U.S. Department of Transportation
Federal Highway Administration

ROAD BUSINESS

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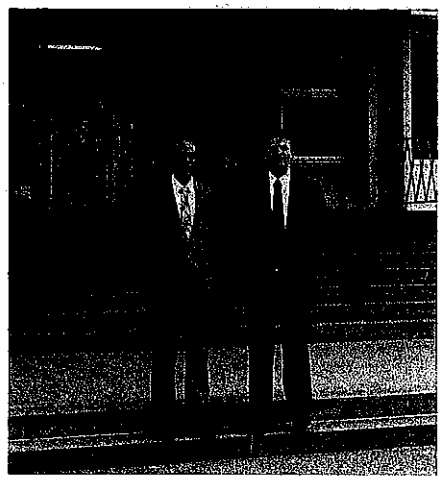

Above: From left to right are Pete Prentice, road agent for the town of Sandwich, and Jim Moore, administrator of the state bureau of municipal highways.

On The Road In New Hampshire

New additions to the T² Center advisory board

The Technology Transfer Center is lucky to have the opportunity to welcome Jim Moore and Pete Prentice to its advisory board. Without the quarterly advisory board meetings the New Hampshire T² Center would not be where it is today. Since the center began in August of last year it has responded to over 1,000 requests for information, put together a mailing list of 1,400 individuals interested in New Hampshire's local roads, sent out 14,000 separate mailings containing numerous pieces of information, conducted 22 workshops and seminars on local road related subjects, and instigated many other activities pertinent to New Hampshire's local roads. We look forward to more successes with the advise we will receive from our new additions to the advisory board.

Pete Prentice is the appointed road agent for Sandwich, NH. For the last three years he has been managing a good mix of gravel and paved roads. He knows what its like to be elected to his position and what it means to be responsible for plowing driveways in addition to the town roads. Pete has many experiences in the type of local road operations that are common to our state. This, along with his dynamic personality, make him an excellent addition to the board.

Jim Moore is the new administrator for the NH DOT's bureau of municipal highways. Prior to this position, Jim spent 15 years as the design chief for off system bridges. As the administrator for municipal highways, Jim is responsible for managing the block grant moneys as well as the various highway aid available to municipalities. In addition, he also handles two year no cost bridge inspections for all New Hampshire towns, manages specific city or town requests for maintenance and repair of property used in connection with highways, and provides engineering services for the purpose of consultation pertaining to highways and bridges.

Jim Moore is another example of our top quality state engineers and we are pleased to have him participating on the T² advisory board. ■

Preparing for Winter Operations

Equipment, materials, and planning for snow removal

Preparation for winter operations is a function of annual maintenance work which must not be neglected. Maintenance of winter equipment is an ideal rainy-day project for road crews. Plans must be made to handle emergencies and to provide for adequate supplies and equipment for use in winter storms.

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— ALSO IN THIS ISSUE —

CALIBRATION CHART

Gate Opening (Hopper type Spreaders)				Pounds Discharged Per Mile								
	A	B	C									
Control Setting	Shaft RPM (Loaded)	Discharge Per Revolution (Pounds)	Discharge Rate (Lbs/Min)	5 mph X 12.00	10 mph X 6.00	15 mph X 4.00	20 mph X 3.00	25 mph X 2.40	30 mph X 2.00	35 mph X 1.71	40 mph X 1.50	45 mph X 1.33
1	30	7	210				630					
2		This Weight Remains Constant										
3												
4												
5												
6												
7												
8												
9												
10												
11												

Winter Operations...
continued from p. 1

Equipment Maintenance:

Summer and fall are ideal times for maintenance on equipment used to fight winter storms. Plow blades should be checked for bending or cracks. Any defects noticed in this inspection should be reported and blades replaced as needed. Check bolts to be sure they are properly seated and free of defects. Mold boards should be sanded free of rust and painted. Plow blade wax should be applied after the paint is cured. This allows the snow to more easily flow along the mold board. Failure to do this may cause snow to accumulate in front of the plow causing undue strain on the truck's engine.

Plow hitches should be checked for ease of operation as well as correct height adjustments. Chains for the lifts also should be checked for damaged or cracked links. It's better to spend a few minutes on maintenance now than a few hours during a major snow storm.

Next, check the tailgate spreaders, inspect the augers, then sand and paint both these and the boxes, if needed. Unnecessary friction from rusted augers can cause jams at the worst possible times. The spinner should be level and the vanes straight without bends. Check the level of hydraulic fluid in the reservoir as well as the condition of the fluid itself. Check the hoses for leaks or wear at connections and bends. Replace any defective or possibly defective sections of hose.

