monday, April 11, 2022 11:08 AM
To: Cavanaugh, Shelley
Subject: Services Contract - DSA

Hi Shelley,

I hope you are doing well.

Can you please prepare a Services Contract for Dynamic Systems Analysis, as per Proposal 22-015 Rev B Dated April 7, 2022. The work shall be undertaken on a time and materials basis to an upset limit of ss. 13, 17

The proposal is located in the following folder:

s. 15

Adams, James W

From: Adams, James W s. 15
Sent: Tuesday, April 12, 2022 10:03 AM
To: Colin Wilson
Cc: Dean Steinke; michele.archibald@dsaocean.com; ryan@dsaocean.com
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Hi Colin,

Attached is the PO for quote 22-015 (RevB). I'll follow-up with the Services Contract when ready. In the meantime, can you please forward a copy of your insurance?

Note that a different PO# will be provided for Quote 22-014.

Thanks and looking forward to working with you,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com <mailto:james.adams@bc

Attachments:

PO_2_358399_0_US.pdf	(46 KB)
image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Tuesday, April 12, 2022 9:34 AM
To: Dean Steinke; Erickson, Ingrid; Michele Archibald
Cc: colin.wilson@dsaocean.com; ryan@dsaocean.com; Paterson, Bruce; Stahuliak, Marian
Subject: RE: FW: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface (DSA Revised Quote)

All, BCF Purchasing has reactivated DSA as an active vendor; no need to complete the form.

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com<mailto:james.adams@bcferries.com>
bcferries.com<http://www.bcferries.com/>

From: Dean Steinke <dean.steinke@dsaocean.com>
Sent: April 12, 2022 9:31 AM
To: Erickson, Ingrid <Ingrid.Erickson@bcferries.com>; Michele Ar

Attachments:

image001.png	(109 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)
image005.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
s. 15
Sent: Thursday, April 14, 2022 9:18 AM
To: Colin Wilson
Cc: Dean Steinke; Paterson, Bruce; Erickson, Ingrid
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Hi Colin and Dean,

Please find the attached PO related to the simulation of the BSC in berth.

We will follow-up with a services contract shortly.

Thank you,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com <mailto:james.adams@bcferries.com>
bcferries.com <http://www.bcferries.com/>

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: April 08, 2022

Attachments:

BCFS-DSA-Estimate-22-014-RevB - Simulation of lateral offset with modified sheave location on Baynes Sound Connector.pdf	(392 KB)
PO_2_358495_0_US (1).pdf	(47 KB)
image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Thursday, April 21, 2022 1:48 PM
To: Adams, James W
Cc: P-BCF-22BSC
Subject: [EXTERNAL] Baynes Sound Connector Study RFI

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

I am updating the model we used for the BSC back in 2016 and wanted to confirm a few dimensions with you.

In order to capture the behavior of the terminal to ferry contact dynamics and cable interaction we require:

- 1) Dimensions of the pontoon (length, width, height, draft)
- 2) Locatio

Attachments:

image.png

(365 KB)

Adams, James W

From: Adams, James W ^{s. 15}
Sent: Thursday, April 21, 2022 3:50 PM
To: Colin Wilson
Cc: P-BCF-22BSC; Bruce Paterson (Bruce.Paterson@bcferries.com)
Subject: RE: [EXTERNAL] Baynes Sound Connector Study RFI

Hi Colin,

Please see below in green for the requested information for the dynamic analysis. The attached drawings may provide additional information if needed:

- 1) Dimensions of the pontoon (length, width, height, draft)
 - a. Length: 18m, Width: 17m, height: 3.6m
 - b. Draft w/o apron on deck of ship: 2.46m (seaward end) and 2.67 (shoreward end)
 - c. Pontoon guide cable location: 0.87m from top of pontoon and 8.15m from pontoon centerline
 - d. Pontoon drive c

Attachments:

image002.png	(60 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)
CF-236018-230-KPF-01 DRIVE & CABLE ARRGMNT R9.pdf	(1.0 MB)
189-130.02-001 Profile Decks and Sections - Rev 3.pdf	(1.3 MB)
32-269-SK001b.pdf	(142 KB)
14-029 Transmittal 002 - Fender System Technical Submittal KPFF Review 2014-04-23.pdf	(2.6 MB)
Test Cert 20-069 Rope 1 - Reel #134424-01.pdf	(373 KB)

Dean Steinke

From: Dean Steinke <dean.steinke@dsaocean.com>
Sent: Thursday, April 21, 2022 9:28 AM
To: Adams, James W
Cc: Michele Archibald; Cavanaugh, Shelley
Subject: Re: FW: [EXTERNAL] Re: 92466 Dynamic Analysis of Widened BSC Cable Ferry

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

Please find attached.

Kind regards,

Dean.

On Thu, Apr 21, 2022 at 9:10 AM Adams, James W
<James.Adams@bcferries.com<mailto:James.Adams@bcferries.com>> wrote:
Hi Dean,

Just following up with the contract. Can you please sign page 6 and return a signed copy?

Thanks,

James

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
BCFS Services contract signed.pdf	(1.8 MB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Friday, April 22, 2022 12:37 PM
To: Adams, James W
Cc: P-BCF-22BSC; Paterson, Bruce
Subject: Re: [EXTERNAL] Baynes Sound Connector Study RFI

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Received. Thanks a lot!

C

On Thu, Apr 21, 2022 at 3:50 PM Adams, James W
<James.Adams@bcferries.com<mailto:James.Adams@bcferries.com>> wrote:
Hi Colin,

Please see below in green for the requested information for the dynamic analysis. The attached drawings may provide additional information if n

Attachments:

image002.png	(60 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Thursday, April 28, 2022 12:55 PM
To: Colin Wilson
Cc: Michele Archibald
Subject: RE: [EXTERNAL] Baynes Sound Connector Study RFI

Hi Colin,

Yes, I believe you received this on April 14th. I still need to follow-up the services contract.

Thanks,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com<mailto:james.adams@bcferries.com>
bcferries.com<http://www.bcferries.com/>

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: April 28, 2022 12:46 PM
To: Adams, James W <James.Adams@bc

Attachments:

RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface	(486 KB)
image001.png	(60 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)
image005.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Thursday, April 28, 2022 12:46 PM
To: Adams, James W
Cc: Michele Archibald
Subject: Re: [EXTERNAL] Baynes Sound Connector Study RFI

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Hi James,

I forgot to ask, were you able to put together a PO for the quote numbered 22-014 - the original hull assessment?

Cheers,

C

On Thu, Apr 28, 2022 at 10:55 AM Colin Wilson <colin.wilson@dsaocean.com> wrote:

Hi James,

We are working on both studies simultaneously.

Cheers,

C

On Thu, Apr 28, 2022 at 10:06 AM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Colin,

Can you please advise if you are planning to complete the both the original hull and widened hull studies at the same time, or are you planning to phase the studies?

Thanks,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** 250-360-7672 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: April 22, 2022 12:37 PM

To: Adams, James W <James.Adams@bcferries.com>

Cc: P-BCF-22BSC <michele.archibald-P14017301-3AZHY81@mailbox.insight.ly>; Paterson, Bruce

<Bruce.Paterson@bcferries.com>

Subject: Re: [EXTERNAL] Baynes Sound Connector Study RFI

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Received. Thanks a lot!

C

On Thu, Apr 21, 2022 at 3:50 PM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Colin,

Please see below in **green** for the requested information for the dynamic analysis. The attached drawings may provide additional information if needed:

- 1) Dimensions of the pontoon (length, width, height, draft)

ss. 13, 17

ss. 13, 17

- 2) Location of the bumpers relative to the centerline - also if you have an idea for the stiffness of the bumpers, I imagine the bumper deflection influences the overall displacement of the cables.

ss. 13, 17

- 3) Confirm the lateral spacing of the guide cables (I have 7.4m from the centerline)

ss. 13, 17

- 4) Confirm the location of the guide cable sheaves (I have 35m from the midship)

ss. 13, 17

- 5) ss. 13, 17

Let me know if you have any questions.

Thanks,

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: April 21, 2022 1:48 PM

To: Adams, James W <James.Adams@bcferries.com>

Cc: P-BCF-22BSC <michele.archibald-P14017301-3AZHY81@mailbox.insight.ly>

Subject: [EXTERNAL] Baynes Sound Connector Study RFI

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

I am updating the model we used for the BSC back in 2016 and wanted to confirm a few dimensions with you.

In order to capture the behavior of the terminal to ferry contact dynamics and cable interaction we require:

- 1) Dimensions of the pontoon (length, width, height, draft)
- 2) Location of the bumpers relative to the centerline - ss. 13, 17, 21
- 3) Confirm the lateral spacing of the guide cables ss. 13, 17, 21
- 4) Confirm the location of the guide cable sheaves ss. 13, 17, 21

The drawings you supplied can probably be annotated with this information from the CAD program relatively easily. ss. 13, 17, 21

Let me know if anything is unclear!

Cheers,

Colin

--

Colin Wilson, P.Eng.

Senior Ocean Engineer

www.dsaocean.com P +1-250-483-7207 x105

D +1-250-800-0958

Ocean Engineering Consultants & Creators of ProteusDS

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Senior Ocean Engineer

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D +1-250-800-0958

Ocean Engineering Consultants & Creators of ProteusDS



Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Thursday, April 28, 2022 12:58 PM
To: Adams, James W
Cc: Michele Archibald
Subject: Re: [EXTERNAL] Baynes Sound Connector Study RFI

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Yes I did! I missed that one. Disregard.

C

On Thu, Apr 28, 2022 at 12:55 PM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Colin,

Yes, I believe you received this on April 14th. I still need to follow-up the services contract.

Thanks,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** 250-360-7672 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: April 28, 2022 12:46 PM

To: Adams, James W <James.Adams@bcferries.com>
Cc: Michele Archibald <michele.archibald@dsaocean.com>
Subject: Re: [EXTERNAL] Baynes Sound Connector Study RFI

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Hi James,

I forgot to ask, were you able to put together a PO for the quote numbered 22-014 - the original hull assessment?

Cheers,

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Hi James,

We are working on both studies simultaneously.

Cheers,

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Hi Colin,

Can you please advise if you are planning to complete the both the original hull and widened hull studies at the same time, or are you planning to phase the studies?

Thanks,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: April 22, 2022 12:37 PM

To: Adams, James W <James.Adams@bcferries.com>

Cc: P-BCF-22BSC <michele.archibald-P14017301-3AZHY81@mailbox.insight.ly>; Paterson, Bruce <Bruce.Paterson@bcferries.com>

Subject: Re: [EXTERNAL] Baynes Sound Connector Study RFI

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Received. Thanks a lot!

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Hi Colin,

Please see below in green for the requested information for the dynamic analysis. The attached drawings may provide additional information if needed:

1) Dimensions of the pontoon (length, width, height, draft)

ss. 13, 17



2) Location of the bumpers relative to the centerline - also if you have an idea for the stiffness of the bumpers, I imagine the bumper deflection influences the overall displacement of the cables.

ss. 13, 17



3) Confirm the lateral spacing of the guide cables (I have 7.4m from the centerline)

ss. 13, 17



4) Confirm the location of the guide cable sheaves (I have 35m from the midship)

ss. 13, 17



Let me know if you have any questions.

Thanks,

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: April 21, 2022 1:48 PM

To: Adams, James W <James.Adams@bcferries.com>

Cc: P-BCF-22BSC <michele.archibald-P14017301-3AZHY81@mailbox.insight.ly>

Subject: [EXTERNAL] Baynes Sound Connector Study RFI

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The drawings you supplied can probably be annotated with this information from the CAD program relatively easily. **ss. 13, 17, 21**

ss. 13, 15, 17, 19, 21

Let me know if anything is unclear!

Cheers,

Colin

--

Colin Wilson, P.Eng.

Senior Ocean Engineer

www.dsaocean.com **P** +1-250-483-7207 x105

D +1-250-800-0958

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Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Thursday, April 28, 2022 10:56 AM
To: Adams, James W
Cc: P-BCF-22BSC; Paterson, Bruce
Subject: Re: [EXTERNAL] Baynes Sound Connector Study RFI

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

We are working on both studies simultaneously.

Cheers,

C

On Thu, Apr 28, 2022 at 10:06 AM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Colin,

Can you please advise if you are planning to complete the both the original hull and widened hull studies at the same time, or are you planning to phase the studies?

Thanks,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** 250-360-7672 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: April 22, 2022 12:37 PM

To: Adams, James W <James.Adams@bcferries.com>

Cc: P-BCF-22BSC <michele.archibald-P14017301-3AZHY81@mailbox.insight.ly>; Paterson, Bruce <Bruce.Paterson@bcferries.com>

Subject: Re: [EXTERNAL] Baynes Sound Connector Study RFI

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Received. Thanks a lot!

C

On Thu, Apr 21, 2022 at 3:50 PM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Colin,

Please see below in **green** for the requested information for the dynamic analysis. The attached drawings may provide additional information if needed:

1) Dimensions of the pontoon (length, width, height, draft)

ss. 13, 17

[Redacted content]

2) Location of the bumpers relative to the centerline - also if you have an idea for the stiffness of the bumpers, I imagine the bumper deflection influences the overall displacement of the cables.

ss. 13, 17

[Redacted content]

ss. 13, 17

3) Confirm the lateral spacing of the guide cables (I have 7.4m from the centerline)

ss. 13, 17

4) Confirm the location of the guide cable sheaves (I have 35m from the midship)

ss. 13, 17

Let me know if you have any questions.

Thanks,

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: April 21, 2022 1:48 PM
To: Adams, James W <James.Adams@bcferries.com>
Cc: P-BCF-22BSC <michele.archibald-P14017301-3AZHY81@mailbox.insight.ly>
Subject: [EXTERNAL] Baynes Sound Connector Study RFI

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ss. 13, 15, 17, 19, 21

Let me know if anything is unclear!

Cheers,

Colin

--

Colin Wilson, P.Eng.

Senior Ocean Engineer

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Senior Ocean Engineer

www.dsaocean.com P +1-250-483-7207 x105

D +1-250-800-0958



Adams, James W

From: Adams, James W s. 15
Sent: Thursday, April 28, 2022 10:06 AM
To: Colin Wilson
Cc: P-BCF-22BSC; Paterson, Bruce
Subject: RE: [EXTERNAL] Baynes Sound Connector Study RFI

Hi Colin,

Can you please advise if you are planning to complete the both the original hull and widened hull studies at the same time, or are you planning to phase the studies?

Thanks,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com <mailto:james.adams@bcferries.com>
bcferries.com <http://www.bcferries.com/>

From: Colin Wilson <colin.wilson@dsaocean.co

Attachments:

image001.png	(60 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)
image005.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Monday, May 2, 2022 2:58 PM
To: Paterson, Bruce
Cc: Amusan, Sam
Subject: RE: BSC Asset Betterment - Capacity proposals

Hi Bruce,

I am preparing an RFP for the terminal capacity assessment as a result of increasing the displacement of the BSC. Can you let me know if the principal particulars noted in the attached General Arrangement drawing from Feb 2 are still up to date? ss. 13, 17

Sk013b with the ss. 13, 17 Drawing is attached for reference.

The unit weights we used for these

Attachments:

BSC General Arrangement - Widening RevA.pdf	(1.3 MB)
BUCK-266-SK013b.pdf	(910 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Friday, May 13, 2022 10:59 AM
To: Adams, James W
Subject: [EXTERNAL] Baynes Sound Connector Update

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

Unfortunately my trip was delayed by a day and I am just getting back to the office now. I will start to process the results from the simulations we finished over the last couple days but I won't have anything for you today.

I will call you early next week and we can discuss the results.

Adams, James W

From: Adams, James W s. 15
Sent: Friday, May 13, 2022 12:09 PM
To: Colin Wilson
Cc: Bruce Paterson (Bruce.Paterson@bcferries.com)
Subject: RE: [EXTERNAL] Baynes Sound Connector Update

Hi Colin,

Thanks for the update, can you setup a call with Bruce and myself to discuss your findings next week?

Regards,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com <mailto:james.adams@bcferries.com>
bcferries.com <http://www.bcferries.com/>

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: May 13, 2022 10:59 AM
To: Adams, James W <James.Adams

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Thursday, May 19, 2022 12:18 PM
To: Colin Wilson
Cc: Bruce Paterson (Bruce.Paterson@bcferries.com)
Subject: FW: BSC - Modifications to the end bulwarks

Hi Colin,

As discussed, see attached for sketches of the existing BSC/berth interface. See email below for additional notes.

Scenario 2 (Sketch SK002) appears to match your initial modeling. It will be interesting to double check this once the simulation is complete.

Thanks,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com <mailto:james.adams@bcferries.c

Attachments:

BUCK-XXX-SK001.pdf	(838 KB)
BUCK-XXX-SK002.pdf	(838 KB)
BUCK-XXX-SK003.pdf	(839 KB)
image001.jpg	(20 KB)
image002.png	(96 KB)
32-269-SK001b.pdf	(142 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Friday, July 8, 2022 2:05 PM
To: Colin Wilson
Cc: Bruce Paterson (Bruce.Paterson@bcferries.com)
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Hi Colin,

Just checking in, were you planning to provide an update before issuing the final report?

Thanks,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com <mailto:james.adams@bcferries.com>
bcferries.com <http://www.bcferries.com/>

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: July 06, 2022 3:36 PM
To: Erickson, Ingrid <Ingrid.Erickson@bcferr

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Thursday, June 16, 2022 2:34 PM
To: Adams, James W
Cc: P-BCF-22BSC; P-BCF-22DAW
Subject: [EXTERNAL] Baynes Sound Connector Update

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

I wanted to give an update of the progress of the BSC analysis. Sorry about the delay on our end, I have been called out of the office a few times. No additional hours have been spent. We will be delivering this up shortly.

As per our last discussion, we are looking closely at the fender

Adams, James W

From: Adams, James W s. 15
Sent: Friday, June 17, 2022 4:10 PM
To: Colin Wilson
Cc: P-BCF-22BSC; P-BCF-22DAW; Bruce Paterson (Bruce.Paterson@bcferries.com); Sam Amusan (Sam.Amusan@bcferries.com)
Subject: RE: [EXTERNAL] Baynes Sound Connector Update

Hi Colin,

Thanks for the update on the Dynamic Analysis. You have made some good progress with the analysis so far. It is certainly interesting to see the cable loads developed on the drive cable at the berth. Have you determined if there is an increase in cable loads mid-channel with the widened vessel?

