

Resort Municipality of Whistler: Wastewater Treatment Plant Primary Sedimentation Tank Assessment Report

Project No. 210505

January 26th, 2022

Prepared for:



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Executive Summary

Enginuity Consulting Ltd. (Enginuity) has performed visual inspections and condition assessment of the four Primary Sedimentation/Equalization Tanks (PST1, PST2, PST3, PST4) at the Municipality of Whistler Wastewater Treatment Plant for Resort (RMOW).

The qualitative assessments have been based on visual review from within the tanks, observing all the critical areas to determine conditions, create inventory lists and suggest maintenance & inspection schedules to improve the reliability and operation of the tanks. The tables below summarize the findings. For in-depth details, please reference Section 2: Mechanical Inspection Results and Section 3: Structural Inspection Results.

It should be noted that during the course of this inspection process, PST1 and PST2 had some substantial component failures, which were replaced after the initial visual inspection, however before the completion of this report. These items have been described as “New” in this report.

The table below captures a summary of all findings for the four tanks:

Priority	Definitions	Total Findings	Percentage
1S	Significant safety issue	0	0%
P1E	Engineering and further investigation required	24	17%
P1R	Replacement or repair, no engineering required	2	1%
P2	Could potentially lead to P1 in 1-2 years	99	71%
P3	Could potentially lead to P2 in 1-2 years	16	11%
	Total	139	100%

PST1 had a total of 26 New component that have been identified in the body of this report, however, not included in the table above.

1. Introduction

1.1. Purpose

Inspections of existing facilities will typically involve either qualitative or quantitative approaches. This could include various levels of assessment with the application of different tools and methods. Visual inspections of the Primary Sedimentation/Equalization Tanks fall within Level 0 of the qualitative assessment, defined as “*experience-based subjective assessment of deterioration effects and other damage after visual inspection*” and fall within the following criteria:

- Perform visual field inspection of the identified facilities structures as per Figure 1.
- Report conditions related to visible structural and mechanical reliability and serviceability.
- Provide recommendations for maintenance planning, further inspections, and suggestions for design of reinforcements.

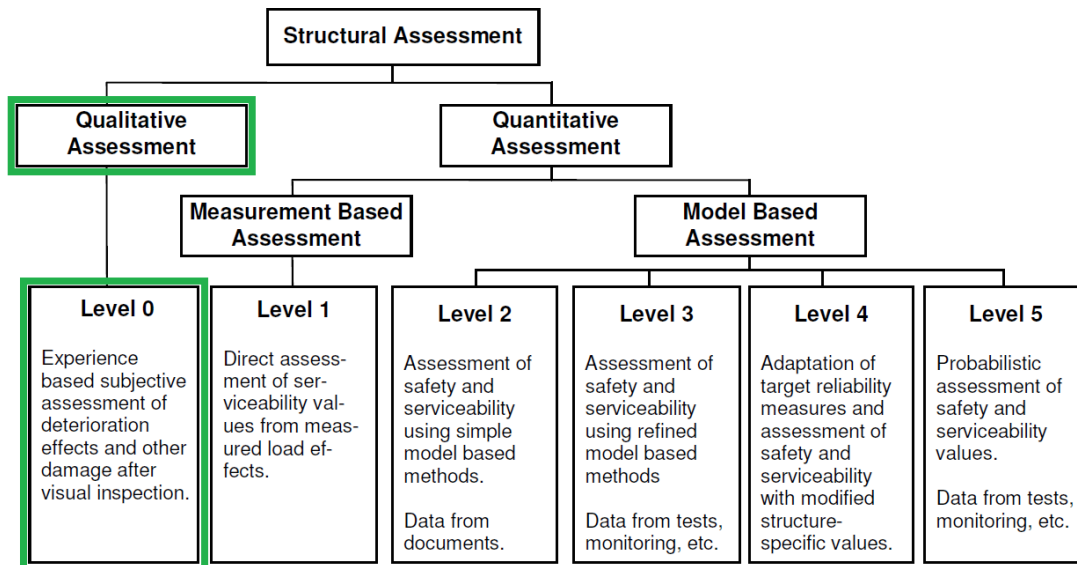


Figure 1. Context of the Structural Assessment Levels (Courtesy of SAMCO, 2006)

Inspection of the RMOW Wastewater Treatment Plant was aimed at identifying structural and mechanical conditions which may potentially affect reliability of the tanks and internal components, with implications on safety and facility operations. Since reduction of serviceability may lead to a limitation of use, the following conditions have been evaluated and reported during the assessment:

Mechanical

- Defective and damaged equipment and or components
- Corrosion
- Misalignment
- General wear and tear

The following have not been evaluated:

- Performance analysis
- Design suitability
- Destructive testing on equipment
- Bearings conditions

- Equipment internal defects and damages
- Operational observations

Structural

- Spalls (Loss of Concrete) with rusting exposed rebar.
- Rust stain, at visible crack and joints.
- Existing concrete patches or repairs.

The following have not been evaluated:

- Attainment of the maximum resistive capacity.
- Transformation of the structure or part of it into a mechanism.
- Stability of the structure(s) or part of it.
- Sudden change of the assumed structural system (e.g. snap through).

An important goal of this assessment is assisting the Management and Operations teams of the Wastewater Treatment Plant to minimize the operational costs by optimizing inspection, maintenance, and repairs; thus, providing information about the Plant's condition for prioritization of maintenance and repairs. This data is projected to serve management in the planning and decision-making process for expenditures on reliability improvement, and maintenance.

1.2. Facility Description

The Wastewater Treatment Plant of Resort Municipality of Whistler is located at 1135 Cheakamus Lake Rd, Whistler, BC. The four (4) Primary Sedimentation Tanks are housed within the Primary building. Each 31.5m by 6.0m with a depth of 3.2m. During the winter seasons PST1 and PST2 are in operation while PST 3 and PST4 are used for equalization. In the summer seasons the plant generally shuts down either PST1 or PST2 while using PST3 and PST4 as equalization tanks. This facility handles all the wastewater from the town of Whistler.



Figure 1: Location of RMOw Waste Water Treatment Plant (Courtesy of Google Maps)

The Primary Sedimentation Tanks each consists of a Longitudinal Collector and a Cross Collector. The Longitudinal and Cross Collectors are driven by motors located outside of the tanks. These Collectors carry 'Flights' which scrape the bottom of the tanks to remove the sludge from the tanks. If in operation, the system is rotating continuously.



Figure 2: Inspection in PST1

The tank structure itself is constructed out of concrete. There are three (3) influent gate valves and three (3) effluent gate valves. The sludge is pumped out of the tanks from the bottom of the tanks (under the Cross Collectors).



Figure 3: Concrete Tank, PST1

2. Mechanical Inspection Results Summary

The mechanical inspection consists of visual review of equipment within the (Primary Sedimentation) Tanks. It should be note, early in the inspection process, PST1 had major mechanical failure. The (failed) equipment was examined, and the findings can be found in Appendix 1. The equipment has since been replaced with new parts in November 2021 and is in good working condition, these items have been identified as “new” in the summery tables below. Later in the inspection process, PST2 also had major mechanical failure, however the replacement process has not yet started as of the date of this report. PST3 and PST4 are in working condition, other than items summarized in the tables below and details in Appendix 1.

2.1. Primary Sedimentation Tank 1 (PST1)

Note: the inspection was conducted on the failed existing parts. All the equipment has since been replaced.

SYSTEM	DESCRIPTION	ITEM	PRIORITY	MAINTENANCE / INSPECTION SCHEDULE	EST. COST
LONGITUDINAL COLLECTOR	Drive motor	M01-1L	P3	Weekly, sound, performance, data log review	n/a
	Drive gearbox	M01-1L	P3	Weekly, sound, performance, data log review	n/a
	Collector chain	M02-1L	new	Monthly, alignment, cleanliness, performance	n/a
	Drive chain	M03-1L	new	Monthly, alignment, cleanliness, performance	n/a
	Wear shoes	M04-1L	new	Seasonal	n/a
	Filler blocks	M05-1L	new	Seasonal	n/a
	C-channel fiberglass flights	M06-1L	new	Seasonal	n/a
	Drive sprockets	M07-1L	new	Monthly, alignment, cleanliness, performance	n/a
	Dished offset sprocket	M08-1L	new	Monthly, alignment, cleanliness, performance	n/a
	Idler sprocket	M09-1L	new	Monthly, alignment, cleanliness, performance	n/a
	Shear pin sprocket	M10-1L	new	Monthly, alignment, cleanliness, performance	n/a
	Take up assembly	M11-1L	new	Monthly, alignment, cleanliness, performance	n/a
	Wall bearings	M12-1L	new	Annually	n/a
	Collector wear strips	M13-1L	new	Seasonal	n/a
	Shafts, pins and set collars	M14-1L	new	Seasonal	n/a
Skimmer	M15-1L	P1E	Monthly	<\$50K	
CROSS COLLECTOR	Drive motor	M01-1C	P3	Weekly, sound, performance, data log review	n/a
	Drive gearbox	M01-1C	P3	Weekly, sound, performance, data log review	n/a

LONGITUDINAL COLLECTOR	Collector chain	M02-1C	new	Monthly, alignment, cleanliness, performance	n/a
	Drive chain	M03-1C	new	Monthly, alignment, cleanliness, performance	n/a
	Wear shoes	M04-1C	new	Seasonal	n/a
	Filler blocks	M05-1C	new	Seasonal	n/a
	C-channel fiberglass flights	M06-1C	new	Seasonal	n/a
	Drive sprockets	M07-1C	new	Monthly, alignment, cleanliness, performance	n/a
	Dished offset sprocket	M08-1C	new	Monthly, alignment, cleanliness, performance	n/a
	Idler sprocket	M09-1C	new	Monthly, alignment, cleanliness, performance	n/a
	Shear pin sprocket	M10-1C	new	Monthly, alignment, cleanliness, performance	n/a
	Take up assembly	M11-1C	new	Monthly, alignment, cleanliness, performance	n/a
	Wall bearings	M12-1C	new	Annually	n/a
	Collector wear strips	M13-1C	new	Seasonal	n/a
	Shafts, pins and set collars	M14-1C	new	Seasonal	n/a

2.2. Primary Sedimentation Tank 2 (PST2)

SYSTEM	DESCRIPTION	ITEM	PRIORITY	MAINTENANCE / INSPECTION SCHEDULE	EST. COST
LONGITUDINAL COLLECTOR	Drive motor	M01-2L	P3	Weekly, sound, performance, data log review	\$50K+
	Drive gearbox	M01-2L	P3	Weekly, sound, performance, data log review	
	Collector chain	M02-2L	P2	Monthly, alignment, cleanliness, performance	
	Drive chain	M03-2L	P2	Monthly, alignment, cleanliness, performance	
	Wear shoes	M04-2L	P2	Seasonal	
	Filler blocks	M05-2L	P2	Seasonal	
	C-channel fiberglass flights	M06-2L	P1E	Seasonal	
	Drive sprockets	M07-2L	P2	Monthly, alignment, cleanliness, performance	
	Dished offset sprocket	M08-2L	P2	Monthly, alignment, cleanliness, performance	
	Idler sprocket	M09-2L	P1E	Monthly, alignment, cleanliness, performance	

	Shear pin sprocket	M10-2L	P2	Monthly, alignment, cleanliness, performance
	Take up assembly	M11-2L	P2	Monthly, alignment, cleanliness, performance
	Wall bearings	M12-2L	P1E	Annually
	Collector wear strips	M13-2L	P2	Seasonal
	Shafts, pins and set collars	M14-2L	P2	Seasonal
	Skimmer	M15-1L	P1E	Monthly
CROSS COLLECTOR	Drive motor	M01-2C	P3	Weekly, sound, performance, data log review
	Drive gearbox	M01-2C	P3	Weekly, sound, performance, data log review
	Collector chain	M02-2C	P2	Monthly, alignment, cleanliness, performance
	Drive chain	M03-2C	P2	Monthly, alignment, cleanliness, performance
	Wear shoes	M04-2C	P2	Seasonal
	Filler blocks	M05-2C	P2	Seasonal
	C-channel fiberglass flights	M06-2C	P2	Seasonal
	Drive sprockets	M07-2C	P1E	Monthly, alignment, cleanliness, performance
	Dished offset sprocket	M08-2C	P1E	Monthly, alignment, cleanliness, performance
	Idler sprocket	M09-2C	P1E	Monthly, alignment, cleanliness, performance
	Shear pin sprocket	M10-2C	P2	Monthly, alignment, cleanliness, performance
	Take up assembly	M11-2C	P2	Monthly, alignment, cleanliness, performance
	Wall bearings	M12-2C	P1E	Annually
	Collector wear strips	M13-2C	P2	Seasonal
Shafts, pins and set collars	M14-2C	P2	Seasonal	

2.3. Primary Sedimentation Tank 3 (PST3)

SYSTEM	DESCRIPTION	ITEM	PRIORITY	MAINTENANCE / INSPECTION SCHEDULE	EST. COST
LONGITUDINAL COLLECTOR	Drive motor	M01-3L	P3	Weekly, sound, performance, data log review	n/a
	Drive gearbox	M01-3L	P3	Weekly, sound, performance, data log review	n/a
	Collector chain	M02-3L	P2	Monthly, alignment, cleanliness, performance	n/a

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	Drive chain	M03-3L	P2	Monthly, alignment, cleanliness, performance	n/a
	Wear shoes	M04-3L	P2	Seasonal	n/a
	Filler blocks	M05-3L	P2	Seasonal	n/a
	C-channel fiberglass flights	M06-3L	P2	Seasonal	n/a
	Drive sprockets	M07-3L	P2	Monthly, alignment, cleanliness, performance	n/a
	Dished offset sprocket	M08-3L	P2	Monthly, alignment, cleanliness, performance	n/a
	Idler sprocket	M09-3L	P1E	Monthly, alignment, cleanliness, performance	<\$50K
	Shear pin sprocket	M10-3L	P2	Monthly, alignment, cleanliness, performance	n/a
	Take up assembly	M11-3L	P2	Monthly, alignment, cleanliness, performance	n/a
	Wall bearings	M12-3L	P1E	Annually	<\$50K
	Collector wear strips	M13-3L	P2	Seasonal	n/a
	Shafts, pins and set collars	M14-3L	P2	Seasonal	n/a
	Skimmer	M15-1L	P1E	Monthly	<\$50K
	CROSS COLLECTOR	Drive motor	M01-3C	P3	Weekly, sound, performance, data log review
Drive gearbox		M01-3C	P3	Weekly, sound, performance, data log review	n/a
Collector chain		M02-3C	P2	Monthly, alignment, cleanliness, performance	n/a
Drive chain		M03-3C	P2	Monthly, alignment, cleanliness, performance	n/a
Wear shoes		M04-3C	P2	Seasonal	n/a
Filler blocks		M05-3C	P2	Seasonal	n/a
C-channel fiberglass flights		M06-3C	P2	Seasonal	n/a
Drive sprockets		M07-3C	P2	Monthly, alignment, cleanliness, performance	n/a
Dished offset sprocket		M08-3C	P2	Monthly, alignment, cleanliness, performance	n/a
Idler sprocket		M09-3C	P1E	Monthly, alignment, cleanliness, performance	<\$50K
Shear pin sprocket		M10-3C	P2	Monthly, alignment, cleanliness, performance	n/a
Take up assembly		M11-3C	P2	Monthly, alignment, cleanliness, performance	n/a
Wall bearings		M12-3C	P1E	Annually	<\$50K
Collector wear strips		M13-3C	P2	Seasonal	n/a
Shafts, pins and set collars	M14-3C	P2	Seasonal	n/a	

2.4. Primary Sedimentation Tank 4 (PST4)

SYSTEM	DESCRIPTION	ITEM	PRIORITY	MAINTENANCE / INSPECTION SCHEDULE	EST. COST
LONGITUDINAL COLLECTOR	Drive motor	M01-4L	P3	Weekly, sound, performance, data log review	n/a
	Drive gearbox	M01-4L	P3	Weekly, sound, performance, data log review	n/a
	Collector chain	M02-4L	P2	Monthly, alignment, cleanliness, performance	n/a
	Drive chain	M03-4L	P2	Monthly, alignment, cleanliness, performance	n/a
	Wear shoes	M04-4L	P2	Seasonal	n/a
	Filler blocks	M05-4L	P2	Seasonal	n/a
	C-channel fiberglass flights	M06-4L	P2	Seasonal	n/a
	Drive sprockets	M07-4L	P2	Monthly, alignment, cleanliness, performance	n/a
	Dished offset sprocket	M08-4L	P2	Monthly, alignment, cleanliness, performance	n/a
	Idler sprocket	M09-4L	P1E	Monthly, alignment, cleanliness, performance	<\$50K
	Shear pin sprocket	M10-4L	P2	Monthly, alignment, cleanliness, performance	n/a
	Take up assembly	M11-4L	P1E	Monthly, alignment, cleanliness, performance	<\$50K
	Wall bearings	M12-4L	P1E	Annually	<\$50K
	Collector wear strips	M13-4L	P1R	Seasonal	<\$50K
	Shafts, pins and set collars	M14-4L	P2	Seasonal	
Skimmer	M15-1L	P1E	Monthly	<\$50K	
CROSS COLLECTOR	Drive motor	M01-4C	P3	Weekly, sound, performance, data log review	n/a
	Drive gearbox	M01-4C	P3	Weekly, sound, performance, data log review	n/a
	Collector chain	M02-4C	P2	Monthly, alignment, cleanliness, performance	n/a
	Drive chain	M03-4C	P2	Monthly, alignment, cleanliness, performance	n/a
	Wear shoes	M04-4C	P2	Seasonal	n/a
	Filler blocks	M05-4C	P2	Seasonal	n/a
	C-channel fiberglass flights	M06-4C	P2	Seasonal	n/a
	Drive sprockets	M07-4C	P2	Monthly, alignment, cleanliness, performance	n/a
	Dished offset sprocket	M08-4C	P2	Monthly, alignment, cleanliness, performance	n/a

	Idler sprocket	M09-4C	P1E	Monthly, alignment, cleanliness, performance	<\$50K
	Shear pin sprocket	M10-4C	P2	Monthly, alignment, cleanliness, performance	n/a
	Take up assembly	M11-4C	P2	Monthly, alignment, cleanliness, performance	n/a
	Wall bearings	M12-4C	P1E	Annually	<\$50K
	Collector wear strips	M13-4C	P2	Seasonal	n/a
	Shafts, pins and set collars	M14-4C	P2	Seasonal	n/a

2.5. Equalization System

SYSTEM	DESCRIPTION	ITEM	PRIORITY	MAINTENANCE / INSPECTION SCHEDULE	EST. COST
EQUALIZATION SYSTEM	Piping and fittings (elbows and tees)	M15	P2	Annually/Seasonal	n/a
	Flowmeter and other instruments	M15	P2	Annually/Seasonal	n/a
	Control valves	M15	P2	Annually/Seasonal	n/a
	Check valves	M15	P2	Annually/Seasonal	n/a
	Drain valves	M15	P2	Annually/Seasonal	n/a
	Gate valves	M15	P2	Annually/Seasonal	n/a

2.6. Main Inlet and Outlet Valves

SYSTEM	DESCRIPTION	ITEM	PRIORITY	MAINTENANCE / INSPECTION SCHEDULE	EST. COST
MAIN VALVES	Inlet gate valve PST1 (GV 201, 202, 203)	M16-1I	P2	Annually/Seasonal	n/a
	Inlet gate valve PST2 (GV 204, 205, 206)	M16-2I	P1E	Annually/Seasonal	<\$50K
	Inlet gate valve PST3 (GV 207, 208, 209)	M16-3I	P2	Annually/Seasonal	n/a
	Inlet gate valve PST4 (GV 210, 211, 212)	M16-4I	P2	Annually/Seasonal	n/a
	Outlet gate valve PST1 (GV 213, 214, 215)	M16-1O	P2	Annually/Seasonal	n/a
	Outlet gate valve PST2 (GV 216, 217, 218)	M16-2O	P2	Annually/Seasonal	n/a
	Outlet gate valve PST3 (GV 219, 220, 221)	M16-3O	P2	Annually/Seasonal	n/a
	Outlet gate valve PST4 (GV 222, 223, 224)	M16-4O	P2	Annually/Seasonal	n/a

2.7. Process Piping within the tank areas

SYSTEM	DESCRIPTION	ITEM	PRIORITY	MAINTENANCE / INSPECTION SCHEDULE	EST. COST
MISC. PROCESS PIPING	Scales and corrosion	M16	P1E	Annually/Seasonal	\$50K+

For the work required for P1S/P1E/P1R items, please refer to the respective inspection records in Appendix 1. These items are recommended to be completed in 2022.

3. Structural Inspection Results Summary

The structural inspection consists of visual review of the concrete structure within the (Primary Sedimentation) Tanks. The concrete shows potential signs of deterioration. This may be caused by abrasion, etch damage and leaching action. An NDT is required to determine the root cause. In addition, replacement of the wood screens is recommended. Other than items summarized in the tables below and details in Appendix 1, the four (4) Primary Sedimentation Tanks are otherwise in working condition.

3.1. Primary Sedimentation Tank 1 (PST1)

SYSTEM	DESCRIPTION	ITEM	PRIORITY	EST. COST
STRUCTURES	Concrete Deterioration – Abrasion & Etch Damage	S01	P2	n/a
	Concrete Deterioration – Etch Damage	S02	P2	n/a
	Concrete Deterioration – Leaching Action and Etch Concrete	S03	P2	n/a
	Concrete Deterioration – Leaching Action	S04	P2	n/a
	Concrete Deterioration – Etch Concrete	S05	P2	n/a
	Concrete Deterioration – Abrasion Damage and Etch Concrete	S06	P2	n/a
	Concrete Deterioration – Abrasion Damage, Etch Concrete and Leaching Action	S07	P2	n/a
	Wood Screen	S08	P1E	<\$50K
	Crack in Grout	S09	P2	n/a

3.2. Primary Sedimentation Tank 2 (PST2)

SYSTEM	DESCRIPTION	ITEM	PRIORITY	EST. COST
STRUCTURES	Concrete Deterioration – Abrasion & Etch Damage	S10	P2	n/a
	Concrete Deterioration – Abrasion & Etch Damage	S11	P2	n/a
	Concrete Deterioration – Leaching Action	S12	P2	n/a
	Concrete Deterioration – Leaching Action	S13	P2	n/a
	Wood Screen	S14	P1E	<\$50K

3.3. Primary Sedimentation Tank 3 (PST3)

SYSTEM	DESCRIPTION	ITEM	PRIORITY	EST. COST
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STRUCTURES	Possible issues on concrete on existing construction joint	S15	P2	n/a
	Concrete Deterioration – Etch Damage	S16	P2	n/a
	Concrete Deterioration – Etch Damage	S17	P2	n/a
	Concrete Deterioration – Abrasion Damage, Etch Concrete	S18	P2	n/a
	Concrete Deterioration – Leaching Action- Damage on Concrete – Corrosion on Steel Frame	S19	P2	n/a
	Concrete Deterioration – Leaching Action	S20	P2	n/a
	Concrete Deterioration – Leaching Action – Damage on Concrete – Corrosion on Steel Frame	S21	P2	n/a
	Frame Corrosion Around inlet Concrete Deterioration – Abrasion damage, Etch Concrete	S22	P2	n/a
	Crack in Grout	S23	P2	n/a
	Minor Corrosion	S24	P2	n/a

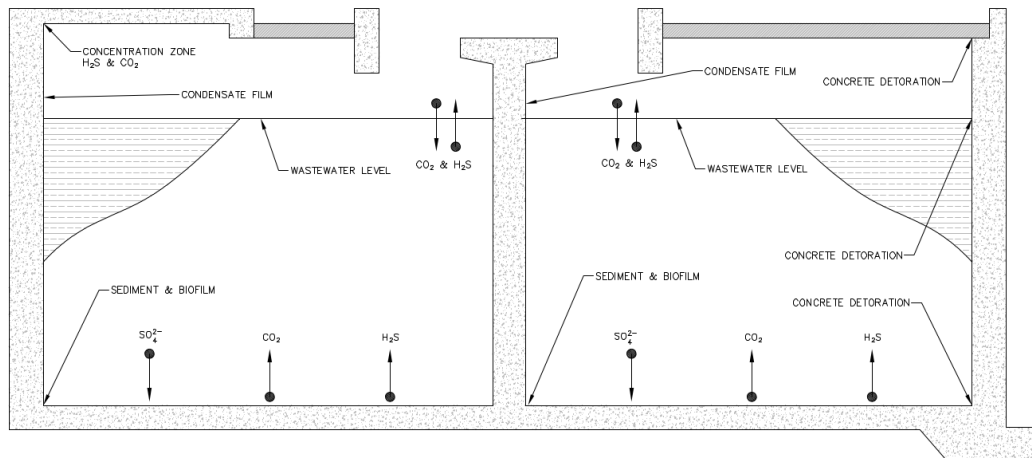
3.4. Primary Sedimentation Tank 4 (PST4)

SYSTEM	DESCRIPTION	ITEM	PRIORITY	EST. COST
STRUCTURES	Concrete Deterioration – Abrasion Damage, Etch Concrete	S25	P2	n/a
	Concrete Deterioration – Leaching Action	S26	P2	n/a
	Missing Bolts – Loosen Bracket – Loosen Bolts	S27	P1R	<\$50K
	Corroded screen and supports	S28	P2	n/a

For the work required for P1S/P1E/P1R items, please refer to the respective inspection records in Appendix 1. These items are recommended to be completed in 2022.

Concrete Surface information

- Certain agents and harsh conditions can cause concrete deterioration, as a result, embedment metal and steel rebar can become corroded, and this corrosion will expedite concrete deterioration.
- In the Primary Sedimentation Tanks, microbiological induced corrosion is a potential reason for concrete deterioration. Four events must happen to induce concrete corrosion. These are the formation of H₂S, releasing of H₂S, reducing concrete alkalinity and finally sulfide oxidation. In the below figure, these events are illustrated:



- Microbiological induced deteriorations are not visible but can only be identified by investigating the following evidence of deterioration:
 - Etch Concrete
 - Leaching action
 - Abrasion Damage
- We recommends various NDT and or Destructive test to identify possible corrosion and alkalinity of the concrete.

4. Recommendation

4.1. Mechanical

It should be noted that the inspections of PST1, PST2, PST3 and PST4 are based on conditions at time of inspection. The inspection schedule and repair/replacement recommendations for PST1 were determined under the assumption all the mechanical equipment will be replaced by November 2021.

Majority of the findings for PST1, PST2, PST3 and PST4 are of P3 and P2 priority in nature, condition that if left “as is”, could lead to the potential for further deficiency. The proposed maintenance and inspection schedule shall be referenced and preformed to ensure mechanical items are in good condition.

In addition to the proposed scheduled inspection, further inspection shall be conducted for all moving parts to ensure they are operating in its intended condition and to identify any potential problems within the equipment not visible on the surface:

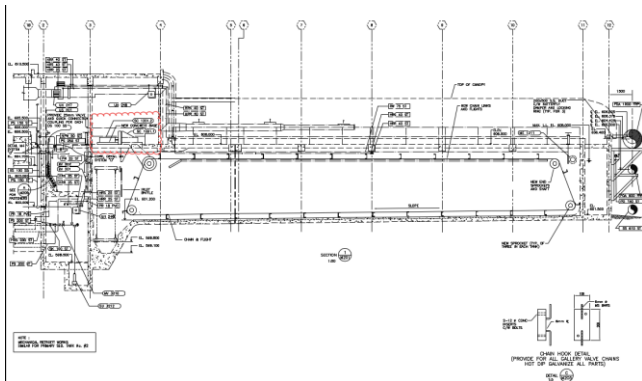
- If possible, conduct a dry run on the system to investigate if there are any restricted movement on certain items.
- Check the symmetrical movement of the flights to note any asymmetrical movement.
- Check for slippage of the sprockets on the shafts.
- Inspect the wall bearings for free movement of the shaft.
- Collect electrical draw information from the drive motors to evaluate for fluctuations on a newly installed PST-1 system vs aging system.
- Engage engineering for the P1E indicated items to further investigate and design corrections as required
- Construct a PMP (Preventative Maintenance Program) based on findings of this report, OEM recommendations and input from the Operations team.

4.2. Structural

Structural inspection identified items classified mostly of P2, with one being P1R. Items classified as P1R shall be corrected to prevent further issues. Further investigation should be conducted to determine the root cause of the findings.

- Conduct NDT (Non-Destructive Testing) to identify steel corrosion magnitudes.
- Conduct NDT (Non-Destructive Testing) and DT (Destructive Testing) to find Alkalinity of concrete especially near to exposed formwork support.
- Engage engineering for the P1E indicated items to further investigate and design corrections as required

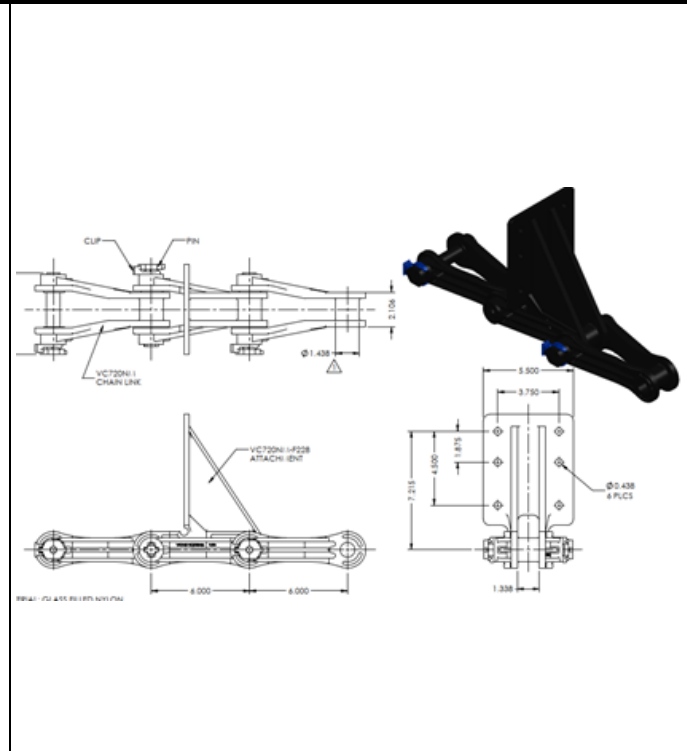
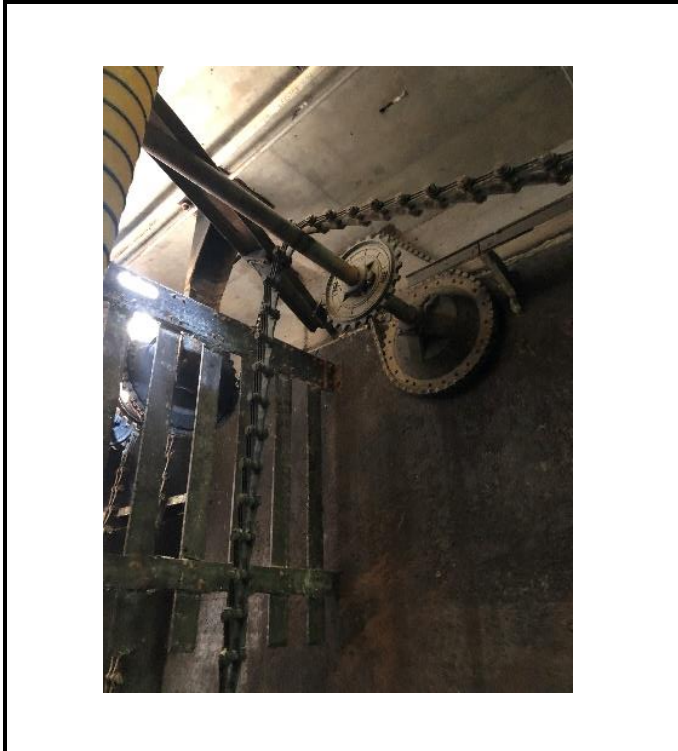
Appendix 1: Inspection Records Details

Item No:	M01-1L – Drive Motor / Drive Gearbox
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P3
Location Detail: Tank #1	Description:
	<p>The motor and gearbox were in a fair condition. However, they are in a corrosive environment and is operating continuously. Periodic maintenance plan is required.</p>
	<p>Required Action:</p> <ul style="list-style-type: none"> - All manufacturers' maintenance manuals of drivers and motors shall be followed. - A mechanical/electrical engineering review may be performed. Detailed data logging/reviewing may be conducted to detect potential operational issues by observing the variance in the load/data log results.



Item No:	M02-1L – Collector Chain
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)

Location Detail: Tank #1	Description:
	<p>Original Equipment - The collector chains were in fair conditions. However, restrictions on the movement of the wall bearings and sprockets caused increased tension and stresses on the equipment.</p>
	<p>Required Action:</p> <ul style="list-style-type: none"> - All manufacturers' maintenance manuals of moving parts shall be followed. - Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers. - Cleaning/removing large scales periodically to reduce the wear and tear.



Item No: M03-1L – Drive Chain

Action Plan & Resolution Timeline Required: 1 year

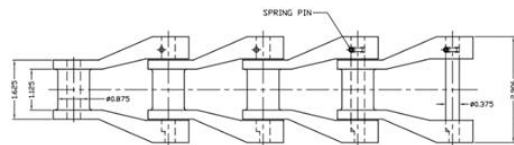
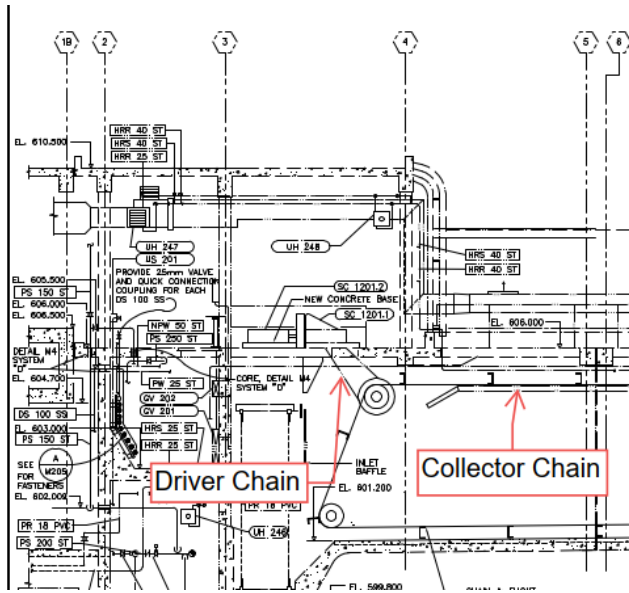
Repair Priority: **New (has been replaced November 2021)**

Location Detail: Tank #1 Description:

Original Equipment -
The drive chains were in fair conditions. However, restrictions on the movement of the wall bearings and sprockets caused increased tension and stresses on the equipment.

