



## Tanks

**Reference Details:**

**Owner** City of  
Columbus/Ohio, USA  
**+++ Main Contractor**  
Kokosing Construction  
Co. Inc., Columbus, OH,  
BBS Corporation,  
Columbus, OH, J.H.C.  
Denver Co.

**DSI Services**

DYWIDAG Unbonded  
Monostrand Tendons;  
DYWIDAG Multistrand  
Tendons; DYWIDAG  
Bar Tendons

**HAP Cremean Water Plant Clearwell Expansion, Columbus, Ohio, USA**

The city of Columbus, Ohio has three water treatment plants and those three plants supply water to a population of over one million people. The largest of the three is the Hap Cremean Water Plant, with 60% of the total capacity of all three plants. To achieve this capacity, the storage capacity had to be increased from 27 million gallons (102 million liters) to 75 million gallons (284 million liters). The six tanks, which are part of the current expansion, are called clearwells and these are basically underground storage tanks for post chlorination and added detention.

Some unique features were incorporated into these tanks, which not only saved significant money for the owner at the time of construction, but will also result in long-term durability. DSI USA was commissioned for the post-tensioning work due to its versatility and reliability.

The rectangular concrete tanks have been provided with rounded corners of 32 feet (9,7 m) radius, which prevents the high bending moments combined with axial tension encountered in the corners of conventional rectangular water tanks in order to eliminate the cracking associated with early deterioration.

In order to help prevent cracking of the roof and floor slabs, they were two-way post-tensioned with fully encapsulated DYWIDAG unbonded monostrand tendons (triple Corrosion protection) in each direction placed in a profile to utilize the best efficiency. The post-tensioning, along with other details specifically designed to prevent shrinkage cracks, are expected to result in virtually crack-free floor and roof slabs over these massive tanks (up to 320 feet /98 m on a side).

A special feature in the post-tensioning of this project is that all three of the post-tensioning products manufactured by DSI were utilized - the encapsulated unbonded DSI monostrand tendons in the base and roof slabs, DYWIDAG multi-strand for horizontal tendons in the walls and the DYWIDAG bars as vertical tendons in the walls. The products were used in the different members as specified by the Engineer for optimum performance and modified by DSI for ease of construction with the bars for vertical post-tensioning.