



**Erie Canal Harbor
Development
Corporation**



2017 PROPERTY CONDITION ASSESSMENT REPORT – Volume I – Structure Assessment

FOR THE

**Buffalo Outer Harbor Access and Activation Civic
Improvement Project**

801 FUHRMANN BLVD., BUFFALO, NEW YORK

May 19, 2017

PREPARED FOR:

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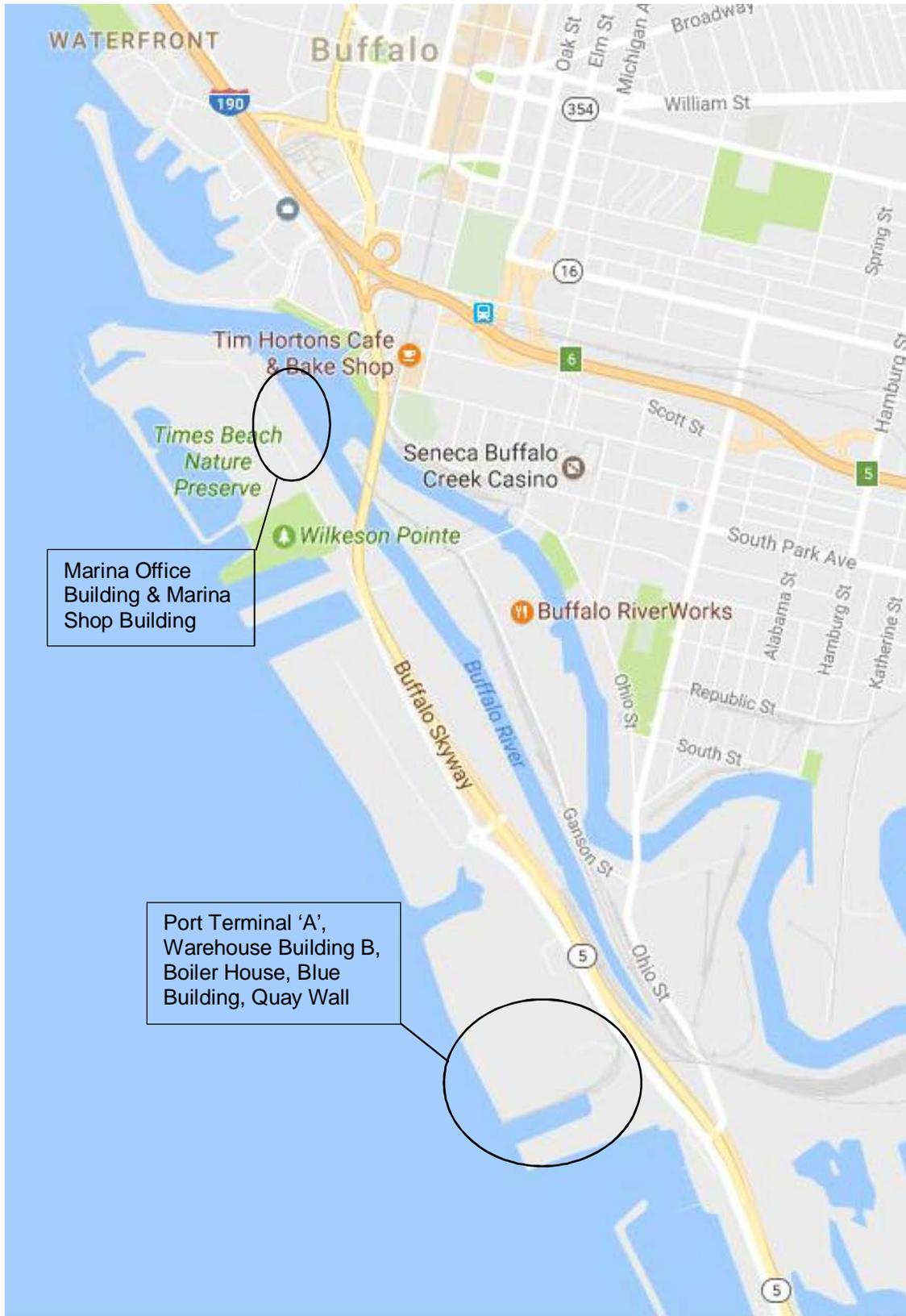


Figure 1. Structures Location Map

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I. Introduction

The 2017 property condition assessment was performed for the Erie Canal Harbor Development Corporation (ECHDC) by WSP USA, Inc. (WSP) from March 27, 2017 to April 3, 2017. The survey was intended to gather data to support a structural assessment and to identify general deficiencies that may require repair and included:

- Visual observations of general conditions with hands-on inspection performed at certain accessible locations that exhibited structural issues.
- Inspections and photographs to be used to develop concepts for needed short-term (1-5 year) structural repairs along with budgetary cost estimates and time required for work, including design, construction support services, and construction inspection.

The structures investigated for this project include the following, as shown on Figures 2 and 3, and described below:



Figure 2: Site Map, South Location



Figure 2: Site Map, North Location

- **Terminal A:** This structure consists of a high-bay storage area along the south side, in addition to first and second floor storage space, and office area on the east end of the building. The structure is steel-framed with CMU infill and a brick veneer. Approximate overall plan dimensions are 1000'x400' with a height of approximately 40 feet. Record drawings were provided and spot-checked for this building.
- **Terminal B:** This building has approximate dimensions of 420'x185' with a height of approximately 30 feet. Record drawings were provided and spot-checked for this building. The building is steel-framed with framing sections at 60 foot center-to-center spacing. The walls and roof of the structure are corrugated metal panels.
- **Administration Building:** This structure, with approximate overall dimensions of 115'x63', consists of a garage and storage area and office spaces along the east side. Record drawings include structural information for column spacing, wall sections, and foundation details. The basement storage area beneath the structure is accessible, and includes an oil storage tank room, pipe room, and access tunnel that heads north towards Terminal A.
- **Blue Building:** This building, with approximate dimensions of 50'x80', is currently in use as a garage and main office area. The main portion of this structure is a metal-framed garage, and there is a secondary masonry-wall

structure at the north end that contains an office space. Record drawings are available for this structure.

- **Marina Office Building:** This building is a masonry-wall structure built in 2014 that acts as an office space for the marina. No record drawings were provided.
- **Marina Maintenance Building:** This masonry-wall structure is currently in use as a storage garage. The current roof structure consists of a wood truss system. No record drawings were available for this structure.
- **Quay Wall:** The Quay Wall is a XX-ft section of sheet piling along the south and west sides of Terminal A. *To be included at completion of inspection*

Though not a highway structure, the inspection procedures were consistent with those of the Department of Transportation, Federal Highway Administration (FHWA) Bridge Inspectors Reference Manual FHWA NHI 03-001, October 2002, in order to provide a condition assessment of the structures consistent with general engineering practice. Description of the FHWA condition assessment criteria is contained within this report with the structure assessments in conformance with the *FHWA Structure Inventory, Condition, & Appraisal Rating Guide for Decks, Superstructures and Substructures (see page 20)*.

Terminal A

The foundation of Terminal A appears to be in Good Condition. There is minor vertical cracking typical at most column bases and the floor slab is generally flat with no major cracking. There are some areas of standing water, due to infiltration through broken pipes or issues with the roof, but these do not appear to have negatively affected the foundation or floor slab. There is an isolated location at the southwest corner of the structure where it appears the foundation wall has shifted slightly at an expansion joint. Additional subsurface investigation may need to be completed to determine if remediation will be necessary, and to what degree.

Columns appear to be in generally Fair Condition. Areas noted in the field notes include minor damage/repair, moderate repair, major repair, and replace. Minor damage or repair consist of minor dents in the column flanges due to being hit which do not pose an immediate threat to the structure's integrity. Moderate and major repair are columns which have incurred enough damage that they are recommended to be repaired during a structure rehabilitation. Columns labeled 'replace' are those with significant section loss due to being hit or from water damage that they require full replacement. The majority of column deterioration appears to be on the first level.

Because the structure is steel-framed with CMU infill, the walls are not included as part of the structural support system, but appear to be in Satisfactory Condition. The exterior brick face appears to be separating from the supporting wall in various locations and mortar is missing from many of the joints. In addition, several lintels are failing or have already failed, allowing water infiltration.

The roof level is rated as Poor Condition, due to the deterioration of the membrane and failure of most of the roof drains. There are numerous locations where the membrane is torn or displaced, and this has led to a severe infiltration of water to the lower levels.

Many of the roof drains are plugged with debris and vegetation, and piping is displaced inside the building, which allows leaking.

Terminal B

The foundation of Terminal B appears to be in Very Good Condition. There is minimal noticeable deterioration to the foundations and floor slab. One location that may warrant additional inspection is at column E14, which appears to have been hit and repaired. The column repair appears to be sound, but the pier and footer have been displaced, so additional subsurface investigation may be required to determine if the support is sufficient as-is or if additional bracing may be required.

Columns are generally in Very Good Condition. The repair to Column E14 appears to be sufficient, and the remaining columns show minimal signs of damage. The roof framing trusses are in Good Condition, but there is some minor damage to the cross-bracing in a few locations shown on the field notes.

The walls of the structure appear to be in Fair Condition. There is some water infiltration along the west side of the structure, which has not caused any significant damage. There is some cracking along the mortar joints on the north and south walls along the east side of the building, likely caused by settlement of the east wall.

Assessment of the roof was done visually via an aerial lift. The roof appears to be in Fair Condition. The metal decking does not show significant signs of damage, but the seams are slightly deteriorated and there are a couple locations where vegetation is growing through the roof.

Administration Building

The foundation of the Administration Building appears to be in Fair Condition. The basement level has some areas of significant water infiltration, with puddling especially in the oil storage tank room. The framing steel is rated as Fair Condition, as there is minor deterioration in some of the columns, mainly as a result of water damage. There is also some vertical cracking in the walls below the bearing locations of the roof joists.

