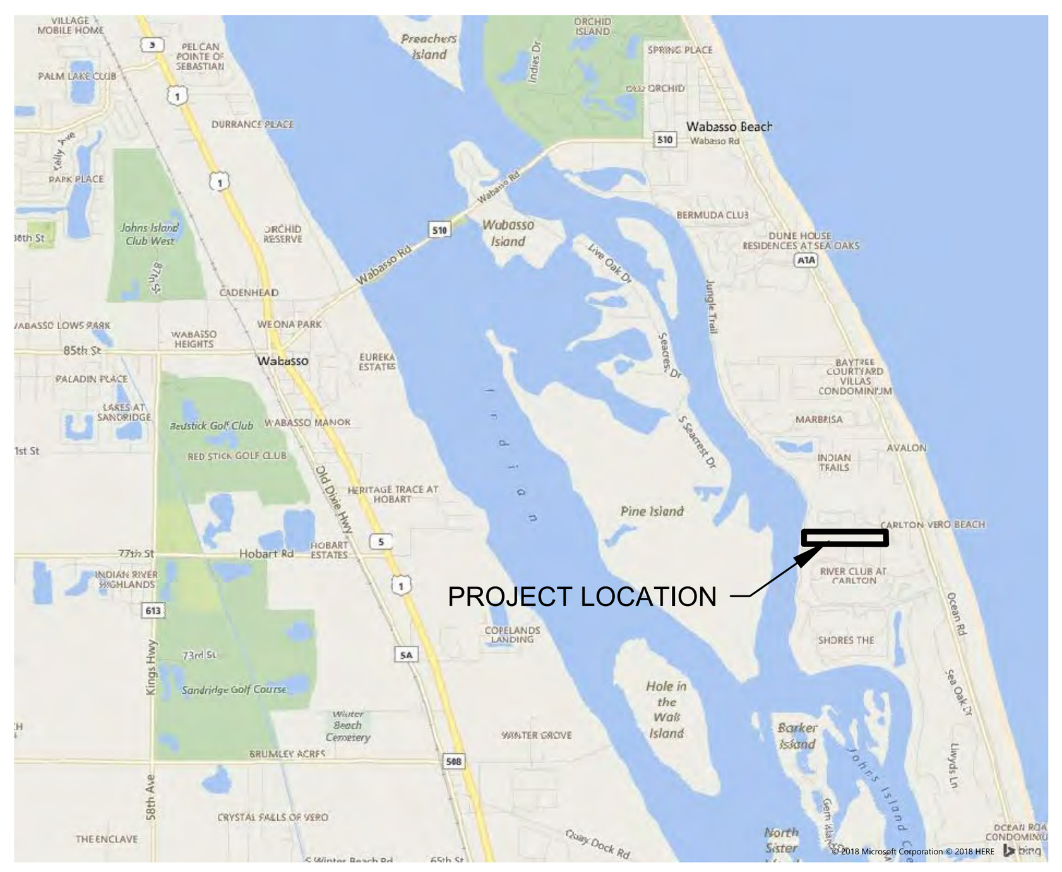
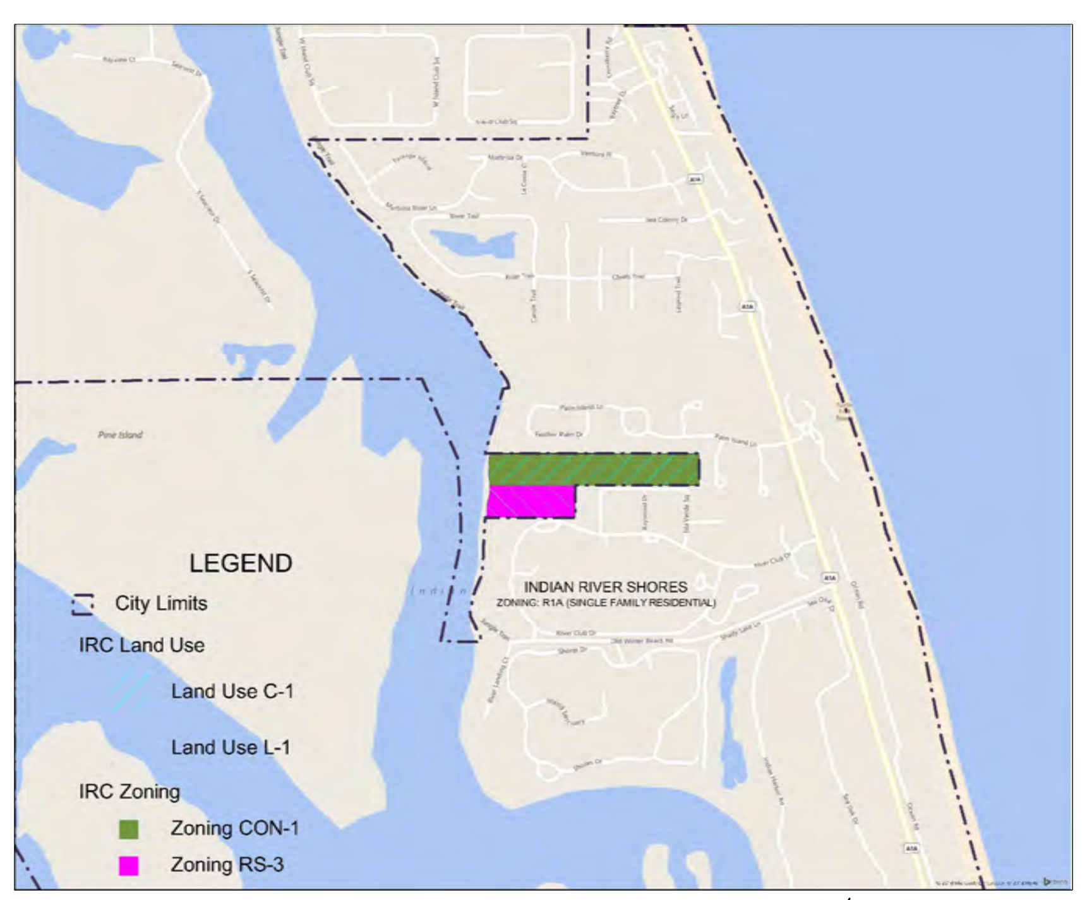
JONES PIER
WETLAND RESTORATION AND CONSERVATION IMPROVEMENTS - PHASE 2
PARKS DIVISION
INDIAN RIVER COUNTY, FLORIDA



LOCATION MAP
N.T.S.



ZONING/LAND USE MAP
N.T.S.

VICINITY MAP
SCALE: 1" = 300'

SHEET INDEX	
SHEET #	SHEET TITLE
C-000	COVER
S-100	EXISTING CONDITIONS PLAN
C-101	PHASE 2 PROJECT BOUNDARIES
C-102	SALTMARSH CREATION GRADING PLAN
C-103	PLANTING PLAN
C-104	FRESHWATER WETLAND CREATION PLAN
C-105	PROPOSED WETLAND IMPACTS
C-106	TREE REMOVAL PLAN
C-107	EROSION CONTROL PLAN
C-108	PLANTING NOTES
C-109	NOTES AND DETAILS
C-110	PUMP DETAILS
C-111	PUMP DETAILS AND SPECIFICATIONS
C-112	CHAIN LINK FENCE DETAILS

REV 5: QC CHANGES FOR BID SET	CJR	11/7/19
REV 4: UPDATED PUMP DETAILS	CJR	10/16/2019
REV 3: UPDATED PUMP DETAILS	KWN	10/03/2019
REV 2: REVISED FOR ADMINISTRATIVE APPROVAL SUBMITTAL	KWN	02/05/2018
REV 1: ADDED FRESHWATER MARSH X-S TO SHEET C-102	KWN	12/12/2018

P:\18-39 Jones Pier\dwg\18-39e.dwg, COVER, Clint Rahjes
Nov. 8, 19, 8:38 AM

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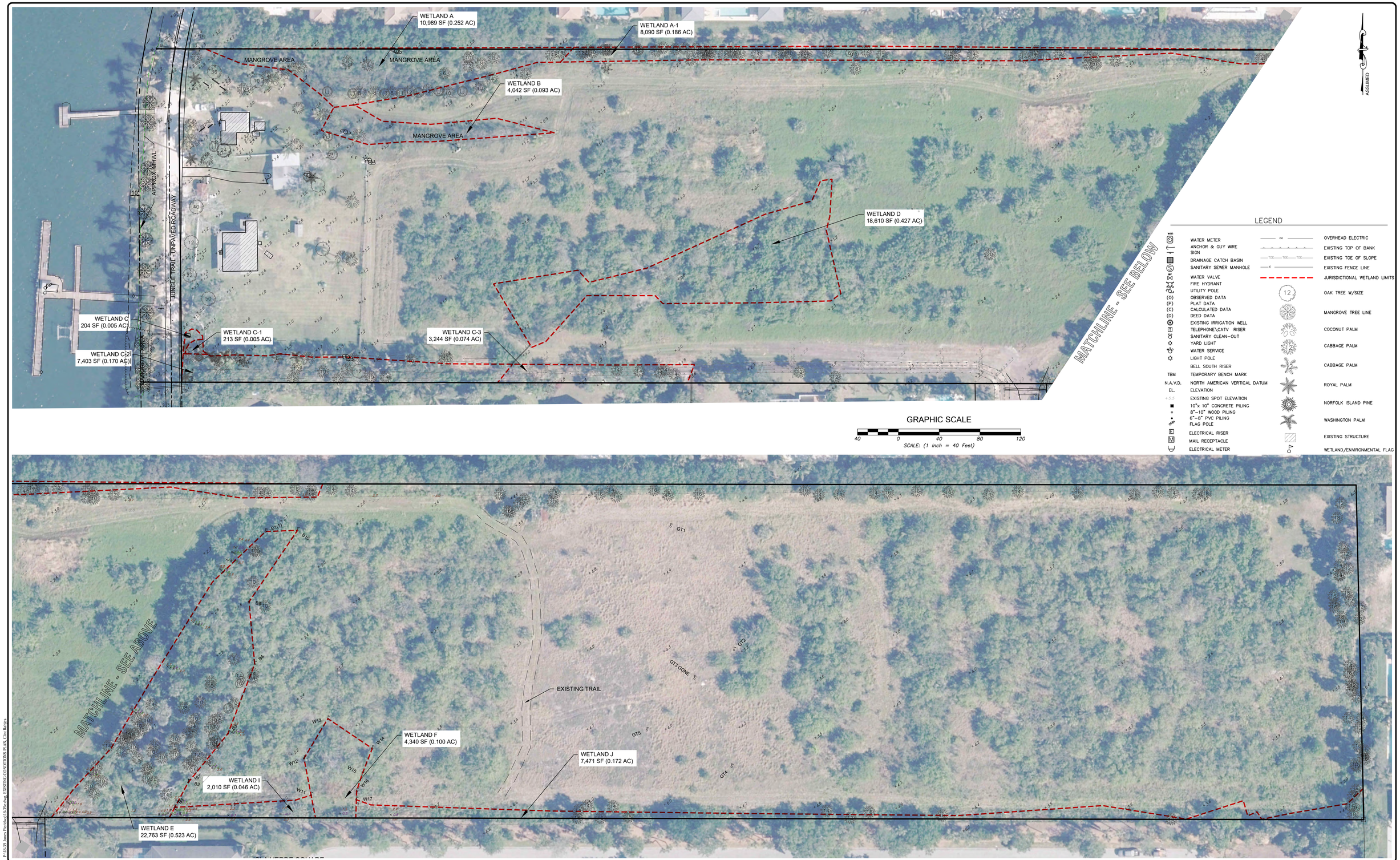
JOHN H. BLUM, P.E.
FLORIDA LICENSE No. 45813
CARTER ASSOCIATES, INC.
SIGNATURE DATE
COA 205 / LB 205

Date: 11/20/18 | PROJ. #: 18-39E



NO.	REVISION	BY	DATE
6			
5			
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3			
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DATE : Nov 2019
PROJ. # : 18-39e
DRAWN BY: KWN
APPD. BY : JHB
PLOT BY : Clint Rahjes
FILE NAME:
REF. # : 20585-C;17-345s
F.B. & PG. : 729/21+;850/56+

Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida
PHASE 2
EXISTING CONDITIONS PLAN

SHEET
S-100

P:\18-39 Jones Pier\dwg\18-39e.dwg, EXISTING CONDITION PLAN, Clint Rahjes
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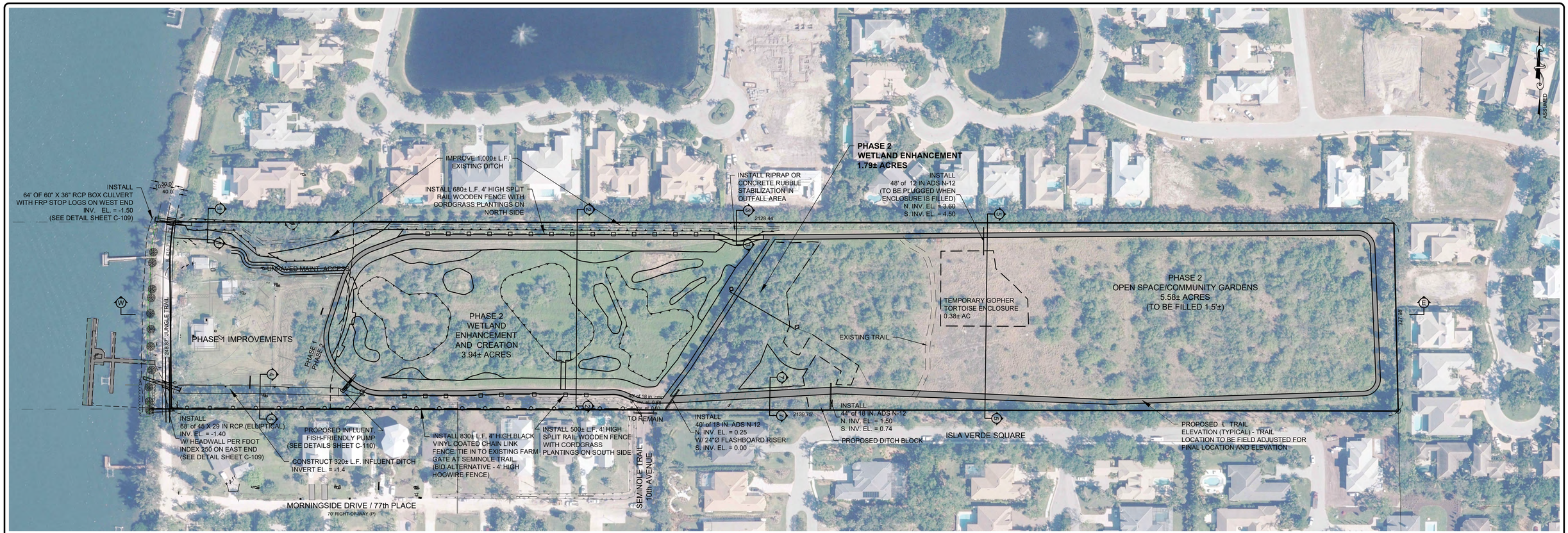

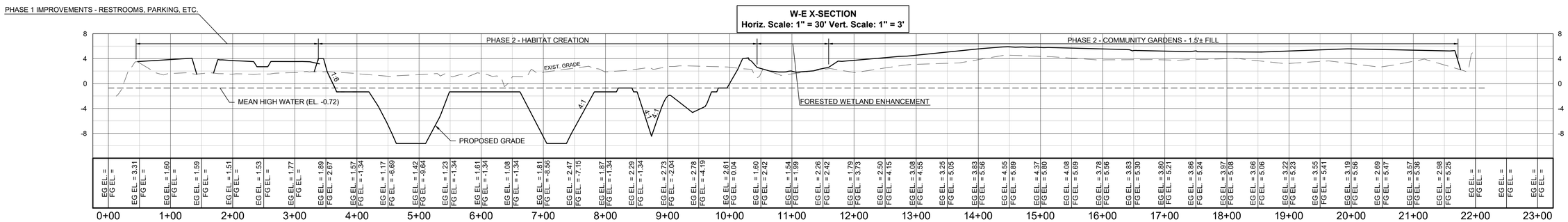

GRAPHIC SCALE

80 0 80 160 240

SCALE: (1 Inch = 80 Feet)

P:\18-39 Jones Pier\dwg\18-39e.dwg, PHASE 2 PROJECT BOUNDARIES, Clint Rahjes
Nov. 14, 19, 8:39 AM

NO.	REVISION	BY	DATE
6			
5			
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1			

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John H. Blum, P.E. SIGNATURE DATE
FLORIDA LICENSE No. 45813
CARTER ASSOCIATES, INC. COA 205 / LB 205

DATE : Nov 2019
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Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida
PHASE 2
PHASE 2 PROJECT BOUNDARIES

SHEET
C-101


INSTALL 64' OF 60" X 36" RCP BOX CULVERT WITH FRP STOP LOGS ON WEST END INV. EL. = -1.50 (SEE DETAIL SHEET C-109)
CONTRACTOR TO IMPROVE FLOW WHILE PRESERVING EXISTING MANGROVES IN THIS AREA
SHALLOW EXCAVATION FOR MANGROVE WETLAND CREATION
INSTALL 680± L.F. 4' HIGH SPLIT RAIL WOODEN FENCE WITH CORDGRASS PLANTINGS ON NORTH SIDE
RE-GRADE NORTH DITCH AS OUTFALL GENERALLY THE CENTERLINE INV. EL. = -2.6 (SEE SHEET C-109 FOR PROFILE)
INSTALL RIPRAP OR CONCRETE RUBBLE STABILIZATION IN OUTFALL AREA
MANGROVE AREA
0.09 ACRES
0.16 ACRES
UNPAVED MAINT. ACCESS
FILL EXISTING DITCH AND CONSTRUCT SOD MAINT. ACCESS
MEANDER TRAIL AS NEEDED TO PRESERVE EXISTING WELL
APPROX. MHWL
JUNGLE TRAIL
PHASE 1 IMPROVEMENTS
0.75 ACRES
0.06 ACRES
0.04 ACRES
0.32 ACRES
0.39 ACRES
0.05 ACRES
0.02 ACRES
0.31 ACRES
1.63 ACRES
0.03 ACRES
0.01 ACRES
WETLAND CREATION AREA
WETLAND RESTORATION AREA
OPEN SPACE
0.06 ACRES
0.2 ACRES
0.25 ACRES
0.1 ACRES
0.01 AC
REMOVE EXISTING CULVERT
CONSTRUCT PROPOSED INFLUENT DITCH INV. EL. = -1.4 WITH RUBBLE-LINED SUMP AREA AS FIELD DIRECTED BY OWNER
PHASE 1
PHASE 2
PHASE 1 OUTFALL
INSTALL 68' of 45 X 29 IN RCP (ELLIPTICAL) INV. EL. = -1.40 W/ HEADWALL PER FDOT INDEX 250 ON EAST END (SEE DETAIL SHEET C-109)
(2) 16' LONG 2" x 8" PRESSURE-TREATED BOARDS EMBEDDED INTO BANK TO FORM 16" HIGH SKIMMER WITH BOTTOM AT EL. -1.0
PROPOSED INFLUENT, FISH-FRIENDLY PUMP (SEE DETAILS SHEET C-110)
EXISTING CULVERT TO BE REMOVED
INSTALL 830± L.F. 4' HIGH BLACK VINYL COATED CHAIN LINK FENCE. TIE IN TO EXISTING FARM GATE AT SEMINOLE TRAIL. (BID ALTERNATIVE - 4' HIGH HOGWIRE FENCE)
INSTALL 500± L.F. 4' HIGH SPLIT RAIL WOODEN FENCE WITH CORDGRASS PLANTINGS ON SOUTH SIDE
TO REMAIN
STEEL FARM GATE
INSTALL 40' of 18 IN. ADS N-12 N. INV. EL. = 0.25 W/ 24"Ø FLASHBOARD RISER S. INV. EL. = 0.00
DITCH BLOCK
INSTALL 44' of 18 IN. ADS N-12 N. INV. EL. = 1.50 S. INV. EL. = 0.74
ISLA VERDE SQUARE

SEE SHEET C-103 - PLANTING PLAN FOR PLANT SCHEDULE
SEE SHEET C-108 - PLANTING NOTES FOR PLANTING INFORMATION

GRAPHIC SCALE

SCALE: (1 inch = 40 Feet)

Wetland Summary				
Description	Min. Elevation	Max. Elevation	Color	Area
OPEN WATER	-10.000	-1.340		1.10± AC
DEEP MARSH	-1.340	-1.090		1.63± AC
SHALLOW MARSH	-1.090	-0.719		0.49± AC
TRANSITIONAL BUFFER	-0.719	6.000		0.74± AC
			TOTAL	3.96± AC

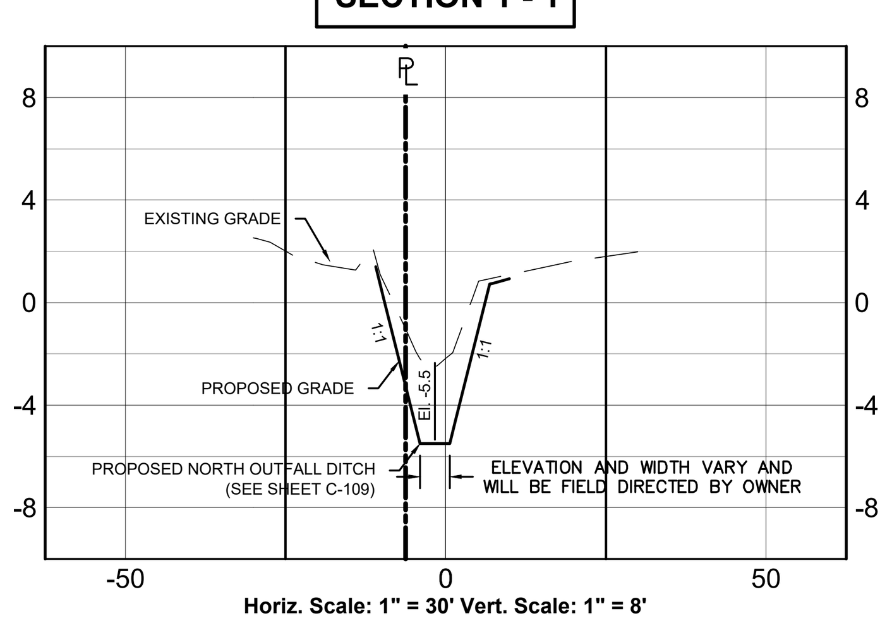
FILL/EXCAVATION VOLUMES	
AREA	VOLUME
PHASE 1	3,000± C.Y FILL
WETLAND /DITCHES	26,680± C.Y EXCAVATION
GARDEN AREA	23,680± C.Y FILL

Elevations on Mean Lower Low Water
Station: 8722059, WABASSO,INDIAN RIVER, FL
Status: Accepted (Feb 10 2011)
Units: Feet
T.M.: 75
Epoch: 1983-2001
Datum: MLLW

