

Super Plant!

The Future of Healthcare Laundering (a case study)

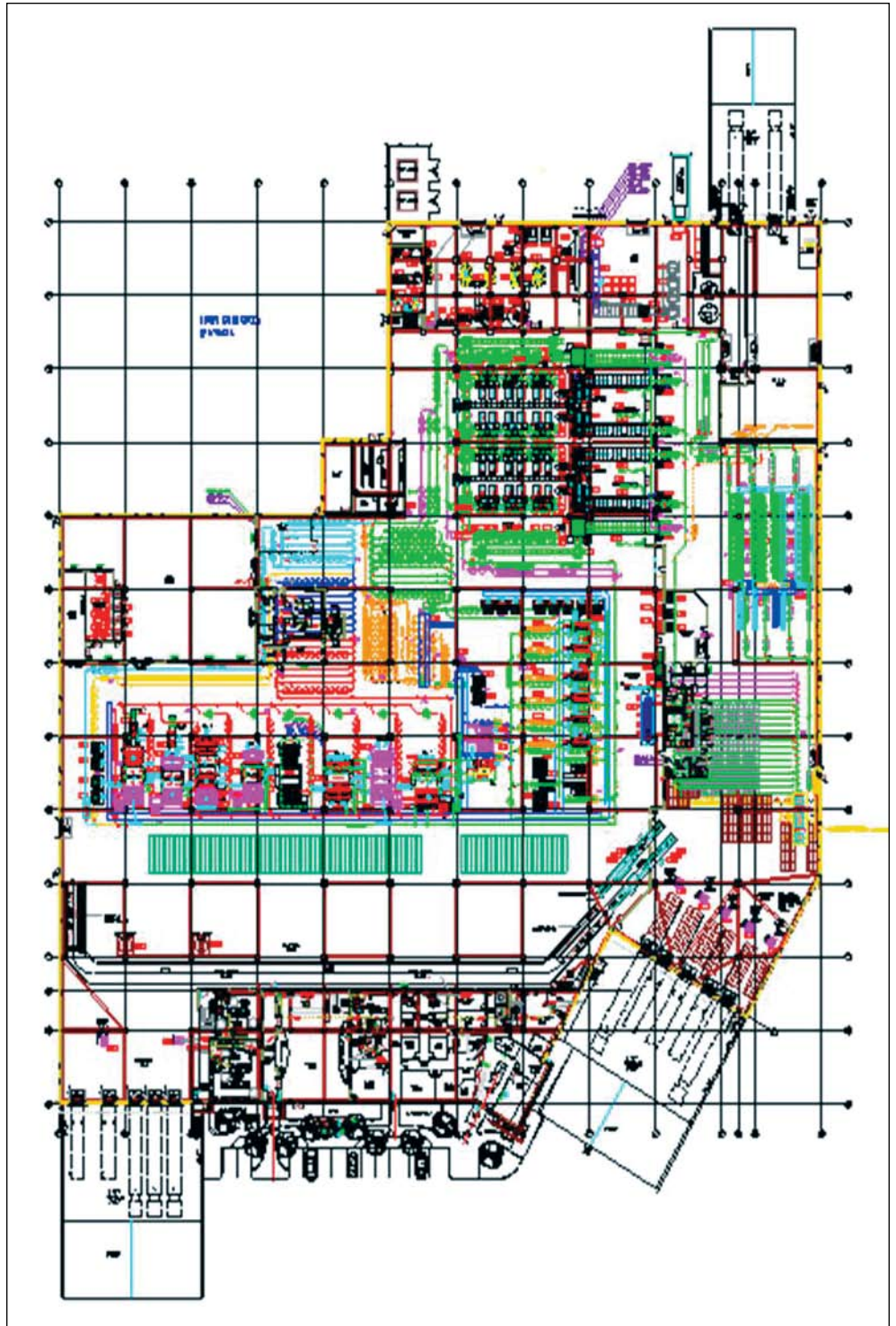
*Outside-the-box design—
from napkin sketch
to operational
facility in 21 months*

By Gerard O'Neill

In this article I am going to describe in a “step-by-step” process the actual stages and progression of a new healthcare facility that we (American Laundry Systems [ALS]) helped design and build from the ground up (green-grass scenario). While we have been involved in many projects over the last 12 years (43 plants to date), this was the first time we had an opportunity to build a “super plant” and be an integral part in the molding of this approximately 200,000-square-foot work of art!