Although not structural, the brick veneer in some locations, particularly along the west exterior wall, is missing mortar and beginning to separate from the supporting structure. This may lead to additional water infiltration and damage if not addressed. The walls are rated as Fair Condition. Along the west side of the building, the original windows have been replaced with CMU infill, and the wall area above the lintels shows signs of cracking typical of masonry construction. While not an immediate concern structurally, the cracking may lead to additional water infiltration, which would eventually create concerns for the structural integrity of the building.

The roof of the Administration Building is rated as Fair Condition. There is some tearing in the roof membrane and degradation to previous patches, which may contribute to further water damage to the interior. There was no visible damage to the joists, but interior inspection was limited to the west end of the structure, as the roof above the office areas was not accessible for this assessment.

The landing pad on the exterior north side of the structure is in Poor Condition. The supporting walls and upper slab show significant deterioration and weathering. Rebar is visible in several locations and there is vegetation growth along the pad. Additionally, the steel unloading structures are severely weathered and corroded.

Blue Building

The Blue Building appears to be in Good Condition overall. There was minor settlement cracking apparent in the CMU of the office section, and the metal panels of the garage portion showed signs of being hit at various locations, especially on the corners, but the structure is generally sound.

The roof of the front office section is in Fair Condition. The roof generally doesn't show signs of significant damage, but there is a section along the eave on the east side that has failed. As this is along an overhang, it is not necessarily a structural issue, but may lead to water infiltration and further damage if not addressed. The metal deck roof on the garage portion does not show signs of notable damage.

The metal framing in the garage section is rated as Good Condition, as there is some damage to the metal panel walls, particularly around the opening framing and exterior corners. Some of the damaged areas show signs of rusting, and there is significant rusting at the pipe penetration on the east side of the structure. The interior framing members show slight rusting at some of the connections, but don't appear to have any significant defects.

Marina Office Building

The marina Office Building was built in 2014, and appears to be in Excellent Condition. The masonry structure shows no immediate signs of deterioration. The interior ceiling is finished with drywall, so the roof supporting structure was not available for inspection, but the exterior showed no signs of damage or deterioration, and there was no sign of water damage on the interior surfaces.

Marina Maintenance Building

The Marina Maintenance Building is generally in Poor Condition. Settlement cracking is visible at each end of the east wall, and a portion of the roof has failed in the southwest corner of the building, allowing for some water damage. The majority of the wooden truss framing for the roof was not visible for this assessment, as there was a plastic layer attached at the ceiling. The flat roof joists appeared to be in Poor Condition, as most of the joists were rusted, and had minor dents. The diagonal bracing members of the joist in the northwest corner have been cut out to make room for the overhead garage door. It appears that the roof was originally flat and the wooden truss replaced this, so the joists are no longer part of the structural support system.

The exterior walls show evidence of settlement cracking along mortar joints, and some of these are visible from the building interior. The wooden lintel above the door on the

west side is displaced, leading to additional water infiltration. Along the north side, the area above the CMU infill is shifting, and is slightly out of plumb with the rest of the wall.

Quay Wall

Inspection scheduled 5/22-5/23

Structure Rehabilitation

Based on the information collected in the condition assessment, repair and rehabilitation needs were developed for the structures. The General Rehabilitation points are those which pertain to multiple structures as an overall assessment, and the Structure-Specific Rehabilitation items are items which focus on application to individual structures.

A summary of the rehabilitation needs for implementing structural repairs are listed below and each item is presented in the last section of this report along with an expanded explanation for the items.

General Rehabilitation:

- Grout injection and sealing of cracks
- Replacing and repointing brick as needed
- Cleaning and repainting steel framing
- Repair/Replacement of steel lintels as needed
- Repair/Replacement of roof membranes

Structure-Specific Rehabilitation

- Rehabilitation is listed as a per-structure basis in the last section of this report.

Construction Estimate Summary

SUMMARY OF COSTS	
	Total
Terminal A	\$ 767,520.00
Terminal B	\$ 54,840.00
Administration Building	\$ 23,228.00
Blue Building	\$ 5,694.00
Marina Office Building	\$ -
Marina Maintenance Building	\$ 5,706.00
Quay Wall	
TOTAL CONSTRUCTION COST	\$ 856,988.00

II. Structures Description

General

This section of the condition assessment report contains general information on the Buffalo Outer Harbor Structures as well as structure condition information collected during the field investigation to assist in assessing necessary rehabilitation efforts required for the structures. Condition findings as well as recommendations for addressing poor structural or safety conditions are provided in the following sections of this condition assessment report.

The Buffalo Outer Harbor Structures are set of buildings currently used for boat and equipment storage, located to the south of downtown Buffalo at 801 Fuhrmann Boulevard. The Structures are along the shoreline of Lake Erie near the end of Ohio Street. The structures are owned by ECHDC, who provided WSP and WSP's subconsultants access to the site for the development of this condition assessment report.

Terminal A

Terminal A was originally constructed as an assembly plant for Ford. The 1000'x400' steel-framed structure consists of a high bay section along the south side, an open floor area on the first and second floors, and an office area at the east end of the building. The column rows are spaced at 25' on center, with framing sections spanning every 40'. The building is approximately 40' high, with a sawtooth roof.

There is evidence of water infiltration through the roof and some windows. The roof membrane is torn in various locations and shows more significant degradation on the weathering (southwest) side of the building. In addition, many of the roof drains are plugged with vegetation and other debris, and several of the drain pipes are disconnected, leading to leaking and puddling in various locations throughout the building. Along the east side of the roof, one of the ridges shows signs of failure, but further investigation was not possible, as the roof membrane was covering the top, and access was not available from the office area on the interior. The aerial lift was used to check the trusses of the high bay area; access was available in locations where the ceiling tile was missing. The ceiling tile had failed in these locations due to water infiltration from the roof level, but the trusses appeared to be generally sound.

The stairways were all CMU-enclosed and seemed generally sound, although the ones along the south side of the second level had significant water infiltration. On both the first and second level, there was some damage to a number of columns, as indicated in the field notes (Appendix B). Damage ranged from minor dents and paint peeling to some with more severe section loss due to being hit or rusting. There were a few areas with apparent repairs.

On the building exterior, a good portion of the brick veneer has mortar missing from the joints. While not directly structural, this may lead to additional water damage to the

structure. There were also several locations where the window lintels had failed, some of which were repaired.

Terminal B

Terminal B is a metal-framed structure approximately 30' high with each framing section at 60' center-to-center spacing. Each framing bay includes columns at each end and a center row of columns, with each side spanning 80'. The trusses and columns show minimal signs of damage, except at column E14. The column at this location appears to have been hit hard enough to deform the flange and web of the W-shape and displace the column pier. A fix was done by welding two channels to either side of the column, but the foundation is still skewed in the N-S direction. This should be monitored to ensure no additional movement occurs. There is some slight damage to the X-bracing, particularly along the east side at the truck bays.

The walls are a combination of CMU on the east and south sides, and metal panel along the upper portion, west, and north sides. The metal panel sections show general signs of wear with some minor rusting at several connections. The CMU in the southeast corner has some settlement cracks, which appear to have been patched at one time. There is very slight evidence of matching cracking at the north end, but the majority occurs along the mortar joints on the short cut-in wall on the south side. The east side truck bays have metal overhead doors, and there was some visible cracking in the CMU joints at the upper corners of several of the doors.

Wearing at the roof level was most significant at the joints, and there was daylight visible from the interior at column line 13. Inspection of the roof was limited to that done from the aerial lift along the edges, but there were no major holes or rusted out areas visible in the decking. Along the edges, the trim showed typical signs of wear, and there was one location along the west side of the roof where vegetation has started growing through a gap in the decking and trim. The roof ventilators show signs of rusting, and the cover is missing from the vent between column lines 6 and 7. No displacement was noted.

Administration Building

The Administration Building is a brick building with metal framing. The west end of the structure is used as a garage and equipment storage, and the east end was used as office space. The basement level extends beyond the building and includes areas for large tank storage, a piping room, and a tunnel which leads north to Terminal A.

The basement level showed typical signs of wear, with some minor settlement cracking apparent along the foundation walls and puddling in various areas. The storage tank room had 2-3 inches of standing water on the floor, and there was a slight musty smell. The tunnel did not appear to have significant damage, and there was scaffolding and temporary lighting strung up along the east edge of the tunnel to the end.

The roof trusses span about 60' and did not appear to have significant damage other than typical rusting. Most of the bearing columns were contained within brick pilasters,

but a couple exposed columns showed typical rusting on their flanges. The rust is not an immediate structural concern, but may be a sign of water infiltration through either the roof or mortar joints.

A full assessment on the east side of the building was unable to be performed, as this end was all office space, and the area was framed in with drywall. Water damage was evident throughout this side of the building, but it could not be determined if this included any structural damage or if it was superficial.

The exterior brick veneer is slightly damaged in some locations, especially around openings. There is mortar missing from a good portion of the joints, and along the west wall the brick appears to be slightly displaced, particularly towards the top of the wall. There is CMU infill along the west wall, and the lintel area shows evidence of settlement cracking. The brick above this cracking is displaced slightly towards the outside of the building.

Along the north side of the building, the landing pad is significantly weathered. The concrete is deteriorating and rebar is visible in several locations. Additionally, there is considerable cracking in the slab with vegetation growth. The steel structures in this area are severely corroded.

The roof was observed via the aerial lift along the exterior perimeter. The membrane is torn in some places and some of the areas which were previously patched show signs of weathering. The roof drains did not appear to have any obstructions, but some of the caps were missing.

Blue Building

The front (north) section of the Blue Building is a CMU structure currently used as office space. The main section on the south is a metal-framed garage used for equipment storage. In general the structure appears to be sound, and shows minor signs of wear, especially at the corners and openings. Along the south side, the corners of the garage have damage from being hit, presumably by cars or equipment driving around the back side of the building.

The CMU office building shows typical signs of wear with some minor settlement cracking. Cracking is visible along the west side, and runs along the mortar joint near the attachment to the garage portion. The rest of the structure appears sound, with the most severe damage being that part of the roof eave on the east side has failed. Each side of the roof eave has some damage to the trim, but these damaged areas do not directly affect the structural integrity of the building.