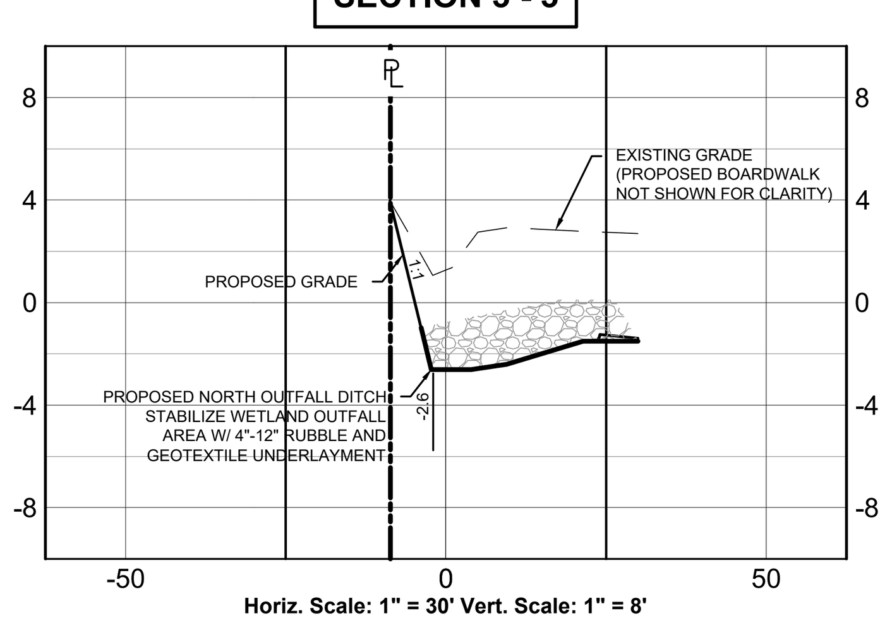
Datum	NAVD 88 Value	Description
MHHW	-0.660	Mean Higher-High Water
MHW	-0.720	Mean High Water
MTL	-0.900	Mean Tide Level
MSL	-0.910	Mean Sea Level
MLW	-1.090	Mean Low Water
MLLW	-1.140	Mean Lower-Low Water
NAVD88	1.140	North American Vertical Datum of 1988

Tidal Datum Analysis Periods
06/01/1972 - 08/31/1972

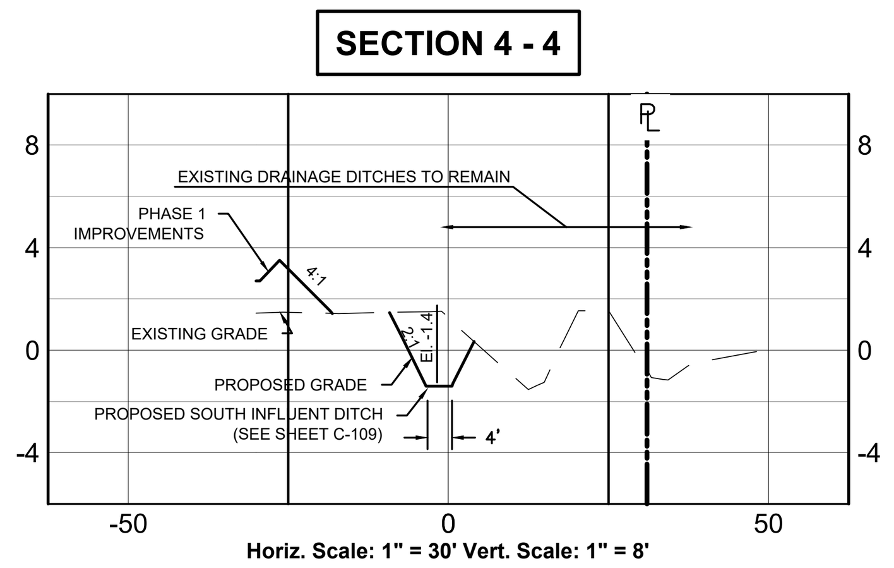
SECTION 1 - 1



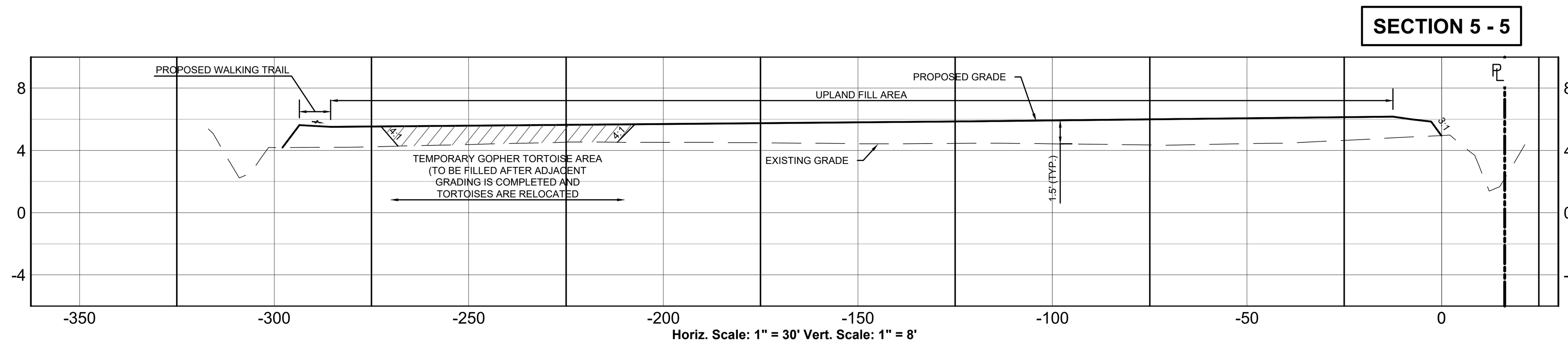
SECTION 3 - 3



SECTION 4 - 4

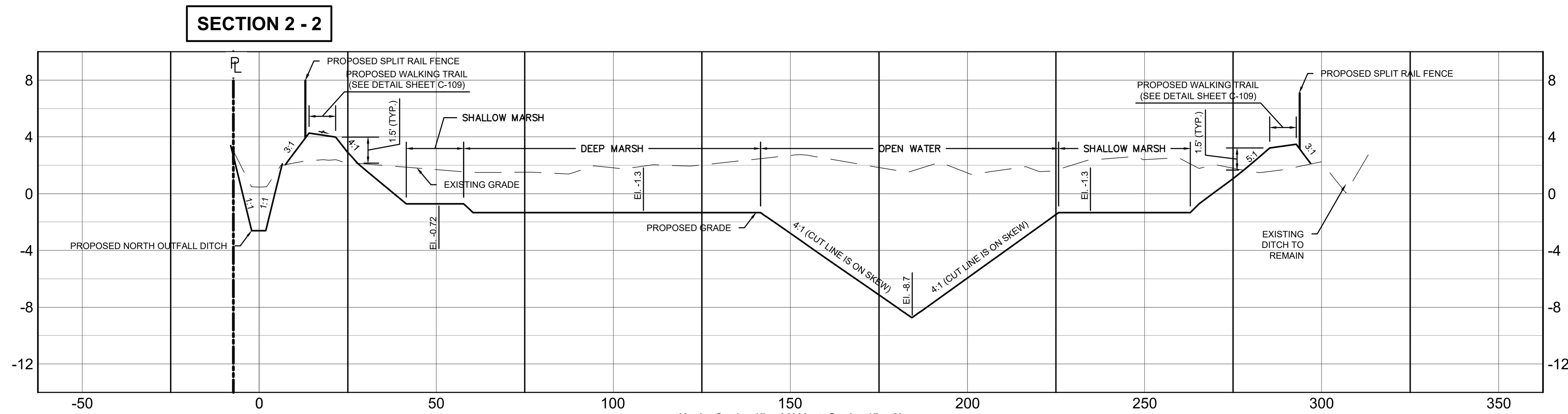


SECTION 5 - 5

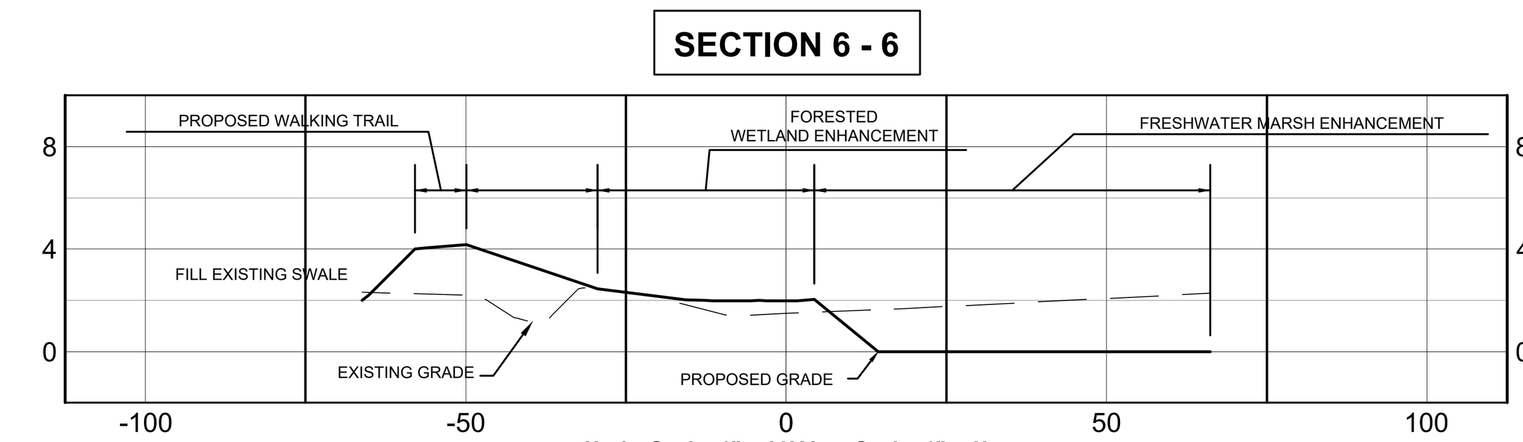


SEE SHEET C-101 FOR PLAN LOCATION

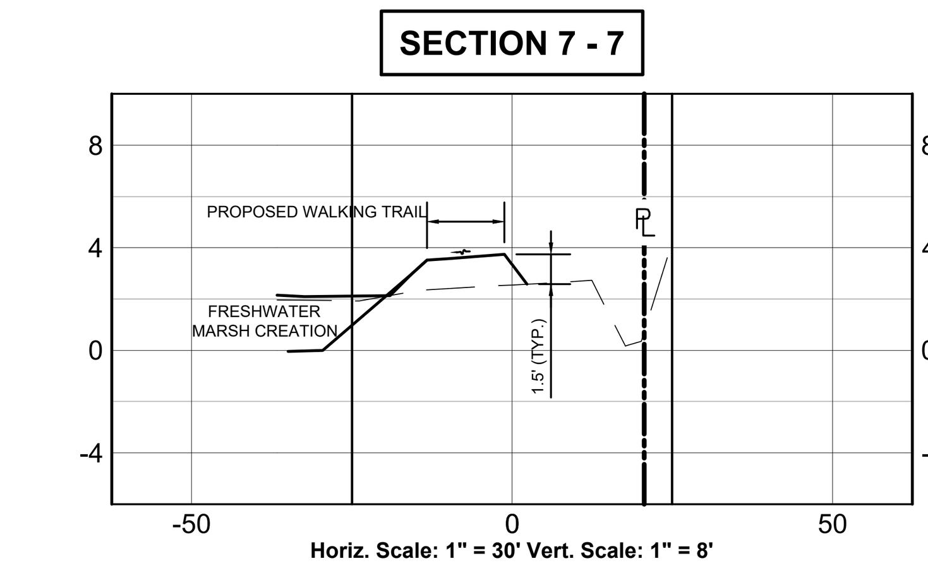
SECTION 2 - 2



SECTION 6 - 6



SECTION 7 - 7



NO.	REVISION	BY	DATE
1	ADDED FRESHWATER MARSH CROSS-SECTIONS	KWN	12/10/18

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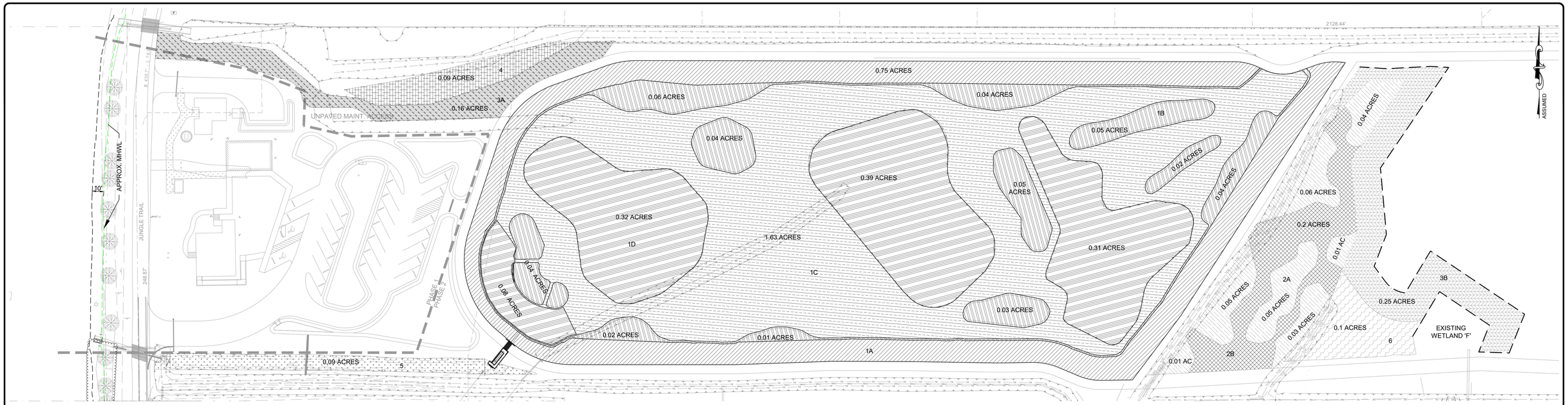
Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida
SITE PLAN
SALTMARSH CREATION GRADING PLAN

SHEET
C-102



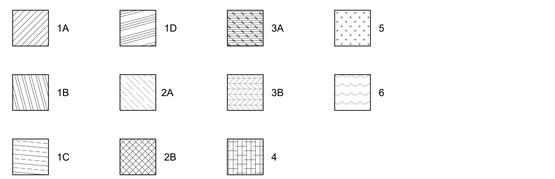
PLANTING SCHEDULE FOR CREATED AND RESTORED VEGETATIVE COMMUNITIES

Planting Zone	Size (acres)	Common Name	Scientific Name	Size [1]	% Cover [3]	# Plants	Spacing (o.c.)
1A Transitional Zone	0.75	Saltwort	*Batis maritima*	LN	10	363	3
		Sea oxeye	*Borrichia frutescens*	LN, 2"	5	182	3
		Saltgrass	*Distichlis spicata*	LN, 2"	10	363	3
		Tropical fimbry	*Fimbristylis cymosa*	LN	3	109	3
		Marsh fimbry	*Fimbristylis spadicea*	LN	3	109	3
		Marsh elder	*Iva frutescens*	LN	3	109	3
		Carolina sea lavender	*Limonium carolinianum*	LN	3	109	3
		Christmasberry	*Lycium carolinianum*	LN	5	109	3
		Knotgrass	*Paspalum distichum*	LN	15	545	3
		Seashore paspalum	*Paspalum vaginatum*	LN, 2"	20	726	3
		Sea purslane	*Sesuvium portulacastrum*	LN, 2"	10	363	3
		Seashore dropseed	*Sporobolus virginicus*	LN, 2"	5	182	3
		Sea blite	*Suaeda linearis*	LN	5	182	3
		Perennial saltmarsh aster	*Symphyotrichum tenuifolium*	LN	3	109	3
		Total			100	3560	N/A
1B Shallow Marsh	**0.40**	Saltwort	*Batis maritima*	LN	15	290	3
		Sea oxeye	*Borrichia frutescens*	LN, 2"	5	97	3
		Saltgrass	*Distichlis spicata*	LN, 2"	20	387	3
		Knotgrass	*Paspalum distichum*	LN	10	194	3
		Seashore paspalum	*Paspalum vaginatum*	LN	10	194	3
		Annual glasswort	*Salicornia bigelowii*	LN	20	387	3
		Perennial glasswort	*Salicornia virginica*	LN	20	387	3
		Total			100	1936	N/A
1C Deep Marsh	1.63	Black needlerush	*Juncus roemerianus*	LN, 2"	50	3945	3
		Smooth cordgrass	*Spartina alterniflora*	LN, 2"	50	3945	3
		Total			100	7890	N/A
1D Open Water [2]	1.10	Widgeon grass	*Ruppia maritima*	N/A	N/A	N/A	N/A
		Paddle grass	*Halophila decipiens*	N/A	N/A	N/A	N/A
		Turtle grass	*Thalassia testudinum*	N/A	N/A	N/A	N/A
		Manatee grass	*Syringodium filiforme*	N/A	N/A	N/A	N/A
		Shoal grass	*Halodule wrightii*	N/A	N/A	N/A	N/A
2 Enhancement Wetland	**2A Forested 0.25**	Cabbage Palm [5]	*Sabal palmetto*	N/A	N/A	20	10
		Live Oak	*Quercus virginiana*	7G	23	10	15
		Gumbo Limbo	*Bursera simaruba*	3G	19	8	15
		False Mastic	*Sideroxylon foetidissimum*	7G	17	7	15
		Leather fern	*Acrostichum danaefolium*	3G	30	50	8
		Saw palmetto	*Serenoa repens*	1G	20	35	8
		Beauty berry	*Callicarpa americana*	3G	18	30	8
		Snowberry	*Chiococca alba*	3G	15	25	8
		Marlberry	*Ardisia escalloniodes*	3G	18	30	8
		Total			N/A	215	N/A
	2B MARSH 0.2	Marsh cordgrass	*Spartina patens*	LN, 2"	20	194	3
		Knotgrass	*Paspalum distichum*	LN, 2"	10	97	3
		Saltgrass	*Distichlis spicata*	LN, 2"	10	97	3
		Sea-oxeye daisy	*Borrichia frutescens*	LN, 2"	10	97	3
		Wax myrtle	*Morella cerifera*	1G	5	48	3
		Saltmarsh mallow	*Kosteletzkya virginica*	1G	5	48	3
		Seaside goldenrod	*Solidago sempervirens*	6",1G	10	97	3
		Sweetscent	*Pluchea odorata*	2",4",6"	10	97	3
		Water hyssop	*Bacopa monnieri*	2",4",6"	5	48	3
		Leather fern	*Acrostichum danaefolium*	3G	10	97	3
		Sawgrass	*Cladium jamaicense*	2",4",6"	5	48	3
		Total				968	

Planting Zone	Size (acres)	Common Name	Scientific Name	Size	% Cover [3]	# Plants	Spacing (o.c.)
3 Upland Buffer	3A 0.16	Sea oxeye	*Borrichia frutescens*	LN, 2"	15	42	5
		Marsh hay cordgrass	*Spartina patens*	LN, 2"	15	42	5
		Snowberry	*Chiococca alba*	3G	30	20	10
		Beauty berry	*Callicarpa americana*	3G	40	30	10
		Scorpiontail	*Heliotropium angiospermum*	1G	15	45	5
		Loosestrife	*Lythrum alatum*	4"	20	50	5
		Marlberry	*Ardisia escalloniodes*	3G	60	15	15
		Scarlet sage	*Salvia coccinea*	2",4",6"	20	50	5
		Fiddlewood	*Citharexylum spinosum*	3G	40	12	15
		Carolina wildpetunia	*Ruellia caroliniensis*	4",G	20	50	5
		Varnish leaf	*Dodonaea viscosa*	3G	30	20	10
		Total			N/A	376	N/A
	3B 0.25	Sea oxeye	*Borrichia frutescens*	LN, 2"	14	60	5
		Marsh hay cordgrass	*Spartina patens*	LN, 2"	15	65	5
		Snowberry	*Chiococca alba*	3G	18	20	10
		Beauty berry	*Callicarpa americana*	3G	23	20	10
		Scorpiontail	*Heliotropium angiospermum*	1G	17	70	5
		Loosestrife	*Lythrum alatum*	4"	18	80	5
		Marlberry	*Ardisia escalloniodes*	3G	14	6	15
		Scarlet sage	*Salvia coccinea*	2",4",6"	18	80	5
		Fiddlewood	*Citharexylum spinosum*	3G	14	6	15
		Carolina wildpetunia	*Ruellia caroliniensis*	4",G	18	80	5
		Varnish leaf	*Dodonaea viscosa*	3G	23	25	10
		Sea grape	*Coccoloba uvifera*	1G	19	8	15
		Wild coffee	*Psychotria nervosa*	1G	36	40	10
		Wild lime	*Zanthoxylum fagara*	3G	7	3	15
		Live oak	*Quercus virginiana*	7G	19	8	15
		Jamaica caper	*Quadrella jamaicensis*	3G	5	5	10
		Satinleaf	*Chrysophyllum oliviforme*	3G	7	3	15
		Gumbo limbo	*Bursera simaruba*	3G	19	8	15
		Mastic	*Sideroxylon foetidissimum*	7G	14	6	15
		Total			N/A	**593**	N/A
4 Created Mangrove	**0.09**	Black mangrove	*Avicennia germinans*	1G	100	34	10
		Total			**100**	**34**	N/A
5 Influent Conveyance	**0.09**	Sea oxeye	*Borrichia frutescens*	LN, 2"	5	22	3
		Saltgrass	*Distichlis spicata*	LN, 2"	10	44	3
		Knotgrass	*Paspalum distichum*	LN	5	22	3
		Black needlerush	*Juncus roemerianus*	LN, 2"	40	174	3
		Smooth cordgrass	*Spartina alterniflora*	LN, 2"	40	174	3
		Total			N/A	**436**	N/A

Planting Zone	Size (acres)	Common Name	Scientific Name	Size	% Cover [3]	# Plants	Spacing (o.c.)
6 Created Wet Prairie	**0.10**	Marsh cordgrass	*Spartina patens*	LN, 2"	20	97	3
		Knotgrass	*Paspalum distichum*	LN, 2"	5	30	3
		Saltgrass	*Distichlis spicata*	LN, 2"	20	100	3
		Sea-oxeye daisy	*Borrichia frutescens*	LN, 2"	10	35	3
		Seaside goldenrod	*Solidago sempervirens*	6",1G	5	20	3
		Sweetscent	*Pluchea odorata*	LN, 2"	10	30	3
		Water hyssop	*Bacopa monnieri*	LN, 2"	20	95	3
		Sawgrass	*Cladium jamaicense*	LN, 2"	10	30	3
		Total			100	**437**	N/A
7 Perimeter Buffer [4]	**N/A**	Live oak	*Quercus virginiana*	7G	20	20	15
		Gumbo limbo	*Bursera simaruba*	3G	20	20	15
		Jamaica caper	*Quadrella jamaicensis*	3G	12	30	10
		Cabbage Palm [5]	*Sabal palmetto*	N/A	N/A	0	0
		Satinleaf	*Chrysophyllum oliviforme*	3G	10	10	15
		Varnish leaf	*Dodonaea viscosa*	3G	10	25	10
		Sea grape	*Coccoloba uvifera*	1G	20	20	15
		Buttonwood	*Conocarpus erectus*	3G	10	10	15
		Fiddlewood	*Citharexylum spinosum*	3G	12	12	15
		White Stopper	*Eugenia axillaris*	3G	10	25	10
		Firebush	*Hamelia patens*	1G	14	35	10
		Wild coffee	*Psychotria nervosa*	1G	26	65	10
		Marlberry	*Ardisia escalloniodes*	3G	15	15	15
		Cocoplum	*Chrsobalanus icaco*	1G	16	40	10
		Snowberry	*Chiococca alba*	3G	12	30	10
		Total			**100**	**357**	**N/A**

PLANTING ZONE HATCH LEGEND



PLANTS IN PLANTING ZONES 1&5 SHALL BE PROVIDED AND INSTALLED BY OTHERS.

