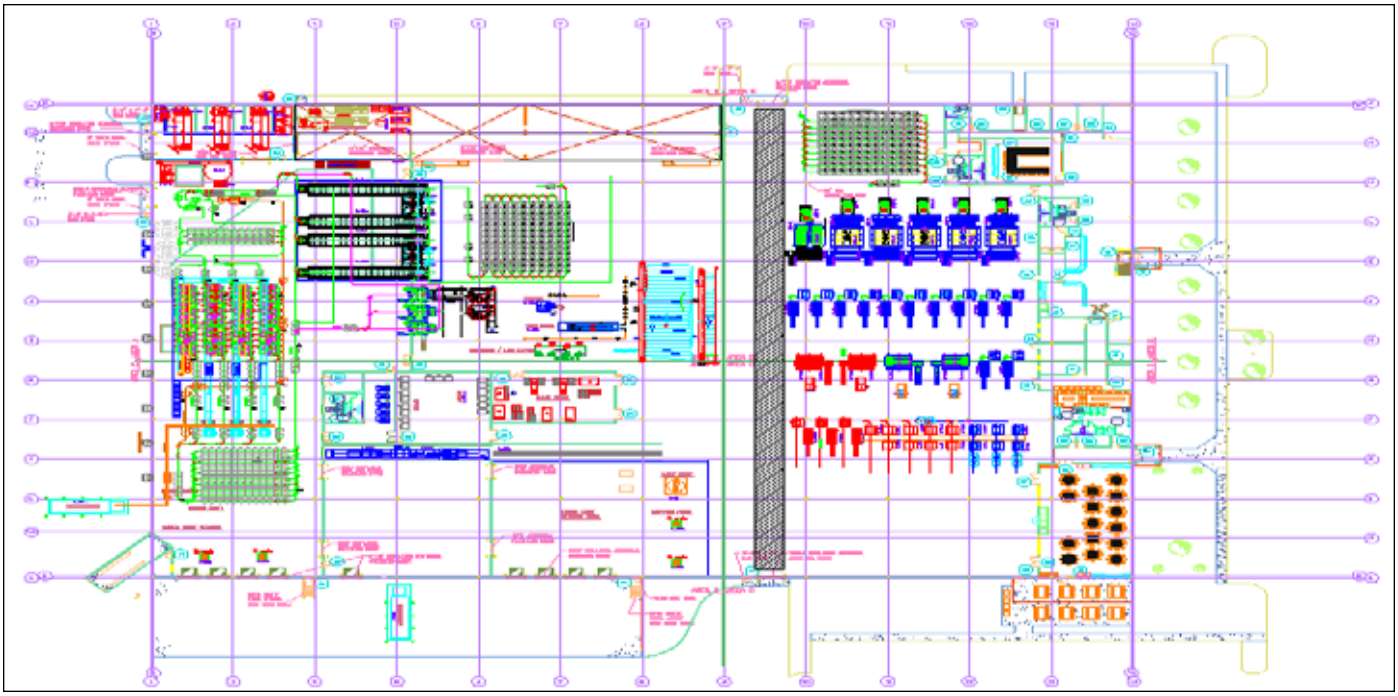
Healthcare: The Future is Now

New Michigan co-op is the first U.S. laundry to deploy "steamless" technology

By Gerard O'Neill



A sketch of the layout of the new plant.

Editor's note: *This is the first of two articles. O'Neill will submit Part II when work is completed on the expansion/refit of the* WMSHL *co-op laundry, which is ALS' 52nd new or retrofitted laundry facility.*

