

# Recycling Center Conceptual Design and Preliminary Cost Estimates

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**SCS ENGINEERS**

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## **ACKNOWLEDGEMENT**

This report was completed under the Pennsylvania Department of Environmental Protection's (DEP) Recycling Technical Assistance Program. SCS Engineers acknowledges the support of DEP to complete this study.

# 1 PROJECT DESCRIPTION

Pike County (County) does not currently provide recycling services to residents. Those seeking to recycle must contract with a private hauler for curbside collection of recyclable materials. The County previously provided recyclable material collection services via a public drop-off center, but the program was discontinued due to contamination of materials and illegal dumping. The County is considering the development of a convenience center facility for the collection of recyclable materials (Recycling Center). The County anticipates collecting cardboard, paper, aluminum, plastic, tires, e-products, appliances, glass, metal, CFL bulbs, and batteries at the new Recycling Center.

The Recycling Center would be used by residents to drop-off designated materials. Individuals from the County Office of Vocational Rehabilitation (OVR) and the Human Resources Center (HRC) would staff the Recycling Center and manage the materials. The facility would be overseen by the County Recycling Coordinator.

Pike County has acquired the local Pennsylvania Department of Transportation (PennDOT) building in a land swap transaction. The property is on the south side of Bennett Avenue within the Borough of Milford. PennDOT is nearing completion of a new headquarters in Blooming Grove Township, and has transferred the title on the Bennett Avenue property to the County. However, the County does not anticipate full access to the site, including buildings and grounds, for a period of time.

The County is considering the modification of the property to address three of Pike County's greatest needs: fleet management and maintenance, document storage, and recycling. Converting the property and existing building(s) to collect recyclable materials from residents requires assistance by professionals experienced in recycling and convenience center design. This recycling technical assistance project includes a site assessment of the property, development of a conceptual site layout, and cost estimates for project start-up. The site evaluation identified potential opportunities and improvements that are needed to convert the property into a recycling convenience center.

## SUMMARY OF WORK

The following summarizes the tasks completed for this project.

### **Task 1 – Data Collection and Site Visit**

SCS hosted a conference call with County staff to discuss the project's scope of work and review site characteristics of the PennDOT property. SCS also prepared and submitted a data request to the County to obtain existing documentation including, but not limited to, property surveys, facility engineering drawings, land-use requirements, and applicable permits. SCS also conducted a site visit in early 2021 with County staff and other stakeholders.

### **Task 2 – Site Modifications and Improvements**

Based on site observations made in Task 1, SCS staff identified potential site improvements, upgrades, and modifications that may be needed in order to establish a Recycling Center at the PennDOT facility.

### **Task 3 – Conceptual Site Layout/Design**

SCS prepared a conceptual site layout of the Recycling Center at the PennDOT recycling facility using AutoCAD. Select site modifications and improvements identified in Task 2 were included in the conceptual layout. The conceptual site layout was developed for implementation of a Recycling Center facility in two phases. Additionally, SCS provided preliminary cost estimates for modification of the existing property.

## Task 4 – Final Report

SCS developed this report to provide the results of the site visit and analysis of the opportunities to convert this PennDOT property into a Recycling Center.

# 2 FINDINGS

## FACILITY OBSERVATIONS

Facility buildings and other key property features of the PennDOT property are presented in **Figure 1** and **Table 1**. The approximate footprints for each building were provided by the County.

### Access and Traffic Flow

The PennDOT facility is accessed from Broad Street/Route 209 off Bennett Avenue. The site has two entrances (labeled Entrance #1 and #2 in **Figure 1**) that form a “U”-shaped internal traffic area that circles a central office (“A” in the **Figure 1**) and garage. Presently, there appears to be no designated direction of traffic flow at the property. Employee parking spots line the inside edge of both entrance roads at the sides of the office, and several additional spots are situated along Bennett Avenue in the building’s front. The facility is fenced-in beginning just beyond the entrance parking spaces. The access gates (Gate #1 and #2) built into the perimeter fence at each entrance are approximately 20-foot wide, a relatively tight squeeze for two-way traffic given the size of vehicles currently in use. Long-body vehicles and other equipment are stored in the facility’s back half, the site’s largest open area.

