

CONSTRUCTION DRAWINGS

CITY OF DAYTONA BEACH RIVERFRONT PARK SEAWALL DESIGN FEBRUARY 20, 2020



LOCATION MAP

SECTION: 08 & 39, TOWNSHIP: 15 SOUTH, RANGE: 33 EAST



INDEX

SHEET	DESCRIPTION
CVR	INDEX & LOCATION MAP
C-01	EXISTING CONDITIONS
C-02	EXISTING CONDITIONS
C-03	AERIAL
C-04	DEMO PLAN 1 OF 4
C-05	DEMO PLAN 2 OF 4
C-06	DEMO PLAN 3 OF 4
C-07	DEMO PLAN 4 OF 4
C-08	SITE PLAN 1 OF 4
C-09	SITE PLAN 2 OF 4
C-10	SITE PLAN 3 OF 4
C-11	SITE PLAN 4 OF 4
C-12	BULKHEAD CROSS-SECTIONS
C-13	CONCRETE CAP CROSS-SECTIONS
C-14	CONCRETE CAP EXPANSION JOINTS
C-15	RAILING DETAILS
C-16	STORMWATER OUTFALL STRUCTURES
C-17	STORMWATER OUTFALL DETAILS
C-18	SHEET-PILE DETAILS
C-19	OUTLOOK DETAILS
C-20	OUTLOOK PILE DETAIL
C-21	PEDESTRIAN BRIDGE DETAILS
C-22	GENERAL NOTES
C-23	GENERAL NOTES
C-24	GENERAL NOTES
C-25	ENVIRONMENTAL NOTES

CITY COMMISSION

DERRICK L. HENRY	MAYOR
RUTH TRAGER	COMMISSIONER 1
AARON DELGADO	COMMISSIONER 2
QUANITA MAY	COMMISSIONER 3
ROBERT A. GILLILAND	COMMISSIONER 4
DANNETTE HENRY	COMMISSIONER 5
PAULA R. REED	COMMISSIONER 6



NOTE TO CONTRACTOR:

THESE DRAWINGS AND THE PROJECT SPECIFICATIONS ARE COMPLEMENTARY, AND ANY REQUIREMENT OF ONE SHALL BE A REQUIREMENT OF THE OTHER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE THE DRAWINGS AND SPECIFICATIONS AND TO COMPARE THE REQUIREMENTS OF EACH DIVISION AND ENSURE THAT EACH TRADE OR SUBCONTRACTOR IS MAKING THE ALLOWANCES NECESSARY TO PROVIDE THE OWNER A COMPLETE FACILITY, OPERATIONAL IN ALL RESPECTS, UNLESS OTHERWISE SPECIFICALLY STATED IN THE DRAWINGS OR PROJECT MANUAL.

IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE CITY'S PURCHASING DEPARTMENT OF ANY DEFICIENCIES OR DISCREPANCIES AMONG THE DIVISIONS OF THE DRAWING AND SPECIFICATIONS PRIOR TO THE BID DATE. NEITHER THE OWNER OR ENGINEER WILL BE RESPONSIBLE FOR ANY DEFICIENCIES OR DISCREPANCIES RAISED AFTER THE BID OPENING. ACCORDINGLY, IN LIGHT OF THESE OBLIGATIONS, THE ENGINEER IS OBLIGATED TO INTERPRET THE DRAWINGS SPECIFICATIONS IN A MANNER THAT WILL PROVIDE THE OWNER WITH A COMPLETE, FUNCTIONING FACILITY FOR THE BID PRICE.

ENGINEER CERTIFICATION:

I HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF FLORIDA PRACTICING WITH DMC, DREDGING & MARINE CONSULTANTS LLC, A CORPORATION, AUTHORIZED TO OPERATE AS AN ENGINEERING BUSINESS, CERTIFICATE OF AUTHORIZATION # 9410, BY THE STATE OF FLORIDA DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION, AND THAT I, OR OTHERS UNDER MY DIRECT SUPERVISION, HAVE PREPARED OR APPROVED THE EVALUATIONS, FINDINGS, OPINIONS, CALCULATIONS, CONCLUSIONS OR TECHNICAL ADVICE HEREBY REPRESENTED BY THESE DRAWINGS.

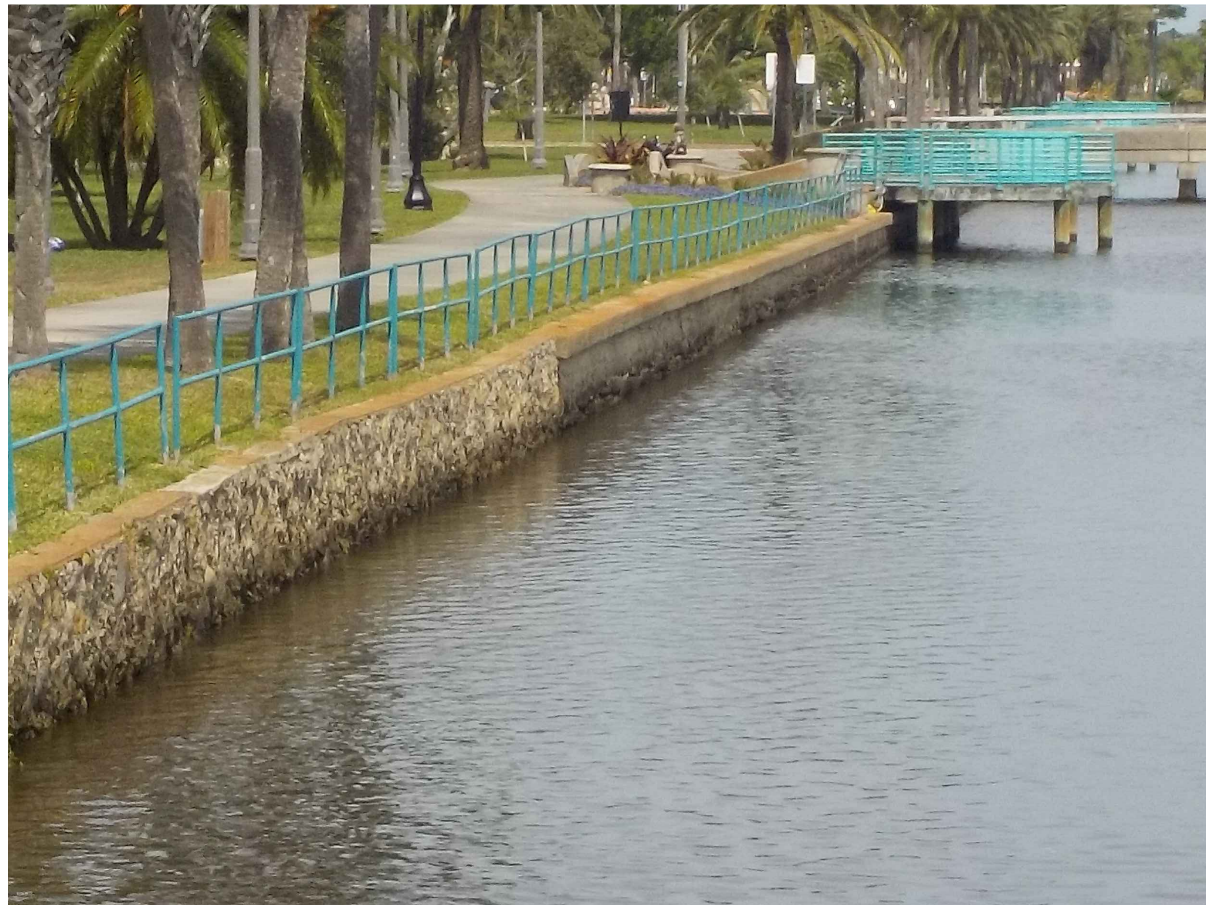
STEPHEN J. KUHN, P.E.
FLORIDA LICENSE No. 67486

REPRODUCTION SCALE:
THESE PLANS SHALL BE PRINTED IN COLOR AND ARE SCALED TO ACCURATELY BE REPRODUCED ON 11X17 SIZED SHEETS. ALL OTHER SHEET SIZES ARE NOT TO SCALE.

Dredging & Marine Consultants 4643 S. Clyde Morris Blvd
Unit 302
Port Orange, FL 32129
Phone:(386) 304-6505
Fax:(386) 304-6506
www.dmc.es.com

DMC
ENGINEERS • SCIENTISTS

Drawing Name: D:\My Share\Synca\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: PHOTOS 1 2/26/2020



EXISTING BULKHEAD LOOKING NORTH FROM ORANGE AVENUE DMC, 03.24.2019



EXISTING BULKHEAD NORTH OF MAGNOLIA AVENUE DMC, 05.23.2019



EXISTING BULKHEAD AT INTERNATIONAL SPEEDWAY BOULEVARD DMC, 05.23.2019



EXISTING BULKHEAD SOUTH OF THE EXISTING PEDESTRIAN BRIDGE DMC, 05.23.2019

DRAWING: EXISTING CONDITIONS	
DMC JOB NO.	19-006-36
DRAWN	NT
CHECKED	AR
APPROVED	SKP
CAD	C3D
SCALE AS SHOWN	
DATE	2-20-2020
SHEET NO. C-01	

PROJECT NAME:
**RIVERFRONT PARK
 SEAWALL DESIGN**

CLIENT:
CITY OF DAYTONA BEACH

STEPHEN J. KUHN, P.E.
 FLORIDA LICENSE NO. 87486

Dredging & Marine Consultants
DMC
 ENGINEERS • SCIENTISTS

4643 S. Clyde Morris Blvd
 Unit 302
 Port Orange, FL 32129
 Phone: (386) 304-6505
 Fax: (386) 304-6506
 www.dmcscs.com

301 S. RIDGEWOOD AVE.
 DAYTONA BEACH, FL 32114
 (386) 671-8400

THE CITY OF DAYTONA BEACH
 INCORPORATED 1852

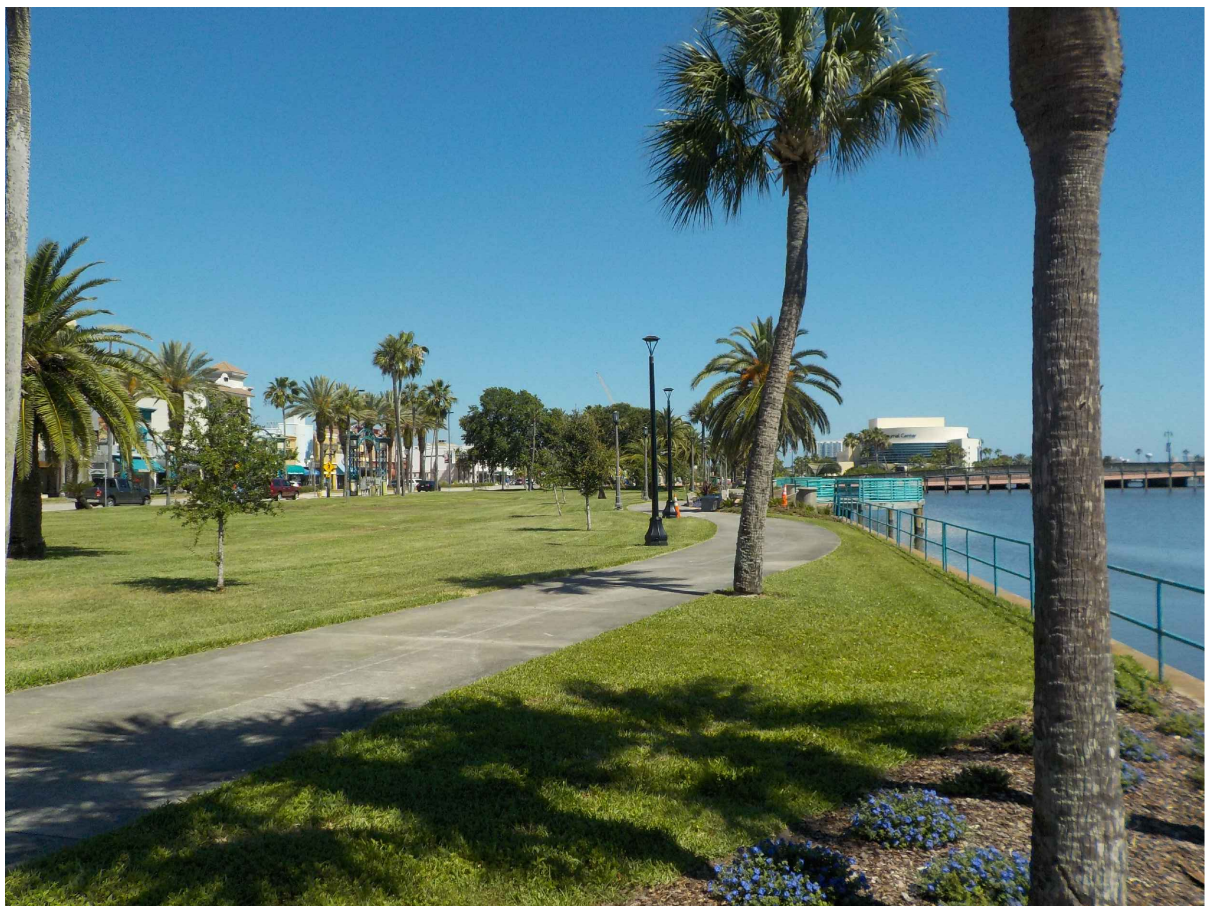
Drawing Name: D:\My Share\Sync\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: PHOTOS 2 2/26/2020



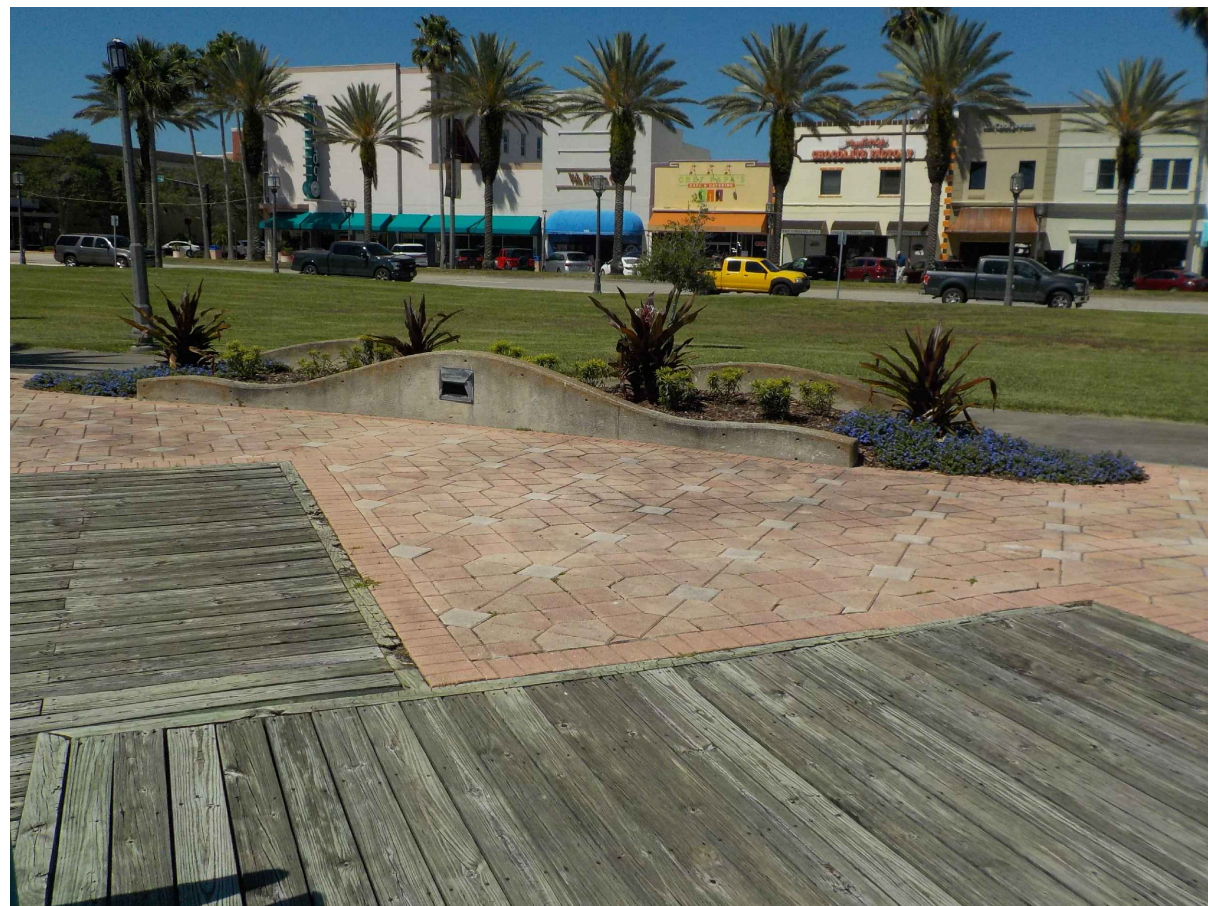
EXISTING BULKHEAD AND BRIDGE ABUTMENT AT ORANGE AVENUE DMC, 03.24.2019



EXISTING TIMBER OUTLOOKS DMC, 03.24.2019



EXISTING SIDEWALK LOOKING NORTH FROM MAGNOLIA AVENUE DMC, 05.22.2019



EXISTING LANDSCAPE STRUCTURES DMC, 05.22.2019

DRAWING: EXISTING CONDITIONS	
DMC JOB NO.	19-006-36
DRAWN	NT
CHECKED	AR
APPROVED	SKP
CAD	C3D
SCALE AS SHOWN	
SHEET NO.	C-02
DATE	2-20-2020

PROJECT NAME:
**RIVERFRONT PARK
 SEAWALL DESIGN**


CLIENT: **CITY OF DAYTONA BEACH**

STEPHEN J. KUHN, P.E.
 FLORIDA LICENSE NO. 87486

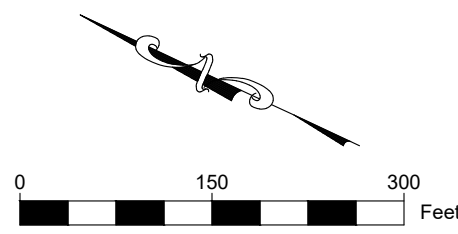
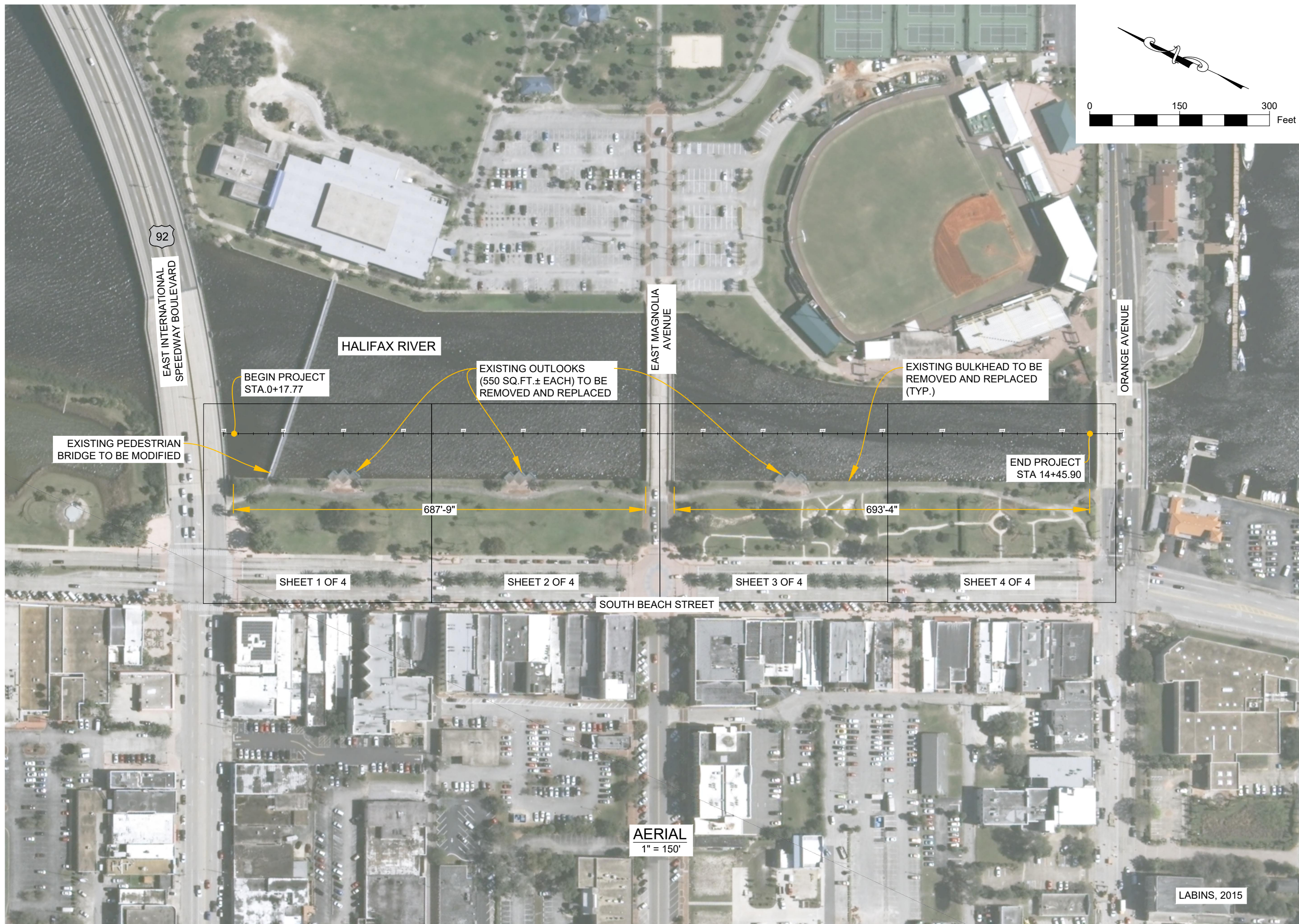
Dredging & Marine Consultants
DMC
 ENGINEERS • SCIENTISTS



4643 S. Clyde Morris Blvd
 Unit 302
 Port Orange, FL 32129
 Phone: (386) 304-6505
 Fax: (386) 304-6506
 www.dmcscs.com

301 S. RIDGEWOOD AVE.
 DAYTONA BEACH, FL 32114
 (386) 671-8400



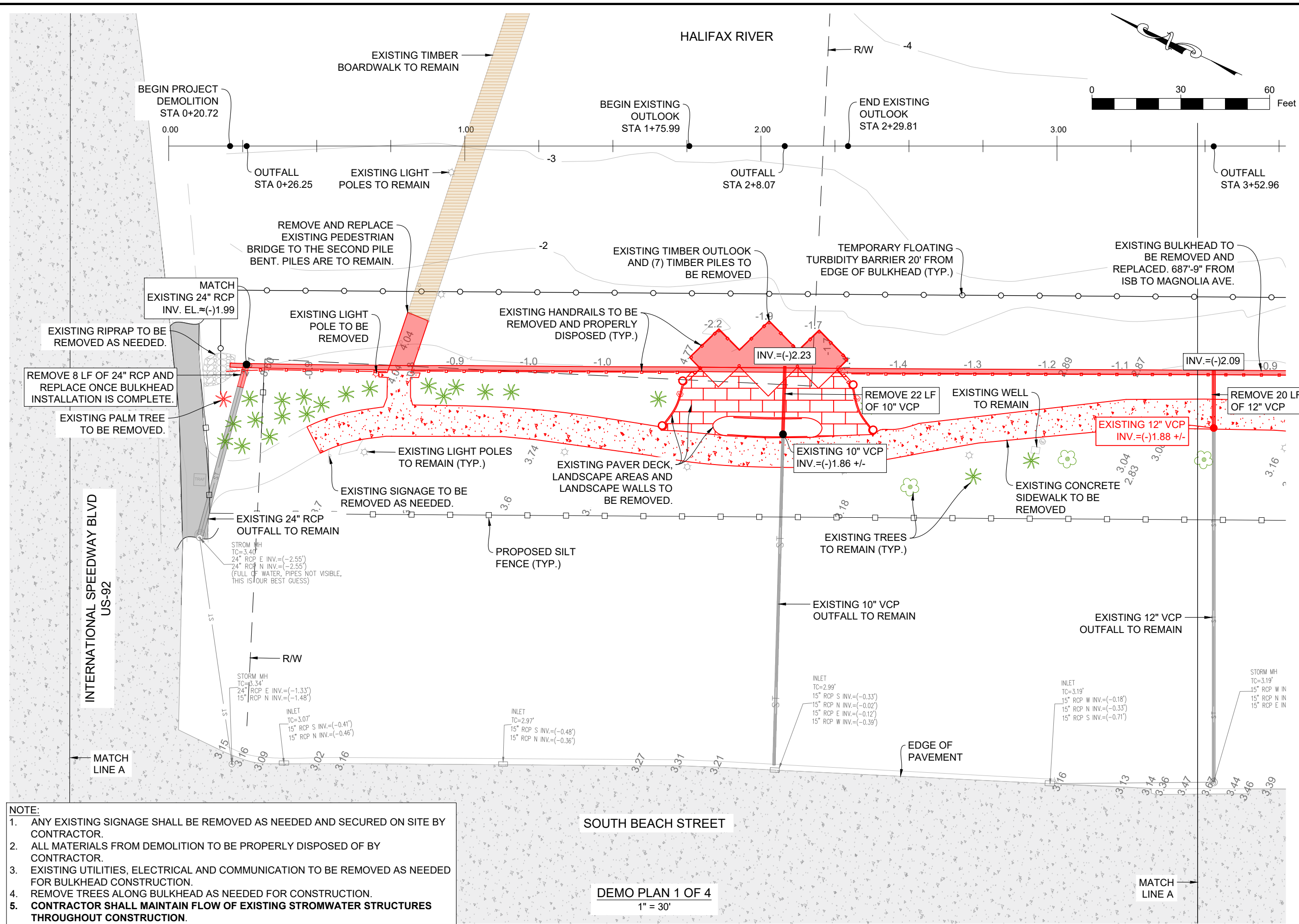
Drawing Name: D:\My Share\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: AERIAL 2/26/2020