Materials:

The most common materials used in snow and ice control are sodium chloride, calcium chloride, and abrasives/anti-skid. For best results, sodium chloride should be used when temperatures are above 25 degrees Fahrenheit and mixed with calcium chloride when the temperature falls below 25 degrees. Abrasives/anti-skids, basically sand and cinders passing a maximum one-half inch screen, are used on hills, curves, intersections, and segments where there is not enough traffic for salt to be effective. Abrasives are also used when temperatures drop below 20 degrees Fahrenheit, making salt or calcium chloride ineffective.

How to Calibrate a Spreader:

Road crews can determine how much salt they are spreading on their roads through a simple mathematical calculation known as calibration.

Calibrating Non-Automatic Controls: Calibration is a method of calculating the pounds per mile of salt that are discharged from the spreader at various truck speeds. It consists of counting the number of auger or conveyer shaft revolutions per minute on the spreader, measuring the salt discharged in one revolution, and multiplying this discharge rate by the number of minutes the truck takes to travel one mile.

Each spreader must be calibrated individually because even the same models can vary greatly at the same setting. Hopper-type spreaders must be calibrated for specific gate openings by measuring the opening from the floor of the conveyer to the edge of the gate.

Before you start, you need to have the following: a dairy scale, canvas or a bucket, a crayon or other marker, and a watch with a second hand.

To calibrate the spreader, follow this step-by-step procedure and refer to the following chart:

1. Warm the truck's hydraulic oil to a normal operating temperature with the spreader system running.

2. Put a partial load of salt on the truck.

3. Mark the shaft end of the auger or conveyer.

4. Dump salt on the auger.

5. Rev the engine to an operating rpm.

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Making A List And Checking It Twice

A check list approach to buying a computer system

by Dr. Dot

So, you have decided to make the big plunge and buy a computer. Naturally, your decision was made after reading hundreds of articles (like this one), talking to many experts, discussing the options with all your friends and, in the final analysis, you have decided that you can no longer live without a computer. Now for the $64,000 question: "What do I buy?"

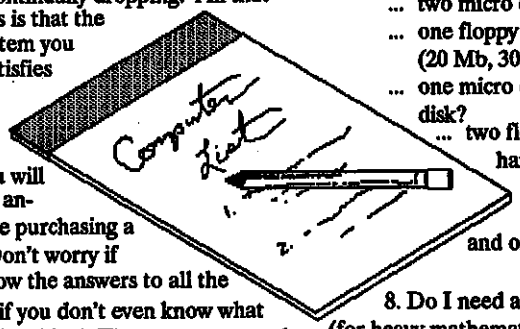
Buying a computer is a little like buying a car – there is an enormous selection to choose from. There is a computer for everyone's checkbook, ranging anywhere from $200 to over $10,000. The purpose of this article is to provide you with a check list of questions which must be asked during the process of purchasing a computer system. I want to emphasize that you are not buying just a computer, but a computer system which includes software, a monitor, a printer, and a variety of disk drives, at minimum.

After looking at the check list below, you will agree that a lot goes into choosing the right computer system. In order to keep everything in perspective, you must remember for what purpose the computer is being purchased. In other words, how do you plan to use the computer? The answers to all the questions on the check list will depend both on how you intend to use the computer and on what software you will need to perform the necessary tasks.

Probably the most important aspect of purchasing a computer system is determining how much technical support you can provide, how much support you will need from others, and how much you are willing to spend for that support.

The second most important thing to remember is never to purchase a system on the word of the salesperson. Make sure you "test drive" the exact system (computer, peripheral hardware, and software) that you plan to purchase. Remember, you would not test drive a Corvette if what you were buying was a Chevy Nova. Computer salesmen have been known to let you try out one system and tell you that the one you are planning to purchase is, for the most part, the same. Don't believe it! A Corvette is not the same thing as a Nova.

Once you buy your computer system, do not worry if a new model comes on the market or if you see a similar system that sells for less. The technology is changing so rapidly that new computers are continually being introduced to the market and prices seem to be continually dropping. All that really matters is that the computer system you purchased satisfies your needs.



Below are the questions you will want to have answered before purchasing a computer. Don't worry if you don't know the answers to all the questions or if you don't even know what the question is asking! The answers are only a phone call away. Just call us at the Technology Transfer Center by dialing 1-800-423-0060 and we will be glad to shed a little light on the subject.

Questions For Computer Buyers

1. Where am I going to buy the computer system?
   - ... the local store?
   - ... a large national company?
   - ... mail order?

2. What kind of service do I want, or need, from the company?
   - ... phone support?
   - ... installation?
   - ... technicians willing to make service calls

3. What kind of warranty do they offer:
   - ... how long?
   - ... how much does it cost?
   - ... where is the work done?
   - ... how fast can they do the work?
   - ... what items does it cover?

