



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
701 SAN MARCO BOULEVARD
JACKSONVILLE, FL 32207-8137

June 17, 2025

Regulatory Division
North Permits Branch
Jacksonville Permits Section
SAJ-2025-01162 (NPR-TMM)

Florida Department of Environmental Protection
Attention: David Matson
3900 Commonwealth Boulevard, Mail Station 520
Tallahassee, Florida 32399
Sent via: David.Matson@FloridaDEP.gov

Dear Mr. Matson:

Reference is made to the application received on May 12, 2025, for a Department of the Army permit to conduct two boardwalk replacement projects as follows:

1. Existing Guana Tolomato Matanzas National Estuarine Research Reserve (GTMNERR) North Beach Parking Area Dune Walkover Improvements (Beach Side): To repair the existing Guana Reserve North Beach Parking Area dune walkover boardwalk and deck overlook. All of the piles supporting the overlook platform and stair transition up to the overlook platform will have the top 3 feet removed. Wood decking on the dune walkover would be replaced with composite decking. There will be no fill involved with the work.
2. Existing GTMNERR North Beach Parking Area Improvements (Parking Lot Side): This will consist of two projects:
 - i. To reconstruct the existing parking lot boardwalk ditch crossing in the center of the parking area to improve the boardwalk. Work would include replacement of existing piles with larger piles and construction of a new boardwalk. The piles would be excavated to remove and replace the piles; however, there would be no fill involved with the replacement of the piles. The contractor will remove the existing joists, beam caps, deck and handrail assembly of the boardwalk and parking lot steps, leaving only the existing piles. The parking lot ditch crossing will be completely removed and replaced. Any materials removed in conjunction with the placement of larger piles will be transported offsite to an upland disposal area.

ii. To reconstruct the existing boardwalk parking lot stairs that lead from the parking lot to State Road A1A. All stairs material will be replaced except for the existing piles. Any materials removed in conjunction with the placement of larger piles will be transported offsite to an upland disposal area. There will be no fill involved with the work.

The contractor will use the existing State Road A1A and parking lot to access the site.

The proposed project site is located at GTMNERR North Beach Parking Area, 1255 A1A Scenic and Historic Coastal Byway, Section 36, Township 4 South, Range 29 East, Ponte Vedra Beach, St. Johns County, Florida. The approximate central coordinates are Latitude 30.116446° and Longitude -81.346075°. The application has been assigned the file number SAJ-2025-01162 (NPR-TMM).

Section 10 of the Rivers and Harbors Act of 1899

The project as proposed will not require a Department of the Army permit in accordance with Section 10 of the Rivers and Harbors Act of 1899 as it is not located within a navigable water of the United States.

Section 404 of the Clean Water Act

The U.S. Army Corps of Engineers (Corps) has determined that the proposed project will not require a Department of the Army permit in accordance with Section 404 of the Clean Water Act. The proposed work may occur in waters of the United States; however, the Corps determined that the proposed work does not involve the discharge of dredged or fill material. Provided the work is done in accordance with the enclosed drawings, Department of the Army authorization will not be required.

This NPR does not address nor include any consideration for geographic jurisdiction and shall not be interpreted as such.

Additionally, your project site may contain species protected by the Endangered Species Act (ESA) of 1972, as amended. You should contact your local U.S. Fish and Wildlife Service (FWS) office to determine if federally listed species or their habitat are present on your project site. If it is determined that federally listed species may be affected by the proposed project, authorization for "incidental take" may be required. FWS can be contacted by emailing FW4FLESRegs@fws.gov.

This letter does not obviate the requirement to obtain any other Federal, State, or local permits that may be necessary for your project. Should you have any questions, please contact Terri M. Mashour at the letterhead address, by email at Terri.M.Mashour@usace.army.mil, or by telephone at 904-251-9179.

Thank you for your cooperation with our permit program. The Corps Jacksonville District Regulatory Division is committed to improving service to our customers. We strive to perform our duty in a friendly and timely manner while working to preserve our environment. We invite

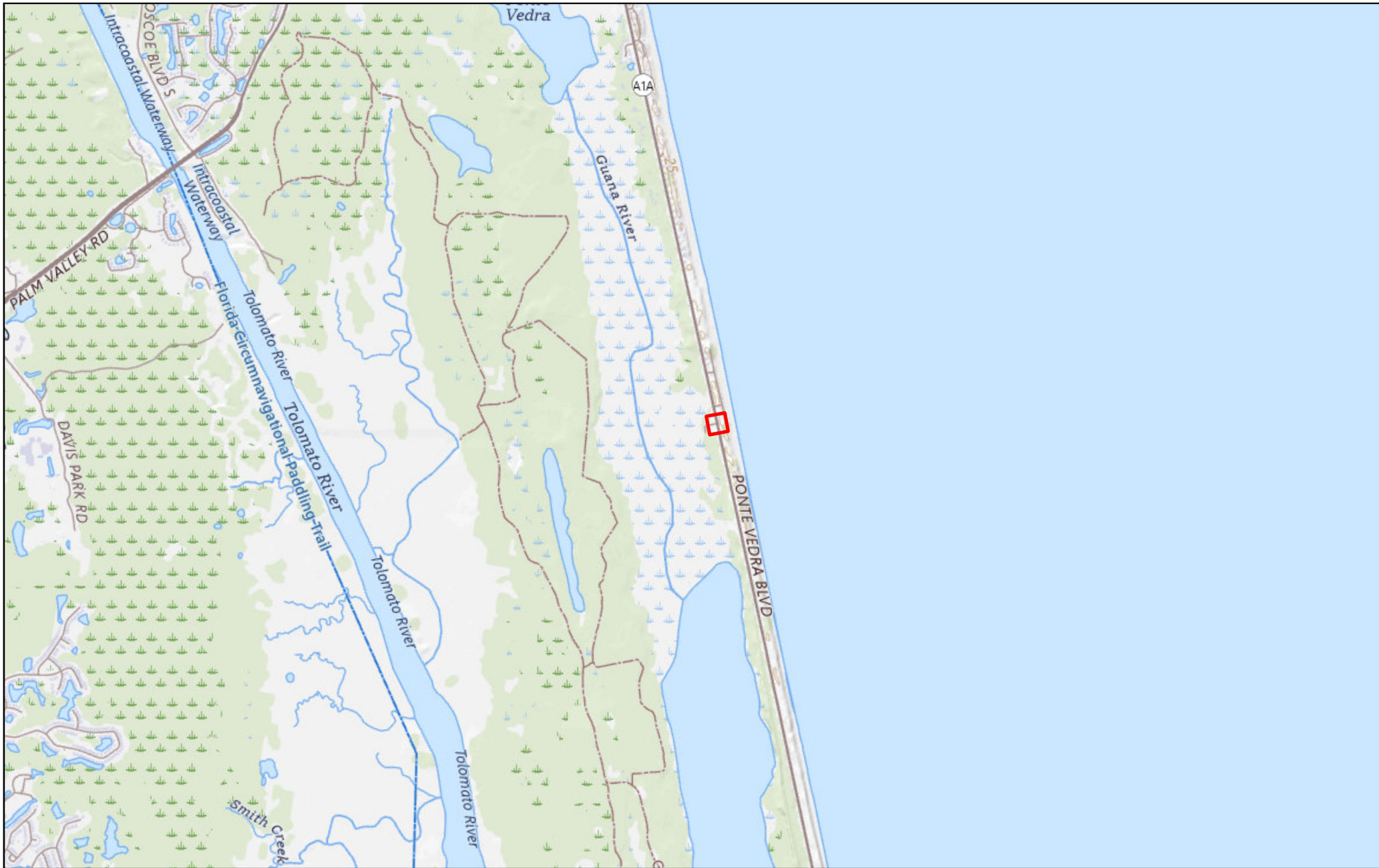
you to take a few minutes to visit <http://per2.nwp.usace.army.mil/survey.html> and complete our automated Customer Service Survey. Your input is appreciated – favorable or otherwise. Please be aware this web address is case sensitive and should be entered as it appears above.

