

Pothole Patching Best Practices

Material Storage

Effective patching starts with good material. Prices for proprietary cold mix are ever increasing and now exceed \$125/ton. But material cost is minor compared to repatching or damage claims due to inferior material. Exposing material to precipitation (Figure 1) undermines the careful chemistry developed by suppliers. At a minimum, store material under a roof (Figure 2) or heavy duty tarp.



Figure 1 – Cold & wet



Figure 2 – Cold but reasonably dry

A **Best Practice** we've observed is converting an old dump truck bed into a storage container and finding room inside the garage during the patching season (Figure 3).



Figure 3 – Warm and dry!

If material is stored at outside ambient temperatures, load up PatchBox for the next day before leaving and park the tonner in the garage overnight. Likewise, load up the skid steer bucket and store in the garage. This provides a head start warming the next load of material.

Patching Process

Extensive research on pothole repair was conducted as part of the Strategic Highway Research Program's (SHRP) H-106 experiment. This is documented in the report titled *Long-Term Monitoring of Pavement Maintenance Materials Test Sites* which is available online at the address below:

<http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/98073/98073.pdf>

According to the report, the throw-and-roll technique proved just as effective as the semi-permanent procedure (drying holes, vertically squaring edges and utilizing vibratory compaction) **when quality materials were used**. This is indeed good news for maintenance crews since throw-and-roll is much less labor intensive.

Interestingly, prior studies concluded that drying holes extend patch life, but it becomes less important when quality proprietary materials are used and when patching occurs at temperatures above freezing.

Here's our take:

1. Squaring pothole edges and utilizing vibratory compaction isn't significant when highly workable (pliable) proprietary cold mix is used as this material will flow to fit the geometry of the pothole when compacted. Slightly overfilling the pothole with material and compacting with a truck tire suffices. A slight crown should result when the proper amount of material is used. Some municipalities prefer to manually tamp potholes (Figure 4) to limit the liability of backing up the truck.
2. Due to the relatively minimal effort required to dry holes, we think it makes sense. Since the freezing and thawing of water causes potholes, shoveling cold mix into a wet pothole seems akin to installing a Band-Aid on a wound without first cleaning and disinfecting it. A lawn blower works well for drying potholes (Figure 5).



Figure 4 – Compacting material



Figure 5 – Removing water & debris

Using torches, diesel fluid or other “tricks” to improve the workability of cold mix should be strictly discouraged. Torches cause localized burning of material and, like adding diesel fluid or other solvents, break down the specially formulated chemistry of the material.

Patching Response Time

Responding quickly to potholes is required to minimize driver dissatisfaction, vehicle damage, accidents and potential liability claims. The process of finding, reporting and repairing potholes will only be as strong as its weakest link.

When it comes to locating potholes, the more eyes the better. Therefore, charge all City employees with the task of reporting potholes, especially those from departments that spend a majority of their workday on the streets (e.g., Public Safety employees and inspectors). Make it easy for them to report potholes.

A **best practice** is to utilize the community's website to report potholes (Figure 6). Today's technology allows electronic reporting, tracking and even an automated email to the originator when the issue is closed out.

The image is a screenshot of a web browser displaying a form titled "Reporting a pothole in Fort Dodge, Iowa". The browser's address bar shows the URL "https://www.fortdodgeiowa.org/egov/apps/action/center.egov?action=form&item=18&fDD=". The form itself is divided into several sections. At the top, there is a map of Fort Dodge, Iowa, with four colored quadrants labeled NW (green), NE (blue), SW (orange), and SE (purple). Below the map, a legend indicates that a red asterisk denotes required information. The form sections include: "Pothole Location Information" with radio buttons for NW, NE, SW, and SE; "Street Name" with a text input field; "Closest Cross Street or Address" with a text input field; "Pothole Condition" with a "Width of hole" dropdown menu and a "Depth of hole" dropdown menu; "Contact Information" with fields for "Full Name", "Daytime Phone Number" (with separate fields for area code, number, and extension), and "Email"; and "Additional Comments" with a text area. The browser's taskbar at the bottom shows various icons and the system clock indicating 5:42 PM on 5/9/2013.

Figure 6 – Fort Dodge, IA uses a web-based form allowing citizens to report potholes

Prior to hitting the streets, take the time to organize reported potholes into an optimized route to reduce travel and minimize left hand turns. Consider using colored push pins on a map to easily identify locations. If justified, send out multiple crews to different areas, each with their defined route. Start with potholes furthest from the garage and work backwards, allowing more time for PatchBox to warm material.

Finally, we get what we measure. Since patching response time is how drivers evaluate us; keep score of this critical metric. Monitor and record the number of reported potholes not yet patched (backlog) and the average time from report received to pothole patched. What percent of potholes are patched within 24 hours of being reported? Make the information visual and share with your crews.

Another Best Practice ... PatchBox

PatchBox LLC was founded by brothers Rick and Gary Brimeyer after observing the various “tricks” that maintenance crews employ to soften cold mix in cold weather, but which ultimately break down its specially formulated chemistry.

Diesel engines are less than 50% efficient, with unused BTUs escaping from the exhaust system. We wondered, “Why not put some of that paid-for energy to work warming cold mix?”

The benefits of PatchBox are many when used with a tonner pick-up with a dump bed and our “Patch Catch” tray (compared to shoveling stiff material from the back of an open bed):

- Dramatically improved ergonomics means safer, happier and more productive workers
- Soft, workable material results in longer lasting patches and increased productivity
- Fewer complaints from drivers resulting from the above
- Cold mix is confined to PatchBox rather than marring truck beds and dropping truck resale value
- No additional energy is required; it’s a green process



Figure 7 – Using “Patch Catch” tray for dramatically improved shoveling ergonomics

Best of all, this solution comes at a price that all but the smallest towns can afford ... and justify when one considers the cost avoidance of front end alignments or a rotator cuff surgery (which averages \$50,000 in medical expenses and 11 months off work).

As such, we believe PatchBox constitutes a **best practice** for cities and towns.

Municipalities and counties with pavements spread across a larger area will likely find PatchBox’s capacity a limiting factor for high volume patching at further distances from the cold mix pile. PatchBox can still be a cost effective complement to the fleet for these entities when utilized for high volume patching within a tighter radius of the pile or for low volume patching at the outskirts.

Contact Us

Feel free to contact us if you have questions, comments or a pothole patching best practice you'd like to share.

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