Hillsborough County Northwest Solid Waste Transfer Station
Innovation to Meet Client Goals with a Limited Budget

Name of Organization:
Hillsborough County Public Works / Solid Waste Management Division
Jurisdiction: County
Approx. Population: 870,000
Cost Per Household: $17.35
Approx. Budget: $11,710,653

Contact:
Megan J. Miller, PE
Operations Manager
Hillsborough County Florida
Phone: 813-209-3078
Email: millermj@hillsboroughcounty.org

SWANA 2015 Excellence Award Entry
Category: Transfer Station
Executive Summary

Hillsborough County, Florida operates a fully integrated solid waste system including a Waste-to-Energy Facility, a Class I landfill, two transfer stations, three yard waste facilities, four community collection centers, three household hazardous waste collection centers, a waste tire facility and a curbside collection recycling program. In 2004, the County initiated a program to expand and reconstruct both transfer stations. The recent economic downturn necessitated that the Northwest Transfer Station expansion be implemented using an innovative, phased approach. Phase 1 of the overall program included renovating the existing transfer station and scale facility. The renovation consisted of constructing a new building over the old building, re-using the existing concrete floors and walls, and demolishing the old building from the inside out while keeping the facility in operation.

Phase 2 includes construction of a new scale facility and roadways. The remaining improvements will be implemented in subsequent phases.

Team Members

Michael E. Strully, P.E.
Professional Engineer II
Public Utilities/Technical Services Division
Hillsborough County, Florida

Megan J. Miller, P.E.
Operations Manager
Public Works/Solid Waste Mgmt. Division
Hillsborough County, Florida

Christopher F. Kuzler, P.E.
Sr. Vice President
King Engineering Associates, Inc.
Tampa, Florida

R. J. Bruner, P.E.
Sr. Project Manager
CH2M HILL, Inc.
Gainesville, Florida

J. Kokolakis Contracting, Inc.
General Contractor
Tarpon Springs, Florida
Program Planning

Site and Facility History

The site of the original Northwest Transfer Station (NWTS) was originally a 126-acre County operated landfill. The site is located along a major thoroughfare (Linebaugh Avenue) and is surrounded by the heavily-used Upper Tampa Bay Trail as well as Rocky Creek which flows into Tampa Bay. In 1980 the landfill was closed and the NWTS was constructed on top of the closed landfill to allow trash that would have been disposed of in the landfill to be hauled to the County’s Southeast Landfill. The NWTS originally consisted of a scale house with in-ground inbound and outbound scales; a metal top-load transfer station building, and several trailers used for administrative offices. In 2000, a community collection center (CCC) was added to the site to allow County residents to drop off non-processable items.

The CCC consists of an elevated ramp area and a concrete “Z-wall” with rolloff containers on the lower side of the wall. In 1997, the County constructed a ±10-acre crushed concrete and asphalt yard and wood waste processing facility (YWPF) to the north of the transfer station building. A 6,000 square foot administration building was also added to the site in 2003. These later facilities were all placed and designed in anticipation of a future site reconstruction.

The original transfer station building consisted of a metal building with a 13,500 square foot concrete tipping floor with two loading slots and two tunnels below. Garbage trucks would turn around on a 12,000 square foot asphalt apron and then back into the tipping floor between the building’s concrete columns. In 1999 the asphalt apron was replaced with concrete slabs on the north and the east side of the building, and these slabs were enclosed with a new metal building. This expansion was meant to better enclose the facility and reduce vector attraction, but it did not increase the size of the tipping floor because the new slabs were outside the tipping floor leachate collection system and because the lower roof height of the new metal building did not allow for tipping. The facility utilized two knuckleboom cranes to compact and groom the loads in the transfer trailers in the tunnels below. The knuckleboom cranes were supported on a steel superstructure and were controlled from a common, central operator’s booth.

