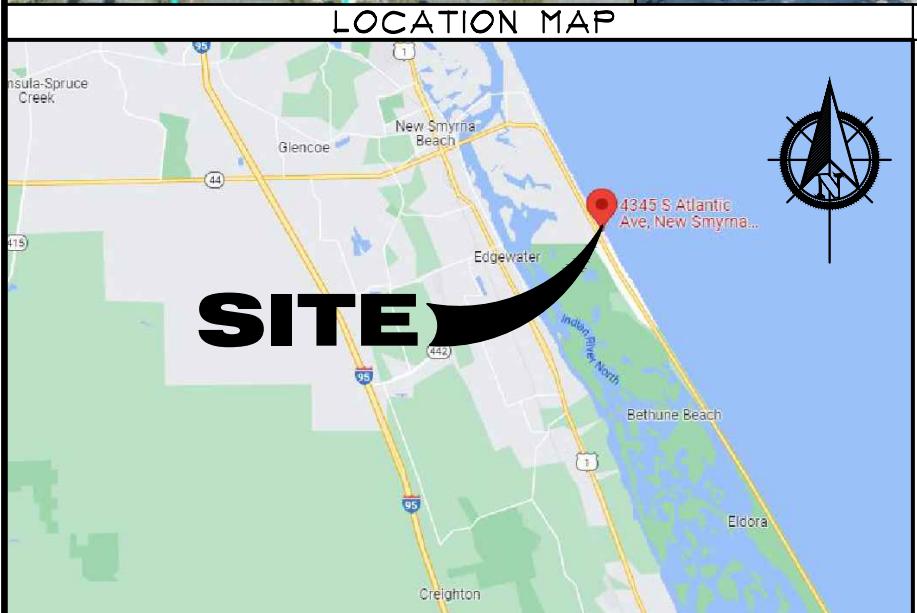


STRUCTURAL PLANS FOR A NEW SEAWALL INSTALLATION AT: SEA DUNES SAND CASTLE

4345 SOUTH ATLANTIC AVENUE
NEW SMYRNA BEACH, FLORIDA 32169



SYMBOLS LEGEND	
ELEVATION	0'-0" ELEVATION HT
SECTION	# DOOR NUMBER
DETAIL	# WINDOW NUMBER
KEY NOTE	# REVISION NUMBER
WALL TYPE	01 ROOM NAME

PROJECT DIRECTORY

ENGINEER OF RECORD - FLORIDA LICENSE NO. 15113



CRA Charles R. Adams & Associates, Inc.

414 Canal Street - New Smyrna Beach, FL 32168 - 386.426.5583
C.A. 4180

INDEX of DRAWINGS

ASO	COVER
ASO	REPAIR PLAN
SI.0	SI.I MATERIAL QUANTITIES, SITE PLAN, INSTALLATION DETAILS
SI.1	GRADING DETAIL
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AS3.0	REPAIR SECTION DETAIL
AS3.1	DETAILS AND SPECIFICATIONS
AS4.0	GENERAL NOTES
AS5.0	BEACH APPROACH STAIR DETAILS
AS5.1	HANDRAIL DETAILS
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AS6.0	SURVEY

SCOPE OF WORK

COMMERCIAL - NEW EMERGENCY SEAWALL REPAIR

PROJECT CODE DATA

7th EDITION FLORIDA BUILDING CODE	2020
FLORIDA ADMINISTRATIVE CODE 62B-33	2020
VOLUSIA COUNTY CODE OF ORDINANCES - PART I - CHAPTER 50 - ARTICLE III - DIVISION 9 - SECTION 50-351	2023
ASCE 7-16	2016
USACE COASTAL ENGINEERING MANUAL	2002
USACE DESIGN OF COASTAL REVETMENTS, SEAWALLS, AND BULKHEADS	1995
USACE SHORE PROTECTION MANUAL VOLUMES I & II	1984
USACE DESIGN OF SHEET PILE WALLS	1994
DOD HANDBOOK - SEAWALLS, BULKHEADS, AND QUAY WALLS	2006
ACI 318 / 19	2022

DIGITAL SEAL

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY CHARLES R. ADAMS ON THE DATE INDICATED HERE. PRINTED COPIES, OF THIS DOCUMENT, ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