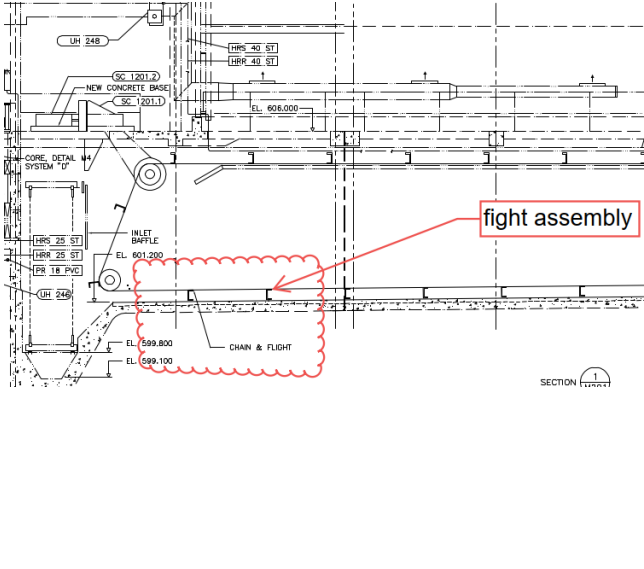
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:	M04-1L – Wear Shoes
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)

Location Detail: Tank #1	Description:
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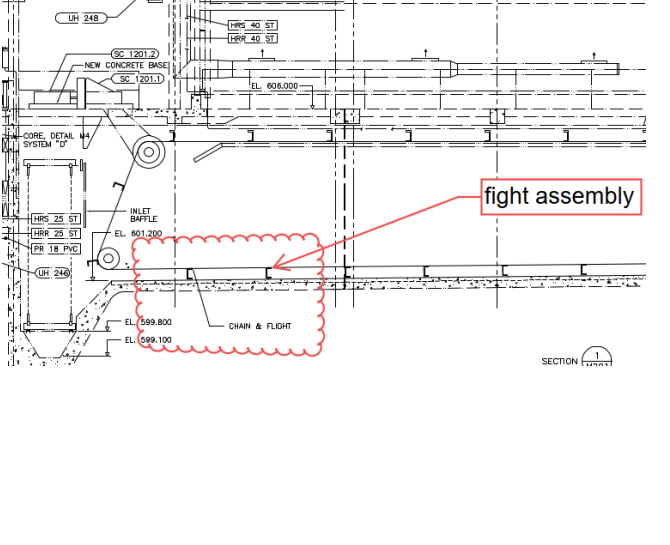
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:	M05-1L – Filler Blocks
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)

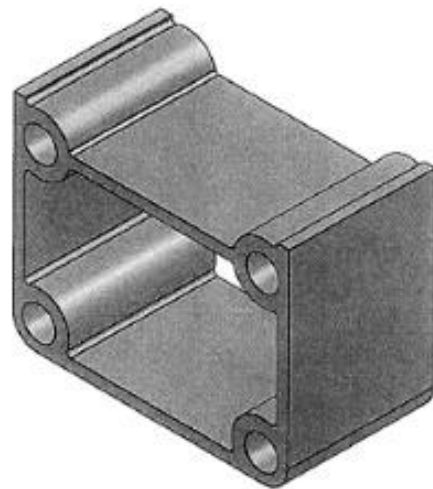
Location Detail: Tank #1	Description:
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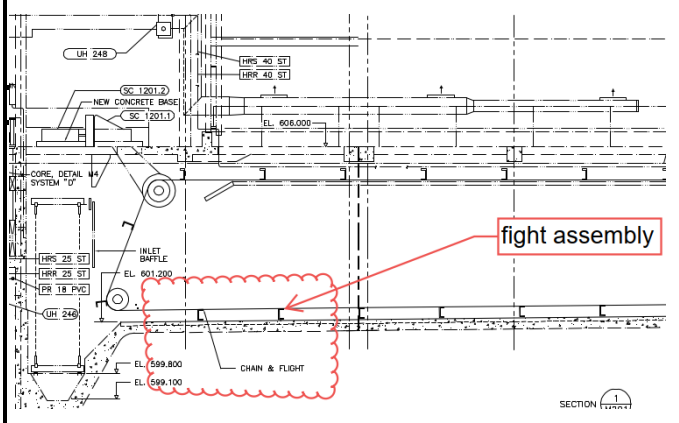
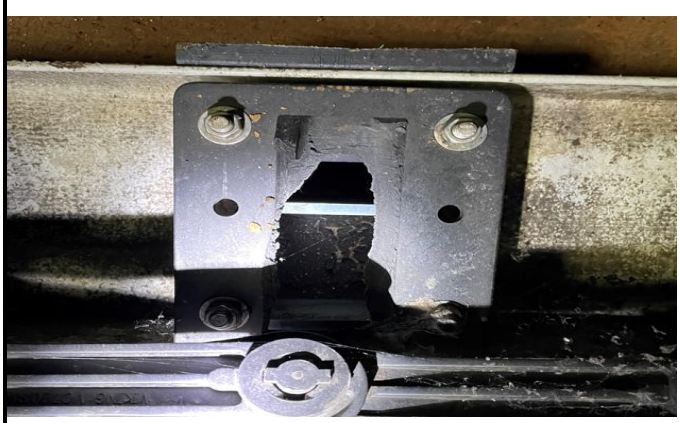



Required Action:

- Inspection for all the fasteners shall be conducted periodically.

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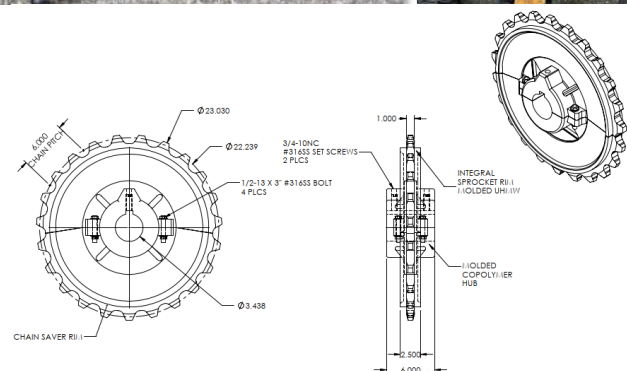
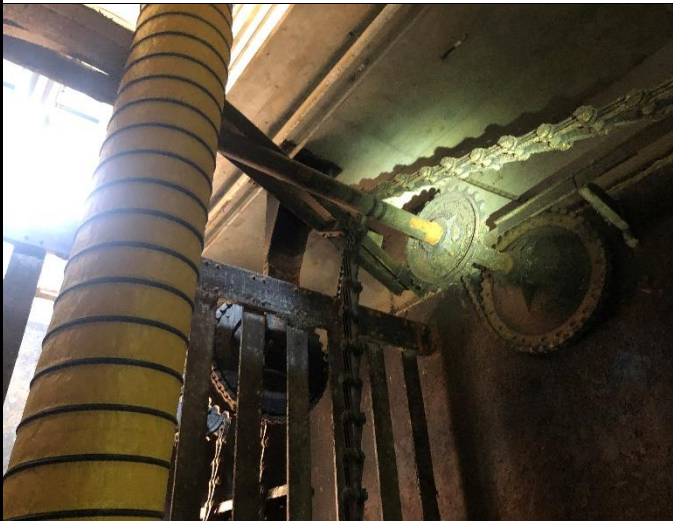
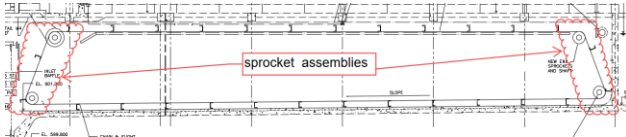
Item No:	M06-1L – C-Channel Fiberglass Flights
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:
	<p>Original Equipment - The flight assembly were in fair conditions. Damage was observed most likely caused when the system failed.</p>
	<p>Required Action:</p> <ul style="list-style-type: none"> - An engineering investigation shall be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification. - All manufacturers' maintenance manuals of moving parts shall be followed. - Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers. - Cleaning/removing large scales periodically to reduce the wear and tear.
	

Item No:	M07-1L – Drive Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

Original Equipment -
The sprockets on the shaft were in a rusty/scaled condition.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

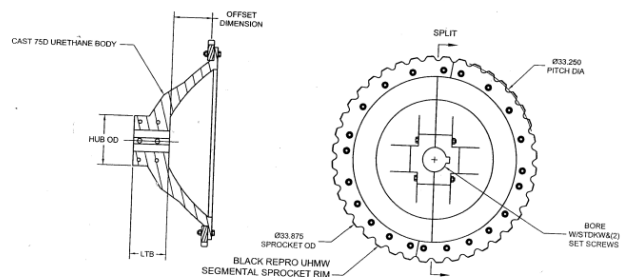
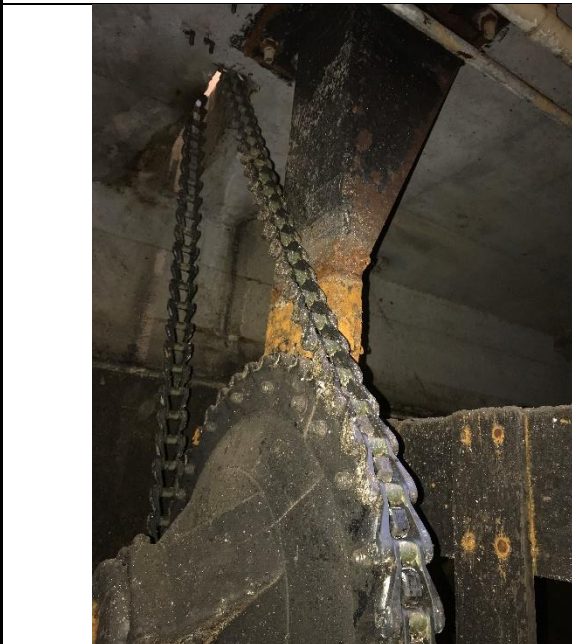
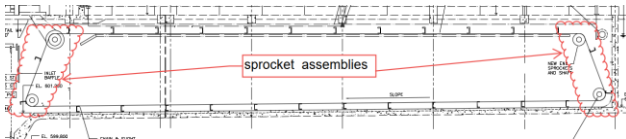


Item No:	M08-1L – Dished Offset Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

Original Equipment -
The sprockets on the shaft were in a rusty/scaled condition.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

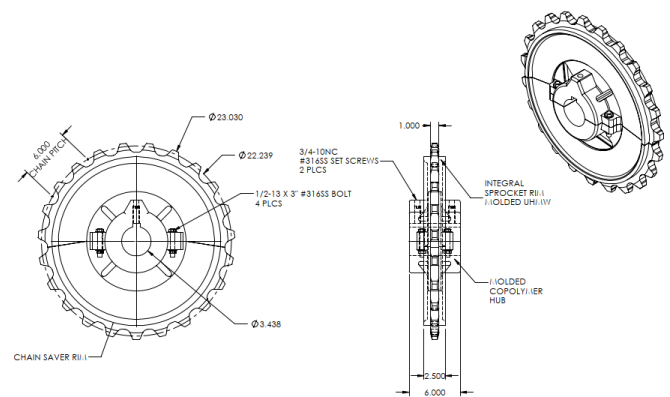
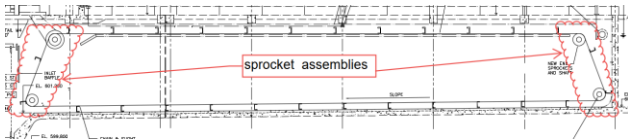


Item No:	M09-1L – Idler Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

Original Equipment -
The sprockets on the shaft were in a rusty/scaled condition. The shaft corrosion potentially caused restrictions in the movement of the sprockets.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

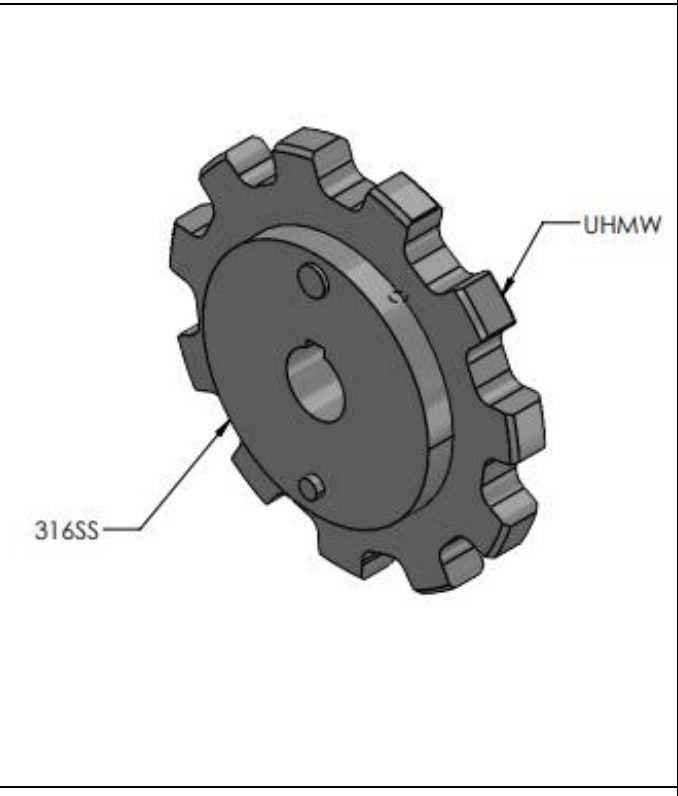
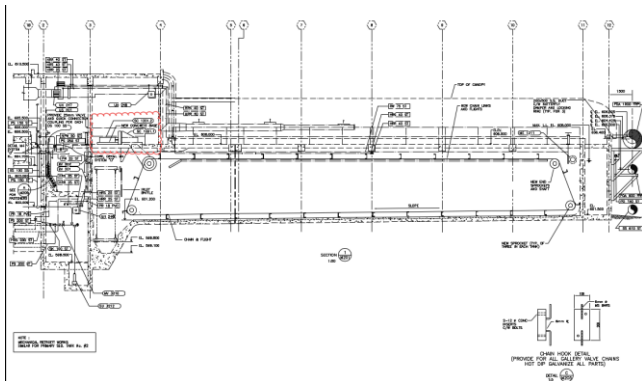


Item No:	M10-1L – Shear Pin Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

Original Equipment -
The sprockets on the drive motor shaft were in fair condition.

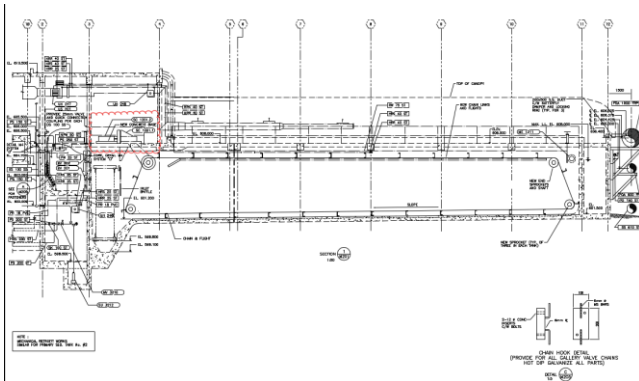
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



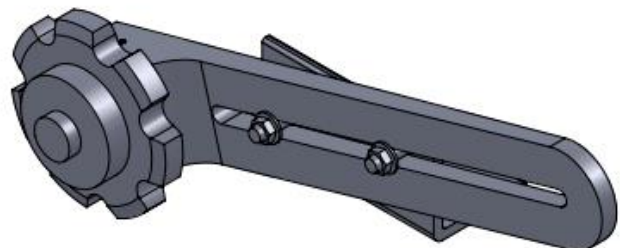
Item No:	M11-1L – Take Up Assembly
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

Original Equipment -
The Take Up Assemblies were in fair condition.



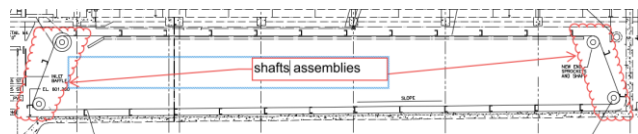
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No:	M12-1L – Wall Bearings
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

Original Equipment -
The wall bearings were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Project No: 210505

Report: 210505-TEC-03-R1-D

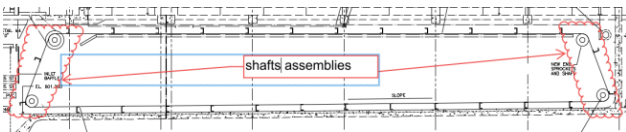
Date: 2022-01-26

Item No:	M13-1L – Collector Wear Strip
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:
	Original Equipment - The wear strips were in fair conditions. No major deficiencies were detected.
	Required Action:
	<ul style="list-style-type: none"> - All manufacturers' maintenance manuals of moving parts shall be followed. - Inspection of wear shall be conducted on a regular basis.



Item No:	M14-1L – Shafts, Pins and set collars
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #1	Description:

Original Equipment -
The shafts were in a rusty/scaled condition.



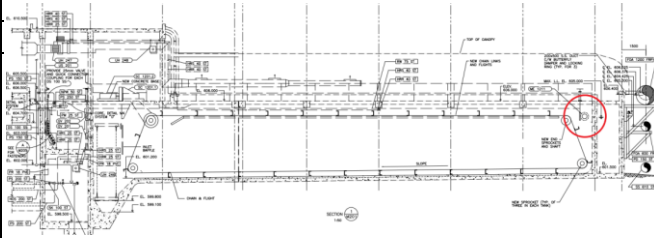
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:	M15-1L – Skimmer
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #1	Description:

The skimmer is in a rusty/scaled condition. Operations noted without occasional movement of the skimmer, they are prone to seizing.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters.
- Consider a revised design for better reliability. All manufacturers' maintenance manuals of moving parts shall be followed.



Item No:

M01-1C – Drive Motor / Drive Gearbox

Action Plan & Resolution Timeline Required:

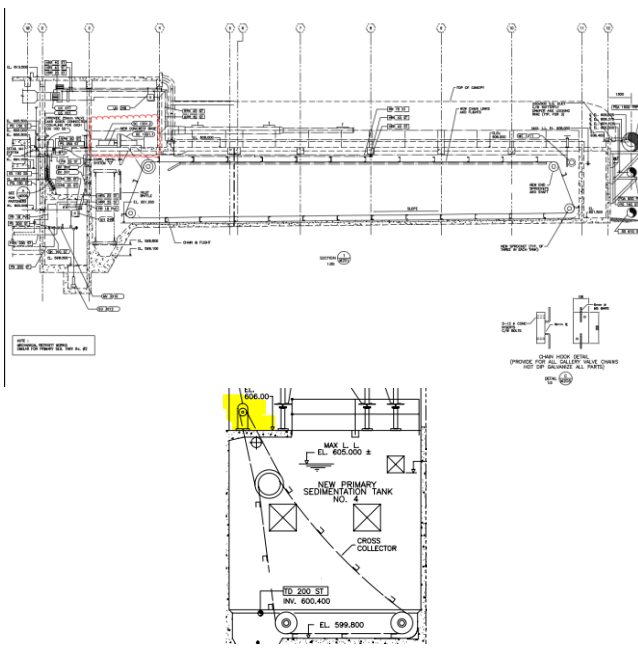
1 year

Repair Priority:

P3

Location Detail: Tank #1

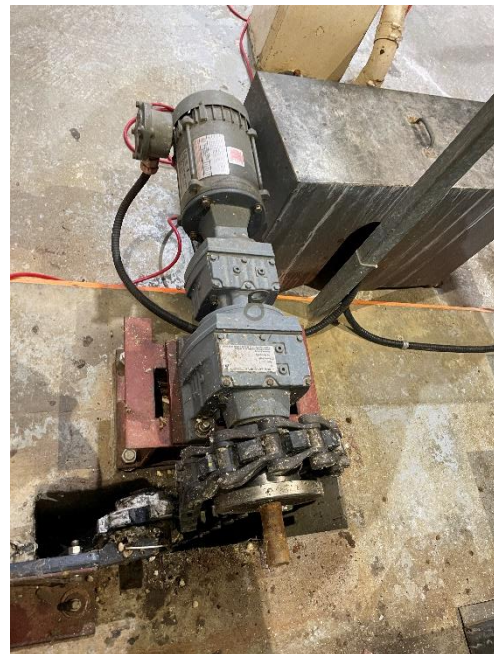
Description:



The motor and gearbox were in a fair condition. However, they are in a corrosive environment and is operating continuously. Periodic maintenance plan is required.

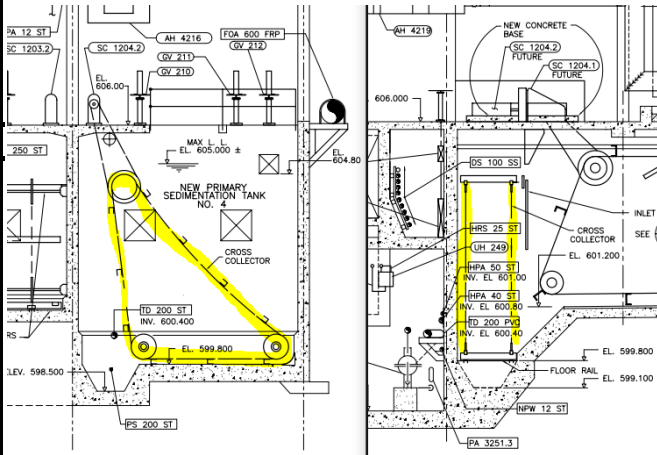
Required Action:

- All manufacturers' maintenance manuals of drivers and motors shall be followed.
- A mechanical/electrical engineering review may be performed. Detailed data logging/reviewing may be conducted to detect potential operational issues by observing the variance in the load/data log results.

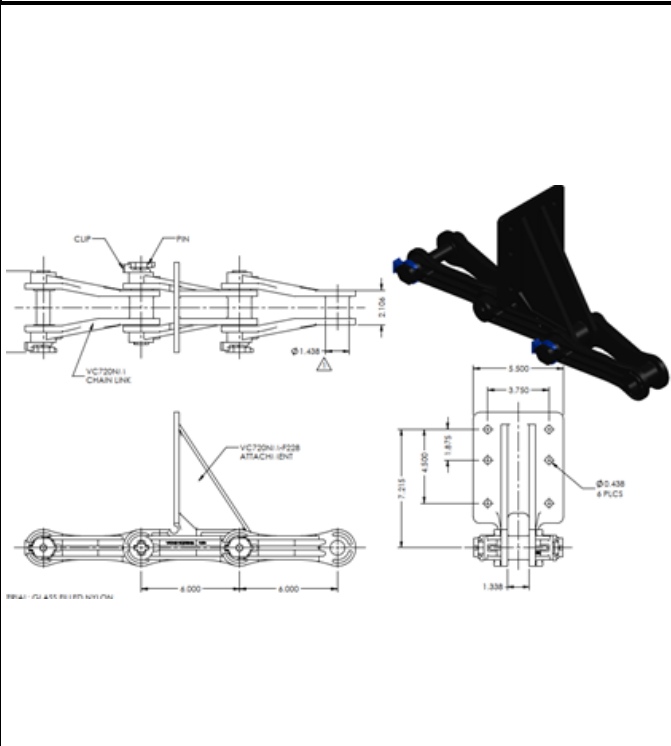
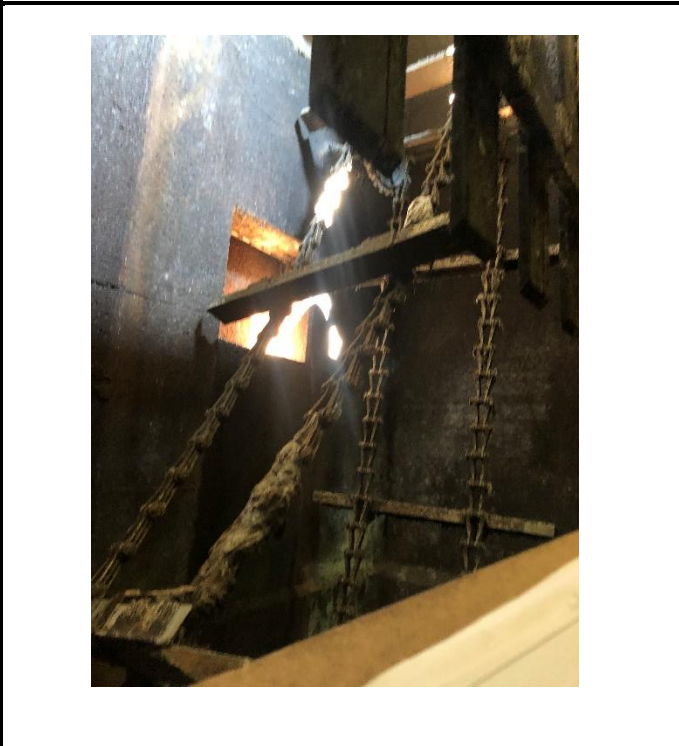


Item No:	M02-1C – Collector Chain
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)

Location Detail: Tank #1	Description:
	The collector chains were in fair conditions.



Required Action:
<ul style="list-style-type: none"> - All manufacturers' maintenance manuals of moving parts shall be followed. - Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers. - Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:

M03-1C – Drive Chain

Action Plan & Resolution Timeline Required:

1 year

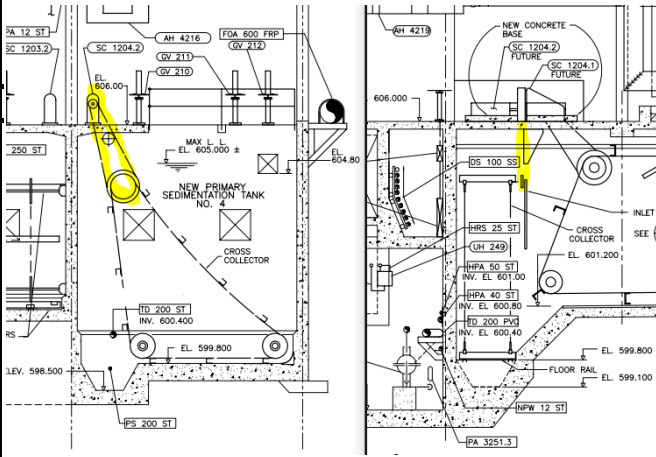
Repair Priority:

New (has been replaced November 2021)

Location Detail: Tank #1

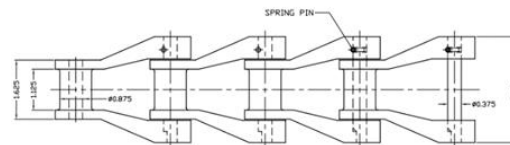
Description:

The drive chains were in fair conditions.



Required Action:

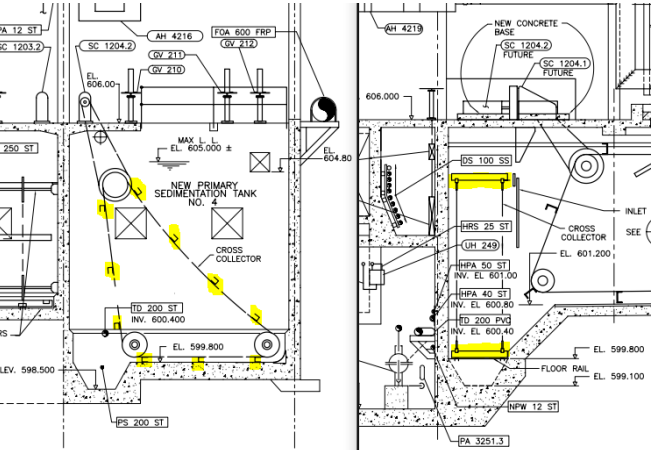
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:	M04-1C – Wear Shoes
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)

Location Detail: Tank #1	Description:
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The wear shoes were in fair conditions. No major deficiencies were detected.



Required Action:

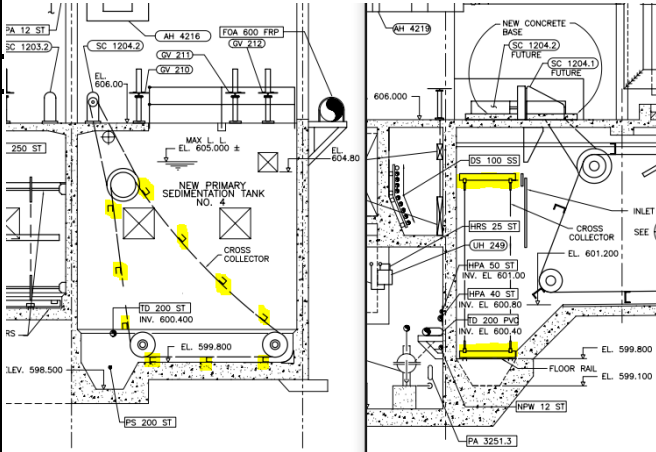
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:	M05-1C – Filler Blocks
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)

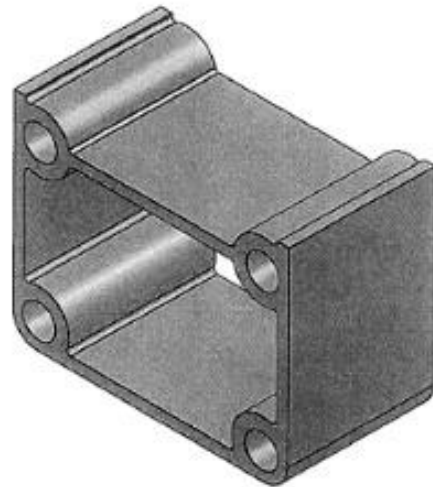
Location Detail: Tank #1	Description:
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The filler blocks were in fair conditions. No major deficiencies were detected.



Required Action:

- Inspection for all the fasteners shall be conducted periodically.



Item No:

M06-1C – C-Channel Fiberglass Flights

Action Plan & Resolution Timeline Required:

1 year

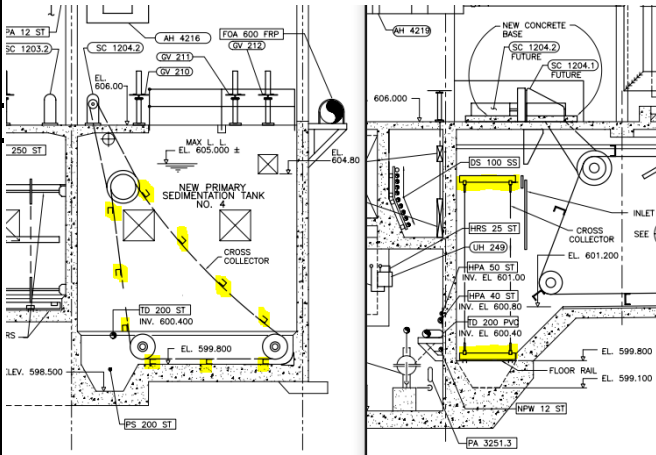
Repair Priority:

New (has been replaced November 2021)

Location Detail: Tank #1

Description:

The flight assembly were in fair conditions.



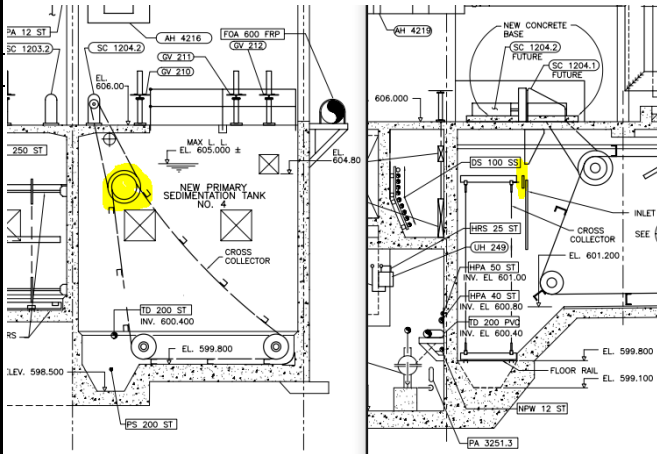
Required Action:

- An engineering investigation shall be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



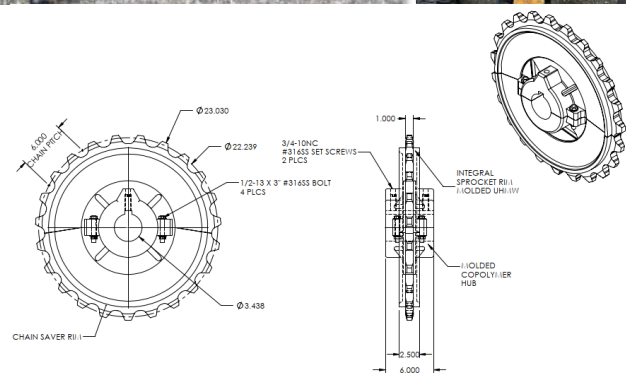
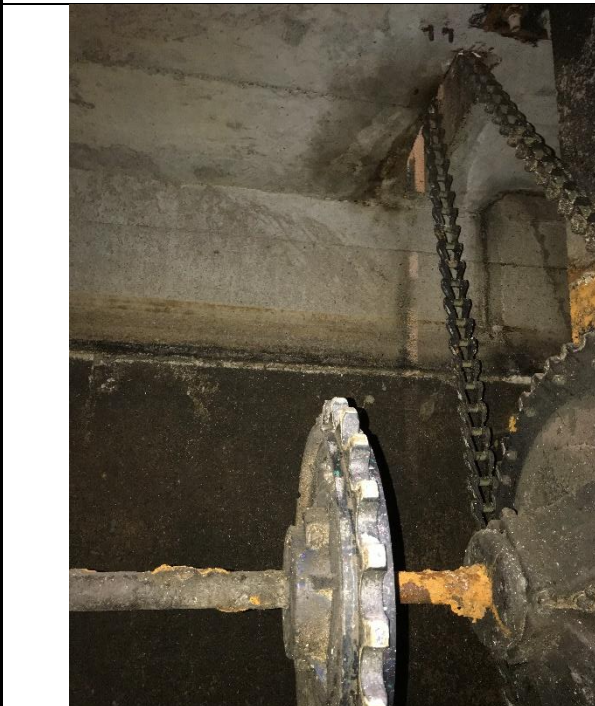
Item No:	M07-1C – Drive Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

The sprockets on the shaft were in a rusty/scaled condition.



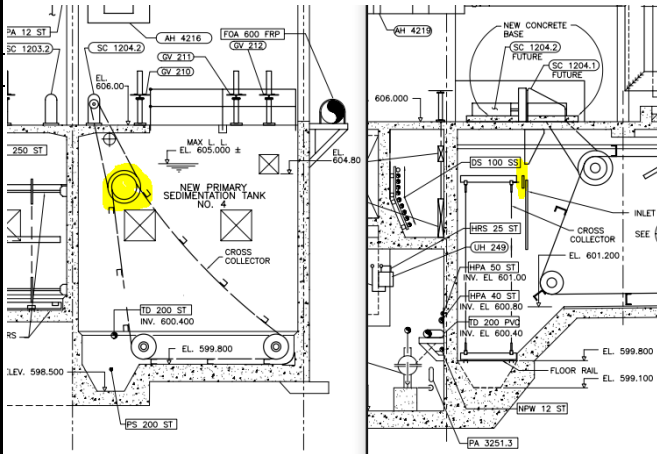
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



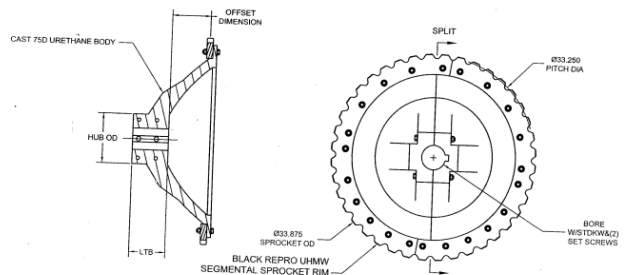
Item No:	M08-1C – Dished Offset Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

The sprockets on the shaft were in a rusty/scaled condition.



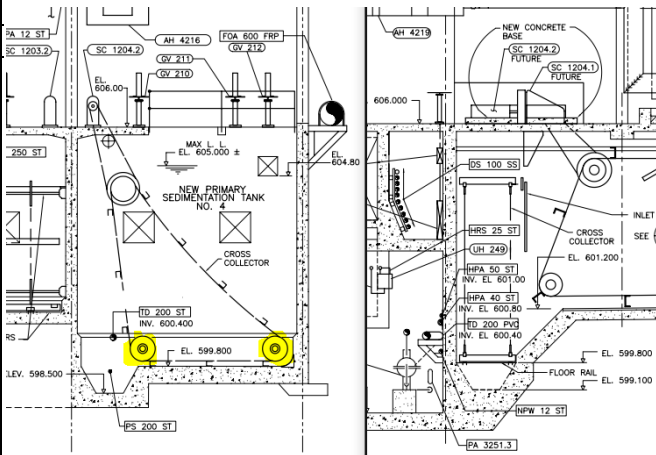
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



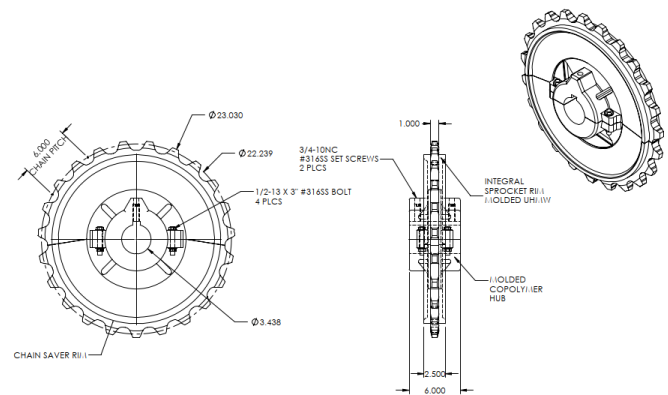
Item No:	M09-1C – Idler Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

The sprockets on the shaft were in a rusty/scaled condition. The shaft corrosion potentially caused restrictions in the movement of the sprockets.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

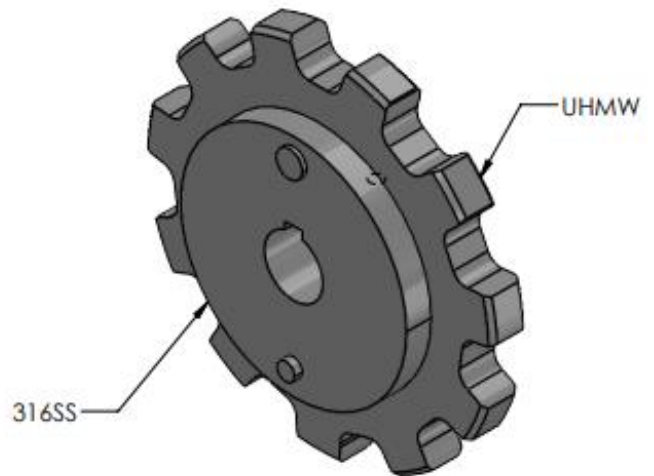
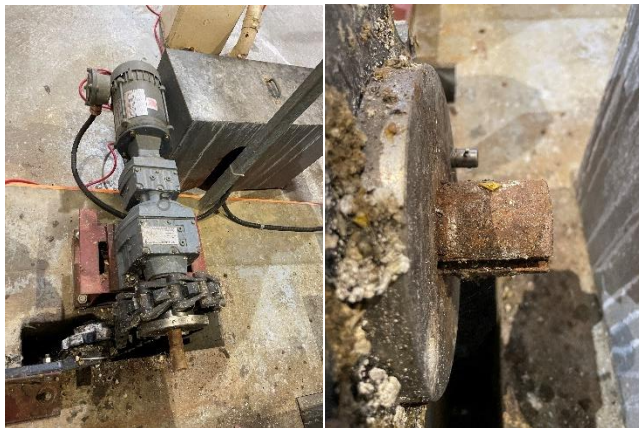
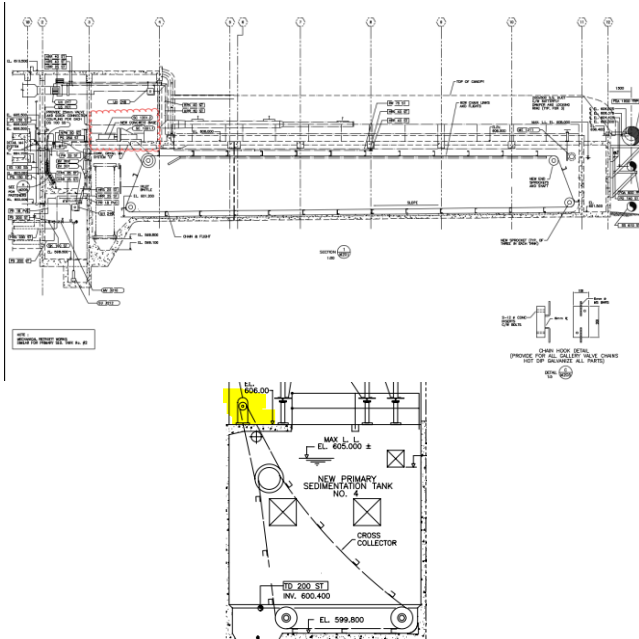


Item No:	M10-1C – Shear Pin Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

The sprockets on the drive motor shaft were in fair condition.