I've cc'd Bruce in case he has any questions or comments.

I'm away Mon-Wed next week. Can you setup a meeting with Bruce and myself Thursday or Friday?

Thanks,

James

James A

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Wednesday, July 6, 2022 3:36 PM
To: Erickson, Ingrid
Cc: Adams, James W; Dean Steinke; Paterson, Bruce; Stahuliak, Marian; Murray, Curtis
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Ingrid,

I will need to confirm with James to make sure his requirements are met, but we can likely issue a final report before July 15th.

Cheers,

Colin

On Wed, Jul 6, 2022 at 3:29 PM Erickson, Ingrid
<Ingrid.Erickson@bcferries.com<mailto:Ingrid.Erickson@bcferries.com>> wrote:
Good Afterno

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image004.jpg	(1 KB)
image008.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Friday, July 8, 2022 2:38 PM
To: Adams, James W
Cc: Paterson, Bruce
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Yes, how about early next week?

Cheers,

C

On Fri, Jul 8, 2022 at 2:05 PM Adams, James W
<James.Adams@bcferries.com<mailto:James.Adams@bcferries.com>> wrote:
Hi Colin,

Just checking in, were you planning to provide an update before issuing the final report?

Thanks,

James

James Adams,

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Monday, July 11, 2022 8:32 AM
To: Colin Wilson
Cc: Paterson, Bruce
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Morning Colin,

I've setup a webex for 3pm today to discuss the report. I believe Bruce and I are also available 11am tomorrow if that works better.

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com <mailto:james.adams@bcferries.com>
bcferries.com <http://www.bcferries.com/>

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: July 08, 2022 2:38 PM
To: A

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Monday, July 11, 2022 8:45 AM
To: Adams, James W
Cc: Paterson, Bruce
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

3pm works great for me. We can review the last iteration of sims and then layout the specific deliverables you want to see in the report.

Thanks!

C

On Mon, Jul 11, 2022 at 8:32 AM Adams, James W <James.Adams@bcferries.com> wrote:

Morning Colin,

I've setup a webex for 3pm today to discuss the report. I believe Bruce and I are also available 11am tomorrow if that works better.

Thanks,

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: July 08, 2022 2:38 PM
To: Adams, James W <James.Adams@bcferries.com>
Cc: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Yes, how about early next week?

Cheers,

C

On Fri, Jul 8, 2022 at 2:05 PM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Colin,

Just checking in, were you planning to provide an update before issuing the final report?

Thanks,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: July 06, 2022 3:36 PM

To: Erickson, Ingrid <Ingrid.Erickson@bcferries.com>

Cc: Adams, James W <James.Adams@bcferries.com>; Dean Steinke <dean.steinke@dsaocean.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Stahuliak, Marian <Marian.Stahuliak@bcferries.com>; Murray, Curtis <Curtis.Murray@bcferries.com>

Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Ingrid,

I will need to confirm with James to make sure his requirements are met, but we can likely issue a final report before July 15th.

Cheers,

Colin

On Wed, Jul 6, 2022 at 3:29 PM Erickson, Ingrid <Ingrid.Erickson@bcferries.com> wrote:

Good Afternoon James and Colin

In regards to Dynamic Systems PO 358495, would you have an ETA when I can expect the final report and Invoice for this service request?

Ingrid Erickson-Dobrovitz

Engineering Administrative Assistant - NI

British Columbia Ferry Services Inc.

T: 250-890-7805 **C:** ss. 15, 19 **F:** 250-339-1046

ingrid.erickson@bcferries.com // bcferries.com

From: Adams, James W <James.Adams@bcferries.com>
Sent: April 14, 2022 9:18 AM
To: Colin Wilson <colin.wilson@dsaocean.com>
Cc: Dean Steinke <dean.steinke@dsaocean.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>; Erickson, Ingrid <Ingrid.Erickson@bcferries.com>
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Hi Colin and Dean,

Please find the attached PO related to the simulation of the BSC in berth.

We will follow-up with a services contract shortly.

Thank you,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: April 08, 2022 4:12 PM
To: Adams, James W <James.Adams@bcferries.com>
Cc: Dean Steinke <dean.steinke@dsaocean.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

I have attached and updated the Quote 22-014 to focus on the 1 in 100 year beam storm conditions.

Let me know if you have any questions!

Cheers,

Colin

On Thu, Apr 7, 2022 at 3:55 PM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Colin,

Thanks for submitting the updated quotation 22-015 Rev B. We look forward to receiving the other quote when ready.

I'll start working on the contract for quote 22-015.

Regards,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: April 07, 2022 3:08 PM

To: Adams, James W <James.Adams@bcferries.com>

Cc: Dean Steinke <dean.steinke@dsaocean.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>

Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

I have attached the updated quote 22-015 (RevB) that added the clarification comments you supplied and based on our discussion today. Note that the hours and price remain the same.

Regarding quote 22-014, we will revisit it and set specific environmental load cases which will steer the scope to be less open ended. Expect an updated quote in the next day or so.

As always, if you have any questions or comments, don't hesitate to call.

Cheers,

Colin

On Thu, Apr 7, 2022 at 2:37 PM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Colin,

Thanks for the call today regarding proposal estimates 22-014 & 22-015.

With regards to the attached proposal estimate 22-014 related to ss. 13, 17

Once we receive updated pricing, I'll work with the project owner to determine if budget is available to proceed.

Also, please send me a revised proposal estimate 22-015 that reflects our discussion and comments noted in my email sent to you yesterday. Please keep the revised estimates separate since we have different budget holders for each analysis.

Thanks,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Colin Wilson <colin.wilson@dsaocean.com>

Sent: March 02, 2022 11:50 AM

To: Adams, James W <James.Adams@bcferries.com>

Cc: Dean Steinke <dean.steinke@dsaocean.com>; Ryan Nicoll <ryan@dsaocean.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>

Subject: Re: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

Thanks again for the opportunity to assist with the Baynes Sound Connector again. I have attached a quote for the first portion of the proposed work we discussed last week. This includes bringing the original model up to 2022 standards and assessing the existing and proposed docking configurations.

Let me know if you have any questions or comments.

Cheers,

Colin

On Tue, Feb 22, 2022 at 10:00 AM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Dean,

Can we change the meeting to Thursday at 9 AM?

Correct, the analysis will be a high level feasibility study.

Thanks!

James

Sent from my iPhone

On Feb 22, 2022, at 9:11 AM, Dean Steinke <dean.steinke@dsaocean.com> wrote:

?

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

Does tomorrow morning at 9:15am work for you? I can send a meeting invite.

In short, the study and analysis you have in mind is feasible. A conversation will be valuable to come up with the key deliverables for the study.

Do you have a timeline requirement?

D

On Fri, Feb 18, 2022 at 1:02 PM Adams, James W <James.Adams@bcferries.com> wrote:

Thanks Ryan, good to hear things are going well at DSA. It's been very busy at BC Ferries too.

Looking forward to chatting with Dean on next steps.

Regards,

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** ss. 15, 19 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

From: Ryan Nicoll <ryan@dsaocean.com>

Sent: February 18, 2022 12:56 PM

To: Adams, James W <James.Adams@bcferries.com>

Cc: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Dean Steinke <dean.steinke@dsaocean.com>; Colin Wilson <colin.wilson@dsaocean.com>
Subject: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

It's good to hear from you. I hope things have been going well in spite of the tumultuous working environment in the last few years. We have managed to stay very busy!

We're happy to help with this. My colleague Dean heads up our services team and will connect with you on next steps in setting up a scope of work for this.

thanks again and have a great long weekend,

cheers,

Ryan Nicoll, P.Eng.

CTO

www.dsaocean.com P +1-250-483-7207 x104

D +1-250-999-6677

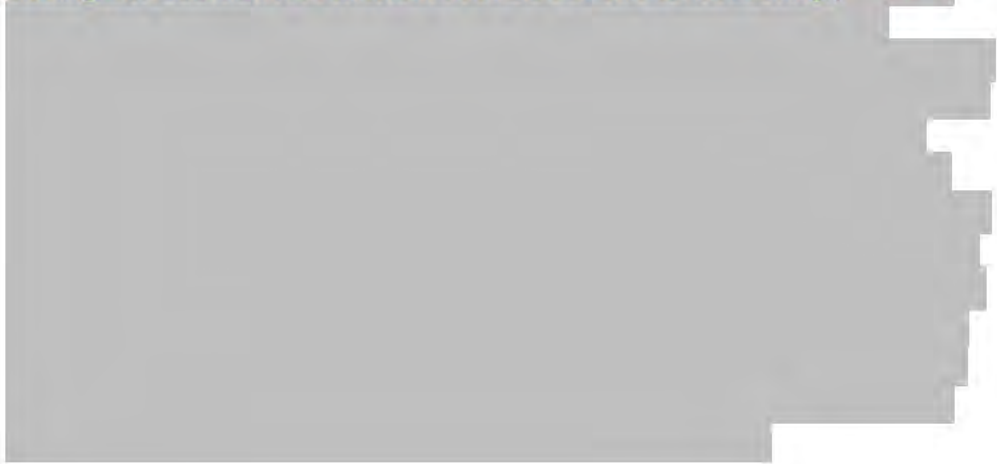
Ocean Engineering Consultants & Creators of ProteusDS

On Fri, Feb 18, 2022 at 12:33 PM Adams, James W <James.Adams@bcferries.com> wrote:

Hi Ryan,

I hope you are doing well.

BCF has a feasibility project that involves widening the cable ferry in order to add two additional lanes. The current concept involves widening the hull by adding one additional section on each side of the center casing (ss. 13, 17



Let me know if you there is a good time to discuss this further.

Attached are a couple preliminary concept drawings provided for reference.

SK008 - ss. 13, 17

SK0010 - ss. 13, 17

Regards,

James

James Adams, P.Eng.

Project Manager, Terminal Construction

British Columbia Ferry Services Inc.

T: 250-978-1317 **M:** 250-360-7672 **F:** 250-361-4922

james.adams@bcferries.com

bcferries.com

--

Dean Steinke, P.Eng.

CEO

www.dsaocean.com **P** +1-250-999-8889

C +1-250-507-0571

Ocean Engineering Consultants & Creators of ProteusDS

--

Colin Wilson, P.Eng.

Senior Ocean Engineer

www.dsaocean.com **P** +1-250-483-7207 x105

D +1-250-800-0958

Ocean Engineering Consultants & Creators of ProteusDS

--

Colin Wilson, P.Eng.

Senior Ocean Engineer

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Ocean Engineering Consultants & Creators of ProteusDS

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Senior Ocean Engineer

www.dsaocean.com P +1-250-483-7207 x105

D +1-250-800-0958

Ocean Engineering Consultants & Creators of ProteusDS



Adams, James W

From: Adams, James W [s. 15](#)
Sent: Monday, July 11, 2022 9:07 AM
To: Colin Wilson
Cc: Paterson, Bruce
Subject: RE: [EXTERNAL] Re: FW: BSC AFU Increase Project - Berth Interface

Thanks Colin, lets chat then.

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: [ss. 15, 19](#) F: 250-361-4922
james.adams@bcferries.com <<mailto:james.adams@bcferries.com>>
[bcferries.com](http://www.bcferries.com/) <<http://www.bcferries.com/>>

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: July 11, 2022 8:45 AM
To: Adams, James W <James.Adams@bcferries.com>
Cc: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: Re: [EXTERNAL] Re: FW: BSC A

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)
image003.jpg	(1 KB)
image004.jpg	(1 KB)

Colin Wilson

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: Friday, July 15, 2022 11:03 AM
To: Adams, James W; Paterson, Bruce
Cc: P-BCF-22BSC; P-BCF-22DAW
Subject: [EXTERNAL] BSC Draft report for review

CAUTION: This email originated from outside of BC Ferries. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James and Bruce,

As I suspected, with holidays upon us, there is some delay for internal QA on the report. However, I have attached the draft report here so that you can have a read and make any comments in parallel with our internal process.

Cheers,

Colin

--

[<https://lh4.googleusercontent.com>

Attachments:

DSA-BCF-22DAW-R01-RevA.0 - Baynes Sound Connector Offset Study DRAFT FOR REVIEW.pdf (1.5 MB)

Adams, James W

From: Adams, James W s. 15
Sent: Friday, July 22, 2022 4:53 PM
To: Colin Wilson; Paterson, Bruce
Cc: P-BCF-22BSC; P-BCF-22DAW
Subject: RE: [EXTERNAL] BSC Draft report for review

Hi Colin,

Thanks for the draft submission. I hope to provide comments back to you early next week.

Have a good weekend,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com <mailto:james.adams@bcferries.com>
bcferries.com <http://www.bcferries.com/>

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: July 15, 2022 11:03 AM
To: Adams, James W <James.Adams

Attachments:

image001.jpg	(1 KB)
image002.jpg	(1 KB)

Paterson, Bruce

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: Tuesday, July 26, 2022 3:43 PM
To: Adams, James W; Colin Wilson
Subject: RE: [EXTERNAL] BSC Draft report for review

Attached are the load conditions for the existing and estimate for the widened version.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: ss. 15, 19
Fax: (250) 978-1166
bruce.paterson@bcferries.com <mailto:bruce.paterson@bcferries.com>
www.bcferries.com <http://www.bcferries.com/>
Safety and Operational Readiness

Notice:
This message, including any attachments, is confidential and may contain info

Attachments:

Pages from 'Baynes Sound Connector-REV 5-PART 1 (Condition 6).pdf	(241 KB)
BSC Widening - Estimated Intact & Damage Stability Conditions.pdf	(96 KB)
image001.jpg	(1 KB)
image002.jpg	(1 KB)

Adams, James W

From: Adams, James W s. 15
Sent: Tuesday, July 26, 2022 3:13 PM
To: Colin Wilson; Paterson, Bruce
Cc: P-BCF-22BSC; P-BCF-22DAW
Subject: RE: [EXTERNAL] BSC Draft report for review

Hi Colin,

See attached for draft comments/questions for discussion.

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: ss. 15, 19 F: 250-361-4922
james.adams@bcferries.com<mailto:james.adams@bcferries.com>
bcferries.com<http://www.bcferries.com/>

From: Colin Wilson <colin.wilson@dsaocean.com>
Sent: July 15, 2022 11:03 AM
To: Adams, James W <James.Adams@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcfe

Attachments:

DSA-BCF-22DAW-R01-RevA.0 - Baynes Sound Connector Offset Study DRAFT FOR REVIEW_Ja COMMENTS.pdf	(1.5 MB)
image001.jpg	(1 KB)
image002.jpg	(1 KB)

ss. 13, 17

ss. 13, 17



	hours	rate	cost
Colin	ss. 13, 17, 21		
Dean	[Redacted]		
Meysam			
		Gst	ss. 13, 17, 21
		Total	
Estimate: 4 weeks			

ss. 13, 17



SERVICES CONTRACT

92466 Dynamic Analysis of Widened BSC Cable Ferry

BRITISH COLUMBIA FERRY SERVICES INC “BC Ferries” Suite 500 - 1321 Blanshard St Victoria, BC V8W 0B7 Attention: James Adams, P. Eng Project Manager Telephone: 250-978-1317 Email: james.adams@bcferries.com Reference PO # 358399	DSA OCEAN (Dynamic Systems Analysis Ltd) “Contractor” 201-754 Broughton St Victoria, BC V8W 1E1 Attention: Dean Steinke Sr. Engineer Telephone: 250-483-7207 Email: dean.steinke@dsaocean.com Date: April 19, 2022
--	---

BC FERRIES AND THE CONTRACTOR AGREE TO THE TERMS AND CONDITIONS CONTAINED IN SECTIONS 1 THROUGH 30, INCLUSIVE, IN THIS AGREEMENT AND IN THE SCHEDULES OUTLINED BELOW AND ANY ADDENDUM ATTACHED HEREIN.

SCHEDULE “A” – SERVICES – (full details set out in Addendum to Schedule “A”)

TERM – April 14 – May 31/22

SCHEDULE “B” - CONTRACT PRICE

a) Maximum Contract Price including applicable taxes: **ss. 17, 21**

b) Fee: **ss. 17,**

c) Approved expenses, not to exceed: **ss. 17, 2**

d) Billing Date: Invoices shall be submitted upon completion, detailing the Services completed and/or the number of hours/days devoted thereto.

e) Payment Terms: Unless otherwise set out in Schedule "B", upon receipt of an invoice detailing the Services performed, payment shall be made net 30 days after receipt of the invoice.