Sincerely,

Terri M. Mashour
Project Manager

Cc:
Colliers Engineering & Design, Attention: Sean Stanton@collierseng.com

Enclosures
Drawings

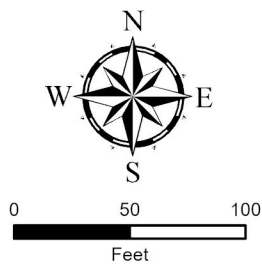


Prepared For: Florida Department of Environmental Protection Division of Recreation and Parks Bureau of Design and Construction 3800 Commonwealth Blvd. Tallahassee, FL 32399 Prepared By: Colliers Raleigh Office 2000 Regency Parkway, Suite 295 Cary, NC 27518 www.colliersengineering.com	 0 2,500 5,000 Feet	Project Area Source: USGS- South Ponte Vedra Beach, FL	Vicinity Map GTMNERR North Beach Access Boardwalk Reconstruction St. Johns County, Florida <table border="1" style="width: 100%;"> <tr> <td>Date:</td> <td>Project #:</td> <td>Drawn By:</td> </tr> <tr> <td>4/14/2025</td> <td>24000297G</td> <td>SS</td> </tr> </table>			Date:	Project #:	Drawn By:	4/14/2025	24000297G	SS	Figure 1	
			Date:	Project #:	Drawn By:								
4/14/2025	24000297G	SS											



Prepared For:
 Florida Department of Environmental Protection
 Division of Recreation and Parks
 Bureau of Design and Construction
 3800 Commonwealth Blvd.
 Tallahassee, FL 32399

Prepared By:
Colliers Raleigh Office
 2000 Regency Parkway,
 Suite 295
 Cary, NC 27518
 www.colliersengineering.com
Engineering & Design



Project Area

Source: USGS

Site Map

*GTMNERR North Beach
 Access Boardwalk Reconstruction*
 St. Johns County, Florida

Date:	Project #:	Drawn By:
4/14/2025	24000297G	SS

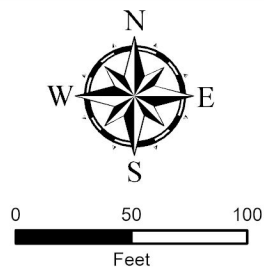
Figure 2





Prepared For:
 Florida Department of Environmental Protection
 Division of Recreation and Parks
 Bureau of Design and Construction
 3800 Commonwealth Blvd.
 Tallahassee, FL 32399

Prepared By:
Colliers Raleigh Office
 2000 Regency Parkway,
 Suite 295
 Cary, NC 27518
 www.colliersengineering.com



- Project Area
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Lake

Source: USFWS

NWI Map

*GTMNERR North Beach
 Access Boardwalk Reconstruction*
 St. Johns County, Florida

Date:	Project #:	Drawn By:
4/9/2025	24000297G	SS

Figure 3



[illegible]

G8 — DETAIL IDENTIFICATION
 A502 — SHEET NUMBER

DISTRICT 3
ST. JOHNS COUNTY

PROJECT # 044412147

CODE LIST

FLORIDA BUILDING CODE, BUILDING (FBC-B)..... 2014 Edition
FLORIDA ACCESSIBILITY CODE.....2014 Edition

DESIGN DATA

CONSTRUCTION TYPE:	N/A	TOTAL BUILDING AREA PER FLOOR:	N/A
OCCUPANCY CLASS:	N/A	BUILDING HEIGHT/NUMBER OF STORIES:	N/A
OCCUPANT LOAD:	N/A	REQUIRED SPRINKLER OR ALARM SYSTEM:	No
TOTAL EXITS:	N/A	NUMBER OF BEDROOMS:	N/A
SQ FT ALTERED AREA	N/A	LEVEL OF ALTERATION:	N/A

DESIGN LOADS (FBC-B CHAPTER 16):

DESIGN LIVE LOAD = 90 psf

WIND LOADS (FBC-B SECTION 1609):

NOMINAL DESIGN 3-SEC GUST WIND SPEED = 120 MPH
RISK CATEGORY = I
EXPOSURE = D

SCOPE OF PROJECT - RECONSTRUCTION OF
EXISTING TIMBER BOARDWALKS THAT PROVIDE
ACCESS FROM THE GUANA TOLOMATO
MATANZAS NATIONAL ESTUARINE RESEARCH
RESERVE PARKING LOTS TO THE BEACHES.

Sheet Number	Sheet Title
C-1	COVER SHEET
C-2	VICINITY MAP AND NOTES
S-1	BOARDWALK 1 PLAN
S-2	BOARDWALK 2 PLAN
S-3	BOARDWALK 3 PLAN
S-4	BOARDWALK 4 PLAN
S-5	DETAIL SHEET 1
S-6	DETAIL SHEET 2
1 of 4	BOARDWALK 1 SURVEY
2 of 4	BOARDWALK 2 SURVEY
3 of 4	BOARDWALK 3 SURVEY
4 of 4	BOARDWALK 4 SURVEY

SETH SCHMID, P.E.
DESIGNER

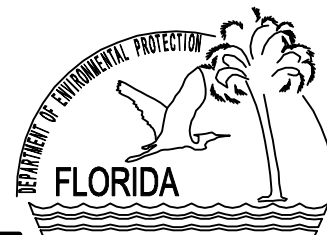
54640
COMPUTER No.

AUGUST 2015
INITIAL ISSUE DATE

CIVIL CONSULTANT:

SETH SCHMID, P.E.
CIVIL ENGINEER
FL. P.E. No. 54640
KIMLEY-HORN AND ASSOCIATES, INC.
12740 GRAN BAY PARKWAY WEST, SUITE 2350
JACKSONVILLE, FLORIDA 32258

C-1



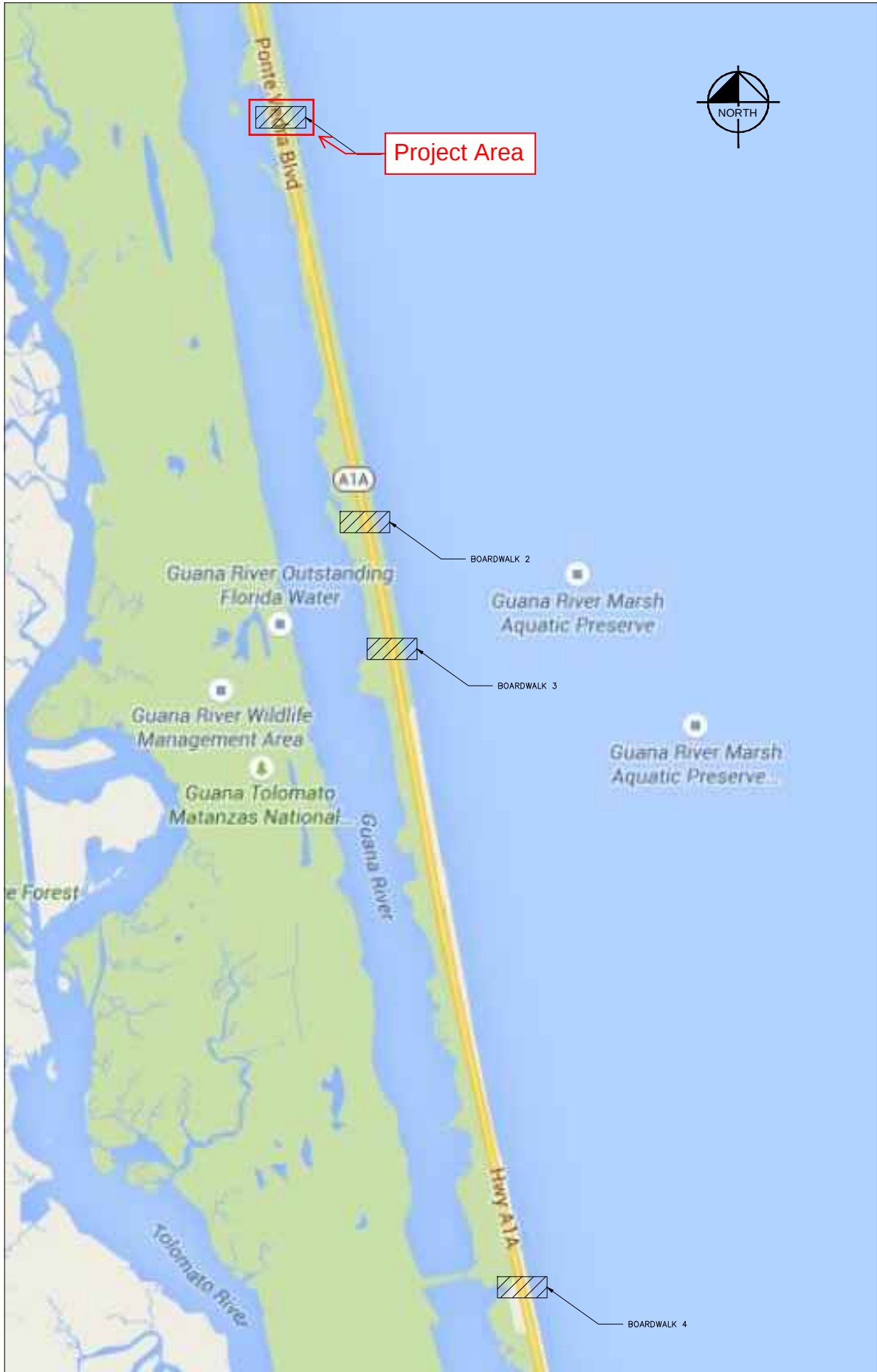
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LEGEND

