

January 25, 2012

Job No. 11320

**Regarding: Structural Investigation
Structures 302 and 304
Le Goulet Wharf, Le Goulet, NB**

STATUS REPORT

FIELD WORK

The field investigation portion of the structural assessment currently being carried out is well underway. Winter conditions, weather and strong channel currents have caused some delays in completing this work.

Several unsuccessful attempts have been made to carry out the underwater portion of the field inspection. To evaluate the structure it was necessary to determine measurements of the remaining thickness of the steel sheet pile along both the harbour side and the channel side of the breakwater. This entailed the coordination and mobilization of a dive team to obtain the necessary ultrasonic measurements along the submerged portions of the exposed faces of these structures.

Upon approval to proceed with the investigation, in early November arrangements were made with the diving company to mobilize as soon as they were available. The first visit was made to the site by the inspection team from Gemtec, North East Dive, and Valron, on November 28, 2011, with the intent to complete the above water survey, inspection, and the diving work. High seas, strong winds, and heavy rain prevented the diving operation from proceeding. These conditions seemed to be specific to Le Goulet Harbour as, a short distance from the site, weather conditions were relatively calm.

The team returned to the site on the next day. Some layout work was completed to locate test pits and establish points along the SSP walls for thickness measurements. Diving operations were started on the harbour side. Failure of the ultrasonic equipment forced us to abort the work without obtaining any measurements. The problem was determined to be a short in the sensor. Field repair was not feasible, forcing postponement of the underwater work. Replacement ultrasonic testing equipment had to be purchased and shipped from the US and did not arrive for several weeks.

As soon as possible after Christmas, arrangements were made for a third visit. The inspection and dive team returned to the site on January 03, 2012. Ice and strong currents foiled all efforts to put a diver in the water to do any work on the channel side. This attempt had to be aborted for safety reasons.

.../2

On January 16, 2012, despite cold temperatures, ice conditions and high winds, the team re-mobilized, and a number of SSP thickness profiles were obtained. The production rate was very low as the currents and ice flows only allowed short periods when the diver could work on the channel side of the structure. Surface ice also had to be removed on the harbour side to allow the diver to enter the water. In addition, ice had to be removed from the SSP surface in the tidal zone in order to prepare the SSP surface for the ultrasonic testing. Over 4 days, vertical thickness profiles on the SSP were obtained at 16 locations on the structure. At each location, 3 profiles were taken, at the outer flange, inner flange, and web of a typical Z-section.

Test locations were dispersed throughout the length of the structure and the corrosion pattern appears to be relatively consistent between profiles. (See attached Sketch S-1 showing test locations.)

Due to site conditions and weather conditions, test pits have not yet been dug to investigate the tie-rod and wale system. This could not be done until after the dive operation was completed so as not to interfere with access for the diving trailer and equipment. It is intended to return to the site to carry this out within 3 weeks time.

Due to the presence of the stockpiled rip rap, it will not be possible to excavate test pits to investigate the condition of the tie-rod system on Structure 304. Also, there is no wharf access to the SSP face for taking additional thickness profiles. Ice conditions and currents make this work unsafe along the corner structure at this time of year. Three profiles were obtained at one location along the north end of this section.

The current status of the investigation work is as follows:

1. The survey of the structure has been completed.
2. Soundings have been completed.
3. The ultrasonic thickness testing has been completed.
4. The digging of test pits is scheduled for the early part of February, 2012.
5. The original structural contract drawings have been obtained.
6. An evaluation analysis of the SSP is underway.
7. An assessment of the feasibility of the possible repair options used at Pigeon Hill and planned for Bouctouche is underway.

.../3

PRELIMINARY FINDINGS

Structure 302:

Channel Face:

Corrosion at the low water zone has reduced steel thickness to an average of about 6 mm from an original 11-12 mm. There are few, if any areas of perforations on this face at and below low water.

At the mud line, the SSP thickness is typically greater than 10 mm.

The top section is severely pitted in many areas. Steel thickness between pits is typically in excess of 10 mm. Localized sections of complete section loss, (at south end), appear to be restricted to above the low-tide zone.

Harbour Face:

Similar loss of section as at the channel face was found at the tidal zone. More perforations exist in this area with adjacent steel reduced to 4 to 6 mm in some test locations.

The mud line is close to this zone due to a higher bottom elevation.

Thickness of SSP quickly returns to close to original just below the mud line.

Tie Rods:

The tie-rod end connections are exposed on the outer face of the SSP. They show minimal deterioration. It is expected that the condition of the buried wales and tie-rods behind the SSP will be good as well.

