



West Park Historical Band Shell

Building Foundation Investigation
Summary of Findings and Recommendations

Presented by Rich Nacey, P.E.
Structural Department Head

Building Foundation Investigation:



Photo 1



Photo 2

Phase I: Preliminary Site Investigation

Phase II: Foundation Exploratory Excavation Investigation



Phase I: Preliminary Site Investigation Objectives: (Site April 1, 2021)

- Understand City concerns regarding the Structure and Foundations.
- Understand the structural demands imposed on the foundations.
- Understand the historical structure.
- Understand the historical changes that have occurred and their structural ramifications.
- Develop the requirements for Phase II Investigation.

Phase I

Typical for All Exterior Walls



Photo 3:

- Above ground masonry block laterally bowing outward .
- Numerous cracks caused by lateral and settlement movement
- Block efflorescence
- Debonded of stucco finish



Photo 4:

- Extensive masonry block deterioration
- Extensive grout deterioration.

Phase I

Interior floor slab



Photo 5:

- Large cracks within concrete floor slab, perpendicular to lateral wall bowing



Photo 6:

- Additional floor cracks and steel column pocket deterioration

Phase I



Photo 7:

- Cementations type fill materials.
- Underneath all of the floor slab.

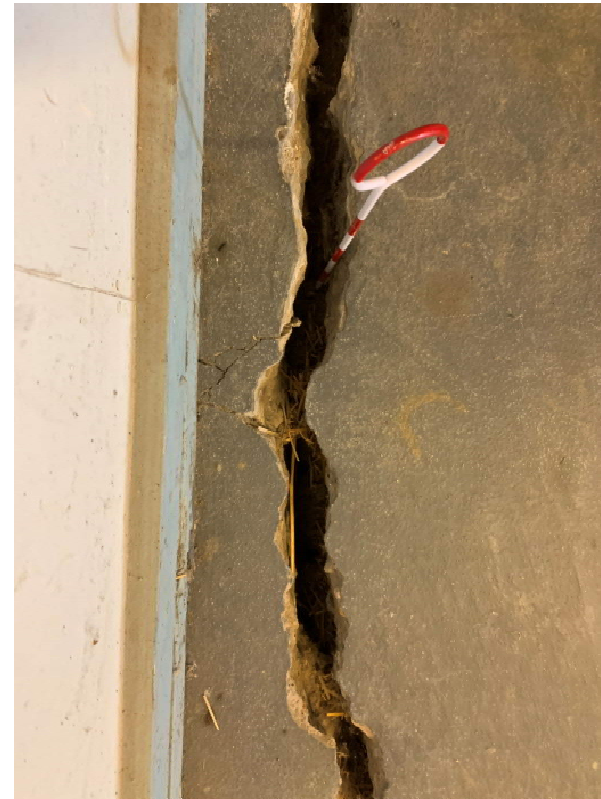


Photo 8:

- Consistency has changed from lightweight concrete to sand backfill



Phase I Conclusions:

- Masonry foundation walls above grade are not salvageable.
- The root cause for the block wall lateral bowing needs to be corrected.
- A thorough review of the contract drawings documents and changes (not available during Phase I) needs to occur.
- Below grade masonry foundation walls and footings need to be investigated via local excavations for salvageability.
- Soil borings are required at and away from the structures for historical comparisons.
- Surrounding saturated grade has detrimental effects to the foundations.
- Public safety concerns due to lateral bowing walls – fenced area now required.



Phase II: Foundation Exploratory Excavation Investigation Objectives

(Site August 9, 2021)

- Understand the Historical and Rehabilitation construction and their structural ramifications.
- Determine if the below grade masonry walls can be reused.
- Determine if foundation soils can continue to support the structure.
- Develop Structure Foundation Recommendations.
- Understand the supporting soil characteristics and properties.



Historical Construction

- 1938 Constructed: includes basement area, that includes restrooms and storage; water and electrical, utilities.
- 1993 Rehabilitation: new steel bandshell space truss, all of the below grade doors and a majority of the windows were filled in with masonry blocks and stucco finish applied.
- 2003 Repairs: basement area was filled with cementitious type backfill.
- 2009 Site drainage changes: construction of three large wetlands, two retention basins and upstream weir control structure.