DRAWING: AERIAL		PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN	
DMC JOB NO. 19-006-36	DRAWN NT CAD C3D	CLIENT: CITY OF DAYTONA BEACH	
CHECKED AR	APPROVED SKP	STEPHEN J. KUHN, P.E. FLORIDA LICENSE NO. 87486	
SCALE AS SHOWN		4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com	
DATE: 2-20-2020		 DMC ENGINEERS • SCIENTISTS	
SHEET NO. C-03		301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400	
		 THE CITY OF DAYTONA BEACH INCORPORATED 1852	

LABINS, 2015

Drawing Name: D:\My Shares\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: DEMO 1 2/26/2020

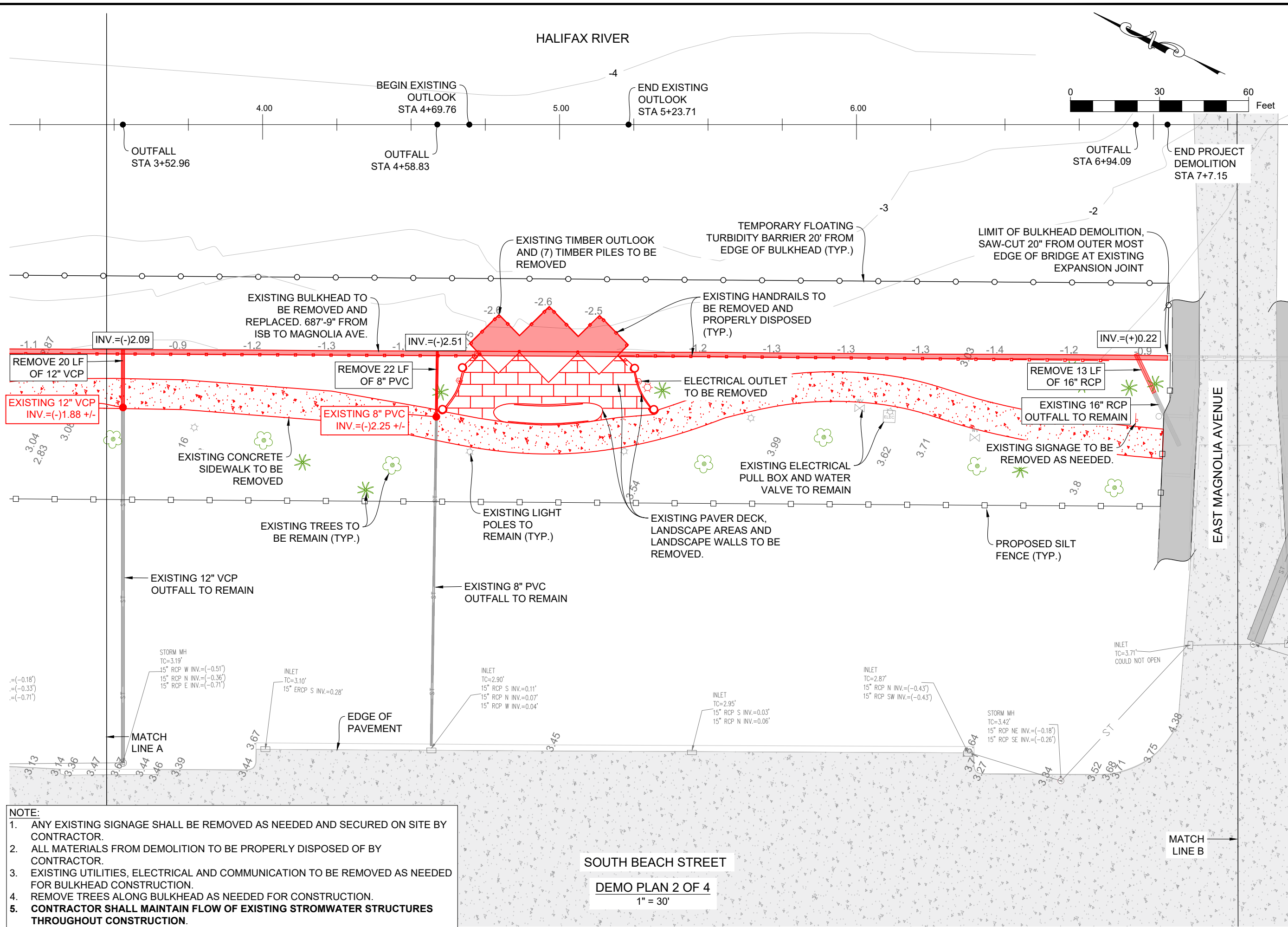


- NOTE:**
1. ANY EXISTING SIGNAGE SHALL BE REMOVED AS NEEDED AND SECURED ON SITE BY CONTRACTOR.
 2. ALL MATERIALS FROM DEMOLITION TO BE PROPERLY DISPOSED OF BY CONTRACTOR.
 3. EXISTING UTILITIES, ELECTRICAL AND COMMUNICATION TO BE REMOVED AS NEEDED FOR BULKHEAD CONSTRUCTION.
 4. REMOVE TREES ALONG BULKHEAD AS NEEDED FOR CONSTRUCTION.
 5. **CONTRACTOR SHALL MAINTAIN FLOW OF EXISTING STORMWATER STRUCTURES THROUGHOUT CONSTRUCTION.**

DEMOLITION PLAN 1 OF 4
1" = 30'

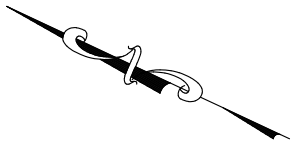
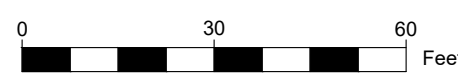
DRAWING: DEMO PLAN 1 OF 4		DMC JOB NO. 19-006-36		SHEET NO. C-04	
PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN		DRAWN: NT		SCALE AS SHOWN	
CLIENT: CITY OF DAYTONA BEACH		CHECKED: AR		DATE: 2-20-2020	
Dredging & Marine Consultants 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com		ENGINEERS • SCIENTISTS		STEPHEN J. KUHN, P.E. FLORIDA LICENSE NO. 87468	
301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		THE CITY OF DAYTONA BEACH INCORPORATED 1962			

Drawing Name: D:\My Shares\DMC Projects\06 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: DEMO 2 2/26/2020



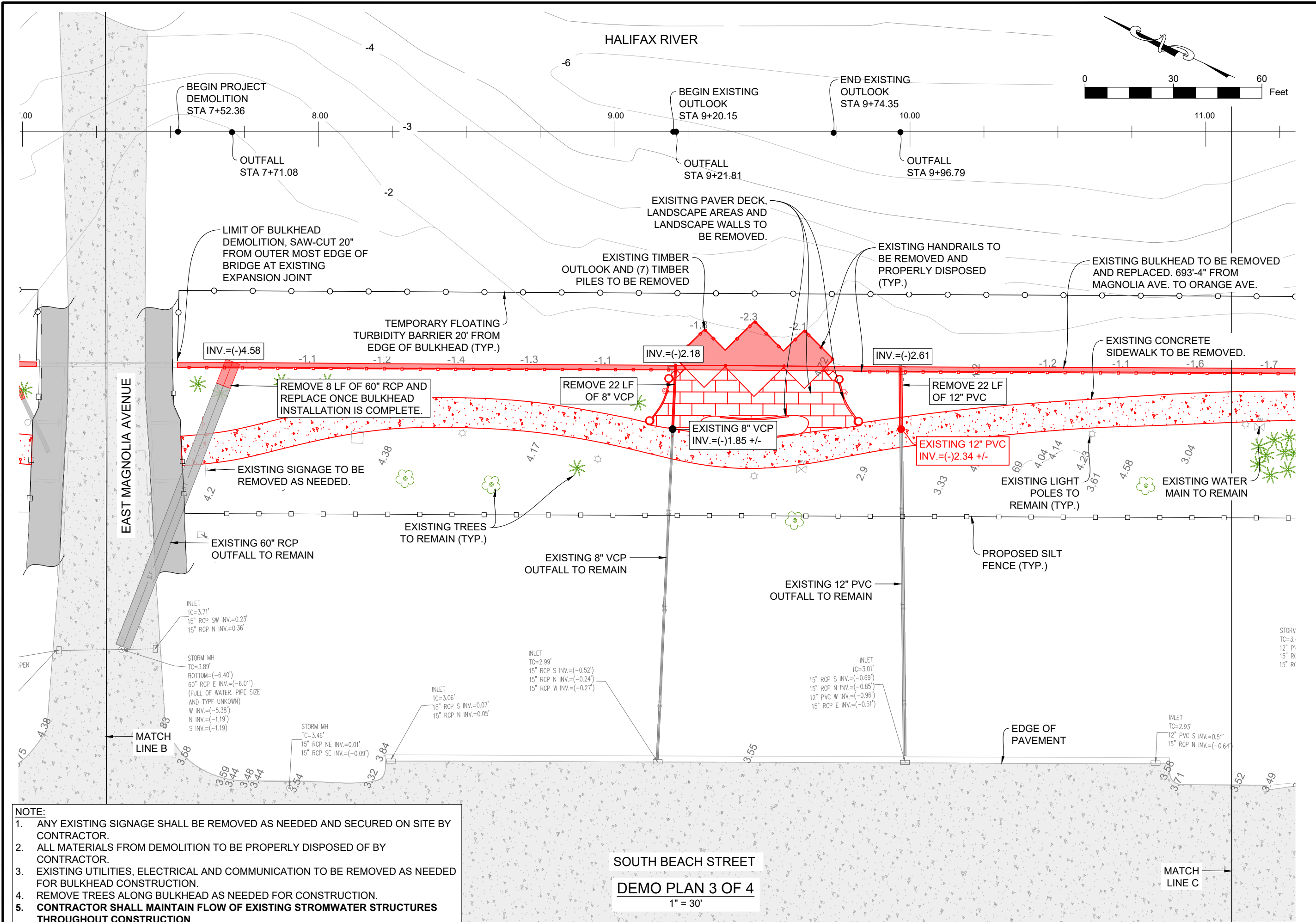
- NOTE:**
1. ANY EXISTING SIGNAGE SHALL BE REMOVED AS NEEDED AND SECURED ON SITE BY CONTRACTOR.
 2. ALL MATERIALS FROM DEMOLITION TO BE PROPERLY DISPOSED OF BY CONTRACTOR.
 3. EXISTING UTILITIES, ELECTRICAL AND COMMUNICATION TO BE REMOVED AS NEEDED FOR BULKHEAD CONSTRUCTION.
 4. REMOVE TREES ALONG BULKHEAD AS NEEDED FOR CONSTRUCTION.
 5. **CONTRACTOR SHALL MAINTAIN FLOW OF EXISTING STORMWATER STRUCTURES THROUGHOUT CONSTRUCTION.**

SOUTH BEACH STREET
DEMO PLAN 2 OF 4
 1" = 30'



DRAWING: DEMO PLAN 2 OF 4 DMC JOB NO. 19-006-36 DRAWN: NT CHECKED: AR APPROVED: SKP DATE: 2-20-2020	PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN CLIENT: CITY OF DAYTONA BEACH	SHEET NO. C-05 CAD: C3D SCALE AS SHOWN DATE: 2-20-2020	Dredging & Marine Consultants 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com DMC ENGINEERS • SCIENTISTS
301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		THE CITY OF DAYTONA BEACH INCORPORATED 1915	

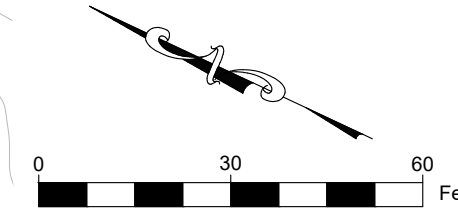
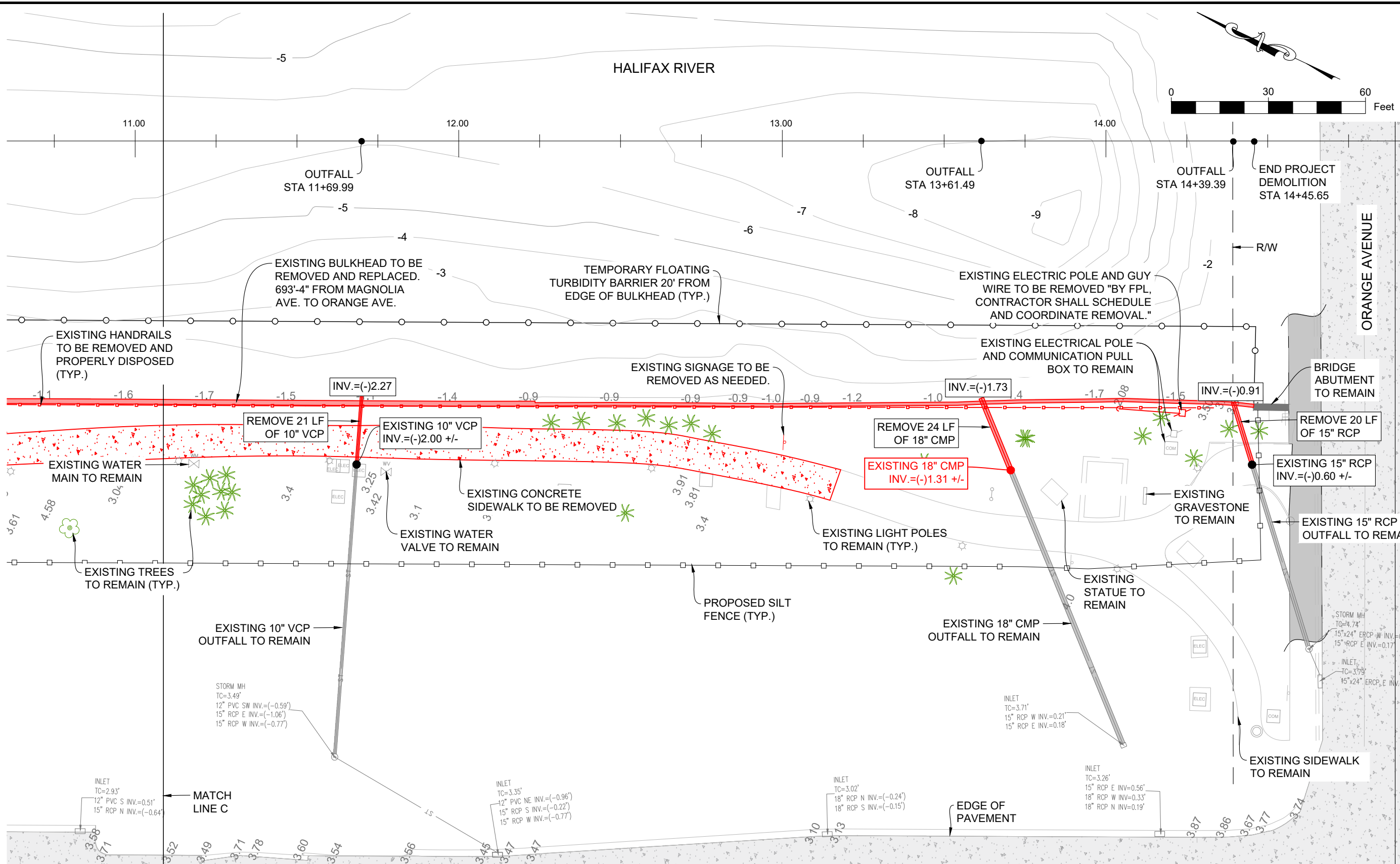
Drawing Name: D:\My Shares\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: DEMO 3 2/26/2020



SOUTH BEACH STREET
DEMO PLAN 3 OF 4
 1" = 30'

DRAWING: DEMO PLAN 3 OF 4 DMC JOB NO. 19-006-36 DRAWN: NT CHECKED: AR APPROVED: SKP DATE: 2-20-2020	PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN CLIENT: CITY OF DAYTONA BEACH	SHEET NO. C-06 SCALE AS SHOWN DATE: 2-20-2020	Dredging & Marine Consultants DMC ENGINEERS • SCIENTISTS 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com
301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		THE CITY OF DAYTONA BEACH INCORPORATED 1887	

Drawing Name: D:\My Shares\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: DEMO 4 2/26/2020

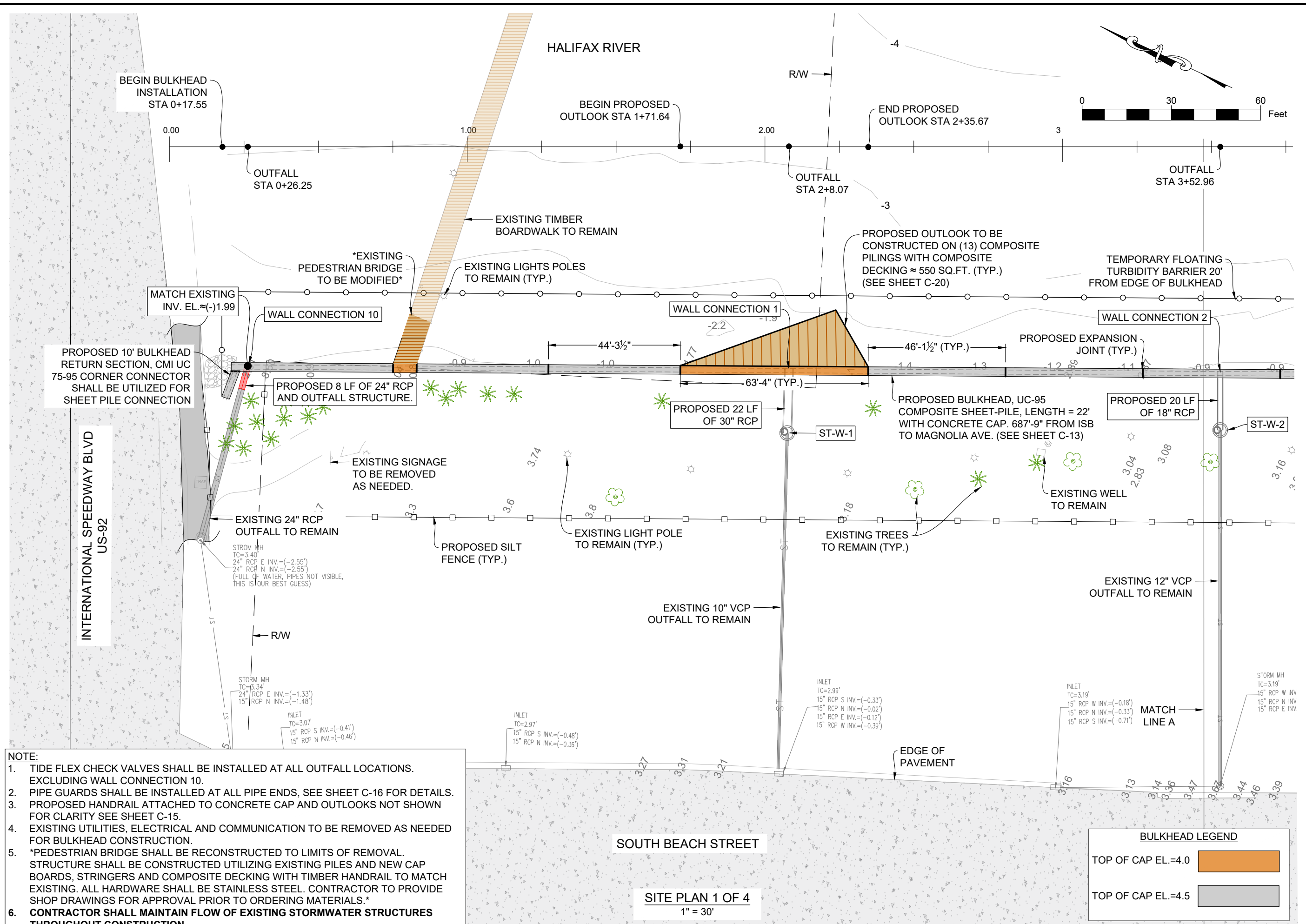


- NOTE:**
1. ANY EXISTING SIGNAGE SHALL BE REMOVED AS NEEDED AND SECURED ON SITE BY CONTRACTOR.
 2. ALL MATERIALS FROM DEMOLITION TO BE PROPERLY DISPOSED OF BY CONTRACTOR.
 3. EXISTING UTILITIES, ELECTRICAL AND COMMUNICATION TO BE REMOVED AS NEEDED FOR BULKHEAD CONSTRUCTION.
 4. REMOVE TREES ALONG BULKHEAD AS NEEDED FOR CONSTRUCTION.
 5. **CONTRACTOR SHALL MAINTAIN FLOW OF EXISTING STORMWATER STRUCTURES THROUGHOUT CONSTRUCTION.**

SOUTH BEACH STREET
DEMO PLAN 4 OF 4
1" = 30'

DRAWING: DEMO PLAN 4 OF 4 DMC JOB NO. 19-006-36 DRAWN: NT CHECKED: AR APPROVED: SKP DATE: 2-20-2020	PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN	CLIENT: CITY OF DAYTONA BEACH	SHEET NO. C-07
4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com			
301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400			

Drawing Name: D:\My Shares\DMC Projects\06 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\SEAWALL-revised.dwg By: DMC-CAD Tab: SITE 1 2/26/2020