The metal framing members of the garage are slightly rusted at several of the connections, but are not otherwise considerably defective. There is some slight damage to the trim around the openings and several of the dented areas are corroded. The interior does not show any significant signs of degradation. There is a pipe penetration on the east side of the building which is extremely rusted, but the majority of the metal siding appears to have typical expected weathering.

The roof of the garage was observed from the aerial lift. The metal decking did not appear to have any significant rusting, and the only notable weathering was some minor rusting along the trim, especially along the east side of the building.

Marina Office Building

The Marina Office Building is a relatively new masonry structure and does not show any immediate signs of deterioration. The interior CMU did not have any cracking or deterioration. The ceiling was finished with drywall, so no inspection was performed on it, but there was no evidence of damage or water infiltration in the office area.

The lift was not available for use to inspect the roof level, but from the ground there was no sign of immediate deterioration.

Marina Maintenance Building

The Marina Maintenance Building was investigated from ground level for the exterior and interior. The exterior of the masonry structure displayed multiple settlement cracks, particularly along the east side of the building. Cracking was evident along mortar joints, and projected through the building, with interior cracking matching that on the exterior surface. There is an area of CMU infill along the north wall, and the upper area of the wall in that section has shifted slightly, so it is no longer plumb with the rest of the wall. Along the west and south sides, the door lintels are failing, which is leading to water infiltration and further damage.

The roof appears to have been flat at one point, and has been replaced with a wooden trussed roof. The former supporting joists are still in place, but the truss at the north end interferes with the overhead garage door. The diagonal bracing members of this truss have been removed to allow the garage door to pass between the upper and lower chords. The remainder of the flat roof trusses are rusted and many have minor dents. There is a plastic layer on the underside of the newer wooden trusses, so most of them were not visible for this assessment. There was one section of the roof in the southwest corner that had failed, and insulation was visible through the plastic from the interior. This has led to some water damage in that corner.

Quay Wall

To be inspected 5/22-5/23

III. Condition Assessment Procedure

General Condition Assessment

On the dates of the Condition Assessment, the average temperature ranged from 40°F to 50°F. There was a slight breeze at the start of the inspection, which did not hinder the use of the man-lift for exterior inspections. There was some rain, which necessitated

moving assessments inside, but inspections were able to be performed on the interior and exterior of each of the buildings over the course of the week.

Access to the structure was through a combination of aerial lift, stairs and walking. There was one 60-foot aerial lift utilized. The aerial lift was utilized along the exterior faces of Terminal A, Terminal B, Administration Building, and Blue Building, and also to spot-check the ceiling in the high-bay area of Terminal A. The lift was used to assess the upper portions of the walls and the roof levels of each of the buildings. Areas around the structures used for access with the aerial lift were thoroughly walked to ensure the terrain was acceptable for the use of the lift. The Marina Office Building and Marina Maintenance Building were not inspected using aerial lifts, as these structures are at the northern site location. Dive inspectors were used to assess the condition of the Quay Wall.

The remainder of the inspection was performed through walking the site and climbing the existing stairwells to access the structure interiors.

IV. SUMMARY OF INSPECTION FINDINGS

GENERAL

The 2017 Condition Assessment findings for the Buffalo Outer Harbor Structures are presented in detail in this section. The findings are itemized in relation to each structure. The items are assigned a rating based on the FHWA Structure Inventory, Condition & Appraisal Rating Guide which is included below.

The inspection finding descriptions are further supplemented by photographs included in *Appendix A* and field notes included in *Appendix B*.

General views of the Buffalo Outer Harbor Structures are included at the beginning of *Appendix A* in order to provide an overall view of the general appearance of each structure and their geometry.

- Terminal A: Overall view of the east side of Terminal A from Fuhrmann Blvd.
- Terminal B: Overall view of the east side of Terminal B from Fuhrmann Blvd.
- Administration Building: View of northeast corner of the structure, including steel scaffolding members at exterior.
- Blue Building: North face of structure – CMU office building shown along the left side, with attached garage behind.
- Marina Office Building: North face of structure.
- Marina Maintenance Building: North face of structure.

FHWA STRUCTURE INVENTORY, CONDITION, & APPRAISAL RATING GUIDE

Numerical condition ratings characterize the general condition of the component being rated in aggregate. They do not describe localized or nominally occurring instances of deterioration. Correct assignment of a condition rating must, therefore, consider both the severity of the deterioration and the frequency of occurrence. If a deficiency reduces the capacity or serviceability of a component, the rating of the component should be reduced accordingly.

Though not a highway structure, the inspection procedures were consistent with those of the Department of Transportation, Federal Highway Administration (FHWA) Bridge Inspectors Reference Manual FHWA NHI 03-001, October 2002, in order to provide a condition assessment of the concrete structure consistent with general engineering practice. The Buffalo Outer Harbor Structures condition assessment includes ratings for each item that is in conformance with the FHWA Items 58 - Deck, 59 – Superstructure, and 60 – Substructure, inspection ratings as noted below.

- **FHWA Items 58 - Deck, 59 – Superstructure, and 60 - Substructure:** The following FHWA general condition rating guidelines were used in the evaluation of Items 58, 59 and 60.

FHWA STRUCTURE INVENTORY, CONDITION, & APPRAISAL RATING GUIDE ITEMS 58 - Deck, 59 – Superstructure, and 60 - Substructure	
<u>Code</u>	<u>Description</u>
N	NOT APPLICABLE
9	EXCELLENT CONDITION – New condition.
8	VERY GOOD CONDITION – No problems noted or superficial deterioration.
7	GOOD CONDITION – Minor isolated deterioration.
6	SATISFACTORY CONDITION – Structural elements show some minor to moderate deterioration.
5	FAIR CONDITION – All primary structural elements are sound but have moderate section loss, cracking, spalling, or scour. Fatigue cracks in steel are arrested or not likely to propagate into critical stress areas.
4	POOR CONDITION – Advanced section loss, deterioration, spalling, or scour. Un-arrested fatigue cracks exist and may likely propagate into critical stress areas.

FHWA STRUCTURE INVENTORY, CONDITION, & APPRAISAL RATING GUIDE ITEMS 58 - Deck, 59 – Superstructure, and 60 - Substructure	
<u>Code</u>	<u>Description</u>
3	SERIOUS CONDITION – Loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Un-arrested fatigue cracks in steel or shear cracks in concrete may be present.
2	CRITICAL CONDITION – Advanced deterioration of primary structural elements. Un-arrested fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
1	“IMMINENT” FAILURE CONDITION – Major deterioration or section loss present in critical structural components, or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put bridge back in light service.
0	FAILED CONDITION – out of service; beyond corrective action, or does not meet currently acceptable standards.

Condition Assessment Access

The condition assessment was conducted as a visual observation of general conditions with hands-on inspection performed at certain accessible locations that exhibited visual structural deficiencies.

Access to the structure was obtained through a combination of aerial lifts, stairs and walking. There was one 60-foot aerial lift utilized. The aerial lift was used along the exterior faces of each of the structures on the south site, and in part of the interior of Terminal A.

The areas not inspected using the aerial lift were located at the north site (Marina Buildings) and in the interiors of each of the buildings. Inspection in these areas was done from the ground level. The full exterior perimeter of each structure was accessible at ground level.

Terminal A

The foundation of Terminal A is rated as Good Condition, as the floor is generally flat with typical settlement cracks as would be expected. There are some areas where there is standing water, typically in sections of the building which match damage to the roof structure or failed drain piping. The foundation and floor slab do not appear to be negatively affected by this water infiltration from ground level. As the structure is metal-framed with a CMU and brick infill, there is typical hairline cracking at each of the

column piers consistent with expected column movement (Photo A_001). This cracking is evident in columns along the exterior walls, but does not appear to be an immediate structural concern. The foundation is generally sound and level, but there is an isolated location near the southwest corner of the structure where the foundation wall appears to have shifted approximately ½" at an expansion joint (Photo A_002). There does not appear to be significant damage to the wall proliferating from this location, but additional subsurface investigation and monitoring may be necessary to determine what, if any, remediation may be required, and how much.

Columns for Terminal A are rated as Fair Condition, as a good portion of them are slightly to moderately damaged, as noted in the Field Notes in Appendix B. Most of the damage and deterioration incurred appears to be in the first level. Damage includes denting, most likely from being struck with equipment, as well as water damage, especially to columns which are in areas matching roof or pipe failure. Columns noted as having minor damage or repair in the Field Notes are those which do not pose an immediate threat to the building's structural integrity, but may need to be monitored to ensure that the damage does not get worse. Moderate and major repair include columns with enough damage or section loss that it is recommended they be repaired to preserve the structure and prevent further damage. Columns labeled 'replace' are those which have incurred significant damage and are no longer capable of functioning at full capacity (Photo A_003). In addition, almost all of the columns have peeling paint, leading to susceptibility to corrosion.

The walls appear to be in generally Satisfactory Condition, as there is mortar missing from many of the exterior joints, and there are some areas where the brick veneer has started to separate from the supporting wall (Photo A_004). There is some hairline settlement cracking visible, but no major cracking which poses a significant threat to the overall stability of the building. Several of the lintels appear to have been repaired, as there are areas along the exterior with newer brick. Some of the lintels show signs of significant weathering, and there are a couple along the south side of the building which have failed. The lintel failure appears to be contained on the veneer, so it does not pose a structural threat, but if not remediated, may lead to water infiltration and further interior damage in addition to the threat of falling bricks if failure does occur.

The roof membrane is torn and displaced in numerous locations, which has led to a severe infiltration of water, both on the roof surface and into the lower levels of the building. Many of the roof drains are blocked with debris and vegetation (Photo A_005), leading to standing water along the roof edges. Some of the piping from the roof drains is disconnected inside the building, leading directly to leaking in the lower levels. Although there are a significant number of patches to the membrane, many of these repairs are now degraded to the point of failure. The roof is rated as Poor Condition because of the damage to the membrane and significant water infiltration. Enough of the membrane is still in place that the underlying structure was not visible for inspection, but there was no noticeable failure in any of the visible roof trusses. Along the east side of the structure above the office spaces, one of the sawtooth ridges appeared to be deformed under the membrane (Photo A_006) but was unable to be investigated, as it was not accessible from either the roof level or from inside the building.

