

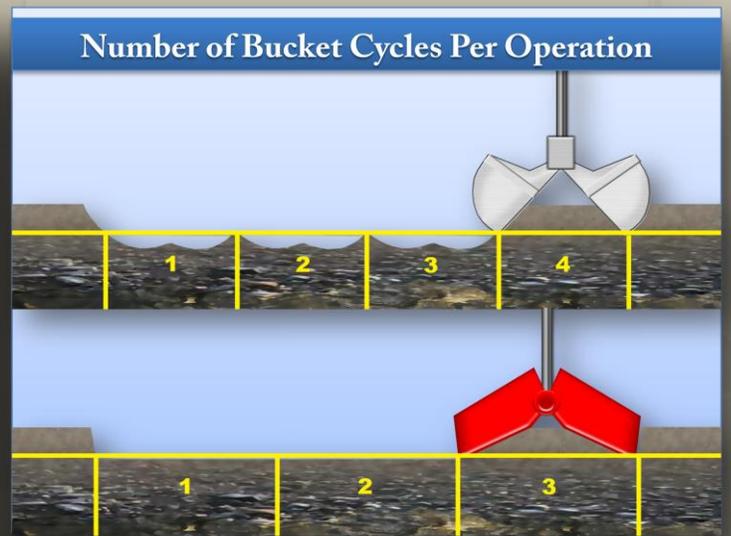
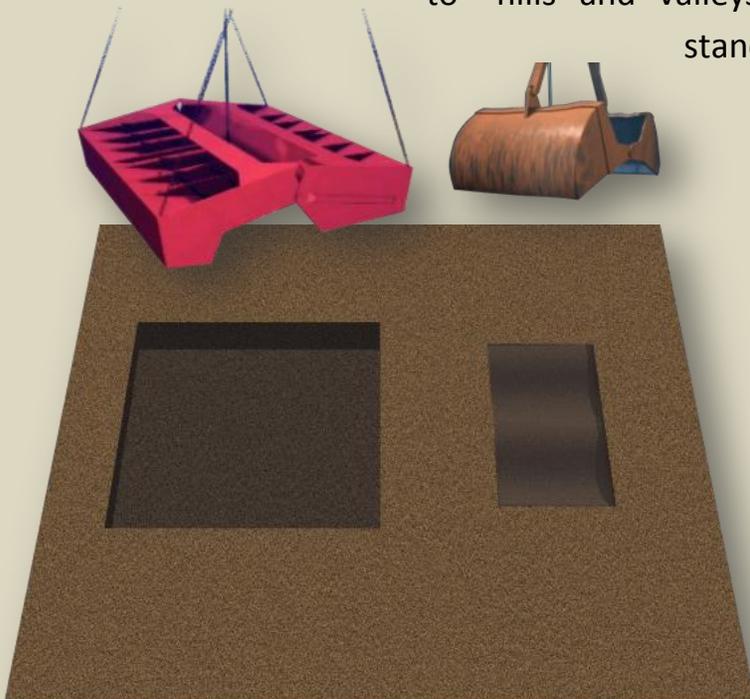
Clamshell Designs – Improving Productivity

Post-Dredge Capping Requirements	Number of Bucket Cycles Per Operation
	
	
Amount of Material to be Handled/Processed	Average Duration of the Bucket Cycle

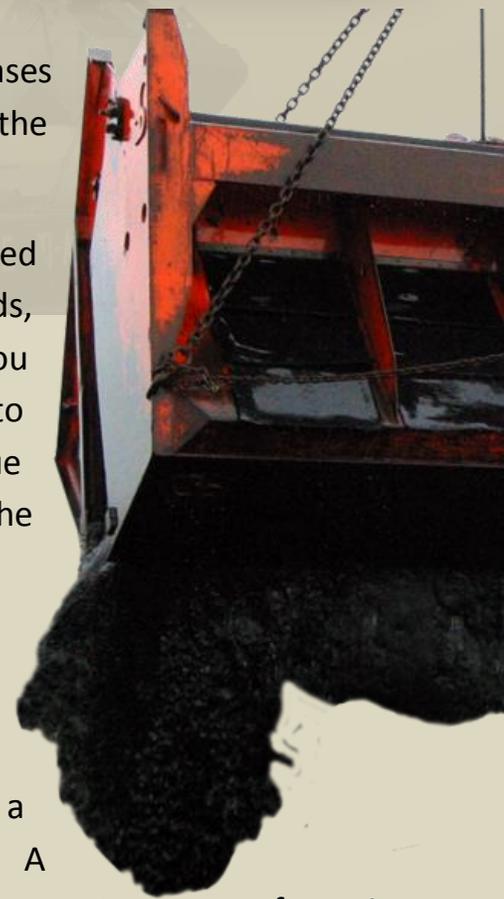
A bucket's design features can drastically affect productivity rates on the jobsite. These factors include: the number of bucket cycles per operation; the average duration of each bucket cycle; the amount of material to be handled/processed; and the post-dredge capping requirements.

