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Capitol Infrastructure Upgrade Report

Michigan State Capitol Commission

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Michigan State Capitol Commission

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Central Utility Plant Developing Smoothly

The last few months have brought great change to the south end of the Capitol, where a new underground central utility plant (CUP) is being built. The CUP will hold all the headend equipment for the geothermal system, including the heater/chiller pumps.

The process of excavating the new CUP was complex. Because the area is closely bordered by a sidewalk, the geothermal field, the Capitol, and a historic tree, engineers recommended installing an earth retention system (ERS). The ERS is composed of twenty-five feet deep auger cast piles filled with grout, and in some cases, steel beams. The piles form a protective barrier between the excavation site and the earth around it, minimizing any negative affects to the surrounding area. Walers (steel beams) were then installed along the ERS to provide additional support.

Once the ERS was completed, excavators began removing the rest of the earth in the footprint of the CUP down to a depth of twenty feet. A sump pit was excavated and installed, and at present, concrete footings for walls and support columns are being poured.

When the wall footings have cured, a kicker block will be installed to fill the space between the footings and the ERS. As the wall subsequently rises on top of the footings, a sand fill will be installed on top of the kicker block, bridging the gap between the ERS piles and the wall.

Together the ERS, sand fill, kicker block and the wall will absorb the pressure of the earth pushing against the CUP.



Pouring concrete for a column pad in the CUP. Note the auger cast ERS piles in the background.

Image Courtesy of The Christman Company

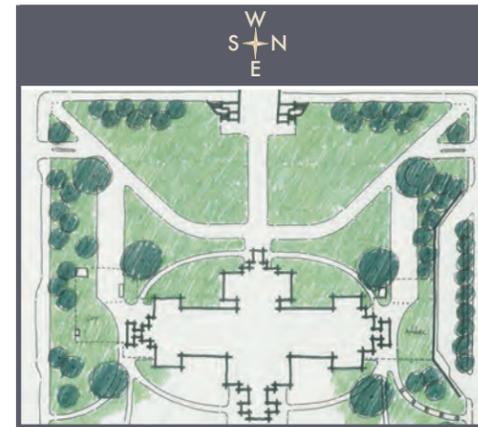
New Snow Melt System Operational

In December of 2017 the MSCC was able to fulfill a long-anticipated promise when the new snowmelt system in the east central walkway went live. The piping for the new system was laid in the concrete during the summer of 2016, as part of the restoration and renewal of the east side of Capitol Square. Now the entire east walkway and the Capitol's front steps are free of snow, improving the safety of visitors and staff.

MSCC to Restore Capitol's Historic West Grounds

The Michigan State Capitol Commission is proceeding with the restoration of the west side of Capitol Square, turning this space back into a beautiful, parklike green lawn. This will complete a major portion of the Capitol Square Master Plan, adopted thirty years ago.

The Capitol's grounds were originally designed by Adam Oliver, a landscape gardener from Kalamazoo. His plans called for a large, open lawn framed by double rows of trees that formed an allée, or a shady walk, around the perimeter of the square. The design for the west lawn was nearly identical to that of the east.



The restoration of the west side of Capitol Square will create a broad, open lawn perfect for events and performances.

Image Courtesy of Beckett & Raeder

Designers have used historic photographs of the west side of the square to inform their work. The restored plan will include a wide curving drive that can accommodate emergency vehicles, and an elliptical sidewalk similar to that which is found on the east side of the building.



A rare 19th century image of the Capitol's west lawn.

Image Courtesy of the Michigan State Capitol Archive

Geothermal Bores Complete, Laterals in Progress

Great progress is being made on the Capitol's new geothermal field, located on the west side of Capitol Square. On Friday, December 8, 2017, the last of the 224 boreholes was successfully drilled, bringing the first phase of the geothermal installation to a close.