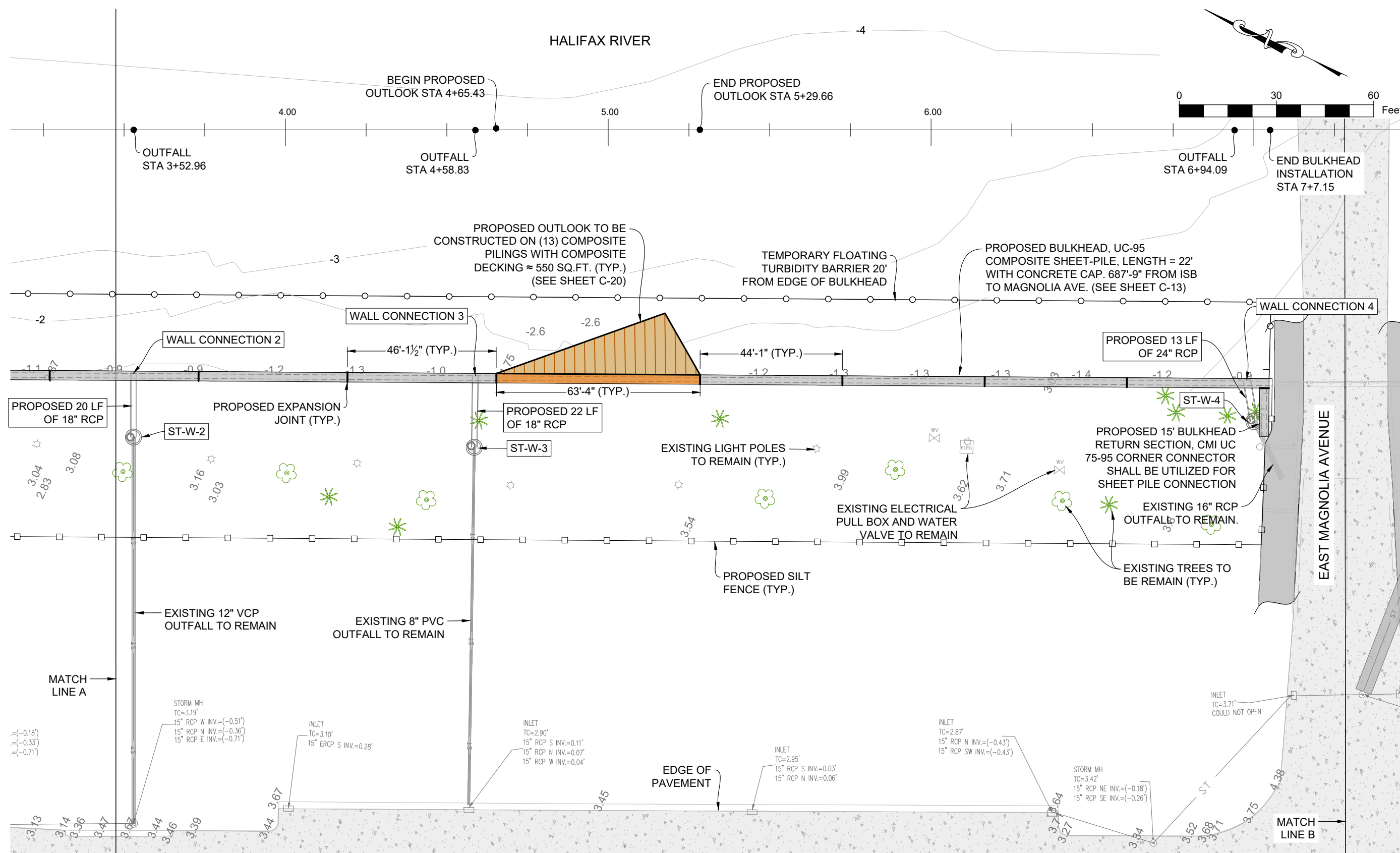
- NOTE:**
1. TIDE FLEX CHECK VALVES SHALL BE INSTALLED AT ALL OUTFALL LOCATIONS. EXCLUDING WALL CONNECTION 10.
 2. PIPE GUARDS SHALL BE INSTALLED AT ALL PIPE ENDS, SEE SHEET C-16 FOR DETAILS.
 3. PROPOSED HANDRAIL ATTACHED TO CONCRETE CAP AND OUTLOOKS NOT SHOWN FOR CLARITY SEE SHEET C-15.
 4. EXISTING UTILITIES, ELECTRICAL AND COMMUNICATION TO BE REMOVED AS NEEDED FOR BULKHEAD CONSTRUCTION.
 5. *PEDESTRIAN BRIDGE SHALL BE RECONSTRUCTED TO LIMITS OF REMOVAL. STRUCTURE SHALL BE CONSTRUCTED UTILIZING EXISTING PILES AND NEW CAP BOARDS, STRINGERS AND COMPOSITE DECKING WITH TIMBER HANDRAIL TO MATCH EXISTING. ALL HARDWARE SHALL BE STAINLESS STEEL. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR APPROVAL PRIOR TO ORDERING MATERIALS.*
 6. **CONTRACTOR SHALL MAINTAIN FLOW OF EXISTING STORMWATER STRUCTURES THROUGHOUT CONSTRUCTION.**

BULKHEAD LEGEND	
TOP OF CAP EL.=4.0	
TOP OF CAP EL.=4.5	

SITE PLAN 1 OF 4
1" = 30'

DRAWING: SITE PLAN 1 OF 4	DMC JOB NO. 19-006-36	DRAWN: NT	CHECKED: AR	APPROVED: SKP
PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN		SHEET NO. C-08		SCALE AS SHOWN DATE: 2-20-2020
CLIENT: CITY OF DAYTONA BEACH		Dredging & Marine Consultants 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com		
ENGINEERS • SCIENTISTS 		301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		

Drawing Name: D:\My Shares\DMC Projects\06 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: SITE 2_2/26/2020



NOTE:

- TIDE FLEX CHECK VALVES SHALL BE INSTALLED AT ALL OUTFALL LOCATIONS. EXCLUDING WALL CONNECTION 10.
- PIPE GUARDS SHALL BE INSTALLED AT ALL PIPE ENDS, SEE SHEET C-16 FOR DETAILS.
- PROPOSED HANDRAIL ATTACHED TO CONCRETE CAP AND OUTLOOKS NOT SHOWN FOR CLARITY, SEE SHEET C-15.
- EXISTING UTILITIES, ELECTRICAL AND COMMUNICATION TO BE REMOVED AS NEEDED FOR BULKHEAD CONSTRUCTION.
- CONTRACTOR SHALL MAINTAIN FLOW OF EXISTING STORMWATER STRUCTURES THROUGHOUT CONSTRUCTION.**

SOUTH BEACH STREET

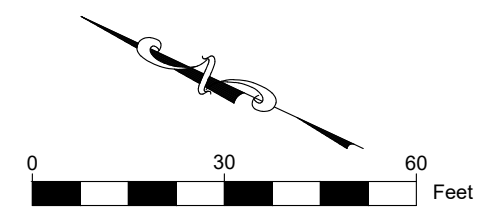
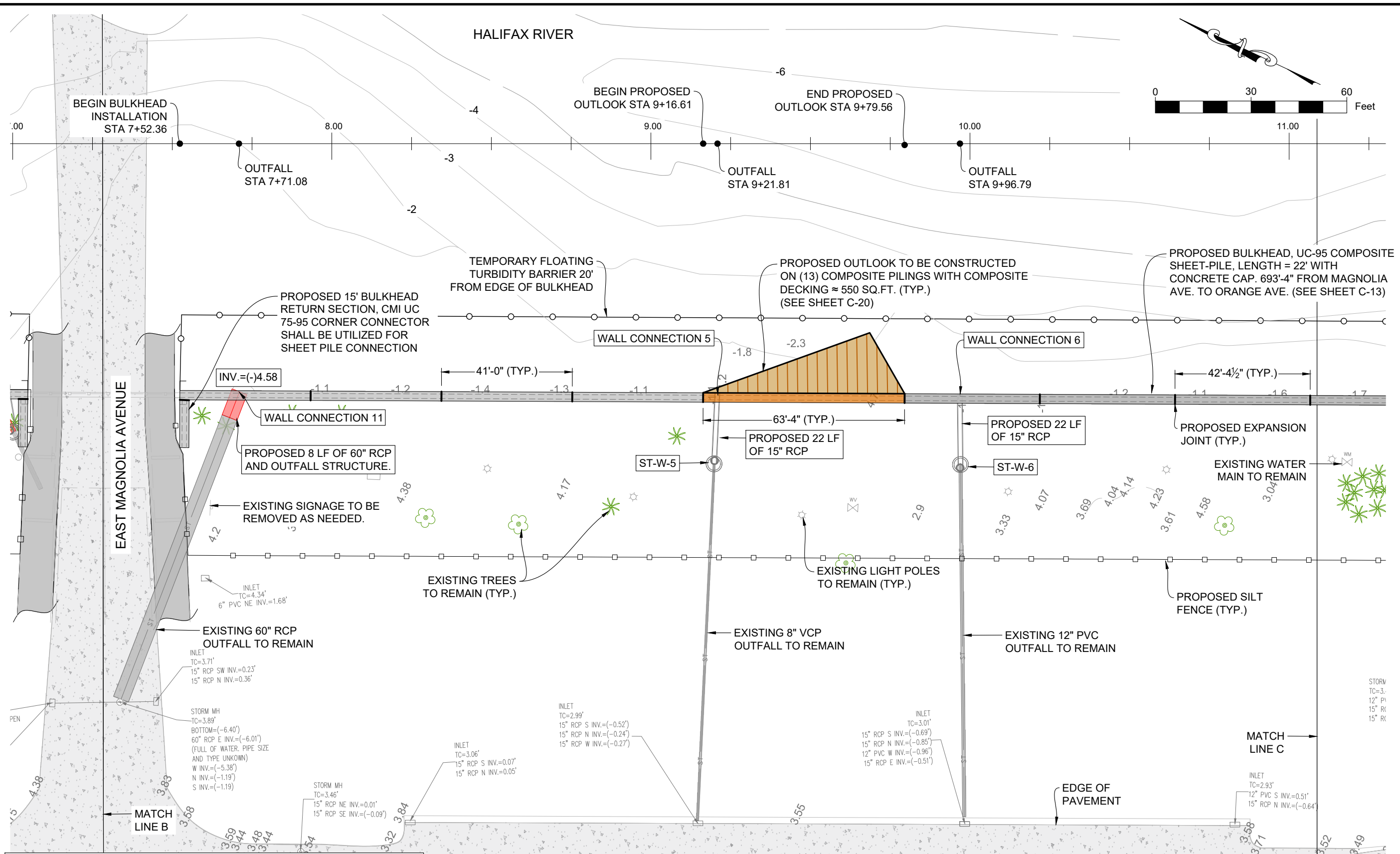
SITE PLAN 2 OF 4

1" = 30'

BULKHEAD LEGEND	
TOP OF CAP EL.=4.0	
TOP OF CAP EL.=4.5	

DRAWING: SITE PLAN 2 OF 4	DMC JOB NO.: 19-006-36	DRAWN: NT	CHECKED: AR
PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN	CLIENT: CITY OF DAYTONA BEACH	DATE: 2-20-2020	SHEET NO.: C-09
DMC Dredging & Marine Consultants 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com		ENGINEERS • SCIENTISTS STEPHEN J. KUHN, P.E. FLORIDA LICENSE NO. 87486	

Drawing Name: D:\My Shares\DMC Projects\06 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: SITE 3 2/26/2020



- NOTE:**
1. TIDE FLEX CHECK VALVES SHALL BE INSTALLED AT ALL OUTFALL LOCATIONS, EXCLUDING WALL CONNECTION 10.
 2. PIPE GUARDS SHALL BE INSTALLED AT ALL PIPE ENDS, SEE SHEET C-16 FOR DETAILS.
 3. PROPOSED HANDRAIL ATTACHED TO CONCRETE CAP AND OUTLOOKS NOT SHOWN FOR CLARITY, SEE SHEET C-15.
 4. EXISTING UTILITIES, ELECTRICAL AND COMMUNICATION TO BE REMOVED AS NEEDED FOR BULKHEAD CONSTRUCTION.
 5. **CONTRACTOR SHALL MAINTAIN FLOW OF EXISTING STORMWATER STRUCTURES THROUGHOUT CONSTRUCTION.**

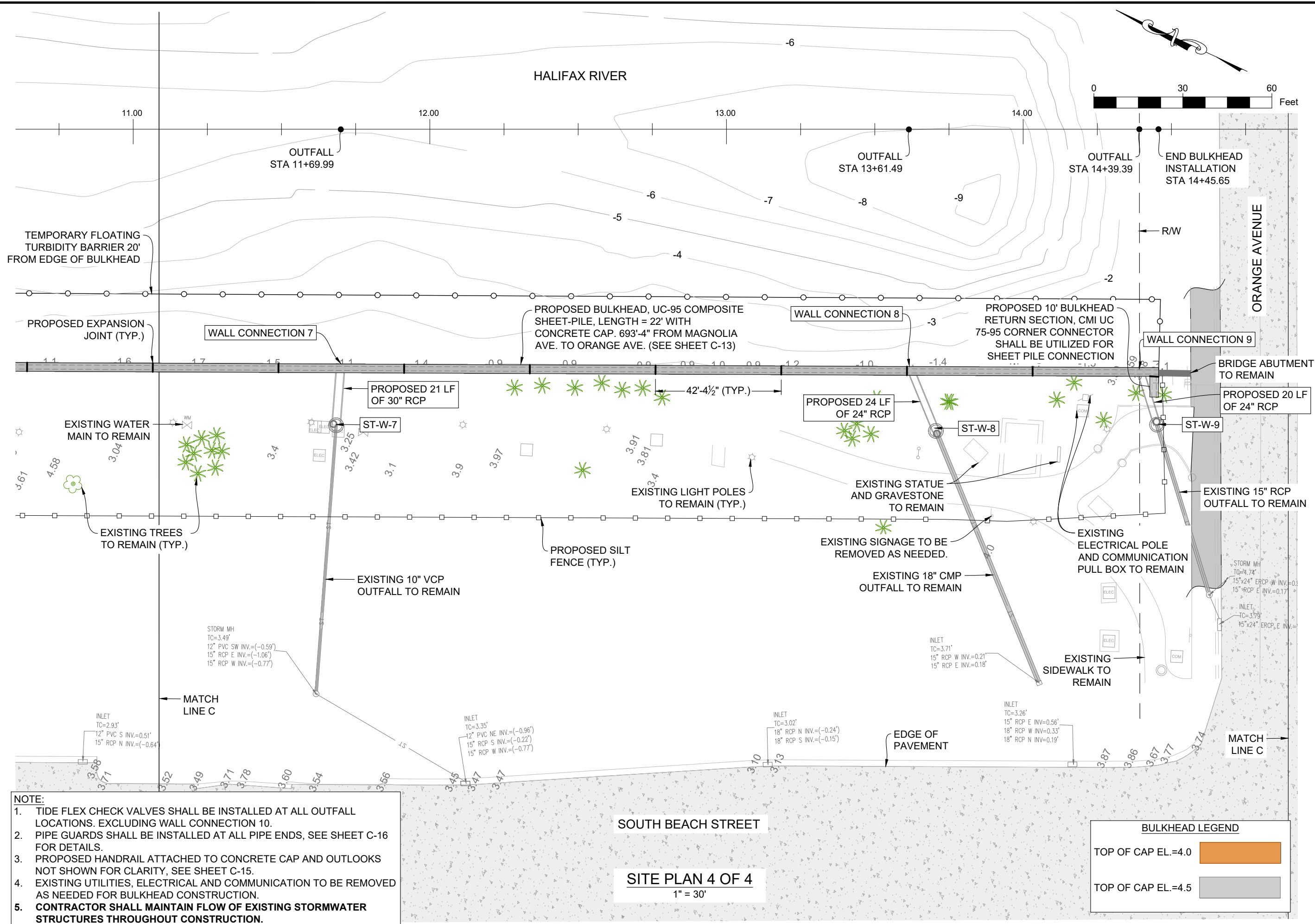
SOUTH BEACH STREET

SITE PLAN 3 OF 4
1" = 30'

BULKHEAD LEGEND	
TOP OF CAP EL.=4.0	
TOP OF CAP EL.=4.5	

<p>DRAWING: SITE PLAN 3 OF 4</p> <p>DMC JOB NO. 19-006-36</p> <p>DRAWN: NT</p> <p>CHECKED: AR</p> <p>APPROVED: SKP</p>	<p>SHEET NO. C-10</p> <p>SCALE AS SHOWN</p> <p>DATE: 2-20-2020</p>	<p>RIVERFRONT PARK SEAWALL DESIGN</p> <p>CLIENT: CITY OF DAYTONA BEACH</p>
<p>4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com</p> <p>DMC ENGINEERS • SCIENTISTS</p>		
<p>301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400</p>		

Drawing Name: D:\My Shares\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: SITE 4 2/26/2020



- NOTE:**
1. TIDE FLEX CHECK VALVES SHALL BE INSTALLED AT ALL OUTFALL LOCATIONS. EXCLUDING WALL CONNECTION 10.
 2. PIPE GUARDS SHALL BE INSTALLED AT ALL PIPE ENDS, SEE SHEET C-16 FOR DETAILS.
 3. PROPOSED HANDRAIL ATTACHED TO CONCRETE CAP AND OUTLOOKS NOT SHOWN FOR CLARITY, SEE SHEET C-15.
 4. EXISTING UTILITIES, ELECTRICAL AND COMMUNICATION TO BE REMOVED AS NEEDED FOR BULKHEAD CONSTRUCTION.
 5. **CONTRACTOR SHALL MAINTAIN FLOW OF EXISTING STORMWATER STRUCTURES THROUGHOUT CONSTRUCTION.**

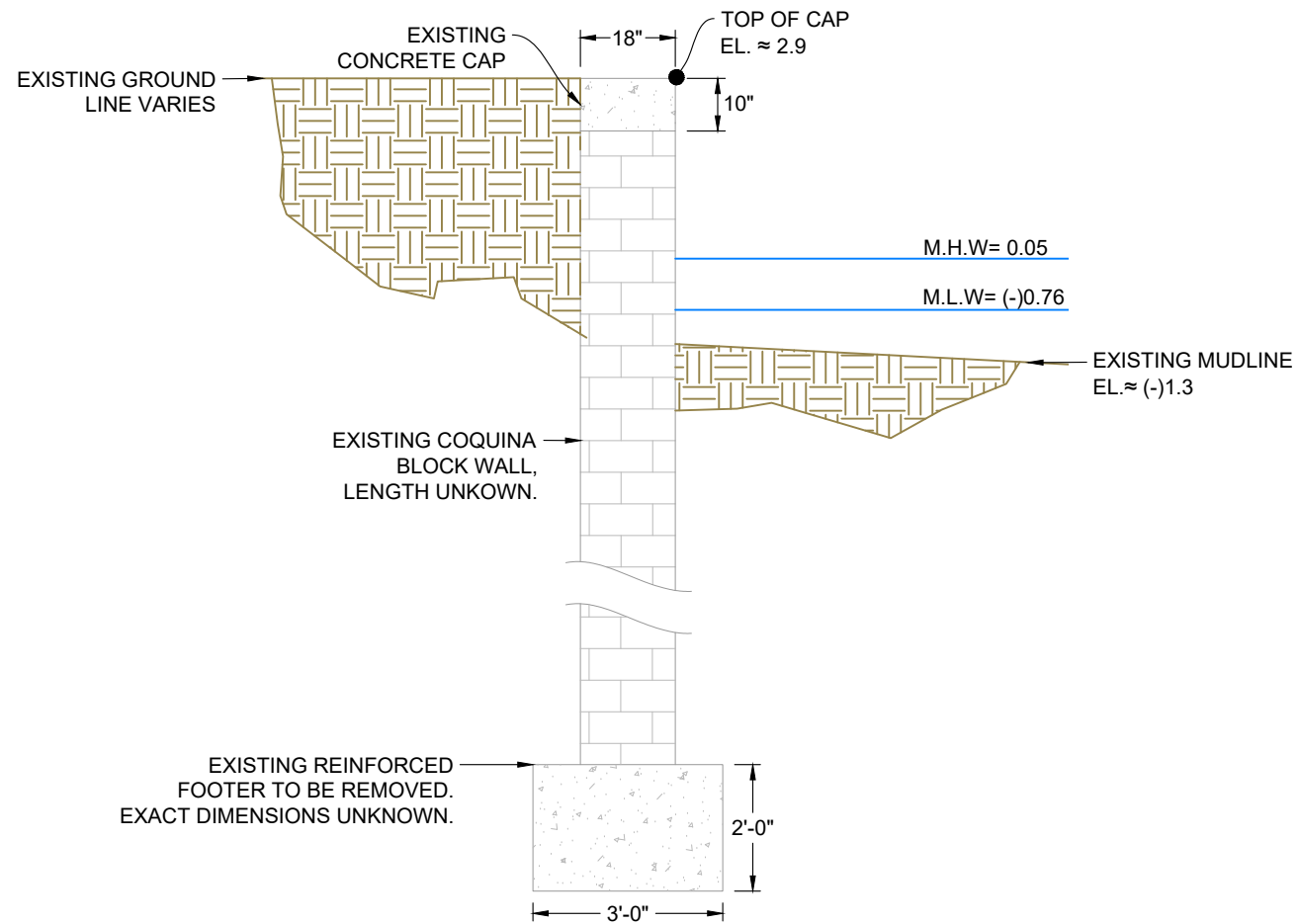
SOUTH BEACH STREET
SITE PLAN 4 OF 4
 1" = 30'

BULKHEAD LEGEND

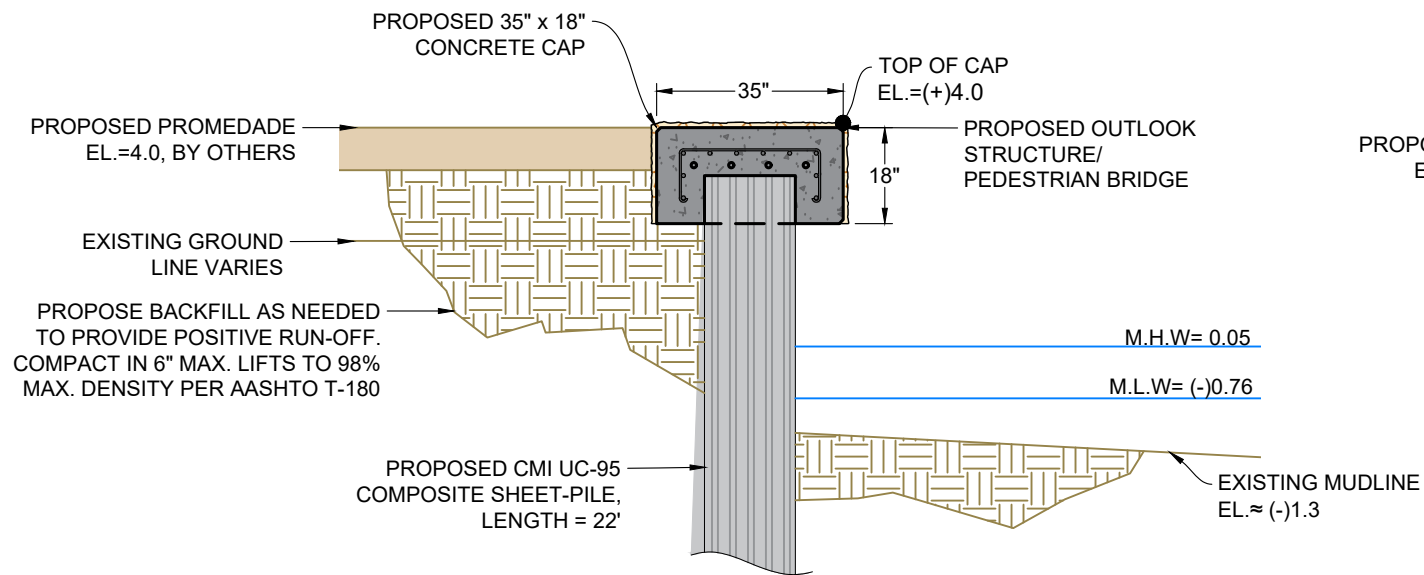
TOP OF CAP EL.=4.0	
TOP OF CAP EL.=4.5	

DRAWING: SITE PLAN 4 OF 4 DMC JOB NO. 19-006-36 DRAWN: NT CHECKED: AR APPROVED: SKP DATE: 2-20-2020	PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN	SHEET NO. C-11 SCALE AS SHOWN DATE: 2-20-2020	CLIENT: CITY OF DAYTONA BEACH 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com DMC ENGINEERS • SCIENTISTS
Dredging & Marine Consultants 301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		THE CITY OF DAYTONA BEACH INCORPORATED 1845	