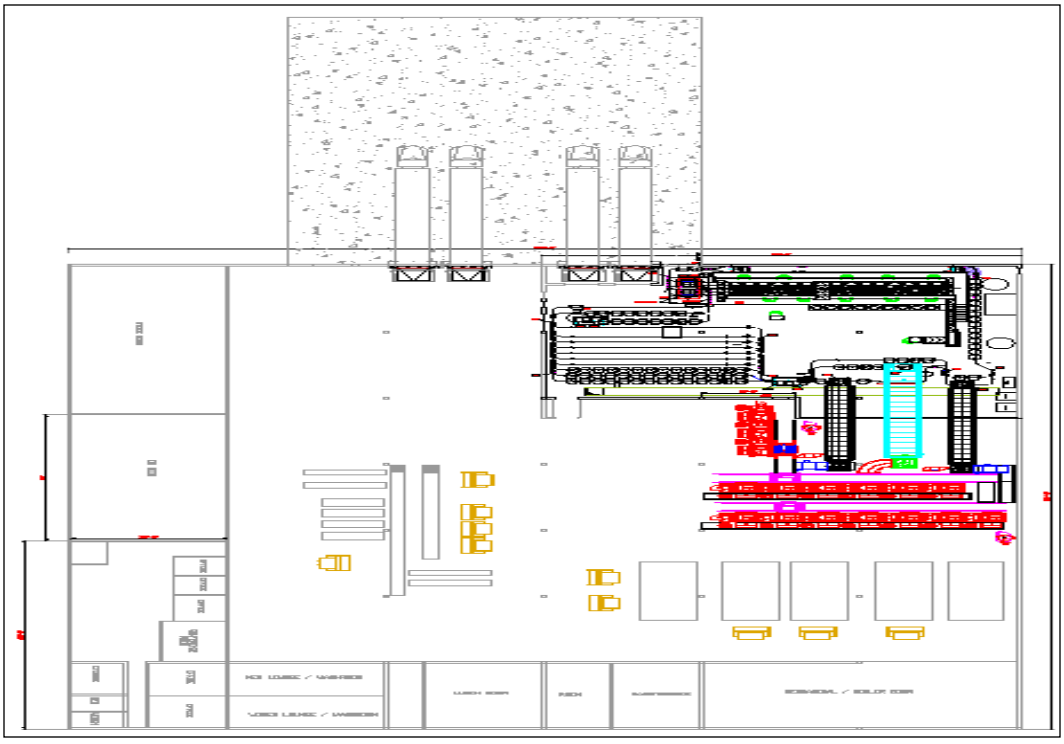
West Michigan Shared Hospital Laundry (WMSHL) is a co-op healthcare facility located in Grand Rapids, MI.

In September 2007, American Laundry Systems (ALS) was awarded a contract to provide consulting and design services to help this facility build a NEW state-of-the-art laundry from a "green grass scenario." The design parameters were as follows:

1. The new facility is to use All NEW equipment featuring the most advanced ideas applicable to our industry from an energy-efficiency point of view and from a production/automation perspective.
2. The facility was to be designed/capable of doing 50 million/lbs. per year on a 7-day single shift.
3. The poundage at the present facility was 28 million/lbs. per year.
4. The existing infrastructure was obsolete; some of it was nearly 30 years old. Improvements were needed.
5. Some newer equipment (circa 1990s) was added to the facility with no attention given to established infrastructure, etc. (e.g., existing process water system was severely undersized and obsolete).
6. The NEW facility was to incorporate the latest technology in material handling and energy conservation.

ALS was given a "plot plan" (The drawing above shows NEW property location with utilities located, etc.), and so the design process began. The idea was to build a NEW facility using all industry-accepted (and some not-so-readily accepted) technologies to create one of the most advanced laundries in the world. Three months later, the design was complete and a budget was produced for the management of WMSHL to bring to the Board of Directors for approval and funding.

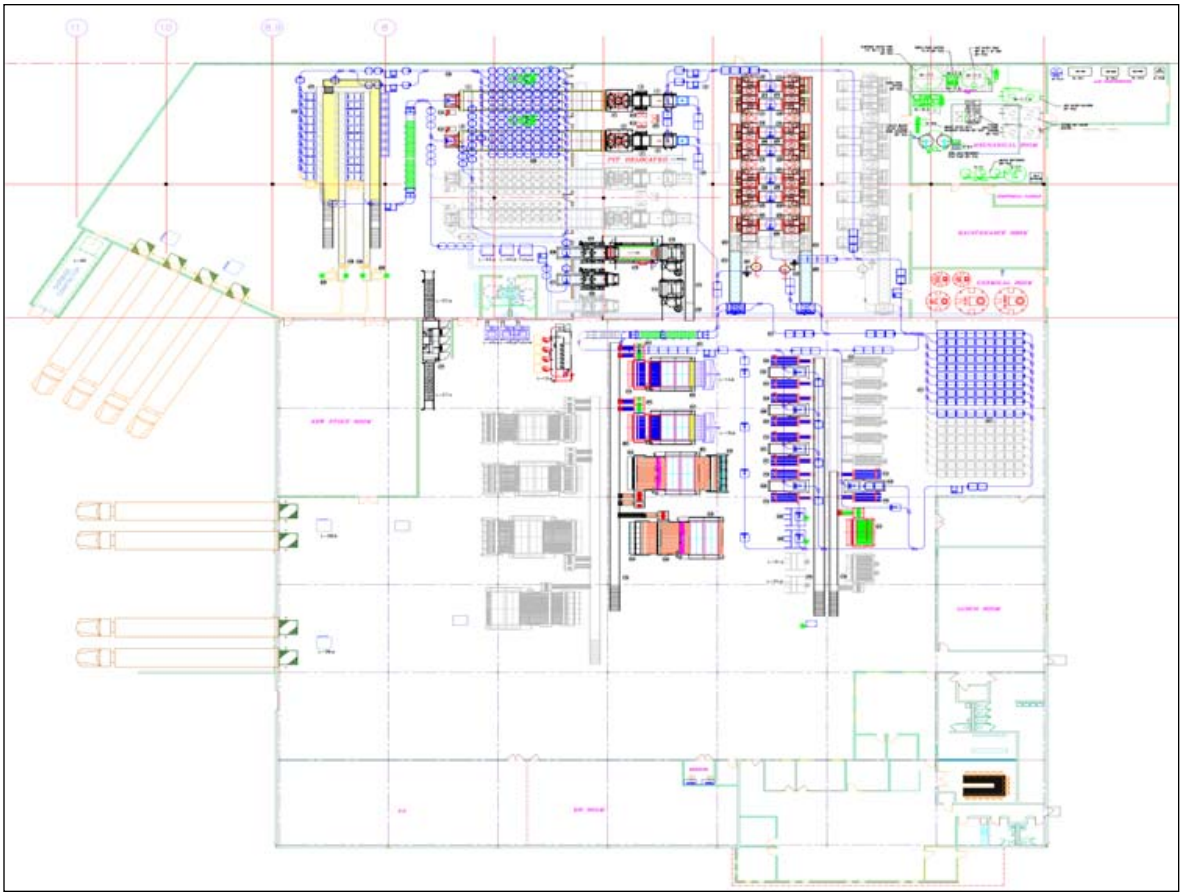
That's when the fun began. The Board wasn't comfortable with the initial budget (approximately $25 million), due to the uncer-