JURISDICTION

CITY OF NEW SMYRNA BEACH

REVISION LOG

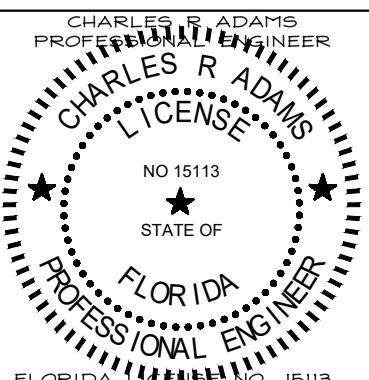
DATE DESCRIPTION

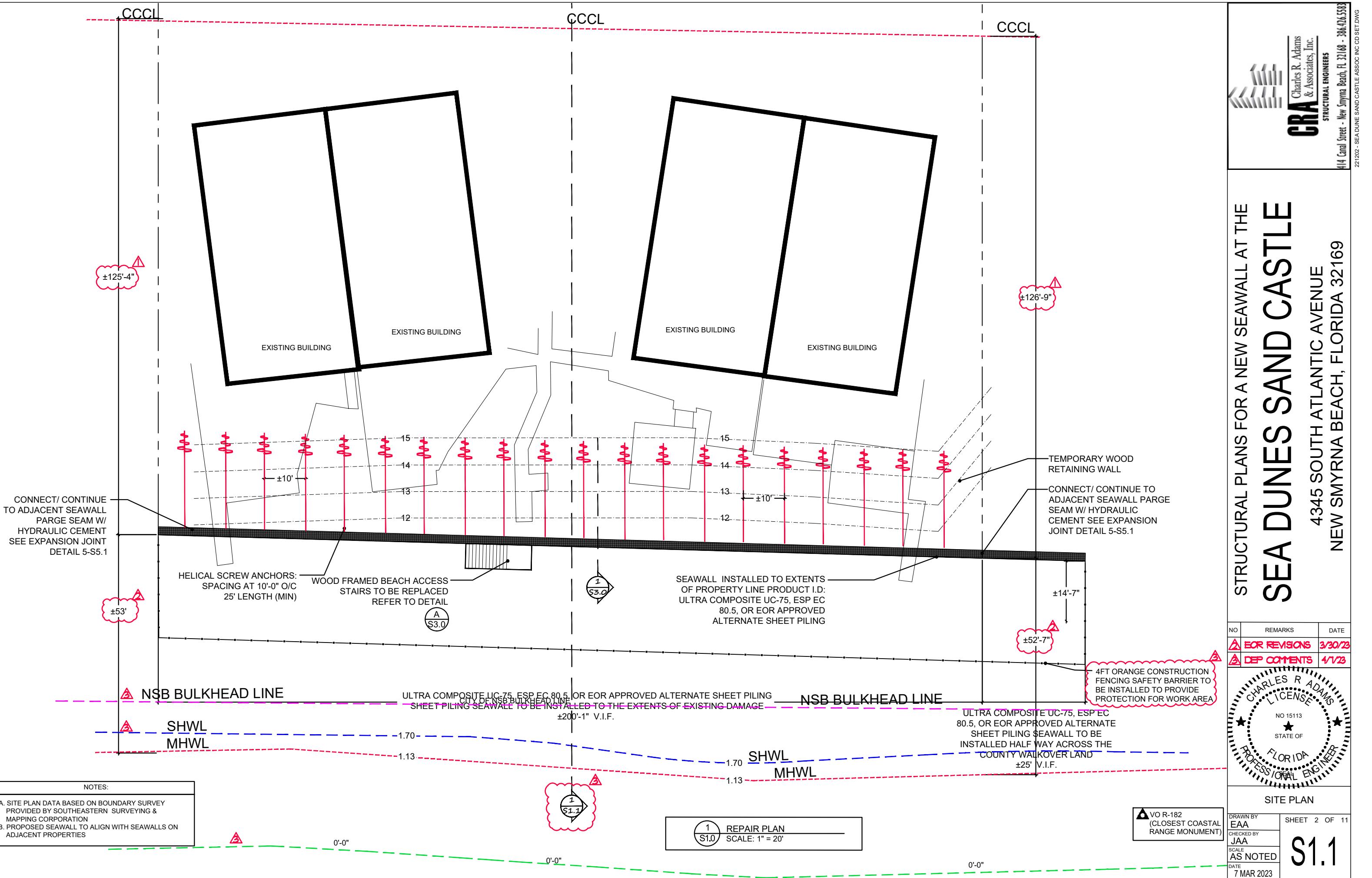
3/14/23 DEP COMMENTS

3/30/23 EOR REVISIONS

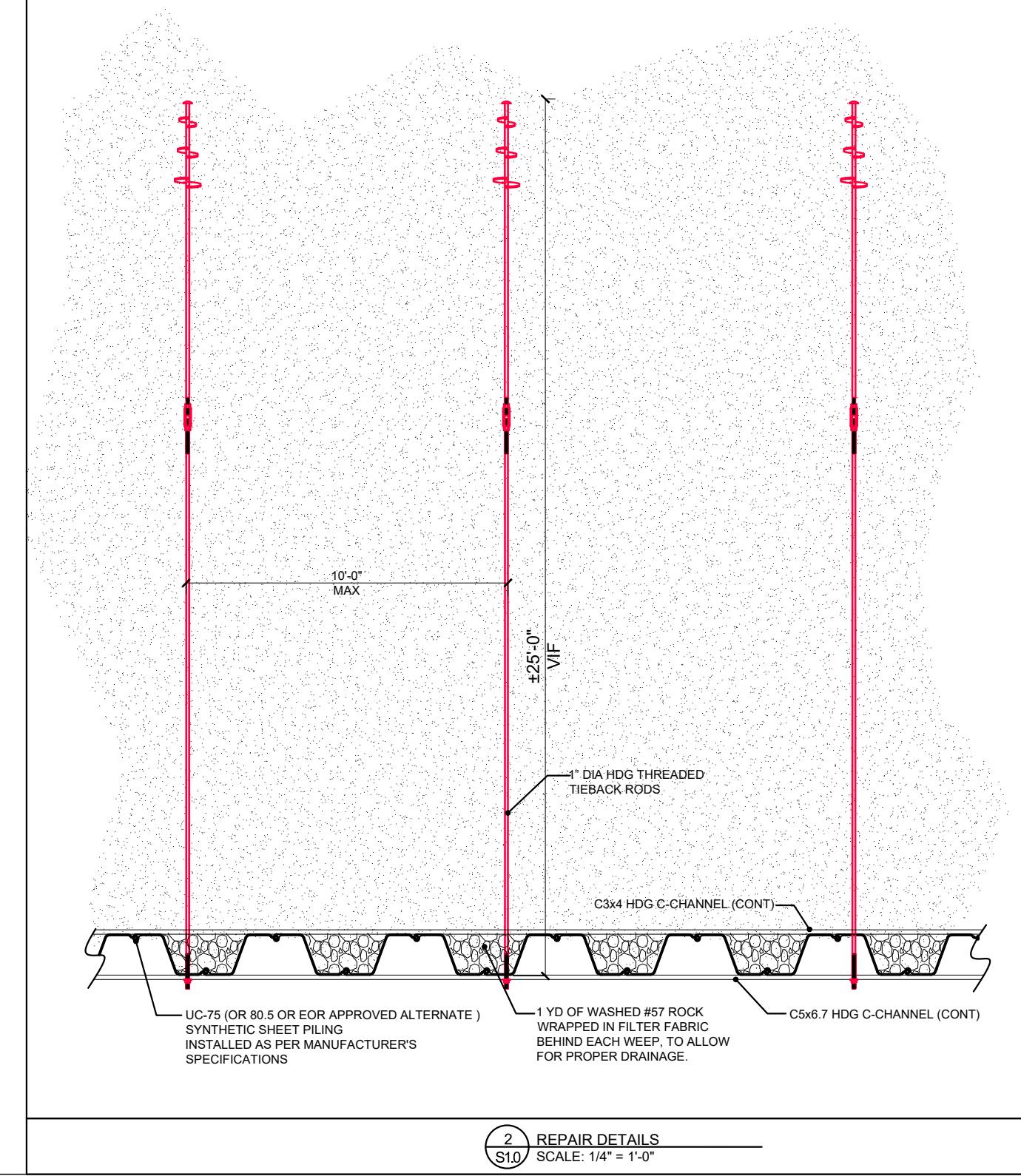
4/7/23 DEP COMMENTS

TO THE BEST OF MY KNOWLEDGE, THESE PLANS AND SPECIFICATIONS COMPLY WITH ALL APPLICABLE BUILDING CODES AND LAND DEVELOPMENT REGULATIONS.
I HEREBY CERTIFY THAT THE ENCLOSED DESIGN PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH FLORIDA ADMINISTRATIVE CODE RULE CHAPTER 62B-33.051.





MATERIALS LIST				
UC-75, ESP EC 80.5 COMPOSITE SHEET PILING	20' TALL SHEET MAX	± 200 LF $\pm 4,000$ FT ³	$<0.05\%$ DISPLACEMENT	
CONCRETE CAP BEAM	26" x 24" x 200'	± 866.7 FT ³	0% DISPLACEMENT	
MARINE GRADE WOOD POSTS	6" x 6" x 72" EMBEDDED	8 QTY	± 12 ft ³ DISPLACEMENT	
HELICAL SCREW ANCHOR	AS PER DETAIL	20 QTY	0% DISPLACEMENT	
BEACH COMPATIBLE SAND FILL	± 114 ft ² x 200'	$\pm 22,800$ ft ³	± 844 YD ³ ▲	
WASHED #57 ROCK	17 WEEPS @ 1YD EACH		± 17 YD ³ ▲	



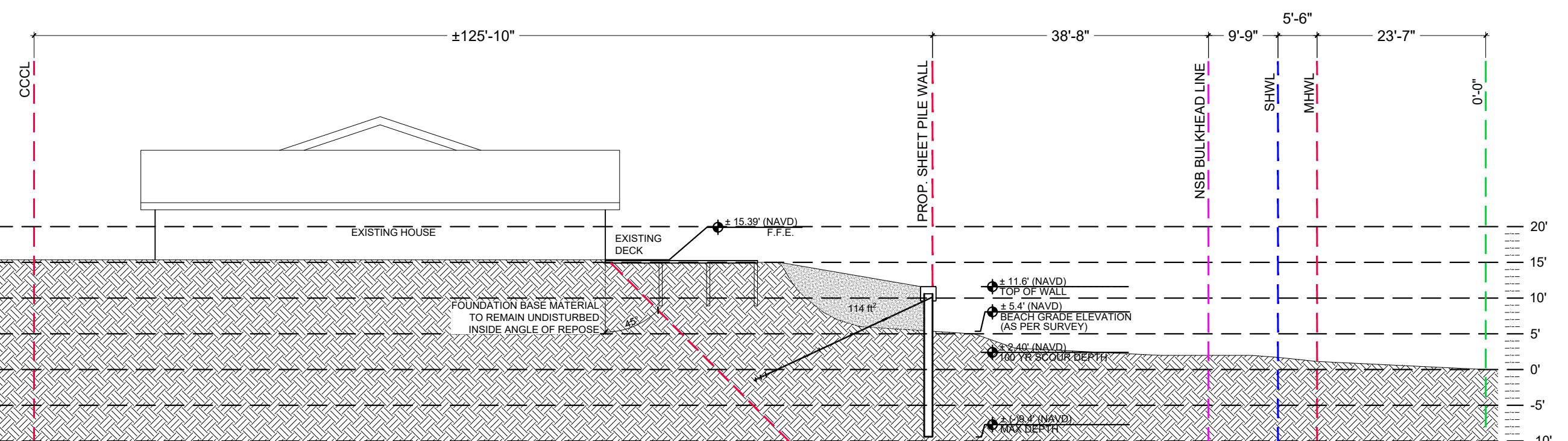
2 REPAIR DETAILS
S1.0
SCALE: 1/4" = 1'-0"

1 NOT USED
S1.0
SCALE AS NOTED
DATE 7 MAR 2023

SEA DUNES SAND CASTLE
4345 SOUTH ATLANTIC AVENUE
NEW SMYRNA BEACH, FLORIDA 32169

NO	REMARKS	DATE
▲	DEP COMMENTS	4/1/23
MATERIAL QUANTITIES, SITE PLAN, INSTALLATION DETAILS		
DRAWN BY EAA	SHEET 3 OF 11	
CHECKED BY JAA		
SCALE AS NOTED		
DATE 7 MAR 2023		

S1.0



1
S12
GRADING DETAIL
SCALE: 1/16" = 1'-0"

NO	REMARKS	DATE
A	DEP COMMENTS	4/1/23
CHARLES R. ADAMS & ASSOCIATES, INC.		
NO 15113 STATE OF FLORIDA		
PROFESSIONAL ENGINEER		
GRADING DETAIL		
DRAWN BY EAA	SHEET 4 OF 11	SCALE AS NOTED
CHECKED BY JAA		DATE 7 MAR 2023