 APPROXIMATE BOARDWALK LOCATION

DESIGN CRITERIA

- A. DECK LIVE LOAD = 90 PSF
- B. WIND DESIGN DATA:
- NOMINAL DESIGN 3-SECOND GUST WIND SPEED = 120 MPH
RISK CATEGORY = I
EXPOSURE = D
- C. CODES:
- 1) 2014 FLORIDA BUILDING CODE
 - 2) ASCE 7-10
 - 3) ANSI/AF&PA NDS-2012



GENERAL CONSTRUCTION NOTES AND SPECIFICATIONS

1. GENERAL:
- A.) PROTECT EXISTING FACILITIES, STRUCTURES AND UTILITY LINES FROM ALL DAMAGE. PROTECT THE WORK, ADJACENT PROPERTY AND THE PUBLIC. CONTRACTOR IS SOLELY RESPONSIBLE FOR DAMAGE OR INJURY DUE TO HIS ACT OR NEGLIGENCE.
 - B.) THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SAFETY AND CONSTRUCTION PROCEDURES.
 - C.) PRIOR TO CONSTRUCTION, FIELD VERIFY ALL DIMENSIONS IN THE DRAWINGS AND DETAILS AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER.
 - D.) REFER TO THE ENGINEER FOR INSTRUCTION FOR ANY DIMENSION NOT GIVEN ON DRAWINGS. SCALING OF DRAWINGS SHALL NOT BE USED TO OBTAIN OR VERIFY ANY DIMENSION SHOWN ON THE DRAWINGS.
2. TREATED WOODS: (OTHER THAN PILES)
- ALL WOOD SHALL BE PRESERVATIVE TREATED (P.T.) - ACQ - ALKALINE COPPER QUAT.
- TREATMENT RETENTION: .60 LB/CF FOR GROUND CONTACT MATERIALS AND .40 LB/CF FOR NON-GROUND MATERIALS.
- JOIST SITE FABRICATION CUTS AND BORINGS IN TREATED LUMBER SHALL BE FIELD TREATED WITH COPPER NAPHTHENATE HAVING A MINIMUM OF 2% METALLIC SOLUTION IN ACCORDANCE WITH AFWA STANDARD M4.

3. LUMBER AND TIMBER GRADES AND STANDARDS:
- BEAMS, JOISTS AND DECKING, SHALL BE NO. 2 SOUTHERN YELLOW PINE, UNLESS OTHERWISE NOTED ON PLANS.
NO. 2 BOARDS SHALL CONFORM TO THE SOUTHERN PINE INSPECTION BUREAU "STANDARD GRADING RULES",
CURRENT EDITION WITH THE FOLLOWING EXCEPTIONS:
- ALL LUMBER AND TIMBER SHALL BE DRESSED, PROVIDE NOMINAL SIZES AS INDICATED ON DESIGN PLANS.

4. PILES:
- PRESERVATIVE TREATMENT: CHROMATED COPPER ARSENATE, 2.5 LB/CF PER FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION 955.
- SPECIES: SOUTHERN YELLOW PINE
- SETTING: PILES MAY BE JETTED OR DRIVEN- IN EITHER CASE, THE LAST REMAINING 2' SHALL BE HAMMER DRIVEN.
- EMBEDMENT: MINIMUM 10' INTO NATURAL GRADE OR AS SPECIFIED ON DESIGN PLANS.

5. CONSTRUCTION TOLERANCES :
- ALIGNMENT AND GRADE:
- PILES SHALL BE SET TO ACHIEVE CONTINUOUS, STRAIGHT CENTERLINE ALIGNMENT AS INDICATED ON DESIGN PLANS, OR AS DIRECTED BY THE PROJECT ENGINEER/ARCHITECT. INDIVIDUAL PILES WITHIN THE ALIGNMENT SHALL BE PLUMB ABOUT THEIR CENTERLINE WHEN CHECKED WITH A PLUMB BOB. CENTERS OF PILES IN CONTINUOUS STRAIGHT RUNS SHALL BE WITHIN 1" OF EITHER SIDE OF THE CENTERLINE ALIGNMENT WHEN CHECKED WITH A TAUT STRING LINE. PILES SHALL BE SPACED AT INTERVALS AND SET TO GRADE AS REQUIRED TO CONFORM WITH EXISTING PILES AND CONDITIONS OR TYPICAL DETAILS FOR DUNE CROSSOVERS. PILING SHALL BE FINISH TRIMMED TO MAINTAIN DESIGN ELEVATIONS. FINISH DECK AND STEP GRADES SHALL BE WITHIN 1/4" OF GRADES INDICATED ON THE DESIGN PROFILE OR SECTION. PILE TOPS SHALL BE NEATLY TRIMMED TO PROVIDE A UNIFORM 3-1/2" TONGUE BETWEEN BEAMS WITH INLAYS PROVIDING FULL CONTACT OF BEAM FACE AND DIRECT, LEVEL BEARING OF BEAM BOTTOMS. GAPS UNDER BEAMS WILL NOT BE ACCEPTED. SHIMS SHALL NOT BE USED.
- OVER CUT PILES WILL BE REMOVED/REPLACED.

6. MOUNTING HARDWARE AND FASTENERS:
- ALL HARDWARE SHALL BE TYPE 316 STAINLESS STEEL (S.S.) UNLESS OTHERWISE SPECIFIED IN PLANS.
- NAILS: SHALL BE STAINLESS STEEL RING SHANK, UNLESS NOTED OTHERWISE.
- SCREWS: SCREWS SHALL BE SELF COUNTERSINKING WITH HEAVY SHANK AND MEDIUM PITCH THREADS. SCREWS SHALL BE STAINLESS STEEL, TYPE 316.
- BOLTS AND BOLTING: BOLT HEADS AND NUT SHALL BE DRAWN DOWN SECURELY TO THE FACE OF THE MEMBER BEING SECURED. ALL MACHINING BOLTS SHALL INCLUDE ONE WASHER EACH AT HEAD AND THREADED ENDS. CARRIAGE BOLTS, WHEN SPECIFIED, SHALL UTILIZE A SINGLE WASHER AT THE THREADED ENDS. GENERALLY, NO BOLT END SHALL PROTRUDE FROM THE WOOD CONNECTION GREATER THAN THREE TIMES ITS DIAMETER.
- ALL FASTENERS SHALL BE STAINLESS STEEL TYPE 316 UNLESS NOTED OTHERWISE.

- EXECUTION: WHERE NAILING IS SPECIFIED FOR WOOD CONNECTIONS, PRE-DRILLING IS REQUIRED TO MINIMIZE SPLITTING. THIS SPECIFICALLY APPLIES TO HANDRAIL COMPONENTS AND WOOD DECKING. PRE-DRILL ONLY THE MEMBER TO BE SECURED. WHERE SCREWS ARE SPECIFIED FOR WOOD CONNECTIONS, PRE-DRILLING IS REQUIRED. DRILL SIZE SHALL BE GAUGED TO ALLOW FULL THREAD PENETRATION.
- HOLES FOR BOLTS AND LAGS: HOLES FOR MACHINE BOLTS SHALL BE BORED WITH A BIT OF THE SAME DIAMETER AS THE BODY OF THE BOLT. HOLES FOR LAGS SHALL BE BORED WITH A BIT NOT LARGER THAN THE BODY OF THE SCREW AT THE BASE OF THE THREAD.
- UTILIZATION OF MECHANICAL NAIL GUNS: CONTRACTOR SHALL REMOVE ANY FEEDER WIRE CHIPS THAT LODGE AND PROTRUDE FROM THE FINISHED DECK SURFACE.

7. EROSION CONTROL:
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING, INSTALLING, MAINTAINING AND REMOVING EROSION / SILT CONTROL BARRIER AS MAY BE REQUIRED BY THE STATE OF FLORIDA OR LOCAL AGENCIES DURING CONSTRUCTION.

8. ACCESSIBILITY HANDRAIL SYSTEM:
- HANDRAILS SHALL BE CONSTRUCTED OF 1 1/4" IPS ALUMINUM SCHEDULE 40, ALLOY 6063-T6 PIPE. ALL FITTINGS SHALL BE OF ONE-PIECE EXTRUSION OR CAST AND MACHINED TO FINAL SHAPE. PROVISIONS SHALL BE MADE TO DRAIN WATER FROM THE RAILING SYSTEM. ALUMINUM HANDRAILS SHALL RECEIVE A MILL FINISH; HAND OR MACHINE SANDED TO 240 GRIT OR BETTER, FINISH EQUAL TO AA-C22A41. ALL FASTENERS SHALL BE TYPE 316 STAINLESS STEEL.