Opportunity rings

In August 2005, I received a call from a potential client in the Ottawa region of Ontario, Canada. He questioned me on my knowledge and abilities to build a “super plant” for him in that area. My first thought was “Is there enough healthcare work to justify this size facility?” Having asked some pertinent questions (e.g., how large a facility, is there land available, proximity to highways, workforce availability and my standard,



An ‘A Team’ of consultants worked with HLS Linen Services CEO Rocco Romeo to develop the plan shown above for a plant that would serve as a showcase facility built to ‘Cadillac’ standards.



Small-piece folders, conveyors and overhead slings in the plant's finishing department. The author applauds CEO Rocco Romeo's ability to "think outside the box" by planning a facility that could process healthcare and high-end hospitality linens, plus a sterilization area for OR packs and a mat cell for laundering walk-off mats.

"Is there gas, sewer, water and electricity available?") and being a straight-to-the-point person, I got on a flight for Ottawa.

Upon arriving, I was surprised to discover that this client knew how to go about this and had already scoped out some property within 15 minutes' drive of his existing 100,000-square-foot facility. Having completed introductions and a thorough interview, we set out to look at this property and get my feedback. My first impressions of the "acreage in question" was that it was "wetlands." This would cause some concern when and if we actually decided to build. However to my delight the client had already checked on the availability and sizing for the gas, sewer, water and electrical utilities. He had even done a preliminary sketch (on a napkin!) of what he had in mind for this new super plant. A napkin you say? Well, you have to start somewhere!

Setting specs

Giving my blessing to the location, lot size (13 acres), and having calculated that the utilities available would be sufficient for this project, we decided to proceed to the next phase: project budget and plant layout! The customer informed me that this was to be a "showcase" facility and that a "Cadillac" standard of plant would be required with all known and industry-standard efficiencies applied to the "Laundry Plant of the Future"!

One of our first discussions was "Architect vs. Design Build" and the pros and cons associated with each. We decided to go the Design Build route at first and brought in a good friend of mine

who has helped me design laundry buildings in the past, Scott Agee, Professional Engineer (P.E.) and president of Agee Engineering in Sacramento, CA. Along with the HLS management team and ALS, Scott helped us with the design for the actual building construction and developed some specifications for the building design. When we had completed the "as built design" and project parameters, our customer decided that it would be better suited and more politically prudent to go the "architect" route!

A local architectural firm was then contacted and invited to help us design and build the structure that would house the equipment and handle the poundage for which we were designing. One million lbs. of laundry per week on one shift was the eventual target for this facility along with some rather different requests for a typical "healthcare" facility. My customer, Rocco Romeo (CEO, HLS Linen Services), had more tricks up his sleeve. He wanted to build a facility that would not only handle healthcare work from the hospitals he serviced, but also some high-end linen from hotels, a sterilization department for OR packs and separate mat cell for washing walk-off mats that the hospitals were outsourcing to a different laundry. "Now we're talking," I said to myself. "These guys are thinking outside the box."

And so work began on the building design with the HLS management team, an architectural team from Hobin & Associates, including yours truly as "laundry consultant and laundry builder," a mechanical/HVAC consulting firm, a structural engineering

Strategic Expansion



Due to wet conditions at the site, contractors drove more than 200 steel piles down 75 feet to bedrock formations in order to secure the foundation of the new plant.



Construction moved forward in March/April 2006. Once the piles and beams were in place, builders added structural steel and the roof-support structure.

consultant, an electrical consultant, a civil-site consultant, a landscaping consultant and project manager (Andre Marcoux, Cleland Jardin Engineering), all meeting weekly or bi-weekly in Ottawa to get the specifications ready to build this super plant.

Along the way, the usual host of issues arose such as:

- What height to build the facility? Answer = 28 feet clear. Later to drop to 26 feet clear to adhere to budgets!
- What thickness of concrete? Answer = 6 inches of 4,000 PSI with 18-inch pads under tunnel presses.
- What size pits and trenches? Answer = 36 inches wide, 80 feet long by 6 total. (1) 1,500 gallon pit. (small pit, but we had ground water issues; remember the land was a swamp!)
- What size and depth of piles? (We had to put the entire facility on steel piles due to the water level and soil compaction issues on the land) All piles and underground concrete support beams were placed strategically so as to reinforce the concrete floor in the areas where the laundry would have “heavy machinery” located. (i.e., boiler room, wash floor and finishing dept.!))