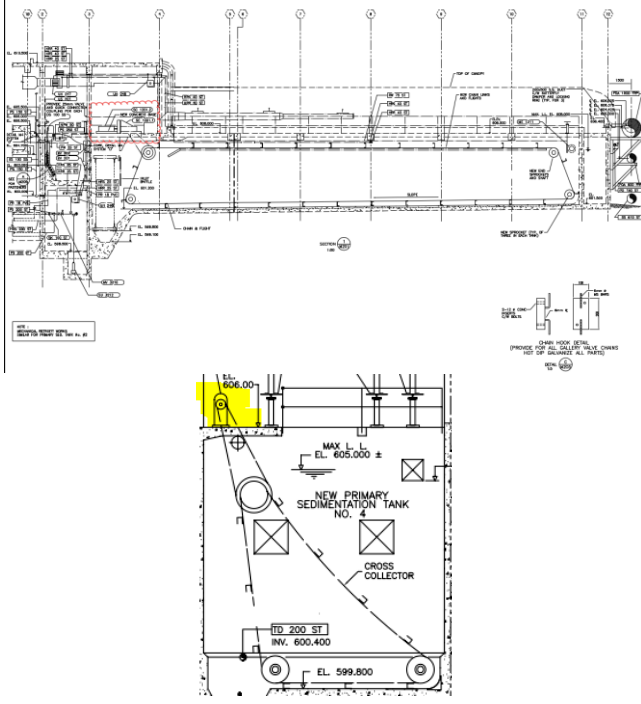
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



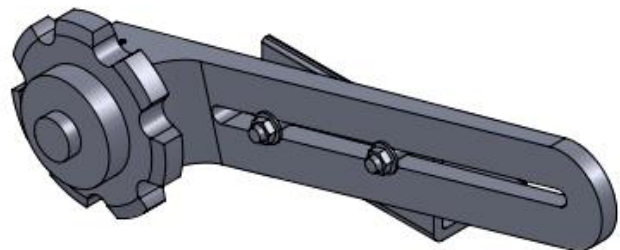
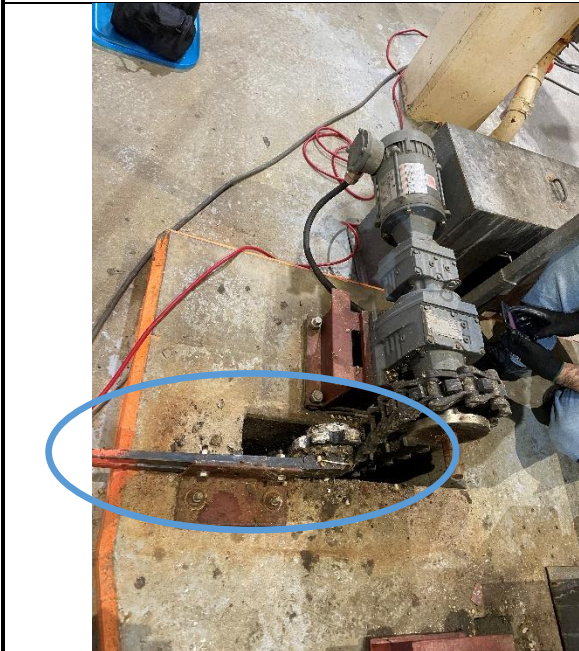
Item No:	M11-1C – Take Up Assembly
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

The Take Up Assemblies were in fair condition.



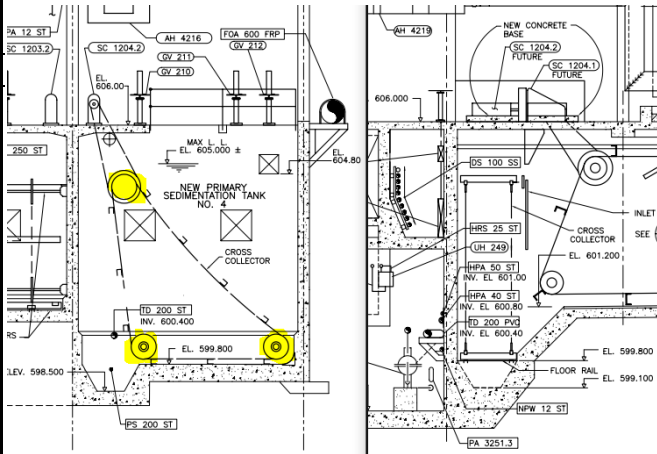
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No:	M12-1C – Wall Bearings
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

The wall bearings were in a rusty/scaled condition.



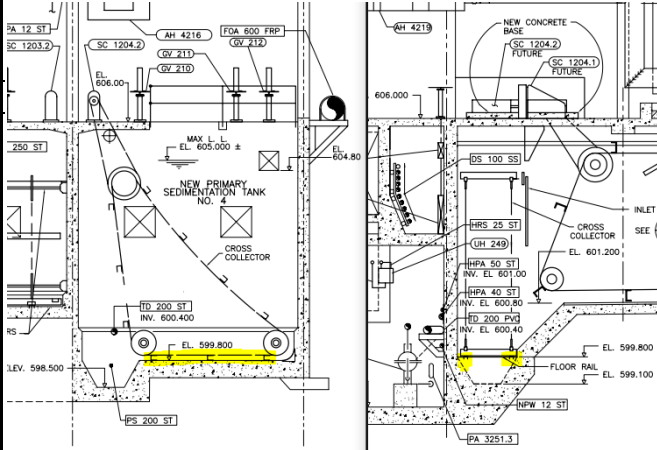
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



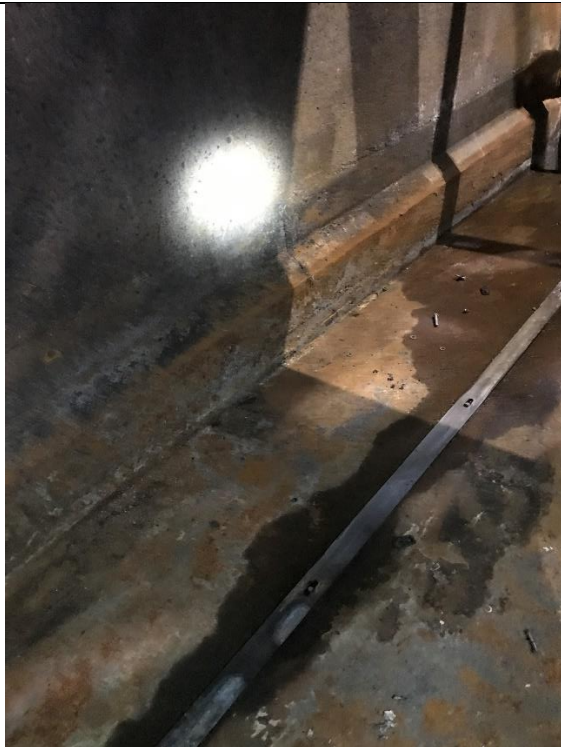
Item No:	M13-1C – Collector Wear Strip
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	New (has been replaced November 2021)
Location Detail: Tank #1	Description:

The wear strips were in fair conditions. No major deficiencies were detected.



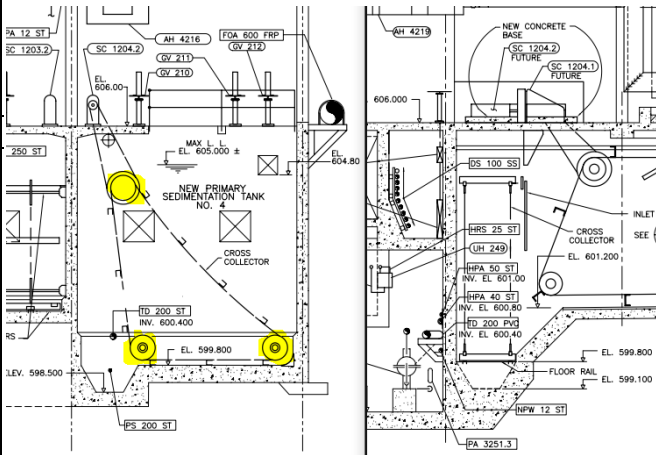
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:	M14-1C – Shafts, Pins and set collars
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #1	Description:

The shafts were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:

M01-2L – Drive Motor / Drive Gearbox

Action Plan & Resolution Timeline Required:

1 year

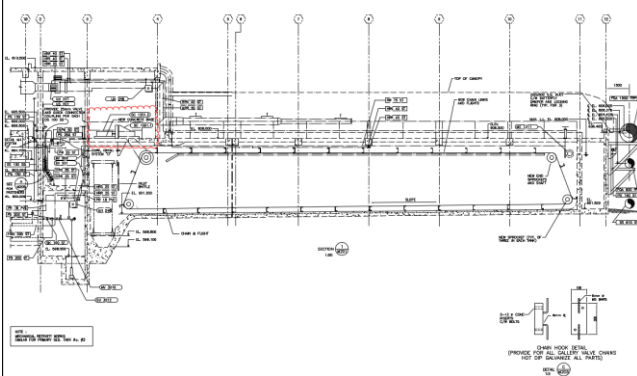
Repair Priority:

P3

Location Detail: Tank #2

Description:

The motor and gearbox were in a fair condition. However, they are in a corrosive environment and is operating continuously. Periodic maintenance plan is required.



Required Action:

- All manufacturers' maintenance manuals of drivers and motors shall be followed.
- A mechanical/electrical engineering review may be performed. Detailed data logging/reviewing may be conducted to detect potential operational issues by observing the variance in the load/data log results.



Item No: M02-2L – Collector Chain

Action Plan & Resolution Timeline Required: 1 year

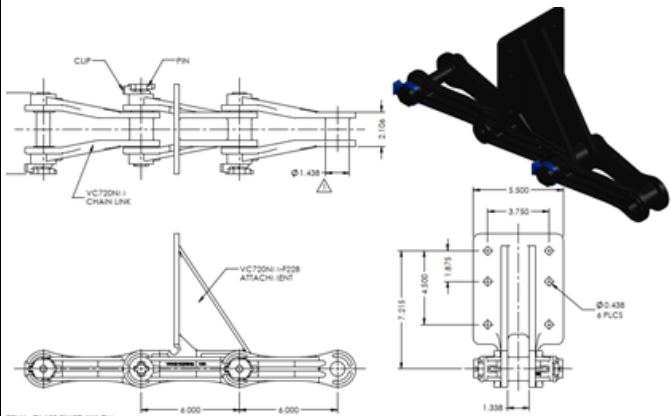
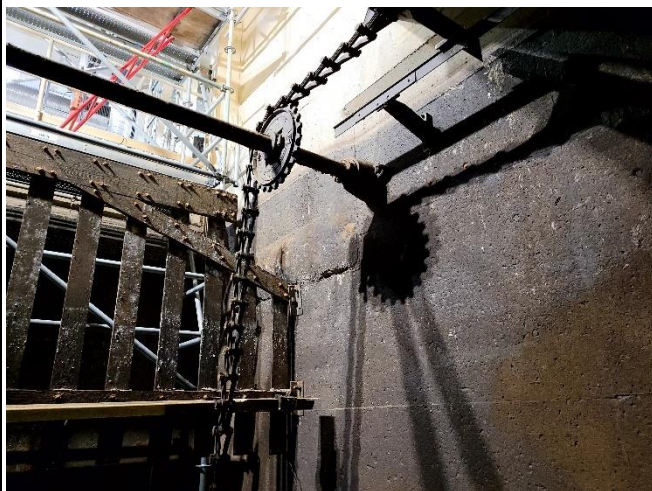
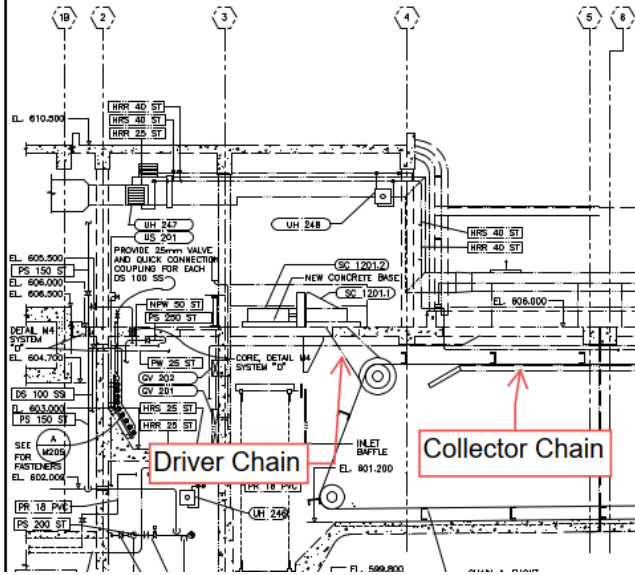
Repair Priority: **P2**

Location Detail: Tank #2

Description:
The collector chains were in fair conditions. However, restrictions on the movement of the wall bearings and sprockets caused increased tension and stresses on the equipment.

Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:

M03-2L – Drive Chain

Action Plan & Resolution Timeline Required:

1 year

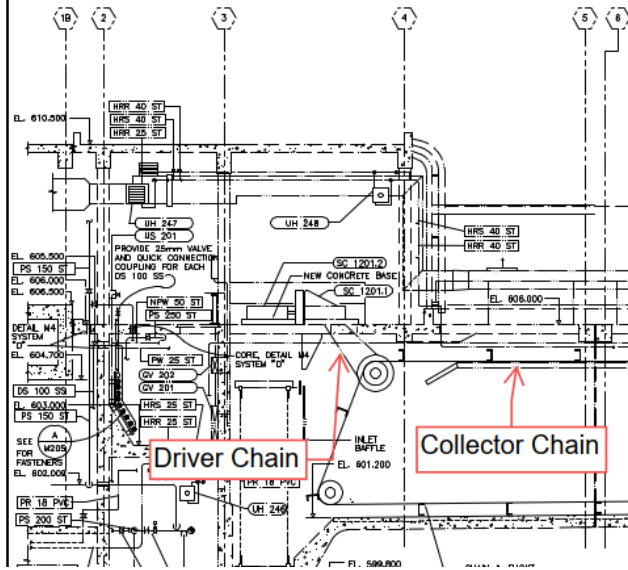
Repair Priority:

P2

Location Detail: Tank #2

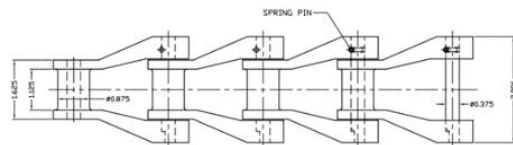
Description:

The drive chains were in fair conditions. However, restrictions on the movement of the wall bearings and sprockets caused increased tension and stresses on the equipment.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



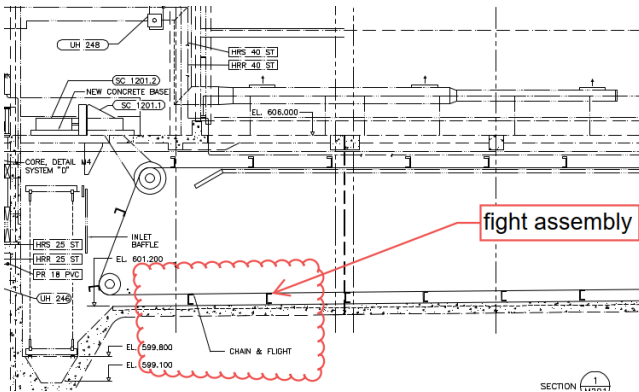
Item No: M04-2L – Wear Shoes

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

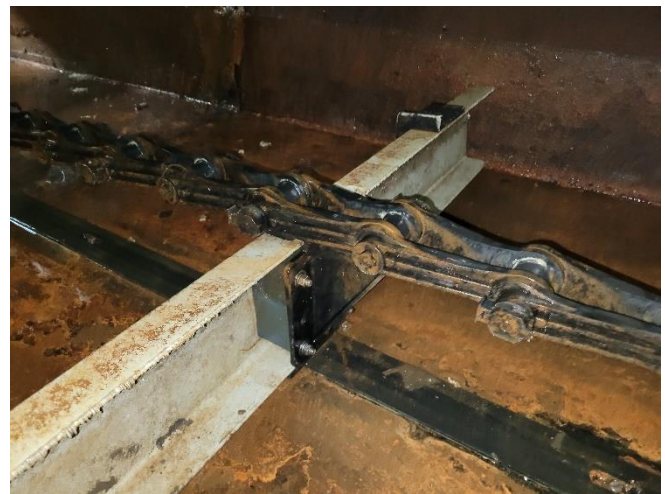
Location Detail: Tank #2 Description:

The wear shoes were in fair conditions. No major deficiencies were detected.



Required Action:

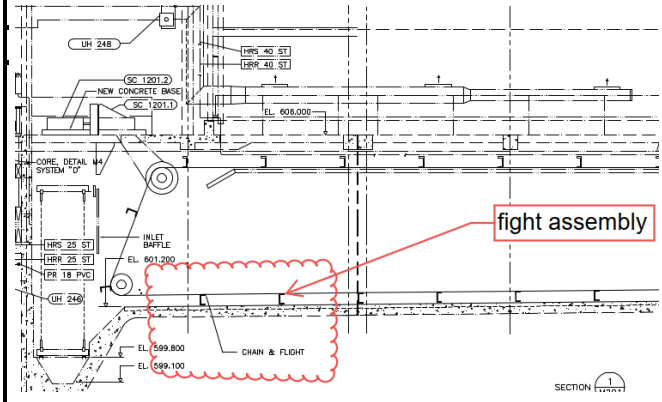
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:	M05-2L – Filler Blocks
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

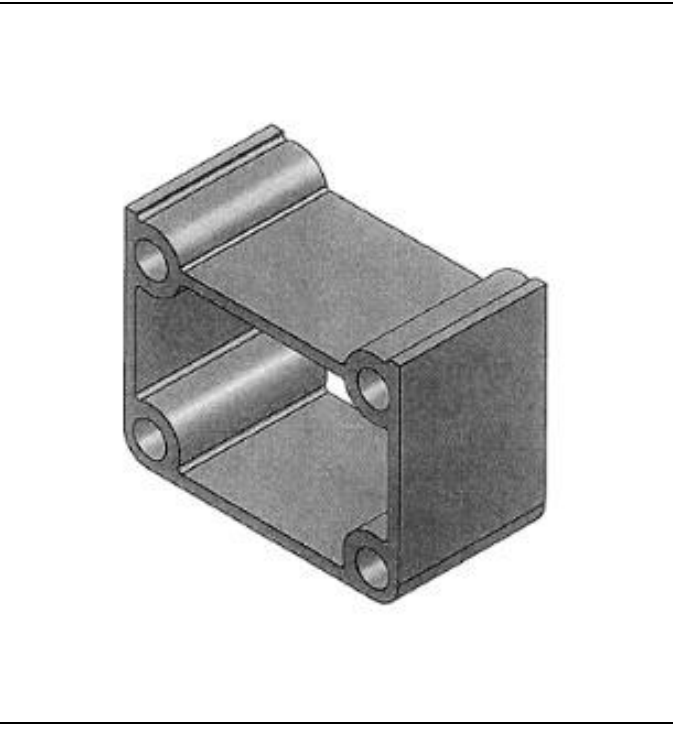
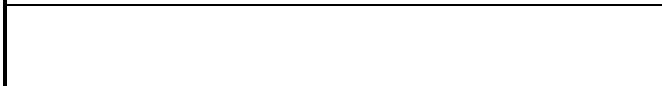
Location Detail: Tank #2	Description:
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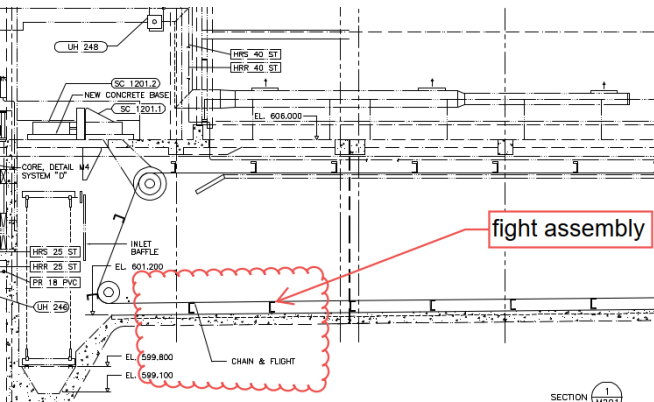


The filler blocks were in fair conditions. No major deficiencies were detected.



Required Action:

- Inspection for all the fasteners shall be conducted periodically.



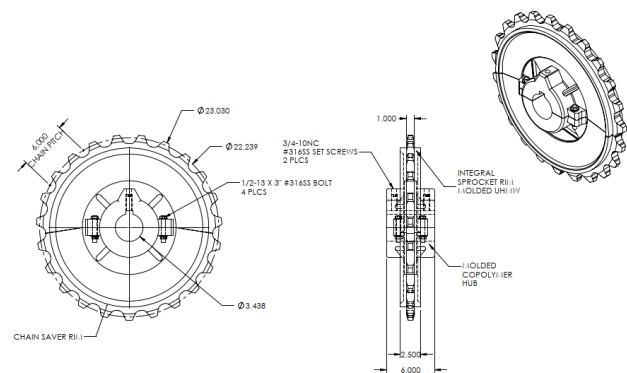
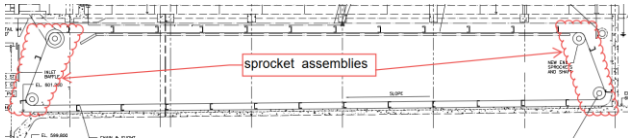
Item No:	M06-2L – C-Channel Fiberglass Flights
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #2	Description:
	<p>The flight assembly were in fair conditions.</p>
	<p>Required Action:</p> <ul style="list-style-type: none"> - An engineering investigation shall be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification. - All manufacturers' maintenance manuals of moving parts shall be followed. - Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers. - Cleaning/removing large scales periodically to reduce the wear and tear.
	

Item No:	M07-2L – Drive Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #2	Description:

The sprockets on the shaft were in a rusty/scaled condition.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

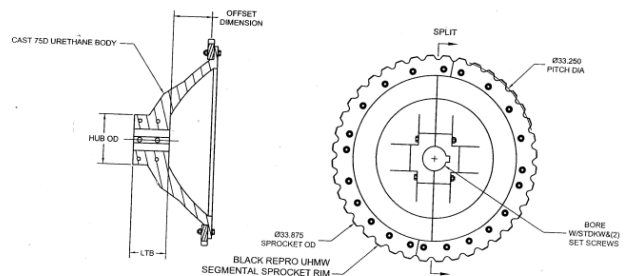
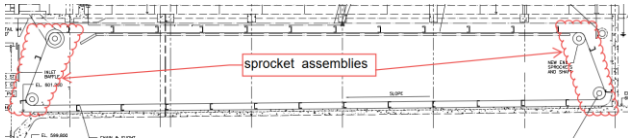


Item No:	M08-2L – Dished Offset Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #2	Description:

The sprockets on the shaft were in a rusty/scaled condition.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No: M09-2L – Idler Sprocket

Action Plan & Resolution Timeline Required: 1 year

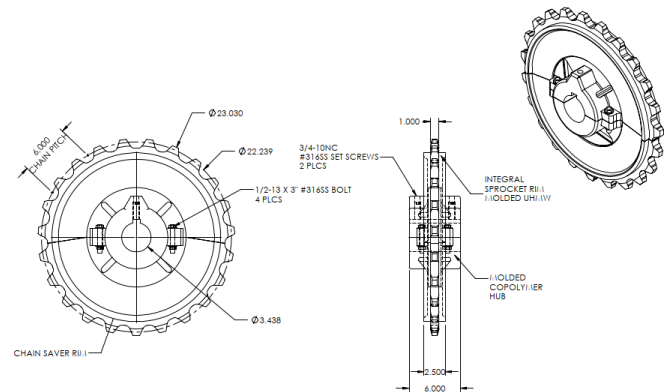
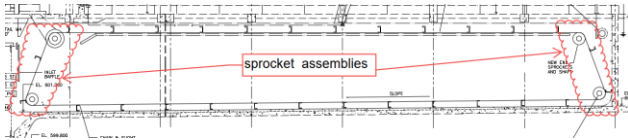
Repair Priority: **P1E**

Location Detail: Tank #2 Description:

The sprockets on the shaft were in a rusty/scaled condition. The shaft corrosion potentially caused restrictions in the movement of the sprockets.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

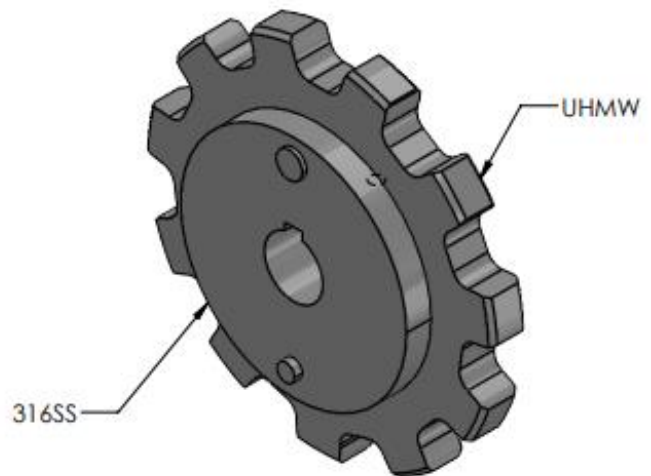
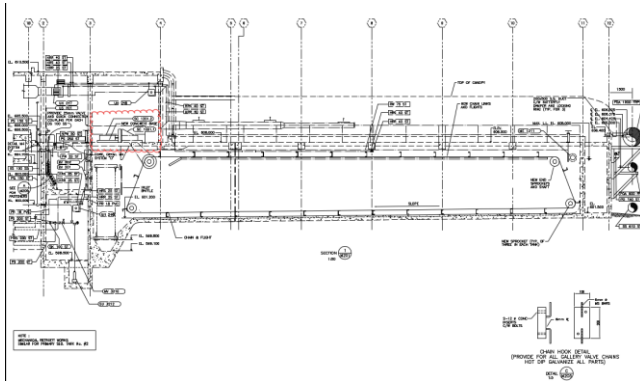


Item No:	M10-2L – Shear Pin Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #2	Description:

The sprockets on the drive motor shaft were in fair condition.

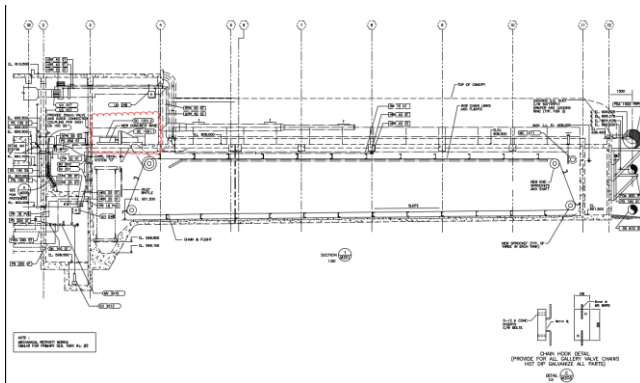
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



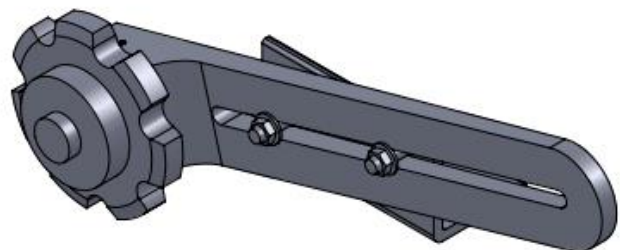
Item No:	M11-2L – Take Up Assembly
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #2	Description:

The Take Up Assemblies were in fair condition.



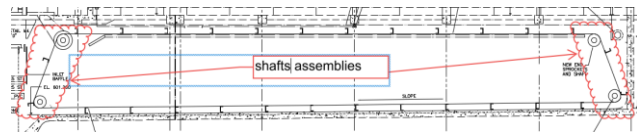
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No:	M12-2L – Wall Bearings
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #2	Description:

The wall bearings were in a rusty/scaled condition.

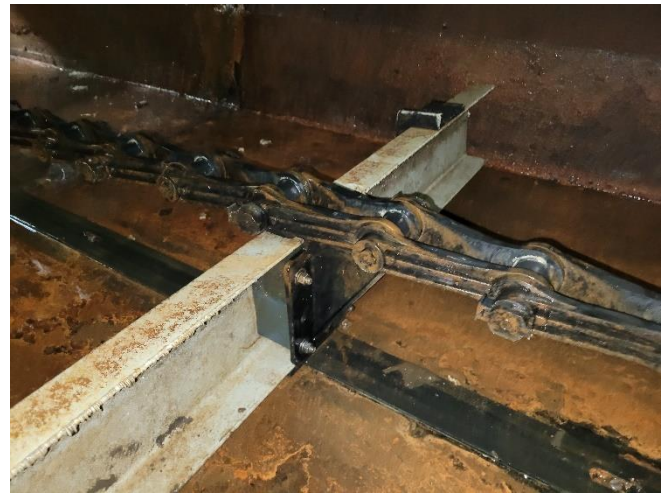


Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:	M13-2L – Collector Wear Strip
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #2	Description:
	The wear strips were in fair conditions. No major deficiencies were detected.
	Required Action:
	<ul style="list-style-type: none"> - All manufacturers' maintenance manuals of moving parts shall be followed. - Inspection of wear shall be conducted on a regular basis.



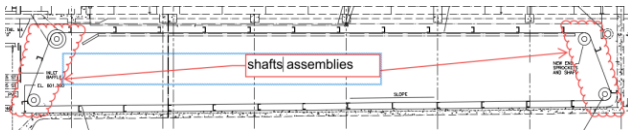
Item No: M14-2L – Shafts, Pins and set collars

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #2 Description:

The shafts were in a rusty/scaled condition.



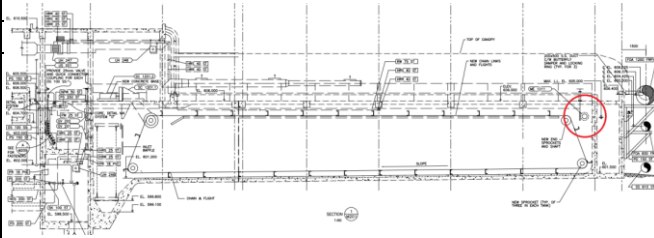
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:	M15-2L – Skimmer
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #2	Description:

The skimmer is in a rusty/scaled condition. Operations noted without occasional movement of the skimmer, they are prone to seizing.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters.
- Consider a revised design for better reliability. All manufacturers' maintenance manuals of moving parts shall be followed.



Item No:

M01-2C – Drive Motor / Drive Gearbox

Action Plan & Resolution Timeline Required:

1 year

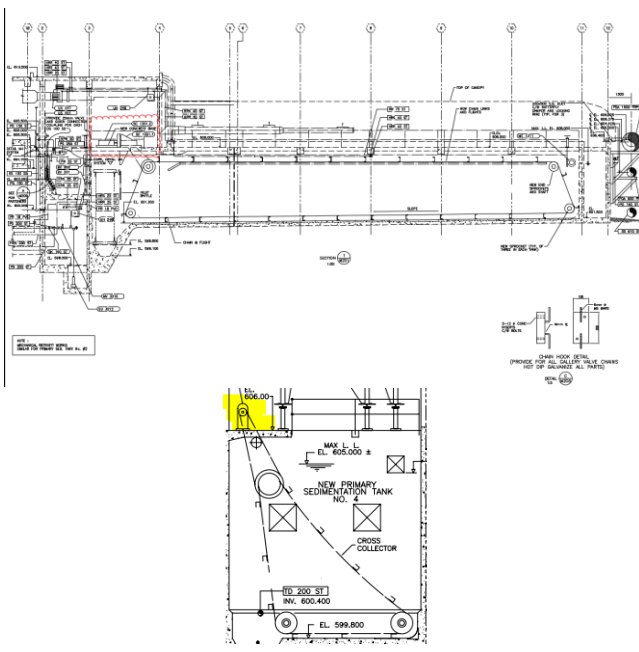
Repair Priority:

P3

Location Detail: Tank #2

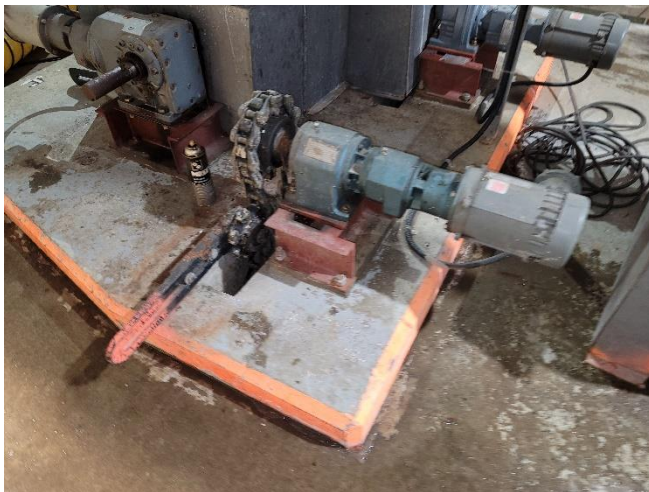
Description:

The motor and gearbox were in a fair condition.



Required Action:

- All manufacturers' maintenance manuals of drivers and motors shall be followed.
- A mechanical/electrical engineering review may be performed. Detailed data logging/reviewing may be conducted to detect potential operational issues by observing the variance in the load/data log results.



Item No:

M02-2C – Collector Chain

Action Plan & Resolution Timeline Required:

1 year

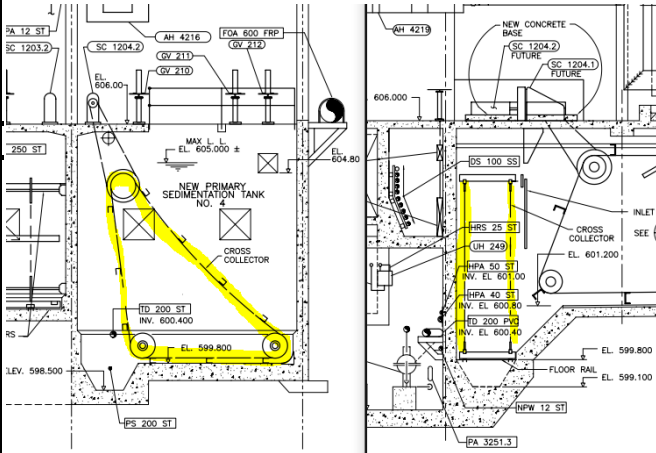
Repair Priority:

P2

Location Detail: Tank #2

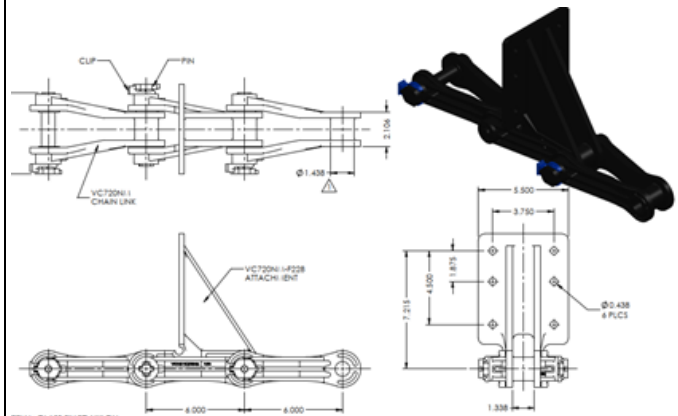
Description:

The collector chains were in fair conditions.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



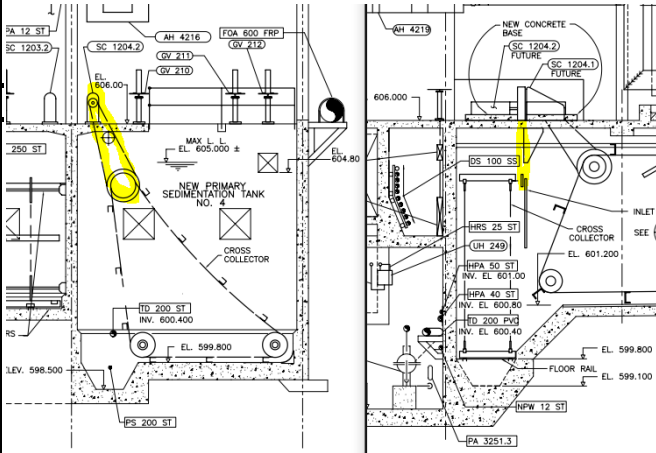
Item No: M03-2C – Drive Chain

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

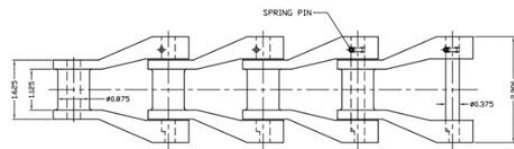
Location Detail: Tank #2 Description:

The drive chains were in fair conditions.