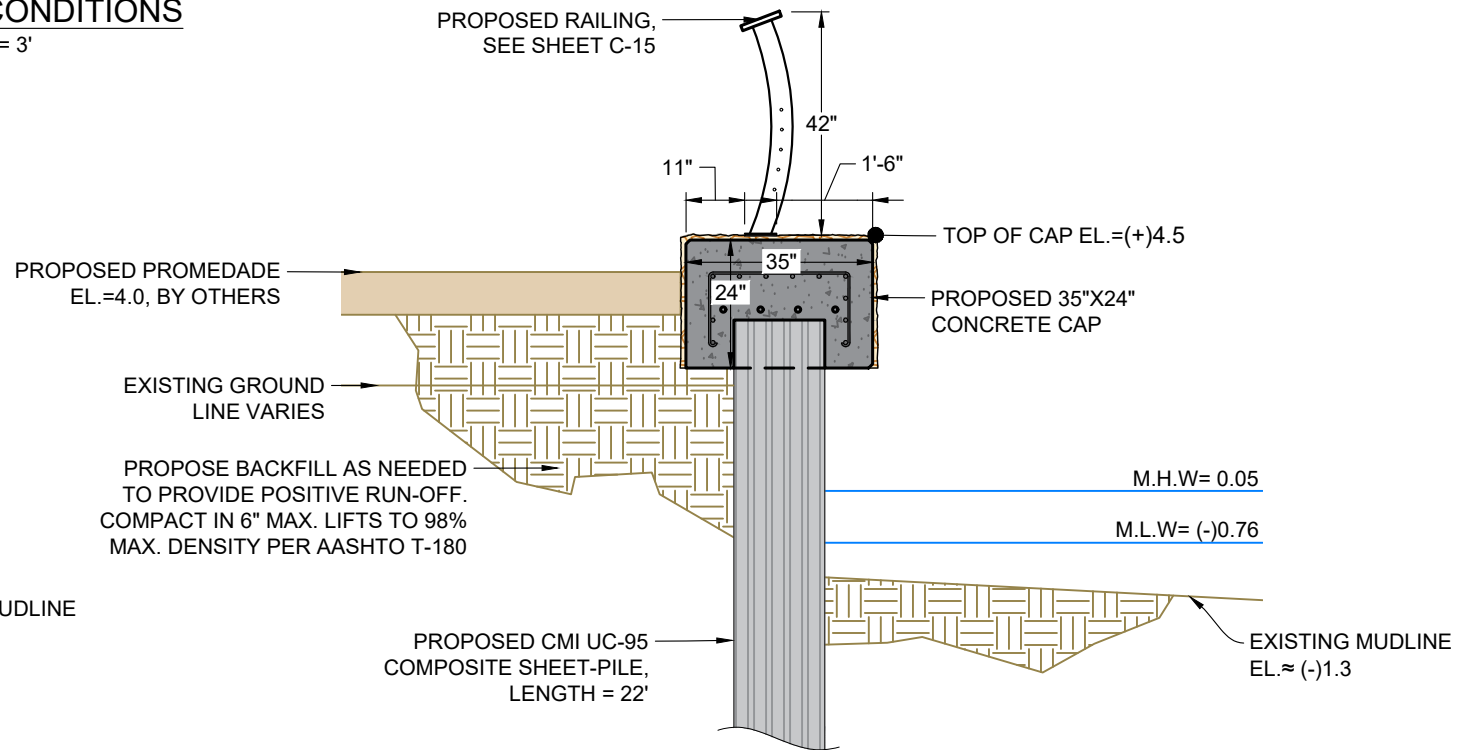
Drawing Name: D:\My Share\Sync\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: BULKHEAD C-SECTION 2/26/2020



EXISTING CONDITIONS
1" = 3'



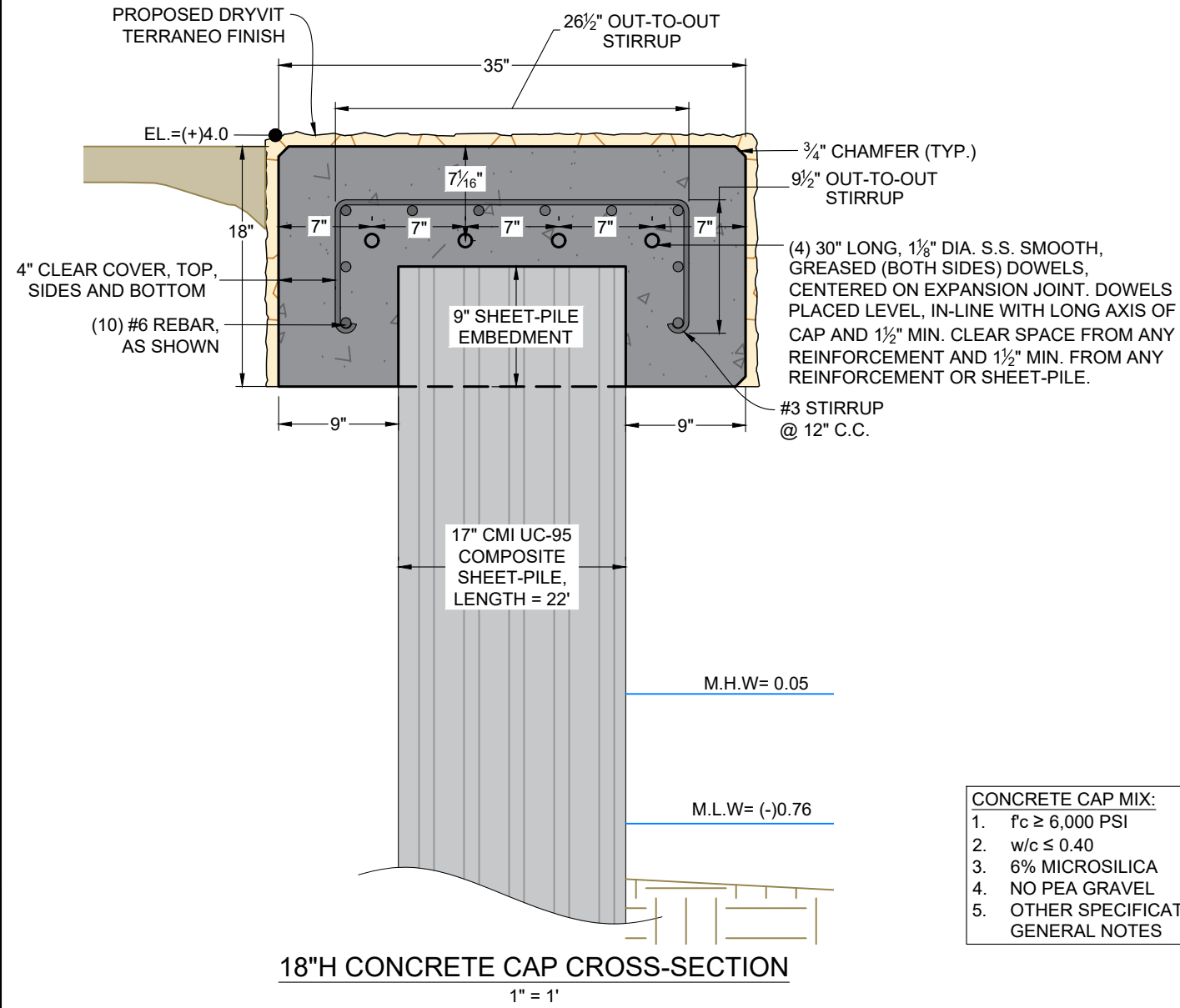
PROPOSED 18"H BULKHEAD CROSS-SECTION
1" = 3'



PROPOSED 24"H BULKHEAD CROSS-SECTION
1" = 3'

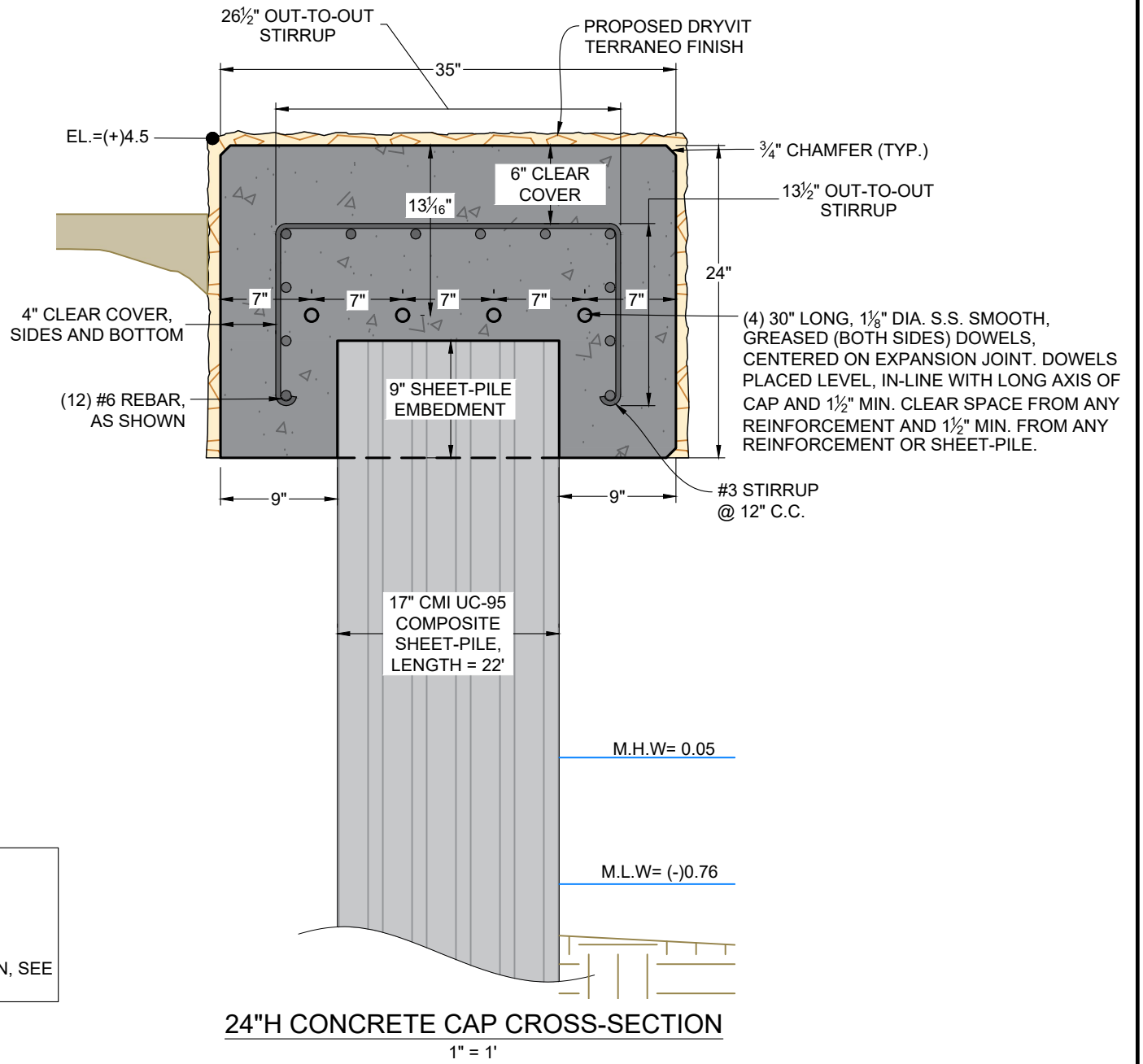
<p>DRAWING: BULKHEAD CROSS-SECTIONS</p> <p>DMC JOB NO. 19-006-36</p> <p>DRAWN: NT</p> <p>CHECKED: AR</p> <p>APPROVED: SKP</p>	<p>SHEET NO. C-12</p> <p>SCALE AS SHOWN</p> <p>DATE: 2-20-2020</p>	<p>PROJECT NAME:</p> <p>RIVERFRONT PARK SEAWALL DESIGN</p> <p>CLIENT: CITY OF DAYTONA BEACH</p>
<p>4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com</p>		<p>STEPHEN J. KUHN, P.E. FLORIDA LICENSE NO. 87486</p>
<p>301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400</p>		

Drawing Name: D:\My Share\Sync\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: CAP C-SECTION 2/26/2020



CONCRETE CAP MIX:

1. $f_c \geq 6,000$ PSI
2. $w/c \leq 0.40$
3. 6% MICROSILICA
4. NO PEA GRAVEL
5. OTHER SPECIFICATION, SEE GENERAL NOTES



DRAWING: CONCRETE CAP CROSS-SECTIONS	
DMC JOB NO. 19-006-36	SHEET NO. C-13
DRAWN NT CAD C3D	CHECKED AR SCALE AS SHOWN
APPROVED SKP	DATE 2-20-2020

PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN

CLIENT: CITY OF DAYTONA BEACH

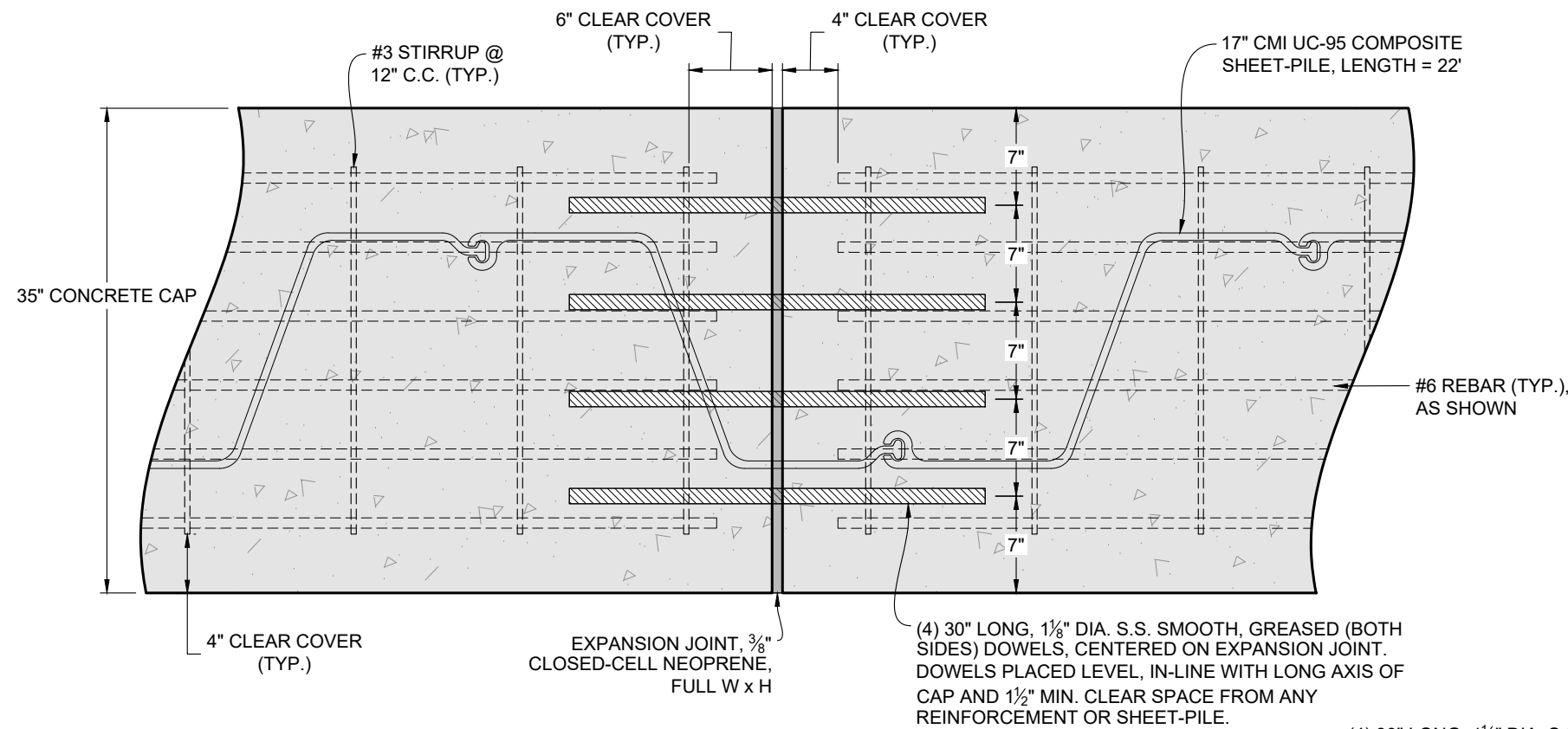
STEPHEN J. KUHN, P.E.
FLORIDA LICENSE No. 87486

Dredging & Marine Consultants
4643 S. Clyde Morris Blvd
Unit 302
Port Orange, FL 32129
Phone: (386) 304-6505
Fax: (386) 304-6506
www.dmcsc.com

DMC
ENGINEERS • SCIENTISTS

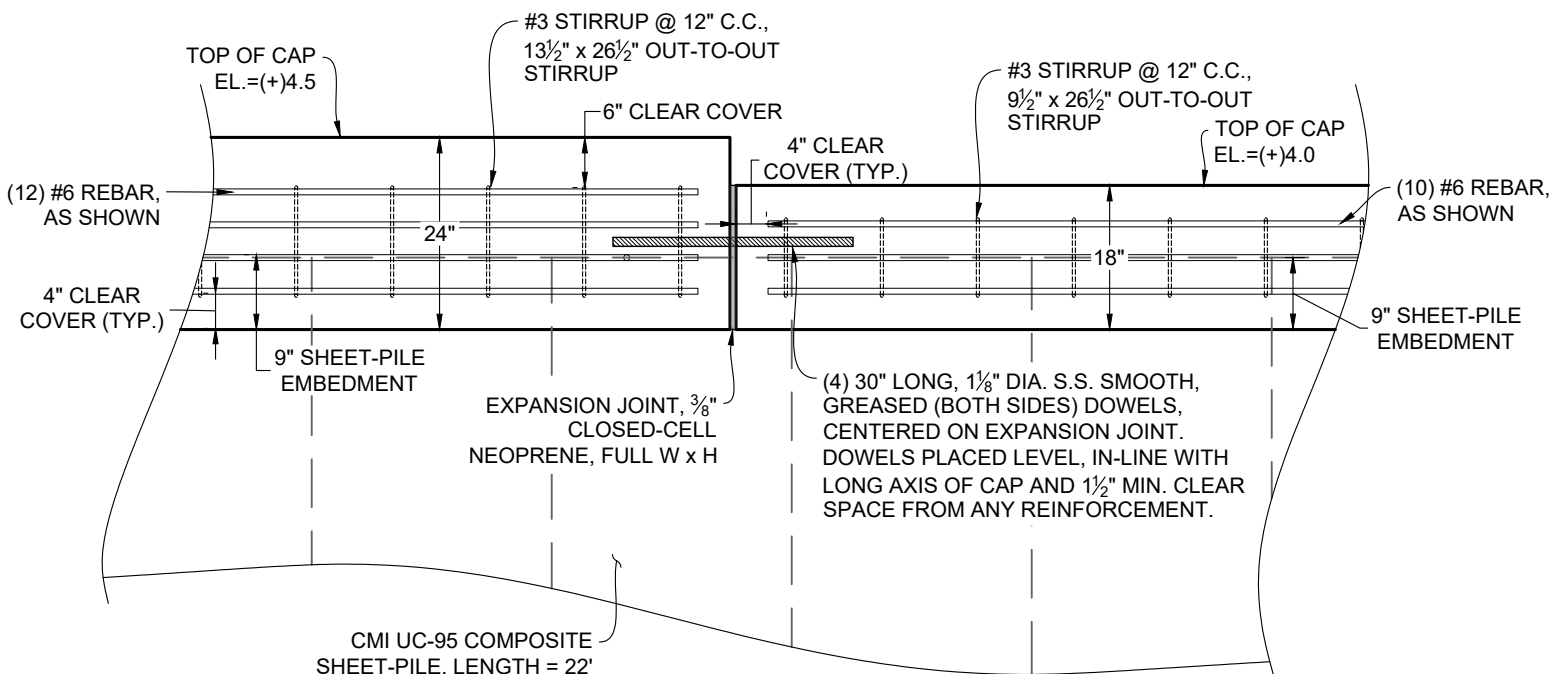
301 S. RIDGEWOOD AVE.
DAYTONA BEACH, FL 32114
(386) 671-8400

Drawing Name: D:\My Share\Sync\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: JOINTS 2/26/2020



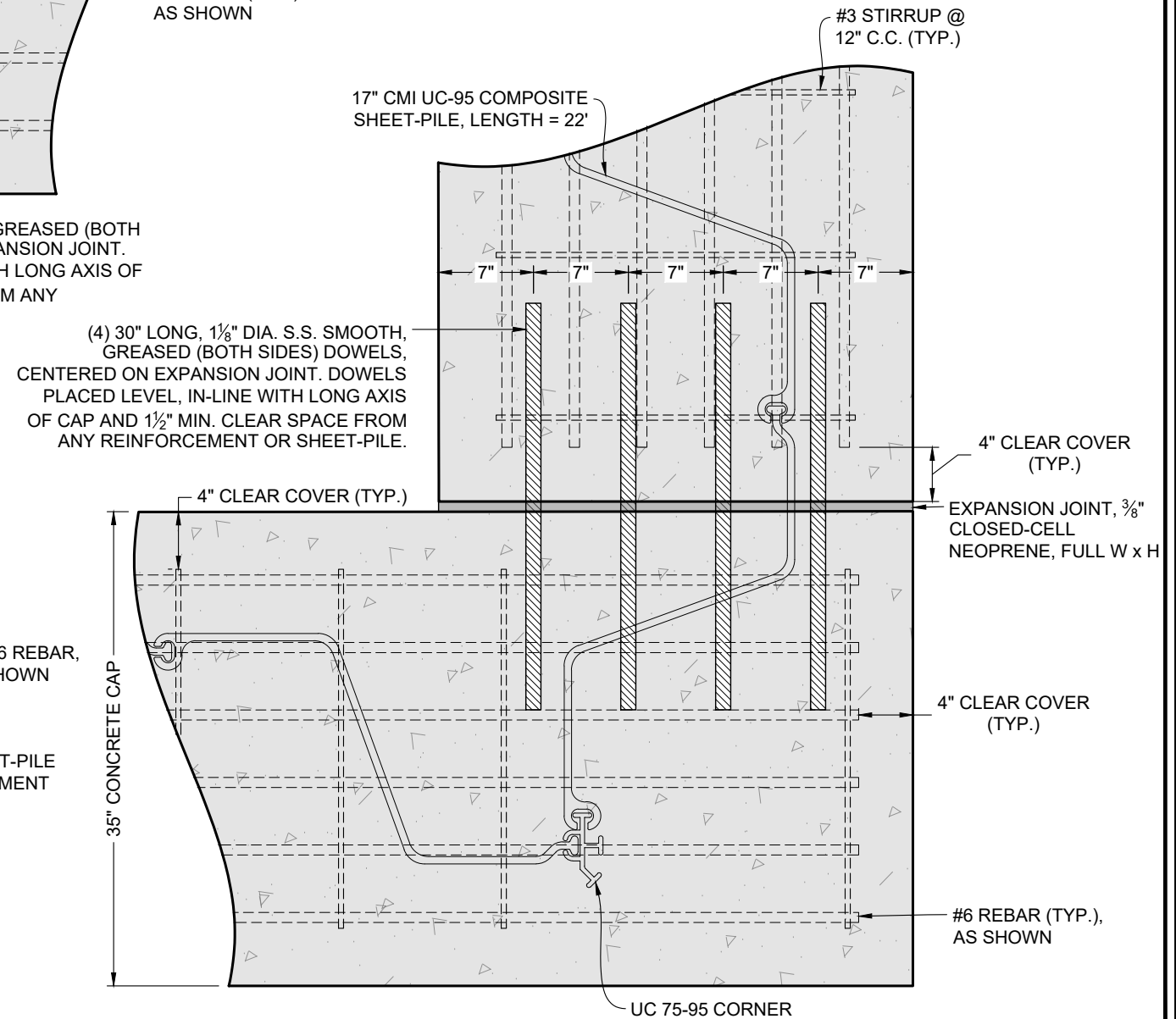
IN-LINE EXPANSION JOINT DETAIL - PLAN

1" = 1'



CONCRETE CAP PROFILE

1" = 2'



CORNER EXPANSION JOINT-TOP

1" = 1'

