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Madison Metropolitan Sewerage District
Fortin Consulting, Inc.

Steve Brown Apartments
A large facility in downtown Madison

- 1000 Students live onsite with parking
- UW Health building, 10 floors
- Underground heated public parking for 200
- 12 business
Brooming snow
Existing problems

• Water softener salt
  – Sump pumps overloaded
  – Pipes corroded from softener salt
  – 3000 gallons of water per regeneration event
  – Dumping 750 lbs of salt per regen into the city sewer
  – Salt sales and service were the same company

• Safety hazard 144,000 volts of power in next room

• Dry salt
  – Wasting salt on exterior grounds
  – 200-300 lbs per event
  – Salt storage space issues
The idea

Road salt reduction training – Fall 2014
Water softener training – Spring 2014

Madison Metropolitan Sewerage District

2 separate trainings, but why not put them together and use the softener salt twice.
Original floor drain
Elevate the drain

Brine regeneration water drains with gravity

Open site drain
Sanitary path

- Reduced sump load
- Plastic pipe
- Reduce safety hazard
Phase one solved several problems

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Mechanics of a water softener

- Saltwater removes calcium carbonate (hardness) from the resin bed
- Brine with calcium, magnesium and iron is called “bitter brine”, normally waste product
- Sweet brine is excess salt water and can be re-used in the softener (softener reclaim)
- Very scientific patented method test salinity
Water softener regeneration steps

1. Back wash
2. Brine displacement
   Brine capture from 45-37 min
3. Slow rinse
4. Fast rinse
Read the manual

- Water softener basics
- Hardness is measured in grains per gallon
- 7000 grains of hardness equals 1 pound
- Madison water 25 grains per gallon

It pays to know the terms when talking to plumbers and technicians
Phase 2 – capture brine

• Add “T” to divert brine during brine displacement cycle (20 minutes)

• Shutoff needed to capture dilute brine (8 minutes)
Diversion tube

Open the shutoff valve to divert brine to IBC (Intermediate base container)

IBC tanks have external pump
Brine reduction with air

Box fan to evaporate the water and increase the salinity to 23.3% to use as road salt brine
Increase the salinity
Move brine with a pump

Single pump can serve many purposes

**Lesson learned**: do not install a sump pump in tank, the salt water will corrode the metal and could affect the seals
Pump to Bobcat

Use pump to transfer brine to the Bobcat tank
Spreading brine

• Buy good tank for the vehicle (125 gallon tank from Fleet Farm $225)
• Retrofit bobcat with boom (8-10 holes) to spread brine
• Make boom removable, breakable, cheap and easy (save $900 and make a boom for $30)
• Broom all snow before brining
• Brine before a liquid precipitation event
Boom construction
Snow policy

• Start brooming snow once footprints visible
• Remove snow until event concludes
• Finish work with 30-50 gallons of brine
• If liquid precipitation is expected, put down brine to prevent slip and fall hazards
Snow
Broomed and brined
Anti-icing
Bitter brine summary

• **Save LOTS of road salt**
  – When needed, spread road salt by hand

• **Brining is simpler than dry salt** spreading (single pump vs. Saltdogg spreader)
  – The solution to finely & uniformly spreading salt

• **Turn softener regen waste into a resource**
  – Softener salt is cleaner than road salt
  – Increase softener efficiency (save salt)
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