INVITATION TO TENDER 18-14

BIG ROCK BOAT RAMP RECONSTRUCTION

MASTER MUNICIPAL CONSTRUCTION DOCUMENTS - 2009 Platinum Edition

UNIT PRICE CONTRACT

April 19th, 2018

301 St. Ann's Road, Campbell River, B.C. V9W 4C7
Telephone: 250.286.5766; Fax: 250.286.5763
clinton.crook@campbellriver.ca

INVITATION TO TENDER 18-14

BIG ROCK BOAT RAMP RECONSTRUCTION

TABLE OF CONTENTS

The complete Contract Documents consist of the following parts:

1. The Master Municipal Construction Documents (Tender Package) consisting of the following parts (**included in this tender package)**:

    - Invitation to Tender
    - Instructions to Tenderers, Part I
    - Form of Tender
        - Appendix 1 - Schedule of Quantities and Prices
        - Appendix 2 - Preliminary Construction Schedule
        - Appendix 3 - Experience of Superintendent
        - Appendix 4 - Comparable Work Experience
        - Appendix 5 - Subcontractors
        - Appendix 6 - Tenderer's Current Projects Underway
    - Agreement - Draft
        - Schedule 1 - Schedule of Contract Documents
        - Schedule 2 - List of Contract Drawings
        - Appendix 7 - Safety Covenant
        - Appendix 8 - Prime Contractor Agreement
        - Appendix 9 – Acceptance of Base Course For Asphalt Paving
    - Supplementary General Conditions
    - Supplementary Specifications

2. Additional reference documentation consisting of the following parts **(not distributed in this tender package) available at www.campbellriver.ca**:
    - Supplementary Specifications, City of Campbell River, Design Standards 2010, Appendix A to Subdivision and Development Servicing Bylaw 3419
    - City of Campbell River, Approved Utility Product List April 2011

3. The balance of the Master Municipal Construction Documents, Platinum, 2009 edition. These documents are available in the "MMCD - General Conditions, Specifications and Standard Detail Drawings" **(not distributed in this tender package)**:

4. Fisheries Act Authorization #17-HPAC-01167:
    - Supplemental Report
    - Appendix 4

5. Levelton Consultants Ltd. March 20, 2013 Geotechnical Assessment Big Rock Boat Ramp Renewal Project Campbell River, BC is attached **For Information Only** and does **not** form part of the Tender *Contract Documents.*

6. Highland Engineering Services Ltd. Technical Memorandum – Test Pitting – June 23, 2017 is attached **For Information Only** and does **not** form part of the Tender *Contract Documents*.

INVITATION TO TENDER 18-14

BIG ROCK BOAT RAMP RECONSTRUCTION

The City of Campbell River invites tenders for the Big Rock Boat Ramp Reconstruction**.** This contract includes the following generalized scope of work:

Work under this Contract includes, but is not limited to, all supervision, construction, equipment, labour, material, permits and related items required for the reconstruction of the Big Rock Boat Ramp breakwaters, concrete ramp, riprap embankments, storm sewer, and installation of floating dock units (supplied by the Owner).

This Tender is available electronically by downloading from the City's website at:
www.campbellriver.ca/city_services/purchasing/request_for_proposal.asp

A **mandatory** site meeting will be **NOT** held.

This Tender is scheduled to close at:

Tender Closing Time:	**3:00 p.m. local time**
Tender Closing Date:	**Wednesday May 16th, 2018** *There will NOT be a Public Opening for this Tender*
Delivered to:	City of Campbell River City Hall 301 St. Ann's Road 1st Floor Reception Desk Campbell River, BC V9W 4C7 **ATTN: Clinton Crook – Purchasing & Risk Management Officer**
Tender Enquiries:	Clinton Crook, SCMP, CPSM Purchasing & Risk Management Officer Telephone: 250.286.5766 Email: clinton.crook@campbellriver.ca

INVITATION TO TENDER 18-14

BIG ROCK BOAT RAMP RECONSTRUCTION

RECEIPT CONFIRMATION FORM

As receipt of this document, and to directly receive any further information, addendums, etc. regarding this competition, please return this form to:

ATTN: Clinton J. Crook, SCMP, CPSM,
Purchasing & Risk Management Officer
Email: clinton.crook@campbellriver.ca
Fax: 250.286.5741

Company Name: _____

Address: _____

City: _____

Province/State: _____ Postal/Zip Code: _____

Telephone No: _____ Fax No: _____

Contact Person: _____

Title: _____

Email: _____

CITY OF CAMPBELL RIVER

TENDER 18-14

BIG ROCK BOAT RAMP RECONSTRUCTION

INSTRUCTIONS TO TENDERERS

PART I

TABLE OF CONTENTS **Page**

INSTRUCTIONS TO TENDERERS - PART I

TO BE READ WITH "INSTRUCTIONS TO TENDERERS - PART II" CONTAINED IN THE EDITION OF THE PUBLICATION "MASTER MUNICIPAL CONSTRUCTION DOCUMENTS" AND APPLICABLE CITY OF CAMPBELL RIVER BYLAWS SPECIFIED IN ARTICLE 2.2 BELOW

Reference No.: **TENDER 18-14**

Contract: **BIG ROCK BOAT RAMP RECONSTRUCTION**

Introduction **1**

1.1 These Instructions apply to and govern the preparation of tenders for this *Contract*. The *Contract* is generally for the following work:

Work under this Contract includes, but is not limited to, all supervision, construction, equipment, labour, material, permits and related items required for the reconstruction of the Big Rock Boat Ramp breakwaters, concrete ramp, riprap embankments, storm sewer, and installation of floating dock units (supplied by the Owner).

1.2 Direct all tender inquiries regarding the Tender, to:

Clinton Crook, SCMP, CPSM,
Purchasing & Risk Management Officer
Telephone: 250.286.5766
Email: clinton.crook@campbellriver.ca

Tender Documents **2**

2.1 The tender documents which a tenderer should review to prepare a tender consist of all of the *Contract Documents* listed in Schedule 1 entitled "Schedule of Contract Documents". Schedule 1 is attached to the Agreement which is included as part of the tender package. The *Contract Documents* include the Drawings listed in Schedule 2 to the Agreement, entitled "List of Drawings".

2.2 A portion of the Contract Documents is included by reference. Copies of these documents have not been included with the tender package. These documents are the Instructions to Tenderers - Part II, General Conditions, Specifications and Standard Detail Drawings contained in the publication entitled "Master Municipal Construction Documents - General Conditions, “Specifications and Standard Detail Drawings" and relevant sections of Supplementary Specifications, City of Campbell River, Design Standards 2010, Appendix A to Subdivision and Development Servicing Bylaw 3419. Refer to Schedule 1 attached to the Agreement or, if no edition has been specified, then the applicable edition shall be the most recent edition as of the date of this *Contract*. All sections of this publication

are by reference included in the *Contract Documents*.

2.3 Any additional information made available to Tenderers prior to the Tender Closing Time by the *Owner* or representative of the *Owner*, such as geotechnical reports or as-built plans, which is not expressly included in Schedule 1 or Schedule 2 to the Agreement, is not included in the *Contract Documents*. Such additional information is made available only for the assistance of tenderers who must make their own judgement about its reliability, accuracy or completeness and neither the *Owner* nor any representative of the *Owner* gives any guarantee or representation that the additional information is reliable, accurate or complete.

Submission of Tenders

3

3.1 Tenders must be submitted in a sealed opaque package, clearly marked on the outside with the above *Contract* Title and Reference No., and must be received on or before:

Tender Closing Time: **3:00 p.m. local time**
There will NOT be a Public Opening for this Tender

Tender Closing Date: **Wednesday May 16th, 2018**

Delivered to: City of Campbell River City Hall
301 St. Ann's Road
1st Floor Reception Desk
Campbell River, BC V9W 4C7
ATTN: Clinton Crook – Senior Buyer

3.2 Late tenders will not be accepted or considered, and will be returned unopened.

3.3 Tender Submission

.1 Tenders **must** be submitted on the Tender Forms included in these tender documents. The addition to or changing of any words in these Tender Forms by the tenderer or the failure to comply with and complete all items may be cause for rejection without consideration of the tender.

.2 The Tender Submission **must** include acknowledgement of receipt of all issued addenda.

.3 The Tender Submission **must** include the specified financial security, in the form of the "Bid Security" as required in Section 5.2 of the Instructions to Tenderers Part II.

.4 The Form of Tender **must** bear the signature of a legal signing authority of the tenderer.

.5 Other than acknowledgement of receipt of addenda, or request for withdrawal or revision, documents submitted as part of a

tender will **not** be considered if received by any of the Owner's facsimile machines.

.6 Except as expressly and specifically permitted in these Instructions to Tenderers, no Tenderers shall have any claim for any compensation of any kind whatsoever, as a result of participating in the tender, and by submitting a bid, each Tenderer shall be deemed to have agreed that it has no claim.

Additional Instructions to Tenderers **4**

Freedom of Information 4.1 The *Owner* is subject to the provisions of the Freedom of Information and Protection of Privacy Act. As a result, while Section 21 of the Act does offer some protection for third party business interests, the *Owner* cannot guarantee that any information provided to the *Owner* can be held in confidence. All tenders, after closing time and date become the property of the *Owner*.

Cost of Tender Submission 4.2 The *Owner* shall not be liable for a Tenderer's cost of submitting a tender.

Evaluation Criteria 4.3 (a) The *Owner* reserves the right to waive informalities in or reject any or all tenders or accept the tender deemed most favourable in the interests of the *Owner*. Tenders will be evaluated on the combination of information provided in the Form of Tender and Appendices, which may offer the best value and not necessarily the lowest price. The *Owner* reserves the right to conduct pre-selection meetings with Tenderers. The *Owner* further reserves the right to conduct post-selection meetings in order to correct, change or adapt the selected Tender to the wishes of the *Owner*. **Acceptance of any tender may be subject to budgetary considerations and/or City of Campbell River Council approval, and/or the approval of other jurisdictions having authority.** Without limiting the foregoing, and without limiting paragraph 15.1 of the Instructions to Tenderers Part II, in the event that Fisheries and Oceans Canada has not issued the Fisheries Act Authorization referred to in paragraphs 4.11 and 4.13 within 60 calendar days of the *Tender Closing Date* the *Owner* reserves the right to reject all tenders, and not award the *Contract*.

Construction Association Policies 4.4

4.4.1 The *Owner* is not a member of the Public Construction Council of British Columbia, the British Columbia Construction Association or any other construction association.

4.4.2 The *Owner* does not adopt or agree to be bound by "The Procedures and Guidelines Recommended For Use on Publicly Funded Construction Projects" produced by the Public Construction Council of British Columbia, September 1989, or any other

procedure/guideline recommended, adopted or produced by any construction association in the tendering and award of the *Contract* of this project.

Good Neighbour Policy

4.5

4.5.1 The *Owner's* Good Neighbour Policy as adopted by City of Campbell River Council on April 15, 1997 shall apply to this contract.

4.5.2 The Policy states: "That Contractors working on Municipal rights-of-way or on private land where new rights-of-way are being created, be required to provide written notice to the residents in the immediate area of the works, describing what is being constructed, when the works will occur, who to contact for more information and what precautions should be taken if necessary; and that the work-site be posted for safety reasons."

Mandatory Site Meeting

4.6 A **mandatory** site meeting will **NOT** be held.

Addition\Deletion

4.7 Tenderers are advised that the *Owner* may, at its option, and subject to available funding and budgetary considerations, delete any *Work* described in the *Contract Documents* or may require that optional work be added to the scope of *Work*.

Omissions and Discrepancies

4.8 The Tenderer must carefully examine the *Contract Documents* and the site of the proposed works, judging for and satisfying themselves as to the probable conditions to be encountered. Should a Tenderer find omissions from or discrepancies in the *Contract Documents*, or be in doubt as their meaning, the Tenderer should notify the Owner no later than 5 days prior to the tender closing, who may cause to send a written instruction to all Tenderers in the form of an addendum, which shall become part of the contract and shall be covered in the contract price. The Tenderer may not claim, after the submission of a tender, that there was any misunderstanding with respect to the conditions imposed by the documents. No oral interpretations made to a Tenderer as to the meaning of the *Contract Documents* shall be considered binding. Every request for an interpretation shall be made in writing, forwarded to the office referred to in paragraph 3.1 of the Instructions to Tenderers – Part I.

Amendment of Tenders

4.9

4.9.1 Delete Paragraphs 12.1 of the Instructions to Tenderers, Part II and replace with the following paragraphs 4.9.2 and 4.9.3:

4.9.2 A Tenderer may, without prejudice to itself, withdraw or revise a tender after it has been deposited with the Owner, provided the request for withdrawal or revision is filed with the Owner in writing, via hand, mail, fax, or e-mail before the time set for the Tender closing to the office referred to in paragraph 3.1 of the Instructions to Tenderers - Part 1. In the case of revision(s), a revised price will

not be accepted, only the addition to or deduction from the tender price will be accepted.

4.9.3 In the case of facsimile or e-mail requests for withdrawal or revision, they will only be accepted if they are received by the *Owner's* Supply Management Department facsimile machine at 250.286.5763 or via e-mail at clinton.crook@campbellriver.ca before the scheduled tender closing time. Tenderers assume the entire risk that the facsimile and computer equipment and staff at the above office will receive the facsimile or e-mail containing the withdrawal or revision. The *Owner* assumes no risk or responsibility whatsoever that any facsimile or e-mail will be received as required and shall not be liable to any *Tenderer* if for any reason a facsimile or e-mail is not received.

For purposes of this paragraph 4.9.3,"received" means the request for withdrawal or revision is visible to the *Owner's* staff in its entirety, and is either in printed form or is capable of immediate reproduction in printed form.

Sub-Surface Conditions

4.10 A geotechnical assessment and test pitting have been completed and the related reports are attached to this Tender **For Information Only**. Tenderers shall make their own assessment of the soil and groundwater conditions at the location.

Environmental Conditions

4.11 An Application for Authorization is currently under review with Fisheries and Oceans Canada (DFO). The issuance of this Authorization is a necessary condition for performance of the Work. While it is expected that this Authorization will be in place in time for the Construction period, as stated in paragraph 4.3 the *Owner* reserves the right to reject all tenders, and not award the *Contract*, if the Authorization is not issued within 60 calendar days of the *Tender Closing Date* . The *Contractor* is required to ensure all conditions of this Authorization are fully adhered to for all Construction related. See Application for Fisheries Act Authorization – Appendix 4 and Supplemental Report.

Working Hours

4.12 Work inside the *Owner's* Property shall be carried out between the hours of 7:00 a.m. and 10:00 p.m. seven (7) days a week unless other arrangements are made between the *Owner* and the *Contractor*.

Commencement And Completion of Work

4.13 The *Owner* requires that the *Work* under this Contract be completed as quickly as possible after *Contract* award, and within the following milestones:

This project requires that all conditions of the Fisheries Act Authorization #17-HPAC-00167, including those related to timing of delivery of the works, be met. This includes requirement that the

marine work be completed over the period of July 1 – August 31, 2018 and that those specific in-water works, as identified in the Environmental Mitigation Plan contained within the Authorization, be completed during low tides

Substantial Performance of this *Contract* to be achieved within 50 *Days* from receipt of the Notice to Proceed.

Form of Tender

CITY OF CAMPBELL RIVER

Reference No.: **TENDER 18-14**

Contract: **BIG ROCK BOAT RAMP RECONSTRUCTION**

TO OWNER:

1 I (WE), THE UNDERSIGNED:

1.1 have received and carefully reviewed all of the *Contract Documents*, including the Instructions to Tenderers, the specified edition of the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings" and the following Addenda:

_____
_____
_____
_____
_____
_____;
(ADDENDA, IF ANY) **(TENDERER TO COMPLETE)**

1.2 have full knowledge of the *Place of the Work*, and the *Work* required; and

1.3 have complied with the Instructions to Tenderers; and

2 ACCORDINGLY I (WE) HEREBY OFFER:

2.1 to perform and complete all of the *Work* and to provide all the labour, equipment and material as set out in the *Contract Documents*, in strict compliance with the *Contract Documents*; and

2.2 to achieve *Substantial Performance* of the *Work* within 50 *Days* from receipt of a Notice to Proceed; and

2.3 to do the *Work* for the price, which is the sum of the products of the actual quantities incorporated into the *Work* and the appropriate Lump Sums set out in Appendix 1, the "*Schedule of Quantities and Prices*", plus any lump sums or specific prices and adjustment amounts as provided by the *Contract Documents*. For the purposes of tender comparison, our offer is to complete the *Work* for the "*Tender Price*" as set out on

Tenderer's Initial	Owner's Initial

Appendix 1 of this Form of Tender. Our *Tender Price* is based on the estimated quantities listed in the *Schedule of Quantities and Prices*, and excludes *GST*.

3 I (WE) CONFIRM:

3.1 that we understand and agree that the quantities as listed in the *Schedule of Quantities and Prices* are estimated, and that the actual quantities will vary.

4 I (WE) CONFIRM:

4.1 that the following Appendices are attached to and form a part of this tender:

4.1.1 the Appendices as required by paragraph 5.3 of the Instructions to Tenderers - Part II; and

4.1.2 the ***Bid Security*** as required by paragraph 5.2 of the Instructions to Tenderers - Part II stated as:

A tender must be accompanied by the *Bid Security* in the form of:

a a Bid Bond issued by a surety licensed to carry on the business of suretyship in British Columbia in a form reasonably satisfactory to the *Owner*; or

b cash, bank draft or letter of credit in a form acceptable to the *Owner*;

in an amount equal to 10% of the *Tender Price*.

5 I (WE) AGREE:

5.1 that this tender will be irrevocable and open for acceptance by the *Owner* for a period of 60 calendar days from the day following the *Tender Closing Date and Time*, even if the tender of another tenderer is accepted by the *Owner*. If within this period the *Owner* delivers a written notice ("*Notice of Award*") by which the *Owner* accepts our tender we will:

5.1.1 within 10 *Days* of receipt of the written *Notice of Award* deliver to the *Owner*:

a a Performance Bond and a Labour and Material

Tenderer's Initial	Owner's Initial

Payment Bond, each in the amount of 50% of the *Contract Price*, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia, and in a form acceptable to the *Owner*; and

b a *Construction Schedule*, as provided by GC 4.6.1; and as per *Supplementary General Condition 4.6.1*; and

c a "clearance letter" indicating that the tenderer is in WCB compliance; and

d a copy of the insurance policies as specified in GC 24 indicating that all such insurance coverage is in place; and

e a Health and Safety Program Manual pertaining to the Work;

f a Construction Environmental Management Plan as per Supplementary Specification 01 57 01;

5.1.2 As per General Condition 4.6.6, the Owner shall issue the Notice to Proceed within 14 days of receipt of the documentation required under item 5.1.1 above.

5.1.3 within 2 *Days* of receipt of written "*Notice to Proceed*", or such longer time as may be otherwise specified in the *Notice to Proceed*, commence the *Work*.

5.1.4 sign the *Contract Documents* as required by GC 2.1.2.

5.1.5 within 10 days of the issue of the *Certificate of Substantial Performance* deliver to the Owner, a Maintenance Period Financial Security as per Supplementary General Condition 25.4.1.

6 I (WE) AGREE:

6.1 that, if we receive written *Notice of Award* of this *Contract* and, contrary to paragraph 5 of this Form of Tender, we:

6.1.1 fail or refuse to deliver the documents as specified by paragraph 5.1.1 of this Form of Tender; or

6.1.2 fail or refuse to commence the *Work* as required by the

Tenderer's Initial	Owner's Initial

Notice to Proceed,

then such failure or refusal will be deemed to be a refusal by me (us) to enter into the *Contract* and the *Owner* may, on written notice to me (us), award the *Contract* to another party. I (We) further agree that, as full compensation on account of damages suffered by the *Owner* because of such failure or refusal, the *Bid Security* shall be forfeited to the *Owner*, in an amount equal to the lesser of:

6.1.3 the face value of the *Bid Security*; and

6.1.4 the amount by which my (our) *Tender Price* is less than the amount for which the *Owner* contracts with another party to perform the *Work*.

7 I (WE) DECLARE THAT:

7.1 no person, firm or company other than the undersigned, has any interest in this tender or in the proposed *Contract* for which this tender is made;

7.2 this tender is made without any connection, knowledge, comparison of figures, or agreement with any other company, firm or person making a tender for the same work;

7.3 in tendering for this work, and when called upon to enter into an agreement with the *Owner*, I (we) will be bound to comply with all laws, statutes, and municipal bylaws pertaining to the work. The agreement will be governed by the laws of the province of British Columbia;

7.4 in submitting this tender I (we) did not rely upon any information provided by the *Owner*, or any of the *Owner's* employees or agents, relating to the conditions, contingencies, risks or other circumstances, local or otherwise, which might influence or affect the performance or the cost of the work, including, without limiting the nature of the ground, subsoil, substrata of the work site, the means of access to the work site, the quality, quantity, nature or location of the materials to be furnished or removed in performance of the work, and the conditions under which the labour force will be employed, except the extent that any such information is expressly set forth in the *Contract Documents*. I (we) have relied on our own examination of the work site and have informed ourselves as to all conditions, contingencies,

Tenderer's Initial	Owner's Initial

risks, and circumstances, local or otherwise, which might influence or affect the performance or the cost of the work. I (we) accept the site prior to the signing of the *Contract*.

8 WE AGREE:

8.1 The work shall be completed entirely in 50 *Days* from Notice to Proceed (The Designated Completion Period);

8.2 There shall be no exclusion of time from the Designated Completion Period for any reason OTHER than delays clearly attributable to the OWNER, its agents, employees or any Authorized Representatives.

9 I (WE) DECLARE THAT:

9.1 I (we) recognize that the lowest or any tender will not necessarily be accepted; and

9.2 I (we) recognize that the *Owner* reserves the right to reject all tenders or to accept the tender which best suits its long term objectives; and

I (we) recognize that the *Owner* reserves the right to accept or reject all or part of this Tender at any time during the period specified by paragraph 5.1 of this Form of Tender.

10 I (WE) DECLARE THAT:

10.1 I (we) do not (or any related company) have any family, ownership, and operating relationships with the City of Campbell River, or any elected official, staff or other officials holding public office in the City of Campbell River and agree that the Owner reserves the right to reject any tender that may be perceived to be in a conflict of interest.

11 I (WE) DECLARE THAT:

11.1 In this tender:

(a) "Related Party of the Tenderer" means:

- an officer or director of the Tenderer;
- a shareholder of the Tenderer;
- a corporation with a shareholder or director who is also a shareholder or director of Tenderer;

Tenderer's Initial	Owner's Initial

(b) "Public Authority" has the same meaning as under the Community Charter.

11.2 I (we) hereby declare that neither the Tenderer nor a Related Party of the Tenderer:

(a) has had a bid bond or performance bond retained or claimed against;
(b) has breached a contract for works or services with the *Owner* or other Public Authority in British Columbia;
(c) has been engaged in a legal action against the *Owner* or another Public Authority in British Columbia, or the elected or appointed officers and employees of the *Owner* or that other Public Authority, in relation to;
- any other contract for works or services;
- any matter arising from the exercise of the *Owner's* or the other Public Authority's powers, duties or functions under the Community Charter, Local Government Act or other enactment;

(d) has been charged or convicted of an offence in relation to the performance of a contract for works or services with the *Owner* or other Public Authority;

within five years of the closing date of this Tender.

Tenderers who are unable to truthfully complete this declaration must provide full particulars of the relevant circumstances. Submission of a false declaration is grounds for rejection of a tender.

11.3 I (we) hereby declare that the *Owner* may in its absolute discretion reject a Tender submitted by a Tenderer if the Tenderer or a Related Party of the Tenderer:

(a) has had a bid bond or performance bond retained or claimed against;

(b) has breached a contract for work or services with the *Owner* or other Public Authority in British Columbia;

(c) has been engaged in a legal action against the *Owner* or another public authority in British Columbia, or the elected or appointed officers and employees of the *Owner* or that other public authority, in relation to:

Tenderer's Initial	Owner's Initial

- any other contract for works or services;
- any matter arising from the exercise of the *Owner's* or the other public authority's powers, duties or functions under the Community Charter, Local Government Act or other enactment;

(d) has been charged or convicted of an offence in relation to the performance of a contract for works or services with the *Owner* or other Public Authority;

within five years of the closing date of this Tender.

11.4 I (we) hereby declare that in determining whether to reject a tender the *Owner* will consider whether:

(a) the legal action is likely to affect the Tenderers ability to work with the *Owner*, its consultants and representatives, and;

whether the *Owner's* or other public authority's experience with the Tenderer indicates that the *Owner* is likely to incur increased costs including but not limited to staff and legal costs in the administration of this contract if it is awarded to the Tenderer.

12 I (WE) AGREE THAT:

12.1 I (we) agree that if any director, officer or employee, agent or other representative of a Tenderer makes any representation or solicitation to the Mayor, any Councillor, officer or employee of the City of Campbell River, other than those specifically designated in the Tender documents, with respect to this Tender, whether before or after the submission of the Tender, the City shall be entitled to reject or not accept the Tender.

Tenderer's Initial	Owner's Initial

MY (OUR) ADDRESS is as follows:

_____
(Full Legal Name of Corporation, Partnership or Individual)

_____
(address)

_____

_____
(city, province) (postal code)

Phone: _____

Fax: _____

E-mail: _____

This Tender is executed this _____ day of _____, 2018.

_____
(Printed Name)

_____
(Authorized Signatory)

Tenderer's Initial	Owner's Initial

Appendix 1

SCHEDULE OF QUANTITIES AND PRICES – GST EXCLUDED
(See paragraph 5.3.1 of the Instructions to Tender – Part II)
(All prices and *Quotations* including the *Contract Price* shall include all *Taxes,* but shall not include *GST, GST* shall be shown separately.)

ITEM	DIV.	SECTION	PARA.	TITLE	QUANTITY	UNIT	UNIT PRICE	TOTAL
	Div 01	**GENERAL REQUIREMENTS**						
1			Supp. Spec 3.1	Mobilization & Demobilization (Max. 10% of Tender Price)	1	Lump Sum		
		01 55 00		**TRAFFIC CONTROL, VEHICLE ACCESS & PARKING**				
2			1.5.1	Traffic control during construction	1	Lump Sum		
		01 57 00		**ENVIRONMENTAL PROTECTION**				
3			1.6.1	Development of the EMP	1	Lump Sum		
4			1.6.2	EMP Implementation, Monitoring & Reporting	50	Daily		
	Div 03	**CONCRETE**						
		03 30 53		**CAST-IN-PLACE CONCRETE**				
5			1.5.1	Cast-in-place Ramp Slab 250mm thick with 600mm thickened edges	480	Sq.m.		
6			1.5.6	Cast-in-place Foot Ramp including vertical pipe and end cap	2	Each		
		03 40 01		**PRECAST CONCRETE**				
7			1.4.6	Precast Ramp Slabs 250mm thick	293	Sq.m.		
8			1.4.7	Precast Butress Blocks	37	Each		
							Sub-Total Page 9 to Summary	

Tenderer's Initial | Owner's Initial

ITEM	DIV.	SECTION	PARA.	TITLE	QUANTITY	UNIT	UNIT PRICE	TOTAL
	Div 31	**EARTHWORKS**						
		31 23 01		**EXCAVATING, TRENCHING AND BACKFILLING**				
9			1.10.3	Over Excavation and Backfill with 75mm Pitrun Gravel	50	Cu.m.		
		31 24 13		**ROADWAY EXCAVATION, EMBANKMENT AND COMPACTION**				
10			1.8.4	Mass Excavation (Removals)	1	Lump Sum		
11			1.8.5	Common Excavation	1000	Cu.m.		
12			1.8.5	Common Excavation (within Basin and Approiach Channel)	550	Cu.m.		
13			1.8.14	Basin and Approach Channel Excavation - Dump & Spread Material on Beach North of North Breakwater	1100	Cu.m.		
14			1.8.15	Breakup of Existing Boat Ramp Slab, Concrete Block Wall and Concrete Wall and Relocation into South Breakwater Core	1	Lump Sum		
		31 32 19		**GEOSYNTHETICS**				
15			1.6.1	Non-Woven Filter Fabric Geotextile	500	Sq.m.		
							Sub-Total Page 10 to Summary	

Tenderer's Initial | Owner's Initial

ITEM	DIV.	SECTION	PARA.	TITLE	QUANTITY	UNIT	UNIT PRICE	TOTAL
		31 37 10		**RIPRAP**				
16			1.4.1	Class 2000 Riprap 2.2m thick	1570	Sq.m.		
17			1.4.1	Class 500 Riprap 1.2m thick	400	Sq.m.		
18			1.4.1	Class 100 Riprap Shoulder, 1.2m thick	120	Sq.m.		
19			1.4.1	Class 25 Riprap Apron, 0.8m thick	27	Sq.m.		
20			1.4.2	Class 100 Riprap Core	300	Cu.m.		
21			1.4.3	Toe Protection Matress	100	Lin.m.		
22			1.4.4	Scour Protection Trench, 3.0m wide, 1.2m thick	50	Lin.m.		
23			1.4.5	Debris Barrier	73	Lin.m.		
24			1.4.6	Removal, Stockpile and Reuse of Embankment Riprap	1	Lump Sum		
25			1.4.7	Gravel Retention Berm	15	Lin.m.		
26			1.4.8	Relocation of Existing Breakwater Riprap	1480	Cu.m.		
		31 62 16		**STEEL PIPE PILES**				
27			1.4.1	Steel Pipe Piles	87	Lin.m.		
	Div 32	**ROADS AND SITE IMPROVEMENTS**						
		32 11 16.1		**GRANULAR SUB-BASE**				
28			1.4.2	75mm Crushed Granular Sub-Base	150	Tonne		
		32 11 23		**GRANULAR BASE**				
29			1.4.1	19mm Crushed Granular Base (Force Account Allowance)	1	Lump Sum	$ 7,500.00	$ 7,500 .00
							Sub-Total Page 11 to Summary	

Tenderer's Initial | Owner's Initial

ITEM	DIV.	SECTION	PARA.	TITLE	QUANTITY	UNIT	UNIT PRICE	TOTAL
		32 12 16		**HOT-MIX ASPHALT CONCRETE PAVING**				
30			1.5.7	Saw Cut Asphalt or Concrete Pavements for permanent pavement restoration	20	Lin. M.		
31			1.5.9	Coordination with Owner's Asphalt Concrete Contractor and Base Preparation for Paving	1	LS		
		31 31 13		**CHAIN LINK FENCES AND GATES**				
32			1.5.4	1.2m Tall Handrail	12	Lin. M.		
	Div 33	**UTILITIES**						
		33 01 30.1		**CCTV INSPECTION OF PIPELINES**				
33			1.6.2	CCTV Pipeline Inspection	34	Lin. M.		
		33 40 01		**STORM SEWERS**				
34			1.6.1, 1.6.2	Sewer Pipe C76 Class V Concrete 900mm diameter, for all depths of main; Imported Backfill	34	Lin. M.		
35			1.6.12	Headwall c/w energy dissipators, outlet grill, Class 25 riprap channel lining & filter fabric	1	Each		
		33 44 01		**MANHOLES AND CATCHBASINS**				
36			1.5.1.1	Manhole base, lid, slab, cover, frame, riser rings and riser sections; 1500mm diameter	1	Each		
							Sub-Total Page 12 to Summary	

Tenderer's Initial | Owner's Initial

ITEM	DIV.	SECTION	PARA.	TITLE	QUANTITY	UNIT	UNIT PRICE	TOTAL
	Div 35	**WATERWAY AND MARINE CONSTRUCTION**						
		35 51 50		**INSTALLATION OF FLOATING DOCKS**				
37			1.3.1	Installation of Floating Docks	1	Lump Sum		

Sub-Total Page 13 to Summary	
Sub-Total Page 9	
Sub-Total Page 10	
Sub-Total Page 11	
Sub-Total Page 12	
Sub-Total Page 13	
TOTAL (GST Excluded)	

Tenderer's Initial | Owner's Initial

Appendix 2

PRELIMINARY CONSTRUCTION SCHEDULE

(See paragraph 5.3.2 of the Instructions to Tenderers - Part II)

Indicate Time-Scaled Network Construction Schedule Based On *Critical Path Method*.
See Supplemental General Condition 4.6.1 For Further Detail

ACTIVITY	MILESTONE DATES	CONSTRUCTION SCHEDULE WITH CRITICAL PATH SHOWN (WEEKS)									
		1	2	3	4	5	6	7	8	9	10

Tenderer's Initial | Owner's Initial

Appendix 3

EXPERIENCE OF SUPERINTENDENT

(See paragraph 5.3.3 of the Instructions to Tenderers - Part II)

Name: _____

Experience:

1. Dates: _____

   Project Name: _____

   Responsibility: _____

   _____

   _____

   References: _____

2. Dates: _____

   Project Name: _____

   Responsibility: _____

   _____

   _____

   References: _____

3. Dates: _____

   Project Name: _____

   Responsibility: _____

   _____

   _____

References: _____

Tenderer's Initial	Owner's Initial

Appendix 4

COMPARABLE WORK EXPERIENCE
(See paragraph 5.3.4 of the Instructions to Tenderers - Part II)

PROJECT	OWNER/ CONTRACT NAME	PHONE NUMBER	WORK DESCRIPTION	VALUE ($)

Tenderer's Initial	Owner's Initial

Appendix 5

SUBCONTRACTORS
(See paragraph 5.3.5 of the Instructions to Tenderers - Part II)

TENDER ITEM	TRADE	SUBCONTRACTOR NAME	PHONE NUMBER

Tenderer's Initial | Owner's Initial

Appendix 6

TENDERERS CURRENT PROJECTS UNDERWAY

PROJECT	OWNER/ CONTRACT NAME	PHONE NUMBER	WORK DESCRIPTION	VALUE ($)	% COMPLETE

Tenderer's Initial	Owner's Initial

Draft Agreement

Between Owner and Contractor

THIS AGREEMENT made in duplicate this _____ day of _____, 2018.

Reference No.: **TENDER 18-14**

Contract: **BIG ROCK BOAT RAMP RECONSTRUCTION**

BETWEEN:

CITY OF CAMPBELL RIVER

(the "*Owner*")

AND:

TBD

(the "*Contractor*")

The *Owner* and the *Contractor* agree as follows:

ARTICLE 1 THE WORK - START/COMPLETION DATES

1.1 The *Contractor* will perform all *Work* and provide all labour, equipment and material and do all things strictly as required by the *Contract Documents*.

1.2 The *Contractor* will commence the *Work* in accordance with the *Notice to Proceed*. The *Contractor* will proceed with the *Work* diligently, will perform the *Work* generally in accordance with the construction schedules as required by the *Contract Documents* and will achieve *Substantial Performance* of the *Work* within 50 *Days* of being issued a Notice to Proceed subject to the provisions of the *Contract Documents* for adjustments to the *Contract Time*.

1.3 Time shall be of the essence of the *Contract*

ARTICLE 2 CONTRACT DOCUMENTS

2.1 "*Contract Documents*" consist of the documents listed or referred to in Schedule 1, entitled "Schedule of Contract Documents", which is attached and forms a part of this Agreement, and includes any and all additional and amending documents issued in accordance with the provisions of the *Contract Documents*. All of the *Contract Documents* shall constitute the entire *Contract* between the *Owner* and the *Contractor*.

2.2 The *Contract* supersedes all prior negotiations, representations or agreements, whether written or oral, and the *Contract* may be amended only in strict accordance with the provisions of the *Contract Documents*.

ARTICLE 3 CONTRACT PRICE

3.1 The price for the *Work* ("*Contract Price*") shall be the sum in Canadian dollars of the following:

3.1.1 the product of the actual quantities of the items of *Work* listed in the *Schedule of Quantities and Prices* which are incorporated into or made necessary by the *Work* and the Lump Sums listed in the *Schedule of Quantities and Prices*; plus

3.1.2 all lump sums, if any, as listed in the *Schedule of Quantities and Prices*, for items relating to or incorporated into the *Work*; plus

3.1.3 any adjustments, including any payments owing on account of *Changes* and agreed to *Extra Work*, approved in accordance with the provisions of the *Contract Documents*.

3.2 The *Contract Price* shall be the entire compensation owing to the *Contractor* for the *Work* and this compensation shall cover and include all profit and all costs of supervision, labour, material, equipment, overhead, financing, and all other costs and expenses whatsoever incurred in performing the *Work*.

ARTICLE 4 PAYMENT

4.1 Subject to applicable legislation and the provisions of the *Contract Documents*, the *Owner* shall make payments to the *Contractor*.

4.2 If the *Owner* fails to make payments to the *Contractor* as they become due in accordance with the terms of the *Contract Documents* then interest calculated at 2% per annum over the prime commercial lending rate of the Royal Bank of Canada on such unpaid amounts shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

ARTICLE 5 RIGHTS AND REMEDIES

5.1 The duties and obligations imposed by the *Contract Documents* and the rights and remedies available hereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

5.2 Except as specifically set out in the *Contract Documents*, no action or failure to act by the *Owner*, *Contract Administrator* or *Contractor* shall constitute a waiver of any of the parties' rights or duties afforded under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach under the *Contract*.

ARTICLE 6 NOTICES

6.1 Communications among the *Owner*, the *Contract Administrator* and the *Contractor*, including all written notices required by the *Contract Documents*, may be delivered by hand, e-mail, fax, or by pre-paid registered mail to the addresses as set out below:

The *Owner:*
City of Campbell River
301 St. Ann's Road
Campbell River, BC
V9W 4C7
Attention: Mr. Jason Hartley, P.Eng., Capital Works Manager
E-mail: jason.hartley@campbellriver.ca

The *Contractor*:
TBD

The *Contract Administrator:*
Highland Engineering Services Ltd.
#104 – 950 Alder Street
Campbell River, BC
V9W 2P8
Attention: Mr. Stuart Masterman P.Eng., CCA
E-mail: smaterman@highland-eng.ca

6.2 A communication or notice that is addressed as above shall be considered to have been received:

6.2.1 immediately upon delivery, if delivered by hand; or

6.2.2 immediately upon transmission if sent and received by fax or e-mail; or

6.2.3 after 5 *Days* from date of posting if sent by registered mail.

6.3 The *Owner* or the *Contractor* may, at any time, change its address for notice by giving written notice to the other at the address then applicable. Similarly if the *Contract Administrator* changes its address for notice then the *Owner* will give or cause to be given written notice to the *Contractor*.

6.4 The sender of a notice by fax or e-mail assumes all risk that the fax or e-mail will be received properly, and the provisions of paragraph 12.5 of the Instructions to Tenderers, Part II apply to the sender for both fax and e-mails.

ARTICLE 7 GENERAL

7.1 This *Contract* shall be construed according to the laws of British Columbia.

7.2 The *Contractor* shall not, without the express written consent of the *Owner*, assign this *Contract*, or any portion of this *Contract*.

7.3 The headings included in the *Contract Documents* are for convenience only and do not form part of this *Contract* and will not be used to interpret, define or limit the scope or intent of this *Contract* or any of the provisions of the *Contract Documents*.

7.4 A word in the *Contract Documents* in the singular includes the plural and, in each case, vice versa.

7.5 This agreement shall ensure to the benefit of and be binding upon the parties and their successors, executors, administrators and assigns.

IN WITNESS WHEREOF the parties hereto have executed this Agreement the day and year first written above.

***Contractor*:**

TBD

_____
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

_____
(AUTHORIZED SIGNATORY)

_____
(WITNESS)

***Owner*:**

City of Campbell River

_____
(GENERAL MANAGER, FACILITIES AND SUPPLY)

_____
(WITNESS)

SCHEDULE 1

CITY OF CAMPBELL RIVER

Schedule of Contract Documents

The following is an exact and complete list of the *Contract Documents*, as referred to in Article 2.1 of the *Agreement*.

NOTE: The documents noted with "*" are contained in the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings", 2009 PLATINUM edition. All sections of this publication are included in the *Contract Documents*.

The documents noted with "**" are available at www.campbellriver.ca

1 Agreement, including all Schedules;
2 General Conditions*;
3 Supplementary General Conditions;
4 Specifications*;
5 Supplementary Specifications
6 Supplementary Specifications, City of Campbell River, Design Standards 2010, Appendix A to Subdivision and Development Servicing Bylaw 3419**;
7 City of Campbell River: Approved Utility Product List**
8 Standard Detail Drawings*;
9 Supplementary Standard Drawings
10 Executed Form of Tender, including all Appendices;
11 Drawings listed in Schedule 2 to the Agreement -"List of Contract Drawings";
12 Instructions to Tenderers - Part I;
13 Instructions to Tenderers - Part II*;
14 Fisheries Act Application For Authorizaton #17-HPAC-01167:
- .1 Supplemental Report January 2018
- .2 Appendix 4 – Measures for Avoiding or Mitigating Serious Harm – Environmental Mitigation Plan (EMP)

15 Tidal Prediction Table – Campbell River
16 The Following Addenda: TBD

SCHEDULE 2

CITY OF CAMPBELL RIVER

List of Contract Drawings

(Complete listing of all drawings, plans and sketches which are to form a part of this Contract, other than Standard Detail Drawings and Supplementary Standard Detail Drawings.)

TITLE	DRAWING NO.	SHEET NO.	DATE	REVISION DATE	REVISION No.
As listed per sheets Big Rock Boat Ramp Reconstruction	13-506	1-13	Mar 28 2018		F
As listed per sheets Big Rock Boat Ramp	395-300	1-11	20/03/2018		B
As listed per sheets Big Rock Boat Ramp Galvanized Steel Docks	395-400	1-26	20/03/2018		B
As listed per sheets Big Rock Boat Ramp Docks	395-1000	1-4	2/03/2018		A

Appendix 7

SAFETY COVENANT

BETWEEN:

_____ of
(Company Name (Print legibly)

_____
(Address)

_____
(City) (Postal Code)

_____
(Phone no.) (Fax no.)

hereinafter referred to as the "Contractor"

AND: **CITY OF CAMPBELL RIVER**

hereinafter called the "Owner"

WHEREAS:

The Contractor covenants and agrees that when performing any work for the Owner, whether directly as a contractor or indirectly as a sub-contractor, it will adhere to all of the requirements of the Occupational Health and Safety (OHS) Regulation, B.C. Reg. 296/97, as may be amended from time to time, that are applicable to the work being performed, and as well will comply with the provisions of the *Workers Compensation Act, R.S.B.C, 1996, c.492*, as amended (the 'Act').

Without limiting the generality of the foregoing, the Contractor agrees:

1) Before commencing any work for the Owner, the Contractor will consult the OHS Regulation and will determine which provisions of the OHS Regulation is applicable to the work that the Contractor is to perform. The Contractor will strictly comply with all applicable OHS Regulations when performing the work.

2) Before commencing any work for the Owner, the Contractor will review and familiarize itself with any existing policies or procedures developed by the Owner in relation to the work. If in the opinion of the Contractor, by following a policy or procedure that the Owner has established in relation to the work, the Contractor, or an employee of the Contractor or of the Owner, or any other worker, is put at increased risk, the Contractor must request a written change of policy or procedure from the Owner, applicable only to the work the Contractor is to perform, before proceeding with the work. The Owner reserves the right to refuse to amend its policies or procedures in response to any such request where the Owner, after such consultation with WorkSafe BC as the Owner considers necessary, determines that the Owner's policy or procedure does not increase the risk to any worker at the location of the work to be performed, and determines that the

   Contractor's request is unreasonable, or is unnecessary for the protection of workers at the location of the work.

3) To have read every section of the OHS Regulation that pertains to the job at hand, to ensure that it understands the pertinent OHS Regulation and its application to the supervisor(s) and to all of the workers at

the location of the work, and to ensure that each worker under the Contractor's supervision follows the applicable OHS Regulation. To assist Contractors with this task, the City of Campbell River directs them to consult with WorkSafe BC directly, to access the WorkSafe BC Regulations and Policies available on the WorkSafe BC website.

4) To understand, comply with and, to the full extent of the Contractor's lawful authority, to enforce all of the following provisions of the OHS Regulation as they pertains to the job at hand and to the workers employed by the Contractor, and to provide to the owner, at any time upon request, evidence of compliance with the following:

a) Rights & Responsibilities – Occupational Health & Safety Program (Part 3, including investigations, inspections, written instructions, records and statistics, adequate supervision, complete understanding by the workforce of the right and responsibility to refuse unsafe work)
b) General Conditions (Regulation – Part 4)
c) Chemical and Biological Substances (Regulation – Part 5)
d) Substance Specific requirements (Regulation – Part 6)
e) Noise, Vibration, Radiation and Temperature (Regulation – Part 7)
f) Personal Protective Clothing and Equipment (Regulation - Part 8)
g) Confined Space Entry (Regulation – Part 9)
h) Lock-out (Regulation – Part 10)
i) Fall Protection (Regulation – Part 11)
j) Tools, Machinery and Equipment (Regulation – Part 12)
k) Ladders, Scaffolds and Temporary Work Platforms (Regulation – Part 13)
l) Cranes and Hoists (Regulation – Part 14)
m) Rigging (Regulation – Part 15)
n) Mobile Equipment (Regulation – Part 16)
o) Traffic Control (Regulation – Part 18)
p) Electrical Safety (Regulation – Part 19)
q) Construction, Excavation & Demolition (Regulation – Part 20)
r) Forestry Operations (Regulation – Part 26)
s) Evacuation and Rescue (Regulation – Part 32)
t) Occupational First Aid (Regulation – Part 33)
u) Coordination of Multiple Employer Workplaces (Regulation – Part 20, s. 20.3)

PROVISIONS OF THE *WORKERS COMPENSATION ACT* – PART 3 SPECIFIC TO CONTRACTORS ON A WORKSITE:

i. Division 3 – General duties of Employers, Workers and Others (Sections 115, 116, 117, 118, 119, 120, 121, 122, 123, 124);
ii. Division 4;
iii. Division 10.

5) The *Workers Compensation Act* stipulates that the Owner (the City of Campbell River) is required to enforce any observed infraction of the Act or Regulation. The Contractor accepts that the City of Campbell River will be conducting periodic checks of the Contractor during the Contractor's work for the City of Campbell River and will be asking the Contractor to comply with the Act/Regulation in the event that any contravention is observed. If a contravention is observed and not corrected, the Contractor may be asked to leave the worksite and may result in termination of the contract for the work.

6) For the purposes of streamlining large construction projects and multiple employer worksites, the Owner reserves the right to designate a "prime contractor" amongst contractors who are working on a job-site together. A designated person employed by the "prime contractor" – appointed by the Owner - will act as the coordinator of the other contractors on that job-site and will ensure that each of the contractors on the job site are following all of the Act and WorkSafe BC Regulations as well as site-specific policies and procedures. This includes having in place an approved WorkSafe BC Safety Program and a list of the qualified persons amongst the other contractors who have been designated to be responsible for each of the other contractor's site health and safety activities.

7) In the event that a prime contractor has been designated, it is the responsibility of the Contractor to inquire who the "prime contractor" is for the worksite and to comply with the requirements for a multiple employer worksite where a prime contractor has been designated, as set out in the preceding section.

NOTE:

a) Payment of WorkSafe BC Assessments by any Contractor does not obviate the responsibility of the contractor to any of the foregoing.

b) The foregoing constitutes requirements of the Prevention Division of WorkSafe BC for any workplace in the Province of British Columbia and constitutes the Owner's expectations of contractors.

The Contractor covenants and agrees that when performing any work for the Owner, whether directly as a contractor or indirectly as a sub-contractor, it will adhere to all of the requirements of the B.C. Employment Standards Act (RSBC 1996), as may be amended from time to time, that are applicable to the work being performed, including but not limited to:

1) Section 36 (2); an employer must ensure that each employee has at least 8 consecutive hours free from work between each shift worked.

2) Section 39; despite any provision of this Part, an employer must not require or directly or indirectly allow an employee to work excessive hours or hours detrimental to the employee's health or safety.

THIS Covenant made the _____day of _____, 2018, in

_____ in the Province of British Columbia.
(City)

CONTRACTOR:

_____
Company Name

_____
Authorized Signatory

_____
(Printed name)

Appendix 8

PRIME CONTRACTOR AGREEMENT

1. The Contractor shall, for the purposes of the Workers Compensation Act, and for the duration of the Work of this Contract:

   .1 be the "prime contractor" for the "Work site", and
   .2 do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with the Act and its regulations, as required to ensure the health and safety of all persons at the "Work site".

.2 The Contractor shall direct all Subcontractors, Sub-subcontractors, Other Contractors, employers, Workers and any other persons at the "Work site" on safety related matters, to the extent required to fulfill its "prime contractor" responsibilities pursuant to the Act, regardless of:

   .1 whether or not any contractual relationship exists between the Contractor and any of these entities, and
   .2 whether or not such entities have been specifically identified in this Contract.

As per the requirements of the Workers Compensation Act Part 3, Division 3, Section 118(1-3) which states:

Coordination of multiple-employer Workplaces

118(1) In this section:

"multiple-employer Workplace" means a Workplace where Workers of 2 or more employers are Working at the same time;

"prime contractor" means, in relation to a multiple-employer Workplace,

(a) the directing contractor, employer or other person who enters into a written agreement with the owner of that Workplace to be the prime contractor for the purposes of this Part, or
(b) if there is no agreement referred to in paragraph (a), the owner of the Workplace.

(2) The prime contractor of a multiple-employer Workplace must

(a) ensure that the activities of employers, Workers and other persons at the Workplace relating to occupational health and safety are coordinated, and
(b) do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with this Part and the regulation in respect to the Workplace.

(3) Each employer of Workers at a multiple-employer Workplace must give to the prime contractor the name of the person the employer has designated to supervise the employer's Workers at that Workplace.

The Contractor covenants and agrees that when performing any work for the Owner, whether directly as a contractor or indirectly as a sub-contractor, it will adhere to all of the requirements of the B.C.

Employment Standards Act (RSBC 1996), as may be amended from time to time, that are applicable to the work being performed, including but not limited to:

3) Section 36 (2); an employer must ensure that each employee has at least 8 consecutive hours free from work between each shift worked.

4) Section 39; despite any provision of this Part, an employer must not require or directly or indirectly allow an employee to work excessive hours or hours detrimental to the employee's health or safety.

I fully understand and accept the responsibilities of the prime contractor designation in accordance with the Workers Compensation Act and the B.C. Employment Standards Act while contracted by the *City* on

project location: _____ and will abide by all Workers Compensation Board Regulation requirements.

Date: _____

Project: _____

Company Name: _____

Authorized Signatory: _____

Printed Name: _____

Witness Signatory: _____

Printed Name: _____

Appendix 9

ACCEPTANCE OF BASE COURSE FOR ASPHALT PAVING

Prior to the laying of asphalt pavement, representatives from (i) the City and Tayco Paving, for direct City constructed project **or** from (ii) the City's Consultant, and the General Contractor for contracted projects, agree to the condition, surface elevations and quality of the road base.

Date: _____

Owner or Consultant's Representative:

_____

General Contractor Representative:

_____

This acceptance does not relieve the General Contractor or the City's Consultant of their responsibilities for the surface elevations and/or condition or subsequent failure of materials below the asphalt pavement. Tayco Paving will continue to be responsible for the asphalt paving relating to the asphalt material and its placement.

The general conditions and specifications for the work will apply and take the precedence over this acceptance. The "Limiting Terms and Conditions" of Tayco Paving also take precedence over this acceptance.

An acceptable method of checking elevations will be used to ensure that the road base is graded ready for asphalt. The intention of this survey is to ensure that asphalt tonnage does not exceed Tayco's calculated estimated tonnage by more than 5%.

Conversion from square metres to tonnage will be calculated at the rate of 125 Kg per square metre for a 50mm thickness of asphalt.

SUPPLEMENTARY GENERAL CONDITIONS

TO BE READ WITH "General Conditions"
CONTAINED IN THE PLATINUM EDITION (printed 2009) OF THE PUBLICATION
"MASTER MUNICIPAL CONSTRUCTION DOCUMENTS"

Reference No.: **TENDER 18-14**

Contract: **BIG ROCK BOAT RAMP RECONSTRUCTION**

TABLE OF CONTENTS

DEFINITIONS **1.0**

1.67.1 ***(delete clause 1.67.1 and replace as follows)***
"Substantial Performance" means the stage of completion of all of the *Work*, as certified by the *Payment Certifier*, when:

a) the *Work* is ready for use or is being used for its intended purpose; **and**

b) the total of the incomplete, defective and deficient Work can be completed at an estimated cost of no more than:

3% of the first $500,000 of the *Contract Price*
2% of the next $500,000 of the *Contract Price*
1% of the balance of the *Contract Price*

1.79 ***(add new clause 1.79 as follows)***
"(amend clause X.XX as follows)" preceding a supplementary clause means this clause provides additional information or restrictions to the referenced clause in the Master Municipal Construction Documents, Volume II.

1.80 ***(add new clause 1.80 as follows)***
"(add new clause X.XX as follows)" preceding a supplementary clause means this clause provides additional requirements or information not found in the Master Municipal Construction Documents, Volume II.

1.81 ***(add new clause 1.81 as follows)***
"(delete clause X.XX and replace as follows)" preceding a supplementary clause means this clause replaces the referenced clause in the Master Municipal Construction Documents, Volume II, in its entirety.

1.82 ***(add new clause 1.82 as follows)***
"Payment Certifier" has the meaning set out in SGC 18.6.6.

1.83 ***(add new clause 1.83 as follows)***
"Provide" or "Provision of" means supply and placement of an item.

1.84 ***(add new clause 1.84 as follows)***
"Engineer" shall mean the *Owner's* engineer appointed to provide technical support during the course of the *Work.*

1.85 ***(add new clause 1.85 as follows)***
"***Critical Path Method***" (CPM) means the method of scheduling a project as follows:

The essential technique for using CPM is to construct a model of the project that includes:

(1) A list of all activities required to complete the project (typically categorized within a work breakdown structure),
(2) The time (duration) that each activity will take to completion, and
(3) The dependencies between the activities.

Using these values, CPM calculates the longest path of planned activities to the end of the project, and the earliest and latest that each activity can start and finish without making the project longer. This process determines which activities are "critical" (i.e., on the longest path) and which have "total float" (i.e., can be delayed without making the project longer). This determines the shortest time possible to complete the project. Any delay of an activity on the critical path directly impacts the planned project completion date (i.e. there is no float on the critical path). A project can have several, parallel, near critical paths. An additional parallel path through the network with the total durations shorter than the critical path is called a sub-critical or non-critical path.

DOCUMENTS **2.0**

Interpretation 2.2.4 ***(delete clause 2.2.4.1 and replace as follows)***

the *Contract Documents* shall govern and take precedence in the following order with the Agreement taking precedence over all other *Contract Documents*:

(a) Agreement
(b) Addenda
(c) Supplementary General Conditions
(d) General Conditions
(e) Supplementary Specifications
(f) Specifications
(g) Drawings listed in Schedule 2 to the Agreement
(h) Supplementary Detail Drawings
(i) Standard Detail Drawings
(j) Executed Form of Tender
(k) Instructions to Tenderers
(l) All other Contract Documents

2.2.4.5 ***(add new clause 2.2.4.5 as follows)***

The *Contract Drawings* will be updated post Tender and will be Issued For Construction by the *Contract Administrator* prior to the commencement of the *Work.*

CONTRACTOR **4.0**

Protection of Work, Property and the Public 4.3.7 ***(add new clause 4.3.7 as follows)***

The *Contractor* shall locate, mark and protect from damage or disturbance, any and all stakes, survey pins, monuments and markers at the *Place of the Work.*
All survey stakes, pins, monuments or markers which, in the opinion of the *Owner*, have been damaged or disturbed shall be made good following construction by a registered B.C. Land Surveyor at the *Contractor's* expense.

Good Neighbour Policy 4.3.8 ***(add new clause 4.3.8 as follows)***

The *Owner's* Good Neighbour Policy as adopted by City of Campbell River Council on April 15, 1997 shall apply to this contract. The Policy states: "That *Contractors* working on Municipal rights-of-way or on private land where new rights-of-way are being created, be required to provide written notice to the residents in the immediate area of the works, describing what is being constructed, when the works will occur, who to contact for more information and what precautions should be taken if necessary; and that the work-site be

posted for safety reasons."

Damage to Improvements and Utilities 4.3.9

(add new clause 4.3.9 as follows)
The *Contractor's* Work shall be confined to the *Owner's* premises, including statutory right-of-ways easements and construction permit limits, whenever possible. The *Contractor* shall not enter upon or place materials on other private premises except by written consent of the individual *Owners* and shall save the *Owner* harmless from all suits and actions of every kind and description that might result from use of private property.

Use of Working Site 4.3.10

(add new clause 4.3.10 as follows)
The *Contractor* shall confine his equipment, storage of materials and operation of Work to the limits indicated by law, permits, or direction of the *Contract Administrator*, and shall not unreasonably encumber the premises with his materials. The *Contractor* shall comply with the *Contract Administrator* instructions regarding signs, advertisements, fires and smoking.

The working site shall at all times be kept free of rubbish and unnecessary hazards to persons, materials, and equipment.

Local, Emergency Traffic and Property Access 4.3.11

(add new clause 4.3.11 as follows)
Local traffic shall be provided access to private properties at all times.

Emergency traffic such as Police, Fire, and Disaster Units shall be provided reasonable access at all times. The *Contractor* shall be liable for any damage which may result from his failure to provide such reasonable access.

Traffic Management Plan 4.3.12

(add new clause 4.3.12 as follows)
If required, the *Contractor* shall submit a Traffic Management Plan for Approval prior to start of construction in which the extent and duration of any road closures associated with the work are identified. Two-way traffic via one open lane shall be maintained on public roads at all times unless the *Contractor* has obtained the *Owner's* approval via a Road Closure Permit. The *Contractor* is cautioned that approval of full road closures is not guaranteed. Traffic control on all roads shall be in strict accordance with the Traffic Control Manual for Work on Roadways published by the Ministry of Transportation and Highways. The *Contractor* shall only use appropriately accredited personnel for Traffic Control.

Temporary Structures and Facilities 4.4.3

(add new clause 4.4.3 as follows)
The *Contractor* shall provide clean sanitary latrine accommodations for the use of his employees as may be necessary to comply with the requirements and regulations of the Ministry of Health and other bodies having jurisdiction. The *Contractor* shall permit no public nuisance.

Construction Schedule 4.6.1

(delete clause 4.6.1 and replace as follows)
The Contractor shall, within the time set out in the *Form of Tender*, prepare and submit to the *Contract Administrator* a time-scaled construction schedule (the "*Baseline Construction Schedule*") prepared using the *Critical Path Method* (CPM). The schedule shall:

.1 Show all significant construction activities, shop drawing submittals and procurement activities.
.2 Show the dependencies between activities so that it may be established what effect the progress of any one activity has on the schedule.
.3 Show completion time and all specific dates and sequencing requirements. Identify activities making up the critical path.

Unless specifically approved by the Contract Administrator, show activities on the schedule with a duration not longer than 15 working days or an assigned value not greater than $100,000 (except activities showing only submittal, fabrication or delivery of material or equipment). Divide activities which exceed these limits into more detailed components. The schedule shall include allowances made for legal holidays and normal weather conditions.

The *Baseline Construction Schedule* shall indicate completion of the *Work* in compliance with the *Milestone Dates.* The *Contractor* shall ensure that the *Baseline Construction Schedule* is in more detail than the *Preliminary Construction Schedule* so as to enable the *Contract Administrator* to compare actual construction progress during the performance of the *Work* with the *Baseline Construction Schedule* as adjusted pursuant to GC 4.6.2.

Fair Wages 4.8.2 ***(add new clause 4.8.2 as follows)***
The *Contractor* attests to compliance with Section 5 of the Skills Development and Fair Wage Act in projects where the provincial contribution to a Municipal project exceeds $250,000.