Let's first look at the obvious. When speaking in terms of productivity, the number of steps needed to complete a project is commonly the first to be evaluated. In a dredging operation, this would consist of how many cycles a bucket must make before job completion. The best way to decrease bucket cycles is to increase the bucket's payload. A larger bucket equals a larger payload which decreases bucket cycles and increases productivity. However, this is not the only way to decrease the number of cycles.

If your payload consists of material dredged beyond the required depth, then you're indirectly decreasing that payload. In other words, fill the bucket, but only with the targeted material. To do this, you need a bucket with a level-cut. The level-cut feature allows you to remove all of the targeted material without the need to overcut due to "hills and valleys" left behind by the standard bucket design.



Another bucket feature that can drastically improve productivity is a larger footprint. A larger, over square footprint covers a larger area. This is especially beneficial in environmental applications when only the soft, contaminated top layer of material needs to be removed.





Other features can minimize/rid unnecessary cycles. These features include an enclosed bucket, closing alarm, and the use of the ClamVision positioning system with additional add-ons.

Open buckets (as shown to the left) can cause material to be suspended into the water column. Enclosed buckets with overlapping side plates prevent backwash and material loss.

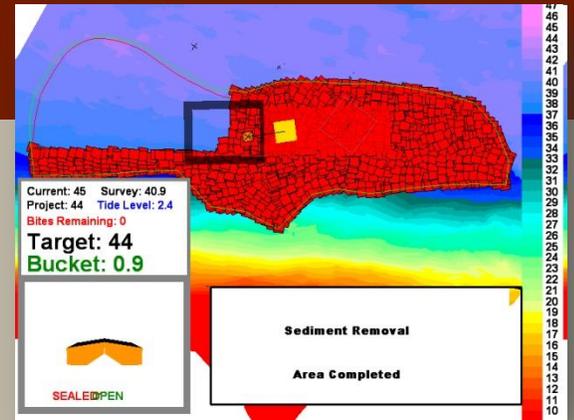
This feature is imperative to environmental applications so contaminated materials do not disperse into the water column.

Obstacles such as logs commonly interrupt dredging operations, and can cause widespread material loss if not dealt with immediately. A closing alarm installed onto the bucket signals the operator during closing failure.



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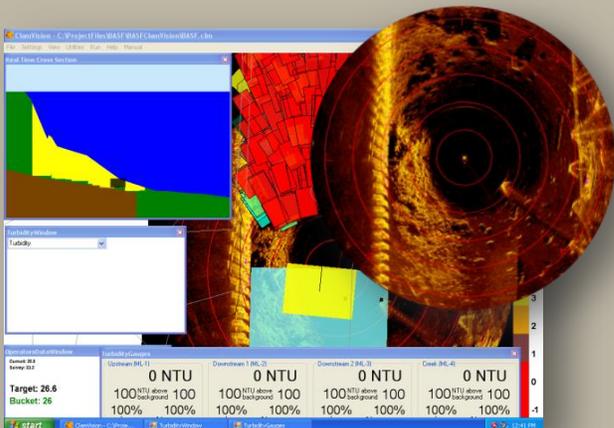
ClamVision positioning software drastically reduces unnecessary cycles by giving the operator a precise location and depth of the bucket while digging. The software displays each bucket footprint, which is color coded by depth, along with a real-time cross sectional view.



Furthermore, a dredge equipped with additional hardware to ClamVision can help job efficiency and completion.

With sonar imagery, the operator is able to view obstacles and proceed appropriately during and prior to dredging. Also, the new ScowMon5.0 is a low powered, low cost solution that meets the USACE Dredge Quality Management requirement.

Additional equipment is available.