S1.0

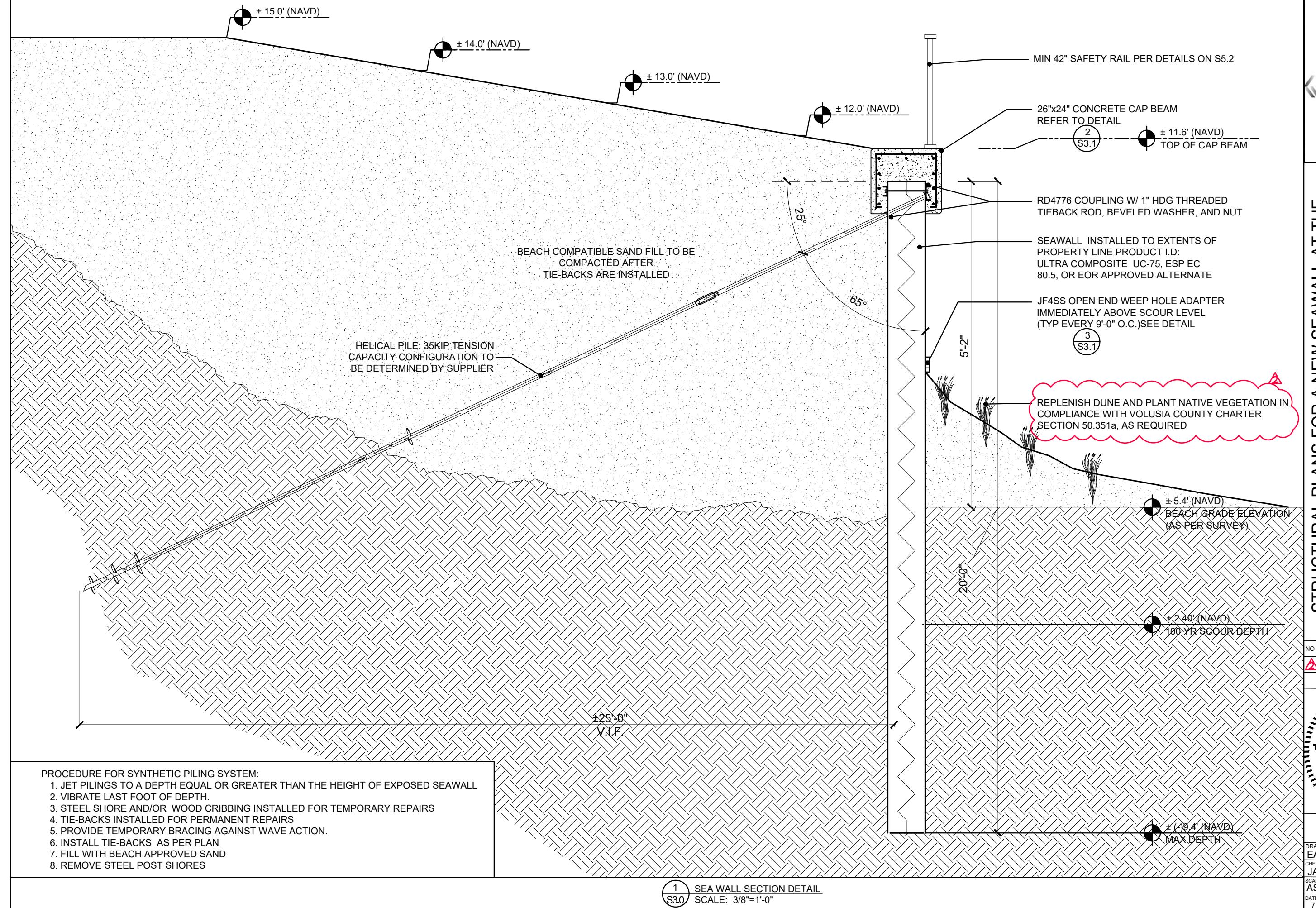


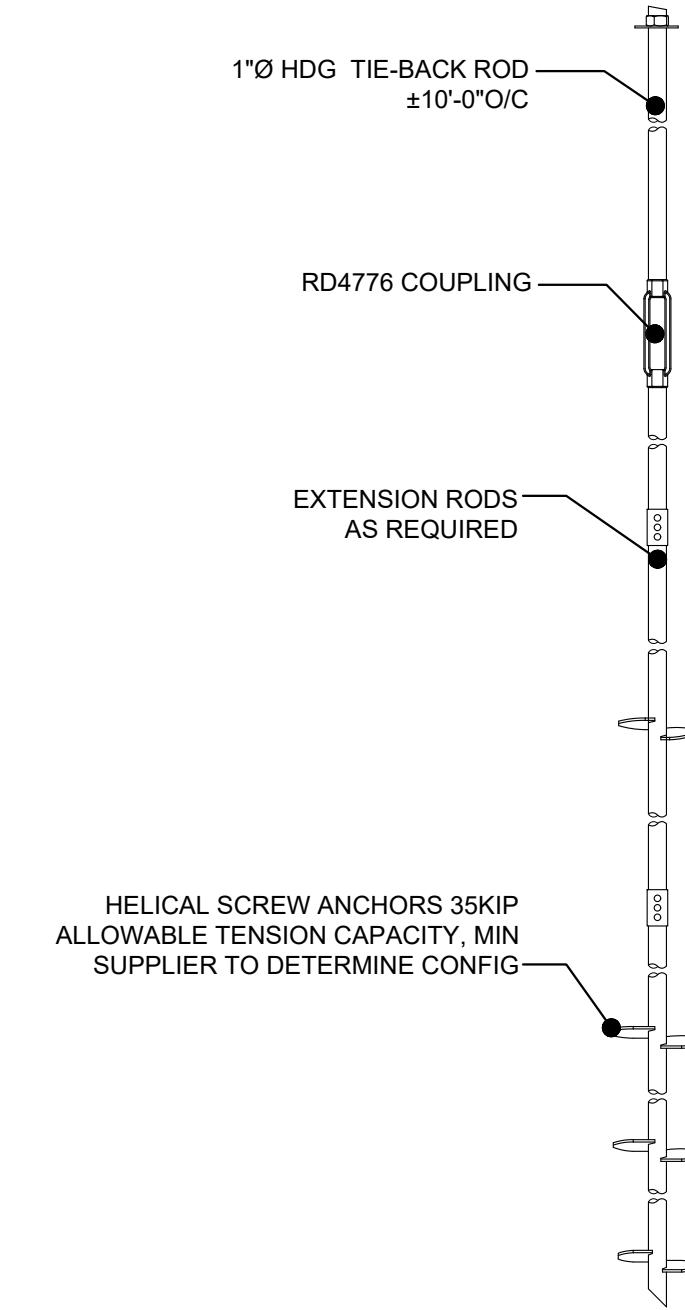
SEA DUNES SAND CASTLE

4345 SOUTH ATLANTIC AVENUE
NEW SMYRNA BEACH, FLORIDA 32169

STRUCTURAL PLANS FOR A NEW SEAWALL AT THE

NO	REMARKS	DATE
CHARLES R. ADAMS LICENSURE NO 15113 STATE OF FLORIDA PROFESSIONAL ENGINEER		
DAMAGE SURVEY PHOTOS		
DRAWN BY EAA	SHEET 5 OF 11	
CHECKED BY JAA		
SCALE AS NOTED		
DATE 7 MAR 2023	S2.0	



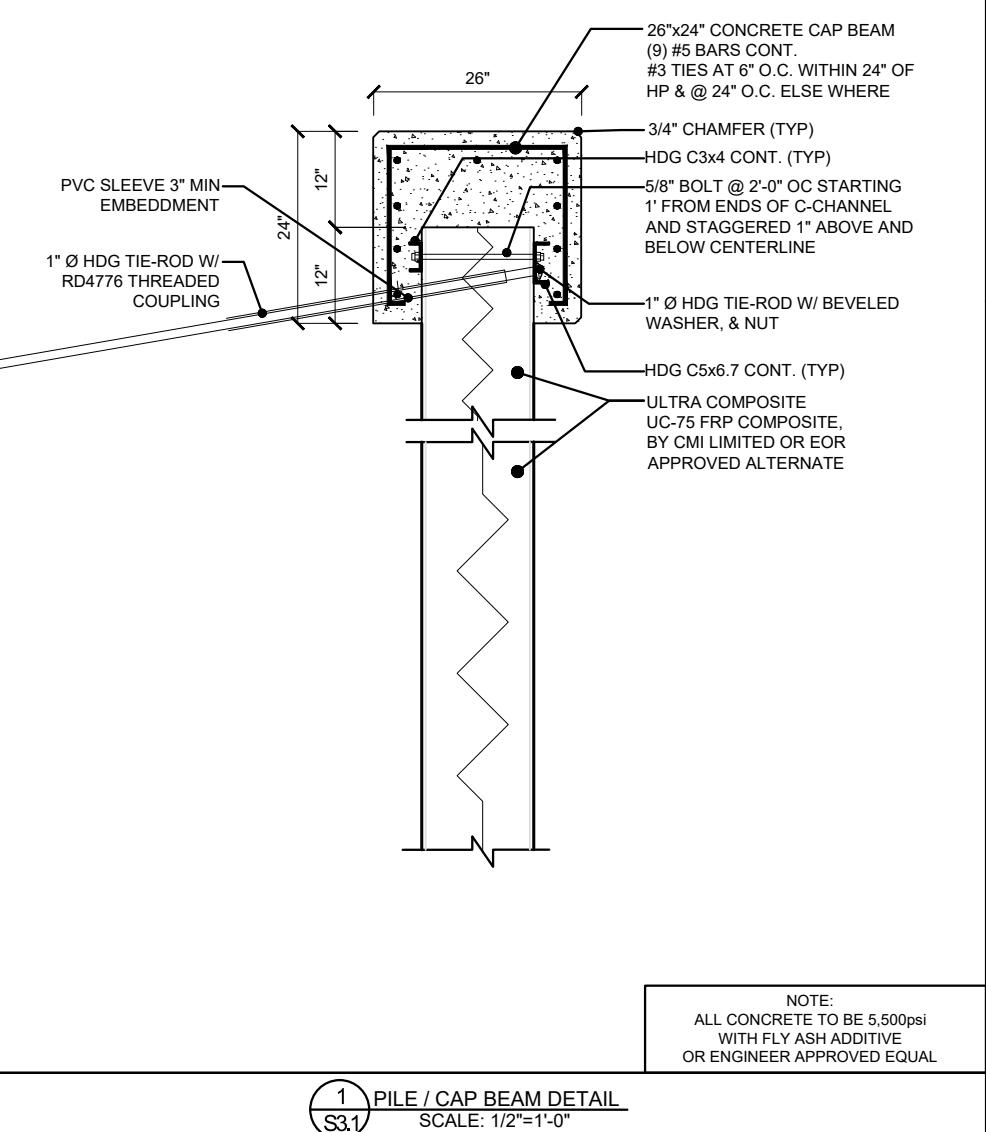
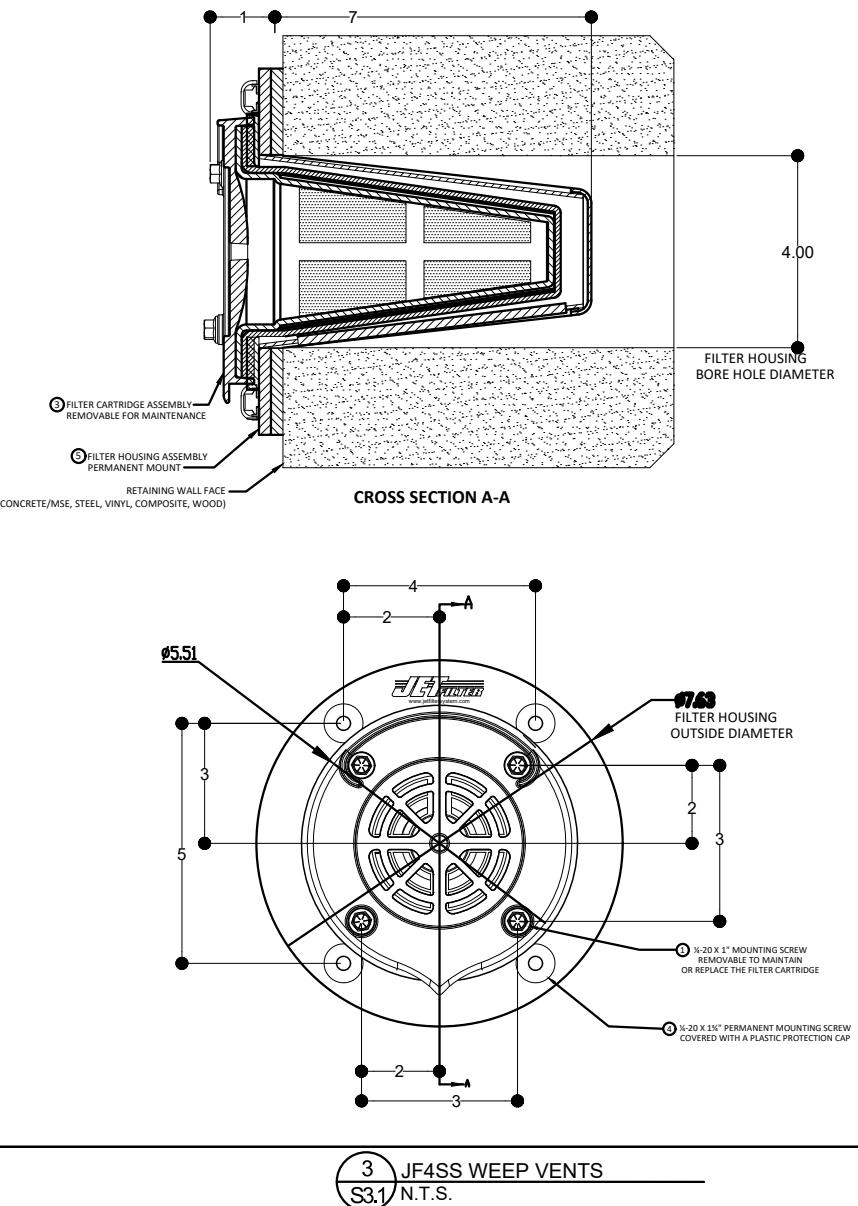