- RAMPS NOT EXCEEDING A SLOPE OF 1:20 DO NOT REQUIRE ACCESSIBILITY COMPLIANCE, BUT DO REQUIRE GUARD RAILS.

9. COMPOSITE MATERIALS:
- ALL DECKING AND RAILING CAP MATERIAL SHALL BE MOISTURESHIELD COMMERCIAL GRADE COMPOSITE SYSTEM OR APPROVED EQUIVALENT. ATTACH WITH STAINLESS STEEL FASTENERS.

- COLOR TO BE DETERMINED BY OWNER.

SHEET NUMBER C-2	VICINITY MAP & NOTES		KHA PROJECT 04412147		LICENSED PROFESSIONAL	 12740 GRAN BAY PARKWAY WEST, SUITE 2350 JACKSONVILLE, FLORIDA 32258 PHONE: 904-828-3900 WWW.KIMLEY-HORN.COM CA 00000696	No.	REVISIONS	DATE	BY
	GUANA TOLOMATO MATANZAS NERR - BOARDWALK IMPROVEMENTS PREPARED FOR FDEP ST. JOHNS COUNTY FLORIDA		DATE AUGUST 2015 SCALE AS SHOWN DESIGNED BY SMT DRAWN BY SMT CHECKED BY		SETH SCHMID, P.E. FLORIDA LICENSE NUMBER: 54640					

PILES TO BE VERIFIED IN FIELD. IF NO PILE IS FOUND, INSTALL NEW PILES TO MATCH OTHER EXISTING PILES WITH MINIMUM 5' EMBEDMENT.



Overlook - remove upper 3 feet of 14 piles and lower deck elevation

EXISTING TIMBER BOARDWALK SUPERSTRUCTURE, INCLUDING CONNECTIONS AND RAILING ARE TO BE REMOVED AND SHALL BE REPLACED AS INDICATED ON THIS PLAN AND IN ACCORDANCE WITH THE ASSOCIATED DETAILS ON SHEETS S-5 AND S-6.

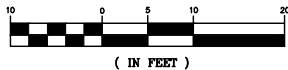
UNLESS NOTED OTHERWISE, THE EXISTING PILES SHALL REMAIN AND BE USED FOR THE NEW BOARDWALK SUPERSTRUCTURE.

UPON REMOVAL OF THE EXISTING DECK SUPERSTRUCTURE, THE TOP OF THE EXISTING PILES SHALL BE INSPECTED BY AN ENGINEER FOR EXCESSIVE CRACKING. SPLITS SHALL BE REPAIRED PER THE DETAIL ON SHEET S-5.

NOTES:

1. HORIZONTAL LOCATIONS OF PILES WERE DETERMINED BY DEGREE SURVEYORS, INC. AS INDICATED ON THEIR MARCH 31, 2015 SPECIAL PURPOSE SURVEY. SOME PILING WERE BURIED IN SAND OR OTHERWISE OBTAINED. THE HORIZONTAL LOCATIONS OF THESE PILES WERE DETERMINED BY EITHER PROBING THROUGH BOARDWALK SLATS OR BY SPLITTING THE HORIZONTAL SUPPORT BEAMS.
2. VERTICAL ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) AS INDICATED ON THE MARCH 31, 2015 SURVEY BY DEGREE SURVEYORS, INC.
3. STAIR LOCATIONS AND DECK LIMITS ARE APPROXIMATE AND ARE REFERENCED TO PILE LOCATIONS.
4. REFER TO TYPICAL DETAILS ON SHEETS S-5 AND S-6 FOR DECK AND STAIR FRAMING.

GRAPHIC SCALE



LEGEND

 ELEVATION OF TOP OF DECK

12740 GRAN BAY PARKWAY WEST, SUITE 2350
JACKSONVILLE, FLORIDA 32258
PHONE: 904-828-3900
WWW.KIMLEY-HORN.COM CA 00000696

LICENSED PROFESSIONAL

SETH SCHMID, P.E.
FLORIDA LICENSE
NUMBER: 54640

DATE: _____

KHA PROJECT
044412147

DATE _____

AUGUST 2015
SALE AS SHOWN

SIGNED BY SMT

DRAWN BY SMT

CHECKED BY

BOARDWALK 1 PLAN

GUANA TOLOMATO MATANZAS NERR – BOARDWALK IMPROVEMENTS
PREPARED FOR FDEP

FLORIDA

ST. JOHNS COUNTY

SHEET NUMBER

S-1

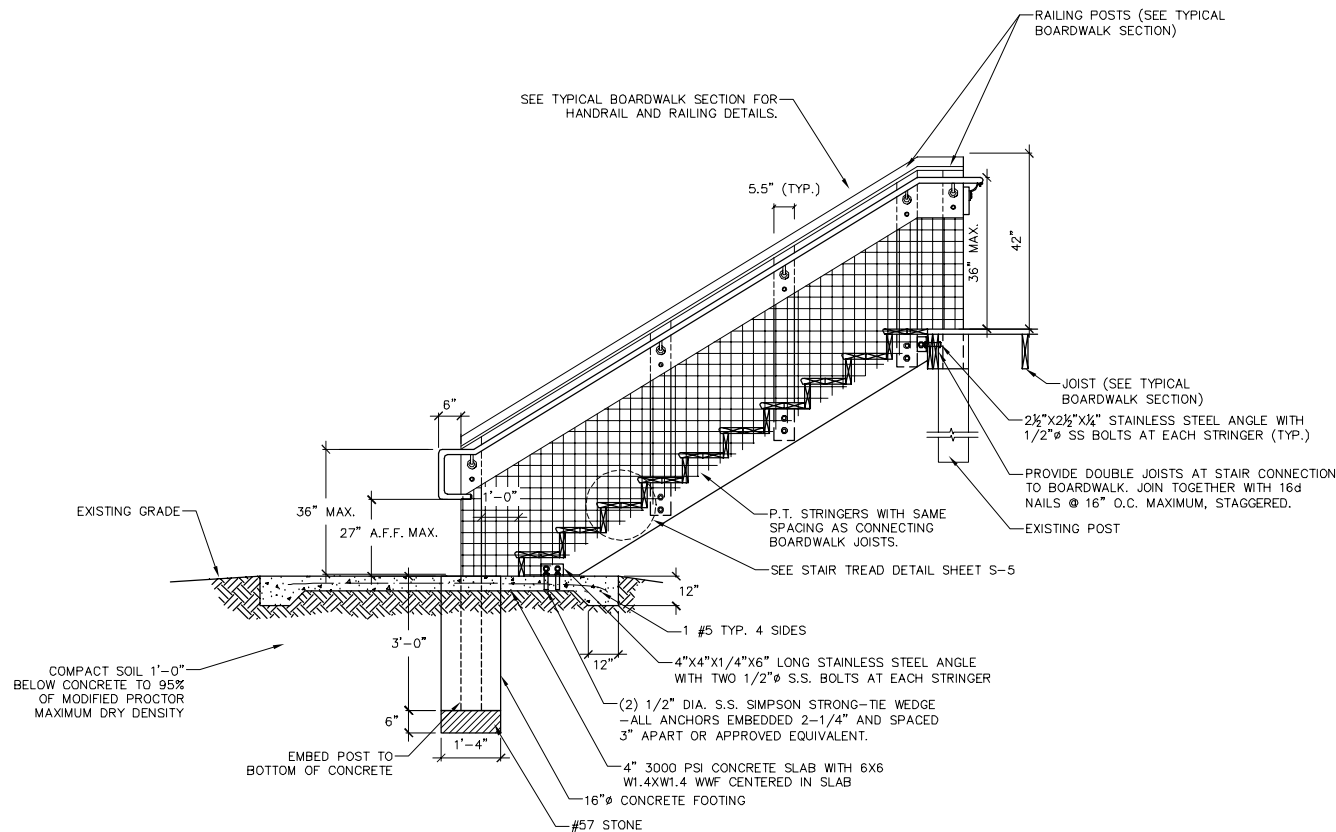
REVISIONS

No.