4. How knowledgeable is the person that is selling me the computer system? (did he/she previously sell used cars?!)

5. What type of computer do I need?
   - ... IBM?
   - ... IBM clone?
   - ... Macintosh?
   - ... Apple II?

The rest of the questions on this list assume that you will be purchasing an MS-DOS computer system (MS-DOS is a common Disk Operating System used with IBM or IBM compatible computers).

6. What central processor (CPU) do I need?
   - ... 8088, 8086, 80286, or 80386?
   - ... what is the clock speed (4 mhz 8mhz 10mhz 12mhz 16mhz etc.)?

7. How many disk drives and of what type?
   - ... two floppy drives, (5 1/4 inch)?
   - ... two micro disk drives (3 1/2 inch)?
   - ... one floppy drive and one hard disk (20 Mb, 30 Mb, etc.)?
   - ... one micro drive and one hard disk?
   - ... two floppy drives and one hard disk?
   - ... one floppy drive, one micro drive, and one hard disk

8. Do I need a numeric co-processor? (for heavy mathematical calculations: spreadsheets, accounting software packages)

9. What type of monitor?
   - ... monochrome (green, amber, white on black)?
   - ... color?
   - ... size (12", 13", 15", 19")?

10. What type of graphics do I need?
   - ... CGA (color graphics adapter - med. resolution)?
   - ... EGA (enhanced graphics adapter - high resolution)?
   - ... Hercules (high resolution primarily monochrome)?
   - ... VGA (Video Graphics Array - high resolution on new IBM PS/2 computers and some clones)?

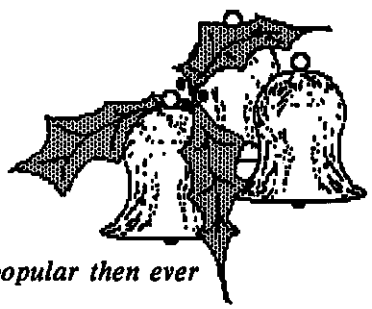
11. Do I want a mouse as an input device (for software that uses it)?

12. How many external ports do I need?
   - ... serial ports (modems, communications, tablets, mouse)?
   - ... parallel ports (how many for printers)?

13. What type of printer do I need?
   - ... dot matrix (fast, inexpensive, near letter quality, graphics)?
   - ... letter quality (type writer results, slower, more money, no graphics)?
   - ... laser (expensive, high quality text and graphics)?

14. What kind(s) and what length of cables do I need to connect everything?

'Tis The Season To Be Jolly -- Not To Be Paving



Late season paving is more expensive, more difficult, and more popular then ever

Increasingly in New Hampshire, paving projects are being put off until later and later in the season. We are only doing about 30% of our paving in the good paving weather months of May, June, and July. About 70% of the production has been moved into August, September, October, November, and now even into December.

Two questions come to mind: (1) Why is it a problem when paving projects are put off to later months? (2) How could such a trend have become so popular?

One thing is for certain, numerous problems arise as the paving season is stretched to its limits. Simply put, **the cities and towns of New Hampshire will get better work for fewer dollars if they pave earlier in the year.** Some of the reasons for this can be seen in the advantages and disadvantages presented below:

■ **Advantages of early season paving**

- Bids that are made in the winter months are generally more competitive, since the producers are looking for work. The bids also tend to be more competitive because they can be figured without overtime or the expense of renting equipment.
- The days are long and the sun makes the pavement warmer. - The equipment has all been refurbished and tested. It is in good condition in the early part of the year.
- The crews are fresh and it is easier to get good workmanship, good joints, more errors corrected, etc.
- The summer weather provides conditions under which traffic will tend to heal and knead the asphalt surface, improving its density and its texture which helps to seal the wearing surface and improve riding quality.
- In cold weather the asphalt is often overheated in order to offset cooling effects, however, in the warmer months the temperatures used to heat the mix are moderate and reasonable. Hence, the asphalt can be heated at a lower cost due to less energy being required and there is a greater chance of avoiding changes in the asphalt's properties due to overheating.

