WELCOME



SNOW AND ICE CONTROL FOR THE CONNECTICUT STATE HIGHWAY SYSTEM

CONNECTICUT DEPARTMENT OF TRANSPORTATION 2013-2014 **APPROACH TO SNOW AND ICE** CONTROL





Snow Season

Starts: November 1 Ends: April 30

All employees, equipment and contractors should be ready for the winter season <u>before</u> November 1

Leave Time

Vacation

•

Single Days

• Requires Maintenance General Supervisors authorization

Less than 3 days

• Requires Transportation Maintenance Managers authorization

REST BREAKS

- 3 hours of rest
- Should be taken out of the truck
- <u>Generally</u> taken between the 17th and 21st hours





tour meather experts

Thursday February 7, 2013 | 11:58 PM

STORM WARNING DISCUSSION:

Phone: 908-850-8600 | Fax: 908-850-8664 http://www.weatherworksinc.com

CONNECTICUT DOT

A LARGE AND DANGEROUS NOR'EASTER IS IMMINENT, WHICH WILL RESULT FROM THE PHASING OF A NORTHERN-STREAM SYSTEM APPROACHING FROM THE GREAT LAKES AND A SOUTHERN-STREAM SYSTEM MOVING UP THE ATLANTIC COAST. SPOTTY LIGHT SNOW IS EXPECTED TO OCCUR SOON, IN ADVANCE O THE MORE MAJOR IMPACTS FRIDAY INTO SATURDAY. GENERALLY, A COATING UP TO I" IS POSSIBLI STATEWIDE BY SUNRISE FRIDAY. EXPECT CONDITIONS TO STEADILY DETERIORATE THROUGH THE DA' FRIDAY AND INTO FRIDAY NIGHT AS THE NOR'EASTER RAPIDLY STRENGTHENS AND SPREADS PRECI OVER THE STATE. SNOW MAY MIX WITH RAIN AND SLEET OVER ZONES 3 – 6 ON FRIDAY (BEST CHANCI SOUTH) WHICH WOULD CUT DOWN ON TOTALS SLIGHTLY. HOWEVER, ANY MIX WILL QUICKLY TUR BACK TO SNOW FRIDAY LATE AFTERNOON/EARLY EVENING AS THE LOW MOVES EAST AND COLD AII RUSHES IN.

THE WORST OF THE STORM LOOKS TO BE FRIDAY NIGHT INTO EARLY SATURDAY, WHERE PERIODS O HEAVY SNOW WILL COMBINE WITH STRONG GUSTY WINDS TO PRODUCE BLIZZARD/WHITEOU' CONDITIONS (WORST IMPACTS OVER EASTERN HALF OF THE STATE). THE STRONG WINDS WILL CAUS BLOWING AND DRIFTING OF SNOW AS WELL AS THE POTENTIAL FOR DOWNED TREES AND POWERLINES SNOW SHOULD GRADUALLY DIMINISH AND END WEST TO EAST FROM THE LATE MORNING TO EARL' AFTERNOON SATURDAY, THOUGH IT WILL STILL REMAIN BREEZY.

EXPECTED STORM TOTAL ACCUMULATION:

ZONE 5 & 6: 10 – 20 INCHES (highest east) **ZONE 7:** 12 – 20 INCHES
 ZONE 1:
 15 – 25 INCHES (highest east)

 ZONE 2 & 3:
 18 – 30 INCHES

 ZONE 4:
 15 – 30 INCHES

ZONE 1 (CENTRAL VALLEY):

Start Time: Friday 2 – 5 AM End Time: Saturday 10 AM – 1 PM

Description: Scattered areas of light snow developing thru the pre-dawn hours, becoming a bit steadier towards daybreak. Meanwhile, expect it to become windy and precip to become moderate in intensity towards evening, and heavy at times thru daybreak. Blizzard conditions will be likely Friday night/early Saturday. Snow should lighten up and taper off 10 am - 1 pm on Saturday.

Winds: Thru 7 am: Easterly increasing to 10 - 20 mph; 7am – 4pm becoming NE 12 – 25 mph with gusts to 35 mph; 4pm Fri – Noon Sat: Northeast to Northwest 20 – 30 mph, gusts to 45 mph

Snowfall: Thru 7am: Coating – 1"; 7am – 4pm Fri: 3 – 6"; 4pm Fri – Noon Sat: 10-20"+

Total Snowfall: 15 – 25" (highest totals in eastern half of zone)

Temperatures: Thru 7am: 22 – 25; Warming to 28 – 32 Friday; Low 18 – 23 Fri Night; High mid-20s Saturday

ZONE 2 (NE HILLS):

Start Time: Friday 2 – 5 AM End Time: Saturday 11 AM – 2 PM

Description: Scattered areas of light snow developing thru the pre-dawn hours, becoming a bit steadier towards daybreak. Meanwhile, expect it to become windy and precip to become moderate in intensity towards evening, and heavy at times thru daybreak. Blizzard conditions will be likely Friday night/early Saturday. Snow should lighten up and taper off 11 am - 2 pm on Saturday.