DATE _____

BY

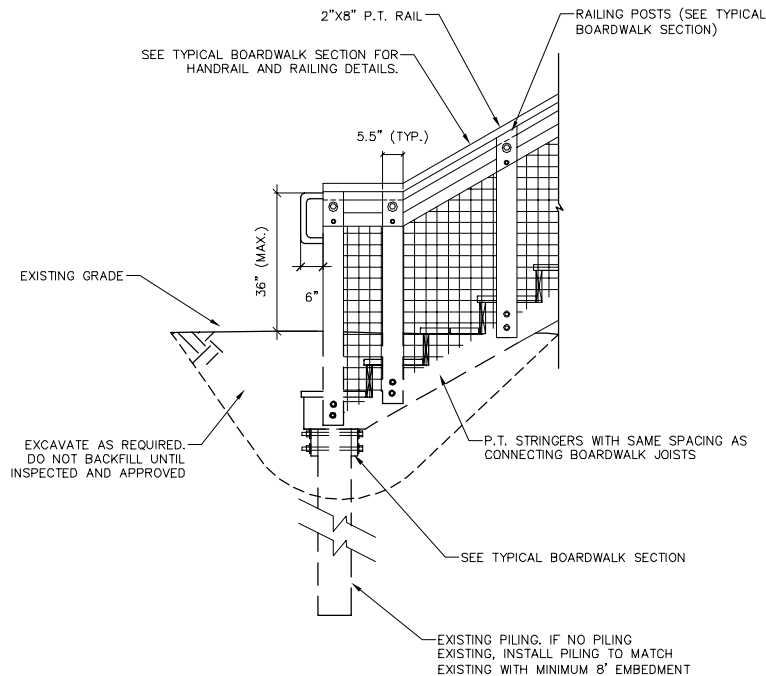
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TYPICAL SLAB AT STAIRS AND STAIR SIDE CONNECTION

SCALE : N.T.S.

NOTE: SEE SECTION STAIR TRANSITION, SHEET S-5, FOR STAIR DETAILS

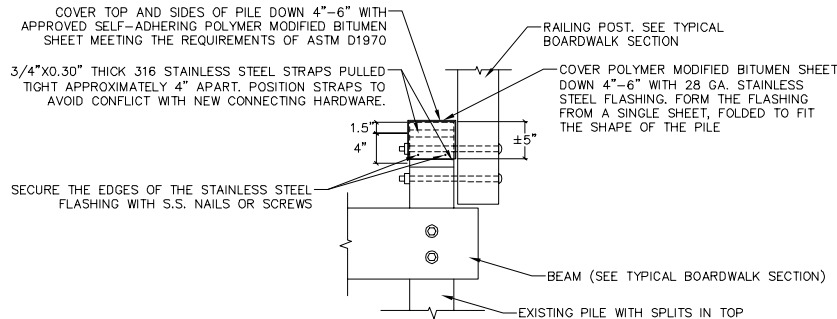


TYPICAL STAIR AT GRADE TRANSITION

SCALE : N.T.S.

NOTE: 1) EXTEND 2 (TWO) STEPS BELOW THE SURFACE ON EACH RAMP
(TYP.)

2) SEE SECTION STAIR TRANSITION, SHEET S-5, FOR STAIR DETAILS



PILE SPLIT REPAIR DETAIL

SCALE : N.T.S.

NOTE: 1. DECKING NOT SHOWN FOR CLARITY
2. REMOVE EXISTING CONNECTION HARDWARE PRIOR TO INSTALLING REPAIR

SHEET NUMBER		DETAIL SHEET 2		KHA PROJECT 044412147 DATE AUGUST 2015 SCALE AS SHOWN DESIGNED BY SMT DRAWN BY SMT CHECKED BY		LICENSED PROFESSIONAL SETH SCHMID, P.E. FLORIDA LICENSE NUMBER: 54640 DATE:		 12740 GRAN BAY PARKWAY WEST, SUITE 2350 JACKSONVILLE, FLORIDA 32238 PHONE: 904.722.8900 WWW.KIMLEY-HORN.COM CA 02000696		No.	REVISIONS	DATE	BY
GUANA TOLOMATO MATANZAS NERR - BOARDWALK IMPROVEMENTS PREPARED FOR FDEP													
ST. JOHNS COUNTY		FLORIDA											

STATE ROAD A1A

BENCHMARK — SET NAIL AND DISK
STAMPED "DSI BENCHMARK"
ELEVATION = 14.57'

LEGEND:

BW DENOTES ELEVATION ON TOP OF BOARDWALK
TP DENOTES ELEVATION ON TOP OF PILING
G DENOTES ELEVATION ON GROUND
APP. LOC DENOTES APPROXIMATE LOCATION

NOTES:

- THIS IS A SPECIAL PURPOSE SURVEY TO COLLECT THE HORIZONTAL AND VERTICAL LOCATION OF EXISTING PILINGS AND ADJACENT GROUND SHOTS ON THE FOUR BOARDWALKS IN THE GUANA RIVER PRESERVE.
- THE HORIZONTAL COORDINATES PROVIDED ARE REFERENCED TO FLORIDA STATE PLANE COORDINATE SYSTEM, FLORIDA EAST ZONE NAD83(2011).
- ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM 1988 (NAVE88). ELLIPSOID HEIGHTS WERE ACQUIRED BY RTK GPS AND WERE CONVERTED TO ORTHOMETRIC HEIGHTS NAVD88 USING GEOID12A. BENCHMARKS USED WERE PUBLISHED NGS BENCHMARKS AS FOLLOWS:
W687 (PID DL5728) ELEVATION 12.73'
E8 (PID BC0608) ELEVATION 14.95'
1322 (PID BC0609) ELEVATION 13.76'
X687 (PID DL5729) ELEVATION 10.32'
V687 (PID DL5732) ELEVATION 17.08'
Z322 (PID BC0599) ELEVATION 20.14'
- PILINGS NOTED HEREON AS APPROXIMATE LOCATION WERE BURIED IN SAND AND/OR OTHERWISE INACCESSIBLE. HORIZONTAL LOCATIONS WERE DETERMINED BY EITHER PROBING THROUGH BOARDWALK SLATS OR BY SPLITTING THE HORIZONTAL SUPPORT BEAMS. VERTICAL LOCATIONS WERE DETERMINED BY SUBTRACTING THE AVERAGE DISTANCE FROM TOP OF BOARDWALK TO TOP OF PILING.

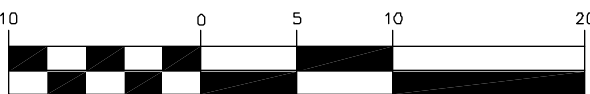
BENCHMARK — SET NAIL AND DISK
STAMPED "DSI BENCHMARK"
ELEVATION = 15.29'

BOARDWALK #1

○ DENOTES 0.50' DIAMETER PILING



GRAPHIC SCALE



(IN FEET)
1 inch = 10 ft.

SURVEY DATE: MARCH 31, 2015	DRAWING DATE: MARCH 31, 2015
FIELD BOOK___817___, PAGE(S)___44-54___	DRAWING SCALE: 1" = 10'
DRAFTED BY: BDC	REVISION DATE:
CHECKED BY: RLT	
COMPUTER FILE: 2015025.DWG	
JOB FILE No. 2015025	

2131 CORPORATE SQUARE BOULEVARD,
JACKSONVILLE, FL 32216
904-722-0400
FAX 904-722-0402
DEGROVE@DEGROVE.COM
LICENSED BUSINESS NUMBER L.B.4603

DEGROVE
SURVEYORS, INC.