### Buildings

There are essentially four permanent structures on site. The front building consists of two sections; an entrance and office on the north side (“A”), and a wide 4-bay maintenance garage on the south side (“B”). There are two bays located at the rear of the garage (on its south side), and one bay located at each of its east and west sides. A prominent chimney is visible in the center of the garage. Two other buildings are situated side-by-side at the rear of the site. A square building (“D”) constructed of sand-colored block with two wing areas is situated on the Route 209 side. It has one single bay in its center that serves as a small maintenance garage. The gray, sheet metal-clad building to its east (“C”) is anticipated to be used to store paper documents in the future. It has three bays corresponding to three internal sections, the westernmost of which has a significant securable/caged portion. The building also has a high ceiling and appears to have had floor drains in use in each bay at some point. The rear of this building contains an additional protected (via overhang) storage area along its entire back length, where there is an additional storage cage area. There is a driveway along the rear of Building C, but not enough clearance between Buildings D and the rear perimeter fence to route traffic through in a loop around the buildings. A steep embankment and drop-off to the Vandermark Creek flood plain was observed just beyond the rear fence line.

### Other Observations

Other than the main fleet parking area between the site’s main structures (“B”, “C”, and “D” in **Figure 1**), the only other location with no buildings/structures is the peninsular southeast part of the site. This area is currently used as a lay down yard for miscellaneous supplies and equipment by PennDOT. In addition, a roughly 50 by 50-foot wastewater treatment system has been installed near

this area to manage sewage produced onsite. It is located immediately east of the three-bay garage and would likely be cost-prohibitive to relocate.

The lay down yard wraps around the treatment system and is recessed relative to the rest of the site. It is grade-separated by a roughly four-foot high retaining wall that was covered in snow at the time of SCS's site visit. An internal fence and third gate allows PennDOT to secure the portion of this area along the retaining wall. Routing traffic in a loop around the treatment system would require infill to develop a ramp to the top of the retaining wall.

Green space at the site is limited to a grass lawn on either side of the office at the front of the facility. Open space along the outside of the entrance driveways was being used for excess snow storage at the time of the site visit. Miscellaneous small sheds or other structures were observed scattered around the property. SCS did not observe any existing pavement markings at the site during the visit.

An exclave property associated with the primary PennDOT facility property was also observed during the site reconnaissance. Located at the intersection of Route 209 and Bennett Avenue, this detached additional site does not contain any notable infrastructure and is used to park vehicles.

