

Condition Assessment and Report of Findings

Town of Holden Beach

Holden Beach Pier

Repair or Replacement Design

Holden Beach, North Carolina April 7, 2025

PRELIMINARY

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION BIDDING OR PERMIT PURPOSES

ENGINEER Luke Cressman, PE

REGISTRATION NO. 055975

DATE: April 7, 2025

REVISION HISTORY

Rev.	Issued Date	Description	Reviewed	Approved
A	4/7/2025	Draft for Review	ALV	LRC

Contents

1		Executive Summary	1
	1.1	Overview	1
	1.2	Findings	1
	1.3	Recommendations	4
2		Introduction	5
	2.1	Authorization / Background	5
	2.2	Purpose and Scope	5
	2.3	Report Terminology and Rating System	£
3		Summary of Findings	6
	3.1	Field Investigation / Methodology	6
	3.2	Superstructure	€
	3.3	Substructure and Foundations	9
	3.4	Summary of Deficiencies	12
4		Repair Option Considerations	14
	4.1	Existing Piles & Remaining Useful Service Life	14
	4.2	Design Loading and Operations for Existing Structure	15
	4.3	ADA Compliance	18
	4.4	Construction Methodology	15
5		Summary and Recommendations	
	5.1	Summary	18
	5.2	Recommendations	18
6		References	18

Tables

Table 1 - Condition Assessment Summary	2
Table 2 - Summary of Deficiency Quantities by Pier Section	
Table 3 - Condition Assessment Summary	
Figures	
Figure 1 - Holden Beach Fishing Pier Plan View and Project Stationing	1
Figure 2 - Holden Beach Fishing Pier Plan View and Project Stationing	5
Figure 3 - Narrow Pier Segment	7
Figure 4 - Wide Pier Segment	7
Figure 5 - Balcony Area Between Sta 0+75 and 0+90	8
Figure 6 - Typical Bent	10
Appendices	
Appendix A – Field Notes	
Appendix B – Town Provided Information	
Appendix C – Photo Log	
Appendix D - Condition Assessment Terminology	

This page is intentionally left blank.

1 Executive Summary

1.1 Overview

The recreational fishing pier and historic pier house in Holden Beach, North Carolina are in disrepair and have been closed off to the public. The Town of Holden Beach (Town) has asked HDR to perform a site investigation of their historic fishing pier, shown in Figure 1.

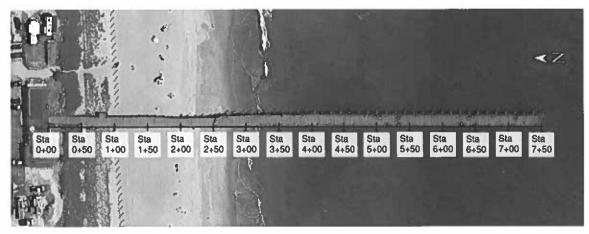


Figure 1 - Holden Beach Fishing Pier Plan View and Project Stationing

On March 3, 2025, HDR conducted a site investigation and condition assessment as defined in the "Waterfront Facilities Inspection and Assessment – Manuals and Reports on Engineering Practice No. 130" published by the American Society of Civil Engineers. The deficiencies recorded have been divided into the following condition assessment categories in line with ASCE's published condition assessment ratings:

- 1. Good (No repairs required)
- Satisfactory (No repairs required)
- 3. Fair (Low priority repair)
- 4. Poor (Moderate priority repair)
- Serious (High to very high priority repairs)
- Critical (High to very high priority repairs)

1.2 Findings

The field investigation of the timber pier was performed from both the pier topside and from below along the beach shoreline to collect data and photos of the pier superstructure and above waterline substructure elements. The substructure investigation from the shore was performed at low tide in order to capture as much of the pier's timber pilings as observable. The structure was divided into four sections or areas:

- Access Ramp Section (Sta 0+00 to 0+75)
- Balcony Viewing Area (Sta 0+75 to 0+90)
- Narrow Pier Segment (Sta 0+75 to 2+50)
- Wide Pier Segment (Sta 2+50 to 7+50)

The overall assessment of the timber recreational pier is in POOR condition and displays varying degrees of individual deterioration as represented in Table 1. In general, the condition of superstructure elements exhibits a higher degree of damage or deficiencies relative to the substructure components.

Table 1 - Condition Assessment Summary

Location	Access Ramp Section	Balcony Area	Narrow Pier Segment	Wide Pier Segment
Superstructure	POOR ¹	CRITICAL	POOR	SERIOUS
Substructure	FAIR ¹	POOR	FAIR	POOR

The pier's superstructure, which includes the deck boards, support joist, handrails, etc., is heavily deteriorated, warped and/or damaged with deficiencies consisting of checks, splits, gouges, and railing failures, and should be entirely replaced.

- The handrails and rail post hardware connections are in CRITICAL condition, particularly the eastern rail. The hardware and rail posts are damaged and heavily corroded and therefore insufficient in transferring or supporting the required OSHA rail load standards.
- There are numerous timber deck boards inadequately connected to the supporting joists as well as several locations where the deck boards deflect excessively under pedestrian loading.
- The spacing between the existing primary timber support joists was field measured at approximately 30-in on center at several locations. The deck boards overlaid atop of the timber joists were visually observed to consist of nominal 2x6 boards. Industry standard spacing recommendations for support joists is 24-in on center to support the serviceability requirements for typical pedestrian loading on recreational piers (assuming 2x6 deck boards).
- Timber rotting / cross-section loss of the primary timber support joists at multiple locations was also observed and in POOR or SERIOUS condition.
- The balcony or viewing pavilion located near station 0+85 was observed to be in CRITICAL condition with deficiencies including failed handrails, loose deck boards, corroded steel hardware, rotted supports, and hollowed timber piles.

The condition of the existing substructure, consisting of pressure treated timber pilings, timber bent caps and timber cross-bracing, was observed to range from FAIR to POOR overall, with individual elements being more serious. Furthermore, the condition assessment was limited to what was visually observed above the waterline at the time of the investigation. Additional deficiencies may exist below the waterline.

 The general condition of pilings that could be visually observed from shore or the pier topsides is FAIR. However, multiple pilings were noted to be in POOR to SERIOUS condition, including a cluster of pilings near the shoreline at low tide. The pier structure

Ramp Section needs to be completely replaced due to ADA non-compliance

consists of approximately 64 total bent systems. Piling and pile bents beyond Station 4+00 were not able to be completely assessed due to the water inaccessibility. Considering the pile bents that were visually observable from both topsides and underneath (approximately 40 of the 64 bents), over 30% of these assessed bent systems were noted to have some piling damage, deterioration or degree of deficiencies requiring repair. It can be reasonably assumed the degree of damage of the bent systems / pilings not assessed have similar if not further degree of deterioration.

- The overall condition of the timber pile caps is FAIR; however, timber rot of the pile caps supporting the timber joists was recorded at several locations. The nominal size of the timber pile caps at each bent system varied between 8x10 to 10x10. Considering the pile bents that were observable (as noted in the previous bullet), over 25% of these timber bents were noted to have some structural deficiencies.
- Several existing cross-bracings were observed to be in POOR or SERIOUS condition.
 There are multiple locations where cross bracing has either split or separated at its
 connection to the piles, rendering the member ineffective. Some bracings are broken,
 snapped, or missing and need to be replaced. When only considering the pile bents
 that were observable, over 40% of these pile bents were observed to have some crossbracing deficiencies.
- The majority of the existing bolted hardware connections have experienced heavy corrosion, section loss, or failure and are classified in POOR to SERIOUS condition.
- There are numerous locations of deteriorated, missing and/or failed hardware connections between the existing timber piles and the timber pile cap.

Additional factors and considerations affecting the condition of the structure includes:

- Limited remaining useful service life of the existing timbers. Timber substructure elements are understood to be a minimum of 25 years old.
- Insufficient or minimal information is available regarding the design loadings for the existing timber pier structure.
- Insufficient or minimal official information is available regarding the as-built condition
 of the foundation pilings. Strike tests would be recommended to understand the in-situ
 capacity of the existing piles.
- The substructure and superstructure for the Ramp Section will be required to be entirely replaced in order to meet federal ADA requirements for pedestrian access.
- The anticipated construction means and methods that would be required to perform a large quantity of the localized repairs would be similar to those needed for new construction (i.e. construction from a work barge in the water OR building out a working jetty (sand or gravel deposit) parallel to the pier. It is HDR recommendation that machinery and/or construction equipment shall NOT be utilized atop of the existing pier deck for operations in the structures present deteriorated state.

1.3 Recommendations

In summary, the overall condition of the existing fishing pier was assessed to be in POOR condition and HDR recommends replacing the timber superstructure in its entirety. The pier approach (superstructure and substructure) will also be required to be rebuilt and reconfigured to satisfy federal ADA requirements. The existing substructure has many structural deficiencies which would require extensive repairs and is currently at the end of its useful service life. This coupled with the fact the recommended construction methods would be similar for both repair and replacement options supports the conclusion that repairing the existing pier would not be structurally cost effective, nor would it provide the longevity or service life that results from replacing the timber fishing pier. Therefore, it is HDR's recommendation that the Town of Holden Beach consider a pier replacement option only.

2 Introduction

2.1 Authorization / Background

The work outlined in this study was authorized by the Town of Holden Beach, North Carolina (Town). The Town is a municipal corporation located in Brunswick County, North Carolina serving a community of nearly 1,000 year-round residents and a higher seasonal population. The work performed herein is in accordance with HDR's proposal dated January 27, 2025, and agreed to on February 11, 2025.

2.2 Purpose and Scope

The recreational fishing pier and historic pier house in Holden Beach are in disrepair and have been closed off to the public. The pier is over 65 years old. The Town has retained HDR to provide preliminary design and cost estimating services related to revitalizing the historic fishing pier. As part of the repair design, the Town has asked HDR to perform a site investigation and condition assessment of their historic fishing pier, shown in Figure 2.

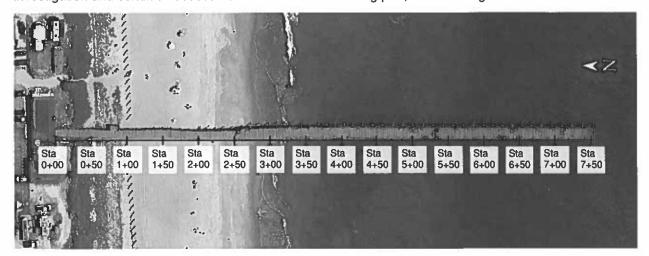


Figure 2 - Holden Beach Fishing Pier Plan View and Project Stationing

The 750-ft long recreational fishing pier consists of a timber superstructure (i.e. deck boards, joists, handrails, benches, appurtenances, utility poles, etc.) supported by a timber substructure comprised of a series of pile bent systems (i.e. piles, bracing, pile cap, etc.). There are 64 substructure bents are generally spaced 12-ft apart. For the purpose of this field investigation, project stationing started at the pier house and ended at the end of the existing pier, as seen in Figure 2. Evidence of previous repairs to structure were noted during the field investigation.

2.3 Report Terminology and Rating System

Throughout this document, references are made to the American Society of Civil Engineers' (ASCE) Waterfront Facilities Inspection and Assessment, Standard Practice Manual, ASCE Manuals and Reports on Engineering Practice No. 130, herein referred to as ASCE, or ASCE guidelines. This document was used as the basis for the condition rating system to rate the individual components as well as the structure's overall condition on a scale from GOOD to CRITICAL. Refer to Appendix D for a detailed description of the condition assessment ratings.

The field investigation performed is classified by ASCE as a special purpose inspection. Special purpose inspections are conducted to collect more detailed information than normally collected during a routine or structural repair or upgrade design inspection. Such information may be necessary to understand the nature and/or extent of deterioration prior to determining the need for any type of repairs. Special purpose inspections may also be utilized to generally estimate the approximate remaining useful life of the structure.

The field observations consisted of both a Level I and Level II inspection according to the ASCE guidelines. A Level I inspection generally consists of a non-destructive visual inspection of the system which is detailed enough to identify major or large areas of damage or deterioration. It also confirms the structural continuity of members. A Level II inspection is more detailed and intended to detect and identify damaged and deteriorated areas that may be hidden on the surface. For this investigation, this included occasional probing of various components to determine their soundness.

3 Summary of Findings

3.1 Field Investigation / Methodology

General conditions of the timber pier as shown in Figure 2 along with the typical deficiencies encountered are described in the following sections. The deficiencies are divided into following condition assessment categories in line with ASCE's condition assessment ratings:

- 1. Good (No repairs required)
- 2. Satisfactory (No repairs required)
- 3. Fair (Low priority repair)
- 4. Poor (Moderate priority repair)
- 5. Serious (High to very high priority repairs)
- 6. Critical (High to very high priority repairs)

Localized and general deficiencies have been captured in the Photo Log in Appendix C. Photo numbers referenced in this report refer to the numbering identifier in the Photo Log of Appendix C.

The field investigation of the timber pier was performed from both the pier topside and from the beach shoreline to collect data and photos of the pier superstructure and accessible substructure elements. The substructure investigation from the shore was performed at low tide in order to capture as much of the pier's structural pilings as observable.

3.2 Superstructure

The superstructure generally consists of nominal 2" x 6" or 2" x 8" timber decking supported by a series of 3" x 10" joists. The overall width of the timber fishing pier is approximately 12'-0" wide from station 0+00 to 2+50 and then widens to approximately 16'-0" wide from station 2+50 to the end of the pier structure (approximately station 7+50). See Figure 3 and Figure 4 below for typical superstructure details. The fishing pier has side rails that extend approximately 45-inches above the top pedestrian walking surface with 2" x 4" midrails and 2" x 6" toe boards. The top rail is an angled 2" x 10" board. The rail posts alternate between 4"x4" and 4"x6" posts spaced approximately 4-feet on center. Public features atop of the fishing pier structure begin

at approximately station 3+25 and consist of various timber benches (spaced about 12-feet on center), a fish cleaning station as well as water and electric utility tie-ins located at station 4+85.

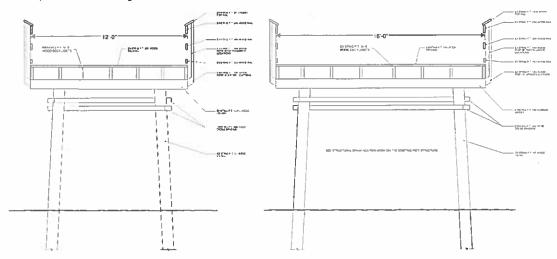


Figure 3 - Narrow Pier Segment

Figure 4 - Wide Pier Segment

3.2.1 Access Ramp Section (Sta 0+00 to Sta 0+75)

The access ramp section from the pier house to the top of pier walking elevation is approximately 75-ft long. For security purposes, the side railing has a continuous chain link fence to prevent unwanted access to the recreational pier. Deficiencies observed include

- Missing or broken railing elements (Photo 1)
- Cut or disconnected chain link fence (Photo 1)
- Checks and flaking in edge joist (Photo 2)

As shown in Photo 1 of Appendix C, the typical side rails, toe boards, and chain link fencing are in POOR condition. There are over 12 locations where the toe boards, midrails, rail posts, and top rails are disconnected and/or split. The chain link fence has also been cut or disconnected in at least 3 locations, Structurally, the railings are POOR, and the deck boards appear SATISFACTORY. However, it was noted that the ramp does NOT meet federal ADA requirements for pedestrian access and would require to be reconfigured and/or replaced.

3.2.2 Balcony Viewing Area (Sta 0+75 to Sta 0+90)

At the end of the access ramp or start of the main pier, there is a balcony area that acts as an overlook for the beach (Figure 5). The balcony superstructure is in CRITICAL condition overall. Deficiencies observed include:

- Railing detachment and failure (Photo 5)
- Loose and soft deck boards
- Split rail posts (Photos 3 and 6)
- Corroded steel hardware (Photo 6 and 67)
- Hollow pile (Photos 4).

While timber piles are a substructure element, the pile top was observed from the balcony as hollowed. Individually, the railing is in CRITICAL condition while the deck boards and hollowed pile are in POOR to SERIOUS condition. The hardware is heavily corroded with sections of failed timber railing and therefore insufficient in transferring or supporting the required OSHA rail load standards.



Figure 5 - Balcony Area Between Sta 0+75 and 0+90

3.2.3 Narrow (12-ft Wide) Pier Segment (Sta 0+75 to Sta 2+50)

The main recreational pier is comprised of two segments – a narrower 12-ft wide section that extends from the top of the access ramp (STA 0+75) to approximately station 2+50 and then transitions to a wider 16-ft wide pier section to the end of the pier. The Narrow (12-ft wide) Pier Segment superstructure is in POOR condition overall. Deficiencies observed include:

- Missing rail elements (Photo 7)
- Edge joist deterioration and splitting (Photos 8 and 11)
- Corroded connection hardware (Photo 11)
- Past joist splice/replacement (Photo 12).