SCHEDULE “C” – APPROVED SUBCONTRACTOR(S)

As set out in Addendum to Schedule “C” – Approved Subcontractor(s)

SCHEDULE “D” – ADDITIONAL TERMS

As set out in Addendum to Schedule “D” – Additional Terms

SCHEDULE “E” – INSURANCE

As set out in Addendum to Schedule “E” – Insurance

TERMS AND CONDITIONS
THE CONTRACTOR

1. The Contractor will:

ss. 17, 21



ss. 17, 21



THE CONTRACT PRICE

ss. 17, 21



BC FERRIES

ss. 17, 21



SUSPENSION OF WORK/TERMINATION

ss. 17, 21



GENERAL

14. The Contractor shall not be the employee or agent of BC Ferries and accordingly shall not purport to enter into any contract or subcontract on behalf of BC Ferries or otherwise act on its behalf. The Contractor hereby acknowledges that BC Ferries shall not be required on behalf of the Contractor to make remittances or payments required by statute of employers and that the Contractor and its employees shall not be entitled to any benefits provided by BC Ferries to its employees.
15. This Agreement is made and shall be interpreted in accordance with the laws of the Province of British Columbia and the laws of Canada applicable therein.
16. Time shall be of the essence of this Agreement.
17. Any notice required to be given hereunder shall be written and may be faxed, delivered by hand or mailed by prepaid registered mail to the addresses on the first page of this Agreement (or at such other British Columbia address as either party may from time to time designate in writing to the other); and any such notice mailed will be deemed to be

- received on the third business day after mailing (weekends, statutory holidays and days on which there is postal service disruption excepted).
18. If any provision of this Agreement is unenforceable or invalid for any reason whatsoever, such unenforceability or invalidity shall not affect the enforceability or validity of the remaining provisions of this Agreement and such provisions shall be severable from the remainder of this Agreement.
 19. No waiver by either party of any breach of a provision of this Agreement shall be deemed to be a waiver of any other breach of this Agreement.
 20. Notwithstanding anything herein to the contrary, neither party hereto shall be deemed in default with respect to the performance of the terms, covenants, and conditions of this Agreement if the same shall be due to any reason beyond the reasonable control of the party including due to any strike, lockout, civil commotion, sabotage, governmental regulations or controls or acts of God. Any party affected by an event of Force Majeure shall give notice of such event to the other as soon as it becomes aware of such event and shall take all reasonable steps to mitigate the effects of such event.
 21. All material, documents, manuals, reports, plans, records, specifications, computer programs, computer source codes, computer documentation, concepts, findings, data, drawings, information and processes prepared or produced by or at the discretion of the Contractor directly or indirectly in connection with the Services or otherwise developed or first reduced to practice by the Contractor or its agents, employees or subcontractors in performing the Services (collectively the "Material") shall belong exclusively to BC Ferries which shall be solely entitled to all patents, copyright, trademark and other intellectual property rights in respect thereof; provided that the Contractor is hereby granted a non-exclusive licence during the Term to prepare and use the Material in performing the Services. Such licence shall terminate upon the termination of this Agreement. No copies, extracts, or any other reproduction of any Material shall be made by the Contractor without the express written permission of BC Ferries. The Contractor hereby irrevocably waives all moral rights and rights of authorship or attribution that the Contractor may have in the Materials. The Contractor represents, warrants and covenants that the Materials do not and will not infringe the intellectual property rights of any other party.
 22. The Contractor acknowledges that during the Term of this Agreement, the Contractor or any of the Contractor's agents, employees or subcontractors may have access to confidential information (the "Confidential Information") concerning BC Ferries or other third parties dealing with BC Ferries which information is of a special and unique value respecting the operation and affairs of BC Ferries and such third parties. The Contractor agrees that any Confidential Information which has or will come into its possession or knowledge in connection with the Services shall be held in the strictest confidence and that, during the Term of this Agreement or at any time thereafter, the Contractor, or any of the Contractor's agents, employees or subcontractors shall not make use of the Confidential Information other than in the performance of the Services and shall not disclose or release it to any other party. This section shall survive the expiry of the Term or the earlier termination of this Agreement.
 23. Upon request of BC Ferries, the Contractor shall permit BC Ferries to inspect, review, retain and/or copy all Material and upon the request of BC Ferries during the Term of this Agreement, or upon termination of this Agreement, the Contractor shall immediately deliver to BC Ferries any or all Materials or Confidential Information, together with all copies thereof and extracts therefrom, which may be in the possession or under the control of the Contractor or its agents, employees or subcontractors.
 24. All assets and property provided by BC Ferries to the Contractor or any of the Contractor's agents, employees or subcontractors will be and remain the exclusive property of BC Ferries and shall be delivered by the Contractor to BC Ferries

- immediately upon BC Ferries giving notice of such request to the Contractor and shall be returned to BC Ferries forthwith upon the completion of the Services or earlier termination of this Agreement in the same or better condition than they were at the time of delivery to the Contractor or its agents, employees or subcontractors.
25. No alteration or amendment to this Agreement shall be effective unless the same is in writing and duly executed by the parties hereto in the same manner as this Agreement.
 26. This Agreement and related local purchase order(s) and any amendment made pursuant to section 25, constitute the entire Agreement between the parties.
 27. Any determination by BC Ferries as to its consent shall be in its absolute discretion.
 28. Where the Contractor is a limited company, the Contractor hereby represents and warrants to BC Ferries that the signatory has been duly authorized by the Contractor to enter into this Agreement without corporate seal on behalf of the said company.
 29. The Contractor acknowledges that BC Ferries is subject to the provisions of the *Freedom of Information and Protection of Privacy Act*, R.S.B.C. 1996, c. 165 ("FOIPPA"). The Contractor will ensure that all personal information that is collected, used, disclosed, retained or created is done so in accordance with FOIPPA.
 30. This Agreement may be executed in counterparts, each of which when so executed shall be deemed to be an original and all of which taken together, shall constitute one and the same agreement.

IN WITNESS WHEREOF the parties hereto have duly executed this Agreement the 19 day of April, 2022.

SIGNED AND DELIVERED on behalf of
British Columbia Ferry Services Inc by its

Authorized signatory

s. 22

Name: James Adams

Title: Project Manager

SIGNED AND DELIVERED on behalf of
DSA Ocean (Dynamic Systems Analysis Ltd)
by its

Authorized signatory

s. 22

Name: Dean Steinke

Title: CEO

ADDENDUM TO SCHEDULE "A" – SERVICES

Item	Description	Cost
1	<p>Dynamic analysis of widened Baynes Sound Connector cable ferry</p> <p>Requirements: BCFS is completing a feasibility study of modifying the Baynes Sound Connector to accommodate ss. 13, 17. The current concept involves widening the hull by ss. 13, 17. BCFS is reviewing the capacity of the berths, cables, and cable anchors based on the increased displacement of the vessel.</p> <p>The proposed modifications to the vessel are: ss. 13, 17</p> <p>Guide cables shall remain the same distance from centerline of the vessel and re-located to bow and stern such that they are in-line and at the same elevation as the drive cable sheave.</p> <p>BC Ferries requires a dynamic analysis to assist with the feasibility assessment. The analysis is required to: ss. 13, 17</p> <p>Environmental conditions for load cases based on previous EYE report representing 1 in 100 year and extreme conditions.</p>	<p>Colin Wilson, P.Eng. – ss. 17, 21</p> <p>Dean Steinke, P.Eng. – ss. 17, 21</p> <p>Meysam Karimi, PhD, EIT – ss. 17, 21 ss. 17, 21</p> <p><input checked="" type="checkbox"/> Time & Materials</p>

<p>Method: An updated vessel model will be generated using ShipMo3D and modeled in the time domain software ProteusDS.</p> <p>Deliverables: A digital engineering analysis report summarizing the system inputs and results of the analysis will be created. The final revision of the report will be sealed by a EGBC licensed Professional Engineer (P.Eng).</p> <p>Schedule: The analysis will be completed 4 weeks after issuance of PO.</p>	
	<p>Total: ss. 17, 21</p>

The following standards apply to all services completed under this contract:

Contractor's Guide to the FOIPPA

https://www.bcferrries.com/web_image/hd4/hca/8825477005342.pdf

Contractor Safety/Security Requirements and Orientation Booklet – Mar 15/21

https://www.bcferrries.com/web_image/h24/h2e/8844243435550.pdf

BCF Vaccination Requirements for Contractors of BC Ferries

<https://www.bcferrries.com/our-company/procurement>

ADDENDUM TO SCHEDULE "B" - CONTRACT PRICE

Per your Quote 22-015 REV B dated April 7, 2022

ss. 17, 21

ADDENDUM TO SCHEDULE "C" - APPROVED SUBCONTRACTORS

NONE

ADDENDUM TO SCHEDULE "D" - ADDITIONAL TERMS

No modifications to the standard Terms and Conditions included herein are permitted. Additional terms included here: Addendum to Schedule "D" – Additional Terms, are subject to BC Ferries review and acceptance.

NONE

ADDENDUM TO SCHEDULE "E" - INSURANCE

GENERAL:

1. The Contractor shall, prior to commencement of the service and at its expense, obtain and maintain, until all conditions of the contract have been fully complied with, insurance coverage in wording and in amounts as hereafter specified unless altered by mutual agreement. Any additional coverage that the Contractor may deem necessary to fulfil its obligations under this contract shall be at the Contractor's own discretion and expense.
2. Payment of any deductible amount shall be the responsibility of the Contractor.
3. General Conditions:
 - Insurance shall be placed with reliable insurers registered and licensed to issue insurance in the Province of British Columbia and acceptable to BC Ferries and shall be in a form acceptable to BC Ferries;
 - Before starting the work under this contract, the Contractor shall give BC Ferries proof of all specified insurance and when requested, within ten working days thereafter, a certificate of insurance evidencing coverage;
 - Insurance shall run continuously from the start of the work to the expiry date, which shall not be less than ten working days after completion of work;
 - The Contractor shall be responsible for all deductibles under policies and insurance provided by the Contractor;
 - Loss or damage covered by an insurance policy shall not affect BC Ferries' or Contractor's rights and obligations under this contract. The Contractor's insurance is Primary;
4. All policies shall state that:
 - BC Ferries shall receive at least thirty working days prior written notice of intended cancellation or material change;
 - The inclusion of more than one Insured shall not affect the rights of any other Insured.
5. The Contractor shall not operate or allow entry onto BC Ferries' property, any unlicensed motor vehicle. Unlicensed mobile equipment will be insured by the Contractor for physical damage and liability.

VEHICLE INSURANCE REQUIREMENT:

1. Automobile insurance coverage shall be arranged with inclusive limits of not less than ss. 17, 21 on a Standard Owners Form Automobile Policy, affording third party liability and accident benefits insurance, as provided by the Insurance Corporation of British Columbia (AUTOPLAN) in accordance with the Automobile Insurance Act for all licensed vehicles owned, leased, rented or used in the performance of this contract.

COMPREHENSIVE GENERAL LIABILITY INSURANCE REQUIREMENT:

1. Comprehensive general liability coverage shall be arranged and shall include as an additional insured, BC Ferries and the Contractor, separately and jointly and shall include a cross liability clause.

Risks insured shall include personal injury, death and property damage including loss of use thereof. Minimum coverage is as follows:

- ss. 17, 21 inclusive limits for bodily injury or property damage or both combined each occurrence, and
- ss. 17, 21 aggregate limits for products and completed operations, personal injury, each policy year.

PROFESSIONAL GENERAL LIABILITY INSURANCE REQUIREMENT:

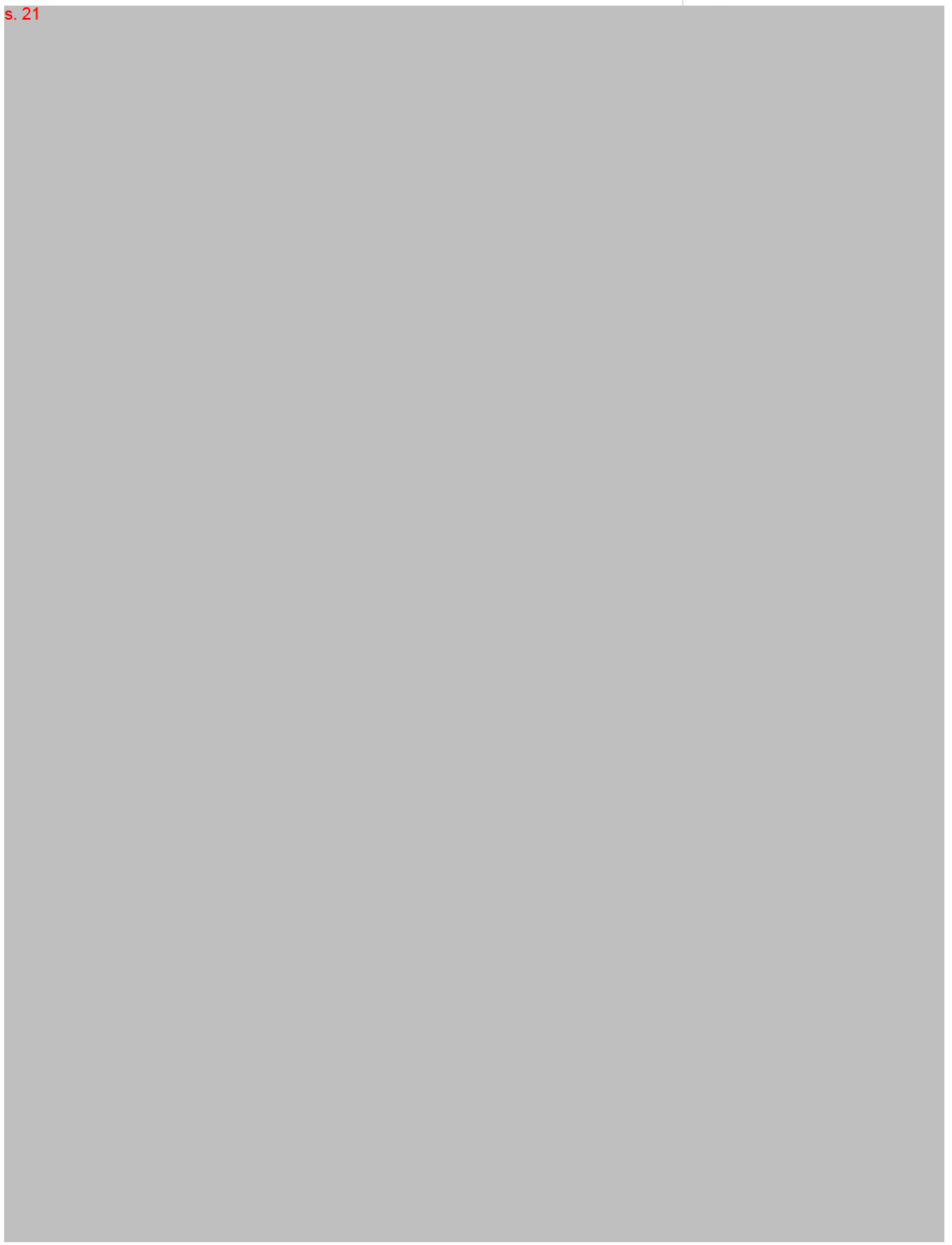
1. Professional Liability insurance shall be arranged from the date of execution of this contract and for a period of two years thereafter. The policy shall carry minimum limits of ss. 17, 21 per claim, and ss. 17, 21 annual aggregate insuring against loss of damage arising out of the professional services rendered by the Contractor or its sub-contractor or employees including personnel on loan to the Contractor and personnel who perform normal services of the Contractor under this contract. ~~The Professional Liability Insurance (Errors and Omissions) shall be in the form of a Single Project Professional Liability Policy.~~

MARINE INSURANCE: (required only for scope where Contractor's services involve boats or barges)

1. Hull & Machinery Insurance including War Risks
Canadian Hulls (Pacific) Clauses 2005 or equivalent, including primary collision liabilities. If primary collision is excluded, then this insurance must be included with the Protection & Indemnity insurance. The policy deductible shall not exceed ss. 17, 21 per incident.
2. Protection and Indemnity Insurance
Secured through entry in a Protection & Indemnity club that is a member of the International Group of Protection & Indemnity clubs to cover liability or equivalent coverage placed with commercial insurers will be subject to BC Ferries' approval, at its discretion; but in no case for limits less than ss. 17, 21. If equivalent coverage is secured, BC Ferries is to be added as an additional insured and the said policy shall be primary and without right of contribution from any insurance otherwise maintained by BC Ferries. The maximum deductible must not exceed ss. 17, 21 per occurrence.

CYBER RISK INSURANCE: (for Contractors who access BCF's network or direct access to a BCF system)

1. Cyber Risk Insurance shall be arranged in an amount of ss. 17, 21 to cover losses resulting from network security liability including but not limited to, introduction of viruses, unauthorized access, disclosure of confidential information, or identity theft.



Pre-Implementation Funding Request

Project Name: BSC - Asset Betterment

Project Number: 92466

Date to CPBC: Sept 28, 2021

Document Supported by:		Date:
Project Manager	Wong, Isaac (Pak Yu)	10/15/2021
Owner	Camaraire, Frank	10/16/2021
Co-Owner	-	-
Sponsor	Storey, Corrine	10/20/2021
CPBC Chair	Sharland, Jill	10/28/2021

Driver	Expansion
Asset Type	Vessel Upgrade
OpEx Responsibility	720 - Fleet PMO



Pre-Implementation Funding Request

Project Name: BSC - Asset Betterment

Project Number: 92466



Current Request & Justification for Pre-Implementation Funding (in '000s)

Previously Released: \$

Capex: \$ 0

Opex: \$ 0

Completed Activities:

None.

Accounting Checklist

Confirmed project capitalization **ss. 13, 17**

Confirmed capex/opex of pre-imp **ss. 13, 17**

Likely write-off or impairment? **ss. 13, 17**

Is attached Concept Proposal updated? **ss. 13, 17**

Total Pre-Implementation Cash Flow (in '000s)

	Total	Previous	F2022	F2023	Future
Capital					
Operating	ss. 13, 17				
Total	ss. 13, 17				

Compare to Overall Budget (in '000s)

	Total Pre-Imp (incl. current request)	Total Budget	%
Capital		ss. 13, 17	
Operating	ss. 13, 17		
Total	ss. 13, 17		

Estimate provided here is Class (AACE) 5, Order of Magnitude Estimate, -50% to +100%, based on preliminary sketches and discussion.