The structural system in the office area along the east side of the building was not able to be investigated, as the interior was completely finished. There was significant water damage and mold to the finishes, but this was not deemed to be a structural issue. Further destructive investigation may be required to assess the wall and roof framing in this area.

Terminal B

The foundations of Terminal B are in generally Very Good Condition. The floor slab and foundation show minimal signs of deterioration and cracking, and the structure as a whole does not have a significant amount of water infiltration. There is some slight settlement along the east wall which is mainly evidenced by cracking in the CMU walls, but the foundation does not show notable signs of failure. The slab exhibits normal cracking along joints, typical of concrete slabs of this type.

Columns, like the building foundation, are rated as Very Good Condition. There is one column (E14), which appears to have been hit and has since been repaired, but the remaining columns all show minimal signs of damage. E14 is significantly deformed along the weak axis, and there is some section loss to the column flange (Photo B_001). The column repair consists of two channel sections stitch-welded to the original column to acquire sufficient engagement length. The column pier is also displaced, but there does not appear to be any repairs made to that. The pier is isolated within the slab and movement appears to be limited to just the pier. Additional subsurface investigation may be required to determine if additional support or bracing is required.

The framing members and walls of the building are rated as Fair Condition. The CMU walls on the north and east sides are sound, and show evidence of some cracking, consistent with slight settlement of the east wall. The cracking is most severe at the southeast corner, and follows the mortar joint from a doorway on the south wall (Photo B_002). The crack appears to have been patched, but has since propagated through the patch and is visible on the interior and exterior faces of the wall. There does not seem to be significant water infiltration along this face of the building, but the crack should be monitored to ensure the wall settlement does not lead to any severe structural issues. The metal panel walls along the remainder of the building do not show any significant signs of degradation besides minor rusting, particularly at the roof level and at penetrations. There is slight damage to some of the cross-bracing at the east loading area, but the roof framing trusses appear to be sound.

From the aerial lift, the roof is found to be in Fair Condition. The metal decking shows weathering consistent with what would be expected for this location, with no major rusting or damage. The roof seams are deteriorating (Photo B_003), and there is daylight visible from the interior along column line 13. This is consistent with the portion of the building where there is the highest amount of water infiltration. Additionally, there is some deterioration along the roof edging and there is some vegetation growth along the west side of the structure at the roof level (Photo B_004).

Administration Building

The Administration Building foundation is rated as Fair Condition. There is some water infiltration in the basement, particularly in the storage tank room, which has 2-3" of standing water. Minor vertical cracks can be seen in the pilasters at the bases of some of the columns. There is typical settlement cracking, consistent with what might be expected of a structure of this age, but there is no significant damage to the structure associated with this cracking.

The CMU infill and brick veneer of the walls is rated as Fair Condition, as there is some minor settlement and cracking, particularly at the bearing locations of the roof joists (Photo BH_001). There is also a good deal of mortar missing from the brick veneer joints, and along the west wall, it appears as though the veneer is beginning to separate slightly from the supporting wall. This damage appears to be confined to the veneer, so is not necessarily an immediate structural issue, but continued degradation of the infilled walls may lead to additional water infiltration and damage to the structure if not addressed. The west wall shows the most significant damage, but it does not appear to be a bearing wall.

The roof, like the rest of the structural portion of the building, is rated as Fair Condition. The membrane, particularly on the south weathering side, is torn in various places and some previous patches are also failing. The roof drains appear to be clear of obstructions, but several are missing the drain covers. The torn membrane and degradation of patches may be a contributing factor to the water damage on the interior of the building. The roof joist inspection was limited to the west side of the building, as the roof above the office areas was not accessible during this investigation.

The landing pad along the north side of the structure is not part of the structural system, but it is in Poor Condition. The foundation walls and supporting slab of this section are significantly deteriorated, and rebar is visible in multiple locations. There is heavy vegetation growth along the entire pad (Photo BH_002), and the steel structures are severely corroded.

Blue Building

The Blue Building displays wearing typical of the other structures on site. The framing and walls are rated as Good Condition, as there is some minor settlement cracking apparent, and the corners of the building appear to have been hit multiple times, most likely by equipment. The CMU walls of the front office section were generally sound, and only displayed minor settlement cracks. The metal framing of the garage portion of the structure had some minor rusting, particularly at some of the connections, but did not appear to have any significant dents or defects. The metal paneling had various areas where there were slight dents, but the only section with notable damage was at a pipe penetration along the east side of the structure where there was noticeable rusting (Photo BB_002).

The roof seems to be in Fair Condition. The roof over the CMU office portion does not appear to have any significant damage, except along the eave on the east side. The roof in this location has failed (Photo BB_003), but as it is along an overhanging section of the roof, it does not pose an immediate structural threat. If left untreated, however, it

may lead to water infiltration and further damage to the roof, and may begin to affect the structure's interior. The metal decking on the garage portion does not show any significant indication of damage besides small rusting areas along the roof trim.

Marina Office Building

The Marina Office Building is the newest of all the structures inspected, and shows the least amount of damage and deterioration. The building is rated as Excellent Condition. The foundation and CMU walls appeared sound and did not show any significant signs of immediate settlement or cracking. The interior of the garage and office portion were finished with drywall, so the roof structure was unable to be inspected, but there were no signs of damage by water or weathering apparent.

Marina Maintenance Building

The Marina Maintenance Building shows significant cracking in the walls, which are rated as Poor Condition. The east wall appears to have significant settlement, and cracking at the north and south walls are evidence of this. Cracking is visible in the mortar joints, and exterior cracking can be matched to that on the building's interior (Photo MSB_001). Door openings on the south and west side have failing wooden lintels, which is leading to water infiltration. At the north end of the structure, the CMU infill area appears to have shifted, and the upper section is slightly out of plumb (Photo MSB_002).

The roof is in Poor Condition, as it shows significant weathering, and a portion on the southwest corner has failed. It appears as though the original roof for this structure was flat, and has since been replaced with wooden trusses, leaving the flat roof steel trusses in place. The original trusses are extremely corroded, and the north most one has been altered to make space for the overhead garage door. The diagonal bracing members of the joist have been cut out (Photo MSB_003), but at this time, this member does not appear to be part of the structural support system. Between the original joists and the new wooden trusses, there is a plastic barrier, which interfered with inspection of the newer wooden trusses.

Quay Wall

To be inspected 5/22-5/23

V. Conclusions and Structure Rehabilitation

Current Overall Condition Assessment Rating

The condition assessment described in this report gathered data to support a structural assessment and to identify general issues that may require repair and included:

- Visual observations of general conditions with hands-on inspection performed at certain accessible locations that exhibited structural deficiencies.
- Inspections and photographs to be used to develop concepts for needed short-term (1-year) structural repairs along with budgetary cost estimates and time required for work, including design, construction support services, and construction inspection.

The Structures included in the scope are currently used as equipment and boat storage located along the shoreline of Lake Erie. The inspection procedures were consistent with those of the Department of Transportation, Federal Highway Administration (FHWA) Bridge Inspectors Reference Manual FHWA NHI 03-001, October 2002, in order to provide a condition assessment of the structures consistent with general engineering practice.

Using the information collected for the structural condition assessment ratings, immediate repair and rehabilitation needs have been developed for each of the structures, with options for varying degrees of expected use. General structure rehabilitation points are those which serve as baseline repairs pertinent to all structures, and further rehabilitation details are listed on a per structure basis.

Condition Assessment Rating per Structure

Structure	Component	Condition Rating
Terminal A	Foundation	Good
	Columns	Fair
	Walls	Satisfactory
	Roof	Poor
Terminal B	Foundation	Very Good
	Columns	Very Good
	Walls	Fair
	Roof	Fair
Administration Building	Foundation	Fair
	Walls	Fair
	Roof	Fair
	Exterior Landing	Poor
Blue Building	Framing	Good
	Roof	Fair
Marina Office Building	General	Excellent

Marina Maintenance Building	Walls	Poor
	Roof	Poor
Quay Wall	TBD	TBD

General Structure Rehabilitation

General structure rehabilitation points presented below include suggested short-term (1-5 year) structural repairs which, in the opinion of PB, will help to preserve the integrity of the structures and prevent an immediate further reduction in structural capacity should they be intended to be put into future use.

- **Repointing of Masonry Veneer:** Each structure showed varying degrees of masonry deterioration, but replacing brick and repointing the most severely deteriorated sections along the faces will go a long way in preventing further water infiltration and damage to the structures.
- **Grout Injection of Cracks:** Cracking described in the structure descriptions should be repaired to prevent further crack proliferation and damage to the structures. Where possible, larger cracks should be patched, and smaller cracks (<1/8" thickness) should be repaired using an injected epoxy grout.

Structure-Specific Rehabilitation

Per the direction of ECHDC, structural rehabilitation recommendations are limited to those that can be completed within one year to extend the usable life of the buildings and ensure no further degradation over the next five years. Structure-specific rehabilitation includes repairs in addition to the initial general rehabilitation items listed above.

- **Terminal A:** In addition to numerous small tears on the roof system to be patched, there are several seams that have delaminated and should be resealed. As noted on the roof plan in the field notes (*Appendix B*), to prevent additional severe damage to the structure, the following structural repairs are recommended to be done for short-term:
 - Yellow areas on the field notes indicate sections of the roof where the membrane is damaged or missing. The most severe roof degradation is along the high roof section at the northeast corner of the building, where the membrane is torn and peeling away from the parapet, allowing water infiltration behind the walls. To mitigate the damage and prevent additional issues, it is recommended that the upper roof level be replaced on each side of the sawtooth (*Appendix B, Terminal A Roof Plan; yellow hatched areas*).
 - Blue areas noted on the roof plan indicate areas with significant standing water. There may be some minor damage to the membrane in these

areas, but the standing water is more likely due to clogged and disconnected roof drains. The drains should be cleared and the piping reattached or replaced as needed to ensure proper drainage and prevention of additional water retention on the roof.

