



**KERR WOOD LEIDAL**  
consulting engineers

Greater Vancouver  
300 – 4185 Still Creek Drive  
Burnaby, BC V5C 6G9  
T 604 294 2088

Contract Documents for

# Primary Sedimentation Tank Upgrades

FINAL

Reference Number: E-40103

January 2025

KWL Project No. 0029.372

Prepared for:



Resort Municipality  
of Whistler

1. Documents that are provided include:
  - a. Addenda (*Not Used for Tender*).
  - b. Invitation to Tender.
  - c. Instructions to Tenderers – Part I.
  - d. Form of Tender:
    - i. Appendix 1 – Schedule of Quantities and Prices,
    - ii. Appendix 2 – Preliminary Construction Schedule,
    - iii. Appendix 3 – Experience of Superintendent,
    - iv. Appendix 4 – Comparable Work Experience,
    - v. Appendix 5 – Subcontractors,
    - vi. Bonds,
    - vii. Copy of Additional Insureds,
    - viii. WorkSafe BC Certificate,
    - ix. Baseline Schedule, and
    - x. RMOW Business License.
  - e. Form of Agreement:
    - i. Schedule 1, Schedule of Contract Documents, and
    - ii. Schedule 2, List of Contract Documents.
  - f. Supplemental General Conditions – Part I Issued by MMCD.
  - g. Supplemental General Conditions – Part II Project Specific.
  - h. Supplemental Standard Detail Drawings – Part I – Issued by MMCD (*Not Used*).
  - i. Supplemental Specifications – Part I – Issued by MMCD.
  - j. Supplemental Specifications – Part II – Project Specific.
    - i. Division 3: Concrete Repair
      - 03 01 37 – Concrete Restoration.
    - ii. Division 46: Water and Wastewater Equipment:
      - 46 43 11 – Primary Sedimentation Tank Equipment.
  - k. Supplemental Specifications – Part III – Payment.
  - l. Attachments:
    - i. Attachment A – Available Record Drawings,
    - ii. Attachment B – Issue for Tender Drawings,
    - iii. Attachment C – Concrete Restoration Products,
    - iv. Attachment D – Safe Work Entry Procedures,
    - v. Attachment F – PST Access Stairs Drawings, and
    - vi. Attachment F – Concrete Inspection Report.

2. Standard Documents not included but referred to as part of the Tender Documents (available in the 'MMCD – General Conditions, Specifications and Standard Detail Drawings').
  - a. Instructions to Tenderers – Part II.
  - b. General Conditions.
  - c. Standard Specifications.
  - d. Standard Detail Drawings.

# Invitation to Tender

**Owner:** Resort Municipality of Whistler  
(Name of Owner)

**Contract:** Primary Sedimentation Tank Upgrades  
(Title of Contract)

**Reference No.:** \_\_\_\_\_  
(Owner's Contract Reference Number)

**The Owner invites  
tenders for:**

The Project Scope of Work includes:

- a) Detailed work plan and schedule.
- b) Upgrading equipment in four Primary Sedimentation Tanks (PST) including chain and flight scraper mechanism, scum trough and finger baffles, and restoring concrete.

An outline of the scope of work is listed below (for details see Bill of Materials in the drawing package):

**1) PST-1**

**Longitudinal Collectors:**

- Removal and replacement of drive gearbox, head shaft wall bearing (housing and inserts), unused grease tubing on idler shaft wall bearings, and flight return rails. Reuse all shafts.

**Cross Collectors:**

- Removal and replacement of drive (480 V motor and gearbox), unused grease tubing on idler shaft wall bearings, and floor rail system. Reuse all shafts.

**Miscellaneous:**

- Removal and replacement of finger baffles, rotating scum trough pipe c/w drive mechanism, and
- PST-1 tank concrete restoration (optional).

**2) PST-2**

**Longitudinal Collectors:**

- Removal and replacement of drive (480 V motor and gearbox), unused grease tubing on idler shaft wall bearings, and flight return rails. Reuse all shafts.

**Cross Collectors:**

- Removal and replacement of drive (480 V motor and gearbox), unused grease tubing on idler shaft wall bearings, and floor rail system. Reuse all shafts.

**Miscellaneous:**

- Removal and replacement of finger baffles, rotating scum trough pipe c/w drive mechanism,
- PST-2 tank concrete restoration (optional), and
- PST-2 concrete joint repair.

**3) PST-3**

**Longitudinal Collectors:**

- Complete removal and replacement of the mechanical system and the drive (480 V motor and gearbox). Reuse all shafts.

**Cross Collectors:**

- Complete removal and replacement of the mechanical system and the drive (480 V motor and gearbox). Reuse all shafts.

**Miscellaneous:**

- Removal and replacement of finger baffles, scum trough and drive mechanism, and
- Facilitate tank concrete inspection.

#### 4) PST-4

##### Longitudinal Collectors:

- Complete removal and replacement of the mechanical system and the drive (480 V motor and gearbox). Reuse all shafts.

##### Cross Collectors:

- Complete removal and replacement of the mechanical system and the drive (480 V motor and gearbox). Reuse all shafts.

##### Miscellaneous:

- Removal and replacement of finger baffles, scum trough and drive mechanism,
- Facilitate tank concrete inspection.

c) Disposal of removed equipment and materials at a registered solid waste facility.

d) Owner supplied equipment: none.

e) Installation of equipment related to PSTs.

f) Testing and commissioning of all electro-mechanical equipment in all four PSTs, including testing of limit switches and motor hand off auto switches, for four fully functional primary treatment systems.

g) Site visit by manufacturer's representative for commissioning of all four PSTs and Operator training.

h) Construction must be complete by substantial performance date identified in the Invitation to Tender.

i) All spaces below walkway elevation are confined spaces, with entry permitted through use of a custom staircase, of which there is only one, to declassify the space. The Contractor must follow the RMOW-prepared WorkSafe BC approved entry plans while working in these spaces and conform to WorkSafe BC requirements.

j) Clean up and restoration of all temporary work to original or better condition.

k) Track all fuel consumption and provide to Contract Administrator monthly.

#### Contract Documents are available at

Tender documents are available online at BC Bid (<https://www.bcbid.gov.bc.ca/>), and Resort Municipality of Whistler's opportunities webpage (<https://www.whistler.ca/business/doing-business/bidAuigus-opportunities>). Tenderers are advised to check regularly for addenda and updates. It is the Tenderer's responsibility to ensure that all issued addenda are included in the tender.

#### Key Dates and Times: (All Times Local)

Tender Site Meeting (Mandatory)\*: Monday, January 20, 2025 at 10:00 a.m.  
Tender Enquiries Deadline:.....**Monday, January 27, 2025 at 2:00 p.m.**  
Tender Closing:.....**Monday, February 03, 2025 at 2:00 p.m.**  
Assumed Notice to Proceed:.....Friday, March 14, 2025  
Substantial Performance:.....Monday, August 31, 2026  
\*Refer to Instructions to Tenderers 4.6.1 for details on the site visit.

**Tenders will be  
received at:**

Sealed tenders clearly marked:  
**Primary Sedimentation Tank Upgrades  
Reference No.**

will be received at:

Attn: Michelle Blattner, Supervisor, Infrastructure Projects  
Resort Municipality of Whistler  
4325 Blackcomb Way  
Whistler, BC V8E 0X5

**Bid Security:**

Each tender must be accompanied by a Bid Security conforming to MMCD  
Platinum Edition *Instructions to Tenderers – Part II* in the amount of 10% of the  
tendered price.

**Owner's Representative:**

For more information, please contact:

Kerr Wood Leidal Associates Ltd.  
300 – 4185A Still Creek Drive  
Burnaby, BC V5C 6G9  
Phone: 778-270-9412  
Fax: N/A  
Attn.: Paul Markin, P.L.Eng., M.A.Sc.

# Instructions to Tenderers



(FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

(To be read with *Instructions to Tenderers – Part II*  
contained in the edition of the publication  
*Master Municipal Construction Documents* specified in Article 2.2 below)

*Owner:* Resort Municipality of Whistler  
(Name of Owner)

*Contract:* Primary Sedimentation Tank Upgrades  
(Title of Contract)

*Reference No.:* \_\_\_\_\_  
(Owner's Contract Reference Number)

**1.0 Introduction**

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

The Project Scope of Work includes:

- a) Detailed work plan and schedule.
- b) Upgrading equipment in four Primary Sedimentation Tanks (PST) including chain and flight scraper mechanism, scum trough and finger baffles, and restoring concrete.

An outline of the scope of work is listed below (for details see Bill of Materials in the drawing package):

**1) PST-1**

**Longitudinal Collectors:**

- Removal and replacement of drive gearbox, head shaft wall bearing (housing and inserts), unused grease tubing on idler shaft wall bearings, and flight return rails. Reuse all shafts.

**Cross Collectors:**

- Removal and replacement of drive (480 V motor and gearbox), unused grease tubing on idler shaft wall bearings, and floor rail system. Reuse all shafts.

**Miscellaneous:**

- Removal and replacement of finger baffles, rotating scum trough pipe c/w drive mechanism, and
- PST-1 tank concrete restoration (optional).

**2) PST-2**

**Longitudinal Collectors:**

- Removal and replacement of drive (480 V motor and gearbox), unused grease tubing on idler shaft wall bearings, and flight return rails. Reuse all shafts.

**Cross Collectors:**

- Removal and replacement of drive (480 V motor and gearbox), unused grease tubing on idler shaft wall bearings, and floor rail system. Reuse all shafts.

**Miscellaneous:**

- Removal and replacement of finger baffles, rotating scum trough pipe c/w drive mechanism,
- PST-2 tank concrete restoration (optional), and
- PST-2 concrete joint repair.

**3) PST-3**

**Longitudinal Collectors:**

- Complete removal and replacement of the mechanical system and the drive (480 V motor and gearbox). Reuse all shafts.

**Cross Collectors:**

- Complete removal and replacement of the mechanical system and the drive (480 V motor and gearbox). Reuse all shafts.

**Miscellaneous:**

- Removal and replacement of finger baffles, scum trough and drive mechanism, and
- Facilitate tank concrete inspection.

**4) PST-4**

**Longitudinal Collectors:**

- Complete removal and replacement of the mechanical system and the drive (480 V motor and gearbox). Reuse all shafts.

**Cross Collectors:**

- Complete removal and replacement of the mechanical system and the drive (480 V motor and gearbox). Reuse all shafts.

**Miscellaneous:**

- Removal and replacement of finger baffles, scum trough and drive mechanism,
  - Facilitate tank concrete inspection.
- c) Disposal of removed equipment and materials at a registered solid waste facility.
- d) Owner supplied equipment: none.
- e) Installation of equipment related to PSTs.
- f) Testing and commissioning of all electro-mechanical equipment in all four PSTs, including testing of limit switches and motor hand off auto switches, for four fully functional primary treatment systems.
- g) Site visit by manufacturer's representative for commissioning of all four PSTs and Operator training.
- h) Construction must be complete by substantial performance date identified in the Invitation to Tender.
- i) All spaces below walkway elevation are confined spaces, with entry permitted through use of a custom staircase, of which there is only one, to declassify the space. The Contractor must follow the RMOW-prepared WorkSafe BC approved entry plans while working in these spaces and conform to WorkSafe BC requirements.
- j) Clean up and restoration of all temporary work to original or better condition.
- k) Track all fuel consumption and provide to Contract Administrator monthly.
- 1.2 The Contractor may wish, upon approval from the Owner, to employ alternate methods of construction for this project.
- 1.3 Direct all technical inquiries regarding the Contract to the Contract Administrator:
- Paul Markin, P.L.Eng., M.A.Sc.  
**Kerr Wood Leidal Associates Ltd.**  
300 – 4185A Still Creek Drive  
Burnaby, BC V5C 6G9  
Phone: 778-270-9412  
Email: PMarkin@kwl.ca
- 1.4 Direct all general enquiries regarding the Contract to:
- Michelle Blattner, Supervisor, Infrastructure Projects  
Resort Municipality of Whistler  
4325 Blackcomb Way  
Whistler, BC V8E 0X5  
Phone: 604-366-1015  
Email: Mblattner@whistler.ca

## 2.0 Tender Documents

- 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 *Contract Drawings*”.
- 2.2 A portion of the *Contract Documents* are 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. They are those contained in the publication entitled ‘Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings’. Refer to Schedule 1 to the Agreement or, if not specified in Schedule 1, then the applicable edition shall be the most recent edition as of the date of the *Tender Closing Date*. 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 judgment about its reliability, accuracy, completeness, and relevance to the *Contract*, and neither the *Owner* nor any representative of the *Owner* gives any guarantee or representation that the additional information is reliable, accurate, complete or relevant.

## 3.0 Submission of Tenders

- 3.1 Tenders must be submitted electronically to:

**Email:** engineerbids@whistler.ca

**Tender Title:** Primary Sedimentation Tank Upgrades

**Reference No.** E-40103

on or before:

**Tender Closing Time: 2:00 pm**

**Tender Closing Date: Monday, February 03, 2025**

- 3.2 Time stamp on the received email will determine if the tender was received on time. Late tenders will not be accepted.
- 3.3 The email submission should indicate the Tender Title and Project Reference No. in the subject line and the full legal name of the Tenderer in the body of the email.
- 3.4 Tenderers should note that the maximum acceptable email size is 8 MB. If greater than 8 MB, Tenderers should email bids in multiple emails. If sending in multiple emails, each email should indicate the total number of emails that are being sent. All emails must be received prior to the submission deadline. Responses are to be prominently marked with the Tender Title and Project Reference, and the full legal name and return address of the respondent.

**4.0 Additional  
Instructions to  
Tenderers**

4.1 Award

- 4.1.1 The Owner will, following receipt of an acceptable tender, issue in writing a Notice of Award to the successful Tenderer. This notice will be given as soon as possible following the closing of tenders and, unless otherwise agreed to by the Tender, not later than sixty 60 days following the closing of tenders.

4.2 Hours of Work

- 4.2.1 The hours of work for all project sections must not extend beyond:

- 0700 h and 1700 h, inclusive, daily for the construction period.

The Contractor shall schedule their work within these hours and will not be permitted to commence work earlier than 0700 h and/or work later than 1700 h for the construction period, except as authorized by the Contract Administrator. Work on Saturdays and Sundays is permitted.

No work on statutory Holidays will be permitted except in case of emergency and then only with written permission of the Contract Administrator and to such extent as they deem it necessary. The Owner reserves the right to not allow any work to be undertaken on Statutory Holidays.

4.3 Budget Constraints

- 4.3.1 Depending on the available funds to complete the capital works program, the scope of work may be decreased due to budget constraints. The Owner reserves the right to reduce or remove projects based on available funds.

4.4 Amendment of Tenders

- 4.4.1 Fax amendments will not be accepted. Instructions to Tenderers – Part II, Section 12.0 Amendment of Tenders, paragraph 12.1 currently allows for fax delivery which will not be accepted in this case. Instead, tenderers are required to submit email amendments to the following (written notice delivered by hand and mail are still acceptable):

Paul Markin, P.L.Eng., M.A.Sc.  
PMarkin@kwl.ca

- 4.4.2 All amendments submitted by email shall meet all requirements detailed in GC12 -- Amendment of Tenders, paragraphs 12.1 through 12.5 for faxed, mailed, or hand-delivered modifications.

4.5 Approved Equals

- 4.5.1 Contractor may request the Owner to approve alternate materials, products or equipment (“Approved Equals”) for items indicated in the Contractor documents, provided such Approved Equals comply in all respects with the applicable Specifications. Applications for Approved Equals must be in writing and supported by appropriate supporting information, data, specifications and documentation. The Owner is not obligated to review or accept any applications for an Approved Equal and may decide to accept an application for an Approved Equal in its sole discretion.
- 4.6 Mandatory Tender Site Meeting
  - 4.6.1 Contractors must attend the tender site meeting. See Key Dates and Times in the Invitation to Tender for details. Contractors will be required to follow all guidelines and best practices put forward by the Government of BC and WorkSafeBC.
- 4.7 Owner’s Privilege
  - 4.7.1 Depending on the available funds to complete the work program, the scope of the work may be decreased due to budget constraints. The Owner reserves the right to reduce or remove projects based on available funds. This clause does not waive owner privileges noted under Instructions to Tenderers – Part II, Section 15.1.
- 4.8 Appendices
  - 4.8.1 Contractor to fill out and return all appendices provided in the Form of Tender.

# Form of Tender

FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT. TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STAND DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.

Owner: Resort Municipality of Whistler  
(Name of Owner)

Contract: Primary Sedimentation Tank Upgrades  
(Title of Contract)

Reference No.: \_\_\_\_\_  
(Owner's Contract Reference Number)

**To Owner**

**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)

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.

**ACCORDINGLY, WE  
HEREBY OFFER**

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

2.2 to achieve Substantial Performance of the Work on or before the date of Substantial Performance as stated under 'Key Dates and Times' on the 'Invitation to Tender

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 unit prices 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 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.

**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.

**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.

4.1.3 The *Consent of Security* – Performance, Labour and Materials Payment filled and signed.



**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 15 *Days* of receipt of the written *Notice of Award* deliver to the *Owner*:
- 5.1.1.1 a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the *Contract Price*, covering the performance of the *Work* including the *Contractor’s* obligations during the *Maintenance Period*, 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*;
- 5.1.1.2 a *Baseline Construction Schedule*, as provided by GC 4.6.1;
- 5.1.1.3 a ‘clearance letter’ indicating that the tenderer is in WCB compliance;
- 5.1.1.4 a copy of the insurance policies as specified in GC 24 and any Supplementary GCs indicating that all such insurance coverage is in place and; and
- 5.1.1.5 a business licence valid within the Resort Municipality of Whistler.
- 5.1.2 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*; and
- 5.1.3 sign the Contract Documents as required by GC 2.1.2.

**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 *Notice to Proceed*, then such failure or refusal will be deemed to be a refusal by us to enter into the *Contract* and the *Owner* may, on written notice to us, award the *Contract* to another party. 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 our *Tender Price* is less than the amount for which the *Owner* contracts with another party to perform the *Work*.

**OUR ADDRESS IS AS  
FOLLOWS**

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Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Attn.: \_\_\_\_\_

This Tender is executed this \_\_\_\_\_ day of \_\_\_\_\_, 2025.

\_\_\_\_\_  
(Full legal name of corporation, partnership or individual)

\_\_\_\_\_  
(Authorized Signatory)

\_\_\_\_\_  
(Authorized Signatory)

**Schedule of Quantities and Prices**  
**(See Paragraph 5.3.2 of the *Instructions to Tenderers – Part II*)**

(All prices and Quotations including the Contract Price shall not include GST. GST shall be shown separately.)

Refer to Supplemental Specification Part III for descriptions of all payment items.					
Section	Description	Unit	Est. Qty	Unit Price (\$)	Total(\$)
<b>Division 1 General Requirements</b>					
01 33 01	Project Record Documents	--	--	--	<i>Incidental</i>
01 42 00	Reference Specifications	--	--	--	<i>Incidental</i>
01 51 01	Temporary Utilities and Lighting	--	--	--	<i>Incidental</i>
01 52 01	Temporary Structures	--	--	--	<i>Incidental</i>
01 57 01	Environmental Protection	--	--	--	<i>Incidental</i>
<b>PST-1</b>					
<b>Division 46 Wastewater Equipment</b>					
46 43 11	Installation of All Mechanical Components for PST-1	LS	100%		
46 43 11	Testing and Commissioning of PST-1 Work	LS	100%		
<b>PST-2</b>					
<b>Division 03 Concrete</b>					
03 01 37	Restoration of Joint Seal	m	14		
<b>Division 46 Wastewater Equipment</b>					
46 43 11	Installation of All Mechanical Components for PST-2	LS	100%		
46 43 11	Testing and Commissioning of PST-2 Work	LS	100%		
<b>PST-3</b>					
<b>Division 46 Wastewater Equipment</b>					
46 43 11	Installation of All Mechanical Components for PST-3	LS	100%		
46 43 11	Testing and Commissioning of PST-3 Work	LS	100%		
<b>PST-4</b>					
<b>Division 46 Wastewater Equipment</b>					
46 43 11	Installation of All Mechanical Components for PST-4	LS	100%		
46 43 11	Testing and Commissioning of PST-4 Work	LS	100%		

**Schedule of Quantities and Prices**  
**(See Paragraph 5.3.2 of the *Instructions to Tenderers – Part II*)**

(All prices and Quotations including the Contract Price shall not include GST. GST shall be shown separately.)

<b>Optional Work Items</b>					
<b>Division 03 Concrete</b>					
03 01 37	PST-1 and PST-2 Concrete Surface Preparation	m	100		
03 01 37	PST-1 and PST-2 Concrete Restoration of Cracks, Erosion and Gravel Seams	m	100		
<b>Division 46 Wastewater Equipment</b>					
46 43 11	Spare Equipment	LS	100%		
				<b>Subtotal All Items</b>	
				<b>GST @ 5%</b>	
				<b>TOTAL</b>	

**Preliminary Construction Schedule**  
(See Paragraph 5.3.2 of the *Instructions to Tenderers – Part II*)

Activity	Contractor Proposed Schedule																																
	Weeks																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
<b>Phase I</b>																																	
Notice to Proceed																																	
Shop Drawings																																	
Equipment Delivery																																	
PST-1 Opt. Concrete Restoration																																	
PST-1 Mechanical Work																																	
PST 1 Recommissioning																																	
PST-2 Opt. Concrete Restoration																																	
PST-2 Mechanical Work																																	
PST-2 Recommissioning																																	
PST-3 and PST-4 Concrete Inspections																																	

**Preliminary Construction Schedule**  
(See Paragraph 5.3.2 of the *Instructions to Tenderers – Part II*)

Activity	Contractor Proposed Schedule																
	Weeks																
	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
<b>Phase II</b>																	
PST-3 Mechanical Work																	
PST-3 Recommissioning																	
PST-4 Mechanical Work																	
PST-4 Recommissioning																	
Substantial Performance Monday, August 31, 2026																	

**Experience of Superintendent**  
(See Paragraph 5.3.3 of the *Instructions to Tenderers – Part II*)

Name \_\_\_\_\_

**Experience**

<b>Dates:</b>	
<b>Project Name:</b>	
<b>Responsibilities:</b>	
<b>References:</b>	

<b>Dates:</b>	
<b>Project Name:</b>	
<b>Responsibilities:</b>	
<b>References:</b>	

<b>Dates:</b>	
<b>Project Name:</b>	
<b>Responsibilities:</b>	
<b>References:</b>	



**Comparable Work Experience**  
 (See Paragraph 5.3.5 of the *Instructions to Tenderers – Part II*)

Project	Owner/ Contact Name	Phone Number and Email	Work Description	Value (\$)



**Subcontractors**  
(See Paragraph 5.3.5 of the *Instructions to Tenderers – Part II*)

Tender Item	Trade / Equipment	Subcontractor / Supplier	Phone Number and Email
46 43 11	Mechanical Trades		
46 43 11	Electrical Trades		
03 01 37	Concrete Restoration		
46 43 11	Chain and Flight Equipment		
	Provide chain resin type: Provide drive chain stretch as % of length under working load: Provide collector chain stretch as % of length under working load:		
46 43 11	Scum Troughs		
46 43 11	Finger Baffles		
46 43 11	Motors and Drives		

# Agreement

(FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

BETWEEN OWNER AND CONTRACTOR

This agreement made in duplicate this \_\_\_\_\_ day of \_\_\_\_\_, 2025.

*Contract:*

Primary Sedimentation Tank Upgrades  
(Title of Contract)

*Reference No.:*

(Owner's Contract Reference Number)

BETWEEN

**Resort Municipality of Whistler**

(Name of Owner)

(the 'Owner')

AND

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(Name and Office Address of Contractor)

(the 'Contractor')

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

**Article 1**

**The Work Start /  
Completion Dates**

- 1.1 The Contractor shall 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 shall commence the Work in accordance with the Notice to Proceed. The Contractor shall proceed with the Work diligently, shall perform the Work generally in accordance with the construction Schedules as required by the Contract Documents and will achieve Substantial Performance of the Work on or before the date as noted in the Invitation to Tender under Key Dates and Times, 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 The Contract Documents consist of the documents listed or referred to in Schedule 1 - 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 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 unit prices 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 because 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 thereunder 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, or by fax, or by pre-paid registered mail to the addresses as set out below:

The *Owner*:

**Resort Municipality of Whistler**

**4325 Blackcomb Way**

**Whistler, BC V8E 0X5**

Fax: **N/A**

Attn.: **Michelle Blattner, Supervisor, Infrastructure Projects**

The *Contractor*:

Fax: \_\_\_\_\_

Attn.: \_\_\_\_\_

The *Contract Administrator*:

**Kerr Wood Leidal Associates Ltd.**

**300 – 4185A Still Creek Drive**

**Burnaby, BC V5C 6G9**

Fax: **N/A**

Attn.: **Paul Markin, P.L.Eng., M.A.Sc.**

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 by fax and received in hard copy; 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 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 assumes all risk that the fax is received in hard copy.

**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:*

\_\_\_\_\_  
(Full legal name of corporation, partnership or individual)

\_\_\_\_\_  
(Authorized Signatory)

\_\_\_\_\_  
(Authorized Signatory)

*Owner:*

**Resort Municipality of Whistler**

\_\_\_\_\_  
(Full legal name of corporation, partnership or individual)

\_\_\_\_\_  
(Authorized Signatory)

\_\_\_\_\_  
(Authorized Signatory)

(INCLUDE IN LIST ALL DOCUMENTS INCLUDING, IF ANY, SUPPLEMENTARY GENERAL CONDITIONS, SUPPLEMENTARY SPECIFICATIONS, SUPPLEMENTARY STANDARD DETAIL DRAWINGS.)

**Schedule 1  
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', Edition dated 2019. All sections of this publication are included in the Contract Documents.

- a) Agreement, including all Schedules;
- b) Invitation to Tender;
- c) Instructions to Tenderer – Part I
- d) Instructions to Tenderer – Part II\*;
- e) Form of Tender;
- f) Form of Agreement;
- g) Supplemental General Conditions, Part I – Issued by MMCD\*;
- h) Supplemental General Conditions, Part II – Project Specific;
- i) General Conditions\*;
- j) Supplemental Specifications, Part I – Issued by MMCD;
- k) Supplemental Specifications, Part II – Project Specific;
  - o Division 3: Concrete Repair
    - 03 01 37 – Concrete Restoration
  - o Division 46: Water and Wastewater Equipment
    - 46 43 11 – Primary Sedimentation Tank Equipment
- l) Supplemental Specifications, Part III – Payment
- m) Specifications\*;
- n) Standard Detail Drawings – Issued by MMCD\* (Not Used);
- o) Attachment A – Available Record Drawings
- p) Attachment B – Issue for Tender Drawings
- q) Attachment C – Concrete Restoration Products
- r) Attachment D – Safe Work Entry Procedures
- s) Attachment E – PST Access Stair Drawings
- t) Attachment F – Concrete Inspection Report
- u) The following Addenda:

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(Addenda, if any)

(COMPLETE LISTING OF ALL DRAWINGS, PLANS AND SKETCHES WHICH ARE TO FORM A PART OF THE CONTRACT, OTHER THAN STANDARD DETAIL DRAWINGS AND SUPPLEMENTARY STANDARD DETAIL DRAWINGS.)

**Schedule 2**

**List of Contract Drawings**

Drawing No.	Title	Rev. No.
G-001	LOCATION PLAN AND DRAWING LIST	0
G-002	PST BUILDING ACCESS	0
M-101	PST-1 PLAN	0
M-102	PST-1 PROFILE	0
M-201	PST-2 PLAN	0
M-202	PST-2 PROFILE	0
M-301	PST-3 PLAN	0
M-302	PST-3 PROFILE	0
M-401	PST-4 PLAN	0
M-402	PST-4 PROFILE	0
M-501	SECTIONS	0
M-502	BILL OF MATERIALS	0



**Supplemental General Conditions**  
**Part I – Issued by MMCD**

Supplemental updates are MMCD issued updates. A complete list of all the Supplemental General Conditions describing each change is not included in this document; however, detailed descriptions can be found on the MMCD website. Bidders are deemed to have visited the MMCD website and have reviewed and understand the Supplemental Updates. It is the Contractor's responsibility to ensure they are aware of all supplemental updates issued by MMCD at time of tender. Any supplemental update issued prior to tender close shall form part of the Contract Documents.

# **Supplemental General Conditions**

## **Part II – Project Specific**

Supplemental General Condition:	<b>GC 2.2.4S – Interpretation</b>		
Affected Document(s):	Volume II	Affected Document(s):	Volume II
Section:	General Conditions	Section:	General Conditions
Change Summary:	<b>Revise order of precedence for <i>Contract Documents</i>.</b>		
Currently:	<p>If there is any inconsistency or conflict between the provisions of the <i>Contract Documents</i>, then:</p> <p>(1) the <i>Contract Documents</i> shall govern and take precedence in the following order with the Agreement taking precedence over all other <i>Contract Documents</i>:</p> <ul style="list-style-type: none"> <li>(a) Agreement</li> <li>(b) Addenda</li> <li>(c) Supplemental General Conditions</li> <li>(d) General Conditions</li> <li>(e) Supplemental Specifications</li> <li>(f) Specifications</li> <li>(g) Drawings listed in Schedule 2 to the Agreement</li> <li>(h) Supplemental Detail Drawings</li> <li>(i) Standard Detail Drawings</li> <li>(j) Executed Form of Tender</li> <li>(k) Instructions to Tenderers</li> <li>(l) All other Contract Documents</li> </ul>		
Should Be:	<p>If there is any inconsistency or conflict between the provisions of the <i>Contract Documents</i>, then:</p> <p>(1) the <i>Contract Documents</i> shall govern and take precedence in the following order with the Agreement taking precedence over all other <i>Contract Documents</i>:</p> <ul style="list-style-type: none"> <li>(a) Agreement</li> <li>(b) Addenda</li> <li>(c) Supplemental General Conditions Part II – Project Specific</li> <li>(d) Supplemental General Conditions Part I – Issued by MMCD</li> <li>(e) General Conditions</li> <li>(f) Supplemental Specifications Part III – Payment</li> <li>(g) Supplemental Specifications Part II – Project Specific</li> <li>(h) Supplemental Specifications Part I – Issued by MMCD</li> <li>(i) Specifications:</li> <li>(j) Drawings listed in Schedule 2 to the Agreement</li> <li>(k) Supplemental Standard Detail Drawings Part II – Project Specific</li> <li>(l) Supplemental Standard Detail Drawings Part I – Issued by MMCD</li> <li>(m) Standard Detail Drawings</li> <li>(n) Executed Form of Tender</li> <li>(o) Instructions to Tenderers</li> <li>(m) All other Contract Documents</li> </ul>		

<b>Supplementary Specification:</b>	<b>Specification GC 4.2 – Safety</b>		
<b>Affected Document(s):</b>	Volume II	<b>Change Type:</b>	Addition
<b>Section:</b>	General Conditions	<b>Reference:</b>	4.2
<b>Currently:</b>	<p>4.2</p> <p>(1) 4.2.1 The <i>Contractor</i> shall be solely responsible for construction safety at the Place of the Work as and to the extent required by applicable construction safety legislation, regulations and codes, including the Workers Compensation Act and applicable regulations, and by good construction practice.</p>		
<b>Addition:</b>	<p>(2) 4.2.2 The <i>Contractor</i> shall be responsible for meeting all WorkSafeBC regulations including but not limited to:</p> <ul style="list-style-type: none"> <li>a. OHS Regulation Part 9, Section 9.18: Control of Harmful Substance In Adjacent Piping.</li> <li>b. OHS Regulation Part 5, Section 5.57: Designated Substances.</li> </ul> <p>(3) Plant staff will isolate, drain, lock out and clean the Primary Sedimentation Tanks before handover.</p> <p>(4) <i>Contractor</i> shall collaborate with the <i>Owner</i> on updates to the <i>Owner's</i> Safe Work Entry Procedure (SWEPE), which allows declassification of the space through use of one set of prefabricated access stairs. The updated SWEPE shall be updated for individual methods and products required to complete the Work and must receive approval by WorkSafe BC.</p>		

<b>Supplementary Specification:</b>	<b>Specification GC 13.9 – Liquidated Damages for Late Completion</b>		
<b>Affected Document(s):</b>	Volume II	<b>Change Type:</b>	Addition
<b>Section:</b>	General Conditions	<b>Reference:</b>	13.9
<b>Currently:</b>	<p>13.9</p> <p>(1) 13.9.1 If the <i>Contractor</i> fails to meet the <i>Milestone Date</i> for <i>Substantial Performance</i> as set out in the <i>Form of Tender</i>, paragraph 2.2 as may be adjusted pursuant to the provisions of the <i>Contract Documents</i>, then the <i>Owner</i> may deduct from any monies owing to the <i>Contractor</i> for the <i>Work</i>:</p> <ul style="list-style-type: none"> <li>a. as a genuine pre-estimate of the <i>Owner's</i> increased costs for the <i>Contract Administrator</i> and the <i>Owner's</i> own staff caused by such delay an amount of \$1000.00 per day or pro rata portion for each calendar day that actual <i>Substantial Performance</i> is achieved after the <i>Substantial Performance Milestone Date</i>; plus</li> <li>b. all direct out-of-pocket costs, such as costs for safety, security, or equipment rental, reasonably incurred by the <i>Owner</i> as a direct result of such delay.</li> </ul> <p>If the monies owing to the <i>Contractor</i> are less than the total amount owing by the <i>Contractor</i> to the <i>Owner</i> under (a) and (b) then any shortfall shall immediately, upon written notice from the <i>Owner</i>, and upon <i>Substantial Performance</i>, be due and owing by the <i>Contractor</i> to the <i>Owner</i>.</p>		

<b>Addition:</b>	(2) 13.9.2 If the period of the <i>Contract</i> is extended due to an omission or act of the <i>Contractor</i> or one of its employees, agents, or subcontractors, then the <i>Contractor</i> shall pay the cost of compensation to the <i>Owner</i> for engineering and inspection services at \$1,000 per day.		
<b>Supplementary Specification:</b>	<b>Specification GC 25.1 – Correction of Defects</b>		
<b>Affected Document(s):</b>	Volume II	<b>Change Type:</b>	Addition
<b>Section:</b>	General Conditions	<b>Reference:</b>	25.1
<b>Currently:</b>	25.1 (1) 25.1.1 The <i>Contractor</i> shall, at the <i>Contractor's</i> own expense, promptly correct defects of deficiencies in the <i>Work</i> that appear prior to and during the period of one year from the date of <i>Certificate of Substantial Performance</i> , or such longer periods as may be specified in the <i>Contract Documents</i> for certain products or <i>Work</i> (the " <i>Maintenance Period</i> "). (2) 25.1.2 During the <i>Maintenance Period</i> the <i>Owner</i> or the <i>Owner's</i> authorized representative shall promptly give the <i>Contractor</i> written notice of observed defects and deficiencies. (3) 25.1.3 The <i>Contractor</i> shall correct or pay for damage resulting from corrections made to the <i>Work</i> pursuant to this GC.		
<b>Addition:</b>	(4) Any <i>Owner</i> incurred costs during warranty claims shall be covered by the <i>Contractor</i> .		

**Supplemental Specifications**  
**Part I – Issued by MMCD**

Supplemental updates are MMCD issued updates. A complete list of all the Supplemental Specifications describing each change is not included in this document; however, detailed descriptions can be found on the MMCD website. Bidders are deemed to have visited the MMCD website and have reviewed and understand the Supplemental Updates. It is the Contractor's responsibility to ensure they are aware of all supplemental updates issued by MMCD at time of tender. Any supplemental update issued prior to tender close shall form part of the Contract Documents.



# Supplemental Specifications

## Part II – Project Specific

### Division 03: Concrete

03 01 37 – Concrete Restoration

### Division 46: Water and Wastewater Equipment

46 43 11 – Primary Sedimentation Tank Equipment

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## Part 1 General

### 1.1 Definition

- .1 Restoration Work shall include the following scope of Work:
  - a. Provide all labour, materials, services, and equipment necessary and reasonable to complete preparations and restoration as set forth in the Contract Drawings and Specifications.
  - b. Restoration Scope shall include:
    - i. Complete concrete joint seal repair in PST-2 continuously along floor and up both walls to 605.200 m elevation (200 mm above peak wet weather flow elevation).
    - ii. *Optional Work*: Restoration of approximately 100 m total of linear concrete deficiencies (cracks, gravel seams and erosion) collectively in PST-1 and PST-2 per the Inspection Report by Metro Testing (Attachment F).
    - iii. Linear deficiencies located variously upon PST-1 and PST-2 floors and walls.
  - c. Surface Preparation:
    - i. Surface preparation to be performed at the PST-2 joint and along linear deficiencies for optional Work unless noted otherwise.
    - ii. Surface Preparation includes surface cleaning, followed by concrete removal to achieve the required concrete surface profile (CSP) according to technical guidelines issued by the International Concrete Repair Institute (ICRI).
    - iii. Alternate surface preparation methods require written approval by the Contract Administrator.
    - iv. Any brush bristles used to remove debris, dirt, deposits, mortar, paste, aggregate or pollutants shall have natural, non-ferrous, or stainless steel bristles.
    - v. Surface preparation, application and curing to be in strict accordance with procedures outlined in the product data sheets and Contract Documents.
  - d. Linear Deficiency – Cracks:
    - i. Repair prepared cracks by applying approved crack repair products according to crack width.
  - e. Linear Deficiency – Erosion and Gravel Seams:
    - i. Repair prepared concrete by applying listed products which include an epoxy-cement bonding agent, a repair mortar, and an optional accelerant.
  - f. Joint Seal Repair:
    - i. Remove and repair deteriorated joint seal by preparing surfaces and application of multi-layered Combi-Flex tape system.
  - g. If the depth of deficient concrete (erosion, neutralization, seams, cracks or otherwise unsound concrete) is discovered to be 75 mm or more, Contractor to notify Contract Administrator in writing before proceeding.

## 1.2 References

- .1 ASTM D 4258 – Standard Practice for Surface Cleaning Concrete for Coating.
- .2 ASTM D7234 – Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
- .3 ASTM D4787 – Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.
- .4 CSA A3000 – Cementitious Materials Compendium.
- .5 CSA A23.2 – 6B Determination of Bond Strength of Bonded Toppings and Overlays and of Direct Tensile Strength of Concrete, Mortar, and Grout.
- .6 CSA A23.1-14 – Concrete Materials and Methods for Concrete Construction.
- .7 CSA A23.1.2-14 – Test Methods and Standard Practices for Concrete.
- .8 CSA A23.4 – Precast Concrete – Materials and Construction.
- .9 CSA A266.1 – Air-Entraining Admixtures for Concrete.
- .10 CSA A266.2 – Chemical Admixtures for Concrete.
- .11 ICRI – Guideline No. 310.2R-2013 or latest edition.
- .12 SSPC-PA 9 – Measurement of Dry Coating Thickness Using Ultrasonic Gages.

## 1.3 Health and Safety

- .1 The confined spaces of the PST environment are declassified through use of one temporary access stair. Entrance into these declassified spaces is required for the completion of the restoration Work. The Contractor is responsible for following the Safe Work Entry Procedure developed by the Owner (Attachment D) and approved by WorkSafe BC to ensure all Health and Safety requirements are met throughout the duration of construction.
  - a. The Safe Work Entry Procedure calls for use of an Owner supplied temporary access stair for declassification of the space per definition by the Occupational Health and Safety Regulation Section 9.1. By improving access/egress with stairs, the space is no longer restrictive for rescue service.
  - b. See Section 3.1.4 this specification for stair installation quality control.
  - c. The Contractor will collaborate with the Owner to help update the Safe Work Entry Procedure for approval by WorkSafe BC. The document will be updated for specific methods and products required to complete the Work.
- .2 The Contractor shall be familiar with WorkSafe BC requirements including but not limited to:
  - a. OHS Regulation Part 9, Section 9.18: Control of Harmful Substance in Adjacent Piping.
  - b. OHS Regulation Part 5, Section 5.57: Designated Substances.
  - c. The completion of the restoration Work may create harmful dust particulates, particularly silica. The Contractor is responsible for implementing measures for controlling workers from silica exposure via a Silica Exposure Work Plan prepared in accordance with WorkSafe BC regulations.
- .3 Contractor shall provide means for Owner and Contract Administrator representatives to safely inspect the restoration Work in accordance with the Owner-prepared procedure.

## 1.4 Qualifications

- .1 Organization Experience:
  - a. The organization performing the Work shall be experienced and shall have successfully completed a minimum of five (5) past projects of a similar nature.
- .2 Personnel Experience:
  - a. All personnel performing the Work shall have minimum three (3) years experience performing work of similar nature.

## 1.5 Submittals

- .1 Approvals: submit a written request to the Contract Administrator for their approval of equivalent or alternative products during bidding period. List each of the alternate materials proposed, surfaces to be covered, manufacturer's name and brand name of material. The Contract Administrator reserves the right to reject a request for alternate product without justification.
- .2 Submit to the Contract Administrator, a minimum of 14 days before starting the restoration Work, the following documents:
  - a. Crew credentials including proof of the required Organizational Experience and Personnel Experience.
- .3 Product data sheets for all products proposed for use when completing the restoration Work including but not limited to:
  - a. Technical specifications and performance criteria.
  - b. Installation procedures including surface preparation requirements.
  - c. Product safety data sheets.
- .4 Workspace Conditioning Procedures:
  - a. Proposed procedures for matching each product's required ambient temperature and moisture requirements during preparation, installation, and curing.
  - b. Project schedule detailing the sequence and timing for completion of the Restoration Work.

## 1.6 Quality Assurance

- .1 Following concrete cleaning, provide access for review by independent structural engineer who will confirm coating scope, procedures and materials as they relate to:
  - a. Surface preparation and ambient temperature.
  - b. Material storage and application techniques.
  - c. Inspection and reporting requirements.
  - d. Testing requirements.
  - e. Safety requirements during application.

## 1.7 Record Keeping

- .1 The Contractor shall keep detailed records on a daily basis and/or email the following to the Contract Administrator daily during each step of the Restoration Work and throughout field testing including:
  - a. Date, time, weather, outdoor and within work area temperature and moisture,

- b. Products applied and methods used,
- c. Key crew member names, and
- d. Photos of completed work.

## Part 2 Products

### 2.1 Materials

- .1 Approved Repair Products:
  - a. Erosion and gravel seams:
    - i. SikaTop Armatec 110 EpoCem.
    - ii. SikaTop 123 Plus.
    - iii. SikaCem Accelerator (Optional).
  - b. Cracks:
    - i. Sikadur-31 Hi-Mod Gel.
    - ii. Sikadur 35 Hi Mod LV.
    - iii. Sikadur 53 CA.
    - iv. Sika AnchorFix 2020.
  - c. Joint Seal:
    - v. Silardur-31 Hi-Mod Gen.
    - i. Evazote High Density Foam.
    - ii. SikaFlex 2C NS Polyurethane Elastomeric Sealant.
    - iii. Sika Combiflex Tape (200 mm width).
  - d. Sikagard EWL Trowel Grade.
- .2 Product Data Sheets are provided in Attachment C.
- .3 Contractor may submit alternate repair products for review and approval by the Contract Administrator .
- .4 Refer to Section 1.5 Submittals for alternate product requests.
- .5 All materials must be of the same manufacturer and must be fully compatible with each other.
- .6 The Contractor is responsible for determining all quantities.

### 2.2 Equipment

- .1 If required, concrete moisture testing to be performed by Tramex moisture meter or Contract Administrator approved equivalent.
- .2 Contractor to provide appropriate equipment for the works described in this section.

## Part 3 Execution

### 3.1 Preliminary Work

- .1 Delivery:
  - a. Deliver materials in sealed original labelled containers, bearing manufacturer's name, type of paint, brand name, colour designation and instructions for mixing and/or reducing.
- .2 Storage:
  - a. Store materials according to the temperatures and conditions listed in the product data sheets, in a well ventilated, heated and single designated area.
- .3 Fire Hazard and Safety:
  - a. Take necessary precautionary measures to prevent fire hazards and spontaneous combustion.
  - b. Where toxic and explosive solvents and materials are used, take appropriate precautions, and do not smoke in the area.
- .4 Temporary Stair Access:
  - a. Contractor to install Owner's temporary access stair for access to tanks according to Safe Work Entry Procedure.
  - b. The stair allows for declassified access to one tank at a time.
  - c. Stair installation requires inspection and approval by structural engineer registered in British Columbia prior to use.
  - d. Provide letter of inspection or record drawing on each stair installation to Owner, sealed by structural engineer registered in British Columbia.
  - e. Refer to record drawing of stair in Attachment E.