Figure 1. Aerial View of PennDOT Site

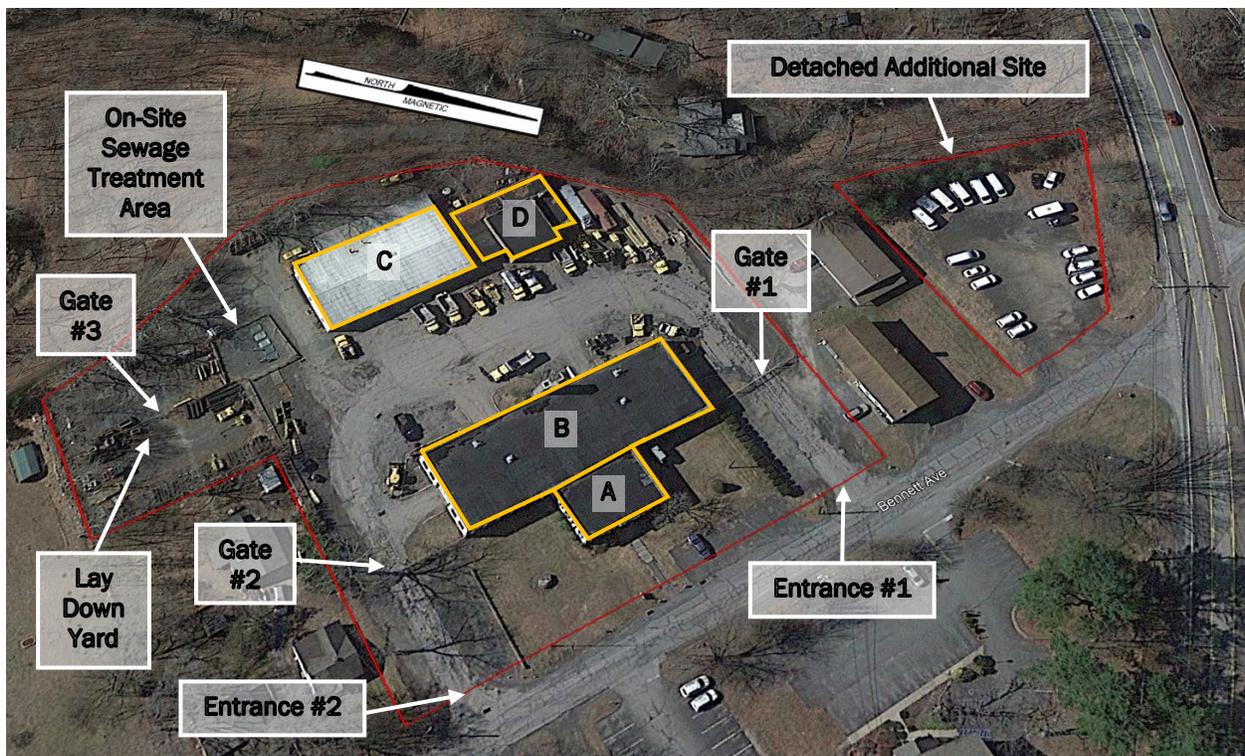


Table 1. Site Building Information

Letter ID (in Figure 1)	Footprint (Est. Sq. Ft.)	Description
A	1,925	<b>Office:</b> Facility reception and office area.
B	8,800	<b>Four-bay (Primary) Garage:</b> Four-bay garage with high ceilings; connects to Office.
C	7,100	<b>Three-bay Garage:</b> Additional garage with high ceilings, secure storage (cages), and outside overhang storage.
D	3,910	<b>One-bay Garage:</b> Block-constructed garage building with employee lounge wing on east side and additional wing with miscellaneous storage on west side.

## COUNTY VISION FOR FACILITY

The County envisions modifying the property to address three of its greatest needs: fleet management, document shredding/storage, and recycling. The first two needs will impact the space available for the third, development of a Recycling Center.

### Fleet Management

The Pike County Transportation Department requires space to store its vehicles and conduct fleet management activities, including operations and maintenance. The current office (Building A) is anticipated to be County office space, primarily for administrative purposes for the Transportation Department. Building B is anticipated to be the operational area for the Transportation Department.

### Document Shredding/Storage

The County currently retains copies of important documents and records in storage at multiple private sector warehouses. This incurs significant costs to the County, so the County prefers to move the necessary warehousing of official documents in-house. In addition, once documents have been scanned and converted to electronic format and the requisite amount of time has passed to comply with document retention requirements, the County seeks to begin a shredding operation. Building C is anticipated to be the location for these activities, which will include shredding of recyclable paper documents as well as (not as easily recyclable) vellum and other material-based documents. The document shredding and storage operation is thought to be complimentary to the Recycling Center concept.

### Recycling Center

Most relevant to this conceptual design effort, the County seeks to provide drop-off collection services for recyclable materials and other materials for its residents (and possibly businesses and other entities). Currently, no public drop-off collection of recyclables or special waste materials occurs in Pike County or, likewise, on the property.

The County previously operated a recycling drop-off location, but this facility was discontinued. In addition, PennDOT managed various waste and recycling streams internal to its own operations at the Bennett Avenue site. These included used tires (from replacements), scrap metal, and used oil at the site. Presumably, some limited amount of current site infrastructure might be left behind by

PennDOT as operations transition to County control. Examples may include used oil collection tanks and general material storage systems.

## CONCEPTUAL DESIGN CRITERIA

According to Pike County's application for Pennsylvania Recycling Technical Assistance, the following materials are anticipated to be accepted at the facility:

- cardboard;
- paper;
- aluminum;
- plastic;
- tires;
- e-products;
- appliances;
- glass;
- metal;
- CFL's;
- batteries.

During the site visit, additional materials and sub-materials were expressed as desired to be collected at the future facility. These materials include:

- televisions/CRT (Cathode Ray Tubes) monitors, a subcategory of e-products;
- paints;
- furniture;
- white goods, a subcategory of appliances that sometimes requires special handling to remove the regulated Freon from spent units such as refrigerators.