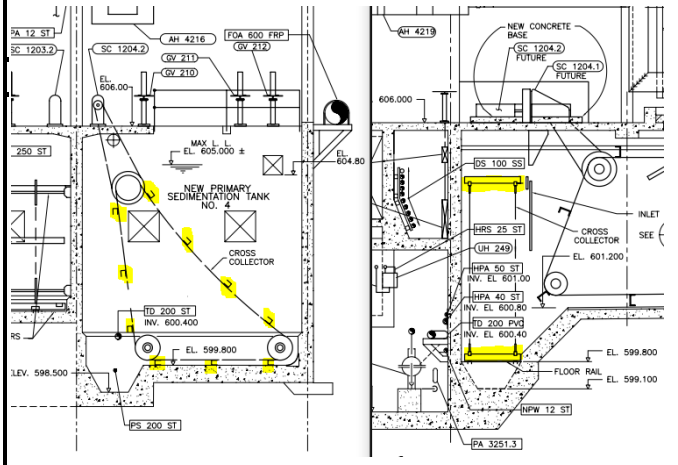
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:	M04-2C – Wear Shoes
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

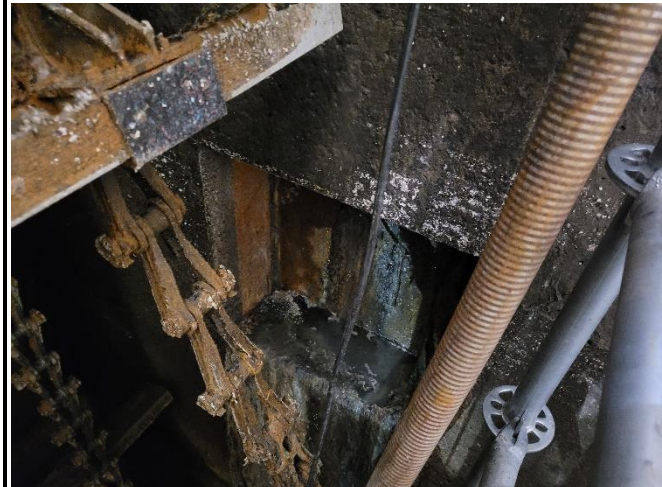
Location Detail: Tank #2	Description:
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The wear shoes were in fair conditions. No major deficiencies were detected.

Required Action:

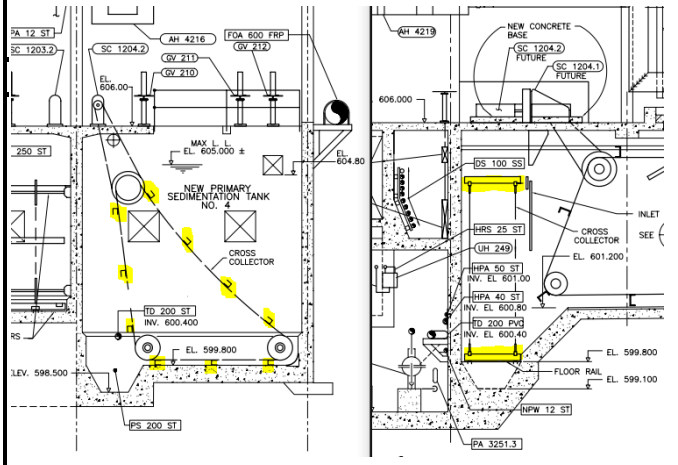
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:	M05-2C – Filler Blocks
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

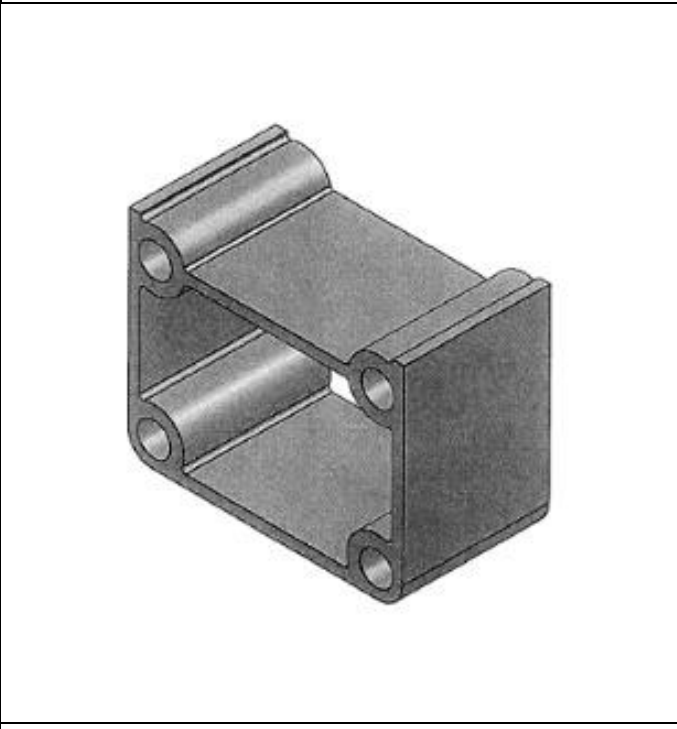
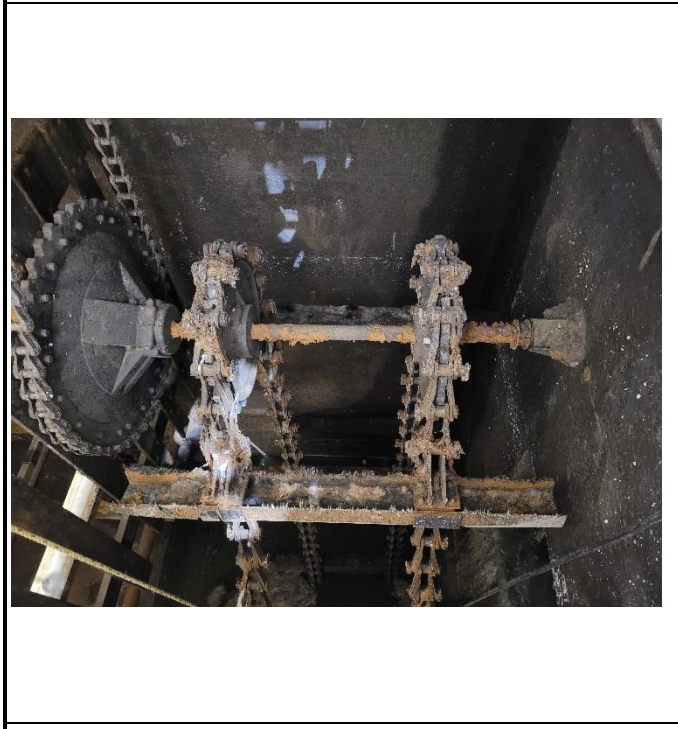
Location Detail: Tank #2	Description:
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The filler blocks were in fair conditions. No major deficiencies were detected.



Required Action:

- Inspection for all the fasteners shall be conducted periodically.



Item No:

M06-2C – C-Channel Fiberglass Flights

Action Plan & Resolution Timeline Required:

1 year

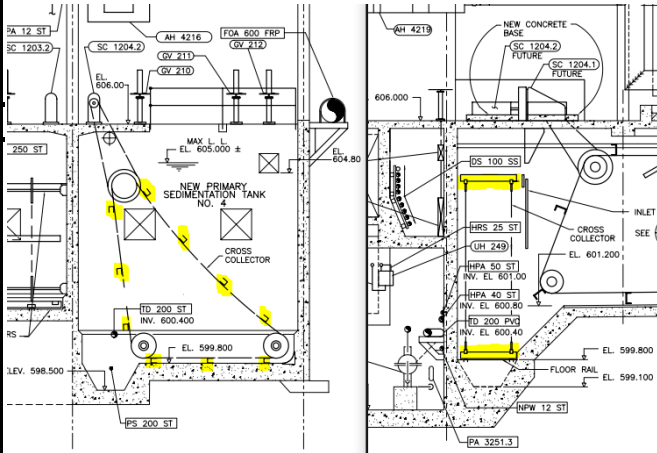
Repair Priority:

P2

Location Detail: Tank #2

Description:

The flight assembly were in fair conditions.



Required Action:

- An engineering investigation shall be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



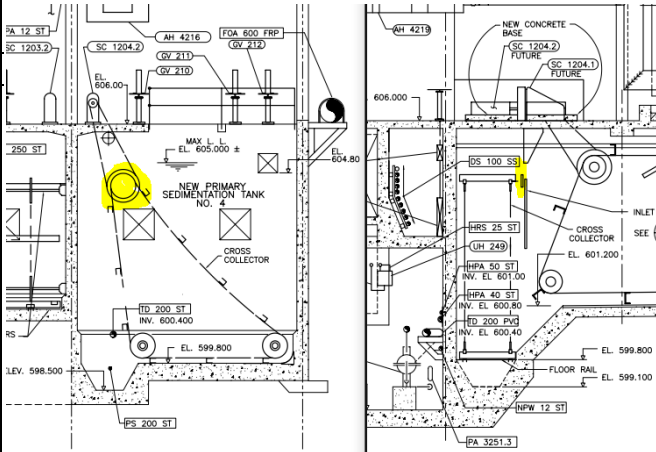
Item No: M07-2C – Drive Sprocket

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

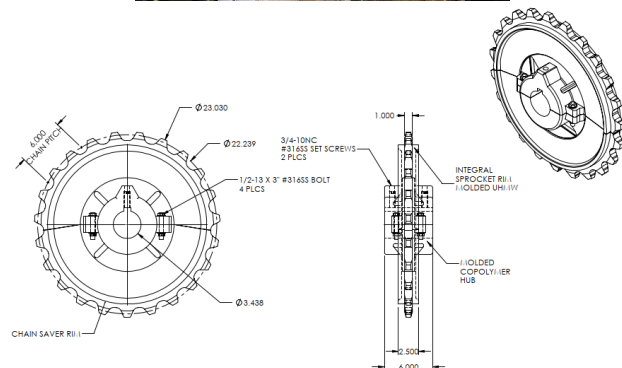
Location Detail: Tank #2 Description:

The sprockets on the shaft were in a rusty/scaled condition.



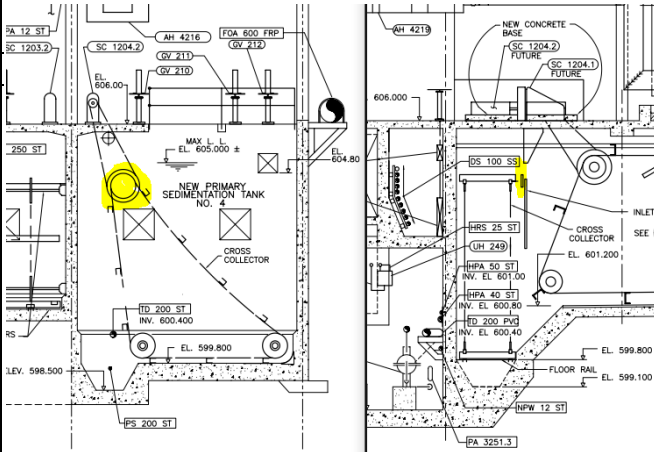
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



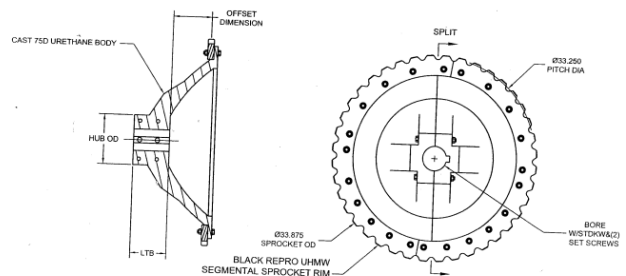
Item No:	M08-2C – Dished Offset Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #2	Description:

The sprockets on the shaft were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



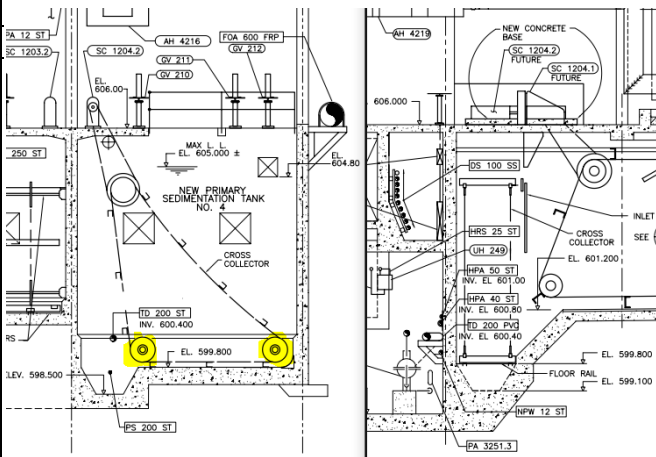
Item No: M09-2C – Idler Sprocket

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

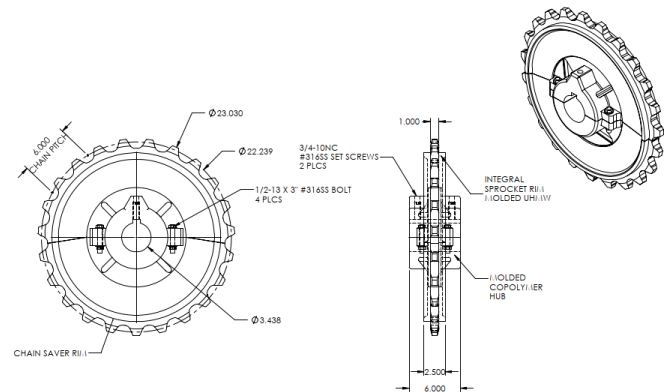
Location Detail: Tank #2 Description:

The sprockets on the shaft were in a rusty/scaled condition. The shaft corrosion potentially caused restrictions in the movement of the sprockets.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No: M10-2C – Shear Pin Sprocket

Action Plan & Resolution Timeline Required: 1 year

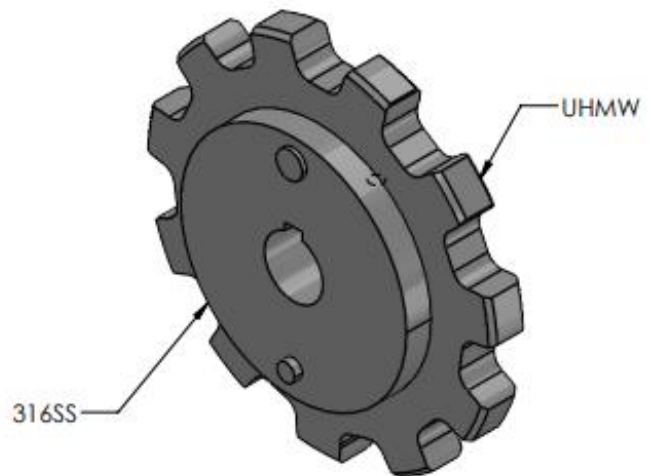
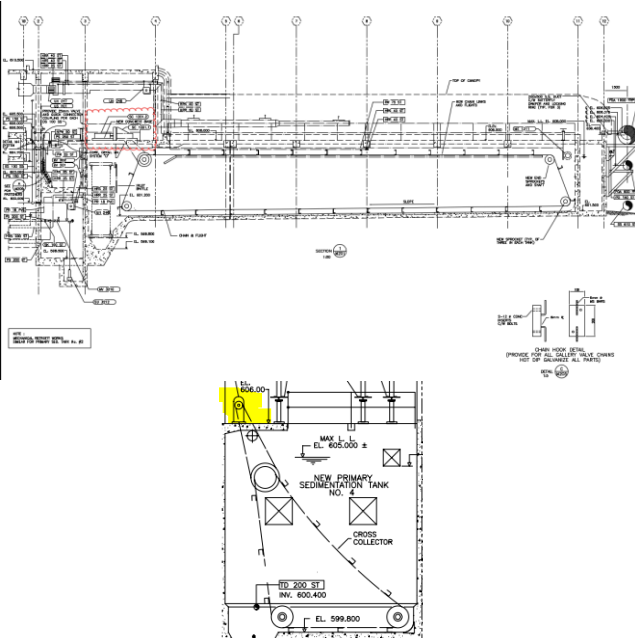
Repair Priority: **P2**

Location Detail: Tank #2 Description:

The sprockets on the drive motor shaft were in fair condition.

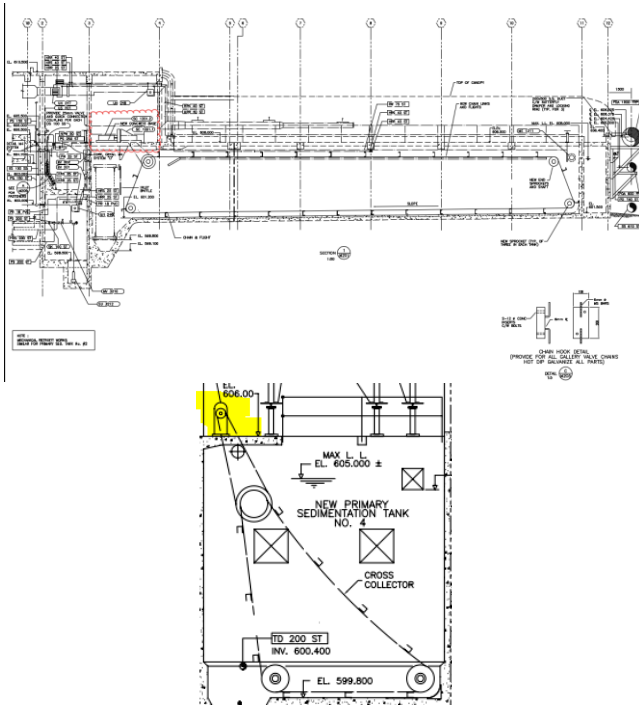
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



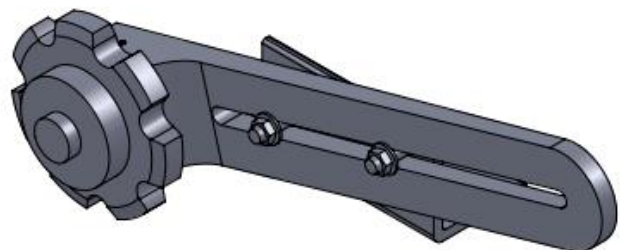
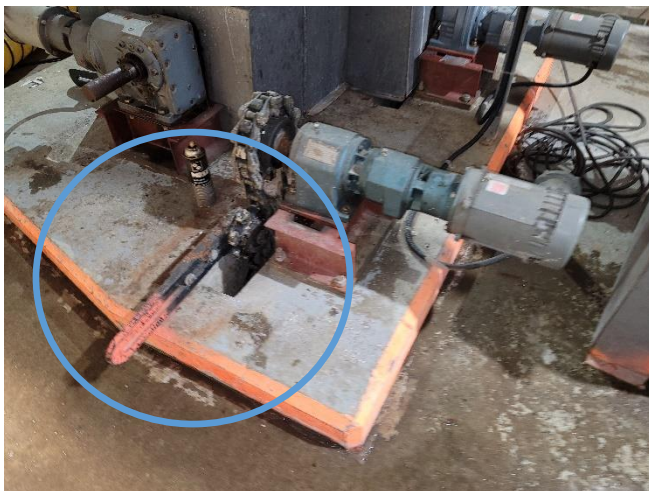
Item No:	M11-2C – Take Up Assembly
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #2	Description:

The Take Up Assemblies were in fair condition.



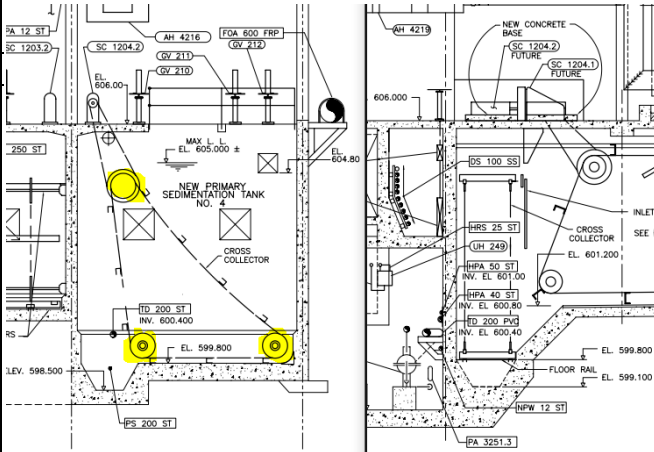
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No:	M12-2C – Wall Bearings
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #2	Description:

The wall bearings were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



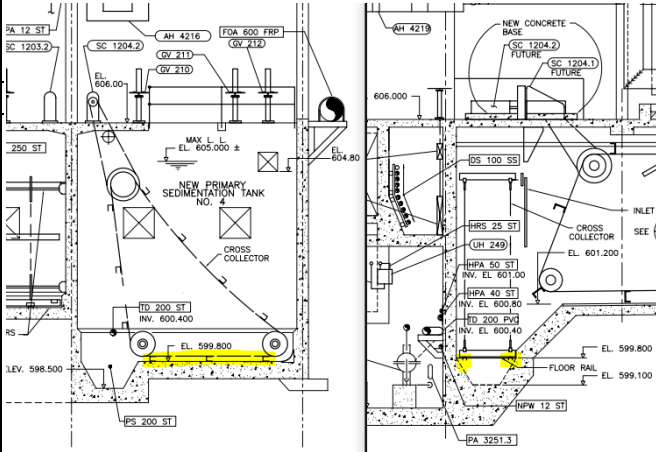
Item No: M13-2C – Collector Wear Strip

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #2 Description:

Not accessible.



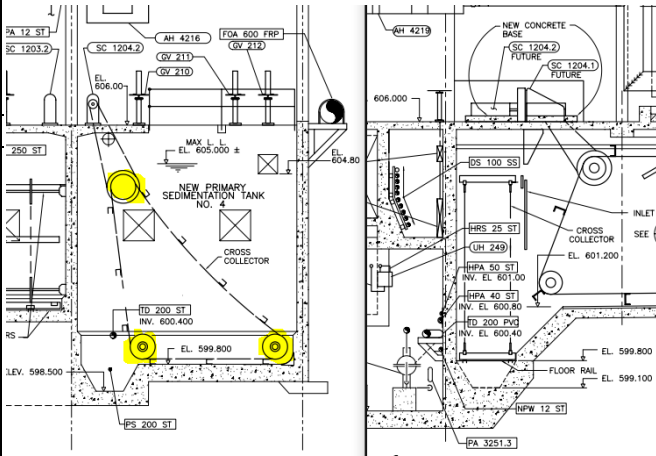
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:	M14-2C – Shafts, Pins and set collars
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #2	Description:

The shafts were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:

M01-3L – Drive Motor / Drive Gearbox

Action Plan & Resolution Timeline Required:

1 year

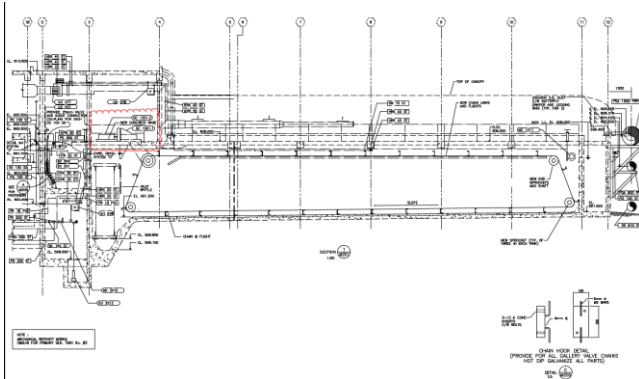
Repair Priority:

P3

Location Detail: Tank #3

Description:

The motor and gearbox were in a fair condition. However, they are in a corrosive environment and is operating continuously. Periodic maintenance plan is required.



Required Action:

- All manufacturers' maintenance manuals of drivers and motors shall be followed.
- A mechanical/electrical engineering review may be performed. Detailed data logging/reviewing may be conducted to detect potential operational issues by observing the variance in the load/data log results.



Item No:

M02-3L – Collector Chain

Action Plan & Resolution Timeline Required:

1 year

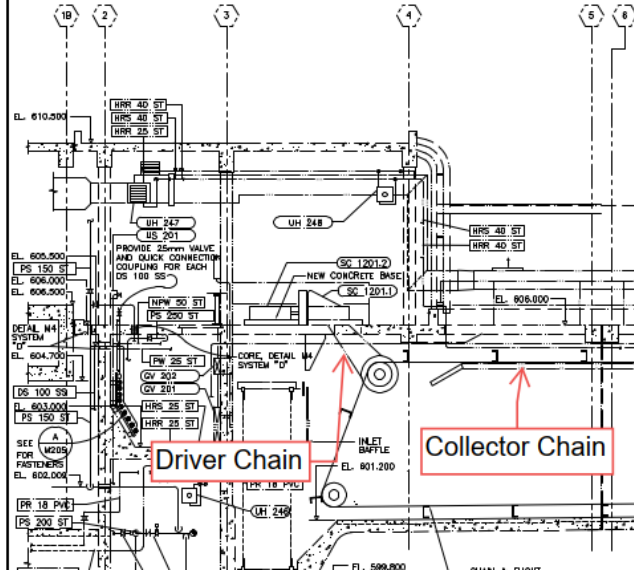
Repair Priority:

P2

Location Detail: Tank #3

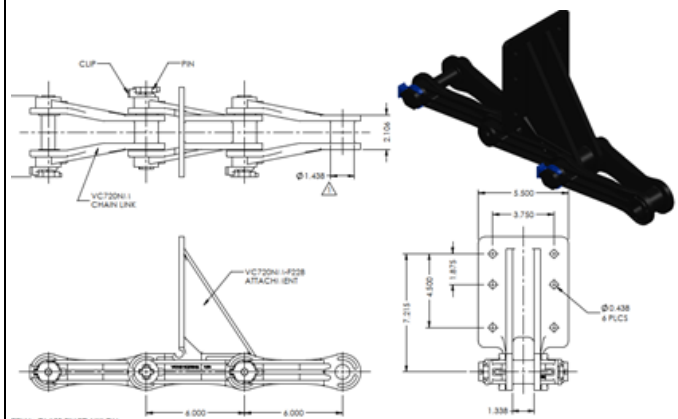
Description:

The collector chains were in fair conditions. However, restrictions on the movement of the wall bearings and sprockets caused increased tension and stresses on the equipment.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



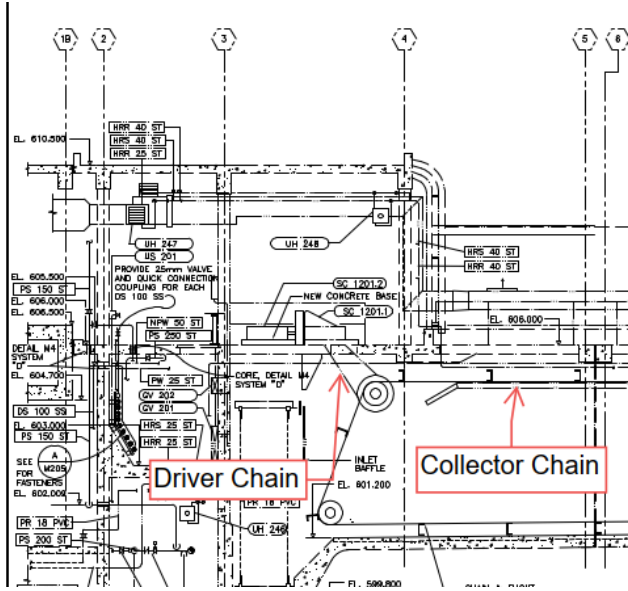
Item No: M03-3L – Drive Chain

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

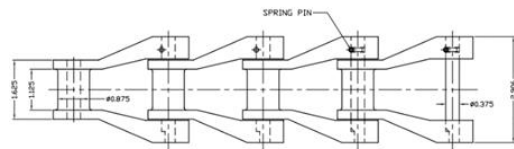
Location Detail: Tank #3 Description:

The drive chains were in fair conditions. However, restrictions on the movement of the wall bearings and sprockets caused increased tension and stresses on the equipment.



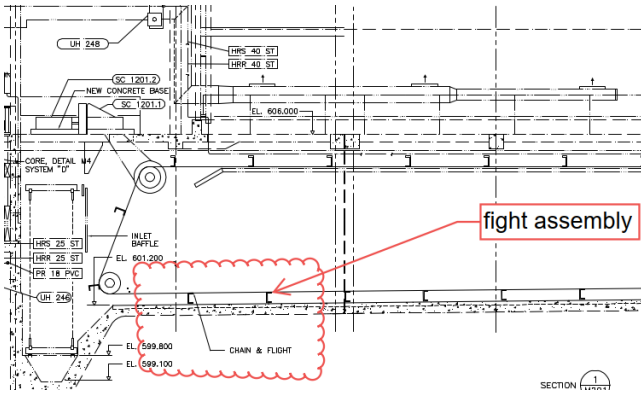
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:	M04-3L – Wear Shoes
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The wear shoes were in fair conditions. No major deficiencies were detected.



Required Action:

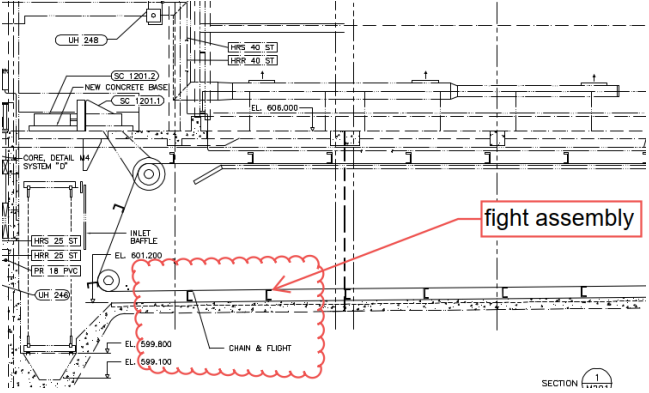
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:	M05-3L – Filler Blocks
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

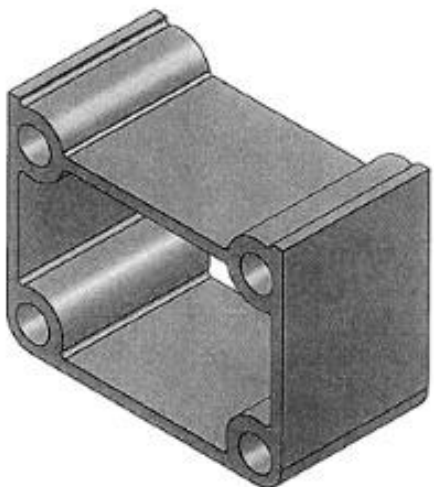
Location Detail: Tank #3	Description:
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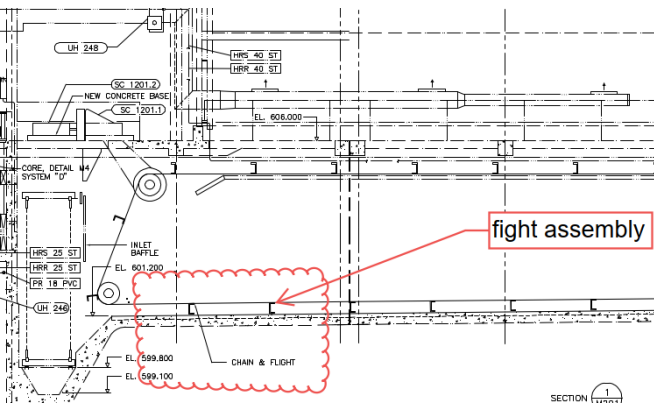
The filler blocks were in fair conditions. No major deficiencies were detected.



Required Action:

- Inspection for all the fasteners shall be conducted periodically.



Item No:	M06-3L – C-Channel Fiberglass Flights
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:
	The flight assembly were in fair conditions. Damage was observed most likely caused when the system failed.
	Required Action:
	<ul style="list-style-type: none"> - An engineering investigation shall be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification. - All manufacturers' maintenance manuals of moving parts shall be followed. - Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers. - Cleaning/removing large scales periodically to reduce the wear and tear.



Item No: M07-3L – Drive Sprocket

Action Plan & Resolution Timeline Required: 1 year

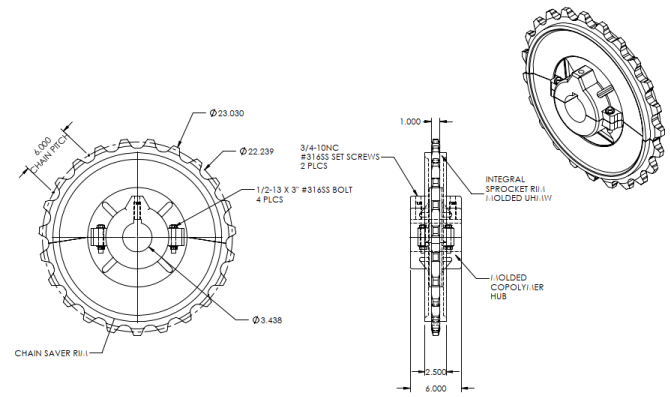
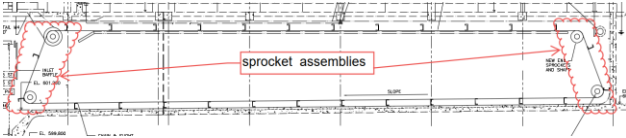
Repair Priority: **P2**

Location Detail: Tank #3 Description:

The sprockets on the shaft were in a rusty/scaled condition.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

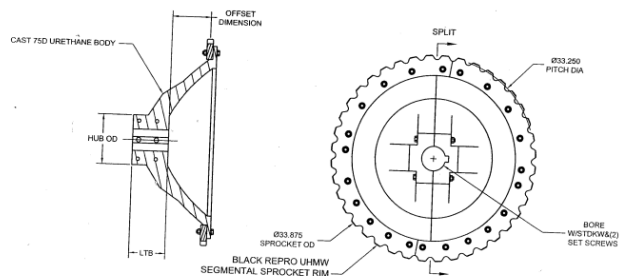
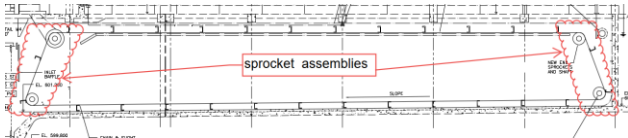


Item No:	M08-3L – Dished Offset Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The sprockets on the shaft were in a rusty/scaled condition.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No: M09-3L – Idler Sprocket

Action Plan & Resolution Timeline Required: 1 year

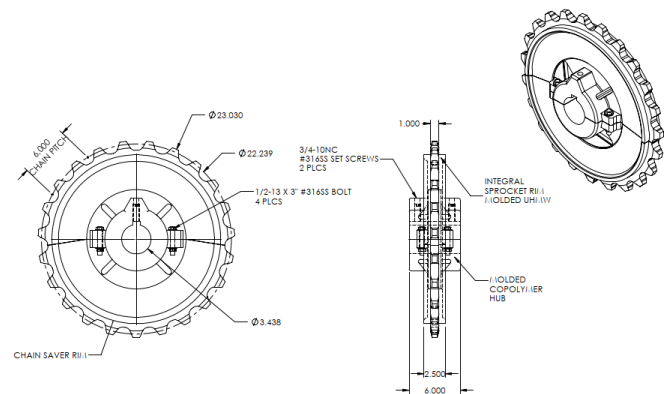
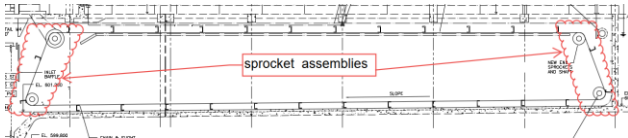
Repair Priority: **P1E**

Location Detail: Tank #3 Description:

The sprockets on the shaft were in a rusty/scaled condition. The shaft corrosion potentially caused restrictions in the movement of the sprockets.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

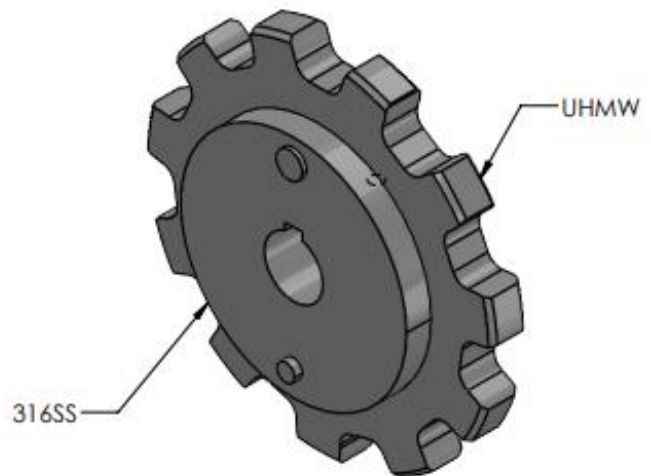
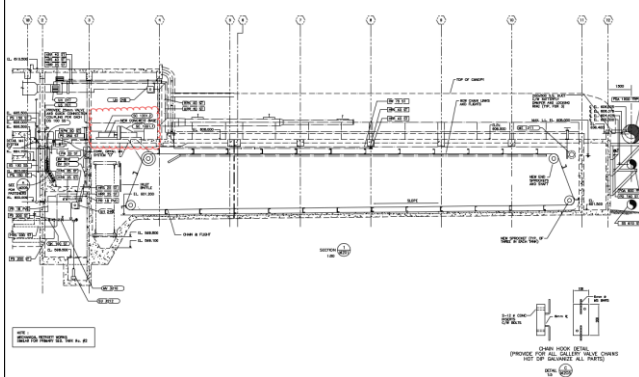


Item No:	M10-3L – Shear Pin Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The sprockets on the drive motor shaft were in fair condition.