Winds: Thru 7 am: Easterly increasing to 10 - 20 mph; 7am – 4pm becoming NE 12 – 25 mph with gusts to 40 mph; 4pm Fri – Noon Sat: Northeast to Northwest 20 – 30 mph, gusts to 50 mph

Snowfall: Thru 7am: Coating – 1"; 7am – 4pm Fri: 3 – 6"; 4pm Fri – Noon Sat: 15-20"+ Total Snowfall: 20 – 30"

Temperatures: Thru 7am: 22 – 25; Warming to 28 – 32 Friday; Low 18 – 23 Fri Night; High mid-20s Saturday

ConnDOT Weather Zones



ZONE 1: CENTRAL VALLEY ZONE 2: NE HILLS ZONE 3: SE HILLS ZONE 4: E. COASTAL PLAIN ZONE 5: W. COASTAL PLAIN ZONE 6: SW HILLS ZONE 7: NW HILLS

Highway Operation Centers Newington & Bridgeport







p3 phelantm, 2/21/2008



Ice Control Chemicals Sodium Chloride



Ice Control Chemicals Magnesium Chloride



Salt vs. Sand Mix (2008)

Cost to treat one lane-mile Salt vs. Sand (approximately)

Salt	Cost Factors	Abrasives
\$56.00	A Purchase Cost/ton, \$	\$60.00
	B Cost of added salt/ton(14%)	\$8.40
	C Mixing cost, \$	\$1.00
\$56.00	D Total Cost (per ton), \$	\$69.40
300	E Pounds per lane mile	750
\$9.00	Cost / lane mile, \$	\$26.00

Does not include spring clean up





Personal Protective Equipment

• Goggles

• Face Shield





Personal Protective Equipment

• Rubber Apron



Personal Protective Equipment

• Boots

• Gloves











Storage Tanks



Rexroth Ground Speed System



Ground Speed Control Panel



Application Rates

 Snow & ice control materials <u>will</u> be applied at the <u>approved rates</u> as soon as there is sufficient accumulation to prevent the material from being blown off

Timing is crucial

Application Rates

Additional applications will be made every 3 to 4 hours after the *initial application* or <u>as required</u> Salt shall be applied at the rate of 200 pounds per lane mile

Pre-Wetting Techniques

- On board systems
 - VariTech
 - Rexroth/Reed
 - Rexroth Ground
 Speed
- Anti- Icing systems
 Salt brine trucks



Rexroth/Reed System











Level of Service

Balance ✓ Cost ✓ Safety Environmental responsibility

Snow and Ice Control Treatment

Pavement temperature and ice/pavement bond are key

Ice/Pavement Bond

• Character of material cast or displaced by traffic

• Appearance of road as viewed in mirrors

• Noise of plow(s)

• Pavement temperature

The Weather

Accurate Weather Information is Essential to an Effective Snow and Ice Plan.

A. Private Weather Forecasting Services
B. Road Weather Information System (RWIS)
C. Our Knowledge and Experience

Pavement Temperature Truck mounted radiometers



RWIS

Road Weather Information Systems



RWIS

Road Weather Information Systems





Pavement Sensors



Our state highway system should remain <u>reasonably safe</u> and in a <u>passable</u> condition by <u>continuous</u> <u>plowing</u> and <u>judicious use</u> of snow and ice materials

m DOT Does NOT Have a Bare Road Policy







Plowing Speeds

Plowing speeds will be monitored!

Distance snow is cast

- Excessive distances from shoulder
- Pedestrians
- Sidewalks
- Buildings
- Overpasses
- Narrow medians onto opposing lanes
- Signs

TAKE IT SLOW

The last truck in echelon should be the Crew Leader or Competent Person to maintain a overall view of the Plowing operation

Application of Snow and Ice Control Materials









Snow and ice control materials will be <u>Closely</u> monitored by:

- Pay Loader operators
- Crew Leaders
- General Supervisors
- Managers
- Directors
- Staff Maintenance