### 3.2 Concrete Preparation and Removal

- .1 Monitoring:
  - a. Contractor to maintain records of humidity and temperature inside the PSTs during restorative work.
- .2 Cleaning:
  - a. Low pressure washing (up to 5,000 psi) of all primary sedimentation tanks (PSTs) interior surfaces to remove deteriorated concrete, dirt, oils, grease and other bond inhibiting materials. Particular attention is to be paid to areas exhibiting obvious cracks, gravel seams, and erosion.
  - b. Use detergent as necessary to achieve clean surface free of contaminants.
  - c. Avoid disturbing existing joint seals.
- .3 Surface Inspection:
  - a. Facilitate inspection by the Contract Administrator following cleaning. Contractor to provide at least 48 hours notice to the Contract Administrator and Owner.

- .4 Removal of Concrete at Linear Deficiencies:
- a. For unsound concrete depths greater than 3 mm, achieve a Concrete Surface Preparation (CSP) of 7 per ICRI Guideline 310.1 (removal of 4 mm sound concrete paste).
  - b. Removal for linear deficiencies shall meet the listed CSP using:
    - i. High pressure water blasting (hydro-demolition) at a pressure of 20,000 psi minimum.
    - ii. Other methods by written approval of the Contract Administrator.
  - c. Blow out crack depths using low pressure compressed air following pressure washing and blasting.
  - d. Immediately notify the Contract Administrator regarding cracks wider than 30 mm, longer than 2 m, deeper than 75 mm or which otherwise show significant wall discolouration below the crack.
  - e. Concrete shall not be removed to a depth greater than the maximum application thickness of the proposed mortar material. Notify the Contract Administrator if concrete removal beyond the maximum is required prior to removing.
  - f. All deteriorated concrete within the linear deficiency shall be removed until a sound substrate is exposed.
  - g. All coarse aggregate particles which are more than 60% exposed and supported on a pinnacle of mortar shall be removed.
  - h. All removed material, water, slurry, and run-off shall be collected and removed from the chamber and disposed off-site in accordance with all environmental regulations.
  - i. Do not cut or damage reinforcing steel.
  - j. Feather-edging is not permitted. Saw cut 20 mm depth at boundaries of restoration.
  - k. Contractor to protect and preserve all concrete joint seals in PSTs. Any damage to seals or pre-existing seal repairs (PST-1) will require repairs at the Contractor's expense.
  - l. Concrete removal shall provide a substrate surface with a relatively uniform surface profile. Prepared substrate surface shall be relatively flat, free from large crests and valleys, and shall conform to the listed CSP.
- .5 Removal at Joint Seal:
- a. Follow 3.2.4 with the following exceptions:
    - i. Prepare surface 300 mm either side of joint to (CSP of 3 per ICRI Guideline 310.1 for removal of 0.25 to 1.0 mm sound concrete paste).
    - ii. Removal adjacent to joint seal shall use:
      - Diamond grinding;
      - Bristle blasting; or
      - Contract Administrator approved alternate.
    - iii. Follow up with light pressure washing to remove bruised concrete and dust, with care not to damage original seal.



- .6 Removal at Cracks:
  - a. Prepare surface of crack 300 mm either side to the CSP listed in 3.2.4a.
  - b. Router crack edges to remove 90 degree sharp edges.
  - c. Remove all debris, dust and loose particles from the crack using air blasting or water jetting.
- .7 Removal Inspection:
  - a. Inform the Contract Administrator when concrete removal is completed to schedule field reviews. Provide at least 48 hours of notice to the Contract Administrator and Owner.

### 3.3 Application of Restoration Products

- .1 Apply selected approved products in strict accordance with the procedures outlined in the product data sheets, including requirements for humidity, wetness and temperature.
  - a. The Contractor shall not interface incompatible products.
  - b. The receiving surface shall be dampened by low pressure washing and allowed to dry to a saturated surface-dry (SSD) condition just prior to product application.
  - c. Provide heating as required in the PSTs to meet product curing temperature and humidity conditions.
  - d. Product application shall not proceed until all substrates are confirmed to be acceptable and authorization to proceed is provided by the Contract Administrator.
  - e. Do not exceed cure times per product literature for field temperature.
- .2 Joint Repair:
  - a. Round nosing of joint sides with mixture of Sikadur 31 Hi Mod Gel and oven-dry sand. Ensure no sharp or abrasive edges.
  - b. If prior seal absent or recessed, insert Evazote high density foam strip, cut to just below joint face for supporting back of Combi-Flex.
  - c. Apply masking tape to top of foam strip as seal breaker to limit tearing during joint movement.
  - d. Apply layer of Sikaflex 2C NS foam sealant to foam strip, filling voids, flush to surface.
  - e. Apply Sikadur 31 Hi Mod Gel to prepared concrete surface, 30 mm wider than edges of Combi-Flex tape on either side of joint, to minimum thickness of 1 mm.
  - f. With gel still tacky, apply and embed Combi-Flex tape into gel for complete coverage of joint.
  - g. Use continuous roll of Combi-Flex tape.
  - h. To surface of Combi-Flex tape, apply thin strip of masking tape over joint gap.
  - i. Apply second layer of Sikadur 31 Hi Mod Gel to completely sandwich Combi-Flex tape edges. Ensure second layer of gel is 30 mm wider than width of Combi-Flex tape, with minimum thickness of 1 mm.
  - j. Do not apply gel to dynamic portion of joint gap.
  - k. Remove masking tape over gap.

- l. Very lightly scuff exposed surfaces, including Combi-Flex tape, using single pass of 80-100 G sandpaper. Wipe with clean rag to remove contaminants and ensure all surfaces clean prior to proceeding.
  - m. Vertical ends of tape system to be installed 200 mm above peak wet weather water level as indicated on Drawings.
  - n. Install SikaFix Polyurethane foam in recess of vertical top end of tape system, each side of tank, to prevent condensation entry behind tape.
  - o. Coat entire tape system surface with Sikagard EWL TG at 50 mm minimum extension past either side of Sikadur 31, with minimum thickness of 1.5 mm (60 mils), completed in single pass.
- .3 Erosion and Gravel Seam Repair:
- a. Erosion and Gravel Seam Repair:
  - b. Apply single coat of SikaTop Armatec 110 EpoCem using manual hand application (no spray equipment) working into irregularities, to 0.5 mm thick.
  - c. Immediately apply repair mortar to minimum of 3 mm thickness. Maximum depth of any lift to be 38 mm.
- .4 Crack Repair Less Than or Equal to 6 mm Wide:
- a. Install surface packers along prepared crack, spaced equivalent to depth of wall or member to be injected.
  - b. Apply Sikadur 31 Hi Mod Gel around each injection port and as cap-seal over crack to be injected, minimum 30 mm wider than edges of crack, to minimum thickness of 1 mm. Allow sufficient cure time before commencing injection.
  - c. Perform injection using Sikadur 35 Hi Mod LV until product is observed at next port, and allow to cure. Provide appropriate ambient curing conditions per data sheet.
  - d. Remove ports and grind flush with concrete surface.
  - e. Use of backing rod or foams requires written approval from Contract Administrator.
- .5 Crack Repair Greater Than 6 mm Up to 30 mm Wide:
- a. Pressure injection only.
  - b. Install mechanical packers along either side of crack in staggered pattern at spacing equal to crack depth typically spaced based on thickness of member to be injected.
  - c. Drill packer holes at 45° angle to the concrete. Minimum drill hole depth must be long enough to reach the middle of the structure under approx. 45° drilling angle.
  - d. Remove dust from packer holes using compressed air.
  - e. Place injection packers in drilled and cleaned packer holes and ensure rubber sleeve tops are below concrete surface. Tap packers in if necessary and hand tighten.
  - f. Remove nipples to check the flow of water and injection resin.
  - g. For horizontal cracks, the starting packer shall be at narrowest part of the crack.
  - h. For vertical cracks, the starting packer shall be the lowest one.
  - i. Before injection, test one port every 1.0 metre to determine correct pressure.
  - j. Inject using Sikadur 53. Ensure ambient conditions meet product data sheet requirements for curing.

- k. Once fully cured, cut and/or grind smooth all repaired surfaces to blend with existing concrete, ensuring no excess materials remain.

**3.4 Joint Field Testing**

- .1 Wet test with clean water prior to introducing effluent into tank.
- .2 Clean water to fill to top of peak wet weather level for 48 hours.
- .3 Mark and measure tank water level at outset of testing.
- .4 Excess leakage will require draining, drying, identification and rectification of deficiencies.

**3.5 Repaired Crack Field Testing**

- .1 Apply ultrasonic testing to detect voids, delamination, or incomplete filling of the crack (anomalies).
- .2 Provide findings to Contract Administrator.

**3.6 Mortar Product Field Testing – Pull-Off Testing**

- .1 The Contractor shall bear all costs associated with performing the following tests including any re-tests as required to meet the testing requirements.
- .2 The Contractor shall repair each location where a test was performed with the same means, methods, and products used for the Restoration Work at the Contractor’s expense.
- .3 For the purposes of this section, the term “Pull-Off Test” refers to the methods and procedures described in CSA A23.2-6B: Determination of bond strength of bonded toppings and overlays and of direct tensile strength of concrete, mortar, and grout - Procedure A.
- .4 Mortar Testing:
  - a. After completing the mortar material installation, complete five (5) Pull-Off Tests.
  - b. Each Pull-Off Test shall be evenly distributed across the restored area.
  - c. Each Pull-Off Test shall test the adhesion of the mortar repair products to the concrete substrate.
  - d. All Pull-Off Tests shall yield a Minimum Tensile Strength according to the following:

Condition	Minimum Tensile Strength (MPa)
Base Surface Tensile Strength < 1.0 MPa	Base Surface Tensile Strength
1.0 MPa < Base Surface Tensile Strength	1.0 MPa

- e. Test points that do not meet the Minimum Tensile Strength are considered a failure and the corresponding test area shall be re-done including removal of mortar material and re-preparation of Concrete Substrate at the Contractor’s expense.
- f. The mid-point between a failed Pull-Off Test and a passed Pull-Off Test forms the extents of the area that requires redoing.
- g. All costs for performing additional Pull-Off Tests to determine the extents of the mortar failure are at the Contractor’s expense.
- h. Each Pull-Off test shall be fully executed until either failure of the materials, or the load limit of the testing apparatus is met.

### Revision History

Rev. No.	Date	By	Checked By	Issued For	Comment
A	November 24, 2024	FPM/SJM	NS	Review	
0	December 12, 2024	FPM/SJM	NS	Tender	

**End of Section**

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## Part 1 General

### 1.1 Description of Work: Primary Sedimentation Tank Upgrades

- .1 The Work under these Specifications relates to four (4) primary sedimentation tanks (PSTs) and includes:
  - a. Supply, delivery and installation of PST equipment including but not limited to:
    - i motors,
    - ii gear (speed) reducers,
    - iii limit switches,
    - iv sprockets,
    - v chains,
    - vi take-up assemblies,
    - vii drive safety guards,
    - viii wall bearings,
    - ix flight assemblies,
    - x wear strips,
    - xi return rails,
    - xii rotating scum troughs, and
    - xiii finger baffles.
  - b. Testing and commissioning of all PSTs.
  - c. Operator training.
- .2 The Work relates to upgrading PST equipment. Refer to mechanical Drawings for details, and M-502 Bill of Materials (BOM) for a list of parts itemized per PST.
  - a. PST-1: Partial equipment upgrade.
  - b. PST-2: Partial equipment upgrade.
  - c. PST-3: Complete equipment upgrade.
  - d. PST-4: Complete equipment upgrade.
- .3 Provide the above equipment and services to ensure all four (4) PSTs are fully functional at the conclusion of the Work.

### 1.2 Related Specifications

- .1 03 01 37 Concrete Restoration.

### 1.3 Governing Standards

- .1 General:

- a. 2024 British Columbia Building Code, or latest edition.
- .2 Material Standards:
  - a. ASTM A240: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and General Applications.
  - b. ASTM D6041: Standard Specification for Contact-Molded Fiberglass, Corrosion Resistant Pipe, and Fittings.
  - c. ASTM D3754: Standard Specification for Fiberglass Sewer and Industrial Pressure Pipe.
  - d. ASTM D570: Standard Test Method for Water Absorption of Plastics.
- .3 Fabrication and Quality Control Standards:
  - a. AWS D1.1 Structural Welding Code.
  - b. ASTM A6/A6M: Standard Specification for General Requirements for Rolled Structural Bars, Plates, Shapes, and Sheet Piling.
  - c. ASTM D2563: Standard Practice for Classifying Visual Defects in Glass-Reinforced Plastic Laminate Parts.
  - d. ASME RTP-1: Reinforced Thermoset Plastic Corrosion Resistant Equipment Certification.
  - e. ASTM D2584: Standard Test Method for Ignition Loss of Cured Resins.
  - f. AGMA 6001: Design and Selection of Components for Enclosed Gear Drives.
  - g. AGMA 9005: Industrial Gear Lubrication.
- .4 Electrical
  - a. C22.1:21: All equipment shall conform to the Canadian Electrical Code, C22.1:21, or latest edition.
  - b. C22.2 No. 100: Motors and Generators.
  - c. C22.2 No. 14: Industrial Control Equipment.
  - d. NEMA MG 1: Motors and Generators.
  - e. IEC 60034 Rotating Electrical Machines.
  - f. IEEE 112: Standard Test Procedure for Polyphase Induction Motors and Generators.
  - g. UL 1004: Standard for Safety for Electric Motors.

#### 1.4 Background

- .1 The Resort Municipality of Whistler (RMOW) operates a municipal wastewater treatment plant (WWTP). The facility has four (4) rectangular primary sedimentation tanks. PST-1 and PST-2 received partial upgrading in 2022 using parts supplied locally. PST-3 and PST-4 have not been upgraded in the last 10 years.
- .2 This Specification is for supply of components listed under Section 1.1.1 for all four (4) PSTs.
- .3 The PSTs are a confined spaces and often contain a corrosive and hazardous atmosphere during operation.

## 1.5 Suppliers

- .1 ClearStream Environmental,
- .2 Connexus Industries,
- .3 Viking Chain,
- .4 Brentwood,
- .5 Avensys,
- .6 Evoqua, or
- .7 Approved equal.

## 1.6 Shop Drawings / Submittals

- .1 As soon as possible after award of contract, the Contractor shall deliver to the Contract Administrator one (1) electronic copy of detailed shop drawings showing the following:
  - a. Make and Model.
  - b. Construction details to scale within shop drawings and general arrangement drawings, showing:
    - i All major tank and mechanism dimensions and elevations;
    - ii Anchor bolt locations and dimensions;
    - iii Mechanism loadings on the tank;
    - iv Principal dimensions;
    - v All materials used;
    - vi Deflection, buoyancy, strength, modulus of elasticity and moment of inertia;
    - vii Drive locations;
    - viii Drive train service factors; and
    - ix Catalogue cutsheets clearly showing all components to be supplied.
  - c. Dimensions and weights of components to be shipped.
  - d. Power and electrical requirements of all electrical components.
- .2 The Contract Administrator will review the submittals and mark them with such corrections as are deemed necessary and will return one (1) copy to the Contractor. Corrected submittals and drawings shall be resubmitted by the Contractor in accordance with the submittal procedure. Any manufacturing done before approval of drawings by the Contract Administrator will be at the Contractor's risk.
- .3 The Contract Administrator has the right to require the Contractor to make any changes in the Contractor's submittals which may be necessary, in the opinion of the Contract Administrator, to make the finished product conform to the requirements and intent of the Specifications without additional cost to the Owner. Review by the Contract Administrator of the Contractor's submittals shall not relieve the Contractor of any part of the Contractor's responsibility for correctness.



## 1.7 Operation and Maintenance Manuals

- .1 As part of operator training, the Contractor shall provide illustrated operation and maintenance manuals covering all equipment supplied under the contract. One (1) digital and two (2) hardcopies of these manuals shall be delivered to the Contract Administrator on or before the date on which delivery of the equipment is made.
- .2 The operation and maintenance manuals shall include, but not be limited to the following items:
  - a. title page and table of contents;
  - b. factory performance test data for motors, gear reduces and associated appurtenances;
  - c. detailed parts lists and scale dimensioned drawings for the equipment and associated appurtenances, including maintenance instructions and weights of each component;
  - d. detailed installation, operating and maintenance instructions for all equipment supplied;
  - e. contents labelled for each section, and an index for each manual; and
  - f. manuals shall clearly identify the intended speed of each collector system.

## 1.8 Quality Assurance

- .1 Supplier's shop welds shall be performed using approved procedures and welders shall be qualified tradespeople.
- .2 Motors and gear reducers shall be supplied with all necessary parts and accessories indicated on the Drawings, Specifications, or otherwise required for a complete, properly operating drive installation, and shall be the latest standard product of a Supplier regularly engaged in the production of chain and flight mechanisms.

## 1.9 Performance

- .1 Motors, drives and sprockets shall provide a longitudinal collector flight speed not to exceed 15 mm/s.
- .2 Motors, drives and sprockets shall provide a cross collector flight speed not to exceed 15 mm/s.
- .3 Flights shall direct scum to the scum trough at the liquid outlet end of the PST, while directing sludge back to the sludge hopper beneath the inlet end of the tank.

## 1.10 Delivery, Storage, and Handling of Equipment

- .1 All components subject to damage from handling or exposure to weather shall be suitably packaged.
- .2 The equipment items shall be supplied, assembled, and suitably crated to prevent damage or distortion during shipment.
- .3 The equipment shall be delivered to the site of the Whistler Wastewater Treatment Plant, 1135 Cheakamus Lake Rd, Whistler, BC, Canada, V0N 1B1. Normal hours of operation are Monday to Friday 8:00 am to 4:00 pm.

**1.11 Shipment**

- .1 Components shall be shipped in a way to fit through the existing doors and access hatches at the WWTP.
- .2 The Contractor shall be responsible for shipping FOB to 1135 Cheakamus Lake Rd, Whistler, BC, Canada, providing documents and coordinating the delivery of the materials to the site.
- .3 The Contractor shall be responsible for all equipment during transit to site. Acceptance of the equipment at the site does not relieve the Contractor's responsibilities under this document.
- .4 Contractor shall provide written notification to Owner's representative upon shipment of equipment and material.
- .5 Equipment and material to be unloaded at the site by the Contractor.
- .6 The Contractor shall allow the Owner's representative to inspect the equipment upon delivery to site.
- .7 The Contractor shall coordinate shipment and delivery and shall organize unloading, and storage.

**1.12 Health and Safety**

- .1 See Specification 03-01-37 Section 1.3.

**1.13 Warranty**

- .1 Warranties on equipment will be provided by the equipment Suppliers, valid for 18 months minimum, from the date written on the Contractor's commissioning report.

## Part 2 Products

### 2.1 General Design

- .1 The longitudinal collector chain and flight mechanism shall be capable of moving settled sludge from each PST liquid outlet end to the tank inlet sludge hopper in a smooth, continuous and even motion without jerking or stalling.
- .2 The longitudinal collector mechanism shall be capable of moving scum for collection by the rotating scum trough.
- .3 The cross collector chain and flight mechanism shall be capable of moving settled and collected sludge across the sludge discharge hopper in a smooth, continuous and even motion without jerking or stalling.
- .4 All chain and flight mechanisms shall be field balanced under the direction of the Supplier.
- .5 Rotating components on or above walkway elevation shall be covered by ventilated non-metallic guards to prevent injury to operators.
- .6 Motors and gear reducers shall be mounted to existing housekeeping pads at walkway elevation above the PSTs.
- .7 The wall bearings shall be mounted to the internal PST concrete walls and shall not conflict with the existing wall bearings' embedded anchors. See record drawings and photos.
- .8 The equipment Supplier shall have a minimum of five (5) years experience in the design and manufacture of rectangular clarifier equipment, with at least three (3) similar sized WWTPs.

### 2.2 Design Criteria

- .1 The motor and gear reducer shop drawings shall note the design speed of the chain and flight mechanisms and shall be sealed by an engineer registered in the Province of British Columbia.
- .2 Limit switches shall be designed to meet the drive design torque, and area classification.
- .3 The PST floor slopes towards inlet slide gates at 1%. Cross collector and solids sump are located adjacent to inlet slide gates, at the inlet end of the PST.
- .4 Screening (6 mm) and grit removal are performed within upstream headworks area.
- .5 Record drawing information on PSTs requires field confirmation by the Contractor prior to fabrication. The dimensions listed below include wall to wall width in tank mid-elevation, with the height at the shallowest point on sloped floor at tank outlet to the maximum liquid level. Concrete benching at the tank bottoms are not included in the below measurements.

PST-1: 31.0 x 5.7 m x 3.5 m	PST-2: 31.0 x 5.5 m x 3.5 m
PST-3: 31.0 x 5.7 m x 3.5 m	PST-4: 31.0 x 5.5 m x 3.5 m

### 2.3 Hardware and Anchors

- .1 Fasteners, anchors and hardware to be Stainless Steel Type 316 or 316L.
- .2 Anchors shall be adhesive type anchors, suitable for installation into cracked and uncracked concrete and qualified for earthquake loading in accordance with ACI 355.2 or 355.4.
- .3 Adhesive products for the anchors shall be Hilti HIT-RE 500-V3 or as approved in writing by the Contract Administrator.

## 2.4 Motors and Drives

- .1 Each collector system shall be driven by individual motor and gear reducer, with limit switch.
- .2 Available power is 3 phase, 460 V, 60 hertz.
- .3 Motor and gear reducer shall be direct coupled.
- .4 Motor shall be totally enclosed fan cooled (TEFC).
- .5 Motors and drives shall be rated for Class 1, Zone 1, Group D service (i.e. explosion proof).
- .6 Drive trains must be designed for the collector speeds listed in Section 1.10.
- .7 Contractor shall supply one year's worth of lubrication products for motors and gear reducers.
- .8 All rotating or moving elements at or above the operational walkway shall be provided with removable, ventilated safety guards composed of durable and corrosion resistant material (fibre reinforced plastic, stainless steel, or engineer approved equivalent).
- .9 Motors and gear reducers to include individual name plates located on the respective units.
- .10 Furnish torque overload devices and visual torque indicator gauges.
- .11 The limit switch shall be provided with either a NEMA-4X enclosure, or hazardous environment rated enclosure for primary clarifiers, and a support bracket for positioning the limit switch adjacent to each torque device. For all collector mechanisms, provide overload control with two adjustable dry contacts for alarm and motor cutout.
- .12 Alarm switch at 100 percent of design running torque.
- .13 Motor cutout switch at 120 percent of design running torque.
- .14 The two switches shall be factory adjusted to accurately calibrate the alarm torque value and overload position.
- .15 A visual torque indicator shall be provided and oriented so that it can be read from the walkway.
- .16 The torque indicator shall be calibrated from 0 to 160 per cent of design running torque.
- .17 Provide 4 wire, 4-20 mA torque transmitter for connection to the plant PLC control system.
- .18 Clean and re-use existing hand / off / auto (HOA) switches.
- .19 Speed reducers shall contain:
  - a. anti-friction bearings enclosed in a weather tight, epoxy coated housing suitable for exposure to wastewater;
  - b. double seals on output shaft;
  - c. oil bath;
  - d. oil sight gauge;
  - e. stainless steel output shaft;
  - f. right angle shafting on longitudinal collector drives (see M-101 Drawing); and
  - g. straight shafting on cross collector drives (see M-101 Drawing).

## 2.5 Collector Shafts, Wall Bearings and Fixed Brackets

- .1 Existing shafts to be re-used on all PSTs.
  - a. PST-1 and PST-2: All shafts to remain in existing wall bearings with the exception of PST-1 head shaft wall bearings, which require replacement.
    - i PST-2 contains new head shaft wall bearings.
    - ii Idler wall bearings to remain in place. Idler wall bearings are obsolete.
  - b. PST-3 and PST-4: New head shaft wall bearings required. Idler shaft wall bearings to be replaced with fixed wall-mounted brackets.
  - c. Only head shafts shall rotate.
  - d. Do not remove rust and scale from non-mechanical areas of shafts.
- .2 Existing steel shaft diameters:
  - a. Longitudinal shafts (PST-1 and PST-2): 4 inch nominal, solid steel.
  - b. Cross shafts (PST-1 and PST-2): 2 inch nominal, solid steel.
  - c. Contractor to field measure shaft dimensions.
- .3 Avoid prior wall anchor locations for mounting new wall equipment.
- .4 Wall bearings for rotating head shafts to contain replaceable bearing insert that is separate from the housing to allow for periodic maintenance of wear parts. Bearings to be designed to allow for replacement of wear parts without removal of shaft (repair-in-place).
- .5 Bearings shall be self-aligning.
- .6 Shaft-mounted sprocket bearings shall use a replaceable shaft-mounted sleeve upon which idler sprockets are mounted.
- .7 Wall and shaft-mounted bearing wear parts shall be composed of ultra high molecular weight polyethylene (UHMW-PE) with a wetted coefficient of friction of 0.10 or lower.
- .8 Fixed bracket material to be stainless steel. Minimum bracket steel thickness to be 10 mm.
- .9 Dimensions: As determined by Contractor based on proposed system dimensions and record drawings.
- .10 Design components based on design calculations incorporating the following criteria:
  - a. Operation under submerged conditions
  - b. Wear strip friction factors:
    - i 0.20 to 0.30 (UHMW-PE on UHMW-PE).
    - ii 0.05 to 0.10 (UHMW-PE on stainless steel).

## 2.6 Drive Sprocket and Shear Pin

- .1 Acceptable drive sprocket materials:
  - a. Nylon 6;
  - b. 316 SS; or
  - c. UHMW-PE teeth with 316 SS body.

- .2 Sprocket to rotate via keyway and attach by set screws to speed reducer shaft.
- .3 Drive sprocket assemblies shall be designed to protect the drive equipment and be furnished with a suitably sized aluminum necked down shear pin to transmit torque from the driving hub to the sprocket.
- .4 In the event of a high load or over torque condition, the shear pin shall break and disengage the drive sprocket from the hub.
- .5 The drive sprocket hub shall be equipped with a trip pin or lug that, upon breaking, shall extend out from the hub and contact a limit switch actuator arm, which shall signal the shut down the motor and an alarm circuit.

## 2.7 Collector Sprockets

- .1 Pertains to drive, head and idler sprockets.
- .2 Acceptable materials include Nylon 6, Nylon 66, isophthalic polyester, polyurethane, and UHMW-PE.
  - a. Water absorption of less than or equal to 2% by mass.
  - b. Tensile strength of 8,000 psi minimum.
  - c. Metallic sprockets shall not be permitted.
- .3 Driven sprocket profile to be offset.
- .4 Head sprockets to use keyway with two (2) set screws.
- .5 Idler sprockets to rotate on fixed shafts.
  - a. Shaft-mounted sprocket bearing sleeves shall use a replaceable shaft-mounted sleeve upon which idler sprockets are mounted.

## 2.8 Chain and Flight

- .1 Consists of collector chain, flights, wear shoes, existing shafting, fixed idler shaft brackets, keys and set collars, head shaft wall bearings, sprockets (drive, driven, head and idler), idler sprocket bearing sleeves, return tracks and support brackets, floor and track wear strips, motor, speed reducing gearbox, drive base, torque overload device and appropriate guards, drive chain and drive chain tightener, flight assemblies, set collars, associated attachment bolts and anchor bolts for a fully functional chain and flight mechanism.
  - a. Design to assume shaft deflection.
- .2 Non-Metallic Chains:
  - a. Drive and collector chains must include tensioning devices.
  - b. Chain and flight materials such as fiberglass reinforced plastic (GFRP) and molded from resins containing UV-inhibitors must be suitable for installation within a corrosive wastewater environment.
  - c. Non-metallic chains shall be fabricated using Nylon-6, Nylon-66, or isophthalic polyester resin with maximum water absorption of 2% by weight.
  - d. Metallic chains, sprockets, flights and bearing wear surfaces shall not be permitted.
  - e. Collector chains shall have a working load not less than 1,400 kg and an average ultimate strength of 3,170 kg.

- f. Drive chains shall have a working load not less than 790 kg and an average ultimate strength of 1,800 kg.
- .3 Flight Assemblies:
- a. Isophthalic polyester glass fiber reinforced plastic with less than 1% water absorption.
  - b. Maximum deflection criteria for the flights during operation: 20 mm for horizontal deflection and 5 mm for vertical deflection.
  - c. Profile minimum of 125 mm high. Width to occupy entire tank bottom width, adjusted for bottom side-benching. Contractor to field measure for each PST.
  - d. Scraper flights shall be spaced at 3 m for Longitudinal Collectors and 1.5 m for Cross Collectors.
  - e. All flights to use non-metallic filler blocks.
  - f. Flight assembly attachment hardware to be 316 stainless steel.
- .4 Wear Shoes:
- a. Each flight to be equipped with two wear shoes for floor wear strips, and two wear shoes for return rails.
  - b. Wear shoes to be non-metallic.
  - c. Wear shoe profile to be slightly rounded on leading and back bottom edges for smooth operation in both directions.
  - d. Wear shoe minimum thickness to be 50 mm.
- .5 Return Rail Tracks:
- a. Two (2) return rail track assemblies per mechanism shall span majority of collector bay to support flight ends on return runs.
    - i Contractor to field confirm 26.5 m length of track runs.
  - b. Tracks shall be sufficiently wide to accommodate lateral movement of flights and fabricated from isophthalic polyester GFRP with less than 1% water absorption.
    - i 75 mm x 75 mm x 9.5 mm minimum.
  - c. Tracks shall contain splice plates between track sections, of same dimensions as tracks, 150 mm minimum length, field drilled and mounted.
  - d. Support brackets shall support rail tracks and shall be installed every 1.8 m.
    - i Support brackets to be 32 mm thick UHMW-PE or approved alternate.
    - ii Support brackets to contain multiple mounting holes for field adjustments.
  - e. Rails to be field drilled for accuracy and shall avoid jumping or jerking motion during transfer to and from rail.
  - f. Rails to contain UHMW-PE wear strips of 13 mm minimum thickness, c/w countersunk fastener holes. Wear strips to be bevelled at flight approach and departure angles by 45 degrees.
  - g. Support brackets composed of stainless steel or glass fiber reinforced plastic.

- h. Deflector rails shall be provided, if required, by the Supplier, to prevent flights from contacting other components within the tanks.

## 2.9 Rotating Scum Skimming Trough

- .1 Provide one (1) new rotating scum skimming trough and manual drive mechanism for each PST – total of four (4) units.
- .2 See record drawing of existing troughs for original dimensions.
- .3 Acceptable trough body materials include:
  - a. 304 stainless steel,
  - b. Glass fiber reinforced plastic, or
  - c. Contract Administrator approved alternative.
- .4 Each 300 mm nominal diameter scum trough shall have a deflection of less than 20 mm from wall to wall under effluent load.
- .5 Each trough shall operate independently.
- .6 Contractor to field confirm trough lengths for each PST.
- .7 Scum accepting slot dimensions shall not permit ingress of water into the trough pipe at the peak wet weather flow of 605.000 m elevation while oriented in the upward position.
- .8 End collars to be stainless steel with UHMW glides.
- .9 Replaceable pipe collar seals at joints shall prevent leakage.
- .10 End bearings to be made of replaceable water lubricated UHMW-PE of 50 mm width minimum.
- .11 Wall plates shall be 316 stainless steel and shall be adjustable to allow for smooth operation of skimming trough.
- .12 Wall connection flanges to be oversized as indicated in the Drawings to avoid interfacing with existing anchors.
- .13 The scum skimmers will possess a hand-wheel for manual actuation and shall rotate 180 degrees, facing up.
- .14 Actuation to be rack and pinion, worm gear, or approved equal.
- .15 Hand operating torque to equal 40 ft-lbs or less.
- .16 Hand operator will be easily accessible from the walkway without the need to enter the confined space environment.
- .17 The scum troughs will possess position indication.
- .18 Actuation gearing shall be constructed from 316 stainless steel or approved equal.
- .19 Operating shaft to be 316 stainless steel.
- .20 The Contractor shall prepare wall concrete and existing wall pipe sleeves for mating to the new scum skimmers.
- .21 End seals shall be made of EPDM or approved equal.



- .22 Grouting, wall anchors and lubrication will be supplied for a fully functional skimming system.

## 2.10 Finger Baffles

- .1 Material:
  - a. High-quality, treated hardwood, marine-grade plywood, or synthetic composite resistant to waterlogging, decay, and microbial attack.
  - b. Wooden materials treated with an environmentally safe preservative (e.g., copper azole or ACQ) to meet local water and environmental regulations.
- .2 Configuration, each PST:
  - a. Number of Fingers: 19 minimum.
  - b. 300 mm center-to-center (c/c).
- .3 Dimensions:
  - a. Finger Width: As per mechanical Drawings, typically 50–75 mm.
  - b. Finger Thickness: Minimum of 32 mm.
  - c. Finger Length: Sized to match the tank geometry and existing units, and extend above the maximum peak wet weather liquid line.
- .4 Attachment Method:
  - a. Secured with corrosion-resistant 316 stainless steel fasteners and wall brackets.
  - b. Brackets to account for water absorption of baffle material under drained conditions.
  - c. Mounted to a structural framework to ensure proper alignment and withstand hydraulic forces during tank filling.

## 2.11 Spare Parts (Optional)

- .1 Contractor to provide three (3) shelf spares of the following:
  - a. Shear pins (longitudinal collector and cross collector).
  - b. Longitudinal Collector head shaft wall bearing inserts.
  - c. Cross Collector head shaft wall bearing inserts.
  - d. Longitudinal Collector idler shaft sprocket sleeve bearing.
  - e. Cross Collector idler shaft sprocket sleeve bearing.
- .2 Contractor to provide the following spares for both longitudinal and cross collectors:
  - a. One (1) drive sprocket.
  - b. Twenty (20) feet of drive chain.
  - c. Ten (10) percent of all collector chain furnished.
  - d. Five (5) flight assemblies.
- .3 Contractor to provide the following spares for scum troughs:
  - a. Two (2) complete trough bearing replacements.

## 2.12 Coatings

- .1 All factory coatings must be suitable for installation within a corrosive wastewater environment.

## Part 3 Execution

### 3.1 Delivery

- .1 Contractor shall coordinate delivery with the Owner and Supplier.
- .2 Contractor to receive deliveries of major equipment.
- .3 The Contractor shall be responsible for temporary storage of equipment during construction.
- .4 Storage location during construction to be agreed upon by the Owner and Contractor.
- .5 If storage located off-site, Contractor to assume all interim transport costs.

### 3.2 Tank Access Stair

- .1 See Specification 03-01-37 Section 3.1.4.

### 3.3 Installation

- .1 Install all equipment in accordance with the Supplier's instructions, recommendations, and approved shop drawings.
- .2 Applicable components shall be field drilled and fit for accuracy and smooth operation.

### 3.4 Testing and Commissioning

- .1 The Supplier shall provide a representative to assist the Contractor during the installation, inspections, and during field start-up and commissioning.
- .2 Testing and commissioning to be performed using dry run test, followed by wet test using dechlorinated water at typical water levels.
  - a. Dry testing to be performed using Supplier recommended lubrication.
- .3 Provide commissioning data sheets for each PST for both dry and wet runs, including:
  - a. Lubrication checks (motors, speed reducers, all chain and flight bearings, scum trough bearings);
  - b. Motor rotation;
  - c. Motor coupling alignment;
  - d. Voltage per phase;
  - e. Motor amperage at start-up and during operation;
  - f. Vibration;
  - g. Observed torque at startup and during operation;
  - h. Limit switch activation points;
  - i. Flight travel speed;
  - j. Behaviour of any binding or jerking;
  - k. Flight deflection (average over 5 flights);

- l. Scum trough deflection; and
  - m. Chain sag for drive and collector chains.
- .4 Each chain and flight as well as scum trough mechanism shall first be dry tested by the Supplier at the discretion of the Contract Administrator and Owner to check for binding, jerky or unusual motion. Successful dry testing is required prior to introducing water into the tanks. All items of equipment must be in full compliance with this Section.
- a. Confirm hand and auto operation; and
  - b. Range of rotation for scum skimming system.
- .5 Each chain and flight as well as scum trough mechanism shall then be water tested by the Supplier at the discretion of the Contract Administrator and Owner, to confirm speed and torque values conform to the design intent.
- .6 Components shall exhibit continuous smooth operation free from skipping and jerking during three complete consecutive rotations of the mechanism. Contractor to rectify causes of rough operation immediately and rerun test.
- .7 The factory trainer representative shall provide on site training to Operations staff and shall furnish operation and maintenance manuals to staff.
- .8 The Contractor shall allow for a minimum of two (2) days for each PST for four (4) trips of full-time representation during start-up and commissioning in their supply quotation.
- .9 Additional time for the Contractor representative shall be paid for at the daily rate provided in the Quotation Form.
- .10 The cost of any changes, adjustments or replacements, which in the opinion of the Owner are due to error or omissions by the Contractor, shall be charged to the Contractor.
- .11 The Contractor shall provide a deficiency list of any remaining items to be completed following startup.

**Revision History**

Rev. No.	Date	By	Checked By	Issued For	Comment
A	December 4, 2024	FPM	NS	Review	
0	December 20	FPM	NS	Final	

**End of Section**

**Supplemental Specifications**  
**Part III – Payment**

## Payment Items - General

The basis of measurement and payment for items included in the Form of Tender Appendix 1 – Schedule of Quantities and Prices are described below. The specific payment descriptions below supersede the applicable payment clauses in the MMCD Platinum Edition Volume II and any MMCD issued Supplemental Updates that may detail payment clauses.

The descriptions of Work to be done under Form of Tender – Appendix 1 – Schedule of Quantities and Prices are general descriptions of the Work only to break down and assess the Tender Price. These descriptions are not intended to include all details of requirements and responsibilities of the Contractor to complete the Works in accordance with the Contract. It is the Tenderer’s responsibility to ensure that the Tender Sum submitted with the Tender is sufficient to complete all the Works based upon the whole of the Contract Documents.

The price bid for each item shall be full compensation for all labour, equipment, materials, de-watering and incidentals necessary to complete the supply, installation and construction of each item as specified to the lines, grades, and cross-section in accordance with the Contract Documents and as directed by the Contract Administrator.

If a Lump Sum Payment is shown in Appendix 1 - Schedule of Quantities and Prices, unless specifically detailed otherwise in the Description of Payment Items, payment shall be based on the Contract Administrator’s estimated percentage of the Contract completed.

## Description of Payment Items

Div.	Pmt. Item	Payment Item Description
<b>01</b>	<b>GENERAL REQUIREMENTS</b>	
		<b>Section 01 10 00 Project Record Documents</b>
	<b>01-1</b>	Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless specifically shown otherwise in the Schedule of Quantities and Prices.
		<b>Section 01 10 00 Reference Specifications</b>
	<b>01-2</b>	All references to Specifications, Standards, or Methods shall be understood to refer to the latest adopted revision, including amendments. There is no Payment applicable to this Section.
		<b>Section 01 51 01 Temporary Utilities and Lighting</b>
	<b>01-3</b>	Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless specifically shown otherwise in the Schedule of Quantities and Prices.
		<b>Section 01 52 01 Temporary Structures</b>
	<b>01-4</b>	Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless specifically shown otherwise the Schedule of Quantities and Prices.
	<b>01-5</b>	Installation of Owner supplied temporary access stairs for declassification of the tanks shall be incidental to the Work.
	<b>01-6</b>	Structural engineer’s inspection and approval for temporary stair installations shall be incidental to the Work for each tank.