The eastern railing and rail posts have connection issues between Sta 1+00 to approximately 1+50 and are in SERIOUS condition overall with stretches of CRITICAL condition. These railings are insufficient in transferring or supporting the required OSHA rail load standards.

3.2.4 Wide (16-ft Wide) Pier Segment (Sta 2+50 to Sta 7+50)

The main recreational pier widens around Sta 2+50 from 12-ft wide to 16-ft wide and continues at 16-ft wide until the end of the pier. As discussed previously, this pier segment includes timber benches and a fish cleaning station (Photo 32). The Wide Pier Segment superstructure is in POOR to SERIOUS condition overall. Deficiencies observed include:

- Warping joist and top deck from Sta 3+25 to about 4+25 (Photos 17 and 18)
- Missing joists between Sta 3+80 to 4+10 (Photos 24 and 25)
- Observed 30-in joist spacing (Photo 24 and 25)
- Joist checking and splitting (Photo 15)
- Corroded connection hardware (various Photos 13-56)
- Disconnected or broken railing elements (Photos 13, 22, 42, 43, 45, 50, 53, & 54)
- · Loose and soft deck boards from
 - Sta 3+55 to Sta 3+65
 - Sta 3+85 to Sta 3+95
 - Sta 5+00 to Sta 5+50
 - Sta 5+75 to Sta 6+50
 - Sta 6+75 to Sta 7+50
- Cracked PVC utility conduit (Photo 31)

Photos 13-56 of Appendix C cover the photographed deficiencies observed from the topside pier investigation of the Wide Pier Segment. Of these deficiencies noted, the most widespread issues are the deck warping and the missing and replacement joists.

The spacing between the existing primary timber support joists in these repaired locations was field measured at approximately 30-in on center. The currently installed deck boards were field measured as 2" x 6" timbers. To support the constructed 2"x6" timber deck planks for both structural and serviceability requirements, the industry recommended joist spacing for pedestrian loadings on recreational piers is typically 24-in on center. As a result, many locations where the spacing exceeds 24" exhibit large deformations under gravity pedestrian loadings. Furthermore, there are numerous timber deck boards inadequately connected to the supporting joists.

The deck warping observed is likely a result or combination of poor construction installation tolerances of uneven pile heights, joist rotting deterioration, and excessive deck board spacing. This is more of a serviceability deficiency as opposed to a structural deficiency with the exception of the joist rotting deficiency. Railing condition is rated as SERIOUS due to the safety implications from the various damage noted from missing top rails, mid rails, and toe boards.

3.3 Substructure and Foundations

The substructure generally consists of a two-pile bent with a 10x10 timber pile cap or transfer beam above the timber piles. The diameters of the timber piles were field measured at various locations and heights due to the current pier being comprised of a mix of original aged piles

and newer repair timber piles. The measured diameters ranged from just over 12-in to 8.5-in each with varying conditions. It is assumed the original pile size installed consisted of a combination of 12-in and 10-in diameter piles. The pile lengths and subsequent embedded penetration below the ground surface is unknown at the time of this investigation report. The image shown in Figure 6 below was provided to HDR by a contractor who performed repair work on the pier circa year 2000/2001. The sketch indicates that the piles should have been installed with 14.5-ft below ground surface penetration.

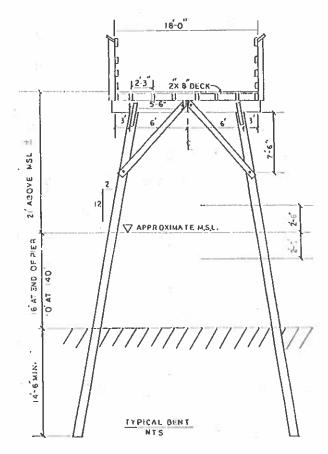


Figure 6 - Typical Bent

3.3.1 Access Ramp Section (Sta 0+00 to Sta 0+75)

The access ramp from the pier house to the top of pier walking surface elevation is approximately 75-ft long. The ramp's substructure is in FAIR condition overall, though there are individual components that range from POOR to SERIOUS. Deficiencies observed include:

- Exterior rot and interior pile hollowing (Photos 57 and 58)
- Cross bracing splits and checks (Photos 59)
- Corroded connections between piles and cross bracing (Photos 61 and 62)

Additionally, it was observed that the substructure is comprised of different structural elements. The largest pile was measured to have a diameter of 13.5-in versus the smallest pile was

measured to have a diameter of 8.5-in. The pile caps also were a blend of 10x10 and 8x10 members. Structurally, the timber members are generally FAIR, but the steel connections are POOR. However, as noted previously, the geometry of the superstructure ramp and subsequent support locations for the substructure elements does NOT meet federal ADA requirements for pedestrian access and would require to be reconfigured and/or replaced.

3.3.2 Balcony Viewing Area (Sta 0+75 to Sta 0+90)

At the end of the access ramp or the start of the main pier, there is a balcony area that acts as an overlook for the beach (Figure 5). The balcony area consists of 2 substructure support bents with the substructure rated in POOR condition overall, though there are individual components that are rated as SERIOUS, Deficiencies observed include:

- Corroded connections and steel hardware
- Rotted and deteriorated members (Photos 63, 65, and 66)
- Detached railing includes a disconnection of joist from pile cap (Photo 64)
- Checking and splitting of cross-bracing and support members (Photos 67 and 68)

Pile caps were observed to be 8x10 members under the balcony viewing platform and piles were measured to be 12-in in diameter. The SERIOUS elements include the rotting support and bracing members.

3.3.3 Narrow (12-ft Wide) Pier Section (Sta 0+75 to Sta 2+50)

The main recreational pier is comprised of two segments – a narrower 12-ft wide section that extends from the top of the access ramp (STA 0+75) to approximately station 2+50 and then transitions to a wider 16-ft pier section to the end of the pier. This pier segment consists of about 15 pile bent systems. The supporting substructure condition within the Narrow Pier Section is in FAIR condition overall, though there are individual components that are rated as either POOR or SERIOUS. Deficiencies observed include:

- Disconnected and failed bracing (Photo 73)
- Rotting pile caps (Photos 71, 72, and 74)
- Rotting and split joists (Photo 70)
- Checking and splitting of cross-bracing and support members (Photos 69 and 74)
- At least 3 hollow piles
- Corroded connections and steel hardware (Photos 75 and 76)

Pile caps were observed to generally be 10x10 members and piles were typically field measured as 12-in in diameter. The SERIOUS elements include the corroded/failed pile to pile cap connections and the disconnected and split bracing members which are no longer structurally effective.

3.3.4 Wide (16-ft Wide) Pier Section (Sta 2+50 to Sta 7+50)

The main recreational pier widens around Sta 2+50 from 12-ft wide to 16-ft wide and continues at 16-ft wide until the end of the pier. This pier segment consists of about 38 pile bent systems.

The supporting substructure condition within the Wide Pier Section is in POOR condition overall, though there are individual components that are rated as SERIOUS.

- Missing pile cross bracing between at least 10 different substructure bents (Miscellaneous Photos 19-56 and 79-90)
- Split or cracked piles (Photos 46 and 47)
- Pile necking, which refers to the reduction in critical pile diameter
- Corroded connections and steel hardware (Miscellaneous Photos 19-56 and Photos 80, 88, 89, and 90)
- Misaligned or damaged pile to pile cap connections (Photos 80, 81, 82, 88, and 89)
- Rotting pile caps and joists (Photos 85, 86, and 87)
- Pile gouging and flaking (Photos 34, 35, 37, 40, 51, 55, 56 and 83)

Pile caps were generally visually observed as 10x10 members, and the largest pile was field measured with a diameter of 12-in while the smallest pile diameter encountered was field measured as 10-in. The Town shall be advised that the limits of the substructure investigations was limited to the visual observations performed the beach shoreline around station 4+00 (Photo 84). The SERIOUS elements include the broken or missing lateral cross bracing members, the cracked piles, and the misaligned or damaged pile to pile cap connections which are not fully connected.

3.4 Summary of Deficiencies

The various deficiencies recorded and mentioned in the report are summarized below. Note that these deficiencies are limited to what was observed above the waterline at the time of observation. Additional deficiencies may potentially exist below the waterline. Deficiencies include:

Railing Element Damages: Missing, broken, or deteriorated top rails, mid rails, and toe boards are included under this category. Railing element damage is where an individual railing element has deteriorated to the point that the railing is unable to carry the OSHA required rail loading locally, but replacing the individual element in kind would restore the OSHA compliance.

- Railing Segment Failure: A railing segment failure occurs when the rail post or rail post connection has deteriorated to the point that the railing is detaching from the pier or is not structurally capable to resist or support the OSHA required rail loading as a system. Replacing an individual element would not be sufficient.
- Deck Board Deficiency: Deck board deficiency covers the condition when the main timber decking is inadequately connected to or supported by the transfer joists. Additionally, this includes locations where the boards appear to be "soft" or "flexible" and where section rot may be likely.
- 3. <u>Joist (Checks, Splits, etc.):</u> This covers various types of observed deterioration to the main support joist members. This includes:

- Checks or splitting (where the timber section starts to develop cracks or starts separating along the grain. These occur either along the member or at the connection point.)
- Flaking (where the timber is noticeable peeling, separating, or delaminating along the outer surface)
- Rotting (where timber organic material is decaying, and the timber was observed to be soft)
- Gouging (where the timber has localized recesses, divots, or seams usually caused external abrasion or erosion)
- Corroded Connections and Steel Hardware: Steel connection hardware such as bolts and nails are considered corroded if the thread or nut is no longer operable or if the section has experienced visually noticeable necking or loss of section.
- 5. <u>Pile Cap (Splits, Checks, etc.):</u> This covers various types of observed deterioration to the pile cap members. This includes:
 - Checks or splitting (where the timber section starts to develop cracks or starts separating along the grain. These occur either along the member or at the connection point.)
 - Flaking (where the timber is noticeable peeling, separating, or delaminating along the outer surface)
 - Rotting (where timber organic material is decaying and the timber was observed to be soft)
- 6. <u>Cross Bracing (Splits, Checks, etc.):</u> This covers various types of observed deterioration to the cross-bracing members. This includes:
 - Checks or splitting (where the timber section starts to develop cracks or starts separating along the grain. These occur either along the member or at the connection point.)
 - Flaking (where the timber is noticeable peeling, separating, or delaminating along the outer surface)
 - Rotting (where timber organic material is decaying and the timber was observed to be soft)
 - Broken / Missing / Disconnected (where the member is unable to carry load from one pile to the other)
 - Gouging (where the timber has localized recesses, divots, or seams usually caused external abrasion or erosion)
- 7. <u>Pile (Splits, Checks, Cracks, Flaking, etc.):</u> This covers various types of observed deterioration to the pile members. This includes:
 - Checks or splitting (where the timber section starts to develop cracks or starts separating along the grain. These occur either along the member or at the connection point.)

- Flaking (where the timber is noticeable peeling, separating, or delaminating along the outer surface)
- Misalignment (where the pile cap does not fully bear on the pile or where connection elements are missing such that load is not fully transferred from the pile cap to the pile as designed)
- Cracking (where the timber is splitting due to localized overstressing. This is different than checking or splitting due to the generation mechanism of the cracking)
- Gouging (where the timber has localized recesses, divots, or seams usually caused external abrasion or erosion)

Railing Failure Deficiency (LF of Pler) (EA) tc (FA) 60 0 0 >50% 1 2 2 Access 75 Ramp Section 2 >50% 1 2 15 15 15 10 1 Balcony Viewing Area 0 4 3 10 3 175 60 50 >50% Narrow Pier Seament 16 200 0 220 >50% 2 16 Wide Pier 500 2 Segment

Table 2 - Summary of Deficiency Quantities by Pier Section

4 Repair Option Considerations

The Town would like to consider the possibility and cost of performing isolated repairs to restore the functionality of the timber pier versus a complete replacement of the pier. In addition to the observed deficiencies from the site investigations, there are a few other considerations factors that impact the viability of a pier repair plan highlighted in the subsections below.

4.1 Existing Piles & Remaining Useful Service Life

The existing pilings are a combination of replacement and original timber piles. The replacement piles were noted as marine treated timber with 2.5 CCA (Chromated Copper Arsenate). The lifespan of marine timber treated with 2.5 CCA is on the order of 20-40 years. These replacement piles were installed circa 2000 according to the Town and are approximately 25 years old. Therefore, they are effectively near the end of their recommended service life. Existing pilings that were not a part of the pile replacement are likely significantly older. From field observations of the relative decay as well as review of the Town's provided documents, it is assumed the original piling could be over 50 years old (see Appendix B).

4.2 Design Loading and Operations for Existing Structure

Insufficient and/or minimal information is available regarding the design loadings for the existing timber pier structure. It should be noted that during the field investigation, the existing pier was observed to noticeably sway under cross current and normal wave loads. Additionally, several areas along the timber pier deck were observed to noticeably deflect under the investigation team's pedestrian walking load.

The design capacity of the existing piles is unknown. While a contractor provided a sketch of typical bent indicating 14.5 feet of penetration below ground surface (Figure 6), there are no official Town records of what was required or constructed. A pile strike testing program could be implemented and recommended to determine the in-situ geotechnical supporting capacity of the existing piles.

4.3 ADA Compliance

The access ramp section from station 0+00 to approximately 0+75 was noted as being noncompliant for ADA considerations as its slope is too steep and will need to be reconfigured or replaced prior to public access. This will require the substructure and respective superstructure between stations 0+00 and around 0+75 to be entirely reconstructed in order to meet federal ADA requirements for pedestrian access. Furthermore, this may impact the substructure interface transition at the start of the Narrow Pier Segment as the new modified ramp would need to tie into the restored pier.

4.4 Construction Methodology

The anticipated construction means and methods that would be required to perform a large quantity of the localized repairs would be similar to those needed for new construction (i.e. construction from a work barge in the water OR building out a working jetty (sand or gravel deposit) parallel to the pier. It is HDR recommendation that machinery and/or construction equipment shall NOT be utilized atop of the existing pier deck for operations in the structures present deteriorated state.

The substructure capacity would need to be verified prior to supporting construction equipment (as noted in Section 4.2), and it is HDR's opinion that modifications to the substructure (additional piles or closer pile bents) would be needed to support construction activities.

5 Summary and Recommendations

5.1 Summary

The overall assessment of the timber recreational pier is in POOR condition and exhibits varying degrees of individual deterioration as represented in Table 3. In general, the condition of the superstructure elements exhibits a higher degree of damage or deficiencies relative to the substructure components.

Table 3 - Condition Assessment Summary

Location	Access Ramp Section	Balcony Area	Narrow Pier Segment	Wide Pier Segment
Superstructure	POOR ²	CRITICAL	POOR	SERIOUS
Substructure	FAIR ²	POOR	FAIR	POOR

The pier's superstructure, which includes the deck boards, support joist, handrails, etc., is heavily deteriorated, warped and/or damaged with deficiencies consisting of checks, splits, gouges, and railing failures, and should be entirely replaced.

- The handrails and rail post hardware connections are in CRITICAL condition, particularly the eastern rail. The hardware and rail posts are damaged and heavily corroded and therefore insufficient in transferring or supporting the required OSHA rail load standards.
- There are numerous timber deck boards inadequately connected to the supporting joists as well as several locations where the deck boards deflect excessively under pedestrian loading.
- The spacing between the existing primary timber support joists was field measured at approximately 30-in on center at several locations. The deck boards overlaid atop of the timber joists were visually observed to consist of nominal 2x6 boards. Industry standard spacing recommendations for support joist spacing is 24-in on center to support the serviceability requirements for typical pedestrian loading on recreational piers (assuming 2x6 deck boards).
- Timber rotting / cross-section loss of the primary timber support joists at multiple locations was also observed and in POOR or SERIOUS condition.
- The balcony or viewing pavilion located near station 0+85 was observed to be in CRITICAL condition with deficiencies including failed handrails, loose deck boards, corroded steel hardware, rotted supports, and hollowed timber piles.

The condition of the existing substructure, consisting of pressure treated timber pilings, timber bent caps and timber lateral cross-bracings, was observed to range from FAIR to POOR overall, with individual elements being more serious. Furthermore, the condition assessment was limited to what was visually observed above the waterline at the time of the investigation. Additional deficiencies may exist below the waterline.

• The general condition of pilings that could be observed from shore or the pier topsides is FAIR. However, multiple pilings were noted to be in POOR to SERIOUS condition, including a cluster of pilings near the shoreline at low tide. The pier structure consists of approximately 64 total bent systems. Piling and pile bents beyond Station 4+00 were not able to be completely assessed due to the water inaccessibility. Considering the pile bents that were visually observable from both topsides and underneath (approximately 40 of the 64 bents), over 30% of these assessed bent systems were noted to have some piling damage, deterioration or degree of deficiencies requiring

² Ramp Section needs to be completely replaced due to ADA non-compliance

repair. It can be reasonably assumed the degree of damage of the bent systems / pilings not assessed have similar if not further degree of deterioration.

