CIF#832

Township of Seguin
Installation of Compactor Systems

Final Project Report, May 15 2015

Township of Seguin

CIF Project number #832

Acknowledgement:

This Project has been delivered with the assistance of Waste Diversion Ontario's Continuous Improvement Fund, a fund financed by Ontario municipalities and stewards of blue box waste in Ontario. Notwithstanding this support, the views expressed are the views of the author(s), and Waste Diversion Ontario and Stewardship Ontario accept no responsibility for these views.

1 Executive summary

1.1 Seguin Township is a rural township located just south of Parry Sound in the Parry Sound district. It covers 750 square kilometers and services 4700 permanent residents, and between 15- 20,000 or more in the summer months.

Seguin Township experienced large haulage fees for rented 40 yard containers of recycled materials that were located at the 4 main transfer sites in the township. In addition, these bins were not always closed, and wind, birds and animals got into the bins, and created a continual mess and ongoing site maintenance. The unique feature of Seguin sites is that they are unmanned and open 24-7.

Seguin staff prepared a proposal to council in 2013 to install 8 compacting recycling bins at the 4 main transfer sites in the township. This proposal was accepted by council, at which point an application for funding was made for assistance from the CIF Fund.

1.2 The project began in early 2014, and installation was completed in late 2014 due to inclement weather. The following equipment (pictured on the following page) was installed, and fully operational as of January 1 2015, at the Christie, Brooks Road, Humphrey and Turtle Lake transfer sites

8 Marathon TC300 compactors
10 RJ40DC bins
8 custom hoppers

Equipment was purchased from EMW, and installed and commissioned by Metro Compactor. Modifications were made to the proposed power supply, to three phase power, and initial heating settings on hydraulic oil tanks were adjusted to optimize efficiency. The Township intends to further improve the operational efficiency by instrumenting the compactors with photo sensors and timers in order to automate the system and reduce staff time spent checking fullness, utilize off-peak electrical rates, and insulate the hydraulic oil tanks.

The capital cost of the proposal was $449,300, of which the CIF fund contributed $214,307 (including 1.76% of non-recoverable taxes) or 47% of all costs related to this project. Actual costs for the project amounted to $482,000. First quarter pro-rata savings at each transfer site are estimated at $1,338 which is projected to save approximately $80,000 annually or a six year payback on investment.

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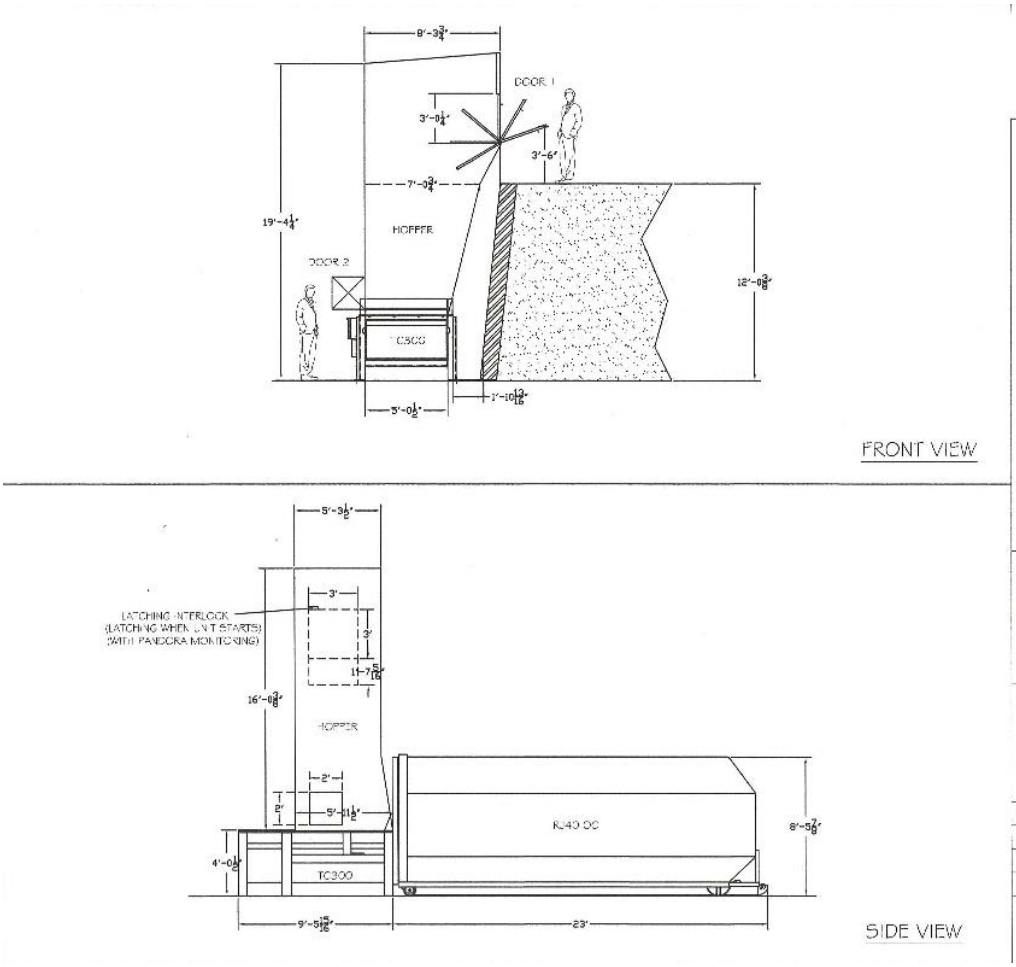