The 1990s and early 2000s saw incredible growth in the Northwest area of the County. This greatly increased the volume of trash being brought to the facility. At the same time, the metal buildings began showing signs of corrosion and the roof panels had extensive leaks. The cranes required continuous maintenance and their steel support superstructure was experiencing fatigue failure. The superstructure fatigue was also a safety issue, because the steel superstructure also supported catwalks used to access the cranes for maintenance and to access the operator's booth. Downtime was customary and expenditures were at a level that supported complete replacement to be cost effective. Eventually, one of the cranes was completely taken out of service and associated catwalks were roped off for safety reasons.
Transfer Station Expansion Goals

The County addresses its customers’ needs and capital infrastructure requirements with continued upgrades and expansions to its integrated solid waste management system. The County recently completed an expansion of its Waste-to-Energy Facility from 1,200 tons per day to 1,800 tons per day. Its landfill capacity expansion includes a new 120-acre landfill disposal area that has its initial phases completed and operational, with additional phases in design. The new disposal area complements the existing 162-acre Class I disposal area with 15 to 20 years of remaining capacity. The County’s two transfer station sites are an important part of its integrated solid waste management system, providing convenient disposal locations for commercial haulers, private haulers and private citizens. Reconstructed, state-of-the-art transfer stations were needed to address the County’s current and growing needs.

Having operated two transfer stations for more than 25 years, Hillsborough County Solid Waste staff was acutely aware of what features were needed in a new facility. County goals included:

- Providing a capacity that will meet 20-year requirements with the ability to expand at a future date;
- Selecting a cost-effective technology that is easy to operate and maintain;
- Separating commercial and private haulers, CCC, yard waste facility and transfer trailer traffic streams as much as possible;
- Eliminating flooding during storms;
- Hardening against hurricanes;
- Providing adequate queuing volume on-site without blocking traffic flow;
- Providing storage and maintenance areas for equipment;
- Buffering the site from the surrounding community.

To be sure that the new facilities would address the County’s goals and meet customer needs in a comprehensive and cost-effective manner, an extensive planning and preliminary engineering effort was conducted. As part of this effort, we:

- Visited other transfer station sites in Florida and other states to see their systems, discuss operations with their staff and explore the latest technologies.
- Met with the County’s commercial haulers to determine their needs and goals.
- Conducted public information meetings.
- Analyzed past and future trends in tonnage and determined the 20-year capacity requirements of the facility.
- Evaluated existing and new technologies in order to select the proper technology for the new facility.
- Developed multiple alternative site plans in order to make best use of the available land.
- Established building architectural and aesthetics requirements.

The result was a fully integrated, master planned site where customers can dispose of their wastes in a fast and user friendly manner.

Design & Construction

Design Requirements

The impacts of the recent economic downturn necessitated that the project be implemented using an innovative, phased approach. Rather than immediately construct an entirely new transfer station building, an extensive study was undertaken to determine means for renovating the existing transfer station and scale facility as an interim measure, with the remaining improvements being completed in subsequent phases. By renovating the existing building and expanding the size of the tipping floor, the facility could process approximately 1,700 tons per day, with enough space to store an additional 1,060 tons of trash on the tipping floor. This should provide...
adequate capacity into the mid 2020s. Various options were evaluated including 1) renovating the existing transfer station structure; 2) renovating the existing transfer station structure including raising its roof, and; 3) constructing a new building over the old building, re-using the existing concrete floors and walls, and demolishing the old building from the inside out. Option 3 was ultimately chosen and implemented under Phase 1 because it provided the County and its customers with a completely renovated transfer station building structure at an estimated construction cost of ±$11 million – $10 million less than the cost of constructing an entirely new building.

**Challenges Posed by Original Transfer Station Building**

The original transfer station building consisted of the two metal buildings described above, concrete floors and push walls and concrete tunnels. Operations were significantly slowed by the original building’s concrete columns, which limited maneuvering and working space on the floor. Other limitations of the existing building included:

- The existing leachate trenches only received flow from the area within the columns, restricting trash processing to within this area;
- The tipping floor was too small for incoming peak deliveries, resulting in unreasonably high stacking and minimal working space on the floor.
- The roof of the main building was sloped toward the loading slots, resulting in a very low roof line over the pits, which did not provide the clearance required for new crane models. Lighting inside the facility was minimal, using “orange” sodium vapor lamps.
- Fans in the walls were too small to provide adequate ventilation and were not functioning.
- Entrance into and exit from the tipping floor was through the same door on the east side of the building, restricting traffic flow.
- Minimal queuing was provided for incoming trucks, resulting in traffic backing up to the scale house.
- The steel supporting the cranes and access catwalks were failing.

As a first step in designing the building renovation, a 3-dimensional scan of the existing building was conducted and a 3D model of the existing concrete floors and walls was developed. Design of the new building then proceeded around these existing components that were to remain.