* PLANTING NOTES ARE PROVIDED ON SHEET C-108 - PLANTING NOTES
1 = PLANT SIZE BASED ON AVAILABILITY - SMALLEST PLANT SIZE AVAILABLE TO BE UTILIZED BY CONTRACTOR.
2 = OPEN WATER AREAS TO BE VEGETATED BY INDIAN RIVER COUNTY
3 = PERCENT COVER MAY EXCEED 100% DUE TO STRATIFICATION OF PLANT MATERIALS.
4 = CLUSTERED PLANTINGS ALONG TRAIL TO BE FIELD FITTED BASED ON LOCATION(S) OF EXISTING TREES. LOCATIONS TO BE FIELD FITTED BASED ON EXISTING VEGETATION.
5 = CABBAGE PALMS TO BE TRANSPLANTED FROM EXISTING IMPACT AREAS.
6 = CONTRACTOR IS RESPONSIBLE FOR ERADICATING/REMOVING ALL BRAZILIAN PEPPER TREES FROM THE EXISTING MANGROVE WETLANDS (EAST OF JUNGLE TRAIL). BRAZILIAN PEPPER TREES ALONG THE PERIMETER OF THE WETLANDS MAY BE REMOVED MECHANICALLY IF THERE IS NO DISTURBANCE TO MANGROVES. CONTRACTOR TO MEET ON-SITE WITH COUNTY STAFF TO OUTLINE THE ACCEPTABLE METHODS FOR REMOVAL/TREATMENT OF BRAZILIAN PEPPER TREES WITHIN THE INTERIOR OF THE MANGROVES.

GRAPHIC SCALE
40 0 40 80 120
SCALE: (1 Inch = 40 Feet)

NO.	REVISION	BY	DATE
1			
2			
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5			

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John H. Blum, P.E.
FLORIDA LICENSE No. 45813
CARTER ASSOCIATES, INC.
SIGNATURE DATE
COA 205 / LB 205

DATE : Nov 2019
PROJ. # : 18-39e
DRAWN BY: KWN
APPD. BY : JHB
PLOT BY : Clint Rahjes
FILE NAME:
REF. # : 20585-C;17-345s
F.B. & PG. : 729/21+;850/56+

Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida

PLANTING PLAN

SHEET
C-103

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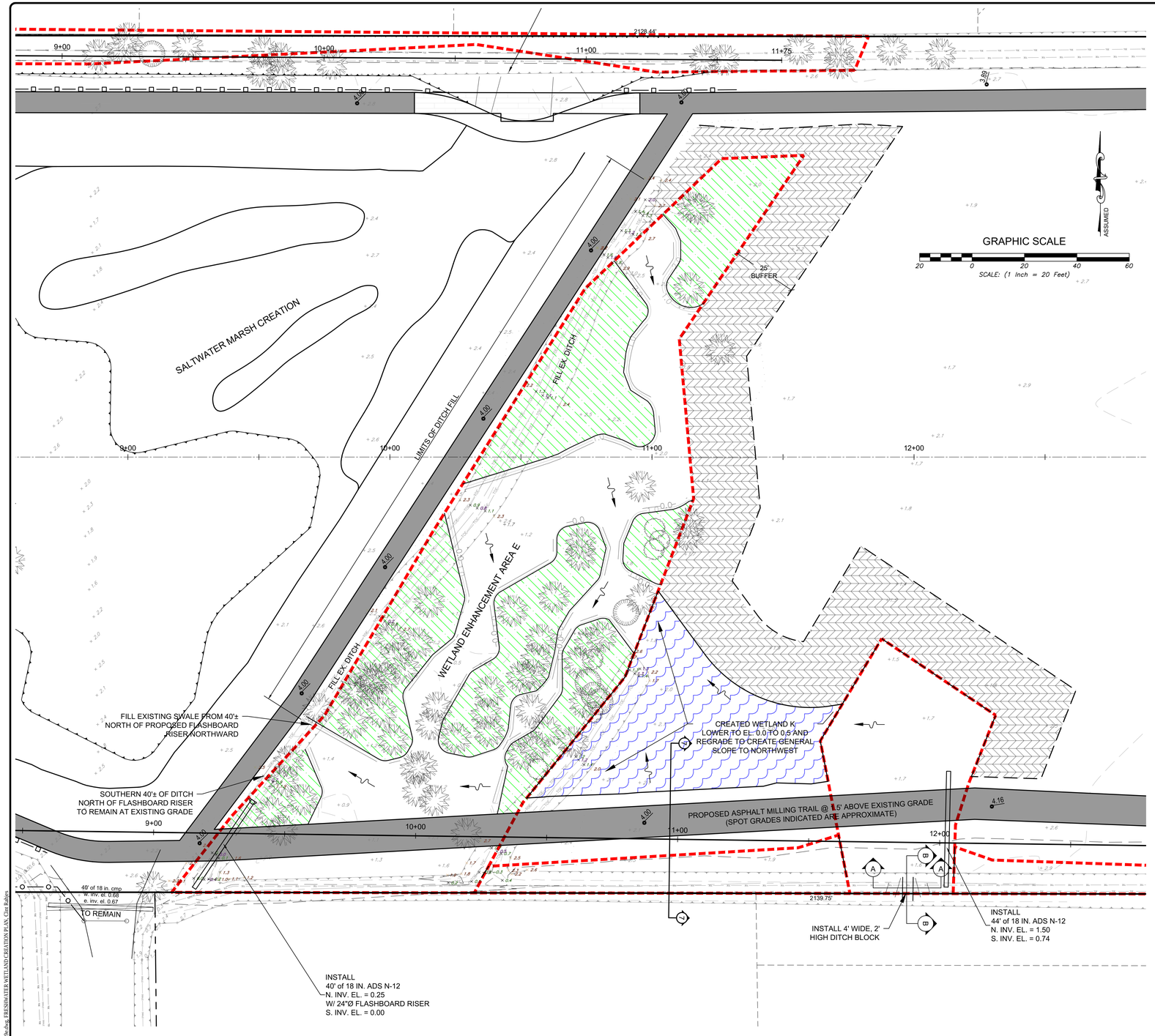
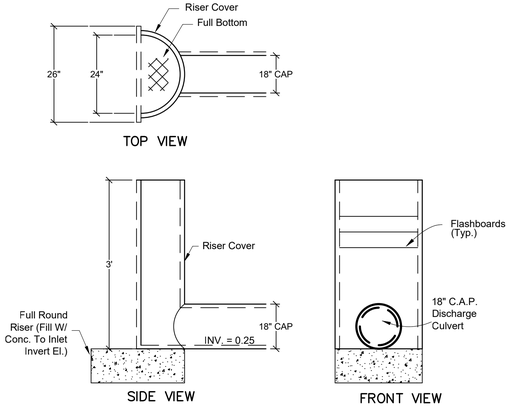
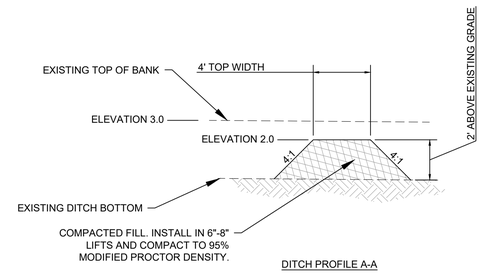
Nov 8, 19, 8:39 AM

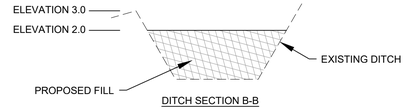




FLASHBOARD RISER DETAIL
NTS



DITCH PROFILE A-A



DITCH SECTION B-B

DITCH BLOCK DETAIL
NTS

HATCH LEGEND

ENHANCED AREA (11,012± SF 0.253± AC, 6"± AVERAGE FILL, PRESERVE EXISTING TREES)

CREATED WETLAND K (4,379± SF 0.100± AC) ROUGH GRADE TO EL. 0.5±

CREATED UPLAND BUFFER (10,898± SF 0.250± AC)

NOTE:
RE-GRADE NON-FILL SECTIONS OF WETLAND ENHANCEMENT AREA E (19,691± SF 0.452± AC, ROUGH GRADE NON-FILL AREAS TO EL. 0.0, PRESERVE EXISTING TREES)

SEE SHEET C-103 - PLANTING PLAN FOR PLANT SCHEDULE
SEE SHEET C-108 - PLANTING NOTES FOR PLANTING INFORMATION

NO.	REVISION	BY	DATE
6			
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F.B. & PG. : 729/21+;850/56+

Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida
Value
FRESHWATER WETLAND CREATION PLAN

SHEET
C-104

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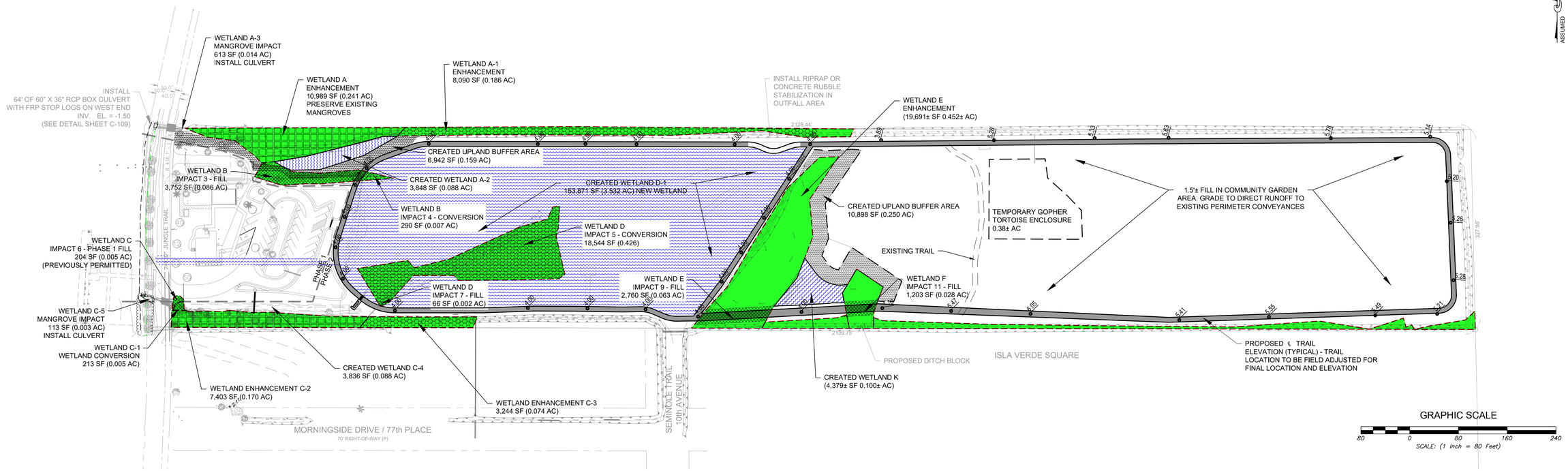

Existing Wetland Impact Summary Table

Wetland ID[1]	Community Type	Existing Size (Acres)	Permanent Wetland Impact (Acres)	Temporary Wetland Impact (Acres)	Wetland Conversion (Acres)	Post-Development Size (Acres)
A	Mangrove Surface	0.241	0.0	0.0	0.0	0.241
A-1	Water/Emergent Herbaceous Vegetation	0.186	0.0	0.0	0.0	0.186
A-3	Mangrove	0.014	0.004	0.01[3]	0.0	0.01
B	Mangrove	0.088	0.088	0.0	0.0	0.088[2]
C-1	Mangrove	0.005	0.0	0.005[3]	0.0	0.005
C-2	Mangrove	0.170	0.0	0.0	0.0	0.170
C-3	Surface Water/Emergent Herbaceous Vegetation	0.074	0.00	0.0	0.0	0.074
C-5	Mangrove	0.03	0.001	0.002[3]	0.0	0.029
D	Shrub/Exotic Dominated Wetland	0.426	0.0	0.0	0.426[4]	0.426[4]
E	Hydric Hammock/Brazilian Pepper	0.523	0.063	0.0	0.0	0.46
F	Wet Prairie/Shrub	0.10	0.028	0.0	0.0	0.072
J	Surface Water/Emergent Herbaceous Vegetation	0.172	0.0	0.0	0.0	0.172
Total		2.029	0.184	0.017	0.426	1.845

HATCH LEGEND

PROPOSED MANGROVE ENHANCEMENT
18,505± SF (0.425± AC)

PROPOSED HERBACEOUS ENHANCEMENT
11,344± SF (0.260± AC)

PROPOSED WETLAND IMPACT
8,645± SF (0.198± AC)

PROPOSED MANGROVE WETLAND CREATION: 3,848± SF (0.088± AC)

PROPOSED SALTMARSH CREATION: 172,705 SF (3.965± AC)

PROPOSED TRANSITIONAL WETLAND CREATION: 4,379 SF (0.1± AC)

EXISTING JURISDICTIONAL
WETLANDS
2.075± ACRES

1 = Refer to Sheet S-100 for the location of existing wetlands.
2 = Existing mangrove ditch to be relocated and re-vegetated adjacent to existing Wetland A.
3 = Temporary wetland impact - Area to be re-graded to facilitate re-establishment of mangroves.
4 = Existing shrub/exotic dominated wetland to be converted to saltmarsh/open water areas for improved habitat.
5 = Wet prairie to be created to connect existing wetlands E and F. Impact are of Wetland E is within cattail/willow dominated area.

FLORIDA GOPHER TORTOISE TEMPORARY EXCLUSION

A SMALL POPULATION OF FLORIDA GOPHER TORTOISES IS PRESENT ON SITE. THE COUNTY WILL OBTAIN THE REQUIRED PERMIT FROM THE FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (FWC) TO TEMPORARILY EXCLUDE TORTOISES FROM THE CONSTRUCTION AREAS TO PREVENT HARM TO TORTOISES. THE PROJECT PLANS PROVIDE THE APPROXIMATE LOCATION AND DIMENSIONS OF THE PROPOSED TORTOISE ENCLOSURE TO BE CONSTRUCTED BY THE CONTRACTOR. THE PROJECT BID SHOULD INCLUDE A COST PER FT ^{2}FOR THE CONSTRUCTION OF THE ENCLOSURE, AS WELL AS A LUMP SUM COST FOR COMPLETION ALL OTHER TASKS OUTLINED BELOW. SPECIFICATIONS FOR THE ENCLOSURE INCLUDE THE FOLLOWING:

(1) THE COUNTY SHALL COMPLETE THE RELOCATION OF THE TORTOISES BASED ON COORDINATION WITH THE CONTRACTOR ON THE APPROPRIATE SCHEDULE FOR THIS WORK. THE COUNTY WILL REQUIRE AT LEAST TWO WEEKS TO MOBILIZE AND COMPLETE THE RELOCATION.

(2) PEN SHALL BE CONSTRUCTED PRIOR TO THE INITIATION OF THE RELOCATION OF ANY TORTOISES OUTSIDE OF THE PEN, SO THAT COUNTY STAFF HAS SUFFICIENT TIME TO ASSESS THE PEN TO ENSURE THAT FWC REQUIREMENTS ARE MET.

(3) THE PEN SHALL CONSIST OF AN INNER ROW OF TRENCHED SILT FENCE (BELTON INDUSTRIES #935 OR EQUIVALENT). A 4' HIGH ORANGE SAFETY FENCE SHALL BE INSTALLED SURROUNDING THE SILT FENCING WITH A GAP OF AT LEAST FOUR FEET BETWEEN FENCES. THE SILT FENCE SHALL BE TRENCHED AT LEAST 8 INCHES INTO THE GROUND TO PREVENT TORTOISE ESCAPE.

(4) THE CONTRACTOR SHALL COMPLETE EARTHWORK IN AREAS OF THE PROJECT TO THE EAST OF THE ENHANCED FORESTED HAMMOCK PRIOR TO THE REMOVAL OF THE SILT FENCE. AS PART OF THE EARTHWORK THE CONTRACTOR SHALL STOCK PILE SUFFICIENT FILL TO BRING THE GOPHER TORTOISE PEN AREA TO THE SAME GRADE AS SURROUNDING FILLED AREAS.

(5) UPON COMPLETION OF THE EARTHWORK THE CONTRACTOR WILL HYDROSEED THE AREA WITH MATERIAL TO BE PROVIDED BY THE COUNTY. IT IS THE COUNTY'S DESIRE TO HAVE THE HYDROSEED COMPLETED SO THAT THE MAXIMUM AMOUNT OF TIME IS ALLOWED FOR ESTABLISHMENT OF PLANTS PRIOR TO THE RELEASE OF THE TORTOISES BACK ONTO FILLED AREAS.

(6) UPON COMPLETION OF THE EARTHWORK EAST OF THE ENHANCED FORESTED WETLAND (WITH THE EXCEPTION OF STOCK PILED FILL DETAILED IN (4), ABOVE, COUNTY STAFF WILL COORDINATE WITH THE CONTRACTOR ON THE SCHEDULE TO EXCAVATE THE TORTOISES FROM THE PEN AREA AND PLACE THEM IN A TEMPORARY HOLDING ENCLOSURE. COUNTY STAFF WILL ARRANGE FOR LABOR AND EQUIPMENT REQUIRED FOR THE EXCAVATION OF THE TORTOISES.

(7) UPON EXCAVATION AND TEMPORARY PENNING OF THE TORTOISES THE CONTRACTOR SHALL FILL AND HYDROSEED THE AREA WHERE THE TORTOISES WERE INITIALLY PENNED.

(8) THE COUNTY WILL PROVIDE SIGNAGE TO BE PLACED ON SITE OUTLINING THE PROTECTION MEASURES FOR GOPHER TORTOISES ON SITE, AND WILL COORDINATE WITH THE CONTRACTOR ON THE LOCATIONS(S) FOR THIS SIGNAGE.

NO.	REVISION	BY	DATE
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1	ADDED CULVERT IMPACTS PER SJRWMD	KWN	12/13/18

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John H. Blum, P.E.
FLORIDA LICENSE No. 45813
CARTER ASSOCIATES, INC.
SIGNATURE DATE
COA 205 / LB 205

DATE : Nov 2019
PROJ. # : 18-39e
DRAWN BY: KWN
APPD. BY : JHB
PLOT BY : Clint Rahjes
FILE NAME :
REF. # : 20585-C;17-345s
F.B. & PG. : 729/21+;850/56+

Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida

PROPOSED WETLAND IMPACTS

SHEET
C-105

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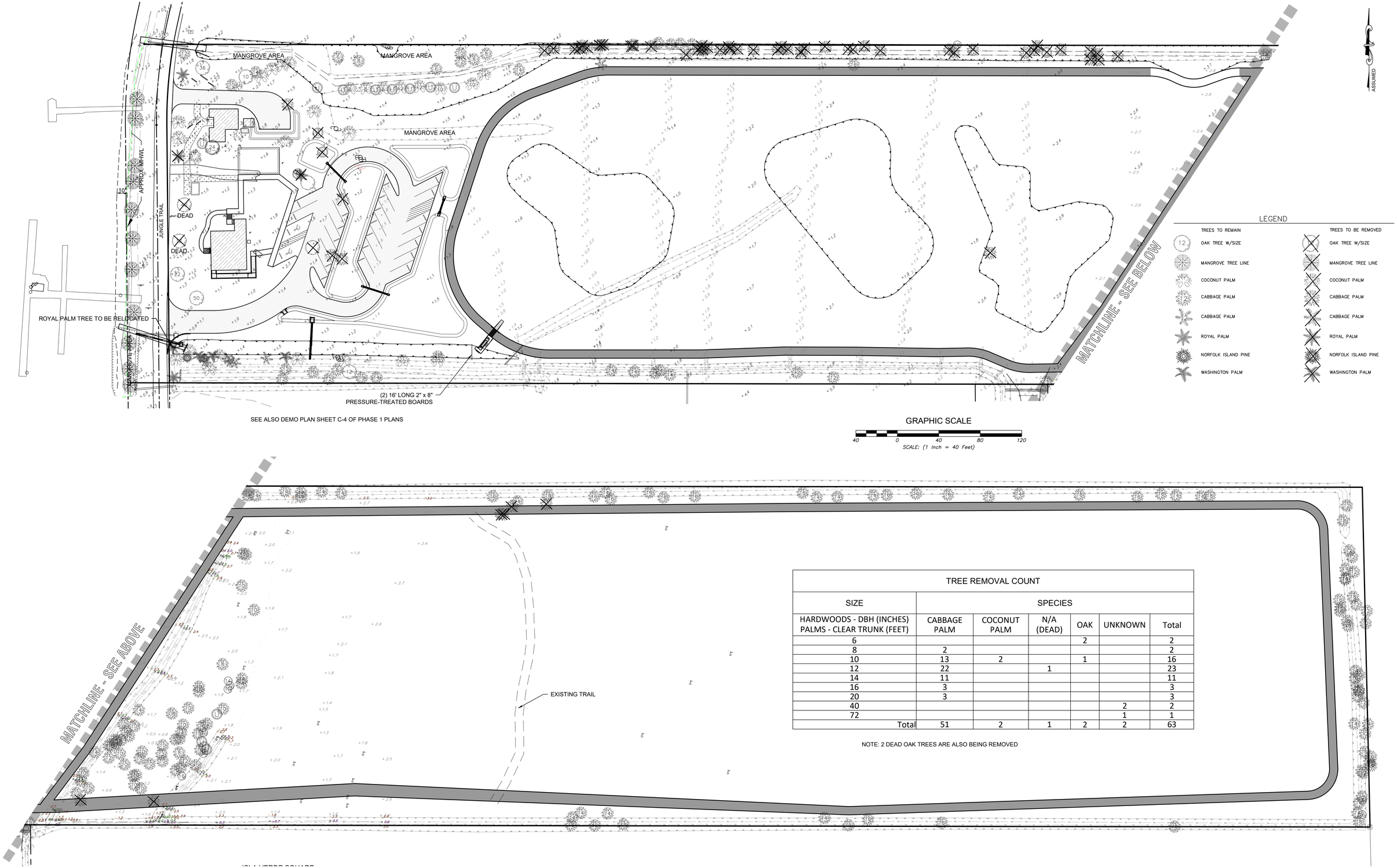

SEE ALSO DEMO PLAN SHEET C-4 OF PHASE 1 PLANS

GRAPHIC SCALE

40 0 40 80 120

SCALE: (1 Inch = 40 Feet)

LEGEND

TREES TO REMAIN	TREES TO BE REMOVED
OAK TREE W/SIZE	OAK TREE W/SIZE
MANGROVE TREE LINE	MANGROVE TREE LINE
COCONUT PALM	COCONUT PALM
CABBAGE PALM	CABBAGE PALM
CABBAGE PALM	CABBAGE PALM
ROYAL PALM	ROYAL PALM
NORFOLK ISLAND PINE	NORFOLK ISLAND PINE
WASHINGTON PALM	WASHINGTON PALM

TREE REMOVAL COUNT

SIZE	SPECIES					
HARDWOODS - DBH (INCHES) PALMS - CLEAR TRUNK (FEET)	CABBAGE PALM	COCONUT PALM	N/A (DEAD)	OAK	UNKNOWN	Total
6				2		2
8	2					2
10	13	2		1		16
12	22		1			23
14	11					11
16	3					3
20	3					3
40					2	2
72					1	1
Total	51	2	1	2	2	63

NOTE: 2 DEAD OAK TREES ARE ALSO BEING REMOVED

NO.	REVISION	BY	DATE
1			
2			
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6			

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John H. Blum, P.E. SIGNATURE DATE
FLORIDA LICENSE No. 45813
CARTER ASSOCIATES, INC. COA 205 / LB 205

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REF. # : 20585-C;17-345s
F.B. & PG. : 729/21+;850/56+

Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida
Value
TREE REMOVAL PLAN

SHEET
C-106

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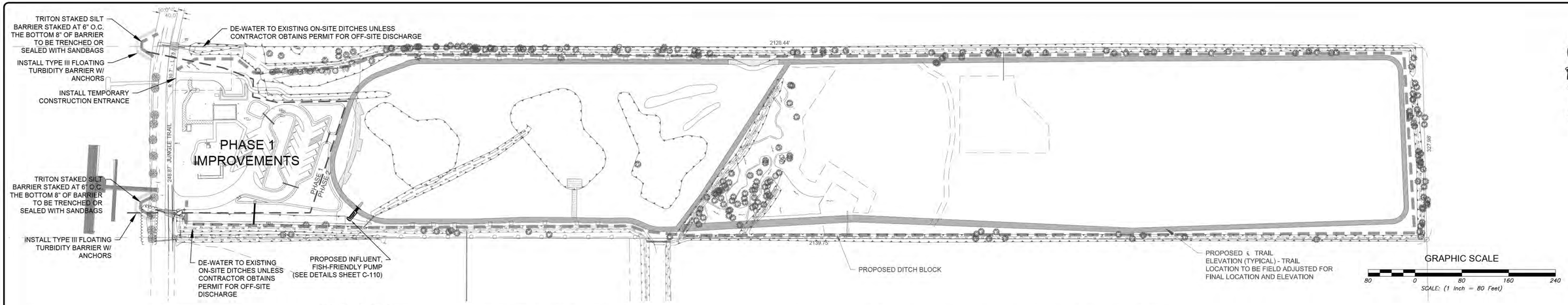
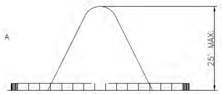
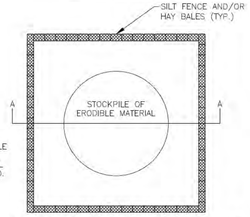


NOTE:
ALL STOCKPILES SHALL BE A MAXIMUM OF 25' HIGH.