Tests and Inspections 4.12.1 ***(delete clause 4.12.1 and replace as follows)***
The *Contractor* shall as part of the *Work* perform, or cause to be performed, all tests, inspections and approvals of the *Work* as specified in the *Contract Documents* or as required by the *Contract Administrator* as part of the *Quality Control*. Any reference in the specifications to inspection and testing shall mean that the *Work* described in the specification must be inspected and approved in a manner approved by the *Contract Administrator*. The *Contractor* shall only employ or engage, as an agent or consultant for testing, a person approved by the *Owner*. Where the specification indicates that the *Contract Administrator* will arrange for testing, the *Contractor* continues to be solely responsible for testing of the *Work*. The *Contract Administrator* may perform additional tests for the *Owner's* sole benefit. The costs of these tests will be the responsibility of the *Owner*.

Truck Routes and Disposal Sites 4.17.1 ***(add new clause 4.17.1 as follows)***
In hauling of material to and from the work site, the routes to be followed by trucks shall be confined to designated arterial and collector roads as shown on the road classification plan as issued by the City. Where a dumpsite can only be accessed by way of a local road, the route shall be the shortest possible way from an arterial or collector road, and shall be agreed to by the *Contract Administrator* in advance of the work. The *Contractor* shall be responsible for road cleanup along all trucking routes used in association with the work. The cost of this cleanup shall be paid by the *Contractor* and considered incidental to the work. It should be noted that a "Soil

		Deposition Permit" is required for any dumpsite within the City of Campbell River. The *Contractor* shall be responsible for obtaining and securing a legal dumpsite. All costs associated with that dumpsite shall be the responsibility of the *Contractor* and shall be considered incidental to the *Work.*
Disposal of Wood Debris, Organic Debris, and/or Waste Excavated Material	4.18.1	***(add new clause 4.18.1 as follows*)** Prior to disposal of any wood debris, organic debris and/or waste excavated material, the *Contractor* shall submit a disposal management strategy in accordance with all applicable Laws, Bylaws and Regulations to the *Contract Administrator* for approval. Subject to the *Contract Administrator's* approval, the *Contractor* shall ensure that all wood debris, organic debris and/or waste excavated material that is removed from the work site is managed in accordance with this approved disposal management strategy. The *Contractor* shall be required to employ acceptable methods of disposal, approved disposal site location(s), and shall be required to obtain and submit copies of all relevant permits and/or approvals prior to the disposal of any wood debris, organic debris and/or waste excavated material Regardless of the aforementioned, the *Owner* reserves the right to disallow any or all of the *Contractor*'s proposed disposal management strategy if it is determined that they will result in undesirable environmental impacts.
Hours of Work	4.19.1	***(add new clause 4.19.1 as follows)*** This project requires that all condition of the Fisheries Act Authorization #17-HPAC-00167, including those related to timing of delivery of the works, be met. This includes requirement that the marine work be completed over the period of July 1 – August 31, 2018 and that those specific in-water works, as identified in the Environmental Mitigation Plan contained within the Authorization, be completed during low tides
VALUATION OF CHANGES AND EXTRA WORK	**9.0**	
Valuation Method	9.2.1.3	***(add new clause 9.2.1.3 as follows)*** Should a lump sum method be used for determination of the value of a *Change*, the *Contractor* shall determine the value of the *Change* by calculating the cost for each item contained within the *Change* and applying a 10% mark up on all costs associated with the *Change* for Overhead and Profit. All costs are required to be supported by documentation satisfactory to the *Contract Administrator* and all applicable rates are to be satisfactory to the *Contract Administrator.*
FORCE ACCOUNT	**10.0**	
Force Account Costs	10.1.1.4	***(delete clause 10.1.1.4 and replace as follows)*** *Force Account Work* performed by a *Subcontractor* shall be paid for in the lesser of: (i) the amount as provided by subparagraphs (1), (2) and (3) of this GC, plus a markup of 5%, or (ii) the actual amount the *Contractor* pays the *Subcontractor* including a markup of 10% on such actual cost to cover all overhead and profit.

DELAYS	**13.0**	
Liquidated Damages for Late Completion	13.9.1.1	**(*delete clause 13.9.1.1 and replace as follows*)** as a genuine pre-estimate of the *Owner's* increased costs for the *Contract Administrator* and the *Owner's* own staff caused by such delay an amount of $1,000 per day or pro rata portion for each calendar day that actual *Substantial Performance* is achieved after the *Substantial Performance Milestone Date*; plus
PAYMENT	**18.0**	
Supporting Documentation	18.2.3	***(add new clause 18.2.3 as follows)*** The *Contractor* shall provide to the *Contract Administrator* the *Adjusted Baseline Schedule* as a pre-condition of the issueance of each *Payment Certificate.*
Holdbacks	18.4.1	***(delete clause 18.4.1 and replace as follows)*** The *Owner* will retain a holdback but will not establish a Holdback Trust Account pursuant to Section 5 of the *Builders Lien Act.*
Substantial Performance	18.6.5	***(delete clause 18.6.5 and replace as follows)*** The *Owner* will release any builder's lien holdback on the 56th day following the date of *Substantial Performance*, or other date as required by law, but the *Owner* may holdback the amounts for any deficiencies or filed builders liens as provided in GC 18.4.2, GC 18.4.3 and 18.4.4, or the Maintenance Period Financial Security if not received by this date.
Payment Certifier	18.6.6	***(delete clause 18.6.6 and replace as follows)*** The *Contract Administrator*, as defined herein, shall be the *Payment Certifier* responsible under Section 7 of the *Builders Lien Act* for certifying *Substantial Performance* of the *Work* of the *Contractor*, but not the *Work* of *Subcontractor*s. The *Contractor* shall co-operate with and assist the *Contract Administrator* by providing information and assistance in as timely manner as the *Contract Administrator* considers necessary to carry out the duties of the *Payment Certifier* for the Contract. The *Contractor* shall be the *Payment Certifier* responsible under Section 7 of the *Builders Lien Act* for certifying *Substantial Performance* of the *Work* of each *Subcontractor*. Prior to certifying completion for a *Subcontractor*, the *Contractor* shall consult with the *Contract Administrator* and obtain the *Contract Administrator's* comments on the status of completion by the *Subcontractor,* including any deficiencies or defects in the *Subcontractor's Work* noted by the *Contract Administrator*. The *Contractor* will indemnify and save the *Owner* harmless from any and all liability the *Owner* may have to anyone arising out of the certification by the *Contractor* of *Substantial Performance* for that *Subcontractor.* Notwithstanding any other provision of the *Contract,* no payments will be due or owing to the *Contractor* so long as a Lien filed by anyone claiming under or through the *Contractor* remains registered against the Project or any lands, or interest therein, on which *Work* for the project was performed. Failure of the *Contractor* to remove all Liens promptly will entitle the *Owner* to damages.

WORKERS COMPENSATION REGULATIONS	**21.0**	
Contractor is "Prime Contractor"	21.2.2	***(add new clause 21.2.2 as follows)*** If the *Work* is being completed as part of a project for which the *Owner* already has a *Prime Contractor* designated then the *Contractor* will be responsible to ensure that they assume direction from the *Prime Contractor* as per the requirements of the Workers Compensation Act Part 3, Division 3, Section 118(1-3).
INSURANCE	**24.0**	
Required Insurance	4.1.7	***(add new clause 24.1.7 as follows)*** The *Contractor* shall ensure the following are additional named insured under this contract: • The City of Campbell River • Highland Engineering Services Ltd. • Outlook Engineering and Landscape Architecture Inc. • Chicalo Burridge Land Surveying and Geomatics • Pacificus Biological Services Ltd. • Baseline Archaeological Services Ltd. • Levelton Consultants Ltd. • Muir Engineering
MAINTENANCE PERIOD	**25.0**	
Correction of Defects	25.1.4	***(add new clause 25.1.4 as follows)*** The *Owner* is authorized to make repairs to defects or deficiencies if, ten days after giving written notice, the *Contractor* has failed to make or undertake with due diligence the required repairs. However, in the case of emergency where, in the opinion of the *Owner*, delay is not reasonable, repairs may be made without notice being sent to the *Contractor.* All expenses incurred by the *Owner* in connection with repairs made pursuant to GC 25 shall be paid by the *Contractor* and may be deducted from the Maintenance Period Financial Security, or other holdbacks. The *Contractor* shall promptly pay any shortfall.
Maintenance Period Financial Security	25.4.1	***(add new clause 25.4.1 as follows)*** within 10 days of the issue of the Certificate of Substantial Performance deliver to the Owner, a Maintenance Period Financial Security in the form of cash or a clean, irrevocable Letter of Credit in a form acceptable to the Owner in the amount of 5% of the Contract Price, issued by a major Canadian chartered bank which has a branch in Campbell River, payable to the Owner within the Maintenance Period.

SUPPLEMENTARY SPECIFICATIONS

TO BE READ IN CONJUNCTION WITH THE

"MASTER MUNICIPAL CONSTRUCTION DOCUMENTS"

Reference No.: **TENDER 18-14**

Contract: **BIG ROCK BOAT RAMP RECONSTRUCTION**

General

1.1 a) Payments will be made on the basis of the unit prices bid in the Tender, and in accordance with Article 18 of the General Conditions.

b) The unit prices bid, unless specifically noted otherwise, shall include the supply of all labour, plant, material, product and equipment necessary to construct the *Work* in accordance with the specifications.

c) The prices bid for supply and installation shall be full compensation for supplying, hauling, installing, cleaning, testing, and placing in service together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.

d) Other materials on site, whether existing structures, vegetation, topsoil, gravel, sand or other excavated or piled materials, are the property of the *OWNER* or of the owner of the land on which the *Work* is located. Only those materials specifically noted in the specification or on drawings, as belonging to the *Contractor* shall become the *Contractor's* property.

e) Where there are excess excavated materials, unsuitable materials excavated or materials of any kind that are excavated but not used in the *Work*, such materials are not the property of the *Contractor* unless authorized in writing by the *Contract Administrator* or specified to be disposed of by the *Contractor*.

Unit Price Contracts

2.1 a) Payments will be made on the basis of the following:

.1 Unit Price items in the Schedule of Quantities and Prices. Where payment terms are listed in the Schedule of Quantities and Prices, these will take precedence over those payment terms listed elsewhere in the Contract Documents.

.2 Changes in the *Work* for items not covered by unit prices, in accordance with Article 7 – Changes in the Work of the General Conditions.

b) For each item in the Schedule of Quantities and Prices, the *Contract Administrator* will, in cooperation with the *Contractor*, measure the quantity of the item completed at the end of the payment period and this will be shown as a percentage of the work completed against the appropriate value for the lump sum assigned to the respective line item.

Mobilization and Demobilization

3.1 a) Mobilization and demobilization shall include the *Contractor's* costs of mobilization at the beginning of the project; and the costs of demobilization at the end of the project.

b) Included in mobilization are such items as bonding, insurance, permits, moving personnel, materials and equipment to the site, setting up temporary facilities, First-Aid, Site Safety, temporary utilities and all preparation for performing the *Work*.

c) Included in demobilization are preparation and submission of operation and maintenance manuals, As-Constructed Record Drawings, comprehensive Bill Of Materials, removal of all personnel, materials and equipment; and cleanup of the site and the *Work*.

d) The lump sum price bid for this work shall be relative to the costs involved but shall not exceed ten percent of the Tender Price.

e) Payment will be made as follows, as approved by the *Contract Administrator*:

I. 60% of the lump sum bid will be included in the first progress payment certificate;

II. 40% of the lump sum bid will be included in the final progress payment certificate.

The *Contract Administrator* may at his discretion recommend partial payment if mobilization or demobilization is not complete.

Dust Control

4.1 During the performance of the *Work*, the *Contractor* is to at all times keep the worksite and such immediate surrounding areas which it may utilize free from waste materials, debris or rubbish and is to employ adequate dust control measures. Water shall be the only material acceptable for dust suppression. If accumulation of such materials, debris, rubbish or dust constitutes a nuisance or safety hazard or is otherwise objectionable in any way, as reasonably determined by the *OWNER* or *Contract Administrator*, the *Contractor* is to promptly remove it. If any claim, suit, losses, or action is brought by a person affected by the transportation of

materials, equipment, goods or wastes to and from the worksite, the *Contractor* shall defend, indemnify and hold harmless all indemnified parties.

Underground Utilities 5.1 It is the *Contractor'S* responsibility wherever necessary to determine location of existing pipes, valves, conduits, vaults, or other underground structures. Wherever it is necessary to explore and excavate to determine the location of the existing underground structures, the *Contractor,* at his own expense, shall make explorations and excavations for such purposes. The *Contractor* shall notify the *Contract Administrator* or his representative of any conflicts.

The *Contractor* shall, at his own expense, provide for the uninterrupted flow of all watercourses, sewers, drains, and any other utility encountered during the work. Water control and siltation control shall be under the direction of a qualified environmental monitor engaged by the *Contractor*.

When any existing mains and/or service pipes, utility ducts, vaults or other utility structures are shown on the drawings and are encountered, the *Contractor* shall support them to the satisfaction of the *Contract Administrator* so as to protect them from injury. The *Contractor* shall, at his own expense, at once repair and make good any injury which may occur to any mains, service or utility pipes or ducts, or facilities, or to any electrical conductor, telephone, cable or natural gas facility or to any sidewalk, crosswalk as a result of this operation.

Support of power, telephone poles, underground mains, wiring and light standards required to complete the work, shall be the responsibility of the *Contractor* and completed in accordance with utility company standards. The *Contractor* shall schedule the work with the appropriate utility company in advance, so as not to delay the work. All costs associated with the work shall be considered incidental and no separate payment be made for this item.

Construction Surveys 6.1 The *Contractor is responsible for all survey layout, including stakes, hubs, and grade control*. The *Contractor* shall survey and layout the work including, but not limited to, as-built invert elevations, offsets and stations of all grade changes, miscellaneous appurtenances, and all existing utilities exposed during construction. The *Contractor* shall provide all stakes, hubs, nails, flagging, and including the supply of casual labour for checking of the work, as required by the *Contract Administrator*. The *Contractor* shall provide the *Contract Administrator* with records of the actual surveys, and "as-built" information pick-up. No separate or additional payment will be made for this work.

General Coordination 7.1 The *Contractor* shall work cooperatively with B.C. Hydro, Telus, Shaw and Fortis to locate private utility ducting. No additional payment shall be made for this work.

Supplementary Specifications

8.1 The following Supplementary Specifications are complementary to the MMCD.

Section	Title
01 55 00	Traffic Control, Vehicle Access & Parking
01 57 01	Environmental Protection
03 30 00	Submittals
03 30 53	Cast-In-Place Concrete
03 40 01	Precast Concrete
31 24 13	Roadway Excavation, Embankment & Compaction
31 32 19	Geosynthetics
31 37 10	Riprap
31 62 16	Steel Pipe Piles
32 12 16	Hot-Mix Asphalt Concrete Paving
32 31 13	Chain Link Fence and Gates
33 40 01	Storm Sewers
33 44 01	Manholes and Catchbasins
35 51 50	Installation of Floating Docks

1.0 GENERAL

.4 ***(Delete and replace as follows)***
Give minimum 72-hour notice to Owner prior to beginning construction and comply in all respects with their requirements. The Contractor will be responsible for any and all local permits required to execute the work.

.7 ***(Add)***
The Contractor shall prepare, or cause to be prepared, a Traffic Management Plan (TMP). The TMP shall be submitted to the Owner for approval and the approved TMP shall be implemented and maintained during the Work.

.8 ***(Add)***
The following provisions must be included in the TMPs:

.1 Closure of the Sea Walk shall not be permitted.
.2 Road closures on Highway 19A will not be permitted. Two-way traffic shall be maintained at all times.
.3 Outside of working hours, the road is to be opened to two-way traffic unless otherwise authorised by the Owner.
.4 Safe pedestrian movement must be maintained.
.5 Pedestrian and cyclist traffic should be accommodated by maintaining the sidewalks and using fencing and other protection measures to segregate this traffic and the construction activities.

.9 ***(Add)***
The TMPs shall:

.1 Include an accurate road configuration, with road names, north arrow marker, speed limit and proposed extents of the Work.
.2 Indicate placement and distance of signs, delineators, cones, barricades, position of certified TCP's and traffic control equipment.
.3 Identify the number of lanes to be obstructed, along with taper lengths and widths of lanes.
.4 Identify impacts to driveways and bus stops, intersections, turning isles, sidewalks, and bike lanes. Include measures to facilitate and maintain access.
.5 Consider project specific restrictions (work hours etc) as outlined in the Contract Documents.
.6 Include a map of full detour routes including the above requirements along each route.

.10 ***(Add)***
The TMP is to be submitted as per Item 5.1.1.f of the Form of Tender. The Contractor will not be permitted to start any of the Work until the TMP has been approved by the Owner.

.11 ***(Add)***
If required, the Contractor shall prepare, or cause to be prepared, a Pedestrian Management Plan (PMP). The PMP shall be submitted to the Owner for approval and the approved PMP shall be implemented and maintained during the Work.

1.4 Traffic Control

.8 ***(Delete and replace as follows)***
Maintain uninterrupted access / egress to / from all properties within or in the vicinity of the Work, unless authorized as part of the approved Traffic Management Plan or by the Contract Administrator.

.10.1 ***(Delete first paragraph and replace as follows)***
Provide Traffic Control Personnel (TCP), trained and certified by the BC Construction Safety Alliance (BCCSA), and properly equipped for the following situations:

1.5 Payment

.1 ***(Delete and replace as follows)***
Payment for all work performed under this Section will be on a lump sum basis. Payment shall be 30% upon preparing TMP(s) (and PMP(s)), securing permits and erecting traffic control devices; 60% distributed in monthly Progress Payments for traffic control persons and related control devices; and 10% upon Substantial Performance.

END OF SECTION 01 55 00

1.0 GENERAL

1.5 (Delete and replace with) Environmental Mitigation Plan

.1 ***(Add)***

General Requirements

.1 The Contractor shall retain a Qualified Environmental Professional (QEP) as part of their project team. The QEP shall maintain professional independence. The QEP shall have the authority to temporarily stop work, if terms and conditions of the Environmental Mitigation Plan (EMP), Best Management Practices (BMPs), regulatory approvals and / or applicable legislation are not being met.

.2 The Contractor will be responsible for the development, implementation, effective monitoring and ongoing maintenance of their own site specific Environmental Mitigation Plan (EMP). This plan is to be completed by the Contractor and submitted to the Contract Administrator in accordance with Section 5.1.1 of the Form of Tender. The Contractor shall submit and the Contract Administrator shall review the EMP in a manner consistent with the provisions of GC 5.3 and GC 5.4. The Contract Administrator shall return the EMP within 5 Days. The Contractor shall make any changes to the EMP and resubmit the EMP within 5 Days unless otherwise directed by the Contract Administrator.

.3 The EMP shall be developed to address all of the regulatory requirements, including the Fisheries Act Authorization conditions, which is included in the Appendix of the Contract Documents. Works shall be completed pursuant to DFO & City permits. The EMP will also include best practices and mitigation measures at a minimum for: sediment and erosion, vegetation, invasive species, wildlife, surface water / aquatics, groundwater, waste, archaeological, air and noise. A spill prevention and response plan will also form a component of the EMP.

.4 The Contractor's site specific EMP shall be implemented 24 hours per day 7 days a week for the duration of the Works.

.2 ***(Add)***

The following does not represent complete content for the Contractor's EMP, however these measures shall be included in the EMP. Minimum contents of the EMP shall be:

.1 Best Management Practices (BMP) or specific mitigation measures related to:

- .A Sediment & Erosion Control
- .B Spill Control and Response
- .C Vegetation Protection
- .D Invasive Species
- .E Wildlife Protection including measures to protect key species
- .F Surface Water
- .G Groundwater

.H Contaminated Material
.I Archaeological
.J Air & Noise
.K Monitoring
.L Reporting

.2 A 11x17 size site plan showing the locations of particular BMP's which are to be employed.

.3 Targeted tide ranges and prospective dates for basin excavation, channel deepening, breakwater construction, and ramp work.

1.6 Payment

.1 ***(Delete and replace as follows)***

Payment for development of and revisions to the EMP will be paid as a Lump Sum. 50% payment shall be made upon review of the EMP by the Owner and 50% payment will be made upon review of the Final Environmental Summary Report.

.2 ***(Add)***

Payment for ongoing EMP Implementation, Monitoring and Reporting will be paid on a daily basis. This item shall include full compensation for meeting the requirements of Section 01 57 01, Supplementary Sections (excluding Work described in 01 57 01 - 1.6.1.1) and implementing a site specific Environmental Monitoring Plan to control all works within the Place of Work 24 hours per day 7 days a week for the duration of the Work. This shall include all labour, equipment and materials required to complete the Work.

1.9 Submittals

.1 ***(Add)***

The Contractor shall submit a Weekly Environmental Monitoring Report to the Contract Administrator within 3 Days following the end of the reporting period (defined as Monday to Sunday). The monitoring report shall include as a minimum:

.1 Name of environmental monitors
.2 Period covered by the report
.3 Date report submitted
.4 Contractor(s) undertaking work during the reporting period
.5 Overall weather conditions during the reporting period
.6 Description, photos and status of Work activities by area
.7 List of meetings and any other material communications with any Environmental Authority (both those that occurred during the reporting period and any that are scheduled or anticipated in future reporting periods) and a summary of key issues discussed or expected to be discussed
.8 A copy of any application for a Permit, report or other submission filed with any Environmental Authority during the reporting period, an updated list of all Permits issued under Environmental Laws for the Work and a schedule for obtaining any additional Permits required under Environmental Laws for the Work
.9 Status report regarding sediment and drainage management plans

.10 Description of outstanding environmental issues and / or non-compliance with Environmental Laws, Permits or other Contractor obligations and corrective actions taken or that will be taken and a schedule for such actions

.11 Any issues or concerns raised by the Environmental Monitor and measures taken or that will be taken to address those issues or concerns

.12 Water sampling data and results received during the reporting period, including results of in-situ turbidity, dissolved oxygen and other water quality parameters as required by the EMP, Environmental Authorities, Environmental Laws or Permits.

.2 ***(Add)***

A Final Environmental Summary Report shall be submitted within 10 Days after Substantial Performance. The Report shall summarise all items contained within the weekly Environmental Monitoring Report for the project duration.

END OF SECTION 01 57 01

1.0 GENERAL

.1 Section 03 30 00 refers to those portions of the *Work* that are unique to the submission of documents by the *Contractor* to the *Contract Administrator* to demonstrate that materials, equipment, methods and work comply with the provisions and intent of the *Contract Documents*. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described hearin.

1.1 Submittals

.1 The following is a list of submittals required for this project. This list is not authoritative, and it is the *Contractor's* responsibility to submit all required submittals as outlined in this Section and all other Sections of the *Contract Documents*.

1. All submittals required in the Form of Tender.
2. Pedestrian Management Plan (if required) per Supplementary Specification 01 55 00.
3. All Quality Control and Quality Assurance tests and inspections of the Work per Supplementary General Condition 4.12.
4. Weekly Environmental Monitoring Reports.
5. Concrete Reinforcement Shop Drawings per Specification 03 20 01 – 1.4
6. Concrete materials test data per Section 03 30 53 – 1.3.1.
7. Cast-in-Place Concrete quality control procedures per Specification 03 30 53 – 1.4.
8. Pre-Cast Concrete quality control procedures per Specification 03 40 01 – 1.3.
9. Shop Drawings for Pre-Cast Concrete Panels per Supplementary Specification 03 40 01-1.6.
10. Test Panels of sawtooth ramp pattern per Supplementary Specification 03 30 53 & 03 40 01.
11. Geosynthetics Material Certifications per Specification 31 32 19 – 1.4.
12. Riprap QC Plan and testing data per Supplementary Specification 31 37 10-1.6.
13. Pipe Pile Material Certifications and Pile Driving Records per Supplementary Specification 31 62 16.
14. Material Certifications for Granular Subbase per Specification 32 11 16.1.
15. Material Certifications for Granular Base per Specification 32 11 23.
16. Acceptance of Base Course for Asphalt Paving per Supplementary Specification 32 12 16.

1.3 Measurement and Payment

.1 Payment for all submittals is incidental to all other parts of the Work.

2.0 PRODUCTS

.1 Not Used

3.0 EXECUTION

.1 Not Used

END OF SECTION 03 30 00

1.5 Measurement and Payment

.1 ***(Delete last sentence and replace with)***
Payment for concrete walls, slabs and other structures under 1.5.2 to 1.5.4 of this Section will be based on area for different thicknesses based on the actual measurement of dimensions of components constructed as detailed on Contract Drawings.

Cast-in-place Ramp Slab 250mm thick with 600mm thickened edges and toe includes subgrade and footing preparation, supply and placing of granular base gravels and geotextile, and supply and placing of steel reinforcement and concrete as shown on *Contract Drawings*. Costs related to preparation of test panel are considered incidental to the Work described in this Section. Excavation will be paid under appropriate pay items in Section 31 23 01 - Excavation, Trenching and Backfilling.

.3 ***(Delete and replace with)***
Payment for cast-in-place reinforced concrete retaining walls, slabs and other items includes all work and materials required to prepare subgrade and footing, supply and placing of granular base gravels and geotextile, all formwork, reinforcement, construction and expansion joints and drain holes as shown on Contract Drawings. Excavation will be paid under appropriate pay items in Section 31 23 01 - Excavation, Trenching and Backfilling.

.6 ***(Add the following clause 1.5.6)***
Payment for Cast-in-place Foot Ramp includes all work and materials required to install the foot ramp as shown on Contract Drawings including all formwork, reinforcement, expansion joints, pipe, pipe end cap. Payment for handrail will be made under 31 31 13 – Chain Link Fences and Gates.

1.6 Inspection and Testing

.4 ***(Add)***
Provide 1m x 2m test panel for inspection of sawtooth ramp pattern 5 Days prior to casting of ramp panels.

.5 ***(Add)***
Provide minimum 72 hrs notice prior to placing of concrete to allow for steel reinforcing inspection. Obtain Contract Administrator’s approval of reinforcing placement before placing concrete.

2.0 PRODUCTS

2.1 Materials

.10 ***(Add the following clause)***
Reinforcing Steel

.1 Reinforcing steel to meet specifications shown on Contract Drawings

2.2 Concrete Mixes

.2 ***(Add)***
Concrete mix to be Class C1 exposure mix.

3.0 EXECUTION

3.3 Workmanship

.1 ***(Delete and replace as follows)***
Provide notice and obtain Contractor Administrator's approval prior to placing concrete in accordance with paragraph 1.6.5 of this Section.

3.5 Subgrade Preparation

.1 ***(Add)***
Excavate or fill to design subgrade to Section 31 24 13 – Roadway Excavation, Embankment and Compaction.

.2 ***(Add)***
Compact as specified in Section 31 24 13 – Roadway Excavation, Embankment and Compaction.

3.6 Granular Subbase and Base

.1 ***(Add)***
For No. 4 (AASHTO M43) stone, compact using a minimum of three (3) full coverages with a vibratory compactor.

.2 ***(Add)***
For all other base materials, compact as specified in Section 31 24 13 – Roadway Excavation, Embankment and Compaction.

3.7 Acceptance

.1 ***(Add)***
Concrete shall develop a minimum compressive strength of 35 MPa at 28 days based on standard cylinder test, performed in accordance with CSA A23.2-9C, based on concrete cylinders collected on the day of placement.

.2 ***(Add)***
One strength test (3 specimen cylinders) shall be made for each 100 square metres of concrete work. In no case, however, shall there be less than one strength test for concrete placed in one day. One cylinder shall be tested at 7 days, 2 cylinders shall be tested at 28 days.

.3 ***(Add)***
The core test shall be performed in accordance with CSA 23.2-14C. The compressive strength of the concrete, based on core tests, shall be interpreted from CSA A23.1-94.

.4 ***(Add)***

In the event that the cylinders, tested at 28 days, fail to achieve the specified strength, the Contractor shall, upon notification, obtain cores for further testing. The cores are to be drilled from the portions of the structure in question and tested prior to day 38.

.5 ***(Add)***

Concrete not meeting the minimum compressive strength criteria shall be rejected and must be removed and replaced at the Contractor's expense.

END OF SECTION 03 30 53

1.0 GENERAL

1.4 Payment

.6 ***(Add Clause 1.4.6)***

Payment for Precast Ramp Slab 250mm thick includes subgrade and footing preparation, supply and placing of granular base gravels, geotextile and precast ramp slabs as shown on *Contract Drawings* and outlined in this Section. Costs related to preparation of shop drawings and test panel are considered incidental to the Work described in this Section. Excavation and backfilling will be paid under appropriate pay items in Section 31 23 01 - Excavation, Trenching and Backfilling. Measurement will be for the net surface of the work covered by the precast panels. No allowance will be made for seams and overlaps.

.7 ***(Add Clause 1.4.7)***

Payment for Precast Buttress Blocks includes subgrade and footing preparation, supply and placing of granular base gravels, geotextile and precast buttress blocks as shown on *Contract Drawings* and outlined in this Section. Excavation and backfilling will be paid under appropriate pay items in Section 31 23 01 - Excavation, Trenching and Backfilling. Payment will be made per block.

1.5 Inspection and Testing

.2 ***(Add Clause 1.5.2)***

Provide 1m x 2m test panel for inspection of sawtooth ramp pattern 5 Days prior to casting of pre-cast panels.

1.6 Submittals

.1 ***(Add Clause 1.6.1)***

Submit shop drawings to Contract Administrator showing pre-cast panel sections. Reinforcement details shown on Contract Drawings are for in-place reinforcement only. The Contractor will be required to submit shop drawings, signed and sealed by a Professional Engineer registered in British Columbia, certifying that the pre-cast panels have been designed to withstand lifting stresses during manufacture, shipping and placement. Shop drawings shall include all information and details needed for the fabrication of the members including, but not limited to, such items as member shapes and dimensions, mark numbers and general arrangement of member locations, mass, reinforcement, embedments, openings, block outs, chamfers, recesses, finishes, concrete mix design, special tolerances, special handling instructions, lifting details and lifting locations.

3.0 EXECUTION

3.2 Subgrade Preparation

.1 ***(Add)***

Excavate or fill to design subgrade to Section 31 24 13 – Roadway Excavation, Embankment and Compaction.

.2 ***(Add)***
Compact as specified in Section 31 24 13 – Roadway Excavation, Embankment and Compaction.

3.3 Granular Subbase and Base

.1 ***(Add)***
For No. 4 (AASHTO M43) stone, compact using a minimum of three (3) full coverages with a vibratory compactor.

.2 ***(Add)***
For all other base materials, compact as specified in Section 31 24 13 – Roadway Excavation, Embankment and Compaction.

3.4 Acceptance

.1 ***(Add Clause 3.4.1)***
Concrete shall develop a minimum compressive strength of 35 MPa at 28 days based on standard cylinder test, performed in accordance with CSA A23.2-9C, based on concrete cylinders collected on the day of placement.

.2 ***(Add Clause 3.4.2)***
One strength test (3 specimen cylinders) shall be made for each 100 square metres of concrete work. In no case, however, shall there be less than one strength test for concrete placed in one day. One cylinder shall be tested at 7 days, 2 cylinders shall be tested at 28 days.

.3 ***(Add Clause 3.4.3)***
The core test shall be performed in accordance with CSA 23.2-14C. The compressive strength of the concrete, based on core tests, shall be interpreted from CSA A23.1-94.

.4 ***(Add Clause 3.4.4)***
In the event that the cylinders, tested at 28 days, fail to achieve the specified strength, the Contractor shall, upon notification, obtain cores for further testing. The cores are to be drilled from the portions of the structure in question and tested prior to day 38.

.5 ***(Add Clause 3.4.5)***
Concrete not meeting the minimum compressive strength criteria shall be rejected and must be removed and replaced at the Contractor’s expense.

END OF SECTION 03 40 01

1.0 GENERAL

1.3 Definitions

.1 ***(Amend as follows)***
Change wording to read "three classes" of excavation and add 1.3.1.3 as follows:

.3 Mass Excavation: As defined as "Removals" under Section 31 23 01 – Excavating, Trenching and Backfilling – 1.3, and also including removal of asphalt as specifically designated on Contract Drawings for removal.

1.8 Measurement and Payment

.4 ***(Delete and replace as follows)***
Payment for Mass Excavation (or Removals), as defined in paragraph 1.3.1 of this Section, will be on a Lump Sum basis, unless noted otherwise in the Schedule of Quantities.

.5 ***(Add to end of first paragraph)***
except where these items are specifically designated as removals on Contract Drawings in which case paymant will be made under part 1.8.4 of this Section.

.14 ***(Add)***
Payment for Basin and Approach Channel Excavation includes all work and materials required to excavate the basin and approach channel (including the construction, maintenance and removal of any access temporary roads), and to dump and spread the material at a location specified in the Schedule of Quantities and Prices. Material is to be spread as directed by the Contract Administrator but will generally be to create a low angle beach profile.

.15 ***(Add)***
Payment for Breakup of Existing Boat Ramp Slab, Concrete Block Wall and Concrete Wall and Relocation into South Breakwater Core includes all work and materials required to breakup the boat ramp slab, concrete block wall as per the sizing requirements shown on the Contract Drawings and relocate the broken up concrete pieces as shown on the Contract Drawings. This item will be paid as a lump sum upon completion of the relocation work.

3.5 Compaction

.5.7 ***(Add)***
The frequency of density tests shall be one test per 150m^2 per 300mm vertical lift.

END OF SECTION 31 24 13

1.0 GENERAL

1.6 Payment

.1 ***(Add to end of clause)***

Payment will also include supply and installation of anchor pins at the spacing specified on the Contract Drawings.

.2 ***(Add)***

For clarification, payment for geotextile filter fabric to be placed under the concrete ramp is included in payment under Section 03 30 53 and 03 40 01.

2.0 PRODUCTS

2.1 Geosynthetic

.1 ***(Delete and replace as follows)***

Geosynthetic filter fabric to be Nilex 4553 Non-Woven Geotextile or approved equivalent with the following minimum product specifications:

.1 Grab Strength: 400N
.2 Elongation: 15%
.3 CBR Puncture: 2000N
.4 Trapezoidal Tear: 133N.

2.2 Products – Anchor Pins

.1 ***(Add)***

Anchor pins to be 200mm long galvanized spiral nails with 1" galvanized washer.

3.0 EXECUTION

3.1 Installation

.1 ***(Delete and replace as follows)***

Ensure overlap is no less than 750mm.

.3 ***(Delete and replace as follows)***

Place pins or staples at 1m spacing.

END OF SECTION 31 32 19

1.0 GENERAL

.2 ***(Add)***

In the case of conflict between this specification and the BCMoTI Section 205 Riprap Specification, the terms of the BCMoTI Section 205 Riprap Specification will prevail.

1.3 Samples

.1 ***(Delete and Replace with)***

For each class of riprap, three representative samples shall be set aside for review by the Contract Administrator at the quarry, as follows:

.1 D_{15} sample - painted Red
.2 D_{50} sample - painted Green
.3 D_{85} sample - painted Yellow

.2 ***(Add)***

The following percentages of riprap are to be inspected and approved by the Contract Administrator while in stockpile, prior to leaving the quarry:

.1 85% of Class 2000 riprap
.2 50% of all other riprap classes

.3 ***(Add)***

The Contractor is to prepare a test panel of Class 2000 riprap armour for review by Contract Administrator. The test panel shall be a minimum of 10m wide and shall be the full design height as shown in the Contract Drawings. The test panel shall be representative of the finish for all riprap armouring and will demonstrate that the riprap surface is in accordance with the Contract Documents.

1.4 Measurement and Payment

.1 ***(Delete and replace with)***

Measurement for machine or hand placed graded riprap armouring shall be for each specified Class and thickness and will be for the actual area placed. No allowance will be made for the quantity of rock placed in excess of these dimensions. Construction, maintenance and removal (if required) of haul roads is considered incidental to payment made under this Section.

.2 ***(Add)***

Payment for Class 100 Riprap Core includes all work and materials required to supply and place the material to the lines and levels shown on the Contract Drawings. Measurement will be by actual volume placed, based on in-place cross sections at sufficient and equal intervals taken by Contract Administrator in areas of inner core placement.

.1 Initial cross sections will be taken after the existing breakwater riprap and broken up concrete has been

relocated to the inner core area and immediately prior to any Class 100 riprap placement.

.2 Final cross sections will be taken upon completion of Class 100 riprap placement to lines and levels required prior to placement of the Class 2000 riprap armouring.

.3 ***(Add)***

Measurement for Toe Protection Mattress includes all work and materials required to place the toe protection mattress as shown on the Contract Drawings. Measurement will be by lineal metre.

.4 ***(Add)***

Payment for Scour Protection Trench includes all work and materials required to excavate trench, supply and place riprap into trench, backfill trench with native beach gravels and spread remaining beach gravels. Measurement will be by lineal metre.

.5 ***(Add)***

Payment for Debris Barrier includes all work and materials required to place the debris barrier as shown on the Contract Drawings. Measurement will be by lineal metre.

.6 ***(Add)***

Payment for Stockpile and Reuse of Embankment Riprap shall include all work and materials required to stockpile embankment riprap on-site and reuse on embankment as specifically designated on the Contract Drawings. This item will be paid as a lump sum.

.7 ***(Add)***

Payment for Gravel Retention Berm includes all work and materials required to excavate supply and place Class 100 and Class 2000 riprap as shown on the Contract Drawings. Measurement will be by lineal metre measured along the top of the gravel retention berm.

.8 ***(Add)***

Payment for Relocation of Existing Breakwater Riprap shall include all work and materials required to relocate the existing breakwater riprap as shown on the Contract Drawings. Measurement will be made based on volumes calculated from survey cross sections taken prior to relocation of the riprap.

.9 ***(Add)***

Payment for Class 25 riprap used for storm outlet structure will be made under pay items in Supplementary Section 33 40 01 - Storm Sewers – 1.6.12.

1.5 Inspection and Testing

.2 ***(Add)***

Standard test methods relating to material type, characteristics, and testing of riprap and aggregates typically associated with riprap installations are provided. The test methods are intended to ensure that the rock is dense and durable, and will not degrade over time. Rocks used for riprap should only break with difficulty, have no earthy odor, no closely spaced discontinuities, and should not absorb water easily. Rocks composed of appreciable amounts of clay or silt shall not be accepted for use as riprap.

.3 ***(Add)***

For each class of riprap used, the Contractor shall provide the Contract Administrator with test results for each test shown in Table 205-C and for testing for Acid Rock Drainage and Metal Leaching at least 5 days prior to placement of the material or as required by the Contract Administrator. Testing shall meet the BC Ministry of Transportation and Infrastructure's requirements outlined in the Ministry's Technical Circular T04-13. Ministry technical circulars are available on-line at:
http://www.th.gov.bc.ca/publications/Circulars/all_technical.asp

TABLE 205-C RECOMMENDED TESTS FOR RIPRAP QUALITY

Property	Test Designation	Allowable Value
Specific Gravity	ASTM D6473	≥2.60
Absorption	ASTM D6473	≤1%
Soundness by use of Magnesium Sulphate	ASTM D5240	≤10% (following 5 cycles)
Micro-Deval Abrasion Loss Factor	ASTM D6928	≤20%

1.6 (Add) Submittals

.1 ***(Add)***

A Riprap Quality Control Plan prepared by a Geotechnical Engineering company must be submitted to the Contract Administrator for review prior to transporting any riprap. This plan shall include provision of necessary submittals and tests all according to MoTI Section 205 Riprap Specification. This plan is to provide details of weigh scales and procedures proposed for recording and verifying tonnes of riprap shipped. Arrange for contract administrator to visit weigh facility. Also as part of Quality Control Plan maintain representative samples of D_{15}, D_{50} and D_{85} samples for each armouring rip rap class conveniently laid out for use by quarry and inspector during creation of stockpiles in quarry. The purpose and limitations of review by the

Contract Administrator will be consistent with the purpose and limitations of GC 5.4.

2.1 PRODUCTS – Riprap

.1 ***(Delete and replace with)***

Rock shall be hard, durable, and angular quarry rock of a quality that will not disintegrate on exposure to salt water or the atmosphere with a specific gravity not less than that shown in Table 205-C. The gradation of rock sizes (mass in kg) for each class of riprap shall conform to Table 205-A.

TABLE 205-A GRADATION OF ROCK SIZES IN EACH CLASS OF RIPRAP

CLASS OF RIPRAP (kg)	*NOMINAL THICKNESS OF RIPRAP (mm)	ROCK GRADATION PERCENTAGE SMALLER THAN GIVEN ROCK MASS (kg)		
		15%	50%	85%
10	350	1	10	30
25	450	2.5	25	75
50	550	5	50	150
100	700	10	100	300
250	1000	25	250	750
500	1200	50	500	1500
1000	1500	100	1000	3000
2000	2000	200	2000	6000
4000	2500	400	4000	12000

* Unless specified elsewhere in Contract Documents

.2 The Gradation of rocks shall be well-graded, approximately the specified or directed sizes, and individual rocks minimum dimension shall be greater than one-third its maximum dimension and none shall have a mass greater than five times that of the specified class of riprap.

.3 For visual comprehension only, Table 205-B indicates the approximate average dimension of an angular rock for each specified class of riprap.

TABLE 205-B APPROXIMATE AVERAGE DIMENSION OF AN ANGULAR ROCK FOR EACH SPECIFIED ROCK CLASS MASS (Sg=2.640)

CLASS (KG)	APPROX. AVERAGE DIMENSION (mm)		
	15%	50%	85%
10	90	195	280
25	120	260	380
50	155	330	475
100	195	415	600
250	260	565	815
500	330	715	1030
1000	415	900	1295
2000	525	1130	1630
4000	660	1425	2055

3.0 EXECUTION

3.1 Surface Preparation

.4 ***(Add)***

Construct and maintain haul roads as required to complete the work.

3.2 Placement

.1 ***(Delete and replace with)***

At the toe of sloped riprap, a sufficient number of the larger rocks shall be placed to form a firm foundation. The remaining larger rocks shall be regularly spaced, at least one every 2.5 m², when placing the general rock mass to the nominal or required thickness over the area indicated. Smaller rocks or spalls shall be well hammered in to fill the interstices and to form a closely massed regular surface. Continue placement working up slope.

3.3 Finishing Tolerances

.1 ***(Delete and replace with)***

Ensure finished Class 2000 riprap is within +200mm to -200mm of specified grade. Ensure all other classes of riprap are within +100mm to -100mm of specified grade.

END OF SECTION 31 37 10

(Add)

1.0 GENERAL

.1 Section 31 62 16 refers to those portions of the work that are unique to the supply and installation of steel pipe piles. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described hearin.

1.2 References

.1 All work shall conform to the provisions contained within the documents titled "*Best Management Practices for Pile Driving and related Operations BC Marine and Pile Driving Contractors Association March 2003."*

1.3 Samples

.1 Samples may be required. The Contractor is required to submit a certification from a certifier that the material supplied meets the specified standards.

1.4 Measurement and Payment

.1 Payment and measurement for steel piles shall be for supply and installation of piles in metres of pile acceptably incorporated into work. Pile tip reinforcement, splices, pile shoes and pile caps shall be considered incidental to the Work.

1.5 Inspection and Testing

As specified under paragraph 2.0 - Products and 3.0 - Execution.

2.0 PRODUCTS

.1 Steel pipe piles shall have minimum yield strength of 310 MPa meeting the requirements of the latest edition of at least one of the following specifications:

- .1 ASTM A252 Grade 3
- .2 API 5L Grade X46
- .3 CSA Z245.1-M with the following provisions:
  - .1 Chemical analysis of material shall show the copper content.
  - .2 All welds shall be full strength and shall satisfy the requirements of either ASTM A53 or CSA Z245.1-M.
  - .3 Flattening tests for ductilityshall be conducted in accordance with the procedure and frequency stipulated in CSA Standard Z245.1-M or ASTM Standard A53.
  - .4 Unless longitudinal welds are certified as conforming to the requirements of ASTM A53, CSA Z245.1-M or API 5L to the satisfaction of the Engineer, welds shall be 100 percent inspected by ultrasonic or electromagnetic inspection according to the requirements of ASTM A53.

This inspection shall be conducted at the Contractor's expense.

.5 The Contractor shall bear the expense of repairing and re-inspecting all rejected welds.

.6 Allowable tolerance on dimensions shall meet the requirements of CSA Z245.1-M.

.7 The minimum length of a pile section used in the fabrication of piles shall be 3.0 m.

.8 Welded pipe splices shall have full strength welds.

3 EXECUTION

.1 Piling shall be handled and stored so as to avoid over stressing or injury, and any piles bent or damaged, or in any way made defective in the opinion of the Owner or Engineer, shall be made good to his satisfaction or replaced.

.2 Welding practice and qualifications of fabricators and erectors of welded construction shall conform to the requirements of CSA Standards W47, W48, and W59, latest editions.

.3 Piles shall be spliced to the required lengths in a workshop or similar suitable place that will ensure good quality splices.

.4 Lengths to be joined shall be manipulated in jigs so that only down-hand welding is employed.

.5 The splice shall be complete joint penetration welds and shall develop the full strength of the pile section. Splices shall be made in a manner that will ensure good alignment of the spliced parts. The number of splices shall be held to a minimum.

.6 The longitudinal welds of pipe pile lengths to be joined shall be staggered 90 degrees.

.7 The end profile of a pile section to be butt welded shall not have a deviation of more than 1.0 - 1.6 mm from a plane perpendicular to the axis of the pile.

.8 Maximum deviation of the line of the pile at the splices shall be 3 mm when measured with a 3.0 m straight edge.

.9 All pile splices shall be 100 percent inspected and tested. This inspection shall be conducted at the Contractor's expense.

.10 Inspections of pile splices shall be by non-destructive ultrasonic tests in accordance with the requirements of AWS D1.1; dynamic. The test results shall be made available to the Engineer. If the inspection of a weld should indicate poor alignment of the pile sections, insufficient penetration of the weld, lack of fusion, slag inclusions, porosity or any such defects, the Contractor shall take the necessary corrective measures to provide a full strength weld to the satisfaction of the Contract Administrator. The cost of correcting defective welds and re-testing shall be borne by the Contractor.

.11 Piles shall be installed in accordance with Best Management Practice for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association – November; 2003.

.12 All pile driving equipment shall be in good mechanical condition and shall be capable of delivering the manufacturer's rated energy output and shall be operated in accordance with the manufacturer's instructions.

.13 Pile driver leads shall be constructed in a manner which affords freedom of movement of the hammer and they shall be held in position by guys, stiff braces or by attaching to cranes or derricks so as to ensure proper support for the pile during driving. Hammer blows at all times shall be in direct line with the axis of the pile.

.14 Steel piles shall be driven without excessive deformation of the head of the pile. The head of the pile shall be cut square and a driving cap shall be provided to hold the axis of the pile in line with the axis of the hammer.

.15 The driving cap shall fit continuously over the top of the pile and shall project about 150 mm down over/into the pile and shall be such that the pile is held properly in line with the leads. A cushion of hardwood, fibre, plywood or other suitable material shall be placed between the driving cap and the hammer. The cushion shall be replaced if so directed by the Contract Administrator or Site Inspector.

.16 Piles shall be driven in the positions shown on the contract Drawings. Piles shall be driven and installed within a tolerance of +/- 50 mm in location and within 0.5% from the specified axial alignment. The Contract Administrator may reject piles driven out of alignment or damaged in any way after inspection. Cost of remedial measures decided by the Contract Administrator shall be borne by the Contractor.

.17 After driving, piles shall be cut off at the elevations shown on the plans. In driving, sufficient length above cut off shall be allowed so that no part of the head of the pile damaged or deformed during driving remains in the work.

.18 Piles shall be cut in a flat plane. A suitable guide shall be used to aid in cutting piles so that the cut off plane is within specified butt weld splice tolerances. If a satisfactory hand-held cut cannot be obtained, the Contractor shall cut the pile with an automatic cutter.

.19 The Contractor shall maintain an accurate record of pile driving. The Contractor shall submit a copy of the record to the Contract Administrator. The Contractor shall co-operate with the Contract Administrator in maintaining these records. The Contractor shall record for each pile:

- Pile number and location
- Date and time driven
- Length of pile drive
- Type of pile driving hamme energy
- Cut off elevation
- Penetration in overburden
- Tip elevation
- Final set and hammer

END OF SECTION 31 62 16

1.5 Measurement and Payment

.9 ***(Add)***

Payment for Coordination with Owner's Asphalt Concrete Paving Contractor will be made by lump sum, and will be paid upon completion of all paving works. This item shall include all work necessary to coordinate scheduling of paving work with the Owner's Asphalt Concrete Paving Contractor and coordinate surface preparation in advance of paving works as shown on the Contract Drawings

END OF SECTION 32 12 16

1.5 Measurement and Payment

.4 ***(Delete and replace with)***

Payment for handrail includes all materials, work and incidentals shown on Contract Drawings and Standard Detail Drawing C14. Measurement will be made horizontally along surface of the ground for the length of handrail installed.

END OF SECTION 32 31 13

1.0 GENERAL

1.5 Scheduling of Work .1 ***(Add to end of first sentence)***

and to suit weather and tides

1.6 Payment .12 ***(Add)***

Payment for Concrete Headwall with Grating includes trench excavation, disposal of surplus excavated material, supply and installation of all headwall structure components and related materials, bedding, imported backfill, filter fabric, Class 25 riprap channel lining blanket, all surface restoration as specified under Excavating, Trenching and Backfilling Section 31 23 01 – 3.6, and all other work and materials necessary to complete installation as shown on Contract Drawings and specified under this Section.

END OF SECTION 33 40 01

1.0 GENERAL

1.5 Measurement and Payment

1.1 ***(Amend as follows)***
Payment for manhole base, lid, slab, cover, frame, riser rings and riser sections includes all components shown on Standard Detail Drawings for manholes including riser rings and riser sections.

1.2 (Amend as follows)
Payment for manhole riser sections will be included in 1.5.1.1, and will be for risers of standard or non-standard heights required to complete manhole from specified invert to finished level.

END OF SECTION 33 44 01

(Add)

1.0 GENERAL

.1 Section 35 51 50 refers to those portions of the Work that are unique to the installation of floating dock units supplied by the Owner. This section must be referenced to and interpreted simultaneously with all other sections pertinent to the works described herein.

1.1 Related Work

.1 Cast-in-place Concrete — Section 03 50 53

.2 Steel Pipe Piles — Section 31 62 16

1.2 References

.1 Not Used

1.3 Measurement and Payment

.1 Payment for Installation of Floating Docks includes all work, and materials required to install the floating dock sections in accordance with this Section. Payment will be made by lump sum upon acceptance of installation by Contract Administrator. 10% of the lump sum value will be held back until Substantial Performance.

1.4 Milestone Dates

.1 Floating Docks shall be supplied by the Owner on or before August 31, 2018.

1.5 Inspection and Testing

.1 The Contractor and the Contract Administrator shall undertake a preliminary condition inspection of the floating dock units upon delivery by others.

.2 The Contract Administrator shall coordinate regular inspections by an Owner's representative during the installation process.

2.0 PRODUCTS

2.1 Floating Docks

.1 Floating docks shall be supplied as follows:

- .1 Floats will be supplied fully assembled except for the items below:
- .2 Pile guides, transition ramp, transition plate and end float feet will be shipped loose complete with all components (bolts, pins etc).

.2 Floating Docks will be supplied and stored on 883 South Island Highway property.

3.0 EXECUTION

3.1 Storage

.1 Contractor will be responsible for storage, security and protection of the floating dock units at all times after the milestone date shown in paragraph 1.4.1 above.

3.2 Placement

.1 Floating docks are to be installed in the final design location as shown on the Contract Drawings.

.2 Installation is anticipated to involve, at a minimum, the following:

.1 Transportation of all floats and components from the Storage area to the Work area.

.2 Locate floating docks as shown on Contract Drawings.

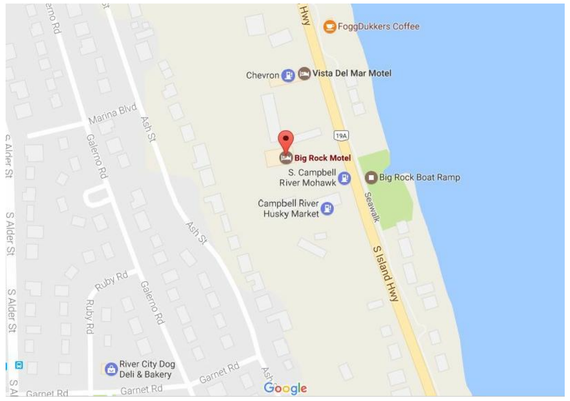
.3 Install pile guides, transition ramp, transition connector plate, end float feet and hinge pins as shown on Contract Drawings.

END OF SECTION 35 51 50

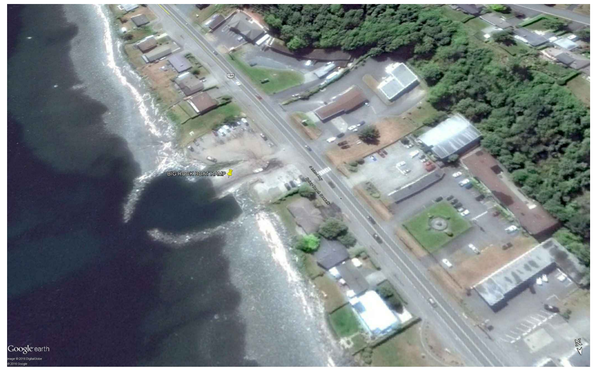
City of Campbell River

Big Rock Boat Ramp Reconstruction

Big Rock Boat Ramp, 985 South Island Highway,
Campbell River BC



Project Location (Google Maps)



Aerial Perspective Looking Southwards

DRAWING LIST:

COVER SHEET
GA01 -GENERAL ARRANGEMENT & CONSTRUCTION LIMITS
D01 -DEMOLITION PLAN AND SITE PREPARATION
C01 -GRADING & SITE SERVICING PLAN
C02 -NORTH AND SOUTH BREAKWATER PROFILES
C03 -RAMP PROFILE & PILING PLAN
C04 -CIVIL SECTIONS AND DETAILS
C05 -CIVIL SECTIONS AND DETAILS
C06 -NORTH BREAKWATER SECTIONS
C07 -SOUTH BREAKWATER SECTIONS
C08 -SOUTH BREAKWATER SECTIONS
C09 -SOUTH BREAKWATER SECTIONS
C10 -RAMP SECTIONS

DRAWING SET STATUS: ISSUE FOR TENDER - ISSUED 2018-03-28

GENERAL NOTES

1. This is an MMCD Platinum project. All work shall conform to the relevant sections of the MMCD Platinum Edition specifications unless otherwise noted. Details not provided in the Contract Drawings shall be from the MMCD Platinum Edition Standard Drawings or as noted. Granular aggregate and other materials where not addressed in MMCD specifications shall be as per the BC Ministry of Transportation Standard Specifications (available on web).
2. These drawing notes are highlights to the Contract requirements. They serve as an outline for site reference and do not govern over the other Contract Documents. Refer to GC 2.2.4 for Contract Document hierarchy. Review and conform to the General Conditions, Specifications, Supplemental General Conditions and Supplemental Specifications and all other parts of the Construction Contract.
3. All work and materials guaranteed for 1 year in accordance with GC 25.0.
4. Assume role of Prime Contractor in accordance with GC 21.2.
5. This work is tide dependent and critical to project schedule. Low tides conducive to project occur in May, June, July and August of 2018. Contractor is to establish tide windows, installation logistics and organize construction schedule to suit.
6. Maintain a clean set of red line mark up as builts for inspection by the Contract Administrator at all times in accordance with Section 01 33 01.
7. As part of the General Conditions of the Contract provide the following, but not limited to: lighting plant as required for any work scheduled at night (i.e. for tides), portable toilet, hoarding along property frontage, project sign per MMCD 01 58 01, Environmental Management Plan, Traffic Management Plan, Quality Control Plan for Provision of Riprap, concrete testing, test panel for sawtooth ramp pattern, hedge protection snow fencing, all required submittals.
8. Retain a Qualified Environmental Professional (QEP) to prepare and administer an Environmental Management Plan for the duration of construction in accordance with GC20.0, Section 01 57 01 and any other relevant Sections of the Contract Documents.
9. A Traffic Management Plan must be submitted in accordance with Supplementary Specification 01 55 00.
10. Coordinate all utility connection requirements with the Owner. The Contractor is responsible for locating all utilities and making BC 1 Call. Per the MMCD Contract no payment will be made for this effort.
11. Provide Notice of Project to Worksafe BC.
12. Provide an approved Riprap Quality Control Plan in accordance with Supplementary Specification 31 37 10 Riprap - 1.6.1S.
13. The Contract Administrator will provide survey control in accordance with GC 3.3.5 and the Contractor shall protect and preserve the survey control in accordance with GC 3.3.5. The Contractor will be solely responsible for laying out the Work in accordance with GC 4.1.1.
14. Provide an approved concrete mix design for boat ramp and stairs suitable for marine environment / municipal application stamped by P.Eng. Retain a professional materials testing firm for concrete quality control. Testing to be in accordance with Supplementary Specifications 03 30 53 and 03 40 01. Materials testing firm to cc Contract Administrator on all test results.
15. Reinforcing steel is to be as detailed on Contract Drawings. Provide shop drawings to Contract Administrator for reinforcing steel.
16. Provide 48 hours notice to Contract Administrator for rebar placement inspection. Casting of concrete may not occur until rebar placement and forms approved.
17. Cast test panel of sawtooth pattern concrete finish for review prior to casting ramp/foot ramp in accordance with Supplementary Specifications 03 30 53 and 03 40 01.
18. Ensure ramp formwork can withstand water action if intended to remain in place during tide cycle. Allow for securely covering fresh concrete for minimum 48 hours with 6 mil poly/sandbags to protect against water erosion.

SCHEDULING OF REQUIRED SUBMITTALS

Submittals to be provided in accordance with Supplementary Specifications 01 33 00.