- The red hatched out area is a section of the roof where the metal cladding covering monitor windows is missing. The windows in this area should be blocked off and the roof sealed.
- Broken and displaced roof drains should be repaired, and columns repaired as needed. The columns to be repaired or replaced per the Field Notes in Appendix B are recommended to be addressed.
- **Terminal B:** Terminal B is in generally Good Condition, and beyond the typical crack repair as with the other structures, there is some degradation of the roof expansion joints and a location where vegetation is present on the roof. The roof layout in Appendix B shows the locations for each of these, colored in yellow and green, respectively. The section shown in blue denotes a missing ventilator hood. On the interior of the structure, no major issues were noted, but the repaired column E14 should be monitored to ensure there is no additional movement and the repair is holding.
- **Administration Building:** Rehabilitation of the Administration Building includes repointing and crack repair as covered in the general rehabilitation items, as well as some roof repair. The tearing in the roof membrane should be patched and sealed, but a full roof replacement is not necessary for the short-term. The outer landing pad does not present an immediate threat to the structural integrity of the building, but the corroded steel framing should be removed as a safety precaution.
- **Blue Building:** Short-term repairs to the Blue Building are as listed in the general rehabilitation items.
- **Marina Office Building:** The Marina Office Building does not require any immediate repairs, as it is in generally Excellent Condition.
- **Marina Maintenance Building:** The Marina Maintenance Building requires short-term repairs as detailed in the general rehabilitation items, as well as some repairs to the roof and door lintels. The cracking on this structure is more severe than that on the other buildings, particularly along the east wall.
- **Quay Wall:** **TBD**

Assumptions and Limitations: In the process of developing the scope of work and associated cost, assumptions were made as listed below.

- Terminal A
 - Identification and mitigation of any hazardous material such as, but not limited to, mold, lead, or asbestos will be by others and is not included in the scope or cost of this report.

- Terminal B
 - Removal and disposal of any existing equipment is not included in the scope or cost of this report.
 - Identification and mitigation of any hazardous material such as, but not limited to, mold, lead, or asbestos will be by others and is not included in the scope or cost of this report.
- Administration Building
 - Materials and equipment in the basement area will be removed and disposed of by others and is not included in the scope or cost of this report.
 - Identification and mitigation of any hazardous material such as, but not limited to, mold, lead, or asbestos will be by others and is not included in the scope or cost of this report.
- Blue Building
 - Identification and mitigation of any hazardous material such as, but not limited to, mold, lead, or asbestos will be by others and is not included in the scope or cost of this report.
- Marina Office Building
- Marina Maintenance Building
- Quay Wall

Construction Estimate Summary

The following chart is a construction estimate for recommended repairs to the structures. Additional details can be found in *Appendix C*.

SUMMARY OF COSTS	
	Total
Terminal A	\$ 767,520.00
Terminal B	\$ 54,840.00
Administration Building	\$ 23,228.00
Blue Building	\$ 5,694.00
Marina Office Building	\$ -
Marina Maintenance Building	\$ 5,706.00
Quay Wall	
TOTAL CONSTRUCTION COST	\$ 856,988.00

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APPENDIX A

Photographs

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General_PortTerminalA



General_WarehouseBuildingB



General_BoilerHouse



General_BlueBuilding



General_MarinaOfficeBuilding



General_MarinaShopBuilding



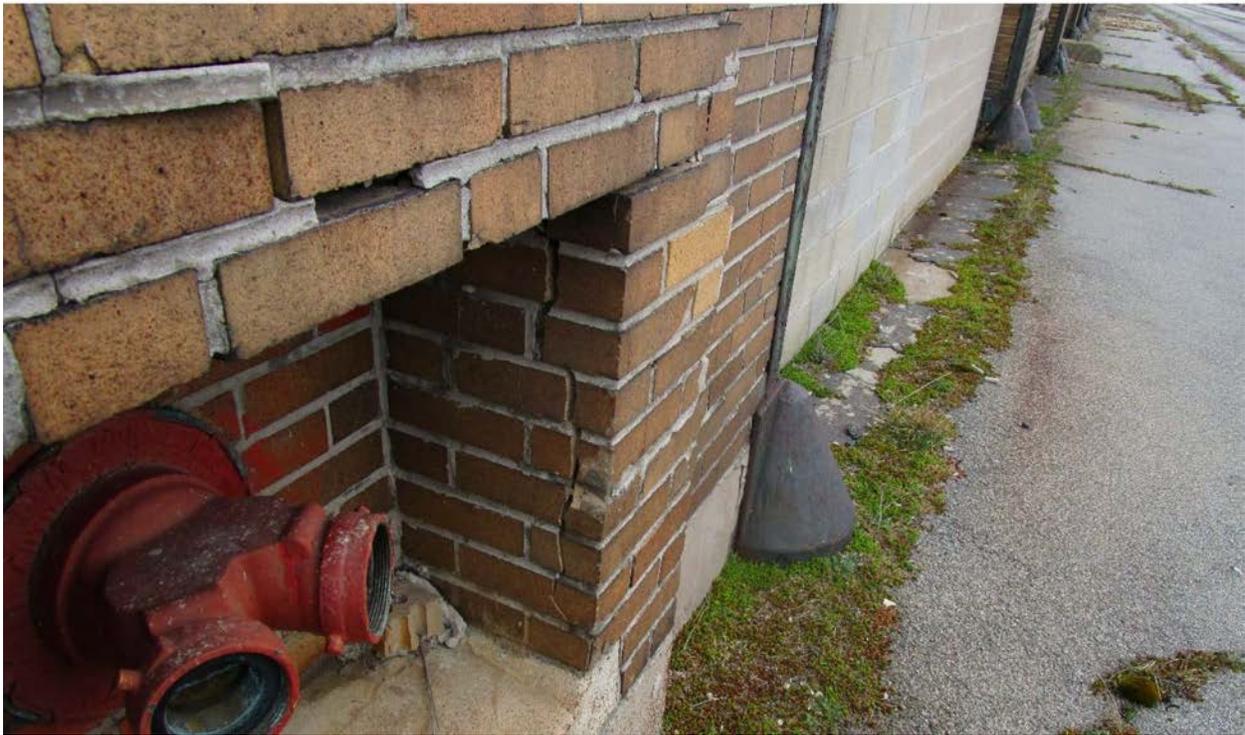
A_001



A_002



A_003



A_004



A_005



A_006



B_002



B_003



B_004



BH_001



BH_002



BB_001



BB_002



BB_003



MSB_001



MSB_002

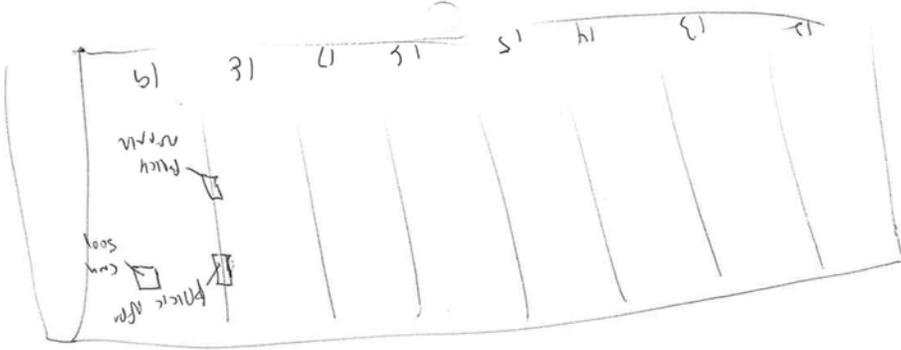


MSB_003

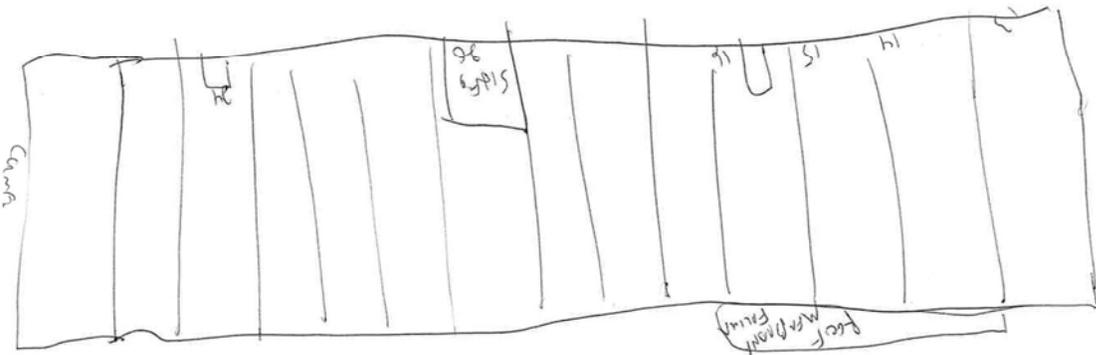
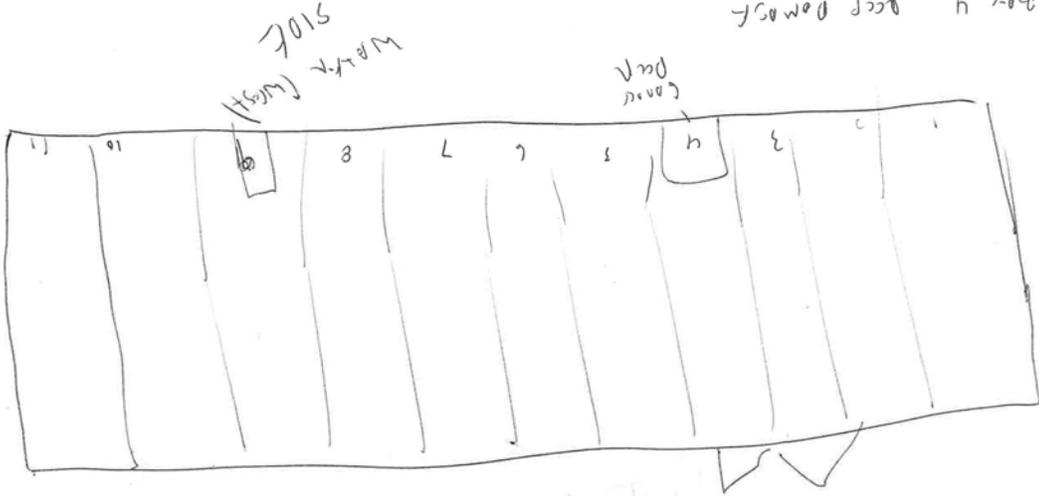
APPENDIX B