Given the volume of trash generated in the northwest part of the County, and the stipulations of its existing franchise hauling agreements, the County did not have the option of closing down the facility in order to construct a new facility. All of the proposed construction needed to take place with the facility in operation. To address this requirement, the design was developed in concert with a detailed sequence of construction that simultaneously addressed construction, demolition maintaining operations and safety. The design was based on the new transfer station building being structurally independent of the existing building so that its main structural features could be constructed without disturbing the existing building. Since the facility is on a closed landfill, this entailed driving over 135 concrete piles around the existing building and constructing the footings for the new building on those piles. On the south side of the building, a new “South Tower” was constructed of CMU block walls and concrete stairs and floors in order to support and provide access to the new knuckleboom cranes, to
provide the necessary new electrical and storage rooms, and to install utility chases into the new building.

New domestic and fire water mains were designed into the site and into the South Tower in order to maintain service to the existing building during construction. Similarly, a new 480 volt electrical service into the site was designed, along with a new electrical building and emergency diesel generator, in order to not disturb the electrical service to the existing building.

Innovative Construction Sequencing

The resulting sequence of construction integrated into the design and executed during construction consisted of:

1. Driving the new piles around the existing building and pouring the required concrete pile caps, foundations and perimeter leachate trenches.
2. Constructing the South Tower.
3. Installing the new site utilities and running the new utility supply lines into the South Tower.
4. Constructing the new electrical building, generator and potable and fire booster pump systems.
5. Constructing the new metal building structural columns and beams around and over the existing building.
6. Installing the new building’s metal roof panels to provide support and rigidity to the frame.
7. Installing the new building’s metal wall panels.
8. Demolishing and removing the existing building from the inside-out.
9. Removing the existing tipping floor wear surface by hydroblasting and pouring the new tipping floor out to the new leachate trenches.
10. Installing the lighting, plumbing, fire protection, crane and HVAC components inside the new building.
11. Testing the new systems and placing the new building into service.

For safety reasons, all of the above was done while alternating the active side of the tipping floor from east to west, along with the corresponding switch in the tunnels below. When construction took place on or over the west side of the tipping floor, operations moved to the east side of the tipping floor and vice-versa. Critical lifts of roof beams and roof section were done during non-working hours to further safeguard operating staff and customers. This was facilitated by the early construction of a new north access road which allowed incoming garbage trucks to access the west side of the tipping floor without crossing construction on the east side of the building. By doing so, the new building was completed without interrupting operations.
New Transfer Station Building Construction

The new transfer station building combines the old tipping floor area and concrete aprons into a single ±29,000 square foot tipping floor. The old concrete columns were removed, the old leachate trench drain was filled with concrete, and a new leachate trench drain was constructed along the north and east perimeters of the new building. By doing so, the area available for processing trash was opened up and more than doubled in size!

Commercial and private haulers use the new north access road and enter the upper level through the accessway in the northwest corner of the building, discharge their load on the tipping floor, and exit the building through the door in the northeast corner. The trash is pushed into one of two open pits by a front-end loader and into a transfer trailer in the tunnel below. The load in the transfer trailer is groomed and compacted by two new knuckleboom cranes before the trailer exits the building.

Key Design Features

The transfer station building has been specifically designed to be aesthetically pleasing and to blend into the surrounding community. The entire building was designed to withstand 150 miles per hour wind loads. Other than the two accessways, the transfer station upper level is fully enclosed, thus containing noise and minimizing the intrusion of birds and the potential for odors outside the building. With the two existing loading slots, the building is capable of processing ±1,700 tons during a 10-hour workday, with enough space on the tipping floor to store an additional ±1,060 tons of trash. The 15 foot-high concrete push walls allow for mounding trash and breaking up bulky items using the front-end loader. Rather than dedicate an area for private haulers to unload, the tipping floor is divided for use by commercial and private haulers using movable concrete barriers. This allows the County to adjust the size of the tipping floor unloading areas in response to seasonal variations. The South Tower provides support for the new building.

Northwest Transfer Station: Innovation to Meet Client Goals with Limited Budgets
cranes and access to the crane and operator’s booth from behind the loading pits and allows the County to perform routine maintenance on the cranes from behind without interfering with tipping floor operations.