DRAWING: CONCRETE CAP EXPANSION JOINTS		DMC JOB NO. 19-006-36		SHEET NO. C-14	
DRAWN	NT	CAD	C3D	CHECKED	AR
APPROVED SKP			SCALE AS SHOWN		
DATE 2-20-2020					

PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN
CLIENT: CITY OF DAYTONA BEACH

STEPHEN J. KUHN, P.E.
FLORIDA LICENSE NO. 87486

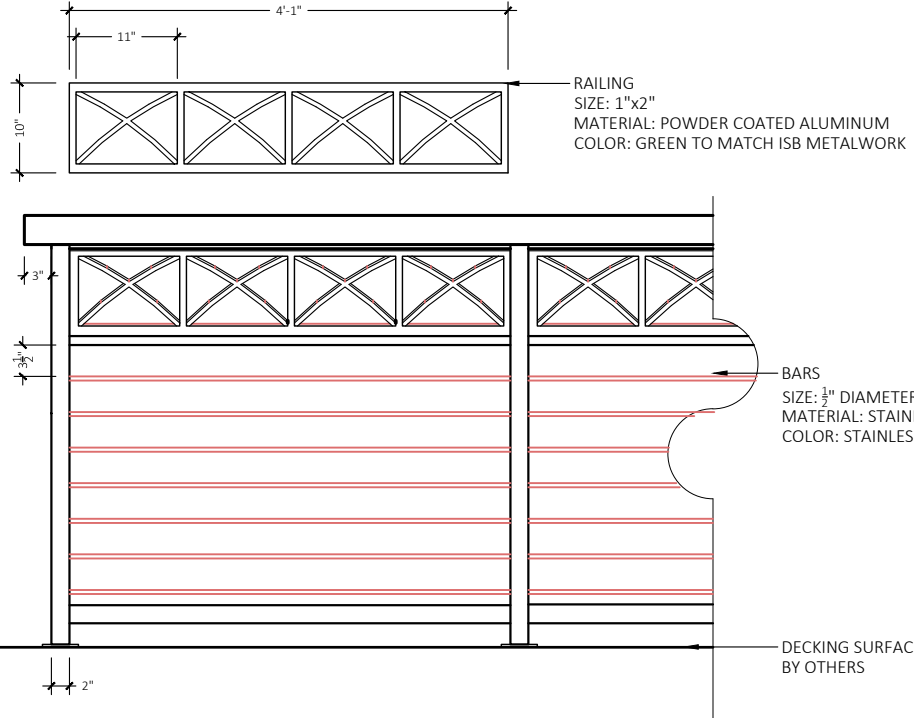
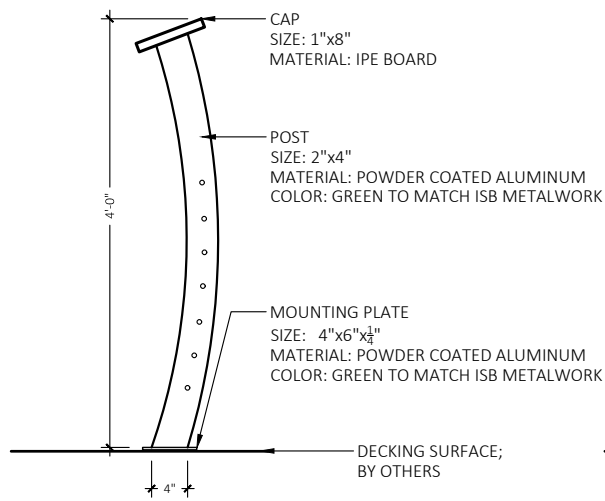
Dredging & Marine Consultants
4643 S. Clyde Morris Blvd
Unit 302
Port Orange, FL 32129
Phone: (386) 304-6505
Fax: (386) 304-6506
www.dmcsc.com

DMC
ENGINEERS • SCIENTISTS

301 S. RIDGEWOOD AVE.
DAYTONA BEACH, FL 32114
(386) 671-8400

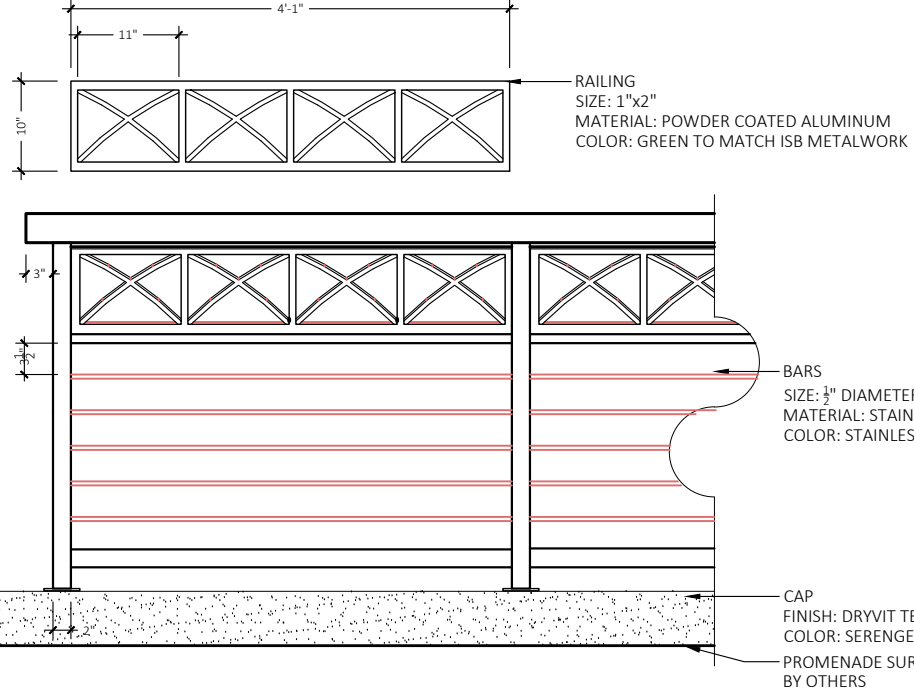
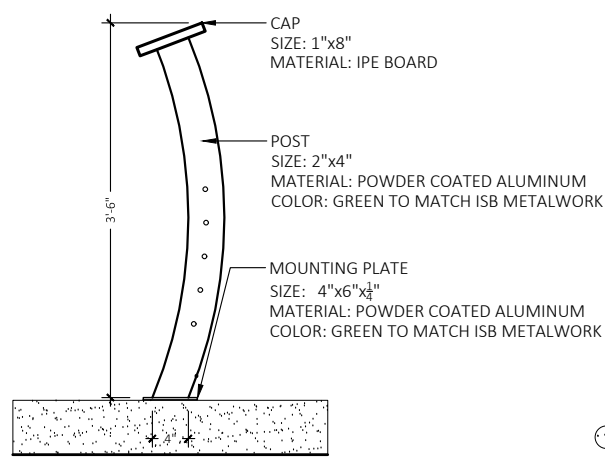
Drawing Name: D:\My Shares\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: RAILING 2/26/2020

NOTE: "KYNAR 500" OR EQUAL COATING. ALL SURFACED, INCLUDING INTERIOR AND EXTERIOR TO BE DIPPED IN A CHROMIUM BATH. COATING SHALL HAVE A 20 YEAR COASTAL WARRANTY. RESIN COATING. COLOR SHALL BE FADE RESISTANT.

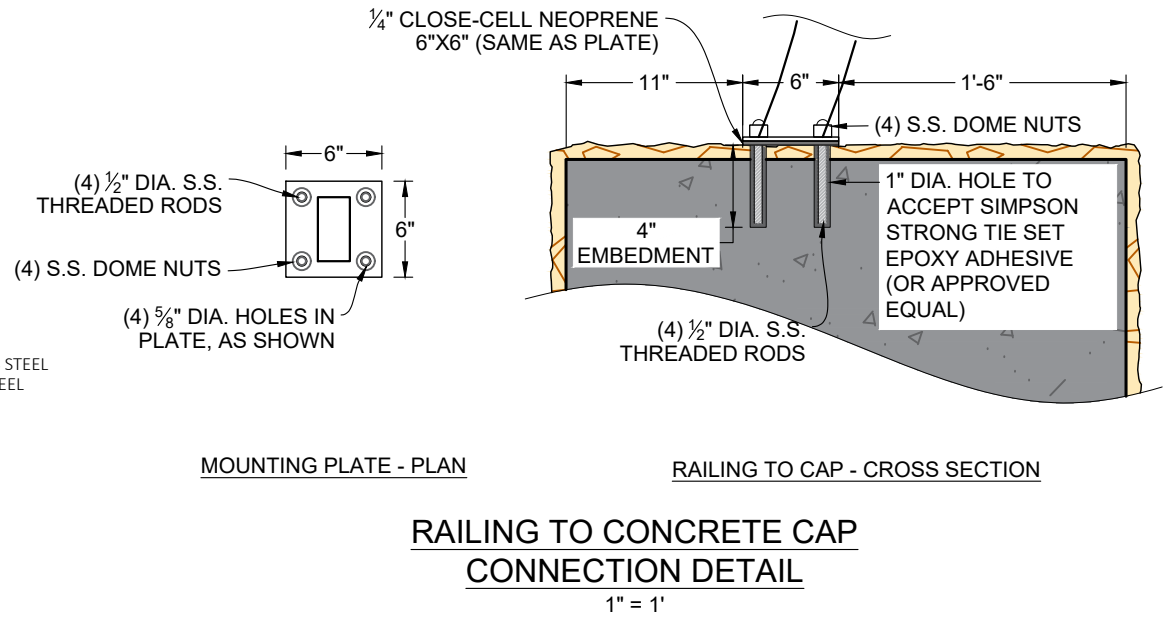


OUTLOOK RAILING DETAILS
N.T.S.

NOTE: "KYNAR 500" OR EQUAL COATING. ALL SURFACED, INCLUDING INTERIOR AND EXTERIOR TO BE DIPPED IN A CHROMIUM BATH. COATING SHALL HAVE A 20 YEAR COASTAL WARRANTY. RESIN COATING. COLOR SHALL BE FADE RESISTANT.

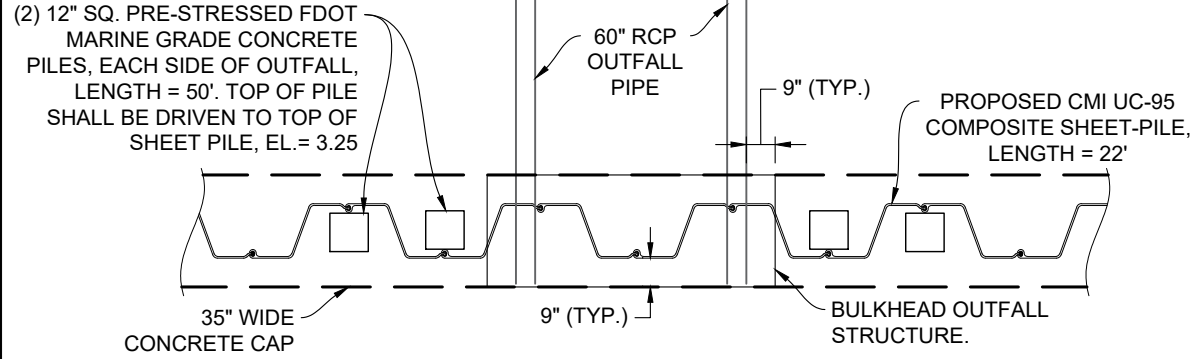


BULKHEAD RAILING DETAILS
N.T.S.

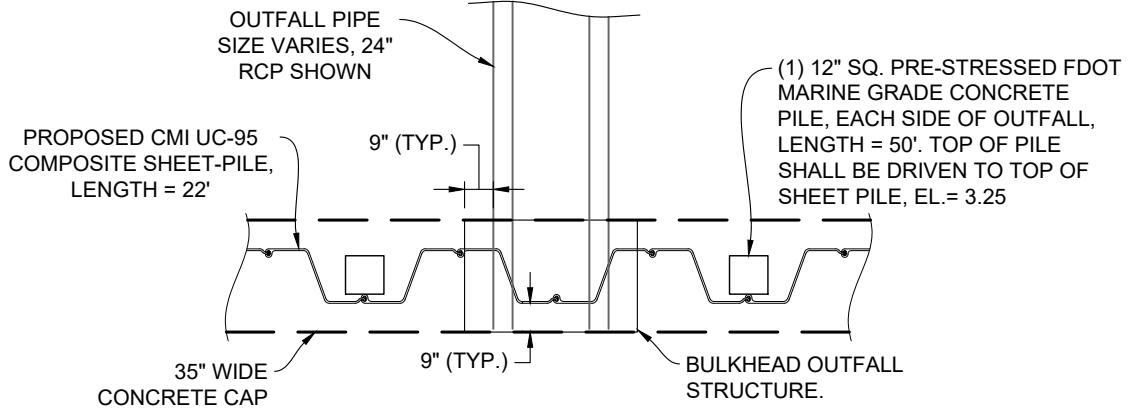


NOTE:
1. RAILING DESIGN BY UPLAND DESIGN TEAM.
2. DMC DESIGN FOR CONNECTIONS TO CAP AND OUTLOOKS.

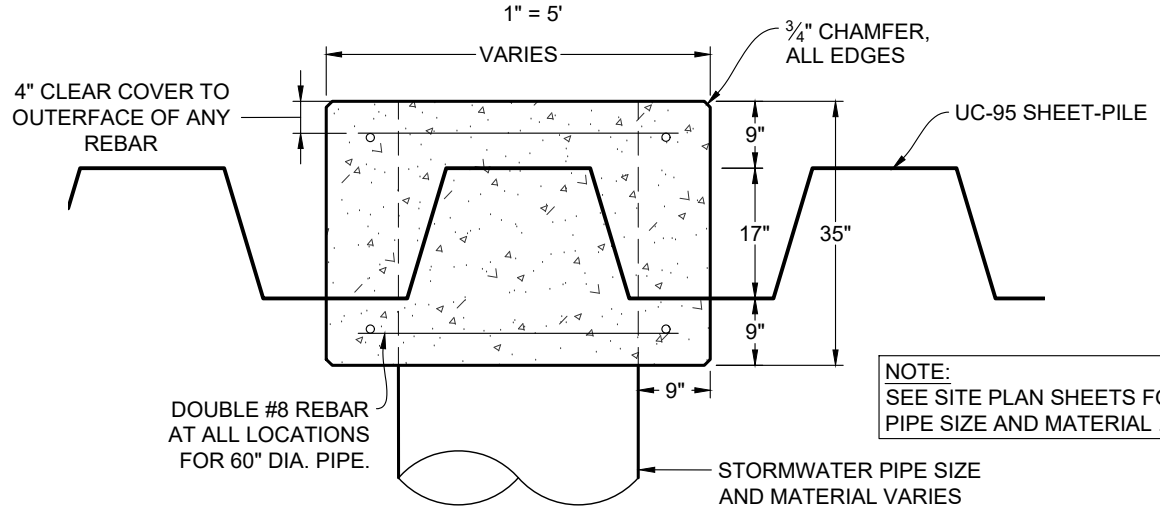
DRAWING: RAILING DETAILS		DMC JOB NO. 19-006-36		SHEET NO. C-15	
PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN		DRAWN: NT	CAD: C3D	CHECKED: AR	SCALE AS SHOWN
CLIENT: CITY OF DAYTONA BEACH		APPROVED: SKP		DATE: 2-20-2020	
4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com		STEPHEN J. KUHN, P.E. FLORIDA LICENSE No. 87486		ENGINEERS • SCIENTISTS	
301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		THE CITY OF DAYTONA BEACH		INCORPORATED	



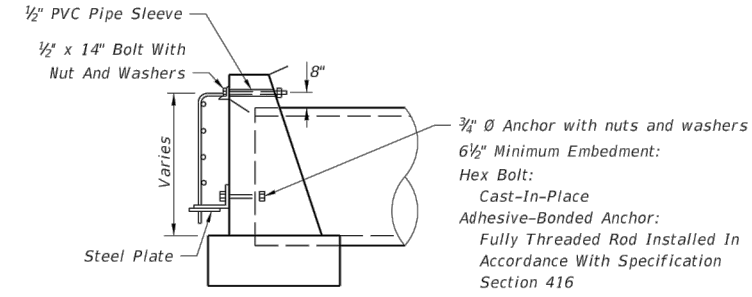
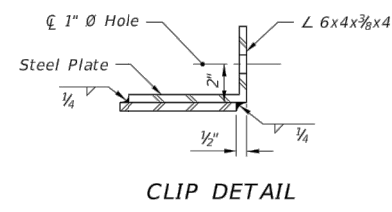
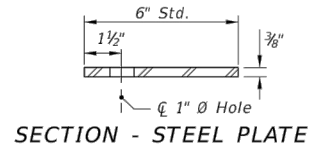
BULKHEAD SUPPORT DETAIL - PLAN 60" RCP OUTFALL



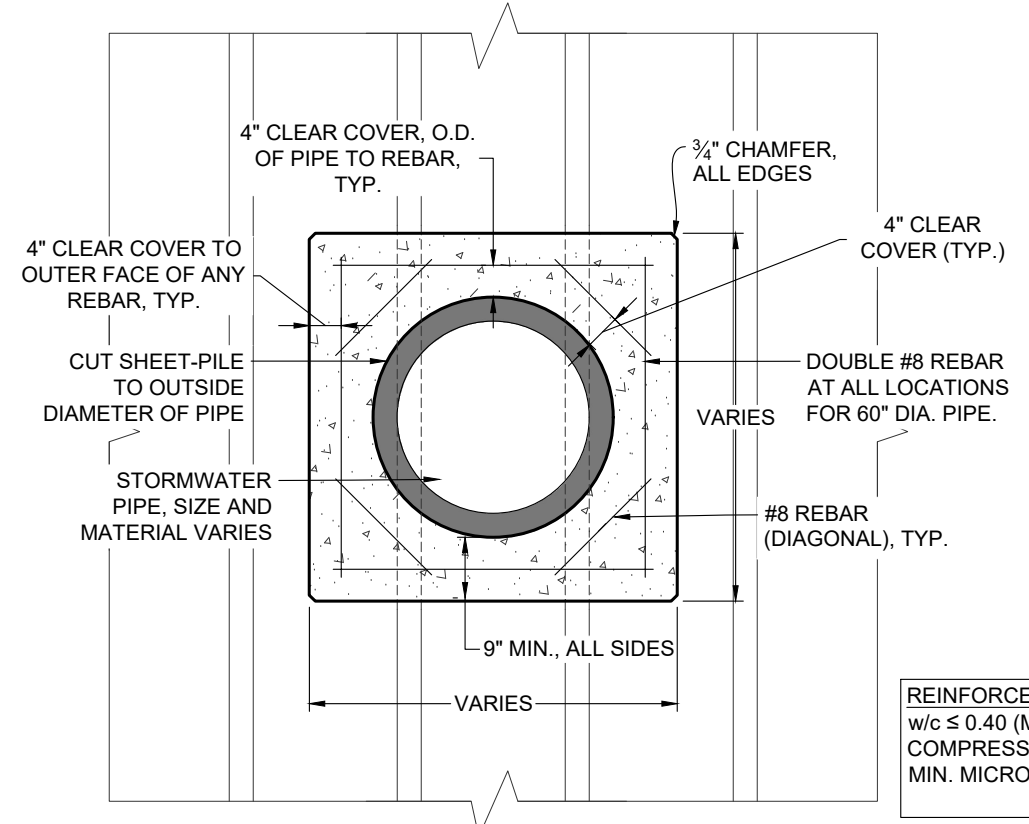
BULKHEAD SUPPORT DETAIL - PLAN 15", 24" & 30" OUTFALLS



NOTE:
SEE SITE PLAN SHEETS FOR OUTFALL
PIPE SIZE AND MATERIAL .



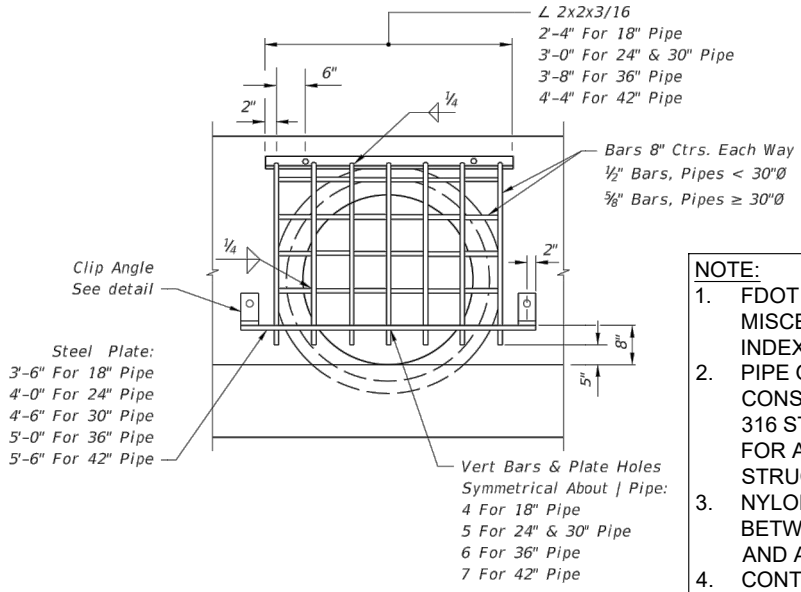
SIDE VIEW



TYPICAL OUTFALL THROUGH BULKHEAD

N.T.S.

REINFORCED CONCRETE MIX:
w/c ≤ 0.40 (MAX.), f/c 6,000 psi
COMPRESSION STRENGTH, 6%
MIN. MICROSILICA (BY WEIGHT)



Pipe Dia.	18"	24"	30"	36"	42"
Gate (Lbs.)	48	58	74	90	111

FRONT VIEW

GUARD AT PIPE OUTFALLS

N.T.S.

- NOTE:
1. FDOT STANDARD PLANS MISCELLANEOUS DRAINAGE DETAILS INDEX 430-001 SHEET 2 OF 3.
 2. PIPE GUARD SHALL BE CONSTRUCTED OF ALUMINUM WITH 316 STAINLESS STEEL HARDWARE FOR ATTACHMENT TO OUTFALL STRUCTURE.
 3. NYLON WASHERS SHALL BE PLACED BETWEEN ALL STAINLESS STEEL AND ALUMINUM COMPONENTS.
 4. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO ORDERING.