The primary design criteria used for the conceptual recycling center schematic design was sizing the layout of the facility to be able to accept the above-listed materials. Other criteria include observed facility infrastructure and rough dimensions as able to be obtained from satellite imagery. The latter criterion is highly uncertain, as SCS was not able to review a formal survey of the Bennett Avenue property. However, SCS obtained approximate property boundary lines from the Pike County GIS Department and used satellite imagery scaled to (roughly) fit combined with field observations to lay out the conceptual site schematic in two phases.

## PRELIMINARY CONCEPTUAL DESIGN

### Schematic

Using the conceptual design criteria above, a preliminary conceptual schematic showing a potential design for a phased recycling center situated at the southern end of the overall facility was developed (**Appendix A**). A potential primary phase (Phase 1) is presented in green in the sketch; a secondary phase is presented with yellow additions. Finally, a conceptualized processing area located in Building D is presented in purple.

### Phase 1

Phase 1 was conceptualized as the addition of a looping collection area with seven roll-off collection containers (open-top) for traditional recyclable materials (i.e. glass, plastic, aluminum, cardboard, paper, etc.). This was assumed to involve roughly 25,000 square feet of paving improvements so residents could use personal vehicles at the collection facility, as the condition of the pavement in the southern part of the facility was not able to be assessed during the site visit. Each of the seven roll-off containers were assumed to be positioned on a 250 square foot concrete pad with embedded

container rails for infrastructure longevity. In addition, grading imported fill to construct an inclined ramp area to overcome the three-foot grade drop along the loop (where there appears to be a short retaining wall) was assumed.

Miscellaneous features include the following:

- **Attendant Building/Fee Booth** - Located close to the center of the proposed loop;
- **Wastewater Treatment Area** - Assumed to remain undisturbed and accessible from various approach angles;
- **Snow Storage Areas** - Assumed based on observations at the site. Minor additional site features assumed include signage and pavement markings/stripping.

## Phase 2

Phase 2 was conceptualized to include the collection of material other than traditional recyclable materials, including tires, electronic waste, bulky waste, and possibly others. The southernmost bay of Building C was sketched to include a drive through portion via redevelopment of the rear wall of the building (if found to be feasible), to allow the facility to continue to operate in inclement weather. Additionally, covered collection areas for e-waste, tires, and appliances as well as a bulky waste collection container were included in the looping drive. The indoor area may also serve to substitute as a flexible collection area, with a compactor installed under cover at the rear of the building for additional, more efficient consolidated collection of material such as bulky waste. Lastly, existing wire storage lockers at the rear of Building C as well as the oil collection tank observed during the site visit were envisioned to be repurposed for collection of materials requiring special storage.

## Additional Potential Development

Building D appears to have the vertical clearance to install recycling processing equipment such as a baler and conveyor to allow further compaction of material. In addition, sorting of material could occur in this building, or some other materials handling to increase the efficiency or effectiveness of the operation. Material could be transferred from collection areas to the processing area by a skid loader, front loader, or by another means. The employee lounge and storage areas in the wings of the building could also be utilized by the site attendants as an enhancement or alternative to the proposed attendant building located central to the collections area.

## Cost Estimate

A preliminary cost estimate based on the conceptual design was also developed (**Appendix B**). Elements such as asphalt paving and import of gravel fill may not be necessary; SCS was unable to observe the extent of the paved area in the southern part of the facility during the site visit. Building D improvements were not estimated, as it is unclear exactly what kind of processing would be conducted at the facility.