Structure 304:

Severe perforations exist along the top 2 metres of the SSP at the south end. There is severe pitting at the north end with steel in the non-pitted areas having a 7-8 mm thickness. The SSP section is reduced to about 6 mm at the low tide zone. The section thickness returns to close to 10 mm at the mud line.

.../4

INITIAL ASSESSMENT:

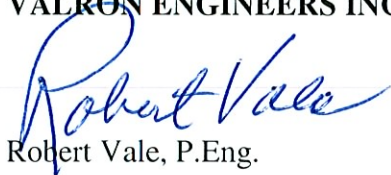
Based on the initial findings, it would appear that it will be feasible to repair the SSP faces using a concrete encasement similar to that used at Pigeon Hill.

The SSP section used on structure 302 is quite shallow, (130 mm \pm). This will make the steel plate repair as considered for the Bouctouche wharf problematic. In addition, the perforated and severely pitted area in the splash zone would make it difficult to repair using plates.

The Pigeon Hill, (and Lameque 406), repair option is felt to be the more appropriate solution.

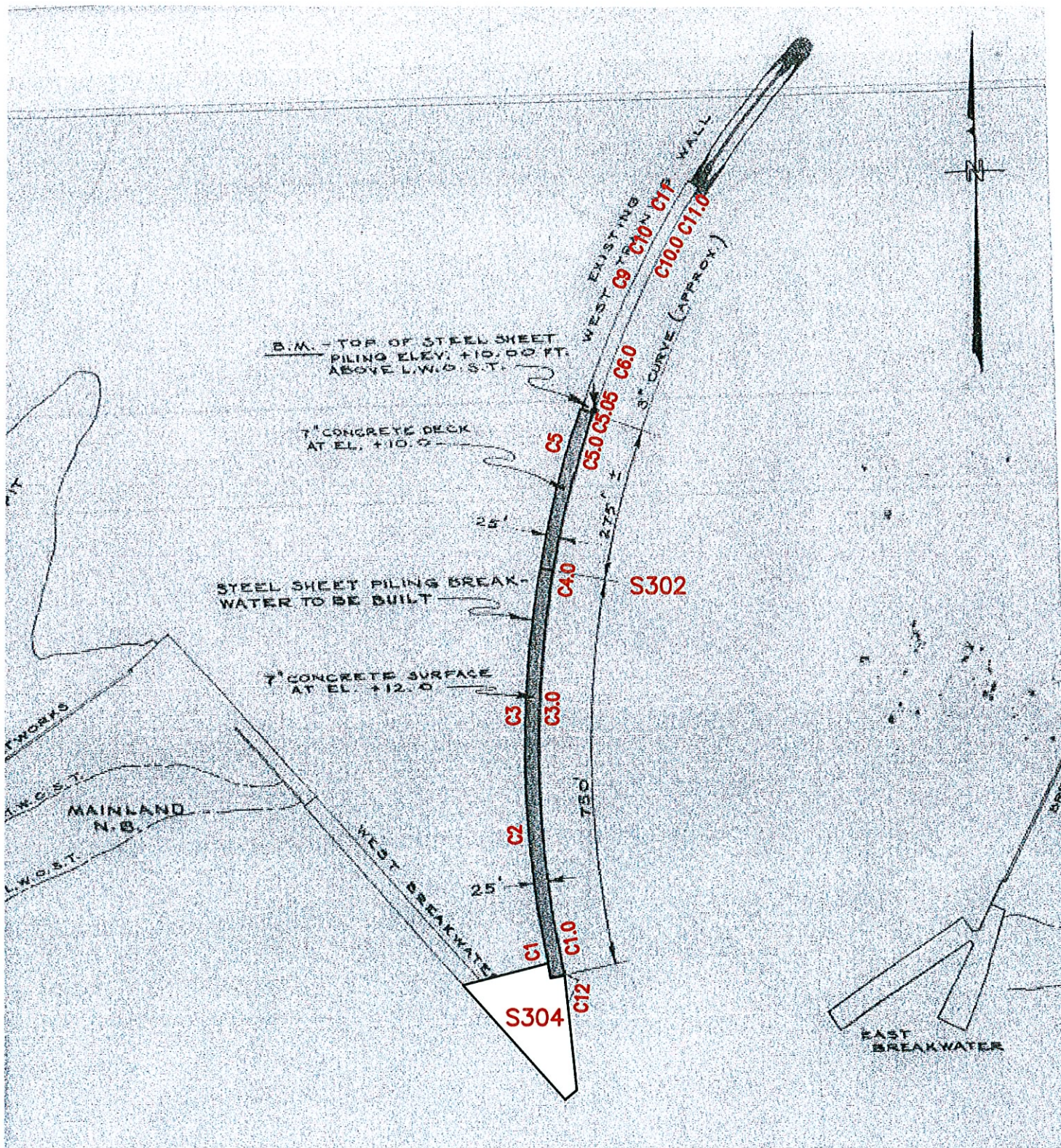
Further analysis is now underway to confirm the above.