■ **Disadvantages of early season paving**

- The user will most likely get less competitive bids late in the year. By this time the contractor has probably logged his books with his regular employees at standard rates of pay. Late bids mean a job figured with additional hires, paying overtime and possibly renting some equipment.
- Renting equipment may be difficult because everybody else wants rentals at the same time. The result is that you end up with insufficient rolling.
- The efficiency and economy of recycling is now being recognized as probably not achievable beyond mid-September because the recycled asphalt piles are cold and wet and pull down the temperature of the virgin portion of the mix.
- There is a tendency, on cooler days, to overheat the mix which means more energy and more fuel costs because the aggregate lying in the stock piles is colder and wetter. Also, the on site workers tend to heat the asphalt mix far beyond what is considered good handling temperature for a specific asphalt. The right temperature is ignored and replaced with one that gives them some additional time for the mix to stay hot so they can roll it. This action causes the asphalt to age more prematurely. The end result is that a much harder asphalt ends up in the pavement than the designers originally had hoped for. This increased hardness is what brings on early brittleness which would include earlier fatigue cracking and increased thermal or transverse cracking.
- Compaction difficulties in colder weather lead to higher permeability and therefore accelerated aging of the asphalt layer.
- During colder weather, it is difficult to make good joints because the mix chills rapidly and any fluke or flaw missed by the workers is pretty much set.
- The traffic does not get a chance to knead the pavement before it goes into service, and therefore cannot help increase density, seal the surface, or enhance riding quality.

All in all, late season paving is packed full of bad conditions which rapidly get worse with each day into the fall. Perhaps a little background will help us understand how the practice of late paving has snowballed into December.

Many highway departments used to use calendar cutoff dates and simply avoided the various arguments that could be given for extending the season. The fiscal year fit well with project planning and good paving weather, and plants would automatically close in the fall. The question of paving late was moot. The few late projects that did occur were given extra special care, such as having extra rollers on the job to insure compaction and keeping the paving train at a slow pace. It was simply accepted that paving in late season weather was more expensive and more difficult.

As interstate construction neared completion, the volumes of asphalt paving increased greatly and one of the innovations we learned about was thicker paving. With this, we learned that with a three-inch plus asphalt layer we can pave later into the year because the heat mass is held in the mix long enough to insure good quality compaction. Unfortunately, a vicious rumor was started. Folks began to think that since the plants were open it was all right to pave regardless of thickness. This is simply not true. While at times it may be ok to place thick pavements late in the fall, it is certainly not ok to place thin (1" to 1 1/2") layers in temperatures less than 40°F.

The problem of late paving has been compounded with the fiscal calendar changing to July 1. This change has influenced many highway superintendents and road agents to wait until July 1 before setting the mechanics in motion for advertising and awarding bids.

While many producers try to influence their customers not to do work late in the year, they have been pressured to accommodate them. Some producers are actually asking waivers on the quality of construction, knowing how difficult paving is during the later months.

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Air Entrained Concrete Gives Best Results

As a protection against freeze-thaw cycles, you may want to look into air entrained concrete for your next new structure

Whenever you install concrete that will be exposed to salt and freeze/thaw conditions make sure your contractor supplies "air entrained" concrete. A chemical added to the concrete incorporates about 6% air in the form of very small bubbles. These bubbles eliminate scaling or flaking that would occur when concrete freezes and thaws under wet conditions.

Large air bubbles from improper compaction will weaken concrete. However, the tiny, uniformly distributed bubbles of properly entrained air make spaces for the moisture in the concrete to expand into when freezing occurs. This reduces pressures that would otherwise break up the concrete surface.

Air entrainment slightly reduces concrete strength, so it's important not to incorporate too much. Some departments of transportation have listed a standard specification of 4.5% to 7.5% as the proper volume for entrained air. We recommend that you get an engineering specification from a certified engineer and that you do not arbitrarily choose some number. Specifications can change depending on the structure.

It's also a good idea to test for proper air entrainment when the concrete arrives. An experienced testing agency employee can use a pressure air meter and get results in just five to ten minutes.

It costs very little to add the air entraining agent at the plant, but it could cost a great deal to break up and replace scaling concrete. Make sure you specify and test for air entrained concrete for your next construction project.

The above article was edited and reprinted for this newsletter from Crossroads, Fall 1987, University of Wisconsin-Madison. ■

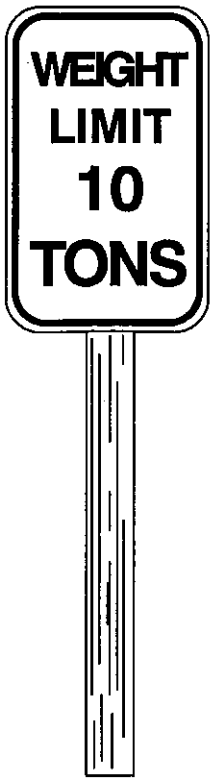
Post Your Bridges

Acknowledging a bridge deficiency is the best defense in a liability case

An under-strength bridge is a safety risk to motorists and a liability hazard to the government responsible for maintaining it. If a bridge cannot safely support the loads normally carried over it, it is essential that the bridge be either posted or strengthened. At a minimum, motorists must have the information they need to drive across an under-strength bridge.