EXISTING FEATURES

MANHOLE	C D S
COMBINED SEWER	C
COMBINED SEWER SERVICE LINE	
STORM SEWER	D
CATCH BASIN	
SANITARY SEWER	
SEWER CLEANOUT	S
WATER MAIN	W
WATER VALVE	
FIRE HYDRANT	
WATER METER	W
WATER SERVICE	W
GAS MAIN	G
GAS VALVE	
TELUS CONDUIT	T
ELECTRICAL CONDUIT	UE
STREET LIGHTING CONDUIT	UE
JUNCTION BOX	J
DAVID STREET LIGHT	
TRAFFIC SIGNAL POLE	
UTILITY POLE	
CURB AND GUTTER	
CONIFEROUS TREE	
DECIDUOUS TREE	
ORNAMENTAL TREE	
COMMERCIAL SIGN	
FENCE	

PROPOSED

STORM SEWER	D
SANITARY SEWER	S
MANHOLE	D1 S1
CATCH BASIN	
WATER MAIN	W
WATER VALVE	
FIRE HYDRANT	
CROSS	
TEE	
BEND	
CAP	
REDUCER	
IRRIGATION CONTROLLER BOX	
IRRIGATION VALVE	
PROPOSED ROAD RECONSTRUCTION	
PROPOSED MILL & OVERLAY	
PROPOSED TRENCH REPAIR	

Consultants:
Civil Engineer & Lead Consultant: Highland Engineering Services Ltd.
Breakwater Design: Outlook Engineering and Landscape Architecture
Survey: Chicalo Burridge Land Surveying and Geomatics
Environmental: Pacificus Biological Services Ltd.
Gravel Hydraulics: Northwest Hydraulic Consultants

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

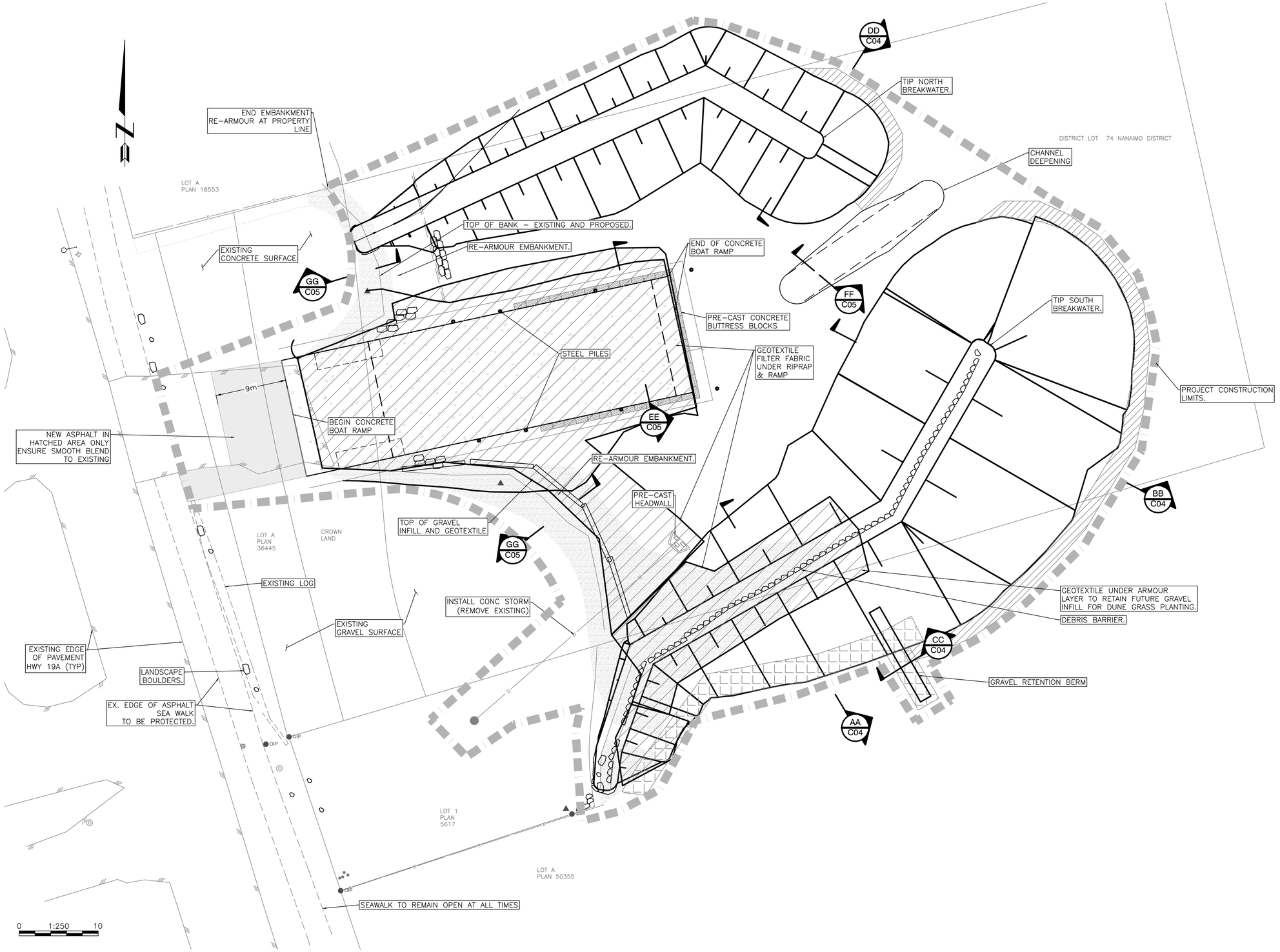
Design by TOB (OUTLOOK) Date January 2017
Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz.
Sheet 01 of 13
Highland Project No. 4079
City Dwg No. 13-506

Project BIG ROCK BOAT RAMP RECONSTRUCTION
Title COVER SHEET



K:\Land Projects 3\4079\DWG\4079 – BASE.dwg Apr 5, 18 5:08:40 PM

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017

Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz. 1:250

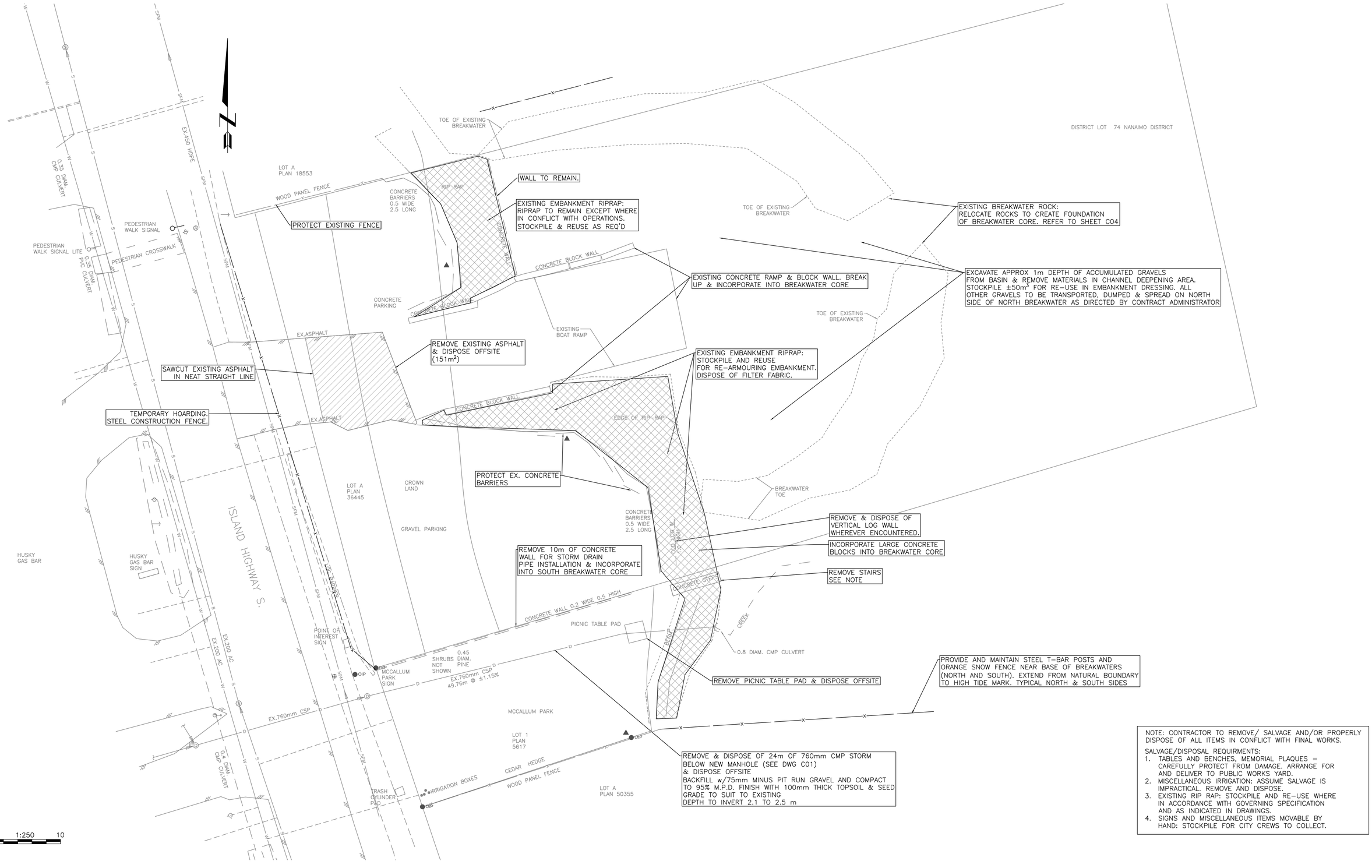
Sheet 02 of 13

Highland Project No. 4079

City Dwg No. 13-506

Project: BIG ROCK BOAT RAMP RECONSTRUCTION

Title: GA01 GENERAL ARRANGEMENT & CONSTRUCTION LIMITS



NOTE: CONTRACTOR TO REMOVE/ SALVAGE AND/OR PROPERLY DISPOSE OF ALL ITEMS IN CONFLICT WITH FINAL WORKS.

SALVAGE/DISPOSAL REQUIRMENTS:

1. TABLES AND BENCHES, MEMORIAL PLAQUES – CAREFULLY PROTECT FROM DAMAGE. ARRANGE FOR AND DELIVER TO PUBLIC WORKS YARD.
2. MISCELLANEOUS IRRIGATION: ASSUME SALVAGE IS IMPRACTICAL. REMOVE AND DISPOSE.
3. EXISTING RIP RAP: STOCKPILE AND RE-USE WHERE IN ACCORDANCE WITH GOVERNING SPECIFICATION AND AS INDICATED IN DRAWINGS.
4. SIGNS AND MISCELLANEOUS ITEMS MOVABLE BY HAND: STOCKPILE FOR CITY CREWS TO COLLECT.

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017

Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street, Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz. 1:250

Sheet 03 of 13

Highland Project No. 4079

City Dwg No. 13-506

Project BIG ROCK BOAT RAMP RECONSTRUCTION

Title D01 DEMOLITION AND SITE PREPARATION

DATUM

HORIZONTAL:
NAD83 U.T.M. ZONE 10 NORTH DERIVED FROM
GCM # 79H9043 AND PLAN VIP56716
TO CONVERT FROM GROUND TO GRID
APPLY COMBINED SCALE FACTOR: 0.9999144

VERTICAL:
CHART DATUM
REFERRED TO GCM # 79H9043
GEODETIC ELEVATION 4.70 METRES
CHART DATUM 7.60 METRES

SURVEY CONTROL POINTS:

POINT #	NORTHING	EASTING	ELEVATIONS	DESCRIPTION
20	5539789.374	340408.829	7.127	PK NAIL
22	5539789.622	340411.723	6.952	OLD IRON PIN
27	5539822.622	340424.542	7.010	SPIKE
29	5539846.898	340423.542	7.060	SPIKE
34	5539722.785	340415.834	7.600	MON 79H9043

ASPHALT PAVING:

- 75mm THICK OF HOT MIX ASPHALTIC CONCRETE OVER
- 75mm THICK OF 19mm MINUS GRANULAR BASE OVER
- 200mm THICK OF 75mm MINUS GRANULAR SUB-BASE OVER APPROVED SUB-GRADE

ALL GRANULAR MATERIALS COMPACTED TO 95% M.P.D.

FINISH GRADE OF WORK.
100.00 ABBREV
5.00
ORIGINAL SURVEYED GROUND ELEVATION.

ABBREVIATIONS
HP = HIGH POINT
LP = LOW POINT
FG = FINISH GRADE
TC = TOP OF CURB
BC = BOTTOM OF CURB
SLAB = TOP OF CONCRETE SLAB
ASPH = FG OF ASPHALT
GRAV = FG OF GRAVEL

GRADING LEGEND

DASHED LINE INDICATES LOCATION OF 3 m CHART DATUM ON RAMP. BELOW 3 m ELEVATION PRE-CAST PANELS ARE REQ'D REFER TO DWG C05.
BREAKWATER CREST.
SOUTH BREAKWATER CENTRELINE
END TOE PROTECTION MATTRESS.
TOE OF NORTH BREAKWATER
BEGIN TOE PROTECTION MATTRESS
TOP OF CHANNEL EXCAVATION
PLACE DOUBLE ROW OF 800 mm PLUS BOULDERS AT BASE OF EXISTING WALL.
0+110.031
END TOE PROTECTION MATTRESS.
BEGIN TRANSITION FROM 3H:1 V SIDE SLOPE.
TOES OF EXIST. BREAKWATER.
RAMP FILL TOE.
0+074.725
0.18 SLAB
0+062.304
0+049.960
0+043.889
TRANSITION COMPLETE FROM 3H:1V TO 2H:1V SIDE SLOPE.
EXISTING ASPHALT DWY
6.89 EP/SLAB
6.00 SLAB
0+085.643
END CONCRETE 0+071.6
BREAKWATER CREST.
BREAKWATER TOE.
PRECAST CONCRETE BLOCK AT SIDES AND TOE OF PRECAST PANEL. PROTECT TOE w/1.5m WIDE x 18m LONG x 0.8m DEEP APRON OF CLASS 25 RIP RAP. DETAILS #08
3.0m CHART DATUM
END OF VERTICAL CURVE
CAST VOID IN BLOCK TO ACCOMMODATE PILE (TYP)
TOP/BOTTOM OF RIP RAP CUT/FILL SLOPE
RAMP FILL TOE
0+000
REFER TO SHEET C03 FOR PROFILE
BEGIN CONCRETE 0+021.62
INCREASE EMBANKMENT SLOPE ANGLE UP TO 1H:1V THIS AREA.
DETAIL #05 SHEET C04 PRE-CAST HEAD WALL INVERT 4.25
TOP OF CUT
FOOT RAMP (FOOTPRINT SHOWN) DETAILS #06, SHEET C05 TYP BOTH SIDES
900mm C76m CLASS V CONCRETE STORM DRAIN@3.5 m @ 0.50%
EX.DMH 1 CB GRATE RIM:6.95 W INV:4.80 E INV:4.75
EXISTING ASPHALT PATH
EX.760mm CSP 49.76m @ ±1.15%
EX.760mm CSP
EX.DMH 2 CB GRATE RIM:7.50 N INV:5.85 W INV:5.88 E INV:5.28
CULVERT OUTLET 4.18 m +/- (DAMAGED)
73 m LIN. METRES OF BOULDER DEBRIS BARRIER TOP OF SOUTH BREAKWATER
BEGIN SCOUR PROTECTION TRENCH.
PLACE APPROX 10-600 DIA BOULDERS AT PROPERTY CORNER AS DEBRIS BARRIER
REMOVE EXIST. CSP DOWNSTREAM OF DMH A
OVERBUILD IN PLACE Ø1500mm DMH A c/w 200mm THICK BASE AND 150mm (MIN.) OF RISER RINGS MAX DEPTH TO FIRST RUNG IS 500mm (STND DWG S1 MMCD) RIM TO SUIT (±7.11) W INV:4.47 E INV:4.46
END SCOUR PROTECTION TRENCH.
BEGIN TOE PROTECTION MATTRESS 3 m OVERLAP WITH TRENCH.
CREST:4.33
GRAVEL RETENTION BERM
SCOUR PROTECTION TRENCH
EXISTING CONTOURS ARE TO CHART DATUM. EXISTING BREAKWATER CONTOURS NOT SHOWN.
ALL ELEVATIONS TO CHART DATUM.
0 1:250 10

TIDAL INFORMATION

LOCATION	ELEVATION ABOVE CHART DATUM				
	LARGE TIDE		MEAN TIDE		MEAN WATER LEVEL
	HHW	LLW	HHW	LLW	
CAMPBELL RIVER	METRES	METRES	METRES	METRES	METRES
	4.8	0.2	4.0	1.3	2.9

LOWEST RECORDED TIDE AT CAMPBELL RIVER -0.2 METRES, JUNE, 1973
HIGHEST RECORDED TIDE AT CAMPBELL RIVER 5.3 METRES, DECEMBER, 1967
C.H.S. CHART #3539 TIDAL DATA FROM CANADIAN TIDE AND CURRENT TABLES VOLUME 6

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017
Review by RKS (HIGHLAND) Date October 2017

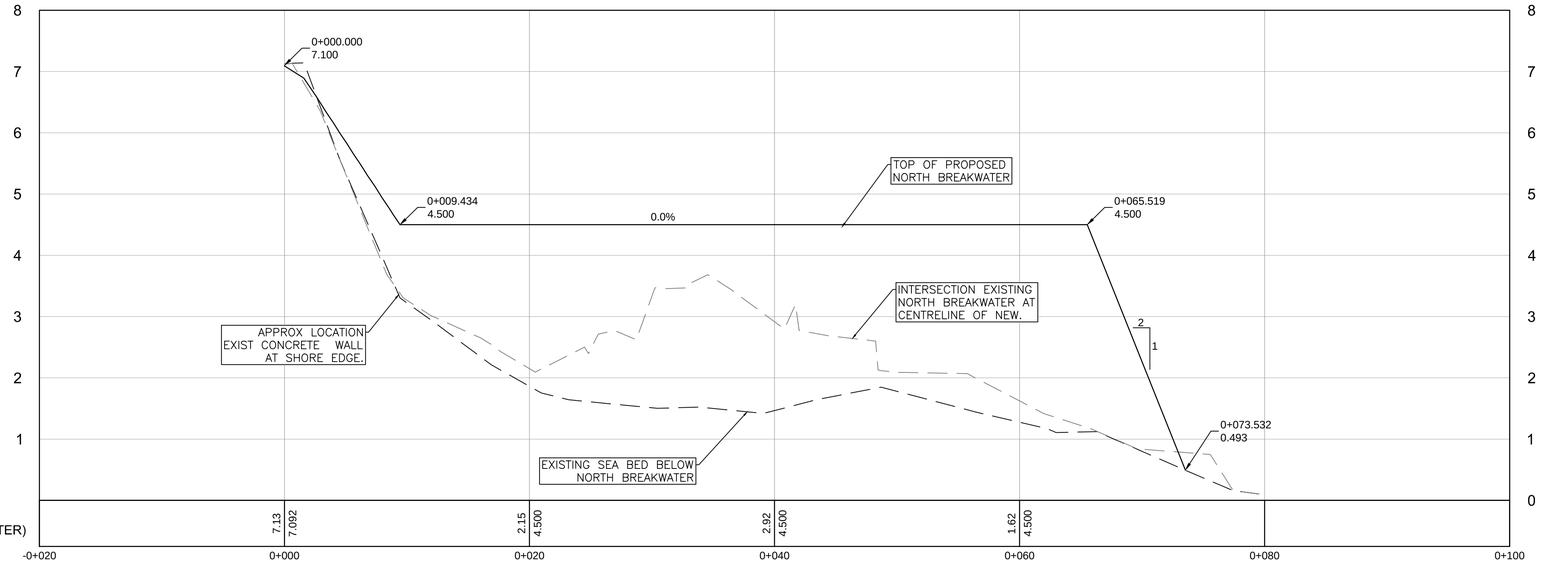
HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

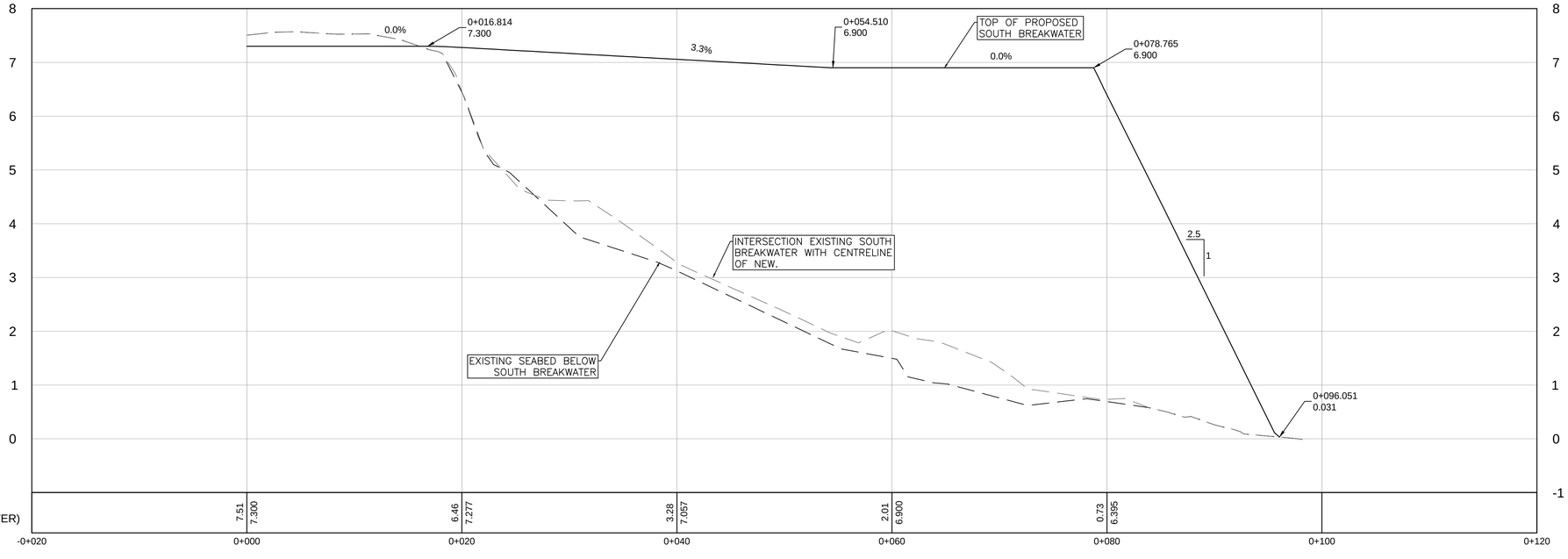
Scale horiz. 1:250
Sheet 04 of 13
Highland Project No. 4079
City Dwg No. 13-506

Project BIG ROCK BOAT RAMP RECONSTRUCTION
Title C01 GRADING & SITE SERVICING PLAN

NORTH BREAKWATER CENTRELINE 5:1



SOUTH BREAKWATER CENTRELINE 5:1



ALL ELEVATIONS TO CHART DATUM.

0 1:250 10

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017

Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz. 1:250

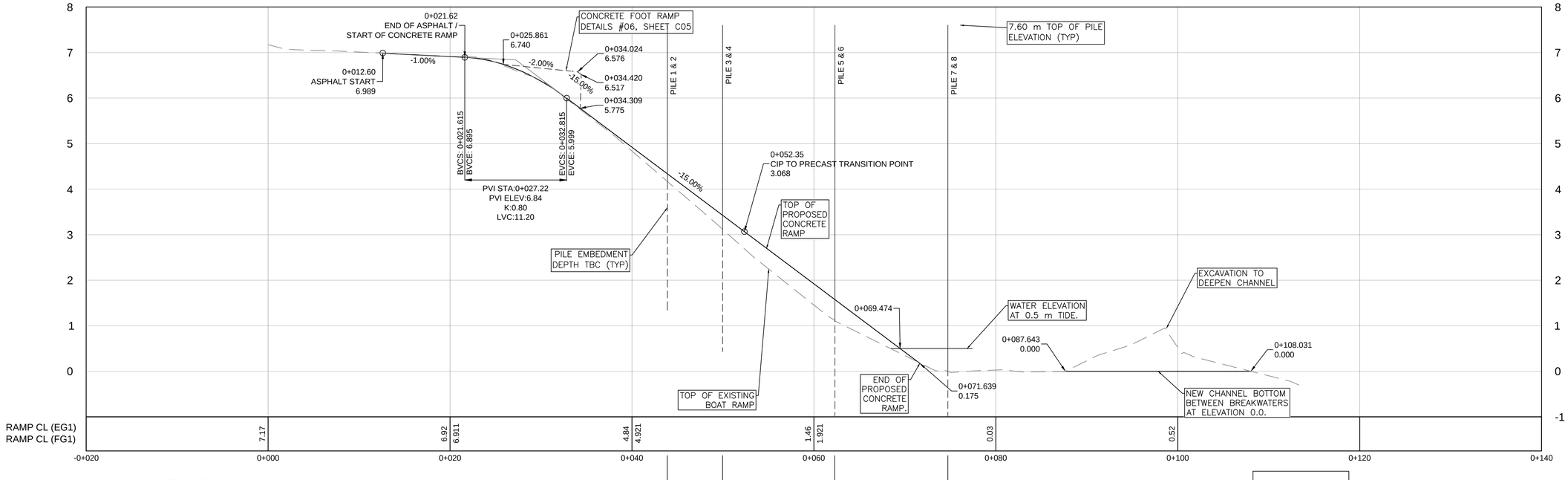
Sheet 05 of 13

Highland Project No. 4079

City Dwg No. 13-506

Project BIG ROCK BOAT RAMP RECONSTRUCTION

Title C02 NORTH AND SOUTH BREAKWATER PROFILES



SCALE 1:250

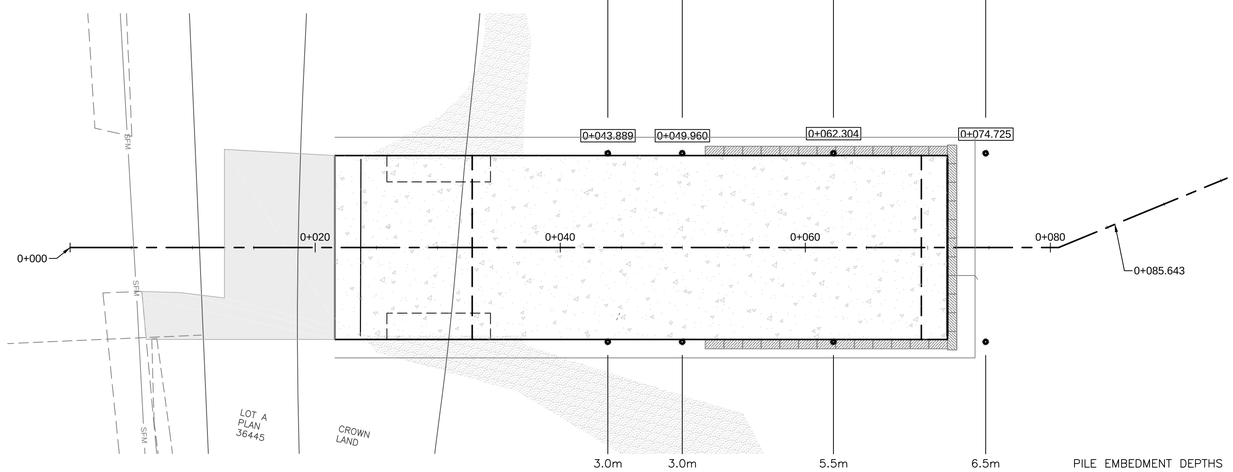
ALL ELEVATIONS
TO CHART DATUM.

PILE #1&2
(12" STEEL)
O/S 7.691
FROM C/L

PILE #3&4
(12" STEEL)
O/S 7.691
FROM C/L

PILE #5&6
(12" STEEL)
O/S 7.691
FROM C/L

PILE #7&8
(12" STEEL)
O/S 7.691
FROM C/L



PILE EMBEDMENT DEPTHS

STEEL PIPE PILES

1. Ø300mm - 0.5" Wt. (x8) PIPE PILE TO ASTM A252 GRADE 3, API5L GRADE x46, CSA Z45.1-M (WITH CONDITIONS)
2. MINIMUM DEPTH OF EMBEDMENT AS SHOWN ON PLAN
3. TOP CUT-OFF ELEVATION AS SHOWN ON PLAN
4. CAP EACH PILE WITH POLYETHYLENE CONE CAP, GLUED WITH EPOXY CEMENT
5. PILE LOCATION TOLERANCE ±50mm & WITHIN 0.5% OF AXIAL ALIGNMENT

PILING PLAN
SCALE 1:250

K:\Land Projects 3\4079\DWG\4079 – BASE.dwg Apr 5, 18 5:09:07 PM

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by: TOB (OUTLOOK) Date: January 2017
Review by: RKS (HIGHLAND) Date: October 2017

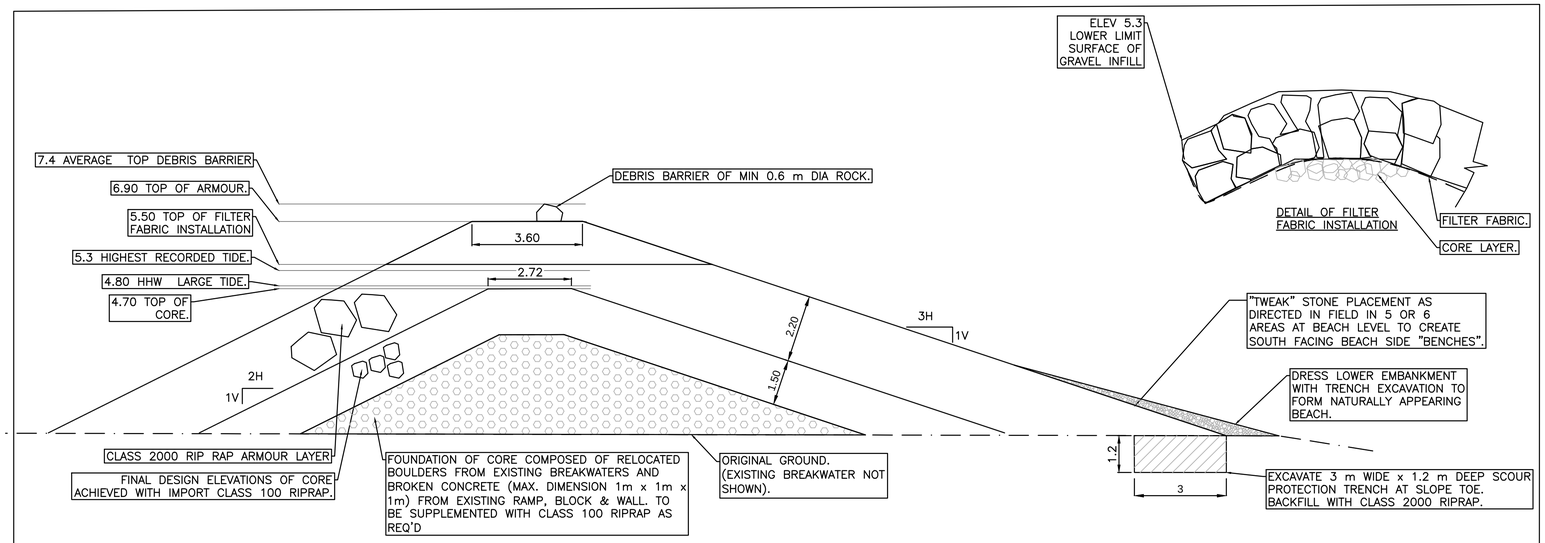
HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

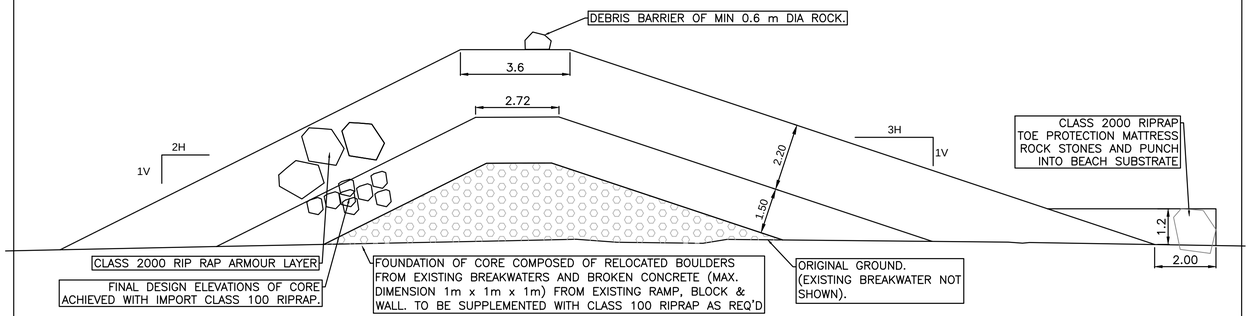
Scale horiz. 1:250
Sheet 06 of 13
Highland Project No. 4079
City Dwg No. 13-506

Project: BIG ROCK BOAT RAMP RECONSTRUCTION

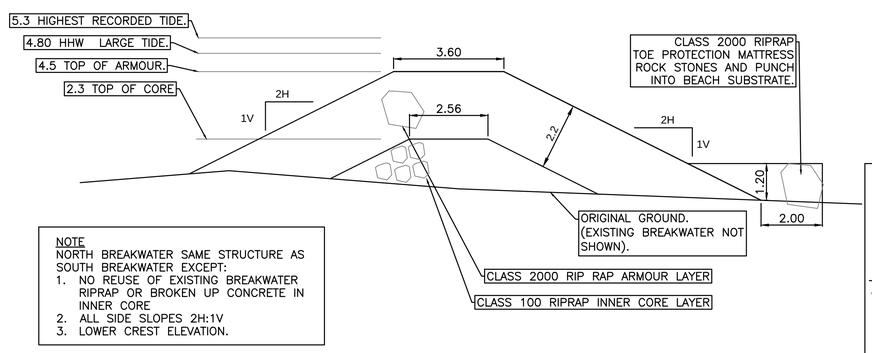
Title: C03 RAMP PROFILE & PILING PLAN



AA SOUTH BREAKWATER TYPICAL SECTION 0 +030 TO 0+ 050 (UPPER TIDE LEVELS)
1:100

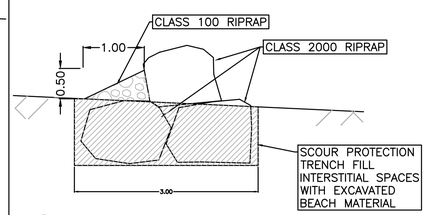


BB SOUTH BREAKWATER TYPICAL SECTION 0 + 050 TO END (LOWER TIDE LEVELS)
1:100

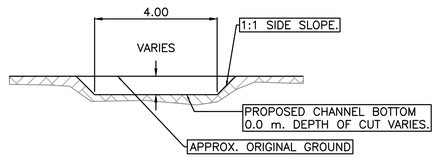


NOTE
NORTH BREAKWATER SAME STRUCTURE AS SOUTH BREAKWATER EXCEPT:
1. NO REUSE OF EXISTING BREAKWATER RIPRAP OR BROKEN UP CONCRETE IN INNER CORE
2. ALL SIDE SLOPES 2H:1V
3. LOWER CREST ELEVATION.

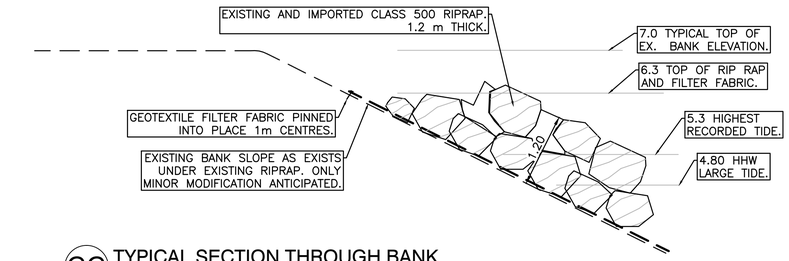
DD NORTH BREAKWATER TYPICAL SECTION
1:100 0 1:100 5



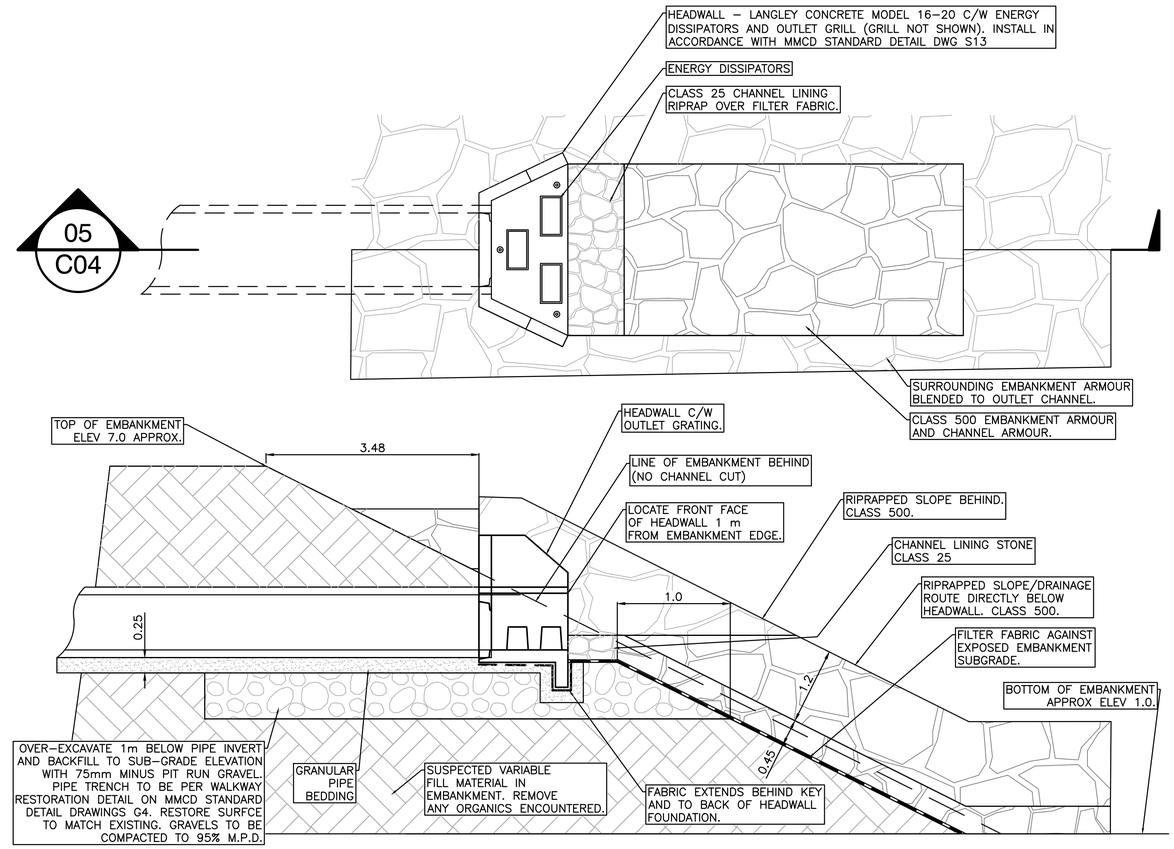
CC GRAVEL RETENTION BERM TYPICAL SECTION
1:50



FF CHANNEL DEEPENING TYPICAL SECTION
1:100



GG TYPICAL SECTION THROUGH BANK
1:50



05 CONCRETE CULVERT OUTFALL
1:50

K:\Land Projects JV\4079\DWG\4079 – BASE.dwg Apr 5, 18 5:09:19 PM

Notes

ALL ELEVATIONS TO CHART DATUM.

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017
Review by RKS (HIGHLAND) Date October 2017

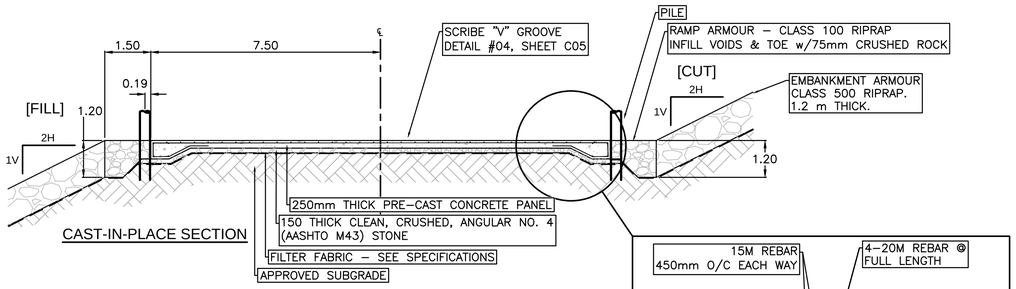
HIGHLAND Engineering Services Ltd.
#104-950 Alder Street, Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

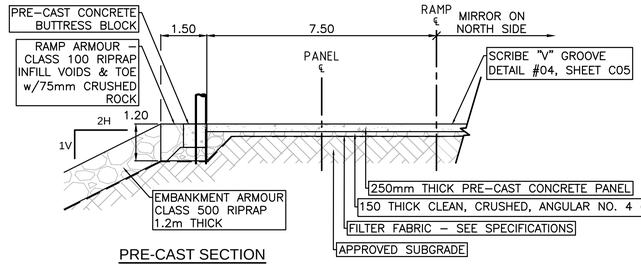
Scale horiz. 1:200
Sheet 07 of 13
Highland Project No. 4079
City Dwg No. 13-506

Project BIG ROCK BOAT RAMP RECONSTRUCTION
Title C04 CIVIL SECTIONS AND DETAILS

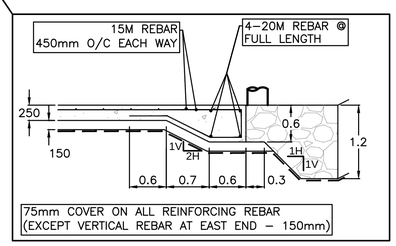
EPOXY-COATED REINFORCING STEEL –
TO THE REQUIREMENTS OF ASTM A 775M AND D 3963M. APPLICATION PLANTS SHALL BE CERTIFIED UNDER THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI) VOLUNTARY CERTIFICATION PROGRAM FOR FUSION-BONDED EPOXY-COATING APPLICATOR PLANTS, AND PROOF OF CERTIFICATION SHALL BE SUBMITTED.
ALL EPOXY-COATED BARS SHALL BE CLEARLY LABELLED WITH THE NAME OF THE MANUFACTURER, THE PRIMER AND THE COATING SYSTEM USED AND THE DATE OF PRODUCTION.
TIE WIRE USED TO TIE EPOXY COATED REINFORCING BARS SHALL BE EPOXY COATED WIRE.



CAST-IN-PLACE SECTION



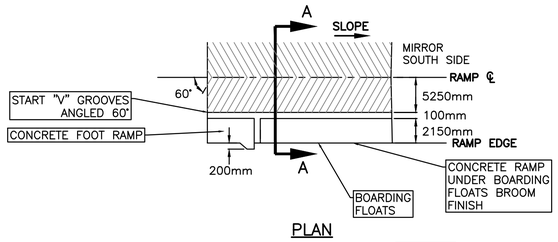
PRE-CAST SECTION



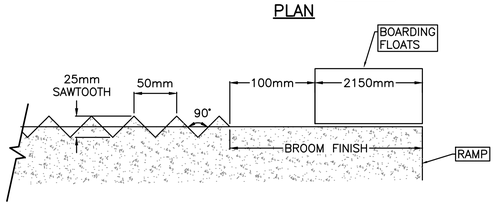
THICKENED SECTION AT END & SIDES

0 1:100 5

EE RAMP TYPICAL SECTIONS - CAST-IN-PLACE AND PRE-CAST
1:100

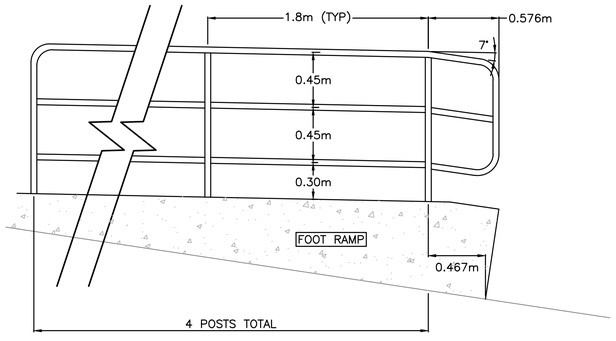


PLAN



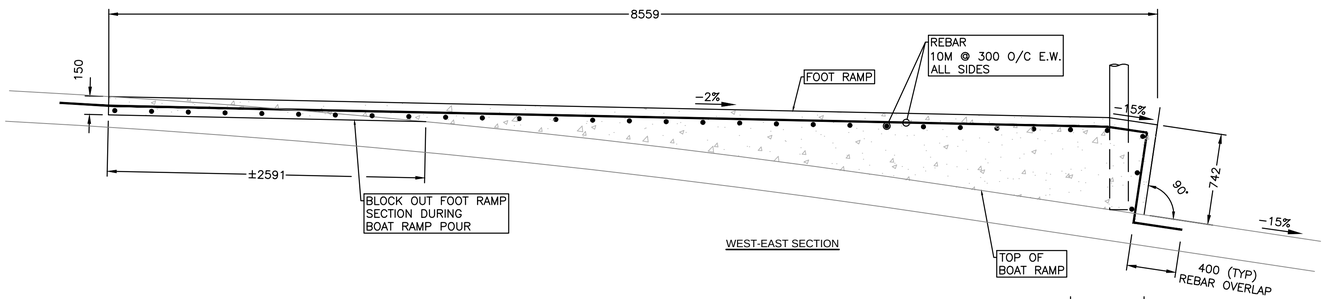
SECTION A–A
"V" GROOVE DETAIL

04 RAMP SLAB & "V" GROOVE
NTS

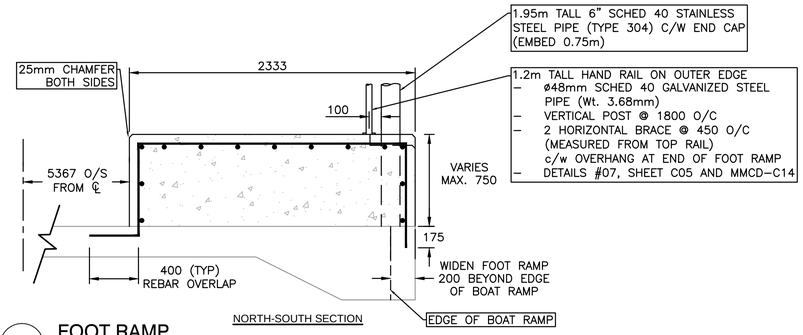


07 FOOT RAMP HAND RAIL OVERHANG
1:25

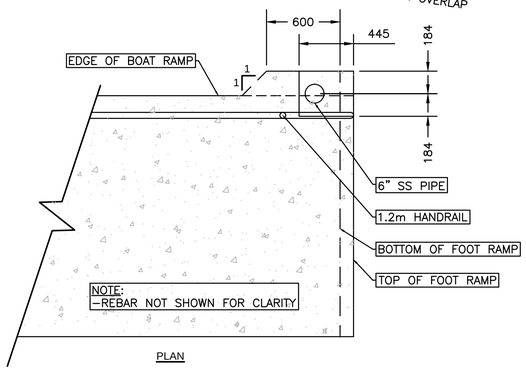
NOTE:
–75mm COVER ON ALL REINFORCING REBAR
–REFER TO RAMP PROFILE FOR CHAINAGE, SHEET C04



WEST-EAST SECTION



NORTH-SOUTH SECTION

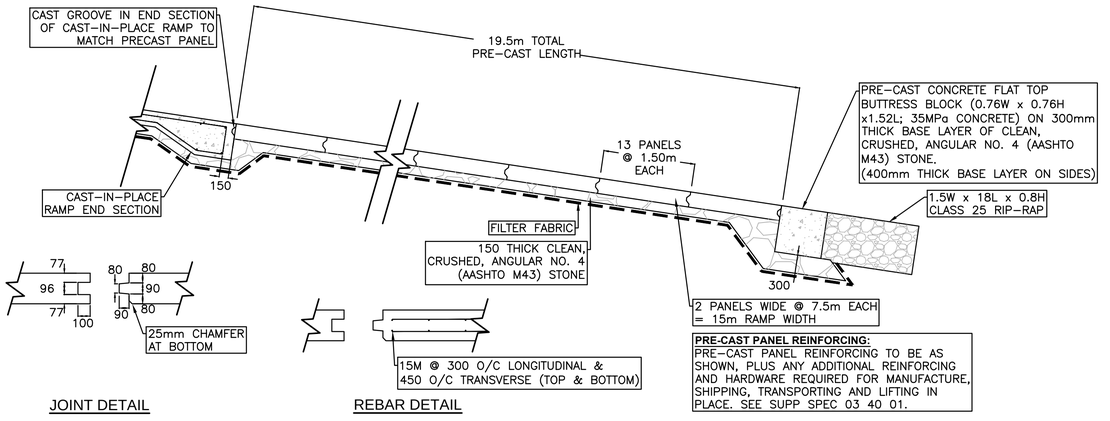


PLAN

06 FOOT RAMP
1:25

RAMP STRUCTURE:
- 250mm THICK REINFORCED PORTLAND CEMENT CONCRETE, MARINE APPLICATION MIX – 2 BAGS OF SILICA FUME/m^3 (CAST EACH SIDE SEPARATELY)
- FILTER FABRIC PINNED IN PLACE 1m O/C WITH 200mm H.D. GALVANIZED TWIST NAIL WITH 25mm H.D. GALVANIZED WASHER
- 150mm THICK – 19mm GRAVEL BASE TYPE 2 MMCD 31 05 17
- ALL CONCRETE TO BE 35MPa @ 28 DAYS 80–100mm SUMP, 5–8% AIR
- APPROVED SUBGRADE
- ALL GRANULAR MATERIALS COMPACTED TO 95% M.P.D.

PRE-CAST PANEL JOINTS:
PRE-CAST PANEL TONGUE AND GROOVE JOINTS ARE TO BE:
– TONGUE ON WEST AND NORTH ENDS (DO NOT CAST TONGUE ON FINAL NORTH END PANEL SECTION)
– GROOVE ON EAST AND SOUTH ENDS.



JOINT DETAIL

REBAR DETAIL

08 PRE-CAST RAMP ELEVATION AND DETAIL
1:50

Notes
ALL ELEVATIONS TO CHART DATUM.

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

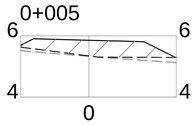
Design by TOB (OUTLOOK) Date January 2017
Review by RKS (HIGHLAND) Date October 2017

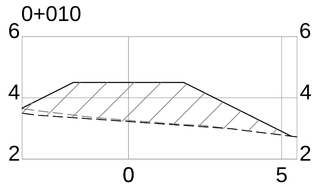
HIGHLAND Engineering Services Ltd.
#104-950 Alder Street, Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

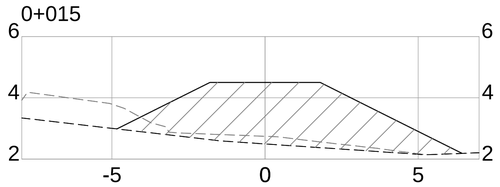
Project: 4079 - BASE.dwg

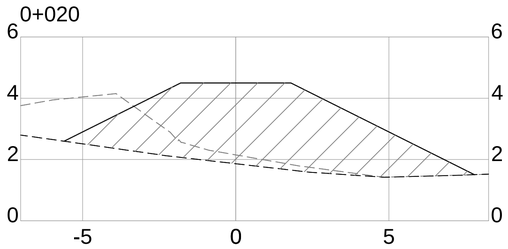
Scale horiz. 1:200
Sheet 08 of 13
Highland Project No. 4079
City Dwg No. 13-506

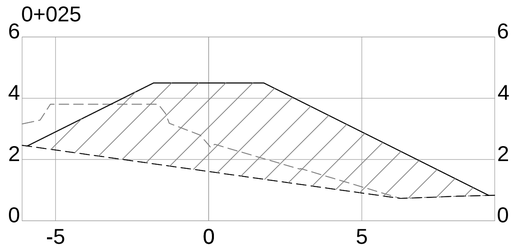
Project BIG ROCK BOAT RAMP RECONSTRUCTION
Title C05 CIVIL SECTIONS AND DETAILS

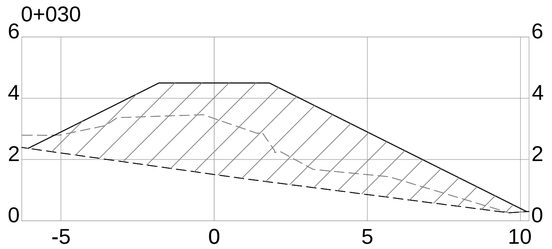


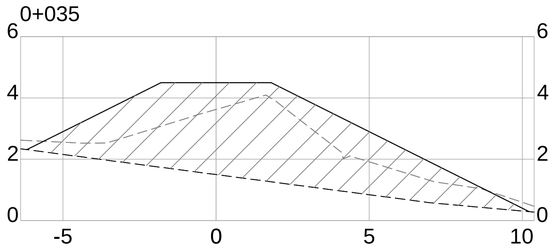


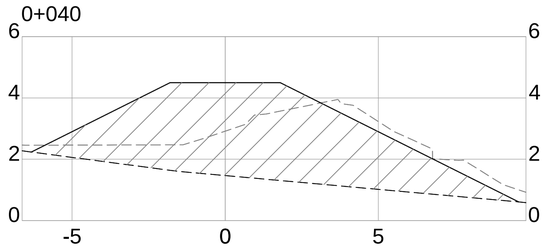


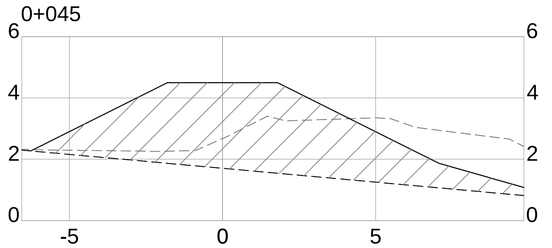


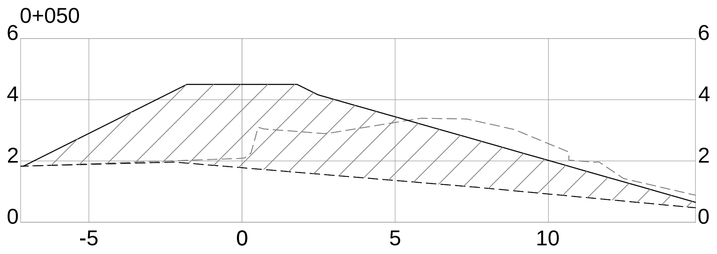


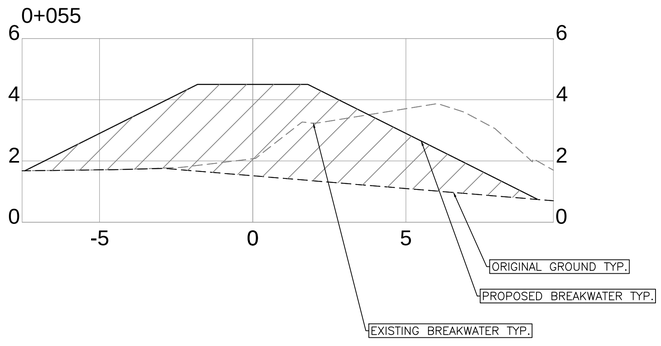


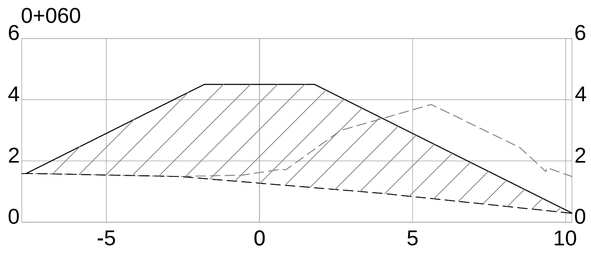












ALL ELEVATIONS
TO CHART DATUM.