- The overall condition of the timber pile caps is FAIR; however, timber rot of the pile caps supporting the timber joists was recorded at several locations. The nominal size of the timber pile caps at each bent system varied between 8x10 and 10x10. Considering the pile bents that were observable (as noted previously), over 25% of these timber bents were noted to have some structural deficiencies.
- Several existing lateral cross-bracings were observed to be in POOR or SERIOUS condition. There are multiple locations where cross bracing has either split or separated at its connection to the piles, rendering the member ineffective. Some bracings are broken, snapped, or missing and need to be replaced. When only considering the pile bents that were observable, over 40% of these pile bents were observed to have some cross-bracing deficiencies.
- The majority of the existing bolted hardware connections have experienced heavy corrosion, section loss, or failure and are classified in POOR to SERIOUS condition.
- There are numerous locations of deteriorated, missing and/or failed hardware connections between the existing timber piles and the timber pile cap.

Additional factors and considerations affecting the condition of the structure includes:

- Limited remaining useful service life of the existing timbers. Timber substructure elements are understood to be a minimum of 25 years old.
- Insufficient or minimal information is available regarding the design loadings for the existing timber pier structure.
- Insufficient or minimal official information is available regarding the as-built condition
 of the foundation pilings. Strike tests would be recommended to understand the in-situ
 capacity of the existing piles.
- The substructure and superstructure for the Ramp Section will be required to be entirely replaced in order to meet federal ADA requirements for pedestrian access.
- The anticipated construction means and methods that would be required to perform a large quantity of the localized repairs would be similar to those needed for new construction (i.e. construction from a work barge in the water OR building out a working jetty (sand or gravel deposit) parallel to the pier. It is HDR recommendation that machinery and/or construction equipment shall NOT be utilized atop of the existing pier deck for operations in the structures present deteriorated state.

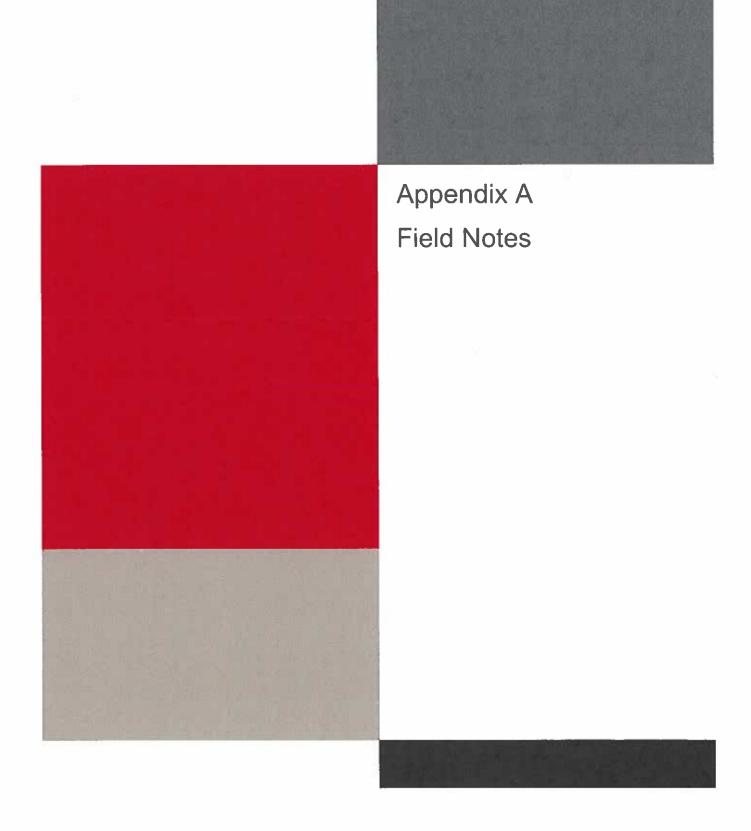
After visiting the site and performing a level I and level II condition assessment of the pier, HDR does not recommend pursuing isolated repairs or relying on the existing substructure to restore the existing timber fishing pier.

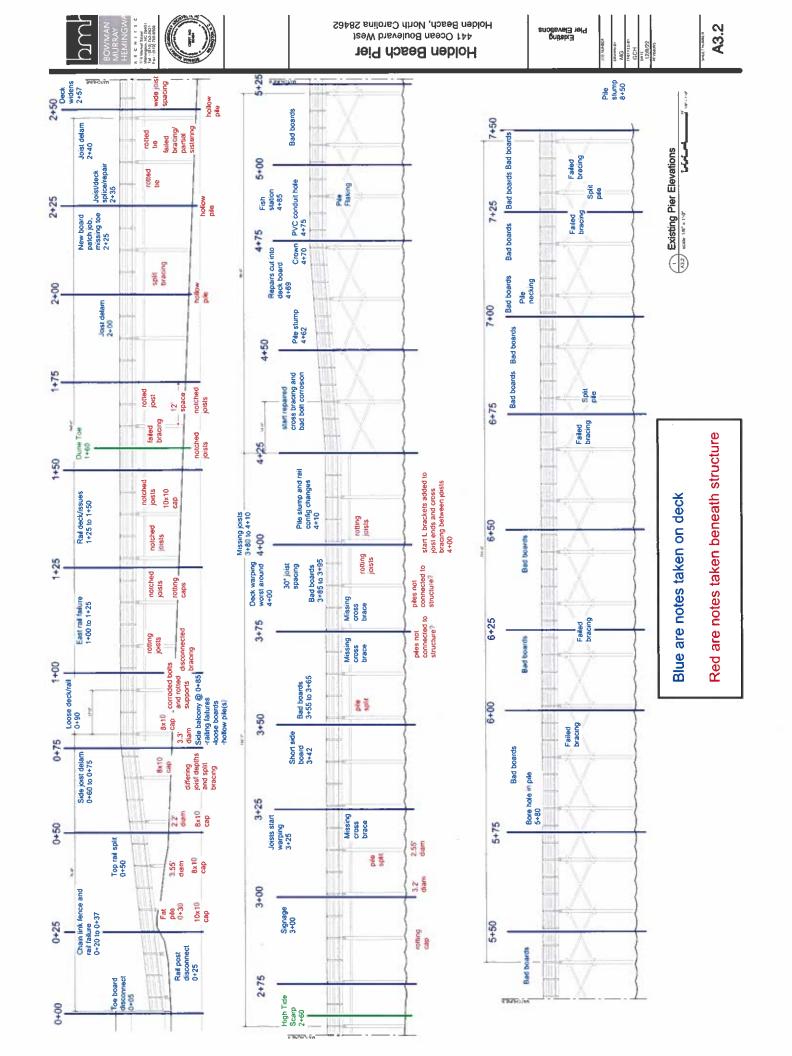
5.2 Recommendations

In summary, the overall condition of the existing fishing pier was assessed to be in POOR condition and HDR recommends replacing the timber superstructure in its entirety. The pier approach (superstructure and substructure) will also be required to be rebuilt or reconfigured to satisfy federal ADA requirements. The existing substructure has many structural deficiencies which would require extensive repairs and is currently at the end of its useful service life. This coupled with the fact the recommended construction methods would be similar for both repair and replacement options supports the conclusion that repairing the existing pier would not be structurally cost effective, nor would it provide the longevity or service life that results from replacing the timber fishing pier. Therefore, it is HDR's recommendation that the Town of Holden Beach consider a pier replacement option only.

6 References

Heffron, Ronald E., & Coasts, Oceans, Ports and Rivers Institute (American Society of Civil Engineers. (2015). *Waterfront Facilities Inspection and Assessment*. Reston, Va.: American Society of Civil Engineers.

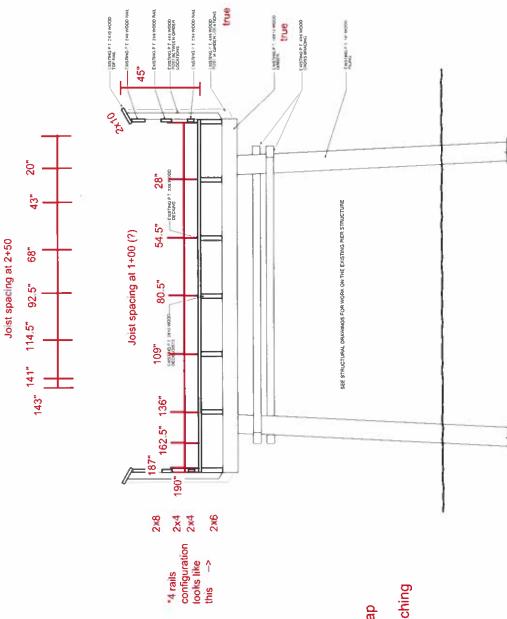




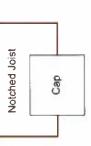
Existing Pier Section

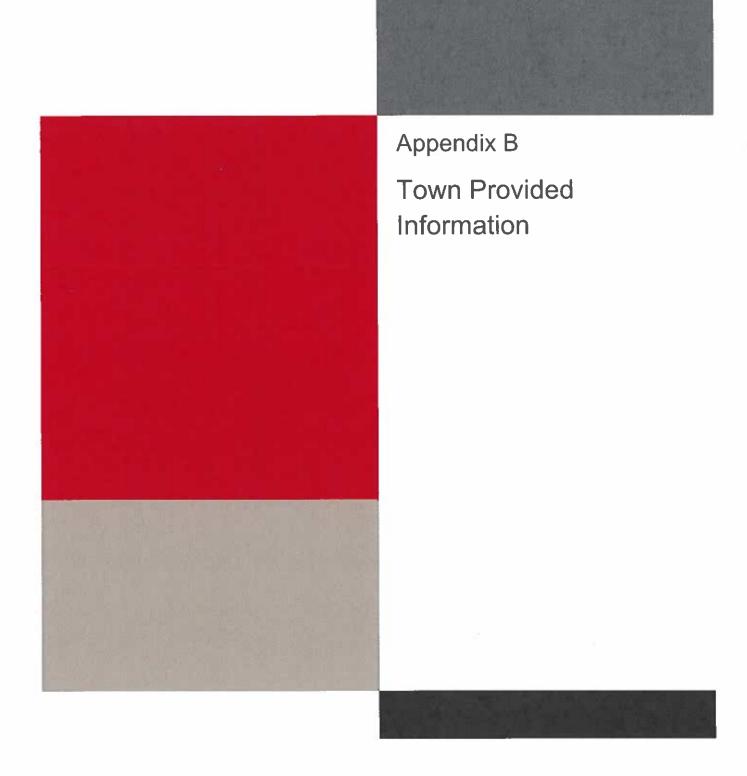
Note - there are mixed joist sizing throughout structure





several bents have this notching Joists are cut around the cap 11" to 9.5"





Holden Beach, North Carolina 28462

441 Ocean Boulevard West Holden Beach Pier Renovation



2

Cover Sheet, Drawing Index Building Data, Life Safety Plan

Existing / Demo Floor Plan Conceptual Floor Plan Existing / Demo Élevations

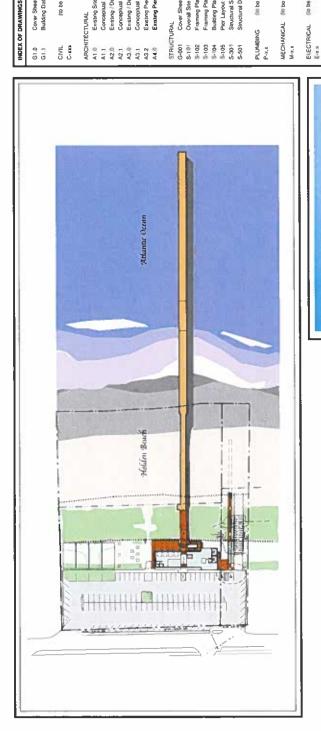
Existing Site Plan

Conceptual Elevations
Existing Pier Elevations
Existing Pier Section

Cover Sheet Overall Site Plan

Holden Beach Pier Renovation The Town of Holden Beach

Holden Beach, North Carolina 28462 441 Ocean Boulevard West









Bowman Murray Hemingway Architects, PC 514 Market Street Wilmington, North Carolina 28401 Phone (910) 762-2621 www.bmharch.com

Civil Engineering & Structural: Andrew Consulting Engineers P. C. 3811 Peeakhtee Avenue, Suite 300 Wilmingon. NC 28403 (910) 202-5655

Plumbing, Mechanical & Electrical: CBHF Engineers, PLLC 2246 Yaupon Drive Wilmington, NC 28401 (910) 791-4000

Nama of Propert. Heidern Bugt'n Pay Rendy phop.	TBD) UPI SAFETY SY
Automin 441 Ocean Bhyll Mont, Indition Now?, MC	Emphasics Lighting 1 to 100 Year
and Tache Sives Concessions, Public Ress	
Discount of Authorized Agent III	Smoth Describes Symmes 199 to 1 to 1 to 1
Cey / County	
Code Entercement Junistantistan. Cen. revites thanh. County	
LEAD DEBACH PROFESSIONAL 1mm	
CAER FEM. Impro	
994	[TBD] LIFESARTY PLANEOUNCHOUS
	Cate Salary Plan Shoot # 20
Structural Augus (sumbra furtural field in Augus Lifes Hr 25245)	Contract and contract and contract and contract and contract and contract and
Other Control of the	Section 1 to 1
	Occupant bads for each area
2911 INC EXISTING BUILDING CODE: Exemp. Complex Mill Proscriptive Mill Proper 14	Occupant leads for each eres
	Ext accepts travel department (1957)
Plastent Property Champe Uho	Common path of trevel detail on Tables 1004.2.1 & 1004.3 2 ***
CLASSEICATION OF WORK WORM AND AMETHOD (PREPHDUSE ONLY)	Doesd and fungions (1920.4)
Physics. Demagnd training waith at speciel blushons	Magnetic and responsing to repeat more consistent of the constant should be consistent of the constant of the
Althoughput Lawald E Athenta ferripping inch to the resistant and guarded	Opposite major (100) 20
New tige Privates	A supported schemater plan and category where the reset flooriessing as
Авитовоп Level II New resimpons for ADA Obrigannica Перозивания	Locazzo, al doors with paint hardway (1019.1.10)
Newsconcept plan-on-grade. News-Photomas Machineral and Electronal Incomes	Locuston of doors with delayed agress locks and the amount of teta-
New wordows and doors	Lucuston of dums with appromagnatic appara succe (1010.19 B)
Training the Committee of the Committee	Locaton of doors equipped with hote-open devices
	Logalities of embergancy and applicated (1930)
CONSTRUCTION AND THE CONTRACTOR CONTRACTOR AND AN ANAMAR AS	The square footogo of each felt area (302)
OUNT) PROPOSED DECUERACY(SLICK 3:-	The equate horizon of each effolia positional lot Opticipative (Cla
W (Table 1604% Commit (1) (1) (1)	High any code encapeans or table notes that may have been withing

		ľ	•
:	Version to 5.7		
	TID: (slow) IMM CP III CONTRACTOR (CN. 2) CONTRACTO	000fV fabre 1604 ty Current	
	TO COMP 1990 ANT RACUATI	QORY (Table 1604.5) Current Proposi	LDING DATA

BASHC SAM DING DATA	DATA				
Cocancion Type (Chet all that appl) Sprinker. (Sho Suropeer (Sho Fre Deept (Sho Sprinker)		000 🛭	14 Class Cla	1 AAA	
FL006 BA14	Fleod Zone – 4E fless Flood Eleventon (BFE) Leant (2015 May Hammor 3720201500m Leant Freen Floor 9 85 F	A (BPE) 11 FT (915/00)K			
GROSS BUILDING	GROSS BUILDING AFEA TABLE, IPHE HOUSE ONLY	or Propaga Ordy)			
Ploor	Employed In Its	Merc Ling Rb	Sub Total (eq.ft) Uthfitted fo	Upde cod fi	
Fest Hose	3 691	0	j	_	
Young	3.005			L	

	Upde cod fis				
	Sub-Total (eq.10) Upititod flo			** *1	
	feetw lag fig.	۰		Countriescopes July 2004 Ju	
The second secon	Employee Its	3.691	3.885	DCD(PaviCy Pressy) Dccquery Cleanicannell Automby 10-1	
	Ploor	Fera Hose	Total	OCCUPANCY Premy Dengency Clean Assembly DAT Premy Dengency Clean	

SPECIAL APPROVALS Department of Inspirators.