State and local officials have done a good job of inspecting bridges and identifying deficiencies. Unfortunately, some local governments are afraid to install signs advising motorists of load restrictions because they fear that acknowledging the deficiency but not correcting it will make them liable in case of an accident. They contend that because they do not have the funds to correct the deficiencies, not announcing them is the best defense.

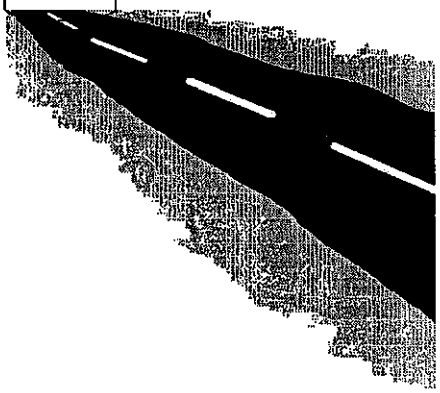
Actually, nothing could be further from the truth. The history of court awards in cases involving under-strength bridges reflects just the opposite. The best defense is posting and maintaining a prioritized list of corrections to be made as funding becomes available. The main reason for posting the bridges, however, is to avoid accidents in the first place. ■



Did You Know ?

...One single 18,000 pound axle load on a truck has the same effect on the asphalt pavement structure as 5,000 plus passenger vehicles. If this is true, what effect does an overloaded truck have on the pavement? Think about it!

...In Vienna, Austria, the government may have come up with a safe use for millions of gallons of wine withdrawn from the market last year after it was found to have been spiked with an antifreeze additive. Mixed with salt, the wine seems to melt hazardous highway ice much better than road salt



'Tis the season...
continued from p. 4

For the most part, the problem of late season paving is an administrative one; one of timing of contracts. New Hampshire can not afford an increase in problem pavements. It is therefore essential that we begin to achieve a reversal in this trend and save ourselves some money and headaches in the process. Just remember, **"Early to bid and early to pave, makes for less work and more money to save."**

Information for the above article was provided by Bob Joubert, The Asphalt Institute's district engineer for New England states. ■

Low-Cost Anti-freeze Can Clog Engines

Cooling heavy duty diesel engines with low-cost automobile anti-freeze is asking for trouble

Antifreeze designed for automotive applications has conditioners to protect aluminum components. These conditioners generally contain high levels of silicate. The higher temperatures and vibrations of diesel engines cause the silicates to fall out of suspension in the antifreeze.

In a diesel engine silicates that have fallen out of suspension, in time, act like small particles of glass bombarding the cooling system. The first problem stage is damage to the water pump shaft and seal from this bombardment. Later the silicates form a gel in the low points of the system. In the third stage the gel solidifies and becomes like granite obstructing the cooling system.

Treating these inexpensive automotive grade antifreezes with expensive conditioners just makes the problem worse since the conditioners also contain high levels of silicate.

One way to protect diesel engines is to use a diesel quality antifreeze which meets the General Motors specification GM6038. However, adding silicate-loaded conditioners to even a GM6038 antifreeze could raise silicates up to a dangerous level similar to inexpensive automotive antifreezes.

Major manufacturers, recognizing this problem, have developed pre-conditioned and low silicate antifreezes specifically for heavy duty diesel engines. Consult your major diesel engine supplier for coolant recommendations. (Note that silicate build-up has not been found to be a problem in gasoline engines, although it is possible).

You may think that you're saving money by buying low-cost antifreeze and trying to improve it by adding conditioners. The fact is, however, that it's more cost effective to buy a conditioned antifreeze, and better for the engines."

The above article was edited and reprinted for this newsletter from Crossroads, Winter 1987, University of Wisconsin-Madison. ■

Winter Operations... continued from p. 2

6. Count the number of shaft revolutions per minute at each control setting of the spreader and then record this figure in Column A.

7. Collect salt for one revolution and weigh it, deducting the weight of the collection container to get the weight of the salt. For greater accuracy, collect salt for several revolutions and divide the number of turns to get the weight for one revolution. Record this figure in Column B.

8. Multiply the shaft rpm (Column A on the chart) by the discharge per revolution (Column B) to get the discharge rate in pounds per minute (Column C). Then multiply the discharge rate by the minutes to travel one mile at various truck speeds (see chart for this figure) to get the number of pound discharge per mile. For example, at 20 mph with a 30 shaft rpm and 7 lbs. discharge, the calculation would be as follows:

30 x 7 = 210 x 3.00 = 6320 lbs. per mile.