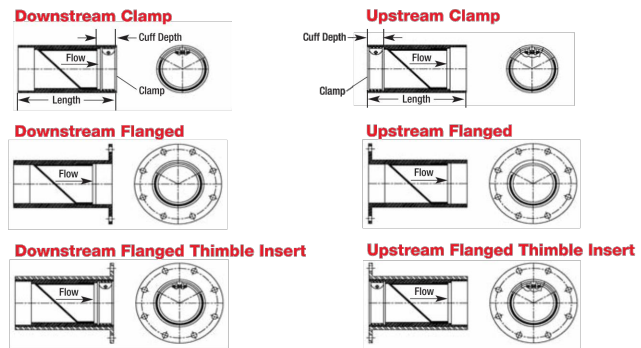
Drawing Name: D:\My Share\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: SUPPORT 2/26/2020

DRAWING: STORMWATER OUTFALL STRUCTURES DMC JOB NO. 19-006-36 DRAWN: NT CHECKED: AR APPROVED: SKP	PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN CLIENT: CITY OF DAYTONA BEACH	SHEET NO. C-16 CAD C3D SCALE AS SHOWN DATE 2-20-2020
 DMC ENGINEERS • SCIENTISTS		
Dredging & Marine Consultants 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com		
301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		

Drawing Name: D:\My Shares\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: ST-CHART 2/26/2020

STORMWATER STRUCTURE TABLE			
STRUCTURE NUMBER	STRUCTURE TYPE	STRUCTURE T.C.	PIPE INVERT(S), DIRECTION(S), SIZE(S)
ST-W-1	MANHOLE (48" DIA.) - INDEX NO.425-001	4.25	-1.83 (SW) 30" RCP -1.89 (NE) 30" RCP -1.05 (N) 15" RCP
ST-W-2	MANHOLE (48" DIA.) - INDEX NO.425-001	4.25	-0.09 (SE) 15" RCP -0.58 (N) 15" RCP -1.89 (NE) 18" RCP -1.88 (W) 12" VCP
ST-W-3	MANHOLE (48" DIA.) - INDEX NO.425-001	6.05	-2.28 (NE) 18" RCP -1.25 (SE) 15" RCP -2.25 (W) 8" PVC
ST-W-4	MANHOLE (48" DIA.) - INDEX NO.425-001	6.00	-1.93 (NW) 24" RCP -1.93 (NE) 24" RCP FIELD VERIFY (SW)
ST-W-5	MANHOLE (48" DIA.) - INDEX NO.425-001	6.05	-1.88 (E) 15" RCP -1.88 (N) 15" RCP -1.85 (W) 8" VCP
ST-W-6	MANHOLE (48" DIA.) - INDEX NO.425-001	4.25	-0.50 (NE) 15" RCP -0.50 (SE) 15" RCP -2.26 (W) 12" PVC
ST-W-7	MANHOLE (48" DIA.) - INDEX NO.425-001	6.05	-2.04 (W) 30" RCP -2.04 (E) 30" RCP -2.04 (SE) 15" RCP -2.04 (N) 15" RCP
ST-W-8	MANHOLE (48" DIA.) - INDEX NO.425-001	6.45	-1.34 (SW) 24" RCP -1.34 (NE) 24" RCP -0.36 (SE) 15" RCP
ST-W-9	MANHOLE (48" DIA.) - INDEX NO.425-001	6.25	-0.62 (SW) 24" RCP -0.62 (NE) 24" RCP
WALL CONNECTION 1	SEE OUTFALL STRUCTURE DETAIL SHEET C-16. TIDE FLEX ULTRAFLEX CHECKMATE AND STAINLESS STEEL BOLTS.	0.14	-2.23 (SW) 30" RCP
WALL CONNECTION 2	SEE OUTFALL STRUCTURE DETAIL SHEET C-16. TIDE FLEX ULTRAFLEX CHECKMATE AND STAINLESS STEEL BOLTS.	-0.57	-2.09 (SW) 18" RCP
WALL CONNECTION 3	SEE OUTFALL STRUCTURE DETAIL SHEET C-16. TIDE FLEX ULTRAFLEX CHECKMATE AND STAINLESS STEEL BOLTS.	-0.71	-2.51 (SW) 18" RCP
WALL CONNECTION 4	SEE OUTFALL STRUCTURE DETAIL SHEET C-16. TIDE FLEX ULTRAFLEX CHECKMATE AND STAINLESS STEEL BOLTS.	0.38	-2.00 (SW) 24" RCP
WALL CONNECTION 5	SEE OUTFALL STRUCTURE DETAIL SHEET C-16. TIDE FLEX ULTRAFLEX CHECKMATE AND STAINLESS STEEL BOLTS.	-0.38	-2.18 (W) 15" RCP
WALL CONNECTION 6	SEE OUTFALL STRUCTURE DETAIL SHEET C-16. TIDE FLEX ULTRAFLEX CHECKMATE AND STAINLESS STEEL BOLTS.	-1.09	-2.61 (SW) 15" RCP
WALL CONNECTION 7	SEE OUTFALL STRUCTURE DETAIL SHEET C-16. TIDE FLEX ULTRAFLEX CHECKMATE AND STAINLESS STEEL BOLTS.	0.68	-2.27 (W) 30" RCP
WALL CONNECTION 8	SEE OUTFALL STRUCTURE DETAIL SHEET C-16. TIDE FLEX ULTRAFLEX CHECKMATE AND STAINLESS STEEL BOLTS.	0.64	-1.73 (SW) 24" RCP

CONTRACTOR TO FIELD VERIFY EXISTING INVERT ELEVATION AND PIPE SIZE



CheckMates® can be made for any pipe I.D. Built to fit in sizes from 3" to 78". Flange shape and bolt pattern can be customized. Flangeless thimble inserts are available.

Nominal Pipe Size	CHECKMATE® VALVE										
	NOMINAL PIPE SIZE I.D.		OVERALL LENGTH*		NUMBER OF CLAMPS	CUFF DEPTH		BACK PRESSURE RATING**		WEIGHT	
	Inches	Millimeters	Inches	Millimeters		Inches	Millimeters	Feet	Meters	lbs	Kg
3	75	1905	5.1	130	1	1.5	38	5	1.5	1.5	0.7
4	100	2540	7.9	201	1	1.5	38	5	1.5	1.5	0.7
3	75	1905	5.1	130	1	1.5	38	5	1.5	1.5	0.7
4	100	2540	7.9	201	1	1.5	38	5	1.5	1.5	0.7
5	125	3175	9.5	241	1	1.5	38	5	1.5	1.5	0.7
6	150	3810	11.0	279	1	2.0	51	83	25.3	9	4
7	175	4445	12.8	325	1	2.0	51	79	24.1	11	5
8	200	5080	15.2	386	1	2.0	51	79	24.1	13	6
9	225	5715	15.4	391	1	2.0	51	75	22.9	17	8
10	250	6350	16.1	409	1	2.0	51	71	21.6	20	10
12	300	7620	19.8	503	1	2.0	51	68	20.1	37	17
14	350	8890	25.8	655	1	4.0	102	64	20.0	110	50
16	400	10160	28.6	726	1	4.0	102	60	18.3	133	52
18	450	11430	31.0	787	1	4.0	102	56	17.1	143	65
20	500	12700	42.1	1069	2	8.0	203	53	16.2	223	102
24	600	15360	47.5	1207	2	8.0	203	45	13.7	304	137
30	750	19125	54.9	1395	2	8.0	203	38	11.6	500	227
36	900	22890	62.3	1582	2	8.0	203	30	9.1	823	376
42	1050	26655	70.6	1793	2	8.0	203	26	7.9	1423	646
48	1200	30420	79.0	2007	2	8.0	203	23	7.0	1801	817
54	1350	34185	86.4	2195	2	8.0	203	17	5.2	2700	1225
60	1500	37950	96.8	2459	2	8.0	229	15	4.6	3315	1504
72	1800	45510	119.0	3023	3	12.0	305	13	4.0	6100	2767
78	1950	49275	119.0	3023	3	12.0	305	13	4.0	7000	3176

*Shorter lengths available.

**Back pressure measured from pipe invert. Higher back pressure ratings available. Consult factory.

NOTE:

1. STORMWATER STRUCTURE TABLE DESIGN BY OTHERS.
2. CONTRACTOR WILL BE REQUIRED TO ATTEND A PRE-CONSTRUCTION MEETING WITH A TIDE FLEX REPRESENTATIVE TO ENSURE PROPER INSTALLATION OF THE CHECK VALVE SYSTEM.
3. STORMWATER RCP PIPES SHALL BE ORDERED AT THE TIME OF NOTICE TO PROCEED AS THE EXACT INTERNAL DIAMETER OF THE PIPES IS NEEDED TO ORDER THE CHECK VALVE. CONTRACTOR SHALL NOTIFY THE ENGINEER TO VERIFY MEASUREMENTS ONCE PIPES HAVE BEEN DELIVERED.
4. EXISTING STORMWATER PIPES SHALL BE DESILTED PRIOR TO INSTALLATION OF NEW STRUCTURES AND PIPE.
5. LANDSIDE LOADING OF THE BULKHEAD WITHIN 20' WILL NOT BE PERMITTED, CONTRACTOR SHALL UTILIZE LONG REACH EQUIPMENT FOR INSTALLATION OF THE CHECK VALVE SYSTEM.

LEGEND

- PIPE INVERT
- FUTURE USE KNOCKOUT
- FUTURE USE KNOCKOUT, CONTRACTOR SHALL PROVIDE FLOW FROM EXISTING PIPE. SEE PLANS FOR EXISTING PIPE SIZE AND INVERT.



Elliptical, Arch and Rectangular Pipes
Elliptical, arch and rectangular pipes for drainage and flood prevention projects have become popular, particularly in high water table areas with shallow surface gradients. CheckMate® Inline Check Valves are the perfect solution for backflow prevention in elliptical, arch and rectangular pipes.

Rubber Flanged
Rubber Flanged CheckMate® Valves can be manufactured with an integral rubber upstream or downstream flange. The flanged CheckMate® gets inserted into the host pipe then can be bolted to a mating flange or anchored to a concrete headwall. The flange can be circular with standard drilling; or circular, square or rectangular with custom flange drilling. The valve is supplied with retaining rings for mounting.

Thimble Inserts
A CheckMate® Thimble Insert is a CheckMate® Valve that is factory-installed, clamped, and pinned into flanged or plain end pipe. The thimble insert assembly can either be inserted into the I.D. of the host pipe, or can be mounted to a mating flange or concrete headwall and extend beyond the pipe. Plain end thimble inserts are inserted into the host pipe and non-shrink grout is placed between the thimble insert O.D. and host pipe I.D. to form the seal.



DRAWING: STORMWATER OUTFALL DETAILS
DMC JOB NO. 19-006-36
DRAWN: NT
CHECKED: AR
APPROVED: SKP
DATE: 2-20-2020
SHEET NO. C-17
SCALE AS SHOWN

PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN
CLIENT: CITY OF DAYTONA BEACH

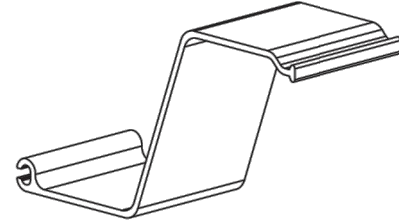
Dredging & Marine Consultants
4643 S. Clyde Morris Blvd
Unit 302
Port Orange, FL 32129
Phone: (386) 304-6505
Fax: (386) 304-6506
www.dmcsc.com

DMC
ENGINEERS • SCIENTISTS

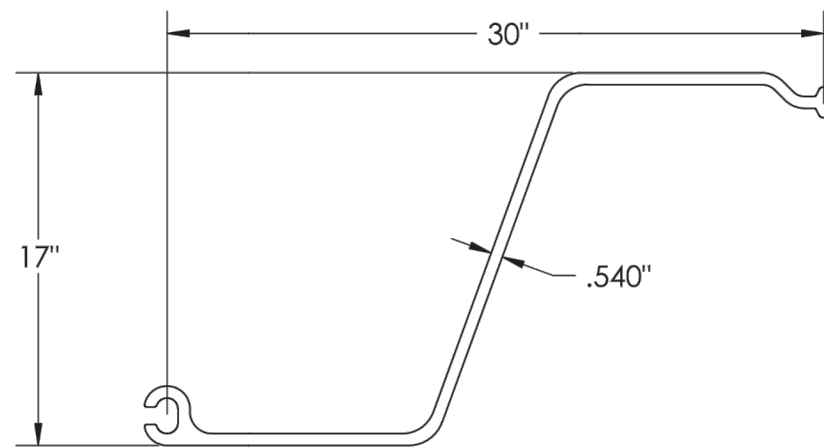
301 S. RIDGEWOOD AVE.
DAYTONA BEACH, FL 32114
(386) 671-8400



UC-95

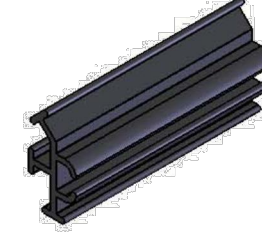


Allowable Moment (M)	48,750 ft-lb/ft	216.84 kN-m/m
Section Modulus (Z)	58.5 in ³ /ft	3,145 cm ³ /m
Moment of Inertia (I)	497 in ⁴ /ft	67,870 cm ⁴ /m
Thickness (t)	0.540 in	13.7 mm
Section Depth	17 in	432 mm
Section Width	30 in	762 mm
Material	Structural FRP Composite	
Standard Colors	Charcoal	
Profile/Patented Features	Z Profile	

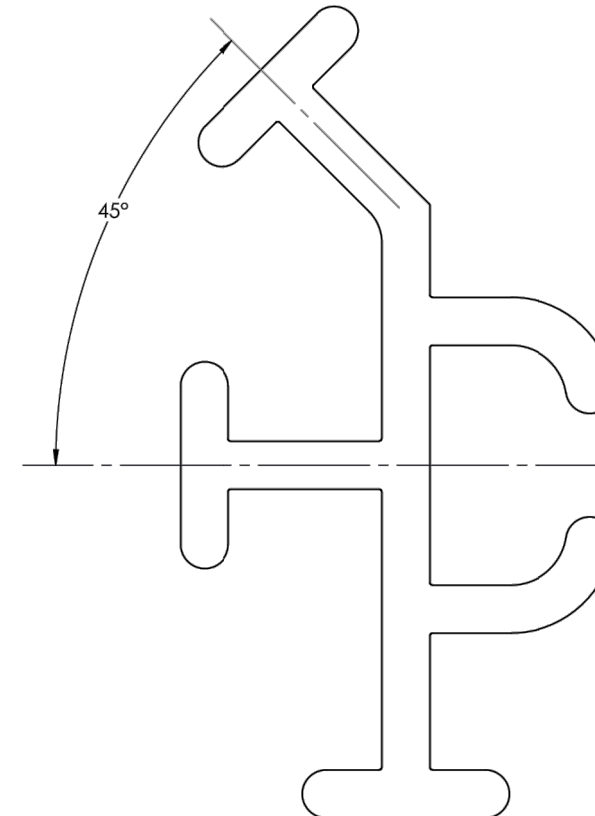


NOTE:
LENGTH = 22'

UC 75-95 CORNER



Material	6061-T6 Marine Grade Aluminum
Standard Colors	Anodized Marine Black
Compatibility	UC-75, UC-95



Visit cmilc.com/legal for more information on referenced trademarks and patents owned by CMI Limited Co.

cmilc.com

cmilc.com

CMI is a Capital Partners company. CMI®, ShoreGuard®, The ShoreGuard Seawall System™, C-loc®, TimberGuard®, GatorGates®, GatorDock Elite™, ArmorWare™, ArmorRod™, Box Profile™, UltraComposite™, Elite Wall™, Elite Panel™, Elite Fascia Panel™, Flat Panel™, XCR™, XCR Technology™, XCR Vinyl™, GatorBridge®, Gator Aluminum™, Gator Sheet Piling™, GatorDock™, I-Beam Lock™, Textured Slate™, CMI™ logo, CMI Sheet Piling Solutions™, Aqua Terra System™, Endurance™, Endurance CSP™, Polaris™, Eclipse™, GridSpine™, 21 Poly™, PileClaw™, SheerScape™, SheerScape Retaining Wall Systems™, Sheer Panel™ and CMI Waterfront Solutions™ are trademarks, service marks or trade names of CMI, United States and International Patent numbers 6,000,883; 6,033,155; 6,053,666; 6,575,667; 7,058,807; 7,058,066; 7,025,539; 7,393,482; 6,231,271; 7,914,237; 8,419,317; 8,753,043; 9,528,241; 9,593,456; 9,745,710 and other patents pending. © 2018 CMI. All Rights Reserved.

DRAWING: SHEET-PILE DETAILS	
DMC JOB NO.	19-006-36
DRAWN	NT
CHECKED	AR
APPROVED SKP	DATE: 2-20-2020
SHEET NO. C-18	

PROJECT NAME:
RIVERFRONT PARK
SEAWALL DESIGN

CLIENT: CITY OF DAYTONA BEACH

STEPHEN J. KUHN, P.E.
FLORIDA LICENSE NO. 87486

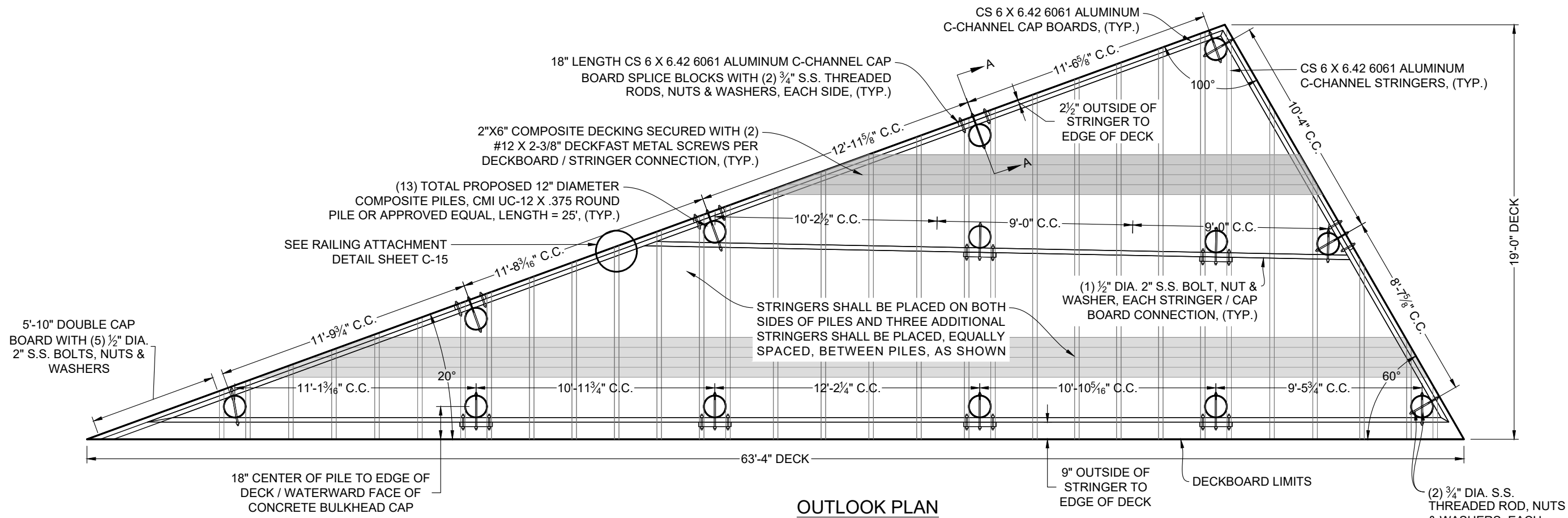
Dredging & Marine Consultants
DMC
ENGINEERS • SCIENTISTS

4643 S. Clyde Morris Blvd
Unit 302
Port Orange, FL 32129
Phone: (386) 304-6505
Fax: (386) 304-6506
www.dmcsc.com

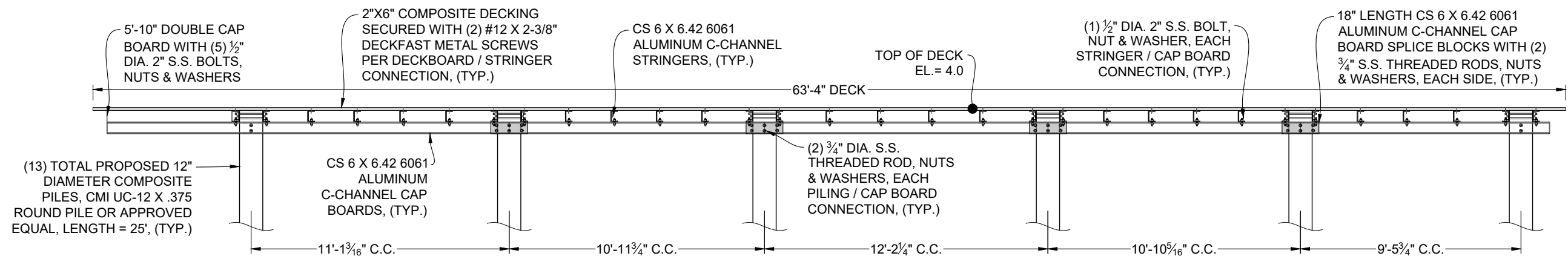
301 S. RIDGEWOOD AVE.
DAYTONA BEACH, FL 32114
(386) 671-8400



Drawing Name: D:\My Shares\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\SEAWALL-revised.dwg By: DMC-CAD Tab: OUTLOOK 2/26/2020

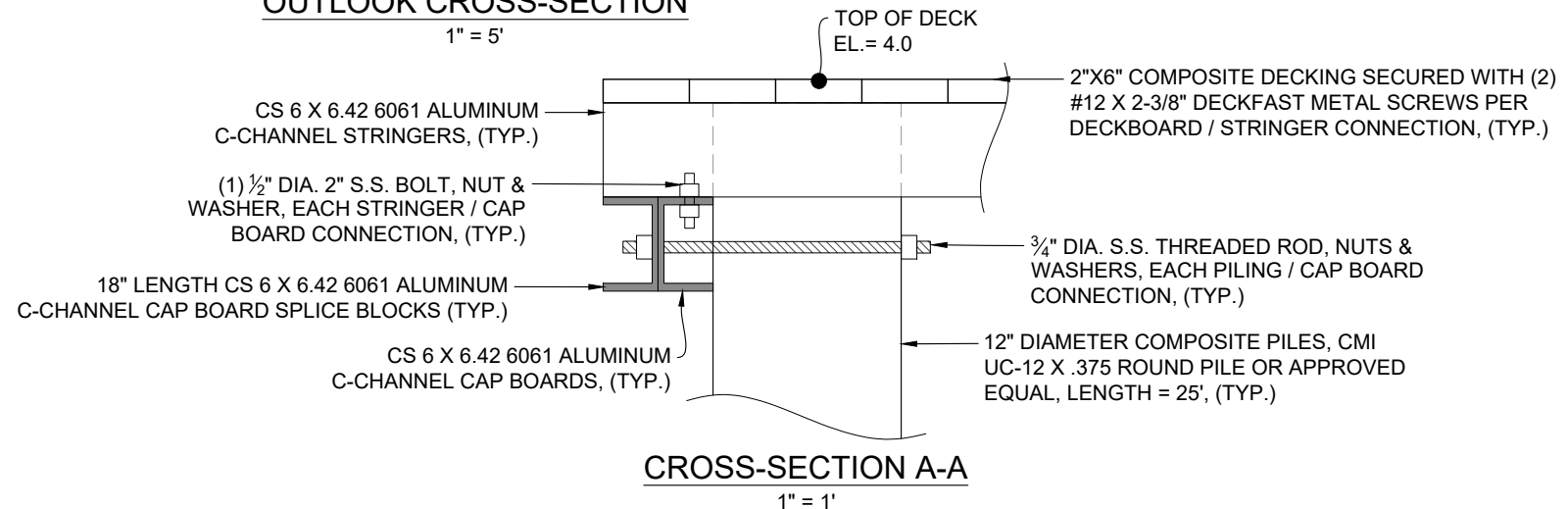


OUTLOOK PLAN
1" = 5'



OUTLOOK CROSS-SECTION
1" = 5'

- OUTLOOK NOTES:**
1. PILES - 12" DIAMETER COMPOSITE PILES, CMI UC-12 X .375 ROUND PILES OR APPROVED EQUAL, LENGTH = 25'. TOP OF PILE EL. = 3.875
 2. CAP BOARDS - CS 6 X 6.42 6061 ALUMINUM C-CHANNEL.
 3. STRINGERS - CS 6 X 6.42 6061 ALUMINUM C-CHANNEL.
 4. CAP BOARD SPLICE BLOCKS - 18" LENGTH CS 6 X 6.42 6061 ALUMINUM C-CHANNEL.
 5. DECKBOARDS - 2"X6" TREX SELECT DECKING OR APPROVED EQUAL.
 6. DECK SCREWS - DECKFAST METAL #12 X 2 3/8" OR APPROVED EQUAL.
 7. PILE / CAP BOARD CONNECTION - (2) 3/4" DIA. S.S. THREADED RODS, NUTS & WASHERS.
 8. PILE / STRINGER CONNECTION - (2) 3/4" DIA. S.S. THREADED RODS, NUTS & WASHERS (WHERE APPLICABLE).
 9. CAP BOARD / STRINGER CONNECTION - (1) 1/2" DIA. 2" S.S. BOLTS, NUTS & WASHERS.
 10. CAP BOARD SPLICE BLOCK CONNECTION - (4) 3/4" DIA. S.S. THREADED RODS, NUTS & WASHERS ((2) PER SIDE).
 11. **ALL CONNECTIONS TO RECEIVE NYLON WASHERS BETWEEN ALUMINUM MEMBERS AND STAINLESS STEEL HARDWARE.**
 12. HANDRAILS NOT SHOWN FOR CLARITY.
 13. HANDRAIL SHALL BE PLACED ON THE CONCRETE CAP AS SHOWN IN PLANS AND SHALL BE PLACED ALONG THE PERIMETER OF EACH OBSERVATION DECK.