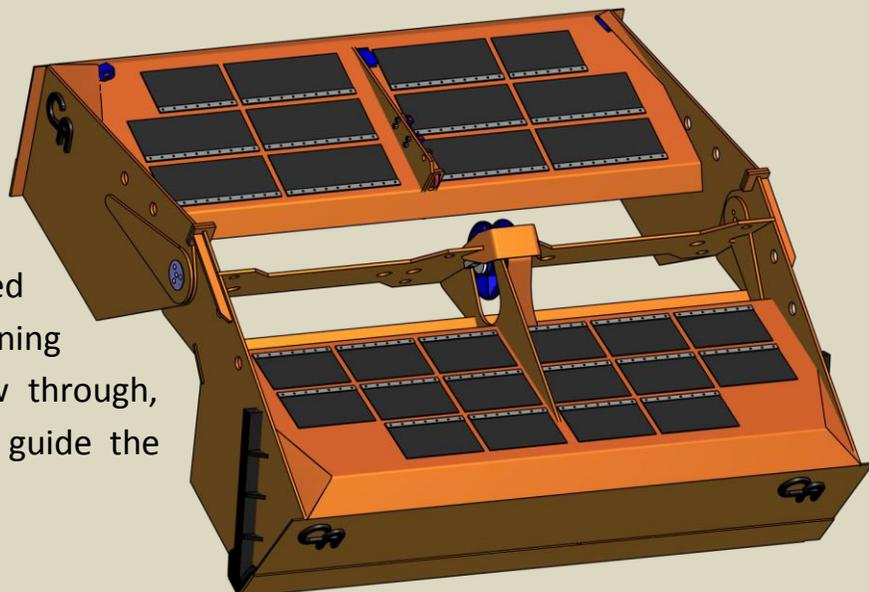
The next factor involved in clamshell productivity is the average duration of the bucket cycle. The faster the bucket remediates, the sooner the job is completed. A major factor involved in the speed of the bucket cycle is water pressure. The use of a hydraulic bucket improves cycle time by giving the operator better control over the bucket. A cable operated bucket tends to sway from crane movement and currents. However, a cable operated bucket will provide much greater benefits than a hydraulic bucket during certain job applications. The cable operated bucket is designed to help increase productivity by working with the water and not against it.



The feature to be on the lookout for is the venting system. The venting system consists of slotted openings along the top surface of the bucket. This surface is slightly angled and covered with rubber flaps, so that water can drain during bucket ascension without backwashing effects. It is this venting

system that helps reduce water pressure during the bucket's descent by allowing air and water to escape through the slotted openings.

Downward guidance can also be achieved in the buckets design. A center opening provides a large area for water to flow through, while a center bar acts as a rudder to guide the bucket downward.



The venting system is not only the key to reducing downward water pressure, but is also the central design feature for reducing material handling and processing costs. Rubber flaps hold the water within the containment area during ascension. Once the bucket reaches the water's surface the water can then be drained from the bucket prior to being dumped into the scow.



Amount of Material to be Handled/Processed

A bucket capable of draining water through the venting system will allow more material per scow load. The scow fill will consist of more solids and less water content reducing the required trips necessary to empty. Slop and cleanup is reduced during material unloading, and overall dredged material is reduced.

The level-cut design feature also reduces overall dredged material by reducing unnecessary solid wastes when remediation proceeds beyond the targeted depth. With water and solids lessened, the need for transporting, handling, and processing is reduced. This will not only speed up production, but will minimize overall job costs.

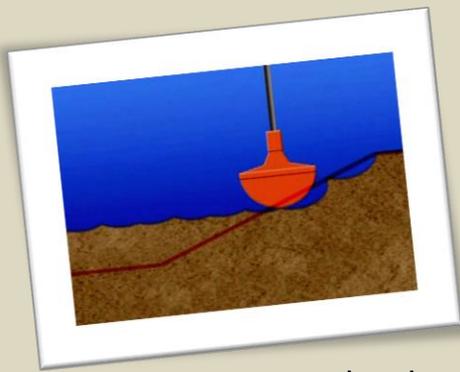


Post-Dredge Capping Requirements



The final factor involved in increasing productivity, is the need for capping. Capping can be a lengthy and costly addition to the dredging operation. However, new and innovative bucket designs are available that not only reduce the need for capping, but can eliminate it altogether.



