Introduction to Full Depth Asphalt Repairs

- Where to START?
- Getting Bids - What to look for
- Setting Work Processes for a Quality Job
- Start in time to finish prior to Winter!
Asphalt Pothole and Patching Repairs

Smaller Repairs!
- Where do Potholes come from
- Planning
- Patching Basics
- Methods
The pothole
What we want to avoid!

• Sure you have had some days when nothing turns out right. This happens to everyone, and if you don’t think so, just check this out...
Sure you have had some days when nothing turns out right. This happens to everyone, and if you don’t think so, just check this out...
First, SHE doesn’t care about the size of the pothole...
Then, SHE accelerates to get out of there...
By now, the car engine is likely to be “dead”...

Pay attention to where this “gentleman” is...
The elderly people who first complained about getting wet, are getting worried, because of what may happen to our lady driver...
Three guys tried to get the car out of there by hand…

Look at this guy’s looks!

desperate
She dives, trying to reach the “shore”

What are these guys looking at?

This is the only one who tries to do something for our lady driver!
One thing is sure: these guys are full of good intentions.

Why help? I can see it all very well from here!
MY CAR

What the heck! I am tired of this...

Man! It is going under!

This “chap” didn’t even budge from here all this time!

But did anyone think these guys could save the car?
Gluglu glu glu glupf glupf...
Just check the size of this pothole!
Next time you complain about the potholes in your town!
Mechanics of Pothole Formation
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- Pavement bends under vehicle weight
  - Bottom layer of pavement stretches and cracks.
  - Continued bending fatigues pavement causing cracks on surface.
- Water enters cracks from rain or snow then freezes
  - Freezing moisture expands cracks breaking apart pavement allowing water to enter base and subgrade.
  - Subgrade loses its supporting capability and the area falls apart.
Methods of Pothole Patching

- Three types
  - Permanent
    - Pavement in good condition
    - Relative long life remaining
    - Agency budget sufficient to allow permanent patching
    - **DO THE JOB RIGHT THE FIRST TIME**
  - Semi-Permanent
  - Temporary
How to determine the scope of work. What requires patching and what does not?

- For Full Depth Asphalt Patching (Permanent Repair)
  - It is recommended that the existing asphalt be cut 1’ outside any alligator cracking in a square or rectangle, perpendicular to the traffic flow.
This can be harder than it seems, as many lots/streets have been left with little to no maintenance during the economic downturn.

This lot would require either a total reconstruct or select a partial area based on your budget and select the area that serves you best. Front Door, Main Entry, Main Drive, then repair that full area.

These repair areas are what I would plan to cut and remove as shown in red:
Cutting the Asphalt-
Sawcut?
Jackhammer?
Rotomill?
Wheel Cut?
Once you establish the area(s), the other main factor is what depth to complete the repairs at.

- You should plan on the removals being 1” to 2” deeper than your existing asphalt.
- If you have the original plans for the property/Street, the asphalt depths will be shown in the details.
- If the plans are not available the asphalt can be cored to check the depth of the existing pavement. Core the lot in at least 4-5 random areas to get a good sampling of the depth. There is a fee for this service.
- Rely on the paving company estimator to provide a standard repair depth for the type of lot and use.
- Without knowing the depth of the asphalt you run the risk of receiving pricing based on a depth that is not as deep as the existing pavement, which will result in cost overruns to your project.
- T-Patch the edges?
Why the Extra 1” to 2” Depth?

We recommend adding to the structural strength of the repairs for several reasons;

- The original pavement failed.
- The extra removal gives the repair crew some onsite sub-base material to rework small subgrade issues with.
- Repairs are never as structurally sound as the original pavement of the same depth.
Planning - The Key Items to Set Out in Advance and in Writing!

1. The areas to be repaired by either square feet, square yards, or by the ton. Preferably include a map of the work.

2. The depth of the repairs (can vary for different areas) in Finished Depth! Specify lift thickness’s and mix type if needed.

3. Details of how the work will be performed; What’s included and what is NOT. (i.e. Subexcavation, Scarify and recompact subgrade, Completion dates, Hours of work…)

4. Pricing needs to be based on these specifications.
So a Quality Repair has:

Vertical edges by either Sawcutting, Rotomilling or Jackhammer.

Excavated to the correct depth:

- All the way into the corners.

Compacted, firm subgrade.

Proper mix design(s) compacted to proper density in appropriate lifts

Finished flush or up to \( \frac{1}{4} \)" above surrounding asphalt.

Work area cleaned up and all spoils hauled away and disposed of.
Asphalt Mix Thickness and Mix Design

Use larger aggregate sized mixes for the bottom lift (CDOTS or SG Designs)

Top lift requires smaller aggregate mix designs (CDOTS or Sx)

Specify lift thickness-One 4” bottom lift has more structural strength than 2-2” lifts of the same design. So you can add strength by designing the depths properly.

Use the city or counties guidelines for mix designs as location (weather) matters.
Simple map of a repair and overlay area - Pictures are worth a Thousand words.

This tells you a lot more about what will be done than repairs of XX Sq. Yds. and Overlay XXX sq yards.
Different sized jobs require different Equipment
Advantages and Disadvantages of Rotomilling for the Removals

Disadvantages- Expense of mobilizing a rotomill, needs a fair tonnage job to pay for bringing in a mill, or needs to be SMALL so that a detail mill can handle the work.

Advantages
- Vertical cut, no sawcutting required.
- Fast, Efficient
- Loads debris in truck in most cases.
- Leaves subgrade cut to grade.
- Allows for partial depth repairs- not recommended unless for cracking or grade repair (HC spaces, etc.)
This is what a properly prepared patch looks like

- Same depth everywhere
- Vertical surfaces tacked
- Subgrade Firm
- Is there Traffic Control?
The bottom lift is finished and ready for the top lift.

Paving back the patch in 2 lifts allows for a larger aggregate mix (Sg or S Mix) to be used in the bottom, adding strength, and results in a better finished top lift.

The top lift can then be placed with a finer aggregate (Sx) for a tight finish.

FOR SMALL PATCHING - less than 15 tons per patch - Specify one asphalt mix design. Otherwise it requires 2 trucks to hold each mix and the asphalt grows cold in the truck as they move from patch to patch.
So, Who would rather be HERE right about now???
• Requires Rotomilling! Common use is for Crack Repair, but rotomilling to partial depth and patching back is much better than tacking and filling a hole.

Rotomill 2.5” to 3”, clean up millings.

Often a geogrid or fabric is required to help retard crack reflection between the existing and the new.

Apply tack to bottom and sides of cut, and pave back the top lift.
The Next Generation

The following video will show us what may be the next generation of Pothole patching.

https://www.youtube.com/watch?v=yuj3NDq4AI4
I suggest to ONLY Emergency Patch in the Winter!

It does not take that much more time to prep a patch properly while you are there.

Questions?