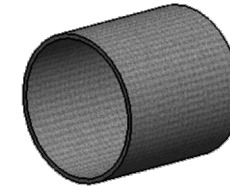
CROSS-SECTION A-A
1" = 1'

OUTLOOK DETAILS		DMC JOB NO. 19-006-36	SHEET NO. C-19
DRAWN NT	CHECKED AR	SCALE AS SHOWN	DATE 2-20-2020
PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN		CLIENT: CITY OF DAYTONA BEACH	
Dredging & Marine Consultants DMC ENGINEERS • SCIENTISTS		4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com	
301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		STEPHEN J. KUHN, P.E. FLORIDA LICENSE NO. 87486	



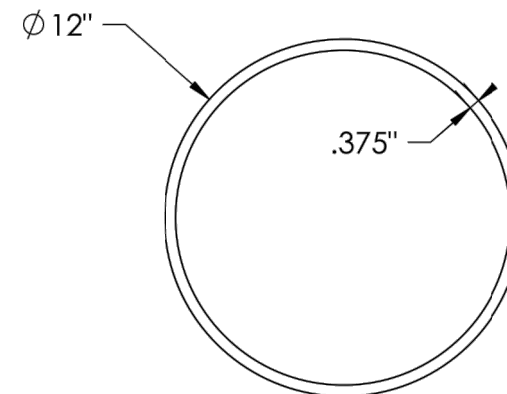
Updated: June 13, 2018

UC 12 x .375 Round Pile



Ultimate Bending Moment¹ (M)	93,525 ft-lb	126.80 kN-m
Full Section Flexural Stiffness¹ (EI)	812x10 ⁶ lb-in ²	2330 kN-m ²
Ultimate Axial Compression Strength²	24,000 psi	165.4 Mpa
Section Modulus (Z)	38.7 in ³	634 cm ³
Moment of Inertia (I)	232 in ⁴	9,657 cm ⁴
Thickness (t)	0.375 in	9.5 mm
Outside Diameter	12 in	305 mm
Material	UltraComposite Structural FRP Composite	
Standard Colors	Charcoal	

1. Tested in general accordance with ASTM D6109
 2. Tested in general accordance with ASTM D6108/D6109



NOTE:
LENGTH = 25'

*For Load & Resistant Factors refer to the Pre-Standard for Load & Resistance Factor Design (LRFD) of Pultruded Fiber Reinforced Polymer (FRP) Structures. No factors of safety have been applied to the specifications shown.

CMI is a Capital Partners company. CMI®, ShoreGuard®, The ShoreGuard Seawall System®, C-Loc®, TimberGuard®, GatorGates®, GatorDock Elite®, ArmorWare®, ArmorRod®, Box Profile®, UltraComposite®, Elite Wall®, Elite Panel®, Elite Fascia Panel®, Flat Panel®, XCR®, XCR Technology®, XCR Vinyl®, GatorBridge®, Gator Aluminum®, Gator Sheet Piling®, GatorDock®, I-Beam Lock®, Textured Slate®, CMI® logo, CMI Sheet Piling Solutions®, Aqua Terra System®, Endurance®, Endurance CSP®, Polaris®, Eclipse®, GridSpine®, 21 Poly®, PileClaw®, ShearScape®, ShearScape Retaining Wall Systems®, Sheer Panel® and CMI Waterfront Solutions® are trademarks, service marks or trade names of CMI, United States and International Patent numbers 6,000,883; 6,033,155; 6,053,866; 6,575,667; 7,058,807; 7,056,066; 7,025,538; 7,393,482; 6,291,271; 7,914,237; 8,419,317; 6,753,043; 9,528,241; 9,593,456; 9,745,710 and other patents pending. © 2018 CMI. All Rights Reserved.

cmilc.com

DRAWING: OUTLOOK PILE DETAIL	
DMC JOB NO.	19-006-36
DRAWN	NT
CHECKED	AR
APPROVED SKP	DATE: 2-20-2020
SHEET NO. C-20	

PROJECT NAME:	RIVERFRONT PARK SEAWALL DESIGN
CLIENT:	CITY OF DAYTONA BEACH

STEPHEN J. KUHN, P.E.
 FLORIDA LICENSE NO. 87486

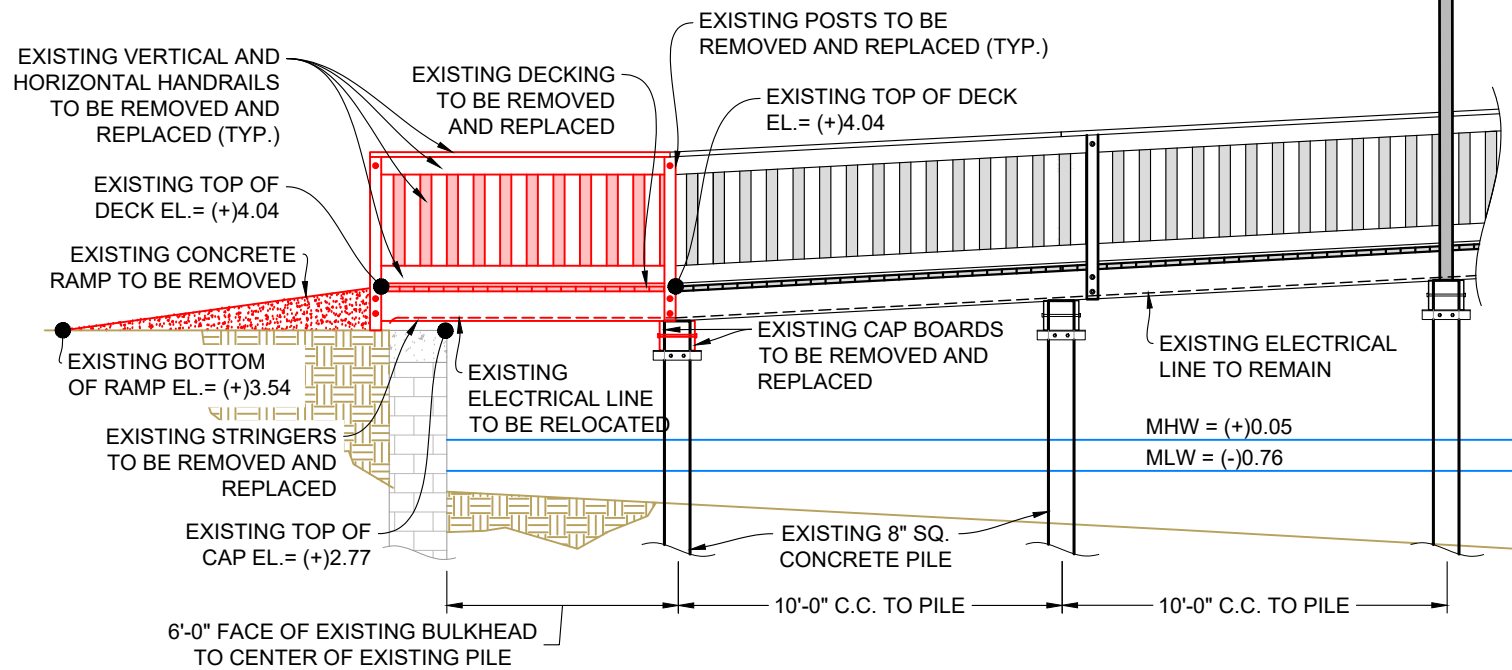
Dredging & Marine Consultants
DMC
 ENGINEERS • SCIENTISTS

4643 S. Clyde Morris Blvd
 Unit 302
 Port Orange, FL 32129
 Phone: (386) 304-6505
 Fax: (386) 304-6506
 www.dmcsc.com

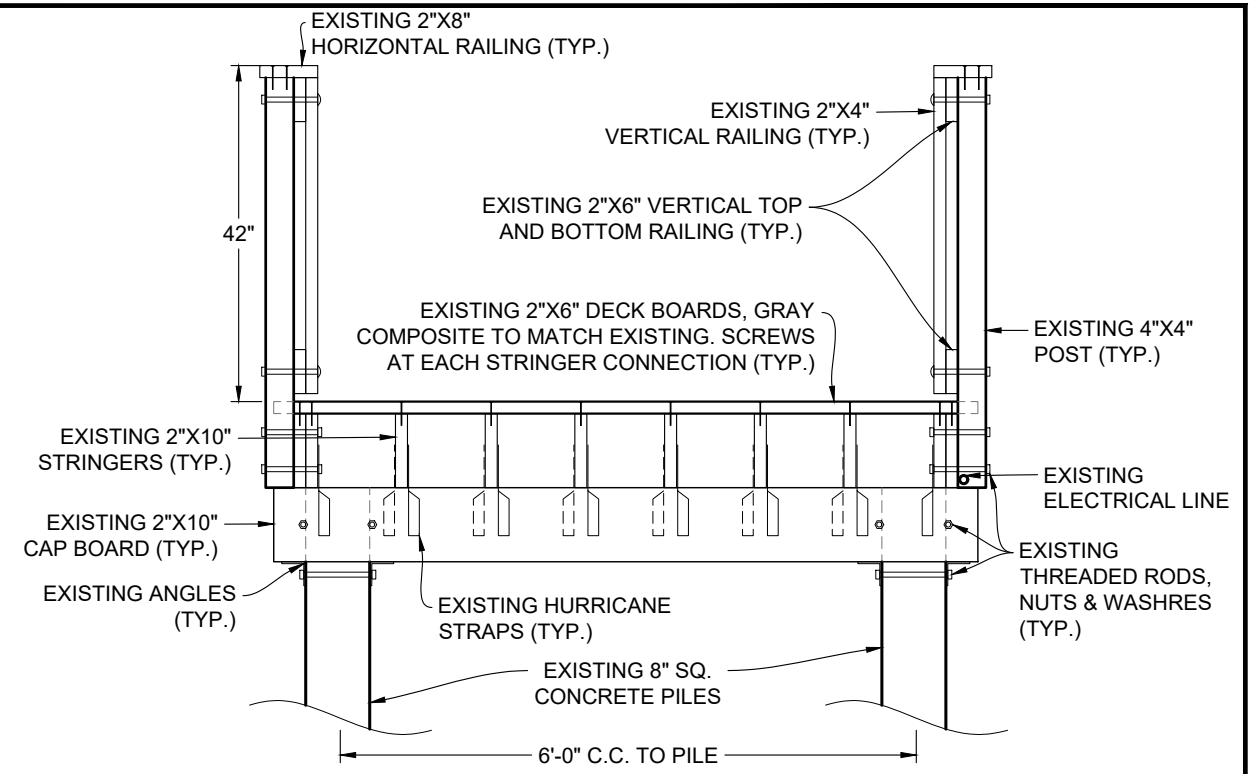
301 S. RIDGEWOOD AVE.
 DAYTONA BEACH, FL 32114
 (386) 671-8400

Drawing Name: D:\My Share\Sync\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: CMI.2 2/26/2020

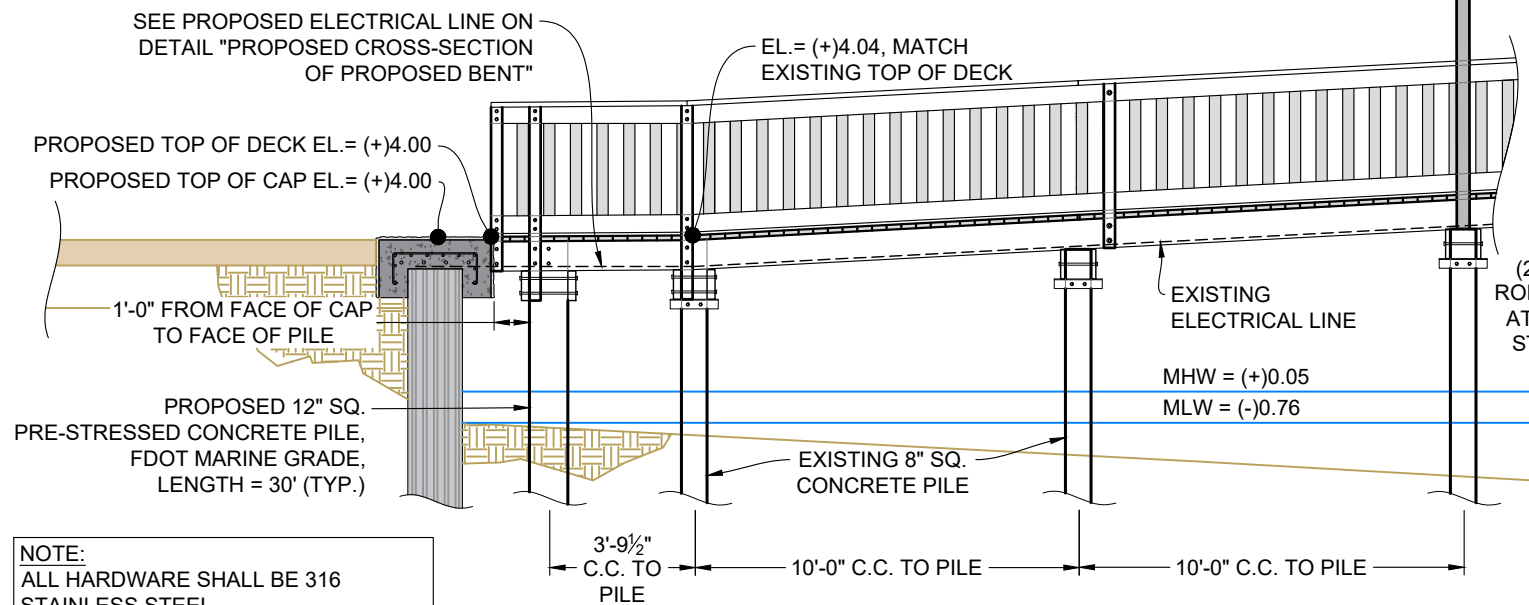
Drawing Name: D:\My Share\DMC Projects\06 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: BRIDGE 2/26/2020



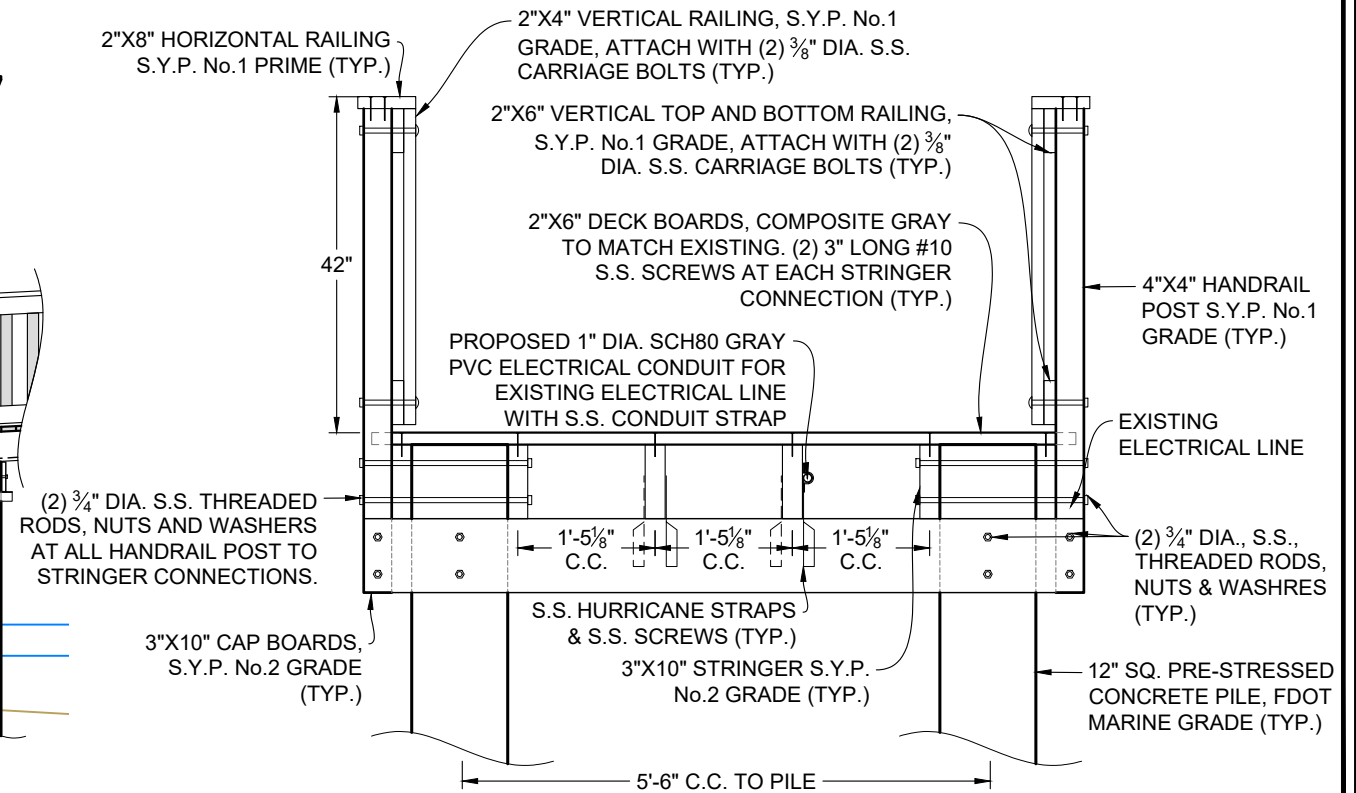
DEMOLITION ELEVATION
N.T.S.



TYPICAL CROSS-SECTION AT FIRST EXISTING BENT
N.T.S.



PROPOSED ELEVATION
N.T.S.



NOTE:
ALL HARDWARE SHALL BE 316 STAINLESS STEEL.

PROPOSED CROSS-SECTION OF PROPOSED BENT
N.T.S.

DRAWING: PEDESTRIAN BRIDGE DETAILS		SHEET NO. C-21	
DMC JOB NO. 19-006-36	CAD C3D	CHECKED AR	SCALE AS SHOWN
DRAWN NT	DATE 2-20-2020	APPROVED SKP	

PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN

CLIENT: CITY OF DAYTONA BEACH

STEPHEN J. KUHN, P.E.
FLORIDA LICENSE NO. 87486

Dredging & Marine Consultants
4643 S. Clyde Morris Blvd
Unit 302
Port Orange, FL 32129
Phone: (386) 304-6505
Fax: (386) 304-6506
www.dmcsc.com



301 S. RIDGEWOOD AVE.
DAYTONA BEACH, FL 32114
(386) 671-8400



IMPORTANT NOTES TO BIDDERS:

- The Contractor shall keep a pile driving log as specified in the plans and may not cut off piles until the Engineer has given approval to do so. The Contractor must provide advanced notification of a request to cut off pilings so that the Engineer may make field observations, if necessary. The Engineer will not make a structural certification if the Contractor does not comply with this requirement. If a vibratory hammer or jetting equipment is used to install pilings, the time needed to hammer and/ or jet each piling shall be recorded.
- The Contractor shall retain all material delivery tickets, material testing reports and cut-sheets/shop drawings for manufactured products for the project and provide copies to the engineer on a weekly basis. The Engineer will not make a structural certification if the Contractor does not comply with this requirement.
- The Engineer must be given advanced notice of the critical stages of construction such as initial construction stakeout, existing bulkhead demolition, pile driving, forming and rebar placement prior to placing concrete, first casting of concrete, framing outlooks before placing deck, etc. The Engineer will not make a structure certification if the contractor does not comply with this requirement.
- A Pre-Construction meeting must be scheduled before start of construction and all parties are to attend including: Owner or Owner's Representative, Engineer, Prime Contractor, Sub-Contractor(s), Surveyor, Applicable Tradesmen, etc. The Engineer will lead the meeting and provide a list of critical items to discuss.
- For the purpose of these specifications. "Project Completion" is defined as completion of an agreed upon list of punchlist items compiled in a planned project walkthrough held at a time the Contractor considers the project to be "Substantially Complete". The Contractor shall notify the owner and engineer at least 48 hours in advance of substantial completion and schedule a mutually agreeable walkthrough contractor must not mobilize the equipment(s) until the "project completion" is approved in writing by the Engineer of Record.

GENERAL:

- All elevations in the project plans are referenced to feet NAVD 1988.
- The project shall be straight, plumbed, level, and elevations are correct as shown in plans.
- Any deviation from these plans, notes or specifications must be approved in writing by the Owner, Owner's Representative or Engineer, or else the deviation will be considered construction non-compliant with the plans and specifications.
- Any discrepancies amongst the plans, notes, specifications and other bid documents must be resolved in writing by the Owner, Owner's Representative or Engineer prior to continuing the work in question.
- These plans, notes and specifications, along with the other components of the project bidding documents, constitute the only instructions to bidders/contractors, unless written addenda are issued.
- All construction, manufacturing, fabrication and testing of materials shall be performed under the guidelines set forth in applicable local, state and federal codes, and/or under recommendations provided in technical publications of respected professional or industry organizations. Material testing programs, where applicable, shall be presented to the Engineer for review and approval prior to construction.
- All products constructed or manufactured/supplied for the project shall be accompanied by industry acceptable warranties or guarantees.
- For the purpose of these specifications. "Project Completion" is defined as completion of an agreed upon list of punchlist items compiled in a planned project walkthrough held at a time the Contractor considers the project to be "Substantially Complete". The Contractor shall notify the owner and engineer at least 72 hours in advance of substantial completion and schedule a mutually agreeable walkthrough.
- A portion of the site lies within flood zone "AE" with a base flood elevation of 4.0 as indicated on Federal Emergency Management Agency Flood Insurance Rate Map Community Panel No. 12127C0359J dated September 29, 2017.
- Any materials interfering with construction, and all abandoned utility lines, pipes, structures and other subterranean objects to be removed, shall be disposed of as directed by the Owner. All materials not claimed by the Owner shall be disposed of at the Contractor's expense in areas provided by the Contractor.
- The Contractor shall provide all sheeting, shoring and bracing required to meet the requirements of the "Trench Safety Act" and to protect adjacent structures or to minimize trench width. Where a separate pay item is not provided, the cost for all sheeting, shoring and bracing required shall be included in the contract price for the item of work for which sheeting, shoring and bracing is anticipated to be required.
- The Contractor shall endeavor to protect private property. Any damage caused by the Contractor in the performance of his work shall be corrected to the satisfaction of the Engineer at the Contractor's expense. Payment shall not be made for this work.
- Any damage to state, county, or local roads caused by the Contractor's hauling or excavation equipment shall be repaired by the Contractor to the satisfaction of the Engineer. Payment shall not be made for this work.
- The construction lengths indicated in these plans are approximate. Actual limits may be set in the field as directed by the Engineer.
- During land alteration and construction activities, it shall be unlawful to remove

- vegetation by grubbing, or to place soil deposits, debris, solvents, construction material, machinery or other equipment of any kind within the dripline of a tree to remain on site unless approved by the Engineer.
- All trimming undertaken on a tree protected by provisions of the land development code shall be pruned in accordance with the National Arborist Association (NAA) Pruning Standards.
- The Owner and the Engineer reserve the right to perform quality assurance testing on all materials delivered to project and to reject all materials not meeting acceptable standards.
- The Contractor shall be responsible for the complete stake-out of the project, i.e., line, grade, slope stake, utility relocations or any other stake-out that may be required to complete the project in accordance with the plans and specifications. Any and all expenses incurred for this work shall be included in the unit price bid for other items. No additional payment shall be made for this work. Contractor shall also be required to provide a certified as-built survey of the grading, drainage and earthwork improvements and meet any minimum requirements of The City of Daytona Beach.
- Overall cleanup shall be accomplished by the Contractor in accordance with city standards or as directed by the Engineer. Any and all expenses incurred for this work shall be included in the unit price bid for other items.
- If, during construction activities, any evidence of historic resources including, but not limited to, aboriginal or historic pottery, prehistoric stone tools, bone or shell tools, historic trash pits, or historic building foundations are discovered, work shall come to an immediate stop and the client and the Florida Division of Historical Resources shall be notified within two working days.
- All materials and construction shall be in accordance with the more stringent of the current FDOT Standards and Specifications or City of Daytona Beach Standards and Specifications.
- Contractor shall be responsible for independently calculating all quantities for the project including earthwork. It is the Contractors responsibility to verify the Engineers estimated quantities included on the bid schedule.
- The Contractor shall provide pumping equipment and devices to properly remove and dispose of water during construction, if needed.
- Refer to construction pollution prevention plan for erosion control notes.

