Buildings and Grounds Winter Maintenance

Rob Doletzky
U of M Campus Statistics

Hardscape

<table>
<thead>
<tr>
<th>Description</th>
<th>Square Feet (sf)</th>
<th>Miles</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads</td>
<td>1,352,766</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Sidewalks</td>
<td>4,443,266</td>
<td>105</td>
<td>8'</td>
</tr>
<tr>
<td>Steps/handicap ramps</td>
<td>119,819</td>
<td>11</td>
<td>24”</td>
</tr>
<tr>
<td>Surface lots/docks</td>
<td>6,737,876</td>
<td>154</td>
<td></td>
</tr>
</tbody>
</table>

Yearly Average of Materials Used

<table>
<thead>
<tr>
<th>Material</th>
<th>Tons</th>
<th>Bags</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treated Rock Salt</td>
<td>1,800</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>50 lb bagged material</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquid de-icer</td>
<td>250,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Winter Maintenance Mission Statement

Establish and promote Best Management Practices for winter maintenance that minimize deterioration to buildings, infrastructure and the environment without compromising safety.
Winter Maintenance Challenges at the University of Michigan

- Operational 24/7/365
- Intertwined within city of Ann Arbor
- Diverse surface areas to maintain
- Increasing expectations
- Microclimate affects
- Environmental & Infrastructure Sensitivity
Campus Service Level Goals

- To keep the University of Michigan campus open to vehicle traffic during any winter storm event.

- Pedestrian routes clear of snow 24 hours after typical snow event has ended (up to 3 inches), 48 hours for larger snows (3 inches or more).

- Hospital Community - Emergency Room and Ambulance entrance are highest priority.
Contacts

- Disabled Persons / Special needs -
  - Carol Dubritsky - ADA Coordinator (763-0235)

- Events or special requests -
  - Plant Operations Call Center (647-2059)
  - Plant Buildings and Grounds Website
Grounds Services handles all general fund building entryways and surrounding walks as well as most other customer accounts (Hospital, Northwood Community Apartments, NCRC, etc.)

Plant Building Services helps with snow removal at entryways during their scheduled shifts.

Parking Services maintains 85% of Campus parking lots.

Athletics handles their own buildings and parking lots with some assistance from Grounds.

Some remote sites are contracted (Wolverine Tower, Trotter House, Argus, etc.)
Winter staff consists of 52 FTE and 30 student/temp workers.

Campus is divided into 8 zones with 7 to 12 people per zone.

Additional staff are scheduled for off hours and weekends.

75% of crew is 6am - 2:30pm, 25% skeleton crew off hours and weekends.

Zone routes are prioritized by building hours, density of people, special needs and microclimates.

Some remote sites are contracted.
Typical Staffing and Equipment per Zone

- 2-3 Pickup Trucks
- 2-3 Bobcat Tool Cat utility vehicles with rotary brooms, plows, and liquid deicer tanks.
- 1-2 Toro Polortrac with rotary broom, plow and snow blower.
- 1 Kubota RTV 1100 utility vehicle with plow and salt spreader or sprayer.
- 4-6 full time staff, 3-5 temporary staff - 6 am to 2:30 pm
- Additional skeleton crew available afternoons, nights and weekends.
Best Management Practices for Hardscape:

- Mechanical Removal with Rotary Brooms, plows or shovels.
- Anti-icing and De-icing using liquids
- Eliminate melt and refreeze by placing the snow correctly
BMP - Brooming and Spraying with one pass
Melt and Refreeze areas
Why Liquid Deicers?

- Increased Service levels
  - Proactively anti-icing before the snow falls.
  - Allows for easier and more thorough mechanical removal.
  - Even distribution of salt on walkways.

- Protecting the environment and infrastructure
  - Using the appropriate amount of salt limits the amount that enters the environment and damages infrastructure.

Liquids Use | Salt/Sand Use | Operational Cost | Useful Life of infrastructure | Environmental Impact | Safety!
Current Liquids in use:

- **Salt Brine (23% sodium chloride in solution)**
  - Used when ground temperatures are above 20 degrees as a de-icer after brooming or direct applications to walks, roads and parking lots for small snows less than \( \frac{1}{4} \) inch.

- **90% Salt Brine / 10% Caliber M1000 Mix**
  - Engineered corn byproduct mixed with Magnesium Chloride
  - Used for all anti-icing and most other de-icing applications.
  - Works at a lower temperature than straight salt brine.
  - Less corrosive.
Current Granular Bagged Material in use:

- For Entryways: “Safer than Salt” product.
  - Blend of Magnesium, Sodium and Potassium Chloride
  - Good all purpose de-icer used at entryways.
  - Less likely to track into buildings and cause slippery floors.
  - Blue color for visual appearance.

- For Extreme cold situations: Magnesium Chloride
  - Only used when temperatures are below zero and ice has formed.
  - Good melting properties at low temperatures.
Let it Snow!

Questions?