Div.	Pmt. Item	Payment Item Description
		<b>Section 01 57 01 Environmental Protection</b>
	<b>01-7</b>	<p>1. This item shall include full compensation for meeting the requirements of Section 01 57 01 and developing and implementing a site-specific Environmental Mitigation Plan to control all works within the work zone 24 hours per day 7 days a week for the duration of the Work.</p> <p>2. Payment for all work performed under this Section will be incidental to payment for work described in other Sections unless specifically shown otherwise in the Schedule of Quantities and Prices.</p>

PST-1		
<b>46</b>	<b>WASTEWATER EQUIPMENT</b>	
		<b>Section 46 43 11 Wastewater Equipment</b>
	<b>46-1</b>	<p><b>Installation of all mechanical components for PST-1</b> <i>Removal of Existing Equipment – Incidental</i></p> <p>Please refer to the bill of materials M-502, drawing M-101 and M-102 in Attachment B.</p> <p>The payment for this section shall be on a lump sum basis per the Schedule of Quantities and Pricing and shall be full compensation for all works necessary to complete the installation of wastewater equipment in accordance with the Contract Documents and as directed by the Contract Administrator.</p>
	<b>46-2</b>	<p><b>Testing and Commissioning of PST-1</b></p> <p>Payment for testing and commissioning and shall be paid according to the lump sum for testing and commissioning within the Schedule of Quantities and Pricing, and shall include the number of days of support from the Supplier for this PST as indicated in the Specification.</p>
	<b>46-3</b>	<p><b>Damage</b></p> <p>Any costs for repair to damage of the equipment during installation shall be considered incidental to the work.</p>

PST-2		
<b>03</b>	<b>CONCRETE</b>	
		<b>Section 03 01 37 Concrete Surface Preparation and Restoration</b>
	<b>03-1</b>	<p><b>Restoration of Joint Seal</b></p> <p>The bid unit rate for this item shall be full compensation for all works necessary to complete the concrete joint seal restoration in accordance with the Contract Documents, Drawings, product data sheets and as directed by the Contract Administrator.</p> <p>1. The payment for this section shall be on a linear basis per the Schedule of Quantities and Pricing and shall be full compensation for all works necessary to restore concrete joint seal full length to 200 mm above peak wet weather liquid level on either side of the tank.</p>

46 WASTEWATER EQUIPMENT	
Section 46 43 11 Wastewater Equipment	
46-4	<p><b>Installation of all mechanical components for PST-2</b> <b><i>Removal of Existing Equipment – Incidental</i></b></p> <p>Please refer to the bill of materials M-502, drawing M-201 and M-202 in Attachment B.</p> <p>The payment for this section shall be on a lump sum basis per the Schedule of Quantities and Pricing and shall be full compensation for all works necessary to complete the installation of wastewater equipment in accordance with the Contract Documents and as directed by the Contract Administrator.</p>
46-5	<p><b>Testing and Commissioning of PST-2 Work</b></p> <p>Payment for testing and commissioning and shall be paid according to the lump sum for testing and commissioning within the Schedule of Quantities and Pricing, and shall include the number of days of support from the Supplier for this PST as indicated in the Specification.</p>
46-6	<p><b>Damage</b></p> <p>Any costs for repair to damage of the equipment during installation shall be considered incidental to the work.</p>

PST-3	
46 WASTEWATER EQUIPMENT	
Section 46 43 11 Wastewater Equipment	
46-7	<p><b>Installation of all mechanical components for PST-3</b> <b><i>Removal of Existing Equipment – Incidental</i></b></p> <p>Please refer to the bill of materials M-502, drawing M-301 and M-302 in Attachment B.</p> <p>The payment for this section shall be on a lump sum basis per the Schedule of Quantities and Pricing and shall be full compensation for all works necessary to complete the demolition of the existent wastewater equipment and installation of the new wastewater equipment in accordance with the Contract Documents and as directed by the Contract Administrator.</p>
46-8	<p><b>Testing and Commissioning of PST-3 Work</b></p> <p>Payment for testing and commissioning and shall be paid according to the lump sum for testing and commissioning within the Schedule of Quantities and Pricing, and shall include the number of days of support from the Supplier for this PST as indicated in the Specification.</p>
46-9	<p><b>Damage</b></p> <p>Any costs for repair to damage of the equipment during installation shall be considered incidental to the work.</p>

PST-4	
46 WASTEWATER EQUIPMENT	
Section 46 43 11 Wastewater Equipment	
<b>46-10</b>	<p><b>Installation of all mechanical components for PST-4</b> <b>Removal of Existing Equipment – Incidental</b></p> <p>Please refer to the bill of materials M-502, drawing M-401 and M-402 in Attachment B.</p> <p>The payment for this section shall be on a lump sum basis per the Schedule of Quantities and Pricing and shall be full compensation for all works necessary to complete the demolition of the existent wastewater equipment and installation of the new wastewater equipment in accordance with the Contract Documents and as directed by the Contract Administrator.</p>
<b>46-11</b>	<p><b>Testing and Commissioning of PST-4 Work</b></p> <p>Payment for testing and commissioning and shall be paid according to the lump sum for testing and commissioning within the Schedule of Quantities and Pricing, and shall include the number of days of support from the Supplier for this PST as indicated in the Specification.</p>
<b>46-12</b>	<p><b>Damage</b></p> <p>Any costs for repair to damage of the equipment during installation shall be considered incidental to the work.</p>

OPTIONAL WORK ITEMS	
03 CONCRETE	
Section 03 01 37 Concrete Surface Preparation and Restoration in PST-1 and PST-2	
<b>03-2</b>	<p><b>Remove and dispose of unsound concrete in PST-1 and PST-2 to allow for concrete restoration.</b></p> <p><b>Perform surface preparation to specification prior to placement of concrete related materials.</b></p> <p>The bid unit rate for this item shall be full compensation for all works necessary to complete the surface preparation and off-site disposal of any removed concrete, in accordance with the Contract Documents, Drawings, product data sheets and as directed by the Contract Administrator.</p> <ol style="list-style-type: none"> <li>1. Unit rate payment on a linear meter basis for crack, gravel seam, and eroded surface preparations per product data sheets. Unit rate surface preparation shall include the removal and offsite disposal of any unsound concrete. The linear metre unit rate shall also include the costs of hydrovac truck (if used), hauling costs, and offsite disposal fees.</li> <li>2. All materials, are to be recycled and disposed of properly, and the cost shall include any special recycling or disposal fees that may be required to do so.</li> </ol>



	<b>03-3</b>	<p><b>Restore concrete cracks, gravel seams and erosion by applying materials per specification.</b></p> <p>The bid linear metre unit rate for this item shall be full compensation for all works necessary to complete the concrete restoration in accordance with the Contract Documents, Drawings, product data sheets and as directed by the Contract Administrator.</p> <ol style="list-style-type: none"> <li>1. Payment under this section is on a linear meter basis for crack, gravel seam, and eroded surface restoration as listed in the Schedule of Quantities and Pricing.</li> <li>2. The work shall not be considered complete until inspected by the Owner's representative.</li> </ol>
<b>46</b>	<b>WASTEWATER EQUIPMENT</b>	
		<b>Section 46 43 11 Wastewater Equipment</b>
	<b>46-13</b>	<p><b>Spare Equipment</b></p> <p>The lump sum for payment of this optional item includes the complete list of spares listed in Section 2.1.1 and shall match the equipment supplied for PST-3 and PST-4.</p>

**Attachment A**

# **Available Record Drawings**

**KEYNOTES:**

- 1 200# PVC C900 WATERMAIN. RESTRAIN ALL JOINTS & WRAP ALL JOINTS IN ACCORDANCE W/ AWWA STANDARDS.
- 2 150# FIRE HYDRANT ASSEMBLY AS PER RMOW STANDARDS.
- 3 100# PVC WATER SERVICE CONNECTION C/W ISOLATION VALVE AS PER RMOW STANDARDS. CONNECT TO EX. WELL CONNECTION TO PLANT.
- 4 200# TEE C/W 200# GATE VALVE.
- 5 63# WATER SERVICE CONNECTION C/W ISOLATION VALVE.
- 6 200# CAP, 200# VALVE & HYDRANT, BLOWOFF ASSEMBLY.
- 7 CORE EX. PIPE CHASE, INSTALL 63# INSULATED WATERMAIN TO HEADWORKS BUILDING. C/W RPP BFP AND PRV. CONNECT TO EXISTING EYEWASH/SHOWER AS REQ'D.
- 8 VERIFY ALL CROSSINGS, UTILIZE VERT. BENDS AS REQ'D TO MAINTAIN MIN. 300mm SEPARATION TO PIPE/STRUCTURE (TYP.).
- 9 600#x750# REDUCER.
- 10 TIE TO EX. 600# S.E. INSTALL 2x750#x750#x600# TEES C/W CONCRETE THRUST BLOCK AND 1-600# AND 1-750# BUTTERFLY VALVES. CONNECT TO EX. 600# MAIN W/90° BENDS, ROBAR COUPLING AND REQ'D FITTINGS UPON COMPLETION OF CLARIFIER #1/#2 UPGRADE. CAP EX. 600# S.E. PIPE TO CHLORINE CONTACT TANK.
- 11 75# PVC WATER SERVICE CONNECTION C/W ISOLATION VALVE AS PER RMOW STANDARDS.
- 12 REMOVE EX. 63# WATER SERVICE & CONNECT NEW WATER SERVICE TO EX. ADMINISTRATION BUILDING. INSTALL 63# RPP BFP AND PRV WITHIN BUILDING. CHLORINATE ALL EXISTING PIPING.
- 13 CORE EX. PIPE CHASE & CONNECT TO EX. 200# SLUDGE PIPE. INSTALL 200#x200#x150# TEE, 200# PLUG VALVE, 150# PLUG VALVE, ROBAR COUPLINGS AND REQUIRED FITTINGS. INSULATE PIPE.
- 14 OVERBUILD MANHOLE ON EX. 300# DRAIN. INSTALL 375#x45" BEND.
- 15 INSTALL 2-750#x45" VERT. BENDS
- 16 CONNECT 63# GAS AS REQ'D. C/W ISOLATION VALVE TO EX. GAS.
- 17 EX. WELL (2) TO BE DECOMMISSIONED
- 18 EXTEND PROPOSED WATERMAIN INTO EX. SOLIDS CONTACT BUILDING C/W RPP BFP AND PRV. CONNECT TO EXISTING PIPING AND DISCONNECT EX. WELL CONNECTION. INSULATE ALL PIPING.
- 19 INSTALL 750# CLEANOUT ON EX. STORM. PLUG EX. NORTH INVERT.
- 20 INSTALL CB C/W 150# PVC TO EX. STM. CONNECT EX. DRAIN FROM MAINTENANCE GARAGE TO MAIN.
- 21 INSTALL 250# PVC SAN PIPE FROM FERMENTER OVERFLOW TO EX. DRAIN. CONNECT TO EX. OVERFLOW WITH ROBAR CPLG AND EXTEND BELOW GRADE WITH 90° BEND. CONNECT FERMENTER SUMP PUMP DISCHARGE TO 250# MAIN WITH WYE CONNECTION

**NOTE:**

MIN. COVER FOR WATERMAIN / SANITARY SEWER / PROCESS PIPING IS 1.8m UNLESS NOTED OTHERWISE.  
MIN. COVER FOR AIR / GAS PIPING IS 1.0m UNLESS NOTED OTHERWISE.

**LEGEND:**

- |  |                               |  |                               |
|--|-------------------------------|--|-------------------------------|
|  | COORDINATE POINT              |  | PROPOSED SWALE                |
|  | KEYNOTE                       |  | PROPOSED CHAIN LINK FENCE     |
|  | SPOT ELEVATION                |  | PROPOSED DITCH                |
|  | FLOW                          |  |                               |
|  | SANITARY                      |  | SYSTEM FERMENTED SLUDGE       |
|  | GAS                           |  | ELU. ELUTRIATION WATER        |
|  | STORM                         |  | PS - PRIMARY SLUDGE           |
|  | WATER                         |  | PE - PRIMARY EFFLUENT         |
|  | RAS - RETURN ACTIVATED SLUDGE |  | SAS - SODA ASH SOLUTION       |
|  | WAS - WASTE ACTIVATED SLUDGE  |  | SE - SECONDARY EFFLUENT       |
|  | ML - MIXED LIQUOR             |  | TF - TREATED FERMENTED SLUDGE |
|  | FOA - FOUL AIR                |  | TEW - TREATED EFFLUENT        |
|  | PA - PLANT AIR                |  | DES - DISTRICT ENERGY         |

LOCATION	PIPE LENGTH (m)	GRADE (%)	DIA.	RIM EL.	PIPE INVERTS	COMMENTS
SAN MH4	16.20	1.0%	200#	600.75	599.21	599.05/ 599.02N
SAN MH3	5.00	1.0%	300#	601.00	601.00	598.97SE/SW 598.92N
SAN MH2A	26.20	0.75%	375#	601.07	598.725/ 598.70N	
SAN MH1	45.50	0.70%	375#	601.05	598.385/ 598.38N	

EXISTING UNDERGROUND UTILITIES AND SURFACE FEATURES THE SIZE AND LOCATION OF ALL UNDERGROUND UTILITIES AND SURFACE FEATURES ILLUSTRATED ON THE DRAWINGS CAN BE CONSIDERED APPROXIMATE ONLY. THE CONTRACTOR WILL BE RESPONSIBLE FOR FIELD CONFIRMING THE EXACT SIZE AND LOCATION OF ALL SURFACE FEATURES AND UNDERGROUND UTILITIES WITH THE INDIVIDUAL UTILITY COMPANIES. ANY CONFLICTS SHALL BE REPORTED TO THE ENGINEER PRIOR TO CONSTRUCTION.

No.	DATE	DESCRIPTION	BY	APPROVED	No.	DESCRIPTION	DATE	APPROVED
7	09.08.31	DESIGN UPDATE	MC	RAF				
6	09.08.04	DESIGN UPDATE	MC	RAF				
5	08.10.13	DESIGN UPDATE	MC	RAF				
4	08.09.13	DESIGN UPDATE	MC	RAF	3	AS CONSTRUCTED	11.04.20	RAF
3	08.06.24	REVISION SE LINE	MC	RAF	2	ISSUED FOR CONSTRUCTION	07.07.30	RAF
2	08.03.13	ADDED INVERTS	MC	RAF	1	ISSUED FOR TENDER	07.05.24	RAF

FOR CONTINUATION REFER TO DWG. C-002



Stantec Consulting Ltd,  
1007 - 7445 - 132 Street  
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Tel: (604) 597-0422  
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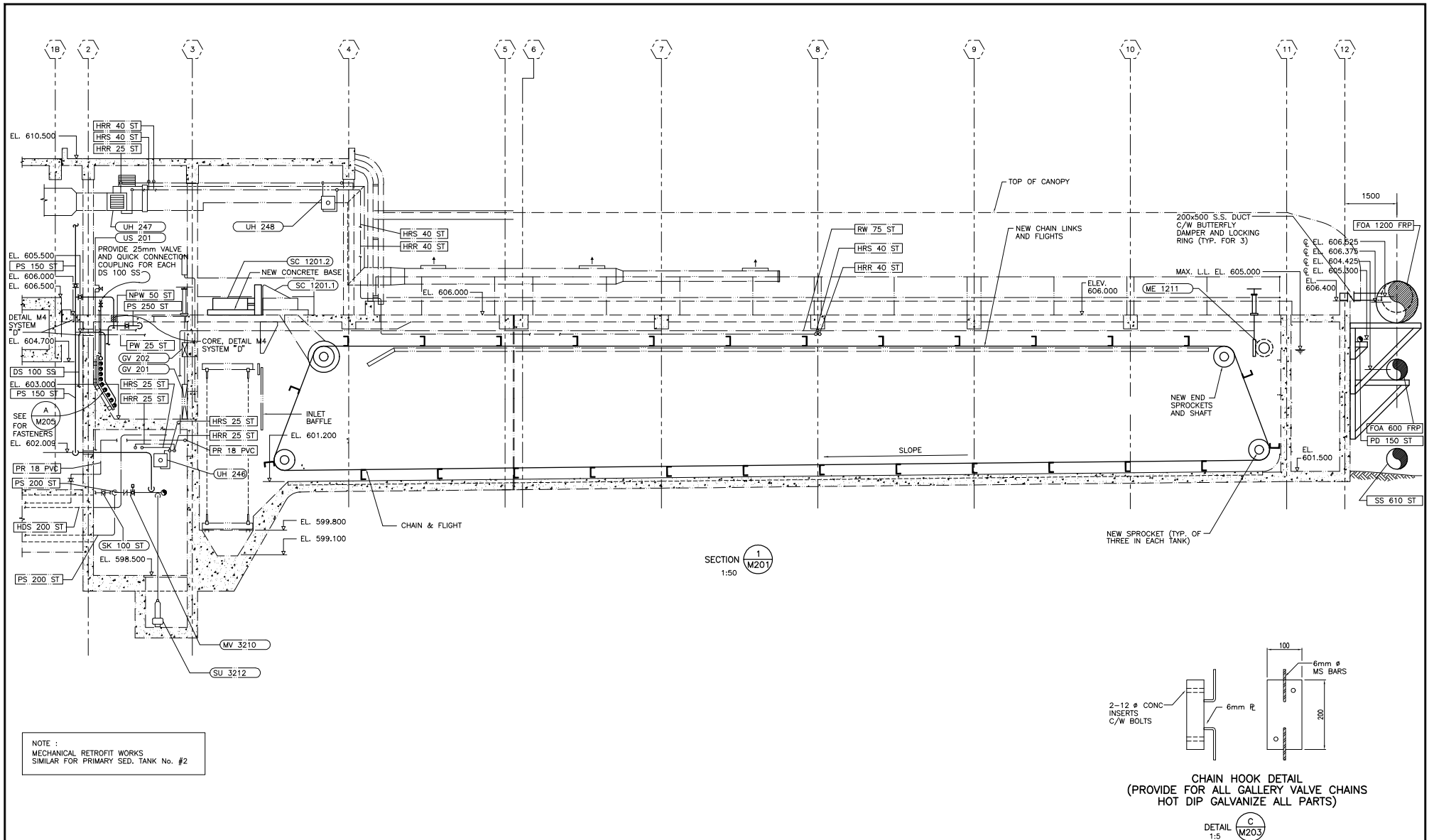
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DRAWN: ESD  
CHECKED: MC  
APPROVED: RAF  
SCALE: 1:250

CLIENT: RESORT MUNICIPALITY OF WHISTLER  
TITLE: WASTEWATER TREATMENT PLANT UPGRADE  
YARD PIPING - NORTH

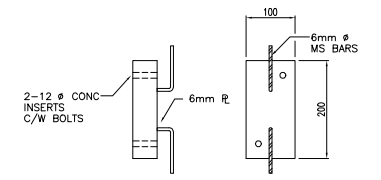
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JOB No. 111700234  
REVISION: 7  
STATUS: 3  
DRAWING: C-003







SECTION 1  
M201  
1:50

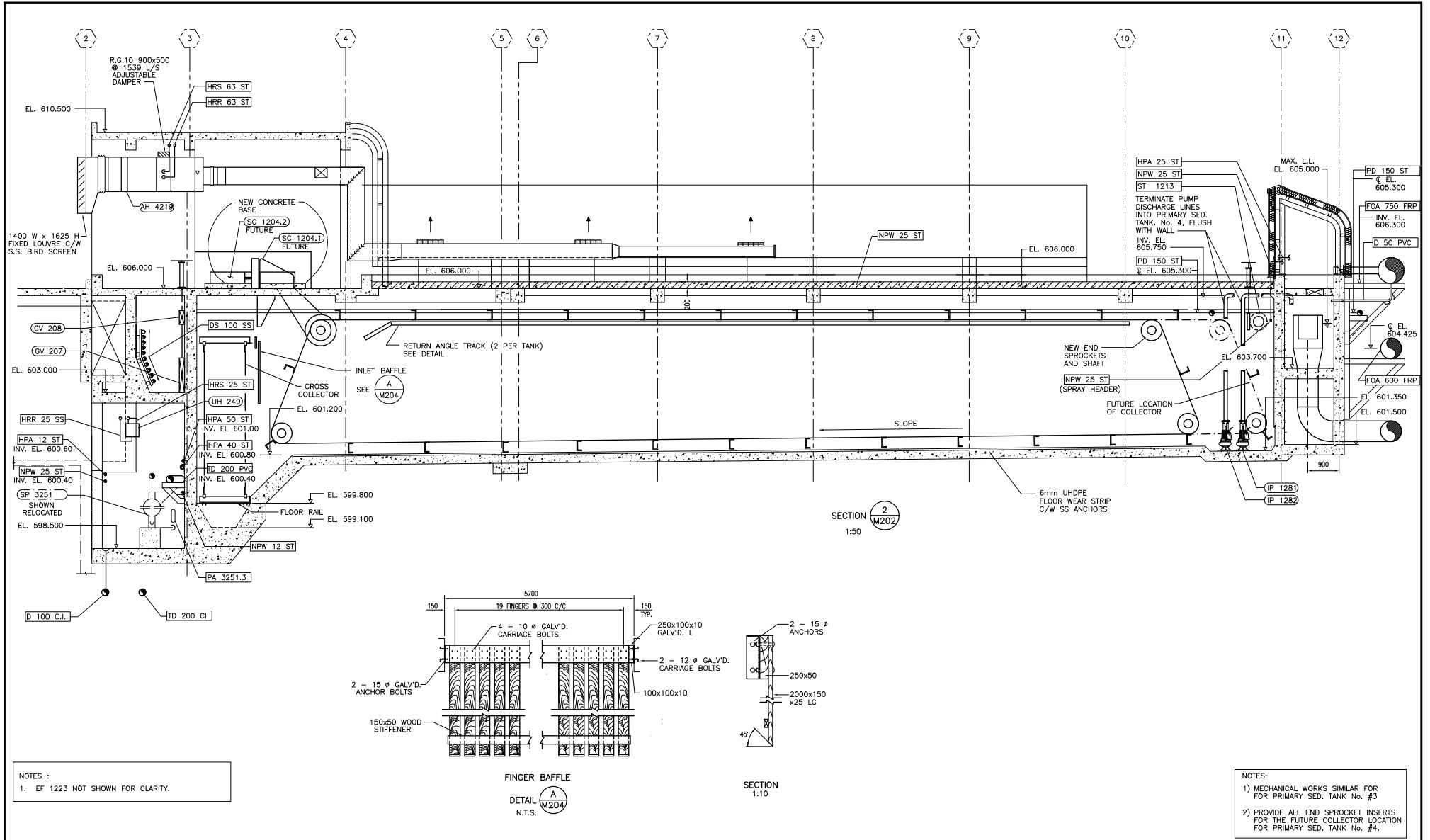


CHAIN HOOK DETAIL  
(PROVIDE FOR ALL GALLERY VALVE CHAINS  
HOT DIP GALVANIZE ALL PARTS)

DETAIL C  
M203  
1:5

NOTE :  
MECHANICAL RETROFIT WORKS  
SIMILAR FOR PRIMARY SED. TANK No. #2

ACAD DWG: M203 1:50 98-02-18										DESIGNED: H.F.W.		DAYTON & KNIGHT LTD. Consulting Engineers		RESORT MUNICIPALITY OF WHISTLER WASTEWATER TREATMENT PLANT—STAGE III EXPANSION—CONTRACT 1 EXISTING PRIMARY SEDIMENTATION TANK — SECTION		SCALE: 1:50		M203	
REVISIONS										DRAWN: WSL/KM/LW/ES				DRAWING No. 179.11.1		DRAWING No. 179.11.1			
ISSUE DATE DRAWN CHK'D APP'D DESCRIPTION										CHECKED: HK				SHEET 127 OF 249		ISSUE C			
ISSUE DATE DRAWN CHK'D APP'D DESCRIPTION																			
B APR/96 LW HK HK ISSUED FOR CONSTRUCTION																			
C FEB/98 JC HK HK RECORD DRAWING																			



ISSUE	DATE	DRAWN	CHK'D	APP'D	DESCRIPTION
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C	FEB/98	JC			RECORD DRAWING

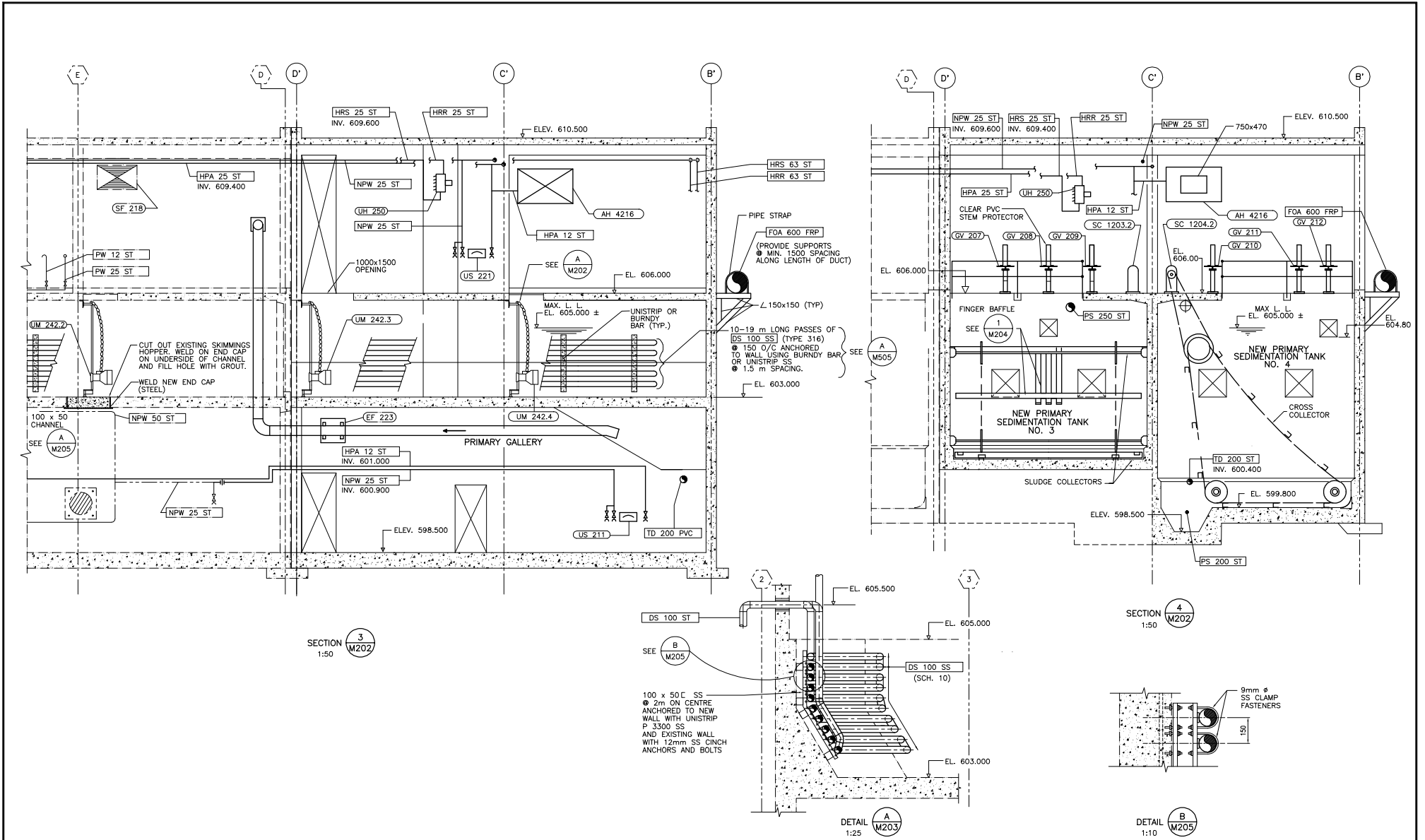
ISSUE	DATE	DRAWN	CHK'D	APP'D	DESCRIPTION

DESIGNED: H.F.W.  
 DRAWN: WSL/XM/ES  
 CHECKED: HK



RESORT MUNICIPALITY OF WHISTLER  
 WASTEWATER TREATMENT PLANT-STAGE III EXPANSION-CONTRACT 1  
 PRIMARY SEDIMENTATION TANK - SECTION

SCALE: AS SHOWN  
 DRAWING No. 179.11.1  
 SHEET 128 OF 249 ISSUE C



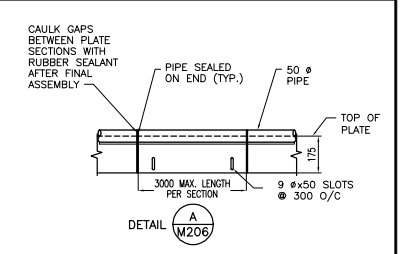
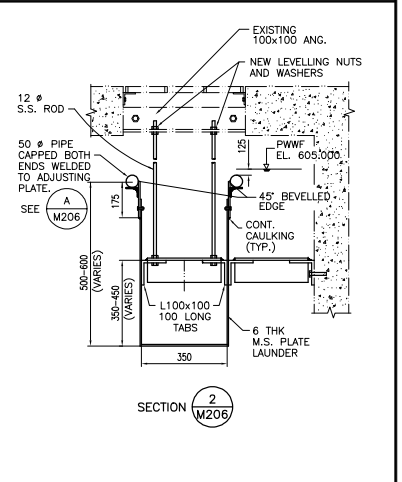
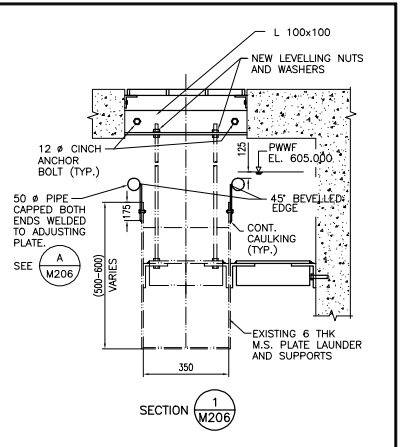
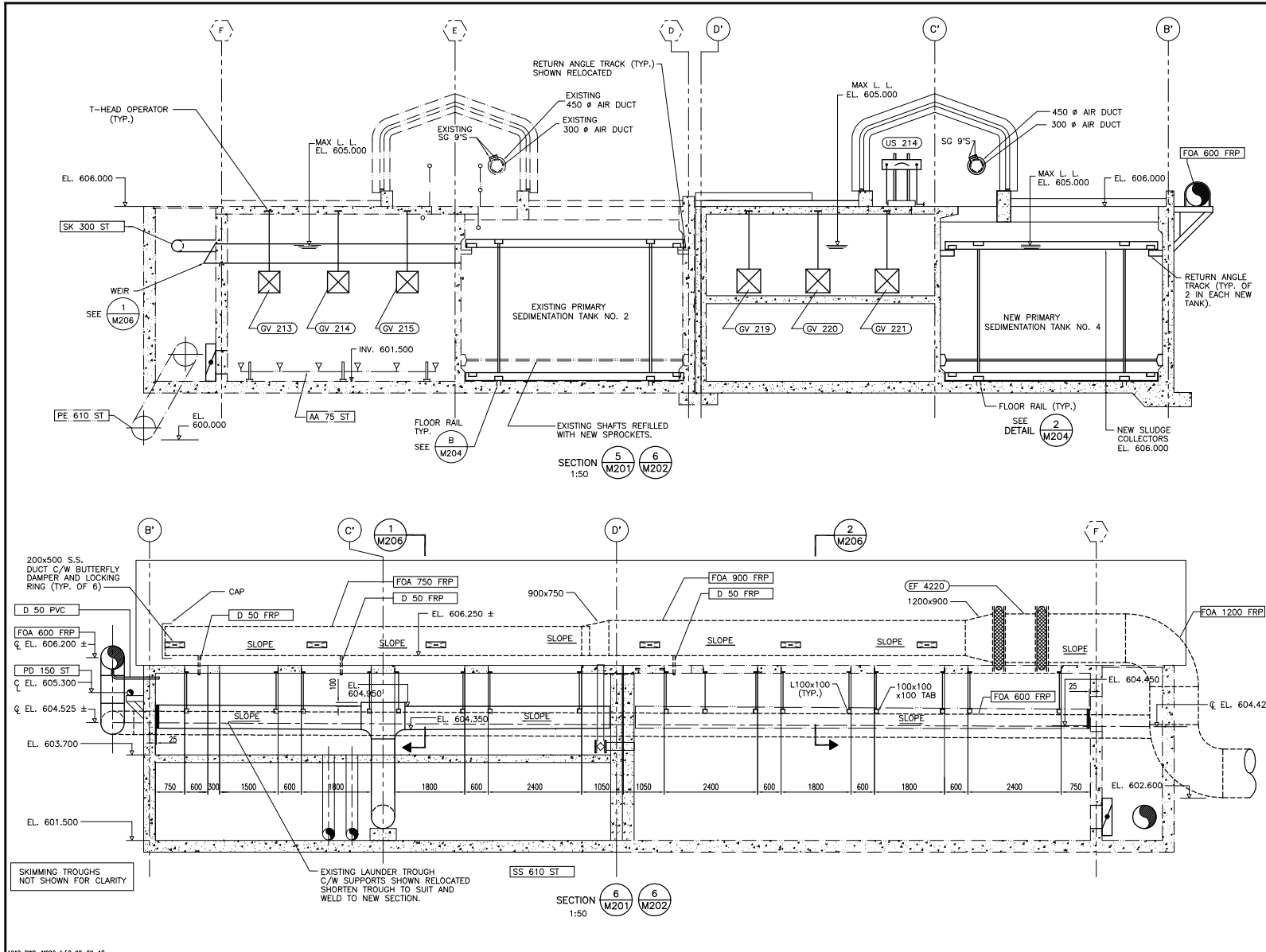
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REVISIONS	ISSUE	DATE	DRAWN	CHK'D	APP'D	DESCRIPTION	ISSUE	DATE	DRAWN	CHK'D	APP'D	DESCRIPTION	DESIGNED	DRAWN	CHECKED	SCALE: 1:50	M205
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C	FEB/98	JC				RECORD DRAWING							WLP/DBC/ES			SHEET 129 OF 249	ISSUE C
													HK				

DAYTON & KNIGHT LTD. Consulting Engineers

RESORT MUNICIPALITY OF WHISTLER WASTEWATER TREATMENT PLANT—STAGE III EXPANSION—CONTRACT 1 PRIMARY SED. TANKS—SECTIONS



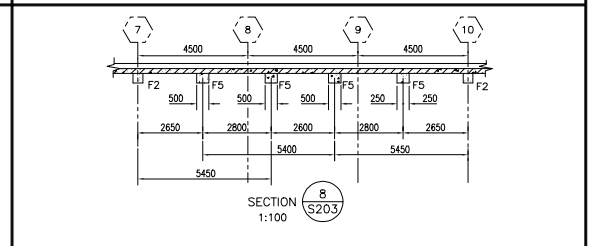
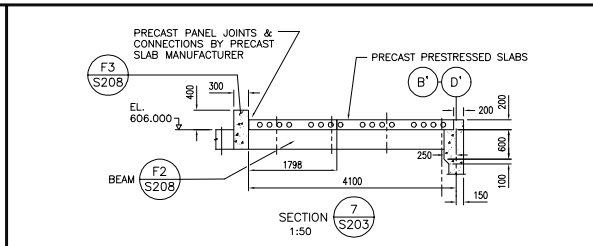
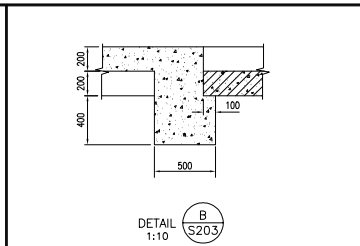
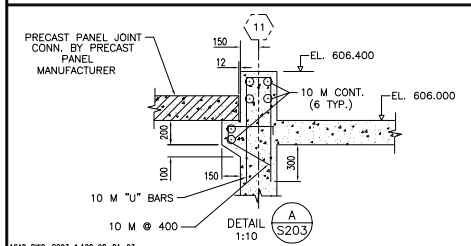
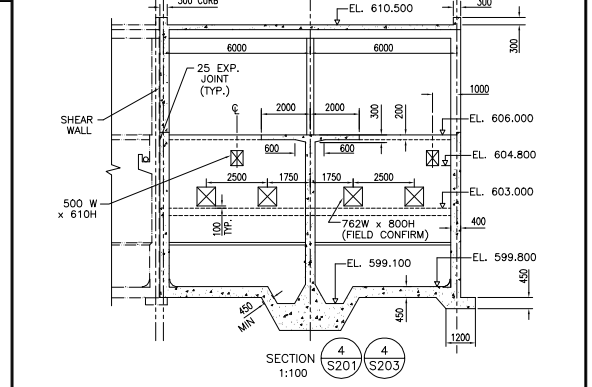
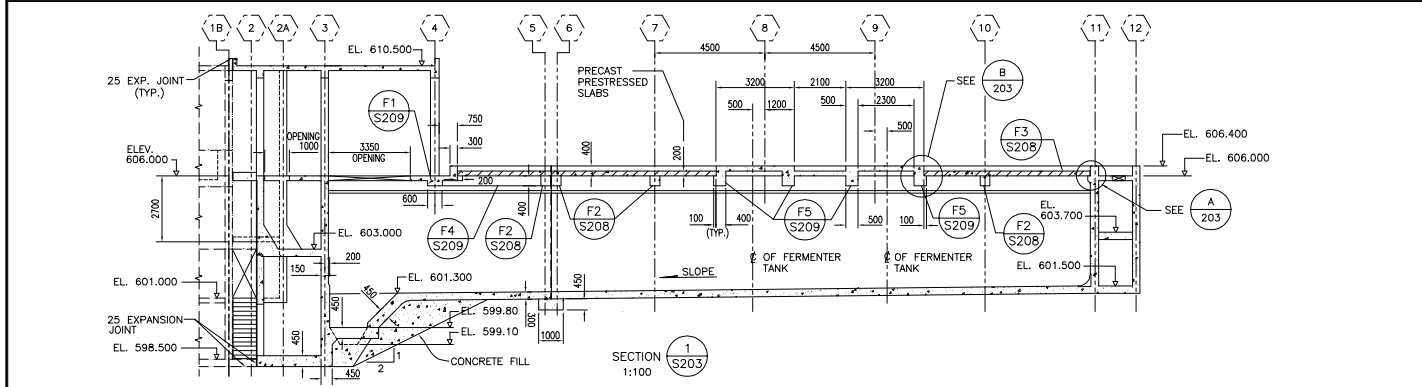
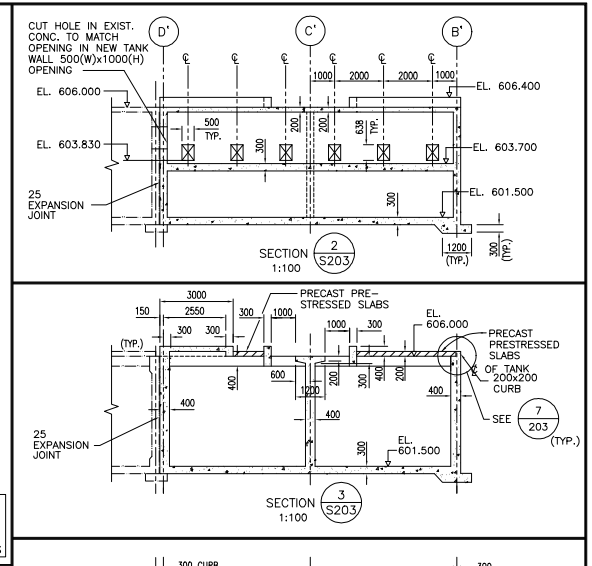
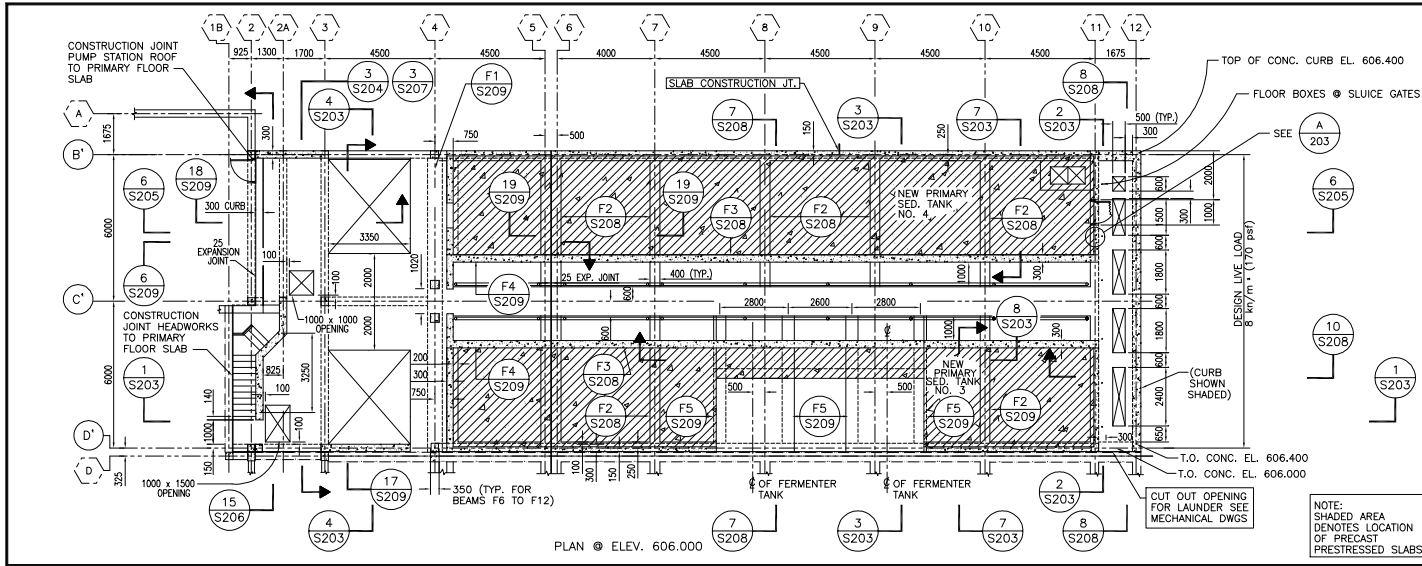


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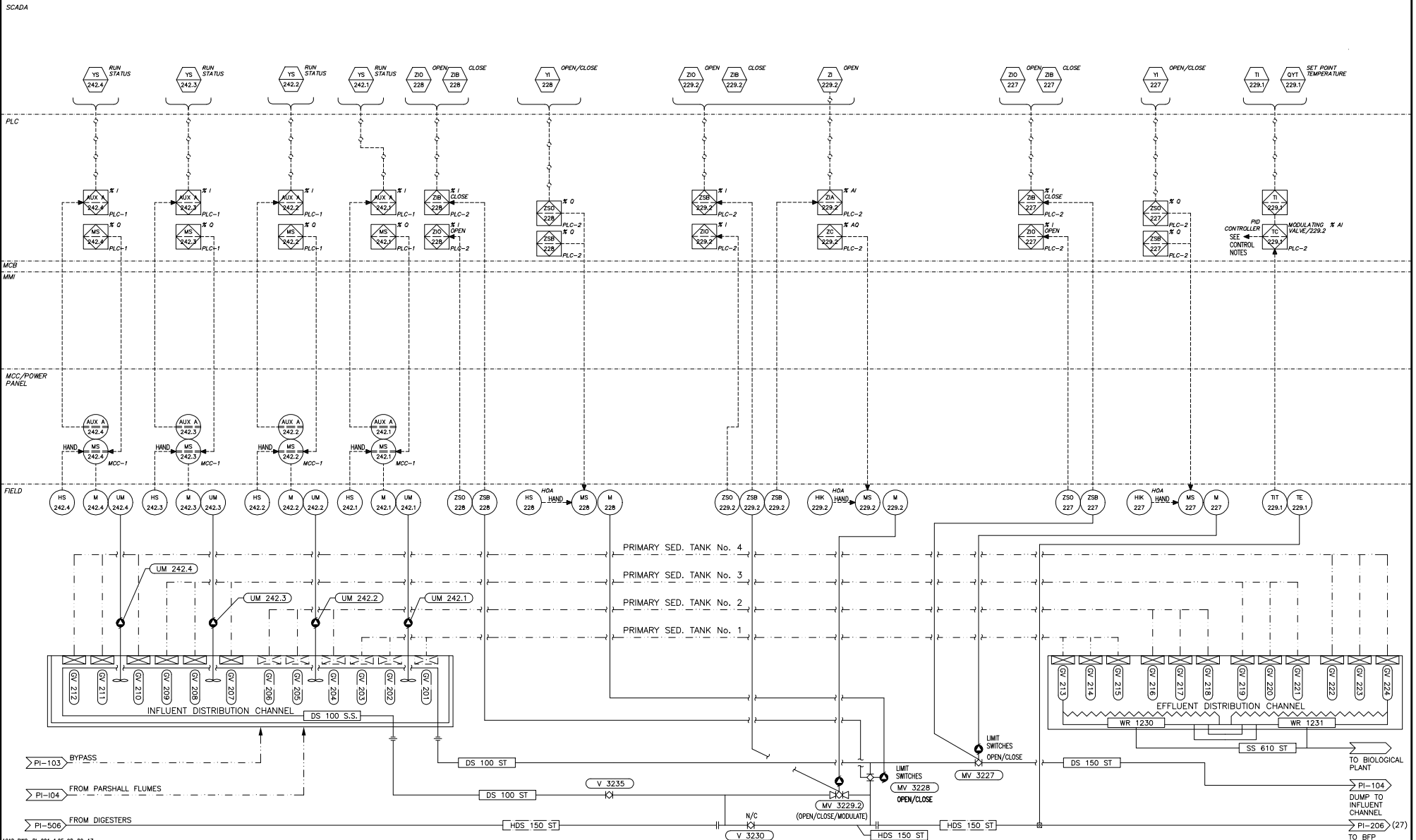
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C	FEB/98	JC			RECORD DRAWING						

DESIGNED	H.F.W.		<b>DAYTON &amp; KNIGHT LTD.</b> Consulting Engineers	RESORT MUNICIPALITY OF WHISTLER WASTEWATER TREATMENT PLANT—STAGE III EXPANSION—CONTRACT 1 PRIMARY SEDIMENTATION TANKS — SECTIONS	SCALE: 1:50	M206
DRAWN	W.SL./K.M./D.K./E.S.				DRAWING No. 179.11.1	
CHECKED	HK				SHEET 130 OF 249 ISSUE C	





ACAD DWG: S203 1:100 98-01-23										DESIGNED: S.O./H.P.W.		DAYTON & KNIGHT LTD. Consulting Engineers		RESORT MUNICIPALITY OF WHISTLER WASTEWATER TREATMENT PLANT-STAGE III EXPANSION-CONTRACT 1 PRIM. SED. TANKS-PLAN @ EL. 606.600-SECT. & CONC. OUTLINE		SCALE: 1:100		S203	
ISSUED FOR CONSTRUCTION										DRAWN: WLP/G.S.						DRAWING No. 179.11.1			
RECORD DRAWING										CHECKED: H.K./R.W.						SHEET 77 OF 249		ISSUE C	



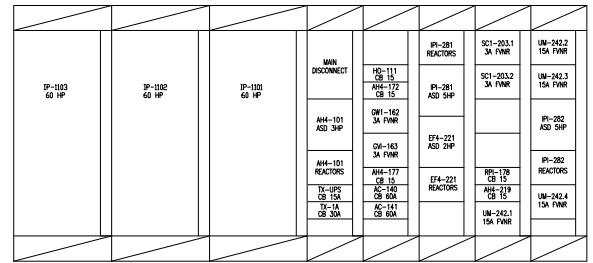
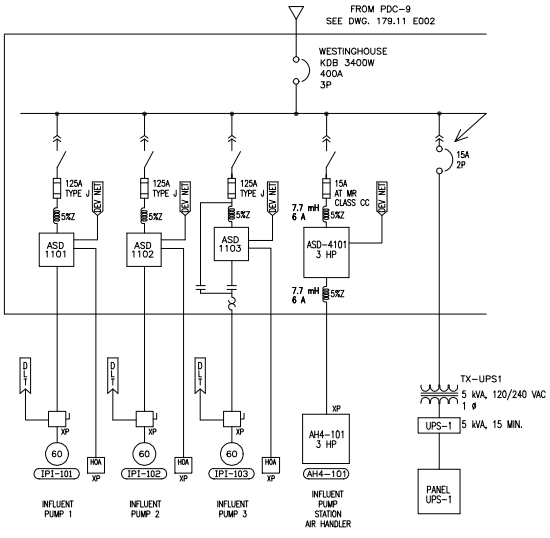
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ISSUE	DATE	DRAWN	CHK'D	APP'D	DESCRIPTION	ISSUE	DATE	DRAWN	CHK'D	APP'D	DESCRIPTION	DESIGNED	CHK'D	APP'D	DESCRIPTION
B	APR/96	ES	HK	HK	ISSUED FOR CONSTRUCTION							HK			
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DAYTON & KNIGHT LTD. Consulting Engineers

