

Congratulations to the 2012 Innovative Design Award Scott D. Thomas, PE LEED AP BD+C Cain Thomas Associates, Inc.



The Innovative Design Award was given to Scott Thomas for providing a thoughtful and innovative approach to plumbing, heating and ventilating at

**STEARNS COUNTY HOUSEHOLD
HAZARDOUS WASTE FACILITY
WAITE PARK, MINNESOTA**



Stearns County Household Hazardous Waste Facility is a 23,000 sq. ft. facility with Offices for staff, one bay of drive through drop off, Product Exchange Room, Bulking Room, Hazardous Waste Storage Rooms and a three bay Shipping area for Shipping of Hazardous Materials. The project construction is nearly complete and Owner occupancy is expected soon.

The innovative design elements of the project consisted of the containment requirements in case of a chemical spill and the use of radiant floor heating to eliminate the need to directly temper the makeup air in the vehicle areas. Containment was accomplished by the

use of flammable waste traps at vehicle areas with shear gate valves to isolate the spill. Fan Jet systems were used to introduce un-tempered outside air into the vehicle bays. The radiant heating systems in those bays was sized to handle the heating requirement of the outside air systems. The Fan Jet systems utilize a fabric duct system with high velocity openings that induce surrounding room air to help temper the outside air via induction type mixing.



Sanitary, Waste and Vent Systems and Hazardous Spill Containment

The hazardous nature of the materials processed in this facility required the ability to contain any spills that could occur with the hazardous materials. The Drive-Through and Shipping Areas were remote from each other and required separate containment of the drainage areas since these areas required trench drain systems associated with the vehicular traffic.

Prefabricated trench drains with sand traps were provided for the areas with vehicular traffic. Each area was provided with a separate flammable waste trap that could be independently isolated from the build-

ing waste system with shear gate valves. The shear gate valves were provided with stem extensions and floor valve boxes with wheel handles.

Containment for hazardous materials storage areas was accomplished with a depressed slab that was not provided with drainage.

Geo-Source Heat Pump Systems

The building is served by a geo source heat pump system with a horizontal slinky loop to absorb heat from and to reject heat to the earth. This system was heating dominant since large volumes of makeup air were also heated with the geo-source systems. The slinky system has a total cool-

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ing capacity of 78 tons and thus the total system heating capacity is 1,170,000 Btu/hr. The total loop field system flow rate is approximately 250 gpm.

The geo-source system serves water to air heat pumps for general space heating and cooling needs. The geo-source system also serves water to water heat pumps to satisfy domestic hot water, radi-

ant floor heating and snow melting needs.

The water to water systems were provided with water storage tanks to provide a buffer to minimize short cycling of the units and provide better controllability of the systems.

A design challenge was to provide makeup air without gas or electric makeup air units/systems for the ventilation systems of the vehicular bays. The County did not want to bring gas to the building and the high cost of electric resistance heating was not desirable.

The vehicular bays were provided with gas detection controls and are ventilated/exhausted at a rate of 1.5 CFM/sq. ft. The outside air is introduced through Fan Jet systems that provide a source of un-tempered makeup air. The air is supplied through the Fan Jet Fabric tube type duct system. The fabric tube is equipped with

small openings that supply the air at a high velocity that induces surrounding room air to bring the supply air up to room temperature in a relatively short distance.

The radiant floor systems serving the Vehicular bays were designed to account for the makeup air heating needs as well as the transmission heat losses. This resulted in radiant floor tubing spaced 9" on center in the Shipping Bays and 6" on center in the Drive-Through Bay.



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