SAFETY MAGNETIC DOOR LOCK - TO PREVENT UNIT CYCLING WHEN DOOR IS OPEN

PANDORA DOOR COUNTER - COUNT NUMBER OF TIMES DOOR OPENS

MAIL BOX STYLE SECOND FLOOR CHARGING DOOR - PAD LOCK LOCKABLE COMPLETE WITH DOOR CLOSURE

SLOPED ROOF FOR WATER DRAINAGE

MAIN FLOOR ACCESS DOOR COMPLETE WITH INTERLOCK

APPROXIMATE WASTE HOLDING AREA IN HOPPER - 18 YARDS

PROJECT:

SEGJIN

DRAWING TITLE:

DRAWN BY:	M.C.
DATE:	NOVEMBER 6, 2013
SCALE:	NTS
CHECKED BY:	
DRAWING NUMBER:	1 OF 1

2 Background

2.1 Description of municipality

Seguin Township is a rural township located just south of Parry Sound in the Parry Sound district. It covers 750 square kilometers and services 4700 permanent residents, and between 15- 20,000 or more in the summer months.

2.2 Description of municipal recycling services provided

The Seguin waste/recycling system consists of 7 sites, 3 main transfer and 4 remote secondary sites to service this large rural area. The waste management system uses a Haul-All Transtor system and smaller HL-6 receptacles for remote sites, and all recycling is collected in rented 40cu yard containers. The unique feature of our sites is that they are unmanned and open 24-7.

Seguin small waste trucks have 2 storage compartments each, and collect all waste and 2 recycling commodities from the remote sites. The garbage is dumped into Transtors at a nearby Transfer site, and the recycling is dumped into open top roll off containers. Once the open top containers are full, they are collected by contractor trucks, and transported to their facility. This is where the double handling of recycling is evident.

2.3 Problem statement

The largest opportunity for efficiency improvements is compacting the recycling commodities. Increasing tonnage in a 40 yd container from the current average of 1.05 tonnes to 4-6 tonnes depending on the commodity, will reduce transport charges significantly. In addition, the benefits of eliminating the double handling of recycled products from remote sites is self-explanatory.

Turtle Lake transfer station compacting units

3. Monitoring & Reporting

3.1 Budget

The capital cost of the proposal was $449,300, of which the CIF fund contributed $214,307 (including 1.76% of non-recoverable taxes) or 47% of all costs related to this project.

3.1.1 Comparison of budget vs actual

Comparison of Budget vs Actual cost - Compactor installation

	Budget	Actual
Compactors - 8 units installed	$ 400,000.00	$ 400,000.00
Electrical	$ 30,000.00	$ 37,000.00
Concrete pads - 8	$ 10,000.00	$ 10,000.00
Fencing	$ 5,000.00	$ 6,500.00
Hydro one upgrades		$ 9,000.00
Labour and equipment	$ 5,000.00	$ 20,000.00
Total	**$ 450,000.00**	**$ 482,500.00**

3.1.2 Explanation of variations in budgeted vs actual

For reliability and where power was available, 3 phase power supplies were provided to sites by Hydro One. This eliminated the 3 phase to single phase inverter used on the hydraulic power pack. These are sensitive to voltage spikes and can burn out ($1500 replacement cost). Hydraulic units are 10hp and 3 phase power is more suited to this horsepower and are recommended if possible.

Some electrical wiring upgrades were made to provide service entrances into the hoppers with local service controls.

Seguin staff provided the labour for this project. It is an actual cost, but is utilizing existing overhead. Site preparation would have cost $50,000 if concrete pads and site modifications were made by a contractor.

3.2 Maintenance

Compaction and hydraulic oil heating costs in the first 4 months of the year in a very cold year , rough estimate of $200 per compactor per month.