5 HELICAL PILE DETAIL
S3.1 N.T.S.

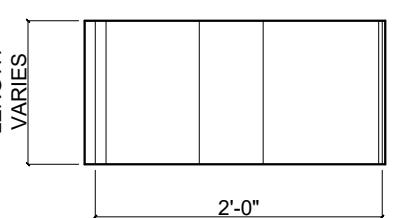
UC-75

ALLOWABLE MOMENT (M):	31,667 FT-LB/FT	140.85 KN-m/m
SECTION MODULUS (Z):	38.0 IN ³ /FT	2,043 cm ³ /m
MOMENT OF INERTIA (I):	266 IN ⁴ /FT	36,325 cm ⁴ /m
THICKNESS (t):	0.400/0.430 IN	10.2/10.9 mm
SECTION DEPTH:	14 IN	356 mm
SECTION WIDTH:	24 IN	610 mm
MATERIAL:	STRUCTURAL FRP COMPOSITE	
STANDARD COLORS:	CHARCOAL	
PROFILE/PATENTED FEATURES:	Z PROFILE	

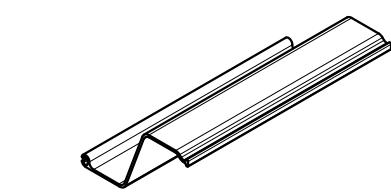
6 ULTRA COMPOSITE SHEET PILE
S3.1 SPECIFICATIONS



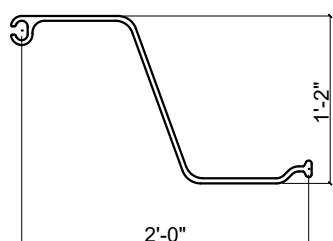
1 PILE / CAP BEAM DETAIL
S3.1
SCALE: 1/2"=1'-0"



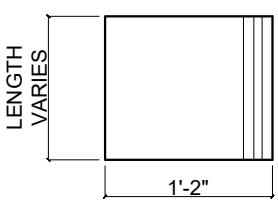
ESP EC 80.5 PROFILE VIEW



ESP EC 80.5 ISOMETRIC VIEW



ESP EC 80.5 PLAN VIEW



ESP EC 80.5 SECTION VIEW

2 ULTRA COMPOSITE PILE
S3.1 N.T.S.

SEA DUNES SAND CASTLE

4345 SOUTH ATLANTIC AVENUE
NEW SMYRNA BEACH, FLORIDA 32169

STRUCTURAL PLANS FOR A NEW SEAWALL AT THE

GENERAL DESIGN AND CONSTRUCTION NOTES

MATERIAL

GENERAL DESIGN:

- ALL MATERIALS SHALL BE AS NOTED UNLESS LOCAL CODES PROVIDE A STRICTER GUIDELINE I.E. GREATER STRENGTH DURABILITY, ETC. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND AND COMPLY WITH THESE CODES.

SHEET PILE:

- SHEET PILE MATERIAL SHALL BE CMI LIMITED CORP UC-75, ESP EC 80.5, OR EOR APPROVED ALTERNATE.

DRAINS:

- OPEN END WEEP HOLE FILTER WITH ADAPTER, INSTALLED IMMEDIATELY ABOVE SCOUR ELEV. @ SPECIFIED SPACING.
- THE JET FILTER ASSEMBLY HOUSING SHOULD NOT BE REMOVED ONCE INSTALLED.
- WEEPS (JF4SS) TO ALLOW FOR EXCESSIVE HYDROSTATIC PRESSURE, FROM STORM WATER BUILD UP, TO RELEASE FROM BEHIND SEA WALL.

STEEL:

- ALL C-CHANNELS, TIE-RODS, AND STEEL FASTENERS SHALL BE HOT DIP GALVANIZED PER ASTM A-153 WITH 2 OUNCES OF ZINC PER SQUARE FOOT.
- ALL REINFORCING BAR SHALL BE GRADE FRP, OR EOR APPROVED EQUAL.
- ALL TIEBACK ROD SHALL BE 60 KSI MINIMUM.

CONCRETE:

- CONCRETE TO HAVE A 28-DAY COMPRESSIVE STRENGTH OF 5,500PSI.
- CONCRETE SHALL HAVE A MINIMUM 25% FLY ASH OR GBFS ADDED TO THE MIXTURE.
- CONCRETE MIX TO HAVE A MAX W/C RATIO OF 0.4.
- CONCRETE TO BE VIBRATED TO MINIMIZE AIR VOIDS.

BACKFILL:

- BACKFILL MATERIAL SHALL BE COMPATIBLE W/THE BEACH SAND & APPROVED BY THE DEP.
- BACKFILL SHALL BE INSTALLED IN ±12" LIFTS AND COMPAKTED TO 95% PROCTOR.
- IN GENERAL, BEACH-COMPATIBLE FILL MATERIAL WILL BE PREDOMINANTLY QUARTZ SAND OF A MEAN GRAIN SIZE DIAMETER BETWEEN 0.20MM AND 0.45MM, WITH A MOIST MUNSELL COLOR VALUE/CHROMA OF 7/1 OR LIGHTER AND A SIMILAR QUANTITY OF SHELL AS THE EXISTING BEACH.
- THE FILL MATERIAL MEETS THE SPECIFICATIONS/CRITERIA OF SUBSECTION 62B-33.005(7), F.A.C.

ANCHORS:

- SHALL BE EOR APPROVED W/ SPECIFIED CAPACITY AND TIE BACK ROD DIAMETER.

WOOD

- ALL LUMBER SHALL BE MARINE GRADE, OR EOR APPROVED ALTERNATE
- ALL LUMBER FASTENERS SHALL BE 316 STAINLESS STEEL, OR EOR APPROVED ALTERNATE

DESIGN:

- DESIGN IS BASED ON SOIL PROPERTIES AS NOTED:

LAYER 1 (ELEV. +15.0 TO -4.5) $\gamma = 115 \text{ PCF}$	$\gamma' = 57 \text{ PCF}$	$\phi = 32^\circ$	C=0 PSF
LAYER 2 (ELEV. +4.5 & BELOW) (DRIVEN CONDITIONS)			
$\gamma = 125 \text{ PCF}$	$\gamma' = 62 \text{ PCF}$	$\phi = 40^\circ$	C=0 PSF
LAYER 1 (ELEV. +4.5 & BELOW) (JETTED CONDITIONS)			
$\gamma = 120 \text{ PCF}$	$\gamma' = 60 \text{ PCF}$	$\phi = 34^\circ$	C=0 PSF
- IF ACTUAL SOIL OR SITE CONDITIONS DIFFER FROM THAT NOTED IN DRAWINGS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR A POSSIBLE REDESIGN.
- DESIGN DOES NOT CONSIDER GLOBAL (SLOPE) STABILITY. AT MINIMUM, GEOTECHNICAL ENGINEER SHALL CONFIRM THAT GLOBAL STABILITY IS NOT AN ISSUE. OTHERWISE, OWNER ASSUMES RISK FOR GLOBAL STABILITY.
- DESIGN DOES NOT ACCOUNT FOR PRESENCE OF UNDERGROUND SPRINGS, WELLS, OR EXCESSIVE WATER FROM SITE RUNOFF. IF THESE CONDITIONS EXIST THE ENGINEERS SHALL BE NOTIFIED.

INSTALLATION

GENERAL INSTALLATION:

- PRIOR TO INSTALLATION, CONTRACTOR SHALL EXAMINE/PROBE ALONG THE ALIGNMENT OF THE SHEET PILE (APPROX. EVERY 5') TO DETERMINE THE POTENTIAL OF ANY SOIL VARIATION OR OBSTRUCTIONS.

- INSTALLATION TO BE CONDUCTED ACCORDING TO ALL APPLICABLE OSHA AND LOCAL CODES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND AND COMPLY WITH THE SE CODES.