Field Notes

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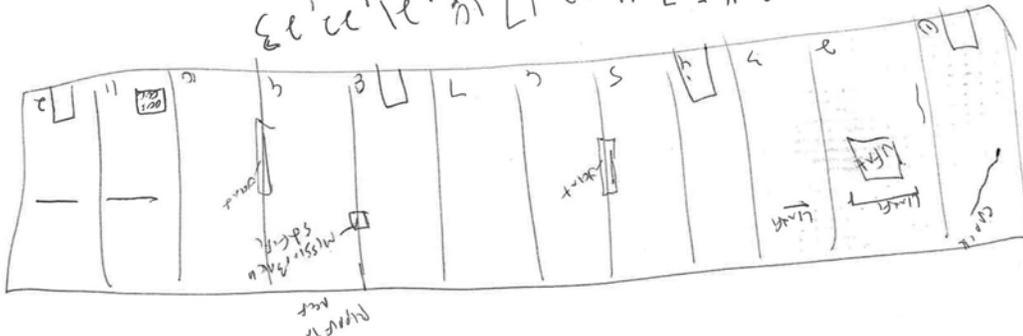


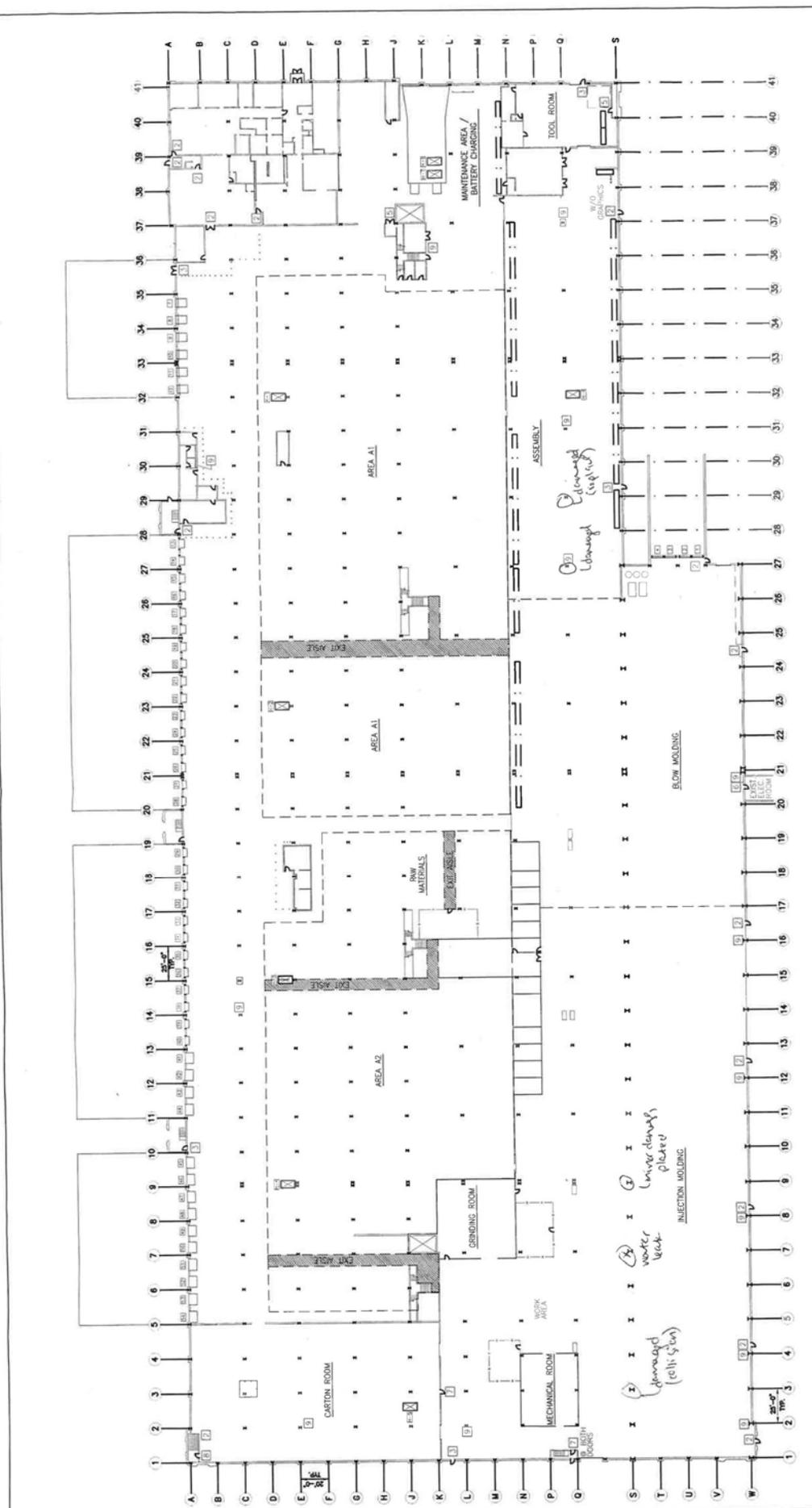
Day 4 Deep dorms
 Day 4 Lunch room to set up
 Day 0/1 Police appear & start taking photos



Day 5 School start
 Day 11 Top floor
 Lunch room 2nd floor

Lunch room 3, 4, 5, 7, 11, 12, 17, 18, 21, 22, 23





NO.	DATE	DESCRIPTION	BY

FIRST FLOOR EMERGENCY EXIT PLAN

901 FUHRMANN BOULEVARD
LAKESIDE TERMINAL "A"

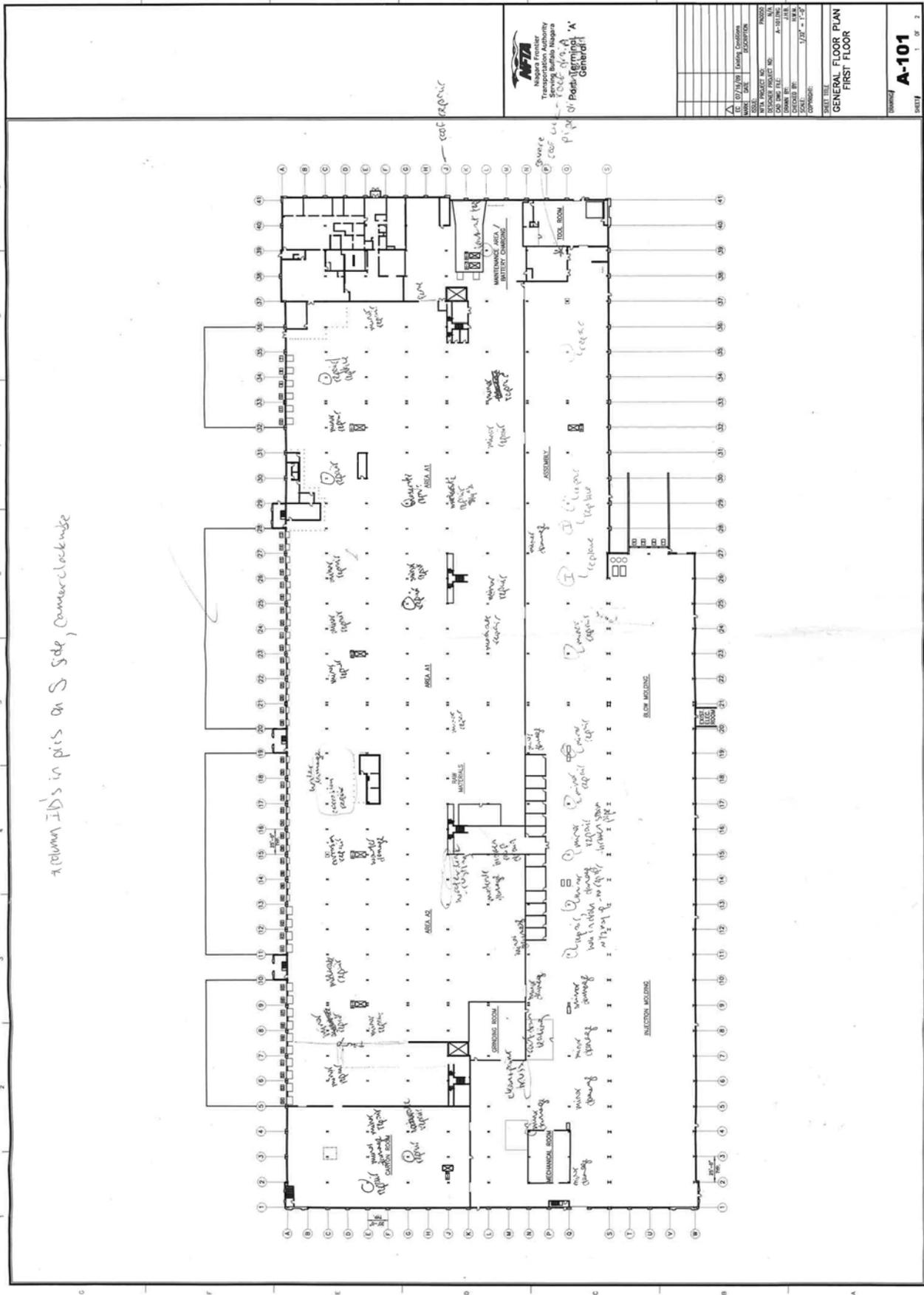
Didonato Associates, P.E., P.C.
Civil Engineers
1000 ...
DATE: 07/27/08
PROJECT NO: 08-0001
DRAWING NO: A-1