K:\Land Projects 3\4079\DWG\4079 - BASE.dwg Apr 5, 18 5:09:41 PM

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017

Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz. 1:100

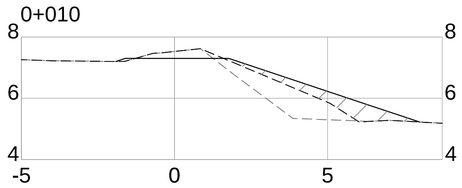
Sheet 09 of 13

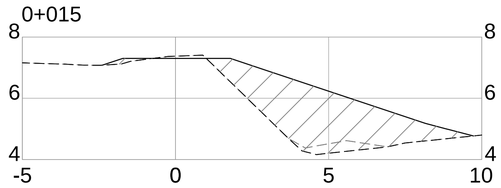
Highland Project No. 4079

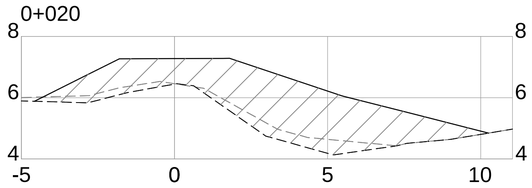
City Dwg No. 13-506

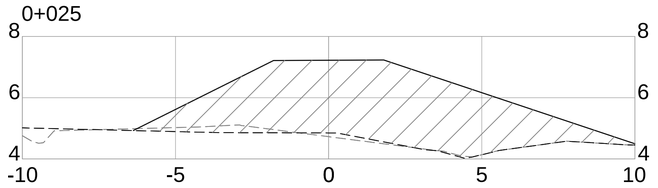
Project BIG ROCK BOAT RAMP RECONSTRUCTION

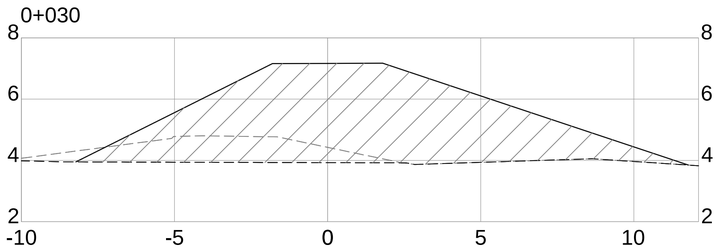
Title C06 NORTH BREAKWATER SECTIONS

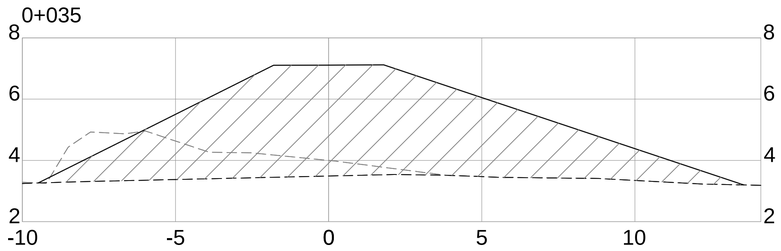


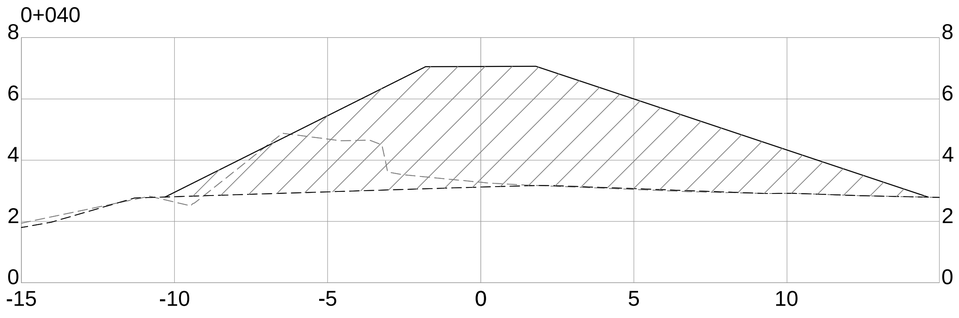


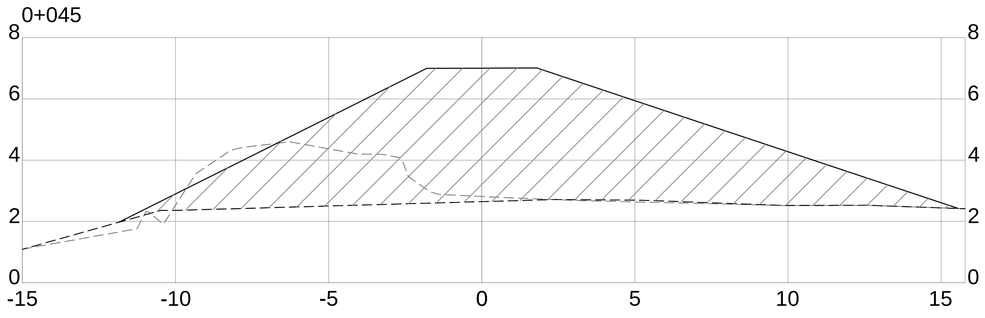


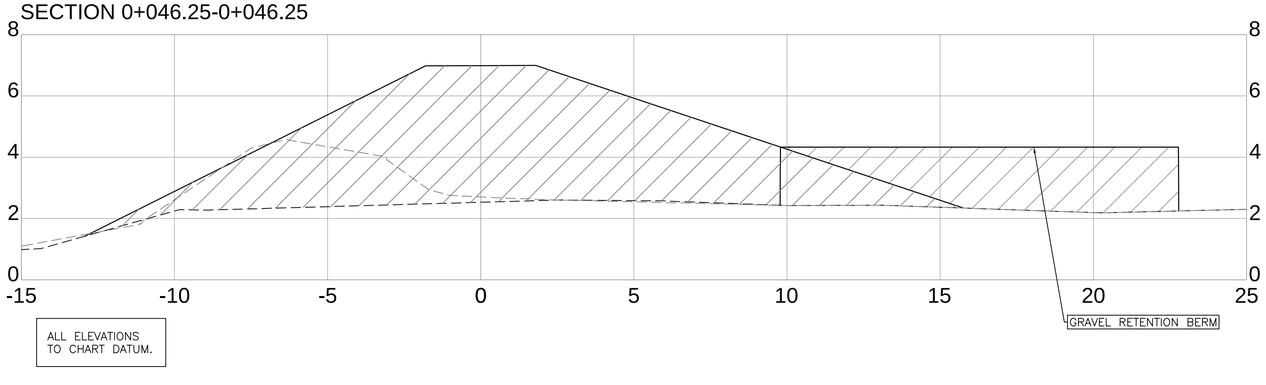


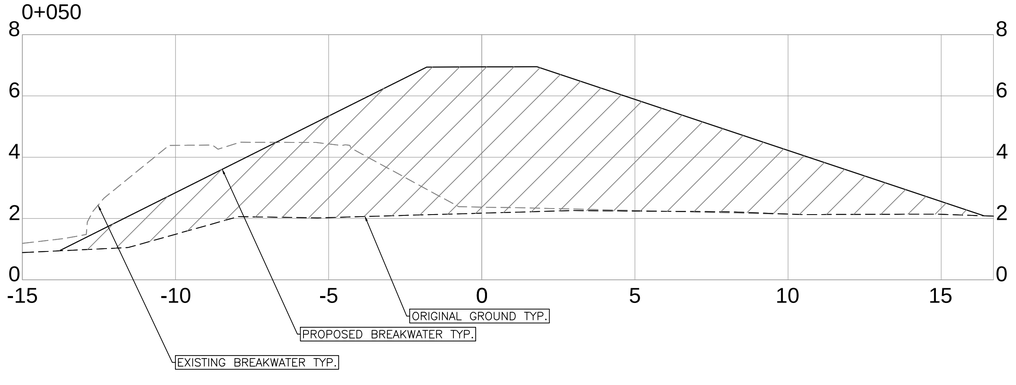












K:\Land Projects 3\4079\DWG\4079 – BASE.dwg Apr 5, 18 5:09:46 PM

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017

Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz. 1:100

Sheet 10 of 13

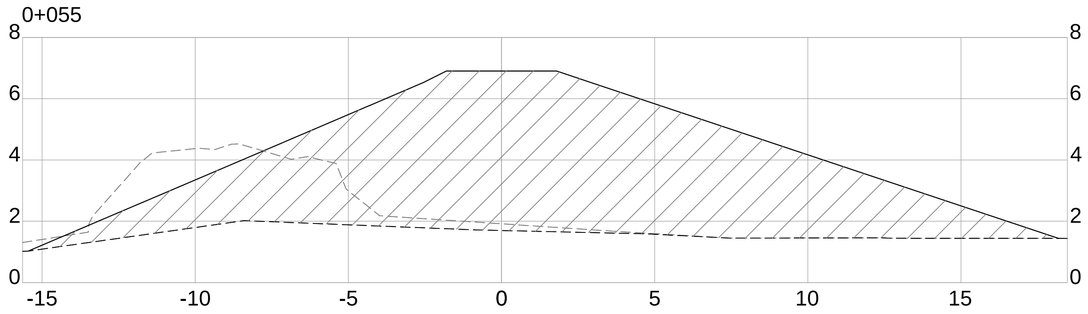
Highland Project No. 4079

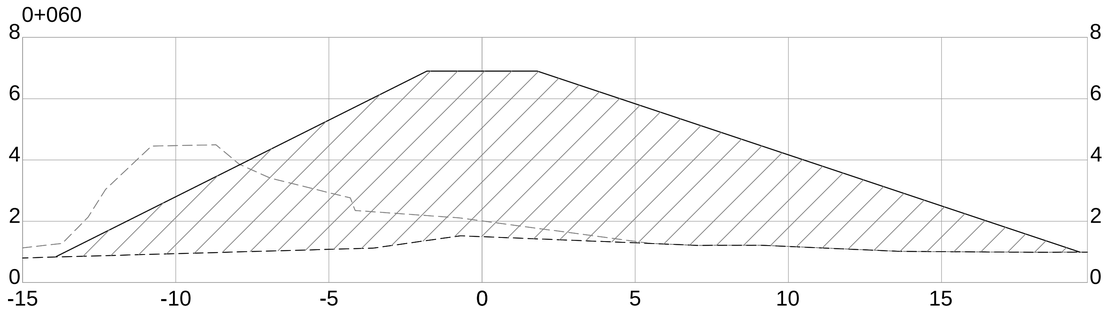
City Dwg No. 13-506

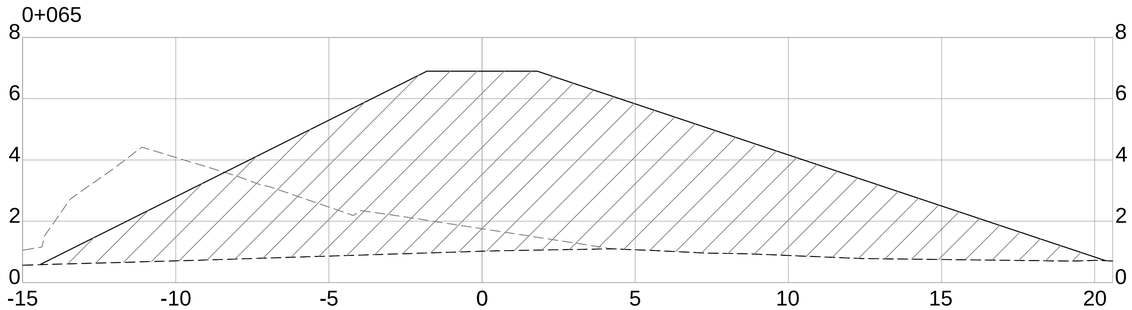
Project BIG ROCK BOAT RAMP RECONSTRUCTION

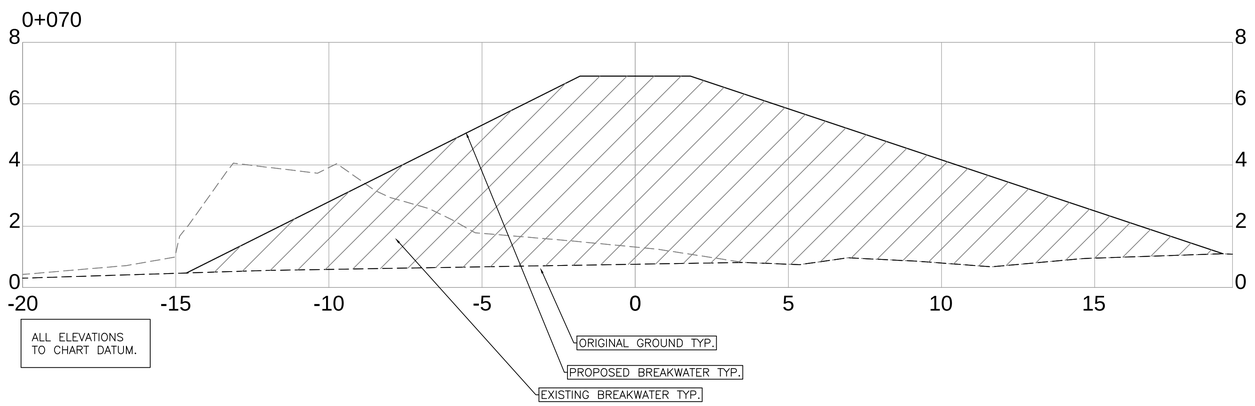
Title

C07 SOUTH BREAKWATER SECTIONS









Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017

Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz. 1:100

Sheet 11 of 13

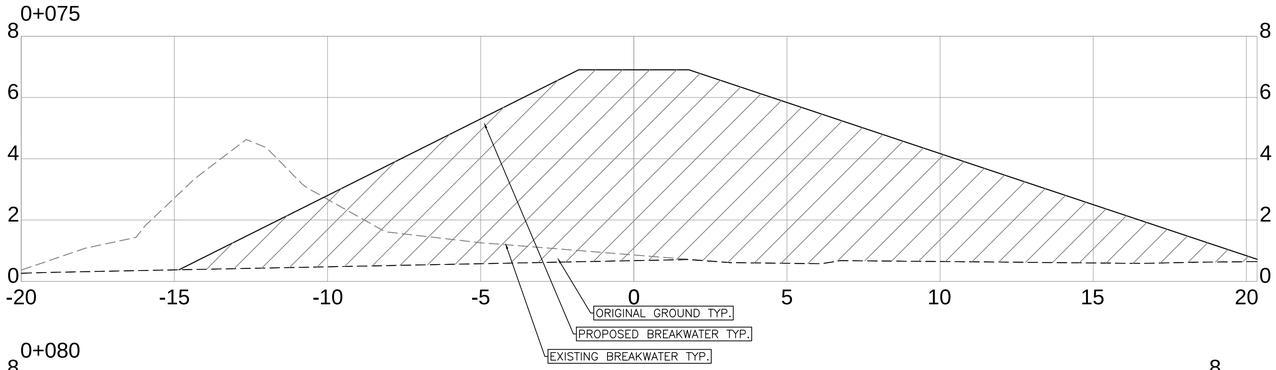
Highland Project No. 4079

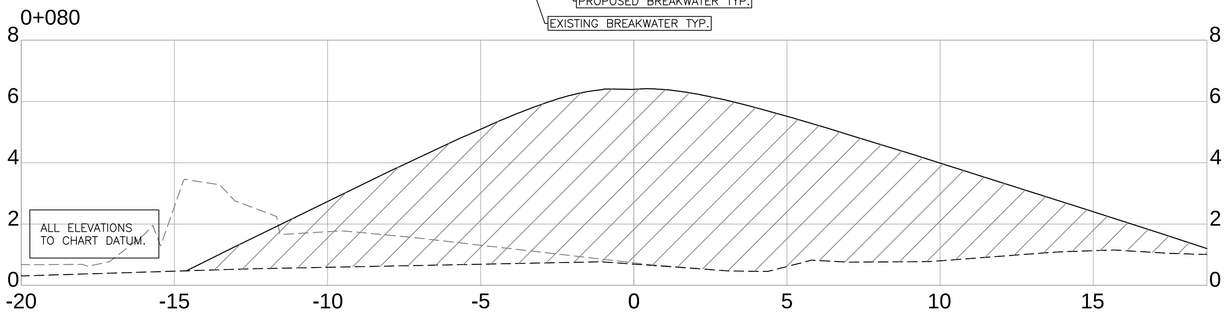
City Dwg No. 13-506

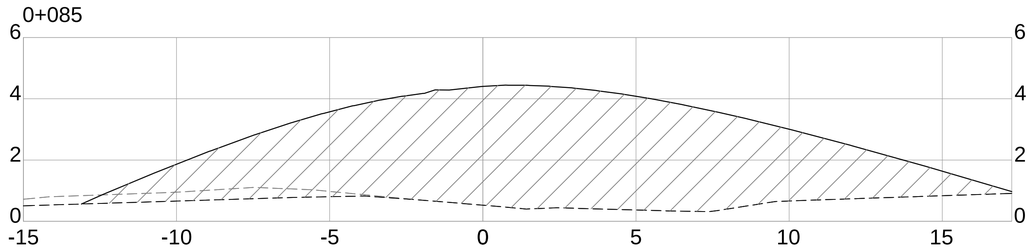
Project BIG ROCK BOAT RAMP RECONSTRUCTION

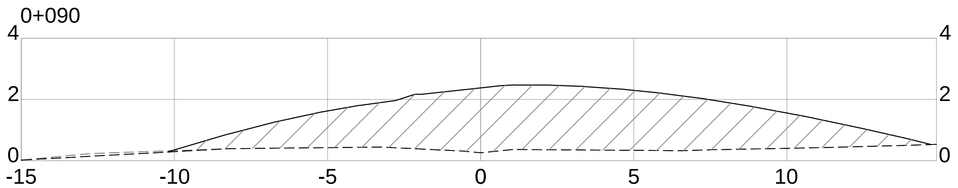
Title

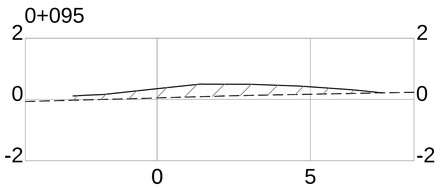
C08 SOUTH BREAKWATER SECTIONS











K:\Land Projects 3\4079\DWG\4079 – BASE.dwg Apr 5, 18 5:09:56 PM

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017

Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz. 1:100

Sheet 12 of 13

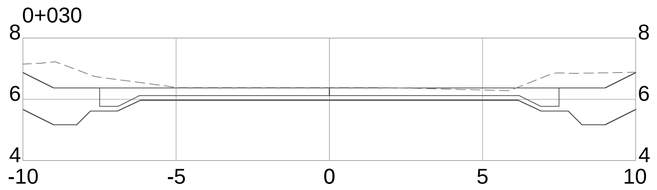
Highland Project No. 4079

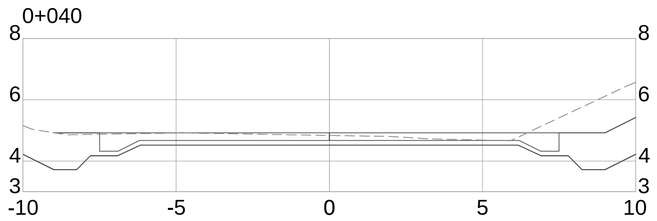
City Dwg No. 13-506

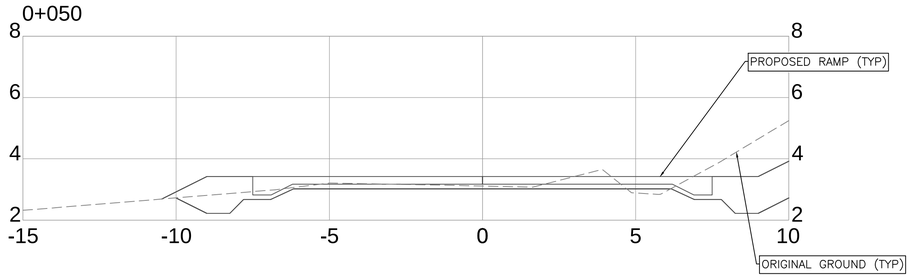
Project BIG ROCK BOAT RAMP RECONSTRUCTION

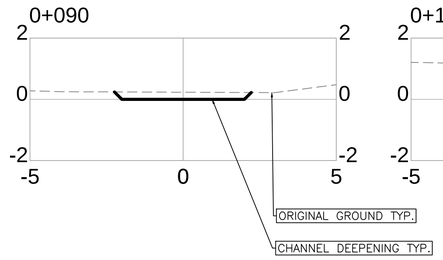
Title

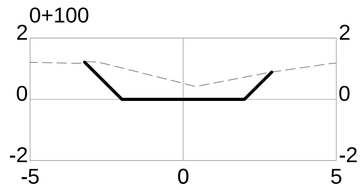
C09 SOUTH BREAKWATER SECTIONS

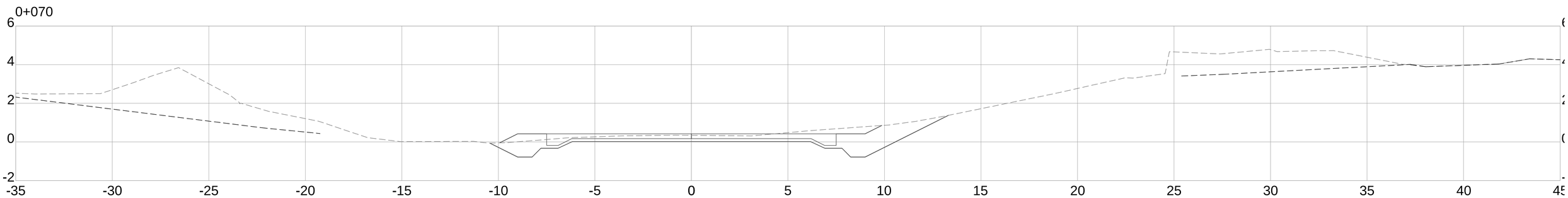












ALL ELEVATIONS TO CHART DATUM.

Notes

Stamp

No.	Date	By	Revisions	Eng.
F	MAR 28 2018	HT	ISSUE FOR TENDER	SMM/RKS
E	MAR 06 2018	HT/SMM	90% REVISED	SMM/RKS
D	OCT 31 2017	HT	90% SUBMISSION	SMM/RKS
C	MAR 17 2017	TOB	FOR TENDER	TOB
B	MAR 13 2017	TOB	FOR REVIEW	TOB
A	FEB 25 2017	TOB	FOR REVIEW	TOB

Design by TOB (OUTLOOK) Date January 2017

Review by RKS (HIGHLAND) Date October 2017

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street,
Campbell River, B.C., V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

Project: 4079 - BASE.dwg

Scale horiz. 1:100

Sheet 13 of 13

Highland Project No. 4079

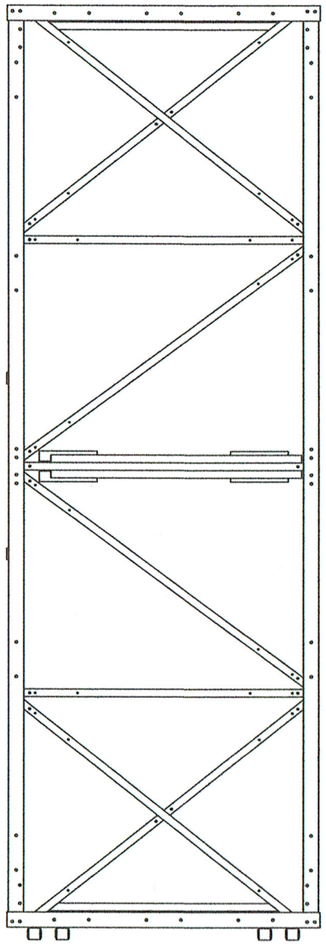
City Dwg No. 13-506

Project BIG ROCK BOAT RAMP RECONSTRUCTION

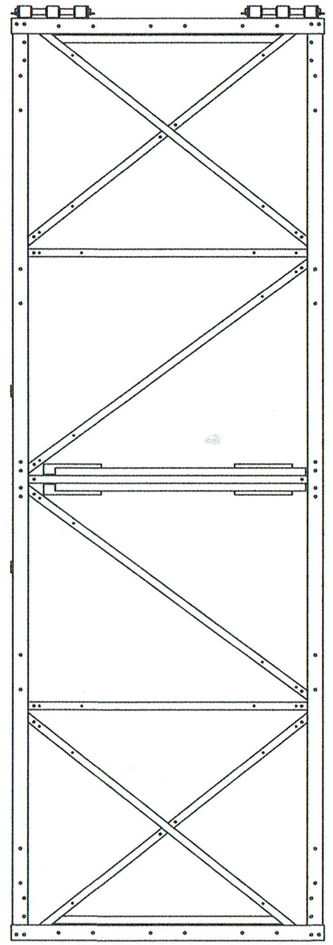
Title C10 RAMP SECTIONS

GENERAL NOTES AND SPECIFICATIONS

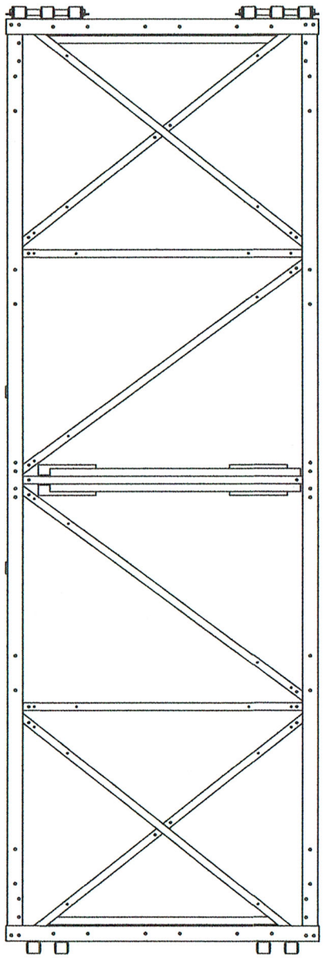
1. ALL STEEL PLATE 44W/300W AND STEEL SHAPES 50W/350W UNLESS NOTED (CSA G40.20/G40.21).
2. HOT DIP GALVANIZED (ASTM A123).
3. REFER TO AMERICAN GALVANIZERS ASSOCIATION "DESIGN GUIDE" FOR VENTING HOLES LOCATION AND SIZE
4. WELDING SHALL ONLY BE UNDERTAKEN BY A COMPANY CERTIFIED BY THE CANADIAN WELDING BUREAU (CWB) TO THE REQUIREMENTS OF CSA 47.1 (LATEST EDITION) IN DIVISION 1 OR 2. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH AND MEET THE QUALITY REQUIREMENTS OF CSA W59 (LATEST EDITION).
   ALL WELDERS EMPLOYED BY THE COMPANY SHALL HOLD VALID QUALIFICATIONS ISSUED BY THE CWB.
   ALL WELDING SHALL BE DONE IN ACCORDANCE WITH WELDING PROCEDURES APPROVED BY THE CWB
5. FRAMES ARE IDENTICAL EXCEPT FOR HINGE CONFIGURATIONS



FRAME 1
SCALE 1:40



FRAME 2
SCALE 1:40



FRAME 3
SCALE 1:40

J.J. KING 25441 PROFESSIONAL ENGINEER
21 MAR 2018

REV.	DESCRIPTION	DATE	APPROVED
B	CHANGED PIPE FROM 22" TO 20"	20/03/2018	JK
A	ISSUED FOR TENDER	2/03/2018	JK

REVISIONS

DIMENSIONS IN INCHES	SHEET SIZE	DRAWN BY	DATE (dd/mm/yyyy)
	B (11x17)	J KING	26/02/2018

CLIENT
CITY OF CAMPBELL RIVER

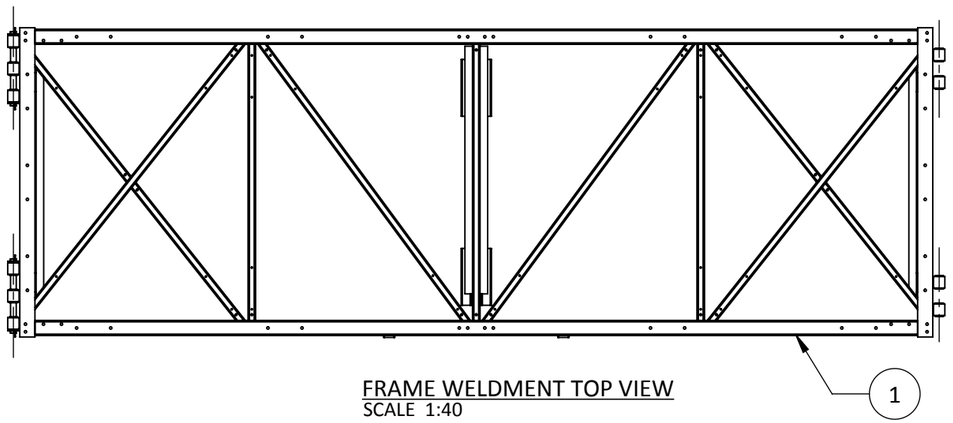
PROJECT
BIG ROCK BOAT RAMP

CR Engineering Inc.

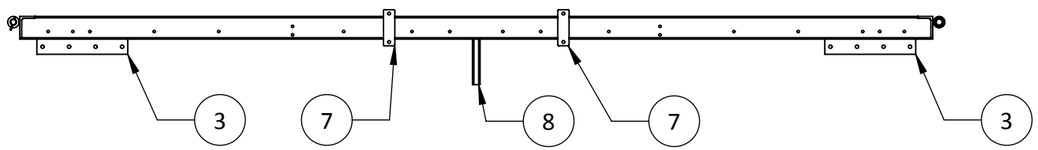
TITLE:
FRAME WELDMENT CONFIGURATIONS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	1 OF 11	B

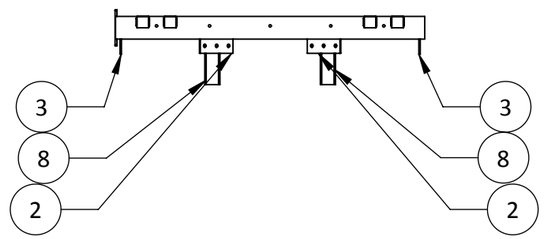
ITEM No.	PART No.	REV	DESCRIPTION	FRAME 1/QTY.	FRAME 2/QTY.	FRAME 3/QTY.	MATERIAL
1	395-131	A	FRAME WELDMENT	1	1	1	50W/350W
2	395-138		MOUNTING PLATE INNER	4	4	4	44W/300W
3	395-136		MOUNTING PLATE OUTER	4	4	4	44W/300W
4	395-54		HINGE TWO - ANGLE END	2	-	2	A513 DOM
5	395-59		HINGE THREE - ANGLE END	-	2	2	A513 DOM
6	395-241		PIPE END STOP	4	4	4	44W/300W
7	395-168		PILE HOOP MOUNT PLATE	2	2	2	44W/300W
8	395-242		PIPE MID-SUPPORT	2	2	2	50W/350W



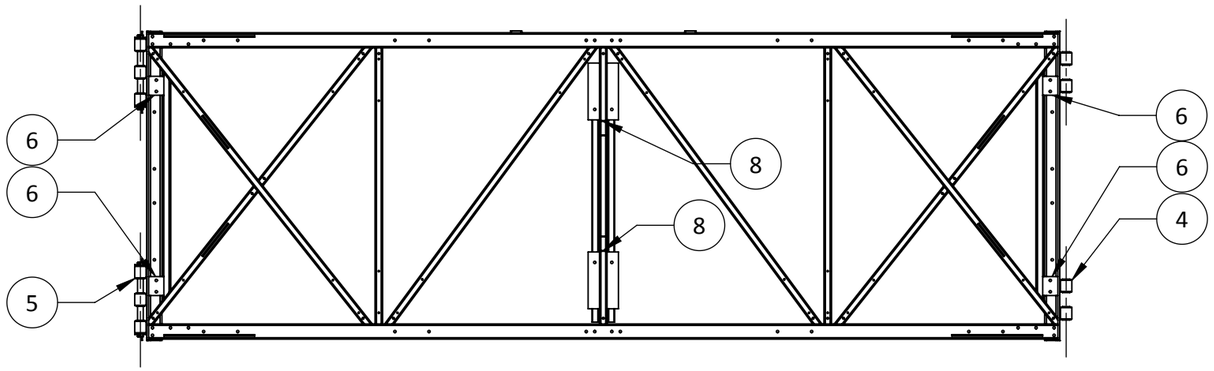
FRAME WELDMENT TOP VIEW
SCALE 1:40



FRAME WELDMENT SIDE VIEW
SCALE 1:40



FRAME WELDMENT END VIEW
SCALE 1:40



FRAME WELDMENT BOTTOM VIEW
SCALE 1:40

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

CLIENT
CITY OF CAMPBELL RIVER

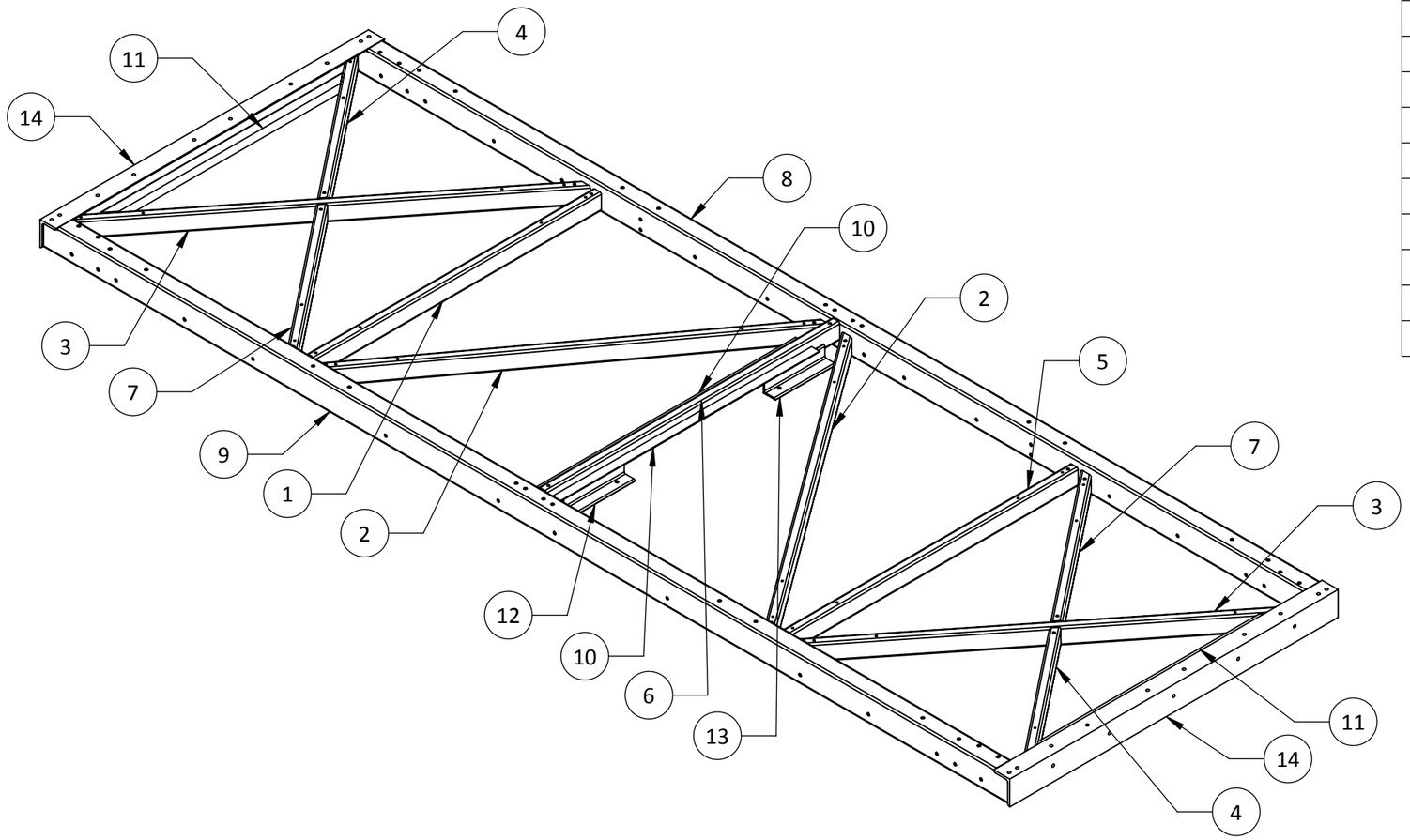
PROJECT
BIG ROCK BOAT RAMP

CR Engineering Inc.

TITLE:
FRAME WELDMENT CONFIGURATIONS BOM

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	2 OF 11	B

NOTE - SEAL WELDS 1/4" FILLET TYPICAL



ITEM No.	QTY.	LENGTH	Description	TOTAL LENGTH
1	1	72 7/8"	HSS 4 x 2 x 3/16	774 5/8"
2	2	92"	HSS 4 x 2 x 3/16	774 5/8"
3	2	93 13/16"	HSS 4 x 2 x 3/16	774 5/8"
4	2	45 11/16"	HSS 4 x 2 x 3/16	774 5/8"
5	1	72 7/8"	HSS 4 x 2 x 3/16	774 5/8"
6	1	72 7/8"	HSS 4 x 2 x 3/16	774 5/8"
7	2	46 1/2"	HSS 4 x 2 x 3/16	774 5/8"
8	1	240"	HSS 6 x 4 x 3/16"	480"
9	1	240"	HSS 6 x 4 x 3/16"	480"
10	2	65 3/8"	L 2 x 2 x 1/4	250 13/16"
11	2	60 1/16"	L 2 x 2 x 1/4	250 13/16"
12	2	15"	L3x3 x 5/16"	60"
13	2	15"	L3x3 x 5/16"	60"
14	2	81 5/8"	L6x4 x 1/2	163 1/4"

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

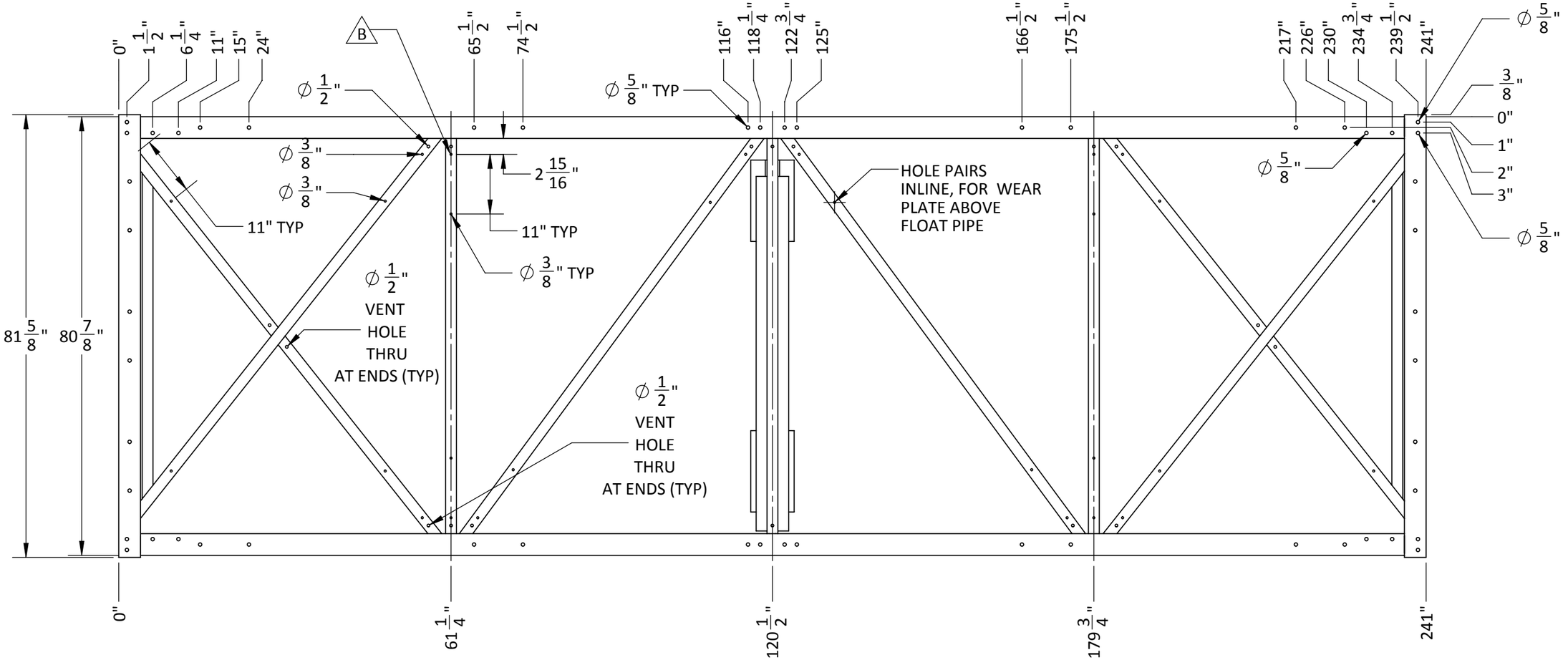
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP

CR Engineering Inc.

TITLE:
FRAME CUT LIST

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	3 OF 11	B



DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

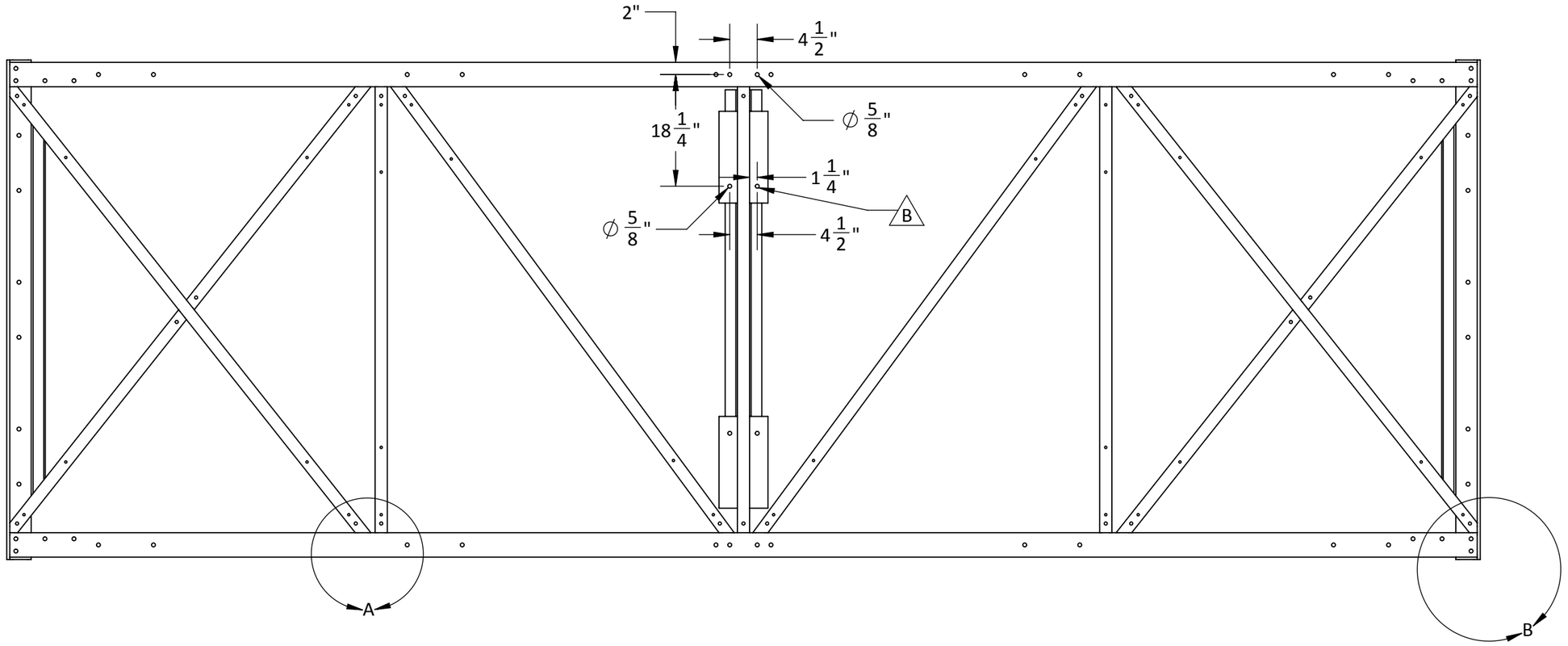
CLIENT
CITY OF CAMPBELL RIVER

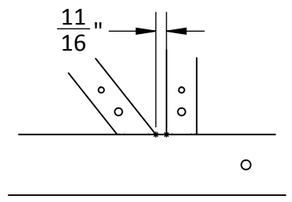
PROJECT
BIG ROCK BOAT RAMP

CR Engineering Inc.

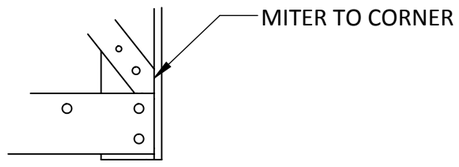
TITLE:
FRAME TOP VIEW

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	4 OF 11	B





DETAIL A
SCALE 1 : 10



DETAIL B
SCALE 1 : 10

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

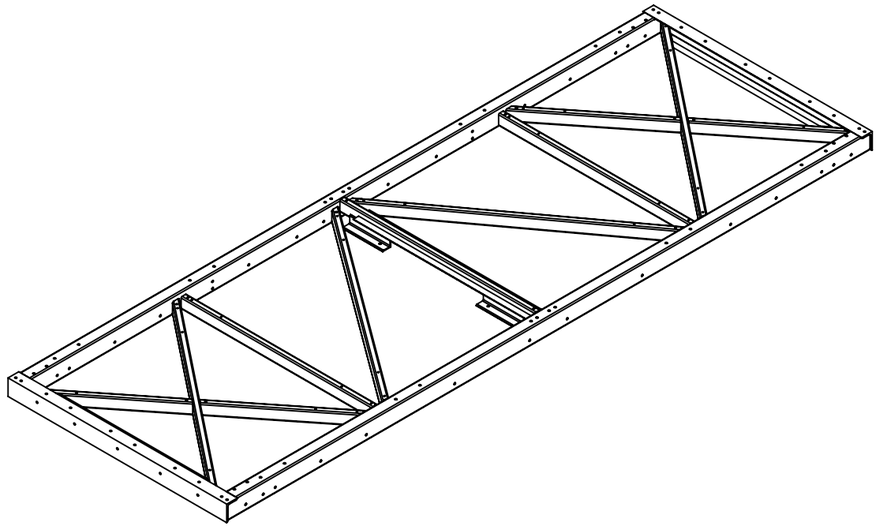
CLIENT
CITY OF CAMPBELL RIVER

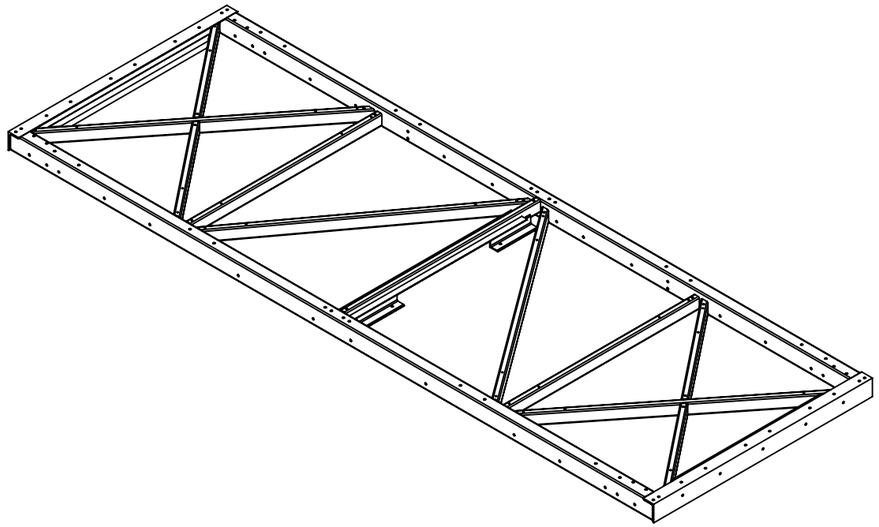
PROJECT
BIG ROCK BOAT RAMP

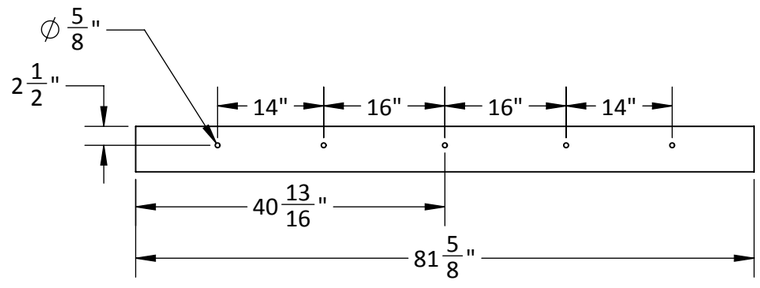
CR Engineering Inc.

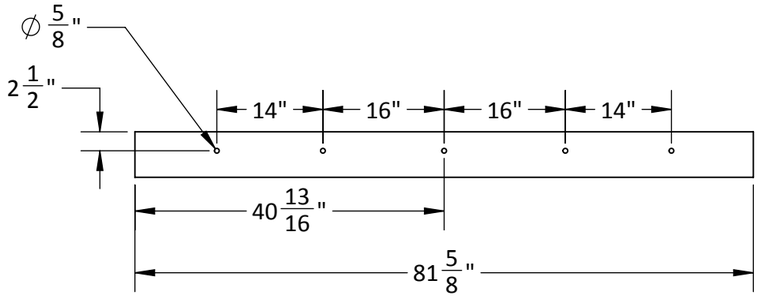
TITLE:
FRAME BOTTOM VIEW

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	5 OF 11	B









DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

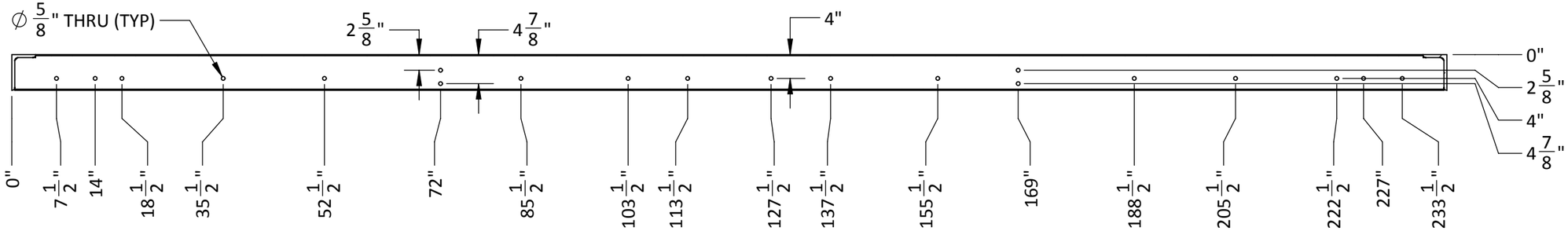
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP

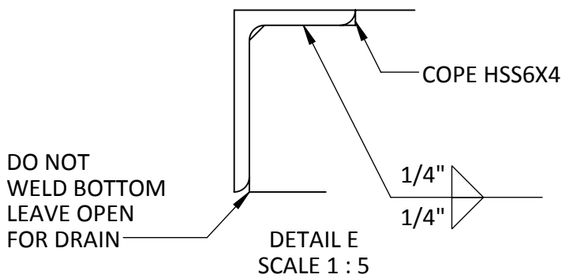
CR Engineering Inc.

TITLE:
FRAME END VIEWS

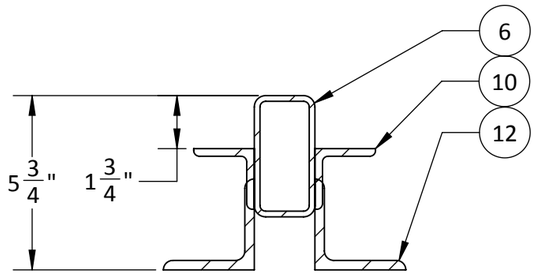
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	6 OF 11	B



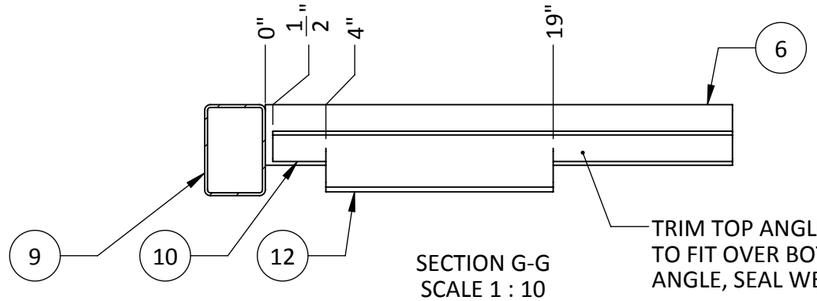
SECTION C-C
SCALE 1 : 20



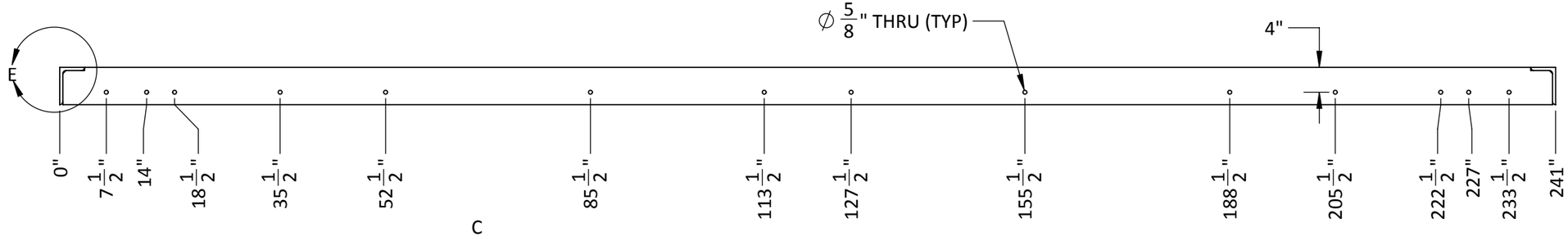
DETAIL E
SCALE 1 : 5



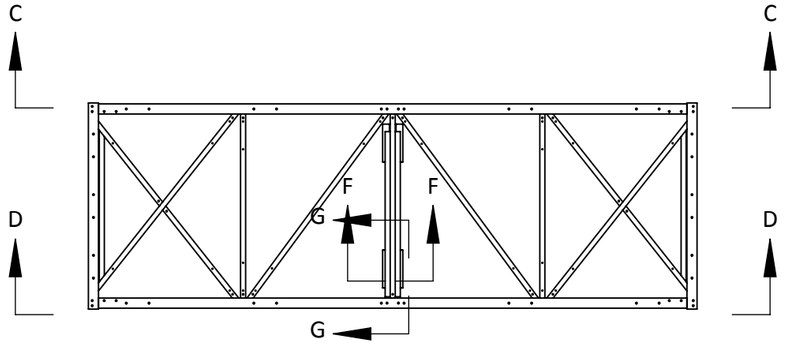
SECTION F-F
SCALE 1 : 5



SECTION G-G
SCALE 1 : 10



SECTION D-D
SCALE 1 : 20



DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY: J KING | DATE: 26/02/2018

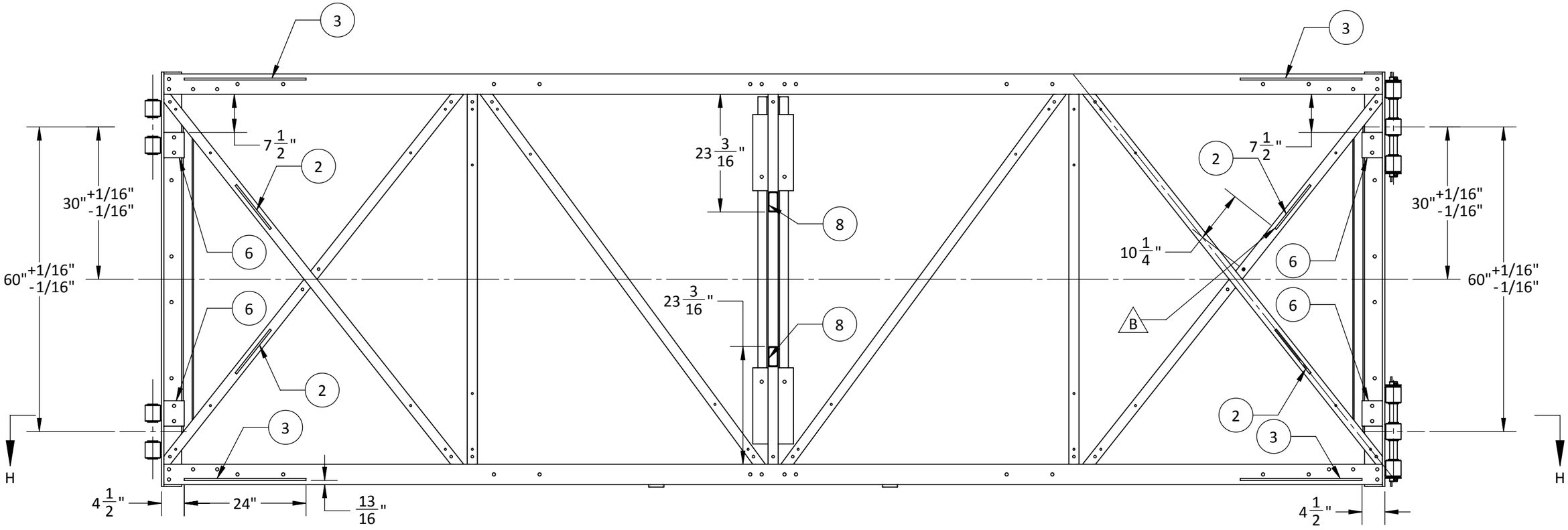
CLIENT
CITY OF CAMPBELL RIVER

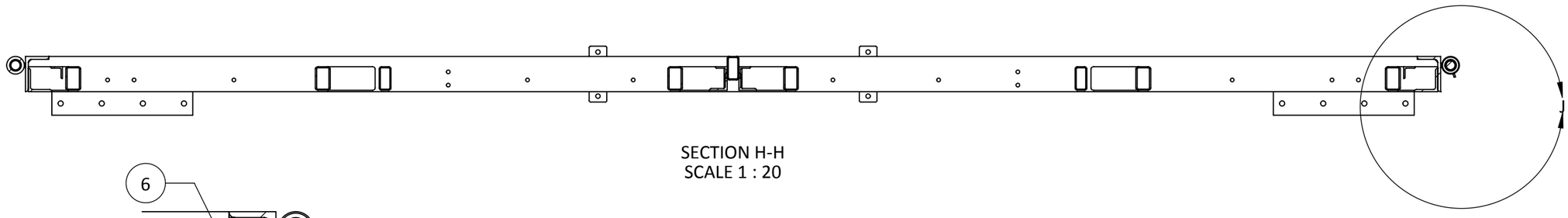
PROJECT
BIG ROCK BOAT RAMP

CR Engineering Inc.

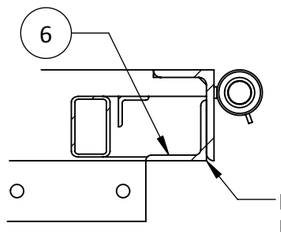
TITLE:
FRAME SIDE VIEWS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	7 OF 11	B





SECTION H-H
SCALE 1 : 20



DETAIL J
SCALE 1 : 10

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

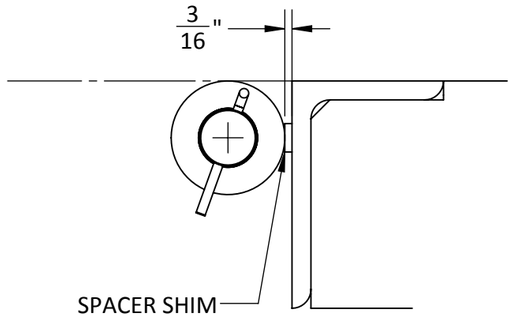
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP

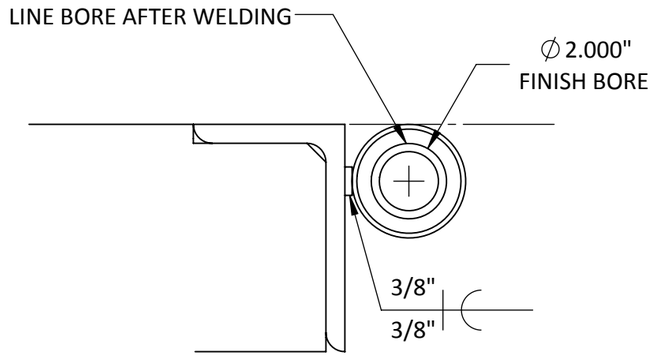
CR Engineering Inc.

TITLE:
FRAME WELDMENT BOTTOM VIEW

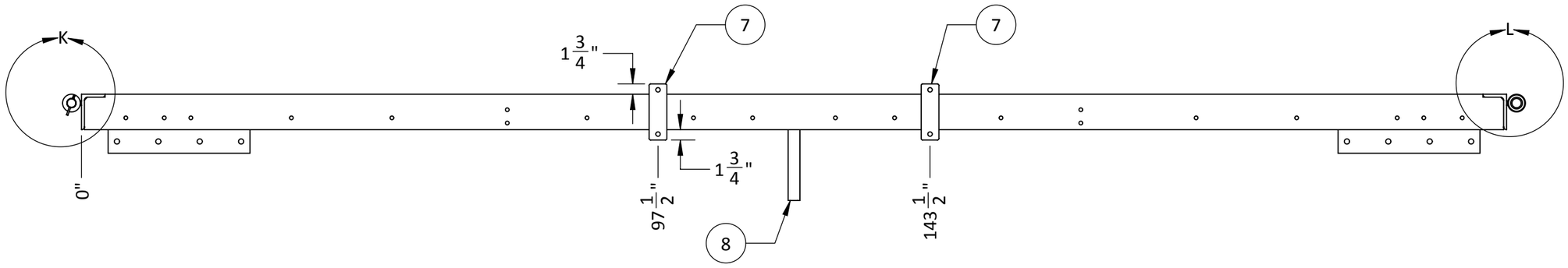
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	8 OF 11	B



DETAIL K
SCALE 1 : 4



DETAIL L
SCALE 1 : 4



DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

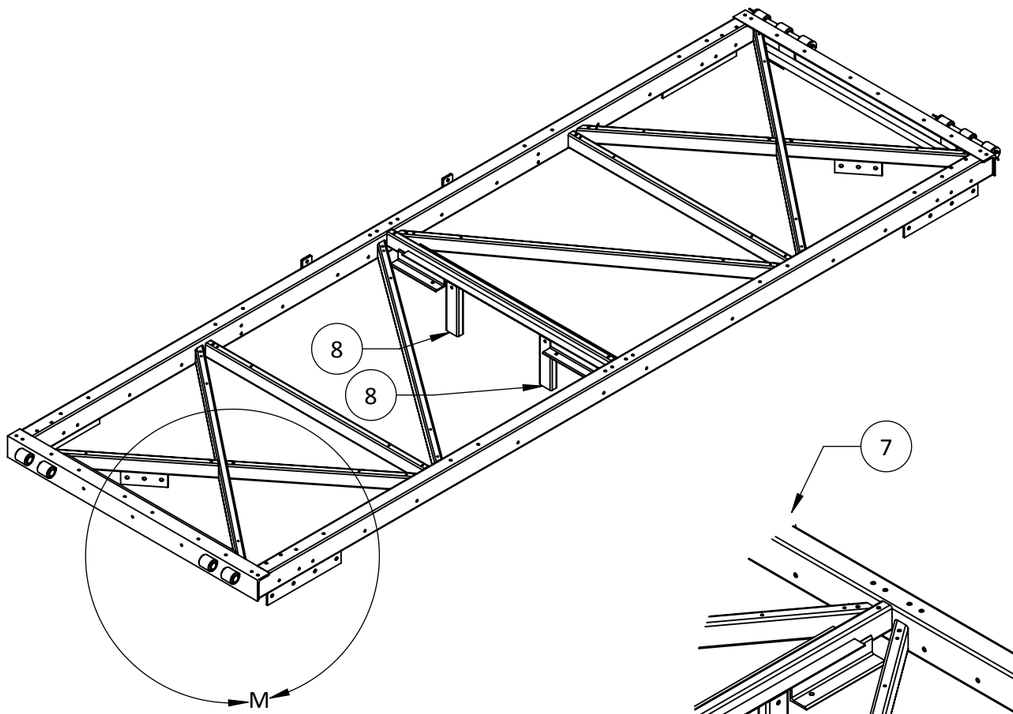
CLIENT
CITY OF CAMPBELL RIVER

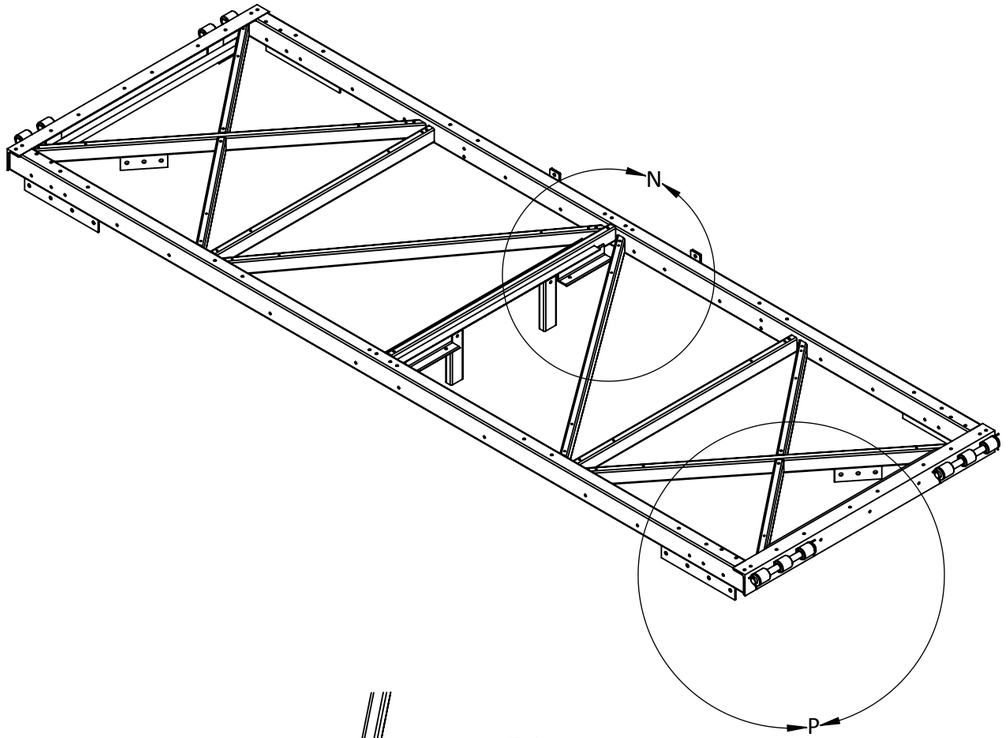
PROJECT
BIG ROCK BOAT RAMP

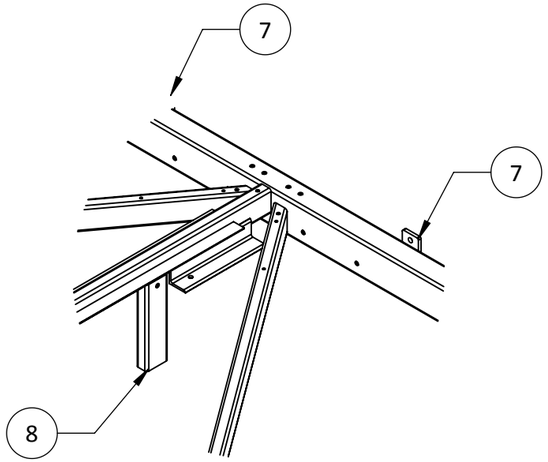
CR Engineering Inc.