The inner panels of the transfer station metal building have been provided with a liner that covers the structural elements, eliminates horizontal surfaces that collect dirt and allows for washdown with a hose. The metal building panels have also been fitted with translucent panels to provide natural lighting and reduce power consumption.

In addition, lighting systems were designed in banks so that portions of the lights can be activated as necessary.

The upper level has a system of wall mounted supply fans and roof mounted exhaust fans that provide 15 air changes per hour to reduce odors, control heat and reduce landfill gas buildup inside the building.

The tipping floor and tunnel have been provided with high pressure and standard hose bibs for washdown purposes.

Trash is pushed into the two loading pits and into trailers below by a front-end loader. Each pit has a dedicated knuckleboom crane that is used to groom and compact the load in the trailer.

The facility’s loading system is unique in that the cranes are controlled from a central, air conditioned operators booth. From the booth, crane operators have full view of the tipping floor and the loading pits. The pit design provides operators with full view of the top of the transfer trailer load and, unlike most facilities, the knuckleboom cranes are capable of tamping, compacting and grooming almost 100% of the top open face of the trash in the trailer below.

Transfer trailer on-board scale readouts, located both on the tipping floor and inside the operators’ booth, have been provided to maximize trailer loads and yet not exceed the maximum allowable 80,000 pound weight limit.

Down below, the tunnel was outfitted with new lighting, ventilation, fire protection and landfill gas alarm systems. Intercoms were also provided in each lane to allow the transfer trailer drivers to communicate with personnel in the operator’s booth. A new high strength concrete floor topping was also added to extend its useful life.

Both the tipping floor and tunnel have been outfitted with a combination fixed and pan/tilt/zoom closed circuit television (CCTV) system. CCTV system controls and displays have been provided in the operator’s booth and in the five offices in the administration building.

Scale Facility

The original scale facility consisted of the scale house, two inbound scales and one outbound scale. As part of the project, the existing inbound outboard scale was replaced...
and a new outbound outboard scale was installed. Both new scales were constructed on new pile foundations and all of the scales are above ground to allow for easy cleaning and maintenance. A bypass lane was also added on the outbound side to allow collection vehicles with stored tare weights to quickly exit the facility without being weighed.

Other improvements to the scale facility include traffic lights that indicate to drivers when it is appropriate to approach and exit the scales and new weight indicators for all the scales. Walkways were also added to allow drivers from the outboard scales to approach the scale house service window. Attendants should never need to leave the scale house to complete a transaction, thus improving safety and security.

**Community Collection Center**

Since instituting its countywide CCC program, Hillsborough County has seen a dramatic decrease in roadside dumping. The new CCC is one of four in the County and consists of an elevated area behind a “Z” shaped retaining wall that allows for the positioning of eight roll-off containers. Available containers include twelve (12) 76-yd, fourteen (14) 60-yd, and eleven (11) 40-yd steel roll-off containers. County residents are free to use the CCC to dispose of household bulky items, scrap metal, electronics, construction & demolition debris, household quantities of paint, and waste tires. There are also two recycling containers for mixed paper/plastic/glass household recyclables.

**Yard Waste Processing Facility**

The yard waste processing facility consists of ±8 acres of crushed concrete base that serves as a working surface for receipt, processing and storage of yard waste, and ±2 acres of asphalt for the windrowing/composting of screened fines. The facility is integrated into the site traffic patterns and shares use of the scale facility with the transfer station.

**Ancillary Facilities**

In addition to the main components of the site, a number of ancillary facilities were also constructed to improve operations and customer service. These include:

- A concrete roll-off container pad that allows roll-off containers to be loaded and unloaded without damaging the asphalt surfaces.
- A 500 kW standby generator capable of powering the transfer station for over 3 days. Diesel fuel tank levels are transmitted to a fuel monitoring and alarm system in the administration building.
- An air conditioned electrical building separate from the transfer station building in order to protect electrical equipment from dirt and dust.
- A fire pump building with a diesel powered fire pump that supplies the transfer station sprinkler system in the event of a fire.
- A potable water booster pump system that maintains an 80 psi supply pressure to the transfer station water system and high pressure hose bibs.