## 3 CONCLUSION

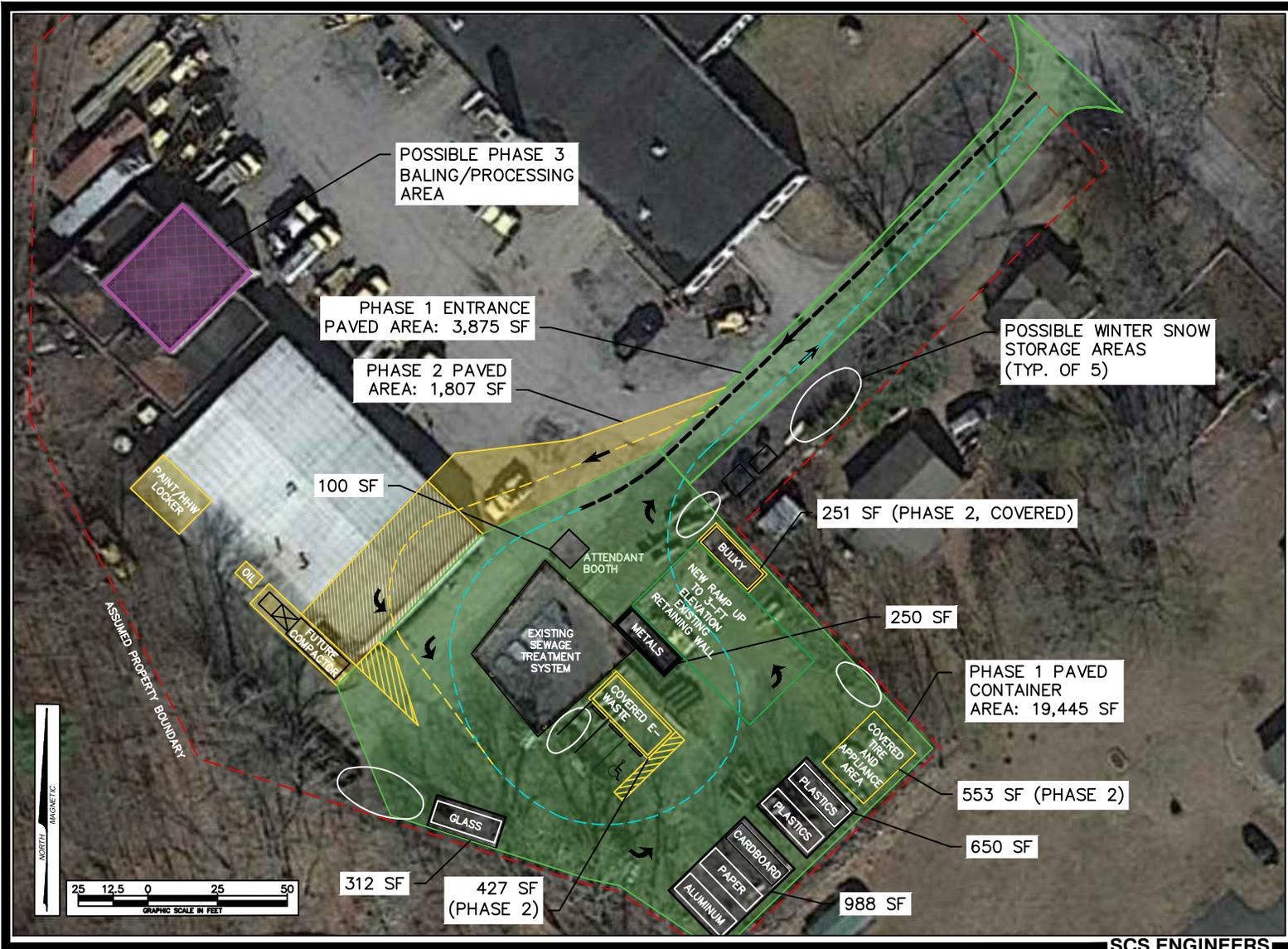
Pike County has acquired a facility with flexibility for conversion into a recycling center to serve its citizens. Currently, no such facility is available to the public in the County. The existing space and various features at the facility may allow a phased implementation of a recycling center as resources become available to install additional collection infrastructure, and perhaps processing equipment

and more sophisticated materials handling systems. As the County considers additional material streams to phase into the facility, it should consider the regulatory nature of different material streams and the corresponding measures for collections, handling, and storage which may be required by PADEP and other regulatory agencies. In addition, the safety of facility users and attendants should always be weighed against the addition of more site infrastructure that may cause congestion, crowding, and potential points of traffic conflict.

Recycling markets and household hazardous waste/e-waste management company fees are somewhat unpredictable. As a result the availability of markets and mode of collection should be thoroughly evaluated prior to selecting materials for collection. Introduction of part-time or full-time staff will introduce employee safety measures. Finally, permitting requirements, both state and local, should be considered prior to any development of the site into a facility that accepts recyclables and other discarded material types.