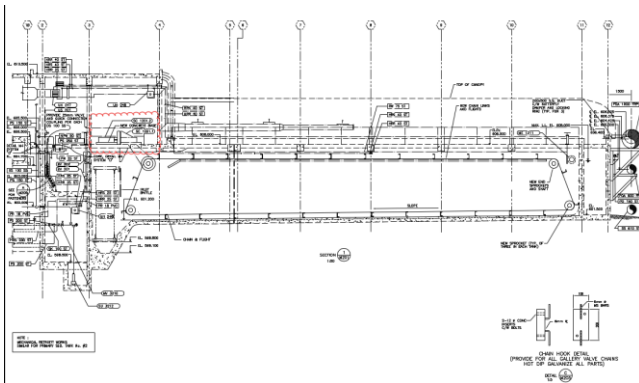
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



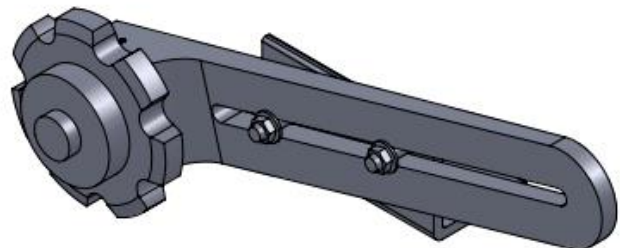
Item No:	M11-3L – Take Up Assembly
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The Take Up Assemblies were in fair condition.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

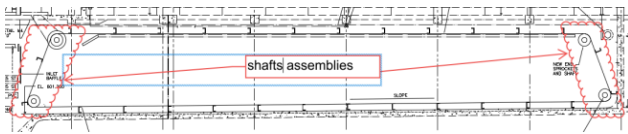


Item No:	M12-3L – Wall Bearings
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #3	Description:

The wall bearings were in a rusty/scaled condition.

Required Action:


- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Project No: 210505

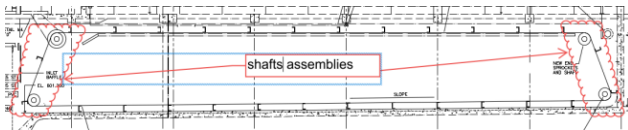
Report: 210505-TEC-03-R1-D

Date: 2022-01-26

Item No:	M13-3L – Collector Wear Strip
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:
	The wear strips were in fair conditions. No major deficiencies were detected.
	Required Action:
	<ul style="list-style-type: none"> - All manufacturers' maintenance manuals of moving parts shall be followed. - Inspection of wear shall be conducted on a regular basis.
	

Item No:	M14-3L – Shafts, Pins and set collars
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The shafts were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



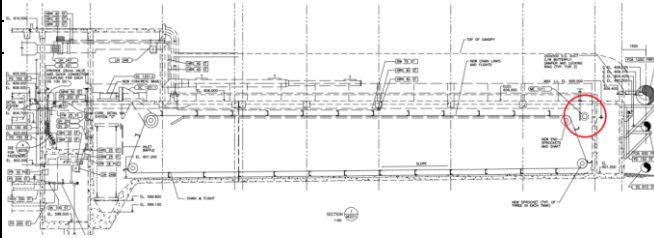
Item No: M15-3L – Skimmer

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

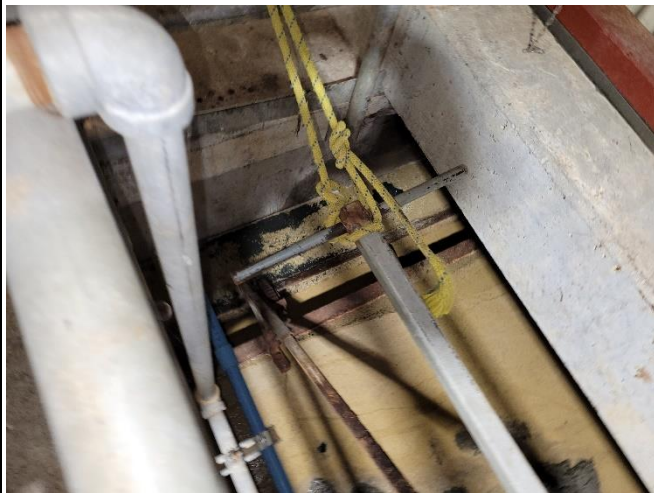
Location Detail: Tank #3 Description:

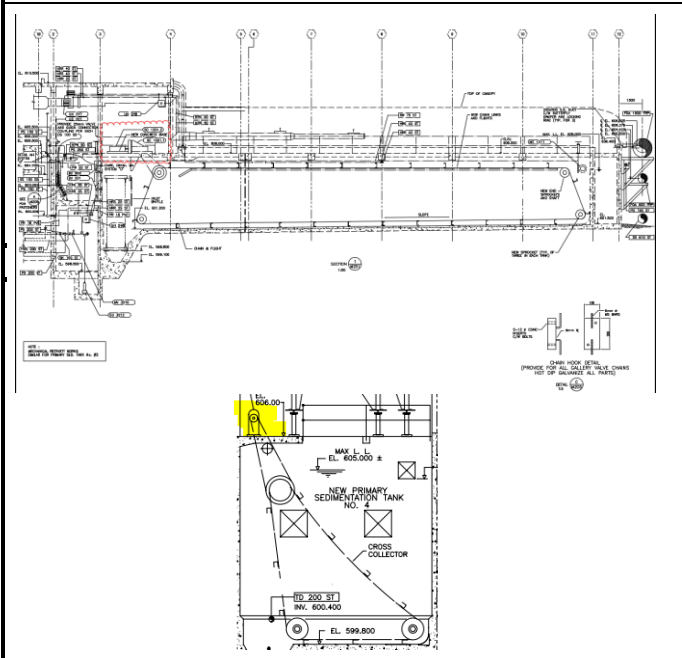
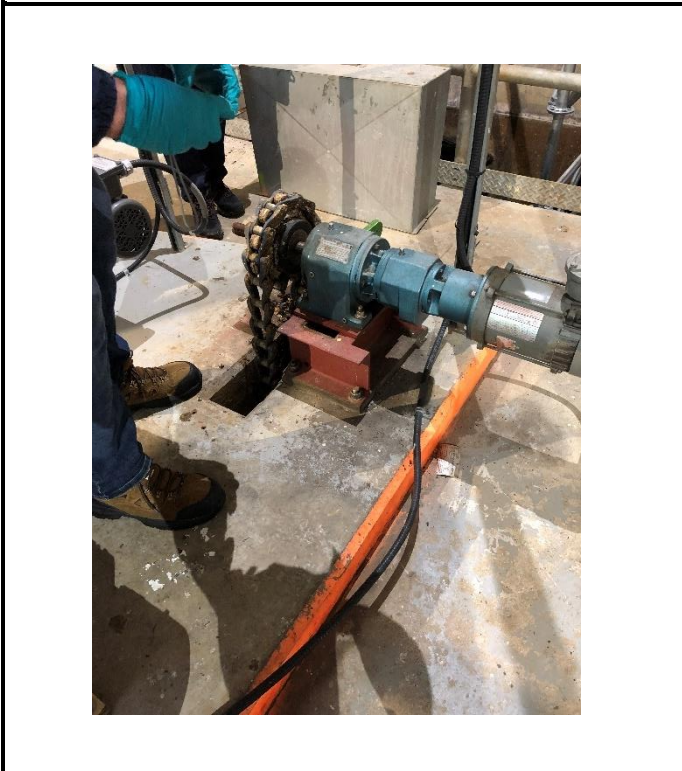
The skimmer is in a rusty/scaled condition. Operations noted without occasional movement of the skimmer, they are prone to seizing.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters.
- Consider a revised design for better reliability.
- All manufacturers' maintenance manuals of moving parts shall be followed.



Item No:	M01-3C – Drive Motor / Drive Gearbox
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P3
Location Detail: Tank #3	Description:
	<p>The motor and gearbox were in a fair condition. However, they are in a corrosive environment and is operating continuously. Periodic maintenance plan is required.</p>
	Required Action:
	<ul style="list-style-type: none"> - All manufacturers' maintenance manuals of drivers and motors shall be followed. - A mechanical/electrical engineering review may be performed. Detailed data logging/reviewing may be conducted to detect potential operational issues by observing the variance in the load/data log results.

Item No:

M02-3C – Collector Chain

Action Plan & Resolution Timeline Required:

1 year

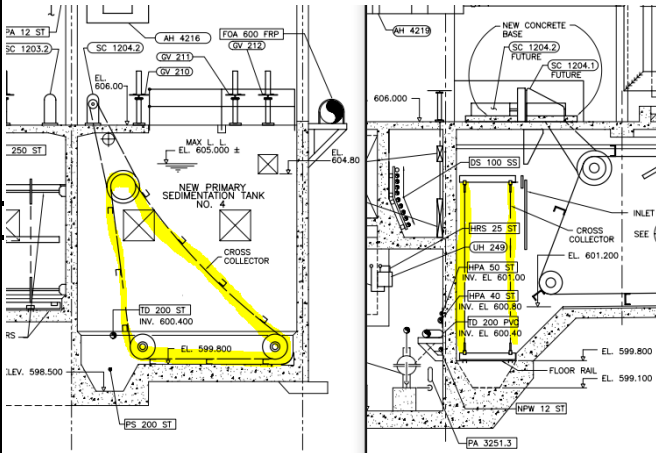
Repair Priority:

P2

Location Detail: Tank #3

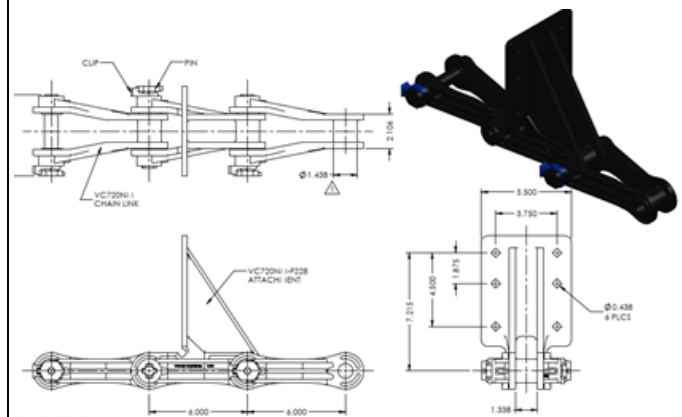
Description:

The collector chains were in fair conditions.



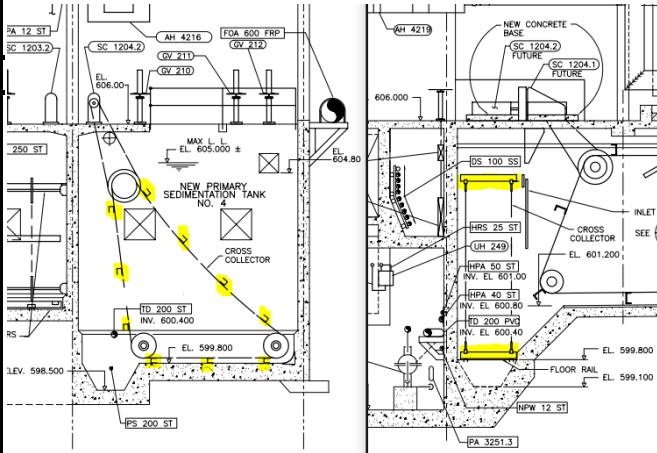
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:	M04-3C – Wear Shoes
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The wear shoes were in fair conditions. No major deficiencies were detected.



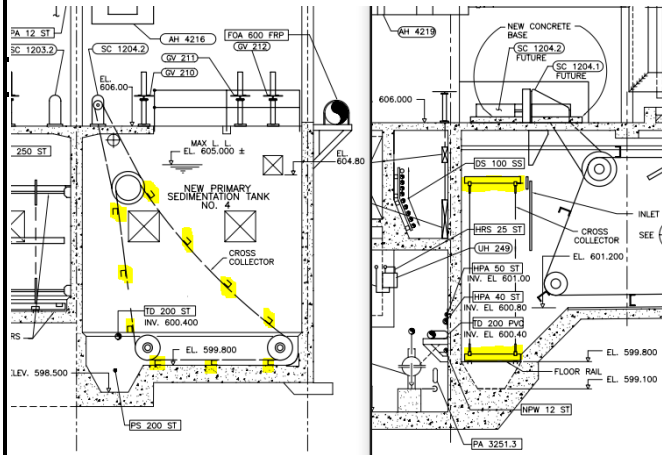
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



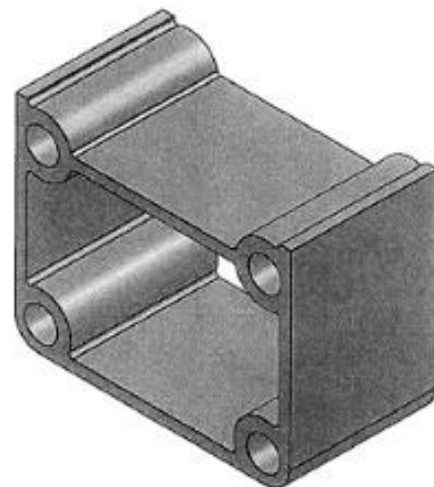
Item No:	M05-3C – Filler Blocks
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The filler blocks were in fair conditions. No major deficiencies were detected.



Required Action:

- Inspection for all the fasteners shall be conducted periodically.



Item No:

M06-3C – C-Channel Fiberglass Flights

Action Plan & Resolution Timeline Required:

1 year

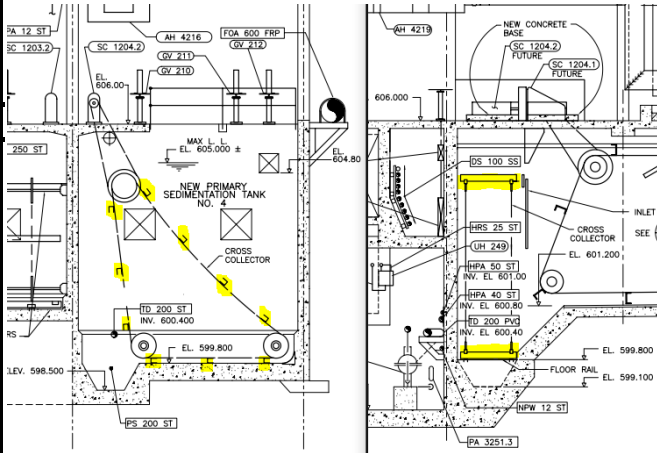
Repair Priority:

P2

Location Detail: Tank #3

Description:

The flight assembly were in fair conditions.



Required Action:

- An engineering investigation shall be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



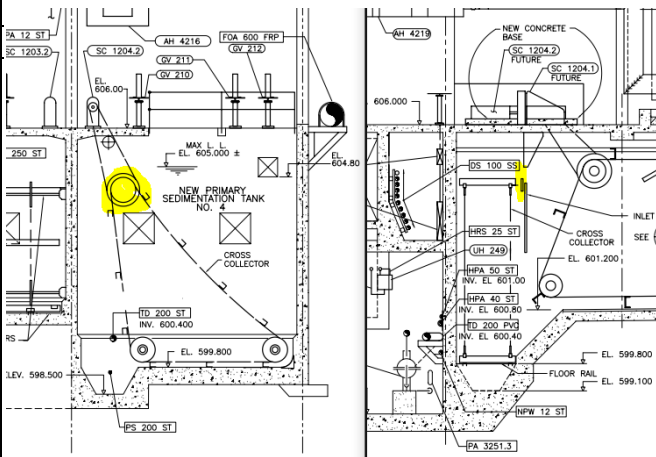
Item No: M07-3C – Drive Sprocket

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

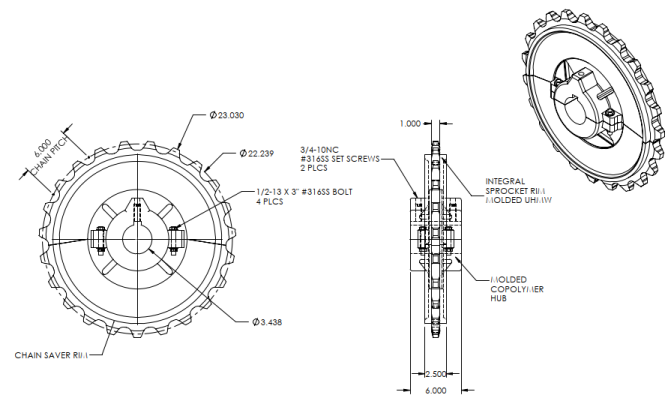
Location Detail: Tank #3 Description:

The sprockets on the shaft were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

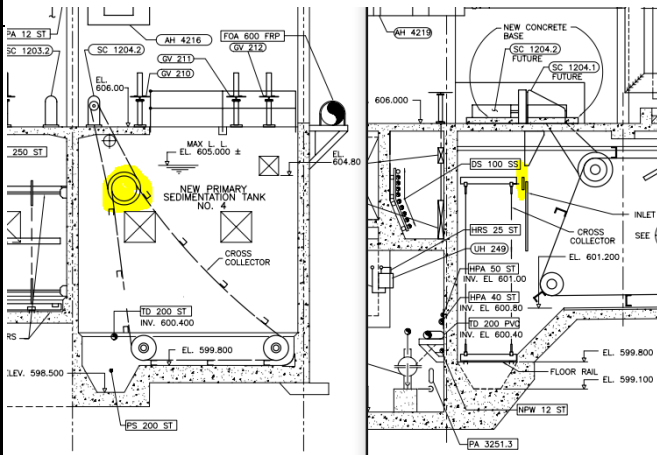


Item No: M08-3C – Dished Offset Sprocket

Action Plan & Resolution Timeline Required: 1 year

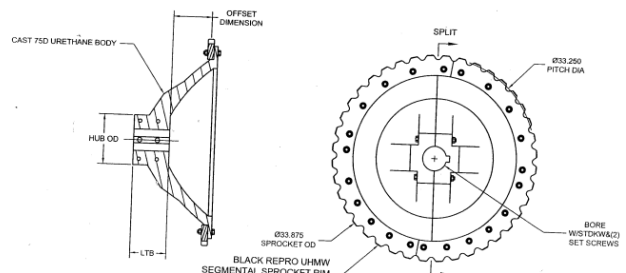
Repair Priority: **P2**

Location Detail: Tank #3
Description: The sprockets on the shaft were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



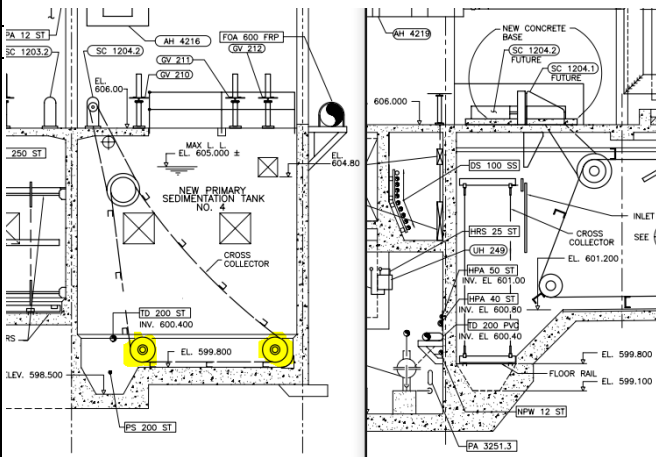
Item No: M09-3C – Idler Sprocket

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

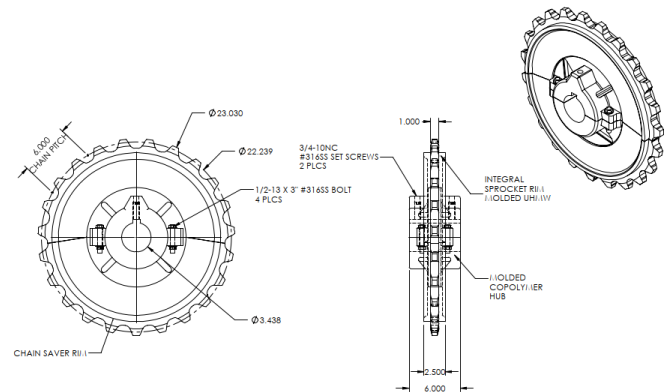
Location Detail: Tank #3 Description:

The sprockets on the shaft were in a rusty/scaled condition. The shaft corrosion potentially caused restrictions in the movement of the sprockets.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

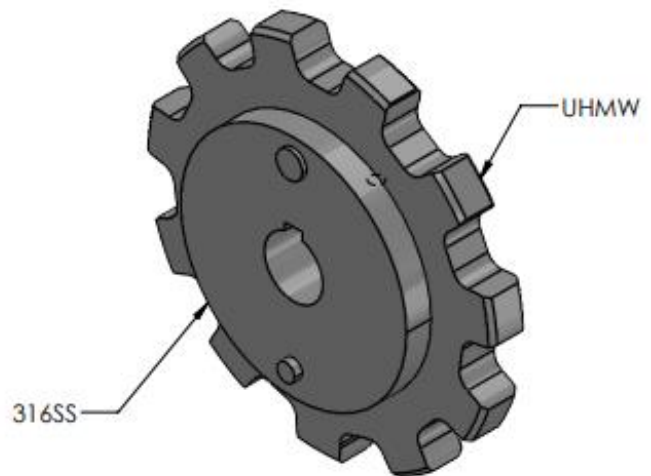
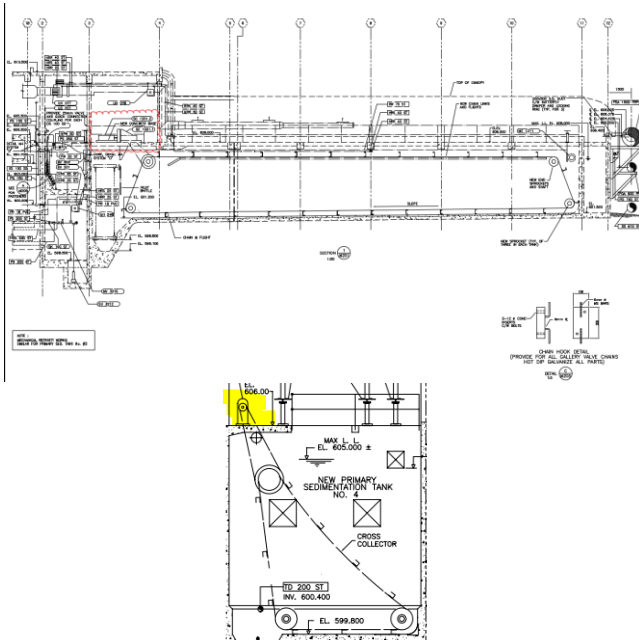


Item No:	M10-3C – Shear Pin Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The sprockets on the drive motor shaft were in fair condition.

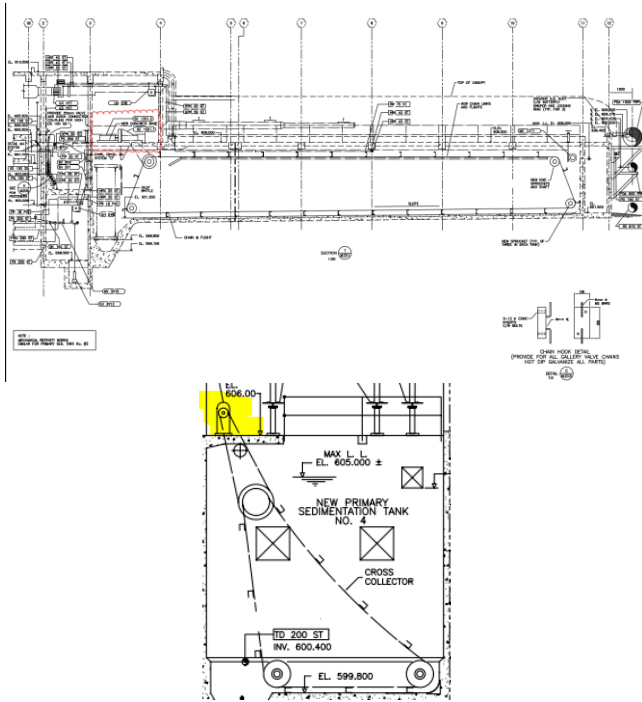
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



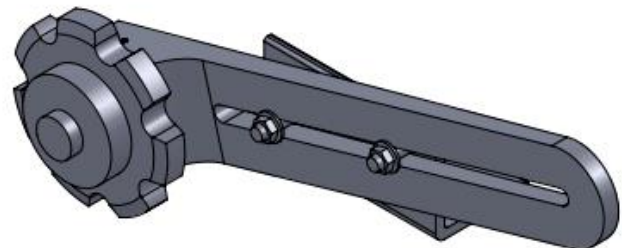
Item No:	M11-3C – Take Up Assembly
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

The Take Up Assemblies were in fair condition.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



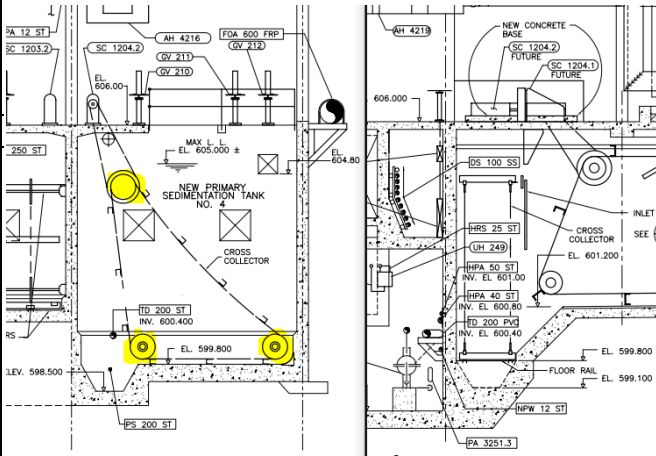
Item No: M12-3C – Wall Bearings

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

Location Detail: Tank #3 Description:

The wall bearings were in a rusty/scaled condition.



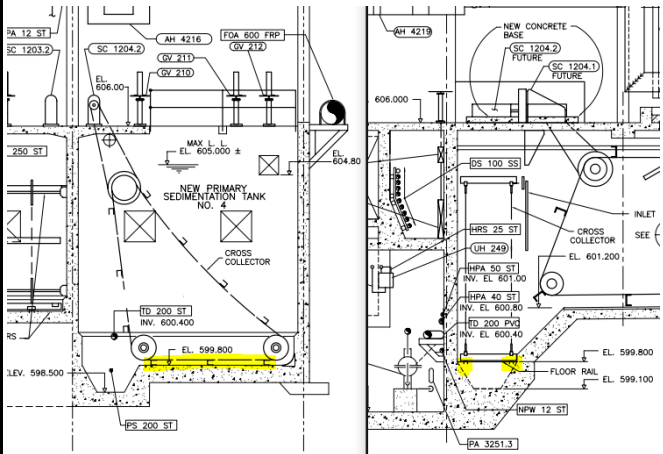
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:	M13-3C – Collector Wear Strip
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

Location Detail: Tank #3	Description: Not accessible.
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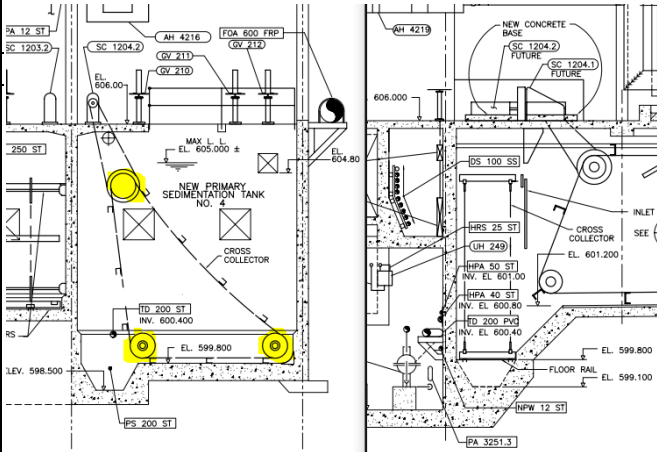
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:	M14-3C – Shafts, Pins and set collars
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #3	Description:

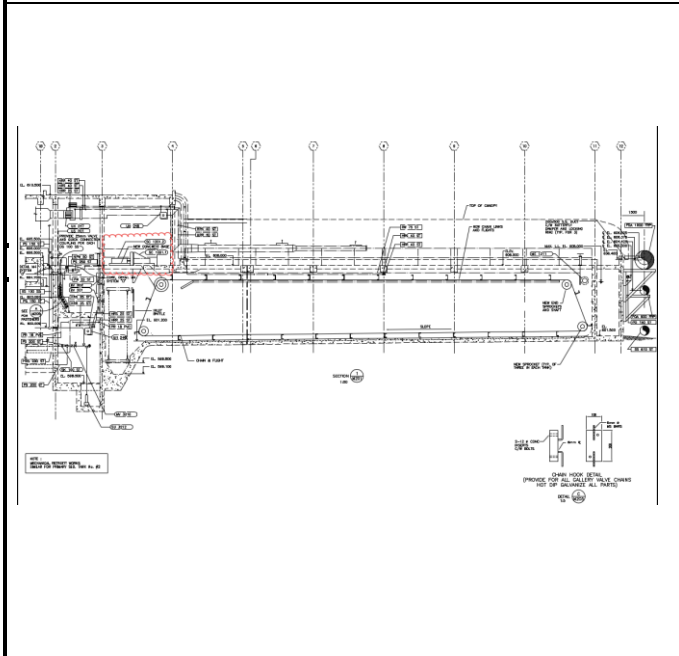
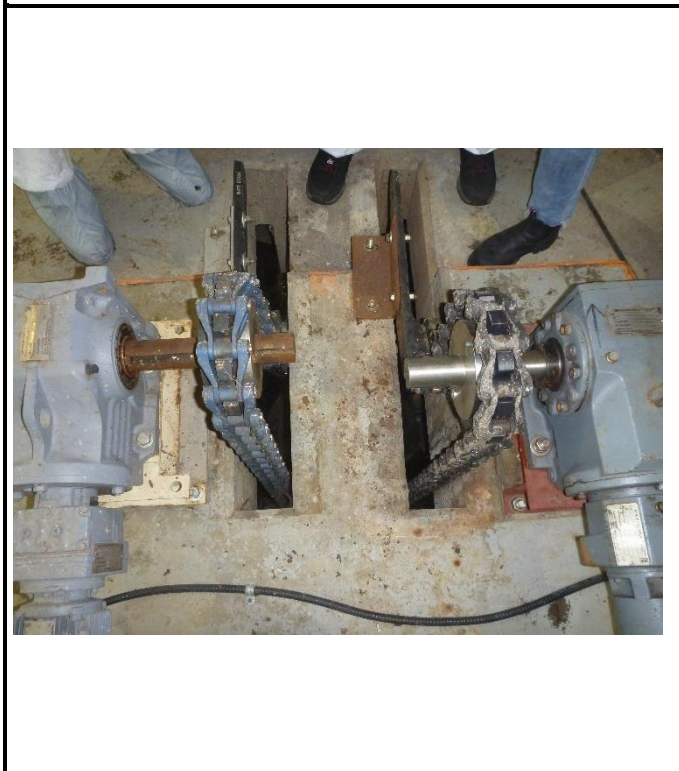
The shafts were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:	M01-4L – Drive Motor / Drive Gearbox
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P3
Location Detail: Tank #4	Description:
	<p>The motor and gearbox were in a fair condition. However, they are in a corrosive environment and is operating continuously. Periodic maintenance plan is required.</p>
	Required Action:
	<ul style="list-style-type: none"> - All manufacturers' maintenance manuals of drivers and motors shall be followed. - A mechanical/electrical engineering review may be performed. Detailed data logging/reviewing may be conducted to detect potential operational issues by observing the variance in the load/data log results.

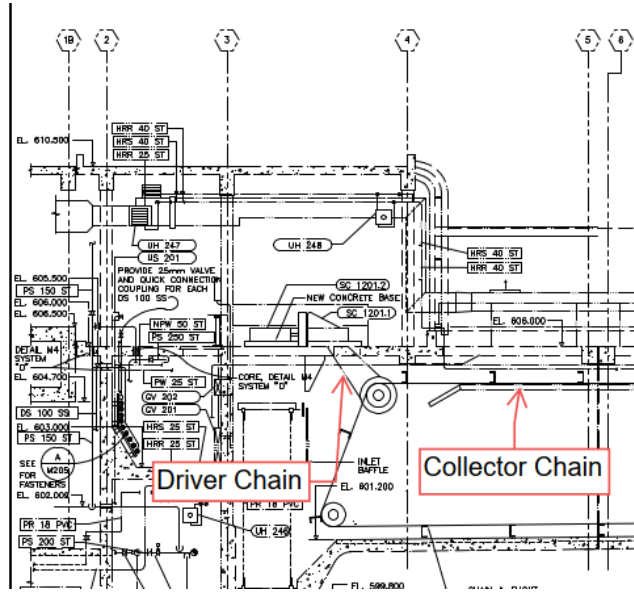
Item No: M03-4L – Drive Chain

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

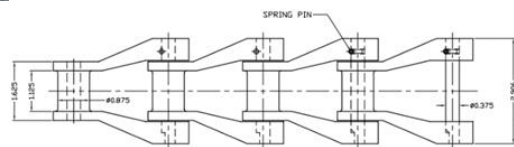
Location Detail: Tank #4

Description:
The drive chains were in fair conditions. However, restrictions on the movement of the wall bearings and sprockets caused increased tension and stresses on the equipment.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



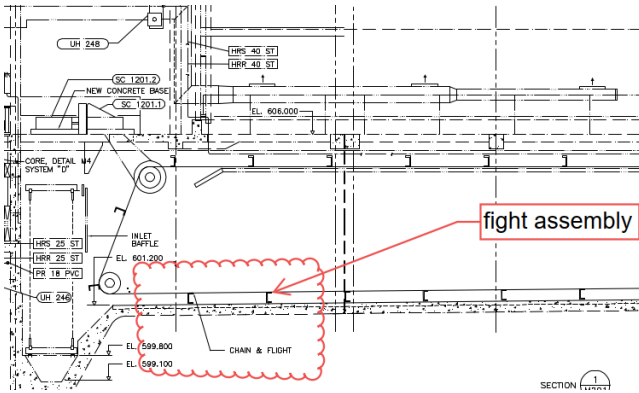
Item No: M04-4L – Wear Shoes

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #4

Description:
The wear shoes were in fair conditions. No major deficiencies were detected.

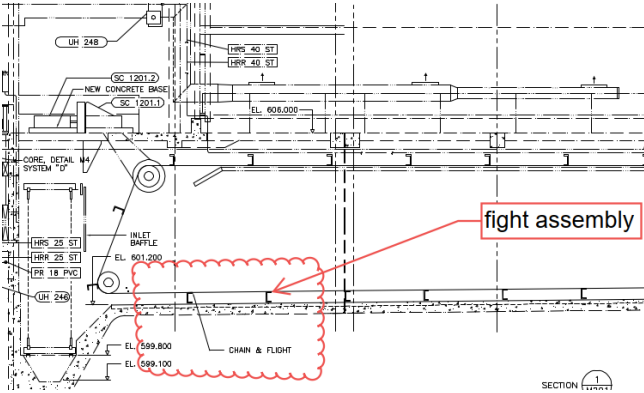


- Required Action:
- All manufacturers' maintenance manuals of moving parts shall be followed.
 - Inspection of wear shall be conducted on a regular basis.



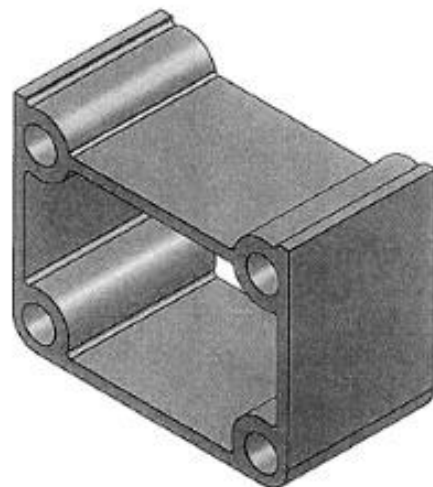
Item No:	M05-4L – Filler Blocks
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #4	Description:

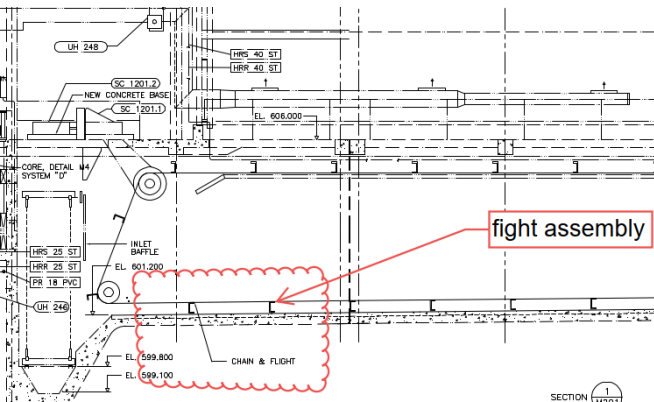


The filler blocks were in fair conditions. No major deficiencies were detected.