All of the above were constructed, and the old facility was demolished, without closing down the facility. Not even for one day!
Environmental Controls & Regulatory Compliance

The entire facility was designed and is operated with the goal of protecting the environment. Construction of the new facility required that six permits be obtained from regulatory agencies. Several of these permits remain in place during operation, and the County is obligated to operate according to their provisions. Of primary importance are the Florida Department of Environmental Protection (FDEP) Solid Waste Facility Permit, the FDEP Environmental Resource Permit (for stormwater) and the Solid Waste Director’s Authorization from the Environmental Protection Commission of Hillsborough County (EPC). In addition to adhering to the conditions in these permits, the facility inherently protects the environment.

Controlling Litter

The enclosed Transfer Station provides a barrier against escaped litter with the perimeter fencing as a final barrier. Spilled or scattered wastes are promptly swept up. Containers and vehicles are sealed or covered except when operations require otherwise. Crews regularly perform litter cleanup and respond when weather conditions aggravate the escape of litter.

By improving commercial haulers’ ability to dispose of collected wastes in an efficient and timely manner, the facility reduces the time that trash remains curbside, improves customer service and improves residents’ ability to properly dispose of trash.

Addition of new brushes under the chutes and above the trailers in the tunnel minimize spillage and litter generation.

Controlling Leachate

The Transfer Station is fitted with trench drains, sumps and drain lines to collect and store leachate and washdown water. A gravity system conveys the leachate from these systems to a below ground storage tank for eventual offsite disposal. Facility and equipment inspections, combined with monitoring of the storage tank containment area, detect potential sources of leachate leaks to the environment and allow early corrective actions to be implemented if necessary. Transfer trailers walking floors and rear doors are “leak proof” in order to minimize leakage in transit to the waste-to-energy facility or landfill.

Controlling Odors

Solid waste is handled in a totally enclosed building. Under normal operating conditions, refuse is removed from the tipping floor to enclosed trailers soon after it is dumped. Odorous wastes are mixed with non-odorous wastes while loading trailers to mitigate odors. We have set an operational goal to tip and push odorous wastes on a priority basis, and to haul trailers containing odorous wastes offsite on a priority basis. Tipped wastes are handled on a first in-first out basis and leachate sumps are cleaned regularly. If needed, washdowns, including the use of appropriate chemical deodorizers, degreasers, and soaps, can be used to eliminate odors.

Controlling Pests

Vectors are controlled by all of the procedures and design features mentioned for litter and odor control. The enclosed building also reduces the entrance of birds. Our staff regularly inspects and maintains systems to detect and control vectors. Wall liner and other seal-off methods have been used where possible to reduce hiding and breeding spaces for vectors.

Minimal Noise Levels

Noise is controlled by the totally enclosed design and operating equipment at the minimum throttle needed for operations.
**Water Conservation**

A new “smart” irrigation system was installed with all the new plantings. The system includes moisture sensors in the ground and only waters the new trees and shrubs when necessary based on moisture levels. The system stops irrigating when the moisture level in the ground reaches the level needed for the type of tree, thus using 1/3 the water of a conventional timer based system.

**Reduced Power Consumption**

The transfer station tipping building has translucent panels to provide natural lighting and reduce power consumption. In addition, lighting systems were designed in banks so that only portions of the lights can be activated as necessary.

**Recycling**

Over 180 tons of steel and concrete collected during demolition of the old transfer station was recycled. Customers can bring tires, yard and wood waste, automotive batteries and metals including white goods and more to the site where they can be assured that these materials will be properly recycled or disposed of, free of charge, in an easy to use, drive-through facility. Solid waste programs that would otherwise be scattered around the county are unified and integrated at one site.

**Preventing Spills**

The site has an approved Spill Prevention, Control and Countermeasures Plan for the fuel storage area pursuant to EPA regulations §112.7(d) of 40 CFR 112.

**Controlling and Treating Stormwater**

The site stormwater system was designed to limit stormwater discharges to levels equal to or below those of the original facility in order to have no additional impact on downstream sites. In addition, a debris screen was added to the discharge pipe into the pond that receives runoff from the trash processing areas in order to reduce the possibility of litter being released into the environment.

**Performance, Economics & Cost Effectiveness**

Cost-Effectiveness

The expected construction cost of all of the originally planned site improvements was $22 million in 2010. As discussed above, due to the economic downturn, the County needed to reduce their budget to $13 million. An interim means of upgrading the facility and increasing its capacity was needed.