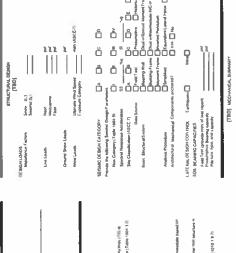
NivaeCY	Present Octoberty Clausic adopted Assertible Oct Michael Oct Octoberty Michael Octoberty Octoberty	Permany Designancy Consider about about 1 A27.855868 V
OCCUPANCY	Premary Or Assembly	Premay Or James Oct

The Characteristics

å

ð

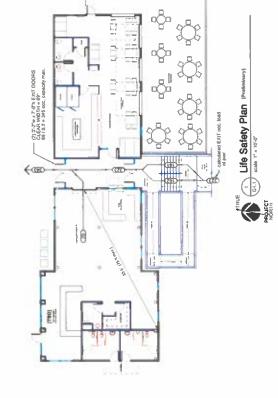
BAZIONO RESORT 1855 PA BAZIONO RESORT « II G. F. II. AFERACE & L. II. II. ACCO.) 104 CA PADAVET « 154" « A 104 CA PADAVET « 154" « A 174 E SE HOLAMO COMENTINE.	FINE SEPARATION 30-MIN ALL BIDES WALLS MON-HATED EXTENDER WALLS	OPF AMOS PROTECTION NOT APPLICANLE OPF AMOS PROTECTIONS NOACE	ACCESSAN, IF ARREND INTERNATING ON-SITE PARKENDS SPACES (TOTAL) IS ACCESSABLE THACKES UNCLUBED)
---	---	--	---



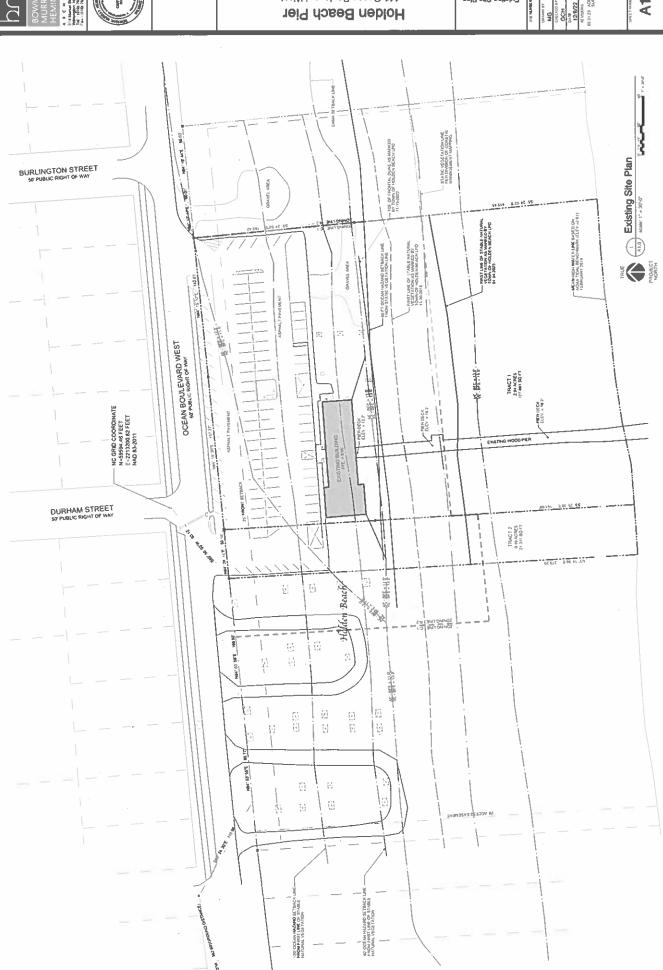
2018 APPENDIX B EXISTING BUILDING DATA SUMMARY

A R C H I T L C 514 Markel Street Waterschool HC 29401 741 (810) 725-262 Fair (810) 722-808

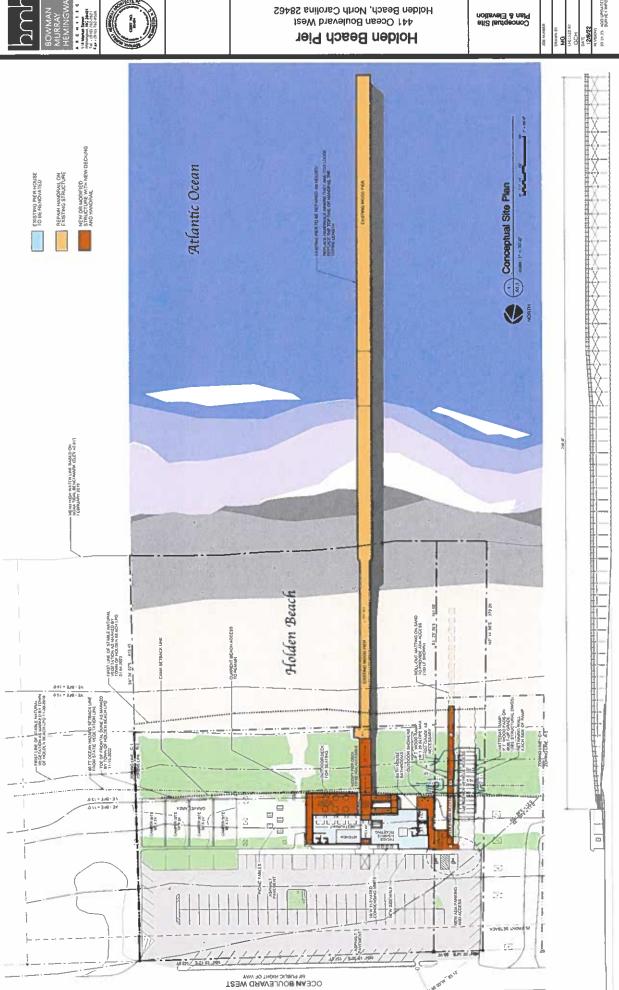




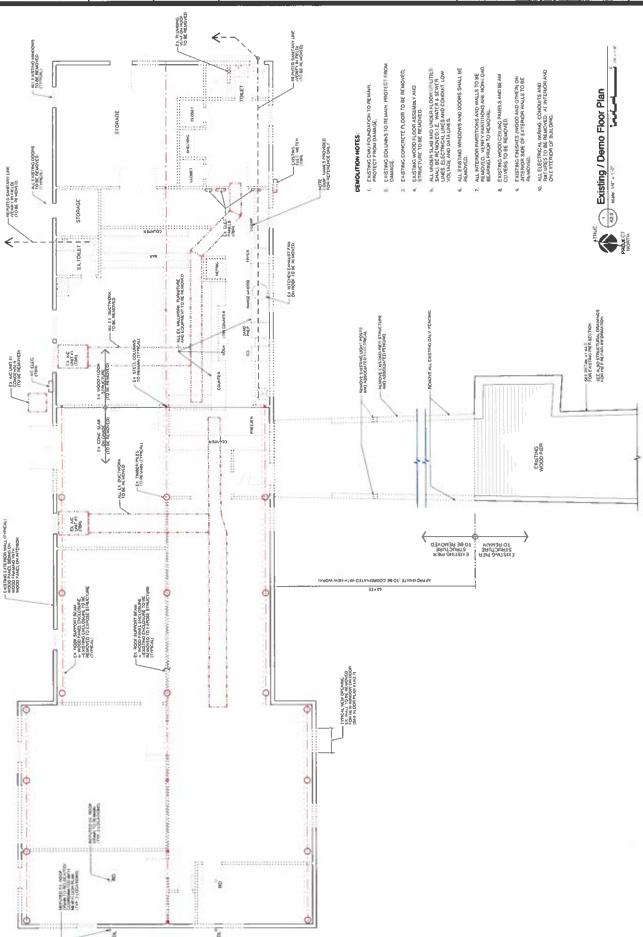








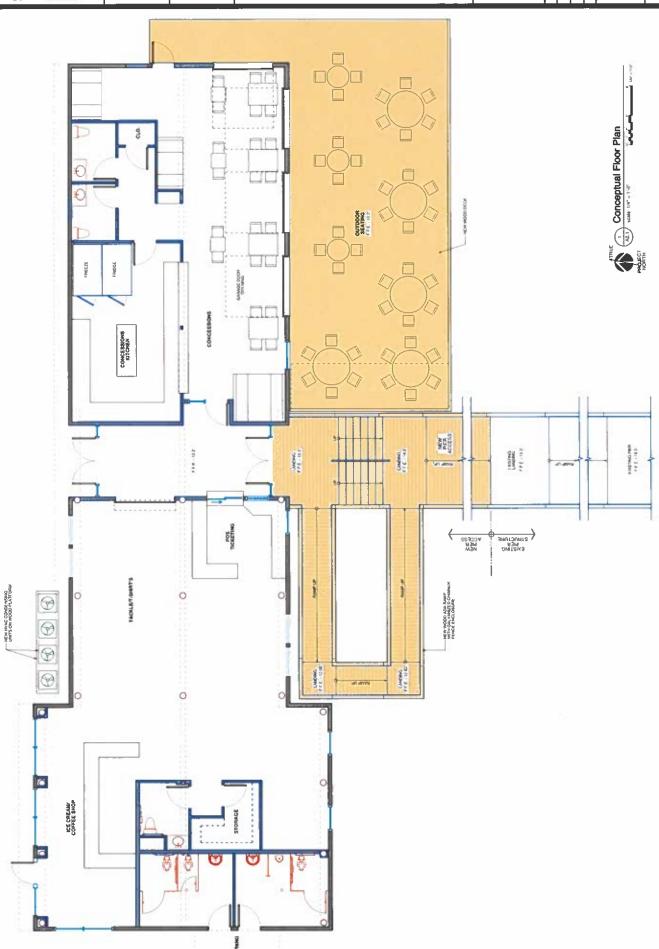
Conceptual Elevation



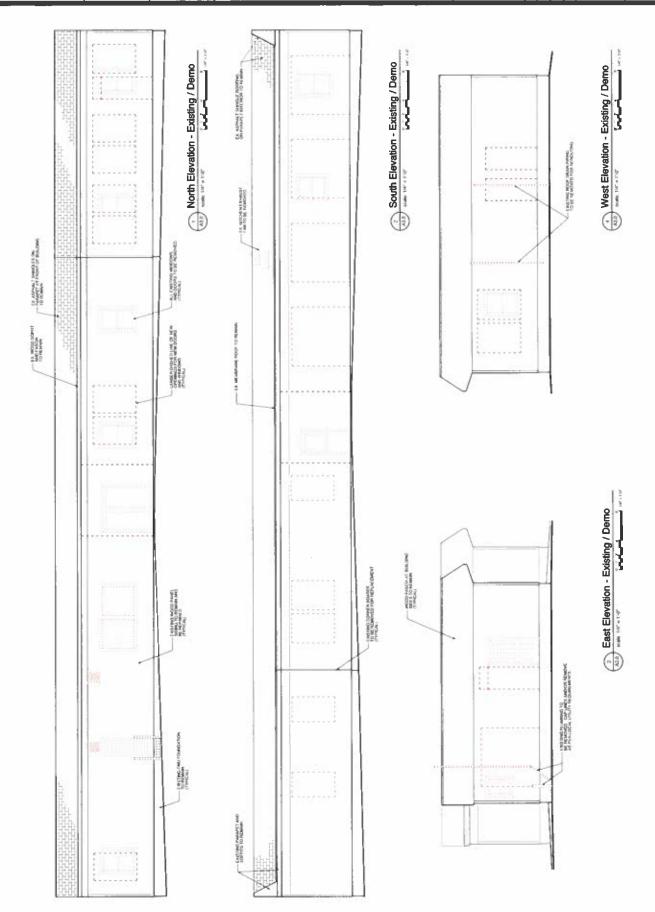




Holden Beach, North Carolina 28462

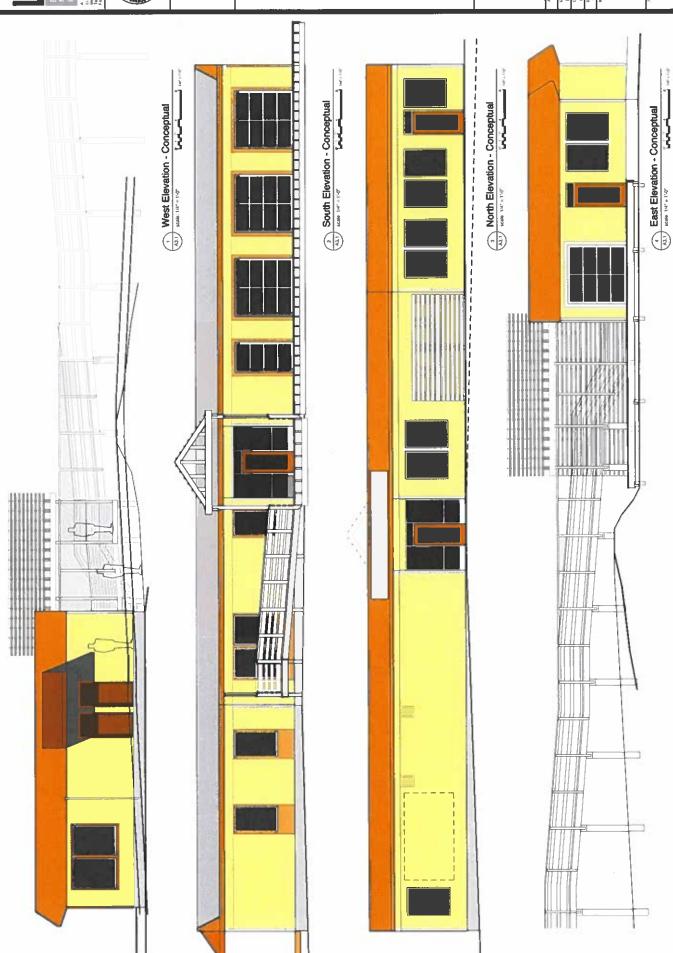




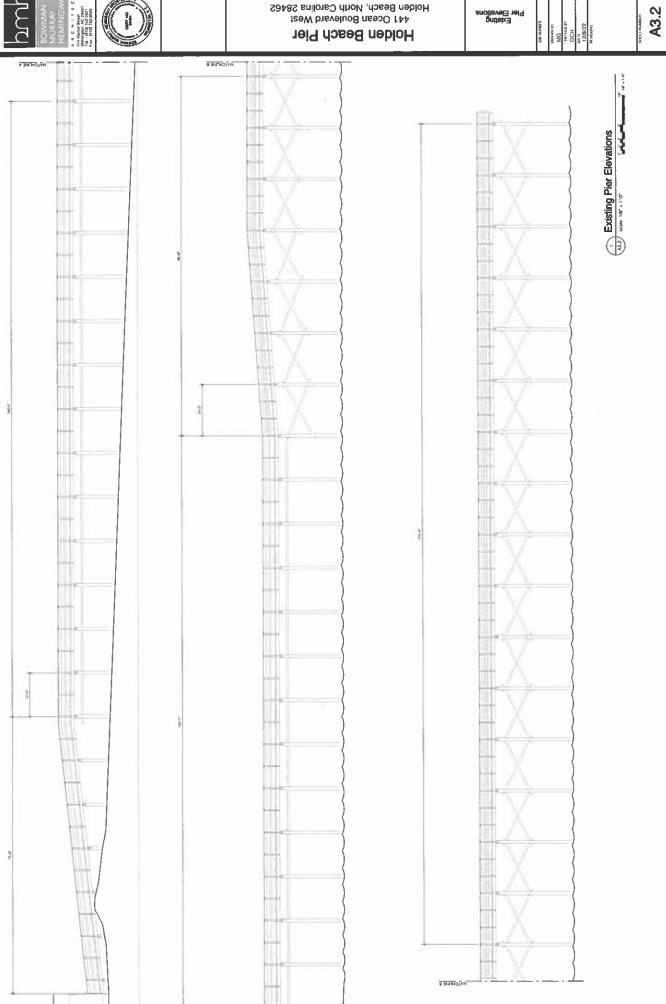










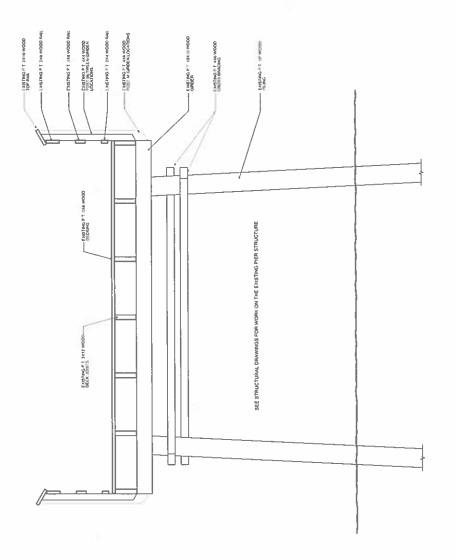


V TALIFACTOR











Existing Pier Section

PIER PROPERTY DEVELOPMENT

INTRODUCTION

The purpose of this document is to initiate discussion concerning development of the pier property by providing a baseline approach to that development. It is also intended to ensure that critical elements such as project cost estimates, life cycle costs, and a clearly defined project approach are addressed in the process. It is not intended to be the final project plan, but to serve as a starting point and to lay out the process for proceeding. Information presented below is partially based on discussions held with Bowman Murray Hemingway Architects (BMH), Andrew Consulting Engineers, and Mid Atlantic Engineering Partners. See attachments A and B for discussion summaries.