SECTION A–A



NOTE:
FOR STOCKPILING ERODIBLE MATERIAL FOR EXTENDED PERIODS, THE AREA SHALL BE SEEDED AND MULCHED.

SEDIMENT CONTROL DETAIL FOR STOCKPILING OF ERODIBLE MATERIAL–N.T.S.

LEGEND

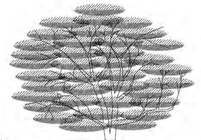
SILT FENCING

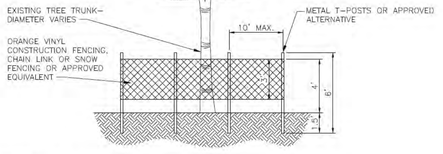
FLOATING TURBIDITY BARRIER

Sampling average for Sampling within the Work Zone:
Samples will be taken within the mixing zone and outside the mixing zone during the entire project by the contractor or water monitoring company.
The samples shall be taken if any noticeable turbid water, foam, oily substance, run-off from work area, after a rain event and during dredge operation. Or at Counties discretion during the project to maintain permit compliance within an Outstanding Florida Waters.
All testing shall be documented on Field Sample Log and kept by the Contractor, engineer, or appropriate staff. The samples must follow F.D.E.P. Standard Operating Procedures.
Back ground samples shall be taken and recorded on record prior to contractor start-up. At separate locations within the work zone.

The results of those samples show the following averages to be followed:

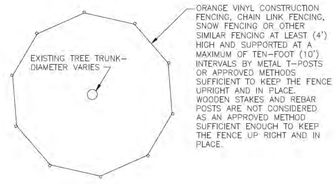
(1) Turbidity samples taken within the mixing zone should not exceed = 29 NTUs above background and must be allowed to settle prior to turbidity barrier being removed at end of work day to meet the background sample.
(2) Turbidity sample taken Outside the mixing zone Shall not exceed =0 NTUs. Above Background up-stream. Tide influenced. Low tide background taken to north of work zone, Hightide background taken to south of work zone.
(3) Samples for pH shall not exceed 7.85 or go below 7.00 outside the mixing zone.
(4) Samples for pH within the mixing zone shall not exceed 8.50 or go below 6.50 at any time.
If above measurements exceed the above chart work needs to stop and another sample should be taken within the hour. Water quality needs to be re-evaluated for compliance. Also, the active site area shall be inspected by County engineer for any possible issues causing the problem. Those issues need to be addressed by the contractor before they can proceed with any further work. The Contractor must implement and maintain any BMPs necessary to address any turbidity or pH issues.





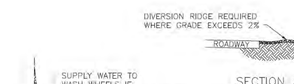
ELEVATION

NOTES:
1. ALL TREES RETAINED ON A SITE SHALL BE PROTECTIVELY BARRICADED BEFORE AND DURING CONSTRUCTION ACTIVITIES.
2. UNDERGROUND UTILITY LINES SHALL BE ROUTED AROUND EXISTING TREES TO THE OUTSIDE OF THE DRIPLINE WHERE ABLE.
3. INSTALLATION OF FENCES AND WALLS SHALL TAKE INTO CONSIDERATION THE ROOT SYSTEMS OF EXISTING TREES.
4. FENCE/BARRICADE SHALL BE INSTALLED AT PERIMETER OF ALL TRESS OR GROUP OF TREES TO BE PRESERVED. FENCE SHALL BE MAINTAINED DURING CONSTRUCTION.
5. DO NOT PARK HEAVY EQUIPMENT ON TREE ROOTS. DO NOT ADD FILL 4" TO 6" AROUND TREE. ALL WORK WITHIN THE CRZ MUST BE DONE BY HAND.

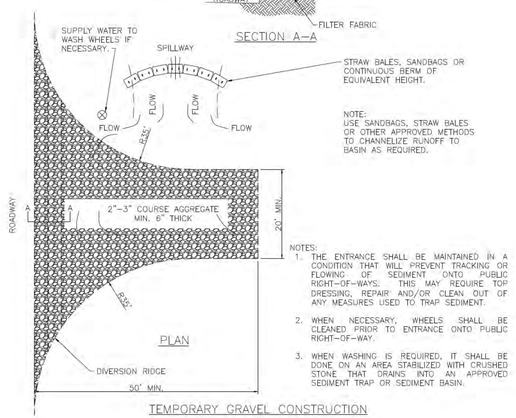


PLAN

PROTECTIVE FENCING FOR TREES–N.T.S.



SECTION A–A



NOTE:
USE SANDBAGS, STRAW BALES OR OTHER APPROVED METHODS TO CHANNELIZE RUNOFF TO BASIN AS REQUIRED.

PLAN

NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAYS; THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT–N.T.S.

EROSION CONTROL NOTES

1. Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land disturbing activity and shall be made functional before up–slope land disturbance takes place.

2. All sediment control measures are to be adjusted to meet field conditions at the time of construction and be constructed prior to any grading or disturbance of existing surface material on balance of site. Perimeter sediment barriers shall be constructed to prevent sediment or trash from flowing or floating on to adjacent properties.

3. Permanent or temporary soil stabilization shall be applied to denuded areas within seven (7) days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven (7) days to denuded areas that may not be at final grade but will remain undisturbed for longer than 30 days. Permanent stabilization shall be applied to areas that are to be left undisturbed for more than one year.

4. During construction of the project, soil stock piles shall be stabilized, covered or contained with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as soil intentionally transported from the project site.

5. A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized.

6. After any significant rainfall, sediment control structures will be inspected for integrity. Any damaged devices shall be corrected immediately.

7. Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume, slope drain structure or approved control.

8. Sediment will be prevented from entering any storm water system, ditch or channel. All storm water inlets that are made operable during construction shall be protected so that sediment–laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

9. When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction.

10. Periodic inspection and maintenance of all sediment control structures must be provided to ensure intended purpose is accomplished. The developer, owner and/or contractor shall be continually responsible for all sediment controls. Sediment control measures shall be in working condition at the end of each working day.

11. Where construction vehicle access routes intersect paved public roads, provisions shall be made to minimize the transport of sediment by tracking onto the paved surface. Where sediment is transported onto a public road surface with curbs and gutters, the road shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual subdivision lots as well as to larger land disturbing activities.

12. All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed.

13. Properties and waterways downstream from construction sites shall be protected from sediment deposition and erosion at all times during construction.

14. Erosion control design and construction shall follow the requirements in index numbers 101, 102 and 103 of F.D.O.T. Roadway and Traffic Design Standards and county permits.

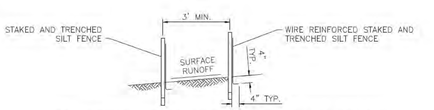
15. Contractor is responsible for all surface water discharges, rainfall runoff or dewatering activities and any permits necessary for dewatering.

16. Contractor must incorporate all BMP's necessary to meet or exceed state water quality and SWPPP requirements.

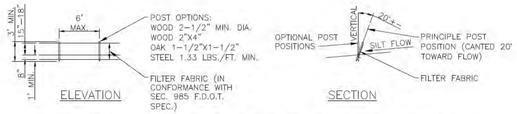
17. The Pollution Prevention Plan is a minimum guideline only. Additional BMP's may be necessary at contractor's expense.

18. NOI to be posted on site.

19. Dewatering activities:
- ***A – Discharge must not exceed state water quality standards.***
- ***B – Contractor must have a transferable SJRWMD Consumptive Use Permit known as a "Noticed General Permit For Short Term Construction De–Watering".***
- ***C – No hydraulic pumps may be used for dewatering unless approved by the water management district for that area.***
- ***D – No turbid discharge. Turbidity readings are required once a week and must be reported to the project engineer.***



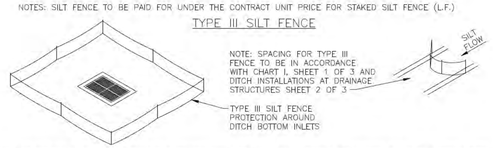
DOUBLE ROW STAKED SILT FENCE FOR USE AROUND WETLANDS–N.T.S.



ELEVATION SECTION

NOTES: SILT FENCE TO BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR STAKED SILT FENCE (L.F.)

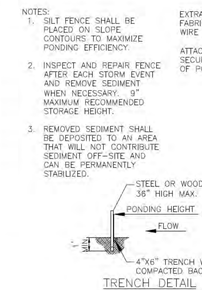
TYPE III SILT FENCE



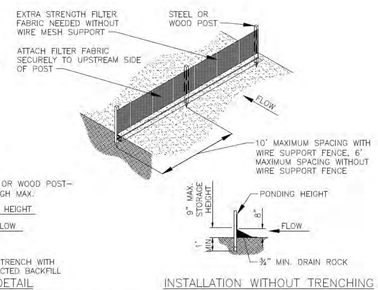
DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

SILT FENCE APPLICATIONS–N.T.S.

NOTES:
1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" MAXIMUM RECOMMENDED STORAGE HEIGHT.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF–SITE AND CAN BE PERMANENTLY STABILIZED.

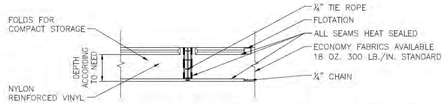


TRENCH DETAIL



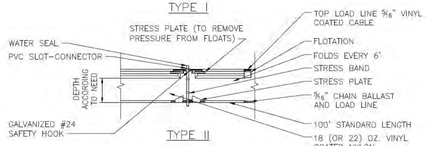
INSTALLATION WITHOUT TRENCHING

TYPE IV SILT FENCE–N.T.S.



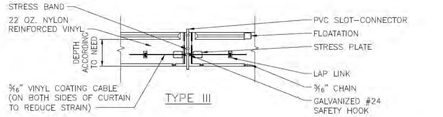
TYPE I. DOT FOR WATERS WITH LOW CURRENTS (NO MORE THAN ONE FOOT PER SECOND) AND LIGHT WINDS: LAKES, PONDS, SMALL STREAMS, MARSHES. FLEXIBLE TOP FLOTATION SECTION WITH ENCAPSULATED EPS FOAM FLOTATION LOGS (6"X6"X4')

TYPE I



TYPE 2. DOT FOR HIGHER CURRENT WATERS (UP TO FIVE FEET PER SECOND): DEEPER LAKES, STREAMS, INTERCOASTAL AND TIDAL AREAS. INCLUDES AN ENCAPSULATED STEEL LOAD CABLE ALONG TOP OF BARRIER AND 8"X8"X4' FLOTATION LOGS. WEAR STRESS POINTS ARE REINFORCED WITH SHIELDS.

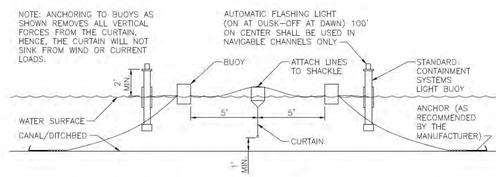
TYPE II



TYPE 3. DOT IS SIMILAR TO TYPE 2. DOT EXCEPT THAT POLYPROPYLENE FILTER FABRIC IS PERMANENTLY INSERTED INTO THE BARRIER SKIRT TO MEET SOME STATE'S SPECIFICATIONS.

TYPE III

BLOW–UP OF SHACKLE CONNECTION



FLOATING TURBIDITY CURTAIN (TIDAL SITUATION–TYPE III)–N.T.S.

F:\18-39 Jones Pier\Dwg\18-39e.dwg, EROSION CONTROL PLAN, Clint Rahjes
Nov 8, 2019 8:39 AM

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John H. Blum, P.E. SIGNATURE DATE
FLORIDA LICENSE No. 45813
CARTER ASSOCIATES, INC. COA 205 / LB 205

DATE : Nov 2019
PROJ. # : 18-39e
DRAWN BY: KWN
APPD. BY : JHB
PLOT BY : Clint Rahjes
FILE NAME :
REF. # : 20585-C;17-345s
F.B. & PG. : 729/21+;850/56+

Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida

EROSION CONTROL PLAN

SHEET
C-107

PART 1 - GENERAL

1.1 PRE-CONSTRUCTION CONFERENCE

A. SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE OWNER'S REPRESENTATIVE AT LEAST SEVEN (7) DAYS BEFORE BEGINNING WORK TO REVIEW ANY QUESTIONS THE CONTRACTOR MAY HAVE REGARDING THE WORK, ADMINISTRATIVE PROCEDURES DURING CONSTRUCTION AND PROJECT WORK SCHEDULE.

1.2 PLANT WARRANTY

A. PLANT WARRANTY:

1. THE CONTRACTOR AGREES TO REPLACE DEFECTIVE WORK AND DEFECTIVE PLANTS. THE OWNER'S REPRESENTATIVE SHALL MAKE THE FINAL DETERMINATION IF PLANTS MEET THESE SPECIFICATIONS OR THAT PLANTS ARE DEFECTIVE.
2. ALL PLANTS SHALL BE WARRANTIED TO MEET ALL THE REQUIREMENTS FOR PLANT QUALITY AT INSTALLATION IN THIS SPECIFICATION. DEFECTIVE PLANTS SHALL BE DEFINED AS PLANTS NOT MEETING THESE REQUIREMENTS. THE OWNER'S REPRESENTATIVE SHALL MAKE THE FINAL DETERMINATION THAT PLANTS ARE DEFECTIVE.
3. PLANTS DETERMINED TO BE DEFECTIVE SHALL BE REMOVED IMMEDIATELY UPON NOTIFICATION BY THE OWNER'S REPRESENTATIVE AND REPLACED WITHOUT COST TO THE OWNER, AS SOON AS WEATHER CONDITIONS PERMIT AND WITHIN THE SPECIFIED PLANTING PERIOD.

1.3 SELECTION AND OBSERVATION OF PLANTS

A. THE OWNER'S REPRESENTATIVE MAY REVIEW ALL PLANTS SUBJECT TO APPROVAL OF SIZE, HEALTH, QUALITY, CHARACTER, ETC.

B. PLANT SELECTION: THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO SELECT AND OBSERVE ALL PLANTS AT THE NURSERY PRIOR TO DELIVERY AND TO REJECT PLANTS THAT DO NOT MEET SPECIFICATIONS AS SET FORTH IN THIS SPECIFICATION.

1.4 PLANT SUBSTITUTIONS FOR PLANTS NOT AVAILABLE

A. SUBMIT ALL WRITTEN REQUESTS FOR SUBSTITUTIONS OF PLANT SPECIES, OR SIZE TO THE OWNER'S REPRESENTATIVE, FOR APPROVAL, PRIOR TO PURCHASING THE PROPOSED SUBSTITUTION.

1.5 PLANTING AROUND UTILITIES

A. CONTRACTOR SHALL CAREFULLY EXAMINE THE CIVIL, RECORD, AND SURVEY DRAWINGS TO BECOME FAMILIAR WITH THE EXISTING UNDERGROUND CONDITIONS BEFORE DIGGING.

B. DETERMINE LOCATION OF UNDERGROUND UTILITIES AND PERFORM WORK IN A MANNER THAT WILL AVOID POSSIBLE DAMAGE. HAND EXCAVATE, AS REQUIRED. MAINTAIN GRADE STAKES SET BY OTHERS UNTIL PARTIES CONCERNED MUTUALLY AGREE UPON REMOVAL.

PART 2 - PRODUCTS

2.1 PLANTS: GENERAL

A. STANDARDS AND MEASUREMENT: PROVIDE PLANTS OF QUANTITY, SIZE, GENUS, SPECIES, AND VARIETY OR CULTIVARS AS SHOWN AND SCHEDULED IN CONTRACT DOCUMENTS.

1. ALL PLANTS INCLUDING THE ROOT BALL DIMENSIONS OR CONTAINER SIZE TO TRUNK CALIPER RATIO SHALL CONFORM TO ANSI Z60.1 “AMERICAN STANDARD FOR NURSERY STOCK” LATEST EDITION, UNLESS MODIFIED BY THE APPROVED DRAWINGS.
2. PLANTS LARGER THAN SPECIFIED MAY BE USED IF ACCEPTABLE TO THE OWNER'S REPRESENTATIVE. USE OF SUCH PLANTS SHALL NOT INCREASE THE CONTRACT PRICE.

B. PROPER IDENTIFICATION: ALL TREES SHALL BE TRUE TO NAME AS ORDERED OR SHOWN ON PLANTING PLANS AND SHALL BE LABELED INDIVIDUALLY OR IN GROUPS BY GENUS, SPECIES, VARIETY AND CULTIVAR.

C. COMPLIANCE: ALL TREES SHALL COMPLY WITH FEDERAL AND STATE LAWS AND REGULATIONS REQUIRING OBSERVATION FOR PLANT DISEASE, PESTS, AND WEEDS.

D. PLANT QUALITY:

1. **GENERAL**: PROVIDE HEALTHY STOCK, GROWN IN A NURSERY AND REASONABLY FREE OF DIE-BACK, DISEASE, INSECTS, EGGS, BORES, AND LARVAE. AT THE TIME OF PLANTING ALL PLANTS SHALL HAVE A ROOT SYSTEM, STEM, AND BRANCH FORM THAT WILL NOT RESTRICT NORMAL GROWTH, STABILITY AND HEALTH OF THE PLANT.
2. **PLANT QUALITY ABOVE THE SOIL LINE:**
   a. PLANTS SHALL BE HEALTHY WITH THE COLOR, SHAPE, SIZE AND DISTRIBUTION OF TRUNK, STEMS, BRANCHES, BUDS AND LEAVES NORMAL TO THE PLANT TYPE SPECIFIED. TREE QUALITY ABOVE THE SOIL LINE SHALL COMPLY WITH THE FLORIDA GRADES AND STANDARDS, TREE GRADE FLORIDA FANCY OR FLORIDA #1) AND THE FOLLOWING:
   1.) CROWN: THE FORM AND DENSITY OF THE CROWN SHALL BE TYPICAL FOR A YOUNG SPECIMEN OF THE SPECIES OR CULTIVAR PRUNED TO A CENTRAL AND DOMINANT LEADER.
   2.) LEAVES: THE SIZE, COLOR, AND APPEARANCE OF LEAVES SHALL BE TYPICAL FOR THE TIME OF YEAR AND STAGE OF GROWTH OF THE SPECIES OR CULTIVAR. TREES SHALL NOT SHOW SIGNS OF PROLONGED MOISTURE STRESS OR OVER WATERING AS INDICATED BY WILTED, SHRIVELED, OR DEAD LEAVES.
   3.) BRANCHES: SHOOT GROWTH (LENGTH AND DIAMETER) THROUGHOUT THE CROWN SHOULD BE APPROPRIATE FOR THE AGE AND SIZE OF THE SPECIES OR CULTIVAR. TREES SHALL NOT HAVE DEAD, DISEASED, BROKEN, DISTORTED, OR OTHERWISE INJURED BRANCHES.
   4.) TRUNK: THE TREE TRUNK SHALL BE RELATIVELY STRAIGHT, VERTICAL, AND FREE OF WOUNDS THAT PENETRATE TO THE WOOD (PROPERLY MADE PRUNING CUTS, CLOSED OR NOT, ARE ACCEPTABLE AND ARE NOT CONSIDERED WOUNDS), SUNBURNED AREAS, CONKS (FUNGAL FRUITING BODIES), WOOD CRACKS, SAP LEAKAGE, SIGNS OF BORING INSECTS, GALLS, CANKERS, GIRDLING TIES, OR LESIONS (MECHANICAL INJURY).
   5.) TEMPORARY BRANCHES, UNLESS OTHERWISE SPECIFIED, CAN BE PRESENT ALONG THE LOWER TRUNK BELOW THE LOWEST MAIN (SCAFFOLD) BRANCH, PARTICULARLY FOR TREES LESS THAN 1 INCH IN CALIPER. THESE BRANCHES SHOULD BE NO GREATER THAN 3/8-INCH DIAMETER.
   b. TREES SHALL HAVE ONE CENTRAL LEADER. IF THE LEADER WAS HEADED, A NEW LEADER (WITH A LIVE TERMINAL BUD) AT LEAST ONE-HALF THE DIAMETER OF THE PRUNING CUT SHALL BE PRESENT.
3. **PLANT QUALITY AT OR BELOW THE SOIL LINE:**
   a. PLANT ROOTS SHALL BE NORMAL TO THE PLANT TYPE SPECIFIED.
   b. THE ROOTS SHALL BE REASONABLY FREE OF SCRAPES, BROKEN OR SPLIT WOOD.
   c. THE ROOT SYSTEM SHALL BE REASONABLE FREE OF INJURY FROM INSECTS, PATHOGENS, HERBICIDE, AND WOUNDS FROM PRUNING.
4. **CONTAINER GROWN PLANTS**
   A.) CONTAINER PLANTS MAY BE PERMITTED ONLY WHEN INDICATED ON THE DRAWING.
   B.) PROVIDE PLANTS SHALL BE ESTABLISHED AND WELL ROOTED IN REMOVABLE CONTAINERS.
   C.) CONTAINER CLASS SIZE SHALL CONFORM TO ANSI Z60.1 FOR EACH SIZE AND TYPE OF PLANT.
5. **BARE ROOT PLANTS**
   A.) HARVEST BARE ROOT PLANTS WHILE THE PLANT IS DORMANT AND A MINIMUM OF 4 WEEKS PRIOR TO LEAF OUT (BUD BREAK).
   B.) THE ROOT SPREAD DIMENSIONS OF THE HARVESTED PLANTS SHALL CONFORM TO ANSI Z60.1 FOR NURSERY GROWN BARE ROOT PLANTS FOR EACH SIZE AND TYPE OF PLANT.
6. **PALMS**
   1.) IN PREPARING PALM TREES FOR RELOCATION, ALL DEAD FRONDS SHALL BE REMOVED.
   2.) ALL REMAINING FRONDS ABOVE HORIZONTAL SHALL BE LIFTED UP AND TIED TOGETHER AROUND THE CROWN IN AN UPRIGHT POSITION. UP TO 2/3 OF THE OLDEST LIVE FRONDS CAN BE REMOVED; ALL FRONDS CAN BE REMOVED ON SABAL PALMS.
   3.) WHEN DIGGING OUT THE ROOT BALL, NO EVACUATION SHALL BE DONE CLOSER THAN 24 INCHES TO THE TRUNK AT GROUND LEVEL AND THE EXCAVATION SHALL EXTEND BELOW THE MAJOR ROOT SYSTEM TO A MINIMUM DEPTH OF 3.5 FEET.
   4.) THE BOTTOM OF THE ROOT BALL SHALL BE CUT OFF SQUARE AND PERPENDICULAR TO THE TRUNK BELOW THE MAJOR ROOT SYSTEM.
   5.) THE CONTRACTOR SHALL NOT FREE-FALL, DRAG, ROLL OR ABUSE THE TREE OR PUT A STRAIN ON THE CROWN (BUD AREA) AT ANY TIME. A PROTECTIVE DEVICE SHALL BE USED AROUND THE TRUNK OF THE TREE WHILE LIFTING AND RELOCATING SO AS NOT TO INJURE THE BUD, OR SCAR OR SKIN THE TRUNK IN ANY WAY.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE AND HANDLING

A. PROTECT MATERIALS FROM DETERIORATION DURING DELIVERY AND STORAGE. ADEQUATELY PROTECT PLANTS FROM DRYING OUT, EXPOSURE OF ROOTS TO SUN, WIND OR EXTREMES OF HEAT AND COLD TEMPERATURES.