Note:

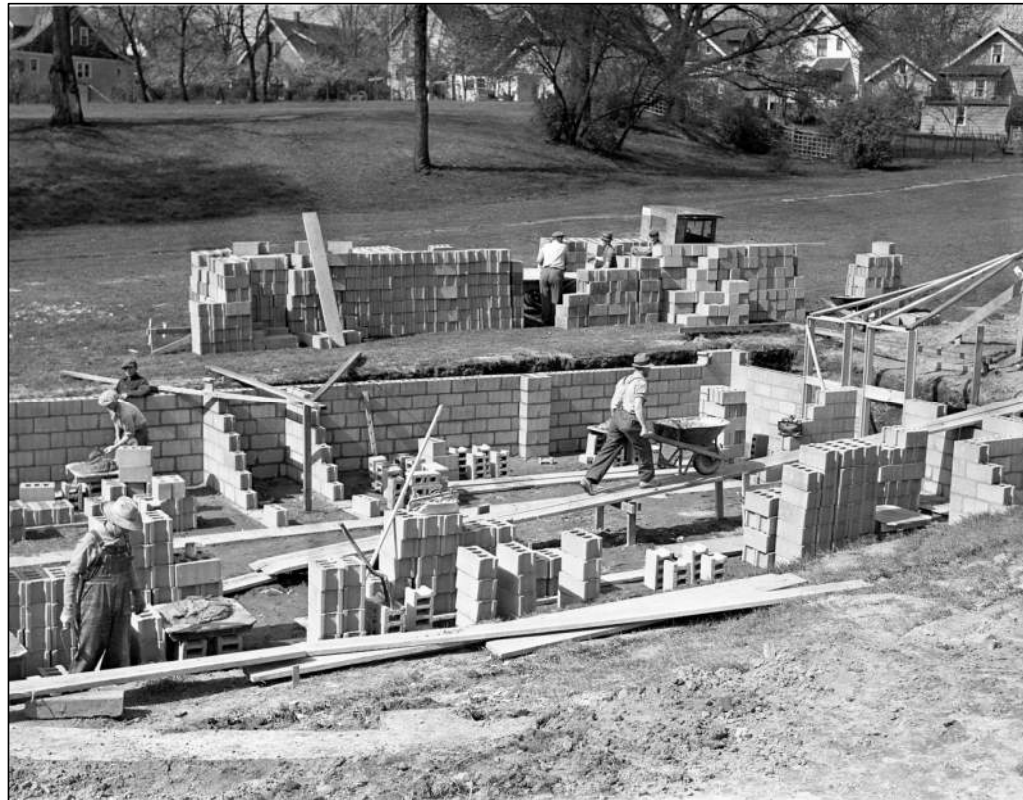
- Building and foundation have currently been in service for 80 years.

