Snow Control by Design to Provide Pollinator Habitat

2015 Environmental Stewardship Conference
Dan Gullickson
MnDOT Office of Environmental Stewardship
Blowing Snow is a Transportation Mobility and ........
Safety Concern
Proper Snow Fence Setback

- MnDOT Agreement No. 74708
  Climatological Characterization of Snowfall and Snow Drift in Minnesota.
- Dr. Mark Seeley PI and Grad Student Martha Shulski

snowfence.umn.edu
Permanent Living Snow Fence

TH 282 in Scott County
Adams Living Snow Fence
Living Snow Fence with a Grassland Nesting Bird and Insect Pollinator Component Planted in Snow Catch Area.

Prevailing Winter Wind Direction

Crop land

20'

10'

20'

150'

Plant berry and nut producing shrubs for the birds to feed on. Depending on the quantity of snow transport the critical shrub height ranges from the 8 to 15 ft tall.

Plant a cool season firebreak (e.g., junegrass, bluegrass, sedges) so fire can be used as management tool in the grasslands.

150 feet is the minimum width of tall grass native prairie to provide winter roosting sites for many wildlife species including the ring-necked pheasant.

Native Grasses Mixture
- Big Bluestem
- Sideoats Grama
- Canadian Wild Rye
- Slender Wheat Grass
- Western Wheat Grass
- Switchgrass
- Little Bluestem
- Indian Grass

Insect Pollinator Wildflower Species
- Black-eyed Susan
- Blazingstar
- Butterfly Milkweed
- Coneflower
- Maximilian Sunflower
- New England Aster
- Purple Prairie Clover
- Stiff Goldenrod
- Wild Bergamot

Seed the road ditch with native grasses to provide additional grassland cover wildlife habit and to control soil erosion.
TH 212 West of Bird Island, MN

Outside Protection Zone

Inside Protection Zone
Hybrid Willow Research
MnDOT Maintenance Research
I–35 near Albert Lea, MN

Bare Pavement Conditions

Native Tall Prairie Grasses/Forbs
Road Design

Ron Tabler
Tabler & Associates
Consultants in Snow & Wind Engineering
Niwot, Colorado

www.tablerassociates.com
MnDOT Train the Trainer Workshop for Blowing Snow Control

May 2 and 3, 2006
MnDOT St. Cloud Training Center
Public Enemy #1
Flattening the Backslope along the Roadway

Prevailing winter wind direction for snow transport (see map to right): 300°

Attack angle of the wind: 60°

Height of the cut measured from the road shoulder: 8 ft

The minimum setback from edge of road shoulder to the top of the backslope should be 107.24 ft.

This minimum setback was found using the equation:

\[ W_{\text{top}} = 95 + (\sin \alpha)5.8H \]

Where \( W_{\text{top}} \) is the minimum setback, \( H \) is the height of the cut measured above the road shoulder in meters, and \( \alpha \) is the attack angle.
Dozer Investment Decision

1 time during construction

Repeated times through MnDOT Maintenance
Problem

Traditional: Flatten Backslope

95 + (Sin \( \alpha \)) 5.8 H

Recommended Section

4 or Less
NW Quadrant TH 10 and TH 32 Interchange

04/17/2006
NW Quadrant TH 10 and TH 32 in March 2013
MnDOT Snow Problem Areas

- 3,700 sites
- Median Length 955 Feet

Legend

Snow Problem
MnDOT’s Google Earth Snow Trap Inventory Location

- `\\AD\CO\Public\Environmental\SnowControl\SnowTrapInventory\SnowTrapsAug2014.kml`
Snow Control Cost Benefit Tool
Partners:

Center for Integrated Natural Resources & Agricultural Management

snowcontroltools.umn.edu
Select an input or add new:
2244 SP 7604-22 TH 12

Agency: MNDOT

Basic Setup *

Name *
2244 SP 7604-22 TH 12
Comments
188 foot setback with fence length of 1,930 feet

Year Installed *
2017

Practice Life *
30

State *
Minnesota

County *
Swift

Problem Segment
2244 (MilePost 34.92)

Snow Problem Area
- Blow Ice
- Drifting

Land *

Traffic *

Costs vs. Benefits
- Annual Cost
- Install Cost
- Drifting
- Blow Ice
- Crashes
- Travel
- Carbon

Living Snow

Structural

Benefit-Cost Ratio
- Living Snow
- Structural

Internal Rate of Return
- Living Snow
- Structural

Annual Payments
- (Structural) Landowner Breakeven
- (Structural) Max Agency
- (Structural) Max Society
- (LSF) Landowner Breakeven
- (LSF) Max Agency
- (LSF) Max Society

Saved 6 months ago.
Thank You

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