This sketch shows the layout of the existing plant.

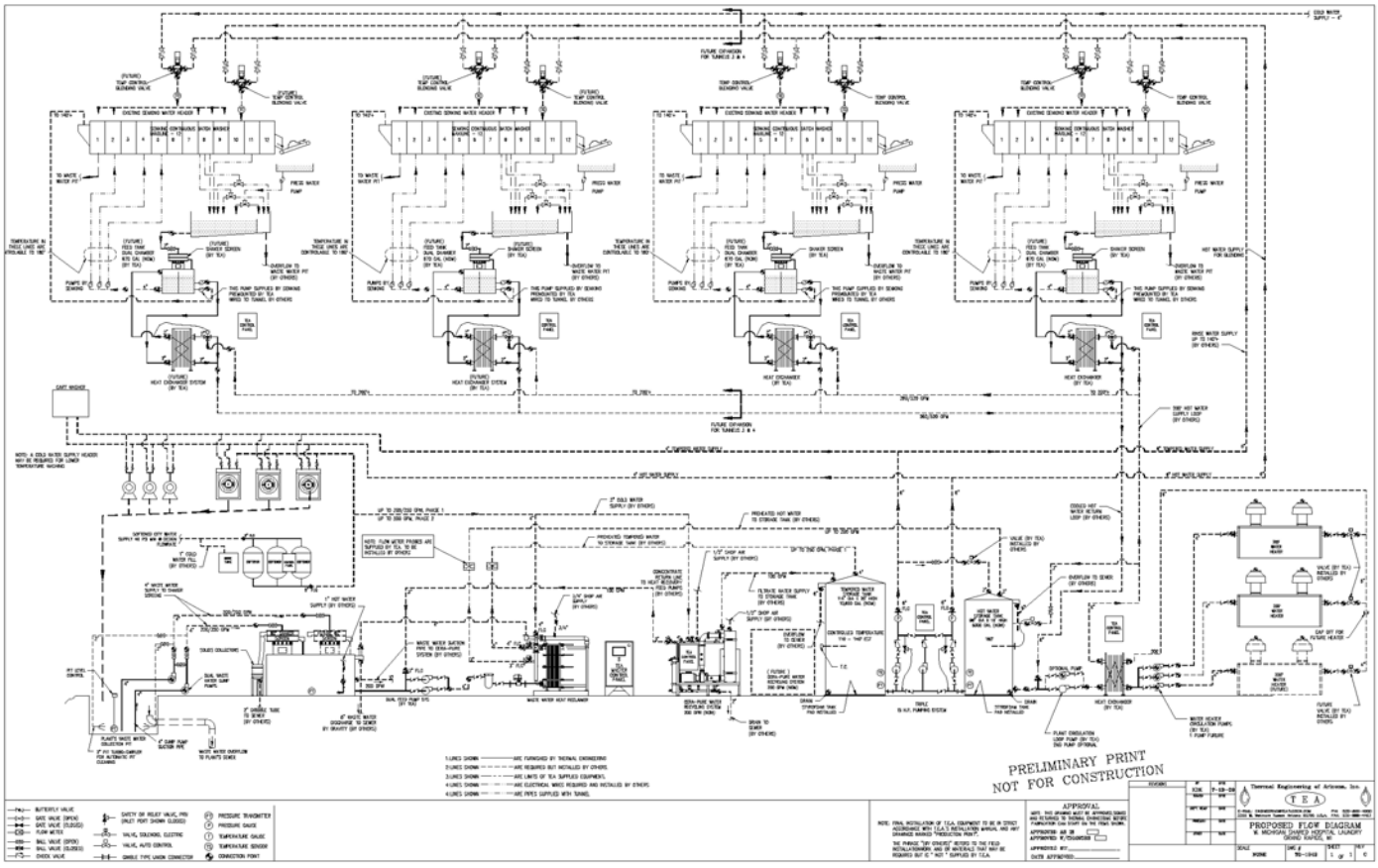
tainty of the economy. They also were concerned that there wasn't a business case for the project (as is) without some major cost increases to the owners/hospitals associated with the co-op. These concerns—along with management changes at WMSHL—brought the project to a halt. At this point, ALS had finished our initial contract with WMSHL. We subsequently were contracted to continue the project under new leadership.