TITLE:
FRAME WELDMENT SIDE VIEW

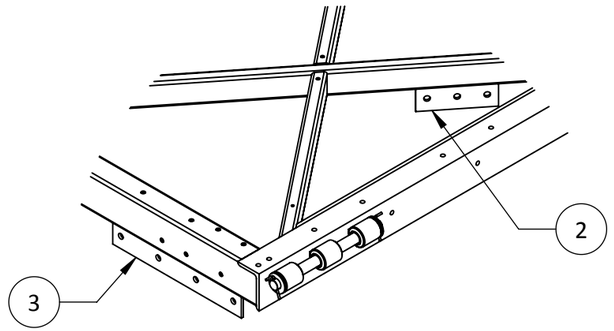
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	9 OF 11	B



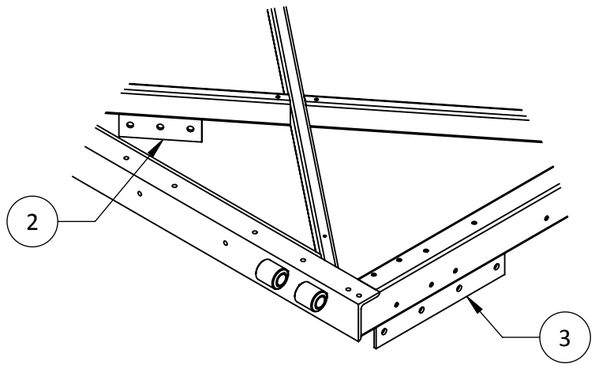




DETAIL N
SCALE 1 : 20



DETAIL P
SCALE 1 : 20



DETAIL M
SCALE 1 : 20

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

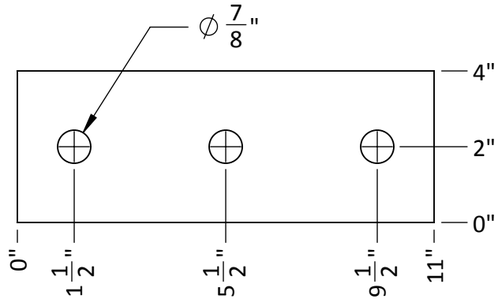
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP

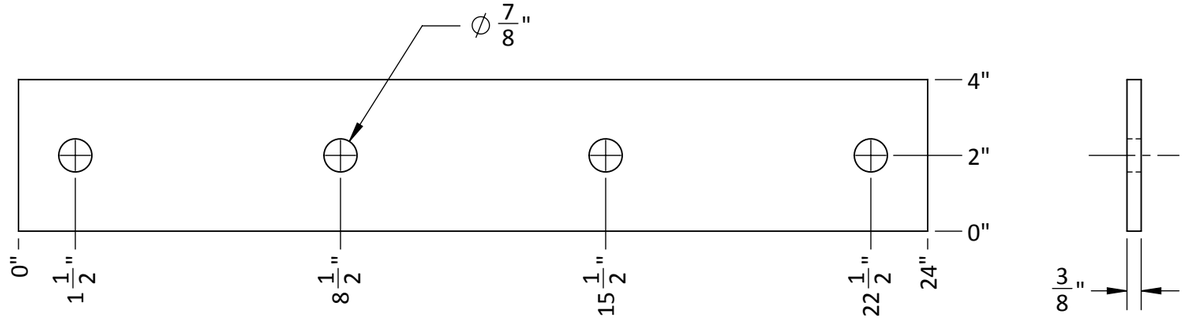
CR Engineering Inc.

TITLE:
FRAME WELDMENT ISOMETRIC VIEWS

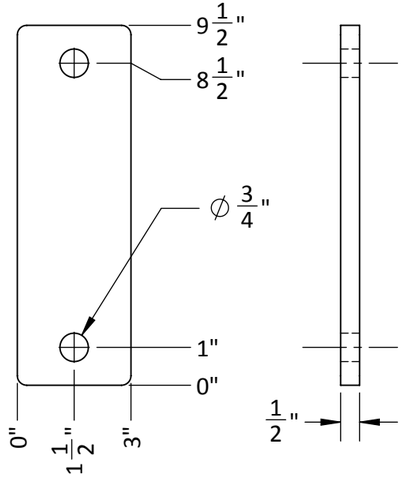
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	10 OF 11	B



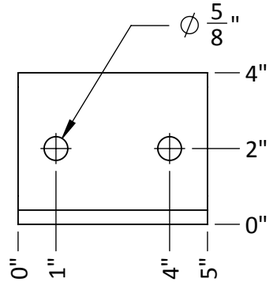
MOUNTING PLATE INNER
P/N 395-138
SCALE: 1:4

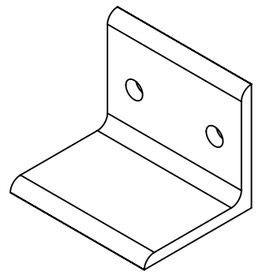


MOUNTING PLATE OUTER
P/N 395-136
SCALE: 1:4

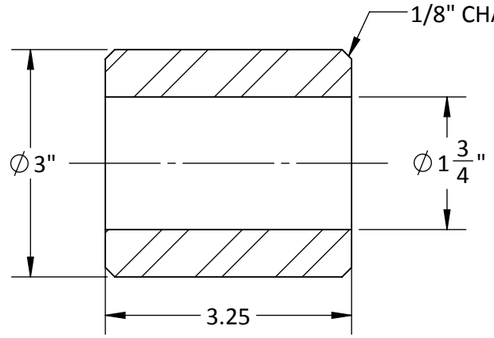


PILE HOOP MOUNT PLATE
P/N 395-168
SCALE: 1:4



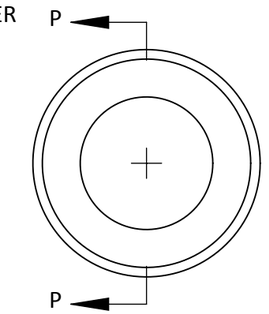


PIPE END STOP
P/N 395-241
SCALE: 1:4

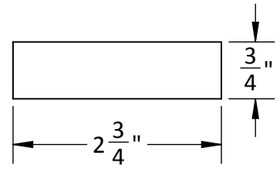


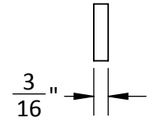
SECTION P-P

ROUGH CUT BORE (DOM 513)
LINE BORE TO ∅2.000"
AFTER WELDING

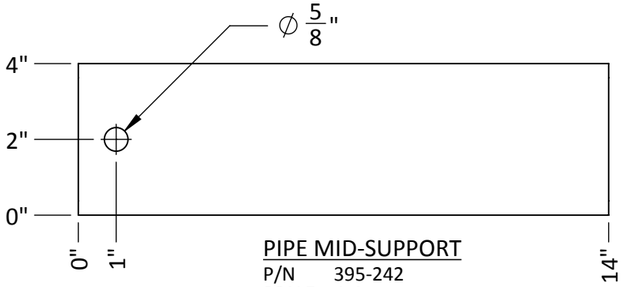


HINGE BODY
P/N 395-56
SCALE: 1:2

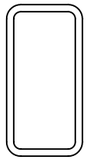




HINGE SPACER SHIM
P/N 395-58
SCALE: 1:2



PIPE MID-SUPPORT
P/N 395-242
SCALE: 1:4



LENGTH	Description
14"	HSS 4 x 2 x 3/16

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 26/02/2018

CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP

CR Engineering Inc.

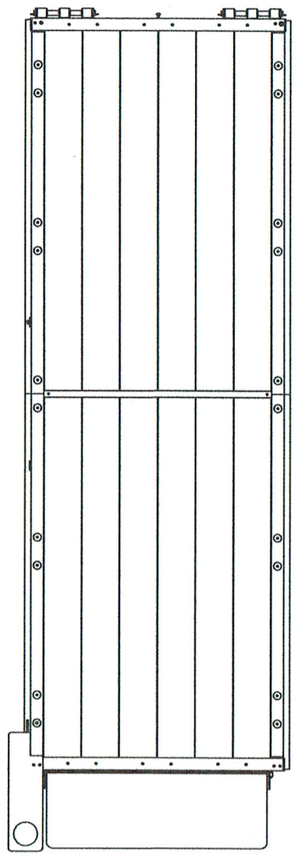
TITLE:
DETAILS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-300	11 OF 11	B

GENERAL NOTES AND SPECIFICATIONS

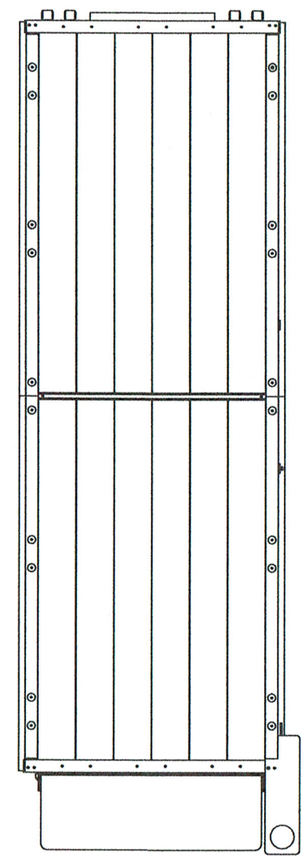
1. ALL STEEL PLATE 44W/300W AND STEEL SHAPES 50W/350W UNLESS NOTED (CSA G40.20/G40.21).
2. HOT DIP GALVANIZED (ASTM A123).
3. REFER TO AMERICAN GALVANIZERS ASSOCIATION "DESIGN GUIDE" FOR VENTING HOLES LOCATION AND SIZE
4. ALUMINUM PLATE 5052-H32 (ASTM B209-10), SHAPES 6061-T6 (ASTM B308).
5. UHMW - RECYCLED UV STABILIZED BLACK
6. WOOD - DOUGLAS FIR #1 GRADE, ROUGH CUT
8. HDPE PIPE - MANUFACTURED IN ACCORDANCE WITH ASTM F714 PE4710 RESIN
9. HDPE PIPE WELDING - END CAPS TO BE BUTT FUSED BY A McElroy CERTIFIED WELDER TO ASTM F2620
10. HDPE PIPE FOAM - 22" DIAMETER ROUND BILLET EPS 15 KOROLITE EPS GEOFOAM ASTM D6817 (NO MORE THAN 1" ANNULAR SPACE ACCEPTED)
11. WELDING SHALL ONLY BE UNDERTAKEN BY A COMPANY CERTIFIED BY THE CANADIAN WELDING BUREAU (CWB) TO THE REQUIREMENTS OF CSA 47.1 AND CSA 47.2(LATEST EDITION) IN DIVISION 1 OR 2. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH AND MEET THE QUALITY REQUIREMENTS OF CSA W59 AND 59.2 (LATEST EDITION).
    ALL WELDERS EMPLOYED BY THE COMPANY SHALL HOLD VALID QUALIFICATIONS ISSUED BY THE CWB.
    ALL WELDING SHALL BE DONE IN ACCORDANCE WITH WELDING PROCEDURES APPROVED BY THE CWB
12. FRAMES ARE IDENTICAL EXCEPT FOR HINGE CONFIGURATIONS

ESTIMATED STEEL WEIGHT WITH GRATING PER FLOAT 2650 POUNDS (1200 KG)



SCALE 1:48

SHORE END LEFT



SCALE 1:48

SHORE END RIGHT

PROFESSIONAL ENGINEER
P.J. KING
J.J. KING
25441
21 MAR 2018

REV.	DESCRIPTION	DATE	APPROVED
B	CHANGED FLOAT PIPE FROM 22" TO 20"	20/03/2018	JK
A	ISSUED FOR TENDER	2/03/2018	JK

REVISIONS

DIMENSIONS IN INCHES	SHEET SIZE	DRAWN BY	DATE (dd/mm/yyyy)
	B (11x17)	J KING	27/02/2018

CLIENT

CITY OF CAMPBELL RIVER

PROJECT

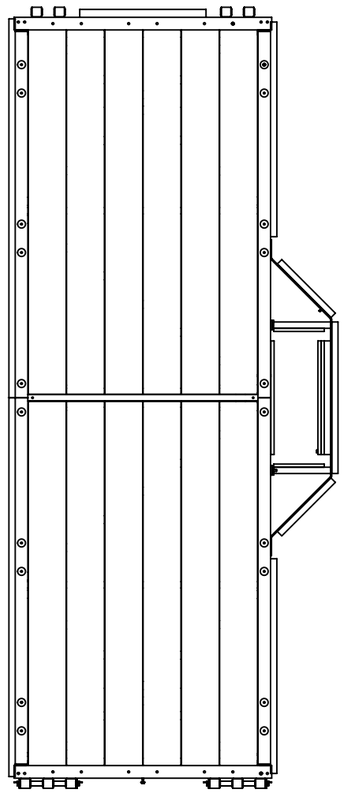
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:

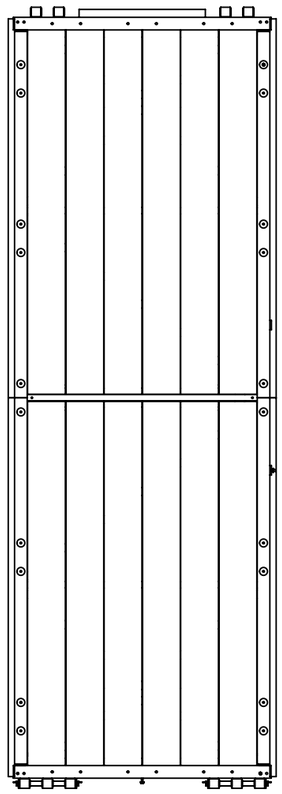
GENERAL ARRANGEMENT
FLOAT CONFIGURATIONS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	1 OF 26	B



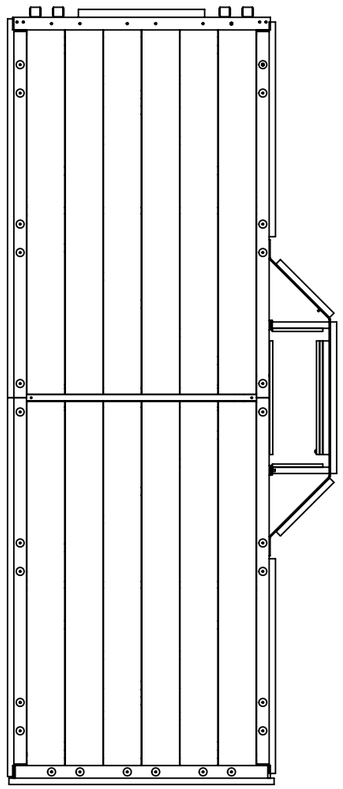
SCALE 1:48

MID FLOAT



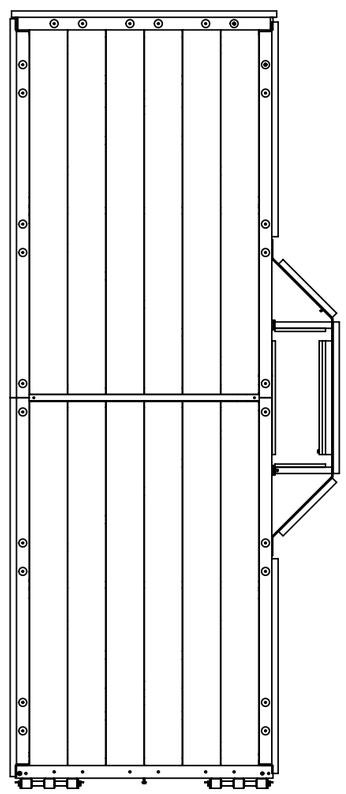
SCALE 1:48

MID FLOAT NO HOOP



SCALE 1:48

OUTSIDE END LEFT



SCALE 1:48

OUTSIDE END RIGHT

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

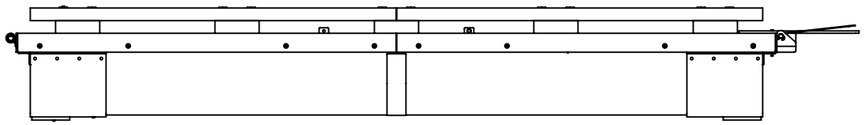
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

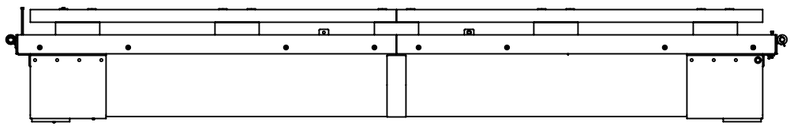
CR Engineering Inc.

TITLE:
GENERAL ARRANGEMENT
FLOAT CONFIGURATIONS

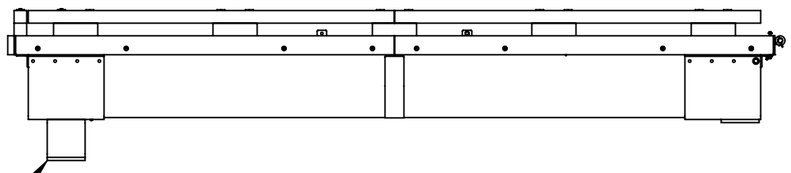
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	2 OF 26	B



SHORE FLOAT



MID FLOAT



OUTSIDE FLOAT

BOLT ON FOOT

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

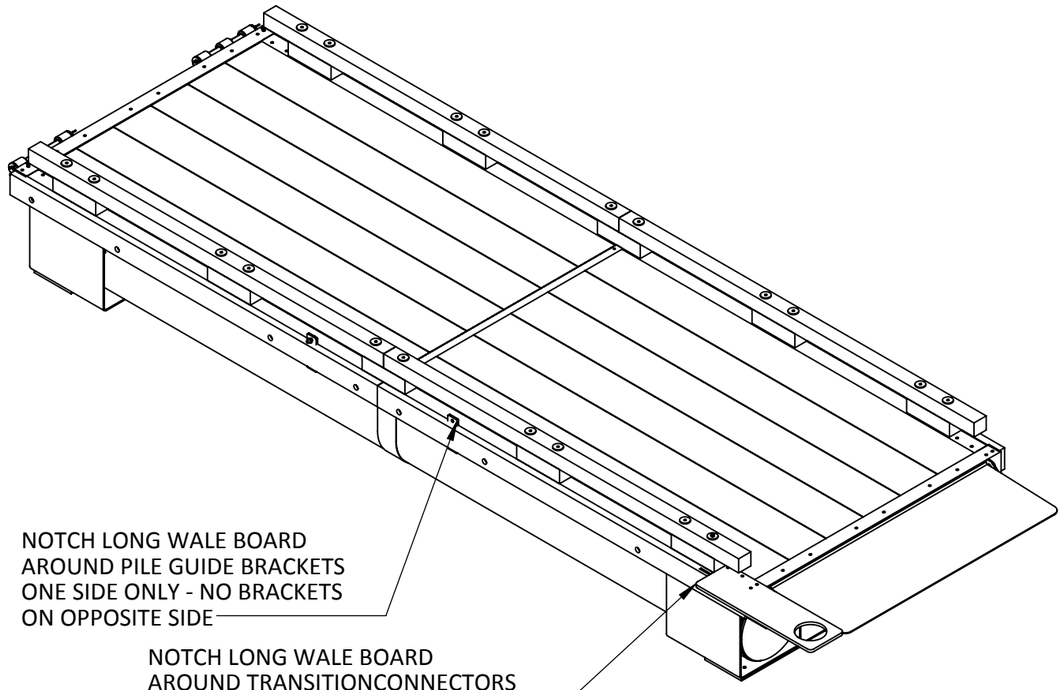
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
GENERAL ARRANGEMENT
FLOAT CONFIGURATIONS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	3 OF 26	B



DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

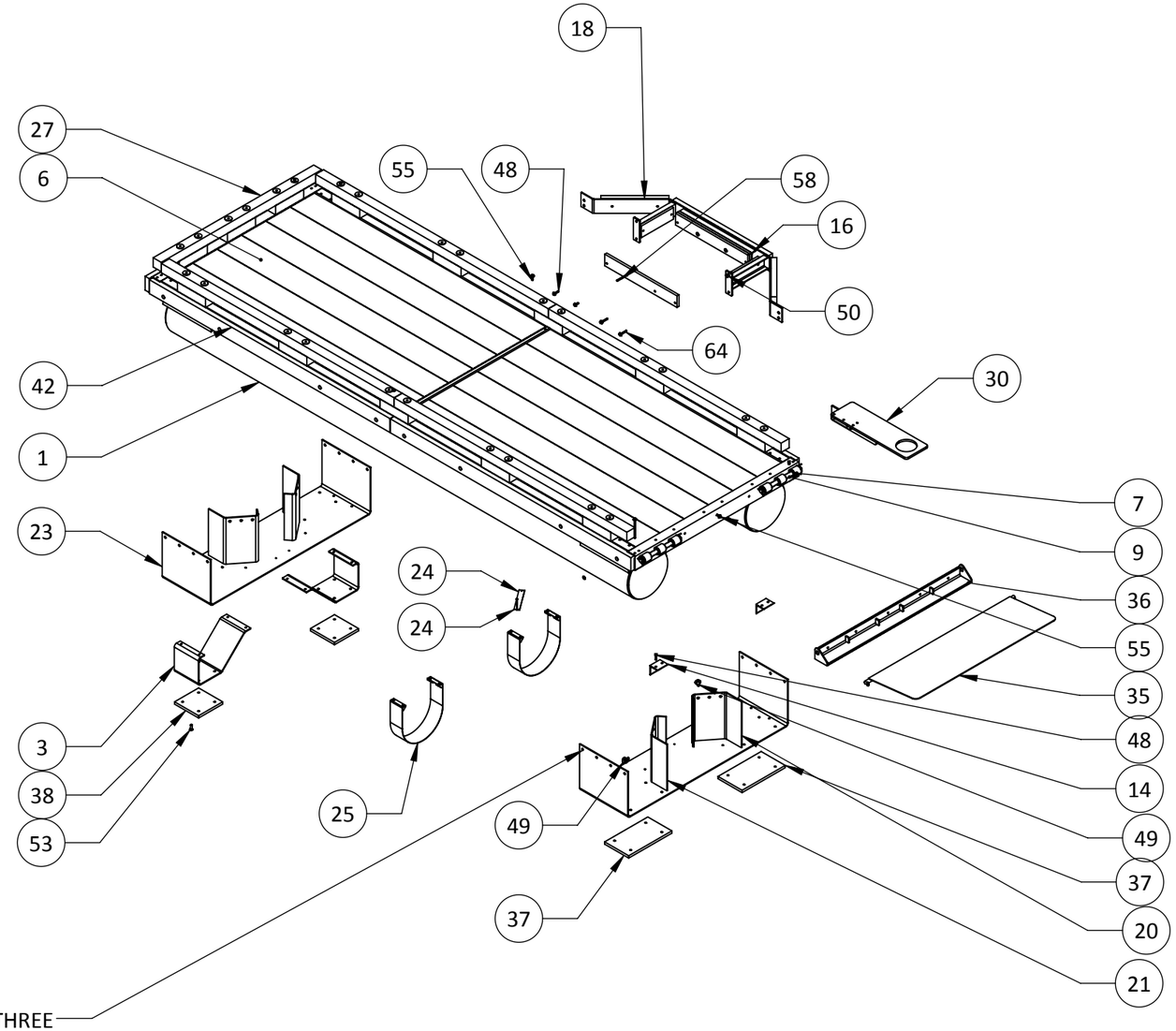
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
GENERAL ARRANGEMENT
FLOAT

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	4 OF 26	B



NOTE - ASSEMBLE WITH
ONE STAINLESS FLAT WASHER
BETWEEN ALUMINUM AND
GALVANIZED BRACKET, ONE
WASHER ON EACH SIDE,
TOTAL STAINLESS WASHERS IS THREE

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

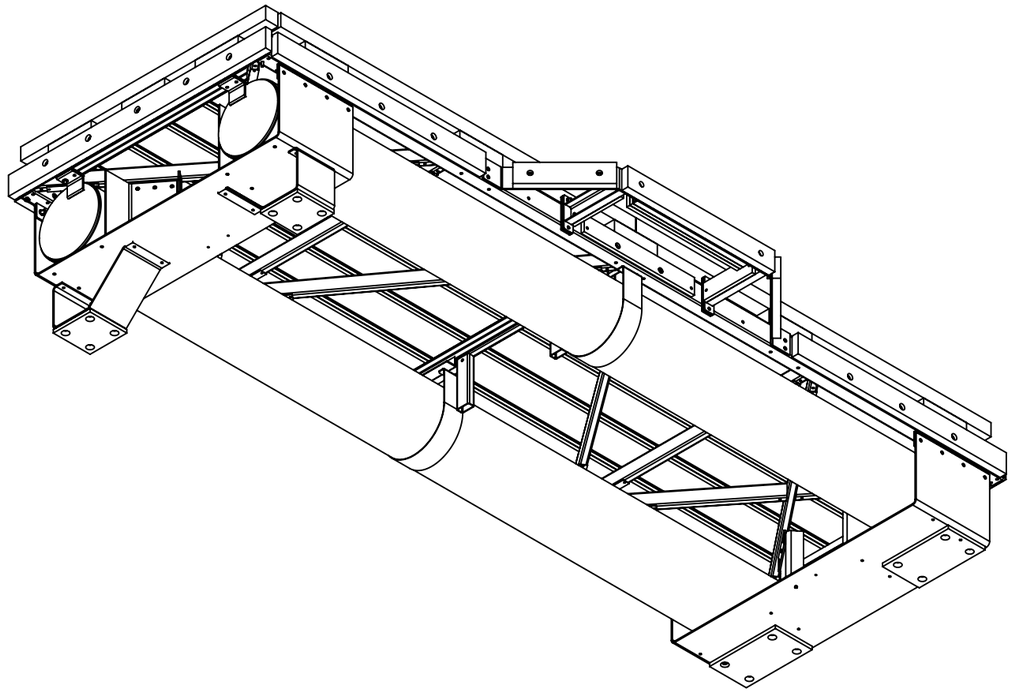
CLIENT
CITY OF CAMPBELL RIVER

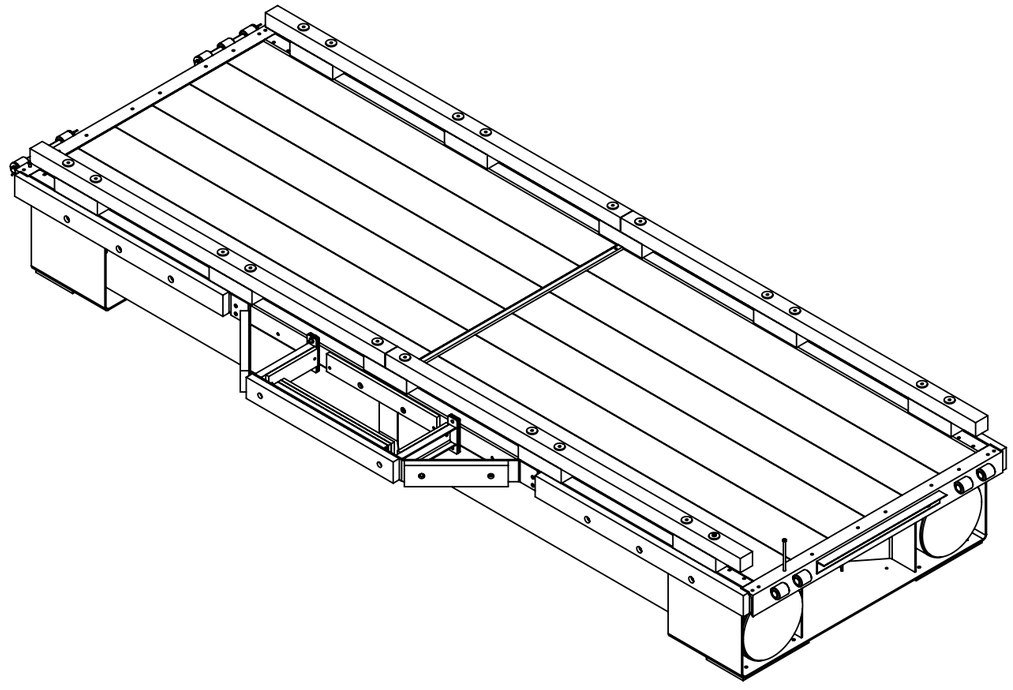
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
EXPLODED VIEW

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	5 OF 26	B





DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
ISOMETRIC VIEWS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	6 OF 26	B

PART No.	DESCRIPTION	SHORE END LEFT/QTY.	SHORE END RIGHT/QTY.	MID FLOAT/QTY.	MID FLOAT NO HOOP/QTY.	OUTSIDE END LEFT/QTY.	OUTSIDE END RIGHT/QTY.	TOTAL	MATERIAL
395-08	20" (508mm), HDPE DR 32.5, BUTT FUSED END CAPS, FILLED WITH ROUND TYPE 2 KOROFLOAT FOAM	2	2	2	2	2	2		HDPE
395-244	CONNECTOR BACKING PLATE	1	1	-	-	-	-		44W/300W
395-275	CONNECTOR LEFT	1	-	-	-	-	-		44W/300W
395-270	CONNECTOR RIGHT	-	1	-	-	-	-		44W/300W
395-206	END FLOAT FOOT	-	-	-	-	2	2		5052-H32
395-145	FLOAT GAP FILLER ANGLE	-	1	1	1	1	-		44W/300W
395-300	FRAME 1 WELDMENT	-	1	-	-	1	-		300W/350W
395-300	FRAME 2 WELDMENT	1	-	-	-	-	1		300W/350W
395-300	FRAME 3 WELDMENT	-	-	1	1	-	-		300W/350W
395-42	GRATING - ROUND HOLE 12" x 1-1/2", 13 GA	12	12	12	12	12	12		STEEL
395-52	HINGE PIN	2	-	2	2	-	2		316 SS
395-65	PILE GUIDE	-	-	1	-	1	1		44W/300W
395-241	PIPE END STOP	4	4	4	4	4	4		44W/300W
395-180	PIPE SUPPORT	2	2	2	2	2	2		5052-H32
395-141	STAINLESS WEAR PLATE	16	16	16	16	16	16		304 SS
395-43	STRAP	2	2	2	2	2	2		316 SS
395-253	TIE UP RAIL BLOCK	10	10	10	10	13	13		ROUGH CUT FIR
395-254	TIE UP RAIL END	-	-	-	-	1	1		ROUGH CUT FIR
395-252	TIE UP RAIL SIDE	4	4	4	4	4	4		ROUGH CUT FIR
395-281	TRANSITION PLATE SUPPORT ANGLE	1	1	-	-	-	-		44W/300W
395-155	TRANSITION RAMP	1	1	-	-	-	-		44W/300W
395-44	UHMW BOTTOM SHOE	4	4	4	4	2	2		BLACK UHMW
395-207	UHMW END FOOT SHOE	-	-	-	-	2	2		BLACK UHMW
395-146	WALE BOARD END	-	-	-	-	1	1		ROUGH CUT FIR
395-151	WALE BOARD LONG SIDE	4	4	2	4	2	2		ROUGH CUT FIR
395-147	WALE BOARD SHORT SIDE	-	-	2	-	2	2		ROUGH CUT FIR
395-208	TIMBER WASHER 1/2"	20	20	20	20	26	26		GALVANIZED
395-245	ZINC ANODE 3LB	2	2	2	2	2	2		MARTYR CM706A OR EQUIVALENT

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
PARTS AND ASSEMBLIES
BILL OF MATERIALS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	7 OF 26	B

PART No.	DESCRIPTION	SHORE END LEFT/QTY.	SHORE END RIGHT/QTY.	MID FLOAT/QTY.	MID FLOAT NO HOOP/QTY.	OUTSIDE END LEFT/QTY.	OUTSIDE END RIGHT/QTY.	TOTAL	MATERIAL
HFBOLT 0.25-20x4.5x0.75-N	BOLT 1/4 x 4-1/2 WITH NUT AND TWO FLAT WASHERS, RED LOCKTITE NUT	32	32	32	32	32	32	448	GALVANIZED
HFBOLT 0.375-16x1.25x1-N	BOLT 3/8 x 1-1/4 WITH NYLOCK NUT AND TWO FLAT WASHERS	4	4	4	4	4	4	56	18-8 STAINLESS
HFBOLT 0.5-13x1.5x1.25-N	BOLT 1/2 x 1-1/2 WITH NYLOCK NUT AND TWO FLAT WASHERS	4	4	4	4	4	4	56	18-8 STAINLESS
HFBOLT 0.5-13x1.75x1.25-N	BOLT 1/2 x 1-3/4 WITH NYLOCK NUT AND TWO FLAT WASHERS	-	-	-	-	8	8	16	18-8 STAINLESS
HFBOLT 0.5-13x2x1.25-N	BOLT 1/2 x 2 WITH NUT AND TWO FLAT WASHERS, RED LOCKTITE NUT	-	3	3	3	3	-	36	GALVANIZED
HFBOLT 0.5-13x2.5x1.25-N	BOLT 1/2 x 2-1/2 WITH NUT AND TWO FLAT WASHERS, RED LOCK TITE NUT	5	5	12	-	17	17	56	GALVANIZED
HFBOLT 0.5-13x3x1.25-N	BOLT 1/2 x 3 WITH NUT AND TWO FLAT WASHERS, RED LOCKTITE NUT	-	-	2	-	2	2		GALVANIZED
HFBOLT 0.5-13x5.5x1.25-N	BOLT 1/2 x 5-1/2 WITH NUT AND TWO FLAT WASHERS, RED LOCK TITE NUT	-	-	8	-	8	8	64	GALVANIZED
HFBOLT 0.5-13x6x1.25-N	BOLT 1/2 x 6 WITH NUT AND TWO FLAT WASHERS, RED LOCKTITE NUT	2	2	-	-	-	-	4	GALVANIZED
HFBOLT 0.5-13x6.5x1.25-N	BOLT 1/2 x 6-1/2 WITH NUT AND TWO FLAT WASHERS, RED LOCKTITE NUT	16	16	16	16	16	16	224	GALVANIZED
HFBOLT 0.5-13x8x1.25-N	BOLT 1/2 x 8 WITH NUT AND TWO FLAT WASHERS, RED LOCKTITE NUT	4	4	-	-	-	-	8	GALVANIZED
HFBOLT 0.5-20x10x1.25-N	BOLT 1/2 x 10 WITH NUT AND TWO FLAT WASHERS, RED LOCKTITE NUT	-	-	-	-	6	6	12	GALVANIZED
HHSBOLT 0.6250-11x2x1.25-N	BOLT 5/8 x 2 GRADE A307 WITH NUT AND TWO FLAT WASHERS, RED LOCKTITE NUT	4	4	4	4	4	4	56	GALVANIZED
HHSBOLT 0.7500-10x2x1.375-N	BOLT GRADE A307 3/4 x 2 WITH NUT AND THREE STAINLESS FLAT WASHERS, RED LOCKTITE NUT	28	28	28	28	28	28	392	GALVANIZED
SCHCSCREW 0.625-11x2x2-HX-N	SCREW COUNTERSUNK 5/8 x 2, WITH NYLOCK NUT AND ONE FLATWASHER	16	16	16	16	16	16	224	18-8 STAINLESS

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
SINGLE FLOAT FASTENERS
BILL OF MATERIALS
(BEST ESTIMATE)

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	8 OF 26	B

ITEM No.	PART No.	DESCRIPTION	QTY.	MATERIAL
1	395-08	20" (508mm), HDPE DR 32.5, BUTT FUSED END CAPS, FILLED WITH ROUND TYPE 2 KOROFLOAT FOAM	28	HDPE
2	395-244	CONNECTOR BACKING PLATE	2	44W/300W
3	395-206	END FLOAT FOOT	4	5052-H32
4	395-145	FLOAT GAP FILLER ANGLE	12	44W/300W
5	395-131	FRAME WELDMENT	14	50W/350W
6	395-42	GRATING - ROUND HOLE 12" x 1-1/2", 13 GA	168	STEEL
7	395-56	HINGE BODY	120	A513 1026 DOM (3" x 1.75") OR EQUIVALENT
8	395-57	HINGE BUSHING	120	MD FILLED NYLON 2" x 1-1/2"
9	395-52	HINGE PIN	48	316 SS
10	395-58	HINGE SPACER SHIM	120	44W/300W
11	281-95	KEEPER PIN	48	304 SS
12	395-138	MOUNTING PLATE INNER	56	44W/300W
13	395-136	MOUNTING PLATE OUTER	56	44W/300W
14	395-241	PIPE END STOP	112	44W/300W
15	395-62	PILE GUARD CHANNEL	16	44W/300W
16	395-63	PILE GUARD MOUNTING CHANNEL	8	44W/300W
17	395-164	PILE GUARD MOUNTING PLATE	16	44W/300W
18	395-61	PILE GUIDE GUARD	8	44W/300W
19	395-168	PILE HOOP MOUNT PLATE	28	44W/300W
20	395-142	PIPE INNER BRACKET LEFT	28	5052-H32
21	395-142	PIPE INNER BRACKET RIGHT	28	5052-H32
22	395-242	PIPE MID-SUPPORT	28	50W/350W
23	395-137	PIPE SUPPORT	28	5052-H32
24	395-141	STAINLESS WEAR PLATE	224	304 SS
25	395-43	STRAP	28	316 SS

ITEM No.	PART No.	DESCRIPTION	QTY.	MATERIAL
26	395-253	TIE UP RAIL BLOCK	146	ROUGH CUT FIR
27	395-254	TIE UP RAIL END	2	ROUGH CUT FIR
28	395-252	TIE UP RAIL SIDE	56	ROUGH CUT FIR
29	395-208	TIMBER WASHER 1/2"	292	GALVANIZED
30	395-144	TRANSITION CONNECTOR PLATE	2	44W/300W
31	395-272	TRANSITION CONNECTOR SPACER BLOCK	2	44W/300W
32	395-271	TRANSITION CONNECTOR STIFFENER	2	44W/300W
33	395-152	TRANSITION HINGE SHAFT	2	44W/300W
34	395-163	TRANSITION KEEPER PIN	4	304 SS
35	395-153	TRANSITION PLATE	2	44W/300W
36	395-281	TRANSITION PLATE SUPPORT ANGLE	2	44W/300W
37	395-44	UHMW BOTTOM SHOE	52	BLACK UHMW
38	395-207	UHMW END FOOT SHOE	4	BLACK UHMW
39	395-66	UHMW WEAR PLATE SIDE	16	BLACK UHMW
40	395-67	UHMW WEAR PLATE OUTER	24	BLACK UHMW
41	395-146	WALE BOARD END	2	ROUGH CUT FIR
42	395-151	WALE BOARD LONG SIDE	40	ROUGH CUT FIR
43	395-147	WALE BOARD SHORT SIDE	16	ROUGH CUT FIR
44	395-148	WALE BOARD HOOP OUTSIDE	8	ROUGH CUT FIR
45	395-149	WALE BOARD HOOP SIDE	16	ROUGH CUT FIR
46	395-245	ZINC ANODE 3LB	28	MARTYR CM706A OR EQUIVALENT

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

CLIENT
CITY OF CAMPBELL RIVER

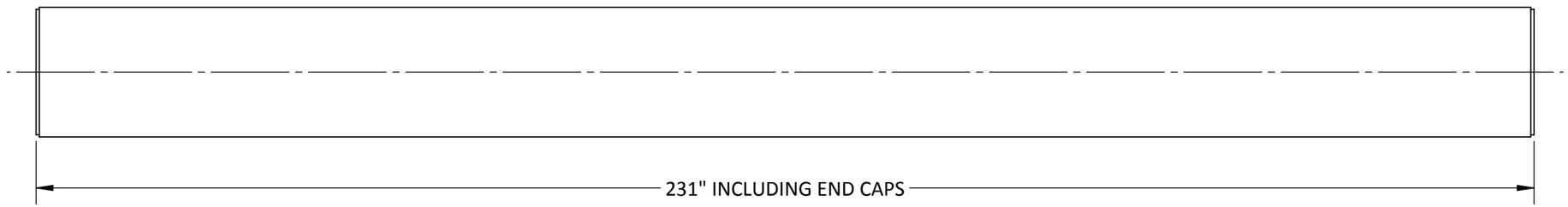
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

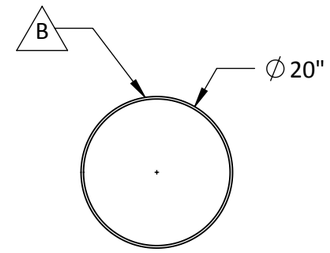
CR Engineering Inc.

TITLE:
PARTS BILL OF MATERIALS FOR ALL 14 FLOATS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	9 OF 26	B

20" (559mm), HDPE DR 32.5, BUTT FUSED END CAPS, FILLED WITH ROUND TYPE 2 KOROFLOAT FOAM
SUPPLIER - SANDALE UTLILITY PRODUCTS, SURREY, BC





DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

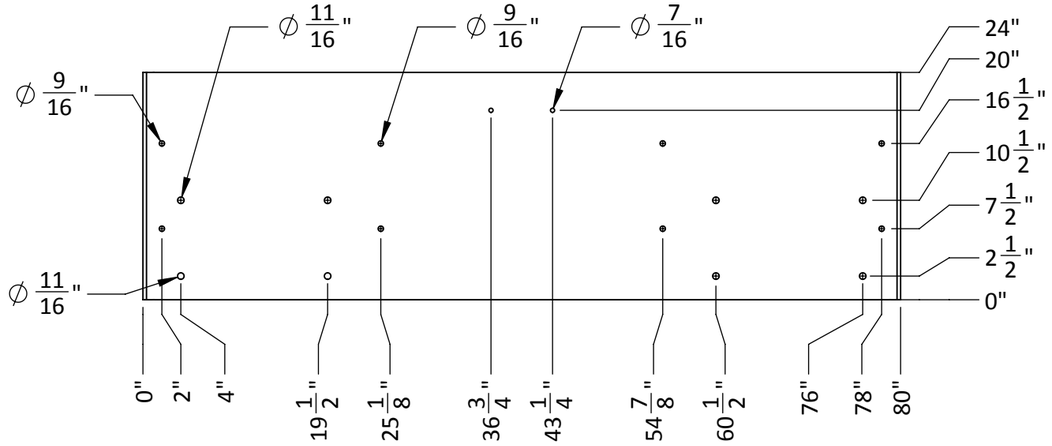
CLIENT
CITY OF CAMPBELL RIVER

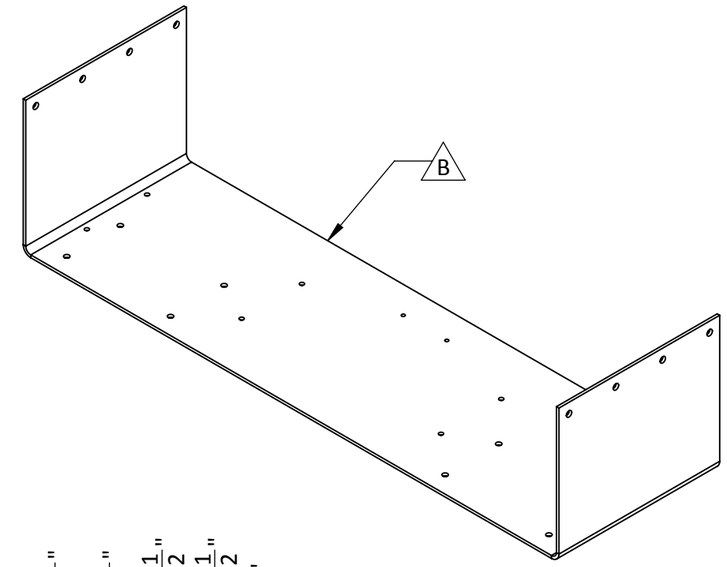
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

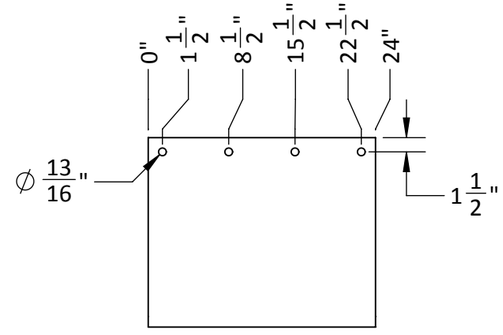
CR Engineering Inc.

TITLE:
FLOAT PIPE

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	10 OF 26	B







PIPE SUPPORT
P/N 395-137
SCALE: 1:16

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

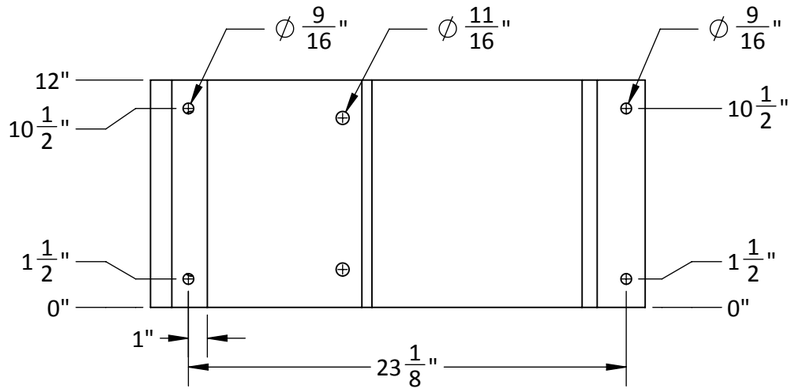
CLIENT
CITY OF CAMPBELL RIVER

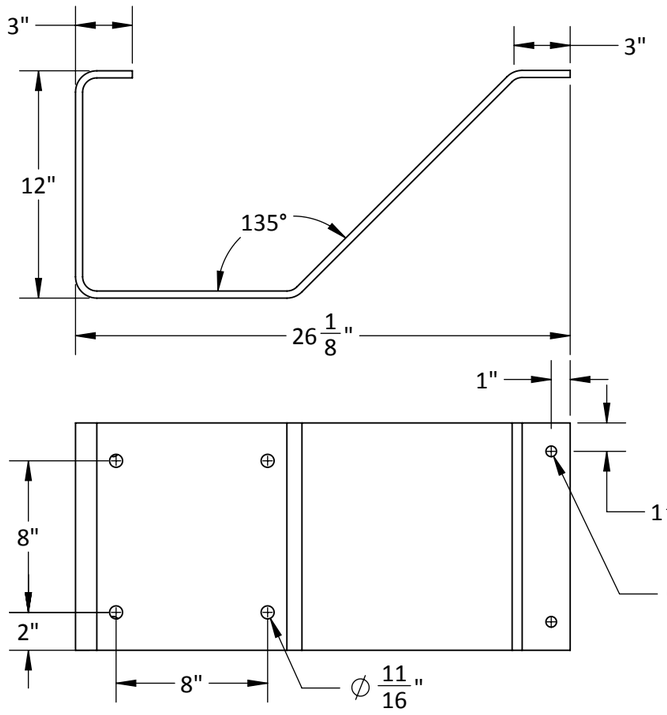
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

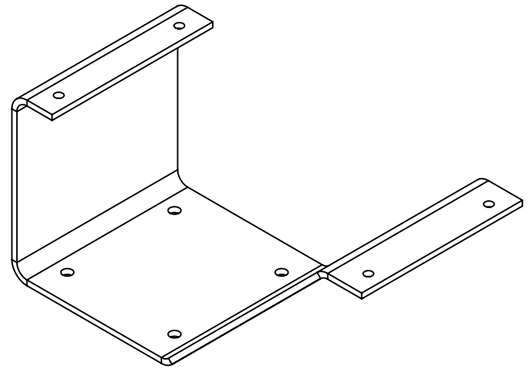
CR Engineering Inc.

TITLE:
PIPE SUPPORT

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	11 OF 26	B







END FLOAT FOOT
P/N 395-206
SCALE: 1:8

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

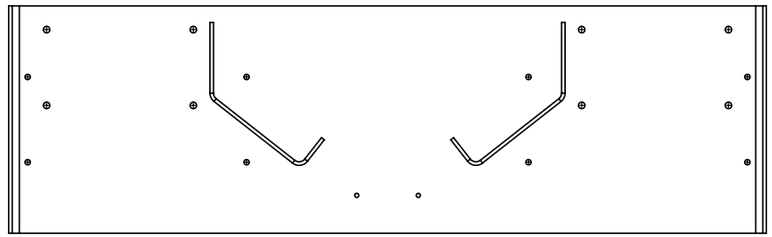
CLIENT
CITY OF CAMPBELL RIVER

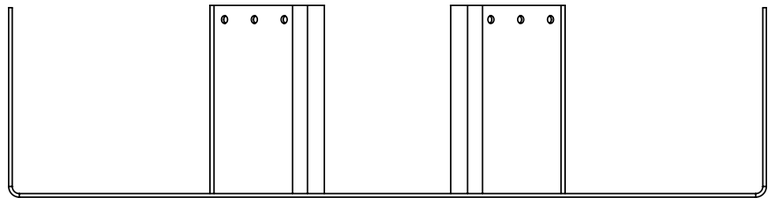
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

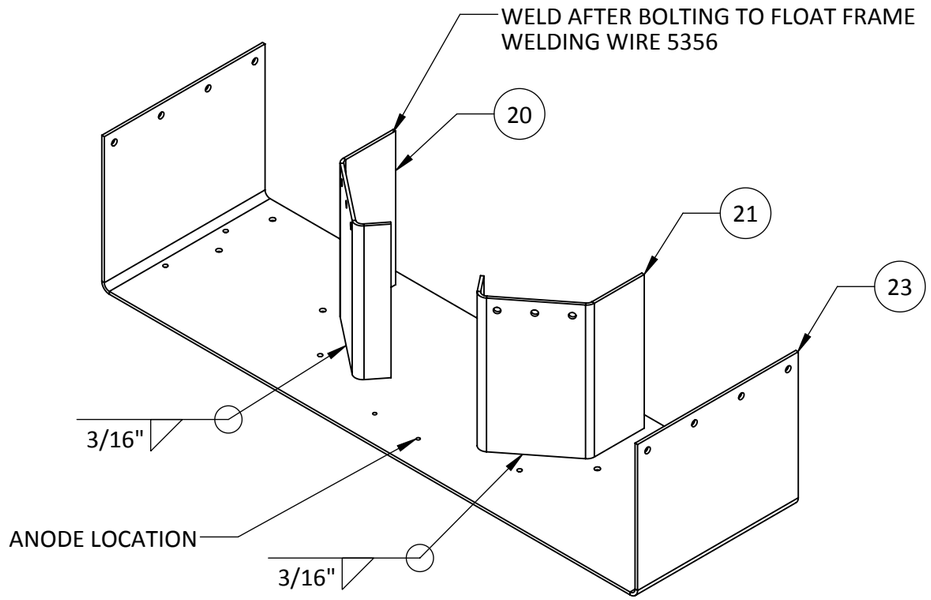
CR Engineering Inc.

TITLE:
END FLOAT FOOT

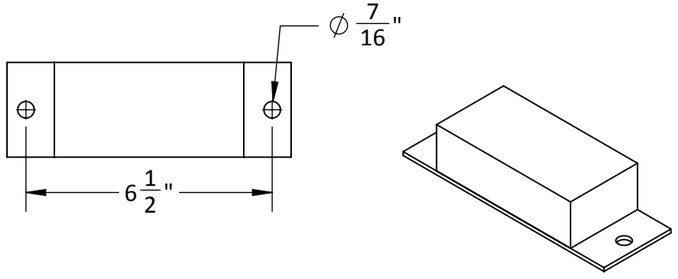
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	12 OF 26	B







PIPE SUPPORT
P/N 395-180
SCALE: 1:16



ZINC ANODE 3LB
P/N 395-245
SCALE: 1:4

MARTYR CM706 OR EQUIVALENT

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

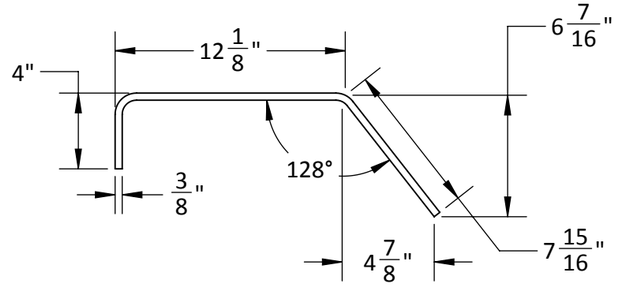
CLIENT
CITY OF CAMPBELL RIVER

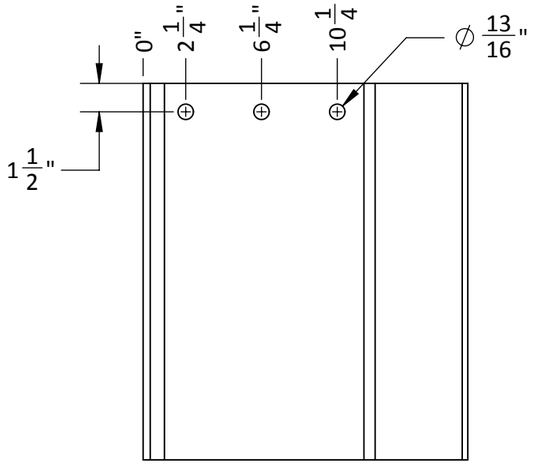
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

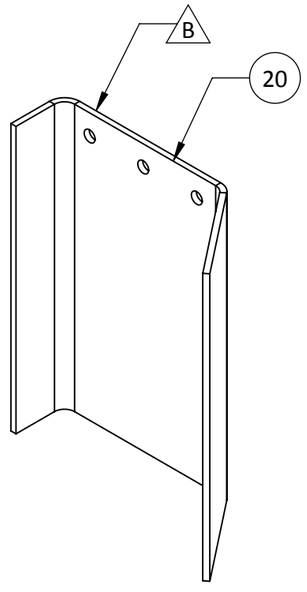
CR Engineering Inc.

TITLE:
PIPE SUPPORT ASSEMBLY

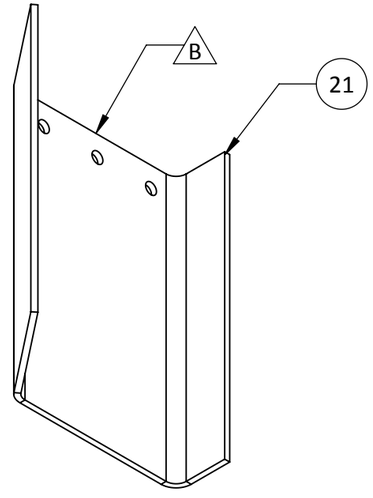
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	13 OF 26	B







PIPE INNER BRACKET LEFT
P/N 395-142
SCALE: 1:8



PIPE INNER BRACKET RIGHT
P/N 395-142
SCALE: 1:8

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

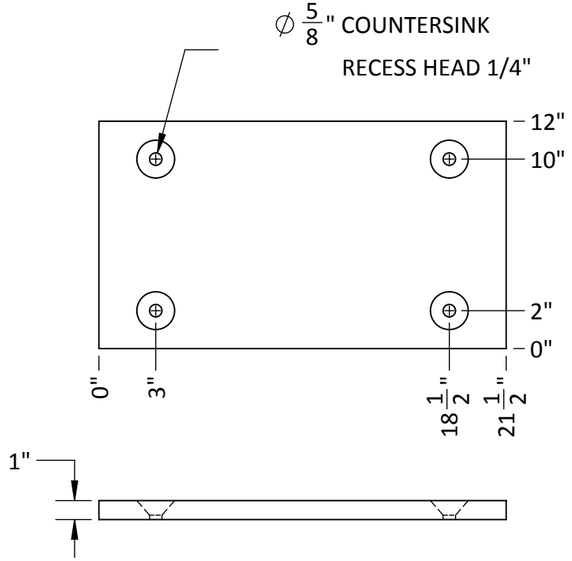
CLIENT
CITY OF CAMPBELL RIVER

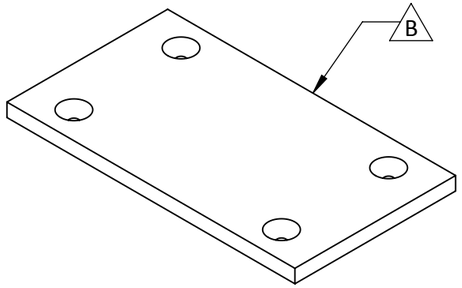
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

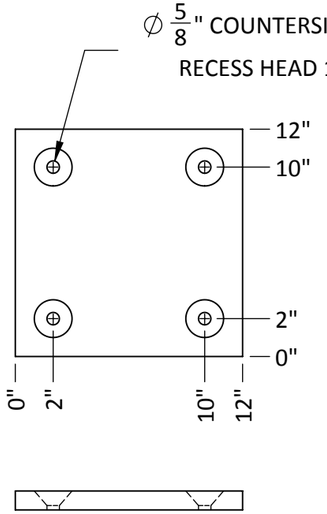
TITLE:
PIPE INNER BRACKET

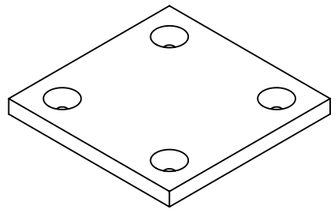
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	14 OF 26	B



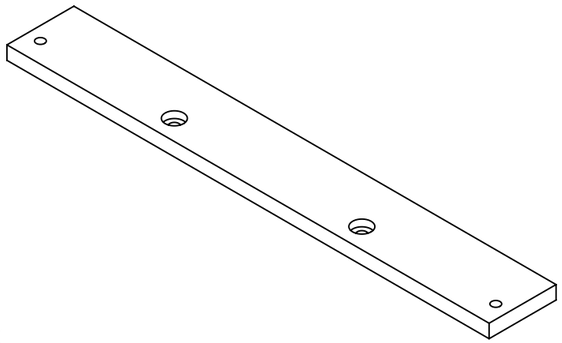


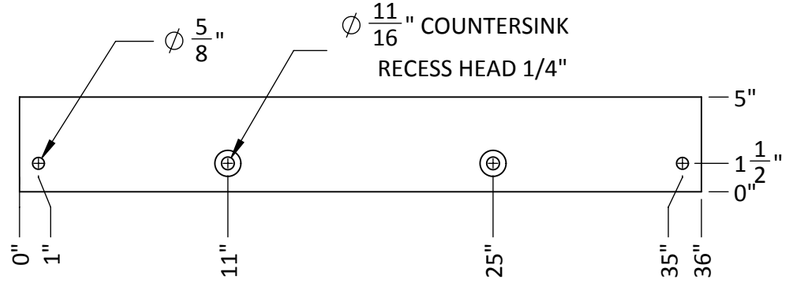
UHMW BOTTOM SHOE
P/N 395-44
SCALE: 1:8



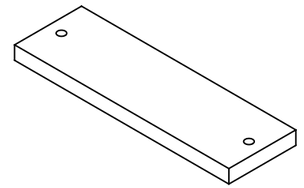


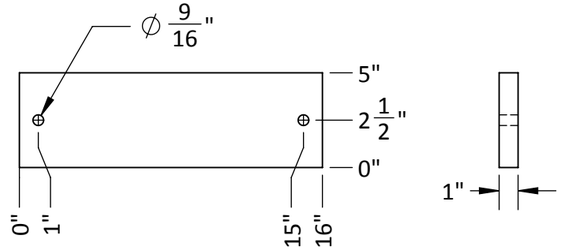
UHMW END FOOT SHOE
P/N 395-207
SCALE: 1:8





UHMW WEAR PLATE OUTER
P/N 395-67
SCALE: 1:8





UHMW WEAR PLATE SIDE
P/N 395-66
SCALE: 1:8

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

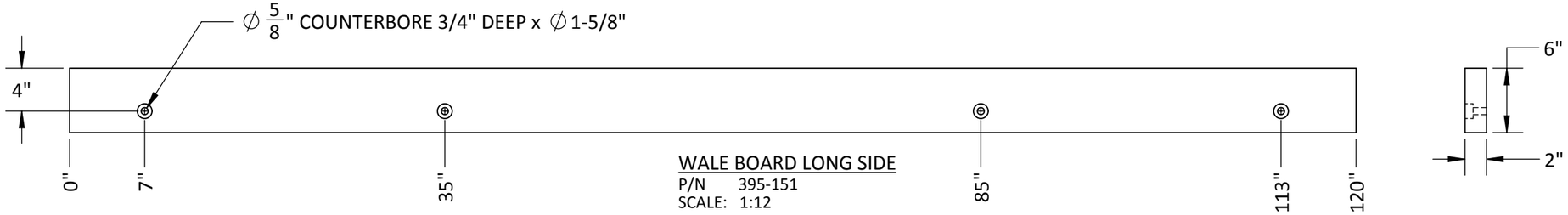
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

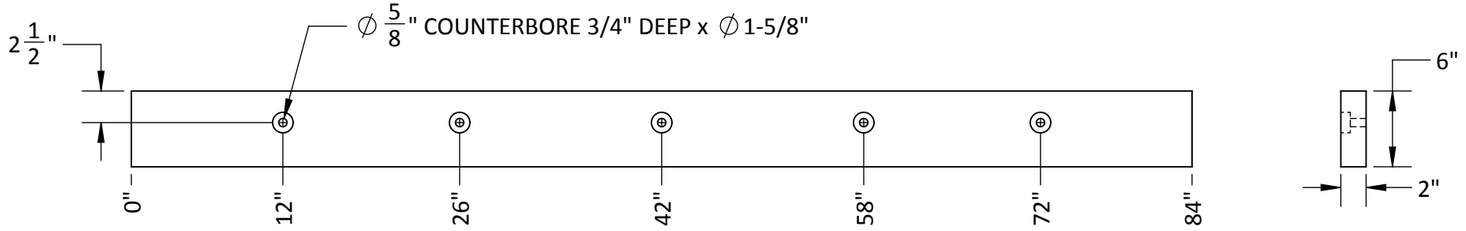
CR Engineering Inc.