The initial engineering study estimated the construction cost of renovating the existing building, with the associated site improvements, to be $11 million. The estimated construction cost at the completion of design was $9.3 million and the construction contract was ultimately awarded for $9.4 million – well within the County’s budget!

The Hillsborough County Solid Waste System has a sound financial foundation by being an Enterprise fund that incorporates Flow Control, Annual Residential Collection and Disposal Non-Ad Valorem Assessments, and full cost accounting. The County’s annual residential collection and disposal assessments of $131.43 and $91.32 are some of the lowest rates in the Tampa Bay area and the State of Florida.

The renovated facility, which took 2 years to construct, meets or exceeds performance expectations in nearly every aspect. The facility has operated well under budget and has maintained projections for the cost per ton for waste transferred to the County waste-to-energy facility and landfill.
Performance, Execution, and Technology

Prior to starting the final design, available technologies were evaluated and weighed against each other from an operations, maintenance and economic standpoint. As a result, the facility is equipped with the newest and most modern processing equipment and technology.

Increased Queuing

The new north access road provides additional queuing and minimizes the former problem with trucks backing up and blocking the scale facility. This improves traffic flow through the site and reduces the time on site for customers.

Lots of Storage Space

The tipping floor has been more than doubled in size from 13,500 to 29,000 square feet – providing for increased storage capacity, facilitating maneuverability and decreasing the time it takes for haulers to unload. Fifteen (15) foot high push walls allow for mounding trash and breaking up bulky items using the front-end loader.

Flexible Tipping Floor

Rather than dedicate an area for private haulers to unload, the tipping floor is divided for use by commercial and private haulers using movable concrete barriers. This allows the County to adjust the size of the tipping floor unloading areas in response to seasonal variations.

Easy to Clean Metal Building

The inner panels of the transfer station metal building have been provided with a liner that covers the structural elements, eliminates horizontal surfaces that collect dirt and allows for washdown with a hose.

Crane System

The electric knuckleboom cranes can access every part of the loaded trailer to distribute and compact wastes efficiently. The cranes are equipped with a tamping head/grapple attachment which allows the operator to remove material from the trailer, if necessary. The electric crane system eliminates exhaust fumes in the building compared to the typical combustion engine grapple. The operator is more comfortable and has better visibility in air conditioned glass operator’s booth removed from ambient noise, dust, temperature and humidity. In this booth, the operator has virtually a 270 degree view of the entire transfer station upper level, allowing for greater monitoring of vehicle traffic and equipment and pedestrian activity.

Oversized Tipping Floor Accessways

Oversized (20-feet-wide by 28-feet-tall) entry and exit accessways to the tipping floor allow commercial vehicles to exit with their load in a tipped position, ensuring trucks can exit in the event of a breakdown.
Optimized Trailers

The County operates trailers with a 48-foot length and a Donavan Sidewinder metal frame and mesh tarp system, which reduces the trailer weight and increases the payload by 3 tons. The trailers include a walking floor system, a leak proof floor, and have recently been outfitted with on-board scales. When drivers enter the tunnel and begin loading, these scales communicate axle weights to the crane and front-end loader operators via wall-mounted digital readouts at the tipping floor and the crane operator booth. The crane operator determines an appropriate weight that maximizes payloads within legal weight limits.

Heavy Equipment

The transfer station utilizes Caterpillar 950 and John Deere 644 loaders equipped with a solid waste package which includes solid tires, extended reach with oversized bucket and beefed up engine and hydraulic components. These loaders are used to move, stack and push waste inside the transfer station. A John Deere 544 loader equipped with a solid waste package and clamshell bucket is used to sweep and clean out material that has accumulated in the loading bays during the loading process. This keeps the loading bays clean and safe and helps ensure compliance with regulatory requirements.

Fire Protection Safeguards

The transfer station tipping level and tunnel are equipped with a full fire sprinkler protection system with extra safety measures for protection. In the event of a fire, the release of fire flow water at 1,250 gallons per minute is automated without the need for human intervention. Simultaneously, a dialing alarm system sends warning signals to the fire department and key personnel. A fire alarm monitoring service is also utilized.

Ventilation Fans

Nine upblast exhaust fans and eleven wall mounted supply fans provide 15 air changes per hour on the tipping floor. The size of these fans and the high number of air exchanges reduces dust inside the building and exhausts dust and odors high into the outside air for dilution. The air exchanges also serves as the primary LFG control system by reducing the potential for LFG to build up inside the building. An exhaust fan and supply ducting in the tunnel provide the same benefit.