- PRIOR TO INSTALLATION CONTRACTOR SHALL EXAMINE SHEET PILE FOR ANY MANUFACTURING DEFECTS, OR DAMAGE DURING SHIPPING. ANY DEFECTIVE OR DAMAGED SHEET PILE SHALL BE DISCARDED AND REPLACED WITH NEW DEFECT & DAMAGE FREE MATERIAL. THIS SHALL BE THE RESPONSIBILITY OF THE SUPPLIER OR CONTRACTOR, AND NOT THE CLIENT OR EOR.

SHEET PILE:

- CONTRACTOR SHOULD REVIEW SOIL BORINGS AND PLAN FOR DIFFICULT DRIVING CONDITIONS, JETTING AND TRENCHING IS ALLOWED FOR NEW SHEET PILE INSTALLATION. LAST 10% OF SHEET PILE DRIVE TO BE VIBRATED.
- SHEET PILE SHALL PENETRATE TO DEPTH SHOWN IN THE PLANS.
- AFTER DRIVING SHEET PILE, SAW PILING OFF AT A TRUE PLANE INDICATED ON THE PLANS. FINAL ELEVATIONS ARE TO BE WITHIN ONE (1) INCH OF ESTABLISHED ELEVATION.
- RETURN WALLS TO BE PROVIDED AT ENDS OF ALL BULKHEADS TO PROVIDE FLANKING PROTECTION.

CONCRETE CAP:

- REFER TO ACI FOR PROPER CURING REQUIREMENTS.
- EXPANSION JOINTS ARE TO BE LOCATED AT NO GREATER THAN 50' INTERVALS
- ANCHOR RODS TO BE PROVIDED 1.5' ON SIDE OF EXPANSION JOINT.

JET FILTER UNITS:

- CORE A TRUE DIAMETER HOLE IN THE SHEET PILLING/SEAWALL OR CONCRETE ABUTMENT ABOUT 4 INCHES BEHIND WALL EVERY 12 FEET ON CENTER, SLIGHTLY ABOVE MEAN WATER LINE IN COASTAL AREAS OR LOWEST ELEVATION. IF POSSIBLE CORE FURTHER INTO THE GROUND AND PACK FLOWABLE MATERIAL BEHIND WALL SUCH AS #57 STONE THEN SAND.
 - INSERT THE JET FILTER ASSEMBLY INTO DRILLED HOLE ON WALL.
 - PRE-DRILL THE MOUNTING HOLES BY USING:
CONCRETE: PILOT HOLE BIT SIZE 3/16"
STEEL SHEET PILING: PILOT HOLE BIT SIZE 7/32" OR 15/64"
COMPOSITE / VINYL SHEET PILING: SELF-TAP
 - ATTACH WITH BI-FLEX SS ANCHORS (SUPPLIED) THROUGH THE ASSEMBLY HOUSING HOLES INTO THE SHEET PILLING/SEAWALL, CONCRETE ABUTMENT A 3/8" SOCKET.
- NOTE: BE SURE TO EPOXY/SEAL AROUND THE HOUSING IF ANY POSSIBLE OPENING TO THE CORE.

MAINTENANCE:

- TO REMOVE OR REPLACE THE FILTER CARTRIDGE, SIMPLY UNSCREW THE (4) SCREWS SECURING THE FILTER CARTRIDGE AND GENTLY PULL OUT.
- ONCE FILTER IS REMOVED CLEAN WITH A SOFT BRUSH WITH A SOFT BRUSH WITH WATER RINSE OR REPLACE, IN REVERSE ORDER.

MONITORING:

- SHEET PILE INSTALLATION SHALL BE SUPERVISED BY A THIRD PARTY MONITORING COMPANY LIKE UES, OR EOR APPROVED ALTERNATE, IN ORDER TO VERIFY EMBEDMENT DEPTH.
- VIBRATION MONITORING SERVICES SHALL BE PROVIDED BY UES, OR EOR APPROVED ALTERNATE, TO VERIFY THAT FDOT VIBRATION LIMITS ARE NOT EXCEEDED.
- TORQUE LOGS FOR HELICAL PILE INSTALLATION SHALL BE SUBMITTED TO THE EOR FOR REVIEW AND APPROVAL PRIOR TO CONTINUING WITH SEAWALL INSTALLATION.

LANDSCAPE:

- COMPLY WITH THE VOLUSIA COUNTY CHARTER, SECTION 50.351a.

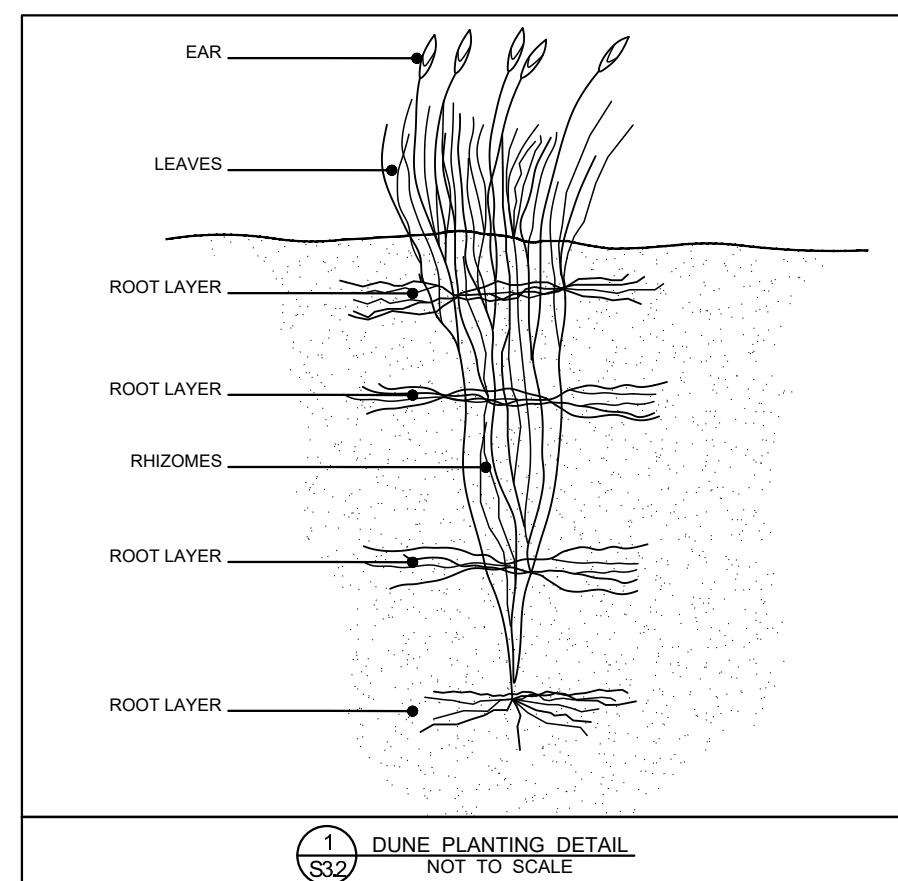
SEA DUNES SAND CASTLE

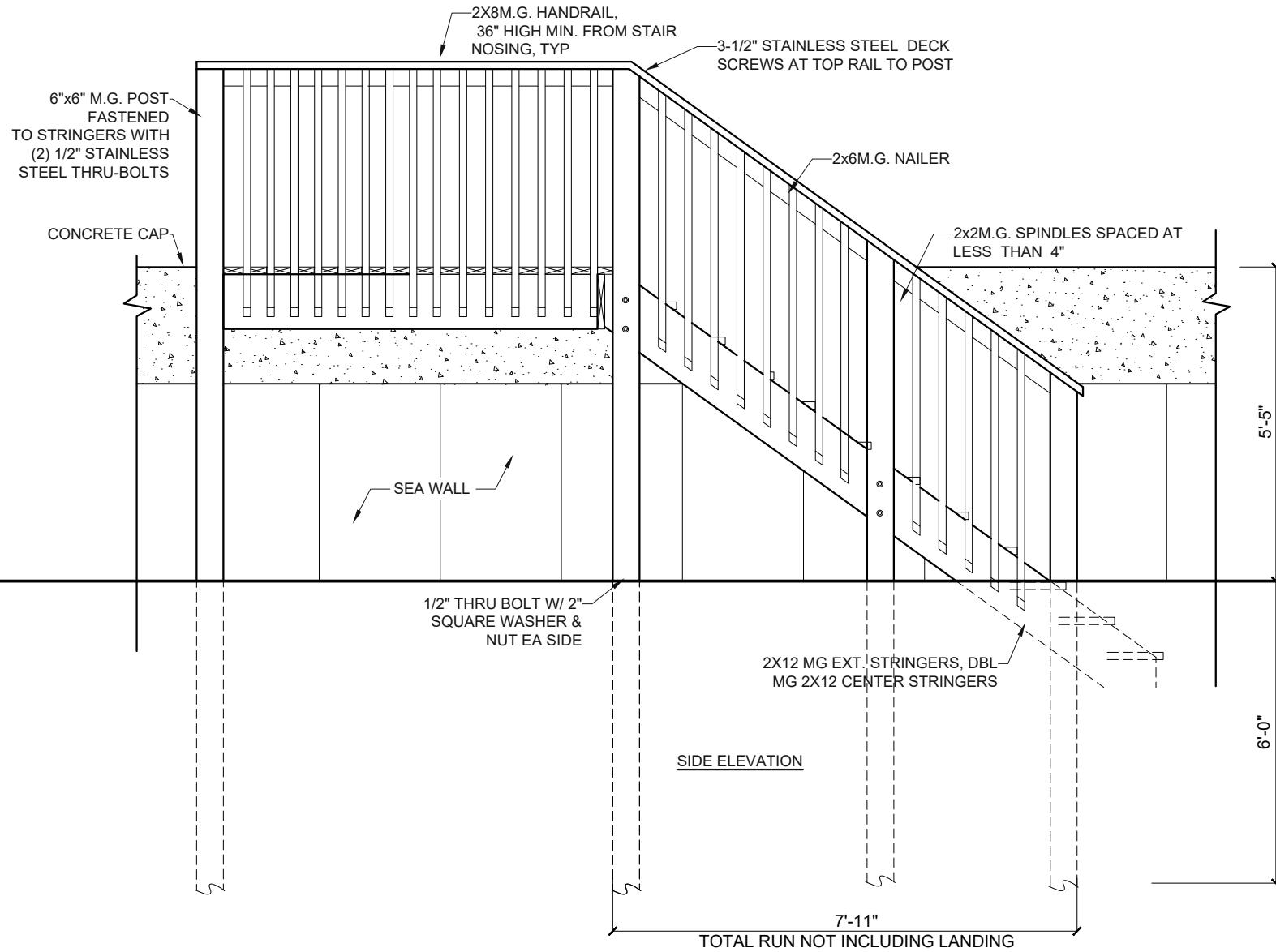
4345 SOUTH ATLANTIC AVENUE
NEW SMYRNA BEACH, FLORIDA 32169

STRUCTURAL PLANS FOR A NEW SEAWALL AT THE SEA DUNES SAND CASTLE

NO	REMARKS	DATE
EOR REVISIONS 3/30/23		
NOTES		
DRAWN BY EAA	SHEET 8 OF 11	
CHECKED BY JAA		
SCALE AS NOTED		
DATE 7 MAR 2023		

