

Merry Go Round Restaurant: Green Building summary

- Saved an existing 16,000 SF structure and roof from the landfill
- Bldg intended for a lower altitude, less harsh environment. Single pane glass, about 3 inches of batt insulation in the roof, ducts to nowhere throughout the entire building and old inefficient mechanical system with little control. Guest and employee comfort complaints abounded
- Budget was a great concern due to unknown conditions possible once demolition started. This caused a very conservative approach to selecting upgrades.
- Where could we get the most “bang for the buck”. ROI opportunities are limited due to shortened run time (i.e. winter season only). We looked at more progressive opportunities for energy saving- PV, Solar Hot Water etc but decided in the end to spend money where it would have the biggest impact and where the incremental cost over what had to be done would be minimal relatively. There were a great number of low hanging fruit which could be captured at MGR- we focused efforts there.
- We chose not to follow any formal green building programs or ratings for the same reason. We wanted to approach this project logically and put the money into the actual upgrades which would have an impact. We expect to see a 30% increase in efficiency minimum
- Waiting for commissioning to determine success of project but initial feedback is positive

Specific upgrades:

- Economizer for walk in cooler to allow free cooling most of the time (to be installed Spring '12)
- Low hanging fruit like occupancy sensors, LED or Compact Florescent lamping throughout
- The kitchen hoods are variable speed and run based on temperature sensors.
- All large equipment has modulating ability based on a call for heat so the equipment is using the minimum required to meet demand
- The demand for heat has been drastically reduced- rarely called for during the day when solar, people and cooking loads add interior heat. At night, the reset temperature is around 60 degrees and heat is rarely called for due to added insulation
- The DHW tanks were replaced with a single indirect fired tank. Due to the size of the boilers, this tank will behave much like an instantaneous hot water heater providing a constant flow of hot water for kitchen and restroom use. Expected benefit of increased efficiency (from about 80% to 96%) for DHW production.
- Code allows us to put in as low as 75% efficient non-condensing boiler. Compared to this, our boiler array (94% efficient) saves roughly 145 million btu/yr (about 21% savings) just on building space heating and make-up air.
- The make-up air energy efficiency increased from about 80% for an indirect fired furnace to 96% efficient with a properly sized hot-water coil. Using the boiler for make-up air for just the 3 new hoods (pizza, soup, dish), a hot-water coil would save 110 million BTU per year.
- Elected to install a DDC system mid-way through the project. Initially, we thought the system did not warrant such sophistication but quickly realized the remote controllers we had planned for might not provide the ongoing performance we wanted nor the ability to monitor remotely.
- DDC system allowed us to fine tune and fully utilizes the upgrades we had put into place. With the DDC system we can set up certain modes automatically- to ramp down during unoccupied hours, morning warm up etc

- Single pane storefront was replaced with double pane insulated glass units with a U factor which exceeded the minimum code performance for our climate zone
- Little (3" of blanket insulation on top of the roof structure) to no (some exterior walls) insulation was replaced with significant insulation. Spray foam was used for maximum R-value and envelope tightness. The exterior wall insulation exceeds the R-value required by code (overall R30.7 installed, R20.5 required per code). Roof insulation was significantly increased- R-10 was already in place above the roof structure, we added 6-7" of spray foam under the roof deck for an additional R value of R27.2
- All exterior materials were replaced to complete the overall transformation from an building envelope that had visible exterior light showing in some cases to a fully sealed, tight envelope.
- Due to the amount of natural light and a minimal lighting plan, with efficient lamps, we were well under the allowable wattage for lighting- ~14,000 W vs ~19,000 W allowable
- The ceiling material is Beetle kill pine- more than half was harvested from local forests (4 Mile area, WRNF)
- Kitchen equipment, when replaced, was selected for the most efficient in the brand class (as we have discussed, a number of the commercial refrigeration companies are not up to speed on Energy star)
- Recycled content flooring products used (rubber flooring, RE-Tire: Re-Tire Recycled Rubber Flooring by Capri Cork . The "Re" in Re-Tire is post-consumer and post-industrial rubber. The "Tire" is SBR synthetic rubber made from old tire scrap.; Kitchen Flooring, Eco Grip: Manufactured from 100% post-industrial recycled PVC material; Carpet Tiles, Flor: recycled content derived from industry scraps

Challenges:

- Budget
- Limited opportunity for ROI due to seasonal nature
- Finding equipment- i.e. we had challenges trying to find energy star rated refrigeration equipment as manufacturers find energy star to be difficult to keep up with particularly as models change slightly
- Desire for ease of operation due to remote location

Gas savings

Higher utilities in December due to tuning of equipment and construction activity

38% savings in January. Much warmer January than 2011 but probably still a 20% decrease