Concept Proposal

Project Name: BSC - Asset Betterment
 Project Number: 92466



Business Need

ss. 13, 17

[Redacted content]

Preliminary Scope & Budget Assumptions

Vessel Upgrades Assumptions:

- ss. 13, 17

[Redacted content]

[Redacted content]

Terminal Upgrades Assumptions:

- ss. 13, 17

[Redacted content]

Risk Profile

Significance (impact) ss. 13, 17

Presence (likelihood) ss. 13, 17

[Redacted content]

Sponsor	Corrine Storey
Owner	Frank Camaraire
Manager	Isaac Wong
Analyst	Stuart Camden

Estimated Milestones

Pre-Imp Funding Request	ss. 13, 17
Business Case Submission	ss. 13, 17
Available for Use	ss. 13, 17
Closeout	ss. 13, 17

Capital Placeholder History

	F2022 Portfolio	Current Estimate
Budget	-	ss. 13, 17
AFU Date	-	ss. 13, 17

Note: This project was not included in the approved F22 Capital Plan

F2022 Placeholder Budget (\$'000's)

Total Capital	-
Opex – Feasibility	-
Opex – Training	-

Ongoing Operating Impacts TBD

Appendix 1: Work Breakdown Structure (Vessels)

Project Name: BSC - Asset Betterment

Project Number: 92466

Work Breakdown Structure - Vessels				
Task Number	Task Name	Description	Capital/Operating	Budget
ss. 13, 17				

Appendix 2: Project Details

Project Name: BSC - Asset Betterment

Project Number: 92466

Preliminary Scope & Budget Assumptions

Scope:

- ss. 13, 17
[Redacted content]

Project Benefits:

- ss. 13, 17
[Redacted content]

Potential Dis-Benefits:

- ss. 13, 17
[Redacted content]

Placeholder Estimate:

ss. 13, 17
[Redacted content]







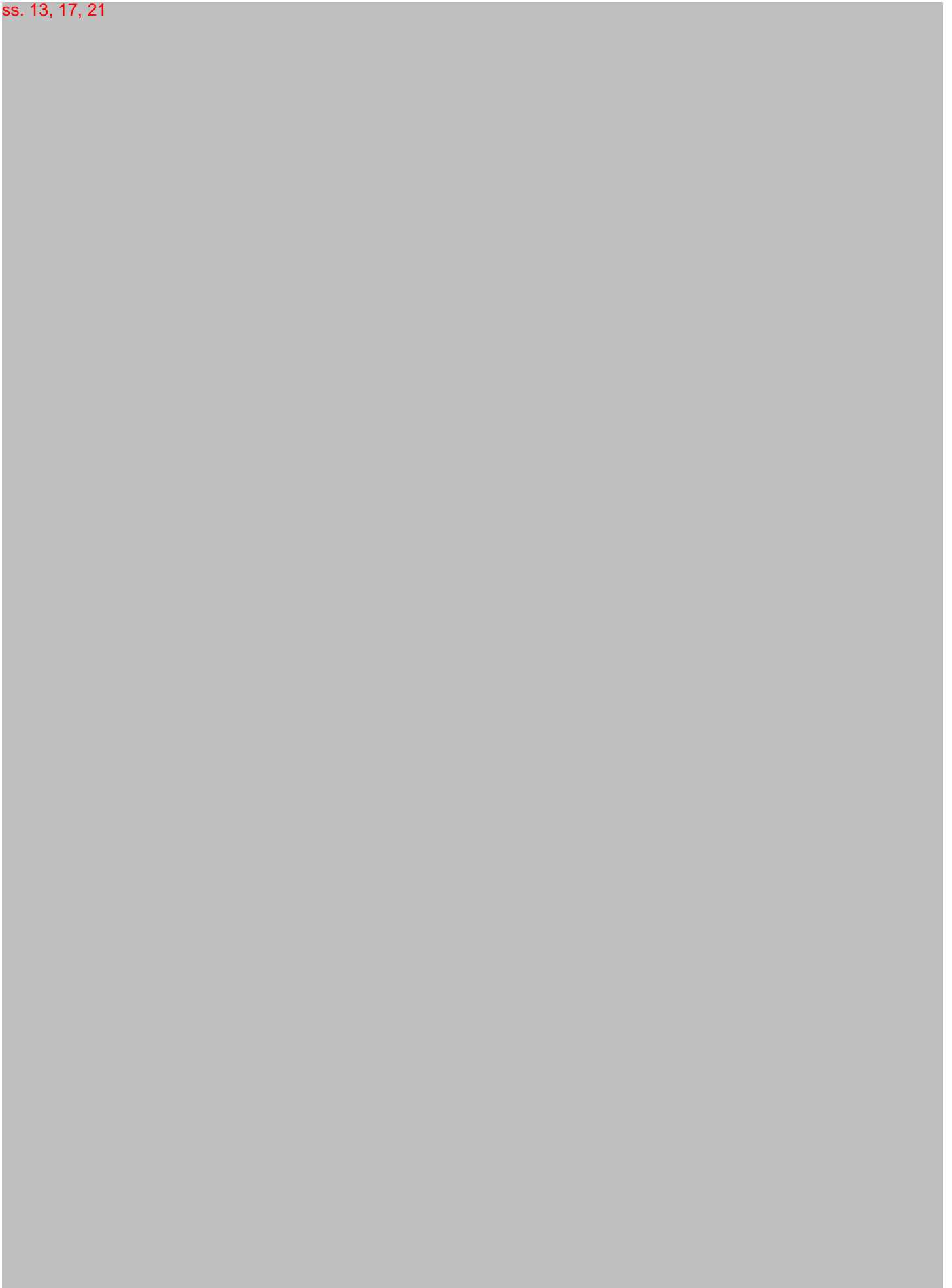


ss. 13, 17, 21









ss. 13, 17, 21



Doyle, Joanne

From: Adams, James W
Sent: March 29, 2022 12:17 PM
To: Paterson, Bruce; Doyle, Joanne; Simpson, Peter
Cc: Amusan, Sam; Wong, Isaac (Pak Yu); McWalter, Emma
Subject: RE: BSC Asset Betterment - Capacity proposals
Attachments: BUCK-266-SK013b.pdf; BUCK-266-SK014a.pdf

Hi Everyone,

Further to our meeting last week regarding the BSC expansion, please find the attached two drawings and notes below:

- SK013 rev B - s. 13, s. 17

s. 13, s. 17

- SK014 Rev A - s. 13, s. 17

s. 13, s. 17

s. 13, s. 17

Please let me know if you have any suggestions/questions with the autoturn study.

Thanks,

James

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: s. 15, s. 19 F: 250-361-4922
james.adams@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: March 15, 2022 3:30 PM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>
Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: BSC Asset Betterment - Capacity proposals

Joanne/Peter,

My clarifications in red in the text below.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.

Tel: (250) 978-1385

Cell: s. 15, s. 19

Fax: (250) 978-1166

bruce.paterson@bcferries.com

www.bcferries.com

Safety and Operational Readiness

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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>

Sent: March 15, 2022 1:38 PM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>

Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Subject: RE: BSC Asset Betterment - Capacity proposals

Hi Bruce & All,

Thank you very much for this summary, missing the last meeting I wondered where we left it.

Item #3 – Vessel Capacity

s. 13, s. 17



Item #4 – Commercial capacity

s. 13, s. 17



A couple other questions I have include:

- s. 13, s. 17
- 

s. 13, s. 17

Peter – any other factors we should be considering for the capacity of the vessel or either of the projects

s. 13, s. 17

Thanks,
Joanne

Joanne Doyle
Manager, Fleet Strategic Planning
Strategy & Community Engagement
British Columbia Ferry Services Inc.
The Atrium
Suite 500, 1321 Blanshard St., Victoria, BC V8W 0B7
T: 250-978-1322 C: s. 15, s. 19 F: 250-388-9599
Joanne.doyle@bcferries.com
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Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: BSC Asset Betterment - Capacity proposals

Joanne/Peter,

I am following up our recent meetings on the BSC capacity expansion, re. items to follow up:

Item #3 – Heat Maps (AEQ Capacity). s. 13, s. 17

s. 13, s. 17

s. 13, s. 17

Item #5 – Commercial Capacity. s. 13, s. 17

s. 13, s. 17

Does this make sense, or are there other factors to consider?

Bruce Paterson, P.Eng, M.Eng

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To: [Paterson, Bruce](#); [Doyle, Joanne](#); [Simpson, Peter](#)
Cc: [Amusan, Sam](#); [Wong, Isaac \(Pak Yu\)](#); [McWalter, Emma](#)
Subject: RE: BSC Asset Betterment - Capacity proposals
Date: March 29, 2022 12:17:32 PM
Attachments: [BUCK-266-SK013b.pdf](#)
[BUCK-266-SK014a.pdf](#)

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- SK013 rev B [s. 13, s. 17](#)
[s. 13, s. 17](#) of the
- SK014 Rev A - [s. 13, s. 17](#)
[s. 13, s. 17](#)

[s. 13, s. 17](#)

Please let me know if you have any suggestions/questions with the autoturn study.

Thanks,

James

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s.13, s.17

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- s.13, s.17

- s.13, s.17

- s.13, s.17

- s.13, s.17

Peter – any other factors we should be considering for the capacity of the vessel or either of the projects ~~s.13, s.17~~ ?

Thanks,
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Joanne Doyle
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s. 13, s. 17

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To: Amusan, Sam; Wong, Isaac (Pak Yu); Paterson, Bruce; McKinnon, Miles; Adams, James W; Cennon, Quentin; Manouchehrinia, Babak
Cc: McWalter, Emma; Simpson, Peter
Subject: RE: BSC 92264 / 92466 Follow up Meeting
Attachments: BSC Project - Strategic Planning Action Items Follow-up.pdf

Hello All,

In advance of the next meeting here is a summary of the action items from Strategic Planning.

I am unable to make the meeting but Peter will be there to go through the information with you.

s. 13, s. 17

s. 13, s. 17

If you have any questions on this material please reach out in advance of the meeting or they can be discussed at the meeting.

Thanks,
Joanne /Peter

Joanne Doyle
Manager, Fleet Strategic Planning
Strategy & Community Engagement
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BSC Expansion Project

Strategic Planning Action Items from meeting Feb 10, 2022

From the February 10th BSC Project meeting there were a number of action items for Strategic Planning. The summary response for these to support discussion at next meeting March 3.

s. 13, s. 17



BSC Expansion Project

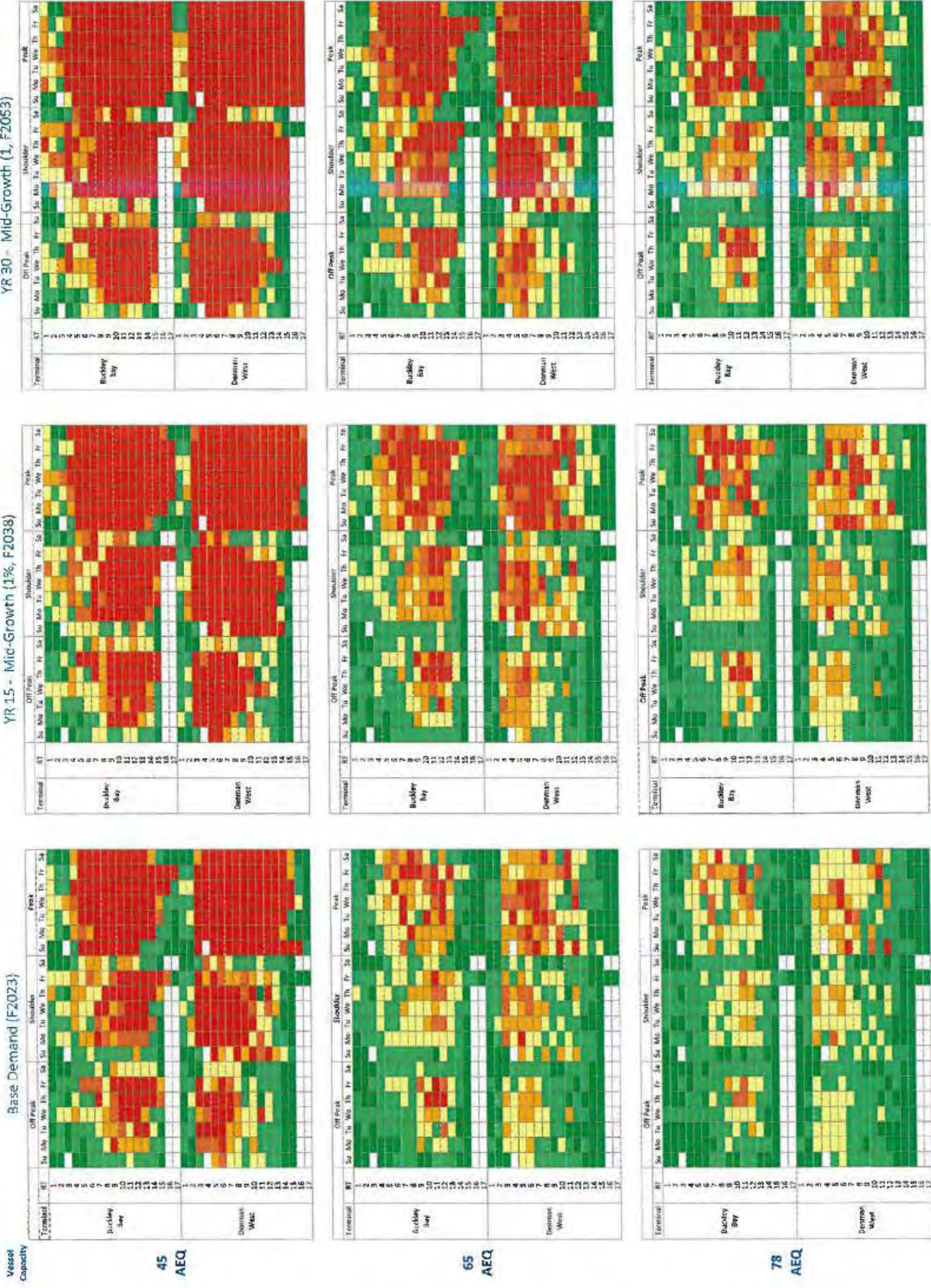
Strategic Planning Action Items from meeting Feb 10, 2022

s. 13, s. 17



APPENDIX 1 - HEAT MAPS

Sample Week Analysis - Mid Growth, No Shuttling

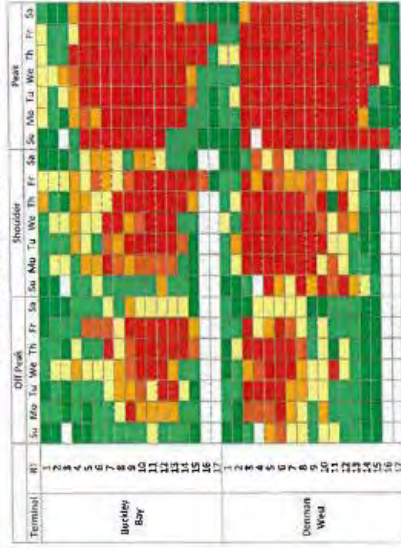


APPENDIX 1 - HEAT MAPS

Sample Week Analysis - High Growth, No Shuttling

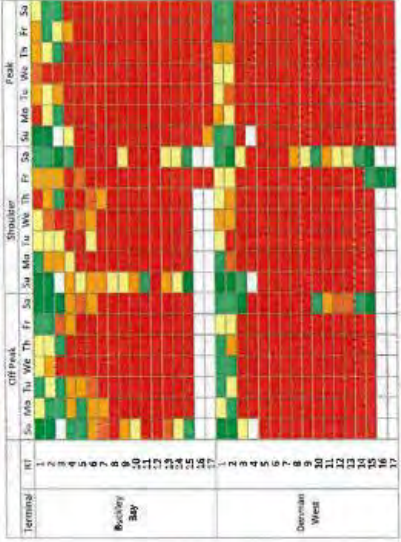
Base Demand (F2023)

Vessel Capacity



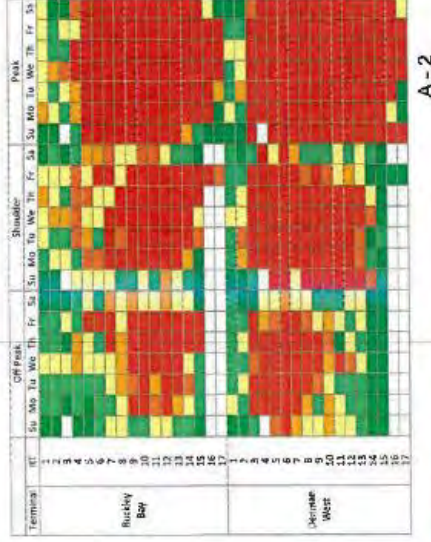
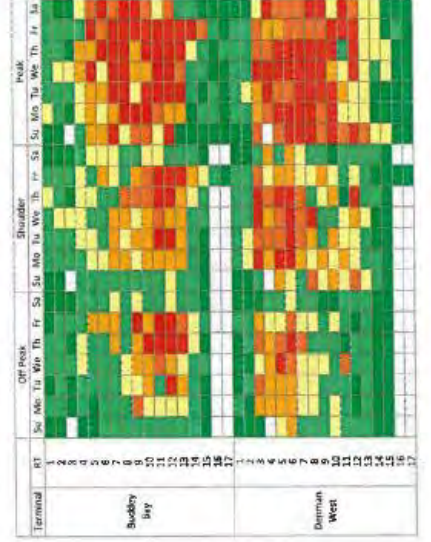
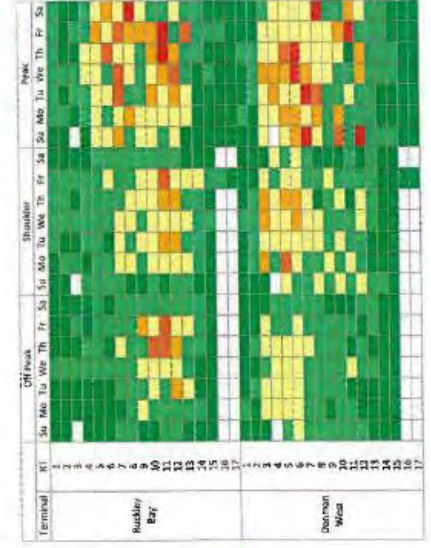
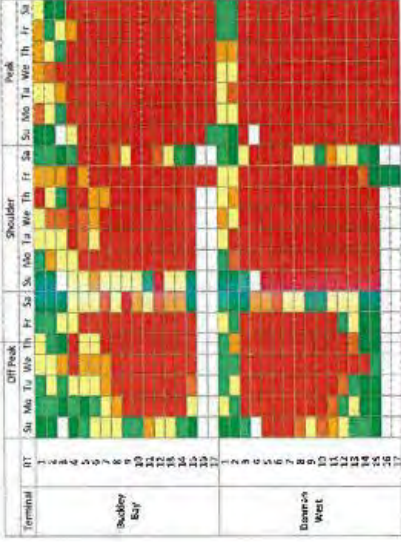
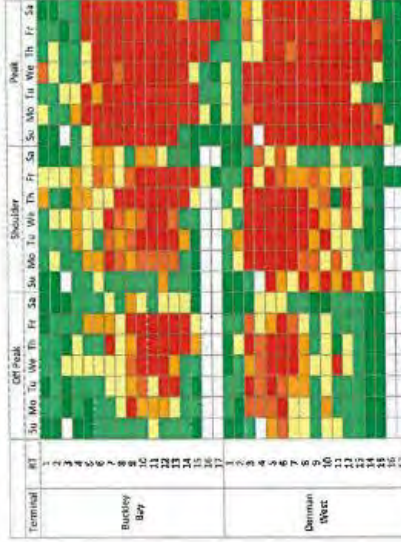
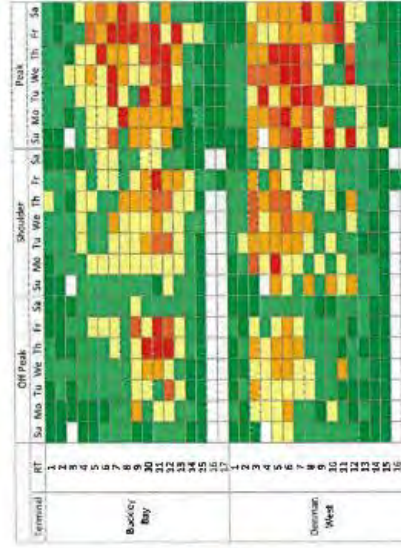
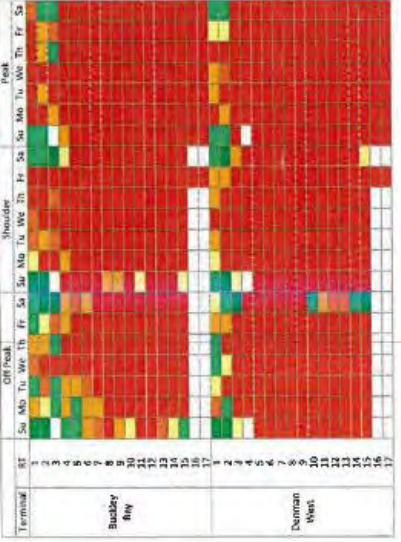
45 AEQ