Development of the pier property should encompass the entire property, not just the pier and pier building. Development can however be separated into two separate components, namely the pier structure and the land parcels. Separation of the components (and components into phases) is necessary as funding is limited. Given that the pier is the primary feature of the property and considering its deteriorated condition, it is recommended that it be given first priority for funding. Development of the land parcel should not be constrained by a requirement to retain the current pier building, but should be based on a "clean sheet" approach to broaden the potential uses for the property. Renovation of a building in such poor condition that is several feet below the flood plain in an ocean front location is not advisable. A constraint that will have to be considered however are the requirements of the PARTF grant agreement that was entered into in 2022 which restricts the use of the property to recreational purposes indefinitely.

For each of these components, some form of financial/business case analysis should be performed to determine the development, operational and maintenance costs of any proposed options, as well as the potential revenue that can offset the above costs. Initial development costs will be produced in the preliminary design process and refined in the detailed design process. This information will assist decision makers in determining how/if the town can move forward as well as provide a foundation for seeking outside funding sources and partnerships. This is likely to be more complicated for parcel development in that several possible uses may have to be iteratively analyzed. Further, consideration must be given as to whether the town should enter into commercial real estate development that could compete with local businesses on the island (and off). Lessees would have to cover 100 percent of the debt service, maintenance and operations cost, insurance, etc. Otherwise they would be essentially subsidized by the tax payers which would not be fair to tax paying businesses on the island. Given today's delivery oriented society, dedicated space for deliveries from local businesses may be a viable option.

PIER

The pier component of the project needs to be addressed from two perspectives, namely repair and replacement. Preliminary design work, project cost estimates and life cycle costs (30 years) need to be developed by the technical agent for each perspective to support decision making.

PIER REPAIR

With regard to repairing the pier, the initial RFP issued by the town came in with a low bid that was 100% over the budgeted amount. This RFP was considered the minimum amount of work to be done to reopen the pier as efficiently as possible. In order to more closely match the budget, it was suggested that the scope be reduced and the project rebid. At that time, the primary cost reduction tool was to water jet the new pilings in versus driving them in.

Consulting Engineers and Mid-Atlantic Engineering Partners determined that the piles must be driven in. Driving piles provides a determination/verification of the pile capacity (bearing load and uplift resistance) and greater resistance to lateral loading which dannot be obtained by jetting alone. However, cost savings could be achieved by doing the piling installation from the pier deck to minimize the use of floating plant (a significant cost driver). To accomplish repairs from the deck, the pier would have to be repaired from the shore out (replacing fasteners, bracing, etc) and possibly strengthened (additional stringers) to support equipment and materials for replacing piles and other structure. The added benefit of this approach is that future pile replacement, maintenance and storm damage repairs could likely be done from the deck avoiding considerable cost and accomplished in a more timely fashion. A structural analysis and design will be required to support this approach. The existing pier building would have to be razed to provide access for equipment and materials onto the pier. It should be noted that all present at the BMH meeting agreed that the building is a tear down. Since the building is in such poor condition that is several feet below the flood plain in an ocean front location, razing it should not be an issue.

The pier repairs will likely need to be accomplished in phases to fit within the available funding and not jeopardize higher priority projects. Preliminary design work, and project cost estimates for each phase must be developed for proper decision making. Suggested phases would be as follows:

- 1. Structural Stabilization of the existing pier This will include replacement of all 16 major/ severely damaged piles, replacement of all fasteners, and a significant portion of the bracing, if not all, depending on analysis results. Analysis may call for additional bracing as well.
- 2. Safety repairs This phase would complete repairs to make the pier safe for the public, to include handrails, ADA access, etc.
- 3. Complete remaining repairs These repairs include plumbing, electrical and decking replacement.
- 4. Extend the pier to 250 feet This final phase would restore the pier to its original 1000 feet and reach significantly deeper fishing waters than that available at the current 750 ft (4-8ft).

These phases could be combined into combinations of base bids with options based on funding availability.

PIER MAINTENANCE

Given the age of the pier components, (anywhere from 25 to 65 years), maintenance costs must be planned for. Contrary to what was originally reported in the pier inspection reports, the pier pilings are not greenheart hardwood (Greenheart wood is naturally decay and marine organism resistant, has a service life of 50 years, and is significantly stronger than treated pine or fir), but are pressure treated green wood of an unknown species (see final Mid Atlantic Report). Unfortunately, there are no maintenance or repair records available for the pier, so the exact age of the piles is not known. The current assumption is the last pile installation was possibly in 1999. Based on discussions with industry professionals, pressure treated pilings have an expected service life of 25 years. Fortunately, piling inspection results that included pic penetration and hammer testing found most, if not all the piles to be sound, except those with cracks or fissures. It should be noted that several of the damaged piles had damage at the pile cap where the dowel pin connection was made, which is likely to be an ongoing problem in the future. Consequently, a condition based maintenance program should be implemented with periodic and post storm inspections of the pier to allow for planned maintenance and repair. In addition to planned maintenance, repairs from storm damage need to be considered as well.

Given this consideration and the maintenance challenges cited above, a capital reserve fund for supporting the pier may be advisable.

PIER REPLACEMENT

The initial assumption here is that a new wood pier will be constructed as opposed to a concrete pier primarily due to cost. Although a concrete pier is preferred, it may not be financially supportable for a small tax base like Holden Beach. While the upfront cost to replace the pier will be higher than repairing the pier, the life cycle costs will likely be less. A better design with more robust components (larger/concrete piles, better bracing, known pile embedment, greater height above the surf) will provide a more storm resistant structure and new materials will greatly reduce maintenance costs for many years after construction. It may also be possible to leverage off the Oak Island pier replacement project to reduce engineering and cost estimating costs as well (Andrew Consulting was the design agent). It should be noted that the Oak Island pier was replaced for approximately 2.6M in the 2017-2019 time frame.

Funding a pier replacement will likely require financing the project with some sort of loan or bond. Any option to finance a pier replacement should be approved by the property owners/voters in a referendum or by some other reliable method. It is also possible to phase this project too by replacing the current 750 feet initially and constructing the last 250 feet at a different time to for funding flexibility.

Again, a condition based maintenance program should be implemented with periodic and post storm inspections of the pier to allow for planned maintenance. In addition to planned maintenance, repairs from storm damage need to be considered as well. Given this consideration and the maintenance challenges cited above, a capital reserve fund for supporting the pier may be advisable.

SITE DEVELOPMENT

Public (primarily the tax payers) input and the aforementioned financial analysis will drive the features to be developed on the site. In addition, site development will have to comply with the requirements of the PARTF grant contract. If a conflict arises, a contract modification could be possibly negotiated. For the features that are chosen, an annual cost for maintenance, repair and operation (life cycle cost) must be developed. This along with any debt service payments will be needed for decision making and budgeting purposes. In the event that some sort of building(s) are considered, the design should not impede access to the pier for maintenance and repair purposes. All features must be ADA compliant of course.

GOING FORWARD

It is recommended that the following tasks be initiated as soon as financially possible to provide decision making information for the BOC to determine how and when to proceed with the project. Specific Statements of Work should be developed for the technical agent to ensure the desired outcomes are obtained. In addition, a competent project manager needs to be identified to oversee this work.

- Task 1 Initiate preliminary design work for repair of the current pier from the deck(in phases similar to that outlined above), to include cost estimates for each phase and a draft Maintenance and Repair Plan with yearly cost estimates.
- Task 2 Initiate preliminary design and cost estimates for a new wooden pier (in phases as outlined above), to include cost estimates for each phase and a draft Maintenance and Repair Plan with yearly cost estimates.
- Task 3 Initiate preliminary land site wide conceptual design(s) that comply with PARTF requirements to include initial cost estimates for construction, operation and maintenance.
- Task 4 Conduct a financial/business case analysis should be performed to determine potential revenue that can offset the development costs. This should include some type of market analysis of any potential commercial/retail facilities that may be on the site.

FINANCING

Unexpended funds from the pier repair account should be available this year to fund the above preliminary design and financial work. For constructing the project, see attachment C, Town of Holden Beach Debt Service. It can be seen that in FY25-26, debt service will be reduced by approximately 484K. In FY26-27, another 702K debt is eliminated providing a running total of 1.186M that could be available to fund pier construction. It should be noted that in FY 27-28 the Central Reach Beach Renourishment debt will be paid off, but that the available funds may be applied to the Beach and Inlet reserve fund.

It is imperative that it be understood that **the pier is an amenity and will have to compete against critical infrastructure and other non critical projects for funding.** Examples of critical infrastructure projects include water system capacity increases, stormwater projects, fire station replacement (for 24/7 manning), road paving, beach and inlet maintenance, etc.

If the project cannot be funded within the existing budget, alternative financing such as a loan, bond, or grants, or some other method may be an option. In order to pursue these options, the above tasks must be complete so prospective financiers can adequately evaluate the request. It should also be noted, that from a state and county perspective, there are four other ocean fishing piers within an hour's drive from the Holden Beach causeway. This fact could adversely affect the attractiveness of state and county assistance. This is further exacerbated by the beach, canal and several fishing locations already in existence at Holden Beach.

Last, and perhaps most important, any financing arrangement must be approved by the voters/property owners given the magnitude of the costs involved. While a public hearing may be all that is legally required, they typically result in very poor attendance in part due to the fact that around 70% of the property owners do not live here and the hearings are not extensively advertised. A referendum during an election year (2025) may be more appropriate or some other iron clad way of assessing the property owners' position.

NOTIONAL TIMELINE

The following time line is an educated guess based on experience and will necessarily have to be refined based on more detailed discussion. It is also based on using the current technical agents (BMH,

Andrew Consulting) to leverage off the already completed work and Andrew Consulting's experience with designing the Oak Island Pier

Task 1 - 3 months $- \frac{7}{1}/\frac{2024 - \frac{10}{1}}{2024}$

Task 2 - 3 months - 09/1/2024-12/01/2024

Task 3 - 6 months - 02/01/2025-07/01/2025

Task 4 - Pier portion-7/1/2024-10/1/2024; Site Portion - TBD depends on task 3 results

Actual construction times for pier repairs and land parcel development will depend on available funding and selected site features. Replacement of the pier is estimated to take 3 years based on construction of the Oak Island pier.

OTHER OPTIONS

Suggestions have been made to pursue a Public Private Partnership (PPP) in an effort to reduce the financial and operational burden on the Town. While a PPP is a viable option, attachments D, E and F clearly demonstrate that a lot of work must be completed before a partnership can be considered.

STAKEHOLDERS

The primary stakeholders for this project are the Holden Beach property owners as they have the financial responsibility for all costs associated with the pier, whether they use it or not. Businesses on the island are secondary stakeholders in that financial support for the pier could affect their overhead and for those businesses near the pier, their foot traffic volume. Day visitors are secondary stakeholders in that they are not financially responsible for the pier given that using the pier is optional for them. Renters/vacationers and are not considered stakeholders as they are customers of the rental property owners. Consequently, their interests are presumably represented by the rental property owners.

SUMMARY

The purpose of this document is to initiate discussion concerning development of the pier property by providing a baseline approach to that development. It is not intended to be the final project plan, but to serve as a starting point. Development of the pier property should encompass the entire property, not just the pier and pier building, with priority given to addressing the pier. Phases have been suggested to make the development financially manageable. A notional timeline for preliminary work has been outlined with possible funding scenarios to accomplish it. Last information concerning public private partnerships is provided along with stakeholder information.

3-14-2024 Meeting Summary

The following is a summary of the meeting discussions held on Thursday, March 14, at 10:30 between Rick Paarfus, Chip Hemingway of Bowman Murray Hemingway Archetects (BMH), Neal Andrew and Zachery Norris of Andrew Consulting Engineers (structural engineering).

At the onset of the meeting, Mr. Paarfus, who is a sitting commissioner for the Town of Holden Beach, stated that he was not there representing the Town of Holden Beach, had no authority to direct or authorize any participants to take action on behalf of the Town or encumber the town in any manner. He further stated that he was there seeking information concerning the Holden Beach pier on his own accord as a private individual and was solely responsible for all costs incurred for the meeting.

Mr. Paarfus inquired if the structural repairs were based only on the documentation provided by the Town or if they had performed their own inspections and incorporated their findings into the repair design. Mr. Andrew stated that they had done their own inspections as well as reviewed the provided documentation to develop the repair designs.

Mr. Paarfus inquired about formal project cost estimates that were developed by the firms for the Town and was informed that they were not requested and consequently not provided. Mr. Hemingway was pressed by the Town Manager for a number for budgetary purposes and he provided a guestimate verbally of 2.1M. It was noted by Mr. Paarfus that without a proper cost estimate it limits the owner's ability to negotiate with a contractor and that it is not good practice to go to bid without a formal cost estimate on a project of this value. It was agreed that formal project cost estimates should be developed prior to any future bidding.

Pile installation methods were discussed next. After consulting with their geotechnical engineer, it was determined that the piles must be installed in the same manner as originally called for in the pier repair bid documents, i.e. driving. It was noted that some jetting may be necessary to penetrate hard pan beneath the mud line, but the final portion of the installation has to be done by driving. Driving not only provides a determination of the pile capacity (bearing load and uplift resistance), but also provides greater resistance to lateral loading of the pile which cannot be obtained with jetting alone.

Mr. Paarfus inquired if jetting piles in could have contributed to the pile cap failures (breakage) and loss of load bearing contact in the inspection reports. Mr. Andrew did not attribute those issues to jetting, but did note that the dowel pins used to attach the horizontal members to the pile caps can corrode and expand sufficiently that when combined with lateral loading can break the pile cap. His preferred method to connect the structure would be through bolting vs. doweling.

The possibility of repairing pile caps vs. replacing piles was briefly discussed and it was determined that this is not recommended unless it is the only repair that the town could afford.

Reduction of the scope was then discussed. The approach to reduce the scope would be to minimize the need for floating plant to make repairs and accomplish the work from the pier deck. To accomplish this, the pier structure would have to be repaired from the shore out (replace all fasteners, bracing, etc.) and possibly strengthened (additional stringers) to be able to support equipment and materials to do the work. Mr. Paarfus noted that the inspection reports indicated that the stringers were held in place with nails, brackets, or no visable form of attachment to the horizontal structural members. A structural analysis will be required to support this approach.

In order to accomplish repairs from the pier deck, the center of the pier house will have to be removed to allow equipment to access the pier. Importantly, it should be noted that all in attendance consider the pier house a tear down. It was agreed by all present that it did not make sense to renovate a building in such poor condition that was several feet below the flood plain in an ocean front location. In fact, BMH nearly turned down the job because of the previous BOC's insistence that the pier house be renovated.

The discussion turned to how the pier repairs might be phased in order to accommodate a limited budget. Structural stabilization of the pier is the first step to be considered. The second phase would be to complete repairs to make the pier safe for the public (handrails, other safety issues). The third phase would be to complete ADA requirements, electrical and plumbing repairs. Formal cost estimates for each of these phases will have to be prepared to see if the current budget can support them.

Maintenance and repair of the pier was also briefly discussed. Mr. Paarfus noted that the existing piles are not green heart wood as stated in the original inspection reports, but that the species is not known (see final Mid-Atlantic Engineering report). In addition, pressure treated piles are thought to have a service life of roughly 25 years in the marine environment. He stated that he understands that remaining service life is difficult to assess, but some sort of starting point is necessary for maintenance planning. Plans can be adjusted based on inspections over time. Mr. Andrew also noted that planning for the inevitable storm damage repairs must also be considered.

Future tasking relative to the pier project was discussed. It was agreed that a clear scope of work/task statement should be developed for the whole property. The plan should include

Repair of the current pier in phases, with cost estimates
Preliminary design and cost estimates for a new wooden pier (possibly leverage off of Oak Is. Design)
Preliminary site wide design and cost estimates for entire property with cost estimates
Preliminary Draft Maintenance & Repair plan with yearly cost estimates

All of the above should be divided into phases to support multi year funding due to limited resources. Mr. Paarfus addressed the fact that the property's use is currently constrained by a Parks and Recreation Trust Fund grant that will have to be considered in planning for the property. He also said that pier project funding has to compete against other higher priority critical infrastructure projects for resources. However, if the above project information was available, the BOC would be in a much stronger position to develop a funding strategy and to pursue other funding sources.

