

TIME TO TRADE IN THE ROTARY PHONE FOR A SMARTPHONE

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Pneumatic tools began appearing back in the 1840's in the mining industry. The first "jackhammer" is believed to have been developed back in 1849, by Jonathon Couch. Did you know that the invention of the jackhammer predates the invention of the telephone by 27 years?

Little has changed with jackhammering through the years (that is 170 years!). It is a tough, physical, dirty job, and really rather crude when you think about it. Meanwhile, phone technology has developed by leaps and bounds. Some of you may remember the "party lines" that phased out in the 1960's and



'70's. Or, do you remember the rotary phones on land lines, which really were not that long ago either? Touch

tone technology actually came on the scene in the 1960's and phased out the rotary dialing soon thereafter. Today, practically everyone now has a smartphone and you just cannot live without it. You would scoff at anyone who has an old rotary phone nowadays. Even the land lines themselves are to the point that they are becoming obsolete.

Could you imagine using your rotary phone while all of your friends are using their smartphones? That is exactly what is happening to agencies that are not embracing change in

technology from jackhammering to a more sophisticated repair technology that is prevalent in the industry – hydrodemolition. Hydrodemolition is to jackhammering, what the smartphone is to rotary phones and party lines.

States like Illinois, Indiana, Ohio, and Pennsylvania have been effectively using hydrodemolition technology for a long time (over 25 years). Yet many other states do not, or refuse to even explore it. They are still stuck using their rotary phones (jackhammers). Why? It's really rather perplexing. It is similar to failing to embrace smartphones.

Jackhammering has really nothing positive going for it anymore. It is puzzling when you think about it, that it is still being used. It is hard, labor intensive work that has little productive value. It is tough physically on the operators and can lead to personal injury.

The sound of the hammer blows, combined with the explosive air exhaust, makes pneumatic jackhammers dangerously loud, near the operator's ears (even with protective earmuffs or plugs). Tinnitus, a condition in which a consistent noise is heard in the ear in the absence of an external source of sound, can be a repercussion of excessive jackhammering by a laborer. Even with advancement in jackhammer technology to add silencers around the barrel of the tool, the primary noise source comes from the chisel striking the object (concrete) being removed,

and that cannot be altered. It is still in close proximity to the worker's ears.

Another potential side effect is carpal tunnel, due to prolonged exposure from



the vibration conducted by the tool. Raynaud's syndrome is a physical effect that can also be experienced. This is a condition in which

the body overreacts to the perpetual motion from the hammer action, causing cold and numbness in the hands and feet. Workers who have done this type of work for many years will tell you just how worn down their bodies have become from the effects of jackhammering.

Recently, the effects from silica dust have become an issue with concrete removal. It is known to cause breathing problems, if exposed to the dust. Agencies now must take precautions to limit exposure of workers to silica dust.

The thing is, in these current times, where safety is paramount, all of these potential physical issues that jackhammering can present are completely avoidable with the upgraded technology that is so readily available. Hydrodemolition technology is all done by high pressure water

Continued on back

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Continued from front

through robotics, and is self-propelled and computerized. It will inflict no personal injury to workers. Being driven by water, there is no silica dust generated.

COMPARISONS	Hydrodemolition	Jackhammering
Bond Interface Damage	NO	YES
Silica Dust	NO	YES
Vibration to Reinforcing Steel	NO	YES
Damage to Surrounding Concrete	NO	YES
Micro-Fracturing	NO	YES
Selective Removal of Concrete	YES	NO
High Physical Demand on Labor Force	NO	YES
Pre-Sounding for Delaminations	NO	YES
Final Measuring of Quantities	NO	YES
Production Rate	HIGH	POOR
Overruns	NO	OFTEN
Disagreements Over Quantities	NO	POSSIBLE

These are just comparisons of the physical attributes. There is a technique to effectively jackhammering, when it comes to repairing reinforced concrete bridge decks in order to not further damage the deck. Care needs to be taken to not damage the existing reinforcing steel by not impacting it during the jackhammer operation. When the steel is impacted that vibration will reverberate through the steel and can lead to causing further delamination along the rebar line that can now damage what was the sound concrete. The impact to the concrete can lead to additional microfracturing of the deck. The art of jackhammering

is passing away, as generations go by.

Then there is the issue of production, and that is not even a close comparison. Jackhammering is so slow! One

hydrodemolition robot will out produce a jackhammer crew by 20 times the production rate or more.

The other added value in hydrodemolition is its ability to properly prepare the surface for a dense concrete overlay – so much more effectively than

conventional milling. This is the biggest advantage and the real hidden gem of hydrodemolition – the surface preparation. That is why it should be mandated for preparation for overlays, and that is where agencies can drive the specification.

Similar to how you would not give a painting contractor the option of just power washing a bridge or abrasive blasting it, you should not give a contractor the option of doing substandard prep work prior to the overlay. Especially, when that preparation is the most critical part of the overlay installation in achieving a

long-term bond. Demand the highest quality. A contractor needs to be held to high standards and the best quality, and that is hydrodemolition surface preparation.

Contractors have been milking jackhammer repair for so long because it is a great overrun item for them. Why would they want to change when they can take advantage of the system? When is the last time you seen a bridge deck with deck repair quantities that come in at or under plan quantity? The contractor feasts on these overruns, and the agency pays the piper. Hydrodemolition is a known bid item that does not overrun because it can be bid by the total deck area. Why would you specify an item that traditionally overruns and costs your agency lots of "additional" money that was not budgeted? You would not run your household budget like that, so why would you fund your projects like that? It is not a responsible action of the taxpayers' dollars.

If you are an agency that is still specifying rotary phones for a cell phone world, you need to get with the times. Hydrodemolition technology is here to replace the archaic equipment that contractors are using, and all the additional internal damage it is doing to the bridge deck, too. After 170 years, don't you think it is time for a change? It is time to trade in that rotary phone (jackhammer) for a smartphone (hydrodemolition).