YR 15 - High-Growth (2.3%, F2038)



65 AEQ

YR 30 - High-Growth (2.3%, F2053)



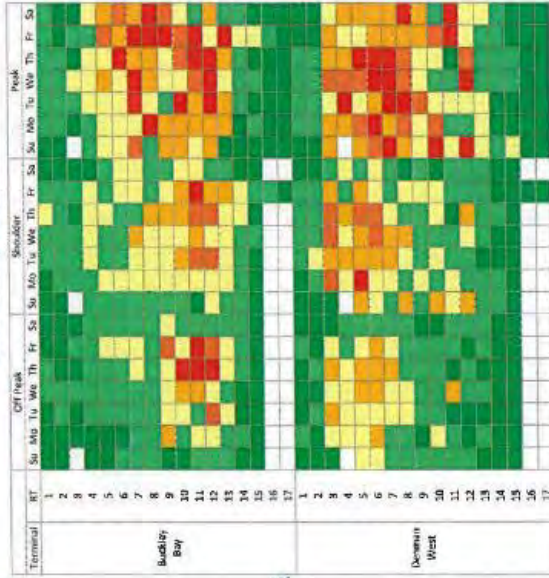
78 AEQ



APPENDIX 1 - HEAT MAPS

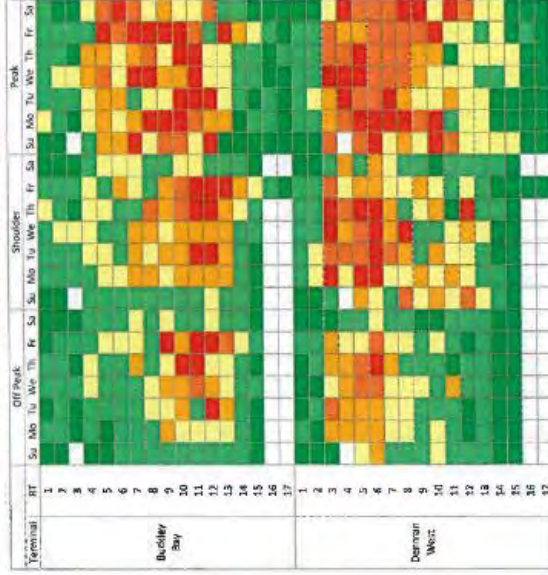
Sample Week Analysis - Mid Growth, Includes Shuttling as practical

Base Demand (F2023)

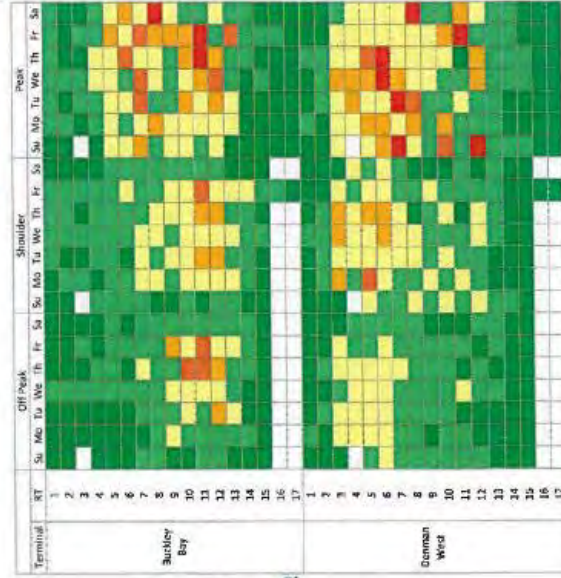
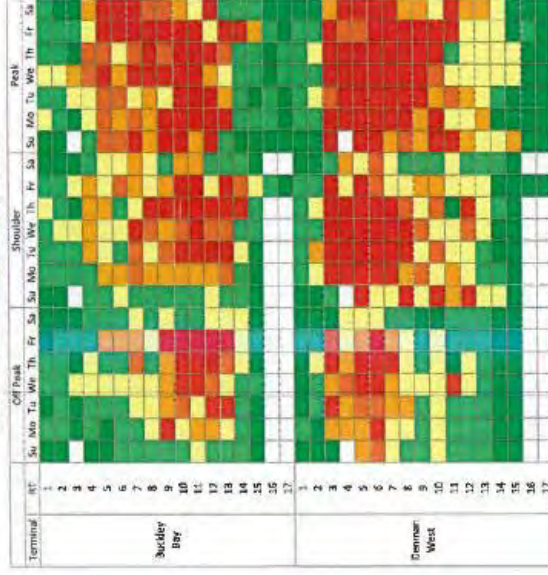


65 AEQ

YR 15 - Mid-Growth (1%, F2038)



YR 30 - Mid-Growth (1%, F2053)



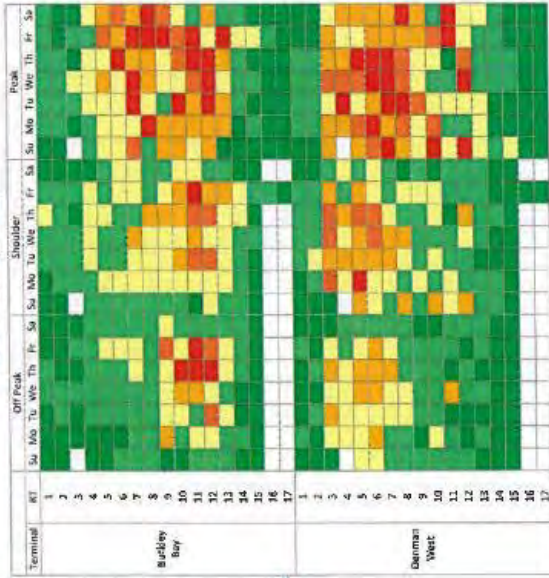
78 AEQ



APPENDIX 1 - HEAT MAPS

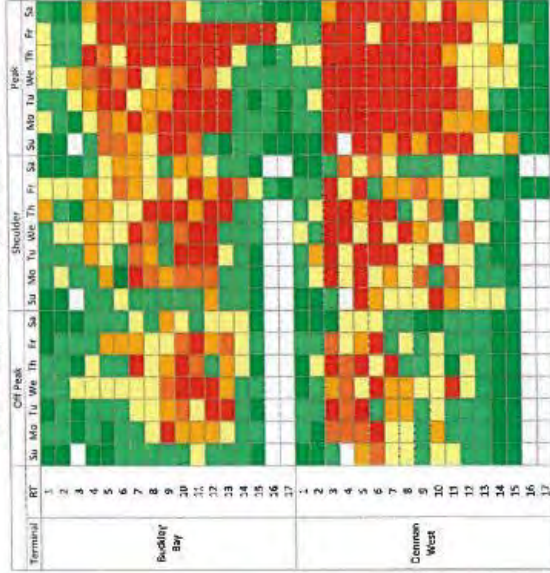
Sample Week Analysis - High Growth, includes Shuttling as practical

Base Demand (F2023)

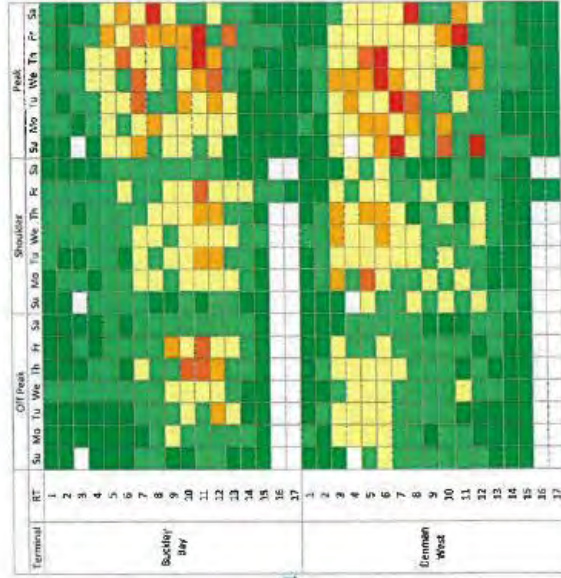
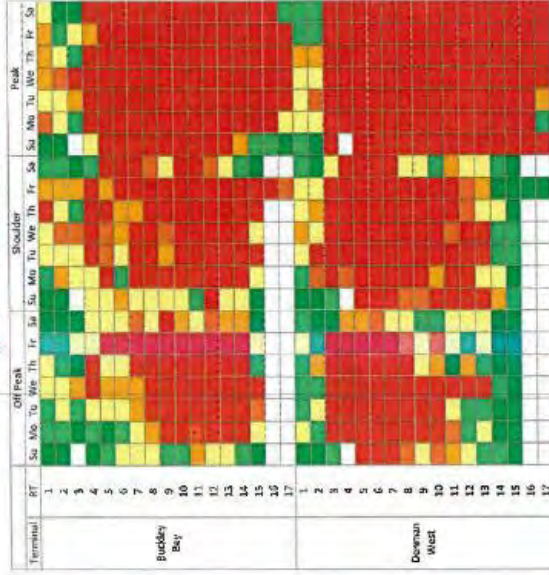


65 AEQ

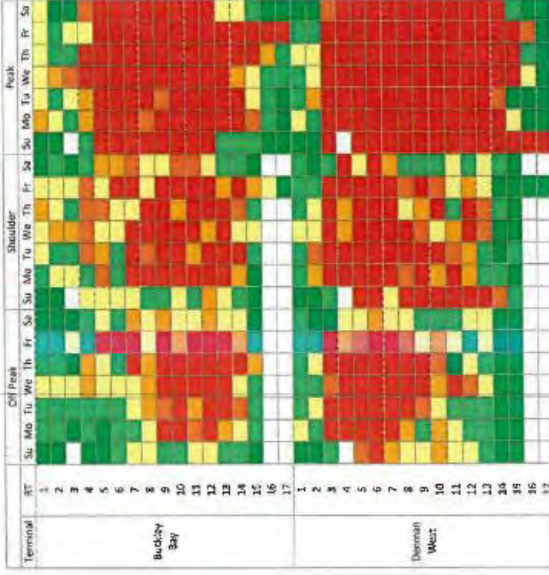
VR 15 - High-Growth (2.3%, F2038)



VR 30 - High-Growth (2.3%, F2053)



78 AEQ

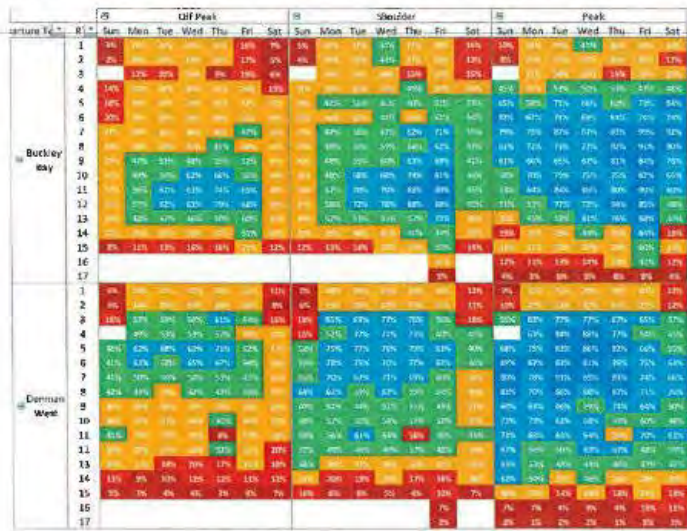


AEQ Demand Analysis - Route 21

Percentile AEQ Analysis, F20

Percentile	All Sailings YR			Peak Season			Peak Season Combined		
	Buckley Bay	Denman West	Route	Buckley Bay	Denman West	Route	Buckley Bay	Denman West	Route
0.05	46	48	47	51	51	51	53	53	53
0.9	90	90	90	92	92	92	92	92	92
0.95	92	92	92	93	93	93	94	94	94
0.98	94	94	94	95	95	95	103	102	102
Total Sailings	5838	5838	11676	1300	1300	2600	1152	1155	2307

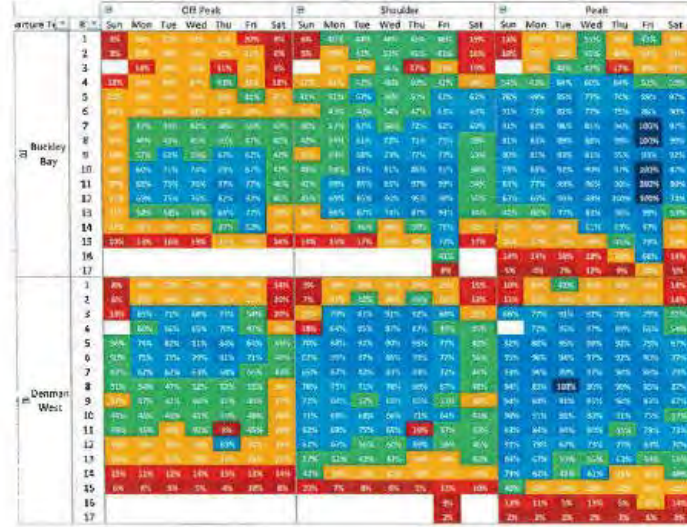
Route 21 estimated average AEQ capacity utilization of a 70 AEQ Vessel, based on F20 with zero growth



Route 21 estimated average AEQ capacity utilization of a 80 AEQ Vessel, based on F20 with zero growth



Route 21 estimated average AEQ capacity utilization of a 70 AEQ Vessel, based on F20 demand with 2% growth for 10 yrs



Route 21 estimated average AEQ capacity utilization of a 80 AEQ Vessel, based on F20 demand with 2% growth for 10 yrs



Passenger Demand Analysis - Route 21

Passenger Demand, F20, Percentile Analysis

Percentile	All Sailings YR		Peak Season		Peak Season Combined	
	Buckley Bay	Denman West	Buckley Bay	Denman West	Buckley Bay	Denman West
0.85	86	81	112	100	125	111
0.9	96	89	121	108	142	126
0.95	111	101	130	118	206	171
0.98	127	116	139	127	247	210
Total Sailings	5838	5838	1300	1300	1152	1155

Passengers per AEQ, F20

Percentile	F16-F20 All Sailings	F16-F20 Peak Sailings	F20 All Sailings	F20 Peak	F20 Peak combined
	Average	1.8	2.1	1.8	2
0.85	2.29	2.56	2.22	2.5	3
0.9	2.4	2.69	2.37	2.65	3.74
0.95	2.7	2.96	2.6	2.89	4.45
0.98	3.05	3.33	3	3.18	5.05
Total Sailings	56425	12967	11676	2600	2307

Potential Passenger Capacity using F20 Peak Combined Pass/AEQ Analysis

Percentile	Pass/AEQ	Vessel Capacity (AEQ)			
		45	70	75	80
Average	2.28	102.6	159.6	171	182.4
0.85	3	135	210	225	240
0.9	3.74	168.3	261.8	280.5	299.2
0.95	4.45	200.25	311.5	333.75	356
0.98	5.05	227.25	353.5	378.75	404

Students travel Tables

Average Students Travelling ex Buckley Bay F20

Departure	Su	Mo	Tu	We	Th	Fr	Sat
7:00:00 AM	0	0	0	0	0	0	0
7:40:00 AM	0	0	1	1	0	0	0
8:20:00 AM	1	1	0	0	0	0	0
9:00:00 AM	0	0	0	1	0	2	0
10:00:00 AM	2	5	2	5	0	1	1
11:00:00 AM	1	1	0	1	0	1	1
12:05:00 PM	1	0	0	0	0	1	1
1:05:00 PM	1	1	0	1	1	1	1
2:00:00 PM	2	1	2	2	2	1	2
3:00:00 PM	2	1	2	2	2	2	2
4:00:00 PM	3	14	15	13	12	15	2
5:00:00 PM	4	4	4	6	4	5	3
6:00:00 PM	6	7	5	4	5	7	4
7:00:00 PM	1	2	2	2	1	3	1
8:05:00 PM	2	4	6	4	5	5	2
8:30:00 PM	1	1	1	4	2	2	2
9:30:00 PM	1	2	2	3	3	3	2
10:00:00 PM	1	1	2	0	1	2	1
11:00:00 PM	0	0	0	0	0	0	0

Max Students Travelling ex Buckley Bay F20

Departure	Su	Mo	Tu	We	Th	Fr	Sat
7:00:00 AM	1	2	1	0	1	0	1
7:40:00 AM	1	2	19	28	2	1	2
8:20:00 AM	4	4	2	12	0	2	1
9:00:00 AM	3	3	1	51	9	73	5
10:00:00 AM	69	52	45	59	6	22	25
11:00:00 AM	5	43	2	45	3	25	4
12:05:00 PM	6	4	3	11	4	18	4
1:05:00 PM	5	15	3	17	4	4	7
2:00:00 PM	25	28	21	38	32	11	6
3:00:00 PM	38	5	7	30	25	30	8
4:00:00 PM	10	33	32	32	28	42	7
5:00:00 PM	12	12	35	19	38	47	10
6:00:00 PM	14	17	17	9	15	41	16
7:00:00 PM	4	5	3	5	5	16	3
8:05:00 PM	6	13	11	12	11	38	8
8:30:00 PM	7	4	3	22	5	5	6
9:30:00 PM	4	7	7	10	11	12	6
10:00:00 PM	2	5	4	1	3	7	4
11:00:00 PM	2	0	2	2	0	3	2

Doyle, Joanne

From: Wong, Isaac (Pak Yu)
Sent: September 13, 2021 8:40 AM
To: Paterson, Bruce
Cc: Kearney, Bob; McKinnon, Miles; Doyle, Joanne
Subject: RE: BSC, Expansion

Thanks for the information Bruce.