Last, Mr. Paarfus inquired about the evolution of the project with regard to direction from the previous BOC. Based on the dates on the pier house drawings and the pier repair drawings, it appears that the BOC focus had initially been on the pier house for the first year, until around the May 2023 timeframe and then the direction shifted to the pier repairs to get it open. BMH confirmed that this is correct. Mr. Paarfus stated that he felt the pier project was handled in a way others do not agree with which was also the general consensus of those in attendance. It was noted that the intent was to get the pier reopened as cost efficiently as possible but the cost still proved to be over budget.

The meeting adjourned at roughly 11:34 a.m.

Prepared by Rick Paarfus

Discussion with Stuart Lewis, P.E., MidAtlantic Engineering Partners 2-27-24@9:45 a.m.

Subject: Project GES-2201, Holden Beach Pier - Due Diligence Inspection

Stuart and I discussed the findings of the subject report (2022-05-17_GES-2201_LetterReport_2.0), potential issues with the pier, and areas for consideration before proceeding with repairs. The inspection and following report were generated as part of a due diligence inspection of the pier in 2022 before Holden Beach's acquisition. The MidAtlantic Engineering Partners was contracted under Geosyntec to inspect the pier elements underwater. This discussion included the following items:

- 1. Inspection
- 2. Piles
- 3. Overall Pier Structure
- 4. Pre-Construction
- 5. Cost Benefit Analysis
- 6. Construction Approach

Inspection:

- We performed the Due Diligence Inspection following ASCE Manuals and Reports on Engineering Practice No. 130 "Waterfront Facilities Inspection and Assessment" standards. A Due Diligence inspection aims to form an engineering opinion of the general condition of a structure and estimate the order-of-magnitude replacement costs and repair costs.
- All timber piles were inspected visually and tactilely during the inspection, from the caps down to the mudline.
- Tactile inspection included hammer and pic penetration on the piles. The tactile inspection aims to determine the physical condition of the elements compared with the original as-built condition.
- We found most, if not all, of the piles to be sound, except for those with cracks or fissures, as noted in the report.
- The timber piles (except where noted) were in minor condition, i.e., looked good from the mud line up to the bracing, with no significant damage or deterioration noted.

Piles:

- Typically, 1-2 ft. below the mudline timber piles are usually in good shape due to a lack of oxygen, no marine bores, rot, or deterioration.
- The timber piles' point of fixity results in piles either breaking at the mudline or at other points of fixity (near bracing).
- Most piles from the current shoreline to the offshore end are pressure-treated green piles but unknown timber species or pressure-treated material. Based on Mr. Lewis's experience, these piles have a service life of 25 years. The pressure treatment does not penetrate the pile fully and can wash out on the exterior. EPA rules/regulations no longer permit creosote timber piles in the marine environment.
- Mr. Lewis recommends replacing piles with pre-cast concrete piles for longevity. He also noted that composite piles are around 1.75 times as expensive as pre-cast concrete piles.
- You can install pre-cast concrete piles without causing damage.
- Mr. Lewis has used composite piles in the New York City harbor; they have superior abrasion resistance compared to concrete and timber.

ATTACHMENT B

• Mr. Lewis does not recommend jetting piles in for public access structures like a fishing pier. Resistance to uplift forces is a big concern (surface friction), and the pile capacity (end bearing and surface friction) cannot be determined/evaluated as with pile driving.

Pier Structure:

- Overall, Mr. Lewis thought the structure needed a more robust design for the environmental forces from the Atlantic Ocean.
- Current bracing could be more adequate.
- Pier deck height requirements can vary based on local requirements.
- We did not perform a load rating analysis as part of MidAtlantic's scope. However, the pier likely was designed to be 100 lbs/SF.

Pre-Construction:

- As per the ASCE Manual, a design-level inspection and additional engineering activities should be performed before construction.
- Pile bracing needs to be redesigned, as they appeared to be undersized based on the level of braces broken.
- Should a re-build of the pier be considered, using pre-cast concrete piles for replacements. However, due to the geographic location and possible hurricanes, even concrete piles can fail with specific loads.
- To open the pier before repairs, the city should develop Pier closure criteria to include the number of people allowed on the pier, certain load limits around specific areas where known failed piles and caps exist, weather conditions that dictate temporary closure, etc.

Cost-Benefit Analysis

- Given the geographic location of the pier and the unpredictability of the Atlantic and Hurricanes, even the most robust pier can fail to mother nature.
- A more robust pier will be more expensive. The alternative could involve installing a lower-quality pier that we can replace. Certain criteria for use would be implemented, i.e. weather restrictive use.
- Perform annual inspections of the pier before peak-season tourism to minimize downtime of the pier. (perform inspection between Feb-March to allow for repairs to be completed in April)

New Pier Construction

- Build out from shore, remove the need for floating construction.
- We should evaluate pier loading to determine what equipment loads are acceptable, if any.
- Wilmington, NC, and Charleston have reputable marine contractors for this work.
- Create a nationwide solicitation for qualified contractors for the new pier construction.

Town of Holden Beach, NC

Debt Service By Issue for All Types from 07/01/2022 to 07/01/2038 All Types

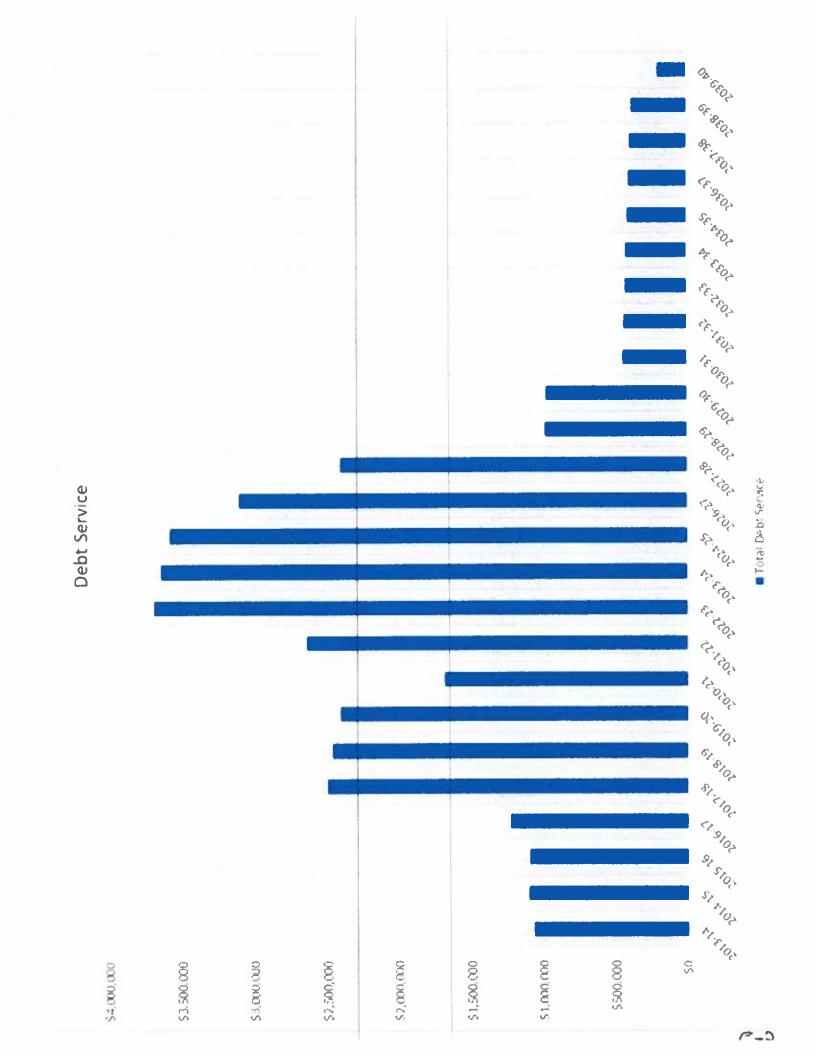
Schedule Profile as Of Frequency First Period End End Date Maturity Dates 07/01/2022 Annual 07/01/2023 07/01/2038

	interest rate	FY 23	FY 24	FY 25	FY 26	FY 27
SLOCK Q 2022 Pramissory Note	3.180%	365,133.33	354,533.33	343,933.33		-
OC 2015 Note - Real Estate	2.420%	93,334,83	93,334.83	93,334.83	-	
	2.100%	64,770.39	64,770.39	64,770.39	64,770.40	
AC TRUCK 2021 Capital lease	2,205%	181,366,67	177,691.67	174,016.67	170,341.67	- 1
2005 Sanitary Sewer Revolving Loan	2.205%	415,821,67	415.821.67	415,821.65	415,821.68	
2004 Sanitary Sewer Revolving Loan	2.180%	1,317,720,00	1,291,560.00	1,265,400.00	1,239,240.00	1,213,080.00
ENTRAL REACH 2016 Note - Flood and Erosion Control	3.810%	237,793,45	230,173,45	222,553.45	214,933.45	199,267.48
OWN HALL 2008 Note - Real Estate	2.347%	518,174,85	518,964.01	519,407,29	519,176.31	519,505.64
2019B Taxable Enterprise Systems Revenue Refunding Bonds	1.920%	152,443.06	150,153.55	147,864.05	145,574.54	143,285.03
LS REIMBURSEMENT 2021 Note - Sanitary Sewer	2,290%	69,312.07	68,120.49	66,928.91	65,737.33	64,545.75
LS REIMBURSEMENT 2021A Note	3.180%	277,959.90	279,175,12	273,099.04	267,022.95	260,946.86
PIER 2022 Installment Financing Contract Annual Debt Payment	3.48074	3,693,830.22	3,644,298.51	3,587,129.61	3,102,618.31	2,400,630.76

ATTACHMENT C

C - 1

					4					
FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35	FY 36	FY 37	FY 38
		-	-			-				-270
-		-	-	-		-	-		-	46
	-	-	•	-	4 -	-	-	-	-	•
-	•	-	-	•	-		•	-	-	-
-	-	-	-	-	-		-	•	•	•
	-	-	•	•	-	•	-	•	-	**
-	-	-	•	-	-	-	12		•	20
520,152.04	517,583.78	-				-	-		-	50
140,995.53	138,706.02	136,416.51	134,127.00	131,837.49	129,547.99	127,258.48	124,968.97	122,679.46	120,389.95	-
63,354.16	62,162.58	60,971.00	59,779.41	58,587.82	57,396.24	56,204.66	55,013.08	53,821.50	52,629.92	•
254,870.78	248,794.69	242,718.60	236,642.52	230,566.44	224,490.35	218,414.26	212,338.18	206,262.09	200,188.00	194,109.84
979,372.51	967,247.07	440,106.11	430,548.93	420,991.75	411,434.58	401,877.40	392,320.23	382,763.05	373,205.87	194,109.84



https://canons.sog.unc.edu/2014/03/new-construction-delivery-methods-public-private-partnerships-p3/



Coates' Canons NC Local Government Law

New Construction Delivery Methods - Public-Private Partnerships (P3)

Published: 03/05/14

Author Name: Norma Houston

In my last two posts, I described the new <u>design-build</u> and <u>design-build</u> and <u>design-build bridging</u> construction delivery methods authorized by the General Assembly during the 2013 legislative session. This post completes our discussion of the new delivery methods by outlining the third method authorized in <u>S.L.</u> 2013-401/H857 – public-private partnerships (P3).

What is a Public-Private Partnership?

The basic concept of the P3 legislation is to provide flexible contracting authority under which units of government can partner with a private developer for the construction, operation, and financing of a capital project. Prior to the legislation's enactment, local governments had to seek authorization from the General Assembly through local acts to enter into public private partnerships. The new legislation makes this development and financing option available statewide to all public entities.

Public-private partnerships are not new in North Carolina. This type of contracting method has been authorized from time to time by the General Assembly, such as for the Department of Revenue's Tax Information Management System in 2009 (S.L. 2009-451, Sec. 6.20), the Town of Matthews in 2010 (S.L. 2010-52), Onslow County in 2013 (S.L. 2013-37), and certain Department of Transportation projects (G.S. 136-28.1) and toll roads (S.L. 2012-184). Similar public-private financing authorization has been available for well over a decade for NCSU's Centennial Campus, UNC-CH's Horace Williams Campus, and the Millennial Campuses of other UNC constituent institutions (Article 21B of Chapter 116). Public schools have had public-private partnership authorization since 2006 for built-to-suit capital leases (G.S. 115C-532; this statute expires July 1, 2015). Public-private partnerships were the subject of a 2009 legislative study commission and a study by NCSU's Institute for

Copyright © 2009 to Present School of Government at the University of North Carolina.

ATTACHMENT D

Emerging Issues. What is new is the statutory framework for entering into a P3 contract and the availability of this contracting and financing method for any unit of local government without having to obtain specific legislative authorization through a local act.

A public private project is defined under the new <u>G.S. 143-128.1C</u> as a "capital improvement project undertaken for the benefit of a governmental entity and private developer pursuant to a development contract that includes construction of a public facility or other improvements, including paving, grading, utilities, infrastructure, reconstruction, or repair, and may include both public and private facilities." Under the P3 construction delivery method, the unit of government is authorized to acquire, construct, own, lease (as lessor or lessee), and operate a public-private project or facilities within a public-private project, and may make loans or grants for these purposes. Importantly, the private developer must provide at least 50% of the financing for the total cost of the project. The Local Government Commission must approve the contract if it involves a capital or operating lease.

P3 Contracting Process

To enter into a P3 contract, units of government must comply with the statutory requirements set out in G.S. 143-128.1C. The procedures are similar to those required for design-build and design-build bridging contracts only in that they are based on the Mini-Brooks Act. Otherwise, the P3 procurement requirements are substantially different.

Adopt Written Findings: To begin the P3 contracting process, the unit of government must make written findings that it has a critical need for the project. While the statute does not specifically require governing board approval, entities that are a public body under the Open Meetings Act (Article 33C of Chapter 143) must adopt these findings at an open meeting of the body, which for local governments means the governing board must approve the findings. Unlike the design-build and design-build bridging statutes, there are no specific criteria that must be adopted by the governing board other than a finding that there is a critical need for the project.

Determine Programming Needs: After approving the use of the P3 method, the unit must determine its programming requirements for the facilities to be constructed under the P3 contract and the form in which private developers submit their qualifications. This information forms the basis of the RFQ the unit advertises.

Publish Notice of RFQ: Next, the unit must advertise notice for interested private developers to submit their qualifications. The advertisement must be published in a newspaper of general circulation within the county in which the unit is located. The statute does not specify a minimum timeframe for the publication period, but units should choose a time sufficient for interested parties to develop a proposal taking into consideration the complexity of a P3 project. While the unit is not required to

https://canons.sog.unc.edu/2014/03/new-construction-delivery-methods-public-private-partnerships-p3/publish the programming requirements in the advertisement itself, it must make these requirements available to potential respondents in whatever form the unit deems appropriate.

Receive Responses: Units may choose to receive responses to its RFQ in any form it deems appropriate; sealed proposals and a public opening are not required. Private developers must submit the following information as part of their response to the RFQ:

- 1) Evidence of financial stability (the statute specifies that information that constitutes a "trade secret" under <u>G.S. 66-152(3)</u> remains confidential).
- 2) Experience with similar projects.
- 3) An explanation of project team selection by either listing licensed contractors, licensed subcontractors, and licensed design professionals whom the private developer proposes to use for the project's design and construction, or a statement outlining a strategy for open contractor and subcontractor selection based competitive bidding procedures.
- 4) A statement of the developer's availability to undertake the public-private project and projected time line for project completion.
- 5) Any other information required by the unit.

Evaluate Responses and Select Developer: The unit may award the development contract to the private developer it determines to be best qualified, which is the standard of award under the Mini-Brooks Act (G.S. 143-64.31). However, unlike a traditional Mini-Brooks Act selection process, the unit may negotiate with one or more of the respondents during the evaluation process. The statute is silent on the criteria the unit must use in evaluating the qualifications of the respondents, so the unit is free to develop their own criteria based on its programming needs, project scope, and any other factors related to the project it deems appropriate.

Award Development Contract: The unit's governing board must award the development contract at an open meeting after a public hearing and at least 30 days' published notice of the terms of the contract. The advertisement of the terms of the contract and the public hearing must be in a newspaper of general circulation within the county in which the unit is located. The unit must also make available a summary of the contract terms and conditions, and indicate how to obtain a copy of the complete contract.

Development Contract Terms and Conditions: The development contract between the unit and the private developer specifies the parties' interests, roles, and responsibilities for the project. At a minimum, the contract must address:

1) The property interests of the unit and the private developer (this could include ownership, lease arrangements, or both).

Copyright © 2009 to Present School of Government at the University of North Catolina.