Rules of operation

From August to December 2005, the ‘A Team’ of consultants met consistently and e-mailed furiously to keep the project on the “fast track,” according to our customer’s requirements. We needed to break ground in the spring of 2006 and have the plant operational

by the Spring of 2007. That gave us 12 months to build a building, install the laundry equipment, all utilities, training and start up in a 12-month window. Wow, that’s aggressive! But I like a challenge. So we settled down to design a layout that suited all parties, owner, architect and laundry consultant! After many revisions, the layout (see drawing, pg. 98) was settled on with an optional 30,000 square-foot corner for future expansion. Requests for Proposals (RFPs) were worked on at the same time that the architect was designing the building. After some six weeks of regular meetings with the client, we finally produced a “short list” of equipment vendors that could support a project of this magnitude. A weeklong trip to Europe eventually helped the customer decide on a vendor for the washroom and finishing department. The “mechanical room” equipment was also chosen at this time, along with the material handling vendor. The following list of vendors ultimately were chosen for this project:

- 1) American Laundry Systems (laundry consultants, project management and mechanicals, including equipment Installation)
- 2) Kannegiesser (washroom, mat cell and finishing equipment)
- 3) E-Tech Inc. (material handling)
- 4) Kemco Systems Inc. (process water system)
- 5) Miura Boiler Co. Ltd. (boilers)
- 6) Sullair Corp. (air compressor)



Above is one of four 300 BHP boilers in the plant. The plant also has a 100 BHP boiler for sterilization of OR packs.



A view of pipes and ductwork leading from the top of the boilers to the plant's 26-foot ceiling.

- 7) Gettinge (sterilization equipment)
- 8) Pioneer Industries (cart washer)
- 9) G.A. Braun (small-piece folders)

Purchase orders were issued in January/February 2006 and a local general contractor (Fuller Construction) was awarded the building contract.

We had some strict rules of operation on this project to keep change orders to a minimum and adhere to this extremely aggressive schedule. Both the customer and the “laundry consultant” had to answer any “laundry-related” questions with regards to the building. For example: I initiated a rule on this project that certain elevations, and areas within these elevations, were “no go areas” for different trades and vendors. With a 26-foot clear, the GC/builder had the area from the bottom of the bar joist to the bottom of the roof deck (36 inches) to run all building services (sprinkler, HVAC duct, lighting, etc.). Twenty-four inches below the bar joist was reserved for the “laundry equipment mechanicals” (i.e., steam, air, gas, water, etc.). The next 6-8 feet was for the sole purpose of running the “monorail” equipment (clean and soil). This was to ensure that all factions involved would have **no obstructions** in the various work areas! From time to time it was prudent to allow a sub-trade access to another area that was not allocated to that particular sub-trade and it had to be approved by the “laundry consultant” before work could proceed. The end

result with this was a change-order list hovering around \$150,000 on a project in the region of \$30 million.

Frugal glory

Construction began in earnest in March/April of 2006, having cleared the property of trees and brush earlier in the year. We also had a “pre-load” of gravel, etc. loaded onto the entire facility area (*this ensures soil settlement is complete prior to putting the weight of the building on the property*). Pre-cast concrete construction with a steel frame was the order of the day, but first we had to deal with the 200+ steel piles that needed to be driven into the bedrock to support this structure. Due to the swampy soil conditions of the site, we had to drive steel piles 75 feet through the soil to the bedrock formations below. These piles and preformed concrete beams interconnected to essentially support the entire facility (building and equipment).

Once the piles and beams were set in place, then the structural steel and roof-support structure was added. Starting at the rear of the building, the structural steel went up relatively quickly. Of course the typical calculations were made to ensure that the various areas of the roof could support the rather large loads being suspended from the structure. I calculated that in certain areas where full slings, water lines, gas lines and steam lines were located, we would need 60 lbs./PSF over snow load and 40 lbs./PSF in all other areas carrying monorail only. This ensured that we weren't over building the roof structure in various areas and yet

Strategic Expansion



Light tables equipped with computer monitors are used for inspecting garments in the OR packroom. Conveyor equipment is visible to the left of the photo.



A view of the plant's four tunnel washers located in the "mezzanine/equipment platform" area. These tunnels feed clean goods to 24 dryers.

had all the support we needed in the areas that did need extra strength.