TITLE:
BLACK UHMW PARTS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	15 OF 26	B

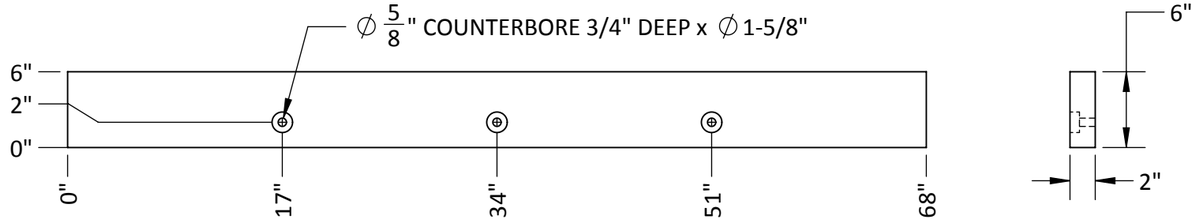


WALE BOARD LONG SIDE
P/N 395-151
SCALE: 1:12

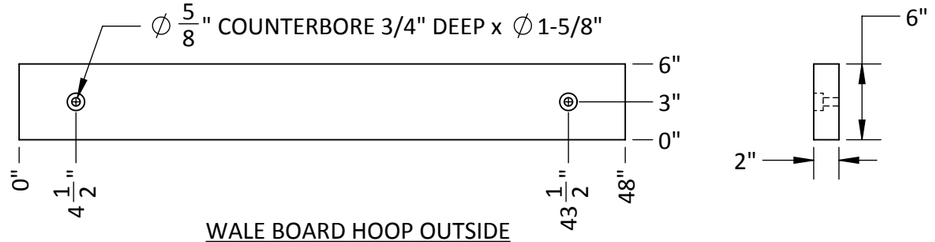


WALE BOARD END
P/N 395-146
SCALE: 1:12

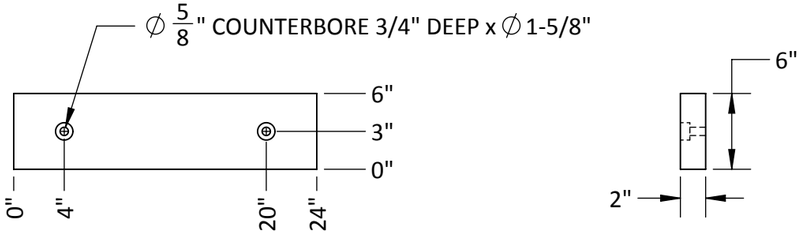
NOTE - NOTCH LONG SIDE WALE BOARD AROUND PILE GUIDE BRACKETS AND TRANSITION CONNECTOR



WALE BOARD SHORT SIDE
P/N 395-147
SCALE: 1:12



WALE BOARD HOOP OUTSIDE
P/N 395-148
SCALE: 1:12



WALE BOARD HOOP SIDE
P/N 395-149
SCALE: 1:12

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

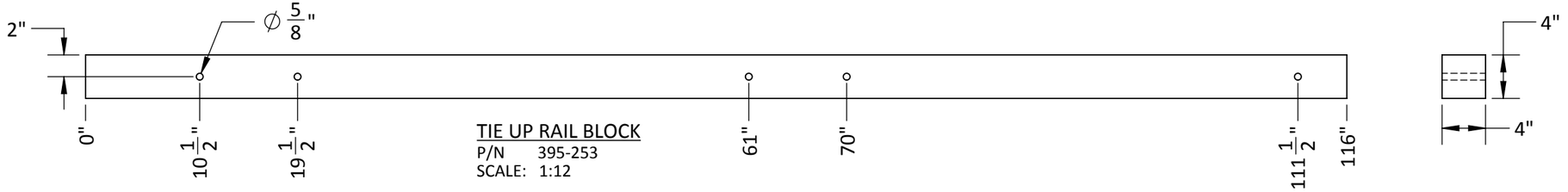
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

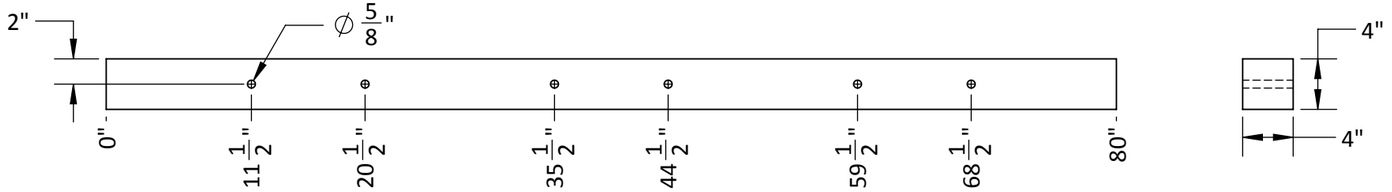
CR Engineering Inc.

TITLE:
FIR TIMBER PARTS

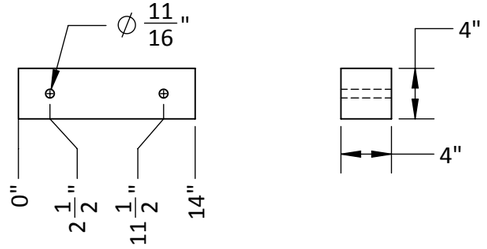
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	16 OF 26	B



TIE UP RAIL BLOCK
P/N 395-253
SCALE: 1:12



TIE UP RAIL END
P/N 395-254
SCALE: 1:12



TIE UP RAIL BLOCK
P/N 395-253
SCALE: 1:12

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

CLIENT
CITY OF CAMPBELL RIVER

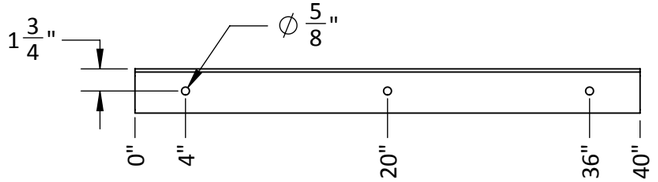
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

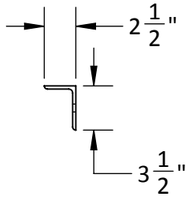
CR Engineering Inc.

TITLE:
FIR TIMBER PARTS

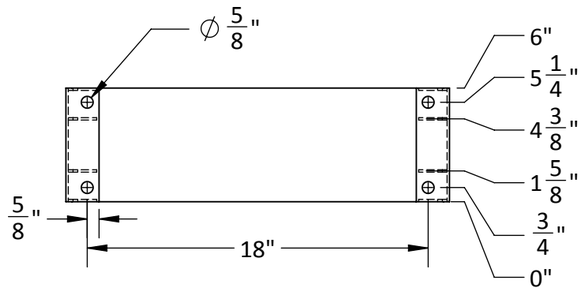
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	17 OF 26	B

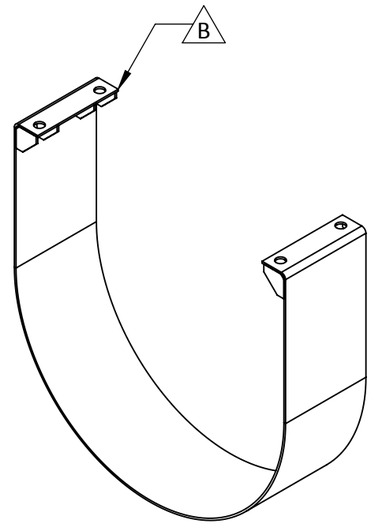
LENGTH	Description
40"	L3.5x2.5x0.25



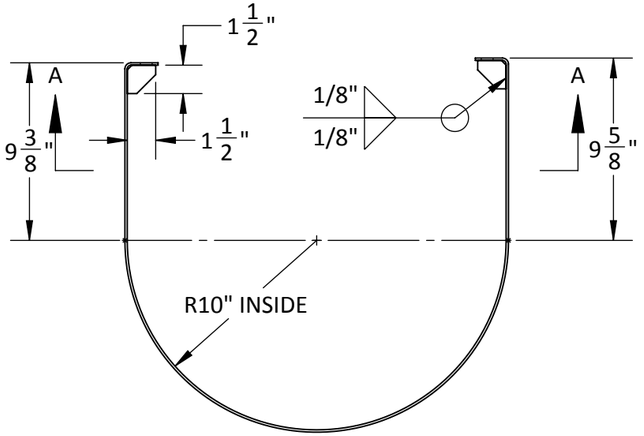


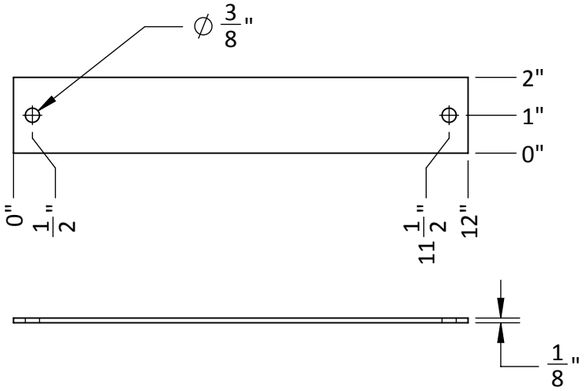
FLOAT GAP FILLER ANGLE
P/N 395-145
SCALE: 1:12



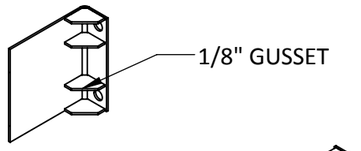


STRAP
P/N 395-43
SCALE: 1:8

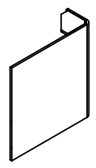




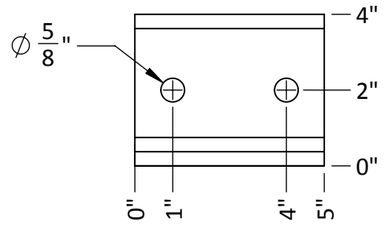
STAINLESS WEAR PLATE
P/N 395-141
SCALE: 1:4

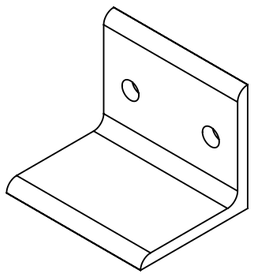


SECTION A-A



LENGTH	Description
5"	L 4" x 4" x 3/8"





PIPE END STOP
P/N 395-241
SCALE: 1:4

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

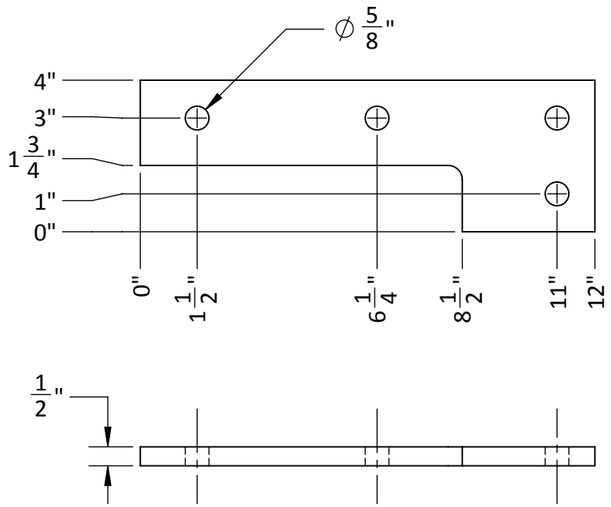
CLIENT
CITY OF CAMPBELL RIVER

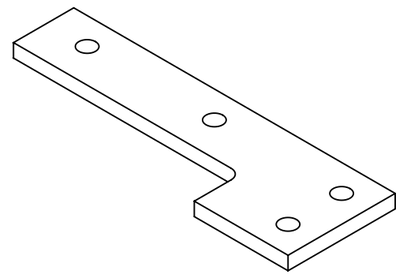
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
DETAILS

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	18 OF 26	B





CONNECTOR BACKING PLATE
P/N 395-244
SCALE: 1:4

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

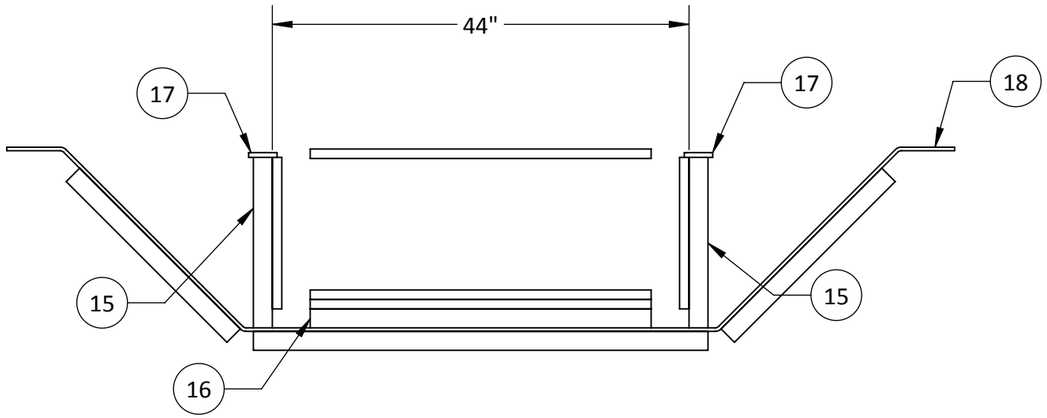
CLIENT
CITY OF CAMPBELL RIVER

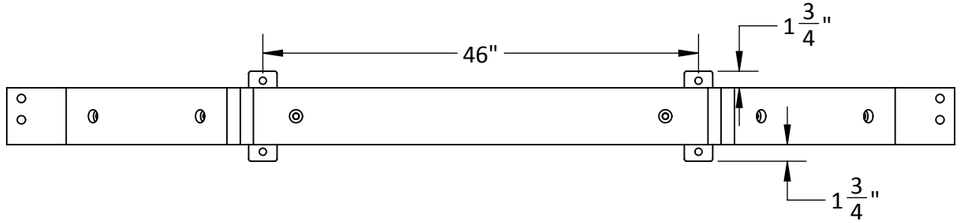
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

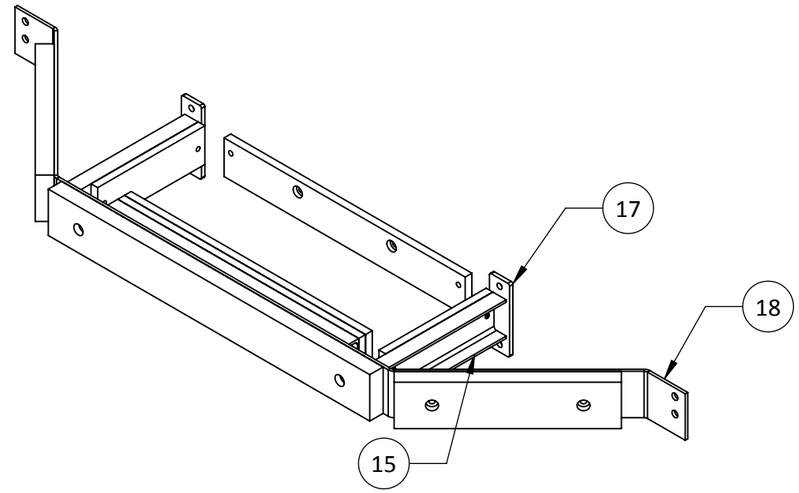
CR Engineering Inc.

TITLE:
TRANSITION PILE
CONNECTOR BACKINGP PLATE

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	19 OF 26	B







PILE GUIDE
P/N 395-65
SCALE: 1:16

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

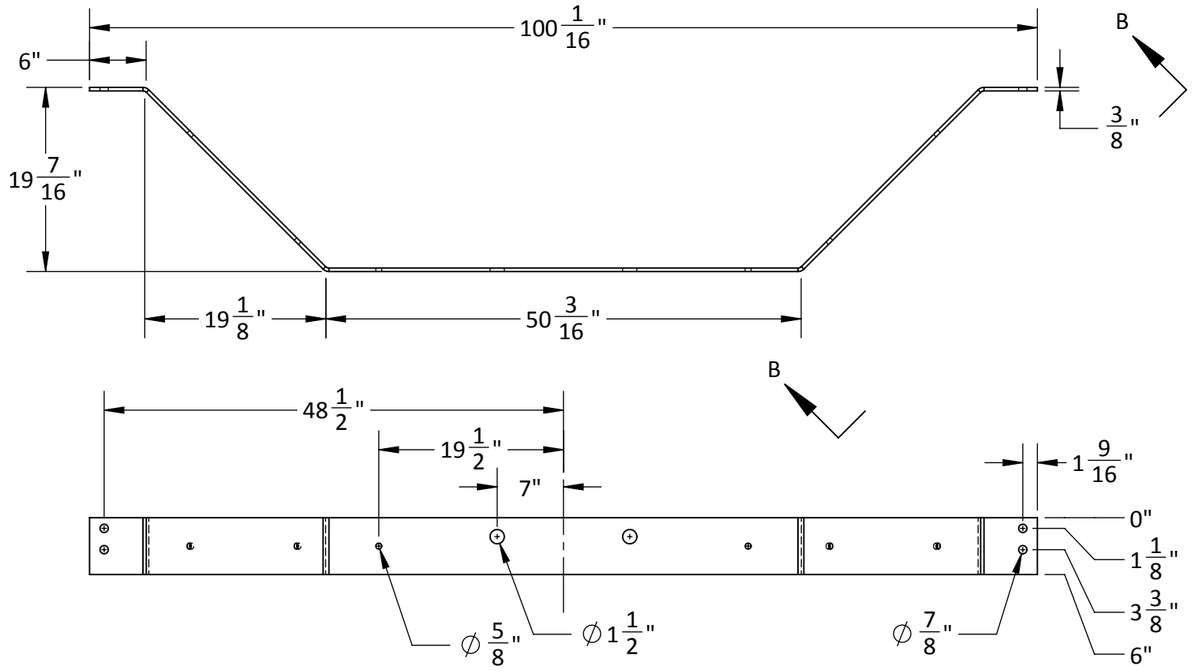
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

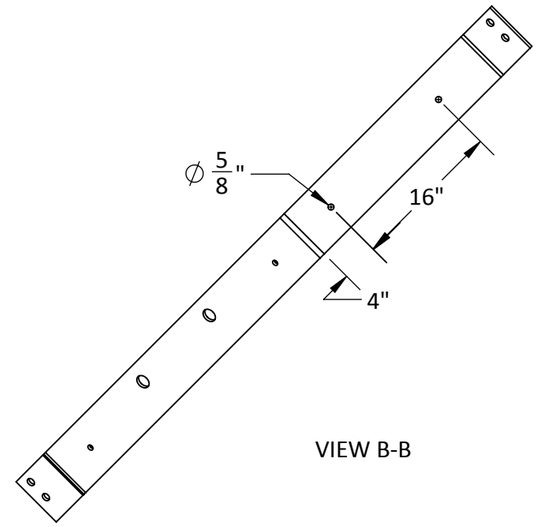
CR Engineering Inc.

TITLE:
PILE GUIDE ASSEMBLY
GALVANIZED

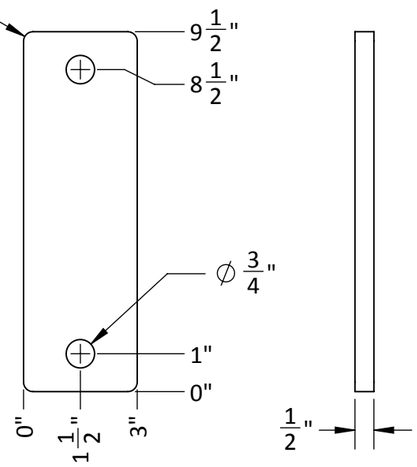
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	20 OF 26	B



PILE GUIDE GUARD
P/N 395-61
SCALE: 1:16

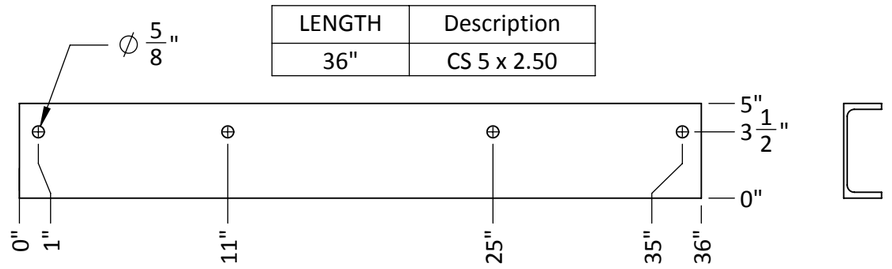


VIEW B-B



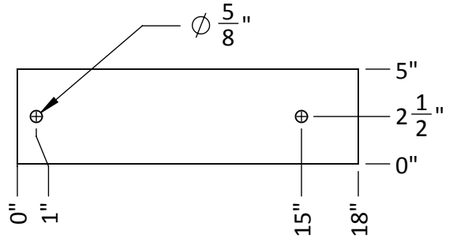
PILE GUARD MOUNTING PLATE
P/N 395-164
SCALE: 1:4

LENGTH	Description
36"	CS 5 x 2.50



PILE GUARD MOUNTING CHANNEL
P/N 395-63
SCALE: 1:8

LENGTH	Description
18"	CS 5 x 2.50



PILE GUARD CHANNEL
P/N 395-62
SCALE: 1:8

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

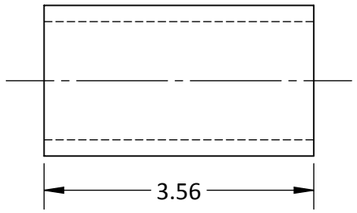
CLIENT
CITY OF CAMPBELL RIVER

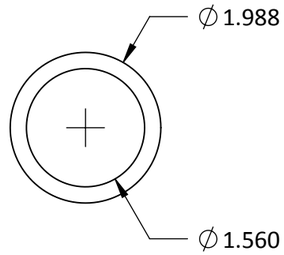
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
PILE GUIDE DETAILS

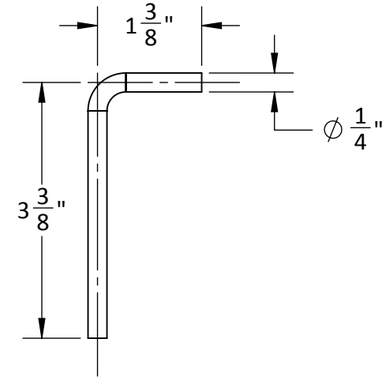
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	21 OF 26	B



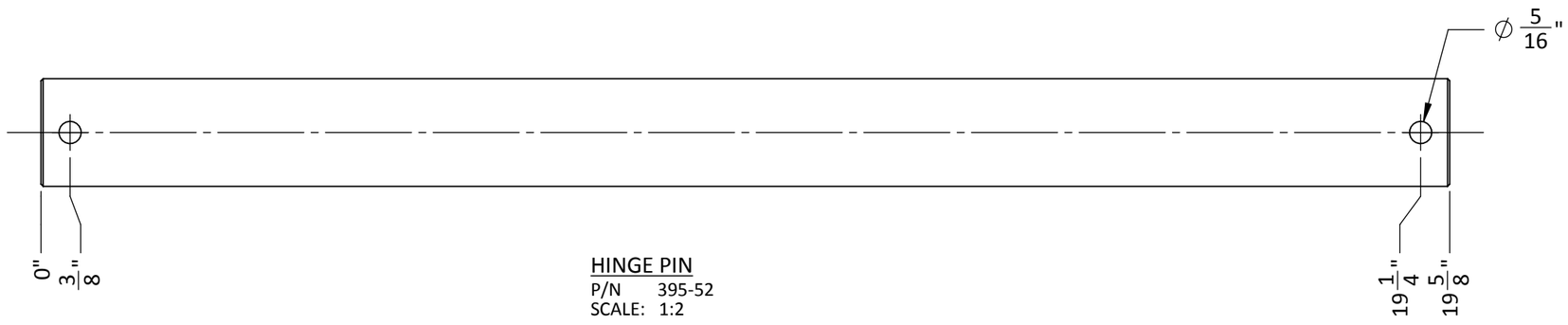


HINGE BUSHING
P/N 395-57
SCALE: 1:2

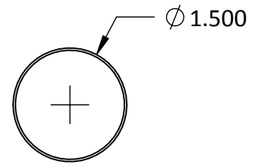
MD FILLED NYLON 2" ∅ x 1-1/2" ∅ ROUGH STOCK



KEEPER PIN
P/N 281-95
SCALE: 1:2



HINGE PIN
P/N 395-52
SCALE: 1:2



DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

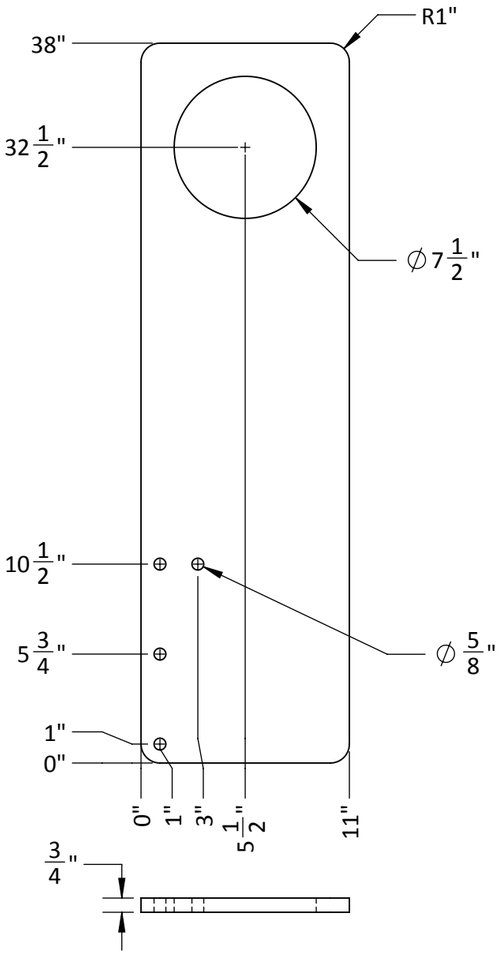
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

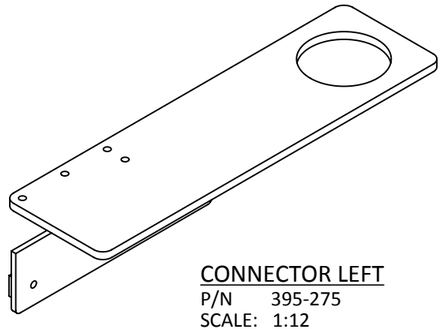
CR Engineering Inc.

TITLE:
HINGE DETAILS

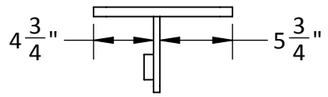
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	22 OF 26	B

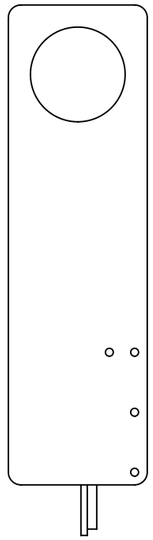


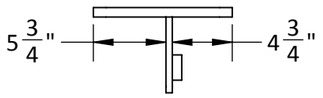
TRANSITION CONNECTOR SPACER BLOCK
P/N 395-272
SCALE: 1:4

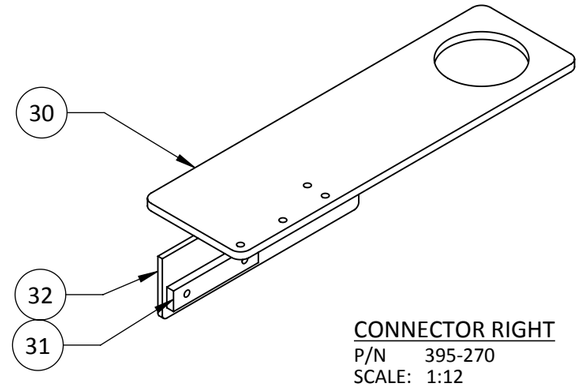


CONNECTOR LEFT
P/N 395-275
SCALE: 1:12

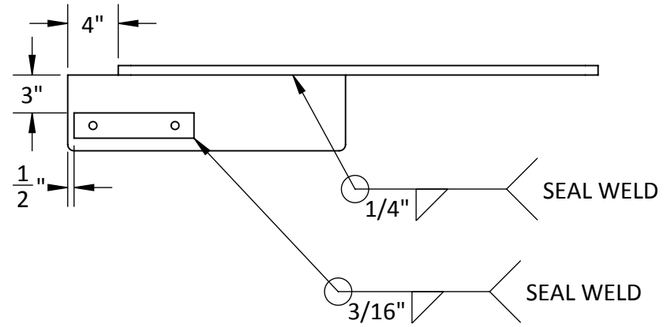


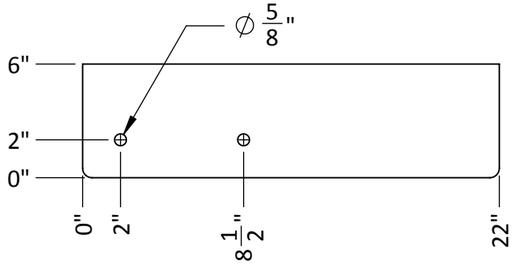




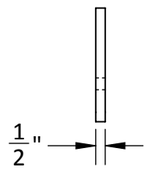


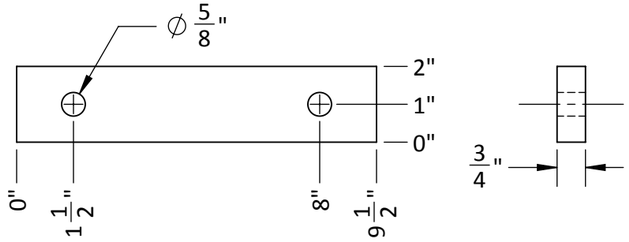
CONNECTOR RIGHT
P/N 395-270
SCALE: 1:12





TRANSITION CONNECTOR STIFFENER
P/N 395-271
SCALE: 1:8





TRANSITION CONNECTOR SPACER BLOCK
P/N 395-272
SCALE: 1:4

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

CLIENT
CITY OF CAMPBELL RIVER

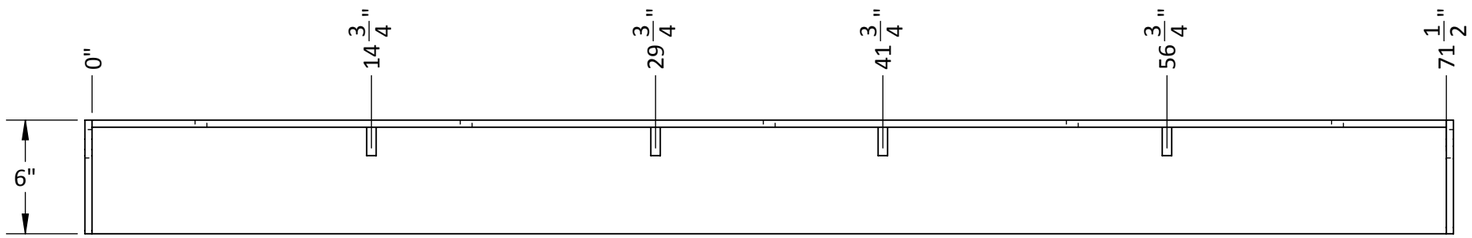
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

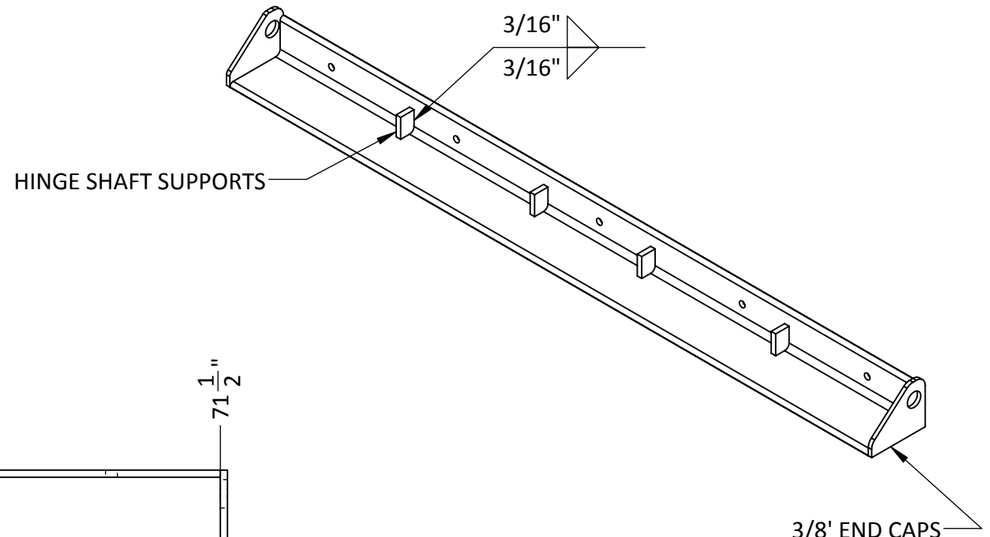
CR Engineering Inc.

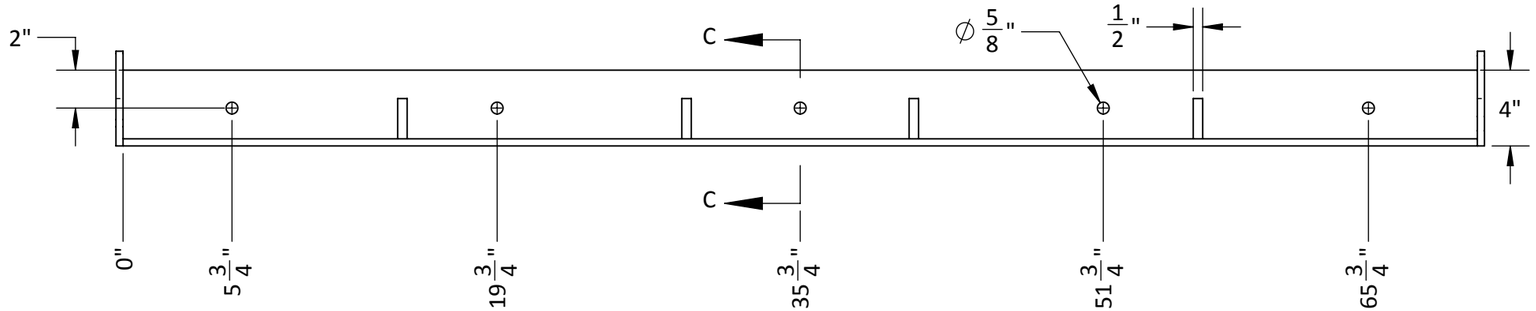
TITLE:
TRANSITION CONNECTOR
MAKE LEFT AND RIGHT HANDED

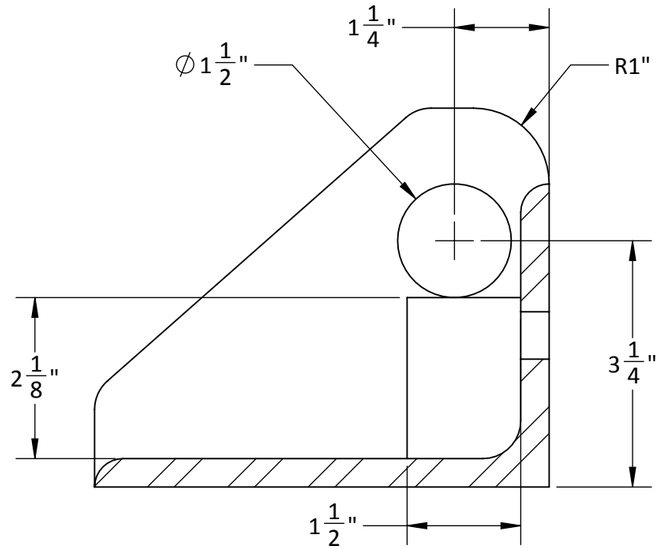
PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	23 OF 26	B

LENGTH	Description
71 1/2"	L6x4x0.375









SECTION C-C
SCALE 1 : 2

TRANSITION PLATE SUPPORT ANGLE
P/N 395-281
SCALE: 1:8

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

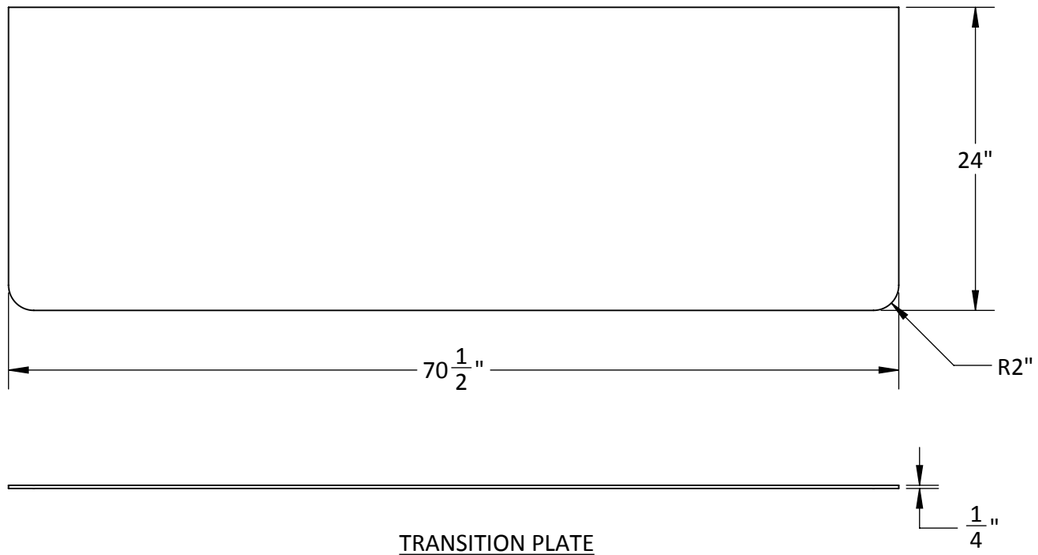
CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

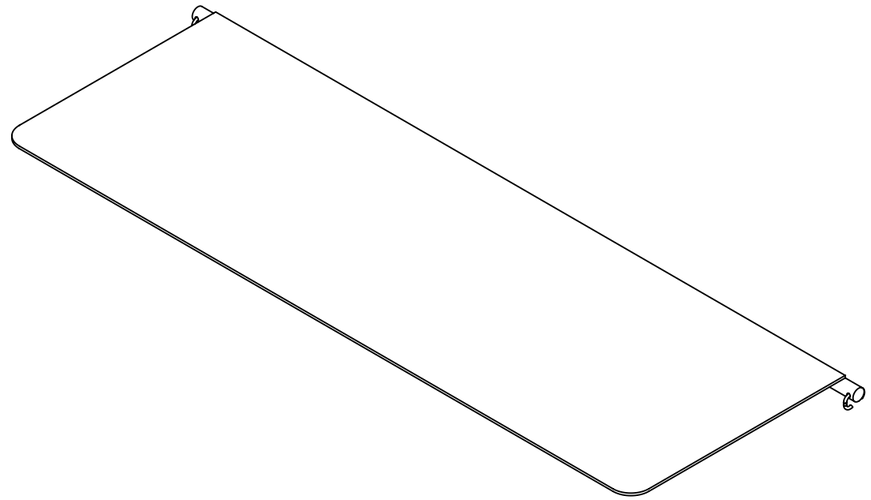
TITLE:
TRANSITION SHAFT SUPPORT

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	24 OF 26	B

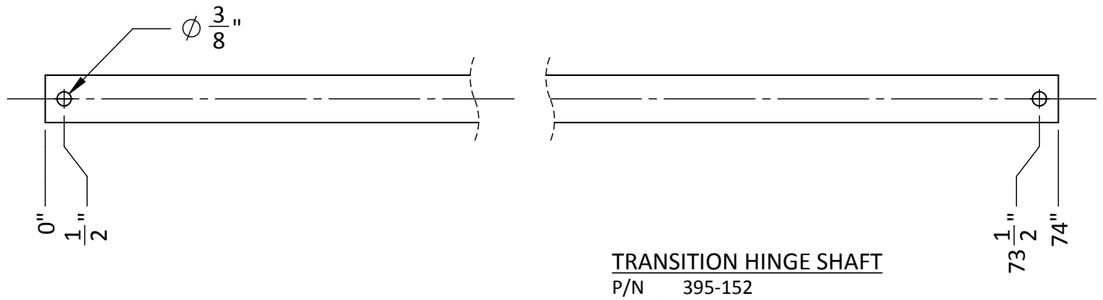


TRANSITION PLATE
P/N 395-153
SCALE: 1:12

MATERIAL - 44W

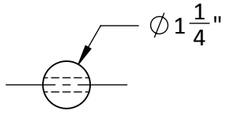


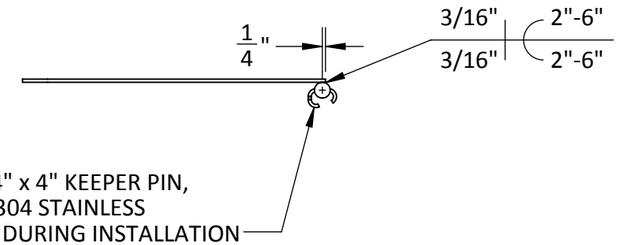
TRANSITION RAMP
P/N 395-155
SCALE: 1:12



TRANSITION HINGE SHAFT
P/N 395-152
SCALE: 1:4

MATERIAL - 44W





DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

CLIENT
CITY OF CAMPBELL RIVER

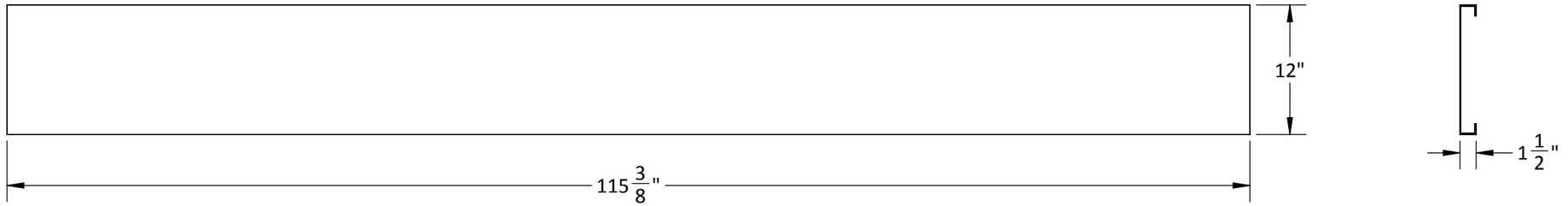
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
TRANSITION RAMP ASSEMBLY

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	25 OF 26	B

ROUND HOLE GRATING
12" x 1-1/2" x 13 GA
RAW STEEL



GRATING - ROUND HOLE 12" x 1-1/2", 13 GA
P/N 395-42
SCALE: 1:12

DIMENSIONS ASME Y14.5M
X/X = ± 1/8"
.X = ± 0.1"
.XX = ± 0.01"
.XXX = ± 0.001"
ANGLES = 3°

DIMENSIONS - INCH | DRAWN BY J KING | DATE 27/02/2018

CLIENT
CITY OF CAMPBELL RIVER

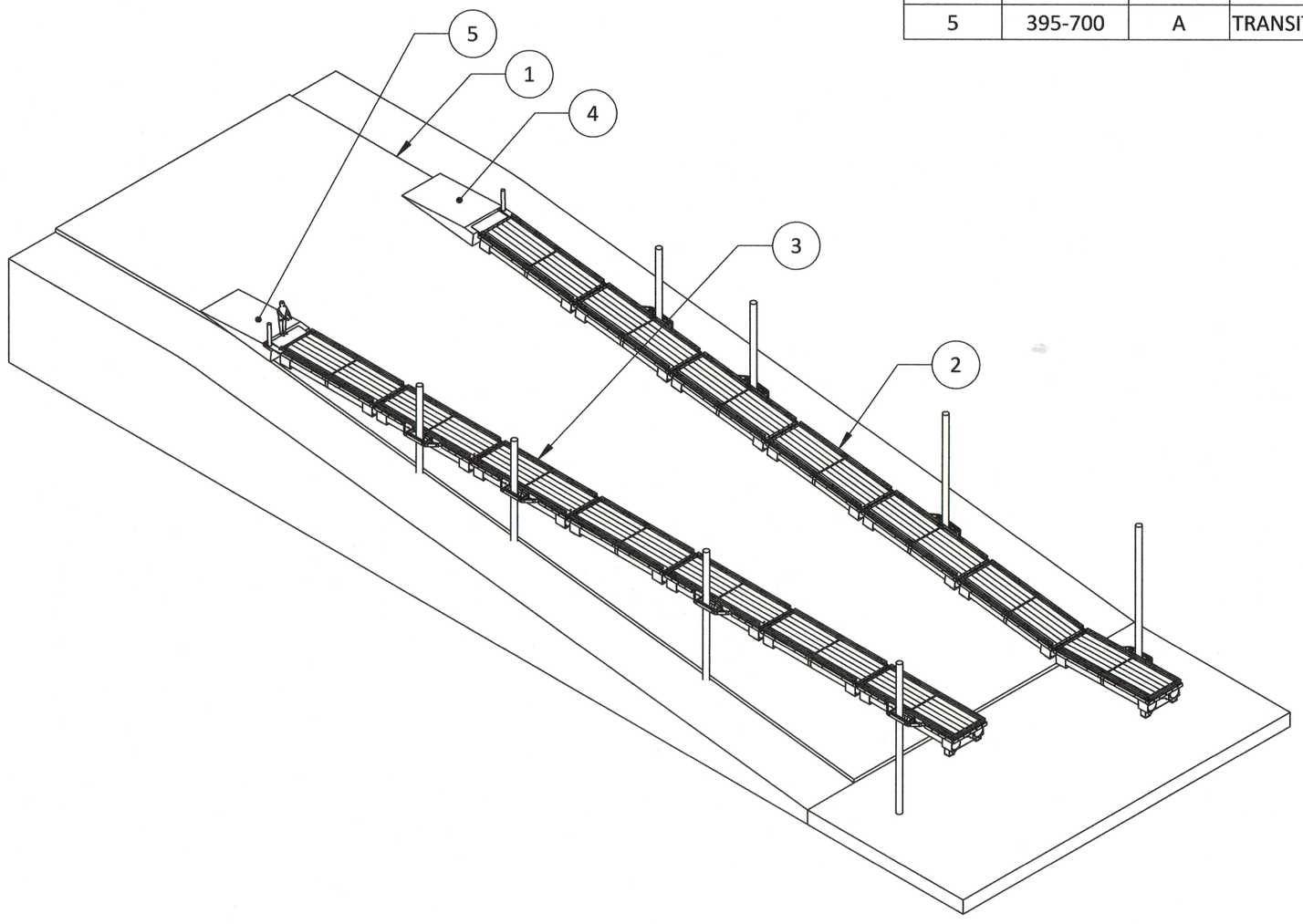
PROJECT
BIG ROCK BOAT RAMP
GALVANIZED STEEL DOCKS

CR Engineering Inc.

TITLE:
GRATING

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-400	26 OF 26	B

ITEM No.	PART No.	Revision	DESCRIPTION	QTY.
1	395-05	A	BOAT RAMP	1
2	395-100	A	DOCK ASSEMBLY LEFT SIDE	1
3	395-200	A	DOCK ASSEMBLY RIGHT SIDE	1
4	395-700	A	TRANSITION RAMP ASSEMBLY LEFT	1
5	395-700	A	TRANSITION RAMP ASSEMBLY RIGHT	1



PROFESSIONAL ENGINEER
J. KING
25441
BRITISH COLUMBIA
5 MAR 2018

REV.	DESCRIPTION	DATE	APPROVED
A	ISSUED FOR TENDER	2/03/2018	JK

REVISIONS

DIMENSIONS IN METERS	SHEET SIZE	DRAWN BY	DATE (dd/mm/yyyy)
	B (11x17)	J KING	26/02/2018

CLIENT

CITY OF CAMPBELL RIVER

PROJECT

BIG ROCK BOAT RAMP DOCKS

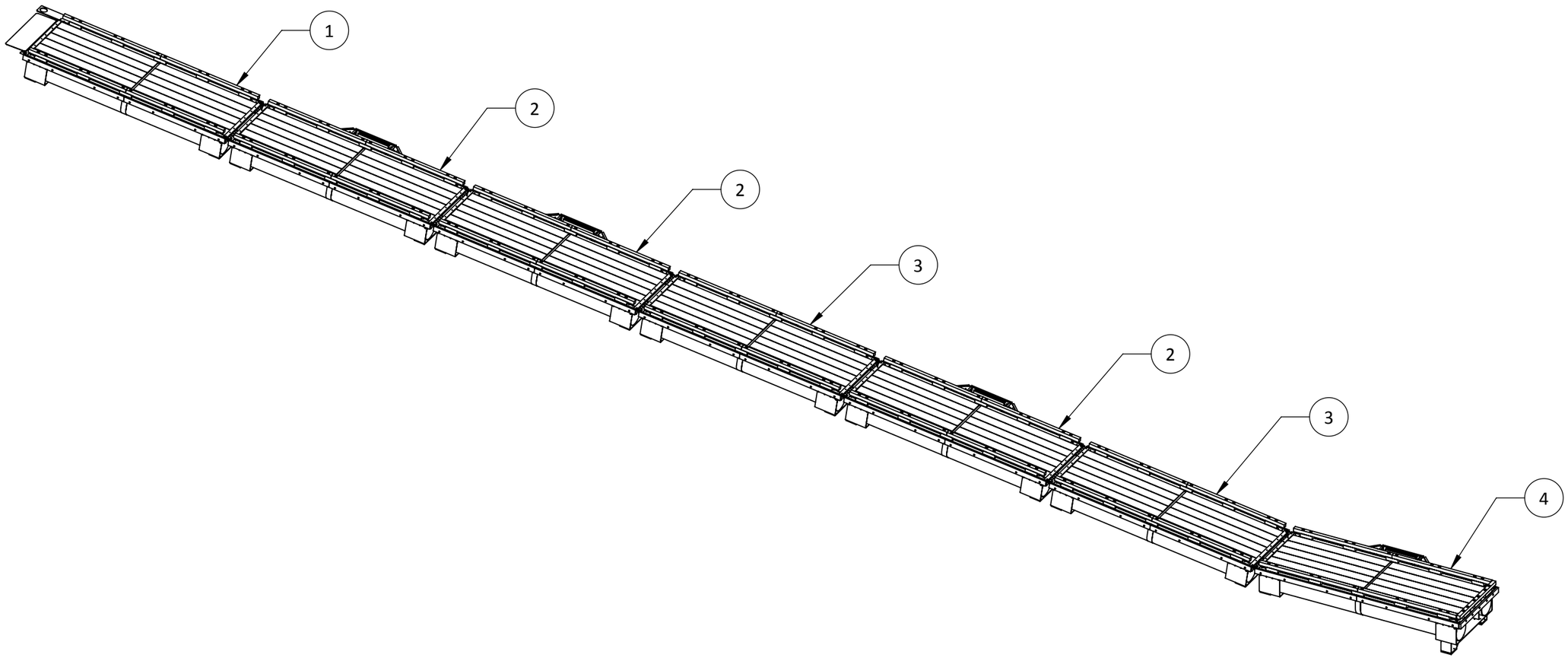
CR Engineering Inc.

TITLE:

GENERAL ARRANGEMENT

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-1000	1 OF 4	A

ITEM No.	PART No.	Revision	DESCRIPTION	QTY.
1	395-400	A	SHORE FLOAT LEFT	1
2	395-400	A	MID-FLOAT	3
3	395-400	A	MID-FLOAT NO HOOP	2
4	395-400	A	OUTSIDE FLOAT LEFT	1



DIMENSIONS IN METERS	SHEET SIZE	DRAWN BY	DATE (dd/mm/yyyy)
	B (11x17)	J KING	26/02/2018

CLIENT

CITY OF CAMPBELL RIVER

PROJECT

BIG ROCK BOAT RAMP DOCKS

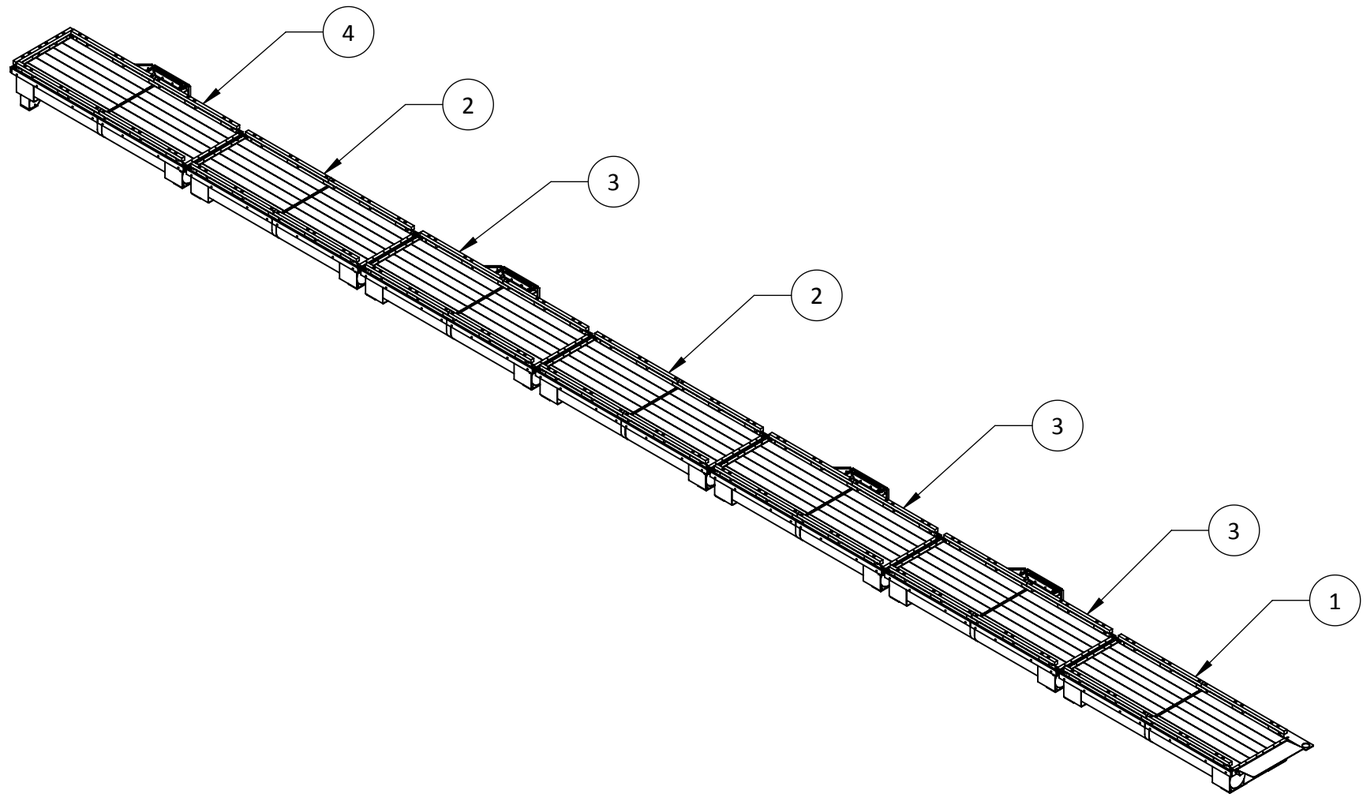
CR Engineering Inc.