B. DO NOT DELIVER MORE PLANTS TO THE SITE THAN THERE IS SPACE WITH ADEQUATE STORAGE CONDITIONS. PROVIDE A SUITABLE REMOTE STAGING AREA FOR PLANTS AND OTHER SUPPLIES.

3.2 COORDINATION WITH PROJECT WORK

A. THE CONTRACTOR SHALL COORDINATE WITH ALL OTHER WORK THAT MAY IMPACT THE COMPLETION OF THE WORK.

B. COORDINATE THE RELOCATION OF ANY IRRIGATION LINES, HEADS OR THE CONDUITS OF OTHER UTILITY LINES THAT ARE IN CONFLICT WITH TREE LOCATIONS. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY CONFLICTS ENCOUNTERED.

3.3 PLANTING

A. FOR TREES TO BE PLANTED IN PREPARED PLANTING SOIL THAT IS DEEPER THAN THE ROOT BALL DEPTH, COMPACT THE SOIL UNDER THE ROOT BALL USING A MECHANICAL TAMPER TO ASSURE A FIRM BEDDING FOR THE ROOT BALL.

B. SET TOP OUTER EDGE OF THE ROOT BALL AT THE AVERAGE ELEVATION OF THE PROPOSED FINISH. SET THE PLANT PLUMB AND UPRIGHT IN THE CENTER OF THE PLANTING HOLE.

C. BACKFILL THE SPACE AROUND THE ROOT BALL WITH THE SAME PLANTING SOIL OR EXISTING SOIL THAT WAS EXCAVATED FOR THE PLANTING SPACE. BRACE ROOT BALL BY TAMPING PLANTING SOIL AROUND THE LOWER PORTION OF THE ROOT BALL. PLACE ADDITIONAL PLANTING SOIL AROUND BASE AND SIDES OF BALL IN SIX-INCH (6") LIFTS. LIGHTLY TAMP EACH LIFT USING FOOT PRESSURE OR HAND TOOLS TO SETTLE BACKFILL, SUPPORT THE TREE AND ELIMINATE VOIDS. DO NOT OVER COMPACT THE BACKFILL OR USE MECHANICAL OR PNEUMATIC TAMPING EQUIPMENT.

D. WHEN THE PLANTING HOLE HAS BEEN BACKFILLED TO THREE QUARTERS OF ITS DEPTH, WATER SHALL BE POURED AROUND THE ROOT BALL AND ALLOWED TO SOAK INTO THE SOIL TO SETTLE THE SOIL. DO NOT FLOOD THE PLANTING SPACE. AIR POCKETS SHALL BE ELIMINATED AND BACKFILL CONTINUED UNTIL THE PLANTING SOIL IS BROUGHT TO GRADE LEVEL.

E. WHERE INDICATED ON THE DRAWINGS, BUILD A 4-INCH HIGH, LEVEL BERM OF PLANTING SOIL AROUND THE OUTSIDE OF THE ROOT BALL TO RETAIN WATER. TAMP THE BERM TO REDUCE LEAKING AND EROSION OF THE SAUCER.

F. THOROUGHLY WATER THE PLANTING SOIL AND ROOT BALL IMMEDIATELY AFTER PLANTING.

G. REMOVE ALL NURSERY PLANT IDENTIFICATION TAGS AND RIBBONS AS PER OWNER'S REPRESENTATIVE INSTRUCTIONS.

1. CONTAINER GROWN MATERIALS WILL BE: (1) REMOVED FROM THE CONTAINER (2) SUBJECT TO ROOT BALL SHAVING (3) REMOVE ALL ROOTS AND SUBSTRATE ABOVE THE ROOT COLLAR AND THE MAIN STRUCTURAL ROOTS ACCORDING TO ROOT CORRECTION DETAILS SO ROOT SYSTEM CONFORMS TO ROOT OBSERVATIONS DETAIL (4) SUBJECT TO REMOVAL OF ALL SUBSTRATE AT THE BOTTOM OF THE ROOT BALL THAT DOES NOT CONTAIN ROOTS.
2. BARE ROOT PLANTS WILL BE INSTALLED AS FOLLOWS: (1) DIG THE PLANTING HOLE TO THE DIAMETER OF THE SPREAD OF THE ROOTS TO A DEPTH IN THE CENTER THAT MAINTAINS THE ROOT COLLAR AT THE ELEVATION OF THE SURROUNDING FINISHED GRADE AND SLIGHTLY DEEPER ALONG THE EDGES OF THE HOLE (2) SPREAD ALL ROOTS OUT RADIAL IN THE PREPARED HOLE MAKING THE HOLE WIDER WHERE NEEDED TO ACCOMMODATE LONG ROOTS. ROOT TIPS SHALL BE DIRECTED AWAY FROM THE TRUNK (3) MAINTAIN THE STEM PLUMB WHILE BACKFILLING SOIL AROUND THE ROOTS (4) LIGHTLY TAMP THE SOIL AROUND THE ROOTS TO ELIMINATE VOIDS AND REDUCE SETTLEMENT.

3.4 STRAIGHTENING PLANTS

A. MAINTAIN ALL PLANTS IN A PLUMB POSITION THROUGHOUT THE WARRANTY PERIOD. STRAIGHTEN ALL TREES THAT MOVE OUT OF PLUMB INCLUDING THOSE NOT STAKED. PLANTS TO BE STRAIGHTENED SHALL BE EXCAVATED AND THE ROOT BALL MOVED TO A PLUMB POSITION, AND THEN RE-BACKFILLED.

3.5 PRUNING OF TREES AND SHRUBS

A. PRUNE PLANTS AS DIRECTED BY THE OWNER'S REPRESENTATIVE. PRUNING TREES SHALL BE LIMITED TO ADDRESSING STRUCTURAL DEFECTS AS SHOWN IN DETAILS; FOLLOW RECOMMENDATIONS IN "STRUCTURAL PRUNING: A GUIDE FOR THE GREEN INDUSTRY" PUBLISHED BY URBAN TREE FOUNDATION, VISALIA CA.

B. ALL PRUNING SHALL BE PERFORMED BY A PERSON EXPERIENCED IN STRUCTURAL TREE PRUNING.

3.6 WATERING

1. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE TO ENSURE THAT ADEQUATE WATER IS PROVIDED TO ALL PLANTS FROM THE POINT OF INSTALLATION UNTIL THE DATE OF SUBSTANTIAL COMPLETION ACCEPTANCE.

3.7 CLEAN-UP

A. DURING INSTALLATION, KEEP THE SITE FREE OF TRASH, PAVEMENTS REASONABLY CLEAN AND WORK AREA IN AN ORDERLY CONDITION AT THE END OF EACH DAY. REMOVE TRASH AND DEBRIS IN CONTAINERS FROM THE SITE NO LESS THAN ONCE A WEEK.

B. ONCE INSTALLATION IS COMPLETE, WASH ALL SOIL FROM PAVEMENTS AND OTHER STRUCTURES.

C. MAKE ALL REPAIRS TO GRADES, RUTS, AND DAMAGE BY THE PLANT INSTALLER TO THE WORK OR OTHER WORK AT THE SITE.

D. REMOVE AND DISPOSE OF ALL EXCESS PLANTING SOIL, SUBSOIL, MULCH, PLANTS, PACKAGING, AND OTHER MATERIAL BROUGHT TO THE SITE BY THE CONTRACTOR.

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John H. Blum, P.E. SIGNATURE DATE
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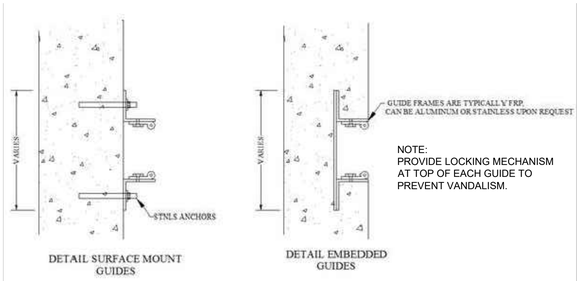
CARTER ASSOCIATES, INC. COA 205 / LB 205

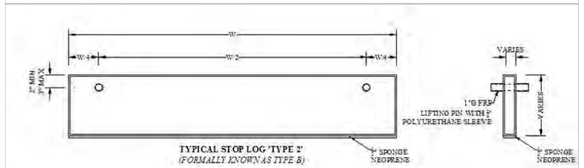
DATE : Nov 2019
PROJ. # : 18-39e
DRAWN BY: KWN
APPD. BY : JHB
PLOT BY : Clint Rahjes
FILE NAME :
REF. # : 20585-C;17-345s
F.B. & PG. : 729/21+;850/56+

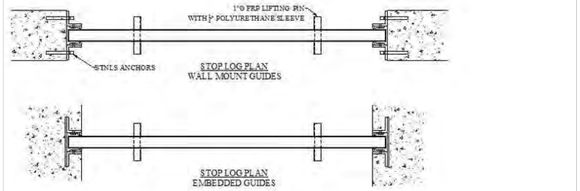
Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida

PLANTING NOTES

SHEET
C-108

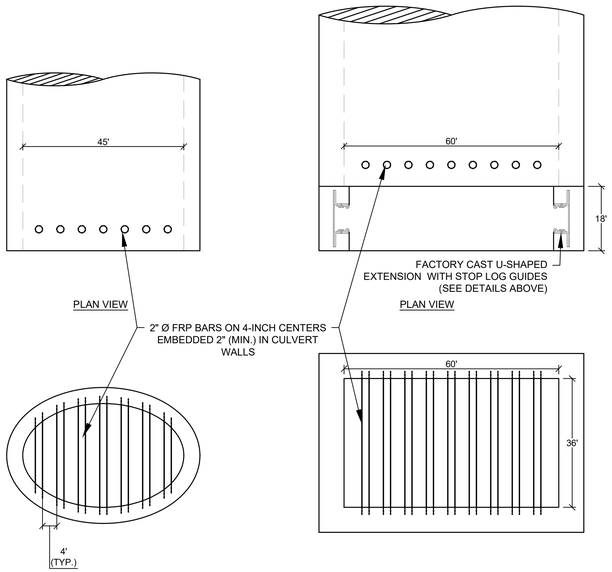






SOUTH CULVERT

NORTH CULVERT



PIPE INLET PROTECTION

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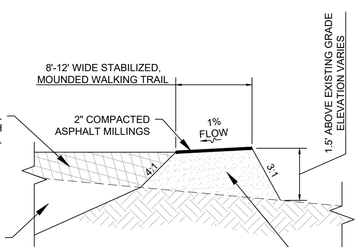

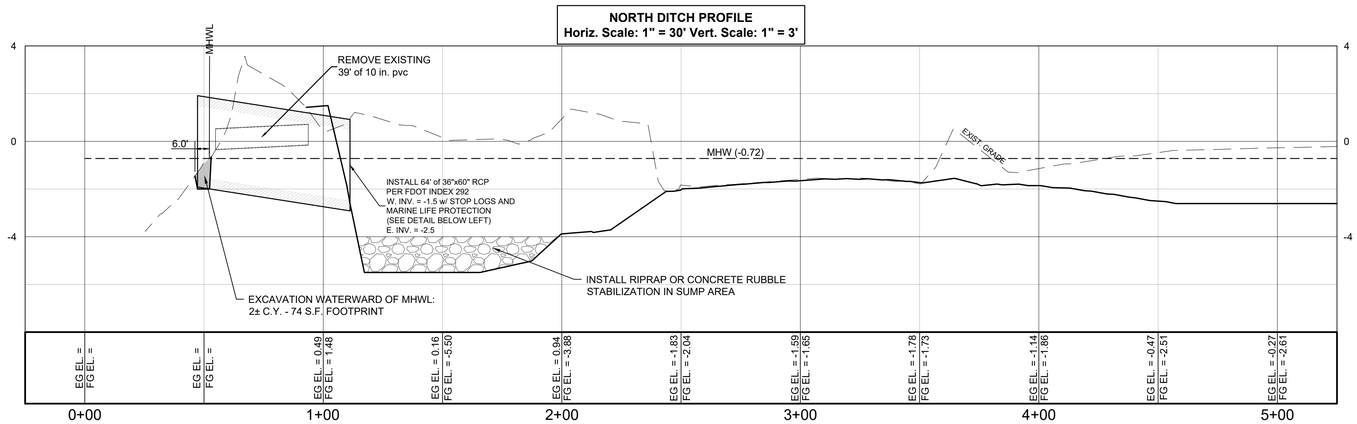

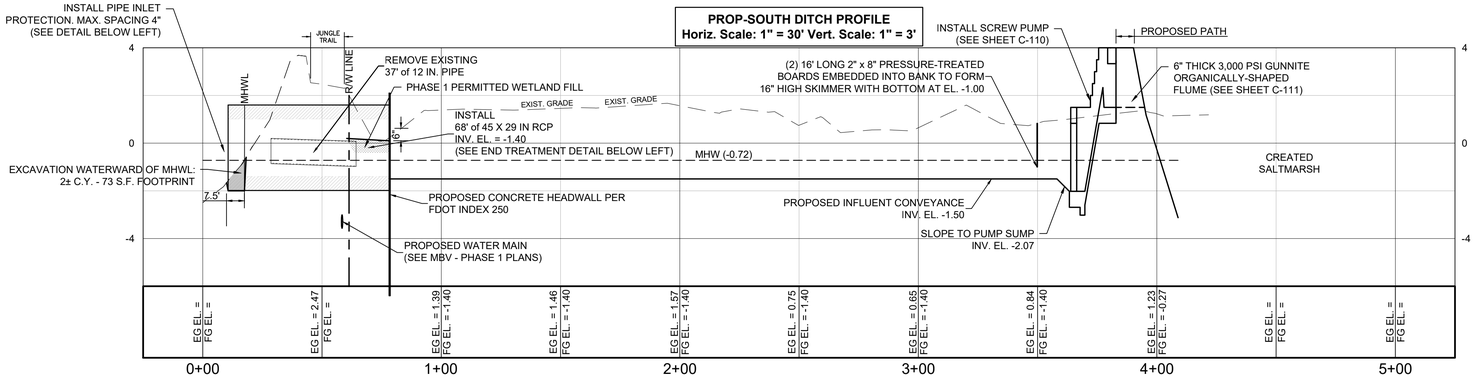

NOTE: ALL PRECAST STRUCTURES AND CONCRETE PIPE SHALL BE CONSTRUCTED WITH COMPOSITE OR EPOXY COATED REINFORCING BARS

INSTALLATION OF DRAINAGE PIPE AND STRUCTURES

1. GENERAL REQUIREMENTS

A. ALL WORK SHALL BE PROVED TO BE IN FIRST CLASS CONDITION AND CONSTRUCTED PROPERLY IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. ALL DEFECTS AND LEAKS DISCLOSED BY REQUIRED TESTING SHALL BE REMEDIED. ALL TESTS SHALL BE PERFORMED BY THE CONTRACTOR AND OBSERVED BY THE ENGINEER.

B. ALL PIPE AND STRUCTURES SHALL BE INSTALLED ON DRY, FIRM BEDDING. THE FREE-WATER SURFACE SHALL BE LOWERED TO AT LEAST 12 INCHES BELOW THE BEDDING SURFACE PRIOR TO PLACING PIPE OR STRUCTURES AND SHALL BE MAINTAINED AT THAT DEPTH THROUGHOUT BEDDING, HAUNCHING, AND INITIAL BACKFILLING OF THE WORK. DURING SUBSEQUENT BACKFILLING, THE WATER LEVEL SHALL BE KEPT SUFFICIENTLY BELOW THE WORKING SURFACE TO ALLOW COMPACTION OF BACKFILL TO THE REQUIRED DENSITY, AND UNTIL REQUIRED DENSITY TESTS HAVE BEEN PERFORMED.

C. TEMPORARY SUPPORTS SHALL BE INSTALLED FOR ADEQUATE PROTECTION AND MAINTENANCE OF ALL UNDERGROUND AND SURFACE STRUCTURES, WATER LINES, DRAINS, AND OTHER OBSTRUCTIONS ENCOUNTERED IN THE PROGRESS OF THE WORK. ANY STRUCTURES WHICH MAY HAVE BEEN DISTURBED SHALL BE RESTORED UPON COMPLETION OF THE WORK.

D. BLASTING SHALL NOT BE PERMITTED EXCEPT BY WRITTEN APPROVAL OF THE ENGINEER.

E. TRENCHING AND SUBSEQUENT BACKFILLING WITHIN THE GENERAL CONSTRUCTION SITE SHALL BE ACCOMPLISHED AS EXPEDITIOUSLY AS POSSIBLE IN ORDER TO PREVENT TRENCH DECAY AND MAINTAIN A CLEAR OPERATIONAL AREA.

F. PRIOR TO ANY EXCAVATION OR TRENCHING OUTSIDE THE DESIGNATED LIMITS OF THE WORK SITE, THE CONTRACTOR SHALL SECURE THE NECESSARY PERMITS AND/OR AUTHORIZATION FROM THE APPLICABLE OWNER, OR CONFIRM THAT SUCH HAS BEEN PREVIOUSLY OBTAINED. THE STIPULATIONS OF SAID PERMIT OR AUTHORIZATION SHALL BE COMPLETELY FOLLOWED AND, PRIOR TO CONSTRUCTION OPERATIONS, NOTICE SHALL BE PROVIDED TO THE APPROPRIATE OWNER AND ENGINEER.

G. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THESE SPECIFICATIONS, THE APPLICABLE SECTIONS OF THE FDOT SPECIFICATIONS, MANUFACTURERS RECOMMENDATIONS AND THE DRAWINGS.

2. HANDLING MATERIALS

A. PIPE, FITTINGS, AND ACCESSORIES SHALL BE LOADED AND UNLOADED BY HAND OR SKIDDING SO AS TO AVOID SHOCK OR DAMAGE. UNDER NO CIRCUMSTANCES SHALL SUCH MATERIALS BE DROPPED; PIPE SHALL NOT BE HANDLED ON SKIDWAYS SHALL NOT BE SKIDDED OR ROLLED AGAINST PIPE ALREADY ON THE GROUND.

B. IN DISTRIBUTING THE MATERIAL AT THE SITE OF THE WORK, EACH PIECE SHALL BE UNLOADED OPPOSITE OR NEAR THE PLACE WHERE IT IS TO BE LAID IN THE TRENCH.

3. ALIGNMENT, GRADE, AND COVER FOR BURIED PIPING SYSTEMS

A. PIPE SHALL BE LAID AND MAINTAINED TO THE REQUIRED LINES, DEPTHS, AND GRADES.

B. WHEREVER OBSTRUCTIONS NOT INDICATED ON THE DRAWINGS ARE ENCOUNTERED DURING THE PROGRESS OF THE WORK AND INTERFERE TO SUCH AN EXTENT THAT AN ALTERATION IN THE DRAWINGS IS REQUIRED, THE ENGINEER WILL ORDER A DEVIATION FROM THE LINE AND GRADE OR ARRANGE WITH THE OWNERS OF THE STRUCTURES FOR THE REMOVAL, RELOCATION, OR RECONSTRUCTION OF THE OBSTRUCTIONS.

4. PIPE TRENCH EXCAVATION

A. TRENCH DIMENSIONS

A.1. THE MINIMUM WIDTH OF THE TRENCH SHALL BE EQUAL TO THE OUTSIDE DIAMETER OF THE PIPE AT THE JOINT PLUS 8 INCHES FOR UNSHEETED TRENCHES, OR 12 INCHES FOR SHEETED TRENCH, AND THE MAXIMUM WIDTH OF TRENCH, MEASURED AT THE TOP OF THE PIPE, SHALL NOT EXCEED THE NOMINAL PIPE DIAMETER PLUS TWO FEET, UNLESS OTHERWISE SHOWN ON THE DRAWING. DETAILS OR APPROVED BY THE ENGINEER. TRENCH WALLS SHALL BE VERTICAL FROM THE BOTTOM OF THE TRENCH TO A LINE MEASURED ONE FOOT ABOVE THE TOP OF THE PIPE. FROM ONE FOOT ABOVE THE TOP OF THE PIPE TO THE SURFACE, THE TRENCH WALLS SHALL BE AS NEARLY VERTICAL AS SOIL CONDITIONS WILL PERMIT, UNLESS OTHERWISE DETAILED ON THE DRAWINGS. SPACES FOR JOINTS, FITTINGS, MANHOLES AND OTHER STRUCTURES SHALL BE MAINTAINED UNLESS OTHERWISE APPROVED BY THE ENGINEER, OR ALTERNATE METHODS ARE DETAILED ON THE DRAWINGS. SHOULD THE SPECIFIED MAXIMUM WIDTH OF TRENCH BE EXCEEDED, THE PIPE SHALL BE ADEQUATELY REINFORCED AS DIRECTED BY THE ENGINEER, AT THE CONTRACTOR'S EXPENSE.

