

Located on Capitol Hill, the House Underground Garage (HUG) is divided into East House Underground Garage (EHUG) and West Underground Garage (WHUG). Constructed in 1968, this 45-year old facility had significant structural and safety complications due to chloride degradation. The facility consists of plaza levels, multilevel parking areas, traffic lanes, ramps between levels, offices and associated maintenance shops and egress stairways.

The Architect of the Capitol (AOC) chose the Hydro-Demolition process over jack hammering as it provided a highly innovative construction method and management strategy, maximizing value and minimizing impacts to our clients, congressional stakeholders. New technology never used before on Capitol Hill and enhanced project management skills were created to meet implementation challenges presented by this important rehabilitation effort involving 515,000 square feet. Both the EHUG and WHUG were completed ahead of schedule, allowing newly appointed Members of Congress and visitors for the 2013 Presidential Inauguration to use the facilities.

The Hydro-Demolition process uses high-pressured water to blast through concrete at specified depths. Hydro-Demolition is an ideal technique for removing concrete with its speedy production, minimum structural vibration and reduced noise levels. The process is fast paced and extremely efficient, but more importantly, precise and controllable, allowing the AOC to remove only the necessary materials, without compromising surrounding sound structures or rebar. It was imperative for both phases to be completed within their respective 12-month durations.

As previously mentioned the HUG is located on Capitol Hill and is located directly across from a residential neighborhood. The WHUG's first-level houses occupied offices and shop space. This is where the efficiency and the environmental (lower noise and dust levels) benefits of Hydro-Demolition innovation played a major role. The offices and shops could remain open and fully operational to continue serving the Members of Congress and the residential neighborhood did not submit any noise complaints. The Hydro-Demolition method also changed the management procedures of the project. The project team had to adapt to the fast paced speed of rehabilitation that included, implementing quicker Request for Information responses, assigning Structural Engineers and consultants to evaluate the slab during Hydro-Demolition, weekly meetings to track progress of the amount of production and day-to-day quality control inspections.

From a construction cost saving and environmental perspective, a major advantage of the Hydro-Demolition method is its ability to completely clean the embedded corroded reinforcing steel, providing a better bonding surface for the new concrete and eliminating a separate sand blasting process to remove the corrosion if only jack hammering was used. In addition, Hydro-Demolition eliminated costs and impacts from containment and clean-up incurred from sandblasting.

With the Hydro-Demolition method being relatively new to construction on Capitol Hill it provided significant benefits that yielded successful completion to the HUG projects and will now also be implemented in another future garage rehabilitation projects on Capitol Hill. In summary a total of 284,540SF of wall-to-wall hydro-demolition was completed. Construction activity pollution prevention plan that controlled the dust and debris from contamination of the air and sewer run-offs was implemented. It also contributed to construction waste management, which diverted more than 98% construction debris from landfills which aided in the sustainability and LEED goals of the AOC.

This LEED Gold certified facility now is structurally sound, well lit, energy efficient and a prime example of how to use technology to renew older buildings for extended life, by implementing sustainable practices and reducing the environmental impact to adjacent neighbors and surrounding areas.

HYDRO-DEMOLITION – CONCRETE REMOVAL

2013 NOVA Award Nomination 18