Calibrating Automatic Controls: Automatic controls come with factory calibration cards that give the rate of spread for each setting. However, should you need to calibrate, use the following steps:

1. Remove the spinner.

2. Set the auger on a given number, such as No. 2.

3. Tie a sack or heavy canvas under the spreader discharge chute.

4. Mark a specific distance, such as 100 or 1,000 feet.

5. Drive that distance with the spreader operating.

6. Weigh the salt collected in the sack or canvas.

7. Multiply the weight of the salt by 5.2 for 1,000 feet or 5.28 for 100 feet. The answer will be the pounds of salt discharged per mile, which will remain constant regardless of truck speed. Separate calibrations must be done, however, for each control setting.

Winter Plow Plan:

Now that the equipment is in excellent shape, it's time to prepare the plan. Starting with a map of the municipality's streets, break the pattern into segments which can each be handled by a separate piece of snow removal equipment. Consider all the factors available before deciding on the size of the segment. Consider length of roads in the segment, lane miles of road, topography (flat or hill? crisscrossing roads with cul de sacs? long sections with infrequent crossroads?), etc. After considering these and any other factors, decide on the required segments and assign the appropriate plowing units to each. Drive through each segment as a final test and make adjustments as needed.

Next, meet with the snow plow drivers and review each one's assigned segments. Give the drivers time to drive through their segments and develop a working knowledge of the best way to proceed with the required patterns. Primary streets should be plowed first with feeder streets second and residential areas (cul de sacs, etc.) last.

When your plans are complete, present them at a public meeting. Also make the plans available at the Municipal Building so that residents can see that you are using a definite, efficient method. Publishing the winter snow removal plan in your local newspaper is also beneficial.

Now your equipment is in shape, your crews are ready to go, and your citizens are informed. All you need is snow.

Free Publications:

We will be glad to send you the following publications on winter operations at no charge as long as supplies last. To request these publications, contact the Technology Transfer Center at 1-800-423-0060 or send in the attached mailer from this newsletter.

High Pressure Salt Brine Deicing Conference
(FHWA, 1980, 115 pages)

Ice Melting Characteristics of Calcium Magnesium Acetate
(FHWA, 1986, 11 pages)

Using Salt and Sand for Winter Road Maintenance
(Wisconsin T2 Center, 4 pages)

The above article, by Ed Stellfox, RTAP Engineer, was reprinted from Pennsylvania State University's fact sheet,Preparing for Winter Operations. ■

R. A. A. NEWS

The New Hampshire Road Agent Association

Londonderry Sets The Stage For Things To Come

40 public officials now know a lot more about road reclamation

With the help of Wes Beebe, Londonderry's public works director, high quality information sharing in New Hampshire has become a reality. Back in August of this year, Wes hosted a free demonstration on road reclamation. About 40 New Hampshire town and city officials showed up to get a first-hand look at a reclamation project.

How did all of this get started? It was initiated by Wes shortly after the first annual Road Agent Association meeting held this last spring. "I just thought some of the surrounding towns might be interested in seeing what actually went into a complete reclamation project" explained Wes. "It's an interesting process and we were involved in the whole nine yards. The idea behind the Road Agent Association is to share information, and I felt that this was a good opportunity to let others get an inside look at pavement recycling."

So what would you get out of a demonstration of this sort? Just ask Wes. "First we had some coffee and then shared with everyone the behind-the-scenes decisions that led us to doing the reclamation project. We talked about the costs that were involved and then let everyone see for themselves what went into road pulverizing, grinding, fabric installation, grading, fine grading, and using a 10-ton vibratory roller."

Demonstrations are one of the best ways to find out more about a particular construction process, installation procedure, or some specific operating technique. As can be seen by the turn-out in Londonderry, there is a need to do more of these demonstrations.

If you are going to be involved with a particular project this spring (culvert installation, bridge rehabilitation, seal coating, or some other road and bridge project) please consider letting us use your project as a demonstration site. The cost will be nothing and the time involved will be less than minimal.

If you are interested in sharing information with other towns, please contact one of the following individuals for more information (or call 1-800-423-0060):

- Curt Dunn
  Mason 878-2392
- Henry Sherburne
  Littleton 444-5051
- Dave Wadleigh
  Tilton 286-4721
- Garth Witty
  MontVernon 673-6080 ■

Whenever you go to a town garage you can find some very innovative tools, equipment, and cost-saving ideas. The Road Agent Association is looking for tips from the field. The purpose is to collect as many good ideas as possible and compile them into a simple, easy-to-use reference and distribute it to all New Hampshire towns and cities.