- https://canons.sog.unc.edu/2014/03/new-construction-delivery-methods-public-private-partnerships-p3/
 2) The development responsibilities of the unit and the private developer (this could include both construction and on-going operation and maintenance activities).
- 3) The financing responsibilities of the unit and the private developer (remember that the private developer must provide at least 50% of the financing for the total cost of the project).
- The parties' good faith efforts to comply with HUB participation requirements and to recruit and select small business entities (the term "small business entities" is not defined in the statute).

 The development contract also may require the developer to be responsible for some or all of the construction, purchase of materials and equipment, compliance with HUB participation requirements, and to use the same contractor(s) as the unit. It also may require the developer to purchase materials for the project at a reasonable price. If the project utilizes the design-build construction delivery method, the procurement requirements of the new design-build statute (G.S. 143-128.1A) apply. Performance and payment bond requirements also apply, and the statute sets out specific procedures for claims under a payment bond made against the private developer. [4]

The private developer with whom the unit contracts cannot perform any design or construction work on the project unless a contractor defaults, a qualified replacement cannot be obtained in a timely manner, and the unit approves.

Finally, the private developer and its contractors must comply with state HUB participation requirements, which include bidders' good faith efforts to solicit historically underutilized businesses on building construction projects costing \$300,000 or more (G.S. 143-128.2).

[1] G.S. 143-128.1C(a)(8).

[2] G.S. 143-128.1C(b).

[3] G.S. 143-128.1C(j). A capital or operating lease involving a public school cannot contain provisions relating to student assignment (G.S. 143-128.1C(l)).

[4] G.S. 143-128.1C(g).

All rights reserved. This blog post is published and posted online by the School of Government to address issues of interest to government officials. This blog post is for educational and informational use and may be used for those purposes without permission by providing acknowledgment of its source. Use of this blog post for commercial purposes is prohibited. To browse a complete catalog of School of Government publications, please visit the School's website at www.sog.unc.edu or contact the Bookstore, School of Government, CB# 3330 Knapp-Sanders Building, UNC Chapel Hill, Chapel Hill, NC 27599-3330; e-mail sales@sog.unc.edu; telephone 919.966.4119; or fax 919.962.2707.

Copyright © 2009 to Present School of Government at the University of North Carolina

Public-Private Partnership

A new law became effective on October 10, 2023, and applies to any covered public enterprise agreements executed on or after that date.

Part IV of S.L. 2023-138 (See attachment F) compels LGC approval of any agreement in which a local government concedes or transfers control of a public enterprise that the local government owns or operates to a nongovernmental entity.

The requirements for these arrangements include holding a public hearing describing the terms of the agreement. After the public hearing, the local unit's governing board may proceed only after adopting a resolution declaring that the proposed arrangement is in the public interest. In making this determination, the board must consider ALL the following:

- 1. The physical condition of the public enterprise;
- 2. The capital replacements, additions, expansions, and repairs needed for the public enterprise to provide reliable service and meet all applicable federal standards;
- 3. The availability of federal and State grants and loans for system upgrades and repairs of the public enterprise;
- 4. The willingness and the ability of the nongovernmental entity to make system upgrades and repairs and provide high-quality and cost-effective service;
- 5. The reasonableness of the amount to be paid to the unit of local government to enter the arrangement;
- 6. The reasonableness of any amounts to be paid by the unit of local government to exit the arrangement;
- 7. The service quality guarantees provided by the arrangement and the consequences of any failure to satisfy the guarantees;
- 8. The most recent income and expense statement and asset and liabilities balance sheet of the nongovernmental entity and any consolidated nongovernmental entity;
- The projected rates to customers of the public enterprise during the term of the arrangement and the affordability of the services of the public enterprise resulting from such projected rates;
- 10. The experience of the nongovernmental entity (and, if applicable, its affiliates within the consolidated nongovernmental entity) in the operation of utility systems similar to the public enterprise that is the subject of the arrangement; and
- 11. The alternatives to entering the arrangement and the potential impact on utility customers if the arrangement is not entered.

Local units should record the governing board's findings addressing all these considerations as part of the written resolution or supporting documentation.

Once the governing board adopts its resolution, the LGC may consider the proposed arrangement for approval. Like a bond issuance, the local government will apply to the LGC for approval and work with Department of State Treasurer staff to prepare the appropriate documentation and address any concerns.

ATTACHMENTE

Public-Private Partnership

The LGC may only approve the proposed arrangement if it finds and determines that the customers of the public enterprise will enjoy reasonable and material short-term and long-term savings and other net benefits from the arrangement during the term of the arrangement without the imposition of any material cost or charge upon termination of the arrangement.

The LGC may consider any of the following in making its determination (this is a non-exclusive list):

- 1. The projected financial feasibility of the proposed arrangement in the short-term and long-term, its effect on rates to be charged to the customers of the public enterprise under the arrangements being proposed, and its effect on the quality of services to be provided by the public enterprise under the arrangement.
- 2. The projected rates to customers of the public enterprise during the term of the arrangement, the basis for the establishment of such rates and the reasonableness of the basis, and the affordability of the services of the public enterprise resulting from such projected rates.
- 3. If the unit of local government will receive an initial payment for participating in the arrangement, a summary of the unit of local government's proposed plans for the use of the initial payment.
- 4. If there is any indebtedness of the unit of local government associated with the public enterprise, the plans for the retirement or defeasance of such indebtedness.
- 5. The financial condition of the nongovernmental entity and its affiliates within the consolidated nongovernmental entity and its ability to carry out the undertakings required of the nongovernmental entity in the arrangement.
- 6. The experience of the nongovernmental entity and its affiliates within the consolidated non-governmental entity in the operation of utility systems similar to the public enterprise that is the subject of the arrangement.
- 7. The nongovernmental entity's plans to finance its initial participation in the arrangement and future improvements to the public enterprise and the expected participation of the unit of local government in any financing.
- 8. The obligations of the nongovernmental entity set forth in the agreement for the maintenance of the public enterprise and the installation of improvements to the public enterprise during the term of the arrangement and the requirements of the agreement that adequate reserves be maintained during the term of the arrangement for such maintenance and improvements.
- 9. The plans set forth in the agreements for the arrangement for maintaining the quality of the components of the public enterprise to be returned to the control of the unit of local government at the end of the term of the agreement.
- 10. Any ongoing financial and other commitments of the unit of local government under the arrangement during its term.
- 11. Any financial payments the unit of local government is expected to be required to pay to the nongovernmental entity or any other person or entity at the end of the arrangement.

Public-Private Partnership

12. The effect, if any, of the arrangement on the tax status of interest on debt obligations issued by the unit of local government, or any other units of local government on account of contractual arrangements the other unit of local government may have with the unit of local government proposing the agreement being considered.

As with other contracts requiring LGC approval, any agreement subject to this new law that is executed without LGC approval is void. And the law makes it unlawful for any officer, employee, or agent of a local unit to take any actions pursuant to the agreement.

alteration, or removal, the cost shall (i) include all labor and materials costs associated with the project for the applicable dam and (ii) not include the costs associated with acquisition of land or right-of-way, design, quality control, electrical generating machinery, or constructing a roadway across the dam.

- Immediately upon completion of construction, repair, alteration, or removal of a dam, the owner shall file a certification with the Director, on a form prescribed by the Department, and accompanying documentation, which shows actual cost incurred by the owner for construction, repair, alteration, or removal of the applicable dam.
 - <u>a.</u> The owner's certification and accompanying documentation shall be filed with the as-built plans and the engineer's certification.
 - b. If the Director finds that the owner's certification and accompanying documentation contain inaccurate cost information, the Director shall either withhold final impoundment approval, if applicable, or revoke final impoundment approval, if applicable, until the owner provides accurate documentation and that documentation has been verified by the Department.
- Final approval to impound shall not be granted until the owner's certification and the accompanying documentation are filed in accordance with subdivision (3) of this subsection and the remainder of the application processing and compliance fee has been paid as provided by this subsection.
- (5) Payment of the application processing and compliance fee shall be by check or money order made payable to the Department and reference the applicable dam.
- (b) The Dam Safety Account is established as a nonreverting account within the Department. Fees collected under this section shall be credited to the Account and shall be applied to the costs of administering this Part."

PART IV. REQUIRE APPROVAL BY THE LOCAL GOVERNMENT COMMISSION FOR LOCAL GOVERNMENTS TO ENTER INTO AGREEMENTS TO CEDE OR TRANSFER CONTROL OVER A PUBLIC ENTERPRISE TO A NONGOVERNMENTAL ENTITY; PROHIBIT LOCAL GOVERNMENTS FROM ENTERING NONDISCLOSURE AGREEMENTS IN ORDER TO RESTRICT ACCESS TO PUBLIC RECORDS SUBJECT TO DISCLOSURE UNDER THE PUBLIC RECORDS ACT

SECTION 5.(a) Article 8 of Chapter 159 of the General Statutes reads as rewritten:

"Article 8.

"Financing Agreements and Other Financing Arrangements: Arrangements for Nongovernmental Control of Public Enterprises.

"§ 159-154. Nongovernmental control of public enterprises.

- (a) For purposes of this section, the following definitions apply:
 - (1) Adjusted revenues. Gross revenue of a public enterprise minus the cost of commodity purchases and wholesale electricity purchases for the public enterprise.
 - (2) <u>Consolidated nongovernmental entity. Collectively, all affiliated nongovernmental entities, which includes each entity's parents,</u>

ATTACHMENT F

subsidiaries, and each other entity that owns, directly or indirectly, at least ten percent (10%) of the capital or voting rights of the entity, and each other entity in which the entity owns, directly or indirectly, at least ten percent (10%) of the capital or voting rights.

- (3) Control. Any one or more of the following, except that a contractual arrangement by a unit of local government with a nongovernmental entity to provide specified maintenance services for a fixed fee or fee per service basis alone does not create control of the public enterprise for purposes of this section:
 - a. The authority to expend or otherwise manage during any fiscal year more than fifty percent (50%) of a public enterprise's adjusted revenues.
 - b. Responsibility for provision to the public of the services previously provided by the public enterprise.

c. Responsibility for operation and maintenance of a material portion of the assets and facilities of the public enterprise.

d. The authority to manage a material portion of the staff responsible for operation and maintenance of the assets and facilities of the public enterprise.

(4) Nongovernmental entity. – Any person or entity other than (i) the State, (ii) a unit of local government, or (iii) a public body created pursuant to Chapter 159B of the General Statutes.

(5) Public enterprise. – All or a material portion of one or more of the systems set forth in G.S. 160A-311, G.S. 153A-274, and Chapter 162A of the General Statutes.

(6) Unit of local government. – A "unit of local government" as defined in G.S. 159-7 and a "public authority" as defined in G.S. 159-7.

- (b) No unit of local government may concede or transfer control of any public enterprise that the unit of local government owns or operates to any nongovernmental entity or consolidated nongovernmental entity or enter into an agreement to do so unless the concession or transfer of control and the agreement thereunder have been approved by the Commission pursuant to this section as evidenced by the secretary's certificate thereon. Any agreement subject to Commission approval under this section that does not bear the secretary's certificate thereon shall be void, and it shall be unlawful for any officer, employee, or agent of a unit of local government to take any actions thereunder.
- Before executing an agreement subject to this section, the governing board of the unit of local government shall file an application for Commission approval of the agreement with the secretary of the Commission. The application shall state such facts and have attached to it such documents concerning the proposed agreement and the arrangements proposed to be carried out thereunder as the secretary may require. The Commission may prescribe the form of the application. Before the secretary accepts the application, the secretary may require the governing board or its representatives to attend a preliminary conference at which time the secretary and deputies may informally discuss the proposed agreement and arrangements proposed to be carried out thereunder.
- (d) Prior to the Commission's consideration of whether to approve an agreement subject to this section and the arrangements thereunder, the governing body of the unit of local government shall conduct a public hearing on whether the proposed arrangement is in the public interest and following the public hearing the governing body shall adopt a resolution or take a similar action stating that it determines that the proposed arrangement is in the public interest. The public hearing shall be held by the governing body of the unit of

local government proposing the arrangement following publication of notice of the public hearing at least 10 days prior to the public hearing. The notice of public hearing shall describe the proposed arrangement in general terms. In determining that the arrangement is in the public interest, the governing body of the unit of local government shall consider, at a minimum, all of the following:

- (1) The physical condition of the public enterprise.
- (2) The capital replacements, additions, expansions, and repairs needed for the public enterprise to provide reliable service and meet all applicable federal standards.
- (3) The availability of federal and State grants and loans for system upgrades and repairs of the public enterprise.
- (4) The willingness and the ability of the nongovernmental entity to make system upgrades and repairs and provide high-quality and cost-effective service.
- (5) The reasonableness of the amount to be paid to the unit of local government to enter into the arrangement.
- (6) The reasonableness of any amounts to be paid by the unit of local government to exit the arrangement.
- (7) The service quality guarantees provided by the arrangement and the consequences of any failure to satisfy the guarantees.
- (8) The most recent income and expense statement and asset and liabilities balance sheet of the nongovernmental entity and any consolidated nongovernmental entity.
- (9) The projected rates to customers of the public enterprise during the term of the arrangement and the affordability of the services of the public enterprise resulting from such projected rates.
- (10) The experience of the nongovernmental entity and its affiliates within the consolidated nongovernmental entity in the operation of utility systems similar to the public enterprise that is the subject of the arrangement.
- (11) The alternatives to entering into the arrangement and the potential impact on utility customers if the arrangement is not entered.
- (e) The Commission may approve an agreement for a unit of local government to concede or transfer control of a public enterprise and the arrangement to do so if it finds and determines that the customers of the public enterprise will enjoy reasonable and material short-term and long-term savings and other net benefits from the arrangement during the term of the arrangement without the imposition of any material cost or charge on the unit of local government or its customers upon termination of the arrangement. In determining whether a proposed agreement and the arrangements thereunder shall be approved, the Commission shall have authority to inquire into and to give consideration to such matters that it may believe to have bearing on whether the proposed agreement and the arrangement thereunder should be approved. Such matters may include any of the following:
 - The projected financial feasibility of the proposed arrangement in the short-term and long-term, its effect on rates to be charged to the customers of the public enterprise under the arrangements being proposed, and its effect on the quality of services to be provided by the public enterprise under the arrangement.
 - The projected rates to customers of the public enterprise during the term of the arrangement, the basis for the establishment of such rates and the reasonableness of the basis, and the affordability of the services of the public enterprise resulting from such projected rates.

- (3) If the unit of local government will receive an initial payment for participating in the arrangement, a summary of the unit of local government's proposed plans for the use of the initial payment.
- (4) If there is any indebtedness of the unit of local government associated with the public enterprise, the plans for the retirement or defeasance of such indebtedness.
- (5) The financial condition of the nongovernmental entity and its affiliates within the consolidated nongovernmental entity and its ability to carry out the undertakings required of the nongovernmental entity in the arrangement.
- (6) The experience of the nongovernmental entity and its affiliates within the consolidated non-governmental entity in the operation of utility systems similar to the public enterprise that is the subject of the arrangement.
- (7) The nongovernmental entity's plans to finance its initial participation in the arrangement and future improvements to the public enterprise and the expected participation of the unit of local government in any financing.
- (8) The obligations of the nongovernmental entity set forth in the agreement for the maintenance of the public enterprise and the installation of improvements to the public enterprise during the term of the arrangement and the requirements of the agreement that adequate reserves be maintained during the term of the arrangement for such maintenance and improvements.
- (9) The plans set forth in the agreements for the arrangement for maintaining the quality of the components of the public enterprise to be returned to the control of the unit of local government at the end of the term of the agreement.
- (10) Any ongoing financial and other commitments of the unit of local government under the arrangement during its term.
- (11) Any financial payments the unit of local government is expected to be required to pay to the nongovernmental entity or any other person or entity at the end of the arrangement.
- The effect, if any, of the arrangement on the tax status of interest on debt obligations issued by the unit of local government, or any other units of local government on account of contractual arrangements the other unit of local government may have with the unit of local government proposing the agreement being considered.
- (f) The Commission may require that any projection or other analysis provided to the Commission in connection with its consideration of the arrangement be prepared by a qualified independent expert approved by the Commission.
- (g) If the Commission tentatively decides to deny the application because it cannot be supported from the information presented to it, it shall so notify the unit of local government filing the application. If the Commission approves or denies the application, the Commission shall enter its order setting forth such approval or denial of the application. If the Commission enters an order denying the application, the proceedings under this section shall be concluded. An order approving an application shall not be construed as an approval of the legality of the agreement in any respect.
- (h) If the Commission approves an agreement and the arrangements thereunder as provided in this section and thereafter the parties determine to terminate the agreement voluntarily prior to the expiration of its stated term, the unit of local government shall not enter into any such termination arrangement unless the termination is approved by the

Commission following a procedure similar to the procedure for initial approval of the agreement and arrangement required by this section. This section shall not prohibit the termination of an agreement in the exercise of legal remedies following a breach of the agreement in accordance with its terms.