S4.0





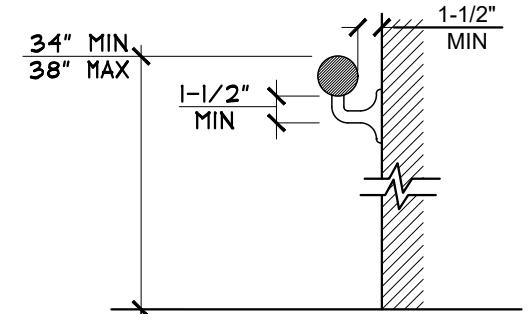
1 STAIR DETAILS
S5.0 SCALE: 3/8"-1'-0"

NOTES:

1. HANDRAIL, SUPPORTS, & FASTENERS SHALL BE CAPABLE OF SUPPORTING A 250lb. POINT LOAD @ ANY POINT ON SYSTEM. TOP RAIL SHALL BE A MIN. HEIGHT OF 36".
2. HANDRAIL STYLE, SPINDLES OR RAILS, TO BE DETERMINED BY OWNER.

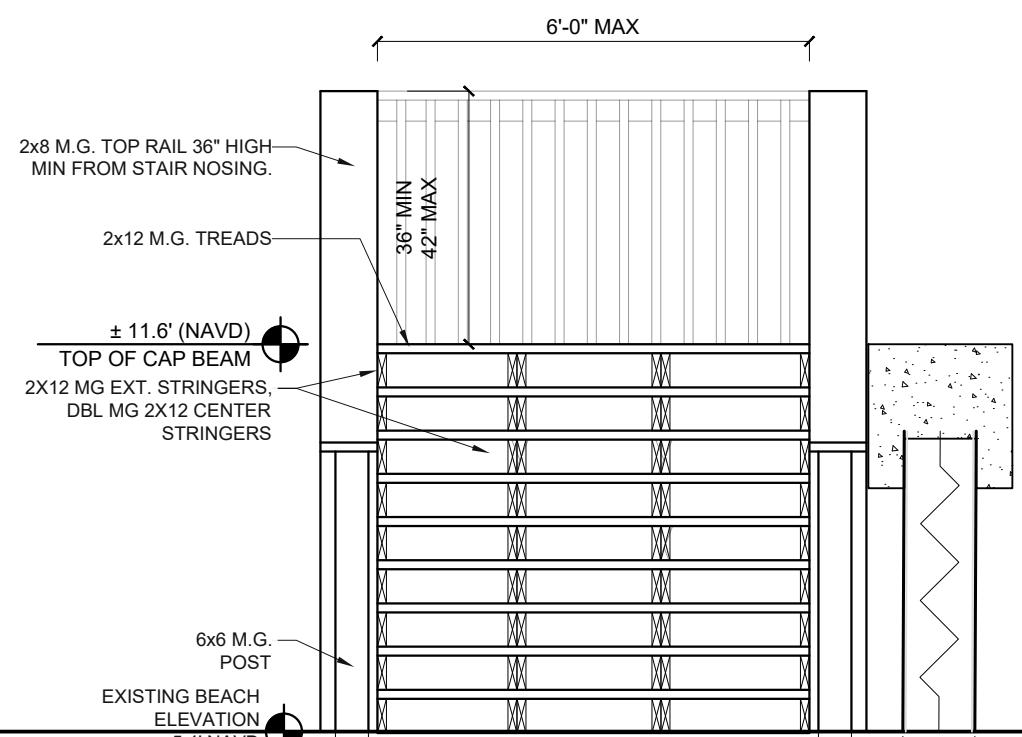
STAIR DATA:

TOTAL RISE±65"
TOTAL RISERS9
RISER DISTANCE±7-3/16"
TOTAL TREADS8 @ 11-1/4"
LANDINGS0
TOTAL RUN±95"



HANDRAIL GRIPPING SURFACES WITH A NON-CIRCULAR CROSS SECTION SHALL HAVE A PERIMETER DIMENSION OF 4" MINIMUM AND 6-1/4" MAXIMUM, AND A CROSS-SECTION DIMENSION OF 2-1/4" MAXIMUM.

1 RAIL DETAILS
S5.0 SCALE: 1"-1'-0"



NOTES:

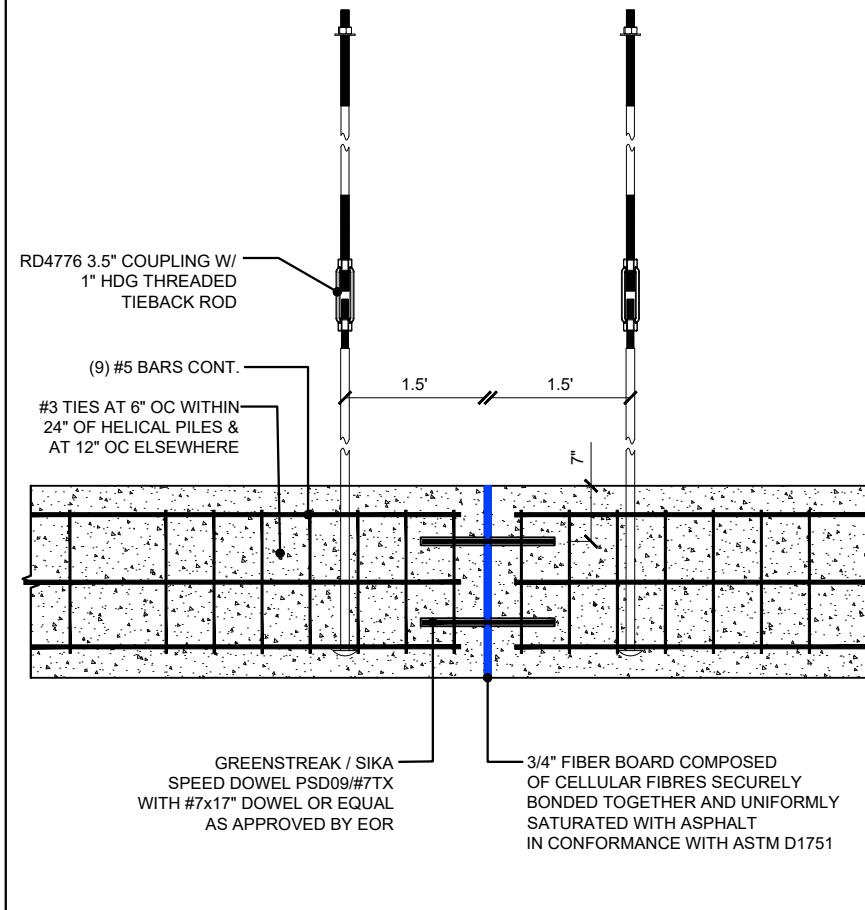
1. HANDRAIL, SUPPORTS, & FASTENERS SHALL BE CAPABLE OF SUPPORTING A 250lb. POINT LOAD @ ANY POINT ON SYSTEM. TOP RAIL SHALL BE A MIN. HEIGHT OF 36".
2. HANDRAIL STYLE, SPINDLES OR RAILS, TO BE DETERMINED BY OWNER.
3. STAIRS TO BE SAME ELEVATION AS TOP OF CAP & EXTEND 3 STEPS BELOW THE BEACH ELEVATION, CONTRACTOR TO DETERMINE