So, where does the $100.00 come in? Think of it as a raffle. One idea will buy you one ticket. Every time you send in an idea to the RAA, you will have a greater chance of winning $100.00.

How does it work? When we receive an idea from you (written down, recorded on video tape, shown in a photograph, called in on our toll free 800 number, etc.) we will put one entry card in the drum with your name, address, and phone number on it. The more ideas we receive from you, the more entry cards you'll have in the drum and the greater your chances of winning will be.

WIN
$ 100.00 $

When will the drawing be? The drawing will happen in the spring at the next annual Road Agent Association meeting. Advanced notices will be sent to everyone announcing date, location, and time of the meeting. Then, at that meeting, the winner will be picked from the drum of cards and handed a check from the Road Agent Association in the amount of $100.00.

Who is eligible to win? Anyone whose permanent residence is in the state of New Hampshire can enter the drawing.

What kind of ideas will make acceptable entries? Acceptable entries must pertain to the operation of a town or city highway department; for example budgeting, road construction techniques, road maintenance techniques, equipment maintenance, home-made tools, equipment designs, winter maintenance techniques, planning policies and procedures, shop and work zone safety, personnel issues, purchasing equipment or materials and supplies, cost savings of any kind... and the list goes on and on.

To kick things off, to the right is an idea someone came up with in Iowa. They wanted to share their idea and now others may benefit from it. Let's see what New Hampshire can do!

Manhole Cover Lifter

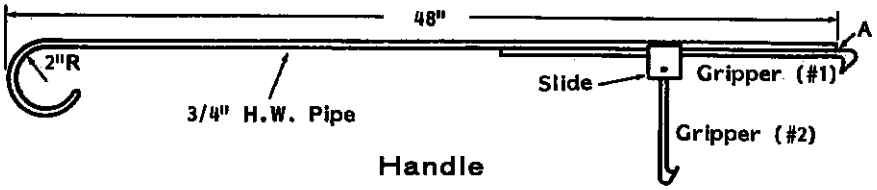
Replace the old crowbar method of lifting manhole covers

A diagram for this tool is on page 8 of this newsletter. The tool has two grippers which hook into the grooves of a manhole. When the handle is pulled, the grippers are drawn together to lift the manhole.

The lifter is constructed of 1-inch tubular material spanning the diameter of a manhole cover and is equipped with strap iron hooks which grip the cover when the longer member is lifted. This allows the manhole cover to be lifted without the fear of a strained back, broken fingernails, or pinched fingers.

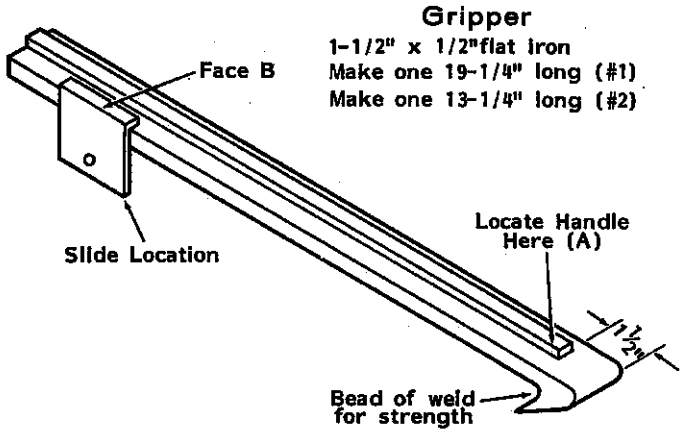
The designer of this device is Larry Phillips, a design specialist in the public works department of the city of Des Moines, IA. ■

Manhole Cover Lifter

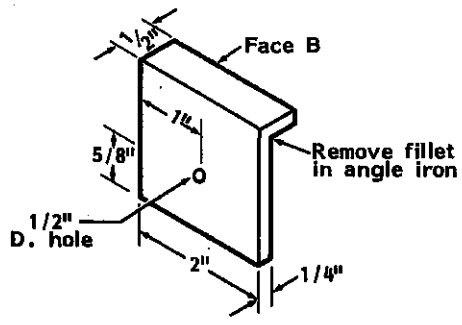


Handle

Bend Handle Around
4" I.D. Pipe



Gripper
1-1/2" x 1/2"flat iron
Make one 19-1/4" long (#1)
Make one 13-1/4" long (#2)



Slide
(make 2)

Procedure

1. Bend nose @ 60° angle
2. Taper nose to aid in slot engagement
3. Locate Handle on long Gripper 1-1/2" from end and weld along side of handle
4. On short Gripper locate & weld 1/2" I.D. pipe x 1-1/2" long on end opposite angle bend
5. Fasten together with 1/2" x 2-3/4" bolt thru slide (#1) short gripper (pipe end) & slide (#2) weld nut on bolt
6. (Optional) Add wheels (3-1/2" ϕ) with 1/2" rod extending inside of handle & set screw located on top of handle.
   Wheels are 3" apart @ axle.