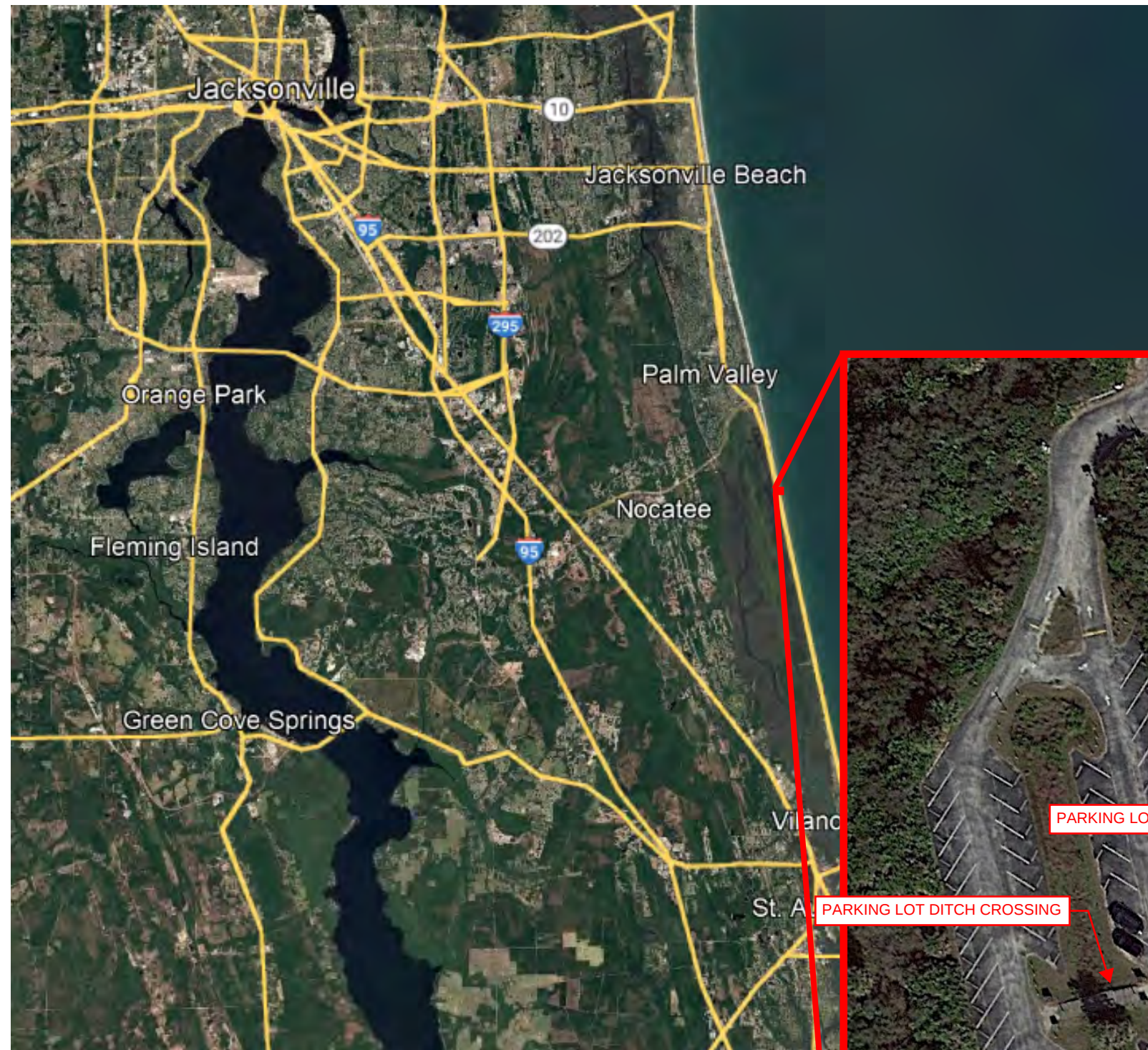
THIS SURVEY MEETS THE STANDARDS OF PRACTICE FOR PROFESSIONAL SURVEYORS AND MAPPERS IN THE STATE OF FLORIDA PURSUANT TO CHAPTER 5J-17.051 & 5J-17.052, F.A.C.

BRENDA D. CATONE, P.S.M., FLORIDA CERTIFICATION NO. 5447

NOTICE:
NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER

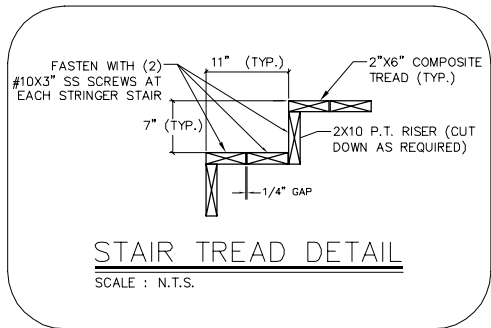
CERTIFIED TO:

KIMLEY HORN, INC.



- EROSION CONTROL NOTES:**
1. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
 2. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE INSPECTED DAILY AND REPAIRS MADE AS NECESSARY TO ENSURE THE PROPER AND CONTINUED FUNCTION OF THE CONTROL(S).
 3. ALL EROSION AND SEDIMENTATION CONTROL SHALL REMAIN IN PLACE UNTIL A PERMANENT VEGETATIVE COVER HAS BEEN ESTABLISHED.
 4. UNDER NO CIRCUMSTANCES SHALL SEDIMENTS BE PERMITTED TO EXIT THE PROJECT LIMITS, INCLUDING TRACKING BY VEHICLES ON PAVED ROADWAYS. THE CONTRACTOR SHALL MAKE IMMEDIATE REPAIRS OR ENHANCEMENTS TO ANY EROSION CONTROL SYSTEM THAT ALLOWS THE RELEASE OF SEDIMENTS.

SHEET NO.	GUANA TOLOMATO MATANZAS NERR		PROFESSIONAL REGISTRATION NUMBER 100000000000000000 FLORIDA PE #64775	DESIGNER : G. RUDD	ISSUE DATE:	SYMBOL	REVISION	DATE	REVISION	DATE
	SHEET TITLE									
	NORTH BOARDWALK IMPROVEMENTS PROJECT		CONSULTANT : Colliers	DRAWN BY: M. LEONARD	COMP. FILE No.:	SYMBOL A	REVISION	DATE	REVISION	DATE
	SITE MAP									
				Department of Environmental Protection DIVISION OF RECREATION AND PARKS Bureau of Design and Construction 3800 Commonwealth Blvd., Tallahassee, FL 32399 (850) 425-2300						



GENERAL NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR INSPECTING AND ACCEPTING THE EXISTING CONDITIONS OF THE SITE PRIOR TO BIDDING.
2. ALL DISTURBED AREAS WITHIN THE LIMITS OF RESTORATION SHALL BE REVEGETATED AS SPECIFIED BY THE PARK SERVICE BIOLOGIST.
3. EXISTING UNDERGROUND UTILITIES SHOWN ARE BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL ENSURE THAT THE UTILITY SYSTEMS DO NOT CONFLICT WITH THE PROPOSED PROJECT. CONFLICTS SHALL BE REPORTED TO THE PROJECT MANAGER IMMEDIATELY.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES. REMOVAL AND/OR RELOCATION OF EXISTING UTILITIES IN CONFLICT WITH THE WORK, CONSTRUCTION OF TEMPORARY UTILITIES IN THE EVENT THAT EXISTING UTILITY SERVICE MUST BE INTERRUPTED AND ANY OTHER CONSTRUCTION RELATED ACTIVITIES THAT MAY AFFECT EXISTING OR PROPOSED UTILITIES, THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES IS BASED ON INFORMATION PROVIDED BY THE UTILITY OWNERS, AVAILABLE RECORDS, AND SURVEYED FIELD INFORMATION. THE INFORMATION MAY NOT REFLECT ACTUAL CONDITIONS, INCLUDE ALL UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED, OR SHOW THE UTILITIES IN THE CORRECT HORIZONTAL OR VERTICAL LOCATIONS. THE CONTRACTOR WILL MAKE IS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS NECESSARY TO ESTABLISH THEIR LOCATIONS AND AVOID DAMAGE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING ALL GRADE STAKES, LINES AND LEVELS.
6. THE CONTRACTOR SHALL SOLID SOD ALL DISTURBED AREAS UNLESS OTHERWISE SPECIFIED OR SHOWN. NO SOD WITH MONOFILAMENT OR PLASTIC MESH BACKING WILL BE ALLOWED.
7. NO SEPARATE PAYMENT WILL BE MADE FOR DEWATERING. THE COSTS FOR DEWATERING ARE INCLUDED IN THE UNIT PRICES FOR CONSTRUCTING THIS PROJECT.
8. ALL AREAS, STREETS, DRIVEWAYS, PARKING LOTS, ETC. DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL OR BETTER CONDITION.
9. THE CONTRACTOR WILL HAVE ALL REQUIRED PERMITS IN-HAND PRIOR TO BEGINNING CONSTRUCTION, AND WILL PERFORM ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERMITS OBTAINED BY THE OWNER AND THOSE PERMITS OBTAINED BY THE CONTRACTOR.
10. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR WILL SUBMIT TO THE OWNER'S PROJECT MANAGER A SCHEDULE OF VALUES, A CONSTRUCTION SCHEDULE, AND A SAFETY PLAN.
11. THE CONSTRUCTION SCHEDULE WILL DESCRIBE IN DETAIL HOW THE CONSTRUCTION IS TO BE PHASED, ESTABLISH START AND FINISH DATES FOR ALL SIGNIFICANT CONSTRUCTION ACTIVITIES, AND IDENTIFY ALL CONTROLLING ITEMS OF WORK. THE SCHEDULE IS TO BE APPROVED BY THE OWNER'S PROJECT MANAGER, AND WILL BE UPDATED ON A MONTHLY BASIS TO REFLECT ACTUAL WORK PROGRESS. PAYMENT FOR PREPARING, UPDATING AND SUBMITTING THE SCHEDULE WILL BE INCLUDED IN THE PAY ITEM FOR MOBILIZATION OR OTHER PAY ITEMS AS APPROPRIATE.
12. THE CONTRACTOR SHALL SUBMIT AN EROSION CONTROL PLAN FOR APPROVAL BY THE OWNER'S PROJECT MANAGER AND WILL ADDRESS THE INSTALLATION AND MAINTENANCE OF ALL TEMPORARY AND PERMANENT SEDIMENT AND EROSION CONTROL DEVICES TO BE USED DURING EACH PHASE OF CONSTRUCTION, INCLUDING TREE REMOVAL, CLEARING AND GRUBBING, EXCAVATION, HAULING OF EXCAVATED MATERIALS, AND PLACEMENT OF EMBANKMENT AND BACKFILL. THE PLAN ALSO WILL DETAIL THE EROSION CONTROL MEASURES TO BE EMPLOYED AT ALL STOCKPILE AND CONSTRUCTION STAGING AREAS AND WILL DEFINE THE MAXIMUM LIMITS OF ALL ACTIVE CONSTRUCTION ZONES.
13. ANY NATIONAL GEODETIC SURVEY MONUMENT WITHIN THE LIMITS OF CONSTRUCTION MUST BE PROTECTED. IF IN DANGER OF DAMAGE, THE CONTRACTOR WILL IMMEDIATELY NOTIFY THE PROJECT MANAGER AND:

FDEP, BUREAU OF SURVEY AND MAPPING, MS 105
3900 COMMONWEALTH BLVD.
TALLAHASSEE, FLORIDA 32399
(850) 245-2606 (OFFICE)
(850) 245-2645 (FAX)
14. PRIOR TO ANY SCHEDULED INTERRUPTION OF UTILITY SERVICE, THE CONTRACTOR WILL COORDINATE SUCH INTERRUPTION WITH THE UTILITY PROVIDER AND WILL PROVIDE A MINIMUM 24-HOUR NOTICE TO THE AFFECTED PARTIES. THE CONTRACTOR WILL NOTIFY THE ELECTRIC UTILITY A MINIMUM OF TWO WEEKS PRIOR TO CONSTRUCTION IN THE VICINITY OF THEIR FACILITIES.
15. NO TRENCHES WILL BE ALLOWED TO REMAIN OPEN OVERNIGHT.
16. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF VEGETATION ON AND ADJACENT TO THE PROJECT SITE, AND WILL BE SOLELY LIABLE FOR DAMAGE TO VEGETATION ON PROPERTIES ADJACENT TO CONSTRUCTION WORK ZONES. ALL TREES WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE PROTECTED EXCEPT THOSE TREES IDENTIFIED ON THE PLANS TO BE REMOVED. ALL TREES OUTSIDE THE CONSTRUCTION WORK ZONE ARE TO BE PROTECTED TO THE MAXIMUM EXTENT PRACTICABLE. TREE BARRICADES WILL BE INSTALLED AND MAINTAINED AROUND ALL TREES TO BE PROTECTED AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE PROJECT MANAGER.
17. THE CONTRACTOR IS RESPONSIBLE TO PLACE AND MAINTAIN ROADSIDE WARNING SIGNS WHEN WORK IS BEING CONDUCTED IN THE PROPERTY RIGHT OF WAY OR WHEN MACHINERY IS ENTERING AND LEAVING THE PROJECT SITE.
18. THE CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF EXCAVATED MATERIAL OFF-SITE UNLESS OTHERWISE DIRECTED BY THE PROJECT MANAGER.
19. ENSURE THAT ALL EQUIPMENT, PRIOR TO BRINGING ON-SITE, IS WASHED AND FREE OF SOIL, SEED, OR OTHER ORGANIC MATTER. EQUIPMENT MAY BE INSPECTED BY THE OWNER'S REPRESENTATIVE PRIOR TO OFF-LOADING FOR USE. ADDITIONAL CLEANING WILL BE PERFORMED OFFSITE BY THE CONTRACTOR IF THE OWNER'S REPRESENTATIVE DETERMINES IT IS NEEDED.

SHEET NO.	GUANA TOLOMATO MATANZAS NERR		PROFESSIONAL REGISTRATION NUMBER: 98765 FLORIDA PE #64075											
	PARKING AREA STRUCTURES													
	DETAILS													
	NORTH BOARDWALK IMPROVEMENTS PROJECT													
	PROJECT TITLE													
S-102	SHEET TITLE		Consultant :											
	PROJECT TITLE		Engineering & Design											
														
			Department of Environmental Protection DIVISION OF RECREATION AND PARKS Bureau of Design and Construction 3800 Commonwealth Blvd., Tallahassee, FL 32399 (850) 425-2300											
DESIGNER : G. RUDD			ISSUE DATE:		SYMBOL		REVISION		DATE		REVISION		DATE	
DRAWN BY:			COMP. FILE No.:		A		C				B		D	
REVIEWED BY: M. LEONARD			STATE PROJECT No:											

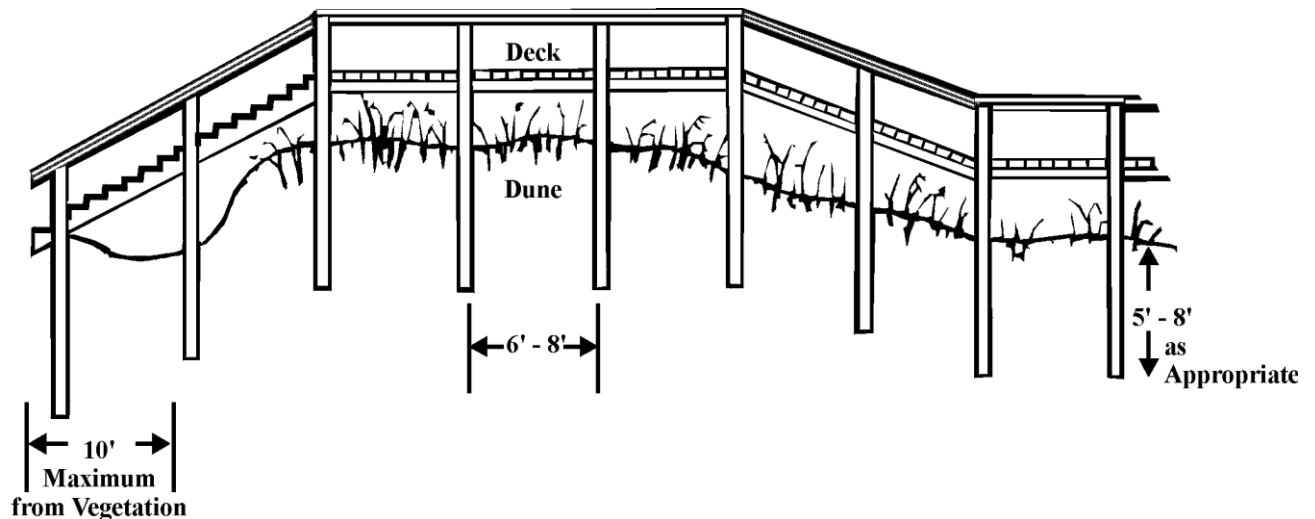


CCCL Dune Walkover Guidelines

On many of Florida's beaches, sand dunes and coastal vegetation provide significant protection to upland property, upland development, and the beach dune system. The Florida Department of Environmental Protection (DEP) encourages the design of beach access, including beach and dune walkovers, to protect the dune topography and dune vegetation from pedestrian traffic, allow for the natural recovery of damaged or eroded dunes and to not interfere with sea turtle nesting.

TYPICAL DUNE WALKOVER PROFILE

⇐ To the Beach



PERMIT REQUIREMENTS

A permit from DEP is required for construction of walkovers on most sandy beaches fronting on the open waters of the Atlantic Ocean or Gulf of Mexico. In areas where a Coastal Construction Control Line (CCCL) has been established pursuant to provisions of Section 161.053, Florida Statutes (F.S.), a permit is required for all excavation, construction, or other activities with the potential to cause beach erosion or damage coastal vegetation. On sandy shorelines where a CCCL line has not been established, a permit is required for construction activities within 50 feet of the mean high water line (see Section 161.052, F.S.).

Permits for walkovers contain standard conditions that require construction to be conducted in a manner that minimizes short-term disturbance to the dune system and existing vegetation. Replacing vegetation destroyed during construction with similar plants suitable for beach and dune stabilization is required. Only limited excavation for the placement of support posts is allowed, and walkovers cannot be constructed during the

marine turtle-nesting season, which extends May 1 through October 31 (except for Brevard through Dade counties, which extends March 1 through October 31).

GENERAL SITING GUIDELINES

The walkover must be located and designed to protect dune features, to minimize disturbance of native vegetation, to not obstruct lateral beach access and to minimize the amount of construction material that may become debris during a storm. Elevated walkovers are not required for all beach accesses, such as in sparsely vegetated, low profile dune areas where on-grade sand or shell paths are suitable for controlling foot traffic. Note that on-grade beach mats are considered to be structures that require CCCL permits. Walkovers are generally constructed over the frontal dune and perpendicular to the shoreline. Dune walkovers are designed to extend at least to the seaward toe of the frontal dune or the existing line of vegetation and are allowed no farther than 10 feet seaward of the vegetation. The optimum siting of the walkover structure can be determined by contacting a [CCCL field inspector](#).