A.2. TRENCH GRADE FOR PIPE OR STRUCTURES NOT REQUIRING SPECIAL BEDDING MATERIAL SHALL BE DEFINED AS THE GRADE OF THE BOTTOM SURFACE OF THE UTILITY OR STRUCTURE TO BE CONSTRUCTED OR PLACED WITHIN THE TRENCH. SUCH SHAPING OF THE TRENCH BOTTOM, AS MAY BE REQUIRED TO PROVIDE SUITABLE BEDDING, SHALL BE CONSIDERED TO BE A PART OF THIS WORK. TRENCH GRADE IN NON-CUSHIONING MATERIAL SHALL BE DEFINED AS 6 INCHES BELOW THE OUTSIDE OF THE BOTTOM OF THE UTILITY, WHICH 6 INCHES SHALL BE BACKFILLED WITH SUITABLE BEDDING MATERIAL. UNAUTHORIZED EXCAVATION BELOW TRENCH GRADE SHALL BE BACKFILLED TO TRENCH GRADE AND SUITABLY COMPACTED BY THE CONTRACTOR WITHOUT ADDITIONAL COST TO THE OWNER. FINAL TRIMMING AND GRADING OF TRENCH BOTTOM SHALL BE DONE MANUALLY.

5. BACKFILL AND BEDDING MATERIALS

A. BACKFILL AND BEDDING MATERIAL SHALL BE SELECT GRANULAR MATERIAL, FREE FROM ORGANIC MATTER, OF SUCH SIZE AND GRADATION THAT THE DESIRED COMPACTION CAN BE READILY ATTAINED AND SHALL MEET THE REQUIREMENTS FOR A3 MATERIAL ACCORDING TO THE REVISED BUREAU OF PUBLIC ROADS CLASSIFICATIONS. MATERIAL FROM THE CONTRACTOR'S EXCAVATIONS MAY BE USED, IF IT MEETS THE ABOVE REQUIREMENTS. OTHERWISE IT MUST BE IMPORTED.

6. BEDDING AND FOUNDATIONS

A. THE TRENCH SHALL BE EXCAVATED BELOW THE PLANNED BOTTOM OF THE PIPE TO A DEPTH EQUAL TO 1/4 THE NOMINAL DIAMETER OF THE PIPE, OR 6 INCHES, WHICHEVER IS GREATER. THE OVER EXCAVATED DEPTH SHALL BE BACKFILLED USING BEDDING MATERIALS THAT HAVE BEEN CAREFULLY COMPACTED AND SHAPED USING HAND TOOLS SO AS TO PROVIDE A UNIFORM SUPPORT FOR THE LOWER PORTION OF THE PIPE BARREL. SHAPING UNDER THE PIPE BELLS SHALL BE SO THAT THE BELL DOES NOT SUPPORT THE PIPE AND JOINTS CAN BE MADE WITHOUT BEDDING MATERIAL INTERFERENCE.

7. PIPE TRENCH BACKFILL

A. INITIAL BACKFILL

A.1. INITIAL BACKFILL SHALL BE PLACED AS SOON AS POSSIBLE AFTER LAYING THE PIPE AND SHALL MAINTAIN A PACE WITH THE PIPE LAYING SO THAT NO MORE THAN FIVE PIPE JOINTS SEPARATE LAYING AND BACKFILLING OPERATIONS. INITIAL BACK FILL SHALL INCLUDE ALL HAUNCHING AND BACKFILL FROM THE TOP OF THE BEDDING TO A COMPACTED DEPTH OF TWELVE INCHES OVER THE PIPE. ALL HAUNCHING AND BACKFILLING SHALL BE DONE IN THE DRY.

B. INITIAL BACKFILL SHALL BE DONE AS SPECIFIED BELOW:

B.1. HAUNCHING OF THE PIPE SHALL BE BY HAND PLACEMENT AND COMPACTION OF MATERIAL IN MAXIMUM 4 INCH LAYERS FROM THE BOTTOM OF THE TRENCH TO THE SPRINGLINE OF THE PIPE, TAKING CARE TO FILL ALL VOIDS BELOW AND AROUND THE PIPE. BACKFILLING SHALL BE CAREFULLY CONTINUED IN LAYERS NOT EXCEEDING 6 INCHES IN THICKNESS FOR THE FULL TRENCH WIDTH UNTIL THE COMPACTED FILL IS 12 INCHES ABOVE THE TOP OF THE PIPE.

B.2. DURING INITIAL BACKFILLING THE FILL SHALL BE DEPOSITED EVENLY ALONG BOTH SIDES OF THE PIPE FROM A HEIGHT NOT TO EXCEED 2 FEET ABOVE THE TOP OF PIPE, AND FILL SHALL NOT BE DROPPED DIRECTLY ON THE UNPROTECTED PIPE SURFACE.

B.3. THE BACKFILL TO ONE FOOT ABOVE THE TOP OF THE UTILITY SHALL BE THOROUGHLY COMPACTED WITH CURVED END TAMPING BARS UNDER AND ON EACH SIDE OF THE PIPE AND FLAT TAMPED BETWEEN THE PIPE AND TRENCH WALL AND SHALL BE COMPLETED BEFORE THE REMAINDER OF THE TRENCH IS BACKFILLED. INITIAL BACKFILL SHALL BE COMPACTED TO 100 PERCENT OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180. NO SUBSEQUENT BACKFILL WILL BE PERMITTED UNTIL THE INITIAL BACKFILL HAS BEEN ACCEPTED BY THE ENGINEER OR HIS AUTHORIZED REPRESENTATIVE.

C. SUBSEQUENT BACKFILL

C.1. SUBSEQUENT BACKFILL IS THAT BACKFILL BETWEEN THE INITIAL BACKFILL AND THE FINISHED GROUND LEVEL OR BOTTOM OF SUBBASE.

C.2. SUBSEQUENT BACKFILL MATERIAL SHALL BE PLACED FULL TRENCH WIDTH IN HORIZONTAL LAYERS NOT EXCEEDING 12 INCHES LOOSE DEPTH AND COMPACTED BY POWER-OPERATED TAMPERS, ROLLERS, OR VIBRATORY EQUIPMENT TO A DENSITY EQUAL TO 98 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180 FOR PIPE PLACED UNDER AND ADJACENT TO ROADWAYS OR PAVED SURFACES, AND 95 PERCENT UNDER AREAS WHERE NO PAVEMENT IS TO BE CONSTRUCTED AND VEHICULAR TRAFFIC IS NOT TO PASS OVER THE PIPE. EACH LAYER SHALL BE COMPACTED TO THE SPECIFIED DENSITY PRIOR TO PLACING SUBSEQUENT LAYERS. THE THICKNESS OF THE LOOSE LAYER MAY BE INCREASED WHEN IN-PLACE DENSITY TESTS SHOW THAT THE SPECIFIED DENSITY CAN BE OBTAINED.

D. COMPACTION METHODS

D.1. MECHANICAL COMPACTION SHALL BE ACCOMPLISHED USING PNEUMATIC OR GASOLINE-POWERED TAMPERS OR FLAT-PLATE VIBRATORS, WITH THE EXCEPTION THAT THE FIRST TWO FEET OF BACKFILLING OVER THE PIPE SHALL BE COMPACTED BY HAND-OPERATED TAMPING DEVICES.

D.2. FLOODING OR PUDDLING WITH WATER TO CONSOLIDATE BACKFILL IS NOT ACCEPTABLE, EXCEPT WHERE SAND IS ENCOUNTERED BELOW UNPAVED AREAS ONLY, AND ONLY WITH PRIOR APPROVAL BY THE ENGINEER. THE FLOODING OR PUDDLING OPERATION SHALL BE REPEATED WITH EACH TWO FEET OF BACKFILL PLACED.

E. DENSITY TESTS

E.1. THE CONTRACTOR SHALL ARRANGE TO HAVE SUFFICIENT SOIL TESTS MADE BY AN INDEPENDENT TESTING LABORATORY SELECTED BY THE ENGINEER TO DEMONSTRATE CONFORMANCE OF HIS WORK WITH THE STABILITY AND COMPACTION LEVELS REQUIRED BY THESE SPECIFICATIONS. COMPACTION TESTS SHALL BE TAKEN AT INTERVALS LISTED HEREIN OR AS DEEMED NECESSARY BY THE ENGINEER.

E.2. ANY PROPOSED ALTERNATIVE TEST METHODS TO THOSE SPECIFIED HEREIN MUST BE APPROVED BY THE ENGINEER PRIOR TO TESTING, AT THE REQUEST OF THE ENGINEER, THE CONTRACTOR SHALL PROVIDE SUCH DOCUMENTATION OF A PROPOSED ALTERNATIVE TEST METHOD AS THE ENGINEER MAY REQUIRE TO EVALUATE THE METHOD FOR APPROVAL.

E.3. IN NO CASE SHALL THE CONTRACTOR PROCEED WITH CONSTRUCTION ON COMPACTED MATERIAL UNTIL THE TESTS PROVE SATISFACTORY AND APPROVAL IS GIVEN BY THE ENGINEER.

E.4. IN GENERAL, AT LEAST ONE TEST FOR MAXIMUM DRY DENSITY/OPTIMUM MOISTURE CONTENT SHALL BE PERFORMED ON A REPRESENTATIVE SAMPLE OF EACH INHERENTLY DIFFERENT MATERIAL TO BE USED FOR COMPACTED BACKFILL OR EMBANKMENT FILL. FOR MATERIAL OF UNIFORM COMPOSITION AND TEXTURAL CLASS, A MINIMUM OF ONE TEST PER 200 CU. YD. OF MATERIAL SHALL BE PERFORMED AT THE POINT OF USE.

E.5. GENERALLY, IN-PLACE DENSITY TESTS SHALL BE PERFORMED AT APPROXIMATELY 20 FOOT INTERVALS; ONE EACH SIDE OF PIPE FOR EACH 12 INCH LIFT. ADDITIONAL DENSITY TESTS MAY BE REQUIRED BY THE ENGINEER. IF ANY TESTS RESULTS ARE UNSATISFACTORY, THE CONTRACTOR SHALL RE-EXCAVATE AND RECOMPACT THE BACKFILL AT HIS EXPENSE UNTIL THE REQUIRED COMPACTION IS OBTAINED.

8. PIPE SYSTEM LAYING AND JOINTING

A. GENERAL

A.1. UNLESS OTHERWISE SPECIFIED HEREIN OR DIRECTED BY THE ENGINEER, ALL PIPE AND FITTINGS SHALL BE LAID AND JOINED IN ACCORDANCE WITH THE APPROPRIATE MANUFACTURER'S DIRECTIONS WITH REGARD TO ALLOWABLE BARREL AND JOINT DEFLECTION, SPIGOT SEATING DEPTH, GASKET PLACEMENT, LUBRICATION, BOLT TORQUE, PIPE CUTTING/TRIMMING, AND PUSHING/PULLING METHODS FOR JOINT ASSEMBLY.

A.2. PRIOR TO PLACING IN THE TRENCH, EACH PIPE SECTION, JOINT, AND FITTING SHALL BE CHECKED FOR DAMAGE OR DEFECTS SUCH AS CRACKS, BLISTERS, COATING/LINING SEPARATION, GOUGES, AND THE LIKE. ANY DAMAGE OR DEFECTIVE MATERIALS FOUND SHALL NOT BE INSTALLED UNLESS APPROVED BY THE ENGINEER, AND SHALL BE MARKED "REJECTED" AND IMMEDIATELY REMOVED FROM THE WORK SITE.

A.3. PRIOR TO INSTALLATION, THE INTERIOR OF ALL PIPE AND FITTINGS SHALL BE INSPECTED FOR DEBRIS, SEDIMENT ACCUMULATION, SAND, AND THE LIKE, AND SHALL BE CLEANED AS REQUIRED TO REMOVE SUCH FOREIGN MATTER. JOINT SURFACES SUCH AS GASKETS, GASKET GROOVES, SPIGOTS, AND BELLS SHALL BE CLEANED OF SAND AND GRIT PRIOR TO JOINING.

A.4. GASKET LUBRICANTS SHALL BE STORED AND APPLIED IN A MANNER THAT WILL PREVENT SIGNIFICANT CONTAMINATION OR PICK-UP OF SAND AND GRIT.

A.5. THE PIPE SPIGOT SHALL BE CENTERED IN AND ALIGNED WITH ITS MATING BELL PRIOR TO INSERTION AND FORCED EVENLY IN A STRAIGHT LINE TO SEATING DEPTH, TAKING CARE NOT TO OVER-BELL THE JOINT. WHERE REQUIRED, DEFLECTIONS SHALL BE MADE AFTER THE JOINT IS SEATED.

A.6. JOINING SHALL GENERALLY BE DONE BY HAND OR BY PUSH-BAR WITH A CUSHION BLOCK WHENEVER PIPE SIZE AND WEIGHT PERMIT. WHEN A MECHANICAL PUSHING/PULLING DEVICE SUCH AS CHAIN-PULLER, COME-ALONG, AND THE LIKE IS REQUIRED, THE DEVICE SHALL BE USED IN A MANNER THAT WILL NOT DEFORM GOUGE, CHIP, OR OTHERWISE DAMAGE THE PIPE OR CAUSE SIGNIFICANT DISTURBANCE OF THE PREPARED BEDDING. IN NO CASE SHALL JOINTS BE MADE BY "POPPING-ON" OR SWINGING THE SPIGOT INTO THE BELL TO SEAT THE JOINT.

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John H. Blum, P.E.
FLORIDA LICENSE No. 45813
CARTER ASSOCIATES, INC.
SIGNATURE DATE
COA 205 / LB 205

DATE : Nov 2019
PROJ. # : 18-39e
DRAWN BY: KWN
APPD. BY : JHB
PLOT BY : Clint Rahjes
FILE NAME :
REF. # : 20585-C;17-345s
F.B. & PG. : 729/21+;850/56+

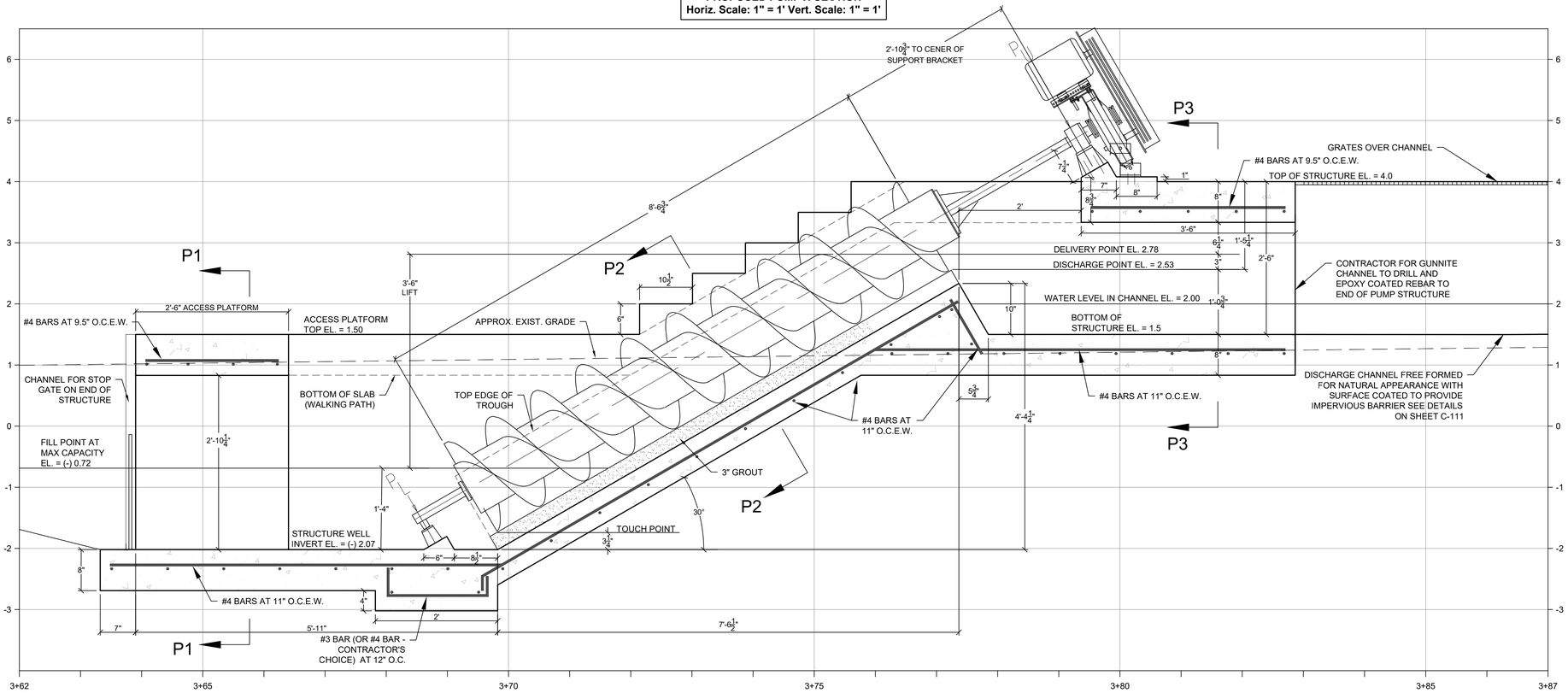
Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida

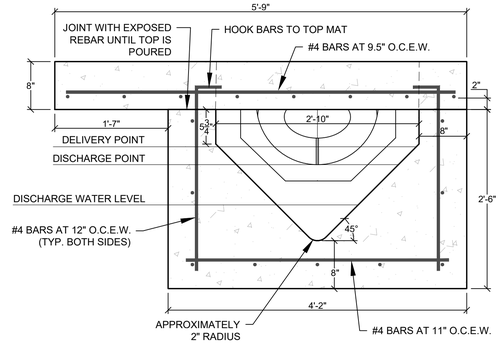
NOTES AND DETAILS

SHEET
C-109

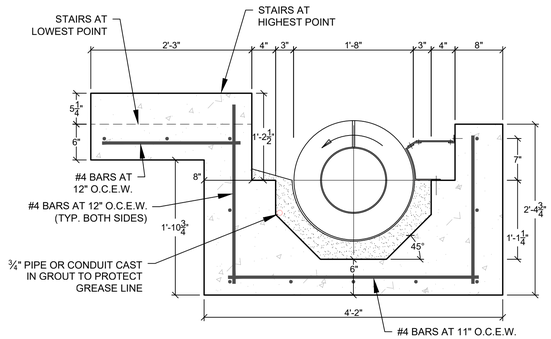
Nov. 6, 19 8:40 AM
P:\18-39 Jones Pier\Dwg\18-39e.dwg, C-109 NOTES AND DETAILS, Clint Rahjes

PROPOSED PUMP X-SECTION
Horiz. Scale: 1" = 1' Vert. Scale: 1" = 1'





SECTION P3
SCALE: 1" = 1'



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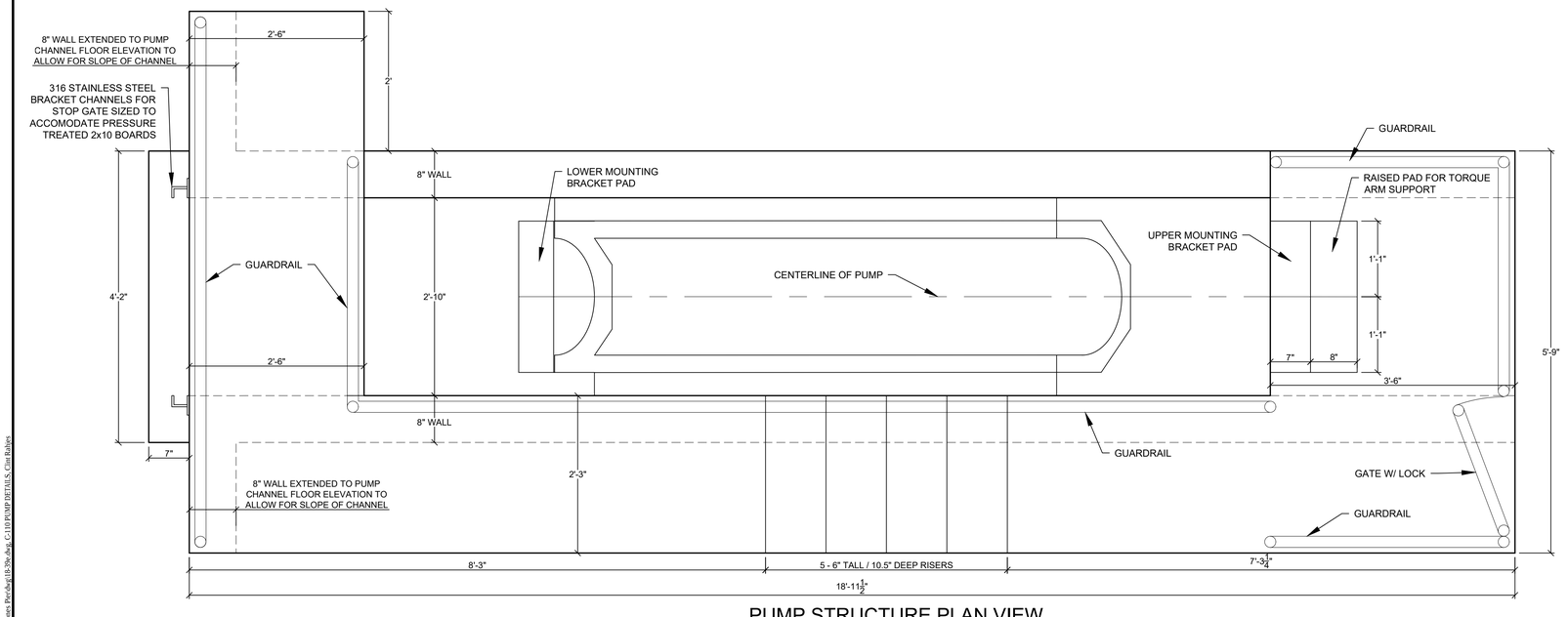
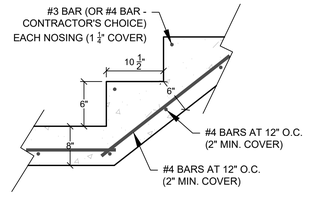
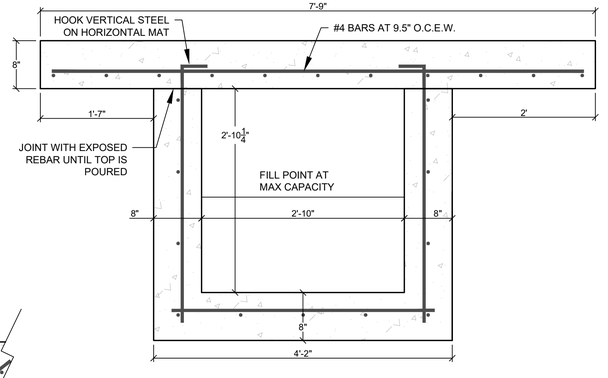


PUMP STRUCTURE PLAN VIEW
SCALE: 1" = 1'



TYPICAL RISER DETAIL
NOT TO SCALE



SECTION P1
SCALE: 1" = 1'

NOTE: ALL REBAR PROPOSED IN STRUCTURE TO BE CORROSION RESISTANT (I.E. EPOXY COATED OR GLASS FIBER REINFORCED POLYMER) ALTERNATIVE SOLUTIONS MAY BE PROPOSED. SEE TECHNICAL SPECIFICATIONS FOR REBAR.

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Jones Pier
Wetland Restoration and Conservation Improvements
Indian RIver County, Florida

PUMP DETAILS

SHEET
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P:\18-39 Jones Pier\Dwg\18-39e-Dwg-C-110 PUMP DETAILS_Clint Rahjes
Nov. 8, 19, 9:48 AM

SECTION 43 24 41 - OPEN SCREW PUMP EQUIPMENT

INDIAN RIVER COUNTY, FLORIDA
JONES' PIER CONSERVATION AERA

PART 1 _ GENERAL

1.01 SUMMARY

A. THE CONTRACTOR SHALL FURNISH, INSTALL AND PLACE IN SATISFACTORY OPERATING CONDITION OPEN SCREW PUMP ASSEMBLIES AND APPURTENANCES AS SHOWN ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS.

