



Indiana DOT Invests in Improved Salt Storage

New construction features standardized buildings.

The Indiana Department of Transportation (INDOT) has been storing salt in storage structures for the past 40 years and all salt has been under roof since the mid-to late-1970s in INDOT facilities around the Hoosier State. But a new round of construction was launched in 2003 featuring standardized Cover-All Building Systems (www.coverall.net) structures using concrete, steel, and textile materials. Eight are in operation already, replacing the last generation of structures, which ranged from two bay sand/salt mixing sheds to shingled salt domes. INDOT also operates five modern steel storage structures. The structures and INDOT's salt management program have won nine Salt Institute Excellence in Storage Awards (www.saltinstitute.org).

In the 1990s, INDOT became concerned that its outdoor loading practices were an unnecessary environmental risk and operational problem. As an interim step, in 2000 INDOT began constructing load-out additions to its existing salt domes. Current INDOT salt storage structures handle salt capacities ranging from 600 tons to 13,500 tons with the Cover-All buildings representing the larger capacities. Using the standard Cover-All building easily enables INDOT salt storage operations to contain the salt and minimize any environmental effects associated with salt. INDOT intends to add a minimum of two Cover-All buildings per year to ensure all future salt is unloaded, stored, and loaded in an efficient and environmentally secure manner.

Upgraded salt storage has been a

staged, systematic program using objective criteria. These include the age of the existing structure, its location with regard to proximity to wellhead protection areas and Interstate highways, whether the current structure includes a covered/secured load out structure, and capacity-related considerations such as its capacity-to-use history and the number of salt routes it supplies.

INDOT determined to use a standard Cover-All building for cost efficiency. Each facility includes a vehicle wash and a storage building for all trucks and salt spreaders. The steel-fabric structure is installed on top of eight-ft concrete walls. Each standard structure is 120 ft wide, but in varying lengths to be determined by annual salt usage for each individual location. Each building includes a salt storage area and a 120- by 50-ft area for drive-through capability and salt brine operations with secondary containment. The secondary containment area is used for tanks to make brine and storage tanks for reclaimed wash water, salt brine, and liquid calcium chloride. Floor drains and a sump capture any spillage and recycle it to the brine maker.

With salt loaded to seven ft, each standard building contains enough salt to meet the current annual five-year salt usage average. The standard size can be varied based on a five-year average use, with the objective being to store a full average season's supplies for salt routes serviced by the storage facility. The five-year annual average use is utilized to provide protection from potential supply disruptions in times of seasonal demand.

Vehicle Wash Facility

Each facility, once completed, will have an on-site, separate vehicle wash facility with an underbody wash system and a catwalk system. These use high pressure car wash-type wands with two wands on each side positioned at the floor level and two additional wands on each side positioned at the platform level. The wash facility also employs a high pressure under-body pressure washer to reduce the adverse effects of salt on the underside of the department's fleet of salt trucks. The under body wash system produces 300 psi and 30 gpm. The system is comprised of two 15-gpm stainless steel spinners. The system has a 50-gal aboveground storage tank fed by a two-in. fresh water line; the wash bay pit holds 1,500 gal of water. The wash facility also employs dual catwalks that allow a more thorough washing with the wash bay manual pressure washer. The wash bay also employs beams for demounting the salt spreader box and a more thorough cleaning of the vehicle and spreader.

All wash bay water goes through a Highland Tank (www.highlandtank.com) aboveground oil/water separator, which can produce a maximum of 28 gpm of ten ppm or less oil/grease water. The clean water is drained from the oil/water separator into an underground sump pit with a duplex grinder pump system. Each pump is rated at three- to five-hp capable of delivering 50 gpm. The clean wash water is pumped to the salt building to be stored in a standard aboveground 10,000-gal tank in the secondary containment area and used as

feed water for making salt brine. Supplied/city water is utilized for the brine process only if there is a shortage of wash water.

Excess wash water is stored in the 10,000-gal tank until it is needed in the brine making process. A level sensor in the 10,000-gal storage tank tells the pumps in the pit when to stop once the level in the tank reaches 80 percent or so capacity. If truck washing continues when the tank is full, the clean water is discharged to the sanitary sewer system.

INDOT has moved aggressively towards use of salt brine as an anti-icing agent sprayed on roadways ahead of a winter event or sprayed on top of spreader loads as a prewetting agent for spreaders without injection tanks. Brine is also used to fill the injection tanks of spreaders that pre-wet at the spinner. In general, brine is utilized in situations where tem-

peratures are 15 degrees Fahrenheit or higher.

The department also employs storage buildings for all trucks and spreaders at existing upgraded and newly constructed facilities. The structure is designed with 16- by 50-ft bays that are multiplied by the number of snow trucks that are assigned to a facility. In addition, the entire structure employs secondary containment and minimal heat.

INDOT not only complies with all state environmental regulations, but its use of salt storage buildings allows the agency to store enough snow and ice chemicals to support normal INDOT operations during an average winter sea-

son. The wash bay and storage building enable INDOT to maintain the equipment utilized during winter snow events. Storing the equipment under roof and on concrete extends equipment life and cuts maintenance costs—delivering improved taxpayer value and stretching constrained budget dollars.

For more information about INDOT's salt storage program please contact Steve McAvoy, Facilities Manager at smcavoy@indot.in.gov.

The preceding originally appeared in Salt & Highway Deicing, Salt Institute Newsletter, First Quarter 2010, www.saltinstitute.org.

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Exterior view (right) and interior view (below) of the Cambridge City salt storage facility.