SEA DUNES SAND CASTLE

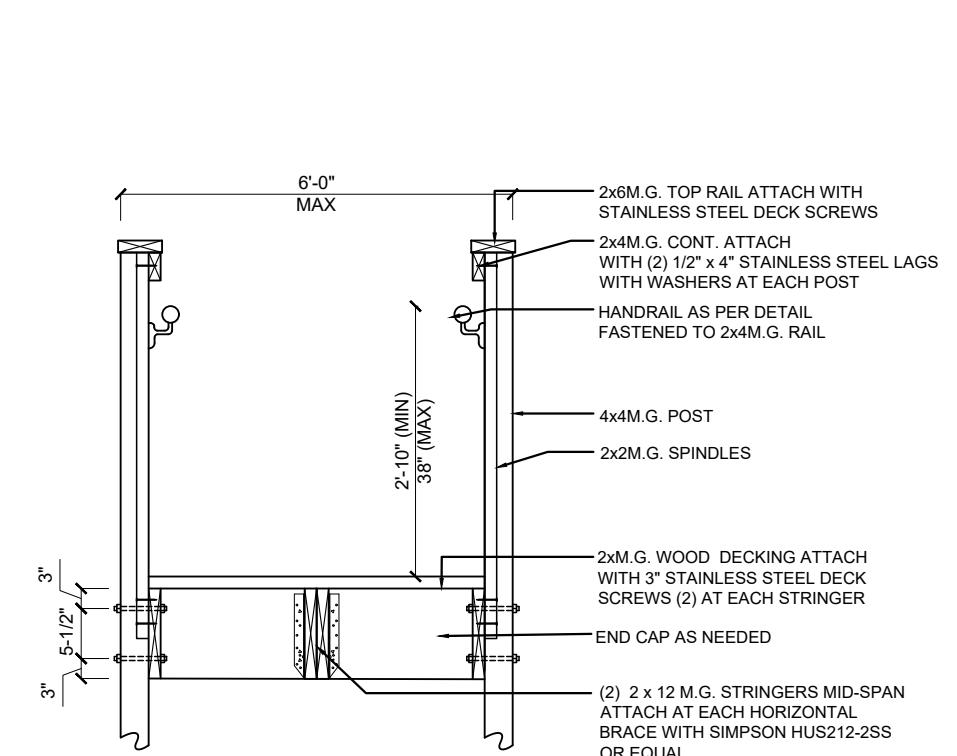
4345 SOUTH ATLANTIC AVENUE
NEW SMYRNA BEACH, FLORIDA 32169

NO	REMARKS	DATE
CHARLES R. ADAMS LICENSURE NO 15113 STATE OF FLORIDA PROFESSIONAL ENGINEER		
BEACH APPROACH STAIRS		
DRAWN BY EAA	SHEET 9 OF 11	
CHECKED BY JAA		
SCALE AS NOTED		
DATE 7 MAR 2023		

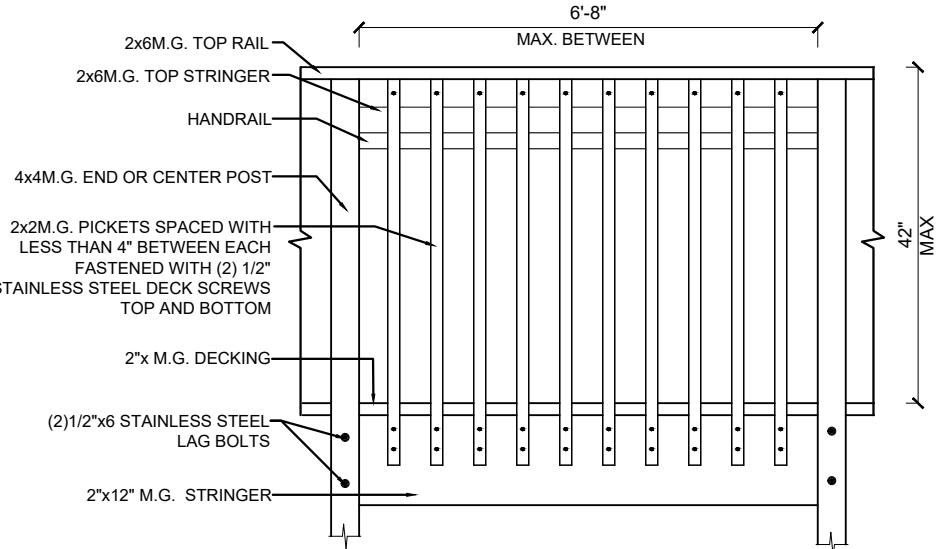
S5.0



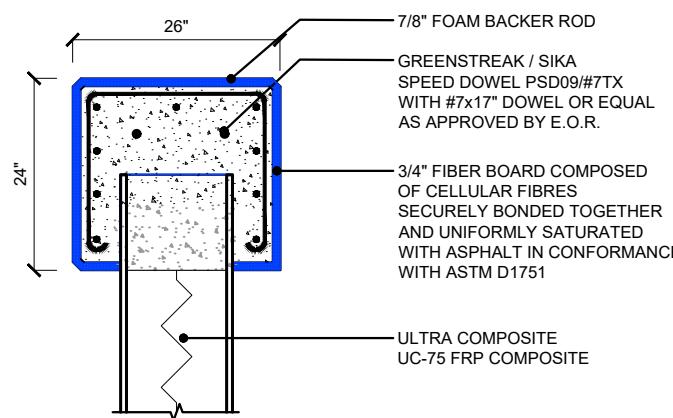
5 EXPANSION JOINT DETAIL - PLAN VIEW
S5.1
SCALE: 1/2"=1'-0"



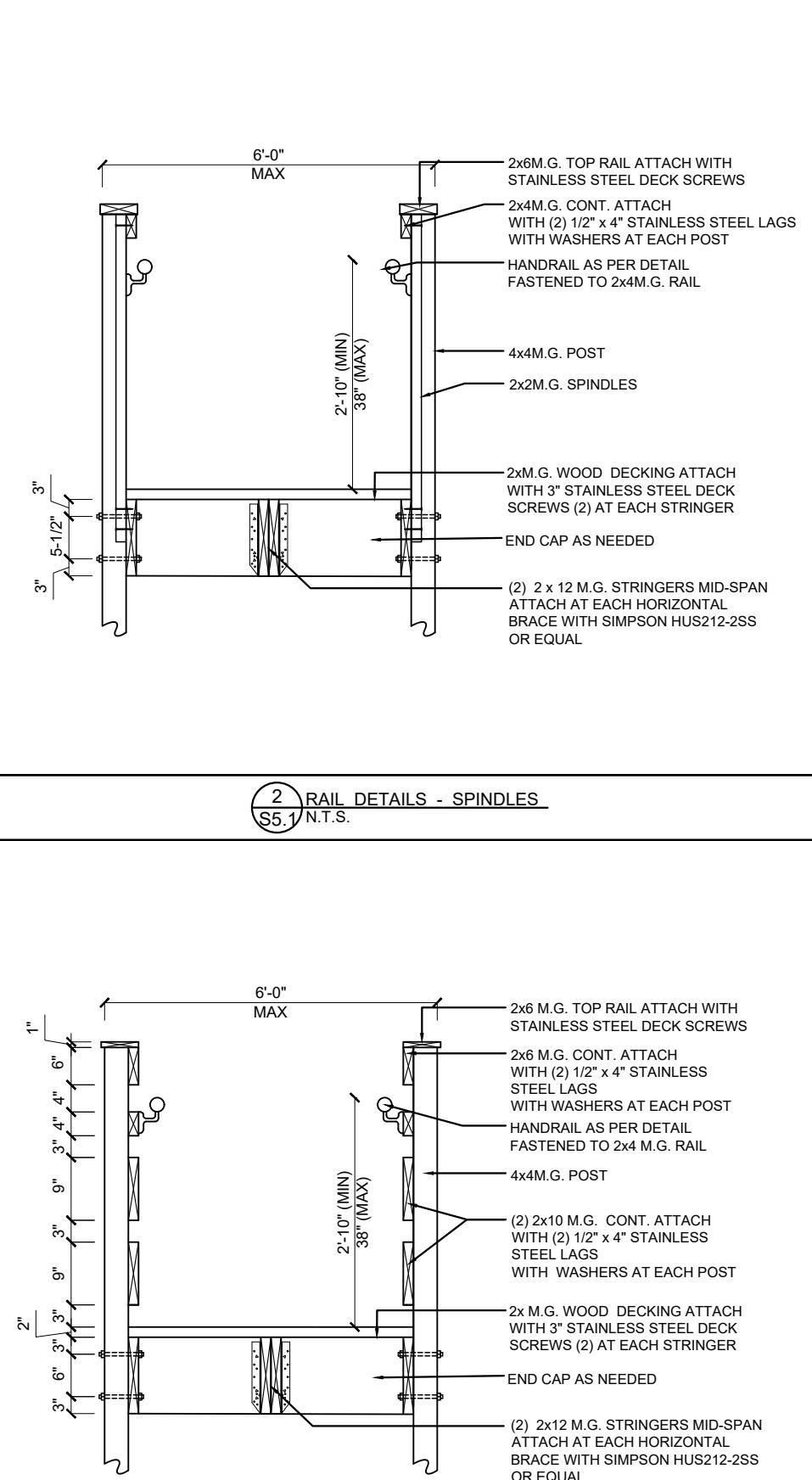
2 RAIL DETAILS - SPINDLES
S5.1 N.T.S.