Historical Photos



1938 Construction Dependent Wood Structures
NOTE: Below grade door and windows

Historical Photos



1938 Construction of Basement oundation

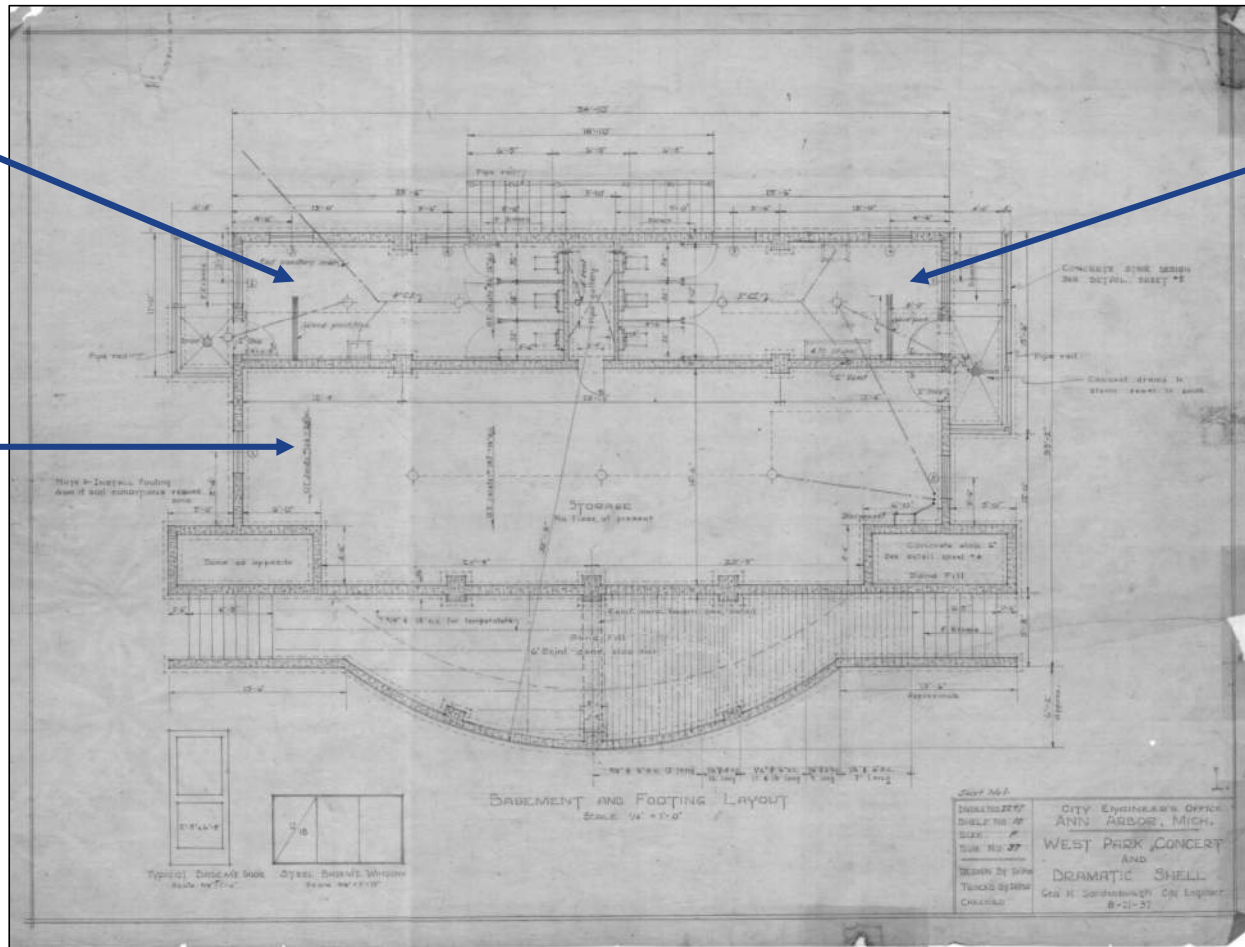
- Full basement of masonry walls and concrete strip footings

Historical Plans

Basement public restroom
(concrete floor)

Basement public restroom
(concrete floor)

Basement storage area
(soil floor)



1938 Historical Basement and Footing Drawing

Phase II: Test Pit # 1



Photo 9: Weeping Corner Wall Cracks



Photo 10:

- Saturated and Local Erosion at Footing
- Ground water flowing under footing

Phase II: Test Pit # 2



Photo 11: Along East Wall

- Saturated soils
- Weeping wall cracks



Photo 12: Deteriorated Basement Door Infill Area

- Saturated soils
- Weeping wall cracks
- Voids within walls

Phase II: Test Pit # 3



Photo 13: Saturated Soils and Local Erosion along wall and footing



Photo 14: Flowing ground water along East wall

Phase II

Conclusion:

- The masonry block and grout strengths have been compromised due to prolong submergence in ground water and freeze thaw cycles.
- Interior cementitious backfill materials has deteriorated due to freeze thaw cycles and is now similar to typical saturated sand backfill causing the lateral bowing of the exposed masonry walls.
- The retained moisture within the structure has caused the stucco finish, block and grout deterioration.
- Non-stagnant flowing ground water below the bottom of the footing has resulted in a loss of soil bearing capacity.
- The structure is supported on poor soils (peat and soft silty sands)