TITLE:

DOCK ASSEMBLY LEFT SIDE

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-1000	2 OF 4	A

ITEM No.	PART No.	Revision	DESCRIPTION	QTY.
1	395-400	A	SHORE FLOAT RIGHT	1
2	395-400	A	MID-FLOAT NO HOOP	2
3	395-400	A	MID-FLOAT	3
4	395-400	A	OUTSIDE FLOAT RIGHT	1



DIMENSIONS IN METERS	SHEET SIZE	DRAWN BY	DATE (dd/mm/yyyy)
	B (11x17)	J KING	26/02/2018

CLIENT

CITY OF CAMPBELL RIVER

PROJECT

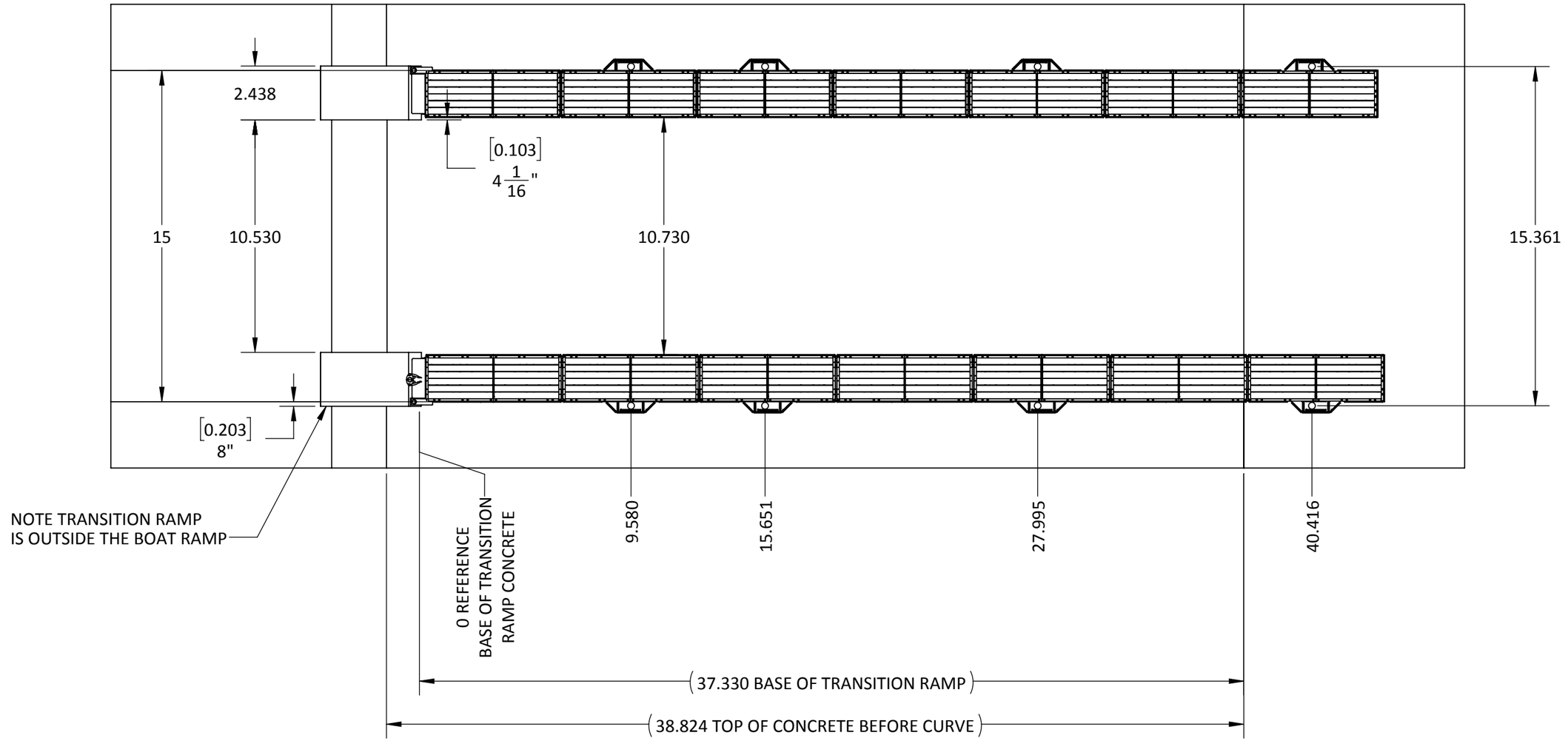
BIG ROCK BOAT RAMP DOCKS

CR Engineering Inc.

TITLE:

DOCK ASSEMBLY RIGHT SIDE

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-1000	3 OF 4	A



DIMENSIONS IN METERS	SHEET SIZE: B (11x17)	DRAWN BY: J KING	DATE (dd/mm/yyyy): 26/02/2018

CLIENT
CITY OF CAMPBELL RIVER

PROJECT
BIG ROCK BOAT RAMP DOCKS

CR Engineering Inc.

TITLE:
PLAN VIEW
DOCKS AND PILES

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
395	395-1000	4 OF 4	A

BIG ROCK BOAT RAMP
Fisheries Act Authorization #17 – HPAC-01167: SUPPLEMENTAL REPORT

January 2018

PACIFICUS Biological Services Ltd

T: 250-949-9450 F:250-949-7656 PO Box 2760 Port Hardy, BC V0N 2P0
info@pacificus.ca www.pacificus.ca

BIG ROCK BOAT RAMP
Fisheries Act Authorization #17 – HPAC-01167: SUPPLEMENTAL REPORT

Prepared for:

City of Campbell River.
Jason Hartley, P.Eng
301 St. Ann's Road, Campbell River, BC V9W 4C7
Tel: 250.286.5790, Cell: 250.203.4823, Fax: 250.286.5741
www.campbellriver.ca

Date:

February 16, 2018

Prepared by:

Trevor Nowak, RBTech

Reviewed by:

Doug McCorquodale, RPBio
Pacificus Biological Services Ltd.
PO Box 2760, Port Hardy BC, V0N 2P0

Table of Contents

Introduction

On November 15, 2017, the City of Campbell River (the City) with the assistance of Pacificus Biological Services (Pacificus) submitted an application for a Paragraph 35(2)(b) *Fisheries Act* Authorization for the redevelopment of a boat launch and breakwater at the existing Big Rock Boat Ramp site located south of the City center along the foreshore area. Fisheries and Oceans Canada (DFO) responded on December 22, 2017 with a letter entitled *Subject: Application for a Paragraph 35(2)(b) Fisheries Act Authorization – Incomplete.* Contained in that letter was a list of additional information required in order to proceed with the review of the application[1]. This report addresses each point, 17 in total, listed in the letter and is intended to be supplementary to the previous report entitled *Big Rock Boat Ramp – Application for Fisheries Act Authorization* (the *Application Report*) which was submitted on November 15[2].

[1] Fisheries and Oceans Canada. File:17-HPAC-01167. Subject: Application for a Paragraph 35(2)(b) *Fisheries Act* Authorization – Incomplete. December 22, 2017. Prepared by Byron Nutton, A/Team Lead, Fisheries Protection Program

[2] Big Rock Boat Ramp, Application for Fisheries Act Authorization. November 2017. Prepared for: City of Campbell River. Prepared by: Pacificus Biological Services. Pp. 122.

Supplemental Information

Schedule 1, Sections 2 and 3: Description of Proposed Work, Undertaking or Activity

1) **a) Clarify the purpose of the trench and coffer dam and provide information as to why they are required for the breakwater construction.**

   The scour protection trench is being incorporated into the construction of the southern breakwater. The purpose of the trench is to install large material for the southern breakwater below grade in order to create a strong foundation that will resist erosion and scour from wave action and tidal currents. There will be no need for a coffer dam to prevent water from entering the trench during construction. Due to the location of work within the intertidal zone, all work can be completed in the dry during periods of the tide-cycle when water level is lower than 2m Chart Datum (CD).

   b) Provide the proposed construction methods and materials for each temporary and permanent work undertaking or activity associated with the construction of the breakwaters and berm including the trenches and coffer dam.

   Details for the proposed construction methods and materials have been outlined in Section 2.0 of the *Application Report*. In addition to the information provided in the *Application Report* the following methods and materials will be used for constructing the breakwaters (details provided by Stuart Masterman P.Eng, CCA, Highland Engineering Services Ltd.):

   - Breakwater construction will start from the upland area and progress seaward. It will be performed in two 'lifts' (inner core and outer armour layers)
   - Materials used for the inner core will be suitably sizes riprap from existing breakwaters, and imported Class 100 riprap, free of potential acid generating (PAG) rock
   - Materials used for the armour layer will be suitably sized riprap from the existing breakwaters and imported Class 2000 riprap, free of PAG rock
   - Inner Core Construction:
     - The inner core of Class 100 riprap will be delivered by truck, dumped into place and then graded using an excavator
     - Once in place, trucks will drive on top of the inner core which will serve as an access road.

- An excavator may work from the beach level to allow trucks to dump material at the end of the 'road'/inner core in a continuous manner

- Outer Armour Layer and Gravel Retention Berm Construction
  - Upon completion of the inner core, work on the outer armour layer will commence starting at the seaward end of the breakwater and progressing back towards the upland area
  - Trucks will back along the access road to deliver Class 2000 rip rap and an excavator, located on the inner core access road, will manually place each piece of riprap
- Scour Protection Trench - Excavation of the trench along the southern toe of the southern breakwater will coincide with the construction of the southern breakwater.
  - An excavator will excavate beach materials for the scour protection trench along the toe of the south breakwater and underneath the gravel retention berm. Trenches will be filled with Class 2000 riprap and excavated beach materials will be placed back over the riprap to fill the interstitial spaces. Remaining beach material will be spread and graded to match the existing beach grade. The toe of the southern breakwater and the gravel retention berm riprap will be placed over the scour protection trench
  - Refer to the C04 Civil Sections and Details within Appendix 3 of the *Application Report* for a detailed cross section of the completed scour protection trench and the material used.
- Excavation and infilling of the scour protection trench will occur in the dry above the HWM during a period of low-tide level such that <u>no coffer dam will be required</u> to prevent water from entering the trench. Any works commenced on the trench must be completed or filled in prior to the tide inundating the work area. An open trench cannot be left to be inundated between tide cycles.

c) Clarify the locations and footprints (i.e. area in m^2) of temporary and permanent works undertakings or activities associated with the construction of the breakwaters and berm, including trenches and coffer dams.

The scour protection trench will overlap with the toe of the outside edge of the southern breakwater; refer to C01 Grading and Site Servicing Plan within Appendix 3 of the *Application Report* for the exact location and dimensions of the scour protection trench. The footprint of temporary (<8 hours) impact due to trench excavation (including 2.5:1 side slopes on excavation) will be ~470m^2 (Pers. Comm. – Stuart Masterman). Following infilling with beach material the final footprint of the trench will be 155m^2; however, once the new breakwater material has been installed, the footprint of the scour protection trench will be completely occupied by the footprint of the southern breakwater. Therefore, the scour protection trench will not result in a permanent increase of the project footprint beyond what is occupied by the southern breakwater.

Schedule 1, Section 8: Description of Effects on Fish and Fish Habitat

2) **Provide a description of the effects the temporary and permanent works, undertakings or activities associated with the construction of the breakwaters and berm (including trenches and coffer dams) will have on fish and fish habitat.**

In Section 8.0 of the *Application Report*, the sub-section titled "Breakwater Improvements – Pathways of Effects" outlines the potential effects to fish and fish habitat that may result from both temporary and permanent works, undertakings or activities associated with the construction of the breakwaters and berm.

The possible effects from temporary activities during the removal of the existing breakwaters and installment of the new ones are as follows:

- Changes in habitat structure and cover – As the existing breakwater material is removed from the site, the marginal reef-like habitat provided by the previous breakwater material will be temporarily removed prior to the new material being installed. The temporary change in habitat structure and cover is considered low-risk due to the marginal habitat being affected and based on the lack of utilization of the existing breakwaters by Commercial, Recreational or Aboriginal (CRA) species observed during fish and fish habitat assessments of the structure.

- Changes in sediment concentrations – Activities such as the removal of existing breakwater material and placement of new material may cause temporary changes to sediment concentrations in the water column as a result of increased turbidity due to disturbance of sand and/or silt substrate. This temporary change is considered to be low risk due to the sediment and erosion control measures that will be in place during these activities. Measures will include, but are not limited to: conducting works in the dry during a low-tide period, careful placement of new material vs. dropping or dumping, installation of a silt curtain to contain sediment-laden water within the inner basin of the project, and turbidity monitoring by an on site QEP that may result in pulsed work activity.
- Changes in contaminant concentrations – These changes may potentially occur as a result of the introduction of foreign material (i.e. offsite rock) or heavy equipment working adjacent to the marine environment. However, based on the measures and standards to avoid or mitigate serious harm provided in the Environmental Mitigation Plan (EMP) of the *Application Report*, changes in contaminant concentrations are not likely to occur; material brought on site will be clean and certified free of PAG rock and all equipment will be in proper working order with appropriate spill prevention and response measures in place.
- Changes in food supply – Similar to the changes in habitat structure and cover, changes to food supply will only be temporary and occur as a result of the alteration of substrate composition and changes in habitat structure while the breakwaters area being replaced. These temporary changes are expected to be low risk due to the low productivity observed during the initial habitat assessment. Following replacement of the breakwaters, changes to the food supply resulting from changes to substrate composition and habitat structure will gradually return to a state similar to what was available prior to the alterations.

The possible effects resulting from permanent works (i.e. construction of new breakwaters) are as follows:

- Changes in habitat structure and cover – The new breakwaters will result in an increase in the three-dimensional area of the current reef-like habitat created by

the existing breakwaters. In addition, some subtle changes to the shape and aspect of the habitat structure will occur. These changes are considered low-risk based on the marginal habitat that already exists at the site, and the fact that the previous reef-like habitat will be replaced with more reef-like habitat.

Schedule 1, Section 9: Measures and Standards

3) **Describe the proposed mitigation measures that will be implemented to avoid or mitigate serious harm to fish as a result of the construction of temporary and permanent works (eg. trenching and coffer dams) associated with the breakwaters and berm.**

Note: No coffer dams will be associated with any aspect of this project. In Appendix 4 – Measures for Avoiding or Mitigating Serious Harm – The EMP of the *Application Report*, a list of Project Specific mitigation measures is provided for the purposes of breakwater construction. In addition to these measures already listed, the following will be applied during construction of the breakwaters:

- The EM will conduct a site examination each work day prior to works commencing, in order to identify and salvage any fish that may become trapped or isolated within the breakwater material following the receding tide. Further details describing fish salvage techniques are provided below in point 6.
- Rock removal and placement will occur during daytime tides that allow the work to occur in the dry. For the small area where in water works cannot be avoided 1m CD to 0m CD then works must occur when the water level is <1m CD.
- Further to the previous bullet, works will be timed appropriately such that all excavations occur in the dry. No machinery tracks are to become or work while inundated in water. Works required in the lower regions of the intertidal zone will occur when the tide-level is at its lowest and progress shoreward as the tide level rises.
- All large material (i.e. Class 2000 rip-rap for the new breakwaters) will be "placed" and not "dropped" or "dumped" into place in order to minimize ground disturbance; smaller material (i.e. Class 100) may be "dumped" or "dropped" in place so long as it is in the dry and above the current HWM.

- Any and all material being installed in wetted areas will be "placed" and not "dumped" in order to minimize sediment creation and allow fish and other motile organisms to swim away and avoid being crushed.
- Machinery must operate from the shore side of structure or from the core of the new breakwaters such that the tracks never enter the water.

4) **Confirm rock material will be tested and only used if verified as non-acid generating.** Confirmed - It will be the responsibility of the contractor conducting the works to provide verification that the material brought on site for the new development is safe for the intended use as a marine breakwater and not PAG rock.
5) **Confirm machinery will only operate in the dry (i.e., tracks will not enter the water).** In Section 4.0 - Timeline of the *Application Report*, it states that "The specific work locations of the breakwater will follow the July low tides with the works closest to 0m CD being timed for the period of July 10th through the 14th". Further to this, in Appendix 4 of the *Application Report* the fourth bullet in the list of Project Specific – Breakwater measures states "The base of the new breakwater should be placed during the low tide periods when the water level is ≤1.0m above CD". In addition, the sixth bullet in the same list states "Machinery should operate from the shore side of the structures or from the core of the new breakwater above the current water level however placement of rock can occur below the current water level in instances where the tide will not go low enough. Where possible machinery should work from a location above the HHWM". Further to these mitigation measures, the following will be applied during construction of the breakwaters and all other components located within the intertidal area:
    - All works requiring machinery to enter the intertidal zone at the site will take place during a low tide period, such that the work can be carried out "in the dry".
    - Machinery must work from a location above the current water level.
    - No machinery tracks will enter the water during operation within the intertidal zone.
6) **Describe proposed measures intended to avoid the death of fish during work (e.g. fish trapped in trenches, stranded on the tote road of the breakwaters after the tide**

recedes, crushed from rock), including but not limited to construction practices and timing of works.

Section 4.0 – Timeline of *the Application Report* states that "The specific work locations of the breakwater will follow the July low tides with the works closest to 0m Chart Datum being timed for the period of July 10th through the 14th", such that works can be conducted in the dry and in isolation of fish. Further to this, in Appendix 4 of the *Application Report*, the EMP provides a comprehensive set of mitigation measures; the intent of each mitigation measure is to avoid the death of fish during work. Measures within the EMP specific to avoiding death of fish during work can be found in the following sections:

- Environmental Monitor
- Measures to Protect Key Species – Herring Salmonids and Forage Fish
- Timing

In addition to these measures, the following will be applied:

- Every effort will be made at the end of each work day to leave the site in a condition where fish stranding will not occur; the EM will conduct an examination of the site at day's end to ensure this.
- If deemed necessary (i.e. fish stranding is not 100% preventable), the EM will conduct routine morning inspections of any areas likely to strand fish when they become wetted during a period of high tide and then the tide recedes (e.g. interstices in the new breakwaters and/or tote road, trenches or holes excavated for work purposes, etc.).
- In the event that fish are identified during these salvage inspections, they will be removed from the stranding habitat with buckets and dipnets and released to the marine environment outside of the work area and the factor or situation which lead to fish stranding will be addressed or rectified during that low tide cycle.
- The number and species of all stranded fish, alive or dead, identified by the EM will be recorded and kept track of as part of the daily monitoring duties. All dead fish will be reported to DFO as per the guidance outlined in point 13(c) of this document.

- Rock used for the new breakwaters will be "placed" and not "dropped" or "dumped" into the water in order to allow fish and other motile organisms to swim away and avoid being crushed.
- The seaward portion of the new ramp will not be constructed in the dry; therefore, this portion will be composed of pre-cast concrete panels that can be placed below the HWM. This will avoid the need for in-water concrete forms and pouring uncured concrete below the HWM which carries an added risk of altering pH and killing fish.

7) Confirm that activities will be ceased if any marine mammal is within 500 m of works and only resume once the animal has left the immediate area or has not been resighted for 30 minutes.

In Appendix 4 of the *Application Report*, the EMP states in the section Measures to Protect Key Species – Marine Mammals that "In-water operations must be temporarily suspended if whales or other marine mammals (i.e. sea lions) approach to within 500m of site". In addition to this measure the following will be applied:

- Works will only resume once the animal has left the immediate area or has not been resighted for 30 minutes.

8) a) Clarify what marine works will and will not be conducted in the dry (e.g. infill works below 0m chart datum). Include the estimated duration (hours/days) and the approximate footprint (area) of works that will not be conducted in the dry.

As per the DFO response letter, point 15(b) states that "*the ramp extension, piles and dredge footprint…are not considered further in this review*"; however, for the purposes of differentiating project components that will occur and will not occur in the dry, these components have been mentioned here. With the exception of certain components of the breakwater construction, dredging of the access channel, installation of the seaward edge of the new ramp and two seaward pilings, <u>all works will be conducted in the dry</u>. No breakwater work will occur below 0m CD; however, a portion of the breakwater construction will occur between 0 and 2m CD and therefore will not be conducted in the

dry since the time-frame of work does not coincide with any 0m tides[3]. Similarly, dredging of the access channel will not be conducted in the dry. Construction of the upper portion of the ramp, installation of the shoreward pilings, storm drain improvements and embankment improvements will all occur in the dry.

Details for works not being completed in the dry are as follows:

- Total footprint of breakwaters to be installed below 2m CD is 1845m^2. Anticipated work duration is 10 days.
- Channel and basin excavation (i.e. dredging) will all be below 2m CD; total footprint of 103m^2. Anticipated work duration is 4 days.
- The seaward portion of the new ramp will not be constructed in the dry; therefore, this portion will be composed of pre-cast concrete panels that can be placed below the HWM and avoid the need for coffer dams and in-water concrete forms. Footprint for the lower portion of the ramp below 2m CD is 201m^2. Anticipated work duration is 2 days.

b) Clarify that marine works not conducted in the dry will be conducted during daylight to avoid potential impacts to marine mammals and fish. – The following will be applied to the Timing section of the EMP:

- Works that will not be conducted in the dry will only occur during daylight hours in order to allow visual monitoring of marine mammals and fish to avoid potential impacts to these species.

Schedule 1, Section 10: Monitoring of Mitigation Measures

9) Provide detailed monitoring measures that will be put in place to assess the effectiveness of measures and standards that will be implemented to avoid serious harm during the construction of temporary and permanent works associated with the construction of the breakwaters and berm including during trenches and coffer dams.

Note: No coffer dams will be associated with any aspect of this project. It is the

[3] Fisheries and Oceans Canada – Tides Currents and Water Levels, Campbell River (#8074), 2018 Tide Tables (PST, Z+8) May to August: http://www.waterlevels.gc.ca/Eng/data/table/2018/wlev_ref/8074#s4.

responsibility of the QEP hired as the EM for the project to observe site conditions and assess the effectiveness of measures and standards implemented to avoid serious harm during construction. The roles and responsibilities of the EM are provided in the Environmental Monitor section of the EMP in Appendix 4 of the *Application Report*. Further to the measures outlined in this section, the measures provided in the Project Specific – Breakwater section of the EMP also provide measures and standards for the construction of the breakwater components including the berm and scour protection trench. In addition to these measures, the following monitoring measures will be in placed in order to assess the effectiveness of measures and standards implemented to avoid serious harm:

- Visual assessment of the tidewater below the HWM for increased turbidity, hydrocarbon sheen or any other deleterious substance.
- In the event that turbidity is observed, turbidity monitoring will be conducted utilizing a turbidity meter. Refer to point 11 for details regarding turbidity monitoring.
- Visual assessment of potential stranding areas such as excavated holes, substrate interstices, etc. for dead and/or wounded fish.
- Visual assessment of the adjacent tidewater for forage fish, juvenile salmonids and/or marine mammals.
- Visually monitoring the pouring of uncured concrete as well as testing pH using a certified meter in order to ensure no uncured concrete or concrete was enters the marine environment.
- Visual inspections of equipment to ensure no spills or leaks have occurred.
- Visual inspection of spill response kits to ensure sufficient spill response materials, supplies and equipment are on site.
- Routine measuring of project footprint to ensure works are occurring as per drawings.
- Further to the previous point, the EM will be responsible for communicating with the engineers and workers on site to ensure that there are no deviations from the engineer drawings and/or increase in project footprint.
- It will be the responsibility of the EM to assess these indicators in order to determine the effectiveness of the measures and standards that have been

implemented in order to avoid serious harm and apply the appropriate contingencies and/or temporarily halt works.

- Further details regarding monitoring measures and the responsibility of the EM are addressed in point 10.

10) Clarify what work or phase of work the qualified EM will be onsite monitoring (e.g., in-water works, placement of material on seabed) and provide rationale to support the level of construction monitoring.

The roles and responsibilities of the EM are provided in the Environmental Monitor section of the EMP in Appendix 4 of the *Application Report*. The second sentence of the second bullet of that section states that "It is the responsibility of the EM to determine the level of monitoring required during each component or activity to achieve the goals outlined within this report (no serious harm to fish during the construction phase)". As such, it is difficult to clearly identify all aspects of work where and when the qualified EM will be present during construction. However, within the EMP certain aspects of the project have been identified as "sensitive" works whereby the EM must be on site until completion of these phases of the project. Further to this, the supplementary document has expanded on EM roles and timing below. As per the DFO response letter, point 15(b) states that "*the ramp extension, piles and dredge footprint…are not considered further in this review*"; however, in order to clarify all works that the EM will be present for, some of those project components have been mentioned here. Sensitive works listed in the EMP of Appendix 4 where the EM must remain on site at all times are provided below:

- *Measures to Protect Key Species (Herring Salmonids and Forage Fish*) - If herring or juvenile salmonids are observed to be present at any time during construction of the facility the EM should be immediately contacted and appropriate mitigation measures implemented to protect these species or suspend works until it is safe to continue works. Rationale – The EM is responsible for preventing fish from being killed as a result of this project.
- *Measures to Protect Key Species (Herring Salmonids and Forage Fish)* - An EM must conduct a forage fish spawn assessment in any likely habitats adjacent to the site prior to works commencing and every 7 days during the duration of the works as per the guidance in Appendix 2 of the City of Campbell River

Marine Foreshore Habitat Assessment and Restoration Plan (2011) and Moulton, L. (2001). Forage fish spawning may require that works be suspended. Rationale – It is unlikely that forage fish spawning will occur during the time frame when works are to occur; however, based on the presence of suitable substrate for forage fish spawning immediately adjacent to the site, an EM must be present to conduct these surveys.

- *Spill Control Response Plan* - Machinery will be inspected by the EM prior to entering the work area and be free of leaks and drips. This should occur on a daily basis for all machines working below the HHWM. Rationale – In the interest of spill prevention, the EM is responsible for ensuring that any piece of machinery with the potential to cause a spill does not enter the intertidal area.
- *Sediment and Erosion Control Plan* - The EM must guide the placement of silt and debris control to adequately contain and prevent the release of demolition and construction debris, materials, and any deleterious substances to the marine environment. Rationale – It is the responsibility of the EM to routinely monitor the effectiveness of sediment and erosion control measures on site. In addition, the EM will be responsible for collecting background turbidity levels on a daily basis.
- *Project Specific (Breakwater)* - The EM must conduct a forage fish spawn assessment as per the forage fish specific guidance. Rationale – see above regarding forage fish spawn assessment.
- *Project Specific (Breakwater)* - An EM must be onsite during rock work within the lower intertidal area of the marine environment. Works on the upper slopes and in the high intertidal zone could occur without the direct oversite of the EM. Rationale – rock removal and placement below the current HWM has the greatest potential to cause turbidity and/or kill fish from being crushed by rocks; the EM will monitor work activity to ensure turbidity levels remain low and no fish are killed by being crushed from rocks.
- *Project Specific (Ramp)* - An EM should be onsite during all activities when raw-uncured concrete will be poured. Rationale – raw-uncured concrete can be toxic to fish and increase pH if it enters the aquatic environment; the EM will

ensure that no raw-uncured concrete enters the marine environment and that pH remains at background levels during concrete works.

- *Project Specific (Ramp)* - The EM will monitor pH during the concrete works. If an increase in pH above 1.0pH is noted then mitigation in the form of a $C0^2$ bubbler must be administered and pH continued to be monitored until the curing process is completed. Rationale – see above.
- *Project Specific (Dredging)* - A QEP must be on site throughout the duration of the dredging activities to coordinate mitigation measures and to respond as necessary to site specific events. Rationale – dredging activity below the current HWM will cause the suspension of sediment; it is the responsibility of the EM to ensure the sediment plume remains within the inner basin of the project and/or turbidity levels beyond breakwaters do not exceed background levels (see point 11 for further details on turbidity monitoring).

Appendix 3 of this report provides a predicted task schedule for the proposed construction of the Big Rock Boat Ramp and includes anticipated EM involvement and tasks based on the nature of work occurring.

11) Provide detailed methods that will be used to assess effectiveness of sediment and erosion control mitigation measures and standards including but not limited to the frequency and schedule for monitoring, sample location, sample depths, water quality thresholds and locations of where compliance is to be met, baseline data collection, and location of reference/background sites.

The EM, in coordination with the work crew will seek to avoid creating sediment or turbid water by conducting the majority of works in the dry above the HWM. The EM will obtain background turbidity levels on a daily basis as part of the daily monitoring duties.

In situations where works cannot be conducted in the dry, i.e. placement of material for the base of the breakwaters, etc., the EM will visually monitor the effectiveness of sediment and erosion control mitigation measures on an ongoing basis while the in-water works are taking place. The EM will visually monitor adjacent tide-water for turbidity and/or sediment plumes originating from the immediate work area. In the event that turbid water

is observed to be originating from the work site, the following turbidity monitoring measures will be implemented:

- Turbidity will be monitored with a portable LaMotte Nephelometer.
- Two reference sites will be established on either side of the work site in order to accommodate tide current direction for either ebb or flood periods. The reference sites will be located at minimum 100m from the work area. See Figure 1 in this document.
- At each reference site, two measurements will be obtained: one at 0.15m depth below the surface (to assess the freshwater layer on the surface) and one between 0.5 and 1.0m depth (to assess the saltwater layer below the freshwater lens).
- A reference level, i.e. background level will be obtained and recorded at these reference sites each day the EM is on site.
- In the event that turbidity resulting from work activity is observed in the tidal waters adjacent to the work site, the EM will apply the following monitoring measures:
    - Sample locations will be established at strategic points in order to assess the spatial impact of turbidity. The EM will determine sample locations based on the site and environmental conditions at the time the turbidity is observed. For example, sample locations may be established immediately at the point of discharge, 20m from the point of discharge and 50m from the point of discharge.
    - Sample depths at these locations will be the same as the reference location depths: 0.15m (freshwater lens) and 0.5-1.0m (saltwater layer).
    - The location for compliance to be met will be set at 20m from the point of discharge; however, the EM may select a different compliance location based on site and environmental conditions at the time.

- Sampling frequency will be conducted at appropriate intervals in order to assess the temporal impact of turbidity. The EM will establish a sampling frequency which will reflect the pace of work and rate at which sediment is discharging to the marine environment. For example, sampling may occur every 5 minutes if sediment is discharging at a high rate and the area of the plume is extensive, or every hour if the plume appears to be localized and small in size.
- Shutdown criteria will be applied as per the provincial *Ambient Water Quality Guidelines (Criteria) for Turbidity, Suspended and Benthic Sediments*[4]. See Appendix 2 of this document for shutdown criteria for turbidity.

[4] British Columbia Water Quality – Ambient Water Quality Guidelines for Turbidity, Suspended and Benthic Sediments. https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/turbitity-or.pdf

Figure 1. A map indicating the approximate location of reference sites for the purposes of collecting background turbidity levels.

12) Include a reporting protocol consistent with *Section 38(5)* of the *Fisheries Act* regarding the duty to report the deposit of deleterious substances into water frequented by fish.

The *Application Report* contains a Spill Control Response Plan within the EMP provided in Appendix 4. In addition to the spill control measures listed in this plan, the following reporting protocol will be applied in the event a deposit of deleterious substances enters the tidal water adjacent to the site:

- Any deposit of a deleterious substance to water frequented by fish will be reported to DFO - 1-800-889-8852 (24 hours)
- The construction crew will be responsible for having a suitable spill response plan prior to the commencement of work. Measures within the plan will be adhered-to in the event a spill occurs.

13) Provide a monitoring plan and schedule (i.e., from commencement to completion) that includes the following.

A primary construction schedule for the Big Rock Boat Ramp project is provided in Figure 2 of Appendix 1 in the *Application Report*. This is a tentative schedule, subject to alteration based on weather, unforeseen delays, etc. A monitoring schedule including potential objectives and duties of the EM has been developed and is based on the primary construction schedule. This schedule is provided in Appendix 3 of this report.

a) Monitoring of the work area (i.e. infill) after tidal inundation to evaluate and record any fish mortality and stranding (including evening, weekends or times when works are not being undertaken.

Measures for monitoring and salvaging stranded fish have been provided above in point 6. These measures include, but are not limited to the following:

- If deemed necessary (i.e. fish stranding is not 100% preventable), the EM will conduct routine morning inspections of any areas likely to strand fish when they become wetted during a period of high tide and then the tide recedes (e.g. interstices in the new breakwaters and/or tote road, trenches or holes excavated for work purposes, etc.).
- In the event that fish are identified during these salvage inspections, they will be removed from the stranding habitat with buckets and dipnets and released to the marine environment outside of the work area.
- The number and species of all stranded fish, alive or dead, identified by the EM will be recorded and kept track of as part of the daily monitoring duties.

Additional details for stranding monitoring are provided in the EM schedule in Appendix 3 of this report.

b) **Provide a fish salvage plan that will include pre-construction (i.e. prior to infilling) fish salvage and in the event of fish stranding during works.**

The EM will be responsible for determining if fish exclusion and salvage is necessary in order to prevent serious harm to fish. In addition, the following measures must be taken in order to prevent serious harm to fish due to stranding:

- Breakwater Removal –
    - Conducted in the dry in order to reduce the need for fish salvage.

- As material is removed from the breakwaters monitoring and salvage of stranded fish will be conducted by the EM.
- Salvage methods will include hand salvage, dip nets, minnow buckets, etc. in order to relocate fish from interstices and other stranding sites as material is removed.
- Eliminate or reduce the potential for stranding prior to leaving site each day; avoid the creation of pockets, holes, interstices, etc. where fish may become entrained when the tide rises leading to stranding following the receding tide.

- Breakwater Construction –
  - Conducted in the dry in order to reduce the need for fish salvage.
  - Pre-work inspection of potential stranding sites – salvage if necessary
  - Ongoing monitoring for fish stranding as the tide inundates and recedes through the work site.
  - Salvage methods will include hand salvage, dip nets, minnow buckets, etc. in order to relocate fish from interstices and other stranding sites as material is removed.
  - Eliminate or reduce the potential for stranding prior to leaving site each day

c) Include a reporting protocol consistent with Section 38(4) of the Fisheries Act regarding the duty to report serious harm to fish.

All stranded fish (alive or dead) that are identified by the EM will be recorded and kept track of as part of the daily monitoring duties. Number, type and species will be recorded in the EM's notes. Weekly activity logs will report all fish mortalities and those that are salvaged. The number that are killed will be reported to DFO as per Section 38(4) of the *Fisheries Act*.

Schedule 1, Section 11: Measures and Standards to Avoid or Mitigate Serious Harm to Fish

14) **Update your mitigation contingency measures where necessary to include measures that will be implemented if the measures and standards in *Schedule 1 Section 9* above are not successful.**

The following statements were taken from Section 11.0 of the *Application Report*: "*The EM will be responsible for determining if the avoidance and mitigation measures provided in the EMP are not being adhered to during construction activity. In any situation where it is apparent to the EM that serious harm cannot be avoided in order to complete a certain task or component of the project, the EM will have the authority to stop works until appropriate measures can be applied to prevent serious harm, or a change in operation or design is necessary*." Based on the following, the requirement for a contingency plan is unlikely:

- The majority of works will be performed in the dry, and therefore of low risk to fish habitat.
- A thorough and appropriate mitigation plan will be in place.
- Works will be conducted during the appropriate reduced risk timing window for marine waters in the Campbell River area.
- If mitigation proves to be unsuccessful during construction the contingency will be the EM halting works until a time when there is no longer any impact to fish or habitat.

Schedule 1, Section 12: Residual Serious Harm to Fish After Implementation of Avoidance and Mitigation Measures Standards

15) **Your characterization of the direct habitat impacts expected to result from the proposed work is not reflective of the program's determination. The program has determined the residual serious harm to fish as a result of the proposed works will include the destruction of 2229m^2 of intertidal and subtidal habitat within the direct footprint. This value was calculated by taking the proposed 2D footprint of the breakwater and berm below the HWM (977m^2+2016m^2+18m^2) and subtracting the existing 2D footprint of the breakwater below the HWM (827m^2).**

a) **Update your values throughout the report –** As per direction from DFO, this supplemental report will be provided in lieu of an amended application report (Pers.

Comm. – Marina Wright, Fisheries Protection Biologist – DFO). Therefore, any future documents providing supplementary information for the purposes of the Fisheries Act Authorization #17 HPAC – 01167, will reflect the updated value for residual serious harm to fish habitat. The revised Offsetting Plan to be submitted in conjunction with this document will reflect the updated footprint (surface area) for the residual serious harm to fish habitat after implementation of avoidance and mitigation measures and standards.

Schedule 1, Section 13: Offsetting Plan

16) **Based on the information provided to date the Program has determined that your current offsetting plan comprised of softshore erosion protection and the enhancement of marine riparian does not meet the Fisheries Productivity Investment Policy (the Policy). The Program has determined that the proposed offset measures do not provide additional benefits to fisheries productivity and do not adequately offset the residual serious harm to fish that will result from your proposed project. Therefore, the Program has not conducted a detailed review of your offsetting plan for completeness at this time. –** A new Offsetting Plan has been developed that will provide additional benefits to fisheries productivity and adequately offset the residual harm to fish that will result from the construction of the new Big Rock Boat Ramp. This Offsetting Plan is provided in the document "*Schedule 1, Section 13: Offsetting Plan for the Proposed Construction of the Big Rock Boat Ramp*" (the Offsetting Plan). The proposed Offsetting Plan that has been selected is the restoration of eelgrass beds within the Campbell River estuary.

The Campbell River estuary has been utilized for many years by commercial and industrial enterprises which have impacted the growth of marine vegetation such as eelgrass. Eelgrass beds create important habitat for CRA species such as Dungeness crabs, juvenile salmonids and forage fish species. The Tyee Club of Campbell River (the Tyee Club) is planning to conduct an extensive debris clean-up effort in the vicinity of Tyee Spit where dock infrastructure has been in place for many years and debris has accumulated. In order to rehabilitate areas where debris has degraded benthic plant communities; subtidal eelgrass planting is being proposed for the areas of greatest impact. The newly created eelgrass habitat would augment the existing degraded habitat in the estuary and offset the

residual harm from the BRBR development. For additional offsetting details, please refer to the Offsetting Plan which reflects the recommendations and requirements set out in the *Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting*.

Letter of Credit

17) A revised Letter of Credit will be required:

a) The revised Letter of Credit should reference the *Fisheries Act Authorization #17 – HPAC-01167* instead of the *Big Rock Boat Ramp Application for Fisheries Act Authorization*, dated November 2017, as this document is now outdated.

b) Update the Letter of Credit to reflect the revised cost estimate if necessary.

c) Provide a draft revised Letter of Credit for review prior to issuance.

A Letter of Credit referencing the appropriate Authorization # will be submitted to DFO following submission of the Supplementary Report and the revised Offsetting Report.

Appendix 1: Letter from Fisheries Oceans Canada Re: Application for a Paragraph 35(2)(b) *Fisheries Act* Authorization – Incomplete.

Fisheries and Oceans Canada / Pêches et Océans Canada

Pacific Biological Station
3190 Hammond Bay Road
Nanaimo, BC, V9T 6N7

Our file / Notre référence
17-HPAC-01167

December 22, 2017

Jason Hartley
City of Campbell River
301 St Ann's Road,
Campbell River, BC
V9W 4C7

via email: Jason.Hartley@campbellriver.ca

Dear Mr. Hartley:

Subject: Application for a Paragraph 35(2)(b) *Fisheries Act* Authorization – Incomplete

Further to the receipt of your application for a Paragraph 35(2)(b) *Fisheries Act* authorization on November 15, 2017, the Fisheries Protection Program (the Program) of Fisheries and Oceans Canada has reviewed the application. Our review has determined that some of the information and documentation set out in the *Applications for Authorization under Paragraph 35(2)(b) of the Fisheries Act Regulations* has not been provided and as such, the application is incomplete.

The following information and documentation is required in order for the application to be complete:

Schedule 1 Sections 2 and 3: Description of Proposed Work, Undertaking or Activity

1) You have described the excavation of a trench and construction of a coffer dam related to the construction of the breakwaters.
   a) Clarify the purpose of the trench and coffer dam and provide information as to why they are required for the breakwater construction.
   b) Provide the proposed construction methods and materials for each temporary and permanent work, undertaking or activity associated with the construction of the breakwaters and berm including trenches and coffer dams.
   c) Clarify the locations and footprints (i.e. area in m^2) of temporary and permanent works, undertakings or activities associated with the construction of the breakwaters and berm, including trenches and coffer dams.

Fisheries and Oceans Canada | Pêches et Océans Canada

Schedule 1 Section 8: Description of Effects on Fish and Fish Habitat

2) Provide a description of the effects the temporary and permanent works, undertakings or activities associated with the construction of the breakwaters and berm (including trenches and coffer dams) will have on fish and fish habitat.

Schedule 1 Section 9: Measures and Standards

3) Describe the proposed mitigation measures that will be implemented to avoid or mitigate serious harm to fish as a result of the construction of temporary and permanent works (eg. trenching, coffer dams etc.) associated with the breakwaters and berm.
4) Confirm rock material will be tested and only used if verified as non-acid generating.
5) Confirm machinery will only operate in the dry (i.e., tracks not entering water).
6) Describe proposed measures intended to avoid the death of fish during work (e.g., fish trapped in trenches, stranded on the tote road of the breakwaters after the tide recedes, crushed from rock), including but not limited to construction practices and timing of works.
7) Confirm that activities will be ceased if any marine mammal is within 500 m of the works, and only resume once the animal has left the immediate area or has not been re-sighted for 30 minutes.
8) Working in the dry and in isolation of fish is a standard best management practice.
   a) Clarify what marine works will and will not be conducted in the dry (e.g., infill works below 0 m chart datum). Include the estimated duration (hours/days) and the approximate footprint (area) of works that will not be conducted in the dry.
   b) Clarify that marine works not conducted in the dry will be conducted during daylight to avoid potential impacts to marine mammals and fish.

Schedule 1 Section 10: Monitoring of Mitigation Measures

9) Provide detailed monitoring measures that will be put in place to assess the effectiveness of the measures and standards that will be implemented to avoid serious harm during the construction of temporary and permanent works associated with the construction of the breakwaters and berm including during trenches and coffer dams.
10) Clarify what work or phase of work the qualified environmental monitor will be on-site monitoring (e.g., in-water works, placement of material on seabed) and provide rationale to support the level of construction monitoring.
11) Provide detailed methods that will be used to assess effectiveness of sediment and erosion control mitigation measures and standards including but not limited to the frequency and schedule for monitoring, sample locations, sample depths, water quality thresholds and locations of where compliance is to be met, baseline data collection, and location of reference/background sites.
12) Include a reporting protocol consistent with Section 38(5) of the *Fisheries Act* regarding the duty to report the deposit of deleterious substances into water frequented by fish.

Fisheries and Oceans Canada / Pêches et Océans Canada

13) Provide a monitoring plan and schedule (i.e., from commencement to completion) that includes the following:
   a) Monitoring of the work area (i.e., infill) after tidal inundation to evaluate and record any fish mortality and stranding (including evening, weekends or times when works are not being undertaken).
   b) Provide a fish salvage plan that will include pre-construction (i.e., prior to infilling) fish salvage and in the event of fish stranding during works.
   c) Include a reporting protocol consistent with Section 38(4) of the *Fisheries Act* regarding the duty to report serious harm to fish.

Schedule 1 Section 11: Measures and Standards to Avoid or Mitigate Serious Harm to Fish

14) Update your mitigation contingency measures where necessary to include measures that will be implemented if the measures and standards in *Schedule 1 Section 9* above are not successful.

Schedule 1 Section 12: Residual Serious Harm to Fish After Implementation of Avoidance and Mitigation Measures and Standards

15) Your characterization of the direct habitat impacts expected to result from the proposed work is not reflective of the Program's determination. Based on the information you provided, the Program has determined the residual serious harm to fish as a result of the proposed work will include the destruction of 2229 m^2 of intertidal and subtidal habitat within the direct footprint of the works. This value was calculated by taking the proposed 2D footprint of the breakwater and berm below the high water mark (977 m^2 + 2061 m^2 + 18 m^2) and subtracting the existing 2D footprint of the breakwater below the HWM (827 m^2).
   a) Based on item 15 above and your updated information referenced in *Schedule 1 Sections 8, 9 , 10 and 11* above, please update your residual serious harm to fish determination (including applicable tables) as required.
   b) Please note that other project components which include the ramp extension (72 m^2), piles (0.35 m^2) and dredge footprint (103 m^2) are not anticipated to result in serious harm and are not considered further in this review.

Schedule 1 Section 13: Offsetting Plan

16) Based on the information provided to date, the Program has determined that your current offsetting plan comprised of softshore erosion protection and the enhancement of marine riparian does not meet the *Fisheries Productivity Investment Policy* (the Policy). The Program has determined that the proposed offset measures do not provide additional benefits to fisheries productivity and do not adequately offset the residual serious harm to fish that will result from your proposed project. Therefore the Program has not conducted a detailed review of your offsetting plan for completeness at this time.

Fisheries and Oceans Canada / Pêches et Océans Canada

a) Provide a new offsetting plan that meets the Regulations and the Policy, and is reflective of the changes to residual serious harm to fish in Section 12 above.

Letter of Credit

17) A revised Letter of Credit will be required.
   a) The revised Letter of Credit should reference the *Fisheries Act Authorization # 17-HPAC-01167* instead of the *Big Rock Boat Ramp Application for Fisheries Act Authorization, dated November 2017*, as this document is now outdated.
   b) Update the Letter of Credit to reflect the revised cost estimate if necessary.
   c) Provide a draft revised Letter of Credit for review prior to issuance.

Upon receipt of this outstanding information and documentation. The Program will notify you to confirm receipt. Within a period of 60 days beginning on the date of receipt of this outstanding information and documentation, the Program will notify you as to whether the application is complete.

If your plans have changed or if the description of your proposal is incomplete or changes during the review of your application, you should contact this office to avoid any unnecessary delays in the review of your application.

If you have any questions, please contact Marina Wright at our Nanaimo office at 250-756-7247, or by email at marina.wright@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Byron Nutton
A/Team Lead,
Fisheries Protection Program

Cc: Derek LeBoeuf, Pacificus Biological Services Ltd. (dleboeuf@pacificus.ca)

Appendix 2: Shutdown criteria for turbidity monitoring at the Big Rock Boat Ramp.

Water quality guidelines (shutdown criteria) for turbidity, for the protection of aquatic life (fresh, marine, estuarine):

Water Use	Turbidity*
Aquatic life (fresh, marine, estuarine)	Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters
	Change from background of 2 NTU at any one time for a duration of 30 d in all waters during clear flows or in clear waters
	Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters
	Change from background of 10% when background is >50 NTU at any time during high flows or in turbid waters

*Values taken from Table 1 in Ambient Water Quality Guidelines (Criteria) for Turbidity, Suspended and Benthic Sediments - Overview Report.
https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/turbitity-or.pdf

Appendix 3: Environmental Monitoring Schedule.

Table. A schedule of proposed tasks for the construction of the Big Rock Boat Ramp including anticipated mitigation measures and EM responsibilities. Durations, start dates and finish dates taken from Figure 2 in *the Application Report*.

Task Name	Duration	*Start	*Finish	**EM Present	Anticipated Mitigation Measures and EM Responsibilities
Fish Window	47 days	Sun 18-07-01	Sat 18-09-01		n/a
Site Preparation	3 days	Wed 18-06-27	Sat 18-06-30	Part-time as needed and as determined by the type and pace of works.	○ Review of the EMP, spill response plan and site-specific measures ○ Daily pre-work and equipment inspection
Install ESC Protection	1 day	Sun 18-07-01	Mon 18-07-02	Part-time as needed and as determined by the type and pace of works.	○ Install and evaluate ESC protection measures ○ Daily pre-work and equipment inspection
Breakup Existing Conc. Ramp	1 day	Mon 18-07-02	Tue 18-07-03	Part-time as needed and as determined by the type and pace of works.	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection
Relocate Existing Breakwater Boulders to New Breakwaters	8 days	Mon 18-07-02	Thu 18-07-12	Full-time/Part-time	○ Daily pre-work, equipment inspection, site inspection ○ Ensure breakwater removal is conducted in the dry ○ Fish salvage in conjunction with material removal – i.e. salvage, relocated and report all fish observed in interstices as material is removed ○ Eliminate or reduce the potential for stranding prior to leaving site ○ Monitor effectiveness of ESC protection
Install new Storm Pipe and Outlet Structure	3 days	Mon 18-07-02	Thu 18-07-05	Part-time as needed and as determined by the type and pace of works.	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection
North & South Breakwater Construction (inc. Gravel Retention Berm)	15 days	Tue 18-07-10	Mon 18-07-30	Full-time/Part-time	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection ○ Pre-work inspection of potential stranding sites; salvage if necessary ○ Ensure breakwater construction occurs in the dry ○ Ensure careful placement of new material ○ Ongoing monitoring of stranding as the work proceeds and the tide inundates and recedes from the work site ○ Eliminate or reduce the potential for stranding prior to leaving site ○ Following completion of the breakwaters, exclude all fish from the inner basin.
Basin Excavation & Channel Cut	4 days	Mon 18-07-30	Sat 18-08-04	Full-time	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection ○ Ongoing monitoring of stranding as the work proceeds and the tide inundates and recedes from the work site ○ Eliminate or reduce the potential for stranding prior to leaving site
Breakwater Finishing	2 days	Sat 18-08-04	Tue 18-08-07	Part-time as needed and as determined by the type and pace of works.	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection ○ Ongoing monitoring of stranding as the work proceeds and the tide inundates and recedes from the work site ○ Eliminate or reduce the potential for stranding prior to leaving site

Task Name	Duration	*Start	*Finish	**EM Present	Anticipated Mitigation Measures and EM Responsibilities
Install Piles for Dock Structure	5 days	Sat 18-08-04	Fri 18-08-10	Part-time as needed and as determined by the type and pace of works.	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection
Embankment Construction / Rehabilitation	7 days	Sat 18-08-11	Mon 18-08-20	Part-time as needed and as determined by the type and pace of works.	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection ○ Ensure works occur in the dry
Form and Pour Concrete Ramp	12 days	Sat 18-08-11	Mon 18-08-27	Full-time as needed and as determined by the type and pace of works.	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection ○ Ensure works occur in the dry
Ramp Embankment	2 days	Mon 18-08-27	Wed 18-08-29	Part-time as needed and as determined by the type and pace of works.	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection ○ Ensure works occur in the dry
Asphalt Paving at Top of Ramp	2 days	Thu 18-08-30	Sat 18-09-01	Part-time as needed and as determined by the type and pace of works.	○ Daily pre-work, equipment inspection, site inspection ○ Monitor effectiveness of ESC protection ○ Ensure works occur in the dry

***Start/finish dates subject to change based on unforeseen circumstances (i.e. weather, equipment maintenance, material and resource availability, etc.)**

****The degree of monitoring will be dictated by the nature of work and associated level of risk for serious harm to occur; e.g. tasks occurring over multiple days may have varying degrees of associated risk based on the location of works, tide level, etc.**

Appendix 4: Measures for Avoiding or Mitigating Serious Harm – Environmental Mitigation Plan (EMP)

The following EMP has been prepared for the purpose of avoiding serious harm during the construction activities related to the completion of the proposed BRBR improvements. It is important that a copy of the EMP is provided to the successful contractor and is fully incorporated in the planning process for this project.

General Operation Mitigation Measures

- Works within the marine environment must be under the guidance of an Environmental Monitor (EM). For more details regarding the responsibilities of the EM, See the Environmental Monitor section below.
- Follow the Measure to Protect Key Species
- Follow and Respect the Appropriate Timing Windows
- Follow the Spill Control and Response plan
- Follow the Erosion and Sediment Control Plan
- Follow Project Specific Measures

Environmental Monitor

- The designated EM should be a third party Qualified Environmental Professional (QEP) with the authority to cease works in the event avoidance and mitigation measures are not effective in preventing serious harm to fish and fish habitat.
- The EM only needs to be onsite during sensitive phases of the project such as removal and placement of breakwater material, pouring of concrete for the boat ramp, etc. It is the responsibility of the EM to determine the level of monitoring required during each component or activity to achieve the goals outlined within this report (no serious harm to fish during the construction phase).
- In the event that the EM feels it necessary, they may remain on site for any project component as they see fit.
- When not onsite the EM must be able to get to site within 10 minutes of being called regarding a potential emergencey (i.e. spill or observation of fish or mammals that have the potential to be impacted.

Measures to Protect Key Species

Marine Mammals:

- In-water operations must be temporarily suspended if whales or other marine mammals (i.e. sea lions) approach to within 500m of site;
- Follow Best Management Practices (Whale-wise, 2013) for vessels operating near whales, dolphins and porpoises: be cautious, slow down, keep clear of the animals' path and do not approach or position your vessel within 400m of a whale. If a vessel is unexpectedly within 100m of a whale, stop immediately and allow the whale to pass.

Herring, Salmonids and Forage Fish:

- If herring or juvenile salmonids are observed to be present at any time during construction of the facility the EM should be immediately contacted and appropriate mitigation measures implemented to protect these species or suspend works until it is safe to continue works;
- If contractors are working when herring spawn occurs or if they become aware of any negative impacts to fish or fish habitat, the work will be suspended until it is safe to continue works.
- An EM must conduct a forage fish spawn assessment in any likely habitats adjacent to the site prior to works commencing and every 7 days during the duration of the works as per the guidance in Appendix 2 of the City of Campbell River Marine Foreshore Habitat Assessment and Restoration Plan (2011) and Moulton, L. (2001). Forage fish spawning may require that works be suspended.

Timing

The applicable fisheries timing windows below are considered to be the time span presenting the least risk of harm to fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed (**Error! Reference source not found.**).

Marine / Estuarine fisheries timing window for south coast area of BC.

Location	Species	Timing Window	
		Start Date	Finish Date
South Coast (Campbell River Area 13E)	All	July 1 – Nov 1	Sept 1 – Feb 15

*From Fisheries and Oceans Canada, Fish Habitat Management website: http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/bc-s-eng.html#area-13 (obtained November 8, 2017).

- Timing of components of the project should follow the outlined schedule or at least the intent of the schedule. The breakwater works has been scheduled to be conducted first so that these specific components, pile driving, dredging, and concrete pouring can be conducted when fish have been excluded and the area is contained with a sediment curtain. Refer to each component specific plan for additional detail.

Spill Control Response Plan

The spill monitoring response plan and procedures will be used to avoid a spill from occurring and to mitigate causing serious harm to fish and fish habitat should a petroleum, oil or fuel spill occur.

- All fueling of equipment will occur at a designated location within the parking lot as far away from drains and in an area easy to contain and with drip catching material set out prior to fueling activities.
- Maintenance of equipment with the potential to result in a spill (i.e. changing hoses) must occur greater than 30m from the HHWM.

- Fuel will be stored in appropriate double-walled containers no less than 30m from the HHWM.
- Emergency spill kits and spill response plans will be kept on-site at all times.
- Each piece of equipment must be equipped with an emergency spill kit and spill response plan;
- Machinery working below the HHWM must be outfitted with eco friendly hydraulic fluid.
- Machinery will be inspected by the EM prior to entering the work area and be free of leaks and drips. This should occur on a daily basis for machines working below the HHWM;
- Machinery will be used and stored only within designated areas;
- Industrial debris (i.e. machinery parts, metal drums, lubricant containers) shall not be disposed of within 30m of HHWM.

Sediment and Erosion Control Plan

- The EM must guide the placement of silt and debris control to adequately contain and prevent the release of demolition and construction debris, materials, and any deleterious substances to the marine environment.
- All construction/demolition debris must be contained, collected and disposed of in an appropriate upland facility in accordance with existing legislation, guidelines and best management practices. Demolition operations should be monitored to determine whether the works are resulting in any adverse effects on fish or fish habitat.
- The use of silt-curtains, coffer dams, etc. in order to contain silt-laden water will be implemented during excavation and other works when disturbance of marine sediments is expected to occur.
- All silt and sediment created that cannot be contained on the bank will be directed back into the basin in order to prevent dispersal into the marine environment beyond the work site.
- All silt laden water created on the terrestrial surfaces of the site will be directed away from the marine environment in order to allow silt and sediment to settle out before entering the marine environment.

- Spoil piles, debris and excavated material stored on site for any length of time needs to be covered in order to prevent the creation of sediment and contained from reaching an environment not contained and isolated from fish.

Project Specific

Breakwater

- The EM must conduct a forage fish spawn assessment as per the forage fish specific guidance.
- An EM must be onsite during rock work within the lower intertidal area of the marine environment. Works on the upper slopes and in the high intertidal zone could occur without the direct oversite of the EM.
- During construction, rock used for infill to create the breakwater must be free of organic soils and other sediment generating material this is essential to prevent the use of silt curtains;
- The base of the new breakwater should be placed during the low tide periods when the water level is ≤1.0m above CD.
- The excavation for the trench may require the use of coffer dams, silt curtains or pumping sediment laden water to an appropriate location in order to prevent the dispersal of silty water beyond the work area.
- Machinery should operate from the shore side of the structures or from the core of the new breakwater above the current water level however placement of rock can occur below the current water level in instances where the tide will not go low enough. Where possible machinery should work from a location above the HHWM.
- The number of trips across the intertidal must be minimized to reduce impacts to the foreshore.
- The colonized rocks that are of suitable size to be used on the exterior of the breakwater must be set aside at a similar tidal depth and reused/incorporated into the new breakwater at a similar elevation and exposure.

Ramp

- An EM should be onsite during all activities when raw-uncured concrete will be poured.
- Concrete will be poured completely in the dry if possible

- The EM will monitor pH during the concrete works. If an increase in pH above 1.0pH is noted then mitigation in the form of a $C0^2$ bubbler must be administered and pH continued to be monitored until the curing process is completed.
- The use of coffer dams, silt-curtains, etc. may be implemented in order to maintain a dry area
- If concrete is being placed with a concrete pump, all hose and pipe connections must be sealed and locked properly to ensure the lines will not leak or uncouple.
- Contractors/crews must ensure that concrete forms are not filled to overflowing;
- All concrete forms will be constructed in a manner that will prevent fresh concrete or cement-laden water from leaking into the surrounding water.
- Fresh concrete should be covered with plastic to further isolate the concrete during the curing process.

Dredging

- A QEP must be on site throughout the duration of the dredging activities to coordinate mitigation measures and to respond as necessary to site specific events.
- Dredging activities must be conducted within the timing window and during the low tide periods when the water level is ≤1.0m above CD.
- A temporary tote road will be created within the inner basin in order to access the opening of the breakwater and prevent further disturbance to marine substrate and sediments.
- Dredging must occur when the site is isolated with silt curtains and excluded from fish.
- Spoil and excavated material created during dredging must be stored in an upland area where silt and sediment cannot re-enter the marine environment until a time when it can be disposed of properly.
- Sediment (gravels, sand or cobbles) that do not contain silt that underlays the gravels should be moved to the north side of the breakwater. The EM should provide guidance on this during works.
- Conduct dredge work on calm days to minimize the suspension of fine sediment particles into the water column and ensure the sediment control measures are not disturbed by wave action;
- Operation of machinery from within the basin must occur.

Piles

- The Best Management Practices for Pile Driving and Related Operations – BC Marine and Pile Driving Contractors Association indicate that protective measures to reduce shock waves are not expected to be required for piles under 18 inches. The piles for this project are 14 inches.
- Recently DFO has revised the acoustic thresholds for in water activities but have not updated how this affects the operational guidance such that the Best Management Practices did in indicating that piles under 18 inches did not require acoustic monitoring. DFO's updated guidance is as follows:
    - The criteria agreed upon by the US Fisheries Hydroacoustic Working Group (FHWG, 2009) for the onset of effects of percussive pile driving activities in terms of injuries to fishes identified the dual criteria of a peak sound pressure level of 206 dB re: 1 µPa and a SELcum of 187 dB re: 1 µPa2·s.
    - Adherence to no excess of 206 dB re: 1 µPa and a SELcum of 187 dB re: 1 µPa2·s for fish with acoustic monitoring within 10 m of the noise source should be conducted for the project.
    - If sound levels exceed the threshold of 206 dB re: 1 µPa , the work must be halted. After consultation with DFO, work can resume only after additional measures have been implemented.
- One of two options should be followed.

Option 1 – Pile Driving without Monitoring

- This option provides a reasonable level of certainty based on previous best management practices and a sufficient buffer in the form of an exclusion area and a contained basin to act as attenuation to any potential impacts as a result of sound waves. The following must be followed for this option:
    - Pile driving must occur when the site is isolated to the outside of the breakwaters and fish are excluded from the basin.
    - All piles except the two piles furthest from the HHWM are driven in the dry and only the two piles furthest from the HHWM will be driven while the area is wetted but must be driven while the water level is ≤1.0m above CD.
    - An EM visually monitors the outside of the breakwaters

- Marine Mammals are not within 500m of the boat ramp during pile driving activities.

Option 2 – Pile Driving with Monitoring

- This option must follow the updated guidance referred to above.
  - Acoustic monitoring is required and must ensure that it the thresholds are not exceeded.
  - An EM visually monitors the outside of the breakwaters
  - Marine Mammals are not within 500m of the boat ramp during pile driving activities.

Embankments

- Minimize vegetation removal during reshaping and maintenance of the embankments.
- Revegetate all exposed slopes, swales and surfaces following completion of the project with a native seed mix.