Required Action:

- Inspection for all the fasteners shall be conducted periodically.



Item No:	M06-4L – C-Channel Fiberglass Flights
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #4	Description:
	<p>The flight assembly were in fair conditions. Damage was observed most likely caused when the system failed.</p>
	<p>Required Action:</p> <ul style="list-style-type: none"> - An engineering investigation shall be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification. - All manufacturers' maintenance manuals of moving parts shall be followed. - Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers. - Cleaning/removing large scales periodically to reduce the wear and tear.
	

Item No: M07-4L – Drive Sprocket

Action Plan & Resolution Timeline Required: 1 year

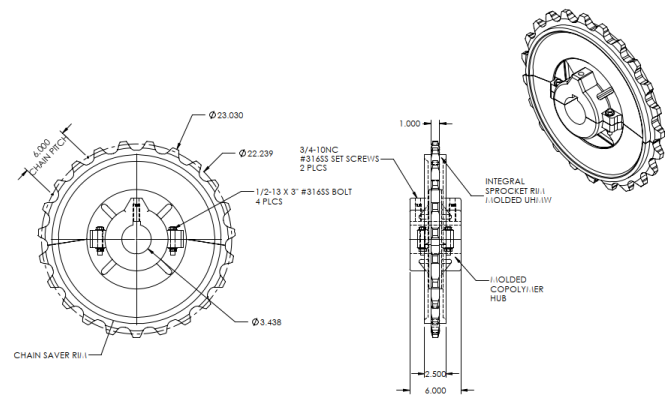
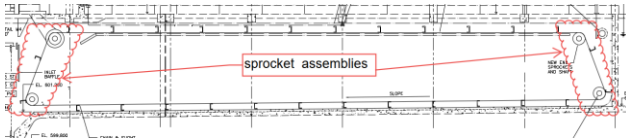
Repair Priority: **P2**

Location Detail: Tank #4 Description:

The sprockets on the shaft were in a rusty/scaled condition.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

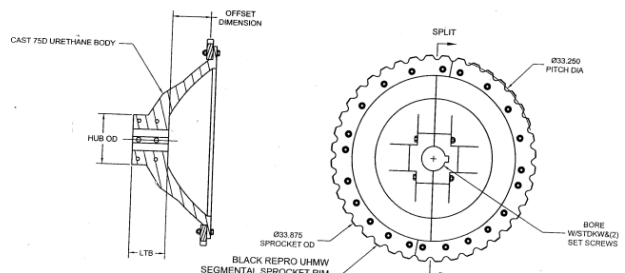
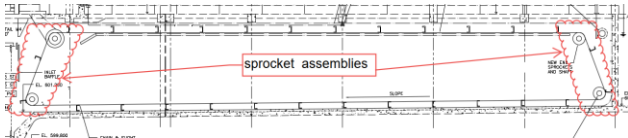


Item No:	M08-4L – Dished Offset Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #4	Description:

The sprockets on the shaft were in a rusty/scaled condition.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No: M09-4L – Idler Sprocket

Action Plan & Resolution Timeline Required: 1 year

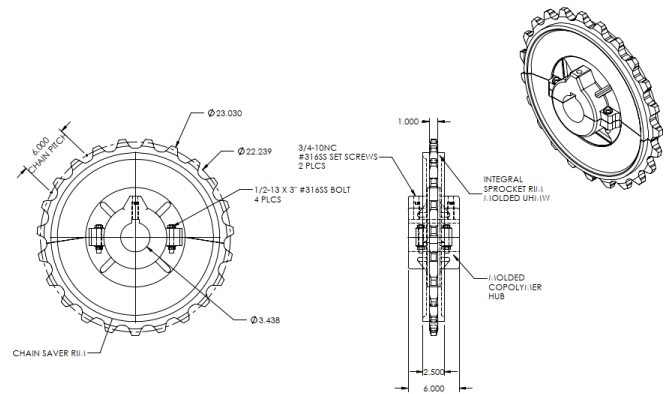
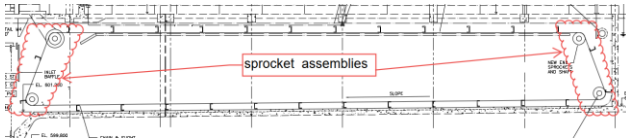
Repair Priority: **P1E**

Location Detail: Tank #4 Description:

The sprockets on the shaft were in a rusty/scaled condition. The shaft corrosion potentially caused restrictions in the movement of the sprockets.

Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

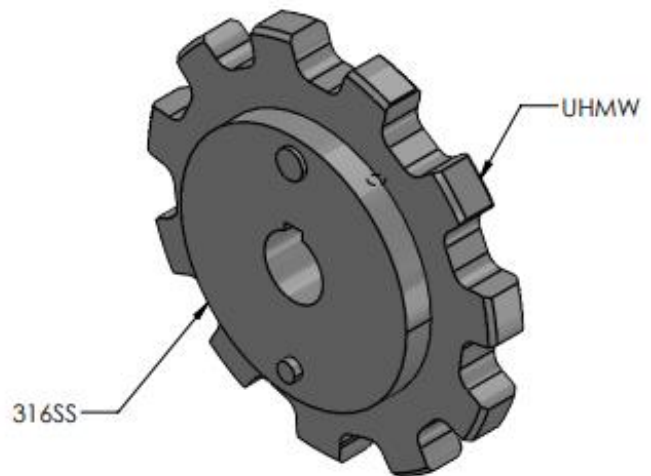
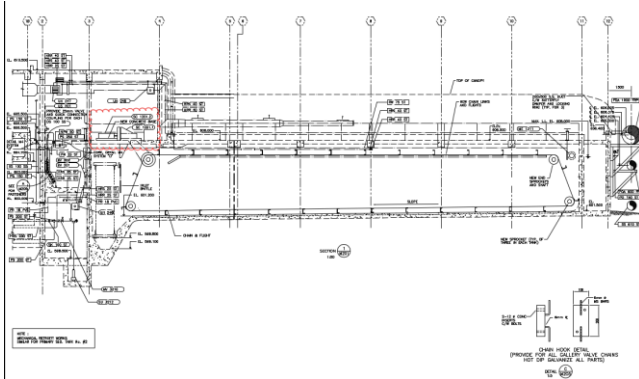


Item No:	M10-4L – Shear Pin Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #4	Description:

The sprockets on the drive motor shaft were in fair condition.

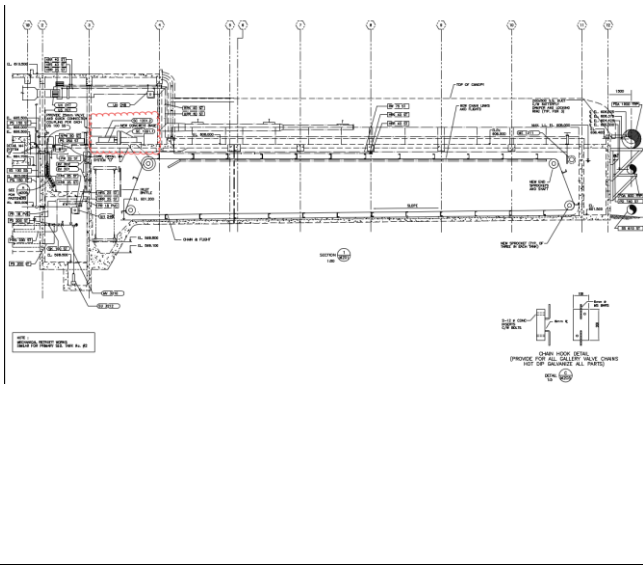
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



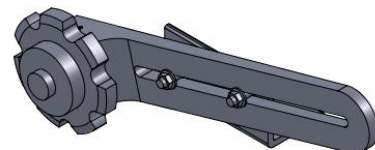
Item No:	M11-4L – Take Up Assembly
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #4	Description:

The Take Up Assemblies were in fair condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration including take up assembly shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, take up assembly and drivers and the driving chain has tensed up properly.
- Cleaning/removing scales periodically to reduce the wear and tear.



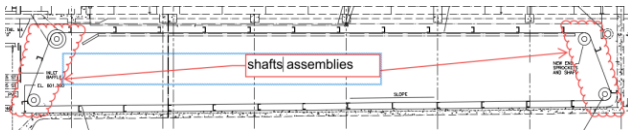
Item No: M12-4L – Wall Bearings

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

Location Detail: Tank #4 Description:

The wall bearings were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:	M13-4L – Collector Wear Strip
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1R
Location Detail: Tank #4	Description:
	Missing bolts and consequently lifted off strip. This lifting off can act as an obstacle against the flights.
	Required Action:
	<ul style="list-style-type: none"> - All manufacturers' maintenance manuals of moving parts shall be followed. - Cleaning/removing scales periodically to reduce the wear and tear. - Moving of the flights shall be inspected periodically since any asymmetrical moving of the flights can be flagged as malfunctioning of some parts of collector system including the Wear strips integrity.



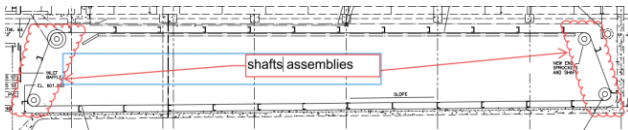
Item No: M14-4L – Shafts, Pins and set collars

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #4 Description:

The shafts were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



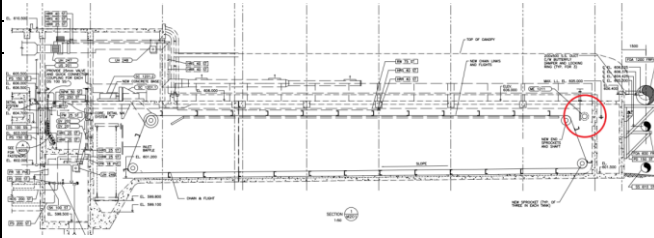
Item No: M15-4L – Skimmer

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

Location Detail: Tank #4 Description:

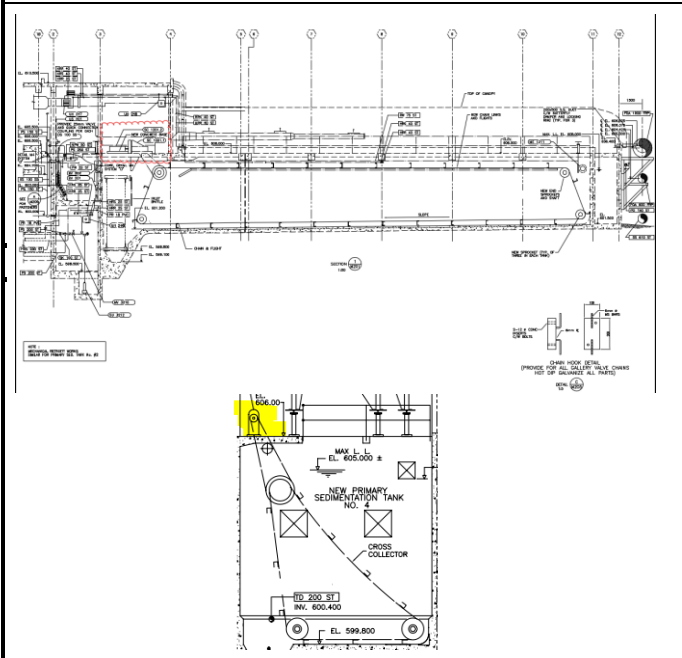

The skimmer is in a rusty/scaled condition. Operations noted without occasional movement of the skimmer, they are prone to seizing.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters.
- Consider a revised design for better reliability.
- All manufacturers' maintenance manuals of moving parts shall be followed.



Item No:	M01-4C – Drive Motor / Drive Gearbox
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P3
Location Detail: Tank #4	Description:
	<p>The motor and gearbox were in a fair condition. However, they are in a corrosive environment and is operating continuously. Periodic maintenance plan is required.</p>
	Required Action:
	<ul style="list-style-type: none"> - All manufacturers' maintenance manuals of drivers and motors shall be followed. - A mechanical/electrical engineering review may be performed. Detailed data logging/reviewing may be conducted to detect potential operational issues by observing the variance in the load/data log results.

Item No: M02-4C – Collector Chain

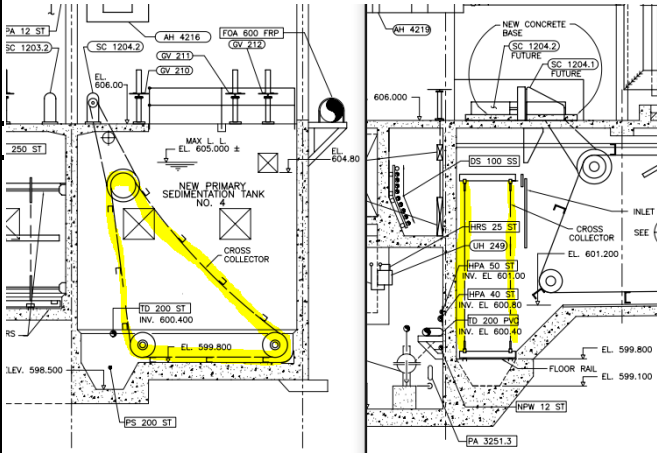
Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #4

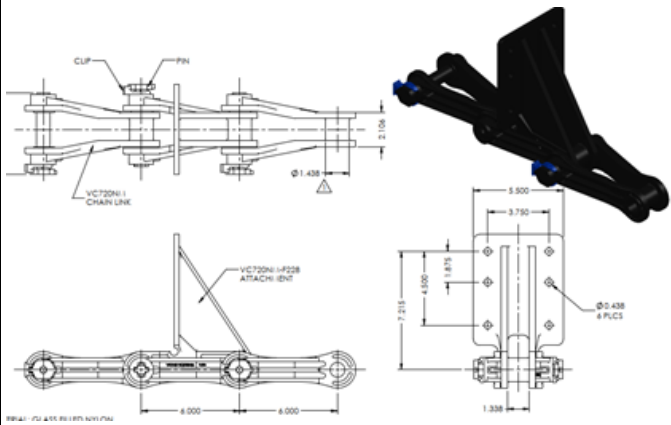
Description:

The collector chains were in fair conditions.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:

M03-4C – Drive Chain

Action Plan & Resolution Timeline Required:

1 year

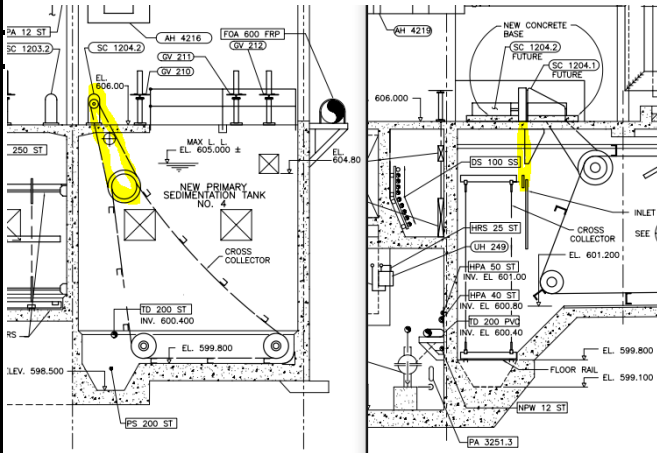
Repair Priority:

P2

Location Detail: Tank #4

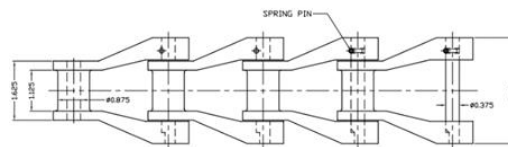
Description:

The drive chains were in fair conditions.



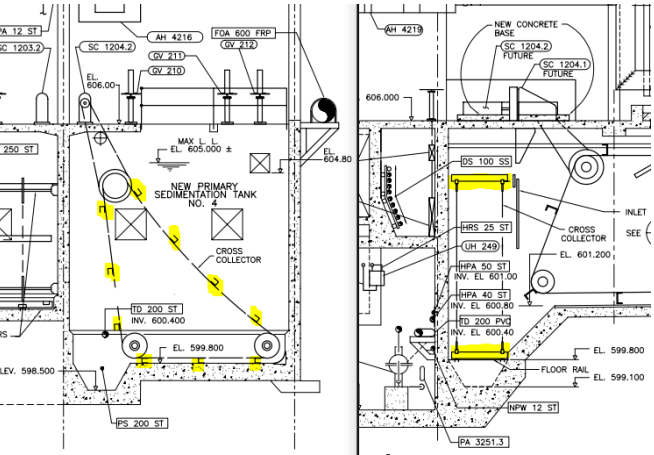
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.



Item No:	M04-4C – Wear Shoes
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #4	Description:

The wear shoes were in fair conditions. No major deficiencies were detected.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



Item No:

M05-4C – Filler Blocks

Action Plan & Resolution Timeline Required:

1 year

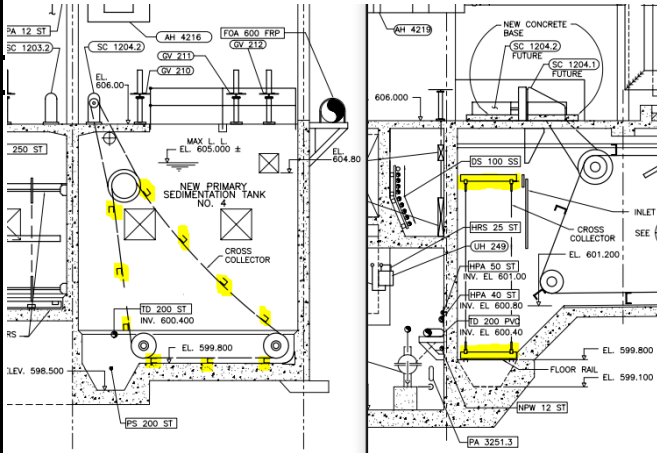
Repair Priority:

P2

Location Detail: Tank #4

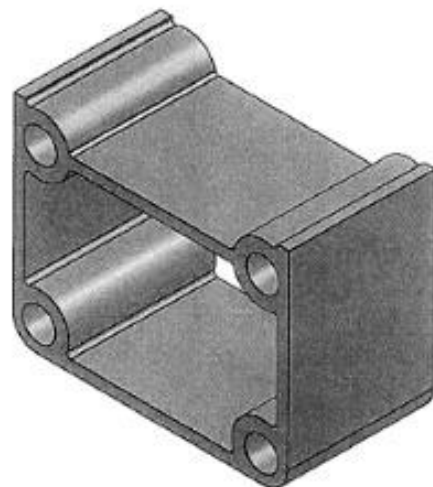
Description:

The filler blocks were in fair conditions. No major deficiencies were detected.



Required Action:

- Inspection for all the fasteners shall be conducted periodically.



Item No:

M06-4C – C-Channel Fiberglass Flights

Action Plan & Resolution Timeline Required:

1 year

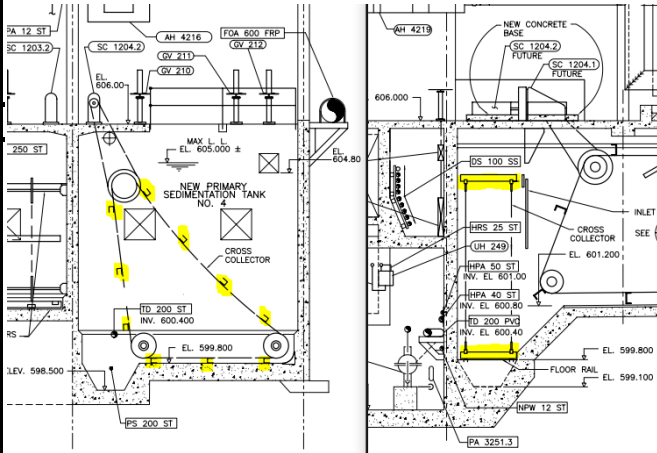
Repair Priority:

P2

Location Detail: Tank #4

Description:

The flight assembly were in fair conditions.



Required Action:

- An engineering investigation shall be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing large scales periodically to reduce the wear and tear.

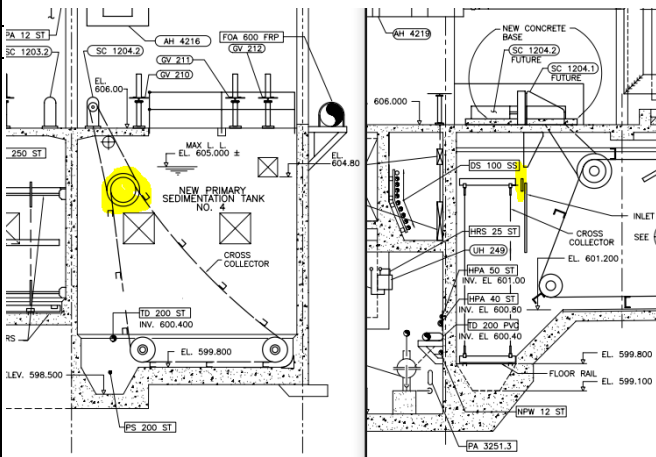


Item No: M07-4C – Drive Sprocket

Action Plan & Resolution Timeline Required: 1 year

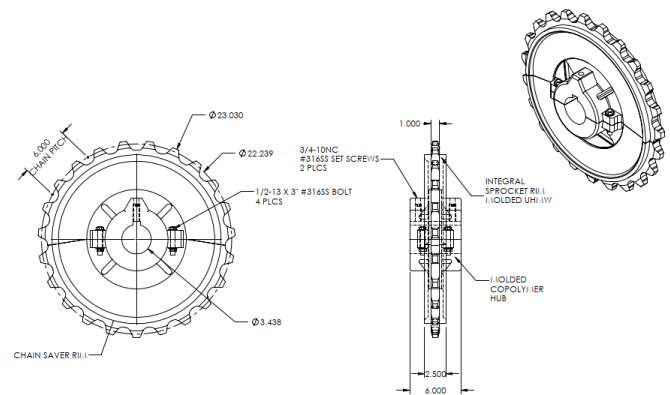
Repair Priority: **P2**

Location Detail: Tank #4
Description: The sprockets on the shaft were in a rusty/scaled condition.



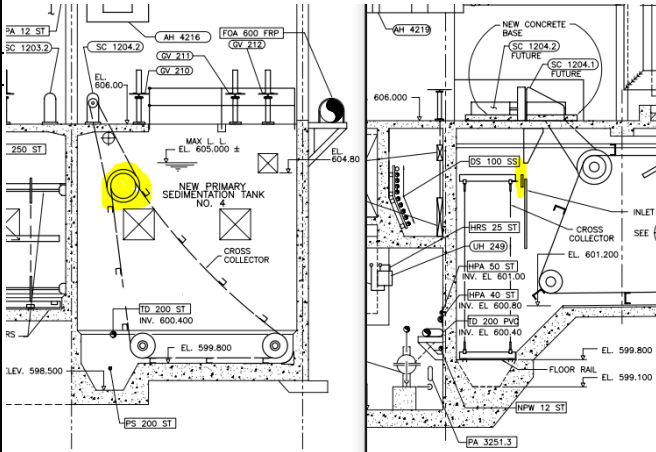
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



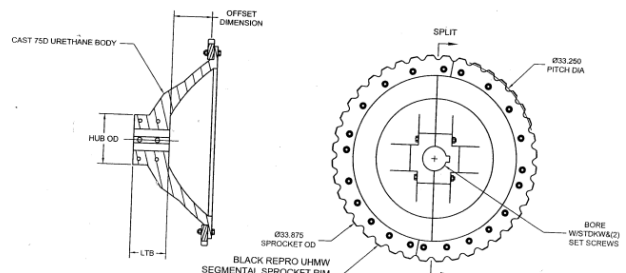
Item No:	M08-4C – Dished Offset Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #4	Description:

The sprockets on the shaft were in a rusty/scaled condition.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



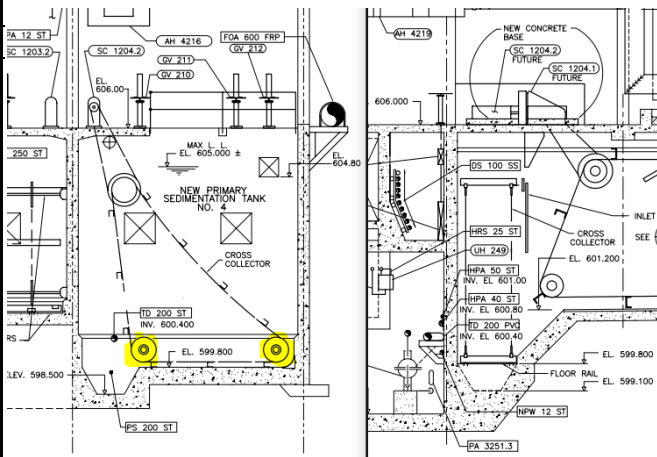
Item No: M09-4C – Idler Sprocket

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

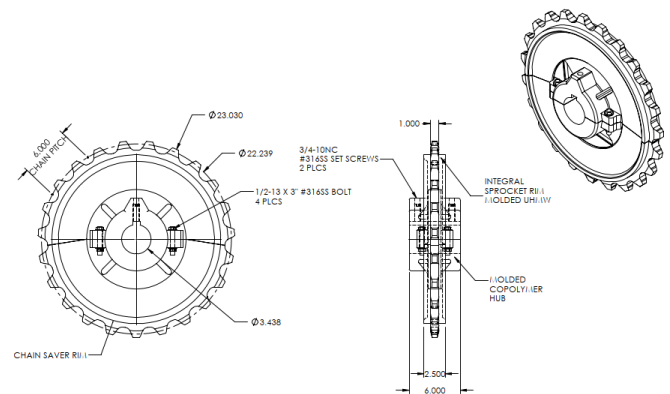
Location Detail: Tank #4 Description:

The sprockets on the shaft were in a rusty/scaled condition. The shaft corrosion potentially caused restrictions in the movement of the sprockets.



Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.

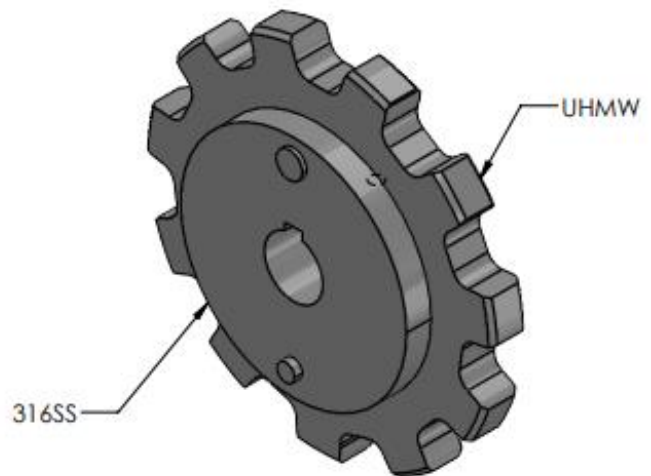
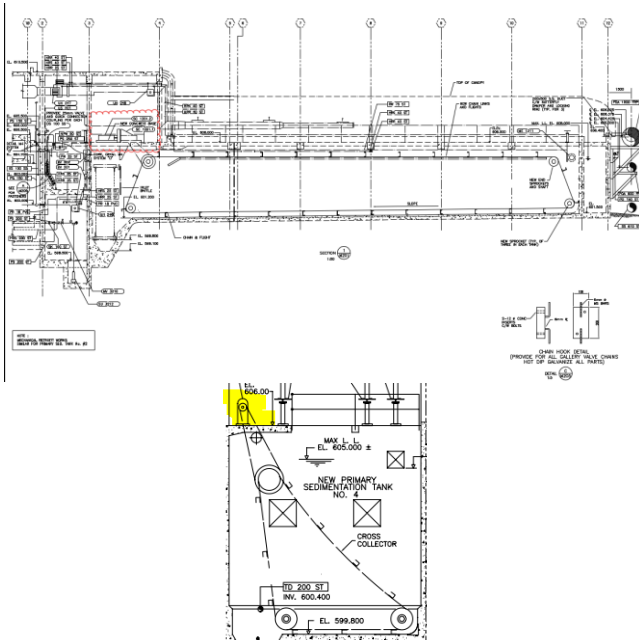


Item No:	M10-4C – Shear Pin Sprocket
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #4	Description:

The sprockets on the drive motor shaft were in fair condition.

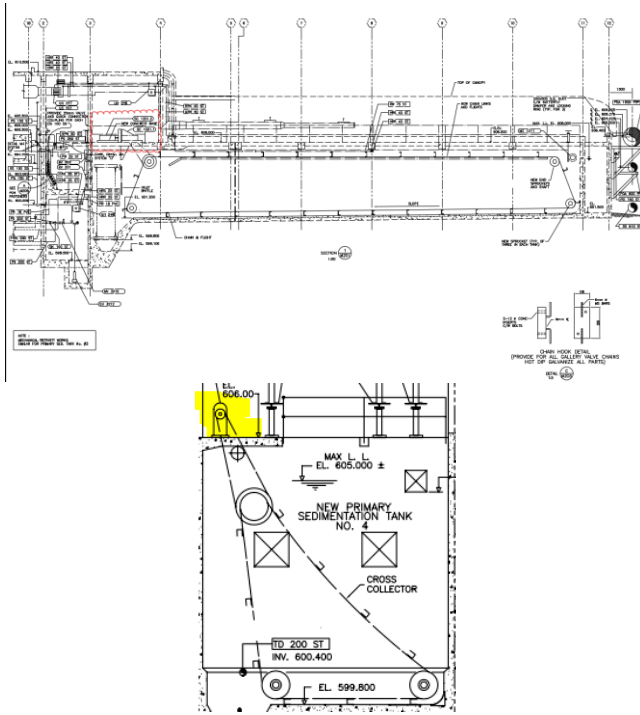
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



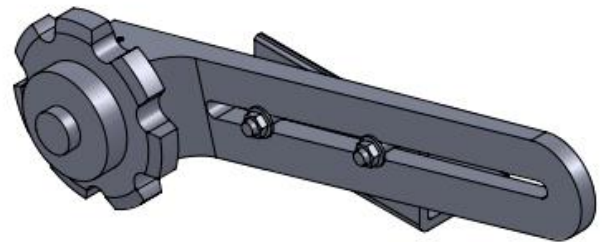
Item No:	M11-4C – Take Up Assembly
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2
Location Detail: Tank #4	Description:

The Take Up Assemblies were in fair condition.



Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Alignment of the drivers within the driving sprockets configuration shall be checked periodically ensuring there is no excessive misalignment/friction between chains, sprockets, shafts, and drivers.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting driven sprockets periodically, ensuring they are fixed on the shaft and fully synchronized with the driver shaft/sprocket without any slippage.



Item No: M12-4C – Wall Bearings

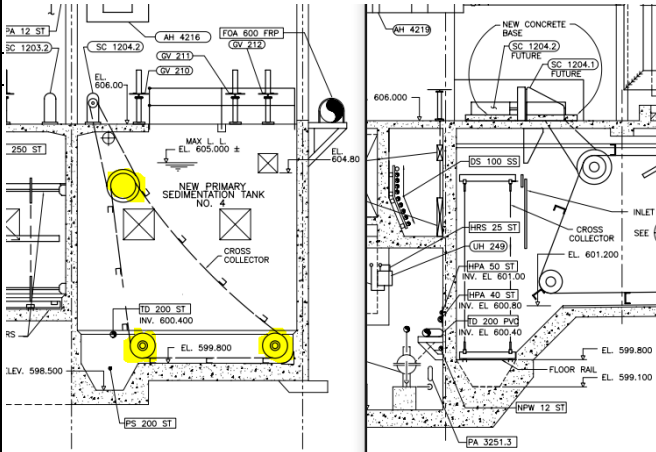
Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

Location Detail: Tank #4

Description:

The wall bearings were in a rusty/scaled condition.



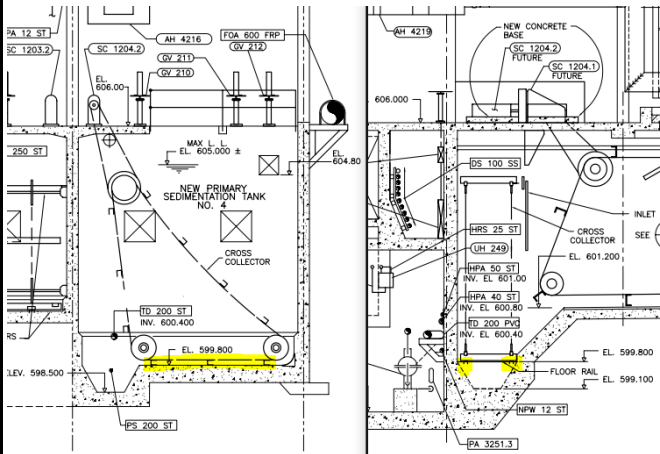
Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.



Item No:	M13-4C – Collector Wear Strip
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

Location Detail: Tank #4	Description: Not accessible.
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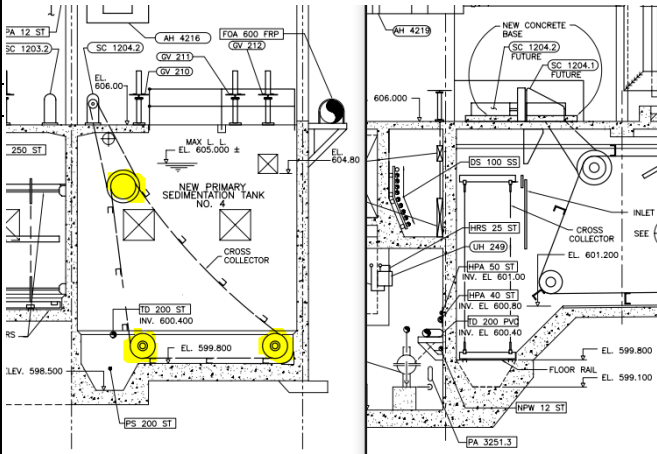
Required Action:

- All manufacturers' maintenance manuals of moving parts shall be followed.
- Inspection of wear shall be conducted on a regular basis.



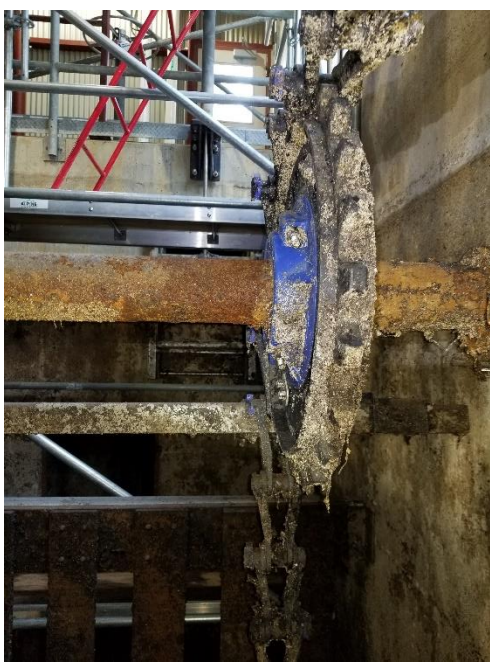
Item No:	M14-4C – Shafts, Pins and set collars
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

Location Detail: Tank #4	Description: The shafts were in a rusty/scaled condition.
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Required Action:

- An engineering investigation should be performed for a root cause analysis over the malfunctioning of the mechanical system along with the corrosion parameters to determine a maintenance plan/possible design modification.
- All manufacturers' maintenance manuals of moving parts shall be followed.
- Cleaning/removing scales periodically to reduce the wear and tear.
- Inspecting shafts and wall bearings periodically, ensuring they are functioning properly within the whole power transmission system.

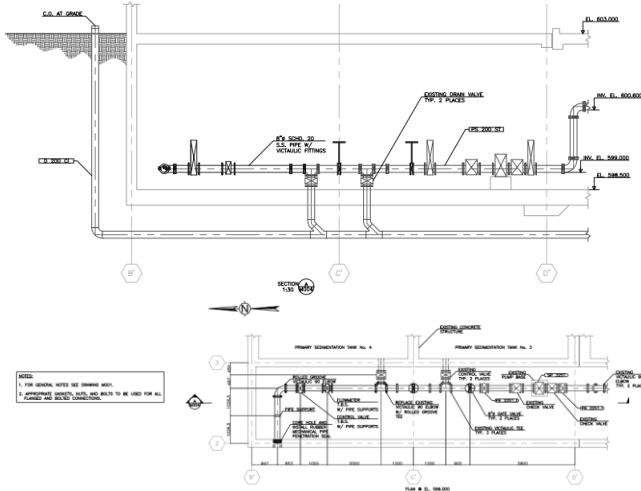


Item No: M15

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: EQ system of Tank #1 through #4 Description:



The system is observed to be in a newer condition. However, lack of proper pipe supports was observed and block valves to the tanks are very worn out. They may need to be replaced. Heat tracing and insulation was not installed on exterior piping and valves.