SHOP DRAWINGS:

Submit any "Shop Drawing" to the Engineer of Record for review and approval, in writing, prior to ordering and before construction. The "Shop Drawings" also includes, but not limited to, mark-up drawings, sketches, cut-sheets, product literature, additional specifications, photographs and letters.

Shop drawings list:

- Schedule for completion of work with tasks and durations defined.
- Shipping, stockpile and site administration plan (SSSAP).
- Temporary Traffic Control Plan (TTCP) for vehicles and pedestrians, including material deliveries, stockpile area(s), workers parking and construction equipment.
- Site-specific safety plan shall be distributed and reviewed with all site workers prior to said workers commencing work on the project site. See "Site Safety" notes.
- Demolition methods, including existing piles and existing bulkhead. Strictly prohibit pile cut-offs. Any existing timber structures to be removed shall be disposed of at an upland site. No debris or components shall be disposed of in the water.
- Changes, alternates or other methods different from project plans must be approved, in writing, via "Shop Drawings".
- After completing the punchlist in the field, the Contractor must submit a itemized punchlist, as-built survey and record drawings for final changes and the Engineer of Record approving in writing.

SURVEY INFORMATION:

Topographic information shown hereon from survey performed by ARC Surveying & Mapping, Inc. 06/26/2019. Referenced on the North American Vertical Datum of 1988 (NAVD 88).

SOIL BORINGS:

Structural calculations based on the Geotechnical Evaluation, Report # 134898, dated June 20, 2019 by Universal Engineering Sciences, Inc. The Geotechnical Report has a total of four borings, B-1, B-2, B-3 and B-4. Refer to the Geotechnical Report.

CONSTRUCTION SURVEYING:

- Stake-out survey of the project is the responsibility of the Contractor. Beginning and end points will be provided by the Owner, Owner's Representative or Engineer either by stakes in the field or in the project drawings.
- The staked project must be approved by the Engineer prior to commencing construction. The Engineer reserves the right to make alignment changes based on conditions portrayed by the initial stakeout.
- Methods and frequency of continuing stake-out during construction shall be submitted to the Engineer for approval prior to beginning construction.
- The Contractor must perform an independent construction record survey (as-built survey)

as a check for compliance at the end of the project. The record survey must be signed and sealed by a State of Florida licensed Professional Surveyor. The record survey must be referenced to feet NAVD 1988.

- The Prime Contractor is advised that certification of the project elevations and alignment is required by the Engineer for final acceptance of work.

AS-BUILT SURVEY AND RECORD DRAWINGS:

- As-built survey and record drawings shall be submitted at the time of the punchlist review and shall be reviewed by the Engineer for completeness and correctness.
- The record drawings shall be a designated set of drawings maintained on site for the purpose of hand-marking all changes and deviations from the original design, no matter how slight. Color markings are preferred.
- The record drawings shall also contain any and all field changes with respect to location, alignment, height, width, length, depth, materials, products, etc.

INSPECTION COORDINATION:

- The Engineer will be conducting routine observations and observations at critical stages of construction. A minimum of 72 hours notice shall be given to the Engineer prior to commencing the critical stages of construction. In general, critical stages are the initial work on the major structure components. Examples of critical stages of construction are: completion of construction stakeout, initial sheet piling installation, framing, concrete forming and rebar placement prior to casting concrete, first section of concrete casting and finishing, first section of backfilling and compaction, etc.
- The local city or county may perform their own construction observations in addition to the Engineer. No observers other than the Engineer or his/her designated representative shall have the authority to determine compliance with plans and specifications.
- Other observers may relay information to the Engineer, but it will be the Contractor's ultimate responsibility to maintain contact and resolve disputes, questions, field changes, payment requests, etc. directly with the Owner, Owner's Representative or Engineer.

DEMOLITION, CLEARING AND RESTORATION:

- Demolition or clearing may require permits. The contractor shall acquire all necessary building permits from the local municipality prior to commencing work.
- Clearing and removal of vegetation, rocks and debris will be required within the project structure footprint.
- Demolition or removal of objects, debris, or material specified or obstructing construction shall take place only to the extent necessary.
- Any permitted demolition or removal from submerged lands or adjacent uplands shall be fully contained within siltation devices such that permit turbidity requirements and state water quality standards are met.
- The site shall be restored by removing and finishing all evidence of construction including temporary haul roads, vehicle ruts, stockpile areas, shoreline slopes and vegetation, sod and areas subject to project work.

DESIGN SPECIFICATIONS:

- Florida Department of Transportation Standard Specifications for Road and Bridge Construction (Latest Edition), as amended by contract documents.
- Reinforced Concrete Design, Wang & Salmon, First Edition, 1976.
- Introductory Soil Mechanics & Foundations, Sowers & Sowers, Third Edition, 1970.
- Wind calculations per ASCE 7-10, "Other Standards", Section 29.5, Page 308, 2010.
- ASCE 7-10, Impact Loads (Debris), Section C.5.4.5, 2010.
- ASCE 7-10, Hydrodynamic Loads (Current), Section 5.4.3, 2010.
- Shore Protection Manual, U.S. Army Corps of Engineers, 1984.
- U.S.C.O.E. Engineering Manual, Design of Pile Foundations, EM 110-1-2906, 1991.
- Florida Building Code: Accessibility, Latest Edition.
- Florida Department of Environmental Protection
- Florida Fire Prevention Code, 5th Edition
- Florida Safety Code, Latest Edition.

DESIGN LIVE LOADS:

- Surcharge landside bulkhead = 150psf.
- Live load on overlooks = 60psf.

MOBILIZATION AND DEMOBILIZATION:

- It is understood that this project will require work in and over water. Access to near water construction areas is required for material storing, hauling, erection and construction. All facilities, public or private, used for such purposes shall be repaired to their original condition following "Completion" of the project, including grade and topping (sod, tree/vegetation cover, established road, etc.)

Drawing Name: D:\My Share\Sync\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: GNL 2/26/2020

DRAWING: GENERAL NOTES	DMC JOB NO.	19-006-36	SHEET NO.	C-22
	DRAWN	CAD	C3D	SCALE AS SHOWN
PROJECT NAME: RIVERFRONT PARK SEAWALL DESIGN	CHECKED	AR	DATE	2-20-2020
	APPROVED	SKP		
CLIENT: CITY OF DAYTONA BEACH		STEPHEN J. KUHN, P.E. FLORIDA LICENSE No. 87466		
Dredging & Marine Consultants 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com				
		301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		

Drawing Name: D:\My Shares\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: GN2 2/26/2020

- The Contractor shall present a Shipping, Stockpile and Site Administration Plan (SSSAP) to the Owner, Owner's Representative or Engineer for approval. The plan shall be specific to the project requirements for the particular materials to be delivered to the site, describing delivery points, stockpile areas, temporary debris/trash storage areas, temporary field office (including utilities maintained there), fencing, security and a statement of commitment and details for maintaining safety on the site.
- The Owner, Owner's Representative or Engineer shall have the right to exercise reasonable alterations or additions to the SSSAP.
- It is the contractor's responsibility to coordinate, and pay for, necessary utilities to occupy the site and perform the work.
- The Contractor shall not demobilize until project completion. And all parties have agreed and signed off in writing.

SITE MAINTENANCE:

- The Contractor shall maintain a clean and neat site, void of loose debris, trash, remnant parts or materials.
- Trash receptacles and removal service shall be maintained by the Contractor specifically for this project. Pre-existing trash/debris facilities shall not be used to maintain the project.
- Temporary debris piles shall be limited in number as much as practical and contained in designated areas until removal. Debris and trash shall not be scattered in areas outside the limited designated areas at any time.
- Removal of trash/debris shall be scheduled as appropriate to not allow piles to reach five feet in height or greater than ten feet in diameter. Debris individually larger than these dimensions shall be removed from the site within five working days. Receptacles shall not overflow at any time.
- The Contractor shall employ a Temporary Traffic Control Plan (TTCP) for vehicles and pedestrians, including material deliveries, stockpile area(s), worker parking and construction equipment. The plan must be in writing, including sketches or drawings, and must be submitted to the Owner, Owner's Representative or Engineer for review and approval before commencement of any work.
- The Contractor shall follow all applicable local, state and federal codes regarding site maintenance.

SITE SAFETY:

The Contractor shall prepare and adhere to a Site-Specific Safety Plan. The contents of the plan are:

- Identification of potential hazards and injuries pertaining to the specific site and project.
- Location of nearest hospital.
- Assure availability of at least one working cell phone and one vehicle on site at all times.
- Emergency contacts within the subcontractor's organization and at the Prime Contractor's organization.
- All field personnel shall wear appropriate safety attire and utilize appropriate personal protection equipment for a given task/operation such as safety glasses/goggles, masks, shields, gloves, harnesses, hard hats, steel-toed boots, etc.
- Safety kit shall be available onsite at all times with appropriate materials for potential hazards and injuries.
- The Site-Specific Safety Plan shall be distributed and reviewed with all site workers prior to said workers commencing work on the project site.
- The Contractor shall follow all applicable local, state, and federal codes regarding site safety.
- The contractor shall adjust the means and methods of this plan as appropriate for maintaining site and operational safety.
- Concrete trucks and large earth moving equipment shall not be parked or operated within 25 feet of any bulkhead wall.

WORK BY OTHERS ON SITE:

- The contractor shall coordinate with other contractors or utilities which must access, and work in, the same area.
- Disposal of demolition debris, stockpiling material or equipment shall not impede any upland construction or access.

CONTRACTOR REQUIREMENTS FOR SITE CLEARING, GRADING AND EROSION DESIGN AND CONSTRUCTION NOTES:

The following measures represent minimum standards to be adhered to by the Contractor throughout the construction of this project. The regulatory agencies reserve the right to require additional measures to be employed when warranted by extreme conditions, and/or the failure of the contractor to employ appropriate erosion control best management practices. Failure to comply with these provisions shall result in the issuance of a "stop work order".

- It shall be the responsibility of the Contractor to have all protective vegetation barricades and erosion control structures and measures in place prior to the commencement of any earthwork, including preliminary grubbing. These measures include, but are not limited to; temporary construction fences, hay bales, silt fences, and floating turbidity barriers. Further, it shall be the responsibility of the Contractor to maintain all erosion control devices throughout the duration of the entire project. Maintenance shall include periodic inspection and removal of debris abutting erosion control devices.
- Prior to the installation of any fill materials on subject site, silt fences shall be installed: (1). along subject site boundary and property lines; (2). at the edge of conservation easements and wetlands; (3). adjacent to natural landscape buffers; (4). around the perimeter of existing storm water treatment facilities, and; (5). at any additional areas that the city deems in need of protection from potential erosion impacts during construction. These conditions shall apply in all instances where fill material is being installed within 25 feet of any of the aforementioned locations. While these items represent the minimum requirements, the City, ACOE and FDEP reserve the right to impose additional protective measures, as determined during actual site visits conducted throughout project construction.
- At a minimum, the Contractor shall seed and mulch all disturbed areas. Sufficient grass coverage is to be established within thirty days.
- Absolutely no burying of cleared materials is permitted.
- A signed, dated, and sealed letter from a soils engineer or the engineer of record certifying that the areas to be filled have been stripped of organic materials, must be submitted to the city prior to filling.
- Fill material is to be placed in one foot lifts and compacted to the appropriate density (98% for paved areas and 95% for building pads and all other areas as per AASHTO T-180).
- If any muck material is discovered, it shall be required to be removed and replaced with a suitable material that is properly backfilled, compacted and tested using AASHTO T-180 modified proctor method.
- Stockpiles shall not exceed five feet in height measured from the original grade. silt fence shall be placed at the base of all stockpiles.
- Soils are to be stabilized by water or other means during construction. This is intended to reduce soil erosion and the impact to neighboring communities. Adequate watering methods should be employed to allow daily coverage of the entire limits of all areas that do not have an established vegetative cover. Methods to be employed include, but are not limited to, water trucks, permanent irrigation system, temporary sprinkler systems operated by pumping units connected to wet retention ponds, water cannons, temporary irrigation systems mounted atop stockpile areas, and other methods as deemed necessary by the city.

BACKFILL SOIL AND SURFACE TREATMENT:

- Backfill material shall be from an upland source and shall be clean, construction-quality sand, free from organics, oils, grease and debris. The source company shall provide a sieve analysis to the engineer for approval prior to shipping material.
- Backfill material shall be placed in maximum 12-inch lifts and compacted to minimum 98 percent optimum proctor moisture content and density. The bottom, middle and top of backfill shall be tested, at the expense of the Contractor, by a qualified independent testing company. The testing company name, qualifications and contact information shall be provided to the Owner, Owner's Representative or Engineer for approval prior to commencing soil testing.
- Backfilling shall not be performed until after the cap has sufficiently cured to design strength.
- The backfilling and compaction should be performed with the smallest practical equipment to reduce surcharge on the structure during the operation. Heavy equipment shall not be operated within 25 feet of the sheet-piling. The contractor shall review backfilling procedure with the engineer prior to commencing.


SHEET-PILING AND COMPOSITE / CONCRETE PILING INSTALLATION:

- Equivalent composite sheet-pile wall:
 - Crane Materials International (CMI) UC-95
 - Contractor to submit equivalent to Engineer for approval prior to ordering.
- 12 inch square pre-stressed concrete piling, FDOT Marine Grade must have strict occurrence of:
 - Fabricated at a plant that is currently on the listing of FDOT Production Facility.
 - f'c = 6,000 psi.
 - w/c ≤ 0.40.
 - (8) - 1/2" dia. strands (min.).
 - 3" min. clear cover.

- Provide and install concrete piles in accordance with FDOT specification 455.
- Concrete shall be FDOT class IV (special) for an extremely aggressive (marine) environment. provide sufficient fly ash or slag to cement content to increase impermeability of concrete.
- The pilings shall be of the size and length shown in the plans.
- All pilings shall be set full length with top elevation as shown in plans. Cut-offs are not allowed except for minimal required (max. 6") to remove tops damaged by the pile-driver.
- The pile driving equipment shall be of the proper size and have the capacity to handle, place and hold the piles to the alignment shown in the project drawings. The equipment shall be maintained in the safe operating condition.
- Prior to signing of the construction contract, the Contractor being considered shall have all major equipment items available for inspection. Any deficiencies in quality and quantity or type of equipment shall be corrected prior to commencing work and such correction shall be a required condition to properly fulfill the contract. This inspection and subsequent approval shall in no way relieve the Contractor from his obligation to provide all equipment required to properly perform the work.
- Cut-off of piling is strictly not allowed unless approved by the Engineer. The contractor shall make an earnest attempt to drive pilings to grade, utilizing alternate methods or ideas to make the grade. When requesting permission to cut off sheet piles, the Contractor shall provide a minimum of 72 hours advance notice to the Engineer to inspect the site and make recommendations. The sheet pile must remain "as-is" until the Engineer completes the field inspection and makes recommendations. Any sheet pile cut off without written approval by the Engineer shall be removed and replaced at no additional cost to the city.
- Contractor shall keep a pile driving log on the site at all times which shall include the following information: date, time, weather conditions, equipment used, pile location designation, blows per foot over entire driving sequence, total length of pile (after driving and cut-off, if cut-off allowed), amount of jetting or punching (if requested and approved), unusual pile behavior, damage and re-driving. This log shall be available to the Engineer or Owner's Representative at any time during the job. Updated copies of log pages shall be provided to the Engineer at least weekly throughout the project. If a vibratory hammer or jetting equipment is used to install pilings, the time needed to hammer and/or jet each piling shall be recorded.
- Jetting of piles is permitted with approval of the Engineer. The final five (5) feet of all piles must be driven.
- If solid rock, debris or refusal is encountered prior to achieving the minimum penetration, then the strata shall be tool-punched at least two feet into the strata. No additional payment will be made for pile driving where this work is required. It is the Contractor's responsibility to investigate the site and make preliminary probes if necessary. Arrange site visits for this purpose directly with the Owner.
- The pile handling and driving procedure shall not subject the piles to excessive abuse causing damage. The pile-driver/piling connection shall be made such as to minimize damage to the sheet-piling and eliminate or reduce cut-off. Any pile so damaged in handling or driving shall be replaced by a new pile, or otherwise corrected, as directed by the Owner, Owner's Representative or Engineer and at the expense of the Contractor.

PROJECT CONCRETE - CAP AND OUTFALL STRUCTURES

- All mix designs by the concrete supplier or contractor must be submitted to the Engineer for approval prior to submitting order.
- All cast-in-place cap and outfall structure concrete shall be of the same mix design as follows:
 - Compressive Strength = 6,000 psi min.
 - Water-cement ratio <= 0.40.
 - Air entrainment = min. 2 to 3%.
 - Potable water, no chlorides.
 - Type I Cement.
 - 6% addition of microsilica per weight of binders.
 - Large and small aggregates washed and free of chlorides or reactive chemicals.
 - Retarders or accelerators not allowed unless justified to the Engineer prior to their use.
- Concrete cover from all exterior faces shall be 4" clear to the outmost face of any reinforcement, including stirrups, unless otherwise noted in the plans.
- No greater than 45 minutes may transpire between individual castings. Trucks may not sit on for grater than 45 minutes. Trucks sitting full on site for grater than 45 minutes shall be rejected at the contractor's expense. Delays in casting a given form greater than 45 minutes shall be rejected unless an acceptable construction joint can be made.
- A working concrete vibrator must be on site prior to delivery of first concrete. The Owner, Owner's Representative or Engineer shall not allow concrete to be cast otherwise.

DRAWING: GENERAL NOTES	DMC JOB NO.	19-006-36	SHEET NO.	C-23
	DRAWN	NT	CAD	C3D
PROJECT NAME:	CHECKED	AR	SCALE AS SHOWN	DATE: 2-20-2020
	APPROVED	SKP		
RIVERFRONT PARK SEAWALL DESIGN		CLIENT: CITY OF DAYTONA BEACH		
 Dredging & Marine Consultants 4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com		301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400		
 THE CITY OF DAYTONA BEACH INCORPORATED 1915				

Drawing Name: D:\My Share\Sync\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: GN3 2/26/2020

6. Vibrate concrete fully, particularly at corners and edges, in a continuous vertical plunging motion, never allowing the vibrator to become motionless in the concrete. Concrete with substantial voids or honeycombing will be rejected.
7. Use non-metallic chairs and spacers in reinforcement placing, or for any other necessary in-form attachments or alignments.
8. Continually wet water cure horizontal surfaces for at least three days and all exposed concrete surfaces after concrete is set. For the purpose of this specification "set" is when the concrete surface is hard enough so that when "knocked" with the knuckles the concrete is not dented. The Contractor is responsible for arranging a water source for curing purposes prior to commencing casting of concrete.
9. Apply Master Builders/BASF "ConFilm" or Euclid Chemical "Eucobar" product immediately after first float and then after final finish. Refer to manufacturer's recommendations for mixing and application.
10. The final alignment of the concrete cap shell be straight and level per elevations and plans provided.
11. Concrete materials testing per acceptable ASTM methods and intervals. A material testing program must be prepared by the Contractor and/or manufacture for review and approval by the Engineer. At least one set of four cylinders shall be cast for any one day's work, or work between construction joints, or more if prescribed by ASTM.

VERTICAL JOINTS IN CONCRETE CAP:

1. Joints shall be placed where shown in the plans with a full cross-section width of 3/8-inch.
2. Closed-cell neoprene shall be placed the full width and height of the concrete cap with a thickness of 3/8-inch.
3. 30 inch long, 1" diameter, stainless steel, smooth, greased dowels (both sides) as shown in plans.
4. Concrete cap reinforcing shall stop 4 inches from the ends of each segment as shown in the plans.

OVERLOOK:

1. Piles - 12 inch diameter composite piles, CMI UC-12 X .375 round piles or approved equal, length = 25'.
2. Cap Boards - CS 6 6.42 6061 aluminum C-channel.
3. Stringers - CS 6 6.42 6061 aluminum C-channel.
4. Cap board splice blocks - 18" length CS 6 X 6.42 6061 aluminum C-channel.
5. Deckboards - 2" X 6" trex select decking or approved equal.
6. Deck screws - Deck fast metal #12 X 2 3/8" or approved equal.
7. Pile / cap board connection - (2) 3/4" diameter stainless steel threaded rods, nuts and washers.
8. Pile / stringer connection - (2) 3/4" diameter stainless steel threaded rods, nuts and washers (where applicable).
9. Cap board / stringer connection - (1) 1/2" diameter 2" stainless steel bolts, nuts and washers.


10. Railings by others.

BOLTS & SCREWS:

1. All fasteners, including nails, screws, threaded rods, bolts, nuts, washers, plates, lags, etc. shall be grade 316 stainless steel (SS). Washers used with single-bolted or double bolted connections (for example: stringer to piling connection, cap board connections or cross-bracing) shall be minimum 3-inch diameter "dock washers". Standard Washers for Splice Block and Railings.
2. Bolts shall extend fully through the nuts but not extend beyond the nut more than 1/2 inch. Stainless Steel (SS) screws as shown in plans.

ENVIRONMENTAL AND PERMITS:

1. The U.S. Army Corps of Engineers (USACE), Florida Department of Environmental Protection (FDEP), regional Water Management District (WMD) and the local city or county may exert jurisdiction over construction of the project. The contractor shall be responsible to understand and comply with all applicable permit conditions imposed by the jurisdictional agencies, if permits are necessary. If not, the Contractor must at least comply with general state water quality standards for siltation and guidelines for encounters with threatened and endangered species, including, but not limited to, the state manatee guidelines.
2. All building and construction-related permits from the local (city or county) or state authorities are the responsibility of the Contractor.
3. National Marine Fisheries Services has special conditions for sea turtles, smalltooth sawfish and manatees. See details.

<p>GENERAL NOTES</p> <p>DRAWING: 19-006-36</p> <p>DMC JOB NO. 19-006-36</p> <p>DRAWN: NT</p> <p>CHECKED: AR</p> <p>APPROVED: SKP</p> <p>CAD: C3D</p> <p>SCALE AS SHOWN</p> <p>DATE: 2-20-2020</p> <p>SHEET NO. C-24</p>	<p>PROJECT NAME:</p> <p>RIVERFRONT PARK SEAWALL DESIGN</p> <p>CLIENT:</p> <p>CITY OF DAYTONA BEACH</p>	<p>Dredging & Marine Consultants</p> <p>DMC</p> <p>ENGINEERS • SCIENTISTS</p> <p>4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com</p>
<p>301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400</p>		
		



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
 Southeast Regional Office
 263 13th Avenue South
 St. Petersburg, FL 33701

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

- a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.
- b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.
- d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.
- e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.
- f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
- g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006

O:\forms\Sea Turtle and Smalltooth Sawfish Construction Conditions.doc



STANDARD MANATEE CONDITIONS FOR IN-WATER WORK
 2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at ImperiledSpecies@myFWC.com
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8 1/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at MyFWC.com/manatee. Questions concerning these signs can be sent to the email address listed above.

Drawing Name: D:\My Share\Sync\DMC Projects\006 - City of Daytona Beach\19-006-36 Riverfront Park Seawall Design\Drawings\0 SEAWALL-revised.dwg By: DMC-CAD Tab: ENVIRONMENTAL 2/26/2020

DRAWING: ENVIRONMENTAL NOTES	DMC JOB NO.	19-006-36	SHEET NO.	C-25
	DRAWN	CAD		C3D
PROJECT NAME:	RIVERFRONT PARK SEAWALL DESIGN		CLIENT:	CITY OF DAYTONA BEACH
	STEPHEN J. KUHN, P.E.			FLORIDA LICENSE NO. 87486
Dredging & Marine Consultants		4643 S. Clyde Morris Blvd Unit 302 Port Orange, FL 32129 Phone: (386) 304-6505 Fax: (386) 304-6506 www.dmcsc.com		
		ENGINEERS • SCIENTISTS		
301 S. RIDGEWOOD AVE. DAYTONA BEACH, FL 32114 (386) 671-8400				