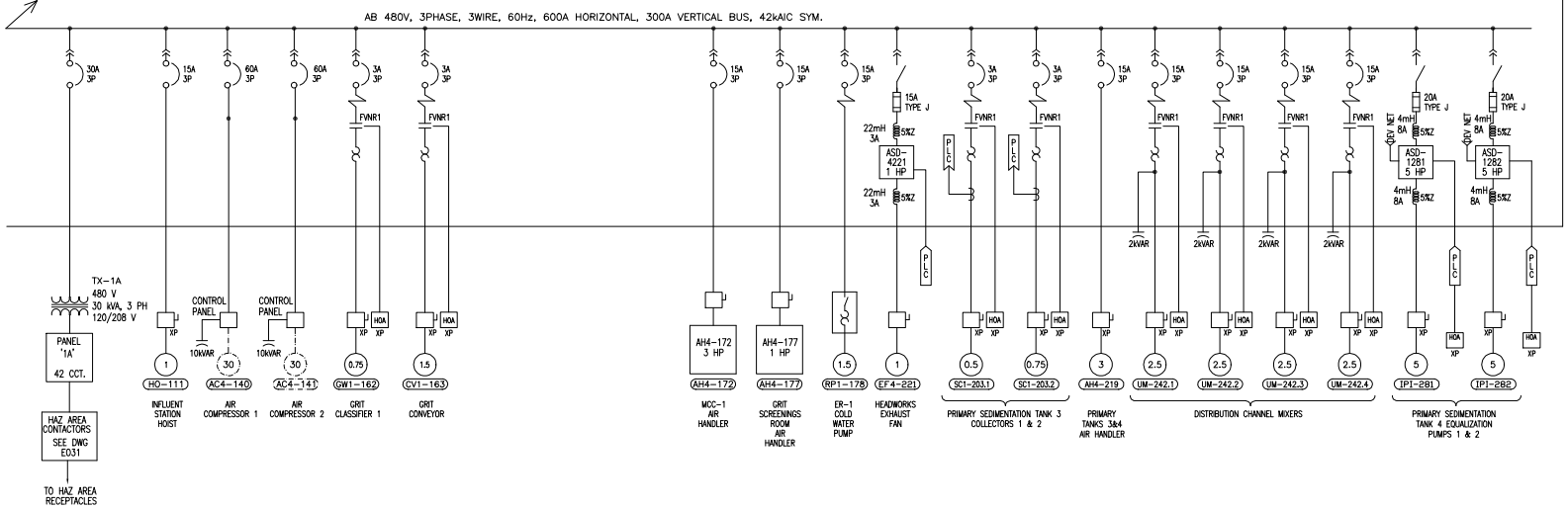
RESORT MUNICIPALITY OF WHISTLER  
SEWAGE TREATMENT PLANT - STAGE III EXPANSION - CONTRACT 1  
PRIMARY SEDIMENTATION INFLUENT - EFFLUENT CHANNELS  
PROCESS AND INSTRUMENTATION DIAGRAM

SCALE: NTS  
DRAWING No. 179.11.1  
SHEET 26 OF 249 ISSUE C



MCC-1

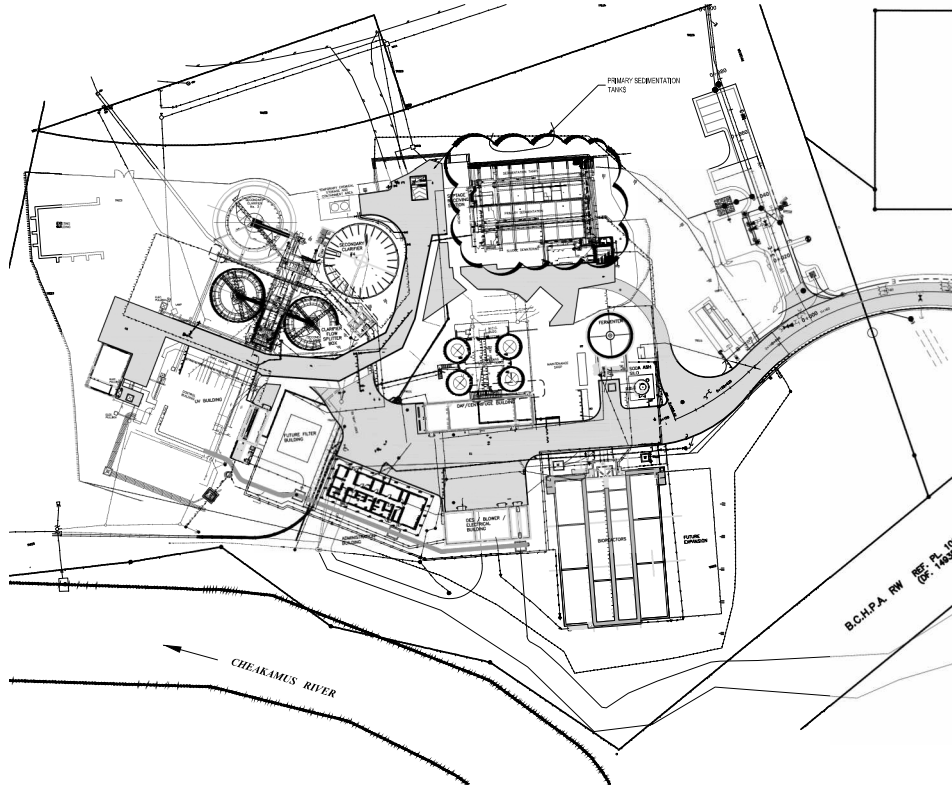
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ACAD DWG: E011 1:1 98-04-14		DATE		DRAWN	CHK'D	APP'D	DESCRIPTION		ISSUE	DATE	DRAWN	CHK'D	APP'D	DESCRIPTION		DESIGNED	DAYTON & KNIGHT LTD. Consulting Engineers	WASTEWATER TREATMENT PLANT - STAGE III EXPANSION - CONTRACT 1 AREA 100 - HEADWORKS ELECTRICAL ROOM 1 MCC-1	SCALE: N.T.S.	ED11
ISSUE	DATE	DRAWN	CHK'D	APP'D	DESCRIPTION		DESIGNED	DAYTON & KNIGHT LTD. Consulting Engineers	WASTEWATER TREATMENT PLANT - STAGE III EXPANSION - CONTRACT 1 AREA 100 - HEADWORKS ELECTRICAL ROOM 1 MCC-1	SCALE: N.T.S.	ED11									
B	APR/96	R.D.	B.H.W.	B.H.W.	ISSUED FOR CONSTRUCTION		ER-1	DAYTON & KNIGHT LTD. Consulting Engineers	WASTEWATER TREATMENT PLANT - STAGE III EXPANSION - CONTRACT 1 AREA 100 - HEADWORKS ELECTRICAL ROOM 1 MCC-1	DRAWING No. 179.11.1	ED11									
C	APR/98	GSAM	BHW	MHW	RECORD DRAWING		ER-1	DAYTON & KNIGHT LTD. Consulting Engineers	WASTEWATER TREATMENT PLANT - STAGE III EXPANSION - CONTRACT 1 AREA 100 - HEADWORKS ELECTRICAL ROOM 1 MCC-1	SHEET 169 OF 249	ISSUE C									

**Attachment B**

# **Issued for Tender Drawings**



**KEY PLAN**  
Scale 1:5000



**LOCATION PLAN**  
N.T.S.

# RESORT MUNICIPALITY OF WHISTLER PRIMARY SEDIMENTATION TANK UPGRADES KWL PROJECT No. 0029.372

**DRAWING LIST**

DWG. NO.	DESCRIPTION
GENERAL	
G-001	LOCATION PLAN AND DRAWING LIST
G-002	PST BUILDING ACCESS
MECHANICAL	
M-001	PST - 1 PLAN
M-002	PST - 1 PROFILE
M-201	PST - 2 PLAN
M-202	PST - 2 PROFILE
M-301	PST - 3 PLAN
M-302	PST - 3 PROFILE
M-401	PST - 4 PLAN
M-402	PST - 4 PROFILE
M-501	SECTIONS
M-602	BILL OF MATERIALS

**KWL** KERR WOOD LEIDAL  
consulting engineers

**TENDER ISSUE**  
DO NOT USE FOR CONSTRUCTION



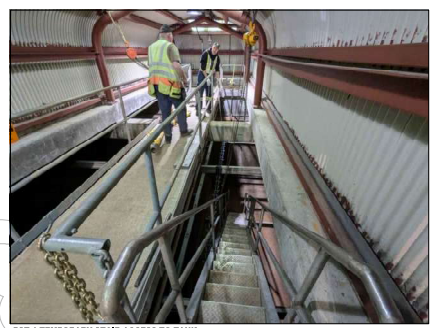
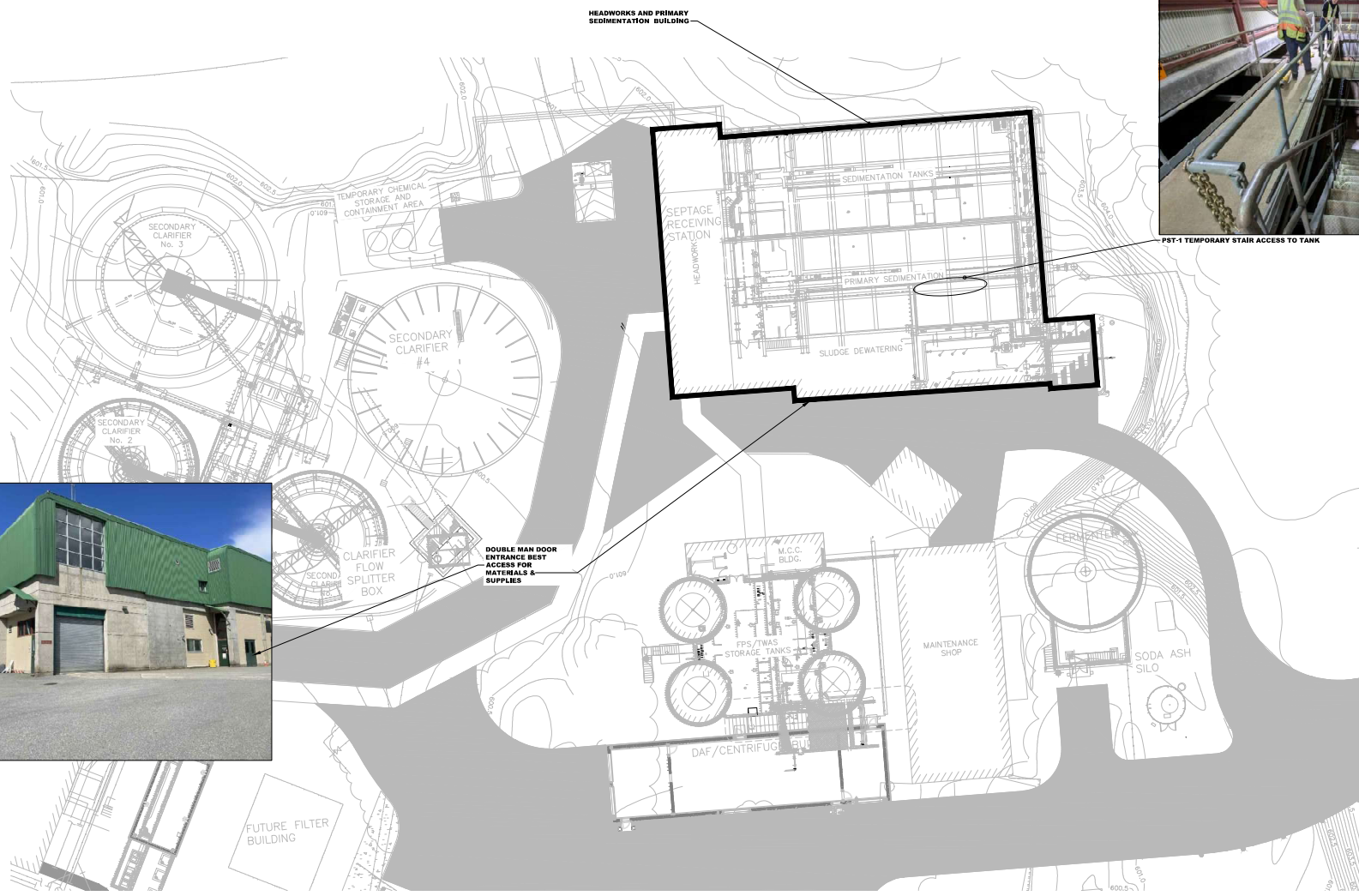
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0	2023-01-07	FPM	AFR	RL/ATB	ISSUED FOR TENDER

Rev	Date	Des	Drawn	Chk	Description

**RESORT MUNICIPALITY OF WHISTLER  
PRIMARY SEDIMENTATION TANK UPGRADES**  
**LOCATION PLAN AND DRAWING LIST**

Project No. 0029-372 Drawing No. **G-001** of **0**  
Title: GENERAL

Page Size: A3D  
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 Scale: 1/8" = 1'-0"  
 Plot Date: 2025-07-17  
 Plot Time: 10:00 AM  
 Plot Path: C:\Users\jleidal\OneDrive\Desktop\Projects\2025\07\001\_PST\_Building\_Access\001\_PST\_Building\_Access.dwg



**SITE LAYOUT**  
Scale 1:250

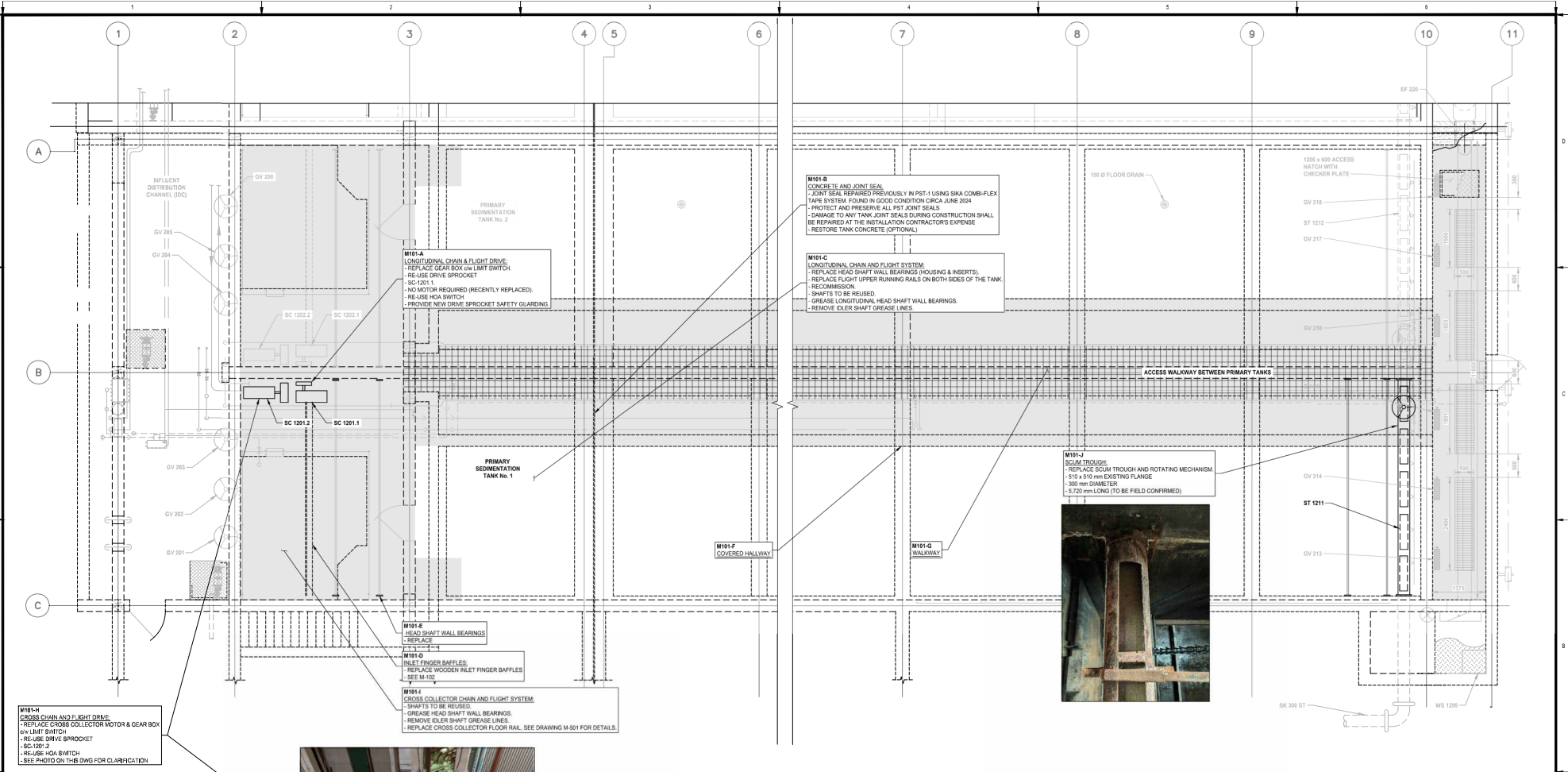
**TENDER ISSUE**  
 DO NOT USE FOR CONSTRUCTION



Rev	Date	Des	Drawn	Chk	Description	Rev	Date	Des	Drawn	Chk	Description
0	2025-07-17	PM	APR	REK/ER	ISSUED FOR TENDER						



Page Size: A3 (D) At 1/8" scale, the paper measures 36" x 48" (914 mm x 1219 mm)



**M101-H**  
 CROSS CHAIN AND FLIGHT DRIVE  
 - REPLACE CROSS COLLECTOR MOTOR & GEAR BOX ON LIMIT SWITCH  
 - REUSE DRIVE SPROCKET  
 - REUSE HOA SWITCH  
 - SEE PHOTO ON THIS DWG FOR CLARIFICATION



**M101-B**  
 CONCRETE AND JOINT SEAL  
 - JOINT SEAL REPAIRED PREVIOUSLY IN PST-1 USING SIKKA COMBI-FLEX TAPE SYSTEM FOUND IN GOOD CONDITION (DECA JUNE 2024)  
 - PROTECT AND PRESERVE ALL PST JOINT SEALS  
 - DAMAGE TO ANY TANK JOINT SEALS DURING CONSTRUCTION SHALL BE REPAIRED AT THE INSTALLATION CONTRACTOR'S EXPENSE  
 - RESTORE TANK CONCRETE (OPTIONAL)

**M101-C**  
 LONGITUDINAL CHAIN AND FLIGHT SYSTEM  
 - REPLACE HEAD SHAFT WALL BEARINGS (HOUSING & INSERTS)  
 - REPLACE FLIGHT UPPER RUNNING RAILS ON BOTH SIDES OF THE TANK  
 - RECOMMISSION  
 - REUSE HOA SWITCH  
 - GREASE LONGITUDINAL HEAD SHAFT WALL BEARINGS  
 - REMOVE IDLER SHAFT GREASE LINES

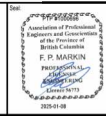


**M101-L**  
 SCUM TROUGH  
 - REPLACE SCUM TROUGH AND ROTATING MECHANISM  
 - 510 x 510 mm EXISTING FLANGE  
 - 300 mm DIAMETER  
 - 2.700 mm LONG (TO BE FIELD CONFIRMED)

- NOTES:**
- CROSS COLLECTORS AND LONGITUDINAL CHAIN AND FLIGHTS NOT SHOWN.
  - RETURNERS AND RECOMMISSION FOR FULLY FUNCTIONAL PST.
  - FOA DUCTING NOT SHOWN.

**PST - 1 PLAN**  
 Scale 1:50

TENDER ISSUE  
 DO NOT USE FOR CONSTRUCTION



Rev	Date	Des	Dwn	Chk	Description
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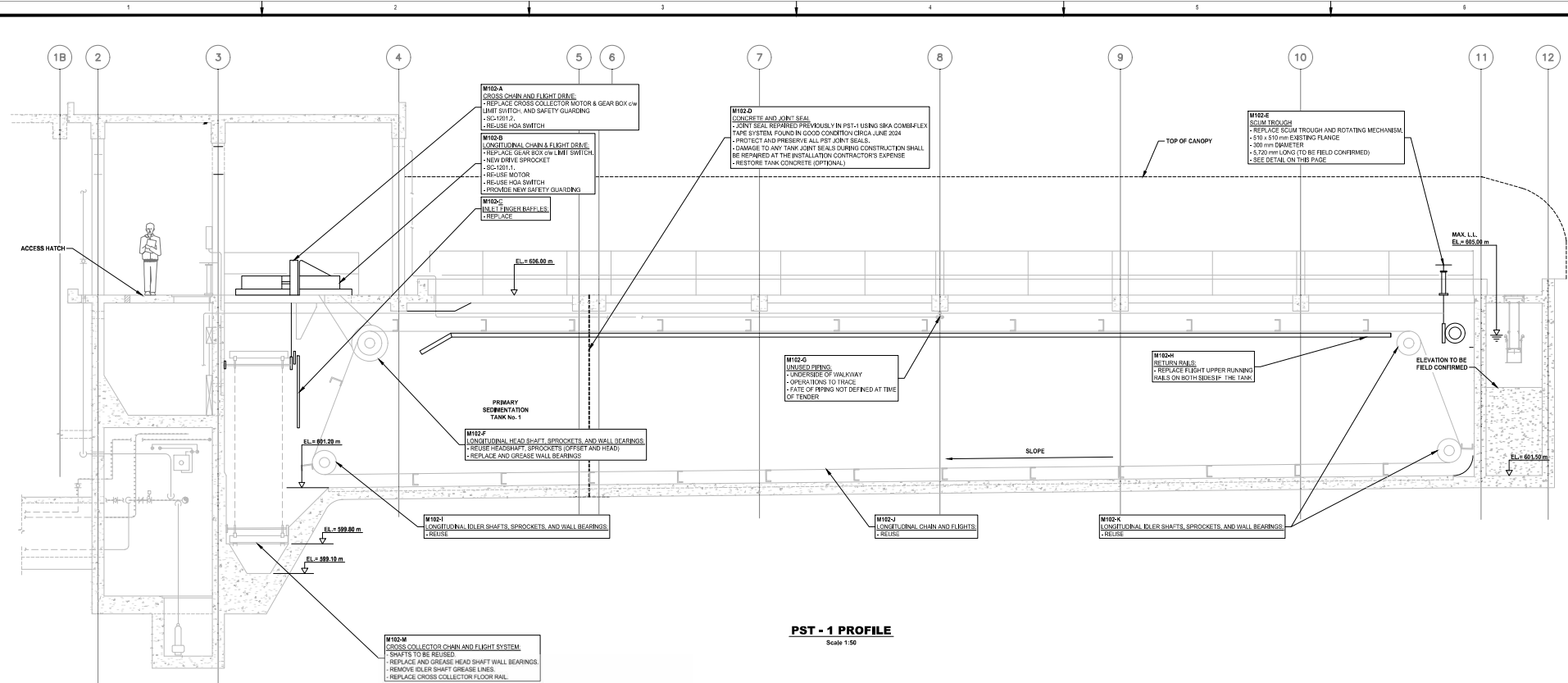
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**RESORT MUNICIPALITY OF WHISTLER**  
**PRIMARY SEDIMENTATION TANK UPGRADES**

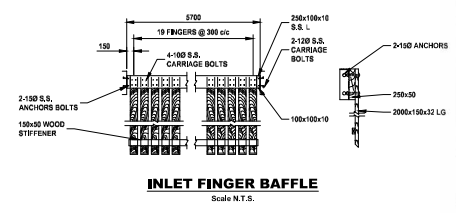
**PST - 1 PLAN**

Project No: 0029-372  
 Title: MECHANICAL  
 Drawing No: M-101  
 Rev: 0

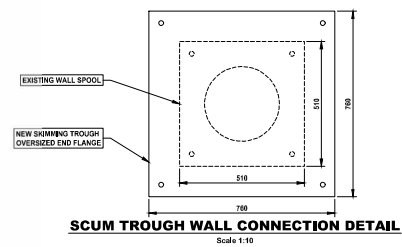
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 Project: 0029-372  
 Drawing: M-102



**PST - 1 PROFILE**  
Scale: 1:50

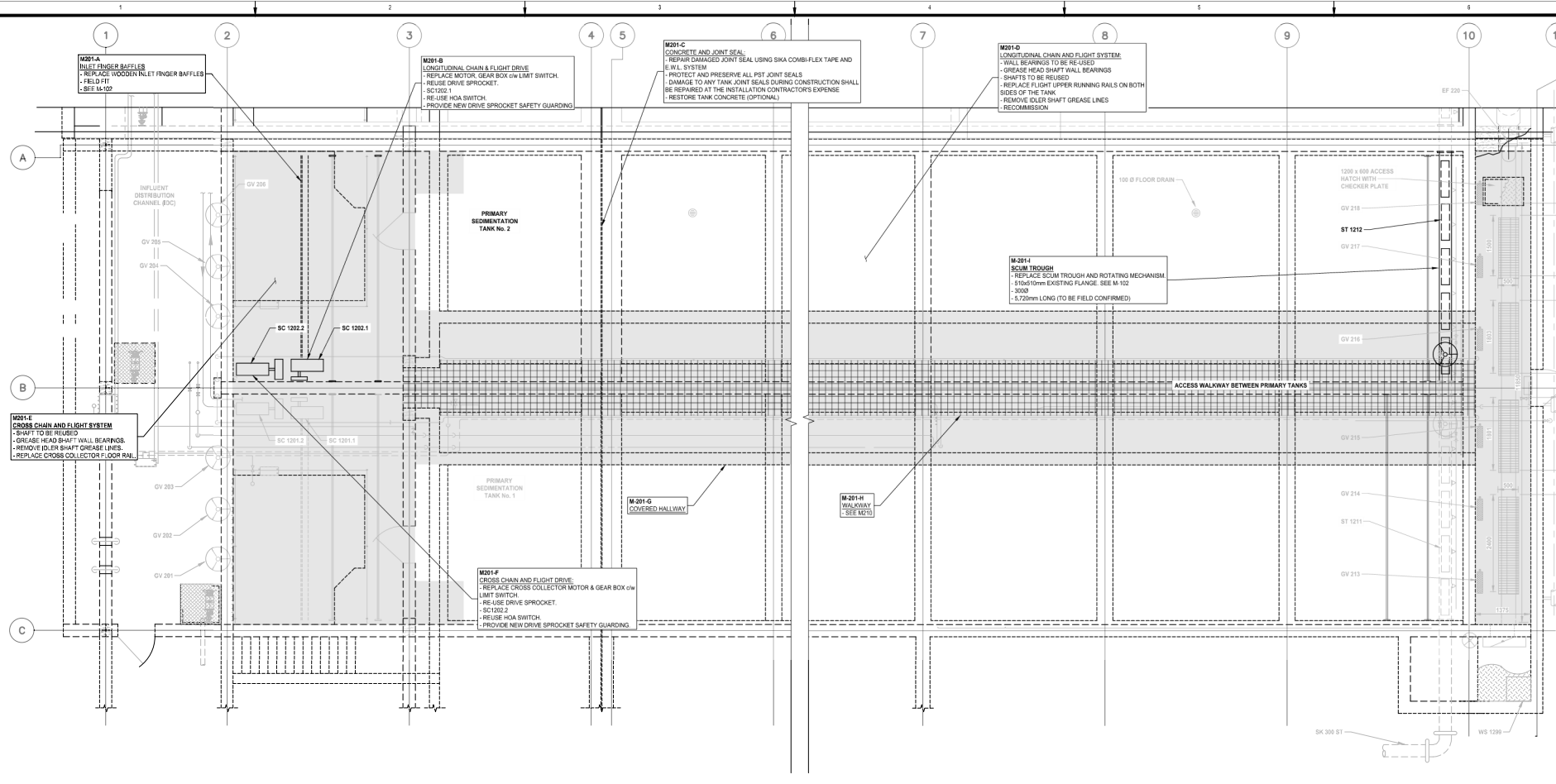


**CROSS COLLECTOR MECHANISM AND FINGER BAFFLE**



Rev	Date	Des	Dwn	Chk	Description	Rev	Date	Des	Dwn	Chk	Description
0	2025-01-07	FFM	AFR	RL/ATB	ISSUED FOR TENDER						

Page: 029 of 029  
 At 100% in paper, measure 100 mm x 100 mm  
 Scale: 1:50  
 Project: 0029-372 - Whistler Primary Sedimentation Tank Upgrades  
 Drawing: M-201 - Mechanical  
 Date: 2025-01-07



**M201-A**  
 FINGER BAFFLES  
 - REPLACE WOODEN FINGER BAFFLES  
 - FIELD FIT  
 - SEE M-102

**M201-B**  
 LONGITUDINAL CHAIN & FLIGHT DRIVE  
 - REPLACE MOTOR, GEAR BOX c/w LIMIT SWITCH  
 - REUSE DRIVE SPROCKET, SC1202.1  
 - REUSE HOA SWITCH  
 - PROVIDE NEW DRIVE SPROCKET SAFETY GUARDING

**M201-C**  
 CONCRETE AND JOINT SEAL  
 - REPAIR DAMAGED JOINT SEAL USING SIKKA COMPLEX TAPE AND E.W.I. SYSTEM  
 - PROTECT AND PRESERVE ALL PST JOINT SEALS  
 - DAMAGE TO ANY TANK JOINT SEALS DURING CONSTRUCTION SHALL BE REPAIRED AT THE INSTALLATION CONTRACTOR'S EXPENSE  
 - RESTORE TANK CONCRETE (OPTIONAL)

**M201-D**  
 LONGITUDINAL CHAIN AND FLIGHT SYSTEM  
 - WALL BEARINGS TO BE RE-USED  
 - GREASE HEAD SHAFT WALL BEARINGS  
 - SHAFTS TO BE RE-USED  
 - REPLACE FLIGHT UPPER RUNNING RAILS ON BOTH SIDES OF THE TANK  
 - REMOVE GLEAS SHAFT GREASE LINES  
 - RECOMMISSION

**M201-H**  
 SCUM TROUGH  
 - REPLACE SCUM TROUGH AND ROTATING MECHANISM  
 - 510x510mm EXISTING FLANGE, SEE M-102  
 - 3000  
 - 5,720mm LONG (TO BE FIELD CONFIRMED)

**M201-E**  
 CROSS CHAIN AND FLIGHT SYSTEM  
 - SHAFT TO BE RE-USED  
 - GREASE HEAD SHAFT WALL BEARINGS  
 - REMOVE ID EN SHAFT GREASE LINES  
 - REPLACE CROSS COLLECTOR FLOOR RAIL

**M201-F**  
 CROSS CHAIN AND FLIGHT DRIVE  
 - REPLACE CROSS COLLECTOR MOTOR & GEAR BOX c/w LIMIT SWITCH  
 - REUSE DRIVE SPROCKET, SC1202.2  
 - REUSE HOA SWITCH  
 - PROVIDE NEW DRIVE SPROCKET SAFETY GUARDING

**M201-G**  
 COVERED HALLWAY

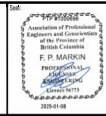
**M201-I**  
 WALKWAY  
 - SEE M201

**PST - 2 PLAN**  
 Scale 1:50

- NOTES:**
- CROSS COLLECTORS AND LONGITUDINAL CHAIN AND FLIGHTS NOT SHOWN.
  - RETURNERS AND RECOMMISSION FOR FULLY FUNCTIONAL PST.
  - FOA DUCTING NOT SHOWN.



TENDER ISSUE  
 DO NOT USE FOR CONSTRUCTION



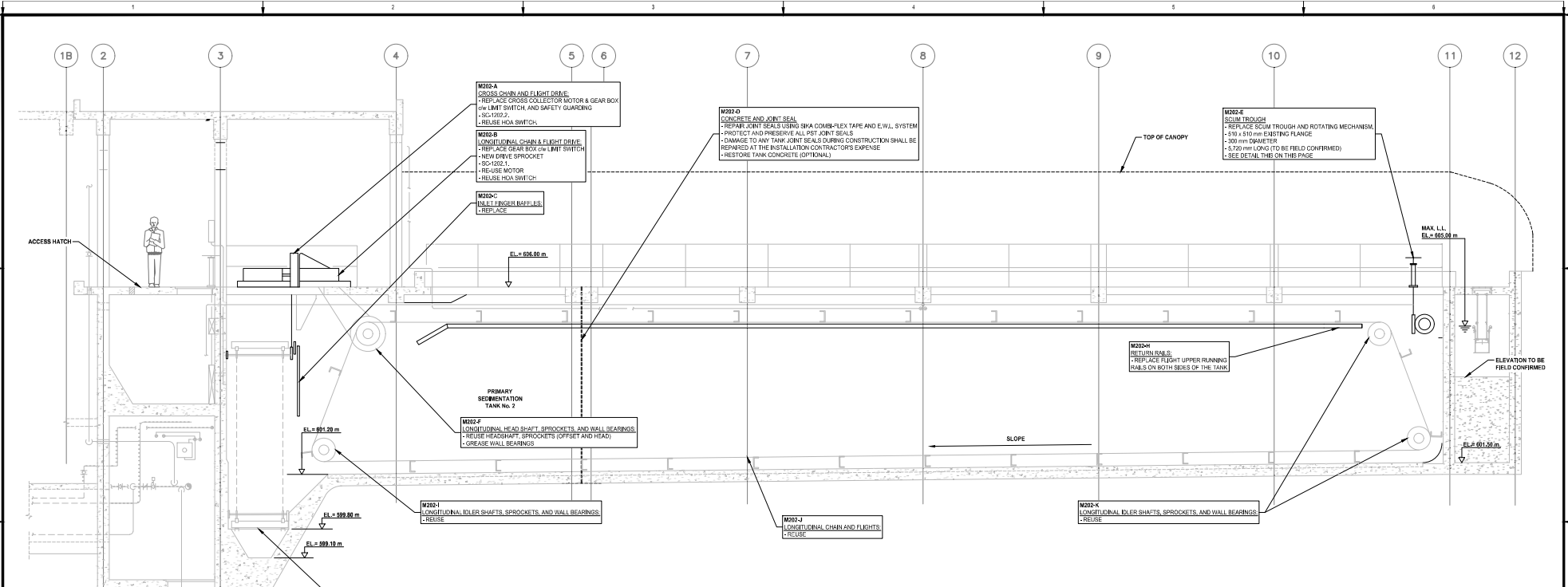
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**RESORT MUNICIPALITY OF WHISTLER**  
**PRIMARY SEDIMENTATION TANK UPGRADES**

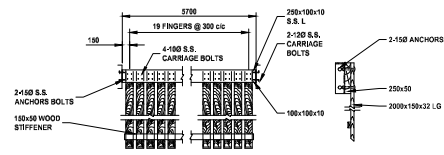
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 Title: MECHANICAL  
 Drawing No: M-201  
 Rev: 0

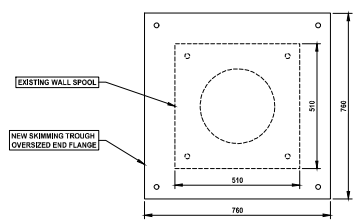
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 Date: 2025-01-07  
 Drawing No: M-202-0  
 Title: MECHANICAL



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Scale: 1:50

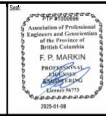


**INLET FINGER BAFFLE**  
Scale: N.T.S.



**SCUM TROUGH WALL CONNECTION DETAIL**  
Scale: 1:10

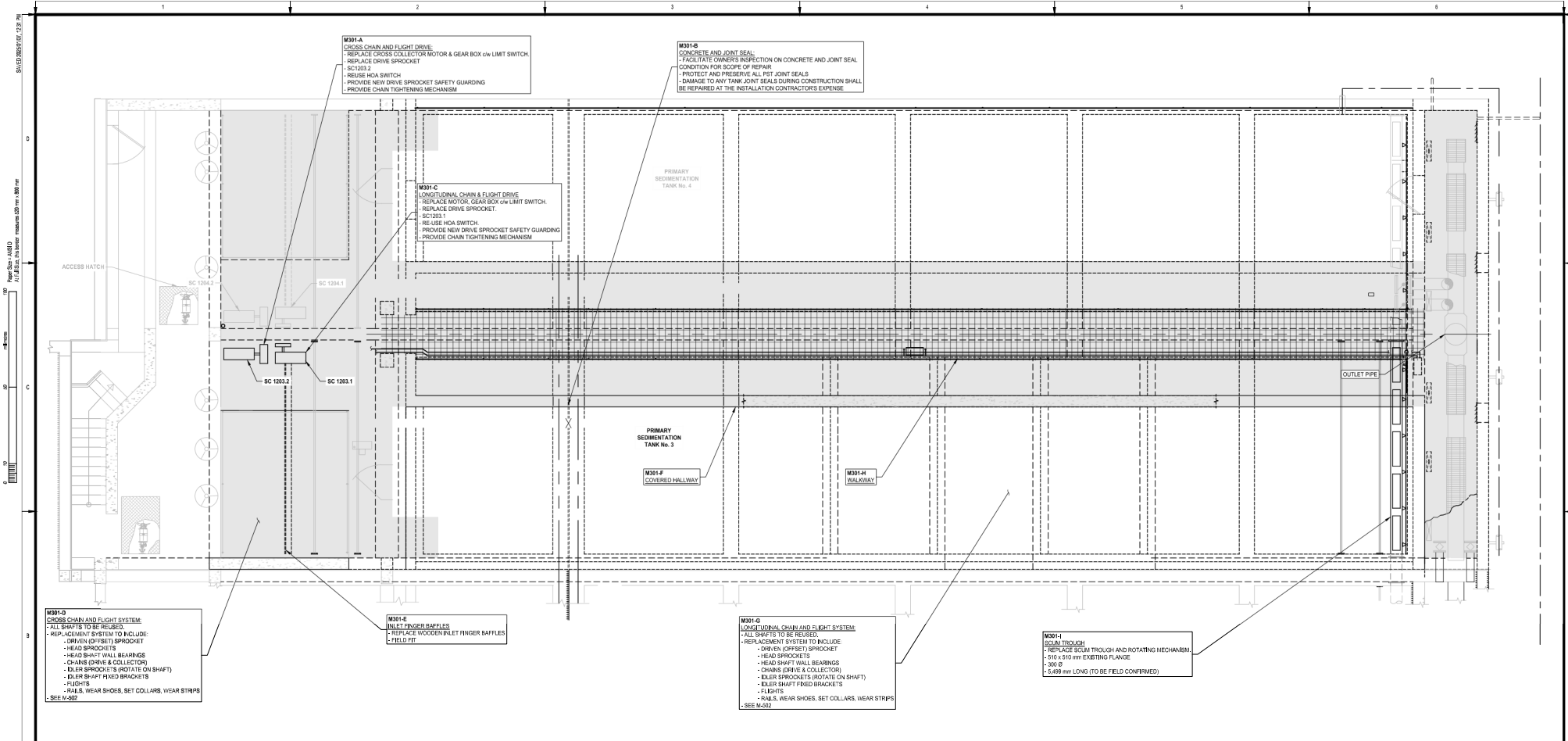
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DO NOT USE FOR CONSTRUCTION



Rev	Date	Des	Drawn	Chk	Description
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Rev	Date	Des	Drawn	Chk	Description

**PST - 2 PROFILE**



**PST - 3 PLAN**  
Scale: 1:50

- NOTES:**
- CROSS COLLECTORS AND LONGITUDINAL CHAIN AND FLIGHTS NOT SHOWN.
  - REPAIRS AND RECOMMISSION FOR FULLY FUNCTIONAL PST.
  - FOA DUCTING NOT SHOWN.