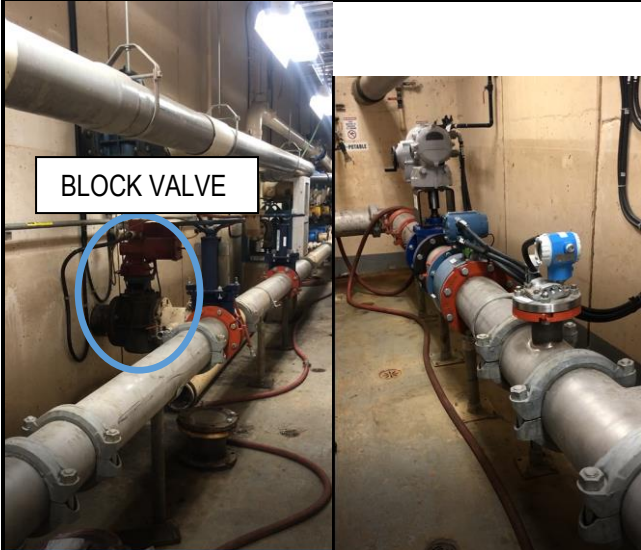
Required Action:

- An engineering investigation should be performed for overall piping and pipe support system/configuration for a better supporting and performance design.
- An engineering investigation should be performed for exterior piping system to determine the need for heat tracing and/or insulation.
- All manufacturers' maintenance manuals of piping components, valves and instruments shall be followed.

Equalization System



Lack of proper supporting



Outdoor control valve without any heat tracing or insulation.

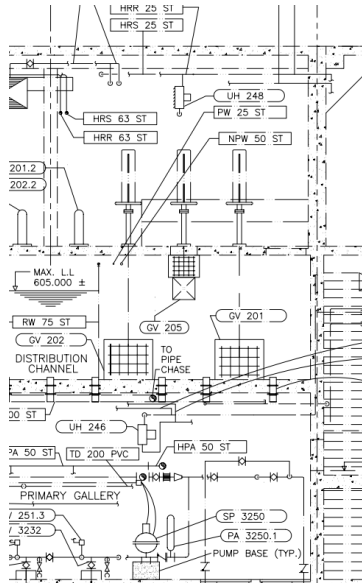
Item No: M16-11

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #1 Description:

GV 201, GV 202, GV 203
Scales at the gates and the gate valves blades was observed. Actuators are in a fair condition.



Required Action:

- An engineering investigation should be performed for overall Gate Valves performances/integrity.
- All manufacturers' maintenance manuals of the valves and actuators shall be followed.
- Cleaning periodically the scales on the gates and blades inside the tank can increase the valve/actuator performance and sealing properties.

Main Gate valves and actuators (Inlet valves)



GV 201

GV 202



GV 203

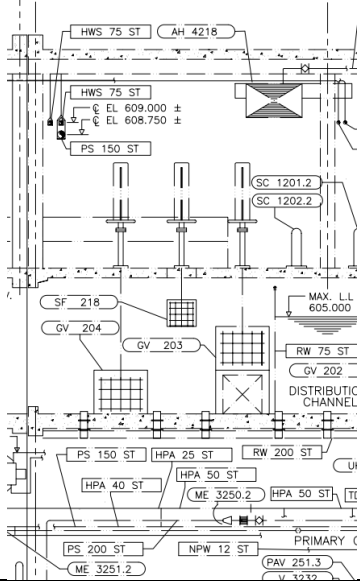


Item No: M16-2I

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P1E**

Location Detail: Tank #2 Description:



GV 204, GV 206
Scales at the gates and the gate valves blades was observed. Actuators are in a fair condition.

GV 205
A displaced gasket was observed. Repair is required.

Required Action:

- An engineering investigation should be performed for overall Gate Valves performances/integrity.
- All manufacturers' maintenance manuals of the valves and actuators shall be followed.
- Cleaning periodically the scales on the gates and blades inside the tank can increase the valve/actuator performance and sealing properties.

Main Gate valves and actuators (Inlet valves)



GV 204

GV 206



GV 205



Item No: M16-3I

Action Plan & Resolution Timeline Required: 1 year

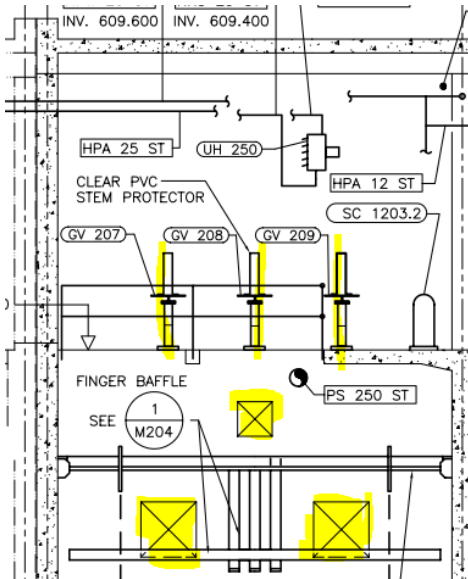
Repair Priority: **P2**

Location Detail: Tank #3 Description:

GV 207, GV 208, GV 209
Scales at the gates and the gate valves blades was observed. Actuators are in a fair condition.

Required Action:

- An engineering investigation should be performed for overall Gate Valves performances/integrity.
- All manufacturers' maintenance manuals of the valves and actuators shall be followed.
- Cleaning periodically the scales on the gates and blades inside the tank can increase the valve/actuator performance and sealing properties.



Main Gate valves and actuators (Inlet valves)



GV 207

GV 208



GV 209

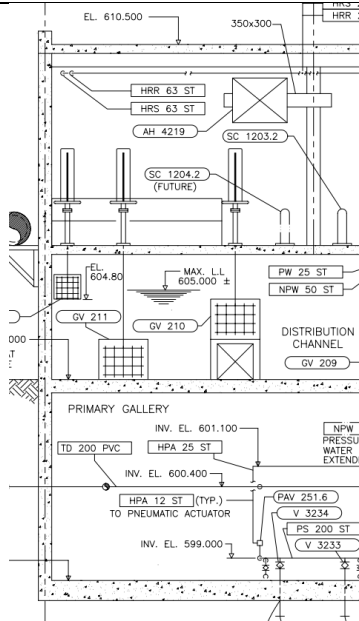


Item No: M16-4I

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #4 Description:

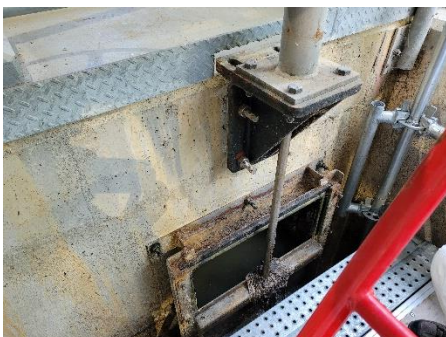


GV 210, GV 211, GV 212
Scales at the gates and the gate valves blades was observed. Actuators are in a fair condition.

Required Action:

- An engineering investigation should be performed for overall Gate Valves performances/integrity.
- All manufacturers' maintenance manuals of the valves and actuators shall be followed.
- Cleaning periodically the scales on the gates and blades inside the tank can increase the valve/actuator performance and sealing properties.

Main Gate valves and actuators (Inlet valves)

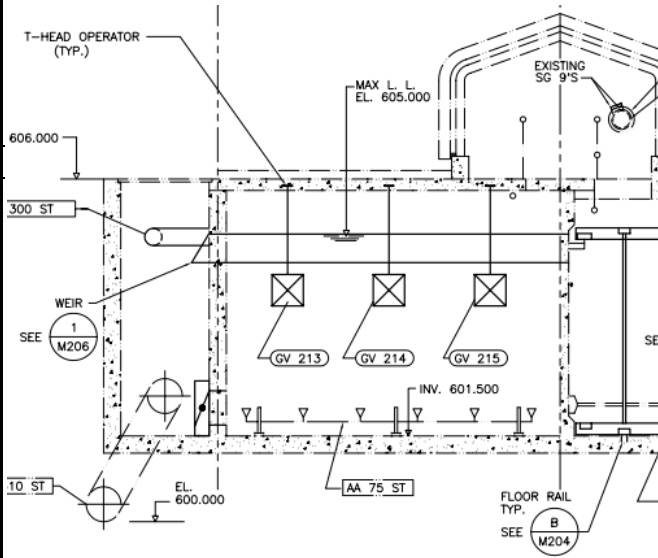


Item No: M16-10

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #1 Description:



GV 213, GV 214, GV 215
Scales at the gates and the gate valves blades was observed. Actuators are in a fair condition.

Required Action:

- An engineering investigation should be performed for overall Gate Valves performances/integrity.
- All manufacturers' maintenance manuals of the valves and actuators shall be followed.
- Cleaning periodically the scales on the gates and blades inside the tank can increase the valve/actuator performance and sealing properties.

Main Gate valves and actuators (Outlet valves)

GV 213



GV 214



GV 215



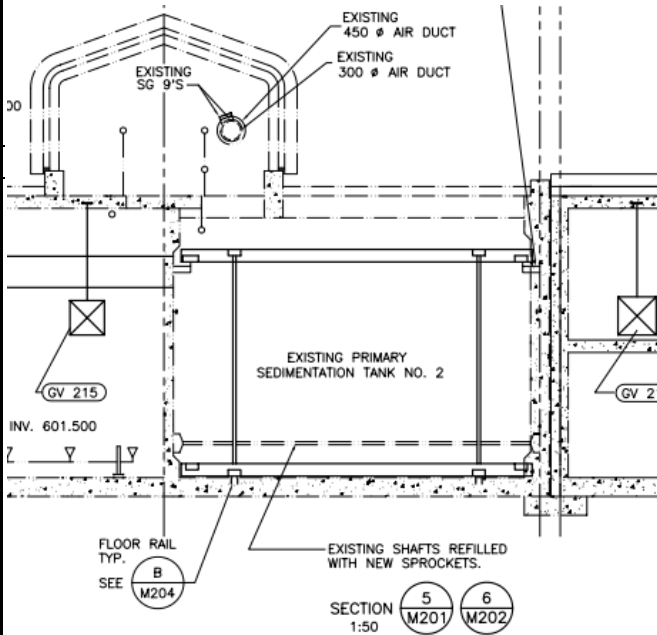
Item No: M16-20

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #2 Description:

GV 216, GV 217, GV 218
Scales at the gates and the gate valves blades was observed. Actuators are in a fair condition.



Required Action:

- An engineering investigation should be performed for overall Gate Valves performances/integrity.
- All manufacturers' maintenance manuals of the valves and actuators shall be followed.
- Cleaning periodically the scales on the gates and blades inside the tank can increase the valve/actuator performance and sealing properties.

Main Gate valves and actuators (Outlet valves)

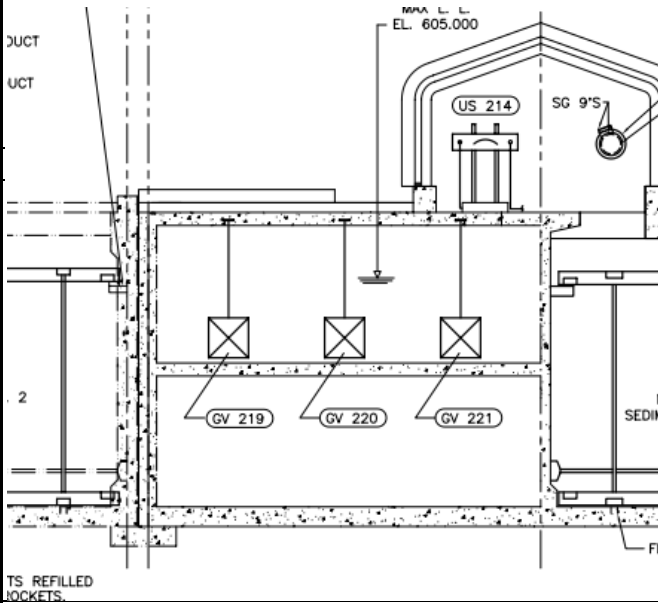


Item No: M16-30

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #3 Description:



GV 219, GV 220, GV 221
Scales at the gates and the gate valves blades was observed. Actuators are in a fair condition.

Required Action:

- An engineering investigation should be performed for overall Gate Valves performances/integrity.
- All manufacturers' maintenance manuals of the valves and actuators shall be followed.
- Cleaning periodically the scales on the gates and blades inside the tank can increase the valve/actuator performance and sealing properties.

Main Gate valves and actuators (Outlet valves)

GV 219

GV 220



GV 221



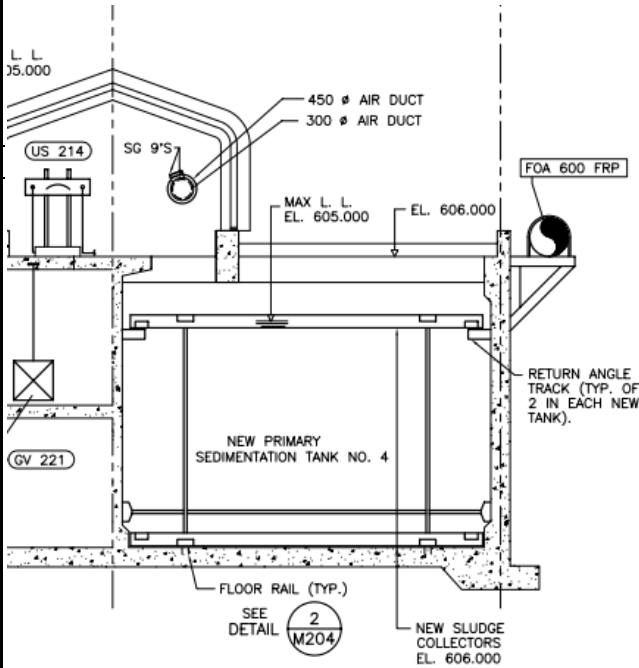
Item No: M16-40

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #4 Description:

GV 222, GV 223, GV 224
Scales at the gates and the gate valves blades was observed. Actuators are in a fair condition.



Required Action:

- An engineering investigation should be performed for overall Gate Valves performances/integrity.
- All manufacturers' maintenance manuals of the valves and actuators shall be followed.
- Cleaning periodically the scales on the gates and blades inside the tank can increase the valve/actuator performance and sealing properties.

Main Gate valves and actuators (Outlet valves)

GV 222

GV 223



GV 224



Item No:	M17
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1E
Location Detail: Tank #1, 3 and 4	Description:
	Scales and possible corrosion for some portions of the pipes and supports that did not have proper sleeve were observable in the tank areas.
	Required Action:
Process Piping	<ul style="list-style-type: none"> - An engineering investigation/specific piping inspection/NDE should be performed for determining the remaining life span of the piping system in those areas. - Cleaning periodically the scales and annually inspection of the piping system is recommended to check the corrosion level and piping system integrity

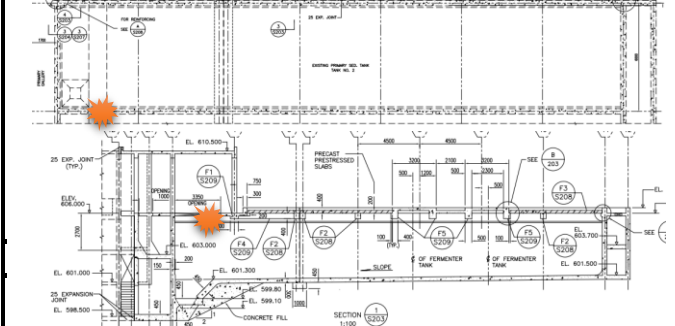


Item No: S01

Action Plan & Resolution Timeline Required: 1 year

Repair Priority: **P2**

Location Detail: Tank #1



Description:

Concrete Deterioration – Abrasion & Etch Damage

Required Action:

- NDT test to identify Cover and Possible steel corrosion.

Concrete wall



Remarks:

Item No:

S02

Action Plan & Resolution Timeline Required:

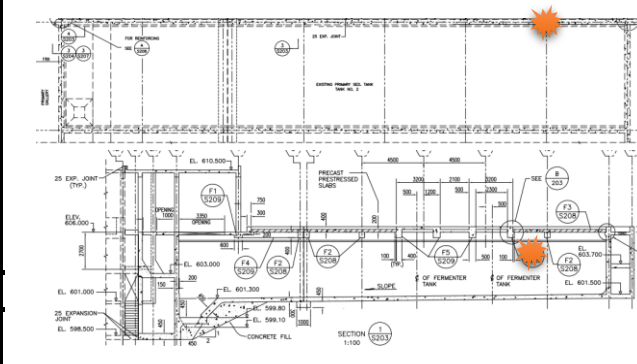
1 year

Repair Priority:

P2

Location Detail: Tank #1

Description:



Concrete Deterioration –Etch Damage

Required Action:

- NDT test to identify Cover and Possible steel corrosion.
- Destructive test to find Alkalinity of concrete especially near to exposed formwork support.

Concrete wall



Remarks:

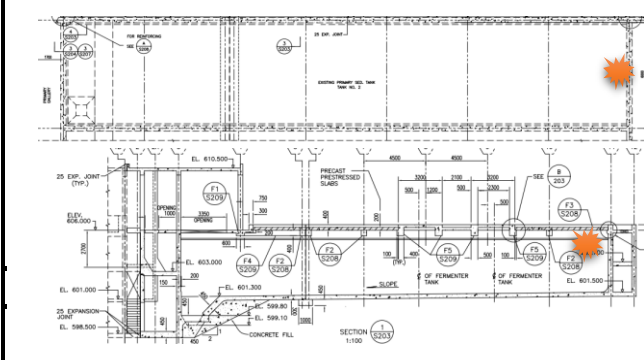
Item No: S03

Action Plan & Resolution Timeline Required: **1 year**

Repair Priority: **P2**

Location Detail: Tank #1

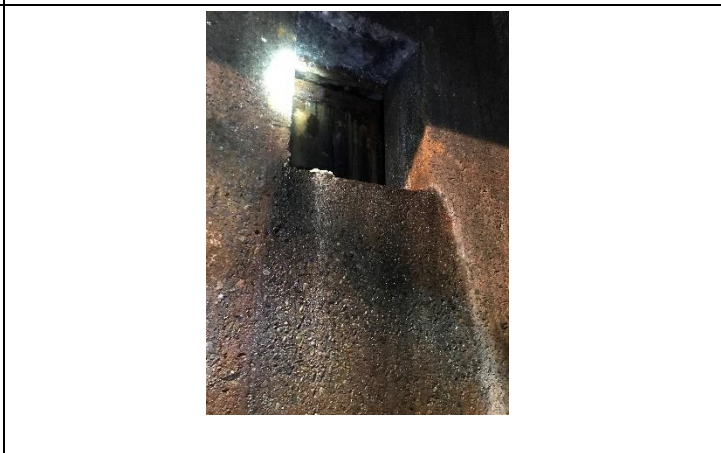
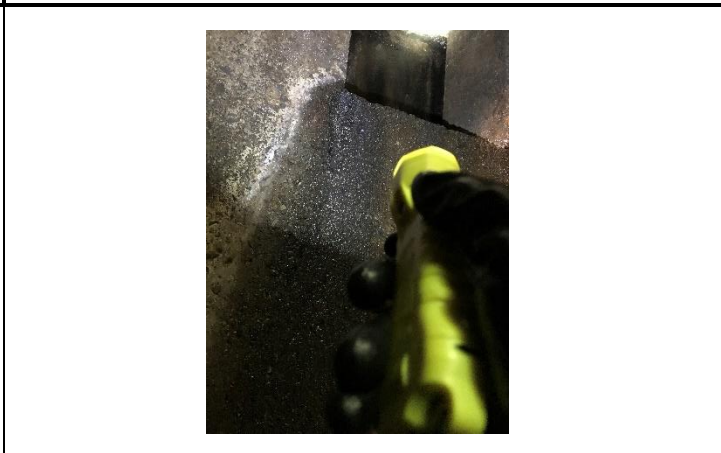
Description:



Concrete Deterioration –Leaching Action and Etch Concrete

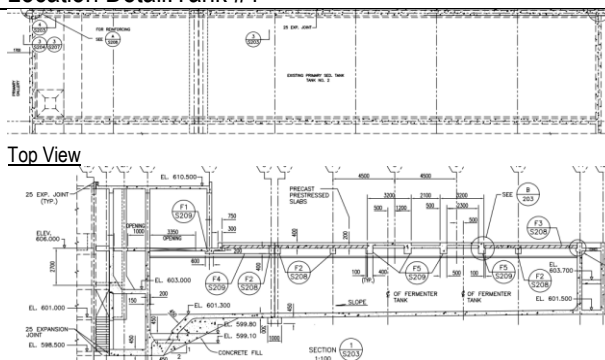
Concrete wall near outlet gate

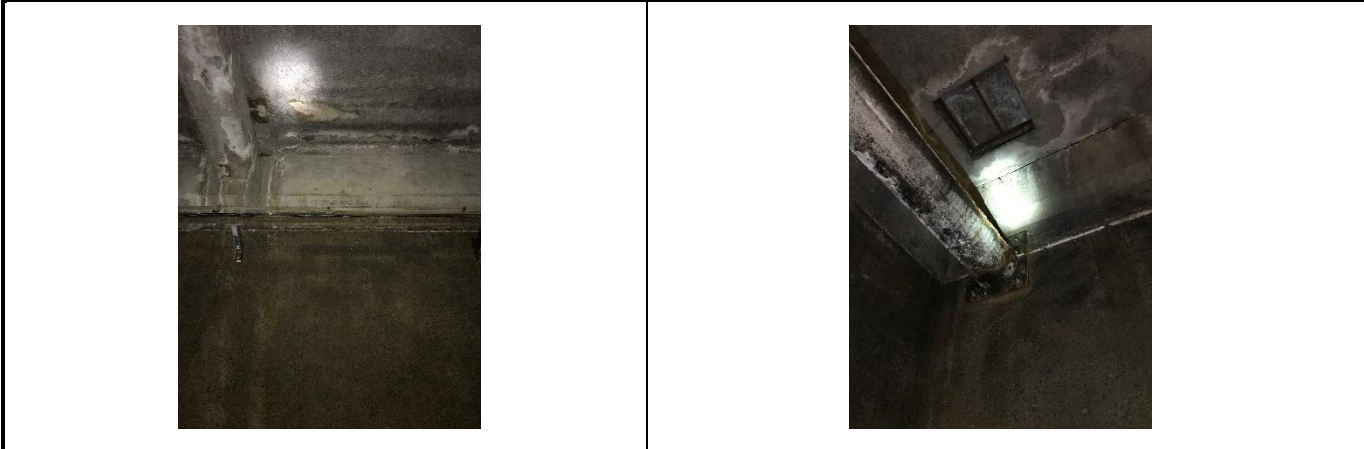
- Required Action:
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.



Remarks:

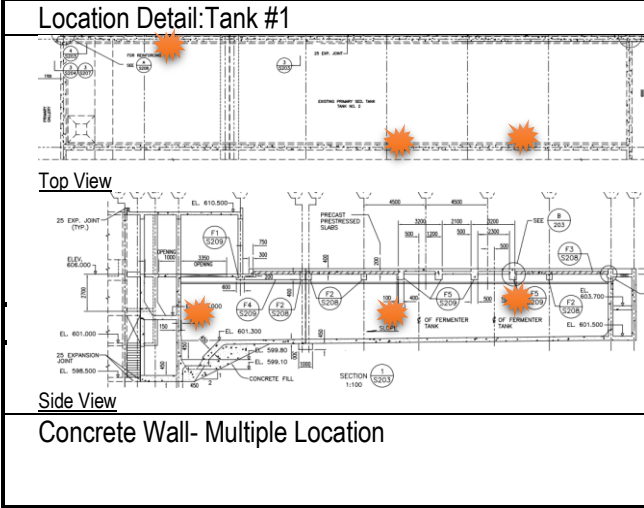
Item No:	S04
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

<p>Location Detail: Tank #1</p>  <p>Top View</p> <p>Side View</p> <p>Concrete Roof, access lid Multiple Location</p>	<p>Description:</p> <p>Concrete Deterioration –Leaching Action</p> <p>Required Action:</p> <ul style="list-style-type: none"> - NDT test to identify Cover and Possible steel corrosion. - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.
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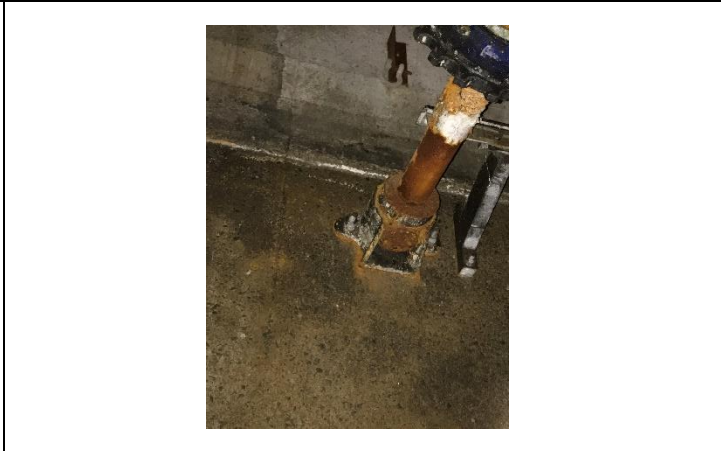
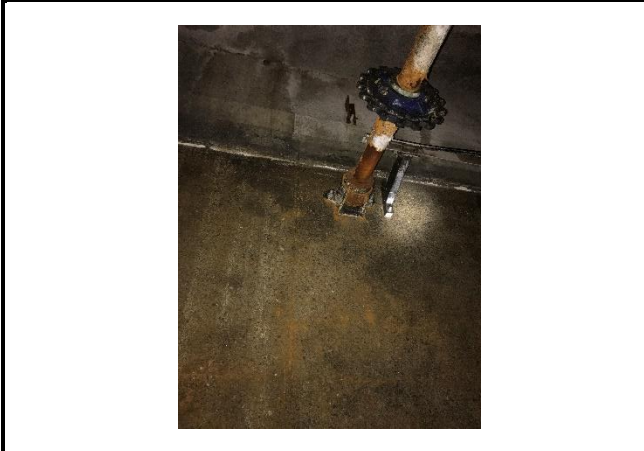
Remarks:

Item No:	S05
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2



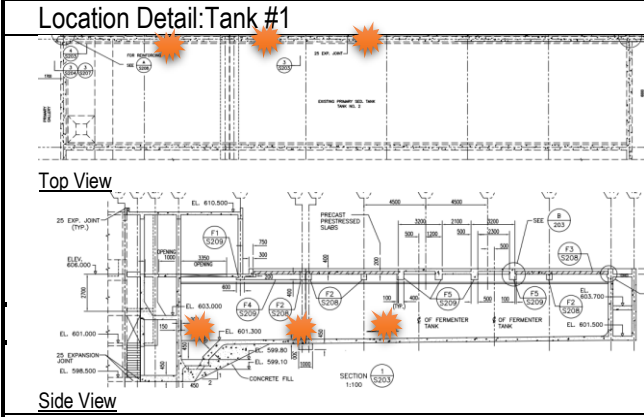
Description:
Concrete Deterioration –Etch Concrete

- Required Action:
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.



Remarks:

Item No:	S06
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2



Description:
Concrete Deterioration –Abrasion Damage and Etch Concrete

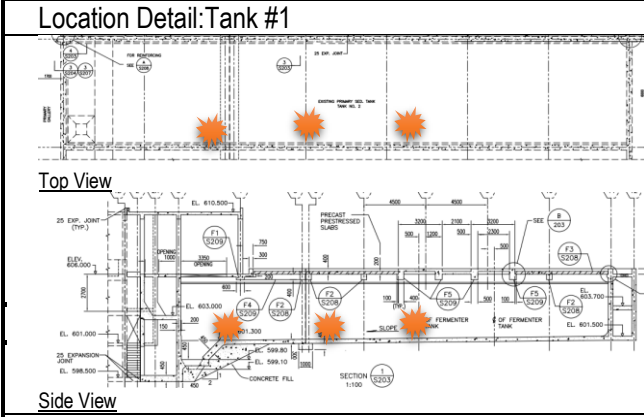
Concrete Wall- Bottom of tank-Multiple Location

- Required Action:
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.



Remarks:

Item No:	S07
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

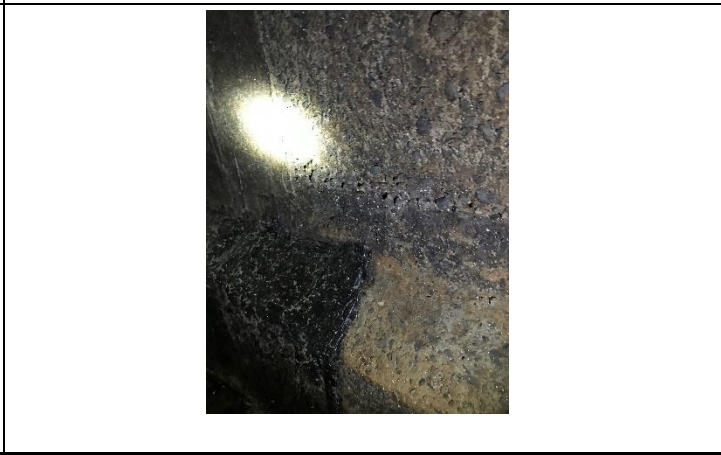


Description:

Concrete Deterioration –Abrasion Damage, Etch Concrete and Leaching Action

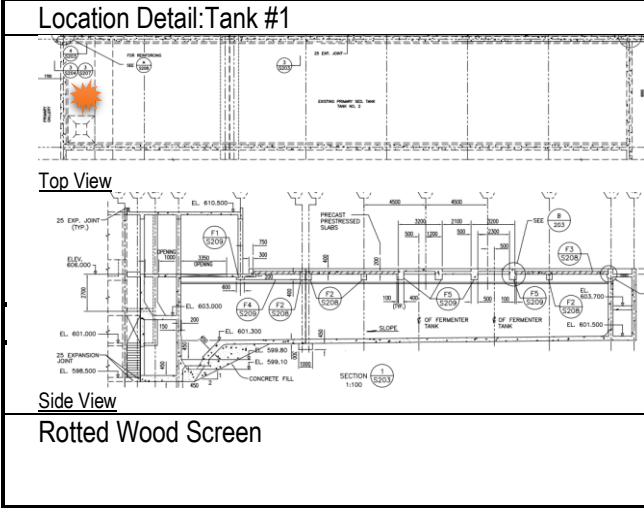
Concrete Wall- Bottom of tank-Multiple Location

- Required Action:
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.



Remarks:

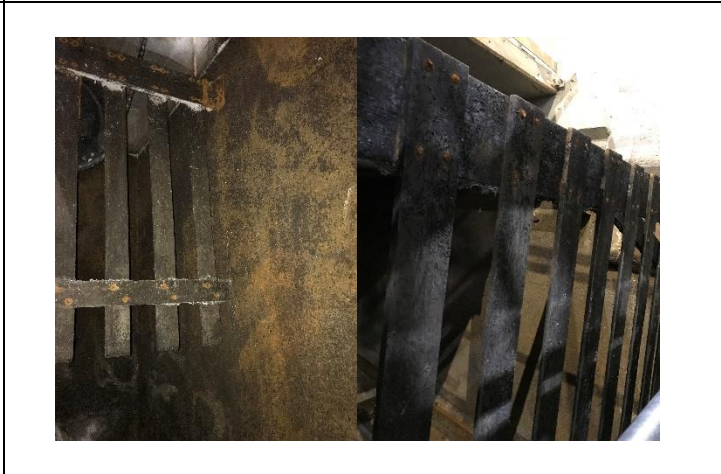
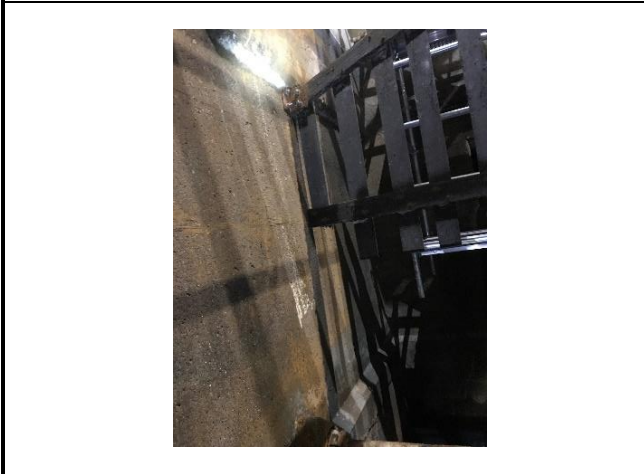
Item No:	S08
Action Plan & Resolution Timeline Required:	45 days
Repair Priority:	P1E



Description:
Wood Screen – deteriorating.
Fasteners on wood screen – corroded and require replacement.

Required Action:

- Replace wood screen complete with fasteners. Consider using a different type of material such as HDP.



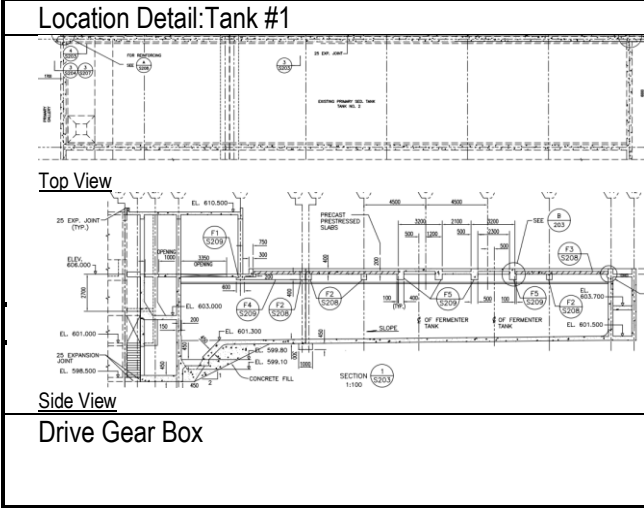
Remarks:

Project No: **210505**

Report: 210505-TEC-03-R1-D

Date: 2022-01-26

Item No:	S09
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2



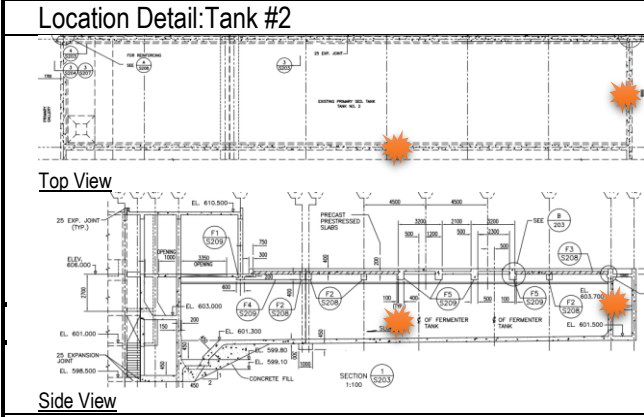
Description:
Crack in Grout

Required Action:
- Repair Grout.



Remarks:

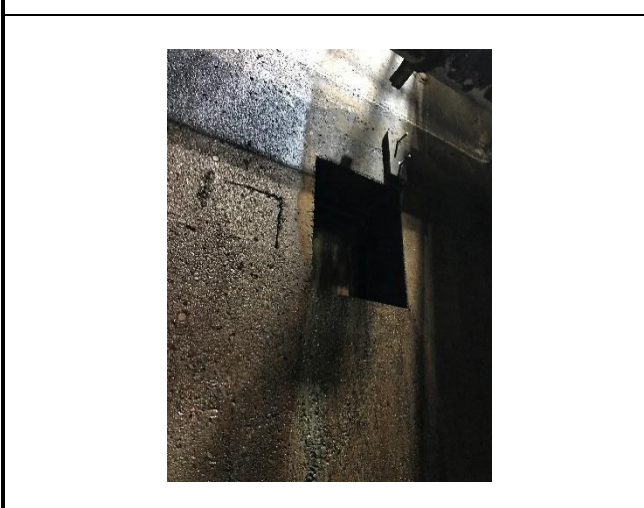
Item No:	S10
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2



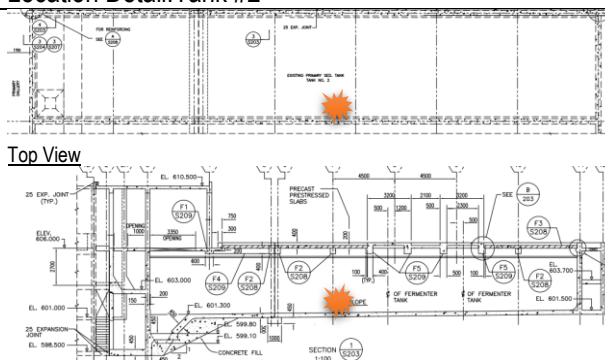
Description:
Concrete Deterioration –Abrasion Damage and Etch Concrete

Side View
Concrete Wall- Bottom of tank-Multiple Location

- Required Action:
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.