Controlling Roadway Ice

A note from cold weather experts in the U.S. -- Alaska

Imagine yourself living in Alaska. No doubt this will be much easier for those of you who live in the "North Country". Yet, wherever you live it is easy to picture ice on the roads in Alaska. With this in mind, we thought it might be nice to share an article with you which appeared in Volume 5 of the Alaskan Transportation, a publication of the University of Alaska, Fairbanks. Like New Hampshire, Alaska is continually looking for better ways of controling icey roadways. This particular article introduces an idea that originated in Sweden, another cold area of the world.

Ice on roadway surfaces creates a safety problem for drivers everywhere in Alaska, especially in urban areas with a high volume of traffic, where stop-and-go driving is common. Traditional methods of ice control are expensive, and each method has disadvantages.

There are two ways to approach the problem. Apply anti-icing materials to the ice or incorporate anti-icing materials in the pavement when the roadway is built.

Sand and salt are commonly applied to icy roads; however, sand provides only temporary skid resistance, and stopping distances on sanded ice are much greater than on dry pavement. Traffic action quickly removes sand, so it must be reapplied often. In addition, sand must be removed from gutters and inlets in urban areas following spring thawing to avoid blockage of drainage systems.

Using salt to remove roadway ice saves travel time and reduces accidents, but may cost the road user more than 10 times as much as the sum of the benefits. The major cost of using salt is the corrosion of vehicles and bridges, which shortens their useful lives. Salt in roadway run-off also can contaminate groundwaters and surface waters.

One way to reduce the environmental impact of salt is to incorporate salt particles in the pavement itself. However, the potential environmental problems of salt run-off can be eliminated completely if large rubber particles are incorporated into the pavement.

A paving system was developed in Sweden 20 years ago which incorporated rubber particles (from 1/16 to 3/8 inches in size) into asphalt pavement. The rubber-modified pavement is a more flexible surface, so that traffic breaks and knocks aside ice on the roadway. This effect is caused by the flexing of protruding rubber particles. Rubber-modified pavement increases both skid resistance and durability.

This system is distributed under the trade names "Skega Asphalt" or "Rubit" in Scandinavia and "PlusRide" in the United States.

But will the Swedish system work in Alaska? To answer this question, the Alaska Department of Transportation and Public Facilities (DOT&PF) installed experimental pavement sections in Juneau, Anchorage and Fairbanks using the PlusRide system.

The experimental pavement sections showed positive results. Rubber-modified pavement in Alaska had the ability to shed an ice cover more quickly than conventional pavements. Furthermore, the pavement was more flexible and fatigue resistant, and it reduced tire noise. Under Alaskan conditions of icy unsalted roadways, stopping distances were consistently reduced on rubber-modified asphalt pavements, averaging 20-25 percent less than normal pavements.

An interesting spin-off of using PlusRide pavement is that the rubber-modified pavement provides a beneficial use for what is normally a troublesome waste product: used tires.

The U.S. Congress recognized this in 1984, when it increased federal funding by 5 percent for highway projects with pavement using rubber. If all 230 million tires discarded annually in the United States could be used for rubberized pavement, they would provide enough for 600,000 lane-miles each year.

Though effective and environmentally benign, the PlusRide system is not a perfect solution to the icy roadway problem Rubberized asphalt is most effective in higher traffic, higher speed areas; slow, light traffic does not produce enough flexing action to loosen ice.

The Alaskan pavements incorporating rubber granules appear to have superior resistance to fatigue cracking, but they are somewhat more susceptible to raveling and potholing than normal asphalt. Keeping field void levels at less than 8 percent by proper mix design, preparation and compaction is critical for raveling resistance. Rubber-modified pavement should not be placed directly on unbound gravel bases, but used as a thin overlay on a conventional pavement.

Overall, however, the use of coarse rubber particles in asphalt paving offers significant advantages when the pavement is properly placed and used in the proper location. This is particularly true for areas such as bridge deck or insulated sections of roadways, where surface temperature differences may lead to differential surface icing.

If you would like to learn more about rubber-modified pavements call the New Hampshire Technology Transfer Center at 1-800-423-0060, or send in the attached mailer and request the following reports: *Asphalt Pavements Modified With Coarse Rubber Particles,* and Subsequent Research – a four-page draft manuscript. ■

This is a local roads Technical Newsletter. It is written for New Hampshire's town and city employees who are responsible for planning and managing low volume roads.

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