- SYMBOLS KEY:**
- [Symbol] EXISTING BUILDING
 - [Symbol] EXISTING MACHINERY
 - [Symbol] EXISTING MISC. STORAGE
 - [Symbol] EXISTING SIGNAGE
 - [Symbol] EXISTING HEAVY
- LEGEND:**
- [Symbol 1] FIRE EXIT SIGN ABOVE DOOR MISSING. NEW FIRE EXIT SIGN TO BE INSTALLED.
 - [Symbol 2] FIRE EXIT SIGN ABOVE DOOR WITH ILLUMINATION
 - [Symbol 3] FIRE EXIT SIGN ABOVE DOOR WITHOUT ILLUMINATION
 - [Symbol 4] FIRE EXIT SIGN SUSPENDED FROM CEILING WITHOUT ILLUMINATION
 - [Symbol 5] EMERGENCY EXIT SIGNAGE MOUNTED ON DOOR
 - [Symbol 6] EMERGENCY EXIT SIGNAGE MOUNTED ON DOOR "NOT AN EMERGENCY EXIT"
 - [Symbol 7] EMERGENCY EXIT SIGNAGE MOUNTED ON DOOR
 - [Symbol 8] EMERGENCY EXIT SIGNAGE MOUNTED ON DOOR
 - [Symbol 9] LOCKED DOOR
 - [Symbol 10] FIRE EXTINGUISHER LOCATION

FIRST FLOOR EMERGENCY EXIT PLAN

SCALE: 1/32" = 1'-0"

4 column JB's in piers on S side, commercial use



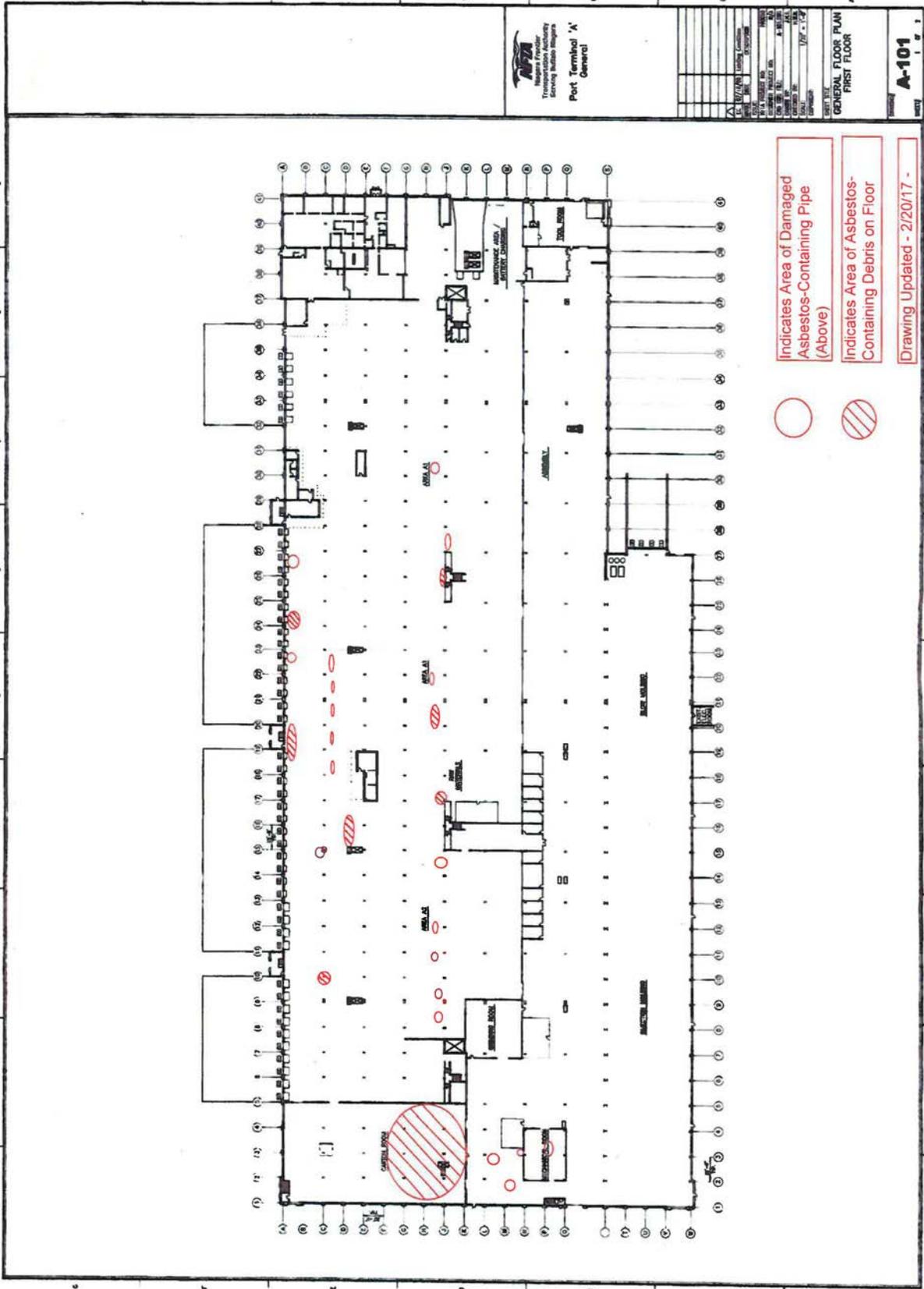
MFA
 Metro Franchise
 Transportation Authority
 1000 Bay Street, Suite 100
 San Francisco, CA 94133
 Phone: (415) 774-3000
 Fax: (415) 774-3001
 Website: www.metrotransit.org

PROJECT INFORMATION

PROJECT NO.	10000
DESIGNER PROJECT NO.	A-10101
DATE OF ISSUE	10/10/10
DATE OF REVISION	10/10/10
SCALE	1/2" = 1'-0"
DATE	10/10/10

GENERAL FLOOR PLAN
FIRST FLOOR

Sheet Title
A-101
 1 of 2





 The Nations Franchise

 The Nations Franchise

 Learning Nation's Empower

 Port Terminal 'A'

 General

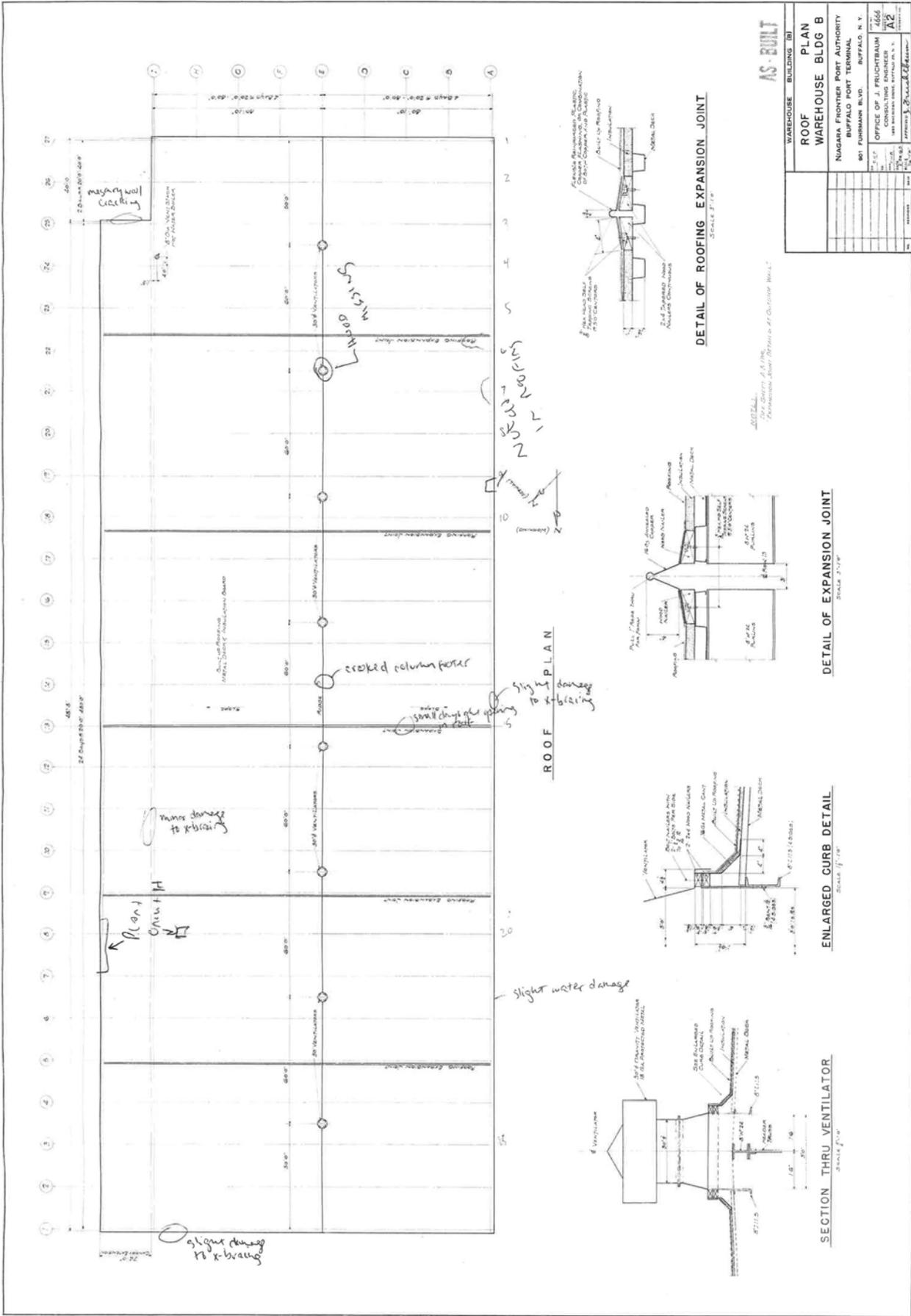
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3	02/20/17	ISSUED FOR CONSTRUCTION
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5	02/20/17	ISSUED FOR CONSTRUCTION
6	02/20/17	ISSUED FOR CONSTRUCTION
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99	02/20/17	ISSUED FOR CONSTRUCTION
100	02/20/17	ISSUED FOR CONSTRUCTION

SHEET TITLE
 GENERAL FLOOR PLAN
 FIRST FLOOR
 Drawing
A-101
 1 2 3

Indicates Area of Damaged
 Asbestos-Containing Pipe
 (Above)

Indicates Area of Asbestos-
 Containing Debris on Floor

Drawing Updated - 2/20/17 -



WAREHOUSE BUILDINGS (B)	
ROOF PLAN	WAREHOUSE BLDG B
NICHOLS FRUITERS PORT TERMINAL	
801 FERRISS BLVD. BUFFALO, N. Y.	
DATE	NOV 1955
PROJECT NO.	4656
OFFICE OF J. FRUCHTBAUM	ARCHITECTS
140 STATE ST. BUFFALO, N. Y.	
SCALE	AS-BUILT

DETAIL -
 THE SHIPPY, J. & PINE,
 EXPANSION JOINT BETWEEN 47 COLUMN ROWS.