Yours sincerely,
Isaac Wong, P.Eng.
T: 604-204-2286 C: s. 15, s. 19

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: September 12, 2021 10:20 PM
To: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Cc: Kearney, Bob <Bob.Kearney@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Doyle, Joanne <Joanne.Doyle@bcferries.com>
Subject: RE: BSC, Expansion

Isaac,

s. 13, s. 17



Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
Tel: (250) 978-1385
Cell: s. 15, s. 19
Fax: (250) 978-1166
bruce.paterson@bcferries.com
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From: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Sent: September 10, 2021 4:00 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: BSC, Expansion

Hi Bruce,

Quick question. If we do the expansion alone first, can the existing propulsion system handle the additional capacity or there will need to be some work?

Thank you.

Isaac Wong, P.Eng., M.Eng., PMP
Project Manager, Fleet Project Management Office,
British Columbia Ferry Services Inc.
12800 Rice Mill Road, Richmond BC V6W 1A1
T: 604-204-2286 C: s. 15, s. 19
Isaac.Wong@bcferries.com

Doyle, Joanne

From: Doyle, Joanne
Sent: April 27, 2021 2:31 PM
To: Paterson, Bruce
Cc: Wong, Isaac (Pak Yu); McKinnon, Miles
Subject: RE: Passenger Loads on the BSC
Attachments: Pages from Baynes Sound Connector VSM.pdf

Including the protocols for shuttling.
See attached.

From: Doyle, Joanne
Sent: April 27, 2021 8:11 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Good Morning Bruce,

Sorry for the late reply – still waiting on some information.

1. Yes there is some minor discrepancy btw AEQ and # of vehicles, but AEQ is the unit of measurement that we use and when speaking specifically about UH it does provide a conservative #. But it is the mix of recreation vehicles and service vehicles that really impact the loading of the vessel and these vehicle types travel during peak demand periods.
2. I have a meeting with AI today – I will get the shuttling protocols for you, I know we changed it up slightly during COVID so I will need to get the Pre-COVID and current practise.
 - a. The heat maps show the shuttle sailings demand at the time of day (approx.) they show up and by changing the vessel capacity shows how demand moves/stacks up (noting that there are very long lines on the Rte 22 side and when we have a larger vessel there the demand will be coming much quicker to Rte 21). The tricky thing with these tables are they are averages and when you have 10 Fridays in the peak and the prime mid-day sailings are averaging 90%+ then we know we are going to have a major problem when a larger ferry is on Rte 22.
 - b. I am not sure we need another category saying shuttling but we can make some assumptions and change the color coding to align – all sailings that average over ##% will likely have shuttling (based on the new capacity of ship) current capacity of ship we know that we provide almost 400 additional sailings in Shoulder/Peak (with 69% being in the peak).
 - c. Will charging limit the amount of time per day that we have to shuttle?
3. Passenger data is only separated btw Foot/Veh passenger at Buckley Bay so it more reliable to use the combined measure of total passengers. Yes the tables are combined Vehicle/Foot Passengers. The data is consistent with other vessels of similar capacity – from an AEQ perspective it is between the Quinsam 63 AEQ (400ppl) and the Capilano 87AEQ (457ppl).
 - a. Do you need me to be a part of the meetings with Fleet Ops?
 - b. Table below is outlines the Percentile Analysis Passenger/AEQ for all two port minor routes F16 to F20

**Passenger per AEQ - F16 to F20 two port minor routes
(no multi port)**

Percentile	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0.98
------------	------	------	------	------	------	------	------	------	------

I hope this is helpful. If not maybe we should chat so I know exactly what it is you are looking for.

I will get back to you all once I meet with AI wrt shuttling protocol.

Thanks,
Joanne

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 20, 2021 3:30 PM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Joanne,

Thanks (again) for the great work. I've marked up the attachments with some comments/observations, some of which I will repeat:

- (1) The Monty Python Question: when Traffic reports AEQ, it breaks down to a unit equivalent to one (1) underheight vehicle of undetermined length, not specifically 6.1m? Thus if we spec a 70AEQ ferry based on 6.1m units, or 427 lane*m, in reality there is statistical distribution of actual vehicles carried when the ferry is fully loaded (i.e the dark blue sailings in your heat map). It's a small point, but it means that a 70AEQ official capacity is actually somewhere between 65 and 80 UH units from the traffic data.
- (2) Do we have policy as when we initiate shuttle sailings? Is it based on certain number of cars in the holding compound (or outside waiting to enter)? If so, how many typically? Does this mean the heat maps need to have another category going from "overload" to "shuttle"?
- (3) The Passenger demand is actually quite problematic if I have understood the tables correctly. The peak data seems to indicate that we should be using at least 2.5-3 passengers per AEQ, so at 70AEQ the licence for 200 is at risk. s. 13, s. 17

s. 13, s. 17

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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: April 20, 2021 8:33 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
 Subject: RE: Passenger Loads on the BSC

Hi Bruce,

I took a slightly different view of the Route 21 data than I would other routes due to the additional shuttling that occurs during peak demand periods of the year. The approach I took was to combine all additional shuttling sailings with the closest scheduled sailing from the departure port – this pooled the demand to be on one of the 14-17 scheduled sailings. Hopefully it can help us identify the actual demand on peak days. To show the difference in approaches – I did look at the data both ways for the peak season (combining shuttling trips and then as provided).

Table 1. Passenger Demand, F20, Percentile Analysis

Percentile	All Sailings YR		Peak Season		Peak Season Combined	
	Buckley Bay	Denman West	Buckley Bay	Denman West	Buckley Bay	Denman West
0.85	86	81	112	100	125	111
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0.95	111	101	130	118	206	171
0.98	127	116	139	127	247	210
Total Sailings	5838	5838	1300	1300	1152	1155

Note the Peak season combined –combines shuttle sailings with scheduled sailings

The attached file also shows the percentile analysis is for the Pass per AEQ which ranges between 3 to 5 depending on the percentile. This is consistent with other vessels of similar capacities, indicating a 400 - 450 passenger licence may be needed.

Table 2. AEQ Demand, F20, Percentile Analysis

Percentile	All Sailings YR			Peak Season			Peak Season Combined		
	Buckley Bay	Denman West	Route	Buckley Bay	Denman West	Route	Buckley Bay	Denman West	Route
0.85	46	48	47	51	51	51	53	53	53
0.9	50	50	50	52	52	52	62	56	57
0.95	52	52	52	53	54	54	96	90	94
0.98	54	54	54	55	55	55	103	102	102
Total Sailings	5838	5838	11676	1300	1300	2600	1152	1155	2307

s. 13, s. 17

The analysis so far doesn't take into consideration any growth. Historically (pre-pandemic) we were seeing growth:

- F20 grew just under 4% in AEQ from F19
- between F18 to F19 there was just over 3% growth in AEQ

The attached pdf has a bit more detail. Take a look and see what you think, let me know if you would like to discuss further.

If we understand what the limitation may be on shuttling (within the operating day) over the current service while still accommodating charging we may be able to show how the new vessel capacity will meet current and future demand.

When we have a 47 AEQ vessel on Rte 22 the demand will be showing up in higher volumes at peak periods of the day.

s. 13, s. 17

Thanks,
Joanne

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 15, 2021 9:13 AM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Joanne,

Thanks for your response. Early next week is fine.

Regarding your final point, I responded to a request from Al de Koninck a few years ago about a general increase in capacity. I don't know if there was ever any detailed traffic analysis on the "right" increase in capacity, or a target for reducing the amount of time in "Shuttle Mode". If there is an opportunity to understand this from the data, perhaps we can better identify the ideal vessel size (or justify our current proposal).

s. 13, s. 17

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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: April 15, 2021 7:22 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Good Morning Bruce,

I will pull some numbers together and get back to you Monday (I have Friday off). If you need sooner let me know.

I have been thinking about the AEQ capacity of the expansion, its link to electrification and the impact of electrification on shuttling - s. 13, s. 17

s. 13, s. 17

Are we looking at different options for AEQ capacity expansion?

When we have some more information on the electrification piece it would be good to better understand the impact on shuttling so we can assess whether the capacity expansion is enough to handle the peak season volumes.

Thanks,
Joanne

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: April 14, 2021 4:14 PM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: Passenger Loads on the-BSC

Joanne,

When we were scoping the proposed expansion of the BSC I was asked there would be any impact on passenger licence (and possibly lifesaving). I perhaps too quickly dismissed this as a concern. I understand she currently has a licence for 200. If the "actual" car capacity went up to something between 70-80 cars, and there is an average occupancy of 2 – 2.5 persons, we get uncomfortably close to the licence. A relatively small number of foot pax could put us over. Can we do some analysis on the peak loads on the BSC to assess what the average vehicle occupancy is; and the range of foot pax loads are seen (do we track the school kids?). Then I suppose we need to consider the crewing impact if say the licence did go to 300.

Thanking you in advance.

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Shuttling During Heavy Traffic

Page 1 of 2

No.	Chapter	Specific Audience <i>(who should be notified)</i>	Sponsor	Approver
07.01.06.165	Seamanship	Vessel Crew	Sr. Master	Marine Supt.

Introduction *(background and objectives)*

Lead Operators shall consider shuttling *(operating at a frequency that offers more sailings than scheduled)* during periods of heavy traffic.

An additional sailing should be considered when leaving more than 10 passengers or 9 vehicles behind and anticipating an overload on the next scheduled sailing during normal operations. (If route 22 is shuttling the above becomes a requirement)

An additional sailing must be carried out when leaving more than 20 passengers or 14 vehicles behind regardless of the expectation of subsequent sailings. (see exceptions in the guidelines below)

When expecting heavy traffic on long weekends, good weather weekends June through early September and during special events shuttling should commence at or before 0940. Due to the nature of the Baynes Sound Connector it is better to err by starting to shuttle early than to wait until it is too late.

Shuttling Guidelines:

§ 15



When a decision is made to shuttle, inform the following:

- OSC
- Buckley Bay terminal
- Route 22 vessel (coordinate with this vessel so as to maintain connecting service to Hornby)
- Post the sign in the Denman West terminal, noting that the ferry is shuttling.

BCF References:

External References:

Date: April 24, 2021

Shuttling During Heavy Traffic

Page 2 of 2

No.	Chapter	Specific Audience <i>(who should be notified)</i>	Sponsor	Approver
07.01.06.165	Seamanship	Vessel Crew	Sr. Master	Marine Supt.

- Ensure the LED sign is displaying the correct information in Denman West

BCF References:

External References:

Date: April 24, 2021

Doyle, Joanne

From: Doyle, Joanne
Sent: April 20, 2021 9:04 AM
To: Anderson, Brian; Simpson, Peter
Subject: BSC Capacity Preliminary Analysis
Attachments: AEQ Demand Analysis F20.pdf; Passenger Demand Analysis F20.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hi Peter and Brian,

Just thought I would share some of the high-level analysis being developed for the BSC capacity expansion project.

Still need to have some growth factored in (question out to Sean) as well as better understanding of the impact that charging an electrified BSC would have on the frequency of sailings above scheduled to help address peak demands based on modelled demand and vessel capacity options (to be identified).

Any comments or questions please let me know.

Thx
j

From: Doyle, Joanne
Sent: April 20, 2021 8:33 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: Passenger Loads on the BSC

Hi Bruce,

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s. 13, s. 17

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Sent: April 15, 2021 9:13 AM
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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>

Sent: April 15, 2021 7:22 AM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Subject: RE: Passenger Loads on the BSC

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Thanks,

Joanne

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Sent: April 14, 2021 4:14 PM

To: Doyle, Joanne <Joanne.Doyle@bcferries.com>

Cc: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Subject: Passenger Loads on the BSC

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Doyle, Joanne

From: McWalter, Emma
Sent: March 25, 2021 2:53 PM
To: Seitz, Robert; Jacobson, Mitchell
Cc: Joyce, Jeff; Monrad, Eric; Carroll, David; Doyle, Joanne
Subject: RE: BSC - Asset Betterment_PIR (Baynes Sound Connector AEQ increase and electrification)

Follow Up Flag: Follow up
Flag Status: Completed

Hi all, thanks for looping me into this discussion – great feedback back to Isaac from the TENG team! Clearly some work to do at my end to educate the Fleet PMO on the TNMP requirements!

The pre-imp study will provide the opportunity to answer many of the questions raised by TENG and also to understand if the proposed AEQ increase will be sufficient to address future growth.

A few comments from master planning wrt rationale for this proposed expansion:

- The expansion of the BSC will greatly reduce customer wait times and support more reliable sailing times through the Route 21 and Route 22 corridor during peak travel periods.
- The expansion of the BSC is key to supporting a vessel with a larger capacity on Rte 22:

s. 13, s. 17

s. 13, s. 17

- The electrification of the BSC furthers BC Ferries commitment to transitioning to clean technologies

Thanks,
Emma

Emma McWalter
Manager Terminal Strategic Planning
British Columbia Ferry Services Inc.
T: 250-978-1415 C: s. 15, s. 19
emma.mcwalter@bcferries.com
bcferries.com

From: Seitz, Robert <Robert.Seitz@bcferries.com>
Sent: March 23, 2021 6:33 AM
To: mitchell Jacobson <mitchjacobson@hotmail.com>; McWalter, Emma <Emma.McWalter@bcferries.com>

Cc: Joyce, Jeff <Jeff.Joyce@bcferries.com>; Monrad, Eric <Eric.Monrad@bcferries.com>; Carroll, David <David.Carroll@bcferries.com>

Subject: Fwd: BSC - Asset Betterment_PIR (Baynes Sound Connector AEQ increase and electrification)

FYI in this potential new project. s. 13, s. 17

s. 13, s. 17

We can discuss.

Rob Seitz, P.Eng
Superintendent, Terminal Development
British Columbia Ferry Services Inc.

T: 250-978-1268 C: s. 15, s. 19

Robert.Seitz@bcferries.com

bcferries.com

Begin forwarded message:

From: "Monrad, Eric" <Eric.Monrad@bcferries.com>
Date: March 22, 2021 at 9:43:14 PM PDT
To: "Wong, Isaac (Pak Yu)" <Isaac.Wong@bcferries.com>
Cc: "Seitz, Robert" <Robert.Seitz@bcferries.com>, "Adams, James W" <James.Adams@bcferries.com>
Subject: RE: BSC - Asset Betterment_PIR (Baynes Sound Connector AEQ increase and electrification)

Isaac,

I wasn't aware that this project was going to be activated and have a few concerns on the terminal side. Some of these will be addressed during the pre-implementation phase, but I've just jotted down my thoughts below.

- I'm not clear on the terminal improvements that are required.

s. 13, s. 17

- What are your assumptions for the terminal implementation budget? s. 13, s. 17

s. 13, s. 17

s. 13, s. 17

Will it be a similar charging system and supporting infrastructure?

- How much pre-imp budget have you allowed for preliminary design of the terminal and possibly traffic flow analysis and updated master plan layouts if we need to increase the size of the

holding compound? I'm assuming that this funding request is to go through to a detailed business case, and we require at least preliminary design and a class C cost estimate for the terminal components.

- Have you allowed any budget for First Nations consultation and capacity funding? s. 13, s. 17

s. 13, s. 17

- What are your expectations for technical and project management support for the terminal components of this project? I don't have this one in my staffing plan for the year.

Eric

Eric Monrad
Superintendent, Terminal Construction
British Columbia Ferry Services Inc.
Suite 500 – 1321 Blanshard Street, Victoria, BC
T: 250-978-2054
eric.monrad@bcferries.com
bcferries.com

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From: Adams, James W <James.Adams@bcferries.com>
Sent: March 22, 2021 5:49 PM
To: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Cc: Monrad, Eric <Eric.Monrad@bcferries.com>; Seitz, Robert <Robert.Seitz@bcferries.com>
Subject: RE: BSC - Asset Betterment_PIR (Baynes Sound Connector AEQ increase and electrification)

Hi Isaac,

Please find the attached PIR with suggested edits in green.

I've cc'd Eric Monrad on my response in case he has further suggestions. In terms of the AEQ increase, I think there should be a statement in the business need section how this aligns with the fleet and terminal master plans. The Buckley bay and DenW holding compounds have been carefully sized for 1 vessel's worth of vehicles. It will be important to study how the increased vessel AEQ may impact traffic flows at each terminal and how this fits in with the fleet and terminal master plans.

Also, as mentioned in the PIR, the BSC's home berth at DenW does not have capacity for shore charging.

s. 13, s. 17

Thanks,

James Adams, P.Eng.
Project Manager, Terminal Construction
British Columbia Ferry Services Inc.
T: 250-978-1317 M: s. 15, s. 19 F: 250-361-4922
james.adams@bcferries.com

bcferrys.com

From: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Sent: March 22, 2021 8:47 AM
To: Adams, James W <James.Adams@bcferries.com>
Subject: FW: BSC - Asset Betterment_PIR

Hi James,

Would you mind to take a quick look at the attached Pre-Imp request before I send out?

Thank you.

Yours sincerely,
Isaac Wong, P.Eng.
T: 604-204-2286 **C:** s. 15, s. 19

From: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Sent: March 21, 2021 10:35 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Cc: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: RE: BSC - Asset Betterment_PIR

Look pretty good guys. A few comments from me. (Re-attaching Bruce's document for Babak):

- My understanding was that pre-imp cannot be capitalized? Not certain on that though.
- Regarding the Terminal Upgrades Assumption: Our previous work determined that the existing BC Hydro service was marginally sufficient. s. 13, s. 17

s. 13, s. 17

- s. 13, s. 17

Thanks,
Miles

Miles McKinnon, P.Eng.
Engineering Manager, Electrical and Control Systems
British Columbia Ferry Services Inc.
T: 250-978-2068 **C:** s. 15, s. 19
miles.mckinnon@bcferries.com
bcferries.com

From: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Sent: March 21, 2021 10:19 PM
To: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>; McKinnon, Miles

<Miles.Mckinnon@bcferries.com>

Subject: RE: BSC - Asset Betterment_PIR

Isaac,

See the attached, with changes in red.

Bruce Paterson, P.Eng, M.Eng

Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.

Tel: (250) 978-1385

Cell: s. 15, s. 19

Fax: (250) 978-1166

bruce.paterson@bcferries.com

www.bcferries.com

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From: Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Sent: March 19, 2021 4:19 PM

To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>

Subject: BSC - Asset Betterment_PIR

Hi Bruce and Miles,

Can you please help to review attached BSC pre-imp funding request to see if I have said something incorrect?