B. RELATED SECTIONS

1. GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, AND GENERAL REQUIREMENTS SECTIONS APPLY TO WORK OF THIS SECTION.

1.02 REFERENCES

A. AMERICAN GEAR MANUFACTURERS ASSOCIATION (AGMA)

B. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

C. AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM)

D. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

E. AMERICAN WELDING SOCIETY (AWS)

F. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

G. STEEL STRUCTURES PAINTING COUNCIL (SSPC)

1.03 SYSTEM DESCRIPTION

A. OPEN SCREW PUMP SHALL BE FURNISHED COMPLETE WITH SPIRAL TYPE 316 STAINLESS STEEL FLIGHTED SCREW, UPPER AND LOWER STUB SHAFTS, UPPER DUAL RADIAL AND THRUST BEARING, LOWER HEAVY-DUTY BEARING, FLOW DEFLECTION PLATES, SHAFT-MOUNTED SPEED REDUCER, V-BELTS AND SHEAVES, DRIVE MOTOR, SPARE PARTS, AND ALL NECESSARY ANCHORAGE MATERIALS. ELECTRICAL CONTROLS ARE NOT INCLUDED IN THESE SPECIFICATIONS AND ARE PROVIDED BY OTHERS.

B. DESIGN PARAMETERS FOR EACH UNIT:

1. NUMBER OF OPEN SCREW PUMPS - 1
2. PROJECT OPEN SCREW PUMP DESIGN CAPACITY, GAL/MIN - 100
3. MAXIMUM OPEN SCREW PUMP CAPACITY, GAL/MIN - 300
4. HYDRAULIC LIFT (H), FEET - 3.5
5. ANGLE OF INCLINATION, DEGREES - 30
6. PROJECT OPEN SCREW PUMP DESIGN ROTATIONAL SPEED, REV/MIN - 17
7. MAXIMUM OPEN SCREW PUMP ROTATIONAL SPEED, REV/MIN - 79
8. PUMP MINIMUM OUTSIDE DIAMETER, INCHES - 20
9. MINIMUM NUMBER OF FLIGHTS - 1
10. FLIGHT THICKNESS, INCHES - 0.25
11. TORQUE TUBE DIAMETER, INCHES - 8.625
12. TORQUE TUBE WALL THICKNESS, INCHES - 0.365
13. MINIMUM LOWER BEARING DIAMETER, INCHES - 2.75
14. MINIMUM UPPER BEARING DIAMETER, INCHES - 3.0
15. PROJECT DESIGN MINIMUM SPEED REDUCER TORQUE RATING, IN_LB - 8,338
16. MINIMUM MOTOR SIZE, HP - 1.5
17. ELECTRICAL POWER CHARACTERISTICS, VAC - HERTZ - PHASE - 110 - 60 - 1 FROM SERVICE - VFD TO BE PROVIDED TO CONVERT TO 3-PHASE MOTOR.
18. ELECTRICAL CLASSIFICATION -NON-RATED

1.04 PRE-QUALIFICATION

A. ALL OPEN SCREW PUMP EQUIPMENT MANUFACTURERS NOT LISTED IN THE PARAGRAPH 2.01 SHALL SUBMIT AT LEAST 15 DAYS PRIOR TO THE ADVERTISED DATE FOR RECEIPT OF BIDS A "QUALIFICATION PACKAGE" FOR THE SUBSTITUTE OR "OR EQUAL" EQUIPMENT WHICH THE MANUFACTURER PROPOSES TO FURNISH IN LIEU OF PRODUCTS IDENTIFIED IN THE CONTRACT DOCUMENTS. THE BIDDER SHALL SUBMIT THE QUALIFICATION PACKAGE UNDER SEPARATE COVER. EACH QUALIFICATION PACKAGE SHALL BE BOUND WITH PROTECTIVE COVER, IDENTIFY THE SPECIFICATION SECTION NUMBER AND TITLE, AND THE PRODUCT MANUFACTURER'S NAME ON A COVER SHEET. THE MANUFACTURER SHALL SUBMIT THE QUALIFICATION PACKAGE IN A SEALED STURDY BOX OR SUITABLE CONTAINER. THIS SECTION OUTLINES THE PROCEDURES FOR PROPOSAL OF SUBSTITUTE OR "OR EQUAL" ITEMS BY "ALTERNATE" MANUFACTURERS.

B. THE USE OF THIS PRE-QUALIFICATION REQUIREMENT IS INTENDED TO PROTECT THE OWNER AND BIDDERS SO THAT NO ONE BIDDER GAINS AN UNFAIR BID PRICE ADVANTAGE BY QUOTING A LOWER PRICE FOR AN OPEN SCREW PUMP THAT DOES NOT COMPLY WITH THE MINIMUM PERFORMANCE AND SALIENT FEATURES SET FOR BY SECTION 43 24 41.

C. THE "QUALIFICATION PACKAGE" FOR THE SUBSTITUTE OR "OR EQUAL" EQUIPMENT ITEM OF PRODUCTS THE MANUFACTURER PROPOSES TO FURNISH SHALL INCLUDE BUT NOT BE LIMITED TO, THE FOLLOWING INFORMATION AS DEFINED IN 1.04.D.

D. THE QUALIFICATION PACKAGE SUBMITTAL REQUIREMENTS FOR THE EQUIPMENT SHALL BE AS FOLLOWS:

1. THE QUALITY ASSURANCES SET FORTH IN SECTION 43 24 41-1.07 FOR THE SUBSTITUTE OR "OR EQUAL" EQUIPMENT ITEM.

2. A COMPLETE SET OF DRAWINGS, SPECIFICATIONS, CATALOGUE CUT-SHEETS, AND DETAILED DESCRIPTIVE MATERIAL OF PROPOSED EQUIPMENT ITEMS OR PRODUCTS. THIS INFORMATION SHALL IDENTIFY ALL TECHNICAL AND PERFORMANCE REQUIREMENTS STIPULATED ON EACH DRAWING AND IN EACH SPECIFICATION SECTION.

3. DETAILED VENDOR INFORMATION SHALL BE SUBMITTED FOR ALL BUY-OUT ITEMS SUCH AS HARDWARE, MOTORS, BEARINGS, REDUCERS, BELTS, AND SHEAVES.

4. LIST SHOWING MATERIALS OF CONSTRUCTION OF ALL COMPONENTS, INCLUDING ALL BUY-OUT ITEMS.

5. AFBMA L10 THEORETICAL DESIGN LIFE CALCULATIONS OF THE UPPER BEARING RADIAL AND THRUST BEARING AT THE MAXIMUM DESIGN CAPACITY OF THE OPEN SCREW PUMP

6. CERTIFICATION THAT THE DRIVE SPEED REDUCER MANUFACTURER IS A MEMBER OF AGMA AND THAT THE TORQUE RATING IS IN ACCORDANCE WITH AGMA STANDARDS.

7. CONFIRMATION THAT THE OPEN SCREW PUMPS WILL BE MANUFACTURED IN THE UNITED STATES IN ACCORDANCE WITH PARAGRAPH 2.16.A.

8. AISC CATEGORY CERTIFICATION AND AWS WELDING INSPECTOR CERTIFICATIONS IN ACCORDANCE WITH PARAGRAPH 2.16.C.

9. MANUFACTURER'S RECOMMENDED SPARE PARTS, INCLUDING ALL BUY-OUT ITEMS.

10. INFORMATION ON EQUIPMENT FIELD ERECTION REQUIREMENTS INCLUDING WEIGHT OF ASSEMBLED COMPONENTS AND WEIGHT OF EACH SUB-ASSEMBLY.

11. A MAINTENANCE SCHEDULE SHOWING THE REQUIRED MAINTENANCE, FREQUENCY OF MAINTENANCE, LUBRICANTS AND OTHER ITEMS REQUIRED AT EACH REGULAR PREVENTATIVE MAINTENANCE PERIOD, INCLUDING ALL BUY-OUT ITEMS.

12. PROCESS EQUIPMENT ELECTRICAL REQUIREMENTS AND SCHEMATIC DIAGRAMS

13. PROVIDE A COPY OF THIS SPECIFICATION WITH A CHECK NEXT TO EACH ITEM TO WHICH THE PROPOSED EQUIPMENT MEETS THE SPECIFIED STANDARD. WHERE THE PROPOSED EQUIPMENT DOES NOT STRICTLY MEET THE REQUIREMENTS OF THIS SPECIFICATION, PROVIDE INFORMATION ON THE PROPOSED EXCEPTION TO THE SPECIFICATION THAT WOULD BRING THE PROPOSED, EQUIPMENT INTO COMPLIANCE WITH THE REQUIREMENTS OF THIS SECTION.

14. CONFIRMATION THAT THE MANUFACTURER HAS REGULARLY ENGAGED IN THE MANUFACTURING AND PRODUCTION OF OPEN SCREW PUMP EQUIPMENT IN THE UNITED STATES FOR A MINIMUM OF TEN (10) YEARS. NO EQUIPMENT SHALL BE SUPPLIED BY ANY MANUFACTURER WITH LESS THAN TEN YEARS EXPERIENCE.

THE MANUFACTURER MUST HAVE INSTALLED AND HAD IN SATISFACTORY USE IN THIS APPLICATION A MINIMUM OF TWENTY (25) INSTALLATIONS OF IDENTICAL (20-INCH DIAMETER) OR LARGER SIZE UNITS AS NOTED IN PARAGRAPH 1.03.B.5. PROVIDE A LIST OF TWENTY-FIVE (25) U.S. INSTALLATIONS OF SIMILAR TYPE EQUIPMENT COMPARABLE TO THE UNITS SPECIFIED.

THE TERM "INSTALLATIONS" SHALL MEAN INDIVIDUAL PROJECTS/CONTRACTS. MULTIPLE EQUIPMENT UNITS FOR A PROJECT WILL BE CONSIDERED AS ONE (1) INSTALLATION TOWARD MEETING THE EXPERIENCE REQUIREMENTS. INSTALLATIONS SHALL BE ONLY THOSE IN THE UNITED STATES (FIFTY STATES). THE INSTALLATION SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

a. NAME AND LOCATION OF INSTALLATION.
b. NAME OF PERSON IN DIRECT RESPONSIBLE CHARGE FOR THE EQUIPMENT.
c. ADDRESS AND PHONE NUMBER OF PERSON IN DIRECT RESPONSIBLE CHARGE.
d. MONTH AND YEAR THE EQUIPMENT WAS PLACED IN OPERATION.
e. BRIEF DESCRIPTION OF EQUIPMENT
f. PROVIDE THE NAME, ADDRESS, AND PHONE NUMBER OF THE CONTACT PERSON AT THE COMPANY THAT WILL PROVIDE SERVICE (BOTH WARRANTY PERIOD AND POST-WARRANTY PERIOD) FOR THE UNIT TO THE OWNER.

BIDS FROM MANUFACTURERS LACKING THE U.S. EXPERIENCE REQUIREMENTS, BUT MEETING ALL TECHNICAL AND PERFORMANCE REQUIREMENTS OF THE CONTRACT DOCUMENTS, CAN BE CONSIDERED IF THE MANUFACTURER PROVIDES A SATISFACTORY TWO (2) YEAR MAINTENANCE BOND IN LIEU OF EVIDENCE OF EXPERIENCE AND OPERATION. MAINTENANCE BOND SHALL BE FOR 150 PERCENT OF THE REPLACEMENT VALUE OF THE EQUIPMENT. THE BONDING COMPANY SHALL HAVE A POLICY_HOLDER RATING OF A+ AND A FINANCIAL RATING OF "CLASS XV" IN THE MOST RECENT EDITION OF "BEST KEY RATING GUIDE". THE BONDING COMPANY SHALL BE LICENSED TO DO BUSINESS IN THE STATE OF FLORIDA.

15. COMPUTATIONS SHOWING ALL STRUCTURAL AND MECHANICAL OPEN SCREW PUMP DESIGN COMPUTATIONS. THE COMPUTATIONS SHALL CLEARLY INDICATE THE FOLLOWING DESIGN PARAMETERS.

a. BRAKE HORSEPOWER AT THE MAXIMUM CAPACITY AND LIFT.
b. REQUIRED REDUCER TORQUE AT THE MAXIMUM CAPACITY AND LIFT.
c. RADIAL BEARING LOAD AND THRUST BEARING LOAD AT THE MAXIMUM CAPACITY AND LIFT.
d. BEARING CENTER DISTANCE.
e. MAXIMUM OPEN SCREW DEFLECTION AT THE MAXIMUM CAPACITY AND LIFT.
f. AFBMA L-10 THEORETICAL DESIGN LIFE CALCULATIONS FOR THE UPPER BEARING ASSEMBLY THRUST BEARING AND RADIAL BEARING

THESE DESIGN CALCULATIONS SHALL BE CERTIFIED BY THE MANUFACTURER AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE UNITED STATES IN DIRECT EMPLOYMENT OF THE MANUFACTURER.

16. ITEMIZED LIST OF ALL DEVIATIONS FROM THE SPECIFICATIONS AND DRAWINGS.

E. SUBMITTAL REVIEW DEPOSIT, IN THE FORM OF A CERTIFIED BANK CHECK IN THE AMOUNT OF $4,000 MADE PAYABLE TO THE OWNER. THIS DEPOSIT WILL BE USED FOR ENGINEER'S REVIEW OF SUBSTITUTE EQUIPMENT. THE ENGINEER'S REVIEW TIME WILL BE DEDUCTED AT A RATE OF $250.00 PER HOUR FOR REVIEWING SUBSTITUTION REQUESTS, REGARDLESS OF WHETHER THE SUBSTITUTION IS APPROVED OR REJECTED. THE OWNER WILL RETURN ANY UNUSED FUNDS TO THE PETITIONER WITHIN 30 DAYS OF THE BID DATE.

F. IF THE BIDDER FAILS TO FURNISH ALL OF THE PRECEDING INFORMATION WHICH HAS BEEN DEEMED NECESSARY BY THE ENGINEER TO EVALUATE A PROPOSED SUBSTITUTE OR "OR EQUAL" EQUIPMENT, THE PROPOSED SUBSTITUTE OR "OR EQUAL" QUALIFICATION PACKAGE WILL BE REJECTED BY THE ENGINEER.

G. THE ENGINEER SHALL BE THE SOLE AUTHORITY FOR DETERMINING CONFORMANCE OF A PROPOSED SUBSTITUTE OR "OR EQUAL" EQUIPMENT ITEM OR PRODUCT WITH THE MINIMUM REQUIREMENTS OF THE CONTRACT DOCUMENTS. UNDER NO CIRCUMSTANCES WILL THE ENGINEER BE REQUIRED TO PROVE THAT AN "ALTERNATE" MAJOR EQUIPMENT ITEM OR PRODUCT IS NOT EQUAL TO THE SPECIFIED EQUIPMENT ITEM OR PRODUCT.

H. FAILURE TO FURNISH THE PRECEDING INFORMATION SHALL BE CAUSE FOR REJECTION OF A PROPOSED SUBSTITUTE OR "OR EQUAL" EQUIPMENT ITEM OR PRODUCT FOR USE ON THIS PROJECT.

1.05 PERFORMANCE

A. EACH OPEN SCREW PUMP SHALL BE ABLE TO PUMP THE PROJECT DESIGN CAPACITY AS NOTED IN PARAGRAPH 1.03.B.2. AT THE HYDRAULIC LIFT (H) NOTED IN PARAGRAPH 1.03.B.4., AN ANGLE OF INCLINATION AS NOTED IN PARAGRAPH 1.03.B.5., AND THE PROJECT DESIGN ROTATIONAL SPEED AS NOTED IN PARAGRAPH 1.06.B.6.

B. EACH OPEN SCREW PUMP BODY, UPPER BEARING AND STUB SHAFT, AND LOWER BEARING AND STUB SHAFT SHALL BE STRUCTURALLY DESIGNED TO HANDLE THE MAXIMUM OPEN SCREW PUMP DESIGN CAPACITY AS NOTED IN PARAGRAPH 1.03.B.3. AT THE HYDRAULIC LIFT (H) NOTED IN PARAGRAPH 1.03.B.4., AN ANGLE OF INCLINATION AS NOTED IN PARAGRAPH 1.03.B.5., AND THE MAXIMUM ROTATIONAL SPEED AS NOTED IN PARAGRAPH 1.06.B.7.

1.06 MATERIALS QUALITY

A. ALL STAINLESS STEEL COMPONENTS INCLUDING THE OPEN SCREW PUMP BODY, FLOW DEFLECTION PLATES, UPPER BEARING AND STUB SHAFT, LOWER BEARING AND STUB SHAFT AND DRIVE-BEARING MOUNTING PLATES SHALL BE FABRICATED IN THE UNITED STATES. MATERIALS THICKNESSES IDENTIFIED IN PART 2 - PRODUCTS ARE THE MINIMUM REQUIREMENTS FOR THIS PROJECT. MATERIALS WITH INCREASED THICKNESSES WILL BE ACCEPTABLE.

B. ALL FABRICATED COMPONENTS SHALL BE MANUFACTURED IN THE UNITED STATES. TO ENSURE PROMPT SERVICE AND TO ENSURE SPARE PARTS AVAILABILITY IN A TIMELY MANNER AND AT A REASONABLE COST, FOREIGN FABRICATED MATERIALS OF CONSTRUCTION FOR THE COMPONENTS IDENTIFIED IN PARAGRAPH 1.06.A. SHALL NOT BE ACCEPTABLE FOR THIS PROJECT.

C. IF METRIC MATERIALS ARE UTILIZED FOR FABRICATION OF THE SCREW PUMP COMPONENTS, THE MANUFACTURER SHALL UTILIZE MATERIALS THAT ARE EQUAL TO OR LARGER FOR UNIT SIZES NOTED AND SHALL UTILIZE MATERIAL THICKNESSES THAT ARE EQUAL TO OR GREATER THAN SPECIFIED.

1.07 QUALITY ASSURANCE

A. IN ORDER TO ASSURE UNIFORM QUALITY, EASE OF MAINTENANCE AND MINIMAL PARTS STORAGE, IT IS THE INTENT OF THESE SPECIFICATIONS THAT ALL EQUIPMENT CALLED FOR UNDER THIS SECTION SHALL BE SUPPLIED BY A SINGLE MANUFACTURER.

B. NAMING A MANUFACTURER IN PARAGRAPH 2.01.A. DOES NOT RELIEVE THEM FROM COMPLYING WITH THE PERFORMANCE FEATURES, THE SALIENT FEATURES, AND THE MADE IN THE U.S.A. REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACT DOCUMENTS REPRESENT THE MINIMUM ACCEPTABLE STANDARDS FOR THE OPEN SCREW PUMP EQUIPMENT FOR THIS PROJECT. ALL EQUIPMENT SHALL CONFORM FULLY IN EVERY RESPECT TO THE REQUIREMENTS OF THE RESPECTIVE PARTS AND SECTIONS OF THE DRAWINGS AND SPECIFICATIONS. EQUIPMENT WHICH IS A "STANDARD PRODUCT" WITH THE MANUFACTURER SHALL BE MODIFIED, REDESIGNED FROM THE STANDARD MODE, AND SHALL BE FURNISHED WITH SPECIAL FEATURES, ACCESSORIES, MATERIALS OF CONSTRUCTION OR FINISHES AS MAY BE NECESSARY TO CONFORM TO THE QUALITY MANDATED BY THE TECHNICAL AND PERFORMANCE REQUIREMENTS OF THE SPECIFICATION.

PART 2 _ PRODUCTS

2.01 MANUFACTURER

A. THE OPEN SCREW PUMP ASSEMBLIES SHALL INCLUDE ALL NECESSARY EQUIPMENT AND APPURTENANCES AS MANUFACTURED BY LAKESIDE EQUIPMENT CORPORATION OF BARTLETT, ILLINOIS, OR PRE-APPROVED EQUAL.

2.02 SPIRAL SCREW

A. THE SPIRAL SCREW SHALL BE FABRICATED OF TYPE 316 STAINLESS STEEL. EACH SPIRAL SCREW SHALL HAVE A MINIMUM OUTSIDE DIAMETER AS NOTED IN PARAGRAPH 1.03.B.8. WITH THE MINIMUM NUMBER OF FLIGHTS AS NOTED IN PARAGRAPH 1.03.B.9. FLIGHTS SHALL BE DIE FORMED WITH A 1:1 PITCH-TO-DIAMETER RATIO AND SHALL HAVE A MINIMUM THICKNESS AS NOTED IN PARAGRAPH 1.03.B.10. THE DISTANCE BETWEEN FLIGHT PITCHES SHALL BE NO MORE THAN THE PUMP DIAMETER ± 0.25-INCH. FLIGHTS SHALL BE HELICAL SHAPED AND CONTINUOUSLY WELDED ON BOTH SIDES TO THE TORQUE TUBE. THERE SHALL BE NO MORE THAN ONE FLIGHT BUTT WELDS PER PITCH, AND ALL FLIGHT BUTT WELDS SHALL BE FULL PENETRATION JOINTS. THE SCREW SHALL BE DESIGNED TO ROTATE COUNTER-CLOCKWISE WHEN VIEWED FROM THE LOWER BEARING END UP TOWARD THE DRIVE ASSEMBLY.

B. EACH TORQUE TUBE SHALL HAVE A MINIMUM PIPE DIAMETER AS NOTED IN PARAGRAPH 1.03.B.11. WITH A MINIMUM WALL THICKNESS AS NOTED IN PARAGRAPH 1.03.B.12., SO THAT SCREW DEFLECTION SHALL NOT BE GREATER THAN THE BEARING CENTER DISTANCE DIVIDED BY 2,000. CALCULATIONS FOR DEFLECTION AND BEARING LOADS SHALL BE BASED ON THE DEAD WEIGHT OF THE SCREW PLUS THE FULL WEIGHT OF LIQUID BEING PUMPED AT THE MAXIMUM OPEN SCREW PUMP CAPACITY AS NOTED IN PARAGRAPH 1.03.B.3. DECREASED LOADING FROM BUOYANCE EFFECTS SHALL NOT BE CONSIDERED IN THE DESIGN CALCULATIONS.

C. THE TORQUE TUBE SHALL BE SEALED WATERTIGHT WITH A WELDED STEEL PLATE AT EACH END. ALL SURFACES OF THE END PLATES MATING WITH THE BOLTED STUB SHAFTS SHALL BE FINISH MACHINED WHILE THE PUMP IS SUPPORTED BETWEEN CENTERS IN A LATHE AFTER WELDING TO THE SUPPORT TUBE AND AFTER ALL FLIGHT WELDING IS COMPLETE TO ASSURE ALIGNMENT AND PARALLELISM.

D. A SOLID TYPE 316 STAINLESS STEEL UPPER DRIVE SHAFT AND LOWER STUB SHAFT FITTED WITH MACHINE FACED STEEL PLATE FLANGE SHALL BE FASTENED TO THE UPPER AND LOWER ENDS OF THE FABRICATED SPIRAL SCREW WITH ASTM HIGH_STRENGTH ALLOY BOLTS.

2.03 LOWER BEARING ASSEMBLY

A. THE LOWER BEARING ASSEMBLY SHALL BE A SEALED, FOOD GRADE GREASE LUBRICATED DESIGN THAT IS FULLY SELF-ALIGNING IN ALL THREE AXIS. NO THRUST LOAD SHALL BE CARRIED BY THE LOWER BEARING.