Standby Generator

Because of its use of topload technology, the facility can operate with or without electrical power. Regardless, the facility is equipped with a 500 kW standby generator that is capable of powering the entire site in the event of a power failure. The capacity of the 2,900 gallons base fuel tank ensures that the facility will have enough fuel to operate at least 3 days on generator power. The generator provides power to the fans, thus maintaining continuous air circulation for worker safety.

Aboveground Scales

The use of aboveground scales at the scalehouse makes cleaning easier and less costly, thus reducing maintenance costs and extending scale life. Large diameter steel-piped rub rails protect haulers from driving off the edge of the scale. Each scale is 70 feet long with a 100 ton capacity.

Leachate Storage System Instrumentation

Leachate is collected by trench drains on the tipping floor and at both ends of the tunnels. The collected leachate flows by gravity to an underground 15,000 gallon dual wall tank located near the administration building. When the tank is ±60% full, a vacuum tanker truck is used to drain the tank and transport the leachate to an approved disposal facility.
The tanker pulls within the concrete and asphalt curbed leachate containment area in order to access the tank manhole and eliminate the chance of a spill.

The buried 15,000 gallon fiberglass leachate storage tank is equipped with a pressure transducer level transmitter, with a level display located on the leachate system control panel on the concrete pad above the tank. This allows operators to determine the level of leachate in the tank in a safe and clean manner without using “dip sticks”. The tank level display sounds an alarm when the tank is 75% full. The tank is also equipped with a secondary containment leak alarm system that sounds an alarm if liquid is detected in the interstitial space between the inner and outer tanks.

► Site-Wide CCTV System

A site-wide CCTV system allows operators in the administration building and tipping floor operator’s booth to observe the overall site, the tunnel and the tipping floor from their desks. Camera images are recorded by digital video recorders and can be watched later, if necessary.

► Site-wide Telecommunications and Computer System

As part of construction, entirely new communications and data systems were integrated between the Administration Building and the transfer station on a full T1 Data Circuit. The site is equipped with Voice Over IP for all phones and computers located in the Administration Building, Scale house, Transfer Station Control Booth that work through the wide area network. All information from the site transmits to and from the County Center located in downtown Tampa, 15 miles from the site.

► 5. Worker and Customer Health & Safety

The facility has been designed with the health and safety of employees and customers in mind. Traffic flow has been designed to minimize conflicts. Handling of most wastes occurs inside the totally enclosed Transfer Station building to limit the nuisance potential of these wastes. The tipping floor provides ample room for customers to tip their loads without coming into contact with Transfer Station equipment operations. Small-load haulers tip at a designated tipping area so they don’t have to compete with larger commercial vehicles. Private citizens have their own drop-off area at the CCC. Because solid waste operations have the potential to be risky, the County’s comprehensive health and safety program is intended to cover all aspects of health and safety for employees, contractors, and the public.

► Traffic Separation

For safety and efficiency, we separate transfer station, yard waste facility and CCC customers. Transfer trailers are provided with a separate staging area. The site is
equipped with improved color-coded signage, directional signs, and traffic signals. Customers at the CCC are provided with their own exit from the site and are directed to the proper roll-off containers based on their material types by the CCC attendant.

Training

Operators and spotters are trained in accordance with subsection 62-701.320(15) of the Florida Administrative Codes. An adequate number of trained spotters are on duty at the tipping floor at all times that the transfer station is receiving waste to ensure that any unauthorized materials are removed from each load and to direct traffic on the tipping floor. At least one trained operator is on duty at all times during facility operating hours. Operators and spotters are certified in regulatory aspects of transfer station operations, such as leachate and storm water management, ventilation and odor control, waste control, operating guidelines and employee health and safety.

Operators and spotters will be trained in initial and refresher courses offered by University of Florida TREEO to meet with the requirements of subsection 62-701.320(15) F.A.C. Selected individuals are also trained and certified in heavy equipment operation. In addition, employees that drive County owned vehicles are required to take a defensive driving class, Community Collection Center attendants are required to have customer service training and heavy equipment operators go through vigorous maintenance and safety training on all equipment. The Hillsborough County Public Works Department requires employees to be trained on certain topics, including First-Aid/CPR, Fall Protection, National Incident Management System (NIMS), Diversity Training, and to participate in weekly and monthly safety meetings where timely, relevant safety, health and wellness topics are discussed.