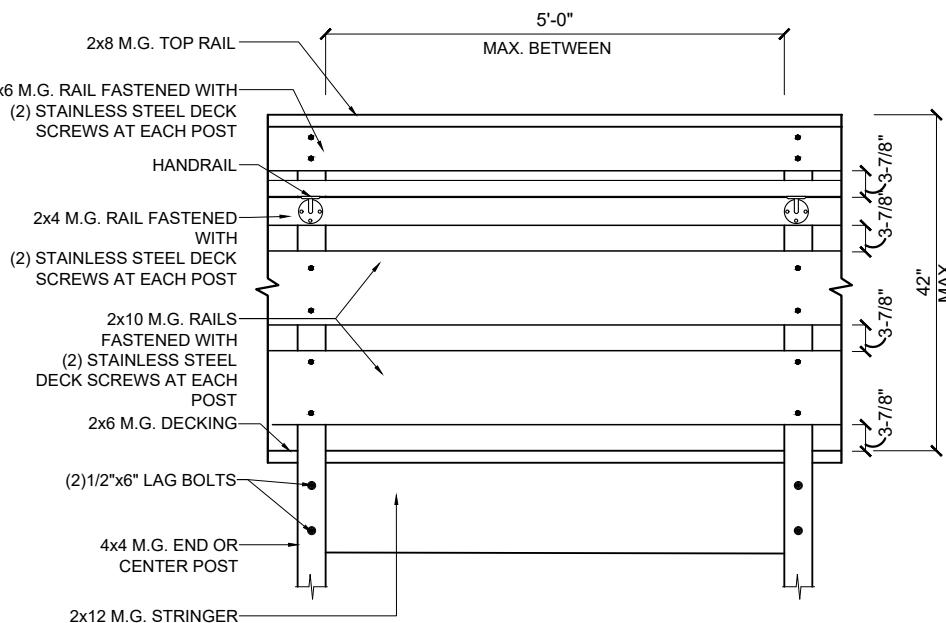
1 RAIL DETAILS - SPINDLES
S5.1



6 EXPANSION JOINT DETAIL - SECTION
S5.1
SCALE: 1/2"=1'-0"



4 RAIL DETAILS - RAILS
S5.1 N.T.S.



3 RAIL DETAILS - RAILS
S5.1 N.T.S.

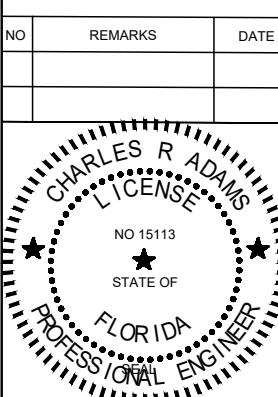
SEA DUNES SAND CASTLE

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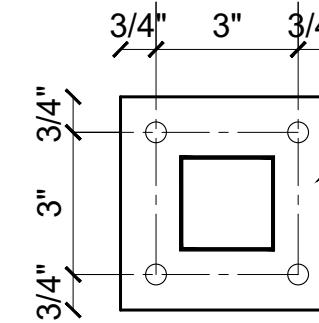
STRUCTURAL PLANS FOR A NEW SEAWALL AT THE

CRA
Charles R. Adams
& Associates, Inc.
STRUCTURAL ENGINEERS

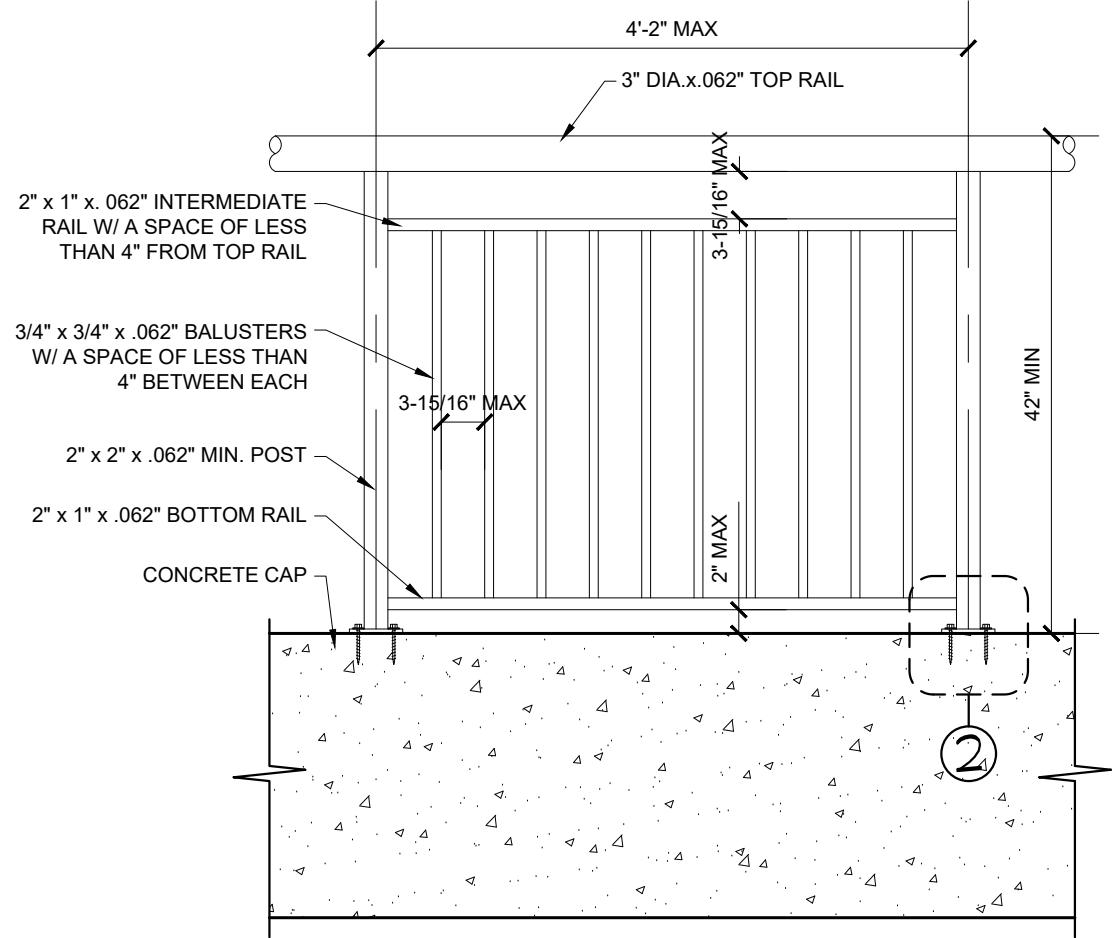
414 Canal Street - New Smyrna Beach, FL 32168 • 306.426.5583
221202 - SEA DUNE SAND CASTLE ASSOC INC CD SET DWG



DRAWN BY
EAA
CHECKED BY
JAA
SCALE
AS NOTED
DATE
7 MAR 2023
S5.1

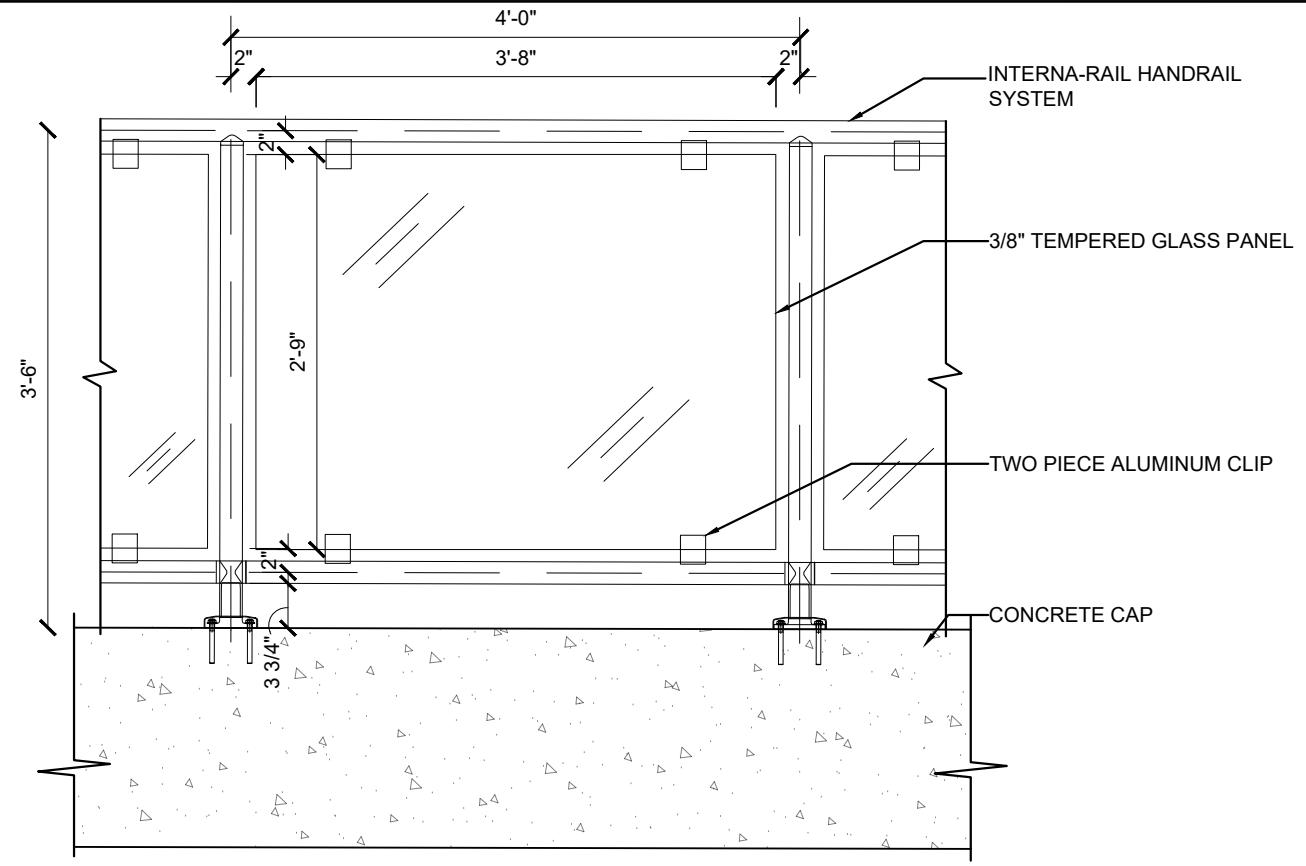


4-1/2" x 4-1/2" x 3/8" PLATE W/ (4) 7/16"
Ø HOLES FOR (4) 3/8" SS THREADED
RODS W/ 3-1/2" EMBEDMENT & HILTI
HIT-HY 150 MAX ADHESIVE



(2) BASE PLATE DETAIL
S5.2 SCALE: 3" = 1'-0"

(1) GUARDRAIL DETAILS - SPINDLES
S5.2 SCALE: 3/4" = 1'-0"



(3) GUARDRAIL DETAILS - GLASS
S5.2 SCALE: 3/4" = 1'-0"

SEA DUNES SAND CASTLE

4345 SOUTH ATLANTIC AVENUE
NEW SMYRNA BEACH, FLORIDA 32169

NO	REMARKS	DATE
△ EOR REVISIONS	3/30/23	
GUARDRAIL DETAILS		
DRAWN BY EAA	SHEET 11 OF 11	S5.2
CHECKED BY JAA		
SCALE AS NOTED		
DATE 7 MAR 2023		

