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STRUCTURAL REVIEW

501 Berrien Street Albion, Michigan

CUSTOMER

Calhoun County Land Bank Authority

ADM Engineering Project # 180004

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SCOPE

The property located at 501 Berrien Street Albion, Michigan is currently vacant and in disrepair. The building is zoned M-1, Light Industrial district. This property was formally owned by Union Steel Products Incorporated, and portions of the facility date back to the early 1900's. Each area of the facility is typically a two-story structure. The main part of the building is a cast-in place concrete structure with the oldest part of the structure a timber and brick building.

ADM Engineering toured the exterior and interior of the building. The roof was not accessed during this visual inspection and lighting on the interior was poor typically. It was visually reviewed for signs of structural deterioration and potential structural problems with using the building for a new purpose. ADM Engineering uses engineering judgment and guidance from building codes & organizations that promote various construction materials, such as, the American Concrete Institute (ACI) in making practical decisions about the structural quality of the structure.

Figure 1 shows an area view of the building and labels the various areas of construction. This will be used as a reference in this report to define what area is being discussed.

AREA-A

The oldest section of the building, Area-A on figure 1, is a timber and brick building. This section is in the worst shape and beyond usability. ADM engineering suggest this section of the building should be demolished. The roof has collapsed on a portion which can be seen in Figure 1, as well as portions of the floor and South wall as shown in photos 1 through 5. The only thing possible with this area is salvage of existing timbers for use elsewhere.

AREA-B

Area-B is a combination of old and newer construction. The result however is a mixed bag of several damaged and potential reuse. This area is the smallest area and had a few items of concerns like deteriorated CMU walls as show in photo 12. In addition, there was a large utility "tunnel" that ran under the floor. ADM Engineering did not venture into this area since is was a confined space and safety conditions were a concern. This area presented the least amount of visible concerns with the concrete structure. If this area was to be repurposed for future use an engineering team would need to model the framing system to determine if the system would need future structural framing meet building codes and new loading conditions.

AREA-C

Area-C appears to be the newest area of construction. It is a combination of concrete and steel framing. The steel roof has collapsed and allowed the weather to intrude into the building structure. Weather is a destroyer of buildings when allowed to attack without protective measures. This area of the building started to show signs of concrete deterioration and possible reinforcing deterioration. This section however could be the area to preserve if the concrete framing is structurally still viable. Like area B it would require and engineering team to fully review all framing elements, model the system and possibly preform testing on the concrete to verify the strength. The time and resources to do this project would be significant.

AREA-D

The second worst area and the largest section of the building is Area-D. This is a two-story full concrete framed structure that clearly shows signs of potential structural deficiencies. There are several areas that have column reinforcing exposed, photo 16 or sign of spalling from concrete or reinforcing deterioration, photos 22, 29 & 30. The floor and roof beams are damaged, photo 19 or show signs of concrete and/or reinforcing deterioration, photos 18, 24, 26, 32 & 33. The beam to column connections around the perimeter and where visible on the interior lead ADM Engineering that they are not structural adequate for future use presently, photos 22,30 & 31. The roof and floor slab are questionable with the amount of water intrusion from a lone term reliability of strength, even some of the floor slab reinforcing is exposed and deteriorating, photo 20.

The strength and durability would be a major concern with this structure moving forward. From a life safety point of view the framing is high questionable and would require major repairs and potentially replacement. A large-scale engineering review of the framing system and a in depth testing of the concrete and reinforcing should be done to gage the full scope of repairs and reinforcing required before consideration of moving forward with repurposing of this area of the property.

CONCLUSION

The conclusion that ADM Engineering has drawn from the structural review of the property at 501 Berrien Street is that a large investment of engineering services would be required to use even part of this facility. This would not be a guarantee that it would still even be possible after the money was invested. The engineering scope could easily reach a six-figure number and the construction cost for repairs could even be in the millions depending on the engineering findings.

Based on our review of the structure ADM Engineering recommends the oldest section of the building area-A should be demolished without question. From a risk management standpoint, it is an accident waiting to happen, not to mention the open area provide access to the building (although not easy) for trespassers to enter and do more damage or become injured themselves.

The rest of the building in the option of ADM Engineering should be demolished and the property used for new development as well. Although there may be some structurally sound areas there is enough in question and not concurrent within the building that leaves enough doubt of the over structural integrity of the building. It is recommended to pursue development of the current property with this current structure.