**M301-D**  
CROSS CHAIN AND FLIGHT SYSTEM  
- ALL SHAFTS TO BE REUSED.  
- REPLACEMENT SYSTEM TO INCLUDE:  
- DRIVEN (OFFSET) SPROCKET  
- HEAD SPROCKETS  
- HEAD SHAFT WALL BEARINGS  
- CHAIN DRIVE & COLLECTOR  
- IDLER SPROCKETS (ROTATE ON SHAFT)  
- IDLER SHAFT FIXED BRACKETS  
- FLIGHTS  
- RAILS, WEAR SHOES, SET COLLARS, WEAR STRIPS  
- SEE M402

**M301-E**  
INLET FINGER BAFFLES  
- REPLACE WOODEN INLET FINGER BAFFLES  
- FIELD FIT

**M301-G**  
LONGITUDINAL CHAIN AND FLIGHT SYSTEM  
- ALL SHAFTS TO BE REUSED.  
- REPLACEMENT SYSTEM TO INCLUDE:  
- DRIVEN (OFFSET) SPROCKET  
- HEAD SPROCKETS  
- HEAD SHAFT WALL BEARINGS  
- CHAIN DRIVE & COLLECTOR  
- IDLER SPROCKETS (ROTATE ON SHAFT)  
- IDLER SHAFT FIXED BRACKETS  
- FLIGHTS  
- RAILS, WEAR SHOES, SET COLLARS, WEAR STRIPS  
- SEE M402

**M301-I**  
SQUIN TROUGH  
- REPLACE SQUIN TROUGH AND ROTATING MECHANISM  
- 510 x 510 mm EXISTING FLANGE  
- 300 Ø  
- 2.689 mm LONG (TO BE FIELD CONFIRMED)

**M301-B**  
CONCRETE AND JOINT SEAL  
- FACILITATE OWNER'S INSPECTION ON CONCRETE AND JOINT SEAL CONDITION FOR SCOPE OF REPAIR  
- PROTECT AND PRESERVE ALL PST JOINT SEALS  
- DAMAGE TO ANY TANK JOINT SEALS DURING CONSTRUCTION SHALL BE REPAIRED AT THE INSTALLATION CONTRACTOR'S EXPENSE

**M301-A**  
CROSS CHAIN AND FLIGHT DRIVE  
- REPLACE CROSS COLLECTOR MOTOR & GEAR BOX CW LIMIT SWITCH  
- REPLACE DRIVE SPROCKET  
- SC1203.2  
- REUSE HOA SWITCH  
- PROVIDE NEW DRIVE SPROCKET SAFETY GUARDING  
- PROVIDE CHAIN TIGHTENING MECHANISM

**M301-C**  
LONGITUDINAL CHAIN & FLIGHT DRIVE  
- REPLACE MOTOR, GEAR BOX CW LIMIT SWITCH  
- REPLACE DRIVE SPROCKET  
- SC1203.1  
- REUSE HOA SWITCH  
- PROVIDE NEW DRIVE SPROCKET SAFETY GUARDING  
- PROVIDE CHAIN TIGHTENING MECHANISM

ACCESS HATCH

PRIMARY SEDIMENTATION TANK No. 3

M301-F COVERED HALLWAY

M301-H WALKWAY

OUTLET PIPE

PRIMARY SEDIMENTATION TANK No. 4



**TENDER ISSUE**  
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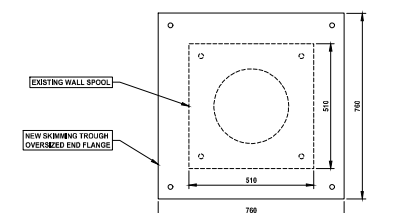
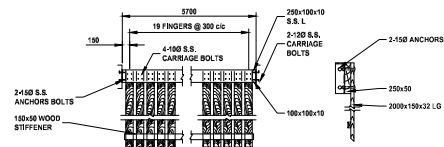
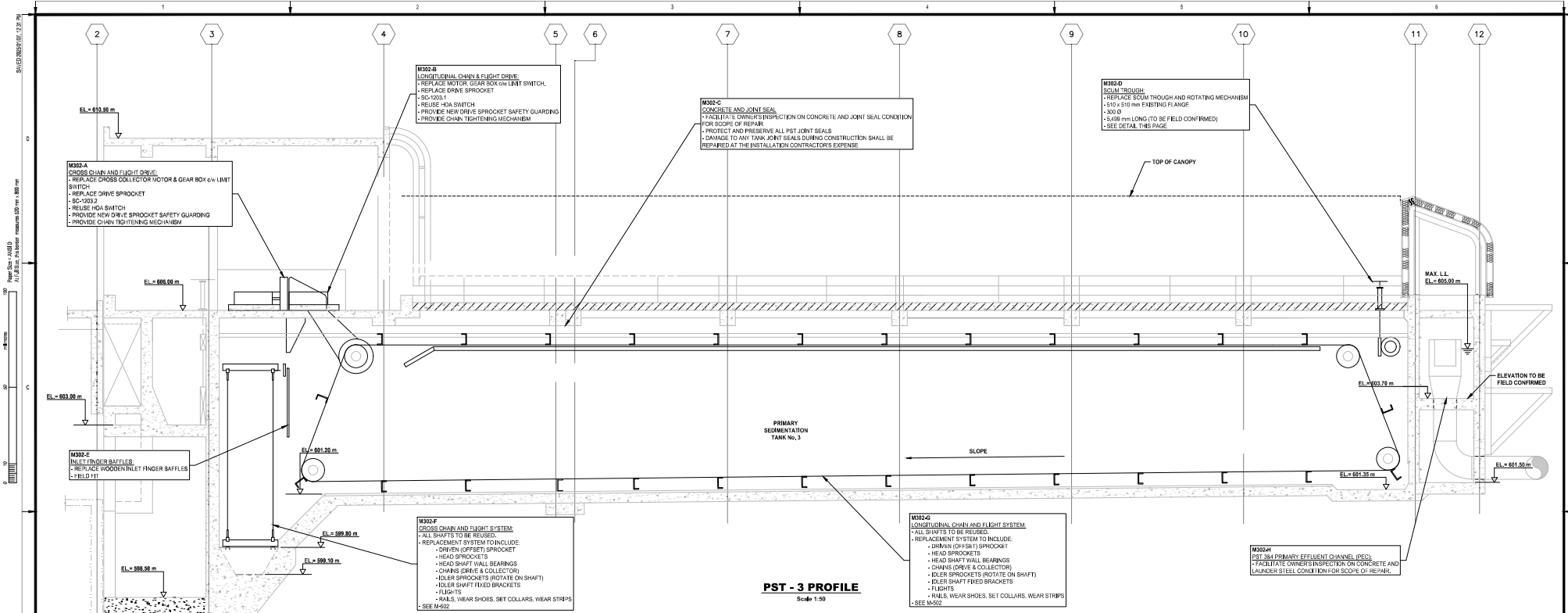
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Rev	Date	Des	Dwn	Chk	Description

**RESORT MUNICIPALITY OF WHISTLER**  
**PRIMARY SEDIMENTATION TANK UPGRADES**

**PST - 3 PLAN**

Project No: 0029-372  
Title: MECHANICAL  
Drawing No: M-301  
Rev: 0



**PST - 3 PROFILE**  
Scale 1:50

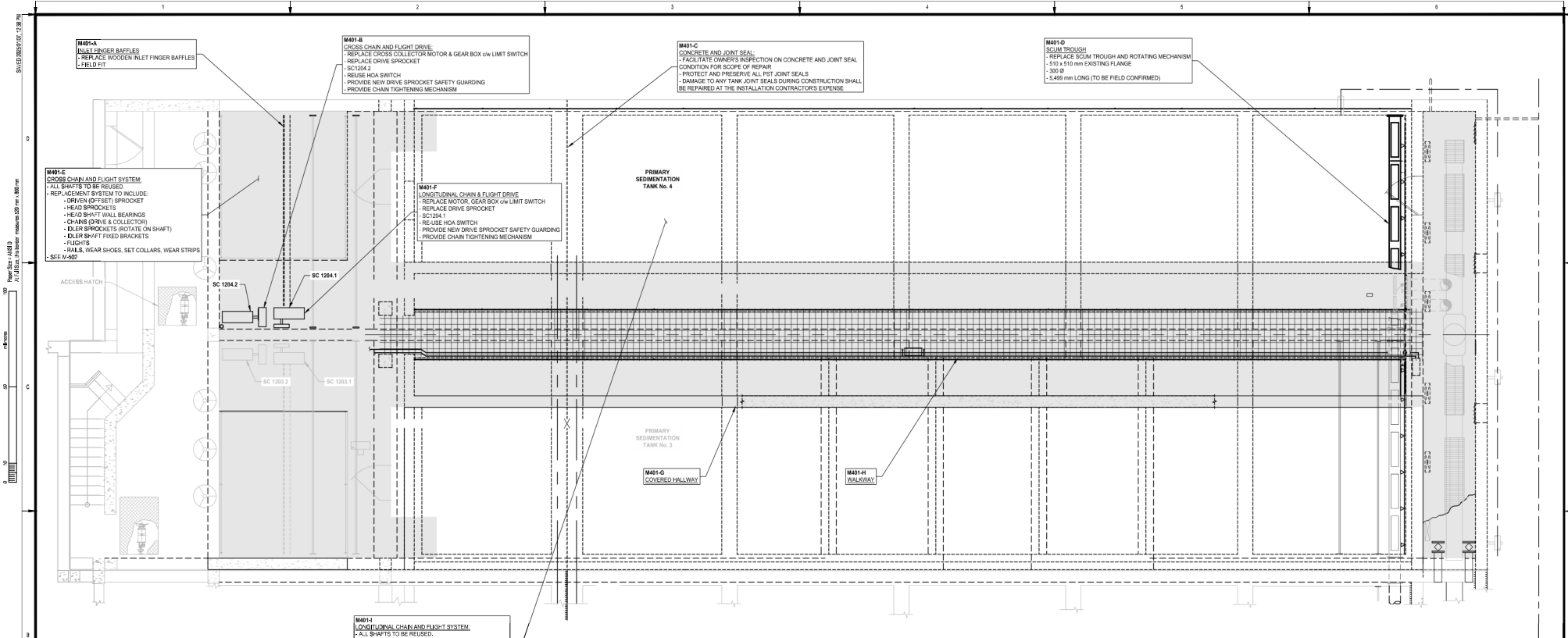
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**RESORT MUNICIPALITY OF WHISTLER  
PRIMARY SEDIMENTATION TANK UPGRADES**

**PST - 3 PROFILE**

Page No: 0029-372  
Title: MECHANICAL  
Drawing No: M-302  
Rev: 0

**TENDER ISSUE**  
DO NOT USE FOR CONSTRUCTION

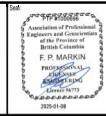


**PST - 4 PLAN**  
Scale 1:50

- NOTES:**
- CROSS COLLECTORS AND LONGITUDINAL CHAIN AND FLIGHTS NOT SHOWN.
  - REPAIRS AND RECOMMISSION FOR FULLY FUNCTIONAL PST.
  - FOA DUCTING NOT SHOWN.



**TENDER ISSUE**  
DO NOT USE FOR CONSTRUCTION

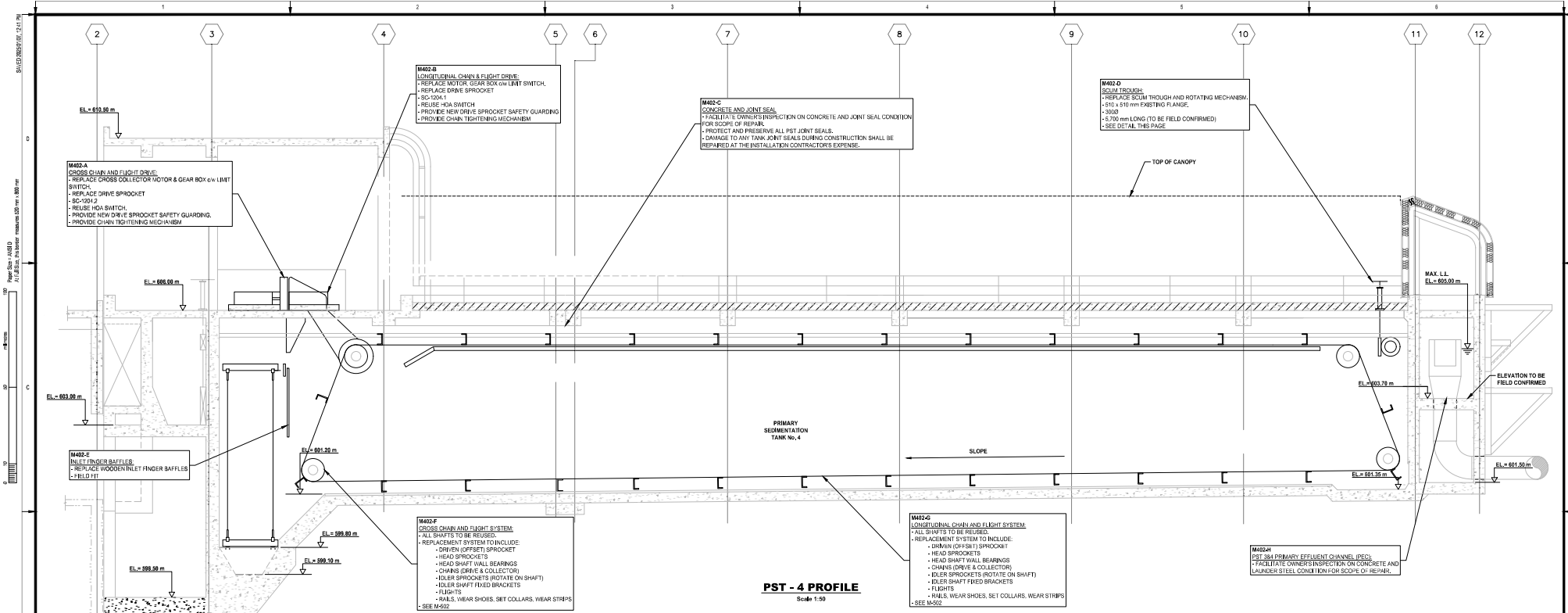


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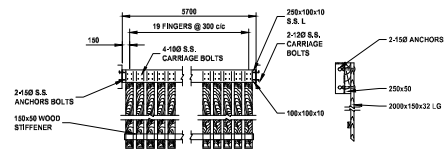
**RESORT MUNICIPALITY OF WHISTLER**  
**PRIMARY SEDIMENTATION TANK UPGRADES**

**PST - 4 PLAN**

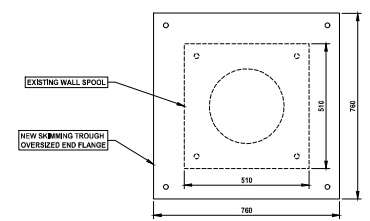
Project No: 0029-372  
Title: MECHANICAL  
Drawing No: M-401  
Rev: 0



**PST - 4 PROFILE**  
Scale: 1:50



**INLET FINGER BAFFLE**  
Scale: N.T.S.

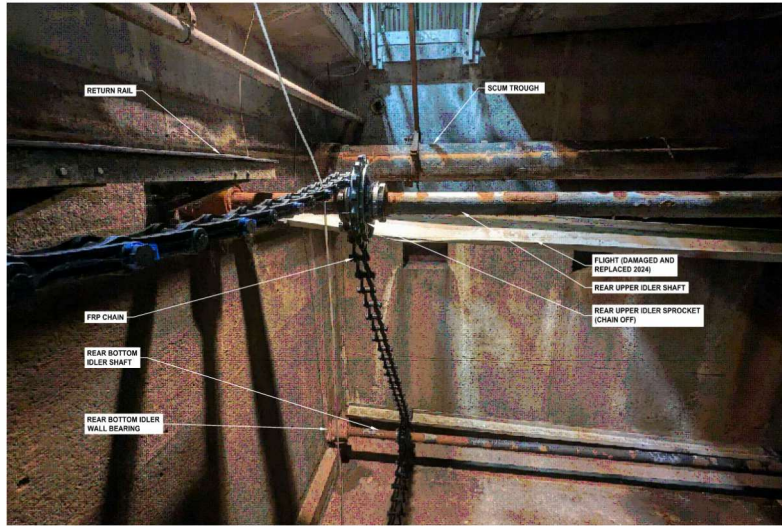


**SCUM TROUGH WALL CONNECTION DETAIL**  
Scale: 1:50

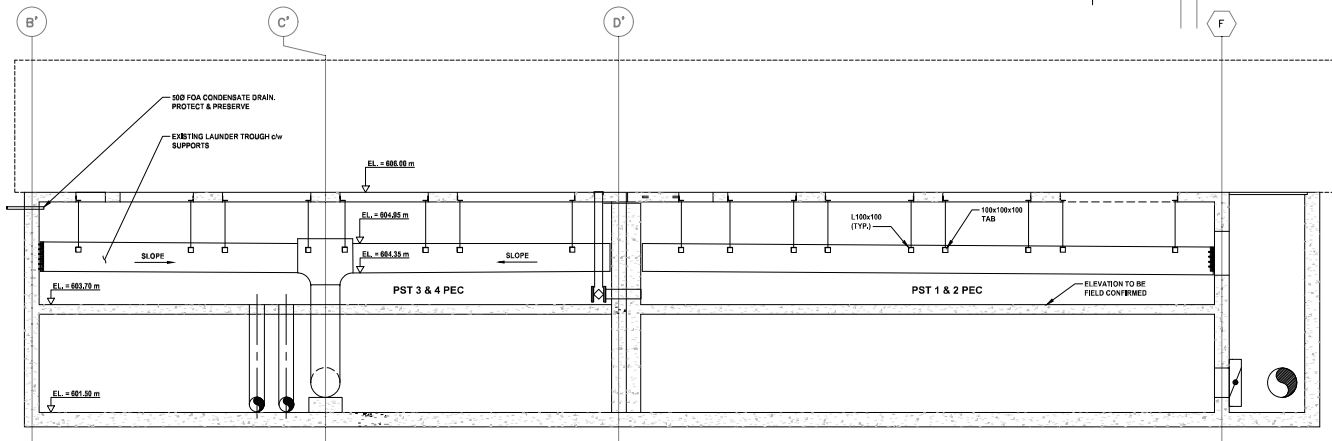
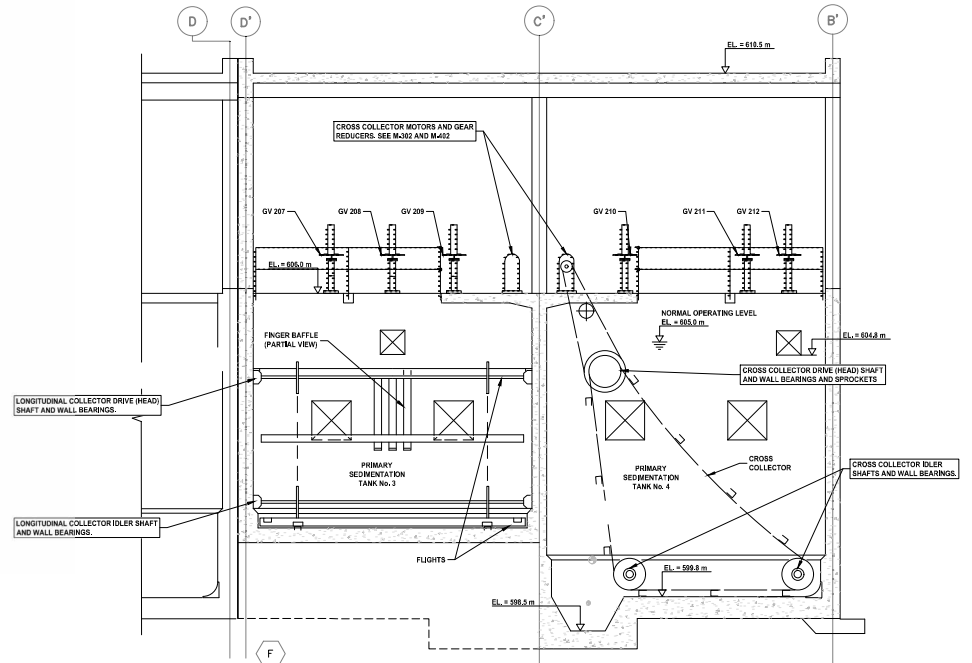
Rev	Date	Des	Dwn	Chk	Description	Rev	Date	Des	Dwn	Chk	Description
0	2025-01-07	FFM	AFR	RL/ET	ISSUED FOR TENDER						



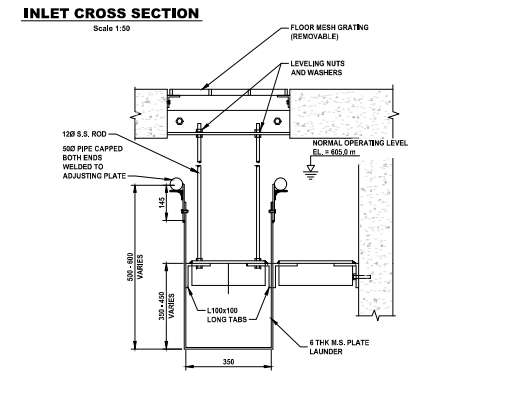
Page: 029 of 030  
 At 100 mm, the interior measures 100 mm x 100 mm  
 Scale: 1:100  
 Date: 2023-01-07  
 Project: RESORT MUNICIPALITY OF WHISTLER PRIMARY SEDIMENTATION TANK UPGRADES



**PST - 1 LONGITUDINAL CHAIN AND FLIGHT**



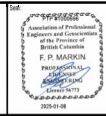
**PEC CROSS SECTION (INFORMATION ONLY)**  
Scale 1:50



**PST-1&2 - 3&4 PEC LAUNDRY CROSS SECTION (INFORMATION ONLY)**  
Scale 1:50

**KERR WOOD LEIDAL**  
consulting engineers

**TENDER ISSUE**  
 DO NOT USE FOR CONSTRUCTION

  
 F. P. MADON  
 Professional Engineer  
 No. 12345  
 B.C. Reg. No. 12345

Rev	Date	Des	Dim	Chk	Description
0	2023-01-07	FFM	AFR	BL/ATB	ISSUED FOR TENDER

Rev	Date	Des	Dim	Chk	Description

**RESORT MUNICIPALITY OF WHISTLER**  
**PRIMARY SEDIMENTATION TANK UPGRADES**

**SECTIONS**

Page No: 0029-032  
 Title: MECHANICAL  
 Drawing No: M-501  
 Rev: 0



**Attachment C**

# **Concrete Restoration Products**



**PRODUCT DATA SHEET**

Edition 03.2018/v1  
CSC Master Format™ 03 64 23  
EPOXY INJECTION GROUTING

# Sikadur®-31 Hi-Mod Gel<sup>CA</sup>

## HIGH-MODULUS, HIGH-STRENGTH, STRUCTURAL, EPOXY PASTE ADHESIVE

<b>Description</b>	Sikadur®-31 Hi-Mod Gel <sup>CA</sup> is a two-component, solvent-free, moisture-insensitive, high-modulus, high-strength, structural epoxy paste adhesive.
<b>Where to Use</b>	<ul style="list-style-type: none"> <li>Structural bonding of concrete, masonry, metals, wood, etc. to a maximum glue line of 3 mm (1/8 in).</li> <li>Grout bolts, dowels, pins, vertical and overhead.</li> <li>Seals cracks and injection port surrounds prior to pressure-injection grouting.</li> <li>Interior, vertical, and overhead repair of concrete as an epoxy mortar binder.</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Insensitive to moisture before, during and after cure.</li> <li>High-modulus, high-strength, structural paste adhesive.</li> <li>Excellent adhesion to concrete, masonry, metals, wood and most structural materials.</li> <li>Paste consistency ideal for vertical and overhead applications.</li> <li>Fast-setting and strength-producing adhesive.</li> <li>Easy mix A:B = 1:1 ratio by volume.</li> <li>Meets ASTM C881, Type I, II, IV and V, Grade 3, Class B and C, epoxy resin adhesive.</li> <li>Meets the requirements of CFIA and USDA for use in food plants.</li> <li>Ministère des Transports du Québec acceptance.</li> <li>Product recognized by the British Columbia Ministry of Transportation (BC MoT).</li> <li>NSF-ANSI 61 Approved for contact with Potable Water (Special order only).</li> </ul>

<b>Technical Data</b>			
<b>Packaging</b>	10 L (2.64 US gal.) unit [Component A : 5 L (1.32 US gal.) and Component B : 5 L (1.32 US gal.)]		
<b>Colour</b>	Concrete Grey		
<b>Yield</b>	1 L yields 1 m <sup>2</sup> of epoxy adhesive, 1 mm thick. 1 L of adhesive when mixed with 1 L by loose volume of oven-dried sand yields approx. 1.5 L of epoxy mortar (1 US gal. = 231 in <sup>3</sup> . 1 US gal. of adhesive when mixed with 1 US gal. by loose volume of oven-dried silica sand yields approx. 346 in <sup>3</sup> of epoxy mortar.)		
<b>Shelf Life</b>	2 years in original, unopened packaging. Store dry at temperatures between 5 and 32 °C (41 and 89 °F). Condition product between 18 and 25 °C (65 and 77 °F) before using.		
<b>Mix Ratio</b>	A:B = 1:1 by volume		
<b>Properties at 23 °C (73 °F) and 50 % R.H.</b>			
<b>Consistency</b>	Non-sag paste		
<b>Pot Life</b>	Approx. 30 min		
<b>Tack-Free Time</b>	1 h 30 min - 2 h (30 mils thickness)		
<b>Compressive Strength ASTM D695, MPa (psi)</b>	<b>4 °C (39 °F)*</b>	<b>23 °C (73 °F)*</b>	<b>32 °C (89 °F)*</b>
2 h	-	-	33 (4785)
4 h	-	14 (2030)	59 (8555)
8 h	-	53 (7690)	67 (9715)
16 h	-	64 (9280)	72 (10 440)
1 day	13 (1885)	81 (11 745)	79 (11 455)
3 days	63 (9135)	81 (11 475)	85 (12 325)
7 days	70 (10 150)	86 (12 470)	87 (12 615)
14 days	76 (11 020)	87 (12 615)	87 (12 615)
28 days	83 (12 040)	87 (12 615)	87 (12 615)
* Product cured and tested at the temperatures indicated			
<b>Tensile Properties ASTM D638</b>			
14 days	Tensile strength	24 MPa (3480 psi)	
	Elongation at break	0.95 %	
	Modulus of elasticity	5.13 GPa (7.4 x 10 <sup>5</sup> psi)	

<b>Flexural Properties ASTM D790</b>		
14 days	Flexural strength	42 MPa (6090 psi)
	Tangent modulus of elasticity	7.22 GPa (10.5 x 10 <sup>5</sup> psi)
<b>Shear Strength ASTM D732</b>		
14 days		19 MPa (2755 psi)
<b>Bond Strength ASTM C882</b>		
Hardened concrete to hardened concrete		
2 days	Dry cure	28 MPa (4060 psi)
14 days	Wet cure	22 MPa (3190 psi)
<b>Deflection Temperature ASTM D648</b>		
14 days	Fibre stress loading = 1.8 MPa (264 psi)	53 °C (127 °F)
<b>Water Absorption ASTM D570</b>		
7 days	24 h boil	0.29 %
<b>VOC Content</b>		
		≤10 g/L
<i>Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.</i>		

## HOW TO USE

**Surface Preparation** Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles disintegrated materials.  
**Concrete:** Sandblast or use other approved mechanical methods.  
**Steel:** Sandblast to white-metal finish.

**Mixing** Pre-mix each component. Proportion 1 part component B to 1 part of component A by volume into clean pail. Mix thoroughly for three (3) minutes with paddle on low-speed drill (300 - 450 rpm), until uniform in colour. Mix only that quantity that can be used within its pot life. To prepare an epoxy mortar, slowly add up to 1 part by loose volume of an oven-dried sand to 1 part of the mixed Sikadur®-31 Hi-Mod Gel<sup>CA</sup> and mix until uniform in consistency.

**Application** **As a structural adhesive:** Apply the neat, mixed Sikadur®-31 Hi-Mod Gel<sup>CA</sup> to the mating or non-mating prepared substrates. Work into the substrate for positive adhesion. Secure the bonded unit firmly into place until the adhesive has cured. Glue line should not exceed 3 mm (1/8 in).

**To seal cracks for injection grouting:** Place the neat material over the cracks to be pressure-injected and around each injection port. Allow sufficient time to set before pressure injecting.

To anchor bolts, dowels and pins: Annular space around bolt should not exceed 3 mm (1/8 in); depth of embedment is typically 10 to 15 times the bolt diameter. Grout with neat Sikadur®-31 Hi-Mod Gel<sup>CA</sup>.

**For interior vertical and overhead patching:** Place the prepared mortar into the void working the material into the prepared substrate and filling the cavity. Strike off level. Lifts should not exceed 38 mm (1 1/2 in).

**Clean Up** Collect with absorbent material. Dispose of in accordance with local disposal regulations. Uncured material can be removed with Sika® Epoxy Cleaner. Cured material can only be removed mechanically.

- Limitations**
- Minimum surface temperature: 4 °C (39 °F).
  - Do not thin with solvents, it will prevent proper cure.
  - Use oven-dried sand only.
  - Maximum epoxy mortar thickness is 38 mm (1 1/2 in) per lift.
  - Product is a vapour barrier after cure.
  - Minimum age of concrete must be 21 - 28 days, depending upon curing and drying conditions.
  - Porous substrates must be tested for moisture-vapour transmission prior to mortar applications.
  - Not for sealing cracks under hydrostatic pressure.

**Health and Safety Information** For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent SAFETY DATA SHEET containing physical, ecological, toxicological and other safety-related data.

KEEP OUT OF REACH OF CHILDREN  
FOR INDUSTRIAL USE ONLY

The Information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions, within their shelflife. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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Certified ISO 9001 (CERT-0102780)  
Certified ISO 14001 (CERT-0102791)





**PRODUCT DATA SHEET**

Edition 05.2021/v1  
CSC Master Format™ 03 64 23  
EPOXY INJECTION GROUTING

# Sikadur®-35 Hi-Mod LV

## HIGH-MODULUS, LOW-VISCOSITY, HIGH-STRENGTH, EPOXY GROUTING/SEALING/BINDING ADHESIVE

<b>Description</b>	Sikadur®-35 Hi-Mod LV is a two-component, solvent-free, moisture-insensitive, low-viscosity, high-strength, multipurpose, epoxy resin adhesive.
<b>Where to Use</b>	<ul style="list-style-type: none"> <li>Pressure injection of cracks in structural concrete, masonry, wood, etc.</li> <li>Grouting bolts, dowels, pins, etc.</li> <li>Gravity feed of cracks in horizontal concrete and masonry</li> <li>Epoxy resin binder for epoxy mortar patching and overlay of interior, horizontal surfaces</li> <li>Seal interior slabs and exterior above grade slabs from water, chlorides, and mild chemical attack and to improve wearability</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Low viscosity</li> <li>Convenient easy mix ratio A:B = 2:1 by volume</li> <li>High strength, structural adhesive for “can’t dry” surfaces</li> <li>Deep penetration and tenacious crack bonding in structural concrete</li> <li>High early-strength developing adhesive</li> <li>Excellent chemical resistance</li> <li>Meets ASTM C881, Type I, II, IV and V, Grade 1, Class B and C</li> <li>NSF-ANSI 61 potable water contact-approved formula available by special order only</li> <li>Product qualified by The Road Authority (TRA) and approved by the Ontario Ministry of Transportation (MTO)</li> <li>Approved by the Ministère des Transports du Québec (MTQ)</li> <li>Approved by Alberta Transportation (AT)</li> <li>Product recognized by the British Columbia Ministry of Transportation(BC MoT)</li> </ul>

**Technical Data**

<b>Packaging</b>	9 L (2.38 US gal.) unit - [Component A : 6 L (1.59 US gal.) and Component B : 3 L (0.79 US gal.)] 450 mL (15.2 US fl. oz) Pre-Pack cartridge, 12/case					
<b>Colour</b>	Clear, amber					
<b>Yield</b>	1 L = 1 m <sup>2</sup> of epoxy adhesive, 1 mm thick. 1 L of adhesive when mixed with 5 L by loose volume of oven-dried quartz sand yields approx. 3.5 L of epoxy mortar. (1 US gal. = 231 in <sup>3</sup> . 1 US gal. of adhesive when mixed with 5 US gal. by loose volume of oven-dried quartz sand yields approx. 808 in <sup>3</sup> of epoxy mortar.)					
<b>Shelf Life</b>	2 years in original, unopened packaging. Store dry between 5 and 32 °C (41 and 89 °F). Condition product between 18 and 29 °C (65 and 84 °F) before using.					
<b>Mix Ratio</b>	A:B = 2:1 by volume					
<b>Properties at 23 °C (73 °F) and 50 % R.H.</b>						
<b>Viscosity</b>	450 - 550 cps					
<b>Pot Life</b>	5 °C (41 °F)		20 °C (60 °F)			
Sample size 200 mL	220 min		32 min			
<b>Tack Free Time</b>	4 °C (39 °F)*		23 °C (73 °F)*		32 °C (89 °F)*	
3-5 mil Neat	14 - 16 h		3 - 3 h 30 min		1 h 30 min - 2 h	
<b>Compressive Strength ASTM D695, MPa (psi)</b>						
	<b>Neat</b>		<b>Mortar (1:5)</b>			
	4 °C (39 °F)*	23 °C (73 °F)*	32 °C (89 °F)*	4 °C (39 °F)*	23 °C (73 °F)*	32 °C (89 °F)*
4 hrs	-	-	-	-	-	6 (870)
8 hrs	-	-	22 (3190)	-	3 (435)	28 (4061)
16 hrs	-	25 (3626)	43 (6236)	-	33 (4786)	39 (5656)
1 day	-	47 (6816)	63 (9137)	-	34 (4931)	47 (6816)
3 days	25 (3626)	67 (9717)	72 (10 442)	42 (6091)	47 (6816)	48 (6961)
7 days	55 (7977)	74 (10 732)	72 (10 442)	43 (6236)	54 (7832)	61 (8847)
14 days	71 (10 297)	77 (11 167)	72 (10 442)	47 (6816)	59 (8557)	61 (8847)
28 days	86 (12 473)	81 (11 748)	72 (10 442)	48 (6961)	61 (8847)	61 (8847)
* Product cured and tested at the temperatures indicated						
<b>Modulus of Elasticity</b>						
<b>ASTM D695</b>	<b>Neat</b>		<b>Mortar</b>			
28 days	2.41 GPa (3.5 x 10 <sup>5</sup> psi)		5.59 GPa (8.1 x 10 <sup>5</sup> psi)			
<b>Tensile Properties ASTM D638</b>						
14 days	Tensile strength		Tensile strength			
	58 MPa (8412 psi)		5.8 MPa (841 psi)			
	Elongation at break		Elongation at break			
	4.2 %		0.3 %			
	Modulus of elasticity		Modulus of elasticity			
	2.8 GPa (4.0 x 10 <sup>5</sup> psi)		5.24 GPa (7.6 x 10 <sup>5</sup> psi)			

<b>Flexural Properties ASTM D790</b>			
14 days	Modulus of rupture	96 MPa (13 923 psi)	15 MPa (2175 psi)
	Tangent modulus of elasticity in bending	2.5 GPa (3.6 x 10 <sup>5</sup> psi)	6.5 GPa (9.4 x 10 <sup>5</sup> psi)
<b>Shear Strength ASTM D732</b>			
14 days		35 MPa (5076 psi)	16 MPa (2320 psi)
<b>Deflection Temperature ASTM D648</b>			
14 days, Fiber stress loading =			
1.8 MPa (264 psi)		53 °C (127 °F)	54 °C (129 °F)
<b>Bond Strength ASTM C882</b>			
(Hardened concrete to hardened concrete)			
2 days	Dry cure		19 MPa (2755 psi)
14 days	Moist cure		19 MPa (2755 psi)
<b>Water Absorption ASTM D570</b>			
7 days	2 h boil		1.1 %
<b>VOC Content</b>			
			≤ 10 g/L

*Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.*

## HOW TO USE

**Surface Preparation** Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles and disintegrated materials.

**Concrete:** Sandblast or use other approved mechanical means to provide an open roughened texture.

**Steel:** Sandblast to white-metal finish.

**Mixing** Pre-mix each component. Proportion 1 part component B to 2 parts component A by volume into a clean pail. Mix thoroughly for three (3) minutes with paddle on low-speed drill (300 - 450 rpm) until uniformly blended. Mix only that quantity that can be used within its pot life.

**To prepare an epoxy mortar:** Slowly add 4-5 parts by loose volume of an oven-dried quartz sand to 1 part of pre-mixed Sikadur®-35 Hi-Mod LV and mix until uniform in consistency.

**Application** **To gravity feed cracks:**  
Pour neat Sikadur®-35 Hi-Mod LV into V-notched crack. Continue placement until completely filled. Seal underside of slab prior to filling if cracks reflect through.

**To pressure inject cracks:**  
Use automated injection equipment or manual method. Set appropriate injection ports based on system used. Seal ports and crack with Sikadur®-31 Hi-Mod Gel or any Sika AnchorFix® products. When the epoxy adhesive seal has cured, inject Sikadur®-35 Hi-Mod LV with slow, steady pressure.

**To anchor bolts, dowels and pins:**  
Annular space around bolt should not exceed 3 mm (1/8 in). Depth of embedment is typically 10-15 times the bolt diameter. Grout with neat Sikadur®-35 Hi-Mod LV.

**To seal slabs:**  
Spread neat Sikadur®-35 Hi-Mod LV over slab. Allow penetration. Remove excess to prevent surface film. Seal interior slabs and above grade, exterior slabs only.

**For an epoxy mortar:**  
Prime prepared surface with neat Sikadur®-35 Hi-Mod LV. Place prepared epoxy mortar before primer becomes tack-free. Place the epoxy mortar using trowels. Compact and level with vibrating screed or trowels then finish with finishing trowel. Sikadur®-35 Hi-Mod LV mortar is for interior use only.

**Clean Up** Uncured material can be removed with Sika® Epoxy Cleaner. Cured product can only be removed mechanically.

**Limitations**

- Minimum application temperature: 4 °C (39 °F).
- Do not thin with solvents.
- Use oven-dried sand only.
- Maximum epoxy mortar thickness: 38 mm (1 1/2 in) per lift.
- Epoxy mortar is for interior use only.
- Do not seal exterior slabs on grade.
- Minimum age of concrete must be 21 - 28 days depending on curing and drying conditions.
- Porous substrates must be tested for vapour transmission prior to mortar application or slab sealing.
- Not for injection of cracks under hydrostatic pressure.
- Do not inject cracks greater than 6 mm (1/4 in).

**Health and Safety  
Information**

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KEEP OUT OF REACH OF CHILDREN  
FOR INDUSTRIAL USE ONLY

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Certified ISO 9001 (CERT-0102780)  
Certified ISO 14001 (CERT-0102791)





# PRODUCT DATA SHEET

## Sikadur<sup>®</sup>-53 CA

EPOXY RESIN-BASED STRUCTURAL GROUT DESIGNED FOR INJECTION, ANCHORING AND SEATING APPLICATIONS

### PRODUCT DESCRIPTION

Sikadur<sup>®</sup>-53 CA is a two-component structural grout based on epoxy resin, designed for injection, anchoring, and seating applications and for use at temperatures between 5 and 30 °C.

### WHERE TO USE

Sikadur<sup>®</sup>-53 CA may only be used by experienced professionals.

- Injection of voids and cracks by gravity or under pressure, including in wet or submerged environments
- Grouting of anchors, posts, connectors for mixed wood or concrete floors, etc.
- Seating of support plates, machine bases, metal rail support saddles (track work, crane tracks), metal profiles, etc.
- Filling of cavities, voids, etc., including in a submerged environment (by displacement of the water in place when filling the void with Sikadur<sup>®</sup>-53 CA)

### CHARACTERISTICS / ADVANTAGES

- Applicable for gravity feeding or pressure injection of cracks widths ranging from 0.5 to 30mm (0.02 to 1.18 in)
- Applicable to a maximum thickness of 30 mm (per layer) for base plate/seating applications
- Application temperature between 5 and 30 °C
- Hardens without shrinkage
- Hardens even in damp conditions
- Barrier against moisture and oxygen
- Prevents the entry of water and the infiltration of substances causing corrosion of the reinforcement in the structures
- Good adhesion on concrete, steel, masonry elements, stone
- Good adhesion on cement-based substrates immersed in salt water
- Displaces water from the cracks and voids during filling
- Good mechanical strength even after hardening underwater
- Injectable with a single piston pump or bulk injection equipment

### APPROVALS / CERTIFICATES

Approved by the Ministère des Transports du Québec (MTQ).

### PRODUCT INFORMATION

CSC MasterFormat<sup>®</sup>

03 64 23 | EPOXY INJECTION GROUTING

Composition / Manufacturing

Mixture of epoxy resin and special fillers

<b>Packaging</b>	6 L (1.59 US gal.) and 12 L (3.17 US gal.) pre-dosed units divided into 2 components (A+B)	
	<b>6 L (1.59 US gal.) unit</b>	
	Comp. A	~4.68 L (1.24 US gal.)
	Comp. B	~1.33 L (0.35 US gal.)
	<b>12 L (3.17 US gal.) unit</b>	
	Comp. A	~9.35 L (2.47 US gal.)
	Comp. B	~2.65 L (0.70 US gal.)
<b>Shelf Life</b>	2 years in original, unopened packaging and stored in appropriate conditions (see 'Storage conditions').	
<b>Storage Conditions</b>	Store dry at temperatures between 5 and 30 °C (41 and 86 °F). Protect material from direct exposure to sunlight and freezing.	
<b>Colour</b>	Comp. A	Grey
	Comp. B	Transparent
	Comp. A + Comp. B (mixed)	Concrete grey
<b>Density</b>	at 23 °C (73 °F) and 50 % R.H.	
	Comp. A	~2.33 kg/L
	Comp. B	~1.01 kg/L
	Comp A + B (mixed)	~2.07 kg/L
<b>Viscosity</b>	3,320 cps (A and B components mixed together)	
<b>Volatile organic compound (VOC) content</b>	27 g/L	(ASTM D2363)

## TECHNICAL INFORMATION

<b>Shore D Hardness</b>	91 (7 days at 23 °C (73 °F) and 50 % R.H.)		(ASTM D2240)
<b>Compressive Strength</b>	<b>cured under water</b>	<b>cured under water</b>	<b>cured at 50 % R.H.</b>
	<b>5 °C (41 °F)</b>	<b>23 °C (73 °F)</b>	<b>23 °C (73 °F)</b>
<b>time</b>			
1 day	-	69 MPa (10,005 psi)	79 MPa (11,455 psi)
7 days	-	81 MPa (11,745 psi)	-
14 days	72.6 MPa (10,527 psi)	91 MPa (13,195 psi)	90 MPa (13,050 psi)
<b>Modulus of Elasticity in Compression</b>	<b>cured under water</b>		(ASTM D695)
	<b>20 °C (68 °F)</b>		
<b>time</b>			
14 days	2,880 MPa (417, 600 psi)		
<b>Tensile Strength in Flexure</b>	<b>cured under water</b>	<b>cured under water</b>	<b>cured at 50 % R.H.</b>
	<b>5 °C (41 °F)</b>	<b>23 °C (73 °F)</b>	<b>23 °C (73 °F)</b>
<b>time</b>			
1 day	-	22.3 MPa (3,233 psi)	29 MPa (4,205 psi)
14 days	31.5 MPa (4,567 psi)	41.6 MPa (6,032 psi)	33 MPa (4,785 psi)

<b>Modulus of Elasticity in Flexure</b>		<b>cured under water</b>	(ASTM C580)
	<b>time</b>	<b>23 °C (73 °F)</b>	
	14 days	4,470 MPa (417,600 psi)	
<b>Tensile Strength</b>		<b>cured under water</b>	<b>cured at 50 % R.H.</b>
	<b>time</b>	<b>23 °C (73 °F)</b>	<b>23 °C (73 °F)</b>
	14 days	16.5 MPa (2,392 psi)	18.7 MPa (2,711 psi)
<b>Pull-Off Strength</b>	Pull-off method		
	<b>time</b>	<b>cured under water</b>	<b>cured at 50 % R.H.</b>
	14 days	2.64 MPa (382 psi) - Concrete failure	2.5 MPa (362 psi) - Concrete failure
<b>Heat Deflection Temperature</b>	46.8 °C (after 14 days)		(ASTM D-648)
<b>Coefficient of Thermal Expansion</b>	6.565 x 10 <sup>-5</sup> per °C (linear expansion between -20 °C and +60 °C) (product cured at 23 °C)		
<b>Chemical Resistance</b>	Contact Sika Canada		

## APPLICATION INFORMATION

<b>Layer Thickness</b>	30 mm (1.18 in) max.		
<b>Ambient Air Temperature</b>	5 °C (41 °F) min. / 30 °C (86 °F) max.		
<b>Mixing Ratio</b>	Comp.A : Comp.B = 8 : 1	per weight	
	Comp.A : Comp.B = 3.5 : 1	per volume	
<b>Substrate Temperature</b>	5 °C (41 °F) min. / 30 °C (86 °F) max.		
<b>Pot Life</b>	Full kit tested at 20 °C (68 °F)		
	<b>Kit Format</b>	<b>Pot Life</b>	
	12.3 kg	29 minutes	
	24.5 kg	30 minutes	

Note: Pot life begins when the two components are mixed. It is shorter at high temperatures and longer at low temperatures. The greater the quantity mixed, the shorter the pot life. For longer pot life at high temperatures, divide the mixed product into several portions. Another method is to cool components A and B before mixing (not below 5 °C / 41 °F).

## BASIS OF PRODUCT DATA

Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.

## LIMITATIONS

- Sikadur®-53 CA should only be used by experienced professionals.
- Do not mix by hand. Only use mechanical mixing

- equipment.
- Mix only full kits. do not split kits or do partial mixes.
- Do not thin with solvents. Solvents will prevent proper cure.
- Pot life at low temperatures is longer than at high temperatures but the product will be more difficult to inject and will take longer to cure.
- Pot life is shorter at higher temperatures.
- Do not exceed the maximum application thickness of 30 mm (per coat).
- Do not seal exterior slabs on grade.
- Minimum age of concrete must be 21- 28 days, depending on curing and drying conditions, for mortar and to seal slabs.

- A suitability study and tests must be carried out in order to establish the compatibility of the resin, the spacing of the injection ports, the injection equipment to use and the pressures to be exerted.
- Not for injection of cracks under hydrostatic pressure at the time of application.
- In case of doubt, take core samples at the crack's location to check for material/resin penetration
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.

## ENVIRONMENT, HEALTH & SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

## APPLICATION INSTRUCTIONS

### SUBSTRATE PREPARATION

#### Concrete / masonry / mortar / stone

Check the resistance of the substrate. The surface after preparation must be clean, dry and free of all contaminants (impurities, oil, grease, coating or existing surface treatment) that could alter the adhesion of the product to the substrate. The substrate must be prepared mechanically (sandblasting, shot-blasting or other appropriate mechanical means) until an open surface texture is obtained. For concrete surface preparation, a CSP 3-4 as per ICRI is required.

#### Steel

All steel contact surfaces must be dry, clean and stable. Remove all existing treatments such as coatings, sealers, wax, and contaminants i.e. dirt, dust, grease, oils, and foreign matter, which will interfere with the adhesion of Sikadur®-53 CA. Prepare steel substrates by appropriate mechanical means, such as abrasive blast-cleaning in order to achieve clean white metal profile equivalent to SSPC-SP10, Near White Metal, 2 to 4 mil anchor profile, and install grout before oxidation of the steel occurs.

### MIXING

Pre-mix each component separately. Empty component B into the component A pail. Mix the combined components for at least three (3) minutes, using a low-speed drill (300 - 450 rpm) to minimize entrapping air. Use an Exomixer® or Jiffy® type mixing paddle (recommended model) suited to the volume of the mixing container. During the mixing operation, scrape down the sides and bottom of the container with a flat or straight edge trowel at least once, to ensure complete mixing. When completely mixed, Sikadur®-53 should be uniform in colour and consistency.