The process of actual boring those 500' holes took about two months, with four large rigs methodically working their way across the 560' by 160' field. As soon as a rig completed one borehole, a closed loop of high density polyethylene pipe was fed into it, and then grouted into place. On average, one rig was able to complete two bores a day.

continued inside on page 3

Inside this issue:

- ✦ Restore West Grounds... 1
- ✦ Geothermal Bores... 1
continued on page 3
- ✦ Environmental Monitoring... 2
- ✦ Generator Vault... 2
- ✦ CIU Moves... 3
- ✦ Utility Plant... 4
- ✦ Snow Melt... 4

Capitol Infrastructure Upgrade Report

Environmental Monitoring Continues in the Dome

Anyone who has taken a moment to gaze up into the Capitol's dome in the last few months has probably noted a new piece of environmental monitoring equipment suspended from the sixth level balcony down to the muse of law, on the north side of the rotunda. The sensor is actually one of many located in some of the most sensitive and significant areas in the Capitol as part of an effort to record the building's ever-changing exterior and interior climates. The data from these sensors will help the engineers and architects working on the Capitol Infrastructure Upgrade (CIU) to determine how the building's art, and antique furniture are being affected and damaged by light and fluctuations in temperature and humidity.



The muse of law, by Italian born artist Tommaso Juglaris.

Image Courtesy of the Michigan State Capitol Archive

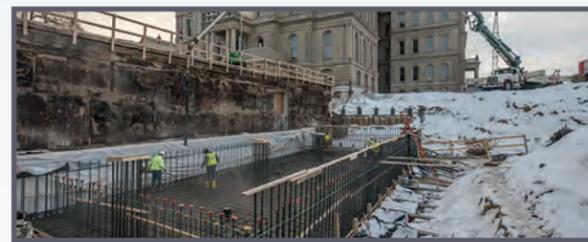
It was these dramatic changes, and the ensuing damage from them, that first inspired the MSCC to study the Capitol's environment and systems in early 2016. When the initial surveys and studies returned alarming information about leaks and failures throughout the

building, the MSCC hired a team of engineers, architects, and systems specialists to address the problems. The team continues to work on improving the Capitol's environment, using tools, such as these monitors, to better understand the present situation.

Concrete Pours Continue for North Generator Vault

Crews are continuing to pour concrete and install rebar for the new generator vault, located immediately west of the Capitol's underground north annex. The vault will house two new generators capable of providing electrical service to the entire Capitol building in the event of a power failure or interruption, so the business of government will continue uninterrupted.

The vault will connect into the underground annex, large portions of which will be reconfigured in order to provide a secure environment for new electrical equipment. The area that housed the Capitol Facilities Office will also be remodeled in an effort to better serve the public and accommodate staff.