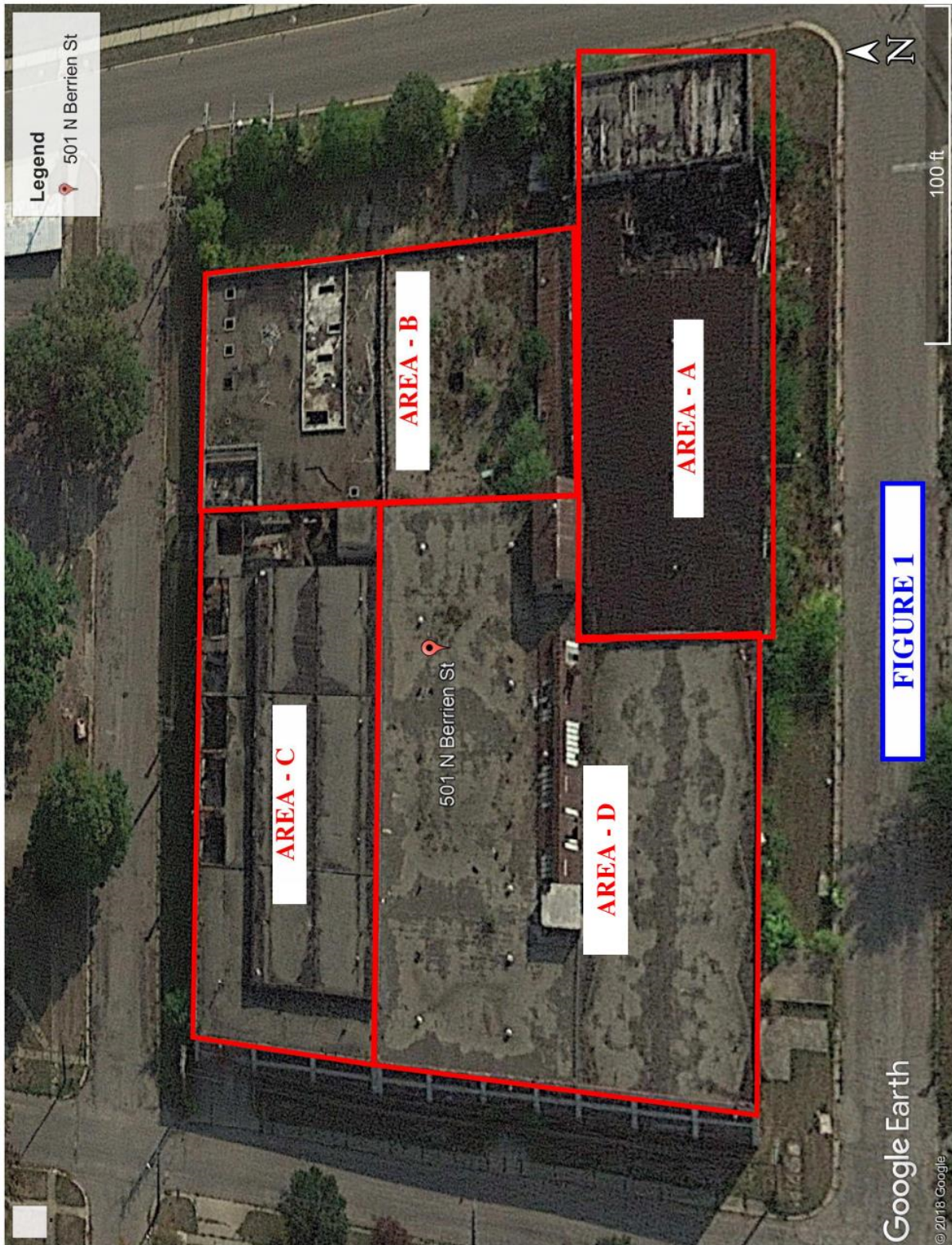


Figure 1 Overall Aerial of Property

As this photo shows that in area-A part of the roof and two sections of the South wall have collapsed.



Photo 1 – Area-A South Wall

A close-up of the roof and wall collapse in area-A.



Photo 2 Area-A South Wall Roof & Wall Collapse

A close-up of the wall collapse in area-A. Notice the roof is starting to show signs of collapsing as well.



Photo 3 Area-A South Wall Collapse

Part of area-A East wall showing the deteriorated brick.



Photo 6 Area-A East Wall Brick Work

Close-up of roof collapse in area-A.



Photo 4 Area-A Roof Section

A view of the roof and wall collapse from the second floor in area-A.



Photo 5 Area-A Roof Collapse



Photo 7 Area-B East Wall

Outside of area-B along the East wall.



Photo 8 Area-B East Wall Close-up

Close-up of the East wall of area-B.



Photo 9 Interior of Area-B

Interior of area-B



Photo 12 – Interior CMU Wall Area-B



Photo 11 Exterior North Wall at Area-B & C



Photo 10 Exterior North Wall Area-C



Photo 13 Interior of Area-C



Photo 14 Interior of Area-C & D



Photo 15 Interior of Area-C



Photo 18 Interior of Areas-D



Photo 17 Interior of Area-D



Photo 16 Exposed Column Reinforcing



Photo 21 Exposed Column Reinforcing



Photo 20 Exposed Floor Slab Reinforcing Steel



Photo 19 Damaged Floor Beam Area-C & D



Photo 24 Several Cracked Roof Beam Area-D



Photo 23 South Wall Area-D



Photo 22 South Wall Deteriorated Column



Photo 25 South Wall Area-D



Photo 26 Exterior South Wall Ground Floor Cracked Beams



Photo 27 South Wall Area-D Structural Beam Cracking



Photo 28 Area-D West Wall Looking South



Photo 29 Area-D West Wall Looking South



Photo 30 Column Deterioration - West Wall



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