For application under water, let the product stand for 15

minutes (at 20 °C / 68 °F) after mixing components A and B for the product to start a pre-reaction, to obtain an optimal adhesion on the substrate.

**Mix only the number of kits that can be installed during the pot-life.**

### APPLICATION METHOD / TOOLS

#### To gravity feed cracks:

Pour neat Sikadur®-53 CA into V-notched crack. Continue placement until completely filled. Seal underside of slab prior to filling if cracks reflect through. Sikadur® 53 CA can be used in cracks widths ranging from 0.5 to 30 mm.

#### To pressure inject cracks:

Use applicable injection equipment or manual bulk gun. Set appropriate injection ports based on system used. Seal ports and cracks with Sikadur®-31 Hi-Mod Gel or any Sika AnchorFix® products. When the epoxy adhesive seal has cured, inject Sikadur®-53 CA with slow, steady pressure. Sikadur®-53 CA is suited for injection of wider cracks with widths in excess of 6 mm.

#### Grouting / Seating:

For optimum flowability for grouting applications, condition materials to 23 °C (73 °F) for 24 hours prior to use. When the product is used for grouting (seating) applications, use watertight formwork to avoid any product leakage. For underwater application, use a system such as a funnel and flexible tubes for pouring the product in order to have sufficient weight / hydrostatic pressure by gravity for underwater injection. It may also be mixed and pumped with an appropriate single component airless pump. Contact your Sika Technical Sales Representative for additional details.

### CLEAN UP

Clean all tools and equipment with Sika® Epoxy Cleaner. Once hardened, product can only be removed mechanically.

## LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

## LEGAL NOTES

The information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of

fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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**Product Data Sheet**

Sikadur®-53 CA  
June 2024, Version 05.02  
020202010010000091





**PRODUCT DATA SHEET**

Edition 12.2017/v1  
CSC Master Format™ 07 95 00  
EXPANSION CONTROL

# Sikadur® Combiflex SG System

SUPERIOR-PERFORMANCE “STRIP-AND-SEAL” SYSTEM FOR WIDE, IRREGULAR, HIGH MOVEMENT AND DIFFICULT-TO-SEAL JOINTS AND CRACKS

<b>Description</b>	Sikadur® Combiflex SG System is an internationally proven and superior-performance sealing system for wide, irregular, high movement and difficult-to-seal joints and cracks. The Sikadur® Combiflex SG System consists of a modified flexible Polyolefin (FPO) waterproofing tape with advanced adhesion using Sikadur®-31 Hi-Mod Gel <sup>CA</sup> , or Sikadur®-30. When fixed across the joint, the tape allows considerable movement in more than one direction, while maintaining a high-quality seal.
<b>Where to Use</b>	<ul style="list-style-type: none"> <li>Construction joints, expansion joints, connecting joints or cracks in tunnels and underground structures.</li> <li>Waste-water treatment and containment structures.</li> <li>On many construction substrates, including concrete, mortar, plaster, asbestos cement, steel, iron, aluminum, wood, glass, polyester, epoxy and other building materials.</li> <li>Roofs, pipes, storage tanks, pools, reservoirs, additions to structures and parking garages.</li> <li>Difficult-to-seal joints or cracks where existing sealants cannot be removed and a surface-mounted seal is the solution.</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Advanced adhesion, no activation of tape required.</li> <li>Durable, economic and cost effective solution.</li> <li>Can restore failed joints without removing defective sealant.</li> <li>Contractor has advantages of always working on surface of substrate.</li> <li>Exceptional adhesion on virtually all common building materials; unmatched compatibility of tape and adhesive.</li> <li>Can even be applied on damp surfaces; Sikadur®-30 and Sikadur®-31 Hi-Mod Gel<sup>CA</sup> are moisture-tolerant.</li> <li>Extended open time of Sikadur®-30 allows for ease of installation; fast-setting values of Sikadur®-31 Hi-Mod Gel<sup>CA</sup> ensures quick turn-around.</li> <li>Waterproof, weather-, chemical- and root-resistant.</li> <li>Withstands UV light.</li> <li>ANSI/NSF Standard 61 approved for potable water (special order, ANSI/NSF grade Sikadur® Combiflex SG &amp; Sikadur®-31 Hi-Mod Gel<sup>CA</sup> only).</li> <li>Product qualified by The Road Authority (TRA).</li> </ul>

**Technical Data**

<b>Packaging</b>	Sikadur®-30 adhesive: 3.7 L (0.98 US gal.) unit Sikadur®-31 Hi-Mod Gel <sup>CA</sup> adhesive: 10 L (2.6 US gal.) unit Sikadur® Combiflex SG tape: 100, 200 and 300 mm (4, 8 and 12 in) wide x 25 m (82 ft) long rolls	
<b>Colour</b>	Sikadur®-30 adhesive: Light Grey Sikadur®-31 Hi-Mod Gel <sup>CA</sup> adhesive: Concrete Grey Sikadur® Combiflex SG tape: Concrete Grey	
<b>Shelf Life</b>	1 year for Sikadur® Combiflex tape in original packaging. Protect Sikadur® Combiflex tape from direct sunlight. Store in cool, dry area. Condition each component between 18 and 29°C (65 and 29°F) before using.	
<b>Yield</b>	Sikadur®-30 adhesive: 1 <sup>st</sup> layer = 3.6 m <sup>2</sup> (38 ft <sup>2</sup> ) at 1 mm (40 mils) thick per 3.7 L (0.98 US gal.) unit, or 1 <sup>st</sup> and 2 <sup>nd</sup> layer = 1.8 m <sup>2</sup> (19 ft <sup>2</sup> ) at 1 mm (40 mils) thick per 3.7 L (0.98 US gal.) unit. Do not apply at thicknesses greater than 3 mm (1/8 in). Sikadur®-31 Hi-Mod Gel <sup>CA</sup> adhesive: 1 <sup>st</sup> layer = 10 m <sup>2</sup> (100 ft <sup>2</sup> ) at 1 mm (40 mils) thick per 10 L (2.6 US gal.) unit, or 1 <sup>st</sup> and 2 <sup>nd</sup> layer = 5 m <sup>2</sup> (50 ft <sup>2</sup> ) at 1 mm (40 mils) thick per 10 L (2.6 US gal.) unit. Do not apply at thicknesses greater than 3 mm (1/8 in).	
<b>Mix Ratio</b>	Sikadur®-30: 3:1 by volume Sikadur®-31 Hi-Mod Gel <sup>CA</sup> : 1:1 by volume	
<b>Service Temperatures</b>	-30 to 40 °C (-22 to 104 °F) wet conditions -30 to 60 °C (-22 to 140 °F) dry conditions	
<b>Properties at 23 °C (73 °F) and 50 % R.H.</b>		
<b>Sikadur® Adhesives</b>	<b>Sikadur®-30</b>	<b>Sikadur®-31 Hi-Mod Gel<sup>CA</sup></b>
<b>Pot Life</b>	Approx. 1 hr 30 min	30 min
<b>Tack-Free Time</b>	-	1 hr 30 min - 2 hrs (30 mils)
<b>Note:</b> Complete Sikadur® adhesive performance information available on respective Product Data Sheet.		

<b>Sikadur® Combiflex SG Tape</b>	
<b>Tensile Properties ASTM D412</b>	
Tensile strength	12 MPa (1740 psi)
Elongation at break	> 600 %
Recoverable elongation	10% (of non adhered tape width)
Tensile set after break	400 %
<b>Tear Resistance ASTM D624</b>	
	12 N/mm (69 lb/in)
<b>Temperature at Embrittlement</b>	
	-40 °C (-40 °F)
<b>Peel Strength ASTM D903</b>	
Concrete Substrate, 7 days	No loss of adhesion between Sikadur® Combiflex SG and Sikadur®-30 or Sikadur®-31 Hi-Mod Gel <sup>CA</sup> ; or between concrete and Sikadur®-30 or Sikadur®-31 Hi-Mod Gel <sup>CA</sup> .
<b>Chemical Exposure</b>	
	<b>Long term to:</b> Water, lime water, cement water, seawater, salt solutions, domestic sewage, bitumen (according to EN 1548), bitumen emulsion coatings (staining possible), etc.
	<b>Temporary to:</b> Light fuel oil, diesel, diluted alkali and mineral acids, ethanol, methanol, petrol, etc.
<i>Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.</i>	

## HOW TO USE

### Surface Preparation

#### Substrate Preparation

Surfaces on either side of the joint or crack must be clean and sound. They may be damp but free from standing water and frost. Remove all existing coatings, impregnations, surface treatments, curing compounds, laitance, oil, grease, dirt, dust or other foreign and loose friable material by appropriate mechanical means, such as sandblasting, to achieve a suitably stable, fine gripping texture similar to ICRI-CSP 1-3.

Deteriorated concrete or cement substrates should be repaired to an even, level line using an appropriate Sika mortar prior to proceeding with Sikadur® Combiflex SG system installation.

Steel substrates should be prepared to a clean and sound condition. Remove all existing treatments such as coatings, sealers, wax, and contaminants i.e. dirt, dust, grease, oils, and foreign matter, which will interfere with the Sikadur® adhesives. Prepare steel substrates by appropriate mechanical means, such as abrasive blast-cleaning in order to achieve a clean, white metal profile equivalent to SSPC-SP10, Near White Metal, 2 - 4 mils anchor profile and apply adhesives immediately before oxidation of the steel occurs.

### Tape Selection

#### Tape Selection

Selection of the correct tape size depends on the expected performance. If necessary, contact Sika Canada Technical Services for advice.

Maximum recoverable elongation: 1 mm (1/25 in) thickness tape: 10% of the non adhered tape width.

**Note:** For higher movement, place and fix tape in a loop into the joint.

#### Tape Preparation

Prepare Sikadur® Combiflex SG tape by unrolling to allow tape to settle and flatten. Protect against contact with dirt or contaminants which would otherwise interfere with adhesion. If the surface of the Sikadur® Combiflex SG tape is contaminated or dirty, clean it with a dry or wet cloth. Use water but do not use solvent for cleaning. Check the Sikadur® Combiflex SG tape for damages during storage and transport (i.e. heavy scratches) and remove critical parts if necessary.

**Note: No activation on site required.**

### Tape Jointing

Sikadur® Combiflex SG tape ends are connected by a process of localised abrading followed by hot air, thermal welding of an overlap.

With an overlap of 40 to 50 mm (1 3/4 to 2 in) in length, the contact surfaces within that overlap must be prepared by roughing the surface with grade 60 - 100 sandpaper or a Scotch® Brite pad. Thoroughly roughen both contact faces in the overlap, removing all traces of a sheen and creating clean, matte and textured surfaces.

**Note:** Only roughen the contact surfaces to be heat welded, otherwise the bonding effect of epoxy adhesives will be reduced.

Using a Leister Triac S or similarly effective heat-welder, with temperatures set at 380 - 400 °C, weld the tape overlaps together. A recommended process is to tack weld either edge/perimeter of the overlap and then completely weld the remainder.

While hot air welding, use a solid rubber or silicone roller to press the two heated contact faces together, ensuring that termination of each of the tapes is securely fastened, without gaps.

Assessment of the welds should be made once the overlap area has cooled. The desired level of adhesion is one where cohesive failure of the tape occurs before bond failure.

### Adhesive Mixing

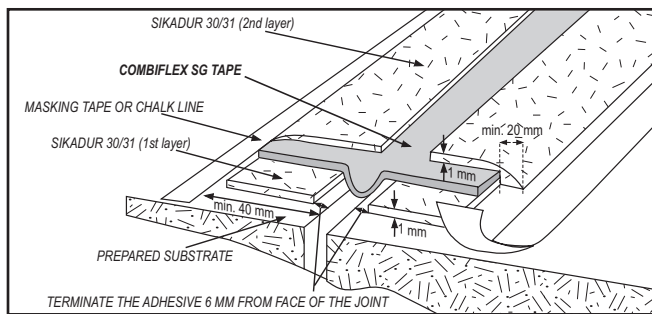
Pre-stir each component of Sikadur®-30 or Sikadur®-31 Hi-Mod Gel<sup>CA</sup> to evenly distribute contents of each part and achieve consistent material. Empty contents of Component A and Component B, or correctly proportioned parts of either adhesive, into a suitably sized and clean mixing vessel if the supplied containers are not appropriate for such. Mix for 3 min using a low-speed drill (300 to 450 rpm) to minimize air entrapment. Use a *Exomixer* type mixing paddle (recommended model). During the mixing operation, scrape down the sides and bottom of the pail with a flat- or straight-edge trowel at least once to ensure thorough mixing. Upon completion of mixing, Sikadur®-30 or Sikadur®-31 Hi Mod Gel<sup>CA</sup> should be uniform in colour and consistency. Mix only that quantity of Sikadur® adhesive which you can use within its pot life.

## Application

**1<sup>st</sup> Layer Adhesive:** Apply a bonding layer of the mixed Sikadur®-30 or Sikadur®-31 Hi-Mod Gel<sup>CA</sup> to the prepared surfaces, parallel to the joint or crack, at a width of at least 40 mm (1.6 in) on either side (depending on the type of joint or crack) and at a thickness of approx. 1 to 2 mm (1/25 to 1/12 in). Terminate the adhesive 6 mm (1/4 in) from the edges of the joint or crack. Work the adhesive into the substrate for positive adhesion and work to either masking tape or chalk mark-defined edges to achieve a neat edge.

**Tape Installation:** Set the Sikadur® Combiflex SG tape into the epoxy adhesive within the open-time and while the resin layer is tacky. Ensure that the tape is located centrally over the joint or crack as this will ensure that the crack or joint is adequately bridged to accommodate any movement. Using a hard roller, similar to a rubber seam or wall paper roller, force the tape down into the epoxy, ensuring that there is complete contact between the tape and the epoxy, with no air entrapment or unbonded locations.

**2<sup>nd</sup> Layer Adhesive:** Apply an encapsulating, 1 to 2 mm (1/25 to 1/12 in) thick layer of the mixed Sikadur®-30 or Sikadur®-31 Hi-Mod Gel<sup>CA</sup> to the upper surface of the bonded Sikadur® Combiflex tape, extending this layer beyond the edge of the FPO tape and onto the underlying epoxy resin. Note: Ensure that no epoxy covers the surface of the Sikadur® Combiflex SG intended to allow for movement.



## Clean Up

Uncured material can be removed from equipment and tools using Sika® Epoxy Cleaner. Cured material can only be removed manually or mechanically. For removal of uncured material from hands and sensitive surfaces, use Sika® Hand Cleaner towels.

## Limitations

- Minimum age of new concrete is 3 to 6 weeks, depending on climate.
- Maximum ambient relative humidity is 95 %
- Minimum surface (substrate) temperature is 4 °C (39 °F).
- Do not apply over wet substrates and standing water.
- Do not thin Sikadur®-30 or Sikadur®-31 Hi-Mod Gel<sup>CA</sup>, as solvents will prevent proper cure.
- It is not recommended to expose Sikadur®-30 or Sikadur®-31 Hi-Mod Gel<sup>CA</sup> to elevated temperatures for prolonged periods.
- Where using Sikadur® Combiflex SG which has red masking tape centrally positioned on the FPO sheet, this must be removed prior to installation.
- Where bonding Sikadur® Combiflex SG to the former grade of Sikadur® Combiflex, use Sikaplan® WT as a connecting tape, adhering Sikadur® Combiflex SG to the Sikaplan® and then adhering the Sikaplan® to the former grade of Combiflex. Consult Sika Canada Technical Services for guidance.
- When Sikadur® Combiflex SG tape is used in traffic areas, cover-plates are required.
- Where in contact with potable water and requiring ANSI/NSF Standard 61-approval, special-order grades of Sikadur®-31 Hi-Mod Gel<sup>CA</sup> and Sikadur® Combiflex SG tape must be used.
- If joints are to be subjected to water pressure, the tape must be supported in the joint. Hard foam or joint sealant is recommended.
- For exposure to negative water pressure, the Sikadur® Combiflex SG tape must be secured with a steel plate fixed on one side.

## Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent SAFETY DATA SHEET containing physical, ecological, toxicological and other safety-related data.

KEEP OUT OF REACH OF CHILDREN  
FOR INDUSTRIAL USE ONLY

The Information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions, within their shelflife. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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Certified ISO 9001 (CERT-0102780)  
Certified ISO 14001 (CERT-0102791)



## PRODUCT DATA SHEET

# Sikaflex®-2c NS EZ Mix

TWO-COMPONENT, NON-SAG, POLYURETHANE ELASTOMERIC SEALANT



### PRODUCT DESCRIPTION

Sikaflex®-2c NS EZ Mix is a two-component, premium-grade, polyurethane-based, elastomeric sealant. It is principally a chemical cure in a non-sag consistency.

### WHERE TO USE

- Intended for use in all properly designed working joints with a minimum depth of 6 mm (1/4 in).
- Ideal for vertical and horizontal applications.
- Can be applied at temperatures as low as +4 °C (39 °F).
- Adheres to most substrates commonly found in construction.
- An effective sealant for use in Exterior Insulation Finish Systems (EIFS).
- Submerged environments, such as canal and reservoir joints.

### CHARACTERISTICS / ADVANTAGES

- Capable of ± 50 % joint movement
- Chemical cure allows the sealant to be placed in joints exceeding 13 mm (1/2 in) in depth for non-moving joint
- High elasticity with a tough, durable, flexible consistency
- Exceptional cut and tear resistance
- Exceptional adhesion to most substrates without priming
- Available in 35 standard architectural colours
- Colour uniformity assured via Color-pak system
- Non-sag even in wide joints

- Easy to mix
- Paintable with water, oil, and rubber-base paints
- Sikaflex®-2c Booster available for faster cure in cold weather
- Traffic grade available, see Sikaflex®-2c NS EZ Mix TG Product Data Sheet for specifications

### ENVIRONMENTAL INFORMATION

- Conformity with LEED® v4 MR Credit (option 1): Building Product Disclosure and Optimization - Material Ingredients
- Conformity with LEED® v4 IEQ Credit: Low-Emitting Materials
- Conformity with LEED®v4 MR Credit (Option 1): Building Product Disclosure and Optimization - Sourcing of Raw Materials

### APPROVALS / CERTIFICATES

- 2-hour UL Fire Rated Joint System Nos. FF-S-1034, FW-S-1020, HW-S-1018, WW-S-1037
- ANSI/NSF Standard 61 approved for potable water contact
- Meets ASTM C920, Type M, Grade NS, Class 25, use T, NT, M, G, A, O
- Meets Federal Specification TT-S-00227E, Type II, Class A
- Meets Federal Specification TT-S-001543A
- Meets Federal Specification TT-S-00230C
- Meets CAN/CGSB 19.24 - M90
- USDA approved
- Canadian Food Inspection Agency (CFIA) acceptance
- Ministry of Transport Québec (MTQ) acceptance
- UL certified to CAN/ULC-S115-05: Standard Method of Firestop Systems and to ANSI/UL 2070: Fire Resistance of Building Joint Systems (FF-S-1034, FW-S-1020, HW-S-1018, WW-S-1037) for use in Canada

## PRODUCT INFORMATION

<b>Packaging</b>	5.7 L and 11.4 L units (1.5 and 3 US gal. units) Color-pak and Sikaflex®-2c Booster sold separately.
<b>Shelf Life</b>	1 year in original, unopened packaging.
<b>Storage Conditions</b>	Store dry at temperatures between +4 °C and +35 °C (39 °F and 95 °F). Condition product between +18 °C and +24 °C (65 °F and 75 °F) before using.
<b>Colour</b>	35 standard architectural colours are available. Special colours available on request.
<b>Volatile organic compound (VOC) content</b>	< 64 g/L

## TECHNICAL INFORMATION

<b>Shore A Hardness</b>	25 ± 5	(ASTM D2240)						
<b>Tensile Strength</b>	0.62 MPa (90 psi)	(ASTM D412)						
<b>Modulus of Elasticity in Tension</b>	0.48 MPa (70 psi)	(ASTM D412)						
<b>Elongation at Break</b>	300 %	(ASTM D412)						
<b>Adhesion in Peel</b>	<table border="1"> <thead> <tr> <th>Substrate</th> <th>Peel Strength</th> <th>% Adhesion loss</th> </tr> </thead> <tbody> <tr> <td>Concrete</td> <td>&gt; 2.63 N/mm (&gt; 15 lb/in)</td> <td>Zero</td> </tr> </tbody> </table>	Substrate	Peel Strength	% Adhesion loss	Concrete	> 2.63 N/mm (> 15 lb/in)	Zero	(Fed Spec.TT-S-00227E)
Substrate	Peel Strength	% Adhesion loss						
Concrete	> 2.63 N/mm (> 15 lb/in)	Zero						
<b>Tear Strength</b>	7.88 N/mm (45 lb/in)	(ASTM D624)						
<b>Service Temperature</b>	-40 °C to +77 °C (-40 °F to 170 °F)							
<b>Chemical Resistance</b>	Good resistance to water, diluted acids, diluted alkalines, and residential sewage. Consult Sika Canada for specific data.							
<b>Resistance to Weathering</b>	Excellent							

## APPLICATION INFORMATION

Yield	Linear Metre of Sealant per Litre				
	Width mm (in)	Depth 6 (¼)	13 (½)	19 (¾)	25 (1)
6 (¼)	24.8				
13 (½)	12.4	6.2			
19 (¾)	8.3	4.1	2.8		
25 (1)	6.2	3.1	2.1	1.6	
32 (1¼)	5.0	2.5	1.7	1.2	
38 (1½)	4.1	2.1	1.4	1.0	

	Depth	
Width	32 (1¼)	38 (1½)
mm (in)		
6 (¼)		
13 (½)		
19 (¾)		
25 (1)		
32 (1¼)	1.0	
38 (1½)	0.8	0.7

<b>Ambient Air Temperature</b>	+4 °C to +38 °C (39 °F to 100 °F)		
<b>Substrate Temperature</b>	+4 °C to +38 °C (39 °F to 100 °F) Sealant should be installed when joint is at mid-range of its anticipated movement.		
<b>Curing Rate</b>	Tack-Free	8-10 hours	(ASTM C679)
	Final cure	3 days	

## BASIS OF PRODUCT DATA

Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.

Properties tested at +23 °C (73 °F) and 50 % R.H. unless stated otherwise.

## LIMITATIONS

- The ultimate performance of Sikaflex®-2c NS EZ Mix, depends on good joint design and proper application.
- Some substrates require priming. Please refer to the Sikaflex® Primers Product Data Sheet or contact Sika Canada.
- Although applying sealants over paints, sealers or coatings is not recommended within the industry, where it cannot be avoided, it is always necessary to test for adhesion. It should also be recognized that the existing paint, sealer or coating will dictate bond values and possibly the integrity of a subsequently applied sealant and thus the performance of the joint.
- Minimum depth in working joint is 6 mm (1/4 in).
- Maximum expansion and contraction should not exceed 50 % of average joint width.
- Avoid contact with materials or surfaces impregnated with, or containing, oil, asphalt, tar or bituminous substances.
- Do not apply or cure in the presence of uncured silicone sealants, alcohol and other solvent cleaners.
- Allow three (3) day cure before subjecting sealant to total water immersion.
- Avoid exposure to high levels of chlorine (Maximum level is 5 ppm).
- Do not apply when moisture vapour transmission exists since this can cause bubbling within the sealant.
- Avoid over-mixing sealant.
- Light colour shades tend to yellow over time when

exposed to ultraviolet rays.

- When overcoating, an on-site test is recommended to determine actual compatibility.

## ENVIRONMENT, HEALTH & SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

## APPLICATION INSTRUCTIONS

### SUBSTRATE PREPARATION

All joint surfaces must be clean, sound, dry and frost-free. Joint walls must be free of oils, tar, asphalt, bitumen, grease, paints, coatings, sealers, curing compound residues, and any other foreign matter that might prevent adhesion. Ideally this should be accomplished by mechanical means. Bond breaker tape or backer rod must be used in bottom of joint to prevent bond.

### Priming

Priming is typically not necessary. Most substrates only require priming if sealant will be subjected to water immersion after cure. Testing should be done, however, on questionable substrates, to determine if priming is needed. Contact Sika Canada or consult Sikaflex® Primers Product Data Sheet for additional information on priming.

**Note:** Most Exterior Insulation Finish Systems (EIFS) manufacturers recommend the use of a primer. When EIFS manufacturer specifies a primer or if on-site bond testing indicates a primer is necessary, Sikaflex®-429 Primer is recommended. On-site adhesion testing is recommended with final system prior to the start of a

job.

## MIXING

Pour entire contents of Component B into pail of Component A. Add entire contents of Color-pak into pail and mix with a low-speed drill (400 - 600 rpm) and proper mixing paddle. Mix for three (3) to five (5) minutes to achieve a uniform colour and consistency. Scrape down sides of pail periodically. Avoid entrapment of air during mixing.

**Note:** When mixing in cold weather < +10 °C (50 °F), do not force the mixing paddle to the bottom of the pail. After adding Component B and Color-pak into Component A, mix the top 1/2 to 3/4 of the pail during the first minute of mixing. After scraping down the sides of the pail, mix again for another minute. The paddle should reach the bottom of the pail between the first and second minute of mixing. Scrape down the sides of the pail a second time and then mix for an additional two (2) to three (3) minutes until the sealant is well blended. When using Sikaflex®-2c Booster, add entire contents into Component A prior to mixing.

**Note:** When mixing 11.4 L (3 US gal.) unit, two containers of Component B and two Color-paks must be used. Colorpak must be used with tint base. For pre-pigmented Limestone, just mix with low speed drill and Sikaflex® paddle (no Color-pak needed).

## APPLICATION METHOD / TOOLS

**Recommended application temperatures:** +4 °C to +38 °C (39 °F to 100 °F). Pre-conditioning units to approximately +21 °C (70 °F) is necessary when working at extremes. Move pre-conditioned units to work areas just prior to application. Apply sealant only to clean, sound, dry, and frost-free substrates. Sikaflex®-2c NS EZ Mix should be applied into joints when joint slot is at mid-point of its designed expansion and contraction.

To place, load directly into bulk gun or use a follower plate loading system. Place nozzle of gun into bottom of joint and fill entire joint. Keeping the nozzle deep in the sealant, continue with a steady flow of sealant preceding nozzle to avoid air entrapment. Also, avoid overlapping of sealant since this also entraps air. Tool as required. Proper joint design for moving joints is 2:1 width to depth ratio, with a recommended 6 mm (1/4 in) minimum and 13 mm (1/2 in) maximum depth of sealant. For non-moving joints, the width to depth ratio

can vary. To accelerate the cure of Sikaflex®-2c NS EZ Mix in cold weather temperatures, add Sikaflex®-2c Booster.

## CLEAN UP

Uncured material can be removed from equipment and tools using Sika® Urethane Thinner and Cleaner. Cured material can only be removed manually or mechanically.

## LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

## LEGAL NOTES

The information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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### Product Data Sheet

Sikaflex®-2c NS EZ Mix  
June 2022, Version 01.02  
02051105000000002





**PRODUCT DATA SHEET**

Edition 12.2017/v1  
CSC Master Format™ 07 14 16  
COLD FLUID-APPLIED WATERPROOFING

# Sikagard® E.W.L. Trowel Grade

## TROWEL-APPLIED, ABRASION, CORROSION AND CHEMICAL RESISTANT URETHANE COATING AND LINING

<b>Description</b>	Sikagard® E.W.L. Trowel Grade is a two-component, resistant and elastomeric urethane-based coating. It is chemically thickened to allow trowel applications up to 250 mils on vertical surfaces with minimum sag. The material has been specifically designed for use in water and wastewater applications, including those which require potable water contact certification. Sikagard® E.W.L. Trowel Grade provides a chemical, corrosion, temperature and abrasion resistant lining and is one of the toughest coatings available, specifically formulated to meet the demanding needs of the water/wastewater industries.
<b>Where to Use</b>	<ul style="list-style-type: none"> <li>▪ Crack filler for tanks, reservoirs and chemical containment structures.</li> <li>▪ For repairs or for forming flashings and seals around pipes and roof penetrations.</li> <li>▪ Cold joint filler, cant strip mortar and lining for vertical surfaces.</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>▪ Trowel Grade offers exceptional waterproofing performance in a formulation modified to allow vertical or free form trowel application:</li> <li>▪ Chemically thickened for application to vertical surfaces, cold joints, cant strips and cracks.</li> <li>▪ Adheres to and bridges between common construction materials such as concrete and steel.</li> <li>▪ Can be applied onto Sikaflex®-2C sealants where movement joint requires chemical and heat resistant coatings.</li> <li>▪ Forms a tough elastomeric coating able to bridge cracks and fill joints.</li> <li>▪ ANSI/NSF 61 certified for potable water contact up to 82 °C (180 °F).</li> <li>▪ Excellent wear and abrasion service.</li> <li>▪ UV stable.</li> <li>▪ Can be repaired when damaged or when new penetrations are added.</li> <li>▪ Can be applied to complex tanks with multiple penetrations, sumps, and irregular shapes.</li> <li>▪ Environmentally sound, complying with the most demanding VOC content standards.</li> </ul>

**Technical Data**

<b>Packaging</b>	<p>3 L (0.8 US gal.) unit: Component A (resin) 2.68 L (0.71 US gal.) can Component B (activator) 0.32 L (0.09 US gal.) bottle</p> <p>17 L (4.5 US gal.) unit: Component A (resin) 15 L (4 US gal.) pail Component B (activator) 2 L (0.5 US gal.) jug</p> <p>A unit consists of Component A (resin) in an underfilled can or pail and Component B (activator) in a bottle or jug. Quantities have been pre-measured to provide the proper mix ratio. Do not estimate proportions or part mix.</p>
<b>Colour</b>	Glossy black. When exposed to direct sunlight the gloss is reduced to matte within 3 - 6 months.
<b>Yield</b>	1.2 m <sup>2</sup> /L (50 ft <sup>2</sup> /US gal.) at 30 mils w.f.t. per coat, two coats to 60 mils w.f.t. total recommended. Coverage rates do not allow for surface profile, porosity or wastage.
<b>Shelf Life</b>	<b>Component A (resin):</b> 2 years when stored at -6 to 43 °C (20 to 110 °F); <b>Component B (activator):</b> 6 months when stored at 21 to 35 °C (70 to 95 °F) Precondition material to at least 15 °C (60 °F) before use.
<b>Mix Ratio</b>	<b>Weight</b> 6.1:1 / <b>Volume</b> 7.7:1
<b>Service Temperature</b>	-51 to 104 °C (-60 to 220 °F)
<b>Properties at 23 °C (73 °F) and 50 % R.H.</b>	
<b>Solids by Volume</b>	89 %
<b>Density</b>	<p>Component A (resin) 0.94 kg/L (7.9 lb/US gal.) Component B (activator) 1.2 kg/L (10.1 lb/US gal.) Mixed and Cured 0.99 kg/L (8.3 lb/US gal.)</p>
<b>Pot Life</b>	Approx. 20 minutes dependent upon application method and temperature.
<b>Curing Time</b>	<p>Potable Water Service 2 weeks @ 60 w.f.t. @ 15 °C (60 °F) Other Applications 24 hours in certain conditions</p>
<b>Adhesion to concrete (dry)</b>	2.4 MPa (350 psi)
<b>Abrasion Resistance ASTM D4060</b>	0.0012 g loss
<b>Elastomeric Waterproofing</b>	<p>ASTM C836 Exceeds all criteria ASTM C0957 Exceeds all criteria</p>

<b>Liner Performance Crack Bridging</b>	
10 cycles @ -26 °C (-15 °F)	> 3 mm (¼ in)
After heat aging	> 6 mm (¼ in)
<b>Extension to Break, ASTM D412</b>	300 %
<b>Hardness, Shore A ASTM D2240</b> @ 25 °C (77 °F)	60
<b>Deflection Temperature ASTM D648</b>	
ASTM D648	Below -51 °C (-60 °F)
ANSI/NSF 61	To 82 °C (180 °F)
<b>Mullen Burst Strength, ASTM D751, 50 mils</b>	1 MPa (150 psi)
<b>Liner Weight</b> (60 mils wet film thickness)	Approx. 1.55 kg/m <sup>2</sup> (31 lb/100 ft <sup>2</sup> )
<b>Recovery from 100% extension</b>	
After 5 minutes	98 %
After 24 hours	100 %
<b>Tensile Strength, ASTM D412</b>	
100 mil sheet	Approx 5.5 MPa (800 psi)
<b>Weathering ASTM D822</b>	5000 hrs
<b>Softening Point, Ring &amp; Ball ASTM D36</b>	> 162 °C (> 325 °F)
<b>Tear Strength ASTM D624 (Die C)</b>	150 lb-in
<b>Water Vapour Permeability ASTM E96</b> Method E, 37 °C (100 °F), 100 mil sheet	0.03 perms
<b>Flammability</b> ASTM D2859 UL790	Pass/Combustible substrate Class A <sup>1</sup> 1. Contact Sika Technical Services for details regarding UL fire ratings.
<b>Jet Fuel Resistance</b> FS 55-S-200D	Pass for joints
<b>Salt Spray ASTM B117</b>	Pass 2000 hrs
<b>VOC Content</b>	88 g/L (0.74 lb/US gal.)
<i>Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.</i>	

## HOW TO USE

### Surface Preparation

#### General

All substrates must be clean and dry with no oil, grease or loose debris. Sikagard® E.W.L. Trowel Grade is recommended for porous and non-porous substrates. Perform adhesion tests to confirm adequacy of surface preparation.

#### Concrete

Concrete surfaces must be clean, sound and dry. Remove any dust, laitence, grease, oil, dirt, curing agents, wax, detritus and contaminants from the concrete by appropriate mechanical means, in order to achieve a profile equivalent to ICRI-CSP 4-6, exposing aggregate. The compressive strength of the concrete substrate should be at least 20 MPa (3000 psi) at the time of application of Sikagard® E.W.L. Trowel Grade.

#### Steel

Steel substrates must be dry, clean and sound. Remove all materials which might impede adhesion, including corrosion products, dirt, dust, grease, oils, detritus and contaminants by appropriate mechanical means, such as abrasive blast cleaning, in order to achieve SSPC-SP10 / NACE No. 2 Near White Blast for immersion situations or SSPC-SP6 / NACE No. 3 Commercial Blast for non-immersion service. Minimum profile must be 3 mil. Use Sikagard® E.W.L. Bonding Agent for greater adhesion. (See separate Product Data Sheet.)

#### Other Metals

Metal substrates, other than steel, must be dry, clean and sound. Remove all materials which might impede adhesion, including corrosion products, dirt, dust, grease, oils, detritus and contaminants by solvent clean and then appropriate mechanical means, such as abrasive blast cleaning, in order to achieve SSPC-SP1. The surface must also be deglossed. Use Sikagard® E.W.L. Bonding Agent for greater adhesion. (See separate Product Data Sheet.)

#### Previous Coatings and Linings

Sikagard® E.W.L. Trowel Grade may be applied over some existing coatings and linings and achieve acceptable performance. Sikagard® E.W.L. Bonding Agent is recommended for greater adhesion. (See separate Product Data Sheet.)

Finished system results will vary due to project specific factors, including service conditions and nature of exposure. Therefore Sika Canada cannot accept responsibility for determining the suitability of an existing coating as a substrate for Sika products. The Owner or their Representative shall perform adhesion tests on any existing coating or lining to determine suitability.

### Priming/ Surface Conditioning

Porous substrates subject to outgassing or metal surfaces requiring barrier protection after blast-cleaning should be primed with Sika® MT Primer (refer to separate Product Data Sheet). Minimum waiting time after application of Sika® MT Primer and before applying Sikagard® E.W.L. Trowel Grade coating must be at least 12 hours at 21 °C (70 °F). Maximum waiting time for the same procedure will be at most 48 hours at the same temperature. Should the maximum waiting time expire but less than 30 days have passed, the primer must be examined for contamination, the pH value checked and the primer solvent wiped with Xylene, before reapplication.

**Or:**

Uneven, profiled and blowholed substrates and those where a temporary moisture barrier is required, should be levelled and sealed with Sikagard®-75 EpoCem®<sup>CA</sup> (refer to separate Product Data Sheet). The minimum waiting time between Sikagard®-75 EpoCem®<sup>CA</sup> and overcoating with Sikagard® E.W.L. Trowel Grade shall be 24 hours and where a moisture barrier is needed the maximum waiting time to overcoat will be 3 days. Should a longer intercoat period be required, consult Sika Canada Technical Services for information.

<b>Mixing</b>	Thoroughly stir Component A (resin) of Sikagard® E.W.L. Trowel Grade in its part-filled container using a slow-speed (200 - 300 rpm), 12 mm (½ in) drill to eliminate entrapping air. Use a 200 mm (8 in) mud or <i>Exomixer</i> ® type paddle suited to the volume of the container.
	<b>Important:</b> Do not draw air into the mix and under no circumstances agitate (shake) or stir Component B (activator) before adding to Component A (resin).
	Slowly add Component B (activator) to Component A (resin) while mixing and mix thoroughly for at least three (3) minutes. During the mixing operation, scrape down the sides and bottom of the container with a flat or straight edge at least once, to ensure complete mixing. When completely mixed Sikagard® E.W.L. Trowel Grade should be uniform in colour and consistency. Mix only the quantity that can be used within its pot life.
<b>Application</b>	Apply Sikagard® E.W.L. Trowel Grade directly to the clean, dry and suitably prepared substrate using a trowel or brush. For thicker applications, mixed material should be allowed to stand and build viscosity for several minutes before attempting to apply. Sikagard® E.W.L. Trowel Grade will not self-level.
	Sikagard® E.W.L. Trowel Grade may be sprayed with a properly configured plural component spray system. Contact Sika Canada for specific recommendations. Spray equipment must be flushed regularly with mineral spirits during application to prevent material from setting up in the hose and pump.
	Sikagard® E.W.L. Trowel Grade may be recoated in 1 hour, depending upon curing conditions, and must be recoated soon after the coating is touch dry (no longer comes off on polyethylene [typically within 4 hours of mixing]). If the coating has cured for longer than this time, the surface must be heavily abraded using a grinder or other mechanical means, and be free of dust and debris before overcoating. Use Sikagard® E.W.L. Bonding Agent for better adhesion only when the recoat window is missed. For immersion conditions, all coats must be applied within four hours of each other, except at joint lines.
	For applications, such as cant strips and expansion joints, where adhesion of subsequent coats is undesirable, allow 12 hours for Sikagard® E.W.L. Trowel Grade to cure prior to recoating or alternatively, use a bond breaker.
<b>Curing</b>	Before placing Sikagard® E.W.L. Trowel Grade into potable water service or similar applications, allow sufficient time for solvents to release from the coating.
	The required time for a 60 mil wet film thickness is two weeks at 15 °C (60 °F) but can vary if the thickness is greater or the curing conditions (ambient and substrate temperatures) are less conducive.
	For many other applications, Sikagard® E.W.L. Trowel Grade may be placed into service after 24 hours have elapsed since the final coat was applied. Contact Sika Canada for specific recommendations.
<b>Disinfection</b>	The cured Sikagard® E.W.L. Trowel Grade coating must be washed, rinsed, and disinfected before being put into service in potable water and fish pond service. Consult Sika Canada for advice.
<b>Clean Up</b>	Clean all tools and equipment, of uncured material, after use with mineral spirits. Spray equipment must be flushed through regularly during application to prevent material from curing in the hose and pump. Once hardened, material is more difficult to remove; soaking in solvent will soften the material and may assist in its mechanical removal.
<b>Limitations</b>	<ul style="list-style-type: none"> <li>▪ Sikagard® E.W.L. Trowel Grade is best installed by skilled and experienced applicators. Consult Sika Canada Technical Services for advice and recommendations.</li> <li>▪ Minimum substrate temperature: 10 °C (50 °F)</li> <li>▪ Substrate temperature must be at least 3 °C (5.5 °F) above the measured dew point.</li> <li>▪ Do not apply the material when the ambient or substrate temperatures are rising or the coating is in direct sunlight.</li> <li>▪ Do not apply in wet weather, when rain is imminent or when the applied coating or the substrate may become wet within 4 hours of application.</li> <li>▪ The material temperature should be at least 15 °C (60 °F) at the time of mixing and application. Sikagard® E.W.L. Trowel Grade may be preheated to facilitate application at low temperatures, but working time will be reduced.</li> <li>▪ Do not thin or part mix the material.</li> <li>▪ Do not mix Sikagard® E.W.L. Trowel Grade by hand; mechanically mix only.</li> <li>▪ Avoid contamination of product with water or moisture. Keep all containers tightly closed until ready for use. All equipment, air supplies, and substrates must be absolutely dry.</li> <li>▪ Use caution when applying Sikagard® E.W.L. Trowel Grade in confined spaces.</li> <li>▪ Spray application of the material will result in reduced working time.</li> <li>▪ Observe the curing times and especially the curing time before immersion into and service in potable water.</li> <li>▪ Sikagard® E.W.L. Trowel Grade appears as a glossy black film when first applied but upon contact with direct sunlight the gloss will be replaced with a matte appearance within 3 - 6 months depending upon the degree of exposure.</li> </ul>

**Health and Safety Information**

For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent SAFETY DATA SHEET containing physical, ecological, toxicological and other safety-related data.

KEEP OUT OF REACH OF CHILDREN  
FOR INDUSTRIAL USE ONLY

The Information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions, within their shelflife. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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Certified ISO 14001 (CERT-0102791)







**PRODUCT DATA SHEET**

Edition 12.2018/v1  
CSC Master Format™ 07 18 00 (07 14 16)  
TRAFFIC COATINGS

# Sika® MT Primer

## HIGH-SOLIDS, MOISTURE-TOLERANT AND ADHESION PROMOTING PRIMER FOR DRY OR DAMP SUBSTRATES

<b>Description</b>	A two component, high-solids, red tinted, translucent epoxy primer. It has been specifically formulated to perform as a moisture-tolerant and adhesion promoting primer.
<b>Where to Use</b>	<ul style="list-style-type: none"> <li>Use as a primer on damp substrates where measured moisture contents are ≤ 6 % beneath Sikalastic® and selected Sika® waterproofing membranes.</li> <li>As a primer to eliminate outgassing of substrates when applying Sikagard® systems, including Sikagard® E.W.L. coatings.</li> <li>Use as an optional adhesion promoter on dry substrates beneath Sikalastic® and selected Sika® waterproofing systems.</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Easy to use, 2:1 p.b.v. ratio.</li> <li>Moisture tolerant up to 6 % p.b.w.</li> <li>Excellent penetration and adhesion.</li> <li>Low tensile modulus.</li> <li>Higher tensile elongation.</li> <li>Low VOC, LEED® Canada credits available.</li> </ul>

**Technical Data**

<b>Packaging</b>	18 L (4.75 US gal.) and 567 L (149,7 US gal.) kits		
<b>Colour</b>	Red tint, translucent after mixing		
<b>Yield</b>	4 - 5 m <sup>2</sup> /L (160 - 200 ft <sup>2</sup> /US gal.) at 8 -10 mils wet film thickness (w.ft.).		
	* One (1) coat of Sika® MT Primer is required when the concrete substrate moisture is < 5 %. Total required thickness is 8 - 10 mils.		
	*Two (2) coats of Sika® MT Primer are required when the concrete substrate moisture is between 5 % and 6 %. Total required thickness is 16 - 20 mils.		
	Coverage rate will vary depending on the porosity and the surface profile of the prepared substrate.		
<b>Shelf Life</b>	2 years in original, unopened packaging. Store dry at temperatures between 4 and 32 °C (40 and 90 °F). Pre-condition product at temperatures between 18 and 24 °C (65 and 75 °F) before use.		
<b>Mix Ratio</b>	2:1 by volume		
<b>Pot Life</b>			
Material Temperature	Time		
10 °C (50 °F)	~ 50 minutes		
20 °C (68 °F)	~ 25 minutes		
30 °C (86 °F)	~ 15 minutes		
<b>Waiting/Recoat Times</b>	Before applying second coat of Sika® MT Primer allow:		
Ambient &			
Substrate Temperature	Minimum	Maximum	
10 °C (50 °F)	24 hours	3 days	
20 °C (68 °F)	12 hours	2 days	
30 °C (86 °F)	8 hours	1 day	
	Before applying Sikalastic® or Sikagard® Epoxy and Polyurethane coatings on Sika® MT Primer allow:		
Ambient &			
Substrate Temperature	Minimum	Maximum	
10 °C (50 °F)	24 hours	3 days	
20 °C (68 °F)	12 hours	2 days	
30 °C (86 °F)	8 hours	1 day	
<b>Cure Times</b>			
Ambient &			
Substrate Temperature	Foot traffic	Light traffic	Full cure
10 °C (50 °F)	~ 24 hours	~ 6 days	~ 10 days
20 °C (68 °F)	~ 12 hours	~ 4 days	~ 7 days
30 °C (86 °F)	~ 6 hours	~ 2 days	~ 5 days
<b>Properties at 23 °C (73 °F) and 50 % R.H.</b>			
<b>Pull-off Strength ASTM D4541</b>			> 2.7 MPa (400 psi) (100 % concrete failure)
<b>Shore D Hardness (7 days) ASTM D2240</b>			78 - 82
<b>Permeability ASTM E96</b>			9 g/m <sup>2</sup> (24 hours / 24 °C [75 °F])
<b>Water Absorption ASTM D570</b>			0.14 g/h - m <sup>2</sup>
<b>Viscosity (mixed)</b>			822 cps
<b>VOC Content ASTM D2369</b>			≤ 50 g/L
<b>Chemical Resistance</b>			Consult Sika Canada

*Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.*

## HOW TO USE

### Surface Preparation

The concrete surface must be clean and sound. Remove any dust, laitance, grease, oil, dirt, curing agents, impregnations, wax, foreign matter, coatings and detritus from the surface by appropriate mechanical means, in order to achieve a profile equivalent to ICRI / CSP 3 - 4 for decks and ICRI / CSP 1 - 3 for walls. The compressive strength of the concrete substrate should be at least 25 MPa (3625 psi) at 28 days and at least 1.5 MPa (218 psi) in tension at the time of application of Sika® MT Primer.