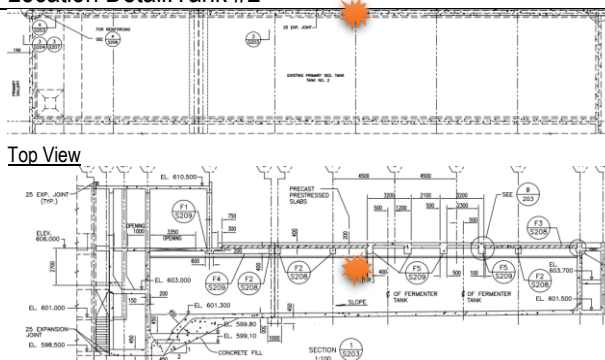
Item No:	S11
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

<p>Location Detail: Tank #2</p>  <p>Top View</p> <p>Side View</p> <p>Concrete Wall- Bottom of tank-Multiple Location</p>	<p>Description:</p> <p>Concrete Deterioration –Abrasion Damage and Etch Concrete</p> <p>Required Action:</p> <ul style="list-style-type: none"> - NDT test to identify Cover and Possible steel corrosion. - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.
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Item No:	S12
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

Location Detail: Tank #2



Top View

Side View

Concrete Wall- Bottom of tank-Multiple Location

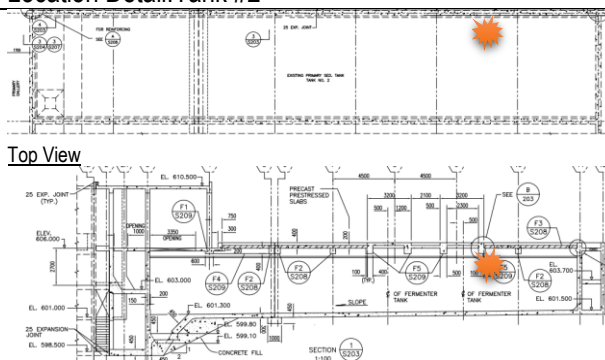
Description:
Concrete Deterioration –Leaching Action

- Required Action:
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.



Item No:	S13
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

Location Detail: Tank #2



Top View

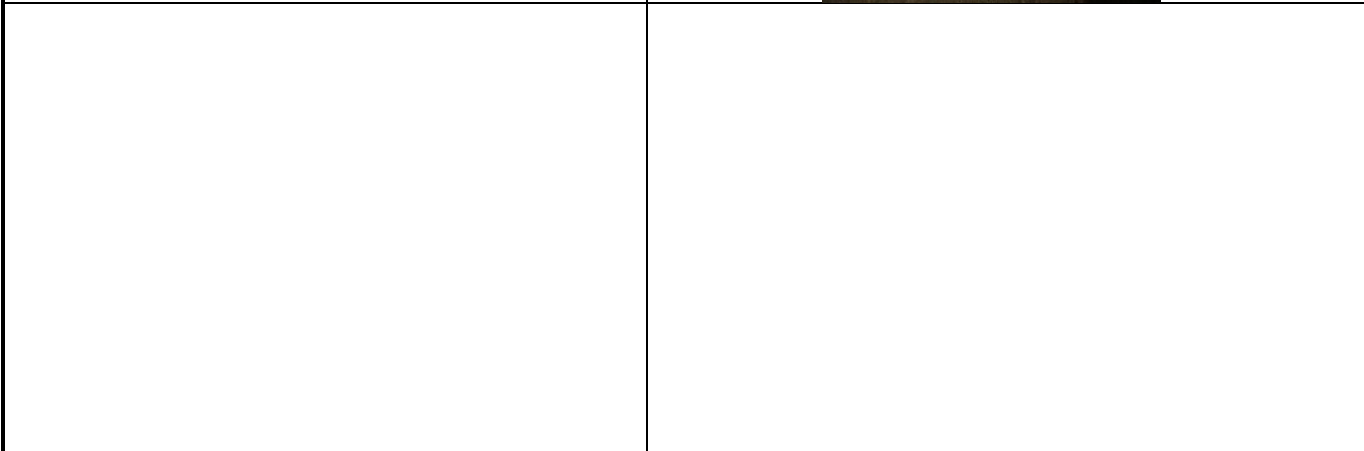
Side View

Concrete Wall- Bottom of tank-Multiple Location

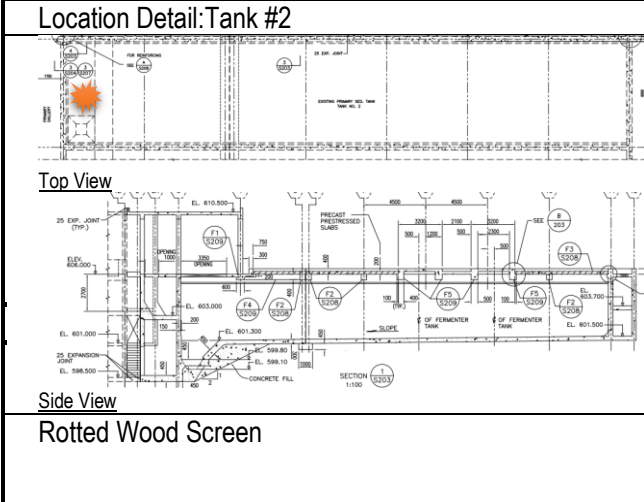
Description:

Concrete Deterioration –Leaching Action

- Required Action:
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete especially near to exposed formwork support.



Item No:	S14
Action Plan & Resolution Timeline Required:	45 days
Repair Priority:	P1E



Description:
Wood Screen – deteriorating.
Fasteners on wood screen – corroded and require replacement.

Required Action:

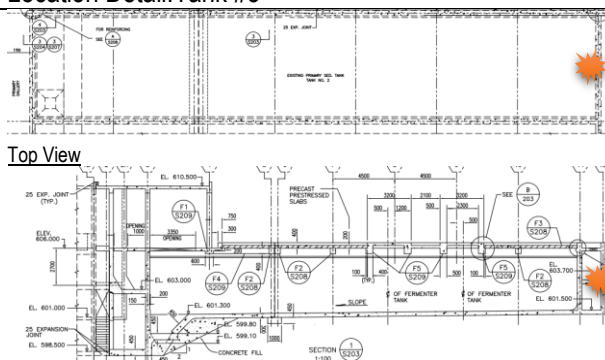
- Replace wood screen complete with fasteners. Consider using a different type of material such as HDP.



Remarks:

Item No:	S15
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

Location Detail: Tank #3



Top View

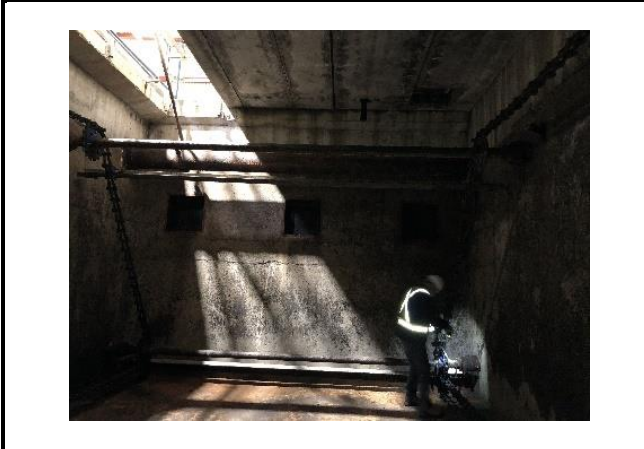
Side View

Concrete Wall- Construction joint or Issues

Description:
Possible issues on concrete on existing construction joint

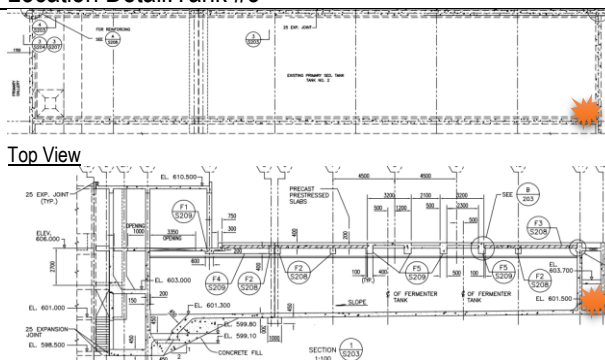
Required Action:

- NDT test to identify Cover and Possible steel corrosion.
- Destructive test to find Alkalinity of concrete.



Item No:	S16
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

Location Detail: Tank #3

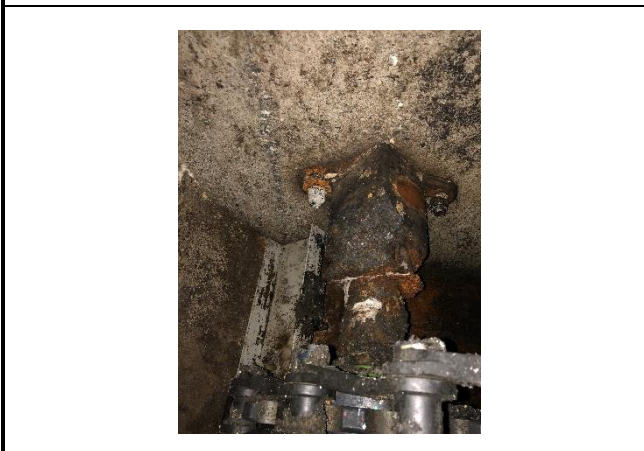
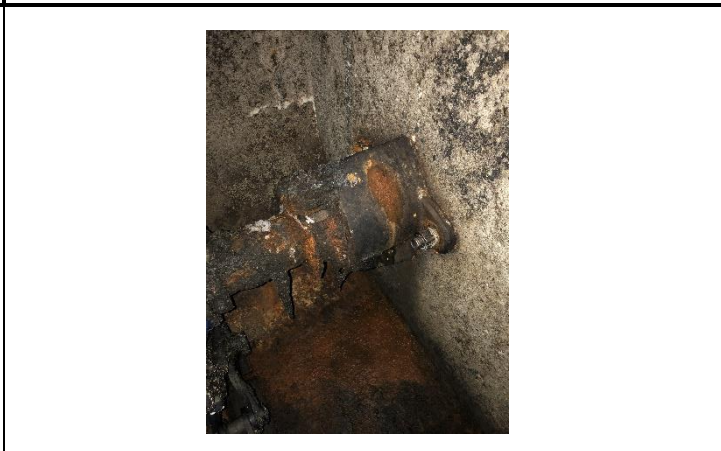
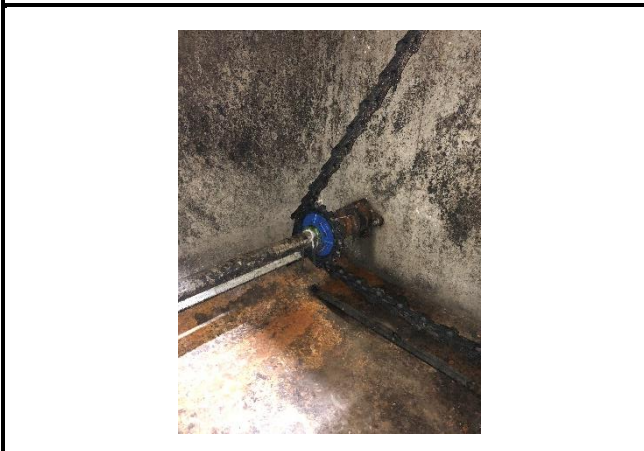


Top View

Side View
Concrete Wall

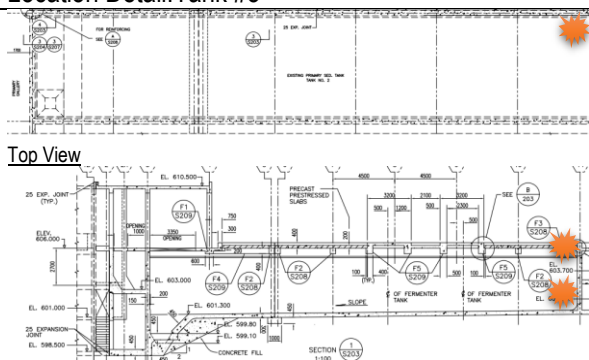
Description:
Concrete Deterioration –Etch Damage

- Required Action:
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete.
 - Anchorage review.



Item No:	S17
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

Location Detail: Tank #3



Top View

Side View

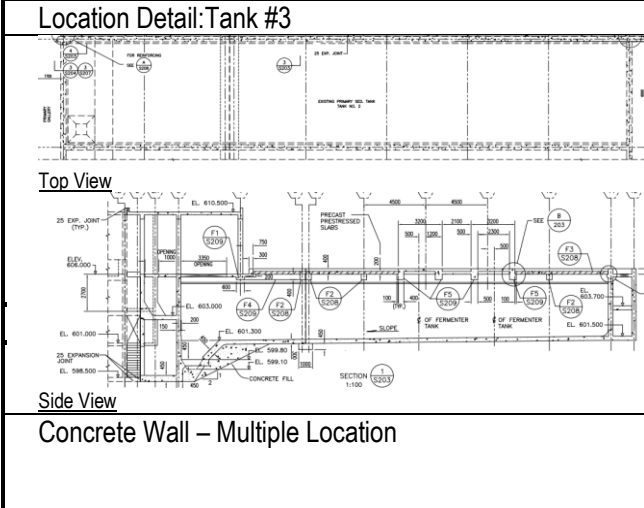
Concrete Wall and connection

Description:
Concrete Deterioration –Etch Damage

- Required Action:**
- NDT test to identify Cover and Possible steel corrosion.
 - Destructive test to find Alkalinity of concrete.
 - Anchorage review.



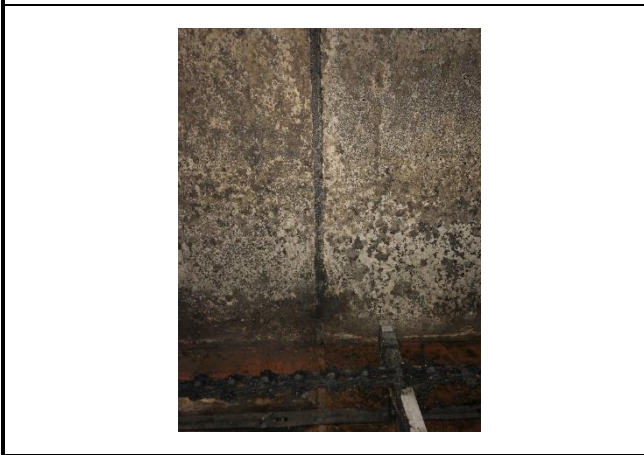
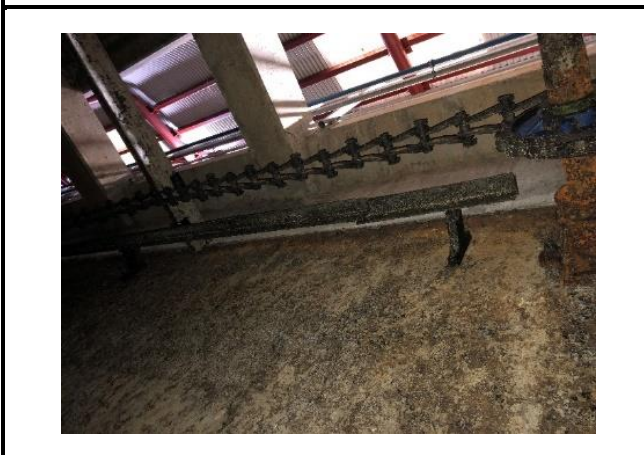
Item No:	S18
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2



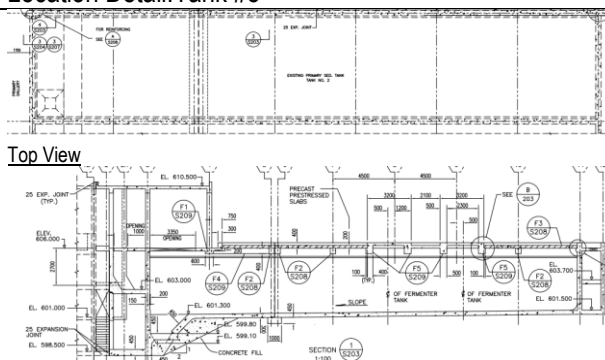
Description:
Concrete Deterioration –Abrasion Damage, Etch Concrete

Required Action:

- NDT test to identify Cover and Possible steel corrosion.
- Destructive test to find Alkalinity of concrete.

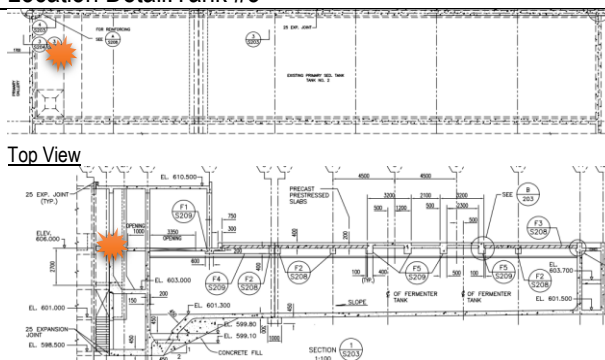


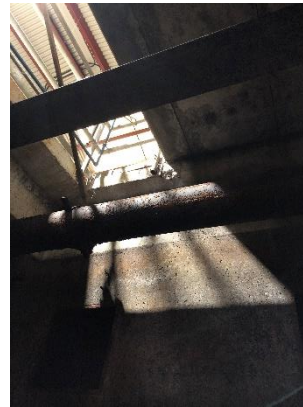
Item No:	S19
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

<p>Location Detail: Tank #3</p>  <p>Top View</p> <p>Side View</p> <p>Concrete Roof – Roof Hatch</p>	<p>Description:</p> <p>Concrete Deterioration – Leaching Action- Damage on Concrete – Corrosion on Steel Frame</p> <p>Required Action:</p> <ul style="list-style-type: none"> - NDT test to identify Cover and Possible steel corrosion. - Destructive test to find Alkalinity of concrete. - Fix Concrete. - Paint - Repair Steel Frame
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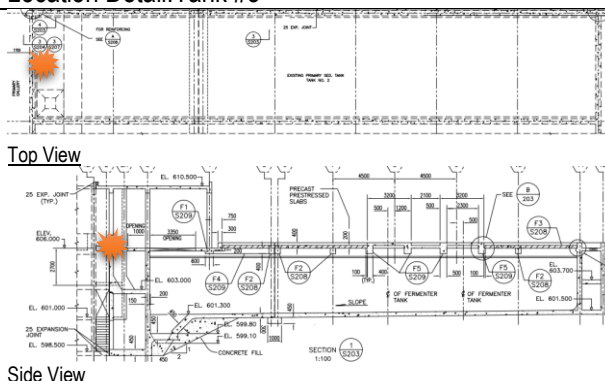


Item No:	S21
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

<p>Location Detail: Tank #3</p>  <p>Top View</p> <p>Side View</p> <p>Concrete Wall</p>	<p>Description:</p> <p>Concrete Deterioration – Leaching Action – Damage on Concrete – Corrosion on Steel Frame</p> <p>Required Action:</p> <ul style="list-style-type: none"> - NDT test to identify Cover and Possible steel corrosion. - Destructive test to find Alkalinity of concrete. - Fix Concrete. - Paint - Repair Steel Frame.
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Item No:	S22
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

<p>Location Detail: Tank #3</p>  <p>Top View</p> <p>Side View</p> <p>Frame – Concrete wall</p>	<p>Description:</p> <p>Frame Corrosion Around inlet Concrete Deterioration – Abrasion damage, Etch Concrete</p> <p>Required Action:</p> <ul style="list-style-type: none"> - NDT test to identify Cover and Possible steel corrosion. - Destructive test to find Alkalinity of concrete. - Paint - Repair Steel Frame
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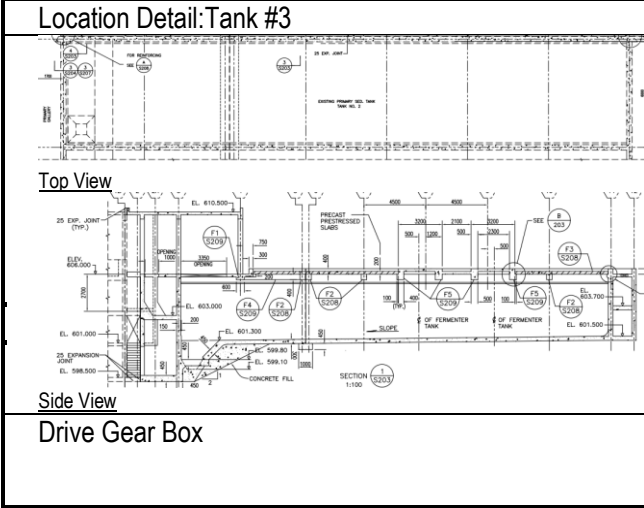


Project No: **210505**

Report: 210505-TEC-03-R1-D

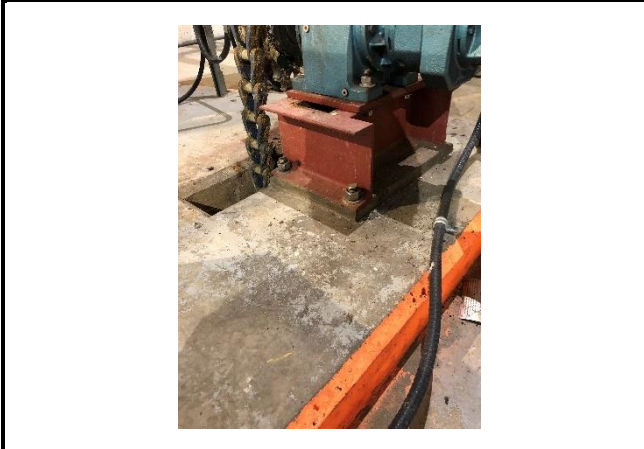
Date: 2022-01-26

Item No:	S23
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2



Description:
Crack in Grout

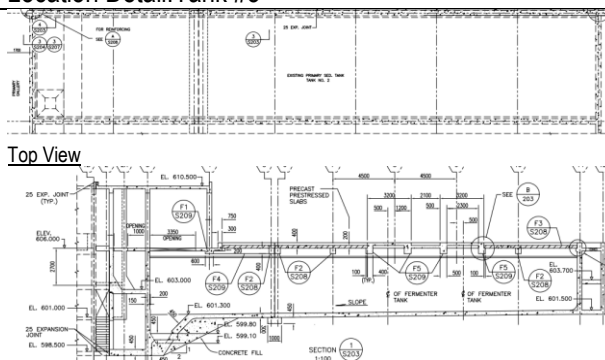
Required Action:
- Repair Grout.



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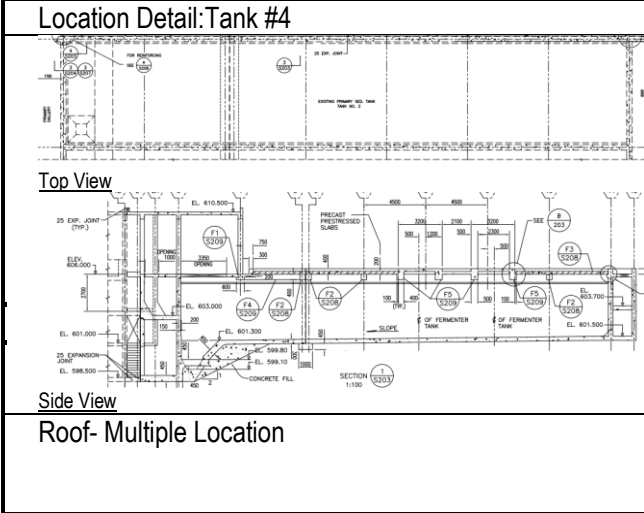
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Item No:	S24
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2

<p>Location Detail: Tank #3</p>  <p>Top View</p> <p>Side View</p> <p>Drive Gear Box</p>	<p>Description: Minor Corrosion</p> <p>Required Action: - Repair Steel Support- Paint.</p>
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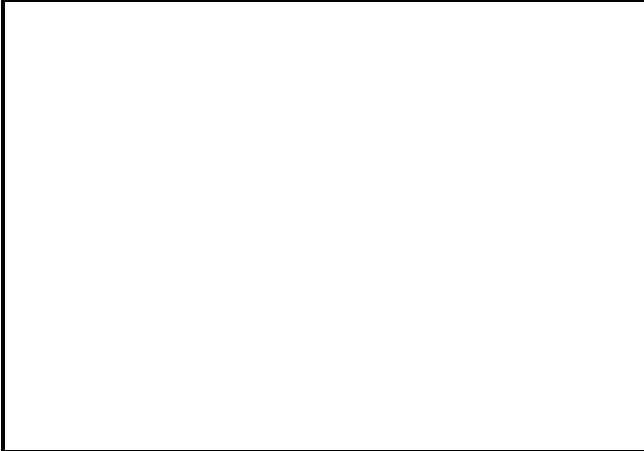
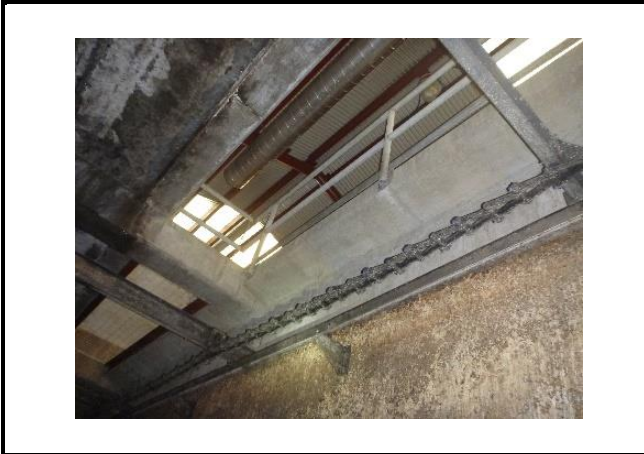
Item No:	S26
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2



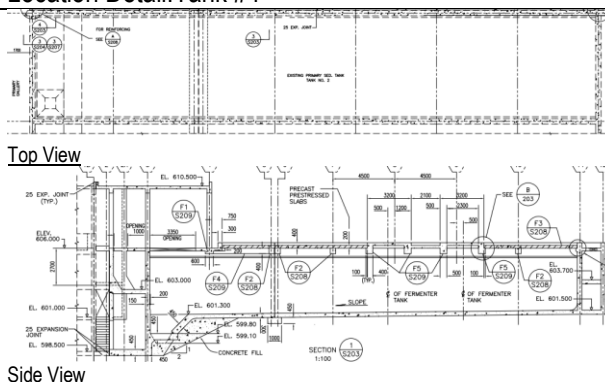
Description:
Concrete Deterioration – Leaching Action

Required Action:

- NDT test to identify Cover and Possible steel corrosion.
- Destructive test to find Alkalinity of concrete.

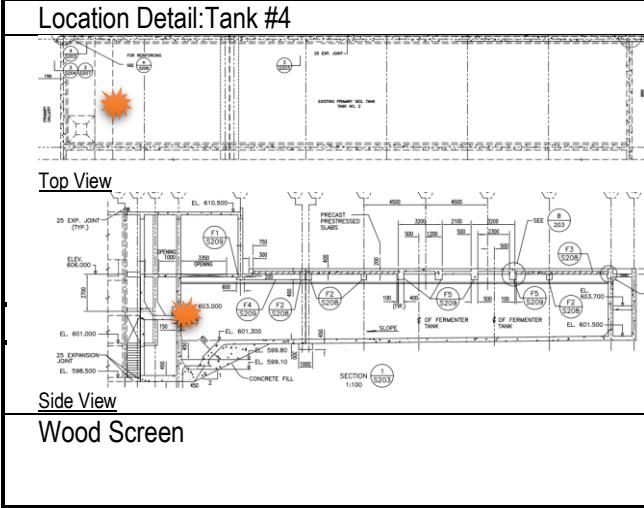


Item No:	S27
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P1R

<p>Location Detail: Tank #4</p>  <p>Top View</p> <p>Side View</p> <p>Multiple Location</p>	<p>Description:</p> <p>Missing Bolts – Loosen Bracket- Loosen Bolts</p> <p>Required Action:</p> <ul style="list-style-type: none"> - Install New Bolts. - Fix Bracket. - Review Loosen Bolts.
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Item No:	S28
Action Plan & Resolution Timeline Required:	1 year
Repair Priority:	P2



Description:
Corroded screen and supports

Required Action:

- Replace wood screen and support.



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Appendix 2: Priority Classification

P1SI

A priority 1 finding considered to be a serious deficiency and posing an immediate safety risk to personnel or to the equipment.

ACTION PLAN & RESOLUTION REQUIREMENTS

- a) Immediate action and resolution required. Inspector must verify resolution prior to close out meeting and prior to leaving the site.
- b) Inspector must still document P1SI findings in the Inspection Report and marked as 'closed'.

P1S

A priority 1 finding that represents a significant safety issue and is considered to be a serious deficiency related to the safety of personnel or to the safety of the equipment. Lack of attention for correction may result in high risk of injury, bodily harm, or business loss. (E.g. Findings related to fall protection issues, such as ladders, platforms, stairs/stair treads, railings, elevated walk ways, etc.)

ACTION PLAN & RESOLUTION REQUIREMENTS

- a) Action Plan & Resolution Timeline required within 45 days of inspection date.
- b) Site should immediately log P1S findings into the site's maintenance register correcting the most serious items first.

P1E

A priority 1 finding that requires engineering to resolve. (E.g. Serious corrosion or indication that equipment are compromised and that it will require engineering assistance to assess the repair and/or replacement).

ACTION PLAN & RESOLUTION REQUIREMENTS

- a) Action Plan & Resolution Timeline required within 45 days of inspection date.
- b) Site should immediately log P1E findings into the site's maintenance register.
- c) Since in most cases P1Es are not quick fixes, a timeline is suggested to complete the fix.

P1R

A priority 1 finding that does not require engineering to assess or determine the design and Action Plan. (E.g. A finding that would be defined as replacement in kind of a structural or mechanical item, or that can be repaired without the need for engineering.)

ACTION PLAN & RESOLUTION REQUIREMENTS

- a) Action Plan & Resolution Timeline required within 45 days of inspection date.
- b) Site should immediately log P1R findings into the site's maintenance register with an Action Plan to repair or replace.
- c) The P1R is suggested to be resolved within 6 months of the inspection date with the most serious findings being addressed first.

P2

A significant enough condition that if left "as is", could lead to the potential for deficiency within 1-2 years.

ACTION PLAN & RESOLUTION REQUIREMENTS

- a) Action Plan & Resolution Timeline required within 1 year of inspection date.
- b) Site should immediately log P2 findings into the site's maintenance register with a 'low priority'.
- c) In most cases, these items can be addressed after all the P1 items are resolved.

P3

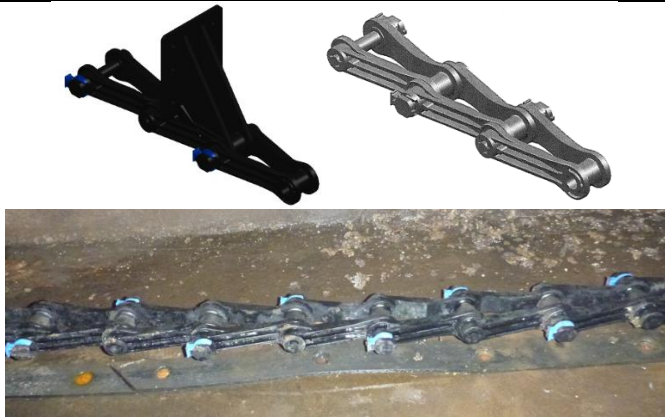
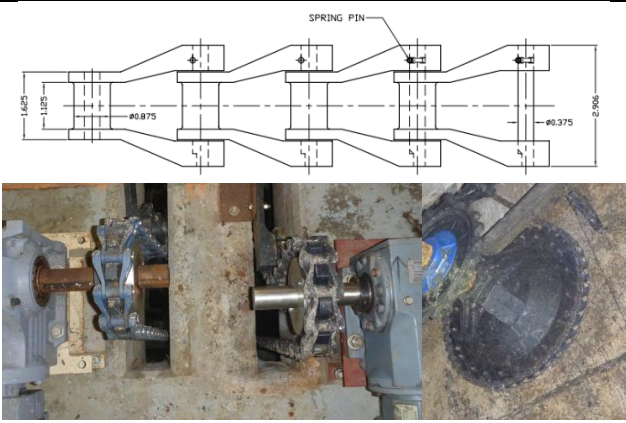

A significant enough condition that if left "as is", could lead to or become a P2 within 1-2 years. (E.g. Typically defined as coating failures with active corrosion and in the beginning stages of loss of material thickness.)

ACTION PLAN & RESOLUTION REQUIREMENTS

- a) Site should log P3 findings into the site's maintenance register with a 'low priority'.
- b) These items can be addressed through normal housekeeping and property improvement initiatives.

Appendix 3: Mechanical Equipment List

4.3. Longitudinal Collector – For All Primary Sedimentation Tank (PST 1, 2, 3, and 4)




Description	Quantity	Picture / Drawing
VC720NM Non Metallic Collector Chain c/w F228 attachment every 10 feet	420'	
VC78NM Non Metallic Drive Chain	20'	
UHMW Carry Wear Shoes	Forty-two (42)	



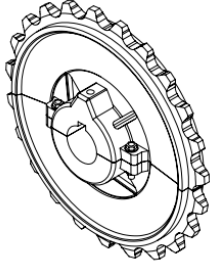

UHMW Return Wear Shoes	Forty-two (42)	
8" Polypropylene Filler Blocks	Forty-two (42)	
3" x 8" x 216.50" Long C Channel Fiberglass Flights	Twenty-one (21)	
VC720-23T Molded Drive Sprocket, 22.21" PD, 3 15/16" bore	Two (2)	



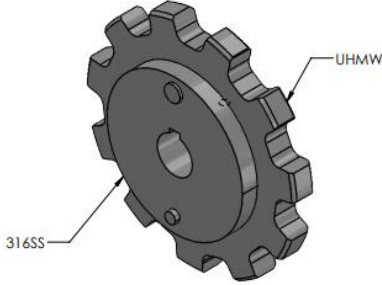

<p>VC78-40T Dished Offset Sprocket, 33.25" PD, 3 15/16" bore</p>	<p>One (1)</p>	
<p>VC720-17T Molded Idler Sprocket, 16.59" PD, 3 15/16" Bore</p>	<p>Six (6)</p>	
<p>VC78-11T Shear Pin Sprocket, 9.26" PD, 2" Bore</p>	<p>One (1)</p>	




<p>Take up Assembly, consists of one (1) VC78-7T Sprocket</p>	<p>One (1)</p>	
<p>each Peak Cap Wall Bearings, 3 15/16" bore</p>	<p>Eight (8)</p>	
<p>3/8" thick x 3" wide x 120" long UHMW Wear Strip</p>	<p>Thirty-eight (38)</p>	
<p>UHMW Set Collar, 3 15/16" Bore</p>	<p>Eight (8)</p>	 <p> <small>5/16-18 UNC #316SS BOLT 2 PLCS</small> <small>#3.938</small> </p>



4.4. Cross Collector

Description	Quantity	Picture / Drawing
VC720NM Non Metallic Collector Chain c/w F226 attachment every 5 feet	140'	
VC78NM Non Metallic Drive Chain	20'	
UHMW Carry Wear Shoes	Twenty-eight (28)	


<p>6" Filler Blocks</p>	<p>Twenty-eight (28)</p>	
<p>3" x 6" x 57" Long C Channel Fiberglass Flights</p>	<p>Fourteen (14)</p>	
<p>VC720-23T Molded Drive Sprocket, 22.21" PD, 1 15/16" bore</p>	<p>Two (2)</p>	 

<p>VC78-40T Dished Offset Sprocket, 33.25" PD, 1 15/16" bore</p>	<p>One (1)</p>	
<p>VC720-17T Molded Idler Sprocket, 16.59" PD, 1 15/16" Bore</p>	<p>Four (4)</p>	
<p>VC78-11T Shear Pin Sprocket, 9.26" PD, 1 1/4" Bore</p>	<p>One (1)</p>	 

<p>Take up Assembly, consists of (1) VC78-7T Sprocket</p>	<p>One (1)</p>	
<p>Peak Cap Wall Bearings, 1 15/16" bore</p>	<p>Six (6)</p>	
<p>3/8" thick x 3" wide x 120" long UHMW Wear Strip</p>	<p>Four (4)</p>	

UHMW Set Collar, 1 15/16" Bore	Six (6)	
Skimmer	One (1)	
Scum Collection Pumps	One (1)	The scum collection pumps were not accessible for photographs.

4.5. Inlet / Outlet Gate Valves

Description	Quantity	Picture / Drawing
Inlet PST 1 and PST 2 only: GV 201, 203, 204 and 206 Square 762 x 762 (30" x 30")	Four (4)	

Inlet PST 1 and 2 only:

GV 202 and 205

Two (2)



Inlet PST 3 and PST 4 only:





GV 207, 209, 210 and 211

Rising stem, floor pedestal
mount

Square 762 x 762 (30" x 30")

Four (4)



<p>Inlet PST 3 and 4 only:</p> <p>GV 208 and 212</p> <p>Rising stem, floor pedestal mount</p> <p>Square 610 x 610 (24" x 24")</p>	<p>Two (2)</p>	 
<p>Outlet PST 1 and PST 2 only:</p> <p>GV 213, 214, 215, 216, 217 and 218</p> <p>Self-contained, non rising stem complete with floor box and cover.</p> <p>Square 610 x 610 (24" x 24")</p>	<p>Six (6)</p>	 

Outlet PST 3 and PST 4 only:

GV 219, 220, 221, 222, 223
and 224

Self-contained, non rising
stem complete with floor box
and cover.

Square 610 x 610 (24" x 24")

Six (6)