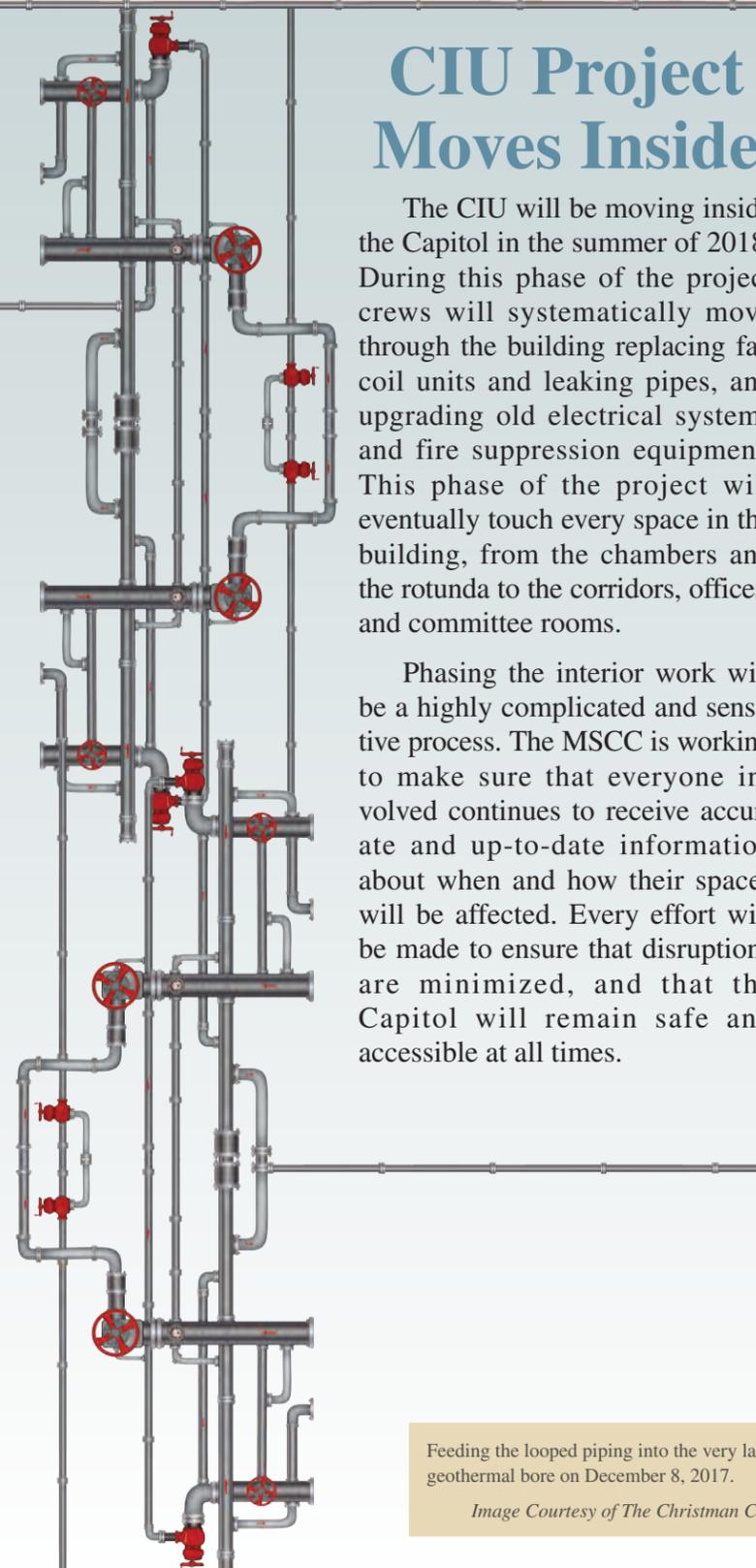
Preparing for a concrete pour in the new generator vault on the north side of the Capitol.

Image Courtesy of The Christman Company

CIU Project Moves Inside

The CIU will be moving inside the Capitol in the summer of 2018. During this phase of the project crews will systematically move through the building replacing fan coil units and leaking pipes, and upgrading old electrical systems and fire suppression equipment. This phase of the project will eventually touch every space in the building, from the chambers and the rotunda to the corridors, offices, and committee rooms.

Phasing the interior work will be a highly complicated and sensitive process. The MSCC is working to make sure that everyone involved continues to receive accurate and up-to-date information about when and how their spaces will be affected. Every effort will be made to ensure that disruptions are minimized, and that the Capitol will remain safe and accessible at all times.



Geothermal Bores...

continued from page 1

The next major step in the installation process, now half finished, is connecting the boreholes (which are located twenty feet on center) together with a series of lateral pipes, also known as horizontals or headers. Each lateral will connect fourteen individual bores.

The laterals are then fused into larger pipes called mains, which will in turn run into the manifold in the central utility plant (CUP). At present half of the laterals have been installed. Midwest Geothermal plans to return and install the other half in the spring, when the weather is more conducive to their work.

By the time the project is complete, engineers estimate that the system will include approximately forty-five miles of piping, the expected lifespan of which is anywhere from fifty to one hundred years.



Feeding the looped piping into the very last geothermal bore on December 8, 2017.

Image Courtesy of The Christman Company

Live Stream

Watch the CIU project unfold on a live stream of the west side of Capitol Square at www.capitol.michigan.gov/restorationlivefeed.

Tour CIU Online

Tour the CIU construction site and learn about the latest progress being made at www.capitol.michigan.gov/restoration.

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