### Mixing

Prestir each component separately to ensure uniform colour and consistency. Empty Component B (hardener) into Component A (resin) in the correct ratio and mix the combined components for at least three (3) minutes at low speed (300 - 450 rpm) with a drill fitted with an *Exomixer*® or *Jiffy* type paddle suited to the volume of the mixing container. For bulk packaging and when not mixing full units, each component must be pre-stirred separately to ensure product uniformity and then accurately measured into a suitably sized and clean mixing container.

**Note:** Keep the mixing paddle in the material to avoid introducing or entrapping air while mixing.

Ensure that the mixed components are completely blended to avoid any weak or partially cured spots in the applied material. During the mixing operation, scrape down the sides and bottom of the container with a flat or straight edge trowel at least once to ensure complete mixing.

When completely mixed, Sika® MT Primer should be uniform in colour and in consistency.

**Do not mix more material than can be applied within the Pot Life, as determined by temperatures on site.**

### Application

Prior to application, measure and confirm substrate moisture content, ambient relative humidity, ambient and surface temperature and dew point. During installation, confirm and record above values at least once every three (3) hours, or more frequently whenever conditions change (e.g. ambient temperature rise/fall, relative humidity increase/ decrease, etc.).

Apply primer by squeegee at the rate of 4 - 5 m<sup>2</sup> / L (160 - 200 ft<sup>2</sup>/US gal.) and back roll to ensure a uniform 8 - 10 mils wet film thickness.

Where a second coat is required, wait until first coat is tack free, which is typically after 12 hours at 20 °C (68 °F) and apply a second coat of the primer using the same technique and at the same coverage as the first.

Ensure that the second coating is free of pinholes and holidays and provides uniform and complete coverage of the entire concrete substrate.

### Clean Up

Clean all tools and equipment with Sika® Epoxy Cleaner. Once hardened, product can only be removed mechanically. Wash soiled hands and skin thoroughly in hot soapy water or use Sika® Hand Cleaner towels.

### Limitations

- Moisture content of concrete substrate must be ≤ 6% by mass (p.b.w. – part by weight) as measured with a Tramex® CME/CMExpert type concrete moisture meter on mechanically prepared surface according to this product data sheet (preparation to ICRI / CSP 3 - 4). If moisture content of concrete substrate is > 6 % by mass, use Sikafloor®-81 EpoCem®<sup>CA</sup> on horizontal surfaces and Sikagard®-75 EpoCem®<sup>CA</sup> on walls and overhead.
- Minimum/Maximum ambient and substrates temperatures 10/30 °C (50/85 °F).
- Maximum ambient relative humidity 85 % (during application and curing)
- Substrate temperature must be 3 °C (5.5 °F) above the measured dew point.
- Do not hand mix material; mechanically mix only.
- Do not thin this product with water or solvent.
- The minimum thickness of Sika® MT Primer when the concrete substrate moisture is < 5 % (as measured with Tramex® CME/CMExpert type concrete moisture meter) is one coat at 8 - 10 mils.
- The minimum thickness of Sika® MT Primer when the concrete substrate moisture falls between 5 % and 6 % (as measured with Tramex® CME/CMExpert type concrete moisture meter) is 16 - 20 mils w.f.t., achieved through two coats, each at 8 -10 mils per coat.
- Do not apply while ambient and substrate temperatures are rising, as pinholes may occur. Ensure there is no vapour drive at the time of application. Refer to ASTM D4263 Standard Test Method for visual indication of vapour drive.
- Freshly applied material should be protected from dampness, condensation and water for at least 72 hours.
- Use of unvented heaters and certain heat sources may result in defects (e.g. blushing, whitening, debonding, etc.).
- Not recommended for exterior slabs on grade where freeze/thaw conditions may exist.

### Health and Safety Information

For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent SAFETY DATA SHEET containing physical, ecological, toxicological and other safety-related data.

KEEP OUT OF REACH OF CHILDREN  
FOR INDUSTRIAL USE ONLY

The Information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions, within their shelflife. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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Certified ISO 9001 (CERT-0102780)  
Certified ISO 14001 (CERT-0102791)



# PRODUCT DATA SHEET

## SikaTop®-123 Plus

POLYMER-MODIFIED, NON-SAG, CEMENTITIOUS MORTAR CONTAINING SILICA FUME PLUS MIGRATING CORROSION INHIBITOR



### PRODUCT DESCRIPTION

SikaTop®-123 Plus is a high performance, polymer-modified, 2-component, fast-setting, non sag cementitious mortar. It is designed especially for repair of overhead and vertical surfaces and is formulated with a migrating corrosion inhibitor to reduce corrosion.

### WHERE TO USE

- On grade, above, and below grade on concrete and mortar
- For structural concrete repairs on vertical and overhead surfaces
- For building facades, soffits, parking structures, industrial plants, walkways, bridges, tunnels, dams and ramps

### CHARACTERISTICS / ADVANTAGES

- High compressive and flexural strengths
- Bond strength ensures superior adhesion
- Increased density: excellent carbon dioxide resistance (carbonation) without adversely affecting water vapour transmission (not a vapour barrier)
- Enhanced with Sika FerroGard®-901, a migrating corrosion inhibitor

- Compatible with coefficient of thermal expansion of concrete
- Excellent freeze/thaw and salt scaling resistance
- Formulated with inert, non-reactive aggregates to eliminate potential Alkali-Aggregate Reactivity (AAR)
- Meets MTO specification for patching materials
- Meets AT B391 specification for patching materials
- Complies with NSF-ANSI standard 61 for potable water contact (special order only)
- Approved by the Ontario Ministry of Transportation and is qualified by The Road Authority (TRA)
- Approved by the Ministère des Transports du Québec (MTQ)
- Recognized by the the British Columbia Ministry of Transportation and Infrastructure (BC MoT)
- Meets CFIA and USDA requirements for use in food plants

### ENVIRONMENTAL INFORMATION

- Conformity with LEED®v4 MR Credit (Option 1): Building Product Disclosure and Optimization - Environmental Product Declarations
- Conformity with LEED®v4 MR Credit (Option 1): Building Product Disclosure and Optimization - Material Ingredients
- Conformity with LEED®v4 MR Credit (Option 1): Building Product Disclosure and Optimization - Sourcing of Raw Materials

### PRODUCT INFORMATION

CSC MasterFormat®

03 01 00 | MAINTENANCE OF CONCRETE

Packaging

20.5 kg (45 lb) unit - (A) 3.5 L jug + (B) 17 kg bag

Shelf Life

Component A : 24 months in original, unopened packaging.

Component B : 12 months in original, unopened bag.

<b>Storage Conditions</b>	Store dry at temperatures ranging between +5 °C – +32 °C (41 °F – 89 °F). For best results, condition product between +15 °C – +24 °C (59 °F – 75 °F) before using. Protect Component A from freezing. If frozen, discard.
<b>Appearance / Colour</b>	Concrete Grey when mixed
<b>Density</b>	2 000 kg/m <sup>3</sup> (125 lb/ft <sup>3</sup> ) (ASTM C185)
<b>Volatile organic compound (VOC) content</b>	<0.5 g/L

## TECHNICAL INFORMATION

<b>Compressive Strength</b>	24 hours	~ 20 MPa (2 900 psi)	(ASTM C109)
	7 days	~ 37 MPa (5 366 psi)	
	28 days	~ 50 MPa (7 250 psi)	

\* Compressive Strength (tested with SikaCem® Accelerator)

Temperature	Dosage	24 hours	2 days	3 days	28 days
0 °C (32 °F)	1 bottle (150 mL)	~1 MPa (145 psi)	~17 MPa (2465 psi)	~24 MPa (3480 psi)	~42 MPa (6091 psi)
0 °C (32 °F)	2 bottles (300 mL)	~2 MPa (290 psi)	~22 MPa (3190 psi)	~30 MPa (4351 psi)	~47 MPa (6816 psi)
10 °C (50 °F)	1 bottle (150 mL)	~20 MPa (2900 psi)	~34 MPa (4931 psi)	~40 MPa (5800 psi)	~54 MPa (7832 psi)
10 °C (50 °F)	2 bottles (300 mL)	~28 MPa (4061 psi)	~38 MPa (5511 psi)	~42 MPa (6091 psi)	~56 MPa (8122 psi)
23 °C (73 °F)	1 bottle (150 mL)	~27 MPa (3916 psi)	~34 MPa (4931 psi)	~40 MPa (5800 psi)	~56 MPa (8122 psi)
23 °C (73 °F)	2 bottles (300 mL)	~31 MPa (4496 psi)	~37 MPa (5366 psi)	~42 MPa (6091 psi)	~58 MPa (8412 psi)

<b>Modulus of Elasticity in Compression</b>	7 days	~17 GPa (2.4 x 10 <sup>6</sup> psi)	(ASTM C496)
	28 days	~26 GPa (3.7 x 10 <sup>6</sup> psi)	

<b>Splitting Tensile Strength</b>	21 days	~5 MPa (725 psi)	(ASTM C496)
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<b>Shear Strength</b>	24 hours	~7 MPa (1015 psi)	(ASTM C882)
	28 days	~17 MPa (2465 psi)	

<b>Pull-Out Resistance</b>	28 days	Greater than concrete	(ASTM C1583)
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<b>Chloride Ion Diffusion Resistance</b>	28 days	Very low - between 100 and 1000 Coulombs	(ASTM C1202)
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<b>Chemical Resistance</b>	Contact Sika Canada Inc.
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<b>Freeze thaw resistance</b>	300 cycles	Module of elasticity greater than 90%	(ASTM C666)
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## APPLICATION INFORMATION

<b>Mixing Ratio</b>	A:B = 1:5.4 by weight depending on consistency required
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<b>Yield</b>	Approx. 10 L (0.353 ft <sup>3</sup> )
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<b>Product Temperature</b>	+15 °C à +24 °C (59 °F to 75 °F)
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<b>Ambient Air Temperature</b>	> +7 °C (> 45 °F)
<b>Substrate Temperature</b>	> +7 °C (> 45 °F)
<b>Finishing Time</b>	Approx. 30 - 60 minutes after placing the mortar
<b>Application Time</b>	Approx. 15 min after mixing the mortar

## BASIS OF PRODUCT DATA

Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods. Properties tested at +23 °C (73 °F) and 50 % R.H. unless stated otherwise.

## LIMITATIONS

- Minimum application thickness: 3 mm (1/8 in)
- Maximum layer thickness: 38 mm (1½ in)
- Minimum ambient and substrate temperature: +7 °C (45 °F) and rising at time of application, unless using Sikacem® Accelerator (refer to Technical Data section for dosage recommendations and strength values at various temperatures)
- Protect the freshly applied mortar from freezing for a period of 24 hours
- Storage is particularly important, it is essential to protect bagged material from exposure to rain, condensation and high humidity as moisture may penetrate the bag, causing lumps
- Do not use/add water to this product

## ENVIRONMENT, HEALTH & SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

## APPLICATION INSTRUCTIONS

### SURFACE PREPARATION

Remove all deteriorated concrete, dirt, oil, grease, or other bond inhibiting materials any contaminants or conditions that may affect adhesion or overall product performances. Following ICRI Guideline 310.2, the concrete surface must be clean, sound and mechanically prepared to obtain a surface profile of CSP 6 – 10 (ex : hydrodemolition, scarification, scabbling + sandblasting, etc.). Follow ICRI Guideline 310.1 for the preparation of the repair perimeter, repair area geometry and cleaning of concrete and reinforcing steel surfaces. Verify the absence of micro cracking following ICRI Guideline 310.2. To ensure optimum repair results, the effectiveness of cleaning and preparation should be

assessed by a pull-off test.

### MIXING

Mix mechanically using a heavy-duty, low-speed drill (300 - 450 rpm) with a Mud Mixer/Box or Propeller-type paddle. Shake Component A before using, then pour approximately 85 % of its content in a clean mixer or pail. Add slowly Component B while continuing to mix until a uniform consistency is obtained (approx. 3 minutes). If a wetter consistency is required, add additional Comp. A and continue mixing until a homogenous consistency is achieved. For a smaller quantity, make sure that each component is properly premixed at the correct ratio.

### APPLICATION

At time of application, the surface should be damp but saturated surface dry (SSD) with no glistening water films. A scrub coat should be applied prior to placement of mortar. Apply a 3 mm (1/8 in) thick scrub coat of SikaTop®-123 Plus into the substrate, filling all pores, voids and edges. Alternatively, SikaTop® Armatec-110 EpoCem® can be used as a bonding agent. Apply the desired mortar layer before bond coat dries. Force product against the edges of repair, working toward center. After filling the repair, consolidate then trim the surface flush with adjacent concrete sides. Allow mortar to reach initial set [30 – 60 min after placing at +23 °C (73 °F)], then finish with wood or sponge float for a textured surface.

For a smooth finish, use a steel trowel wiped with Comp. A during finishing.

If the repair requires several lifts (layers), apply the mortar leaving a rough profile and score the surface immediately in a crosshatch pattern using the corner of a steel trowel to a depth of approximately 6 mm (1/4 in) to provide a mechanical key (with exception to the last layer). Unfinished work from previous day must be roughened and any polymer film removed to ensure bond.

### CURING TREATMENT

As per ACI 308 recommendations for cement concrete, curing is required. To achieve performance consistent with Technical Information, curing must be provided by recognized curing methods, such as wet burlap covered with white polyethylene film or approved water-based curing compound, such as Sika® Florseal WB-18 & -25. Curing must begin immediately after placing and finishing. Moist-curing must be maintained for the first

24 hours only then apply Sika® Florseal WB curing compound. Protect freshly applied mortar from direct sunlight, wind, rain and frost.

#### **CLEAN UP**

Clean all tools and equipment after use with water. Once hardened, the product can only be removed mechanically.

## **LOCAL RESTRICTIONS**

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

## **LEGAL NOTES**

The information, and in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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#### **Product Data Sheet**

SikaTop®-123 Plus  
March 2023, Version 01.03  
020302040070000022

SikaTop-123Plus-en-CA-(03-2023)-1-3.pdf





## PRODUCT DATA SHEET

# SikaTop® Armatec®-110 EpoCem®

### ANTI-CORROSION COATING AND BONDING AGENT



#### PRODUCT DESCRIPTION

SikaTop® Armatec®-110 EpoCem® is a 3-component, water-based epoxy resin, anti-corrosion coating and bonding agent.

#### WHERE TO USE

- **As an anti-corrosion coating for reinforcing steel:**
  - For repairs to reinforced concrete where there is corrosion of the underlying reinforcement steel
  - For preventive protection of reinforcement steel in thin reinforced concrete sections
- **As a bonding agent for use on concrete, mortar or steel:**
  - For repairs to concrete using SikaTop® Plus, Sika MonoTop® and SikaRepair® patching and repair mortars
  - For bonding new concrete and mortar to old

#### CHARACTERISTICS / ADVANTAGES

- Excellent adhesion to steel and concrete
- Acts as an effective barrier against penetration of water and chlorides
- Non-vapour barrier
- Contains corrosion inhibitors

#### PRODUCT INFORMATION

CSC MasterFormat®

03 01 00 | MAINTENANCE OF CONCRETE

Packaging

Small unit : 8 kg (4 L) or 17.6 lb (1.05 US gal. )  
Large unit : 25 kg (12.5 L) or 55 lb (3.3 US gal.)

Shelf Life

1 year in original, unopened packaging.

- Provides an excellent bonding coat for subsequent applications of repair mortars
- Extended open time
- Not affected by moisture
- High mechanical strength.
- Premeasured, ready-to-use kits
- May be spray-applied
- Non-flammable
- Solvent-free

#### ENVIRONMENTAL INFORMATION

- Conformity with LEED®v4 MR Credit (Option 1): Building Product Disclosure and Optimization – Environmental Product Declarations
- Conformity with LEED®v4 MR Credit (Option 1): Building Product Disclosure and Optimization – Material Ingredients
- Conformity with LEED®v4 MR Credit (Option 1): Building Product Disclosure and Optimization – Sourcing of Raw Materials

#### APPROVALS / CERTIFICATES

- Ministère des Transports du Québec (MTQ) acceptance

<b>Storage Conditions</b>	Stored (unopened) in a dry place, at temperatures between +5 °C and +32 °C (41 °F and 89 °F).	
	Components A and B	Protect from freezing. If frozen, discard.
	Component C	Protect from humidity.
<b>Appearance / Colour</b>	Component A	Liquid / White
	Component B	Liquid / Yellowish
	Component C	Powder / Light Grey
	Components A+B+C	Dark Grey
<b>Density</b>	Component A	1.1 kg/L (9.2 lb/US gal.)
	Component B	1.03 kg/L (8.6 lb/US gal.)
	Component C	1.25 kg/L (10.4 lb/US gal.) (dry bulk density)
	Components A+B+C	2 kg/L (16.7 lb/US gal.)
<b>Volatile organic compound (VOC) content</b>	<10 g/L	

## TECHNICAL INFORMATION

<b>Pull-Off Strength</b>	Concrete	2-3 MPa (290-435 psi)	(CSA A23.2-6B)
	Steel	1-2 Mpa (145-290 psi)	
<b>Shear Adhesion Strength</b>	14 days	Wet on Wet	20.7 MPa (3003 psi) (ASTM C882*)
	14 days	12 hours open time	13.8 MPa (2002 psi)
<p><i>*ASTM C881 Specification Minimum Bond Strength 10.3 MPa (1494 psi). Open time (12 hours) between application of SikaTop® Armatec-110 EpoCem® and placement of new concrete or repair mortar. Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.</i></p>			
<b>Chemical Resistance</b>	Consult Sika Canada Inc.		

## APPLICATION INFORMATION

<b>Mixing Ratio</b>	Mix entire unit (A+B+C)		
<b>Yield</b>	<b>Bonding agent:</b> Minimum 8 kg or 4 L/6.6 m <sup>2</sup> (17.6 lb or 1.05 US gal./72 ft <sup>2</sup> ) <b>Anti-corrosion coating:</b> 8 kg or 4 L/2.3 m <sup>2</sup> (17.6 lb or 1.05 US gal./25 ft <sup>2</sup> )		
<b>Application Time</b>	<b>+7 °C (44 °F)</b>	<b>+30 °C (86 °F)</b>	
	2 h	1 h 30 min	
<b>Waiting Time / Overcoating</b>	<b>+10 °C (50 °F)</b>	<b>+20 °C (68 °F)</b>	<b>+30 °C (86 °F)</b>
	16 h	12 h	8 h



## BASIS OF PRODUCT DATA

Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods. Properties tested at 23 °C (73 °F) / 50 % r.h. unless stated otherwise.

## LIMITATIONS

- Do not use as a bonding agent with set accelerated mortars or concrete, e.g. SikaSet®-45, SikaQuick®-1000, SikaQuick®-2500, SikaTop®-123 Plus Winter Grade, RS-S6/RS-S10 and Self-Consolidating concrete. Consult Sika Canada Inc.
- Minimum application temperature (ambient and substrate): +7 °C (44 °F).
- Maximum substrate temperature: +30 °C (86 °F).
- Under no circumstances should water be added to the mix.

### Caution

- Component A - Irritant - Contains epoxy resins.
- Component B - Irritant - Contains amines.
- Component C - Irritant - Contains cement and quartz.
- Product is a strong sensitizer. Avoid eye, skin, and respiratory contact. Use of safety goggles, chemical-resistant gloves and a NIOSH/MSHA organic vapour respirator is recommended. Avoid breathing vapours and dust. Use adequate ventilation. Consult product label for additional information.

### First Aid

In case of skin contact, wash with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes. Contact a physician. For respiratory problems, transport victim to fresh air. Remove contaminated clothing and wash before re-use.

## ENVIRONMENT, HEALTH & SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

## APPLICATION INSTRUCTIONS

### SURFACE PREPARATION

Remove all deteriorated concrete, dirt, oil, grease or any contaminants or conditions that may affect adhesion or overall product performances. Following ICRI Guideline 310.2, the concrete surface must be clean, sound and mechanically prepared by sandblasting, high pressure waterblasting, scarifying or other appropriate mechanical means. Absorbent surfaces must be saturated surface dry (SSD) with no standing water prior to application. Verify the absence of micro cracking

following ICRI Guideline 310.2. To ensure optimum repair results, the effectiveness of cleaning and preparation should be assessed by a pull-off test.

### MIXING

Shake components A and B vigorously before opening. Pour both liquids into a suitable mixing pail and mix for 30 seconds. Add component C slowly while continuing to stir the mixture. Mix mechanically for three (3) minutes, using a low-speed drill (300 - 450 rpm) and *Jiffy* mixer in order to entrain as little air as possible.

### APPLICATION

**Anti-corrosion coating:** Apply coating approx. 0.5 - 1 mm (20 - 40 mil) thick on cleaned and de-rusted reinforcement steel using a stiff paint brush, roller or spray gun. Be sure to coat the underside of the totally exposed steel. Let dry for two (2) to three (3) hours [ambient temperature of +20 °C (68 °F)] before applying a second coat of similar thickness. Let dry for a similar period of time before applying patching mortar, or concrete, to the repair. In the course of application, some of the coating material will inevitably be deposited on the surrounding concrete, but this has no detrimental effect on the finished repair.

**Bonding agent for repair mortar or concrete:** Ensure that the prepared substrate is saturated surface dry (SSD), then apply a bonding coat no less than 0.5 mm (20 mil) thick, using a paint brush, roller or suitable spray gun. For best results, work the bonding slurry well into the substrate to ensure complete coverage of all surface irregularities. Freshly mixed patching mortar or concrete can be applied immediately on SikaTop® Armatec®-110 EpoCem® within the contact time: 8 hours at +30 °C (86 °F), 12 hours at +20 °C (68 °F), 16 hours at +10 °C (50 °F). After this contact time, the adhesion characteristics will be reduced.

### CLEAN UP

Use water to remove uncured material from tools and mixing equipment. Cured, product can only be removed mechanically.

## LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

## LEGAL NOTES

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recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any recommendations, or from any other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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**Product Data Sheet**  
SikaTop® Armatec®-110 EpoCem®  
July 2023, Version 03.02  
020302020050000001



Attachment D

# Safe Work Entry Procedures



# Safe Work Entry Procedure

Name **Primary Sediment and Equalization Tanks**

Date December 9, 2020

## Scope

The work activity taking place inside the tank is **inspection, repair and maintenance** using hand tools primarily to the flights and chains and other surfaces or components. If any power tools, battery tools, cutting, drilling, or grinding takes place then RMOW staff must pull an RMOW WWTP “hot work permit”. Prior to entry, the tank is taken off-line, cleaned and “hosed down” from above using water and is included in these procedures. The process to enter into a tank may take several days as some steps in the procedure do not necessarily happen in one day. This procedure does **not** include for welding or gouging tasks.

In the past, this group of tanks located in the primary building were treated as confined spaces in their as built designs. However, as of November 2020 RMOW have sourced a custom-built staircase that can be installed into the tanks that would declassify these as confined spaces per definition the Occupational Health and Safety Regulation section 9.1. By improving access/egress with stairs, the space is no longer restrictive for rescue service. (Refer to WorkSafeBC Inspection Report 2020109490054A, and Confined Space Hazard Assessment document dated October 25, 2020 prepared by VOHS for reference).

## Hazard Identification Summary

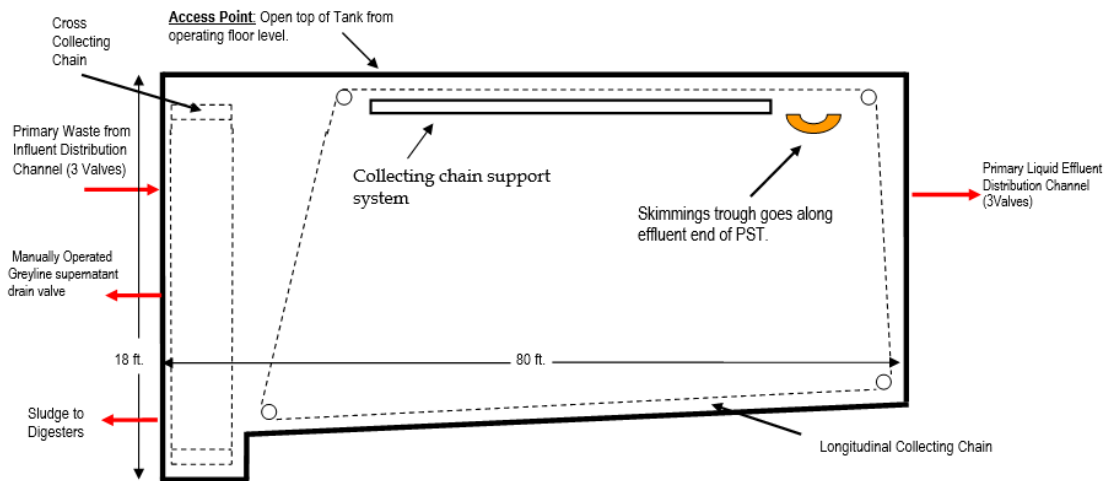
The hazards listed below are a summary of hazards that are known and identified to be associated with entry into these spaces and controlled through these safe work procedures. A detailed hazard assessment was completed by EnviroSafety March 2020.

Atmospheric hazards: Oxygen deficiency, H2S, LEL, sewer gas	Human factors/Ergonomics	Mechanical equipment (flights and chains) pinch points	
Biological agents in waste / sludge (ingestion/skin contact)	Fall from heights	Overhead hazards/tools	Crystalline Silica
Visibility	Slip/trip	Noise	Engulfment

## Tank Dimensions and Shape

Each of the four (4) tanks related to this safe work procedure have the same dimensions. There are two Primary Sediment Tanks and two tanks that operate as Equalization Tanks with one tank, Tank 3, being able to function as both an equalization tank or sediment tank as needed.

Tank Name	Length (ft.)	Width (ft.)	Height (ft.)	Volume (ft. <sup>3</sup> )
Primary Sediment Tank 1	73+7	20	15.5 / 18	25150
Primary Sediment Tank 2	73+7	20	15.5 / 18	25150
Primary Sediment/Equalization Tank 3	73+7	20	15.5 / 18	25150
Equalization Tank 4	73+7	20	15.5 / 18	25150



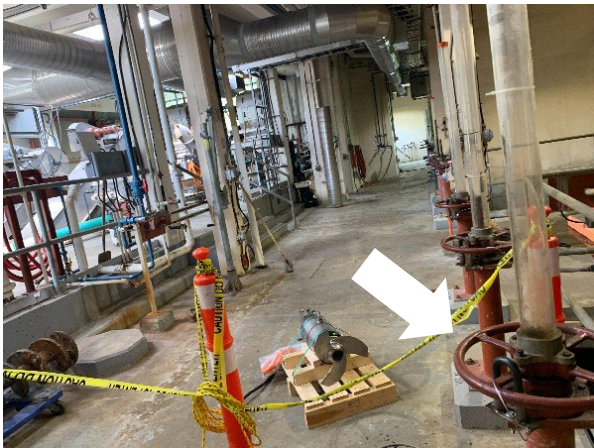
## Safe Work Procedures

### A. Pre-Entry and Tank Preparation Work Tasks

1. Toolbox meeting and with RMOW staff involved participating in entering the tank, along with any RMOW required pre-job safety reviews.
2. Each tank has different influent and effluent gate valves (GV) associated with them. Each valve is been tagged with a specific ID number. See Table A for list of respective RMOW lockout procedures applicable to each tank. Close each influent and effluent GV associated with the tank space planned for entry.
3. Close influent gate valves first, located at the front end of the tanks using the valve wheel (see photo #1). Use lock, tag and hasp for lockout of these valves
4. Remove the grate covers over the effluent gate valves and use a valve key to close these valves and tag. (see photo #2)
5. Follow lockout procedure to complete full draining process.
6. Turn on building ventilation fresh air supply fans 4219 and 4218 manually. Each fan provides **5000 cfm and 6360 cfm** respectively and would otherwise turn on automatically if the **fixed H<sub>2</sub>S** sensors detected levels above **2.0 ppm** or if **fixed LEL** sensors detected levels above **10%**. There are two (2) fixed H<sub>2</sub>S sensors centrally located at the front and back of the four tanks. There is an H<sub>2</sub>S ECP in place. Exhaust fans in the building, fans 4220, 4221 and 4222, exhaust at **11448 cfm, 4664 cfm and 4000 cfm** respectively. These fans control air quality impacted by nearby online tanks from H<sub>2</sub>S, LEL, and maintain normal oxygen levels.
7. Open man doors to outside for additional natural ventilation and fresh air intake (weather permitting).
8. Don PPE listed below.
9. Connect water hose to the water supply port, extend water hose to safely lay on the ground then begin washing, spraying and rinsing the inside surface walls and floor of the tank. Following Cleaning a Primary Sedimentation Tank SOP: 001.

## Safe Work Procedures

10. When tank cleaning is complete the floor drain can be closed again, if needed residual cleaning water can be removed from the tank using pump (SP3250.2 or SP3251.2).



*Photo #1: Influent Gate Valves shown on the right*



*Photo #2: Effluent Gate Valves below grade at back end – use water key to open/close*

### B. Work Area Set Up

11. Stairs will be installed and inspected by a third party contractor. Following installation Omega & Associates Engineering will sign off that stairs have been installed as per engineered drawing. Only remove grating where stairs will be installed. All guardrails and kick plates remain in place to prevent tools and falls from elevation into the space.
12. On the same day of entering the tank, prepare the 4-gas air monitoring device at the Drager X-dock station. The X-dock station bumps the gas monitor, checks calibration and alarm settings.
13. Organize tools, equipment and materials needed for maintenance.
14. For additional fresh air supply inside of tank setup portable ventilation fan and duct into the space.
15. Orient fan intake at the open doorway (weather permitting) or otherwise away from surrounding contaminants.
16. Ensure work tools, if any, are kept clear or secure around the space opening such that they do not fall or get kicked in down the stairs. Kick plates are around the guardrails.

### C. Verification Pre-Entry Testing and Ventilation

17. Inspect PPE functionality and portable ventilation equipment (see requirements below).
18. For each worker entering the tank, follow group lockout procedures referenced in Table A.
19. Turn on gas monitor and check battery charge. Monitor must be calibrated and charged before entry. Place the monitor inside of the pump casing and attach tubing.



# Safe Work Entry Procedure

Name **Primary Sediment and Equalization Tanks**

Date December 9, 2020

## Safe Work Procedures

20. Conduct initial pre-entry atmospheric testing. Wait 2 seconds/foot of tubing for reading. For 15-foot tube wait 30 seconds.

21. Initial reading prior to entry should be:

O <sub>2</sub>	20.9%	CO	0 ppm	LEL	0%	H <sub>2</sub> S	0 ppm
----------------	-------	----	-------	-----	----	------------------	-------

22. Refer to Ventilation Requirements below.

23. Continuously monitor atmosphere inside the space by the worker's breathing zone with the personal 4 gas monitor, one/worker.

24. Low lighting levels inside the space, position temporary lighting above space for additional lighting or bring temporary lights into the space and wear headlamps and use flashlights as needed.

25. With good lighting or flashlight visually inspect each of the influent and effluent gates for any signs of leaking, from outside of the space.

### D. Communication

Worker inside the space would always be in line of sight, verbal communication will be used.

### E. Enter Space

26. Don PPE identified below as appropriate to the work tasks being performed, if not already being worn.

27. Remove 4-gas monitor from pump casing and wear as a personal monitor. "adjust if second monitor is needed then pump stays with standby and personal monitor with worker entering"

28. Ensure ventilation is in place and running.

29. Descend the stairs

30. Perform inspection of the work area and any required repairs or replacement.

31. Until gate valves have been certified by an engineer, a spotter is designated to continuously monitor gates for signs of leaking from influent and effluent gates during worker entry. Leaking gate valve may expose entrants to biohazard waste and will require decontamination.

32. Conduct work as needed.

33. Repeat steps in Section C for Verification Pre-Entry Testing and Ventilation at the start of each shift if work is not complete by end of shift.

34. Follow biohazard exposure control plan and decontamination procedures at end of shift and before breaks.



# Safe Work Entry Procedure

Name **Primary Sediment and Equalization Tanks**

Date December 9, 2020

## F. Work Completion/Exit/Demobilization

35. Spray tools with a general disinfectant including stairs after they have been removed from the space.
36. Wipe down the outside of the coveralls being used if visible contamination/dirt is present as well as tools used inside the space.
37. Place all used/dirty wipes into a garbage bag. Remove coveralls, rolling it inside out.
38. Place coveralls into the garbage bag. Use wipes to clean outside of respirator before taking it off, and put wipes in garbage bag.
39. Remove gloves and put in garbage bag. Wipe hands
40. Remove the respirator and clean inside and place into storage bag/container.
41. Wipe face, put wipes in garbage bag and seal for general waste disposal.
42. Pack up and remove tools, equipment, materials from area.
43. Prepare tank and surround work area to put back online.
44. Follow the reverse of RMOW lockout procedures. See Table A.

## Portable Ventilation

Tanks have open tops inside the primary building. Air in the tanks when empty has been shown to be clean respirable air as large open space with mechanical building ventilation allows for natural mixing. It is not expected that any heavier than air gases would accumulate at the bottom of these tanks. The building has mechanical exhaust and supply fans. In addition to this a portable fan can be provided. A blue Americ portable fan with 12-inch duct size in diameter with 15-foot duct length of flexible ducting can provide 1830 cfm with two (2) bends at 90° in the ducting. **This is in addition to building ventilation.**

$$cfm\ of\ fan = [(air\ changes\ per\ hour) \times (volume\ of\ space\ in\ cubic\ feet)] \div 60\ minutes$$

These tanks have an internal volume of approximately "25150 ft<sup>3</sup>". With "15 foot" of flexible ducting and "two-90°" bends in the ducting:

$$1830\ CFM = ACH \times 25,150\ ft^3 \div 60\ minutes$$

This fan provides "4.4" air changes per hour  
(in addition to building ventilation)





# Safe Work Entry Procedure

Name **Primary Sediment and Equalization Tanks**  
 Date **December 9, 2020**

## Equipment Required

<b>Work Area</b>	<b>Lockout/Isolation</b>
Caution tape, rope	Lockout devices (valve, switch, etc.) Personal locks, tags
<b>Entry/Exit and Rescue</b>	<b>Power</b>
Install Engineered Stairs	Temporary Lighting Headlamp
<b>Communication</b>	<b>Testing</b>
Visual - line of sight Verbal	Drager X-am 2500
<b>Ventilation – Portable</b>	<b>Ventilation – Building</b>
1830 CFM Blue Americ Fan - 2 bends 15' Flex Ducting 12" diameter duct	Building ventilation supply and exhaust fans
<b>Personal Protective Equipment</b>	
Disposable Impervious Coveralls Nitrile Gloves Work Gloves Safety glasses meeting CSA-Z94.3 Class 1A (with half-face respirator only) Steel-toed rubber boots meeting CSA-Z195-M92 NIOSH approved P100 respirator cartridge NIOSH approved Half-Face or Full-Face Respirator	

## Emergency Response

1. Follow standard WWTP First Aid Procedures and site emergency response plan first.
2. If required, contact the RMOW Fire Department at 911
3. Inspect area around tank to ensure all site conditions are as expected, look for hazards that can be controlled or corrected.
4. Provide a clear path/access for emergency responders
5. Report to first responders conditions and tasks or other information required relevant for rescue efforts.

**Whistler Health Care Centre: 4380 Lorimer Road**

## Qualified Person

**Robin Van Driel** M.Sc., CIH, ROH, CRSP  
 (778) 879-8009 | robin@vohsgroup.com



# Safe Work Entry Procedure

Name **Primary Sediment and Equalization Tanks**  
 Date December 9, 2020

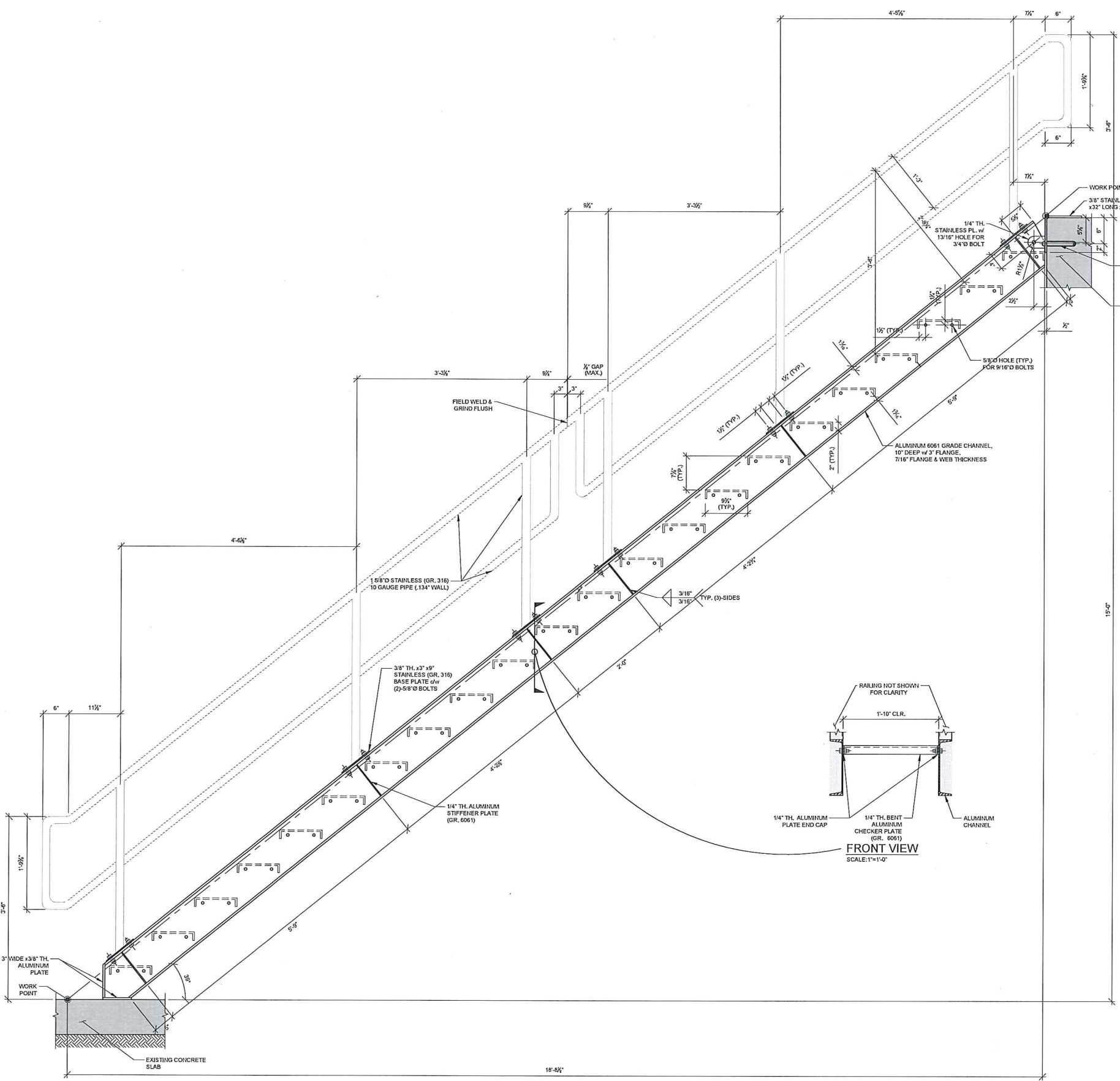
**Table A: List of Lockout Procedures and Valve Information per Tank**

Tank Name	Lockout Procedure Name	Lockout Procedure Number	Date
Primary Sediment Tank 1	Lockout Procedure #1 Primary Sedimentation Tank	#LP009	11/18/2020
Primary Sediment Tank 2	Lockout Procedure #2 Primary Sedimentation Tank	#LP010	11/18/2020
Primary Sediment/Equalization Tank 3	Lockout Procedure – #3 Primary Sediment/Equalization Tank 3	#LP011	11/18/2020
Equalization Tank 4	Lockout Procedure – #4 Equalization Tank 4	#LP012	11/18/2020

Reference Documents		
Document Name	Provided By	Date
Hydrogen Sulfide Exposure Control Plan	Arcose Consulting Ltd.	October 30, 2020
Biological Agents Exposure Control Plan	Arcose Consulting Ltd.	October 30, 2020
Primary Sedimentation Tank / Treatment Plant Stairs [drawing]	Omega & Associates Engineering	October 29, 2020
WWTP Main Process Building HVAC Upgrades 20162812-00 Drawing	Associated Engineering	August 9, 2017
Primary Sedimentation Tank Online/Offline SOP: PRM-4	RMOW WWTP	March 6, 2019
Cleaning a Primary Sedimentation Tank SOP: 001	RMOW WWTP	September 26, 2020
WWTP First Aid Procedures and Emergency Response Plan	RMOW Health and Safety	
Hazard Assessment WWTP-006-CSHA-RMOW-20200403	EnviroSafety	March 9, 2020

Attachment E

# PST Access Stairs Drawings



- NOTES**
- STAIRWAY HAS BEEN DESIGNED IN ACCORDANCE WITH OSHA 1910.25 STAIRWAYS AS BC BUILDING CODE 2018, CLAUSES 3.3.1.14 STATES THAT STAIRS SERVING INDUSTRIAL OCCUPANCIES DO NOT NEED TO COMPLY WITH TYPICAL BC BUILDING CODE REQUIREMENTS. WORKSAFE BC DOES NOT PROVIDE STAIR REQUIREMENTS. GUARDS/HANDRAIL HAVE BEEN DESIGNED IN ACCORDANCE WITH BC BUILDING CODE 2018.
  - CONTRACTORS, SUPPLIERS, SUBTRADES, ETC. ARE TO ENSURE THAT THEY ARE WORKING ON CURRENT DRAWINGS AND SHOULD VERIFY THAT THEY ARE IN POSSESSION OF THE LATEST ISSUE. DISREGARD OBSOLETE DRAWINGS. DO NOT BUILD FROM DRAWINGS UNLESS THEY INDICATE ISSUED FOR CONSTRUCTIVITY.
  - SPECIFIED LOADS (NOT factored):**

<b>IMPORTANCE CATEGORY</b>	= NORMAL
<b>STAIR:</b>	DEAD LOAD = 0.5 kPa (10.4 psf)
LIVE LOAD	= 2.4 kPa (50.1 psf) OR 4.45 kN (1000lb) ULTIMATE ON ANY INDIVIDUAL TREAD, (TOTAL CAPACITY OF STAIRWAY = 16500lb)
<b>HANDRAIL:</b>	= POINT LOAD OF 0.9 kN OR A UNIFORM LOAD OF 0.7 kN/m IN ANY DIRECTION
<b>GUARDRAIL:</b>	= 0.75 kN/m HORIZONTAL LOAD OR CONCENTRATED LOAD OF 1.0 kN IN THE OUTWARD DIRECTION OR 0.38 kN/m HORIZONTAL LOAD OR CONCENTRATED LOAD OF 0.5 kN IN THE INWARD DIRECTION OR 1.5 kN/m VERTICAL.
  - ALL PRODUCTS SPECIFIED ON DRAWINGS TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - IF ANY ITEMS ON THE DRAWING ARE UNCLEAR THE OWNER/CONTRACTOR SHALL OBTAIN CLARIFICATION FROM THE ENGINEER PRIOR TO STARTING WORK.
  - OWNER/CONTRACTOR TO ADVISE ENGINEER WHEN SITE WORK IS IN PROGRESS. ANY WORK COVERED AND NOT INSPECTED MAY NEED TO BE UNCOVERED FOR FIELD REVIEW.
  - THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY BRACING AND SHORING REQUIRED FOR CONSTRUCTION LOADING AND STABILITY UNTIL THE PROJECT IS COMPLETED.
  - ALL MECHANICAL, ELECTRICAL, PLUMBING, VENTILATION AND DRAINING DESIGN SHALL BE PERFORMED BY OTHERS IF REQUIRED BY THE LOCAL AUTHORITY.
  - ALL WORK TO BE IN ACCORDANCE WITH STRUCTURAL DRAWINGS AND B.C. BUILDING CODE. ALL CHANGES SHALL BE FORWARDED TO OMEGA & ASSOCIATES PRIOR TO PROCEEDING WITH CONSTRUCTION.

