



Post-Tension Concrete Structures



Brandenburg®

POST-TENSION STRUCTURES

BRANDENBURG SPECIALIZES IN DEMOLITION AND ENVIRONMENTAL REMEDIATION INCLUDING POST-TENSION DEMOLITION, HAZARDOUS MATERIALS REMOVAL, AND EXCAVATION.

Demolition of post-tensioned concrete structures presents the contractor with unique issues. Post-tensioned concrete is accomplished by tensioning high strength steel cables within the concrete mass. This method is achieved in a process where metal or plastic tubes which contain loose tensioning cables or rods are cast into the concrete. When the concrete reaches a certain design strength, the cables are then tensioned to a pre-determined force. The ends of the cables or rods are anchored to each end of the building component by various types of devices.

Because the cables or rods are not bound to the concrete, they can act like a stretched rubber band. When the concrete is broken, the cable may snap violently causing the imbedded anchors to become projectiles. In addition, the sudden release of the tendons causes the post-tensioned member to lose its tensile strength causing the concrete to fail. The result can be a catastrophic collapse of the entire building.

For post-tensioned structures that can be imploded, the risk of injury or damage is controlled by ensuring that people are kept at a safe distance and that there is no exposure to property if anchors are ejected. To restrain anchors from being ejected, sandbags or other measures are utilized to temporarily hold the anchors during collapse.

For post-tensioned structures that can be demolished using a crane & ball or hi-reach excavator, the system for progressive demolition can be designed to allow the machine to work at a safe distance from the structure. Temporary anchor restraints may also be needed.

For multi-story structures located in a confined location such as a downtown area, Brandenburg develops a demolition plan in conjunction with a design engineer experienced with post-tensioning construction. In these situations, demolition is typically performed floor-by-floor, working from the top floor down until the remaining structure can be demolished using heavy equipment from grade level.

The floor-by-floor method is completed utilizing a combination of mini-excavators, skid steers, man lifts, and hand work performed by laborers.



Shoring is typically used on all floors as the work proceeds. The purpose of shoring is to increase the live load capacity on the deck that is currently being worked on and to give the structure additional support. As each floor is demolished, shoring is removed.

Depending on the circumstances, additional barrier protection is installed around the structure's exterior and near post-tension anchorage locations. These barriers shield adjacent structures, pedestrian and vehicular traffic, and other various live operations.

The physical demolition of the structure begins with the interior and the roof being completely gutted of all combustible and non-recyclable materials. All material is segregated and removed from the structure using the existing elevator shaft or installed chute systems. After the structure has been gutted, each floor slab is typically removed by skid steer loaders using hydraulic and impact hammers. The tension from the cables is released and can be cut with hydraulic shears or torches. Upon completion of each floor slab, equipment is lowered to the next floor and the perimeter walls are removed by pulling them in toward the floor. All debris generated by this work is continuously segregated and moved to the chute area. Materials are then processed on ground level by hydraulic excavators equipped with magnets and concrete processors. Processed materials are sent to recycling facilities, with the exception of non-recyclable combustible materials.

Brandenburg continuously implements fall control measures as hazards are created by the modified structure. Fall protection is achieved by handrail, protective cables, floor-hole coverings, labeling, and continuous safety supervision and training.