The new leadership arrived shortly thereafter and we (i.e., ALS) were contacted to revisit the design process and review the existing proposal regarding the feasibility of a NEW plant. We completed the study in 30 days and reported back to management. Having had permission to review the facility, we determined that there was indeed no need to build a new facility. Instead, a retrofit of the plant and an expansion of approximately 32,000 square feet could indeed satisfy the needs of the customer for many years to come. The budget for such a retrofit and expansion was 50% less than the cost of relocating and building a new building ($12.5 million vs. $25 million). Upon presentation of this proposal to the Board and the implementation of a Project Management Plan—whereby ALS would keep the customer operating WITHOUT interrupting their production—the project was approved and financing was put in place.



Here is a view of the new "RETROFITTED" Plant.

The next step in this process was full design/layout and RFPs (request for proposals). The customer had requested a "Fast Track" process due to the influx of another 2-3 million/lbs. of work that was due to come on board in coming months. This move cleared the way for a total poundage of 31 million/lbs. per year. Currently, the plant was running a 60-hour week (6 days @ 10 hrs/day) with a total of 120 employees working at a rate of around 130 lbs. per operator hour (PPOH). We had informed the customer that with the NEWLY expanded facility and the inclusion of modern, efficient automated equipment, we'd lower the plant operating/working week to 50 hrs/week (5 days @ 10 hrs/day), reduce full-time employees (FTEs) by 12-16 and



The piping and instrumentation diagram (P&ID) shown above features a typical (though modified) "steamless" process flow diagram.

increase PPOH to 165+. (Deliveries would remain on a 6-day/week schedule.)

This would allow WMSHL to grow at the (3%-5%) standard healthcare growth factor, absorb the NEW poundage predicted from new customers and remain in the same newly expanded building for the next 15+ years. The 6th day would remain as an expandable workweek should WMSHL grow faster, or more than the forecasted amount. As you can see in the drawing above, we had accounted for "future" equipment should the need arise! Furthermore, utility savings with modern and efficient equipment would be in the region of 30%-40% vs. the antiquated existing equipment. This plan allowed for an ROI of well under 10 years with a further cost reduction passed on to the hospital ownership after seven years. WMSHL would still be able to operate at well below the national average for healthcare pricing for the foreseeable future!

While the ALS Engineering Department was in the process of designing this newly retrofitted facility, we had also been talking to potential customers about the "steamless" idea that had taken hold in Europe several years ago. (See related article, "Steamless or Less Steam?" pg. 118, June 2009, *Textile Rental*.) Always at the forefront of new technology, ALS took the initiative to visit and investigate some of the facilities in Europe that had adopted this technology. After seeing the extensive benefits of a steamless facility, we researched the possibilities with vendors and equipment suppliers here in the United States. And through some novel idea sharing and massaging, the final outcome was—not to put too fine a point on it—*"We see no reason why not!"*

WMSHL was ecstatic at the idea of being the **first and only** large-scale healthcare facility in North America that would be 100% "steamless," and so they gave us the "GREEN LIGHT" to apply this technology to their new facility.

The ALS Engineering Department, with the help of Thermal Engineering of Arizona (TEA) and Jensen USA, was able to take advantage of this technology that had been proven in Europe and adjust it (I daresay improve on it) for application to the North American healthcare laundry market.