Source: Fisheries and Oceans Canada - 7 days Tidal Predictions

Reference: Chart Datum

Tidal Prediction Table Campbell River (#8074)

Date	Hour																						
PDT	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
7/1/2018	3.4	3.4	3.3	3.4	3.4	3.5	3.6	3.6	3.3	2.9	2.4	1.8	1.4	1.1	1.1	1.2	1.5	2.1	2.8	3.4	3.9	4.1	4	3.7
7/2/2018	3.5	3.4	3.3	3.2	3.3	3.3	3.4	3.5	3.4	3.1	2.7	2.2	1.7	1.4	1.2	1.3	1.4	1.8	2.5	3.2	3.7	4	4.1	3.9
7/3/2018	3.6	3.4	3.2	3.1	3.1	3.1	3.2	3.3	3.3	3.2	2.9	2.5	2.1	1.7	1.5	1.4	1.5	1.8	2.2	2.9	3.4	3.8	4	4
7/4/2018	3.8	3.5	3.3	3.1	2.9	2.9	2.9	3	3.1	3.1	3	2.8	2.5	2.1	1.8	1.7	1.7	1.9	2.1	2.6	3.2	3.7	3.9	4.1
7/5/2018	3.9	3.6	3.3	3.1	2.8	2.7	2.7	2.7	2.8	2.9	3	2.9	2.8	2.5	2.2	2	2	2	2.2	2.5	2.9	3.4	3.8	4
7/6/2018	4	3.8	3.5	3.1	2.8	2.5	2.4	2.4	2.4	2.5	2.8	2.9	2.9	2.9	2.7	2.5	2.3	2.3	2.4	2.6	2.8	3.2	3.6	3.9
7/7/2018	4.1	4	3.7	3.2	2.8	2.5	2.2	2.1	2.1	2.1	2.3	2.7	2.9	3	3	2.9	2.7	2.6	2.6	2.7	2.9	3.1	3.5	3.8
7/8/2018	4	4.1	3.9	3.5	3	2.5	2.1	1.8	1.7	1.7	1.8	2.2	2.6	3	3.2	3.3	3.2	3	2.9	2.9	3	3.1	3.3	3.6
7/9/2018	3.9	4.1	4.1	3.8	3.2	2.7	2.1	1.7	1.4	1.3	1.4	1.6	2.1	2.7	3.2	3.5	3.5	3.4	3.3	3.1	3.1	3.2	3.3	3.5
7/10/2018	3.8	4.1	4.2	4	3.6	3	2.4	1.7	1.3	1	1	1	1.4	2.1	2.8	3.4	3.7	3.8	3.6	3.4	3.3	3.3	3.4	3.5
7/11/2018	3.7	3.9	4.2	4.2	4	3.5	2.8	2.1	1.4	0.9	0.7	0.7	0.8	1.3	2.1	3	3.6	3.9	3.9	3.7	3.5	3.3	3.3	3.5
7/12/2018	3.6	3.7	4	4.2	4.3	4	3.3	2.6	1.8	1.1	0.6	0.5	0.5	0.7	1.3	2.3	3.2	3.8	4.1	4	3.8	3.5	3.3	3.4
7/13/2018	3.5	3.6	3.7	4	4.3	4.2	3.9	3.2	2.4	1.6	0.8	0.5	0.4	0.4	0.7	1.5	2.5	3.4	4	4.2	4.1	3.8	3.5	3.3
7/14/2018	3.3	3.4	3.5	3.6	4	4.2	4.1	3.7	3	2.2	1.4	0.8	0.4	0.4	0.5	0.9	1.8	2.8	3.6	4.1	4.2	4	3.7	3.4
7/15/2018	3.2	3.2	3.3	3.3	3.5	3.8	4.1	4	3.5	2.9	2.1	1.3	0.8	0.6	0.6	0.7	1.2	2.1	3.1	3.8	4.2	4.2	4	3.6
7/16/2018	3.3	3.1	3	3	3.1	3.3	3.6	3.8	3.7	3.4	2.8	2.1	1.4	1	0.8	0.9	1.1	1.7	2.6	3.4	4	4.3	4.2	3.9
7/17/2018	3.5	3.1	2.9	2.8	2.8	2.8	3	3.3	3.5	3.5	3.2	2.7	2.1	1.6	1.3	1.2	1.3	1.6	2.1	2.9	3.7	4.1	4.3	4.1
7/18/2018	3.8	3.4	3	2.7	2.6	2.5	2.5	2.7	3	3.3	3.3	3.1	2.7	2.3	1.9	1.7	1.7	1.8	2.1	2.6	3.3	3.8	4.2	4.3
7/19/2018	4	3.6	3.2	2.8	2.5	2.3	2.2	2.2	2.4	2.8	3	3.1	3	2.8	2.5	2.3	2.2	2.2	2.3	2.5	3	3.5	3.9	4.2
7/20/2018	4.1	3.8	3.4	3	2.5	2.2	2	1.9	1.9	2.2	2.5	2.9	3.1	3.1	3	2.9	2.7	2.6	2.7	2.7	2.9	3.3	3.6	4
7/21/2018	4.1	4	3.7	3.2	2.7	2.3	1.9	1.8	1.6	1.7	2	2.4	2.8	3.2	3.3	3.3	3.2	3.1	3	3	3.1	3.2	3.4	3.7
7/22/2018	3.9	4	3.8	3.5	3	2.5	2	1.7	1.5	1.4	1.5	1.9	2.4	2.9	3.3	3.5	3.5	3.4	3.3	3.3	3.3	3.3	3.4	3.5
7/23/2018	3.7	3.9	3.9	3.7	3.3	2.8	2.3	1.8	1.5	1.3	1.3	1.4	1.9	2.5	3.1	3.5	3.7	3.7	3.6	3.5	3.4	3.4	3.4	3.5
7/24/2018	3.6	3.7	3.9	3.8	3.5	3.1	2.6	2	1.6	1.3	1.2	1.2	1.5	2	2.7	3.3	3.7	3.8	3.8	3.7	3.5	3.4	3.5	3.5
7/25/2018	3.5	3.6	3.7	3.8	3.7	3.4	2.9	2.3	1.8	1.4	1.2	1.1	1.2	1.6	2.2	2.9	3.5	3.8	3.9	3.8	3.6	3.5	3.4	3.5
7/26/2018	3.5	3.5	3.6	3.8	3.8	3.6	3.2	2.7	2.1	1.5	1.2	1.1	1	1.2	1.8	2.5	3.2	3.7	3.9	3.9	3.7	3.5	3.4	3.4
7/27/2018	3.5	3.5	3.5	3.7	3.8	3.7	3.5	3	2.4	1.8	1.3	1.1	1	1.1	1.4	2.1	2.8	3.5	3.9	4	3.8	3.6	3.4	3.3
7/28/2018	3.4	3.4	3.4	3.5	3.7	3.8	3.6	3.3	2.8	2.1	1.6	1.2	1	1	1.2	1.7	2.4	3.1	3.7	4	3.9	3.7	3.5	3.3
7/29/2018	3.2	3.3	3.3	3.4	3.5	3.7	3.7	3.5	3.1	2.5	1.9	1.4	1.1	1.1	1.2	1.4	2.1	2.8	3.4	3.9	4	3.9	3.6	3.4
7/30/2018	3.2	3.1	3.2	3.2	3.3	3.5	3.6	3.6	3.3	2.8	2.3	1.7	1.3	1.2	1.2	1.4	1.8	2.5	3.2	3.7	4	4	3.7	3.4
7/31/2018	3.2	3	3	3	3.1	3.2	3.5	3.5	3.4	3.1	2.6	2.1	1.7	1.4	1.4	1.5	1.7	2.2	2.9	3.5	3.9	4	3.9	3.6

8/1/2018	3.3	3	2.9	2.8	2.9	2.9	3.1	3.3	3.4	3.3	2.9	2.5	2.1	1.8	1.6	1.7	1.8	2.1	2.7	3.3	3.8	4	4	3.8
8/2/2018	3.4	3.1	2.8	2.7	2.6	2.7	2.8	3	3.2	3.3	3.1	2.9	2.5	2.2	2	1.9	2	2.2	2.6	3.1	3.6	3.9	4	3.9
8/3/2018	3.6	3.2	2.8	2.6	2.4	2.4	2.4	2.6	2.8	3.1	3.2	3.1	2.9	2.6	2.4	2.3	2.3	2.4	2.6	2.9	3.4	3.8	4	4
8/4/2018	3.8	3.4	2.9	2.6	2.3	2.2	2.1	2.2	2.3	2.7	3	3.1	3.1	3	2.8	2.6	2.6	2.6	2.8	2.9	3.2	3.6	3.9	4
8/5/2018	3.9	3.6	3.2	2.7	2.3	2	1.9	1.8	1.9	2.1	2.5	2.9	3.1	3.2	3.2	3.1	3	2.9	2.9	3.1	3.2	3.5	3.8	4
8/6/2018	4	3.8	3.5	3	2.5	2	1.7	1.5	1.5	1.6	1.9	2.4	2.9	3.2	3.4	3.5	3.3	3.2	3.2	3.2	3.3	3.4	3.6	3.8
8/7/2018	4	4	3.8	3.4	2.8	2.2	1.7	1.4	1.2	1.2	1.3	1.7	2.3	2.9	3.4	3.7	3.7	3.6	3.4	3.3	3.3	3.4	3.5	3.7
8/8/2018	3.9	4	4	3.8	3.3	2.6	2	1.4	1.1	0.9	0.9	1.1	1.6	2.4	3.1	3.6	3.9	3.8	3.7	3.5	3.4	3.3	3.4	3.6
8/9/2018	3.7	3.9	4.1	4.1	3.8	3.2	2.5	1.8	1.2	0.8	0.7	0.7	1	1.6	2.4	3.2	3.8	4	3.9	3.7	3.5	3.3	3.3	3.4
8/10/2018	3.5	3.7	3.9	4.1	4.1	3.8	3.1	2.4	1.6	1	0.7	0.6	0.6	0.9	1.7	2.6	3.5	4	4.1	3.9	3.6	3.3	3.2	3.2
8/11/2018	3.3	3.4	3.6	3.9	4.2	4.1	3.7	3.1	2.3	1.5	0.9	0.6	0.6	0.6	1.1	1.9	2.9	3.7	4.1	4.1	3.9	3.5	3.2	3
8/12/2018	3.1	3.1	3.2	3.4	3.8	4.1	4.1	3.6	3	2.2	1.4	0.9	0.7	0.7	0.8	1.4	2.3	3.3	3.9	4.2	4.1	3.8	3.4	3
8/13/2018	2.9	2.9	2.9	2.9	3.3	3.7	4	3.9	3.5	2.8	2.1	1.4	1	0.9	1	1.2	1.8	2.7	3.6	4.1	4.3	4	3.6	3.2
8/14/2018	2.8	2.7	2.6	2.6	2.7	3.1	3.6	3.8	3.7	3.3	2.7	2.1	1.6	1.3	1.3	1.4	1.6	2.3	3.2	3.8	4.2	4.2	3.9	3.5
8/15/2018	3	2.6	2.4	2.4	2.3	2.5	2.9	3.4	3.6	3.5	3.2	2.7	2.2	1.9	1.7	1.7	1.8	2.2	2.8	3.5	4	4.2	4.1	3.7
8/16/2018	3.3	2.8	2.4	2.2	2.1	2.1	2.3	2.7	3.1	3.4	3.4	3.2	2.8	2.5	2.3	2.2	2.2	2.3	2.7	3.2	3.7	4	4.1	4
8/17/2018	3.5	3.1	2.6	2.2	2	1.9	1.9	2.1	2.5	3	3.2	3.3	3.2	3	2.8	2.7	2.6	2.6	2.8	3	3.4	3.8	4	4
8/18/2018	3.7	3.3	2.9	2.4	2.1	1.9	1.7	1.7	2	2.4	2.8	3.1	3.3	3.3	3.2	3.1	3	3	3	3.1	3.3	3.5	3.8	3.9
8/19/2018	3.8	3.5	3.2	2.7	2.3	1.9	1.7	1.6	1.6	1.9	2.3	2.8	3.2	3.4	3.5	3.5	3.4	3.3	3.2	3.2	3.3	3.4	3.6	3.7
8/20/2018	3.8	3.7	3.4	3	2.6	2.1	1.8	1.6	1.5	1.5	1.8	2.3	2.8	3.2	3.5	3.7	3.7	3.6	3.4	3.4	3.4	3.4	3.4	3.5
8/21/2018	3.6	3.7	3.6	3.3	2.9	2.5	2	1.7	1.5	1.4	1.5	1.8	2.3	2.9	3.4	3.7	3.8	3.8	3.6	3.5	3.4	3.4	3.4	3.4
8/22/2018	3.5	3.6	3.6	3.5	3.2	2.8	2.3	1.9	1.6	1.4	1.3	1.5	1.9	2.4	3	3.6	3.8	3.9	3.8	3.6	3.4	3.4	3.4	3.4
8/23/2018	3.4	3.5	3.6	3.6	3.5	3.1	2.7	2.2	1.7	1.4	1.3	1.3	1.5	2	2.6	3.3	3.7	3.9	3.9	3.7	3.5	3.3	3.3	3.3
8/24/2018	3.3	3.3	3.5	3.6	3.6	3.4	3	2.5	2	1.5	1.3	1.2	1.3	1.6	2.2	2.9	3.5	3.9	3.9	3.8	3.6	3.3	3.2	3.2
8/25/2018	3.2	3.2	3.3	3.6	3.7	3.6	3.3	2.9	2.3	1.8	1.4	1.3	1.2	1.4	1.9	2.5	3.2	3.7	3.9	3.9	3.6	3.4	3.1	3
8/26/2018	3.1	3.1	3.2	3.4	3.6	3.7	3.6	3.2	2.7	2.1	1.6	1.3	1.3	1.3	1.6	2.2	2.9	3.5	3.9	3.9	3.7	3.4	3.1	2.9
8/27/2018	2.9	3	3	3.1	3.4	3.7	3.7	3.5	3	2.5	1.9	1.5	1.4	1.4	1.5	1.9	2.6	3.3	3.7	3.9	3.8	3.5	3.2	2.9
8/28/2018	2.8	2.8	2.8	2.9	3.2	3.5	3.7	3.6	3.3	2.8	2.3	1.8	1.6	1.6	1.6	1.8	2.3	3	3.6	3.9	3.9	3.7	3.3	2.9
8/29/2018	2.7	2.6	2.6	2.7	2.8	3.2	3.5	3.6	3.5	3.2	2.7	2.2	1.9	1.8	1.8	1.9	2.2	2.8	3.4	3.8	4	3.8	3.5	3.1
8/30/2018	2.7	2.5	2.4	2.4	2.5	2.7	3.1	3.5	3.6	3.4	3.1	2.7	2.3	2.1	2	2.1	2.3	2.7	3.2	3.7	3.9	3.9	3.7	3.3
8/31/2018	2.8	2.4	2.2	2.2	2.2	2.4	2.7	3.1	3.4	3.5	3.3	3.1	2.7	2.4	2.3	2.4	2.5	2.7	3.1	3.5	3.9	4	3.8	3.5
9/1/2018	3	2.5	2.2	2	2	2	2.2	2.6	3	3.3	3.4	3.3	3.1	2.9	2.7	2.7	2.7	2.8	3	3.3	3.7	3.9	3.9	3.7

Levelton Consultants Ltd.

Vancouver Island Region

#8 – 2663 Kilpatrick Avenue
Courtenay, BC V9N 7C8
Canada
Tel: 250-334-9222
Fax: 250-334-3955
e-mail: courtenay@levelton.com

1935 Bollinger Road
Nanaimo, BC V9S 5W9
Canada
Tel: 250-753-1077
Fax: 250-753-1203
e-mail: nanaimo@levelton.com

760 Enterprise Crescent
Victoria, BC V8Z 6R4
Canada
Tel: 250-475-1000
Fax: 250-475-2211
e-mail: victoria@levelton.com

Construction Materials
Building Science
Geotechnical
Metallurgy and Corrosion
Environmental
Physical Testing

20 March 2013
Levelton File: VI13-0021-00

Outlook Land Design Inc.
1326 Docliddle Road
Comox, BC V9M 2P9

Attn: Mr. Tim O'Brien, P.Eng., MBCSLA

Re: Geotechnical Assessment
Big Rock Boat Ramp Renewal Project
Campbell River, BC

1.0 INTRODUCTION

As requested, Levelton Consultants Ltd. (Levelton) has carried out a geotechnical assessment in support of the schematic design for the proposed renewal of the existing Big Rock Boat Ramp in Campbell River, BC.

The assessment was completed in general accordance with Levelton's proposal dated 13 November 2012 (Levelton file reference: PR12-2775-01). Authorization to proceed with the assessment was provided by Outlook Land Design (Outlook) on 11 December 2012. As outlined in the proposal, subsurface assessment work was focussed towards the land based elements of the proposed upgrades.

The following provides a description of the site and proposed upgrades, and presents the results of a subsurface assessment carried out in February 2013 along with geotechnical discussion and recommendations relating to the design and construction of the new boat ramp and associated paved parking. It is anticipated that future geotechnical input will be required during detailed design. The scope of this work will be dependent upon decisions made by the City of Campbell River (the City) regarding design preferences for aspects such as site preparation in the parking area and / or if offshore installations are to be considered further.

Consideration of erosion control and sediment deposition related to ocean currents, littoral drift and wave action are beyond the scope of this assignment and may be looked after by others.

This report incorporates comments provided by Outlook and supercedes a previous version of the report submitted on 18 March 2013.

2.0 SITE AND PROJECT DESCRIPTION

The project area includes the existing boat ramp site, the adjacent property to the south, and a vacant lot approximately 100 m north of the existing boat ramp (985, 991, and 921 South Island Highway, respectively) in Campbell River. The two additional properties are being considered for overflow parking for the new boat ramp. The general site location is shown on Figure 1 and individual property locations are shown on Figure 2.

The boat ramp site (985 South Island Hwy) was accessed directly from the highway and consisted of a gravel parking area that had a concrete slab within the northern portion of the site. There was a concrete boat ramp starting around the middle portion of the site extending down into the sea.

McCallum Park is located immediately to the south of the boat ramp site at 991 South Island Highway. The park was generally flat and grass covered with some landscaping along its border of the boat ramp site.

The third lot included in the project was a relatively flat, grass covered park area located approximately 100 m north of the boat ramp site at 921 South Island Highway. Decorative landscaping stones had been placed around the west side of this site.

The shoreline along the eastern side of all three properties was protected with riprap.

It is understood that the project is to consist of reconstruction and realignment of the existing concrete boat ramp, and construction of asphalt-paved parking area(s), and may include installation of a floating dock. Conceptual plans suggest that the floating dock could be secured near the boat ramp with a series of off shore piles.

3.0 SUBSURFACE ASSESSMENT

A subsurface assessment was carried out at the site on 1 February 2013 and consisted of five auger drill holes advanced with a truck mounted drill rig operated by Grass Roots Drilling Ltd. of Cowichan Bay. The boreholes were advanced to depths ranging from 3.0 to 4.5 m below ground surface. The approximate borehole locations are shown on the Site Plan attached as Figure 2. The bore hole initially contemplated low in the ramp area (described in the proposal) was not possible due to tide elevations at the time of the drilling.

Prior to drilling, Levelton retained the services of a private utilities locator contractor (One Call Locators Canada Ltd. of Chemainus) to confirm the presence and location of underground services at the site and “clear” the borehole locations for drilling.

During drilling, a Levelton representative observed and logged the subsurface conditions encountered and obtained samples at regular intervals. The soil samples obtained were returned to

the Levelton laboratory in Nanaimo for moisture content determination. A detailed description of the subsurface conditions encountered during drilling are presented in the attached borehole summary logs.

Three bore holes were advanced within the boat ramp property (BH13-01 to BH13-03). In general, the soils encountered consisted of variable fills overlying natural deposits of sand / sand and gravel. The fills generally consisted of silty sand or sandy silt with varying amounts of gravel and inclusions of clay soils, organics, and woody debris. The thickness of the fills tended to increase toward the east (i.e., toward the shoreline). In BH13-02, the thickness of fill was observed to be about 0.5 m (potentially 1.5 m thick) while in BH13-01 (near the shoreline); the fills were observed to be about 3 m in thickness. In bore hole BH13-03 – located near the northeast corner of the site – the sand and gravel was underlain by very stiff, grey-blue clay.

Based on their configuration and condition, it is assumed that the fills were placed to reclaim land and extend the shoreline seaward for use as parkland and / or boat ramp access. The presence of organic and woody debris near the base of the fills indicates that the existing fills were placed directly over the original beach surface.

Bore hole BH13-04 – located in McCallum Park – encountered about 2.4 m of variable fill overlying natural sand and gravel. This bore hole was terminated at 3.6 m depth due to effective penetration refusal.

Bore hole BH13-05 – located at the secondary site to the north – encountered a relatively thin (0.15 m thick) layer of organic topsoil overlying sand with gravel.

The underlying natural granular soils were generally wet.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 GENERAL

In general, soil conditions at the site are considered suitable for the proposed upgrades provided that the recommendations presented below are followed. From a geotechnical perspective, it will be preferred to remove the variable, poor quality fill to expose a subgrade of the underlying, natural, non-organic beach sand and gravel within the pavement support areas. Notwithstanding, existing fill thicknesses increase across the properties from west (highway side) to east (shoreline side) and other risk management approaches may need to be considered for the existing boat ramp property and adjacent site to the south. Further discussion is presented in the pavement design section below. Final design will be dependent upon the scope of site preparation that is completed.

Complete removal of poor quality soils is recommended in the area of the new concrete ramp and adjacent retaining structures. Settlement tolerant slope configurations could also be considered adjacent to the ramp.

Geotechnical discussion and recommendations are provided in the following sections for pavements, in-ground stormwater disposal, the new boat ramp and adjacent retaining walls / slopes, contemplated offshore piled dock support, and preliminary construction considerations.

4.2 PARKING AREA

Under the conditions observed, the existing site fills would not be considered as suitable for a bearing stratum for a conventional asphalt pavement structure. The variability in composition and consistency could result in differential settlements across the site and the presence of organics and woody debris could result in long-term settlements as these components decay and lose strength over time.

For construction of asphalt surfaced parking lots, it is typically recommended, from a geotechnical perspective, that removal and replacement of unsuitable fills with engineered fill be carried out. We acknowledge the substantial thickness (~ 3 m) of fills observed on the ocean side of the boat ramp site may be cost prohibitive to fully remove and replace. Alternate site preparation approaches may need to be considered whereby the City accepts the potential for future settlement and related reduced structure life span and / or increased maintenance costs. Conceptually this could involve partial removal and inclusion of geogrid reinforcement to mitigate (not eliminate) the effects of settlement, phased surfacing, or using an alternate surfacing in areas of thicker existing fills.

Engineered fill should consist of imported, well-graded, 75 mm minus, pitrun sand and gravel that is placed in horizontal lifts and compacted to a minimum of 95 percent of Modified Proctor maximum dry density. The existing site fills observed in the bore holes would not be considered suitable for re-use as engineered fill. For preliminary planning purposes, engineered fill should extend laterally beyond the edge of the pavement structure a distance equal to the thickness of fill plus 0.5 m.

For areas where complete excavation and replacement is undertaken to competent natural soils, the following preliminary pavement section is provided to assist the Civil Engineer with preliminary design and concept development: 75 mm asphaltic pavement, over 150 mm crushed base aggregate, over 300 mm of subbase aggregate. We note that the preliminary section is based on geotechnical strength parameters of the pavement section materials and subgrade. Civil engineering design such as grades, drainage, layout and compatibility with surrounding structures are the responsibility of others. Site specific pavement section design was beyond the scope of this assessment. If a formal pavement design is required as the project develops, we would be pleased to assist.

Depending on their location and design depth, the excavation for proposed underground service pipes may expose a subgrade of the existing site fills. Considerations similar to those outlined above for the pavement structures above would likely be required for preparation of the pipe trench subgrade. These may include sub-excavation and replacement and / or use of geogrid to reinforce the subgrade.

4.3 STORM WATER DRAINAGE CONSIDERATIONS

Based on visual observations, the underlying natural sand and gravel encountered at the bore hole locations is inferred to be relatively permeable and generally suitable for in-ground disposal of storm water subject to consideration of the groundwater elevation. The existing (overlying) fills are not considered suitable for in-ground disposal of storm water due to the relatively high fines content. Existing fill should be completely removed in areas of in-ground storm water disposal. In-situ permeability testing should be considered in support of detailed design of an in-ground stormwater exfiltration system.

Design should also include consideration of tidal influences. It may be necessary to incorporate a retention structure or tank to hold drainage prior to discharge into the ground to accommodate fluctuating groundwater levels.

Permeable pavement structures have been used on similar developments on Vancouver Island. Levelton can assist with design of a permeable pavement structure, if requested.

4.4 NEW BOAT RAMP AND ADJACENT RETAINING WALLS / SLOPES

The new concrete boat ramp should be supported on a subgrade consisting of competent natural soils and / or engineered fill placed above a suitable subgrade. Due to its position relative to the site in general, the prepared subgrade for the ramp is anticipated to consist of intact, compact, non-organic beach deposits of sand and gravel. The concrete slab should be underlain by a 300 mm thick layer of crushed gravel base course compacted to a minimum of 95% MPMDD. Detailed design should consider filter compatibility with the underlying soils.

The concrete mix design for the new ramp should be specially developed to resist degradation in the salt water environment. Concrete design should be developed in general accordance with CSA A23.9 which provides guidelines for design of concrete exposed to chlorides.

At the time of the subsurface assessment, the ramp was bounded on the north and south sides by graded slopes with riprap surfacing. It is understood that as part of the proposed upgrades these slopes could be replaced with retaining walls. For this application, retaining walls could consist of large modular concrete blocks (such as Lock-Blocks®), cast-in-place concrete or segmental block walls (such as Allen Block® or Keystone®). The type of wall selected should be suitable for use in a

marine environment and should be able to accommodate some movement / settlement of the underlying beach deposits over time.

Geotechnical input to retaining wall design generally includes the foundation bearing capacity, the expected magnitude of lateral soil loads under design loading conditions, and requirements for geogrid reinforcement within the backfill. In this case, design would also include consideration of wave action (including input from others) and potential for fluctuating saturated backfill conditions (due to tide effects). We have assumed that retaining walls would not be required to be designed for seismic loading conditions.

The underlying natural compact sand and gravel or stiff clay / silt would generally provide suitable bearing for a retaining structure under static loading conditions.

The expected range of construction costs would vary from a graded slope with riprap as the least expensive up through concrete blocks to cast-in-place concrete as the most expensive. The cast concrete wall would require input and design from a structural engineer and would typically have less tolerance to movements.

It is anticipated that the City will have input to the wall / slope type and configuration chosen for the upgrade. Once that decision has been made, detailed geotechnical design input can be provided for that particular type of wall.

4.5 WHARF STRUCTURE

According to preliminary information provided by Outlook, a conceptual design for the wharf structure includes a line of four piles along the centerline of the new boat ramp to provide support for a new floating dock off-shore east of the filled areas described above. We understand that final design will be dependent in part upon input from the public and the City and could involve a pile layout different than shown or even exclude a piled structure.

Based on the information from the current shoreline assessment, and previous local work (including work directly across the street that encountered 7 m thickness of soil conditions similar to those encountered in the recent shoreward drilling program), piles appear to be feasible for construction of the floating wharf. Notwithstanding, we caution that ground conditions can change over short distances at the shoreline and additional subsurface assessment work should be considered.

We understand that piles would be required primarily to resist lateral loads from wave and tidal actions and not need to support significant vertical loads. As such, it will be critical that the piles are embedded into the ground a sufficient distance to achieve fixity. Based on our current understanding of the project, we recommend open ended steel pipe piles since treated timber piles could encounter premature refusal on coarse gravels and / or stiff hard deposits. The depth required to achieve fixity will be dependent upon a number of details not currently known, including the load

conditions (i.e., lateral forces), pile details (i.e., length, size, type, stiffness, etc.), soil strength and dredging plans which will be reviewed during detailed design.

Based on similar structures constructed in the area, preliminary indications suggest the design could include steel pipe piles in the order of 0.6 m diameter with an embedment in the order of 6 to 10 m. Pile embedment requirements will need to be confirmed during detailed design.

To verify soil conditions offshore would be an involved process beyond the scope of this assessment. In addition, due to the relatively small number of piles involved in relation to mobilization for a barge and drill rig there may be merit in combining the subsoil verification program with construction (i.e.,. arriving at site prepared to install the production piles at the same time as drilling or advancing test piles).

4.6 PRELIMINARY CONSTRUCTION CONSIDERATIONS

Construction considerations will be dependent upon the final design and layout of the various facilities. At this time we generally envisage excavation to remove poor quality soils and install new underground service pipes, work in the foreshore area to construct the new ramp and adjacent slopes / retaining structures and possibly dredging / offshore pile driving for new docking facilities.

Temporary excavation slopes for underground service line installations and / or general poor soil removal are not expected to be stable in steep cut conditions. Mechanical shoring (such as a trench box for the utility excavations) or grading back slopes should be anticipated. For preliminary planning purposes, we suggest that a temporary excavation slope with a maximum gradient of 1H:1V (horizontal:vertical) be used in areas of limited groundwater seepage. Depending on the depth of excavation, mid-slope benches may be required to maintain temporary stability. The presence of groundwater seepage – which would be expected to vary with the tides – may require that the side slope gradients be reduced and / or make shoring mandatory.

We understand that the City intends to upgrade Highway 19A. The sequencing of that work with the boat ramp upgrades should be considered in the context of temporary excavation stability – in particular if deep utility installations are proposed near the new highway.

It is recommended that a qualified Geotechnical Engineer review the excavation conditions in the field and confirm the requirements for side slope configuration. All excavations must be carried out in accordance with WorkSafe BC regulations.

The fills encountered were generally silty and excavation for construction could generate a substantial amount of sediment. Depending on prevailing weather conditions and / or groundwater levels during construction, effective control of erosion and sedimentation will be necessary to avoid sediment laden runoff from entering the ocean and / or near-by storm water sewers.

5.0 FUTURE GEOTECHNICAL WORK

Based on the results of the recent assessment, it is anticipated that the following geotechnical tasks could be required as the project moves into detailed design and construction:

- Geotechnical assistance with pile design in particular with respect to lateral loads and recommended minimum penetration for fixity;
- Off-shore subsurface assessment (i.e., probing, drilling, test piling, etc.) to determine potential pile driving conditions and confirm pile installation feasibility;
- Geotechnical design support for retaining walls dependent upon wall type, configuration, and backfill requirements;
- Assistance with and / or review of final pavement structure design in the context of the site preparation methodology selected by the City;
- Assistance with and / or review of concrete mix design in relation to marine application, if requested;
- Further drilling / test pits to better define the lateral extent of fills and / or confirm the favourable conditions inferred on site to north (for contract tendering purposes);
- Field permeability testing within the natural sand and gravel in support of in-ground stormwater disposal design, if requested;
- Review of design and tender documents for general agreement with geotechnical recommendations; and,
- Construction review services: including subgrade reviews, observation of pile driving, in place density testing of engineered fill, and concrete / asphalt testing.

Levelton would be pleased to provide estimated costs and / or budget amounts for the services outlined above.

6.0 CLOSURE

This report has been prepared for the exclusive use of Outlook Land Design Inc. The report has been prepared in accordance with the attached Terms of Reference for Geotechnical Reports

We trust this information meets your needs at the present time. Please do not hesitate to contact the undersigned if you have any questions in the interim.

Yours truly,
LEVELTON CONSULTANTS LTD.

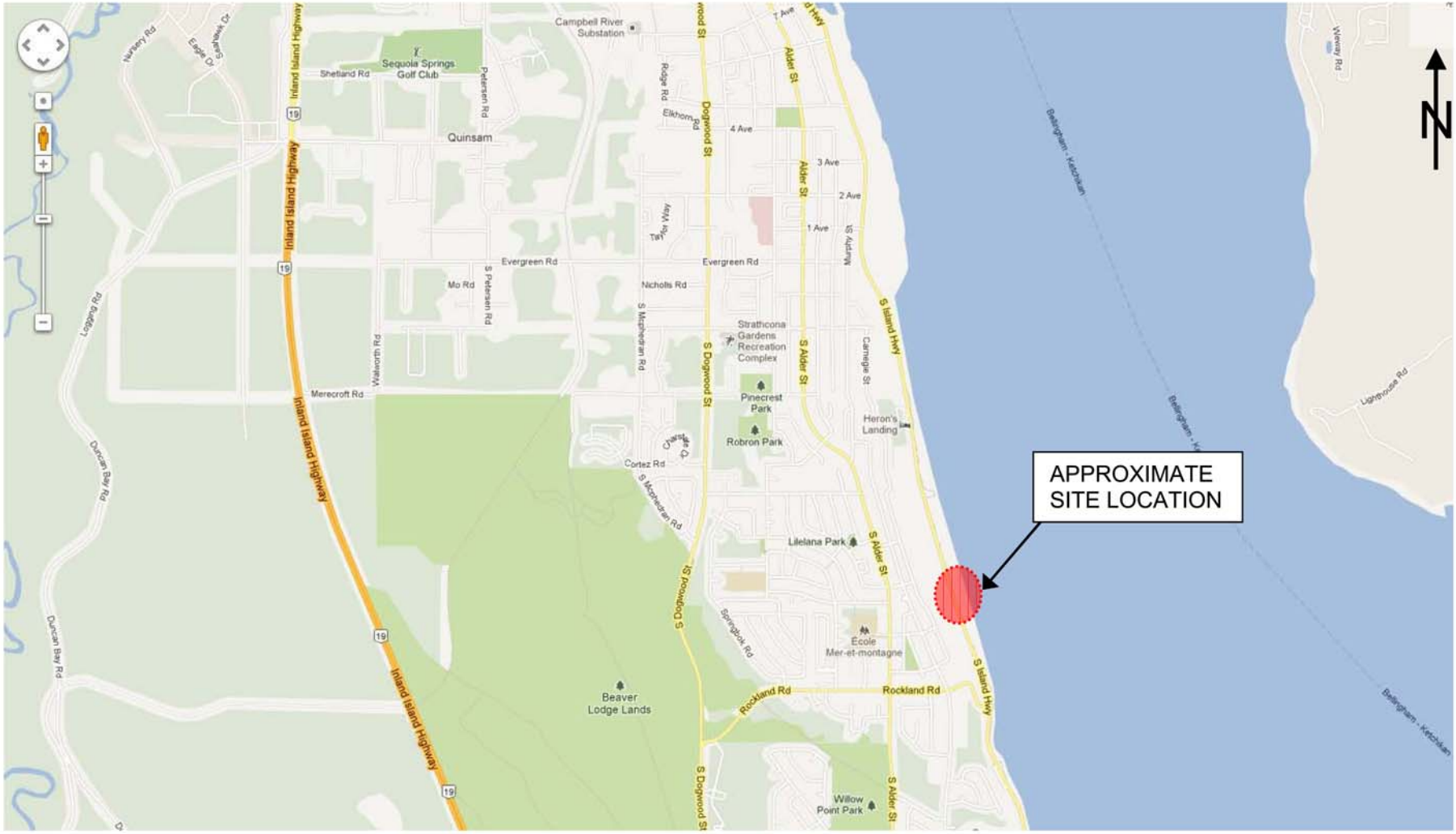
Reviewed by:

SIGNATURE ON FILE

Per: Tom Oxland, P.Eng.
Senior Geotechnical Engineer

Darryl Furey, P.Eng
Senior Geotechnical Engineer

Attachments: Figure 1 – Site Location Plan
Figure 2 – Site Plan
Bore Hole Summary Logs
Terms of Reference for Geotechnical Reports

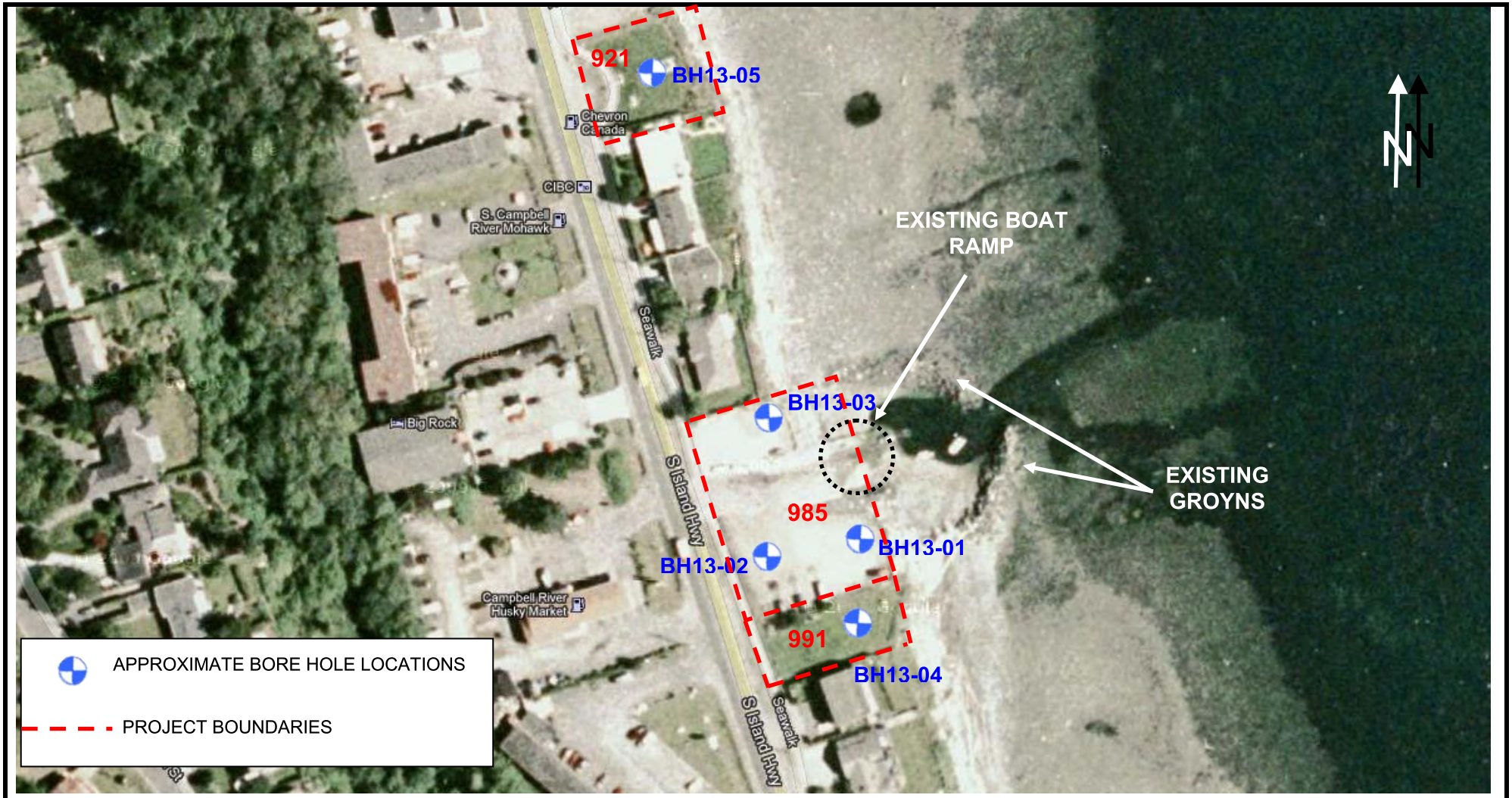


LEVELTON

PROJECT:	CAMPBELL RIVER BOAT RAMP – GEOTECHNICAL ASSESSMENT
TITLE:	SITE LOCATION PLAN
CLIENT:	OUTLOOK LAND DESIGN INC.

FIGURE NO.:	DATE:	FILE NO.:	SCALE:	DRAWN BY:
1	MARCH 2013	VI13-0021-00	NTS	RB

Levelton Consultants Ltd., 1935 Bollinger Road, Nanaimo, B.C., V9S 5W9 Phone: 250/753-1077 Fax: 250/753-1203 Email: nanaimo@levelton.com



LEVELTON

PROJECT: CAMPBELL RIVER BOAT RAMP – GEOTECHNICAL ASSESSMENT					
TITLE: BORE HOLE LOCATION PLAN					
CLIENT: OUTLOOK LAND DESIGN INC.					
FIGURE NO.: 2	DATE: MARCH 2013	FILE NO.: VI13-0021-00	SCALE: NTS	DRAWN BY: RB/TWO	REV.

Levelton Consultants Ltd., 1935 Bollinger Road, Nanaimo, B.C., V9S 5W9 Phone: 250/753-1077 Fax: 250/753-1203 Email: nanaimo@levelton.com

LEVELTON

Big Rock Boat Ramp Upgrade
Campbell River, BC
Geotechnical Assessment

BH13-01

Project No: VI13-0021

Depth (m)	Depth (ft)	Description	C	N	Type	Water Level
		Black, silty, **SAND AND GRAVEL FILL,** moist, organic debris.				
	2	Dark grey, silty, **SAND FILL,** dry to moist.				
1	4				G	
	6	Brown/black, silty, **SAND AND GRAVEL FILL,** moist, wood debris.				
2					G	
	8					
3	10	Grey, **GRAVEL,** some sand, wet.				
	12					
4	14	Very stiff, grey blue, **CLAY,** moist.			G	
		Bottom of hole at 4.5 metres				
5	16					
	18					
6	20					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
S : Shelby
FP : Fixed Piston
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

- ● Moisture Content %
- ► Plastic Limit
- ◄ Liquid Limit
- ▼ Ground Water Level
- (X) Shear strength in kPa (Torvane or Penetrometer)
- X Shear strength in kPa (Unconfined)
- ⊗ Shear strength in kPa (field vane)
- ☒ Remolded strength in kPa
- ■ Percent Passing # 200 sieve

Drill Method: Solid Stem Auger
Date Drilled: 2/1/2013
By: Grass Roots Drilling

LEVELTON

Big Rock Boat Ramp Upgrade
Campbell River, BC
Geotechnical Assessment

BH13-02

Pg 1 of 1

Project No: VI13-0021

Depth (m)	Depth (ft)	Description	C	N	Type	Water Level
		Black/grey, silty, **SAND FILL,** trace gravel, moist, trace wood debris.				
	2	Dark grey, **SAND (FILL?),** trace gravel, wet.				
1	4				G	
		GRAVEL.				
	6	**SAND AND GRAVEL.**				
2	8				G	
3	10	Bottom of hole at 3.0 metres				
	12					
4	14					
	16					
5	18					
6	20					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
S : Shelby
FP : Fixed Piston
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

- ● Moisture Content %
- ► Plastic Limit
- ◄ Liquid Limit
- ▼ Ground Water Level
- (X) Shear strength in kPa (Torvane or Penetrometer)
- X Shear strength in kPa (Unconfined)
- ⊗ Shear strength in kPa (field vane)
- ☒ Remolded strength in kPa
- ■ Percent Passing # 200 sieve

Drill Method: Solid Stem Auger
Date Drilled: 2/1/2013
By: Grass Roots Drilling

LEVELTON

Big Rock Boat Ramp Upgrade
Campbell River, BC
Geotechnical Assessment

BH13-03

Project No: VI13-0021

Depth (m)	Depth (ft)	Description	C	N	Type	Water Level
		Grey, **SILT FILL,** some sand and gravel, moist.				
	2					
		WOOD DEBRIS (LOG).				
1	4					
		Grey, **SAND AND GRAVEL,** trace silt, wet, trace wood debris in upper 0.3m, low recovery from 1.4 to 3.0m, becoming silty with depth.				
	6					
2						
	8					
3	10					
	12					
4					G	
	14					
		Bottom of hole at 4.5 metres				
	16					
5						
	18					
6						
	20					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
S : Shelby
FP : Fixed Piston
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

- Moisture Content %
- Plastic Limit
- Liquid Limit
- Ground Water Level
- Shear strength in kPa (Torvane or Penetrometer)
- Shear strength in kPa (Unconfined)
- Shear strength in kPa (field vane)
- Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method: Solid Stem Auger
Date Drilled: 2/1/2013
By: Grass Roots Drilling

LEVELTON

Big Rock Boat Ramp Upgrade
Campbell River, BC
Geotechnical Assessment

BH13-04

Project No: VI13-0021

Depth (m)	Depth (ft)	Description	C	N	Type	Water Level
		Brown, sandy, **SILT FILL,** trace gravel, moist, wood debris, pockets of grey clay.				
		Grey, **GRAVEL,** some sand, trace silt, wet, very low recovery.				
		Bottom of hole at 3.6 metres				

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
S : Shelby
FP : Fixed Piston
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

- Moisture Content %
- Plastic Limit
- Liquid Limit
- Ground Water Level
- Shear strength in kPa (Torvane or Penetrometer)
- Shear strength in kPa (Unconfined)
- Shear strength in kPa (field vane)
- Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method: Solid Stem Auger
Date Drilled: 2/1/2013
By: Grass Roots Drilling

LEVELTON

Big Rock Boat Ramp Upgrade
Campbell River, BC
Geotechnical Assessment

BH13-05

Project No: VI13-0021

Depth (m)	Depth (ft)	Description	C	N	Type	Water Level
		Brown, **ORGANIC SILT,** wet, occasional rootlets.				
		Dark grey, **SAND,** some gravel, wet, becoming gravelly with depth.				
1	4				G	
2	8				G	
3	10	Bottom of hole at 3.0 metres				

10 20 30 40 50 60 70 80 90

1 LOG PER PAGE VI13-0021_2013-02-04_CAMPBELL_RIVER_BOAT_RAMP.GPJ LEVELTON.GDT 3/20/13

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
S : Shelby
FP : Fixed Piston
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type: Trip Hammer

- ● Moisture Content %
- ► Plastic Limit
- ◄ Liquid Limit
- ▼ Ground Water Level
- (X) Shear strength in kPa (Torvane or Penetrometer)
- X Shear strength in kPa (Unconfined)
- ⊗ Shear strength in kPa (field vane)
- ☒ Remolded strength in kPa
- ■ Percent Passing # 200 sieve

Drill Method:
Solid Stem Auger
Date Drilled: 2/1/2013
By: Grass Roots Drilling

TERMS OF REFERENCE FOR GEOTECHNICAL REPORTS ISSUED BY LEVELTON CONSULTANTS LTD.

LEVELTON

1. STANDARD OF CARE

Levelton Consultants Ltd. ("Levelton") prepared and issued this geotechnical report (the "Report") for its client (the "Client") in accordance with generally-accepted engineering consulting practices for the geotechnical discipline. No other warranty, expressed or implied, is made. Unless specifically stated in the Report, the Report does not address environmental issues.

The terms of reference for geotechnical reports issued by Levelton (the "Terms of Reference") contained in the present document provide additional information and caution related to standard of care and the use of the Report. The Client should read and familiarize itself with these Terms of Reference.

2. COMPLETENESS OF THE REPORT

All documents, records, drawings, correspondence, data, files and deliverables, whether hard copy, electronic or otherwise, generated as part of the services for the Client are inherent components of the Report and, collectively, form the instruments of professional services (the "Instruments of Professional Services"). The Report is of a summary nature and is not intended to stand alone without reference to the instructions given to Levelton by the Client, the communications between Levelton and the Client, and to any other reports, writings, proposals or documents prepared by Levelton for the Client relative to the specific site described in the Report, all of which constitute the Report.

TO PROPERLY UNDERSTAND THE INFORMATION, OBSERVATIONS, FINDINGS, SUGGESTIONS, RECOMMENDATIONS AND OPINIONS CONTAINED IN THE REPORT, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. LEVELTON CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT AND ITS VARIOUS COMPONENTS.

3. BASIS OF THE REPORT

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

4. USE OF THE REPORT

The information, observations, findings, suggestions, recommendations and opinions contained in the Report, or any component forming the Report, are for the sole use and benefit of the Client and the team of consultants selected by the Client for the specific project that the Report was provided. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION OR COMPONENT WITHOUT THE WRITTEN CONSENT OF LEVELTON. Levelton will consent to any reasonable request by the Client to approve the use of this Report by other parties designated by the Client as the "Approved Users". As a condition for the consent of Levelton to approve the use of the Report by an Approved User, the Client must provide a copy of these Terms of Reference to that Approved User and the Client must obtain written confirmation from that Approved User that the Approved User will comply with these Terms of Reference, such written confirmation to be provided separately by each Approved User prior to beginning use of the Report. The Client will provide Levelton with a copy of the written confirmation from an Approved User when it becomes available to the Client, and in any case, within two weeks of the Client receiving such written confirmation.

The Report and all its components remain the copyright property of Levelton and Levelton authorises only the Client and the Approved Users to make copies of the Report, but only in such quantities as are reasonably necessary for the use of the Report by the Client and the Approved Users. The Client and the Approved Users may not give, lend, sell or otherwise disseminate or make the Report, or any portion thereof, available to any party without the written permission of Levelton. Any use which a third party makes of the Report, or any portion of the Report, is the sole responsibility of such third parties. Levelton accepts no responsibility for damages suffered by any third party resulting from the use of the Report. The Client and the Approved Users acknowledge and agree to indemnify and hold harmless Levelton, its officers, directors, employees, agents, representatives or sub-consultants, or any or all of them, against any claim of any nature whatsoever brought against Levelton by any third parties, whether in contract or in tort, arising or related to the use of contents of the Report.

TERMS OF REFERENCE FOR GEOTECHNICAL REPORTS ISSUED BY LEVELTON CONSULTANTS LTD. (continued)

5. INTERPRETATION OF THE REPORT

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

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

c. **Additional Involvement by Levelton**: To avoid misunderstandings, Levelton should be retained to assist other professionals to explain relevant engineering findings and to review the geotechnical aspects of the plans, drawings and specifications of other professionals relative to the engineering issues pertaining to the geotechnical consulting services provided by Levelton. To ensure compliance and consistency with the applicable building codes, legislation, regulations, guidelines and generally-accepted practices, Levelton should also be retained to provide field review services during the performance of any related work. Where applicable, it is understood that such field review services must meet or exceed the minimum necessary requirements to ascertain that the work being carried out is in general conformity with the recommendations made by Levelton. Any reduction from the level of services recommended by Levelton will result in Levelton providing qualified opinions regarding adequacy of the work.

6. ALTERNATE REPORT FORMAT

When Levelton submits both electronic and hard copy versions of the Instruments of Professional Services, the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding upon Levelton. The hard copy versions submitted by Levelton shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions; furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed and sealed versions of the Instruments of Professional Services maintained or retained, or both, by Levelton shall be deemed to be the overall originals for the Project.

The Client agrees that the electronic file and hard copy versions of Instruments of Professional Services shall not, under any circumstances, no matter who owns or uses them, be altered by any party except Levelton. The Client warrants that the Instruments of Professional Services will be used only and exactly as submitted by Levelton.

The Client recognizes and agrees that Levelton prepared and submitted electronic files using specific software or hardware systems, or both. Levelton makes no representation about the compatibility of these files with the current or future software and hardware systems of the Client, the Approved Users or any other party. The Client further agrees that Levelton is under no obligation, unless otherwise expressly specified, to provide the Client, the Approved Users and any other party, or any or all of them, with specific software and hardware systems that are compatible with any electronic submitted by Levelton. The Client further agrees that should the Client, an Approved User or a third party require Levelton to provide specific software or hardware systems, or both, compatible with the electronic files prepared and submitted by Levelton, for any reason whatsoever included but not restricted to an order from a court, then the Client will pay Levelton for all reasonable costs related to the provision of the specific software or hardware systems, or both. The Client further agrees to indemnify and hold harmless Levelton, its officers, directors, employees, agents, representative or sub-consultant, or any or all of them, against any claim or any nature whatsoever brought against Levelton, whether in contract or in tort, arising or related to the provision or use or any specific software or hardware provided by Levelton.

Scope

Test pitting was undertaken in the intertidal zone of the Big Rock Boat Ramp, 985 South Island Highway, Campbell River on June 23, 2017. The purpose of the test pits was to determine the presence/absence of rock that could interfere with the driving of piles and the characteristic of the soils.

Procedure

Test pitting was undertaken with a CAT 330, a relatively large excavator with a weight of about 36 tonnes.

The work commenced at 1030 and was completed by 1200. The stage of the tide cycle during this period was a low tide at 1136 with the tide height of 0.5 metres (hydrographic datum). An environmental monitor was in attendance to review each of the test pit locations for the presence of items of environmental significance.

No fish were harmed during the excavation process as all excavations took place on the dewatered areas on the site. Three test pits were dug at the locations shown on the attached plan.

The ground and soil conditions for all test pits were similar:

1. Top layer of sands and cobbles ranging in size from 25 mm to 300 mm to a depth no greater than 300 mm.
2. Dark grey inorganic silt with little plasticity. This material has grains of uniform size and readily dries when exposed. The consistency of the soil is stiff, however, in an unconfined state it can be easily broken by hand.

The holes were advanced to a depth of 4.0 – 4.5 m; the sides of the excavation were stable and showed no signs of sloughing or ingress of water.

The test pits were backfilled with the excavated material and covered with cobble.

Photographs

Conclusion and Recommendation

The substrate soils at the Big Rock Boat Launch are suitable for the typical single piling used to secure boat dock sections. No rock was encountered in the depth range anticipated for this type of pile.

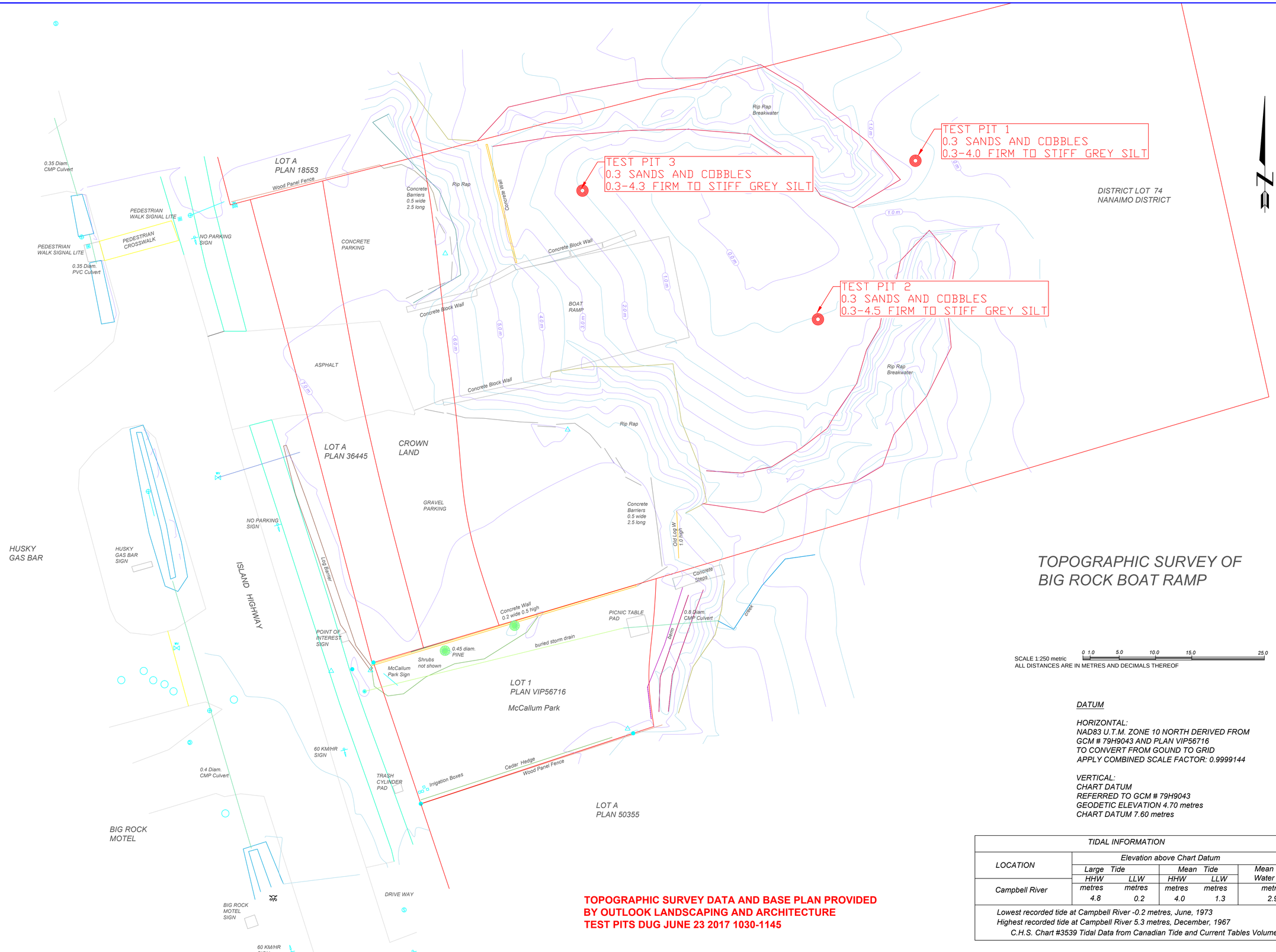
Limitations

The review of the existing soils was undertaken only to determine depths to solid rock and suitability for driving piles for securing dock structures. No other opinions and warranties have been expressed or made.

HIGHLAND ENGINEERING SERVICES LTD.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA STEPHENS

Richard K Stephens, PEng
Enc. Test Pit Location Plan
RKS/ae



TOPOGRAPHIC SURVEY OF BIG ROCK BOAT RAMP

SCALE 1:250 metric
ALL DISTANCES ARE IN METRES AND DECIMALS THEREOF

0 1.0 5.0 10.0 15.0 25.0

DATUM

HORIZONTAL:
NAD83 U.T.M. ZONE 10 NORTH DERIVED FROM
GCM # 79H9043 AND PLAN VIP56716
TO CONVERT FROM GOUND TO GRID
APPLY COMBINED SCALE FACTOR: 0.9999144

VERTICAL:
CHART DATUM
REFERRED TO GCM # 79H9043
GEODETIC ELEVATION 4.70 metres
CHART DATUM 7.60 metres

TOPOGRAPHIC SURVEY DATA AND BASE PLAN PROVIDED BY OUTLOOK LANDSCAPING AND ARCHITECTURE
TEST PITS DUG JUNE 23 2017 1030-1145

TIDAL INFORMATION

LOCATION	Elevation above Chart Datum				
	Large Tide		Mean Tide		Mean Water Level
	HHW	LLW	HHW	LLW	
Campbell River	metres	metres	metres	metres	metres
	4.8	0.2	4.0	1.3	2.9

Lowest recorded tide at Campbell River -0.2 metres, June, 1973
Highest recorded tide at Campbell River 5.3 metres, December, 1967
C.H.S. Chart #3539 Tidal Data from Canadian Tide and Current Tables Volume 6

BC 1 CALL — CALL BEFORE YOU DIG! 1-800-474-6886 or by CELLULAR *6886
CALL AT LEAST 3 FULL WORKING DAYS BEFORE YOU PLAN TO DIG

NO.	REVISION	BY	YY/MM/DD
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–

EXISTING	LEGEND	DESIGN
T	U/G TELEPHONE	T
H	U/G HYDRO	H
G	NATURAL GAS	G
	PERMEABLE PAVING	
S	SANITARY SEWER	S
D	STORM DRAIN	D
W	WATER MAIN	W
P	PAVEMENT	P
C	CURB & GUTTER	C
	SIDEWALK	
	INFILTRATION SWALE	

EXISTING	LEGEND	DESIGN
O.D.	OPEN DITCH	O.D.
SMH	SANITARY MANHOLE	SMH
DMH	STORM MANHOLE	DMH
SIDE INLET TOP INLET	CATCH BASIN	SIDE INLET TOP INLET
HYD.	FIRE HYDRANT	HYD.
W.V.	WATER VALVE	W.V.
U.P.	UTILITY POLE	U.P.

DESIGNED: RKS/HT
DRAWN: HT
CHECKED: –
APPROVED: –
SCALE: AS SHOWN
DATE: MAR 2017
DATE: –
DATE: –

HIGHLAND Engineering Services Ltd.
#104-950 Alder Street, Campbell River, B.C. V9W 2P8
(250) 287-2825
highland@highland-eng.ca
www.highland-eng.ca

TITLE:
CITY OF CAMPBELL RIVER
BIG ROCK BOAT RAMP
985 SOUTH ISLAND HIGHWAY
CAMPBELL RIVER, BC
TEST PIT LOCATION PLAN

CITY DWG #: –
PROJECT: 4079
SHEET 1 OF 1
REV. –