Recommendations: New foundations are required

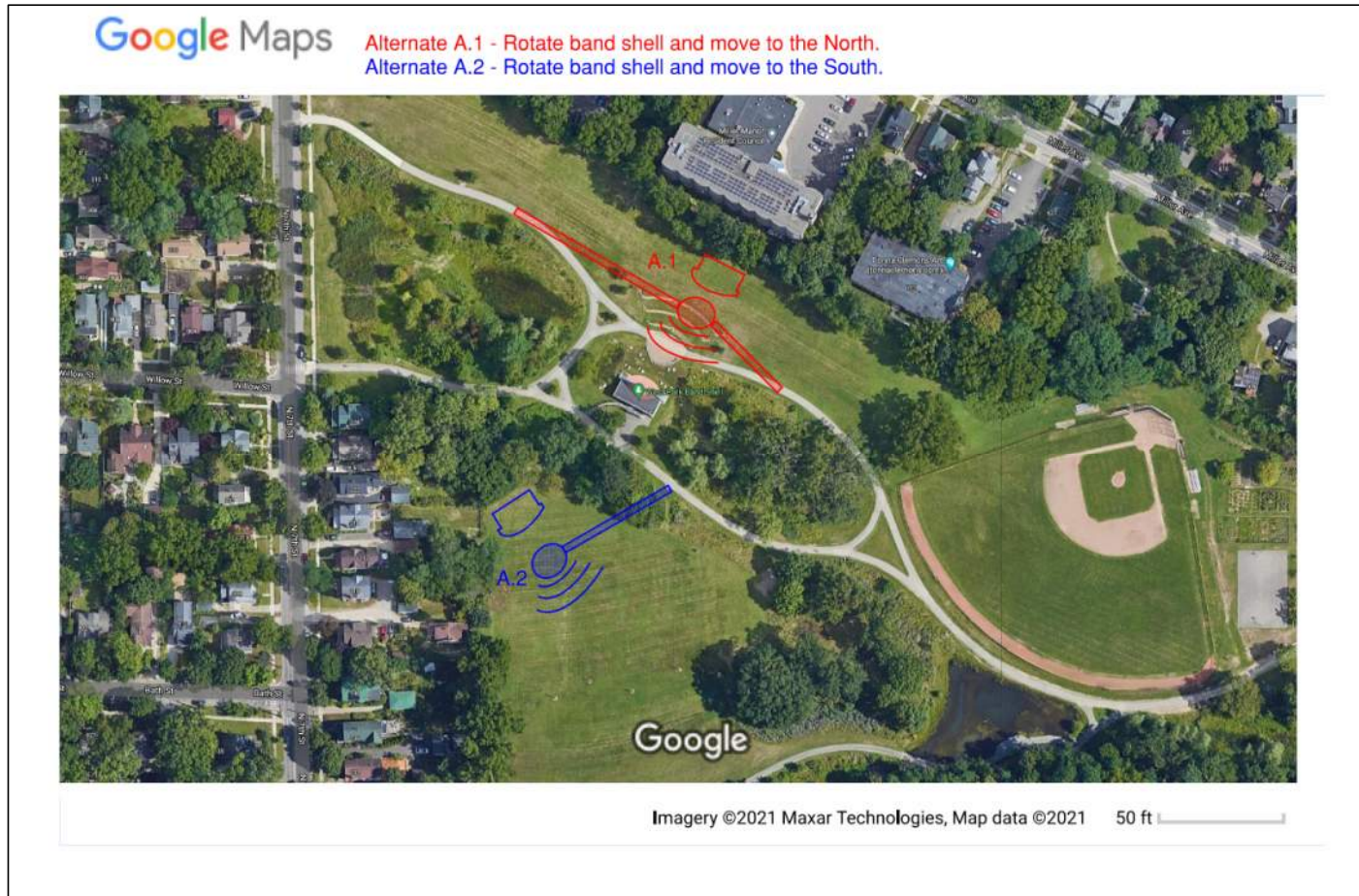
Alternate A: Out of floodplain

- New conventional foundations
- Similar basement with public restrooms
- New audience seating and patio
- Foundation life expectancy: 50 to 75 years
- Conceptual cost- \$2,025,000

Alternate B: Same location

- Deep foundations (Helical piers)
- Significant dewatering efforts
- No public restrooms
- Same audience seating and patio
- Foundation life expectancy: 30 to 50 years
- Conceptual cost- \$1,890,000

Alternate A: Relocate out of floodplain; conventional foundations



Alternate B: Remains at current location; deep foundations