**Appendix A**  
**Conceptual Recycling Center Schematic**



CONCEPTUAL RECYCLING CENTER SCHEMATIC



**Appendix B**  
**Preliminary Planning Level Cost Estimates**

**PRELIMINARY ESTIMATED COSTS  
CONCEPTUAL RECYCLING CENTER SCHEMATIC  
PIKE COUNTY, PENNSYLVANIA**

ITEM NO.	ITEM	UNIT	UNIT COST (UC)	Phase 1		Phase 2	
				Quantity	Line Item Cost	Quantity	Line Item Cost
<b>FACILITY SURFACES</b>							
1	Aggregate Base (8" crushed stone)	sy	\$15	2,600	\$ 39,000	300	\$ 4,500
2	Asphalt Binder Course (3-4")	sy	\$20	2,600	\$ 52,000	300	\$ 6,000
3	Top Coat (1") & Sealer	sy	\$10	2,600	\$ 26,000	300	\$ 3,000
4	Concrete Pads w/Embedded Metal Plates ( also inc. rebar/binding agent)	sy	\$75	280	\$ 21,000	-	\$ -
			<b>Subtotal</b>		<b>\$ 138,000</b>		<b>\$ 13,500</b>
<b>OTHER SITE IMPROVEMENTS</b>							
5	Structural Fill to Create Ramp to Retaining Wall (5 percent grade)	cy	\$50	220	\$ 11,000	-	\$ -
6	Retaining Wall Construction/Reinforcement	sf face	\$75	200	\$ 15,000	-	\$ -
7	Electrical Install/Construction: Assume 5% (rounded) of Sum of Subtotals	%		5%	\$ 13,000	5%	\$ 9,000
			<b>Subtotal</b>		<b>\$ 39,000</b>		<b>\$ 9,000</b>
<b>CONTAINERS, BUILDINGS &amp; OTHER FEATURES</b>							
8	Roll-off Containers (open tops and octagonals)/Freight; including spare	ea	\$10,000	8	\$ 80,000	2	\$ 20,000
9	Roll-off Container Covers	ea	\$4,000	-	\$ -	2	\$ 8,000
10	Compactor, Install, & Associated Packer Boxes (One Main, One Spare Box)	ea	\$45,000	-	\$ -	1	\$ 45,000
11	Used Oil Collection Tank and Paint/HHW Locker Improvements	ls	\$5,000	-	\$ -	1	\$ 5,000
12	Cover Pavillion for E-waste/Tires	ea	\$20,000	-	\$ -	2	\$ 40,000
13	Pre-Engineered Attendant Building (8x12') , Freight & Improvements	ls	\$20,000	1	\$ 20,000	-	\$ -
14	Metal Warehouse Wall Demolition (assume two 8'x20' openings)	ls	\$40,000.00	-	\$ -	1	\$ 40,000
			<b>Subtotal</b>		<b>\$ 100,000</b>		<b>\$ 158,000</b>
<b>OTHER CONSIDERATIONS</b>							
15	Internal Signage/labels	ls		-	\$ 2,000	-	\$ 1,000
16	Pavement Markings/Stencils	ls		-	\$ 3,000	-	\$ 2,000
17	Security/Camera	ls		-	\$ 10,000	-	\$ 5,000
			<b>Subtotal</b>		<b>\$ 15,000</b>		<b>\$ 8,000</b>
<b>SUM OF SUBTOTALS</b>					<b>\$ 292,000</b>		<b>\$ 188,500</b>
Construction Stakeout/Surveying (5%)					\$15,000		\$10,000
Mob/De-Mob Costs (10%)					\$30,000		\$19,000
Cons. Admin, Eng. & Mat. Testing (8%)					\$24,000		\$16,000
<b>Construction Pre-Contingency Total</b>					<b>\$361,000</b>		<b>\$233,500</b>
Contingency - inc. Minor Items (15%)					\$54,150		\$34,897
<b>PRELIMINARY CONCEPTUAL RECYCLING CENTER ESTIMATED COST</b>					<b>\$ 415,150</b>		<b>\$ 268,397</b>

Note: sy = square yard; sf face = square feet of vertical face; cy = cubic yard; ea = each; and ls = lump sum.