Respectfully Submitted by:
VALRON ENGINEERS INC.



Robert Vale, P.Eng.

Encl. [Sketch S-1]
[SSP Thickness Data, PG 1 to 4]



APPROXIMATE LOCATIONS – SSP THICKNESS MEASUREMENTS
 LE GOULET STRUCTURES 302 AND 304
 JANUARY 2012

TABLE 1
LE GOULET SSP WALL INVESTIGATION - STRUCTURE 302 ANDS 304
ULTRASONIC TEST RESULTS

	HARBOUR SIDE READINGS											
Pile Test Locations	C1 - 302			C2 - 302			C3 - 302			C5 - 302		
DEPTH * (M)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)
0.40										9.7	11.3	10.7
1.00	10.6	10.5	6.8	10.5	10.7	10.8						
1.10							10.8					
1.50	10.4	10.0	10.4	10.2	10.5	10.8						
2.00	10.4	10.6	10.9	10.3	10.7	10.5	10.6	9.5-11	9.1	10.8	7.8	10.8
2.50	8.8	8.0	10.1	7.1	8.2	10.0	7.1	8.0	7.7	10.5	10.5	9.8
3.00	10.8	8.2	10.9	10.6	11.2	11.2	10.8	10.9	11.0	10.9	11.3	11.0
3.25				8.4	11.2	11.0	**	**	**	**	**	9.7
3.40							**	4.0	11.3			
3.50	7.5	6.0	8.7	<1	3-4	9.0			11.0	**	**	10.9
3.75				4.3	11.0	11.1						
4.00	7.6	9.9	9.9	7.8	11.2	10.8	8-10	11.3	11.3	5.2	8.6	11.1
4.40										10.4		
4.50	10.0	10.7	10.5							10.3	10.3	11.0
4.60							5.8	9.6	10.8			
4.65				7.8	11.2	11.0						
4.80										11.1		11.4
	BOTTOM 8.2 M			BOTTOM 8.2 M			BOTTOM 7.3 M			BOTTOM 7.0 M		

* Distance in meters down from top of steel sheet piling.

** Steel sheet piling has perforations at this depth.

Location of readings

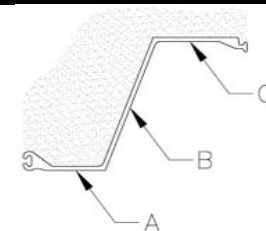


TABLE 1
LE GOULET SSP WALL INVESTIGATION - STRUCTURE 302 ANDS 304
ULTRASONIC TEST RESULTS

	HARBOUR SIDE READINGS									CHANNEL SIDE READINGS		
Pile Test Locations	C 9 - 302			C 10 - 302			C 11 - 302			C 12 - 304		
DEPTH * (M)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)
1.00	11.1	11.4	12.0	11.5	11.6	11.4	12.2	10.1	11.6			
1.50	11.5	11.4	10.8	11.8	11.8	11.7	12.3	11.7	11.9			
2.00	12.1	12.2	12.4	12.3	12.2	10.7	12.5	12.2	12.0			
2.10										8.9		
2.30												
2.40												7.0
2.50	12.2	10.6	11.9	12.5	11.8	10.7	7.6	11.5	9.8	6.5	7.9	
3.00	6.0	9.1	10.7	7.9	7.3	8.0	11.4	5.9	7.8	6.2	5.6	7.6
3.40							12.5	11.9	11.8			
3.50	6.7	12.0	9.5	12.5	10.5	11.8				7.7	7.8	10.3
4.00				10.1	10.4	11.8				9.7	10.1	10.4
4.50				11.5	10.8	11.8				9.2	5.8	10.8
5.00				11.7	11.0	11.1				10.4	9.2	10.8
5.50				11.7	11.2	11.7				10.1	8.9	10.4
6.00										10.7	8.7	10.7
				11.8	11.5	11.8						
	BOTTOM 3.6 M			BOTTOM 3.85 M			BOTTOM 3.6 M			BOTTOM 6.1 M		

* Distance in meters down from top of steel sheet piling.