- STRUCTURAL STEEL**
- ALL STRUCTURAL STEEL TO BE DESIGNED, DETAILED, FABRICATED & ERECTED IN ACCORDANCE WITH CSA S16-14 "LIMIT STATE DESIGN OF STEEL STRUCTURES".
  - ALL STEEL TO BE IN ACCORDANCE WITH CAN/CSA-G40.20 & G40.21
    - HSS SECTIONS TO BE GRADE 350W CLASS C
    - PLATES, CHANNELS, & ANGLES TO BE GRADE 300W
    - W-SECTIONS AND ALL OTHER STRUCTURAL STEEL TO BE GRADE 350
  - THE FABRICATOR SHALL BE CERTIFIED BY THE CANADIAN WELDING BUREAU TO CSA W47.1. COPIES OF FABRICATOR'S CWB CERTIFICATES TO BE PROVIDED WITH THE SHOP DRAWINGS.
  - NONCOMPLIANCE WITH THE ABOVE REQUIREMENTS WILL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE FOR ANY ADDITIONAL COSTS.
  - PAINT ALL STEEL WITH 1 COAT OF PRIMER.
  - ALL FIELD CONNECTIONS TO BE BOLTED U.N.O.
  - NON SHRNK GROUT TO BE MASTERFLOW 928 GROUT OR APPROVED EQUAL.

- ALUMINUM NOTES**
- THE ALUMINUM HAS BEEN DESIGNED IN ACCORDANCE WITH CSA S157.
  - FABRICATION PRACTICES SHALL FOLLOW THOSE FOR STEEL, AS IN CSA S16.
  - THE FABRICATOR SHALL BE CERTIFIED BY THE CANADIAN WELDING BUREAU TO CSA W47.2. COPIES OF FABRICATOR'S CWB CERTIFICATES SHOULD BE PROVIDED WITH THE SHOP DRAWINGS.
  - ALL WELDING SHALL BE ACCORDING TO THE REQUIREMENTS OF CSA STANDARD S244 AND W47.2 AND WELDING WIRE SHALL CONFORM TO CSA STANDARD HA.6.4043 OR HA.6.5356.
  - NONCOMPLIANCE WITH THE ABOVE REQUIREMENTS WILL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE FOR ANY ADDITIONAL COSTS.

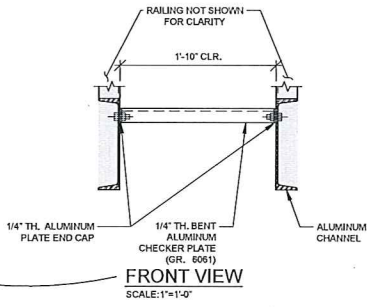
**FIELD REVIEWS**

FIELD REVIEWS AT THE PROFESSIONAL DISCRETION OF OMEGA & ASSOCIATES ENGINEERING LTD. & IS TO ASCERTAIN GENERAL COMPLIANCE WITH THE STRUCTURAL PLANS & SUPPORTING DOCUMENTS FOR THE INTEGRITY OF THE PRIMARY STRUCTURAL COMPONENTS OF THE BUILDING ONLY. FIELD REVIEW DOES NOT MAKE OMEGA & ASSOCIATES ENGINEERING LTD. GUARANTORS OF THE CONTRACTOR'S WORK. FIELD REVIEW IS NOT FOR THE BENEFIT OF THE CONTRACTOR(S) & MAY NOT FORM PART OF THE CONTRACTOR'S CONSTRUCTION QUALITY CONTROL, WHICH SHALL REMAIN THE RESPONSIBILITY OF THE CONTRACTOR(S). OMEGA & ASSOCIATES ENGINEERING LTD. SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR(S) OR FOR THEIR FAILURE TO FULFILL THE INTENT OF THE DESIGN DRAWINGS.

OMEGA & ASSOCIATES ENGINEERING LTD. IS TO BE NOTIFIED 24hrs IN ADVANCE OF ANY WORK REQUIRING A FIELD REVIEW.

THE FOLLOWING ITEMS SHALL BE REVIEWED:

- AT COMPLETION OF INSTALLATION OF STAIRS



**STAIR SIDE ELEVATION**  
 SCALE: 1"=1'-0"

THE SIGNATURE AND SEAL OF THE UNDERSIGNED ON THIS DRAWING CERTIFIES THAT THE DESIGN INFORMATION CONTAINED IN THESE DRAWINGS ACCURATELY REFLECTS THE ORIGINAL DESIGN AND THE MATERIAL DESIGN CHANGES MADE DURING CONSTRUCTION, THAT WERE BROUGHT TO THE UNDERSIGNED'S ATTENTION. THESE DRAWINGS ARE INTENDED TO INCORPORATE ADDENDA, CHANGE ORDERS AND OTHER MATERIAL DESIGN CHANGES, BUT NOT NECESSARILY ALL SITE INSTRUCTIONS.

THE UNDERSIGNED DOES NOT WARRANT OR GUARANTEE, NOR ACCEPT ANY RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE AS-CONSTRUCTED INFORMATION SUPPLIED BY OTHERS CONTAINED IN THESE DRAWINGS, BUT DOES CERTIFY THAT THE AS-CONSTRUCTED INFORMATION, IF ACCURATE AND COMPLETE, PROVIDES AN AS-CONSTRUCTED SYSTEM WHICH SUBSTANTIALLY COMPLES IN ALL MATERIAL RESPECTS WITH THE ORIGINAL DESIGN INTENT.

**RECORD DRAWING CERTIFICATION**

ISSUED FOR RECORD DRAWING

NO.	DATE	ISSUES/REVISIONS

ALL DRAWINGS ARE ONLY TO BE USED FOR THE PURPOSE INDICATED IN THE REVISION BLOCK

**PROFESSIONAL OF**  
**D. J. SEIDA**  
 # 46350  
 BRITISH COLUMBIA  
 FEB 22 2021

**OMEGA & ASSOCIATES**  
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804 10402 ROAD CHILLIWACK, BC V8K 1A6  
 604-756-6162

215-1825 534 AVE. SURREY, BC V3R 2C9  
 604-572-4100

**OQM** CERTIFIED

CLIENT:  
 ADAMS CONSTRUCTION

PROJECT NAME:  
 PRIMARY SEDIMENTATION TANK 2 / TREATMENT PLANT STAIRS  
 WHISTLER, BC

DRAWING TITLE:  
 ELEVATION & NOTES

DESIGN BY: DS  
 DRAWN BY: DKD  
 CHECKED BY: DWK

PROJECT No.: 20-307

DRAWING No.: **S100** SHEET 01 OF 01  
 ISSUE/REV. 0

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**Attachment F**

# **Concrete Inspection Report**

---

Project Number: MB46756  
Date: 2<sup>nd</sup> August 2024

**To:** Kerr Wood Leidal Associates Ltd.  
#200 – 4185 Still Creek Drive  
Burnaby, BC, V5C 6G9

**Attention:** Paul Markin, M.A.Sc., P.Eng., pmarkin@kwl.ca

**Project:** RMOW WWTP Primary Sedimentation Tanks #1 and #2 and EDC-1/2  
**RE:** Evaluation of Concrete

Dear Paul,

As per your request, Metro Testing & Engineering Ltd. (Metro) performed a limited condition evaluation of the concrete in several structures of the RMOW WWTP at 1135 Cheakamus Lake Road in Whistler, BC. Specifically in the context of this report, Metro evaluated the concrete in the following locations:

- Primary Sedimentation Tank 2 (PST-2), on 19<sup>th</sup> June 2024
- Effluent Discharge Channel, on 19<sup>th</sup> June 2024, visual observations from outside only, as access was not possible
- Primary Sedimentation Tank 1 (PST-1), on 26<sup>th</sup> June 2024

Metro's general scope of work was limited to evaluating the current condition of the structural concrete components as far as they were accessible. Our work was limited to non-destructive evaluation techniques, including visual observations, hammer sounding, chain dragging, phenolphthalein testing to determine depth of neutralisation, scanning for concrete cover over rebar, and resistivity testing to estimate the ability of the concrete to protect rebar from corrosion. The following report presents our methodology and findings.

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# 1 Summary

Kerr Wood Leidal (KWL) asked Metro Testing and Engineering Ltd. (Metro) to perform a limited concrete condition evaluation of several structures at the Resort Municipality of Whistler Waste Water Treatment Plant. Metro evaluated the condition of the concrete in Primary Sedimentation Tanks #1 and #2, as well as in the Effluent Discharge Channel as far as practical without accessing the inside of the channel. Our observations and non-destructive tests resulted in the following key interpretations and recommendations for PST-1 and -2.:

- The pre-stressed pre-cast roof slab panels are generally in good condition. Isolated delaminations, spalls and cracks need repair within 5 years
- Several pre-stressed pre-cast roof slab panels have been modified to cut out openings for access hatches. This has disabled the reinforcement. A structural review must be performed before this winter season. Repair may be necessary on short notice, depending on the Structural Engineer's recommendations
- The grout in the roof panel joints is deteriorated. Water may penetrate into the hollow cores of the precast segments and deteriorate reinforcing steel where cracks exist in the panel soffits. Repair the joints with a suitable material preferably within 2 years
- The walls and beams of the tanks are in generally acceptable condition. Local deficiencies, like cracks, gravel nests and eroded surface areas, may increase the local corrosion risk to rebar. More detailed evaluation, for instance by coring or deep chipping, should be performed at the next convenient opportunity, but within 5 years
- The floor slabs appear to be in acceptable condition. No immediate additional testing or repair is necessary
- The expansion joints in PST-2 are in various degrees of deterioration. At minimum, the most deteriorated portions should be repaired at the next suitable opportunity, preferably within one year, to minimise the risk of uncontrolled leakage. Consider repairing with Sikadur Combiflex tape and Sikaguard E.W.L coating, similar to PST-1. If repairing with Combiflex, consider repairing the entire length of all joints, as the connection of old and new Combiflex (in subsequent repairs) would be challenging
- We did not evaluate the concrete in and around the sump pits due to access restrictions, including standing water. Concrete surface conditions appeared to be visually similar to other concrete. Evaluate the components within the next 5 years
- Very approximately 100 m of cracks and gravel seams in the walls should be investigated more closely, or repaired prophylactically

The Effluent Discharge Channel EDC-1/2 could not be entered for observations and testing. Remote visual observations indicate that the concrete above the water line, and possibly of the roof slab soffit, is significantly more deteriorated than the concrete of the sedimentation tanks. Access to a closer evaluation should be provided, preferably within 2 years.



## 2 Introduction

Kerr Wood Leidal (KWL) asked Metro Testing and Engineering Ltd. (Metro) to perform a limited concrete condition evaluation of several structures at the Resort Municipality of Whistler Waste Water Treatment Plant, 1135 Cheakamus Lake Road. The scope of Metro's work, associated specifically with this report, was to non-destructively evaluate the condition of the concrete of the following structures:

- Primary Sediment Tank 2 (PST-2)
- Primary Sediment Tank 1 (PST-1)
- Effluent Discharge Channel EDC-1/2

The purpose of this assessment was to provide information that would guide the preparation of documents and specifications for life extension work of these structures scheduled for 2024 and beyond.

This report documents our visual observations and results of in-situ testing carried out in PST-2 and PST-1, on 19 and 26 June 2024, respectively.

Figures 1 and 2 following show the location and general lay-out of the facility.



**Figure 1** – Location of the Plant (Red Mark, Source: Apple Maps)



Figure 2 – Aerial Image of the plant (Source: Apple Maps)

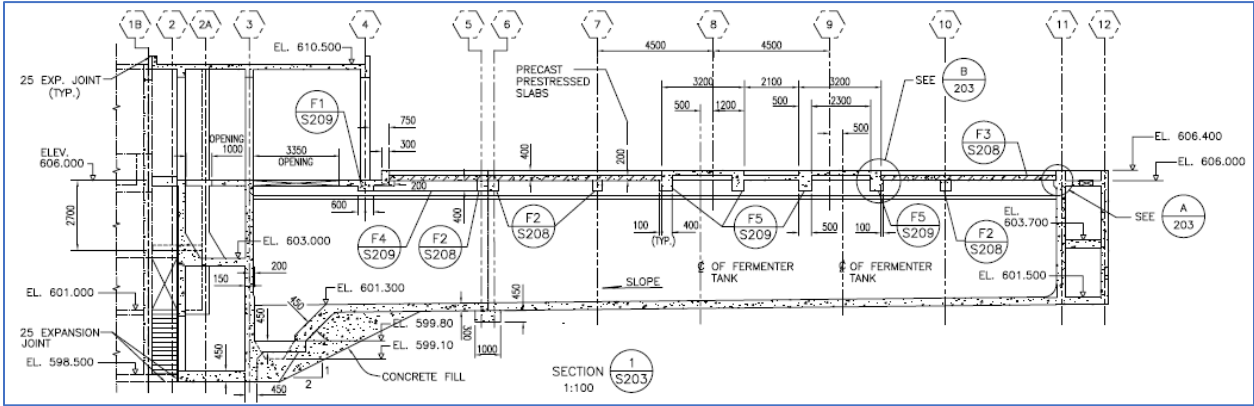
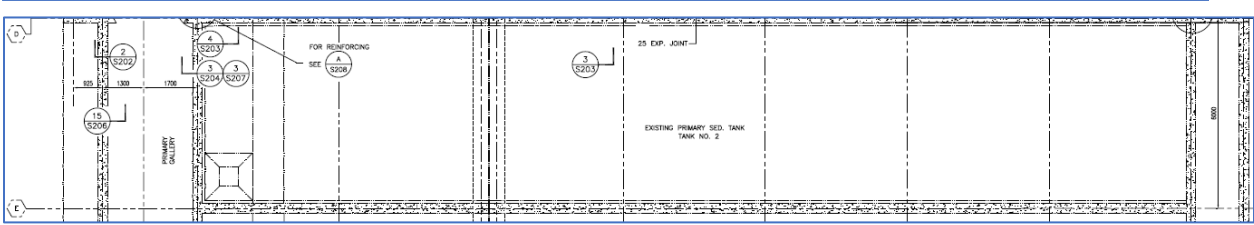


Figure 3 – Cross section through a Primary Sedimentation Tank (Source: Dayton & Knight Record Drawing 179.11.1 S203 dated January) 1998



**Figure 4 – Plan view of a Primary Sedimentation Tank (Source: Dayton & Knight Record Drawing 179.11.1 S201 dated January) 1998**

### 3 Background Information

According to The Municipality of Whistler's web site (<https://www.whistler.ca/services/water-and-wastewater/wastewater-treatment-plant/>), the treatment plant has a tertiary treatment system and an odour control system. In a first stage, inorganic solids are removed from the waste water. In a second stage, other remaining compounds are digested by bacteria and removed. The effluent is then disinfected with UV light and discharged into the Cheakamus River.

A structural drawing associated with the original structure was dated 1986. Additional structural drawings, related to an expansion project, were dated 1998. This indicates that major components of the plant were built approximately 35 years ago, with additional structures built approximately 25 years ago.

An earlier evaluation of PST-1 had been performed in 2016. The joint in PST-1 had been repaired with Sikadur Combiflex tape in 2018. Further, the Combiflex tape on the floor had been coated with Sikaguard E.W.L. during the 2018 repair.

## 4 Scope of Work

Metro's scope of work associated with this specific report, including verbal instructions on site, was limited to performing a non-destructive evaluation of the following components of the plant:

- Primary Sedimentation Tank 2, reinforced concrete only
- Primary Sedimentation Tank 1, reinforced concrete only
- Effluent Discharge Channel 1/2, if and where accessible

## 5 Guidelines

The following guidelines and standards were used and applied, in part or as needed, by Metro:

- EGBC's Professional Practice Guidelines: *Expert Witness*
- EGBC's Professional Practice Guidelines: *Intellectual Property*
- EGBC's Quality Management Guidelines

## 6 Evaluation Methodology

### 6.1 Visual Observations

Visual evaluations are usually performed from distance and close-up, with unaided eyes, or simple magnifying glasses. The purpose of the field observations was to estimate the extent of visible damage to the tank, such as surface deterioration, the formation of cracks or presence of honeycombing and gravel nests. For this project, Metro performed visual observations of the inside walls, floor and roof slabs.

### 6.2 Determination of Concrete Cover

Metro used a Proceq Profometer 5 (Serial No. 55.5706) to determine the approximate concrete cover over rebar. The device uses electromagnetic pulses to induce eddy currents in nearby metals, and interprets the returned signal to deduce the spacing between probe and rebar.

### 6.3 Hammer Sounding and Chain Dragging

Metro used hammer sounding (with a masonry hammer) and chain dragging, to acoustically detect delaminations in solid concrete. Drastic changes in the pitch and attenuation of the sound caused by hammer impact or chain drag indicates the presence of thin or delaminated concrete.

### 6.4 Determination of Depth of Neutralisation

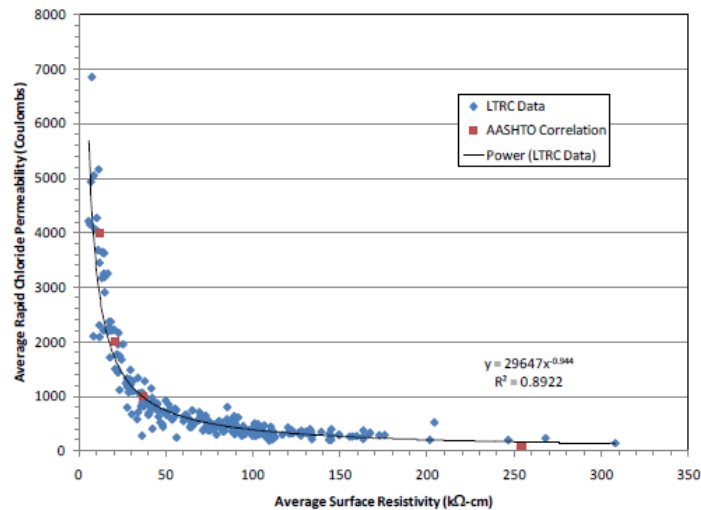
Portland cement concrete is highly alkaline. The alkalinity protects embedded reinforcing steel from some forms of corrosion. Acidic materials, like atmospheric carbon dioxide, or sulphates, may neutralise the alkalinity, thereby increasing the corrosion risk for the embedded steel. In order to determine the depth, to which the concrete may have neutralised, Metro chipped the concrete surface gradually with a masonry hammer, while spraying a solution of phenolphthalein in isopropanol onto the fractured surface. The solution causes a distinct purple colour when in contact with material with a pH > 9. Concrete not undergoing such a colour change is neutralised. Metro measured the depth at which the colour reaction is first observed, and equates this depth to the depth of neutralisation.

## 6.5 Determination of Resistivity

To augment our evaluation of the condition of the concrete, we performed Wenner-probe tests on un-coated concrete surfaces. Wenner probe testing determines the resistivity of the concrete. The results can be used to estimate the uniformity of the concrete. Further, high resistivities are associated with the concrete having a high potential to protect embedded rebar from corrosion, while concrete with low resistivity is associated with a lower capability to provide protection from corrosion. We used a Proceq Wenner Probe (S/N RP02-004-0052) for our work. The following table and chart provide guidance for interpreting the Wenner-Probe test results:

**Table 1 – Interpretation of Wenner Probe test results**

<b>Concrete Resistivity</b>	<b>Likelihood of Corrosion of Embedded Rebar</b>
>100 kΩ.cm	Negligible risk of corrosion
50 to 100 kΩ.cm	Low risk of corrosion
10 to 50 kΩ.cm	Moderate risk of corrosion
10 kΩ.cm	Very high risk of corrosion



**Figure 5 - Published relationship between Resistivity and RCP (ASTM C1202) test values.**



## 7 Test Results


### 7.1 Sedimentation Tank 1

#### 7.1.1 General Conditions


Roland Heere of Metro visited the site on 26 June 2024. The weather was dry. The air temperature was 15°C in the morning, and rising during the day. The surface temperature of the concrete inside the tank was approximately 16 to 17°C in the morning. The tank had been emptied, with the exception of stagnant water in the sump at the West end of the tank. Walls and floor of the tank appeared to have been pressure washed from the ground level, with the concrete sufficiently cleaned to allow visual observations. The plant had provided portable stairs for access. Ventilation and air quality monitoring was in place. Lighting by means of portable lamps was adequate.

#### 7.1.2 Visual Observations



**Table 2 - Top of Roof Slab**





<i>Item</i>	<i>Description</i>	<i>Reference photo</i>
Waterproofing	None in place. Concrete pre-cast panels and joints exposed.	



<p>System</p>	<p>Pre-stressed pre-cast hollow-core panels, supported by concrete beams. Joints grouted.</p> <p>Images to the right: Top - excerpt from 1996 Drawing, secondary beams not shown.</p> <p>Bottom - excerpt from Metro's 19 June 2024 field notes, section of a portion of precast panel.</p>	
<p>Condition of concrete</p>	<p>Top surface of panels slightly eroded.</p>	
	<p>Grout in joints cracked, locally disintegrating.</p>	

	<p>Access hatch opening had been cut into panel, cutting through concrete and pre-stressing wire. Pre-stressing wire in cut face with surface corrosion. Cut extended into adjacent longitudinal beam.</p>	
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**Table 3 - Slab Soffit and Beams**




<i>Item</i>	<i>Description</i>	<i>Reference photo</i>
System	See "Top of Roof Slab"	
Condition of concrete	Longitudinal crack in panel soffit East of sump.	

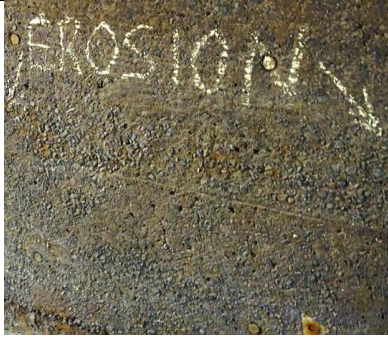

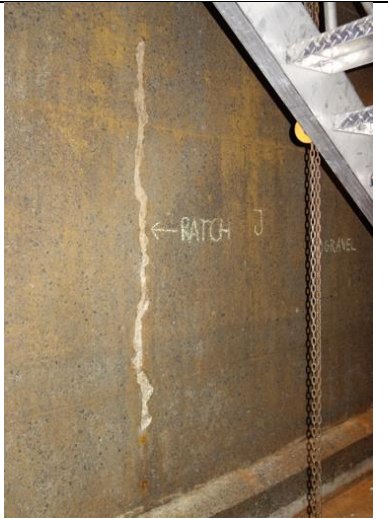

<p>N-S beam east of pit: spalls, stirrup exposed. Steel has only 5 mm concrete cover in damaged location.</p>	
<p>Surface blemishes.</p>	
<p>4<sup>th</sup> Beam East of pit: hairline crack and efflorescence.</p>	
<p>Cracks in panel around cut-out.</p>	





	Crack in precast panel; efflorescence.	
	Steel hangers severely corroded. (This is not a concrete issue, but related to installations.)	

**Table 4 - Walls**

<b>Item</b>	<b>Description</b>	<b>Reference photo</b>
System	Cast-in-place concrete. One expansion joint. Typical wall photo: right.	

<p>Condition of concrete</p>	<p>East wall – cracks under openings. (Note: cracks highlighted by chalk lines on the wall)</p>	
	<p>Walls in general: Isolated tight cracks. Non-uniformities at formwork joints.</p>	
	<p>Concrete of East wall (at outflow) above water line with minor paste loss at surface. Aggregates exposed.</p>	

<p>Concrete in walls below and above water level – Various locations with minor paste loss on surface, exposing aggregate.</p>	
<p>Walls in general – isolated shallow surface voids, typically &lt;10 mm deep</p>	
<p>North Wall - previous repair in satisfactory state.</p>	
<p>North wall – shallow delamination, approximately 1 x 0.1 m.</p>	

<p>North wall – minor leak through tight crack.</p>	
<p>Walls above plinth – gravel nests, recessed concrete.</p>	 
<p>South wall plinth, near sump – plinth apparently chipped back and eroded, likely to create clearance for raking mechanism.</p>	






South wall – joint taped with Sikadur Combiflex, but not coated with (black) Sikaguard E.W.L. above bottom 0.3 m. Joint in acceptable condition.







North wall – Joint taped with Sikadur  
Combiflex, but not coated with (black)  
Sikaguard E.W.L. except for bottom ~0.3 m.  
Joint in acceptable condition.



	<p>North Wall - joint taping, detail.</p>	
	<p>Top of longitudinal walls in generally adequate condition with minor cracking.</p>	
	<p>Secondary beams (N-S) in satisfactory condition, with isolated tight cracks. Efflorescence likely from leaks in roof.</p>	




**Table 5 - Floor**

<b>Item</b>	<b>Description</b>	<b>Reference photo</b>
System	Cast-in-place concrete. One expansion joint. Coated. General photo looking towards sump: right	
Condition of concrete	Previously coated, but coating partially lost. Remaining coating partially delaminated.	
	Isolated, shallow impact craters.	
	Sikadur Combiflex tape with Sikaguard E.W.L. Coating over joint in satisfactory condition. Appears to bind adequately to concrete. It is understood that Combiflex tape and E.W.L. coating were installed in August 2018.	

### 7.1.3 Hammer Sounding and Chain Drag

Hammer Sounding and chain dragging identified only minor delaminations, see table below.

**Table 6 - Delaminations**

<b>Location</b>	<b>Deficiency</b>	<b>Reference photo</b>
Top of Roof Slab	One delamination, approximately 0.25 x 1.3 m (see photo right). Also, small crater near West end, with 0.2 m diameter.	
Soffit of roof slab, and beams	Spot checks on less than 10% of the surface. No delamination detected. However, soffit of precast panel near hatch opening sounded unusual, possibly due to cracking.	
Walls	North wall, near bottom, minor delamination, approximately 0.1 x 1 m. Walls around sump not accessible and not tested.	
Floor	No delamination detected by chain drag. Pit was water filled and could not be tested.	

### 7.1.4 Concrete Cover over Rebar

Concrete cover determination with a Proceq Profometer 5 indicated that typical concrete covers were  $\geq 40$  mm in most locations tested. Lower covers appeared to be local anomalies and not typical for the general condition. Typical test locations were approximately 1 m<sup>2</sup>, although test locations on beams were smaller.

**Table 7 – Concrete Cover**

<b>Location</b>	<b>Element</b>	<b>Concrete cover</b>
Precast panels	At access hatch cut into panel	Cover of prestressing strand to soffit was directly observed. It was approximately 35 mm.
Beams	4 <sup>th</sup> N-S beam from sump	≥40 mm
	4 <sup>th</sup> N-S beam from sump	Main rebar: ≥50 mm One stirrup: 19 mm
	1 <sup>st</sup> N-S beam from sump	One location only, at corroding stirrup: 5 mm
Walls	East wall	Verticals: 39 – 48 mm Horizontals: 57 – 68 mm
	North Wall	Verticals: 45 - 61 mm Horizontals: 62 - 79 mm
	South Wall	Verticals: 46 - 53 mm Horizontals: 61 - 71 mm
	West Wall	Not accessible, not tested
Floor		North – South: 58 – 62 mm East – West: ≥75 mm

### 7.1.5 Depth of Neutralisation

Depth of neutralisation was determined by chipping into the concrete surface and spraying the chipped location with phenolphthalein solution. A colour reaction indicates alkaline concrete, while the absence of a colour reaction indicates that the concrete is neutralised. The following depths of neutralisations were determined:

- East wall, lightly eroded concrete surface: 7 mm
- South wall, regular area: 5 mm
- Floor, coated area: 1 mm
- Floor uncoated area near intact coating: 1 mm
- E-W beam above South wall: 2 mm
- West wall: Not accessible, not tested

### **7.1.6 Resistivity**

We measured resistivity with a Resipod Wenner probe in arbitrarily selected locations, after pre-wetting the test locations with tap water. Resistivities of the concrete in the walls ranged from 200 to 500 k $\Omega$ cm. Resistivity of the floor in one uncoated test location was 300 k $\Omega$ cm.


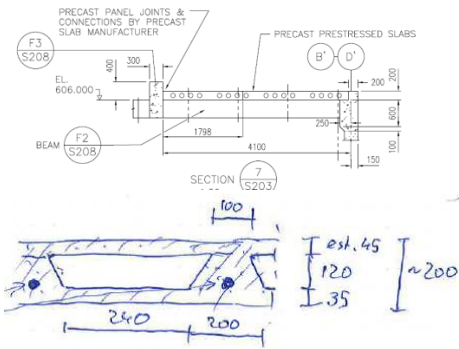
## 7.2 Sedimentation Tank 2

### 7.2.1 General Conditions




Roland Heere of Metro visited the site on 19 June 2024. The weather was dry. The air temperature was 10°C in the morning, and rising during the day. The surface temperature of the concrete inside the tank was approximately 13°C in the morning. The tank had been emptied. The sump at the West end of the tank was not readily accessible. Walls and floor of the tank appeared to have been pressure washed from the ground level, with the concrete sufficiently cleaned to allow visual observations. The plant had provided portable stairs for access. Ventilation and air quality monitoring was in place. Lighting by means of portable lamps was adequate.


### 7.2.2 Visual Observations

**Table 8 - Top of roof slab**


<i>Item</i>	<i>Description</i>	<i>Reference photo</i>
Waterproofing	None in place. Concrete pre-cast panels and joints exposed.	
System	<p>Pre-stressed pre-cast hollow-core panels, supported by concrete beams. Joints grouted.</p> <p>Images to the right: Top - excerpt from 1996 Drawing, secondary beams not shown.</p> <p>Bottom - excerpt from Metro's 19 June 2024 field notes, section of a portion of precast panel.</p>	








<p>Condition of concrete</p>	<p>Top surface of panels slightly eroded. Moss. Minor cracking.</p>	
	<p>Grout in joints cracked, locally disintegrating.</p>	
	<p>Access hatch opening had been cut into panel, cutting through concrete and pre-stressing wire. Pre-stressing wire in cut face with surface corrosion. Cut extended into adjacent longitudinal beam. Broken concrete around opening.</p>	

		
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**Table 9 - Slab Soffit and Beams**





<i>Item</i>	<i>Description</i>	<i>Reference photo</i>
System	See "Top of Roof Slab".	
Condition of concrete	Longitudinal crack in panel soffit. Top right: overview. Bottom right: detail.	

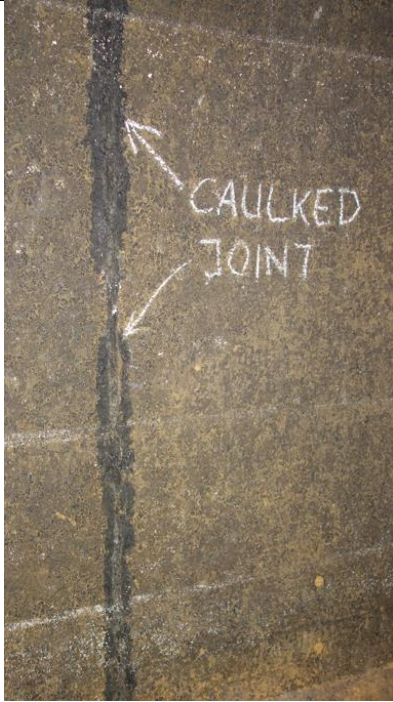
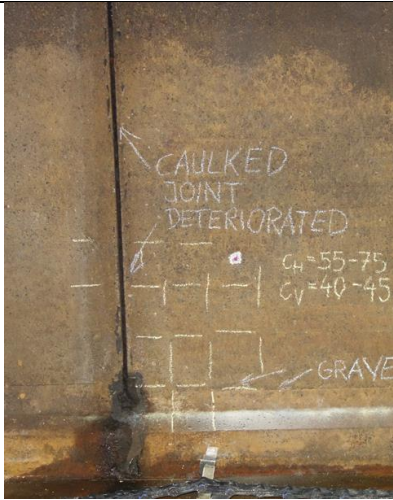
		
	<p>Slab soffit surface varies from smooth and firm (top), to slightly eroded (bottom)</p>	 
	<p>N-S beam East of sump: efflorescence, likely due to rain water leakage from top. Secondary beams typically with localised shallow surface deterioration, but generally firm.</p>	

	<p>Primary (longitudinal) beams on top of walls appear to be in satisfactory condition, with only minor cracks and blemishes.</p>	
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**Table 10 - Walls**



<i><b>Item</b></i>	<i><b>Description</b></i>	<i><b>Reference photo</b></i>
System	<p>Cast-in-place concrete. One expansion joint.            Typical wall photo: right.</p>	

<p>Condition of concrete</p>	<p>Walls firm above and below water line. Slight surface erosion below water line.</p>	
	<p>Walls in sump with visible but shallow surface erosion.</p>	
	<p>Local gravel seams.</p>	
	<p>East wall - crack 2 mm wide on surface, but only estimated &lt;1 mm wide at 10 mm depth.</p>	

<p>Joint</p>	<p>South wall joint – caulked, surface deterioration visible.</p>	
	<p>North wall – joint filler deteriorated, recessed. Top – overview. Bottom – detail.</p>	



**Table 11 - Floor**

<i>Item</i>	<i>Description</i>	<i>Reference photo</i>
System	Cast-in-place concrete. One expansion joint. Coated. General photo looking towards sump: right	
Condition of concrete	Previously coated, but coating partially lost. Remaining coating partially delaminated.	

	Joint filler deteriorating.	
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### 7.2.3 Hammer Sounding and Chain Drag

Hammer Sounding and chain dragging identified only minor delaminations. See table below.

**Table 12 - Delaminations**

<b>Location</b>	<b>Deficiency</b>
Top of Roof Slab	Grout infill locally delaminated. Panels firm.
Soffit of roof slab, and beams	Hollow sound near cracks, likely caused by formed voids in centre of panels. Less than 10% of soffit and beams tested.
Walls	No significant delaminations detected. Walls around sump not accessible and not tested.
Floor	No significant delaminations detected by chain drag. Sump not accessible and not tested.



## 7.2.4 Concrete Cover over Rebar

Concrete cover determination with a Proceq Profometer 5 indicated that typical concrete covers were  $\geq 40$  mm in most locations tested. Lower covers appeared to be local anomalies and not typical for the general condition. Typical test locations were approximately 1 m<sup>2</sup>, although test locations on beams were smaller.

**Table 13 – Concrete Cover**

<i>Location</i>	<i>Element</i>	<i>Concrete cover</i>
Precast panels	At access hatch cut into panel	Cover of prestressing strand to soffit was directly observed. It was approximately 35 mm.
Walls	East wall	Verticals: 55 - 65 mm Horizontal: 75 - 80 mm
	North Wall, 2 locations	Verticals: 62 – 77 mm 60 – 80 mm Horizontal: 37 - 44 mm 40 - 45 mm
	South Wall, 2 locations	Verticals: 48 - 61 mm 65 – >80 mm Horizontal: 65 - >80 mm 60 - >80 mm
	West wall not accessible, not tested	

## 7.2.5 Depth of Neutralisation

Depth of neutralisation was determined by chipping into the concrete surface and spraying the chipped location with phenolphthalein solution. A colour reaction indicates alkaline concrete, while the absence of a colour reaction indicates that the concrete is neutralised. The following depths of neutralisations were determined:

- East wall: 5 - 7 mm
- South wall: 5 – 10 mm, but > 20 mm in gravel nests,  
> 15 mm in pour joint with gravel nest
- North wall: 5 – 7 mm in sound concrete
- West wall: Not accessible and not tested



### **7.2.6 Resistivity**


We measured resistivity with a Resipod Wenner probe in arbitrarily selected locations, after pre-wetting the test locations with tap water. Resistivities of the concrete in the walls ranged from 120 to 350 kΩcm.

### 7.3 Effluent Discharge Channel

The Effluent Discharge Channel was not accessible. Metro removed a section of a floor grate atop the channel, and took several photographs from the inside. The table below shows key observations.

**Table 14 – Effluent Channel, Limited Observations from Top**

<b>Location</b>	<b>Observation</b>	<b>Photograph</b>
Walls below water line.	Surface dark	
Walls at and up to approximately 0.2 m above water line	Deep erosion, estimated to 20 mm depth. Apparently more severe on wall bordering to Sediment Tanks.	

Soffit	Likely shallow surface erosion.	 A close-up photograph of a concrete soffit. The surface is light-colored and shows signs of weathering and erosion, with some darker, recessed areas. To the right, a dark metal structure with a slatted pattern is visible, possibly part of a grate or walkway.
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Based on Metro's visual observations and experience from testing concrete at other locations of the plant, we think that the concrete in the EDC-1/2 at and above the water line, is significantly more deteriorated than inside the Primary Sediment Tanks. We recommend that access be provided at least for the following:

- Visual evaluation after surface pressure washing
- Determination of remaining concrete cover over rebar
- Determination of depth of neutralisation

## 8 Discussion and Recommendations

Key site observations indicate the following:

With local exceptions, the **pre-cast roof panels** are in generally satisfactory condition. Isolated leaking cracks, delaminations and spalls are likely reducing the durability locally, particularly in locations where rebar is not protected from water and air any longer. Evaluate such local deficiencies more closely at the next convenient opportunity, but within 5 years. Evaluation should include extracting and evaluating cores. Repair will be necessary. The grout in the joints between some of the panel has exceeded its service life. It is cracked, delaminated and spalled. It does not provide water proofing, and may never have been able to fully tolerate actual temperature and moisture driven movements. Water may penetrate into the hollow cores of the precast panels and corrode reinforcement where cracks are present. Repair the joints with a suitable material, within the next two years. Where the installation of access hatches has cut pre-stressing wires, the structural capacity of the panels is likely reduced dramatically. **The panels with access hatches require structural evaluation and will likely require strengthening. Perform the structural evaluation before winter 2024/25.**

The **beams** are generally in satisfactory condition, apart from efflorescence (mainly due to water leakage from the top), minor cracking, shallow surface blemishes, and saw cuts at the access hatch. Beams supporting the roof panels which were modified by saw-cutting access openings, are damaged by surficial cuts. This likely diminished the concrete cover over rebar locally, potentially reducing the expected service life. The cuts also have somewhat reduced the beam cross-sections, although the effect on the capacity of the beam may be marginal unless rebar has been damaged. The defects need to be investigated in more detail at the next convenient opportunity and within 2 years, and repaired as necessary.

The **walls** are in satisfactory condition. Cracks are not considered to dramatically affect the global integrity and durability of the structure. However, where moisture and gas can access rebar spanning open cracks, local rebar deterioration may occur. As the depth of neutralisation is typically less than one third of the depth of concrete cover over the rebar, the risk of rebar corrosion due to loss of passivation in uncracked and firm concrete remains low for the foreseeable future. However, where gravel nests (frequently not wider than 10 cm) or cracks exist, the depth of neutralisation may reach the rebar in the foreseeable future if it has not already done so. Localised rebar corrosion may be possible in these locations currently and in the foreseeable future. Very approximately 100 metres of cracks and gravel seams could potentially be of concern. At the next suitable opportunity and within the next 5 years, explore the depth of neutralisation in such locations, using core sampling or deep chipping. Be prepared to repair the test locations and repair or coat affected concrete areas immediately after sample extraction. Alternatively, repair these deficiencies prophylactically.

The **floor** is in satisfactory condition. The surface coating has been lost in many locations, but no major concrete deficiencies have been found. Due to the absence of significant cracking and

due to the shallow depth of neutralisation, no urgent maintenance measures are necessary in the areas observed. Note that Metro was not able to evaluate the concrete in the sumps. At the next convenient opportunity and within 5 years, arrange for a concrete evaluation in the sumps.

The Combiflex tape installed over the **expansion joint** of PST-1 appears to adhere adequately and does not show visible signs of aging and significant distress. The deteriorated joint in PST-2 should be repaired at the next suitable opportunity, preferably within one year, to minimise the risk of uncontrolled leakage. Consider repairing it with Combiflex tape and E.W.L coating, similar to PST-1.

Due to access constraints, we were not able to systematically observe the condition of the **effluent discharge channel**. cursory observations indicate that the walls above the water line and the roof slab soffit have suffered from significant surface erosion, likely due to H<sub>2</sub>S related microbial attack. The depth of erosion may be approximately 20 mm in heavily affected locations. We were not able to determine concrete cover over rebar, but with approximately 20 mm erosion, and arbitrarily assuming a hypothetical depth of neutralisation of 10 mm, the embedded rebar may soon become susceptible to corrosion. We recommend that you test concrete cover and depth of neutralisation at the next suitable opportunity and within 2 years. It is likely that eroded concrete surfaces need to be cleaned, and repaired or at least be coated.

The table below summarises the suggested timeline for additional investigations and repairs:

**Table 15 – Proposed Schedule for Further Evaluation and Repair**

<b>Recommended due date</b>	<b>Element</b>	<b>Task</b>
Fall 2024	Roof panels, and beams with saw cuts at access hatches	Structural evaluation of precast elements which were modified with access hatches. The structural evaluation may require immediate restrictions on traffic and snow loads, and may require repair of the affected panels.
2025	Joint in PST-2	Repair to reduce risk of unintended leakage
2026	Roof joints	Remove deteriorating grout and replace with suitable repair material
	EDC	Provide access and evaluate
2029	Roof panels	Repair delaminations, spalls, cracks
	Walls	Evaluate corrosion risk of rebar in gravel nests. Repair where necessary
	Sumps	Provide access and evaluate concrete of walls and floor

## 9 Limitations and Closure

This interim draft report has been prepared with a customary standard of care and skill, for the exclusive use KWL and for the specific purpose described in Sections 2 and 4 above. Note that this document is subject to major additions and revisions. Any use of this document by third parties, or their reliance on information reported in our report are at the sole responsibility of such third parties. Metro Testing & Engineering Ltd. will not accept any responsibility for any damages suffered by any third party as a result of decisions, or actions, based on this report.

Unless where we specifically expressed it, we have not independently verified information quoted from drawings, plans, literature, or other reports. This report reflects Metro's best judgment based on the information available. If conditions other than those detected and reported are noted subsequently, please inform Metro immediately so that we can review and revise this report as necessary.

We trust this meets your present requirement. Please call 604-436-9111 if you have any questions.

Yours truly,  
**Metro Testing & Engineering Ltd.**

**Reviewed by:**

C.S.



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**Roland Heere, P.Eng.**  
*Sr. Materials Engineer*

**Reviewer:** Curtis Syrnyk