DETAIL OF ROOFING EXPANSION JOINT
 SCALE 3/8" = 1'-0"

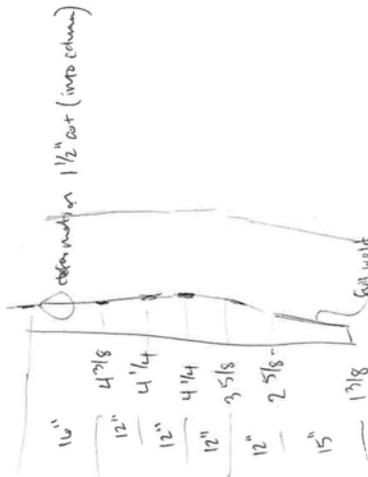
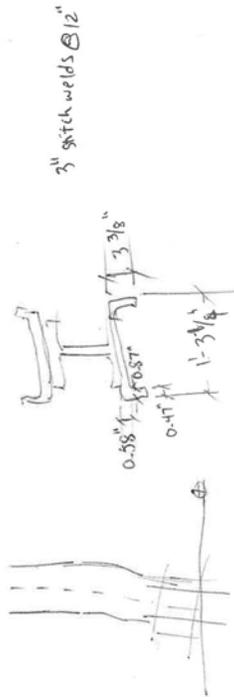
DETAIL OF EXPANSION JOINT
 SCALE 3/8" = 1'-0"

ENLARGED CURB DETAIL
 SCALE 1/2" = 1'-0"

SECTION THRU VENTILATOR
 SCALE 3/8" = 1'-0"

bay 9, water side - minor water damage

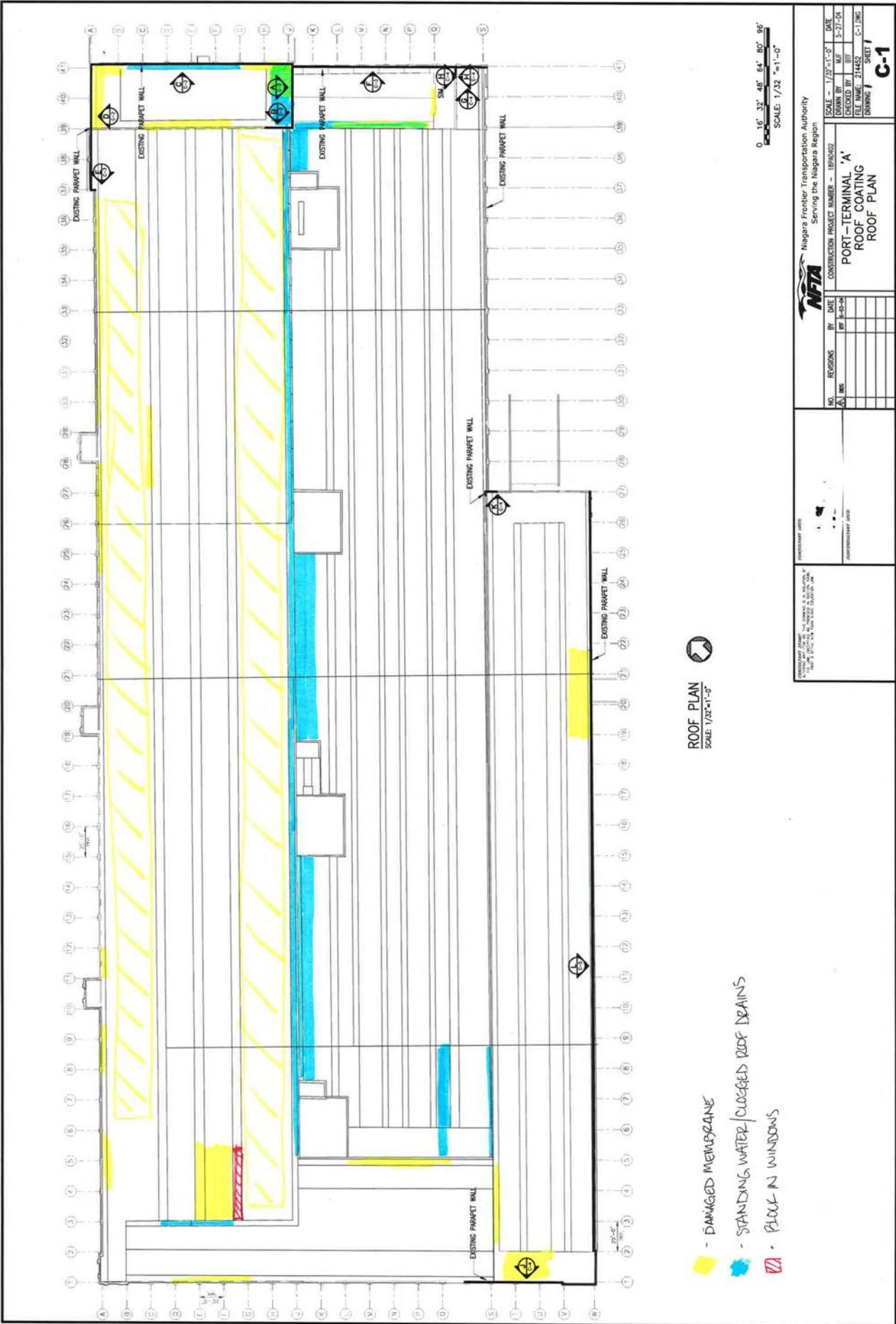
view



Admin Bldg

- Broken drain pipe from roof

DRAFT



ROOF PLAN
SCALE: 1/32"=1'-0"

- - DAMAGED MEMBRANE
- - STANDING WATER / CLOGGED ROOF DRAINS
- - BLOCK-IN WINDOWS

0' 16' 32' 48' 64' 80' 96'
SCALE: 1/32"=1'-0"

		Niagara Frontier Transportation Authority Serving the Niagara Region	
		CONSTRUCTION PROJECT NUMBER - 18R0402	DATE 5-27-01
NO. REVISIONS BY DATE	DRAWN BY M.F.	CHECKED BY D.F.	FILE NAME: 214452
1 A	1 M.F.	1 D.F.	C-1.DWG
PROJECT NAME: PORT-TERMINAL 'A' ROOF COATING		DRAWING / SHEET / C-1	

APPENDIX C

Construction Estimate

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Buffalo Outer Harbor
Outer Harbor Building Condition Assessment
Estimated Cost of Construction
Draft Estimate
5/19/2017

	Quantity	Unit	Unit Cost	Total Cost
Terminal A				
Roof Demolition	80000	SF	\$ 1.00	\$ 80,000.00
Membrane Replacement (Roof System)	80000	SF	\$ 5.00	\$ 400,000.00
Membrane Patching	100	SF	\$ 2.50	\$ 250.00
Clean out Roof Drains	25	EA	\$ 150.00	\$ 3,750.00
Repair/Replace Drain Piping	25	EA	\$ 300.00	\$ 7,500.00
Block and Seal Monitor Windows (insulated panels)	5000	SF	\$ 20.00	\$ 100,000.00
Masonry Repointing	1120	SF	\$ 16.00	\$ 17,920.00
Crack Repair	1120	LF	\$ 130.00	\$ 145,600.00
Column Repair/Replacement	5	EA	\$ 2,500.00	\$ 12,500.00
Terminal B				
Roof Expansion Joint Repair	1860	SF	\$ 2.50	\$ 4,650.00
Remove Vegetation	10	SF	\$ 50.00	\$ 500.00
Membrane Patching	1000	SF	\$ 2.50	\$ 2,500.00
Crack Repair	363.0	LF	\$ 130.00	\$ 47,190.00
Administration Building				
Masonry Repointing	71	SF	\$ 16.00	\$ 1,139.20
Crack Repair	71	LF	\$ 130.00	\$ 9,256.00
Membrane Patching	333	SF	\$ 2.50	\$ 832.50
Exterior Steel Removal	3000	LB	\$ 4.00	\$ 12,000.00
Blue Building				
Masonry Repointing	39	SF	\$ 16.00	\$ 624.00
Crack Repair	39	LF	\$ 130.00	\$ 5,070.00
Marina Office Building				
Marina Maintenance Building				
Masonry Repointing	36	SF	\$ 16.00	\$ 576.00
Crack Repair	36	LF	\$ 130.00	\$ 4,680.00
Lintel Repair	3	EA	\$ 150.00	\$ 450.00
Quay Wall		SF	\$ -	\$ -
SUBTOTAL				\$ 856,987.70
Misc.				
Mobilization (4% Construction Cost)		LS		\$ 34,279.51
Field Construction Allowance (5% Construction Cost)		LS		\$ 42,849.39
TOTAL				\$ 934,116.59

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