GENERAL DESIGN GUIDELINES

Walkovers are designed to be minor, expendable structures that pose only minimal interference with coastal processes and generate minimal amounts of debris. Walkovers constructed across native beach and dune vegetation need to be post-supported and elevated a sufficient distance above the existing or proposed vegetation to allow for sand build-up and clearance above the vegetation. Stairways and ramps leading from the dune bluff or crest down to the beach need to completely span the seaward slope of the dune without installing posts into unstable slopes steeper than approximately 30 degrees. The structure must be designed to minimize the quantity of material used in construction, such as avoiding the use of vertical wood pickets, and reducing the length and width of construction on the beach.

Single family walkovers are not to exceed 4 feet in overall width and the support posts are not to be greater than 4-inch wide posts. Multi-family walkovers are not to exceed 6 feet in overall width and the support posts are not to be greater than 6-inch wide posts. Round posts are preferred to square posts. Support posts cannot be encased in concrete nor installed into dune slopes that are steeper than approximately 30 degrees. Support posts are to have a minimum 5 feet of soil penetration or embedment. Cross bracing is not required for most structures when following the designs in the document "*Beach/Dune Walkover Structures*," referenced at the end of this document. Local governments and property owners are advised to consult with a [CCCL Permit Manager](#) prior to requesting a permit for a walkover that contains switchbacks, long ramps or other features required to comply with the Americans with Disabilities Act Accessibility Guidelines.

WALKOVER ELEVATION GUIDELINES

Walkover heights vary as the structure crosses the beach/dune system. The ground cover changes from the uplands, commonly covered with woody scrub or coastal strand vegetation (saw palmetto/sea grape/scrub oaks), over a dune bluff or one or several dune crest(s), covered with either coastal strand or coastal grassland (sea oats/bitter panicum/marsh hay), down the slope to the dry sand beach, either uncovered bare escarpment or partially covered with beach/dune vegetation (railroad vine/sea rocket/sea oats). Design of the structure and height of the deck from the dune bluff or crest down to the beach also must be considered in setting the walkover elevation with the goal of minimizing the amount of material on the beach.

Walkover Elevations in Uplands. The upland environment of coastal scrub/coastal strand habitat is characterized by more stable soil conditions with less blowing sands and infrequent storm overwash events. The stable conditions allow for the development of a mature woody vegetation and saw palmetto dominated plant community. In addition to thick above ground stem and leaf vegetation between 5 and 15 feet in height,

this plant community has an extensive below ground woody root mat. Walkovers in these upland habitats need be elevated only a sufficient distance above the ground to avoid disturbance of the soil and root systems or cutting of low tree and palmetto trunks. An elevation of the stringers from 6" to 2'-0" above existing grade is expected to be sufficient in many cases. Walkover elevations crossing coastal wetlands within upland areas may require increased elevations. Elevation of the walkover above the leaf canopy is in most cases impractical in coastal scrub or coastal strand habitats where careful pruning needs to be limited to removal of only those aerial branches to create an open passage. Deck elevations need to be no higher than five feet above grade to provide clearance for vegetation, and the movement of sand, water and sea turtles underneath the structure.

Walkover Elevations over Bluffs. The low stringer elevation recommended for uplands can be carried to an eroded bluff line. This will reduce the length of a ramp or walkover down to the beach. Again the objective the walkover elevation is to reduce damage to coastal scrub soils and root systems.

Walkover Elevations over Dune Crests. Dune environments are characterized by mobile sands subject to storm effects (which lower grade elevations) and wind effects (which can raise elevation as sand is trapped). Dunes are dominated by coastal grassland plants adapted to the dynamic environment. These include sea oats, bitter panicum, and little bluestem. Walkovers sited within active dune systems are required to be elevated sufficiently to allow for sand movement and growth of vegetation. Walkover designs published in "Beach/Dune Walkover Structures" referenced below specify a 3'-10" minimum clearance from existing grade to the bottom of the stringers of an up to 6-foot wide (overall dimension) multi-family or public beach access structures, and a 3'-0" minimum clearance to the top of the deck for an up to 4-foot wide single family structures.

Walkover Elevations on Seaward Dune or Bluff Slopes. The elevation of the walkover at the dune crest and the distance of the seaward terminus from the water's edge determine the height of the steps or ramps crossing the seaward slope. The design objective is to get the structure down to the beach in as short a shore-normal (perpendicular to the shoreline) distance as possible while reducing the shore-parallel coverage of the slope. Department guidelines require that the seaward terminus of the structure be no farther seaward than 10 feet from the line of permanent beach dune vegetation or the toe of the frontal dune. Reducing the seaward encroachment and shore-parallel width decreases the potential for storms interacting with the structure, occupation of sea turtle nesting habitat by the structure, and interference with lateral public beach access. Walkovers designed for the Americans with Disabilities Act often increase the length of walkover ramps on the beach. This requires the need for a site specific review for environmental impacts. The burial of the ramp or step terminus a minimum amount (0.5 to 1.0 feet)-foot below grade may allow for use of the walkover after some lowering of the beach elevation from minor storms. However, placement of this terminus below the depth of a post storm beach profile is discouraged as this portion of the walkover will most likely have been damaged by larger storms and to have interfered with coastal processes.

On Grade Access. Elevated walkovers are not necessary in all site conditions and use situations. Where dune development is minimal, beach dune vegetation is sparse and the use infrequent, on-grade footpaths may be preferred. The Department discourages solid concrete walks and footpath surfaces such as stepping stones that create debris or missiles. Other surfaces such as geotextile fabrics, cabled wood planks, or shell require a case by case review. No permanent path surfaces are allowed farther seaward than 10-feet from the dune or vegetation line or within sea turtle nesting habitat.

ALIGNMENT

Wood Walkovers. Elevated wood walkovers designed for reducing erosion of high dunes are recommended to be aligned perpendicular to the shore to reduce the shore-parallel extent of structure subject to wave attack and the amount of material used in construction.

On Grade Access. Sand paths, beach mats and low elevation walkovers crossing low dune systems subject to more frequent flooding are recommended to be layed out at an angle to the dune and shoreline. Diagonal access routes to the beach provide less of a direct path for storm waves to travel inland, may have a “self-healing” function that fills in during storm events, and are expected to provide a less direct route for ebb surge waters to scour channels as the storm’s floodwaters return toward the ocean.

WALKOVER LIGHTING GUIDELINES

Elevated Walkovers. Lights are generally prohibited on dune walkovers or elevated boardwalks and may only be considered under the following conditions: the lighting is required for purposes of building code compliance; light fixtures must be located landward of the frontal or primary dune, whichever is further landward; lighting must be long wavelength, downward directed, full cutoff and fully shielded and cannot be directly, indirectly, or cumulatively visible from the beach.

Beach Access Points. Lighting of beach access routes may be located and configured only for the minimal illumination of pedestrian paths landward of the beach and frontal dunes. All lighting of beach access points must be long wavelength, downward directed, full cutoff and fully shielded and cannot be directly, indirectly, or cumulatively visible from the beach.

OTHER CONSTRUCTION

Decks and Platforms. Decks and platforms are not allowed on the frontal dune and may be attached to the walkover in the dune system if landward of the frontal dune crest and cantilevered from an elevated, post supported walkover otherwise following these guidelines. Landward of the dune or bluff, cantilevered decks can have a maximum two-foot cantilever on each side of a single family walkover for a maximum 8-foot wide deck as measured in the shore-parallel dimension.

Roofs. Roofs and other permanent coverings are generally prohibited on walkovers or attached decks and platforms except where gazebos and other non-beach access related structures are allowable landward of the dune system.

Showers and Waterlines. Pipes and fixtures for showers, footbaths or fish cleaning stations may be run to the landward extent of the walkover, not out onto the beach or frontal dune. Water systems are recommended to include shut off valves in the uplands that can prevent uncontrolled discharges which can erode the beach or dune sand or flood sea turtle nests.

Railings. As minor, frangible or breakaway structures, dune walkovers are to be designed with the minimum amount of wood and other solid material needed to provide access through the dune system. Open railings instead of pickets and use of cables or other materials to prevent falls as required by building code for safety can minimize the amount of materials placed in the dune system that may become debris or missiles in storm events.

REFERENCES

Beach/Dune Walkover Structures, SUSF-SG-76 by Todd L. Walton, Jr., and Thomas C. Skinner. Published by the Marine Advisory Program of the Florida Cooperative Extension Service and the Florida Sea Grant, March, 1983.

Coastal Construction Manual, Volume III: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Buildings in Coastal Areas, Appendix I, Dune Walkover Guidance. FEMA.