** Steel sheet piling has perforations at this depth.

Location of readings

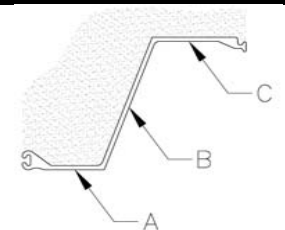


TABLE 1
LE GOULET SSP WALL INVESTIGATION - STRUCTURE 302 ANDS 304
ULTRASONIC TEST RESULTS

	CHANNEL SIDE READINGS											
Pile Test Locations	C 1.0 - 302			C 3.0 - 302			C 4.0 - 302			C 5.0 - 302		
DEPTH * (M)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)
0.00												
1.00												
1.50				7.3								
2.00				10.5	9.5-10.7	11.0	10.7	10.8	10.7			
2.50	7.9	9.4		10.5	10.0	9.7	10.4	9.3	10.3	9.4	8.3	9.7
3.00	5.0	7.2	5.5	11.1	10.7	9.4	10.4	9.7	8.3	11.1	11.0	10.6
3.50	8.4	8.0	10.2	6.1	6.0	9.6	7.2	6.9	9.2	5.8	5.5	9.5
4.00	9.4	9.8	10.6	9.4	9.1	10.8	9.9	9.1	10.9	7.8	8.3	10.9
4.50	9.4	9.6	11.4	8.5	8.7	10.8	9.1	10.3	11.0	8.6	7.9	10.1
5.00	8.5	9.8	11.5	9.3	8.2	9.5	10.2	9.1	10.4	8.3	8.9	10.7
5.50	9.5	9.5	11.2	9.5	9.7	10.8	10.4	10.6	9.8	9.8	9.4	11.0
6.00	11.5	11.4	11.6	10.2	10.1	10.8	9.8	11.1	10.4	10.1	10.8	11.2
6.50										10.5	9.2	11.2
6.60		10.7	10.5				10.3	10.8	10.8			
6.70				10.1	10.1	10.7						
7.10										10.1	10.1	11.1
	BOTTOM 6.6 M			BOTTOM 6.8 M			BOTTOM 6.7 M			BOTTOM 7.2 M		

* Distance in meters down from top of steel sheet piling.

** Steel sheet piling has perforations at this depth.

Location of readings

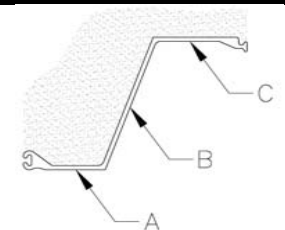


TABLE 1
LE GOULET SSP WALL INVESTIGATION - STRUCTURE 302 ANDS 304
ULTRASONIC TEST RESULTS

	CHANNEL SIDE READINGS											
Pile Test Locations	C 5.0.5 - 302			C 6.0 - 302			C 10.0 - 302			C 11.0 - 302		
DEPTH * (M)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)	A OUTER FLANGE (mm)	B WEB (mm)	C INNER FLANGE (mm)
1.50				11.7	11.0		11.4	11.4	11.4	11.7	11.5	10.4
2.00	9.7	11.0		11.4	11.2	11.1	12.1	12.1	11.5	12.1	12.1	12.0
2.50	11.4	11.5	11.6	11.0	5.6	5.8	10.8	10.5	12.0	12.2	12.1	11.4
2.75							**	**	9.2	6.0	5.7	8.1
3.00	11.1	6.0	9.2	5.8	6.4	8.9	**	6.1	10.3	7.2	7.0	8.7
3.25							6.8	8.9	11.3	6.0	8.5	9.4
3.50	6.9	6.8	8.6	9.0	9.5	11.5	8.2	10.4	11.3	11.4	8.9	8.9
4.00	8.3	10.5	11.0	9.2	10.7	11.7	9.4	10.6	10.2	10.3	10.4	11.8
4.50	8.8	10.2	11.1	11.4	12.0	11.9	8.9	10.0	11.4	11.0	11.9	12.0
5.00	10.1	10.6	11.2	10.9	11.4	11.4	10.1	10.4	11.8	11.2	11.3	11.8
5.50	10.0	11.2	11.4	11.7	12.0	11.8	11.5	10.8	11.8	11.2	11.1	11.2
6.00	10.4	11.4	11.4	11.8	11.6	12.0	11.7	11.0	11.1	11.2	11.0	11.4
6.50	10.9	11.2	11.4	12.1	12.3	12.1	11.7	11.2	11.7	11.8	11.4	11.5
7.00	11.0	11.0	11.1									
7.1							11.8	11.5	11.8			
	BOTTOM 7.3 M			BOTTOM 6.6 M			BOTTOM 7.5 M			BOTTOM 6.5 M		

* Distance in meters down from top of steel sheet piling.

** Steel sheet piling has perforations at this depth.

Location of readings

