Mitchell Show Dome Condition Assessment

PROJECT TEAM

Pierce Engineers (**PE**) Restoration Structural Engineers, and a team of sub-consultants / contractor performed materials testing on the precast concrete frame and a foundation condition assessment of the Show Dome at the Mitchell Park Horticultural Conservatory, Milwaukee, Wi. The assessment work was performed in 2019.

This projecct was coordinated and executed during business hours without disruptions to normal operations including access by public.

The Sub-Consultant team consisted of the following entities:

- **Vector Corrosion Services** (**VCS**): Corrosion & Concrete Material Specialists
- **NDT Corporation** (**NDT**)**:** Non-destructive & Geophysical Testing Services
- Soils & Engineering Services Inc. (SES): Geotechnical Engineers
- Burse Surveying & Engineering, Inc.: Surveying
- Arteaga Construction, Inc.: General Contractor

SUB-SOIL INVESTIGATION

Geotechnical analysis of the bearing capacity of the pavers was performed prior to the introduction of the telescoping man lifts on to the paver paths

STRUCTURE SURVEY

Two surveys were performed, pre and post of materials sampling operations to verify the exact location of the geodesic frame and if any movement occurred during testing. Burse Surveying & Engineering, Inc. performed a total station survey. No movement was detected.

FOUNDATION CONDITION ASSESSMENT

The foundation of the show dome is a pair of concentric rings. The exterior primary foundation retaining wall is located directly underneath the precast dome framing base providing its foundation. The interior secondary foundation wall is interior offset creating a 5’-0” wide mechanical areaway.

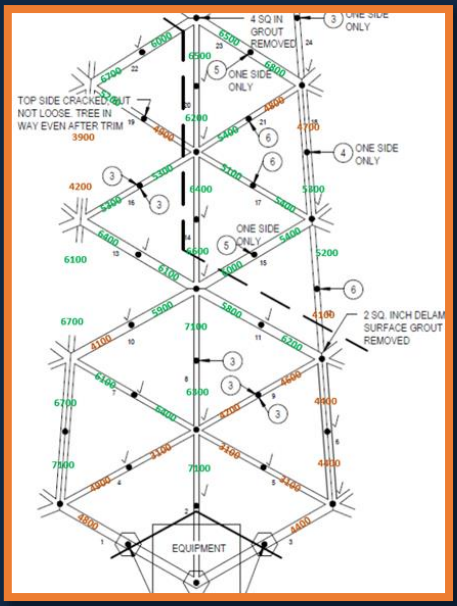
Condition assessment of the concrete foundation was performed by Pierce Engineers via visual assessment, sounding, and sonic / ultrasonic testing of both faces of foundation from the below grade areaway. Sonic / ultrasonic measurements were performed by NDT. Delamination soundings documented in foundation plan & photo survey.

PRECAST CONCRETE FRAME MATERIALS TESTING

VCS performed a corrosion and material evaluation of the concrete frame while NDT Corporation conducted a non-destructive evaluation of the concrete elements. The focus of the evaluation was to identify the extent of concrete deterioration that cannot be observed through tactile inspection alone. This includes corrosion activity, concrete degradation, concrete strength, condition of grout pockets, and weld plates. Testing included the following: Ground penetrating radar (GPR), Electrical continuity, Corrosion Potential Survey, Sonic/Ultrasonic Measurements, Concrete Material Sampling testing for chloride and carbonation, along with exposing two joint locations by grout removal. Sampling locations were selected by team to represent the varied conditions of the precast concrete frame.

Mitchell Park Horticultural Conservatory

Corrosion Potential Testing



Sonic/Ultrasonic Compressive Diagram