Starting at the rear of the building in the (mat cell, boiler room) areas, we proceeded to hang structural steel and then slide the wall slabs into place. As soon as we got 50% of the facility "stood up" then we had the roof installed up to that point. This sequence of events allowed the "laundry mechanicals" to be started to keep the project on schedule. The ALS crews started working in the boiler room and worked their way forward toward the finishing department.

Now let's chat about the "boiler room/mechanical room" for a bit! Every laundry that is being built, plans to build, plans to upgrade or retrofit, etc., needs to *focus* on the boiler room area. Why? This is the heart, soul and brain of any laundry facility. There are literally thousands of dollars to be saved *per day* in this area. I have always stressed to all my clients and on all my projects that while the washroom and finishing areas get all the "glory," it's the support systems behind them that ensures that there's "glory" to be had. In other words, **"Pay attention!" Using every available BTU and re-using them in the boiler room areas will save you thousands of dollars per day/week/month/year!** With efficient air compressors, boilers, proper water softening, RO water (if needed), heat reclamation, vent condensing, stack economizers, water re-use (if applicable), etc. the utility savings in this room alone has an ROI of 12–18 months.

While we worked diligently in this area, the GC/builder contin-

ued to make headway with the rest of the facility with ALS crews fast on his heels. As the sterilizer departments, main washroom, finishing departments, etc., were being completed, the "laundry mechanicals" were being installed right behind them. From August/September 2006 through December 2006, the boiler room and washroom utilities/mechanicals were installed with "future connections" for all future equipment. Of course during the planning stages, calculations were made to ensure that the customer had enough power, water, etc., to hook up any new equipment without having to replace any of the existing boiler room equipment and associated utility headers/lines feeding the present equipment.

Easter or bust

With all of the boiler room now complete, it was time to focus on the washroom area. ALS had recommended using a "mezzanine/equipment platform" to support the 24 dryers for this facility. This idea takes full advantage of the *"use the cube"* theory and also makes for an easier loading of the "clean side" monorail. The mezzanine was built on-site and custom designed to support the loads of the dryers with full loads in each dryer and the conveyors feeding the dryers. The four Kannegiesser tunnel washers and 24 dryers were installed by the end of 2006.

With room for two more tunnels in the future, the ALS crews and support trades moved on to the sterilizer department and finishing areas in January 2007. The E-Tech Inc. installation crews

Strategic Expansion



An exterior view of the new plant with an ornamental fence.



Another view of the plant exterior, including a bench.

also started arriving at this point. With the window of four months (remember startup in Spring 2007) shrinking fast, they made a superhuman effort to accommodate the customer's schedule. By the end of January/early February the finishing department consisting of seven ironers, 14 small-piece folders and eight hand-fold stations was installed and ready for testing. By this time the GC/builder was in the office area and out of the main facility for the most part. As you can see, the coordination among the laundry consultant, GC/builder, project manager and client was crucial to maintaining this pace and achieving so much in a small time frame. (Note: we were planning this construction project for close to 12 months prior to actually putting a shovel in the ground.)

With the monorail crews now hot on our heels, ALS installation teams completed the finishing department by the end of February. It was now our job to coordinate startups and testing all through March, starting again in the boiler room and working our way forward with startup technicians from all over the *world!* (I mean literally, all over the world. It was a gathering of the brightest and best in the business, a *United Nations* of laundry contractors and vendors!

March was the month we had planned for testing all areas and systems prior to our big move date of April 7-8. The usual bugs arose with software conflicts, wiring issues, etc., but all contractors worked feverishly to make the deadline!

Awesome capabilities

The "big move" date was upon us before we knew it, and the customer was moving his facility come hell or high water. Riggers were in place to move some of the existing equipment (feeders and folders), ALS technicians were standing by to install this equipment and coordinate with the electrical trades, etc. The move was complete by Monday, April 9. Now the customer faced the daunting task of adapting to the new facility and working through the various new systems that were in place.

Having a first-rate existing staff, these well-trained and motivated employees welcomed the new facility with open arms and expressions of "shock and awe" as they saw the leap in technology applied to their new facility. With the commitment and dedication of all, this "A Team" assembled this super plant from an idea on a napkin to completion in record time and *on budget!* Another happy ending and satisfied customer was added to our reference list. I really can't resist a challenge. **TR**



Gerard O'Neill is president and CEO of American Laundry Systems, a division of E&O Mechanical Inc, Haverhill, MA. Contact him at 978/373-1883 or goneill@eomech.com.