- (i) If the Commission approves an agreement and the arrangements thereunder as provided in this section and thereafter the parties determine to amend the agreement in a material respect, the unit of local government shall not enter into any such amendment unless the amendment is approved by the Commission following a procedure similar to the procedure for initial approval of the agreement.
- (j) Nothing in this section shall be construed to apply to the sale of a public enterprise to a utility regulated by the North Carolina Utilities Commission."

SECTION 5.(b) G.S. 132-1 is amended by adding a new subsection to read:

"(c) No political subdivision of this State may enter into a nondisclosure agreement in order to restrict access to public records subject to disclosure under this Chapter. The contract by which a political subdivision of this State agrees not to disclose information deemed confidential under State law shall be a public record, unless the existence of the contract is also deemed confidential under State law. If a nondisclosure agreement is associated with one or more closed session meetings under Article 33C of Chapter 143 of the General Statutes, the nondisclosure agreement shall be included in the minutes of each closed session meeting."

SECTION 5.(c) Subsection (b) of this section becomes effective November 1, 2023, and applies to any nondisclosure agreement entered into on or after that date. The remainder of this section is effective when it becomes law.

PART V. EMPLOYEE CLASSIFICATION AND COMPENSATION EXEMPTIONS FOR UTILITIES COMMISSION AND PUBLIC STAFF

SECTION 6.(a) G.S. 62-14 reads as rewritten:

"§ 62-14. Commission staff; structure and function.

- (a) The Commission is authorized and empowered to employ hearing examiners; court reporters; a chief clerk and deputy clerk; a commission attorney and assistant commission attorney; transportation and pipeline safety inspectors; and such other professional, administrative, technical, and clerical personnel as the Commission may determine to be necessary in the proper discharge of the Commission's duty and responsibility as provided by law. The chairman shall organize and direct the work of the Commission staff.
- (b) The salaries and compensation of all such personnel shall be fixed in the manner provided by law for fixing and regulating salaries and compensation by other State agencies, except that the Commission and its employees are exempt from the classification and compensation rules established by the State Human Resources Commission pursuant to G.S. 126-4(1) through (4); G.S. 126-4(5) only as it applies to hours and days of work, vacation, and sick leave; G.S. 126-4(6) only as it applies to promotion and transfer; G.S. 126-4(10) only as it applies to the prohibition of the establishment of incentive pay programs; and Article 2 of Chapter 126 of the General Statutes, except for G.S. 126-7.1.
- (c) The chairman, within allowed budgetary limits and as allowed by law, shall authorize and approve travel, subsistence and related expenses of such personnel, incurred while traveling on official business."

SECTION 6.(b) G.S. 62-15 reads as rewritten:

"§ 62-15. Office of executive director; Public Staff, structure and function.

(a) There is established in the Commission the office of executive director, whose salary and longevity pay shall be the same as that fixed for members of the Commission.

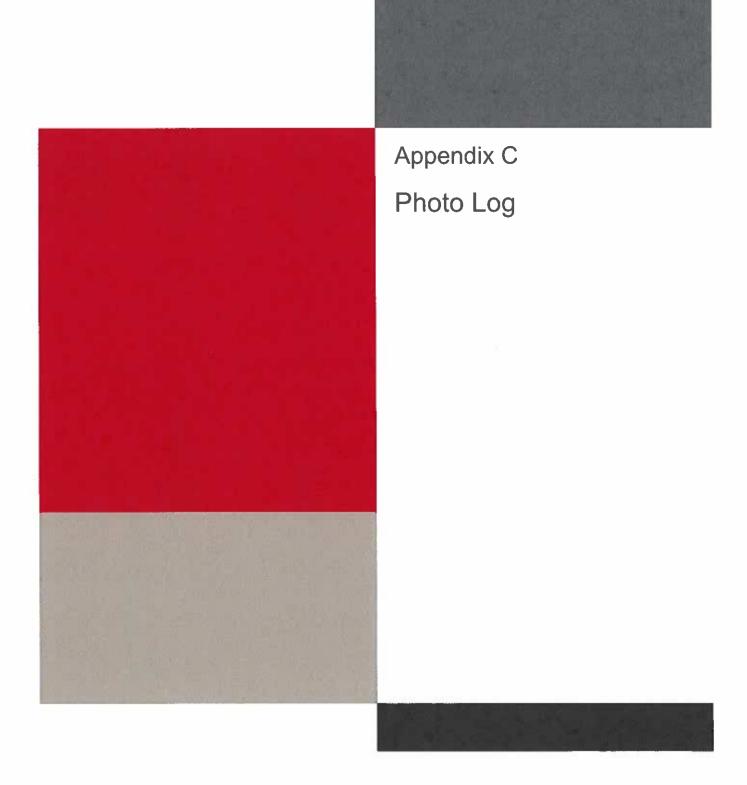




Photo 1: Typical Railing and Fence Damage near station 0+10



Photo 2: Typical Checking and Flaking at Joists near station 0+90



Photo 3: Typical Rail Post Connection Corrosion and Splitting near station 0+90



Photo 4: Typical Hollow Pile near station 0+90



Photo 5: Typical Railing Detachment and Failure near station 0+90



Photo 6: Typical Rail Post Gouging and Connection Bolt Corrosion near station 0+90



Photo 7: Typical Midrail Separation near station 1+25



Photo 8: Typical Joist Deterioration near station 1+25



Photo 9: Typical Utility Conduit Timber Casing near station 2+00



Photo 10: Typical Utility Post near station 2+00



Photo 11: Typical Joist Checking Along Joist and Corroded Connection Bolt near station 2+00



Photo 12: Typical Joist Replacement near station 2+25

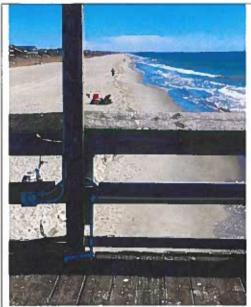


Photo 13: Top Rail Split and Conduit Running along Midrails near station 2+75

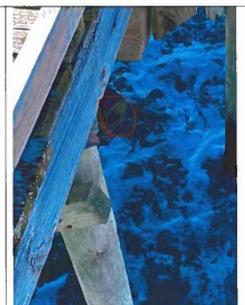


Photo 14: Typical Checks and Splits in the Cross Bracing near station 3+00

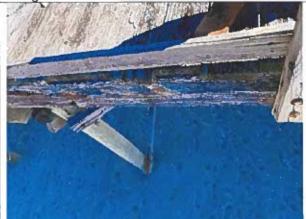


Photo 15: Typical Joist Checking near station 3+00



Photo 16: Typical Spliced Pile Repair. Pile with Observed Gouging near station 3+25



Photo 17: Typical Deck Warping between station 3+25 and station 4+10



Photo 18: Typical Deck Warping between station 3+25 and station 4+10



Photo 19: Typical Corroded Pile Bracing
Connection with Missing Brace near station 3+25



Photo 20: Typical Corroded Pile Bracing Connection with Missing Brace near station 3+75



Photo 21: Typical Timber Pile Flaking and Gouging near station 3+75



Photo 22: Rail Post Corroded Connection Bolt near station 3+75



Photo 23: Corroded Connection and Checking at Rail Post and Timber Pile Cap Beam. Pile with Missing Brace and near station 4+00



Photo 24: Typical Joist Replacement near station 4+00.



Photo 25: Typical Joist Replacement near station 4+00.



Photo 26: Typical Light Post Deterioration Near Base Connection near station 4+00



Photo 27: Typical Corroded Bracing Connection near station 4+25



Photo 28: Typical Replacement Pile with Previous Cut-off Pile in Water near station 4+25



Photo 29: Typical Joist Replacement near station 4+25



Photo 30: Typical Corroded Bracing and Pile Connection near station 4+25

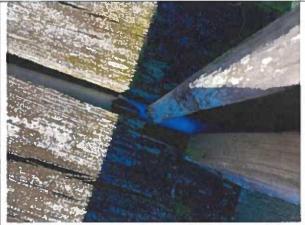


Photo 31: Typical Conduit Housing Damage near station 4+75



Photo 32: Fish Cleaning Station near station 5+00



Photo 33: Typical Corroded Bracing Connection Bolts near station 5+00



Photo 34: Typical Corroded Bracing Connection Bolts with Pile Gouging near station 5+50



Photo 35: Typical Pile Flaking and Gouging near station 5+75



Photo 36: Typical Broken (Disconnected) Bracing near station 6+00



Photo 37: Pile Flaking and Gouging and Bracing Checking near station 6+00



Photo 38: Typical Missing Bracing Member and Corroded Bolt near station 6+25



Photo 39: Typical Broken Bracing Member near station 6+50



Photo 40: Pile Checking and Gouging near station 6+50



Photo 41: Typical Broken Bracing Member and Pile Cap Checking near station 6+75



Photo 42: Typical Top Rail Disconnection near station 6+75



Photo 43: Typical Bench and Disconnected Toe Boards near station 6+75



Photo 44: Typical Broken Bracing Member and Corroded Bolts near station 6+75



Photo 45: Typical Bench and Missing Toe Boards near station 7+00



Photo 46: Cracked Pile near station 7+00



Photo 47: Cracked Pile near station 7+00



Photo 48: Typical Checking in Bracing near station 7+00



Photo 49: Typical Broken Bracing Member and Corroded Bolts near station 7+25



Photo 50: Typical Missing Top Rail and Toe Boards near station 7+25



Photo 51: Typical Pile Gouging and Checking near station 7+25



Photo 52: Typical Broken and Missing Bracing Member and Corroded Bolts near station 7+50



Photo 53: Typical Missing Midrail and Toe Board near station 7+50



Photo 54: Broken Pile Beyond station 7+50



Photo 55: Typical Pile Gouging and Flaking near station 7+50



Photo 56: Typical Pile Gouging and Pitting with Broken Bracing near station 7+50



Photo 57: Typical Pile Exterior Rot Deterioration near station 0+00



Photo 58: Typical Hollow Pile Deterioration near station 0+00



Photo 59: Typical Cross Bracing Checking and Splitting near station 0+50



Photo 60: Typical Joist Notching at Support near station 0+75



Photo 61: Typical Corroded Bolt Between Pile and Bracing Member near station 0+75



Photo 62: Typical Corroded Bolt Between Pile and Bracing Member near station 0+75



Photo 63: Typical Rotting Joist / Supports near station 0+90 Balcony



Photo 64: Typical Detached Railing near station 0+90 Balcony



Photo 65: Typical Rotting Joist near station 0+90 Balcony



Photo 66: Typical Rotting / Hollow Bracing Member near station 0+90 Balcony



Photo 67: Typical Support Checking and Splitting near station 0+90 Balcony



Photo 68: Typical Bracing Member Checking and Splitting near station 0+90 Balcony



Photo 69: Cross Bracing Checking and Splitting near station 1+00



Photo 70: Typical Disconnected and Split Joist near station 1+00



Photo 71: Typical Pile Cap End Rot and Detached Railing Post near station 1+25



Photo 72: Typical Pile Cap End Rot near station 1+50



Photo 73: Disconnected Cross Bracing near station 2+25



Photo 74: Split / Checked Cross Bracing and Pile Cap End Rot near station 2+25

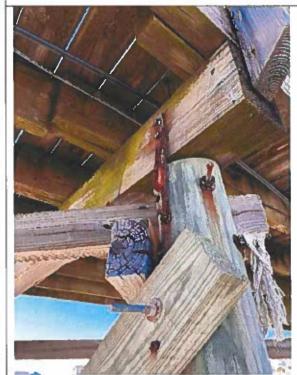


Photo 75: Corroded and Failed Pile / Pile Cap Connection near station 2+50



Photo 76: Corroded Pile / Pile Cap Connection and Cross Bracing Connection near station 2+50

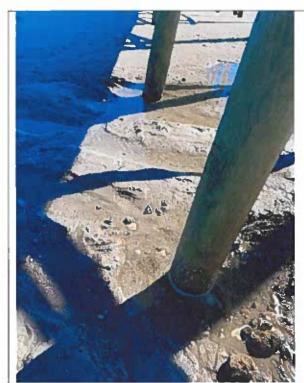


Photo 77: Typical Pile Marine Growth and Localized Scour in the Tidal Zone near station 2+75



Photo 78: Typical Pile Sistering Repair near station 2+75



Photo 79: Typical Pile with Missing Cross Bracing and Missing Pile / Pile Cap Connection near station 3+00



Photo 80: Split Pile Head with missing Pile / Pile Cap Connection Tie near station 3+50



Photo 81: Misaligned Pile Missing Pile / Pile Cap Connection and Missing Bracing near station 3+75



Photo 82: Misaligned Pile Missing Pile / Pile Cap Connection and Missing Bracing near station 3+75



Photo 83: Pile Gouging and Flaking near station 3+75

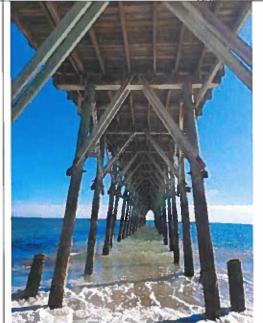


Photo 84: End of Observable Substructure Investigation near station 4+00



Photo 85: Typical Rotting Joist near station 4+00



Photo 86: Rotting Joist and Pile Cap End Rot near station 4+00



Photo 87: Pile Cap Splicing / Repair near station 4+00



Photo 88: Disconnected Pile / Pile Cap Connection and Corroded Bolts near station 4+00

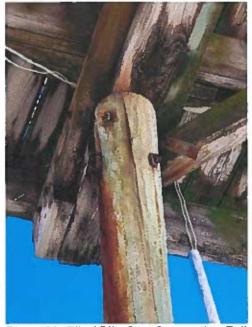


Photo 89: Pile / Pile Cap Connection Failure and Gouging at Pile Top near station 4+00



Photo 90: Broken Bracing and Corroded Connection Bolts Beyond station 4+00

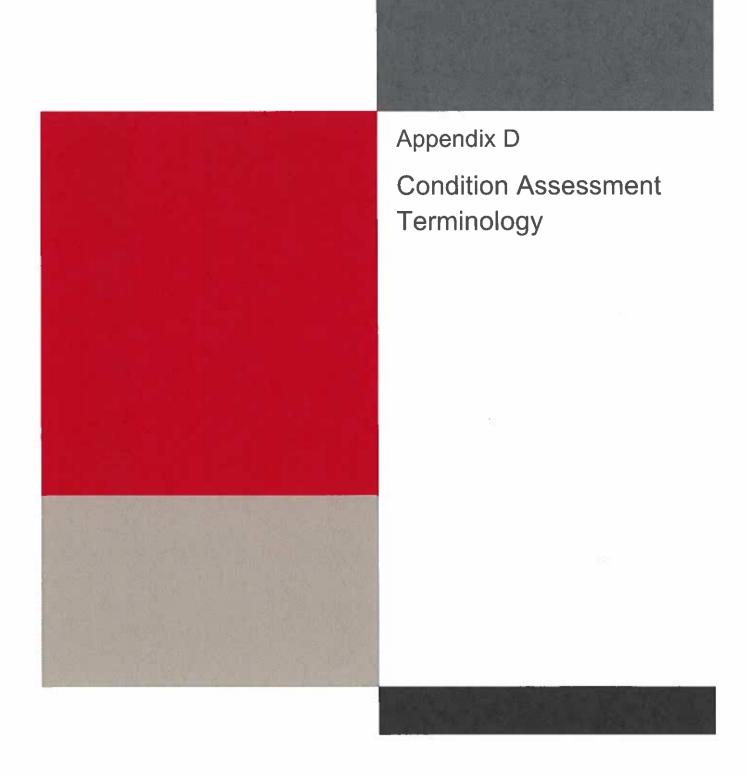


	Table D-1: Condition Assessment Ratings			
Rating	Description			
Good	No visible damage, or only minor damage is noted. Structural elements may show very minor deterioration, but no overstressing is observed. No repairs are required.			
Satisfactory	Limited minor to moderate defects or deterioration are observed, but no overstressing is observed. No repairs are required			
Fair	All primary structural elements are sound, but minor to moderate defects or deterioration is observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure.			
	Repairs are recommended, but the priority of the recommended repairs is low.			
Poar	Advanced deterioration or overstressing is observed on widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.			
Serious	Advanced deterioration, overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible and load restrictions may be necessary. Repairs may need to be carried out on a high-priority basis with urgency.			
Critical	Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high priority basis with strong urgency.			

Source: Waterfront Facilities Inspection and Assessment, ASCE Manuals and Reports on Engineering Practice No. 130, Edited by Ronald E. Heffron., 2015, Published by American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400; p 59.