

Understanding Mortar Line Depth of Cut Critical to “Fast Track” Hydro

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Hydrodemolition is a great tool to remove concrete. The technology can be used to remove both unsound or sound concrete to about any depth desired. It does so in a benign manner that does not induce micro-fracturing or damage reinforcing steel the way conventional jackhammering will.

There is a distinct difference though in deep cutting hydrodemolition versus what is referred to as a “Fast Track” approach, which is what is common for many agencies on deck restoration and overlay projects. “Fast Track” Hydrodemolition involves a single pass of a calibrated water jet to selectively remove all weakened or deteriorated concrete, while at the same time, leaving a very roughened and bondable surface, which is ideal for the attachment of a latex modified concrete overlay.



*Milling (left),
Hydrodemolition surface (right)*

There are a few key components to the process. One, is being able to selectively remove all weakened, micro-fractured, or deteriorated concrete. This is achieved by the calibrated waterjet, regardless of the depth of delamination or weakness in

the top plane of the deck. The jet will not be stopped from penetrating and cutting unless it hits sound concrete by which it is calibrated against. Second, and equally important, is the ability of the jet to cut a very roughened surface for the overlay to grab to. The peaks and valleys generated through the rapid erosion process that cuts the mortar between coarse aggregate provides more bondable surface area for the overlay to grab to. This can be upwards of 300% to 400% more than what a conventionally milled surface would leave.

So now, knowing what the intent of “Fast Track” Hydrodemolition is, how deep is the calibration performed for cutting depth to insure the objective is met? After all, the most important thing is to make sure all bad or weak concrete is taken out. Usually, a specified ½” removal will suffice. But a ½” removal may not be what you are thinking, when it comes to measuring that in the field.

Measuring depth of removal with hydrodemolition is different than conventional cold milling. With regular milling equipment, a clear depth of cut can be achieved because the grinding bits will fracture and remove part of the aggregate. There is a clear and complete removal. A high peak measurement can be easily ascertained through field measuring.

A hydrodemolition cut is different. The waterjets will not cut through the aggregate the way conventional milling cuts through the rock. The jet is actually carving out around the aggregate. This leaves much more amplitude – peaks and valleys.

The best way to specify and gauge the depth of cut with hydrodemolition is through the average mortar depth exposed. When specifying, for instance,

a ½” removal with hydrodemolition, the owner should be looking for an average range between the high peak and low valley of the mortar lines of the specified removal (or in this example, ½”). This will also provide the truest average depth of the overlay thickness that is being applied.



Determine the average depth of cut within the mortar line for removal purposes only.

For an absolute minimum desired clear depth of overlay, the designer should use the conventional milling depth. The average depth of overlay for estimating the amount of overlay volume should then include the average hydrodemolition cut desired, to the mortar line. So, if you mill 2” of concrete, and hydrodemolish with a ½” removal, the average quantity for the purpose of figuring the overlay quantity will be 2 ½”, but the clear distance between the top of overlay and the highest peak in the substrate will still be 2”.

Do not try to specify hydrodemolition removal to the high peak of aggregate! It will result in removing far too much sound material, cutting much deeper than is necessary. This defeats the purpose of attaining the “selective removal” desired and is NOT Fast Track!

For more information on milling with regard to hydrodemolition, contact Pat Martens at **636-441-1376** or patrickmartens161@gmail.com.



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