CITY OF MADISON ENGINEERING DIVISION

Engineering Operations
Maintenance and Vehicle Storage Addition

Existing Facility

- 1972 – Original pre-engineered steel frame building constructed; 22,500 sf vehicle & equipment storage; maintenance shop and wash bay.
- 1997 - 2,400 sf cold storage area addition
- 2002 - new MAU with CO and Nox detection and control system.
- 2006 - Original metal roof insulated and reroofed with white TPO.

Existing Facility

- 2008 – Replaced inefficient, manually controlled HID lighting with T-8 fluorescent fixtures controlled by occupancy sensors.
- 2011 – Installed solar thermal system to provide hot water for entire facility.
- 2012 – 20kW PV addition
- Existing Engineering facilities are in very good conditioned; well-maintained, upgraded systems

Needs

Immediate Needs

Expand Existing VSB

Alleviate overcrowding

Provide safe, efficient working environment

Protect investment in vehicles and equipment


MORBARK


EXIT
SAVE
Bobcat
3312


MORBARK
2401


Madison
STERLING
IESEL
ONLY


VACTOR
MADE IN THE U.S.A.
314

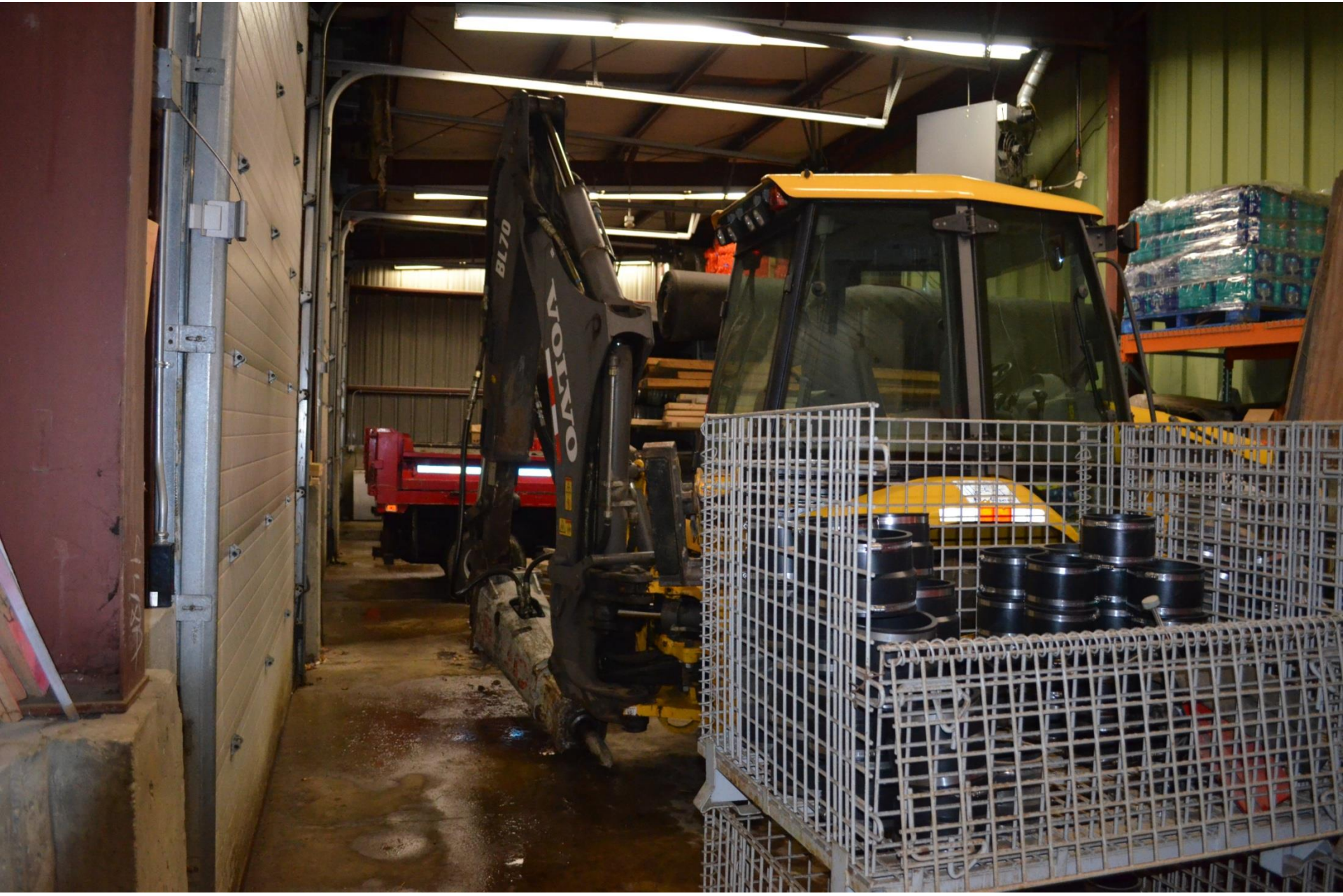

VACTOR
31 4
STOP


GMC
GMC
VOLVO


3925
SAAK


VOLVO
VOLVO


2402


BL70
VOLVO

Proposed Project

Project Objectives

- Alleviate overcrowded conditions to provide a safe, productive work environment and protect significant investment in vehicles and equipment.
- Reduce net energy consumption by at least 50% when compared to a comparable facility designed to meet current code requirements.
- Enhance the existing streetscape.
- Meet these objectives in a cost-effective and sustainable manner.

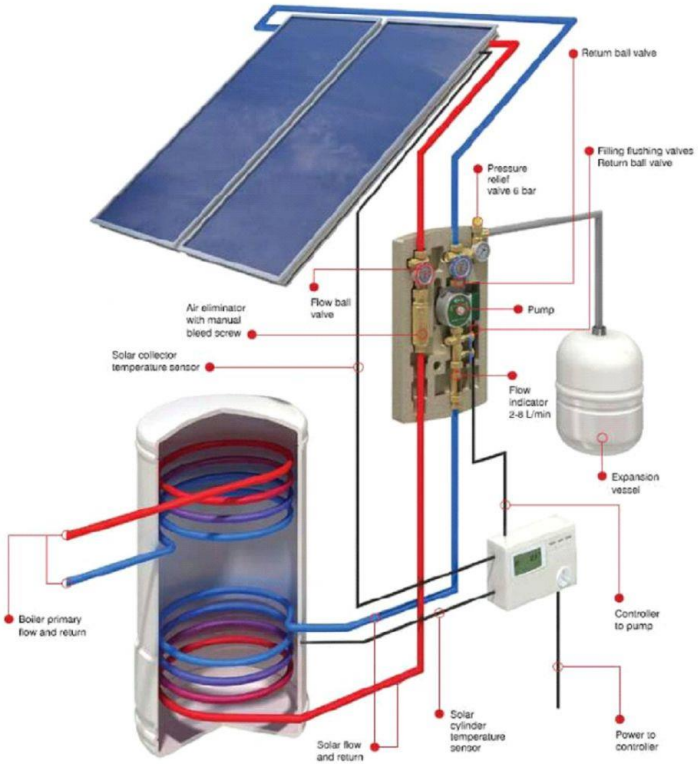
Project Highlights

Proposed Addition

- 21,725 SF floor space to existing facility
- 7,000 SF mezzanine storage

Renewable Energy

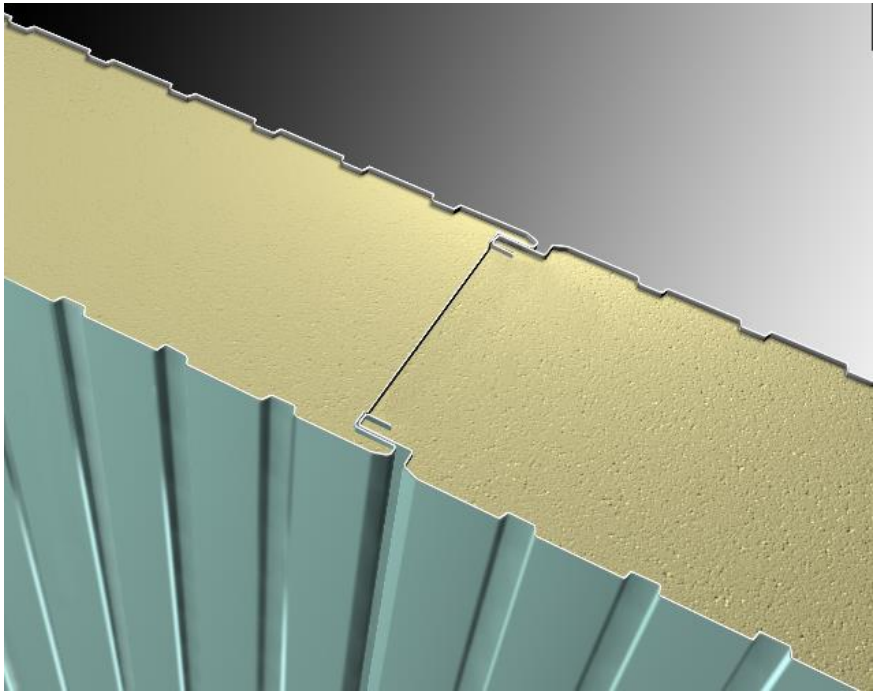
- 60 kW Photovoltaic roof top installation.