						Connect	icut Depart	ment of Tra	ansportatio	n				(and	THE THE THE PARTY					
Date: Garage			Operator Name				Ground Speed Control Echelon		Call Out	Truck No.		SHIFT MILEAGE								
(11 12) (21 24)		Snow & Ice Route Description	e n	Routes:				Contractor Name and Truck #						Ending						
10 2 22	14	ROUND						1	1 2	3	4	5	6	7	8	9	10	Starting		
AM 4 20	PM 15 19 18 17	Start Time (24 hour clock)												Total						
-		End Time (24 hour	clock)			-														
		Loading Loca	ation											1000	Left on	Singhy !!				
MATERIAL	On Board	n Board From Previous Driver		1	2	3	4	5	6	7	8	9	10	Returned	Board	USAG				
SOLID	Buckets	SALT										-								
CHEMICAL	Buckets	10 to 1											-							
	Gallons	BRINE																		
QUID CHEMICA	Gallons	CALCIUM									-									
	Gallons	Magnesium						1000	1000											
PRECIPITAT *See List To	TION TYPE	PRECIPITA	ATION				/	/							ECIPITATI					
2.25		Pavement Temperature (F)										-		FF - Freezing	Fog	/				
	SNO	Snow												FR - Freezing	Rain	/				
	ITIO	Slush/Mealy												IS-Light (Pr	wder) Snow	/				
eck All Appropriate	ONE	Ice/Pack												BL - Blowing	Snow					
	U	Vvet												S - (Ordinary) Snow						
		Patrol	-											SL - Sleet	/					
		Plowing			0									R - Rain	/					
		Solid Chemical												1 /	/					
L L		Liquid Chemical	Liquid Chemical									1 /	Intensity	<u>/:</u>						
F		Abrasives														L -Light				
	N	Lanes Treated													1	M -Moderate				
	ATIC	Solid Rate (Lbs./ N	/lile)											V		H -Heavy				
	Liquid Rate (Gal./ To		Ton)																	
	E E							1						-						



DISTRICT			1	DATE		STOR	M NO.		PILE	NO.			
San		nae	Liquia	arcum, Ma	ignesium,	TOTAL CT	DIC VAPDO	0.00					
Cubic Yards Used and Sodium Gallons Used						TOTAL CO	BIC TAKDS	5.00					
TWO LA	NE - ACT	F 330				TOTAL CU	0.00						
AREA OR SECTION	SALT	10/1	CHLORIDE	MAGNESEM CHEORES	BRINE	TOTAL GA	LLONS CAL						
			-		-	TOTAL GAL	LONS MAGN						
						TOTAL GA	LLONS SAL	T BRINE	· · · · · · · · · · · · · · · · · · ·		-		
							SA	CUBIC	YARDS				
1	10/1 091						0.0						
IULTII	ANE - A	CT 330				STORM TO	TAL				0.0		
AREA OR CALCRUM MAGDEREM SALT						TOTAL TO	DATE						
SECTION	SALT	10/1	CHLORIDE	CHLORES	BRINE		S2	TONS					
I						10/1		0.0					
	-					SALT BRI	NE	-	0.0				
_	-	-		-	-	STP AIGHT	_	0.0					
_		-	-			STORM TO	TAL.	0.0					
						TOTAL TO	DATE						
			-		TOTAL								
	107 11				-	TOTAL	TO OTO DA	RY					
KAMPS-	-ACT 339	,	_	_	SALT TO	IUTALS TH	IS STORM	-					
AREA OR SECTION	SALT	10/1	CALCRIM	MAGNESEM CHLORES	AGENCIES	SECTION	SAND	AGENCIES	SALT	CHLORIDE	CHLORIDE		
							0.00	-	0.00	-	-		
							0.00	-	0.00	-	-		
			-				0.00	-	0.00	-	-		
	_	-	-		-		0.00	-	0.00	-	-		
_	-	-	-		-		0.00	-	0.00				
	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL		TOTAL	TOTAL	TOTAL	TOTAL	TOTAL		
	0.00	0.00			0.00		0.00	0.00	0.00	-			
						GRAN	D TOTAL	TOTAL					
TOTAL P	POST STO	DRM - AC	T 331	_		TOTAL TO	DATE		_				
AREA OR SECTION	SALT	10/1	CALCRIM	MAGNESEM	SALT	SECTION	SAND	OUTSIDE	SALT	MACNESIUM	CALCIUM		
	- Sectors		CHILDREN		- Anna - La	Sportoit	0.00	- Construction	0.00	CHILDREAL			
							0.00		0.00		-		
							0.00	1	0.00		-		
							0.00	-	0.00				
						1	0.00	-	0.00	-	-		
							0.00	-	0.00	-			
	TOTAL	TOTAL	TOTAL.	TOTAL	TOTAL		0.00	0.00	0.00	TOTAL	TOTAL		
	0.00	0.00											

Worst Case Scenarios: Blizzard Conditions / Black Ice







BLACK ICE





Exclusive Manufacturer of The Salt Slurry Generator

The Salt Slurry Generator will:

- Save you money!
- · Reduce the amount of salt usage per lane mile
- Maximize the efficiency of your road salt
- Reduce residual salt build-up on roadways

The roller mill operates at approximately 500-600 RPMs which quickly refines granular material.

- Increases salt volume by 25%
- More grains per square foot

BEFORE Salt Slurry Generator

- · Brine process activates faster, thus melting snow & ice faster
- More material stays on the road surface
- Helps create safer roads faster

SALT SLURRY GENERATOR

Paul T. Rizzo ransportation Maintenance Manager paul.rizzo@ct.gov

Stephen P. Moran Transportation Maintenance Manager stephen.moran@ct.gov