Basically the idea is as follows:

1. Use natural gas to heat as much equipment and water as possible: (using steam to heat water is not only antiquated and inefficient, but the efficiency loss in a typical steam system is in the 30%+ range)
   a. Natural gas-fired equipment is in the 95%+ range, while steam-fired equipment is in the 75%-80% efficiency range.
   b. Use natural gas-fired equipment to "make the HOT water for washing" in the tunnels! (Heat exchangers can be used here for heat transference.)
   c. Re-use as much of the wastewater as possible (and financially feasible).
2. Use natural gas-fired "self contained" thermal ironers for the finishing department
   a. Thermal ironers *can* be used with higher temperature and speed (depending on the quality and polyester makeup of the goods being ironed). That means more pieces are processed per hour

with the correct feeding devices. At the WMSHL facility, Chicago Dryer Corp. equipment was chosen.

3. Use the "super heated" (200°+ F) hot water from the process water system for injection in the garment tunnel for the healthcare uniforms (Note: Leonard Automatics had been working on a NEW tunnel finisher for some time and this was the perfect opportunity for them to apply this new technology.)

With help from the above vendors (Jensen USA, TEA, Leonard, Chicago Dryer and Kaeser [air compressors]), ALS was able to put together a plan to make this laundry the "first of its kind" in North America, if not the world (Note: most European laundries still use some steam in their facilities. This laundry will be 100% steamless!)

The photo above shows part of the air/hvac system, providing positive to negative airflow. This will ensure compliance with Healthcare Laundry Accreditation Council (HLAC) standards for a healthcare facility.

Apart from the steamless idea, some of the other innovations at this NEW facility include:

1. Using a vacuum to presort the heavier and larger items from the sorting deck. Vacuum piping is used on the dump table to send blankets, etc. directly into the appropriate sling. This allows for easier and faster sorting on the actual deck when the sorters don't have to deal with large/heavy items that slow down the sorting process.

2. Vacuum piping is used to rid the dump table area of the plastic bags (soil is delivered in plastic bags from customers). This system sends the trash/plastic directly to a trash container outside. (See NEW plant layout drawing at left.)

3. Large/wide high pressure and faster hydraulic presses are used (courtesy of Jensen USA) to squeeze as much water as possible from the goods prior to delivery either to the dryers or to the finishing department.

4. No shuttle will be used in this facility. All goods bound for the dryers will arrive at the dryer department via the "Clean Goods" automated sling system.

5. Cake breakers will be used at the press area prior to the loading of goods in the automated clean goods monorail system.

6. A high speed "bypass" line will be used to bring goods earmarked for the finishing department to the clean goods buffer storage lines.

7. Small feeding conveyors will be used to bring small-piece goods to the operator station at the small-piece folder department.

8. Open pocket (OP) washer/extractors will be fed with "soil side" loaded conveyors protruding through a soil/clean side separating wall to load chutes feeding the OP washers. This also ensures proper clean and soil side separation for HLAC compliance.

9. Properly designed slope tables will be used to feed the stations at the ironing dept.

10. Variable frequency drives (VFDs) and air dryers will be employed on the air compressors in a "lead, lag" orientation.

11. Water recycling, using ceramic micro filtration (CMF), will be used in conjunction with the steamless process water system.

This is Michigan ... construction continues under any conditions!

12. A "production and utility" global management system will be added to the existing automated modules. This system will feature all of the equipment (process and production) for tracking and analysis of all employee stations, including utility usage at each piece of machinery, etc.
13. A chemical-induction system will be used to ensure the highest possible water temperatures at each stage of the wash process (pre-rinse, wash and final rinse), thus generating lower dry times.
14. Chemical trenches will be used to run all chemical lines to washroom equipment.
15. The FIRST use of 120KG tunnels in North America (265 lb. pocket).
16. This facility will meet ALL current HLAC standards.
17. Both the existing building and the new extension will use New T5 and T8 high-efficiency lighting.

Equipment from Europe now is arriving at the laundry, and ALS crews are busily installing all utilities and process piping. The project is slated for completion this summer. **TR**

Editor's Note #2: *Jensen USA is providing machinery and layout assistance for the refit/expansion of WMSHL's Grand Rapids facility. See related article on pg. 32.*

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

Current conditions in the plant show there's no room to move, let alone accommodate growth.

Above is a view of the frame of the building expansion.

So far, so good. No delays yet!

Here is a view of the completed expansion, including new electrical service transformers.

ALS office staff visits one of the company's crews at WMSHL construction site.