- Expansion of the facility's existing solar thermal system

Enhanced Building Envelope

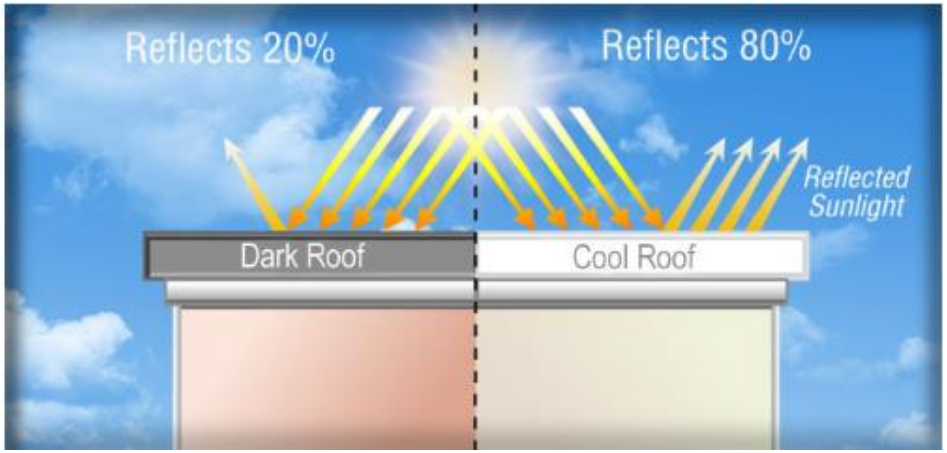
- Minimize heat loss/gain reducing energy consumption
- High-efficiency metal insulated panels (MIP) for roof and exterior wall construction.
- Detailing to avoid air infiltration and thermal bridging.



Enhanced Building Envelope

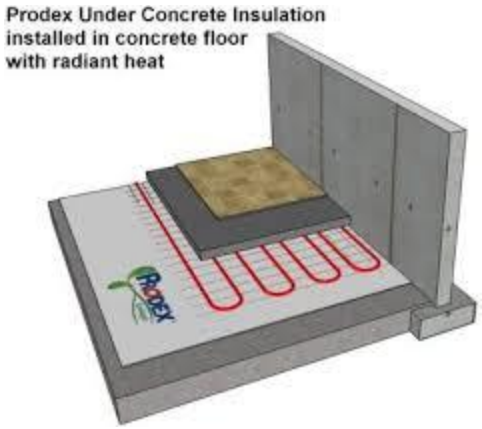
- Triple insulated, low-e, windows.

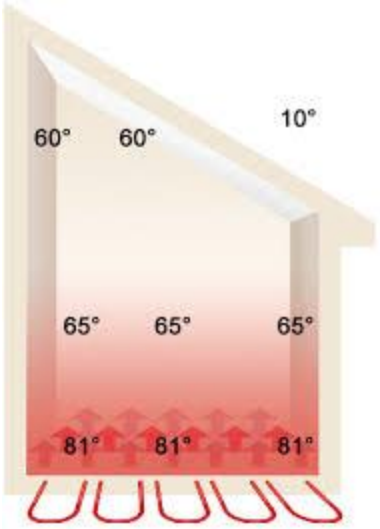
- White roof to minimize heat island effect.



HVAC

- High, efficiency modulating, condensing boilers.
- In-floor radiant heat.