It would be nice if you can reply by end of Monday. I will work on the estimate meanwhile, and submit at that time.

Thank you,

Isaac

Doyle, Joanne

From: Paterson, Bruce
Sent: March 14, 2022 9:45 PM
To: Doyle, Joanne; Simpson, Peter
Cc: Adams, James W; Amusan, Sam; Wong, Isaac (Pak Yu)
Subject: BSC Asset Betterment - Capacity proposals
Attachments: BSC Project - Strategic Planning Action Items Follow-up.pdf; BSC_2 AEQ Count (Rev.A).pdf; BSC_2 Commercial Count.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Vessel Refits & Retirements

Joanne/Peter,

I am following up our recent meetings on the BSC capacity expansion, re. items to follow up:

Item #3 – Heat Maps (AEQ Capacity).

s. 13, s. 17

s. 13, s. 17

Item #5 – Commercial Capacity.

s. 13, s. 17

s. 13, s. 17

Does this make sense, or are there other factors to consider?

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
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Doyle, Joanne

From: Paterson, Bruce
Sent: March 15, 2022 3:30 PM
To: Doyle, Joanne; Simpson, Peter
Cc: Adams, James W; Amusan, Sam; Wong, Isaac (Pak Yu)
Subject: RE: BSC Asset Betterment - Capacity proposals
Attachments: BSC-004 Life Saving Equipment Plan - Rev 3 Jul 17.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Vessel Refits & Retirements, ACTION REQUIRED

Joanne/Peter,

My clarifications in red in the text below.

Bruce Paterson, P.Eng, M.Eng
Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.
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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: March 15, 2022 1:38 PM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>
Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Subject: RE: BSC Asset Betterment - Capacity proposals

Hi Bruce & All,

Thank you very much for this summary, missing the last meeting I wondered where we left it.

Item #3 – Vessel Capacity

s. 13, s. 17

s. 13, s. 17

Item #4 – Commercial capacity

s. 13, s. 17

A couple other questions I have include:

- s. 13, s. 17
- s. 13, s. 17
- s. 13, s. 17
- s. 13, s. 17

Peter – any other factors we should be considering for the capacity of the vessel or either of the projects

s. 13, s. 17

?

Thanks,
Joanne

Joanne Doyle
Manager, Fleet Strategic Planning
Strategy & Community Engagement
British Columbia Ferry Services Inc.
The Atrium
Suite 500, 1321 Blanshard St., Victoria, BC V8W 0B7

T: 250-978-1322 C: s. 15, s. 19 F: 250-388-9599

Joanne.doyle@bcferries.com

bcferries.com | [Facebook](#) | [Twitter](#)

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From: Paterson, Bruce <Bruce.Paterson@bcferries.com>

Sent: March 14, 2022 9:45 PM

To: Doyle, Joanne <Joanne.Doyle@bcferries.com>; Simpson, Peter <Peter.Simpson@bcferries.com>

Cc: Adams, James W <James.Adams@bcferries.com>; Amusan, Sam <Sam.Amusan@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>

Subject: BSC Asset Betterment - Capacity proposals

Joanne/Peter,

I am following up our recent meetings on the BSC capacity expansion, re. items to follow up:

Item #3 – Heat Maps (AEQ Capacity). s. 13, s. 17

s. 13, s. 17

Item #5 – Commercial Capacity. s. 13, s. 17

s. 13, s. 17

Does this make sense, or are there other factors to consider?

Bruce Paterson, P.Eng, M.Eng

Director, Naval Architecture, Engineering British Columbia Ferry Services Inc.

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BSC Expansion Project

Strategic Planning Action Items from meeting Feb 10, 2022

From the February 10th BSC Project meeting there were a number of action items for Strategic Planning. The summary response for these to support discussion at next meeting March 3.

s. 13, s. 17



BSC Expansion Project

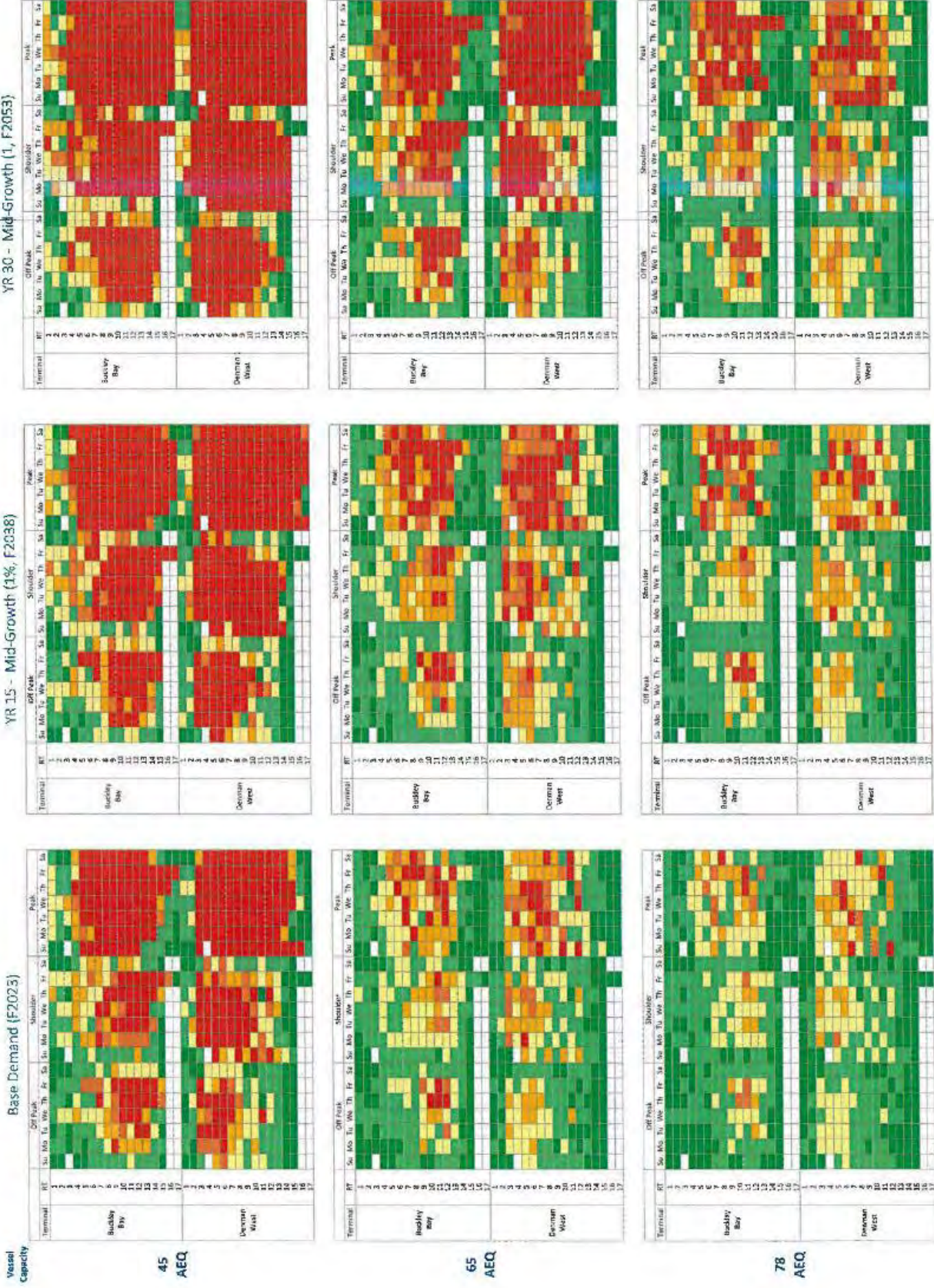
Strategic Planning Action Items from meeting Feb 10, 2022

s. 13, s. 17



APPENDIX 1 - HEAT MAPS

Sample Week Analysis - Mid Growth, No Shutting



APPENDIX 1 - HEAT MAPS

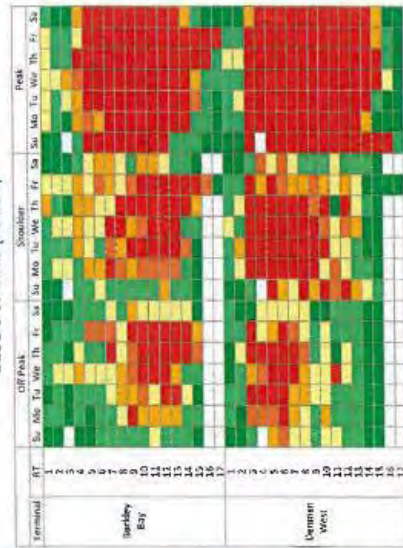
Sample Week Analysis - High Growth, No Shuttling

Base Demand (F2023)

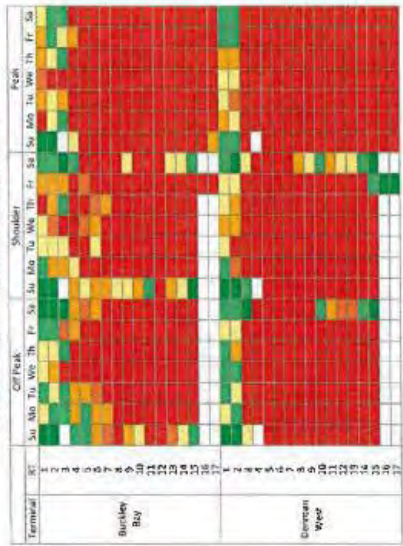
YR 30 - High-Growth (2.3%, F2033)

YR 15 - High-Growth (2.3%, F2038)

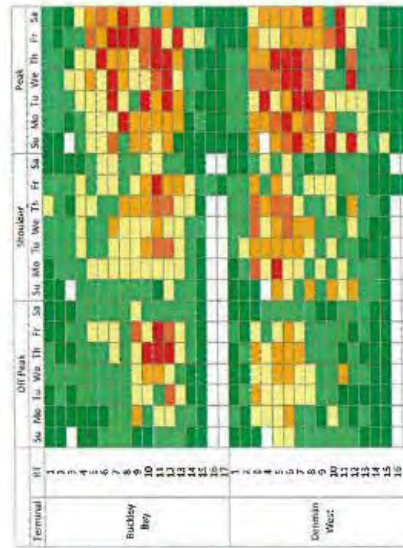
Vessel Capacity



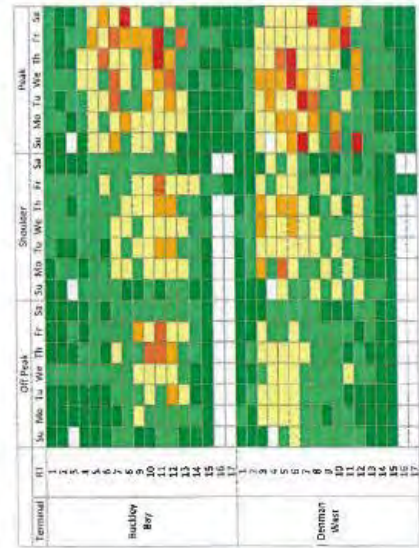
45 AEQ



65 AEQ



78 AEQ



BSC - Expansion Project Vessel Capacity Analysis - Modelled Available Capacity

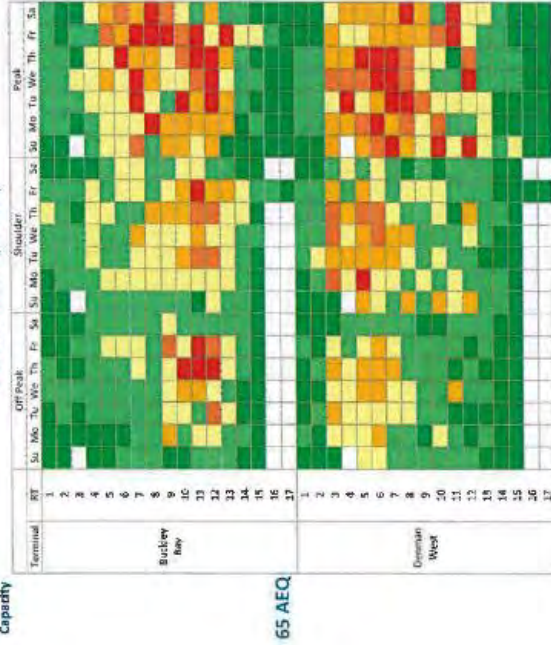


APPENDIX 1 - HEAT MAPS

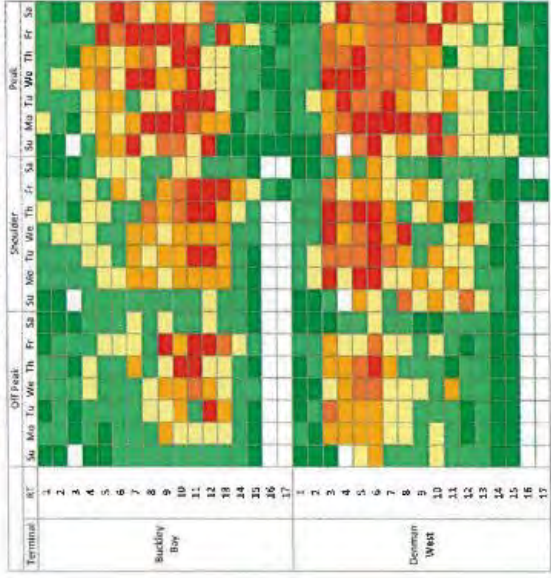
Sample Week Analysis - Mid Growth, Includes Shuttling as practical

Vessel Capacity

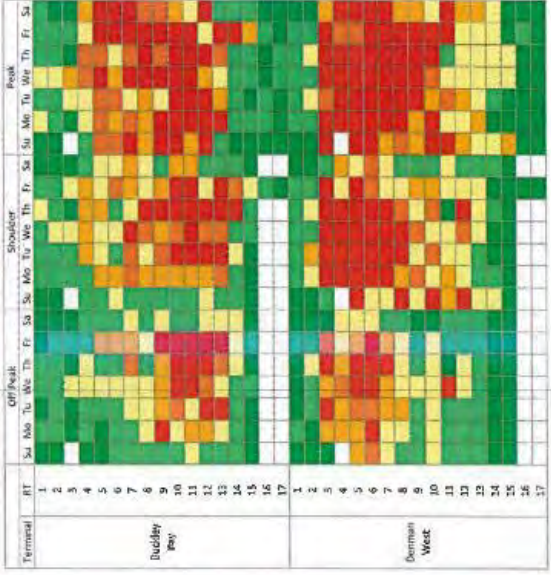
Base Demand (F2023)



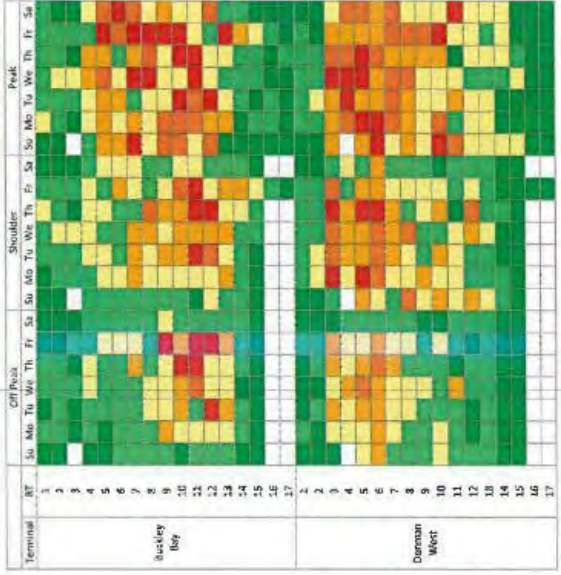
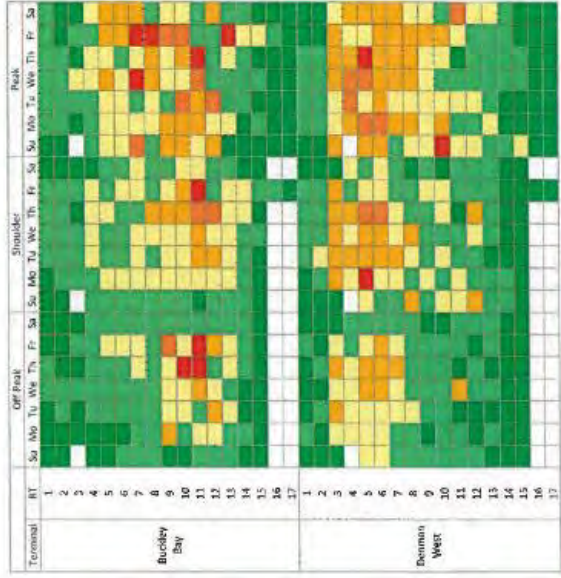
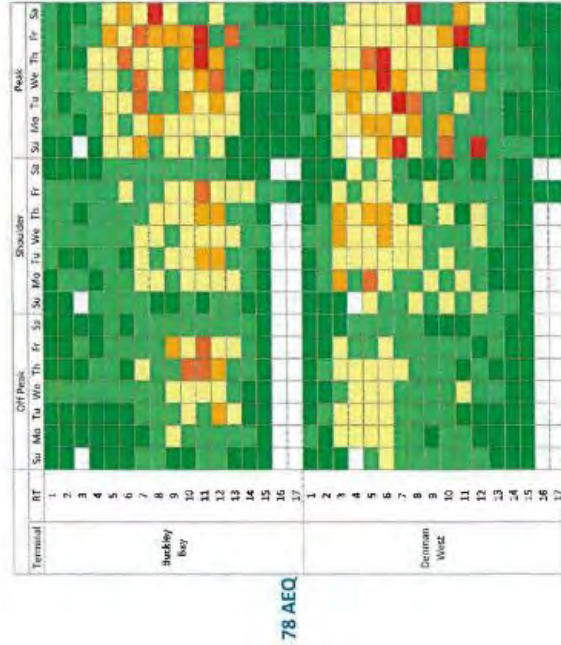
YR 15 - Mid-Growth (1%, F2038)

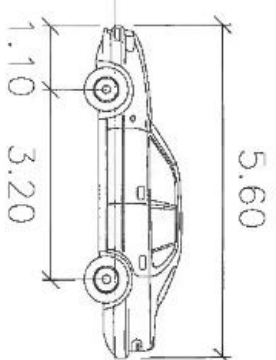


YR 30 - Mid-Growth (1%, F2053)