3.3 Labour

These are unmanned sites, so there must be an inspection daily, often 2 times per day in peak season. Our objective is to have a clean, efficient site where waste and recycling can be deposited quickly and safely.

The current system has been programmed that an operator opens a locked panel and presses the on button. This cycles the compactor 3 times. If there are minimal site visits, the hopper get full, and more time is required for the operator to cycle the compactor, and there is a higher risk of the hopper chute becoming jammed.

Seguin has applied for funding to automate the compactors by use of photo sensors and timers. The photo sensor will be used to trigger a cycle once a level of product is in the hopper. A timer will be used to allow compacting at say 11.00 pm and 6.00am to ensure hoppers are empty before residents start using system, and to operate them during off peak electrical rates.

3.4 Transportation savings

The attached charts shows the direct comparison of compaction vs non compaction at 3 major transfer sites. The 4th was not included because data was not clean due to it being an open top drop off location for the smaller sites, and it was not directly comparable to the other sites.

Turtle Lake transfer station compacting units

Comparison of recycling costs 2014-2015 - Seguin Township Compacting project

Sites	2014								2015							
	Jan		Feb		Mar		3 month total		Jan		Feb		Mar		3 month total	
	lifts	tonnage	lifts	tonnage	lifts	tonnage	lifts	tonnes	lifts	tonnage	lifts	tonnage	lifts	tonnage	lifts	tonnes
Brooks																
cardboard	7	4.92	6	4.31	8	5.61			1	4.75	1	5.32	1	4.55		
comingled	4	2.86	3	2.41	6	3.62			1	3.47	1	4.39	1	3.96		
total tonnes		7.78		6.72		9.23		23.73		8.22		9.71		8.51		26.44
total lifts	11		9		14		34		2		2		2		6	
Turtle																
cardboard	3	2.28	3	2.27	3	2.89			0	0	1	4.53	0	0		
comingled	1	0.54	2	1.62	2	1.74			0	0	0	0	1	3.6		
total tonnes		2.82		3.89		4.63		11.34		0		4.53		3.6		8.13
total lifts	4		5		5		14		0		1		1		2	
Christie																
cardboard	3	2.01	2	1.7	3	2.24			0	0	0	0	1	5.72		
comingled	2	1.45	1	1.04	2	1.6			0	0	0	0	1	4.32		
total tonnes		3.46		2.74		3.84		10.04		0		0		10.04		10.04
total lifts	5		3		5		13		0		0		2		2	
Total month invoice	$	6,032.27	$	5,238.24	$	8,510.37	$	19,780.88	$	718.34	$	1,072.48	$	1,923.83	$	3,714.65

2014 - 3 month average Tonnes/lift		
Total tonnes	Total lifts	Tonnes per lift
45.11	61	0.74

2015 - 3 month average Tonnes/lift		
Total tonnes	Total lifts	Tonnes per lift
44.61	10	4.46

Net pickup reduction **603.24%**

6 X reduction in pickups

4.0 Conclusions

4.1 Projected savings per site based on measured periods and projected tonnes

For analysis, the first quarter of 2014 (baseline) was compared to the first quarter operations in 2015 with the compaction system in place and fully operational.

Cost comparison 3 sites 6 compactors first quarter 2014 vs 2015		
2014	**2015**	**Savings**
$ 19,781	$ 3,715	$ 16,066

The compaction system has reduced the recycling pickup activities by approximately 600%; or one trip in the compaction system versus six in the previous. The projected reduction in annual recycling lift activities demonstrates a significant reduction in costs. Estimated pro rata savings per site per month - $1338. Realistic anticipated savings as quoted in our CIF submission - $80,000 per year, which is in our 2015 budget. Based on this annual savings, the project payback period will be approximately 6 years.

4.2 Next steps to improve efficiency

Optimize heating units on compactors. Heating units were sub-optimally set initially resulting in cost inefficiencies

Seguin has applied for funding to automate the compactors by use of photo sensors and timers. The photo sensor will be used to trigger a cycle once a level of product is in the hopper. A timer will be used to allow compacting at say 11.00 pm and 6.00am to ensure hoppers are empty before residents start using system, and to operate them during off peak electrical rates.

Staff have applied for an additional CIF grant to cover costs of installing electrical timers to power the hydraulic oil heaters in the off peak hours to minimize electrical cost. In addition, insulated boxes will be constructed to house the hydraulic tanks to preserve energy.

Projected cost of upgrades - $16,000

Cost savings per annum - $7,300

Payback 2.2 years.

Brooks Road Transfer site

Storefront

Christie Transfer site

Humphrey Transfer site

Turtle lake transfer site