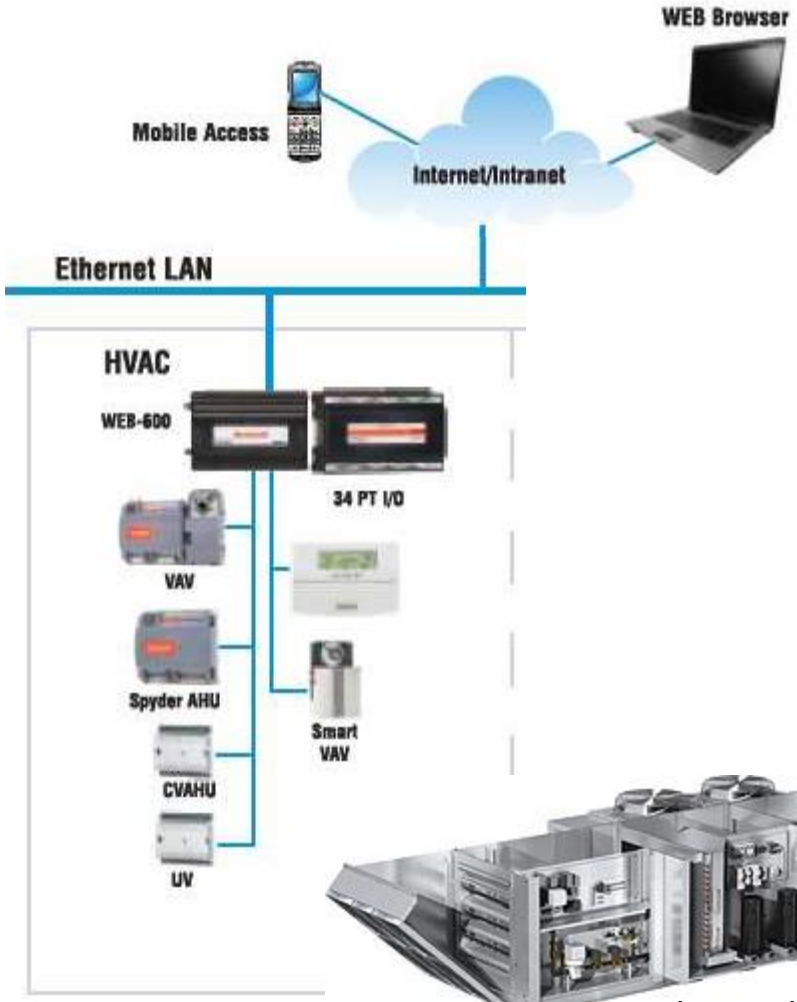




HVAC

- Passive solar wall on south exterior wall
- Naturally preheat outside air used for ventilation
- Provides supplemental heating and reduces demands on HVAC system.

HVAC – Centralized BAS



- Optimize efficient operation
- Provide remote ability to troubleshoot, diagnose and at times resolve operational issues.

Sensors – CO, NOX, Temp

Water Heater

Make Up Air Unit

Boiler

Energy Recovery Ventilation

Lighting

- Incorporation of daylighting to minimize daytime use of artificial lighting.
- High Efficiency LED lighting with enhanced motion and daylighting control.

Landscaping

- Native, low maintenance plantings with deep root systems to promote infiltration.
- Provide food source for pollinators.
- Green wall features on façade facing Emil Street.

Costs

Summary

- Cost
  - $3.725 million
- Sources
  - Sewer $1.98 million
  - Stormwater $990K
  - Landfill $330K
  - Energy Efficiency Fund $125K
  - Renewable Energy Fund $300K

Reason for Budget Amendment

- Procedural
  - $2.9M previously budgeted
  - All but $750K needs to reauthorized
  - Prior years Sewer & Landfill would have carried over
  - With Munis now needs to have been specifically reauthorized
- Increased Costs
  - Project Delay – economic recovery
  - Increased complexity - irregular footprint, dense site, minimal staging area
  - Improvements – suspended mezzamine, MIP, renewables, infloor radiant

Results

Project Objectives & Results

- Alleviate overcrowded conditions to provide a safe, productive work environment and protect significant investment in vehicles and equipment.

- 21,725 sf additional space floor space
- 7,000 mezzanine storage space

Project Objectives & Results

Reduce net energy consumption by at least 50% when compared to a comparable facility designed to meet current code requirements.

Renewable Energy

Source energy 737,024 kBtu per year.
112% of the expanded facility's electricity requirements.

Net Energy Decrease

48.23% less energy than if constructed to meet existing code requirements.

Total Energy Impact

Combined energy efficiency and renewable energy measures reduce energy consumption by 64.74% when compared to current standards for such construction.

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Project Objectives & Results

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Bonus

- Majority of project designed in-house including:
  - Civil
  - Architectural
  - Electrical Distribution
  - Plumbing
  - HVAC
  - Landscaping
- Only design services subbed out to private firms were:
  - Electrical Panel Sizing
  - Fire Protection
  - Structural Steel