Proper Procedures

As part of the project, a complete Operation, Maintenance and Contingency Plan was developed for the site. The Plan outlines facility operations, wastes accepted and not accepted, equipment, waste streams, leachate management procedures, safety guidelines and emergency response procedures. County staff is required to know the requirements of the Plan. Copies of the Plan are available on site for reference.

Proper Equipment

The Hillsborough County Public Works Department supplies personal protection equipment to all employees (e.g. head, eye, face, hand, and foot protection) at no charge to the employee. The wearing of personal protection equipment is strictly enforced for the safety of the employee. Approved hearing protective equipment is available to every employee working in noisy areas; signs are posted as well to inform employees to wear hearing protection. Safety vests are required at all times when entering the transfer station property and hard hats must be worn by everyone entering the transfer station building. Eye wash facilities and quick drench showers have been provided in the work area for employees exposed to injurious materials. First-aid kits are easily accessible at each work area, with necessary supplies available, periodically inspected and replenished as needed.

Excellent Safety Record

Due to the ongoing safety training and the safety features included in the design of the transfer station, injuries in the transfer station have been minor. This is illustrated in Table 1, which lists the most common types of injuries and the number of occurrences between October 2013 and September 2014.

<table>
<thead>
<tr>
<th>Type of Injury</th>
<th>Number of Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backing</td>
<td>0</td>
</tr>
<tr>
<td>Rear End Collision</td>
<td>0</td>
</tr>
<tr>
<td>Traffic Accidents</td>
<td>1</td>
</tr>
<tr>
<td>Falling</td>
<td>0</td>
</tr>
<tr>
<td>Lifting/Pushing</td>
<td>2</td>
</tr>
<tr>
<td>Tipover</td>
<td>0</td>
</tr>
<tr>
<td>Crushing</td>
<td>0</td>
</tr>
<tr>
<td>Lockout/Tagout</td>
<td>0</td>
</tr>
<tr>
<td>Overhead Hazards</td>
<td>1</td>
</tr>
<tr>
<td>Sharps/Medical Waste</td>
<td>0</td>
</tr>
<tr>
<td>Lack of PPE</td>
<td>0</td>
</tr>
<tr>
<td>Weather Related</td>
<td>0</td>
</tr>
<tr>
<td>Insect Related</td>
<td>1</td>
</tr>
</tbody>
</table>
6. Public Acceptance, Appearance & Aesthetics

Hillsborough County takes pride in the appearance of its facilities and went to great lengths to ensure that the new transfer facility fits into the surrounding neighborhood. Also, since the site is open to the public, great measures were taken to make the interior of the site attractive and user friendly.

▶ Color Coordinated Buildings

Because the transfer station is constructed on a hill, it can be seen from a distance and has been specifically designed to be aesthetically pleasing and to blend into the surrounding community. To minimize its visual presence, an earth tone tan was chosen as its main color. The same color scheme was used for the new electrical and fire pump buildings and was used to paint the Administration Building and scalehouse. Colors were chosen using 3-dimensional renderings of the transfer station.

Other than the two accessways, the transfer station upper level is fully enclosed, thus containing noise and minimizing the intrusion of birds and the potential for odors outside the building.

▶ Landscaping Buffers the Site

The site is screened from Linebaugh Avenue by a significant amount of trees and hedges. In order to increase the screening, over 84 new trees and shrubs were planted along the front of the property and in the road right-of-way.

Conclusion

Hillsborough County’s Northwest Transfer Facility has been planned, designed and constructed to meet the needs of its customers and to compliment the other elements of the County’s integrated solid waste management system for the next 20 years. The facility provides a state-of-the-art, easy to use, safe and aesthetically pleasing “One Stop Shop” to process wastes in a fast and user friendly manner. The building renovation was accomplished on a closed landfill using a pile foundation while maintaining uninterrupted facility operation during the construction of the new facilities.

At this time, Phase 2 of the program has been designed and includes construction of a new scale facility and site roadways. Construction of this phase is scheduled for Fiscal Year 2017. The remaining site improvements will be implemented in subsequent phases.