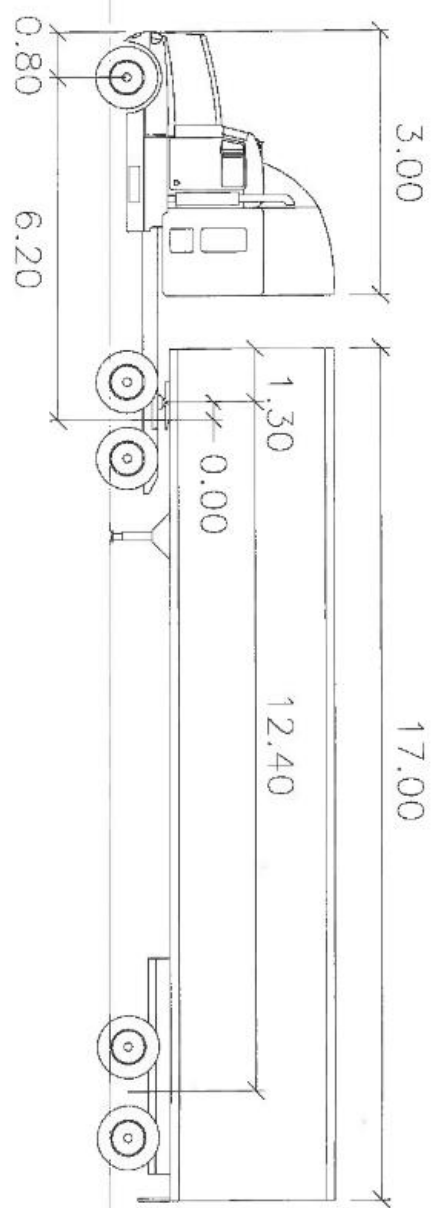
78 AEQ





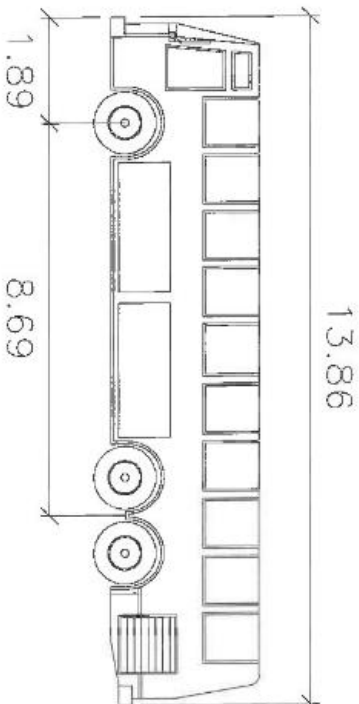
P TAC-2017 (CA)

- Width : 2.00
- Track : 2.00
- Lock to Lock Time : 6.0
- Steering Angle : 35.9



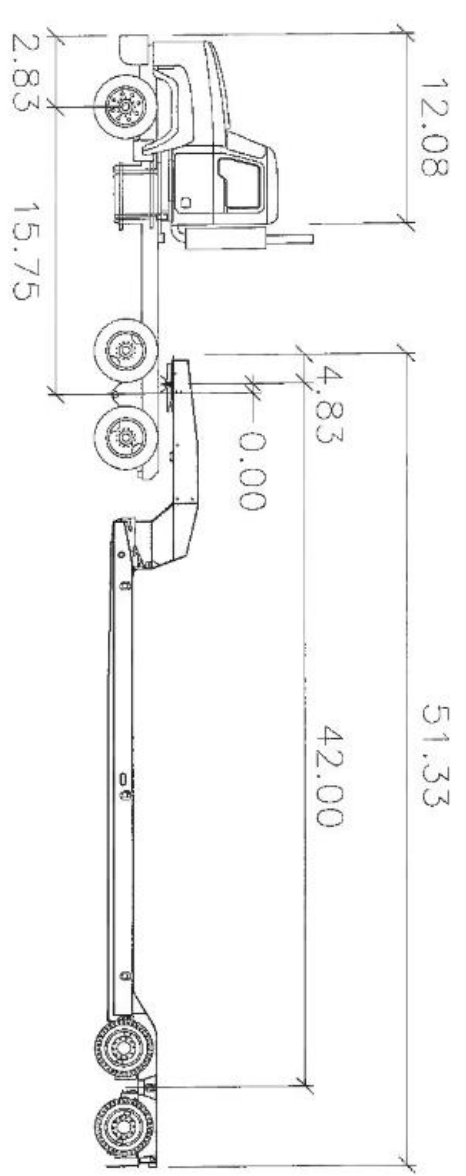
WB-20 TAC-2017 (CA)

- Tractor Width : 2.60
- Trailer Width : 2.60
- Tractor Track : 2.60
- Trailer Track : 2.60
- Lock to Lock Time : 6.0
- Steering Angle : 28.2
- Articulating Angle : 70.0



BUS-14M AASHTOM 2011 (US)

- Width : 2.59
- Track : 2.59
- Lock to Lock Time : 6.0
- Steering Angle : 45.2



Low-Boy Trailer 53 feet NCHRP REPORT 659 (US)

- Tractor Width : 8.50
- Trailer Width : 8.50
- Tractor Track : 8.50
- Trailer Track : 8.50
- Lock to Lock Time : 6.0
- Steering Angle : 22.3
- Articulating Angle : 70.0

TYPICAL AUTOTURN VEHICLES USED

Doyle, Joanne

From: Liu-Atkinson, Hansi
Sent: March 05, 2021 10:20 AM
To: McKinnon, Miles; Doyle, Joanne; Manouchehrinia, Babak
Subject: RE: New Capital Project - BSC Asset Betterment

There must be some witchcraft involved for sure.
Thanks for clarifying. This makes sense (I was thinking of a new vessel completed).

Hansi

From: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Sent: March 05, 2021 10:02 AM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>; Liu-Atkinson, Hansi <Hansi.Liu-Atkinson@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: RE: New Capital Project - BSC Asset Betterment

That clears it up perfectly, thanks Joanne! You must use Ouija board to figure this all out?

Miles

Miles McKinnon, P.Eng.
Engineering Manager, Electrical and Control Systems
British Columbia Ferry Services Inc.
T: 250-978-2068 C: s. 15, s. 19
miles.mckinnon@bcferries.com
bcferries.com

From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: March 05, 2021 9:59 AM
To: McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Liu-Atkinson, Hansi <Hansi.Liu-Atkinson@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: RE: New Capital Project - BSC Asset Betterment

Hi All,

The BSC will remain on Rte 21 and the Kahloke will be on Rte 22 until retirement, s. 18, s. 17

s. 18, s. 17

s. 18, s. 17

Hope those brief notes help – let me know if you have any more questions.

Thx,
Joanne

From: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Sent: March 05, 2021 9:47 AM

To: Liu-Atkinson, Hansi <Hansi.Liu-Atkinson@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Cc: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Subject: RE: New Capital Project - BSC Asset Betterment

Hansi, you read this closer than me to catch that!

For route **21** (Buckley Bay-Denman) the plan is to retain the BSC. s. 13, s. 17

s. 13, s. 17

Route **22** is Denman-Horby. Regarding the comment on extra capacity for this route, there must be a re-deployment being planned – but I'm not sure the details. We could ask Joanne?

Miles

Miles McKinnon, P.Eng.
Engineering Manager, Electrical and Control Systems
British Columbia Ferry Services Inc.
T: 250-978-2068 C: s. 15, s. 19
miles.mckinnon@bcferries.com
bcferries.com

From: Liu-Atkinson, Hansi <Hansi.Liu-Atkinson@bcferries.com>
Sent: March 05, 2021 9:42 AM
To: McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>
Subject: RE: New Capital Project - BSC Asset Betterment

Hi Miles

This is exciting, thank you for sharing.

One question on Frank's first point, is the plan to procure a new vessel completely or retrofit the existing BSC? "... including the increase capacity that will be created on route 22 with a new vessel"

Thanks!
Hansi

From: McKinnon, Miles <Miles.Mckinnon@bcferries.com>
Sent: March 05, 2021 9:38 AM
To: Manouchehrinia, Babak <Babak.Manouchehrinia@bcferries.com>; Liu-Atkinson, Hansi <Hansi.Liu-Atkinson@bcferries.com>
Subject: FW: New Capital Project - BSC Asset Betterment

Hi Babak and Hansi,

Just passing this on for awareness. The project for the Baynes Sound Connector is now official. In the near future I expect we'll have some meetings to plan the approach. s. 13, s. 17

s. 13, s. 17

More to come!

Miles

Miles McKinnon, P.Eng.

Engineering Manager, Electrical and Control Systems
British Columbia Ferry Services Inc.
T: 250-978-2068 C: s. 15, s. 19
miles.mckinnon@bcferries.com
bcferries.com

From: Camden, Stuart <Stuart.Camden@bcferries.com>
Sent: March 04, 2021 11:35 AM
To: Camaraire, Frank <Frank.Camaraire@bcferries.com>; Smith, Sandy <Sandy.Smith@bcferries.com>; Johnston, Darren <Darren.Johnston@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Cc: Elliott, Scott <scott.elliott@bcferries.com>; Riis, Daniel <Daniel.Riis@bcferries.com>; Stahuliak, Marian <Marian.Stahuliak@bcferries.com>; de Koninck, Captain Al <Al.deKoninck@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: RE: New Capital Project - BSC Asset Betterment

Hi Frank,

I will have the project setup in our system and then get a pre-imp request document started in the workflow to send to CPBC for approval.

Stuart Camden, CPA, CA
Senior Business Analyst
Financial Planning & Analysis (Capital)
British Columbia Ferry Services Inc.
Suite 500-1321 Blanshard Street, Victoria, BC, V8W 0B7
T: 250-978-2065 C: s. 15, s. 19
Stuart.Camden@bcferries.com
bcferries.com

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From: Camaraire, Frank <Frank.Camaraire@bcferries.com>
Sent: Thursday, March 4, 2021 11:10 AM
To: Smith, Sandy <Sandy.Smith@bcferries.com>; Camden, Stuart <Stuart.Camden@bcferries.com>; Johnston, Darren <Darren.Johnston@bcferries.com>; Wong, Isaac (Pak Yu) <Isaac.Wong@bcferries.com>
Cc: Elliott, Scott <scott.elliott@bcferries.com>; Riis, Daniel <Daniel.Riis@bcferries.com>; Stahuliak, Marian <Marian.Stahuliak@bcferries.com>; de Koninck, Captain Al <Al.deKoninck@bcferries.com>; McKinnon, Miles <Miles.Mckinnon@bcferries.com>; Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: New Capital Project - BSC Asset Betterment

Good Morning,

At the request of the COO, I have been tasked to create a new project to explore adding the following capabilities to the BSC:

1. Increase the vessel AEQs carrying capacity to better match the demand on that corridor (Route 21/22), including the increase capacity that will be created on route 22 with a new vessel (Darren can perhaps re-phrase this more accurately); and
2. Convert the BSC to 100% electrical (battery) vessel.

Some pre-implementation funding would be necessary to advance the engineering work on the matters to determine feasibility, costs and schedule.

Project Manager: Isaac Wong

Project Owner: Darren Johnston

Project Sponsor: Brian Anderson (to be confirmed with Brian)

What are the steps required to formally create this new project?

Thank you

Frank

Frank Camaraire

Executive Director, Engineering

Operations Division

British Columbia Ferry Services Inc.

Suite 500 – 1321 Blanshard Street, Victoria, British Columbia, V8W 0B7

T: 250-978-1384 **C:** s. 15, s. 19 **F:** 250-978-1166

frank.camaraire@bcferries.com

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Doyle, Joanne

From: Doyle, Joanne
Sent: December 10, 2020 11:22 AM
To: Anderson, Brian
Cc: McWalter, Emma; Hendry, David
Subject: RE: Stretched BSC

Perhaps – but I think that the power requirement is very different for a cable – so it may have some similarities/common infrastructure ss. 13, 17

ss. 13, 17

I like this – finally some interest in an idea we have been chatting about for some time. I am going to set up a meeting in the new year for Fleet Tech/ENG and Strategy to work through a plan.

From: Anderson, Brian <Brian.Anderson@bcferries.com>
Sent: December 10, 2020 11:18 AM
To: Doyle, Joanne <Joanne.Doyle@bcferries.com>; McWalter, Emma <Emma.McWalter@bcferries.com>; Hendry, David <David.Hendry@bcferries.com>
Subject: RE: Stretched BSC

Perhaps the BSC could be the proof of concept for the Island Class?

From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: December 10, 2020 8:16 AM
To: Anderson, Brian <Brian.Anderson@bcferries.com>; McWalter, Emma <Emma.McWalter@bcferries.com>; Hendry, David <David.Hendry@bcferries.com>
Subject: RE: Stretched BSC

Excellent – it is something we have been talking about for a while and I have identified it as a requirement for introducing a larger vessel to Rte 22. I know Stu Wills did a bunch of work on it s. 22 Great to hear.

From: Anderson, Brian <Brian.Anderson@bcferries.com>
Sent: December 10, 2020 7:59 AM
To: McWalter, Emma <Emma.McWalter@bcferries.com>; Doyle, Joanne <Joanne.Doyle@bcferries.com>; Hendry, David <David.Hendry@bcferries.com>
Subject: Fwd: Stretched BSC

Please note request for weighing in...

Begin forwarded message:

From: "Collins, Mark" <Mark.Collins@bcferries.com>
Date: December 10, 2020 at 7:42:13 AM PST
To: "Storey, Corrine" <Corrine.Storey@bcferries.com>, "Anderson, Brian" <Brian.Anderson@bcferries.com>
Cc: "Marshall, Captain Jamie" <Jamie.Marshall@bcferries.com>
Subject: Stretched BSC

Good morning Corrine, Brian,

Please task Bruce Paterson and his design team to start to look at the possibilities of stretching the Baynes sound connector.

We need to start to prepare for this eventuality. Although it may be some years away, we need to do some pre-feasibility work on this so we can understand if it is even a possibility.

Such a stretching could also be combined with electrifying the propulsion system, which could go a long way to improving her reliability and lowering maintenance costs.

ss. 13, 17

The stretching project would increase the capacity from the present 50 AEQ to a target of 70 or 80 AEQ. This may become necessary if we are ever to permit a larger ship to operate on route 22.

Brian, please have the fleet and Terminal master planning teams weigh in with their projections for necessary capacity.

Jamie, this is merely FYI at this stage.

Let's get the thinking and early planning underway in all departments for this. I can see this becoming an issue in the coming years. Let's be ready with a plan.

Thank you,

Mark

M. Collins
BC Ferries

M[s. 15, s. 19]

Doyle, Joanne

From: Paterson, Bruce
Sent: December 10, 2020 4:05 PM
To: Doyle, Joanne; Storey, Corrine
Cc: McKinnon, Miles
Subject: RE: BSC - Electrification and Capacity Increase
Attachments: 70AEQ GENERAL ARRANGEMENT Sht1to2 Rev 0.pdf; RE: BSC electrification follow-up; Cable Ferry Profile(hybrid).pdf; Cable Ferry(Damen Analysis).pdf

Follow Up Flag: Follow up
Flag Status: Flagged


Categories: ACTION REQUIRED, Vessel Refits & Retirements

Joanne, Corrine,

I've attached some materials for the meeting next month, where:

(1) In discussing capacity expansion with Al de Koninck, ss. 13, 17 

ss. 13, 17 

(2) On the electrification, we had Damen do an energy analysis, and Miles also did a check. ss. 13, 17 

ss. 13, 17, s. 21 

Bruce Paterson, P.Eng, M.Eng
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From: Doyle, Joanne <Joanne.Doyle@bcferries.com>
Sent: December 10, 2020 8:41 AM
To: Paterson, Bruce <Bruce.Paterson@bcferries.com>
Subject: BSC - Electrification and Capacity Increase

Good Morning Bruce,

I just got a note from Brian (from Mark) indicating interest to draft a plan for the electrification and capacity increase on the BSC. I know you have looked at this in the past and Stu Wills had also looked into this. I was thinking that I would set up a meeting in the new year with Fleet Technical, Terminal/Fleet Engineering and Strategy to discuss further and make a plan. Does this sound like a good idea? Is there anyone in particular that I should be inviting?

ss. 13, 17

Let me know what you think.

Thanks,
Joanne

Joanne Doyle
Manager, Fleet Strategic Planning
Strategy & Community Engagement
British Columbia Ferry Services Inc.
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Joanne.doyle@bcferries.com
bcferries.com

Doyle, Joanne

From: McKinnon, Miles
Sent: September 07, 2017 1:44 PM
To: Wills, Stuart
Cc: Vollmers, Tony; Paterson, Bruce; Nath, Avisek
Subject: RE: BSC electrification follow-up

Hi Stu,

The calculation is as follows (assuming 50 kWh consumed from the battery in a round trip):



Cheers,
Miles

Miles McKinnon, P.Eng., PMP
Engineering Manager, System Controls
British Columbia Ferry Services Inc.
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miles.mckinnon@bcferries.com
bcferries.com

From: Wills, Stuart
Sent: September 07, 2017 11:14 AM
To: McKinnon, Miles
Cc: Vollmers, Tony; Paterson, Bruce; Nath, Avisek
Subject: RE: BSC electrification follow-up

Hi Miles

Thanks for this e-mail and the time spend in clearly laying out the steps required to be followed.

Given the power available at Buckley Bay and the time available – say 15 minutes of charge time every hour - verses 48 to 50 kwh for a round trip , how much charge (kwh) can be recovered during the 15 minutes charge time ? So over an operational day will the charge periods equal the discharge periods?

Thanks
Stu

Stuart Wills
Engineering Superintendent - North Islands
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stuart.wills@bcferries.com
bcferries.com

From: McKinnon, Miles
Sent: September 07, 2017 10:50 AM
To: Wills, Stuart
Cc: Vollmers, Tony; Paterson, Bruce; Nath, Avisek
Subject: BSC electrification follow-up

Hi Stuart,

Thanks for hosting us last week for our BSC visit, it was great to see the vessel and terminal in person.

I have done some analysis based on the power profile that you provided of percent engine loading (from CAT engine controller) and the known rated engine bkW. ss. 13, 17

ss. 13, 17

From my perspective the key points required to progress an electrification business case are the following:

ss. 13, 17

ss. 13, 17

Since this project is not a corporate priority, Tony and I will not be able to commit a large amount of time at this stage. However, we will be available to assist as we can.

Tony, Bruce: Feel free to add your comments.

Thanks,
Miles

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