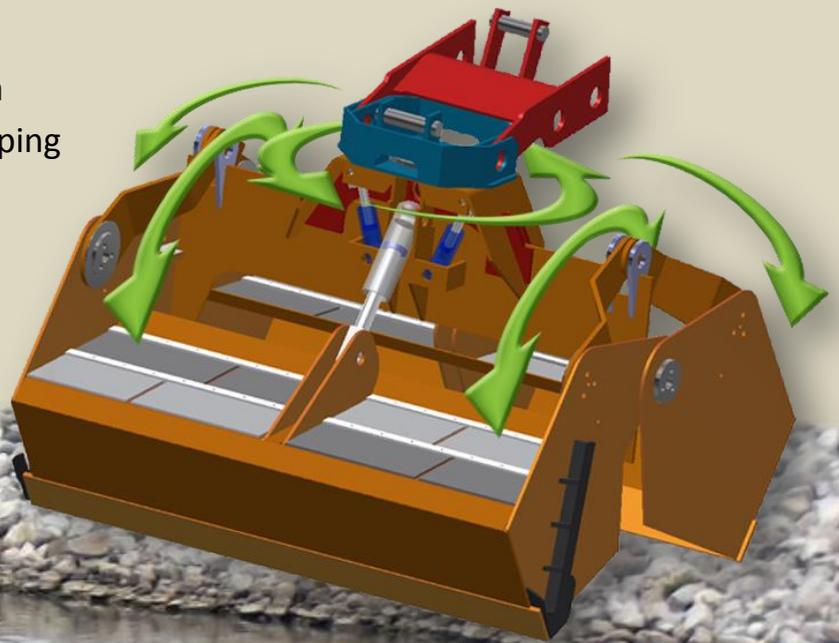


When a bucket over-dredges material, it not only increases necessary bucket cycles, transporting, handling, and processing costs; but it also leaves a hole that often times needs to be filled in with additional material. Therefore, it should once again be mentioned that a bucket with a level-cut feature is critical.



Previously, capping was required in jobs that needed to remediate sloped bottoms. This was true because buckets were only capable of dredging in “steps.” This, however, is no longer the case. Newly innovative buckets feature a sloping profile that allows the operator to angle the bucket along the slope.

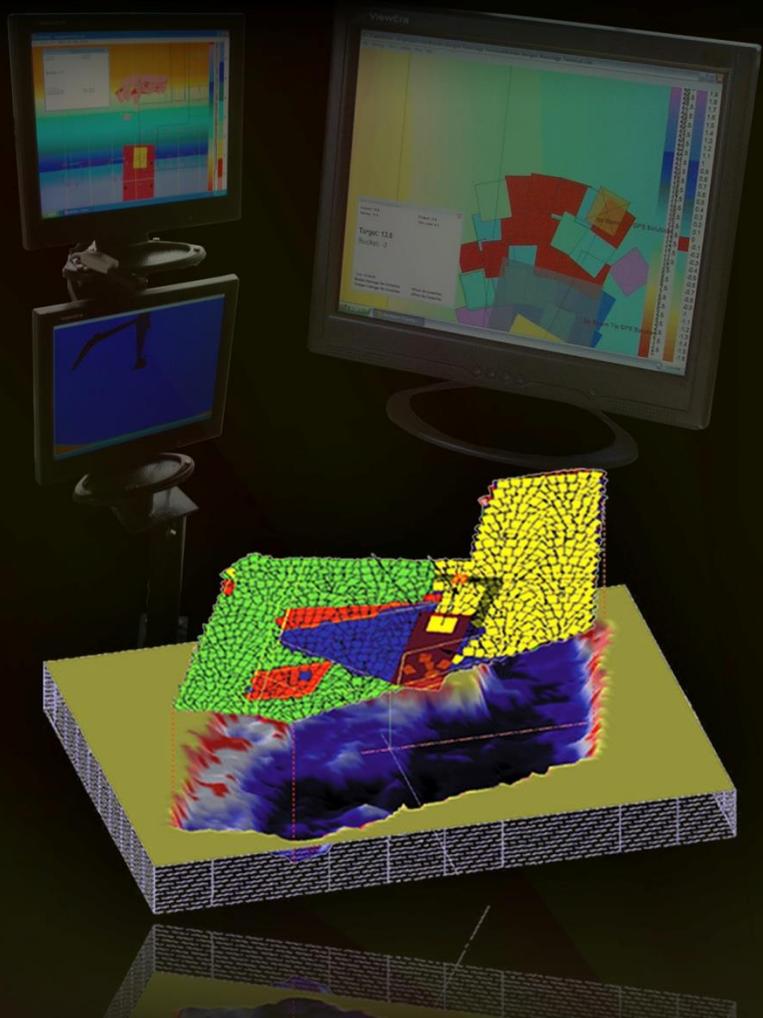
One of the latest bucket designs involves a hydraulic bucket equipped to excavate sloping floors. The bucket not only rotates, but is capable swinging side to side and front to back.



The new Cable Arm hydraulic excavator bucket is now working on the Sheboygan River.

Cable Arm

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CLAMVISION®
Wireless Dredge Positioning System