B. THE LOWER BEARING ASSEMBLY SHALL CONSIST OF A RADIAL SPHERICAL ROLLER BEARING ELEMENT AND A STATIONARY LOWER STUB SHAFT. THE BEARING HOUSING SHALL CONTAIN A MINIMUM OF TWO (2) SPRING LOADED LIP SEALS AT THE BOTTOM OF THE BEARING ASSEMBLY. THE SEALS SHALL BE ARRANGED TO EXCLUDE WASTEWATER AND CONTAMINANTS FROM THE BEARING AND TO CONTAIN THE FOOD GRADE GREASE WITHIN THE HOUSING. THE USE OF LESS THAN TWO LIP SEALS WILL NOT BE ACCEPTABLE.

C. THE BEARING ASSEMBLY SHALL ACCOMMODATE THERMAL EXPANSION AND CONTRACTION OF THE SCREW SHAFT WITHIN THE BEARING HOUSING ON FULLY LUBRICATED SURFACES NOT SUBJECT TO CORROSION OR SEIZURE.

D. THE TYPE 316 STAINLESS STEEL HOUSING SHALL BE DESIGNED FOR CONTINUOUS OR INTERMITTENT OPERATION AND SHALL BE SUITABLE FOR OPERATION IN SUBMERGED OR NON-SUBMERGED CONDITIONS.

E. THE BEARING ASSEMBLY SHALL PERMIT PRECISE ANGULAR (VERTICAL) AND LATERAL (HORIZONTAL) FIELD ADJUSTMENT TO ELIMINATE MISALIGNMENT BETWEEN THE UPPER AND LOWER BEARINGS WITHOUT THE USE OF SHIMS.

F. THE BEARING ASSEMBLY SHALL BE SUPPLIED WITH A TYPE 316 STAINLESS STEEL SPLIT NON_ROTATING SHIELD INSTALLED BETWEEN THE HOUSING AND ROTATING SCREW FOR OPERATION OF THE SHAFT AND SEALS.

G. THE BEARING ASSEMBLY SHALL BE DESIGNED TO ACCOMMODATE ALL STATIC AND OPERATING DEFLECTIONS OF THE SCREW AND TO RESIST ALL LOADS INCLUDING BUOYANT FORCES WHICH MAY OCCUR UNDER MAXIMUM WET WELL CONDITIONS.

2.04 UPPER BEARING ASSEMBLY

A. THE UPPER STUB SHAFT SHALL BE A ONE-PIECE FABRICATED TYPE 316 STAINLESS STEEL DESIGN. TWO-PIECE STUB SHAFT DESIGNS (SHAFT AND MATING FLANGE) WILL NOT BE ACCEPTABLE FOR THIS PROJECT. THE UPPER STUB SHAFT SHALL BE DESIGNED BASED ON THE DEAD WEIGHT OF THE SCREW PLUS THE FULL WEIGHT OF THE LIQUID BEING PUMPED AT THE MAXIMUM SCREW PUMP CAPACITY AS NOTED IN PARAGRAPH 1.03.B.3.

B. THE UPPER STUB SHAFT SHALL EXTEND THROUGH A GREASE LUBRICATED UPPER BEARING ASSEMBLY WHICH SHALL CONSIST OF A SPLIT HOUSING FITTED WITH DUAL BEARINGS, LOWER SPRING LOADED LIP SEAL, BEARING SPACER AND UPPER SPRING LOADED LIP SEAL. THE MINIMUM UPPER BEARING NOMINAL DIAMETER SHALL BE AS NOTED IN PARAGRAPH 1.03.B.14.

C. ALL OF THE THRUST LOAD FROM THE PUMP SHALL BE CARRIED BY A SPHERICAL THRUST_TYPE BEARING ASSEMBLY AND THE UPPER OPEN SCREW PUMP RADIAL LOAD SHALL BE CARRIED BY A SPHERICAL ROLLER BEARING. A SINGLE DUAL_PURPOSE BEARING TO HANDLE BOTH THE RADIAL LOAD AND THE THRUST LOAD SHALL NOT BE ACCEPTABLE FOR THIS PROJECT.

D. THE TWO (2) BEARINGS (RADIAL AND THRUST) SHALL BE POSITIONED IN THE BEARING HOUSING SO THAT THE PRESSURE CENTER OF THE THRUST BEARING AND RADIAL BEARING INTERSECTS THE AXIS OF THE SCREW AT THE SAME POINT TO PROVIDE TRUE SELF_ALIGNMENT IN ALL PLANES.

E. THE RADIAL BEARING SHALL BE RATED AT A MINIMUM OF AFBMA L10 THEORETICAL DESIGN LIFE AS NOTED IN PARAGRAPH 1.03.B.16., BASED ON THE DEAD WEIGHT OF THE SCREW PLUS THE FULL WEIGHT OF THE LIQUID BEING PUMPED AT THE MAXIMUM OPEN SCREW PUMP CAPACITY AT NOTED IN PARAGRAPH 1.03.B.3.

F. THE UPPER STUB SHAFT SHALL BE GROOVED AND POSITIVELY LOCKED INTO THE UPPER BEARING ASSEMBLY BY A SPLIT COLLAR AND LOCKING HALTER RING. USE OF THREADED NUTS TO LOCK BEARINGS AND SHAFTS FOR SUPPORT OF THRUST LOADING SHALL NOT BE ACCEPTABLE FOR THIS PROJECT.

G. A SPLIT BEARING HOUSING SHALL BE PROVIDED TO ALLOW REMOVAL OF THE COVER FOR INSPECTION OF THE BEARINGS WITHOUT REMOVAL OF THE STUB SHAFT OR THE ENTIRE BEARING ASSEMBLY.

2.05 DRIVE ASSEMBLY

A. THE DRIVE ASSEMBLY SHALL BE DESIGNED AND CONSTRUCTED FOR THE PROJECT DESIGN SCREW ROTATIONAL SPEED AS NOTED IN PARAGRAPH 1.03.B.6. THE DRIVE ASSEMBLY SHALL CONSIST OF A SHAFT_MOUNTED SPEED REDUCER, BELTS AND SHEAVES, AND MOTOR.

B. A SHAFT_MOUNTED, DOUBLE_REDUCTION REDUCER IN A CAST IRON HOUSING WITH ALLOY STEEL HIGH HARDNESS HELICAL GEARING, POSITIVE SPLASH_TYPE LUBRICATION, AND DOUBLE LIP OIL SEALS, SHALL BE KEYED TO THE OPEN SCREW PUMP STUB SHAFT. SPEED REDUCER MANUFACTURER SHALL BE A MEMBER OF THE AGMA AND THE REDUCER SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST AGMA STANDARDS.

C. THE OPEN SCREW PUMP STUB SHAFT SHALL BE SUPPORTED BY THE UPPER BEARING, EXTENDED THROUGH THE REDUCER HOLLOW BORE, AND CENTERED AND HELD FIRMLY IN PLACE BY TAPERED BUSHINGS ON EACH SIDE OF THE REDUCER. THE USE OF SETSCREWS AND COLLAR TO LOCK GEAR REDUCER TO SHAFT WILL NOT BE ACCEPTABLE.

D. THE SPEED REDUCER SHALL BE DESIGNED WITH A SERVICE FACTOR OF NOT LESS THAN 1.5 BASED ON THE TORQUE REQUIREMENTS OF THE SCREW OR 1.0 BASED ON THE MOTOR HORSEPOWER, WHICHEVER IS GREATER. THE SPEED REDUCER SHALL HAVE A MINIMUM TORQUE RATING AS NOTED IN PARAGRAPH 1.03.B.15. AT THE PROJECT DESIGN ROTATIONAL SPEED AS NOTED IN PARAGRAPH 1.03.B.6.

E. REDUCER SHALL BE HELD IN POSITION BY A TORQUE ARM AND TORQUE ARM BRACKET. TORQUE ARM BRACKET SHALL BE FASTENED WITH CAST_IN_PLACE ANCHORS. EXPANSION ANCHORS SHALL NOT BE ACCEPTABLE FOR THIS PROJECT.

F. A VISUAL OIL LEVEL GAUGE AND OIL FILLER TUBE FOR THE REDUCER SHALL BE MOUNTED ON THE REDUCER.

G. A BACKSTOP SHALL BE PROVIDED WITH THE REDUCER TO PREVENT REVERSE ROTATION OF THE SCREW.

2.06 BELTS AND SHEAVES

A. POWER TRANSMISSION FROM THE MOTOR TO THE REDUCER SHALL BE BY MEANS OF A SET OF V_BELTS AND SHEAVES. BELTS AND SHEAVES SHALL BE DESIGNED WITH A 1.5 SERVICE FACTOR BASED ON FULL MOTOR HORSEPOWER.

B. SHEAVES SHALL BE TWO SECTION UNITS FOR BOTH DRIVE AND DRIVEN SHEAVES AND SHALL CONSIST OF A TAPERED SPLIT SHAFT BUSHING WITH THREE TAPPED HOLES TO WHICH THE SHEAVE IS ATTACHED BY THREE CAP SCREWS. CHANGING SHEAVES SHALL NOT REQUIRE A WHEEL PULLER.

C. BELTS AND SHEAVES SHALL BE COVERED WITH A FABRICATED AISI TYPE 316 STAINLESS STEEL BELT GUARD IN ACCORDANCE WITH OSHA STANDARDS. BELT GUARD SHALL BE DESIGNED WITH THE EXPANDED METAL FRONT HINGED TO THE MAIN ENCLOSURE FOR EASE OF INSPECTION AND ACCESS. FRONT PANEL SHALL BE HELD IN PLACE VIA STAINLESS STEEL CAPTIVE FASTENERS.

2.07 MOTOR

A. EACH UNIT SHALL BE DRIVEN BY AN 1,800 REV/MIN, 1.15 SERVICE FACTOR, HORIZONTAL, BALL BEARING, CONTINUOUS DUTY, CONSTANT SPEED, DESIGN B, NORMAL STARTING TORQUE, TOTALLY-ENCLOSED FAN-COOLED, PREMIUM-EFFICIENCY, FOOT_MOUNTED MOTOR WITH LEADS TO GASKETED CONDUIT BOX FOR OUTDOOR OPERATION.

B. THE MINIMUM MOTOR SIZE SHALL BE AS NOTED IN PARAGRAPH 1.03.B.18., SHALL BE RATED FOR ELECTRICAL POWER CHARACTERISTICS AS NOTED IN PARAGRAPH 1.03.B.17., AND SHALL BE RATED FOR AN ELECTRICAL ENVIRONMENT AS NOTED IN PARAGRAPH 1.03.B.18.

C. MOTOR SHALL BE MOUNTED ON A FABRICATED STEEL PLATE, WHICH PROVIDES ADJUSTMENT OF BELT SLACK.

2.08 DEFLECTION PLATES

A. A FLOW DEFLECTION PLATE SHALL BE PROVIDED TO CURVE AROUND THE UPPER SECTION ON THE UPTAKE SIDE OF THE SCREW TO DEFLECT THE LIQUID AS THE SCREW ROTATES.

B. THE FLOW DEFLECTION PLATE SHALL BE FABRICATED OF NOT LESS THAN 1/8_INCH THICK AISI TYPE 316 STAINLESS STEEL PLATE COMPLETE WITH STIFFENERS WHERE REQUIRED AND STAINLESS STEEL ANCHORS ON 2_FOOT CENTERS AT THE BOTTOM EDGE.

C. THE DEFLECTION PLATE TOP EDGE SHALL HAVE ADJUSTABLE STAINLESS STEEL ANCHORS AT NOT MORE THAN 8_FOOT CENTERS.

2.09 GROUTING MATERIALS

A. EQUIPMENT MANUFACTURER SHALL FURNISH A RADIUS SCREED FOR THE CONTRACTOR TO PLACE THE FINISHING GROUT IN THE TROUGH WITH THE SCREW AFTER THE UNIT HAS BEEN INSTALLED.

B. EQUIPMENT MANUFACTURER SHALL LOAN TO THE CONTRACTOR ADDITIONAL SHEAVE(S) AND BELTS AS REQUIRED TO OPERATE THE SCREW AT A REDUCED SPEED FOR GROUTING THE TROUGH WITH THE OPEN SCREW PUMP DRIVE.

2.10 ANCHOR BOLTS

A. EQUIPMENT MANUFACTURER SHALL FURNISH ALL ANCHOR BOLTS OF AMPLE SIZE AND STRENGTH REQUIRED TO SECURELY ANCHOR EACH ITEM OF EQUIPMENT. ANCHOR BOLTS, HEX NUTS, AND WASHERS SHALL BE AISI TYPE 316 STAINLESS STEEL UNLESS NOTED OTHERWISE. ANCHOR BOLTS SHALL BE J_TYPE EMBEDDED, OR L_TYPE EMBEDDED. EXPANSION_TYPE ANCHORS WILL NOT BE ACCEPTABLE.

B. ANCHOR BOLTS SHALL BE SET BY THE CONTRACTOR. EQUIPMENT SHALL BE PLACED ON THE FOUNDATIONS, LEVELED, SHIMMED, BOLTED DOWN, AND GROUTED WITH A NON_SHRINKING GROUT.

2.11 SPARE PARTS

A. THE FOLLOWING SPARE PARTS SHALL BE PROVIDED:

1. ONE (1) SET OF V-BELTS

B. SPARE PARTS SHALL BE INDIVIDUALLY BOXED WITH THE PROJECT NAME AND PART NUMBER CLEARLY IDENTIFIED ON EACH INDIVIDUAL BOX. ALL SPARE PARTS SHALL BE SHIPPED IN A SEPARATE CRATE AND CLEARLY LABELED. SPARE PARTS SHALL BE STORED INDOORS BY THE CONTRACTOR IN A TEMPERATURE-CONTROLLED ENVIRONMENT.

2.12 SHOP SURFACE PREPARATION AND PAINTING

A. ALL FABRICATED CARBON STEEL OR CAST IRON COMPONENTS FOR SUBMERGED SERVICE SHALL BE NEAR_WHITE BLAST CLEANED PER SSPC_SP10 AND GIVEN A 2.5 TO 3.5-MIL DRY FILM THICKNESS (DFT) COAT OF TNEMEC SERIES 1 OMNITHANE PRIMER.

B. ALL FABRICATED CARBON STEEL OR CAST IRON COMPONENTS FOR NON_SUBMERGED SERVICE SHALL BE COMMERCIAL BLAST CLEANED PER SSPC_SP6 AND GIVEN A 2.5 TO 3.5-MIL DRY FILM THICKNESS (DFT) COAT OF TNEMEC SERIES 1 OMNITHANE PRIMER.

C. ELECTRIC MOTORS, SPEED REDUCERS, AND OTHER SELF_CONTAINED OR ENCLOSED COMPONENTS SHALL BE SUPPLIED WITH THE MANUFACTURER'S STANDARD FINISH COATING.

D. RUST PREVENTATIVE COMPOUND SHALL BE APPLIED TO ALL MACHINED, POLISHED, AND NONFERROUS SURFACES, WHICH ARE NOT TO BE PAINTED.

2.13 SOURCE QUALITY CONTROL

A. ALL STRUCTURAL STEEL COMPONENTS SHALL BE FABRICATED IN THE UNITED STATES AND SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" PUBLISHED BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION. EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE, ALL PLATES AND STRUCTURAL MEMBERS SHALL HAVE A MINIMUM THICKNESS OF 1/4_INCH.

B. THE EQUIPMENT MANUFACTURER'S SHOP WELDS AND WELDING PROCEDURES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST EDITION OF ANSI/AWS D1.1 "STRUCTURAL WELDING CODE _ STEEL" PUBLISHED BY THE AMERICAN WELDING SOCIETY.

C. DESIGN AND FABRICATION OF STRUCTURAL STEEL MEMBERS SHALL BE IN ACCORDANCE WITH AISC AND AWS STANDARDS. THE MANUFACTURER SHALL COMPLY WITH THE AMERICAN WELDING SOCIETY (AWS) AND THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MOST CURRENT LISTED STANDARDS AND QUALIFICATIONS IN 2004 D1.1, THE CRITERIA PER THE REQUIREMENTS OF SECTION 6 - INSPECTION - STRUCTURAL WELDING CODE. EVIDENCE OF SUCH AWS AND AISC COMPLIANCE SHALL BE SUBMITTED WITH SHOP DRAWING SUBMITTALS AS FOLLOWS:

1. THE FABRICATION FACILITY SHALL SUCCESSFULLY MEET THE QUALITY CERTIFICATION REQUIREMENTS OF THE AISC QUALITY CERTIFICATION PROGRAM WITH A CATEGORY I OR HIGHER. THE AISC QUALITY CERTIFICATION PROGRAM WILL CONFIRM THAT THE AISC CERTIFIED SHOP HAS THE PERSONNEL, ORGANIZATION, EXPERIENCE, PROCEDURES, KNOWLEDGE, EQUIPMENT, CAPABILITY AND COMMITMENT TO PRODUCE FABRICATED STEEL OR STAINLESS STEEL OF THE REQUIRED QUALITY FOR THE WASTEWATER TREATMENT EQUIPMENT.

2. AWS CERTIFIED WELDING INSPECTORS (MINIMUM 2 ON STAFF) SHALL CONFORM TO ALL STANDARDS, CURRENT OR PREVIOUS AS LISTED IN SECTION 6.1.4 AWS QC1, STANDARD AND GUIDE FOR QUALIFICATION AND CERTIFICATION OF WELDING INSPECTORS.

3. AWS NON DESTRUCTIVE TESTING INSPECTORS (LEVEL I, II, III) FOR MAGNETIC PARTICLE AND ULTRA-SONIC TESTING (MINIMUM 2 ON STAFF) SHALL CONFORM TO ALL STANDARDS, CURRENT OR PREVIOUS AS LISTED IN AND IN CONFORMANCE WITH THE AMERICAN SOCIETY FOR NON-DESTRUCTIVE TESTING (ASNT-TC-1A).

PART 3 _ EXECUTION

3.01 FIELD PREPARATION AND PAINTING

A. FINISH FIELD PREPARATION AND PAINTING OF NON-STAINLESS STEEL COMPONENTS SHALL BE PERFORMED BY THE CONTRACTOR AS SPECIFIED IN SECTION _____.

B. THE CONTRACTOR SHALL TOUCH_UP ALL SHIPPING DAMAGE TO THE PAINT AS SOON AS THE EQUIPMENT ARRIVES ON THE JOB SITE.

C. THE CONTRACTOR SHALL FINISH PAINT ELECTRICAL MOTORS, SPEED REDUCERS, AND OTHER SELF_CONTAINED OR ENCLOSED COMPONENTS WITH OIL_RESISTANCE ENAMEL.

D. PRIOR TO ASSEMBLY, THE CONTRACTOR SHALL COAT ALL STAINLESS STEEL BOLTS AND NUT THREADS WITH A NON_SEIZING COMPOUND.

3.02 INSTALLATION

A. THE MANUFACTURER SHALL SCHEDULE ONE (1) TRIP TO THE PROJECT SITE FOR EQUIPMENT START_UP ASSISTANCE AS NOTED IN PARAGRAPH 3.02.B. FOR THE CONTRACTOR AND FOR OPERATING TRAINING AS NOTED IN PARAGRAPH 3.03.A. FOR OWNER PERSONNEL.

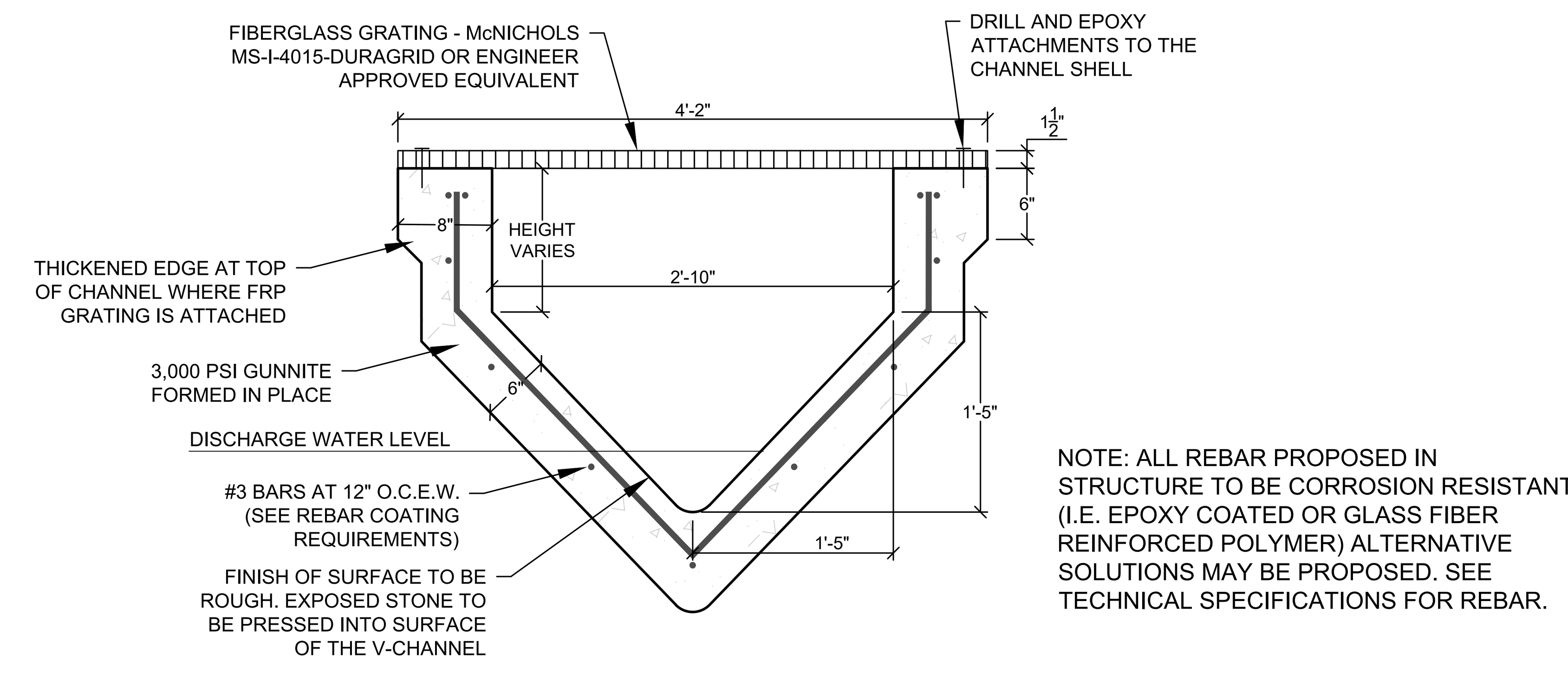
B. AFTER THE CONTRACTOR HAS INSTALLED THE SCREW PUMPS AND THE EQUIPMENT IS CAPABLE OF BEING OPERATED, THE EQUIPMENT MANUFACTURER SHALL FURNISH A QUALIFIED REPRESENTATIVE FOR A MINIMUM OF TWO (2) DAYS (UP TO 16 HOURS) TO INSPECT THE EQUIPMENT AND TO SUPERVISE FIELD-TESTING AND START_UP FOR THE CONTRACTOR.

C. AFTER THE EQUIPMENT HAS BEEN PLACED INTO OPERATION, THE MANUFACTURER'S REPRESENTATIVE SHALL MAKE ALL FINAL ADJUSTMENTS FOR PROPER OPERATION.

3.03 OPERATOR TRAINING

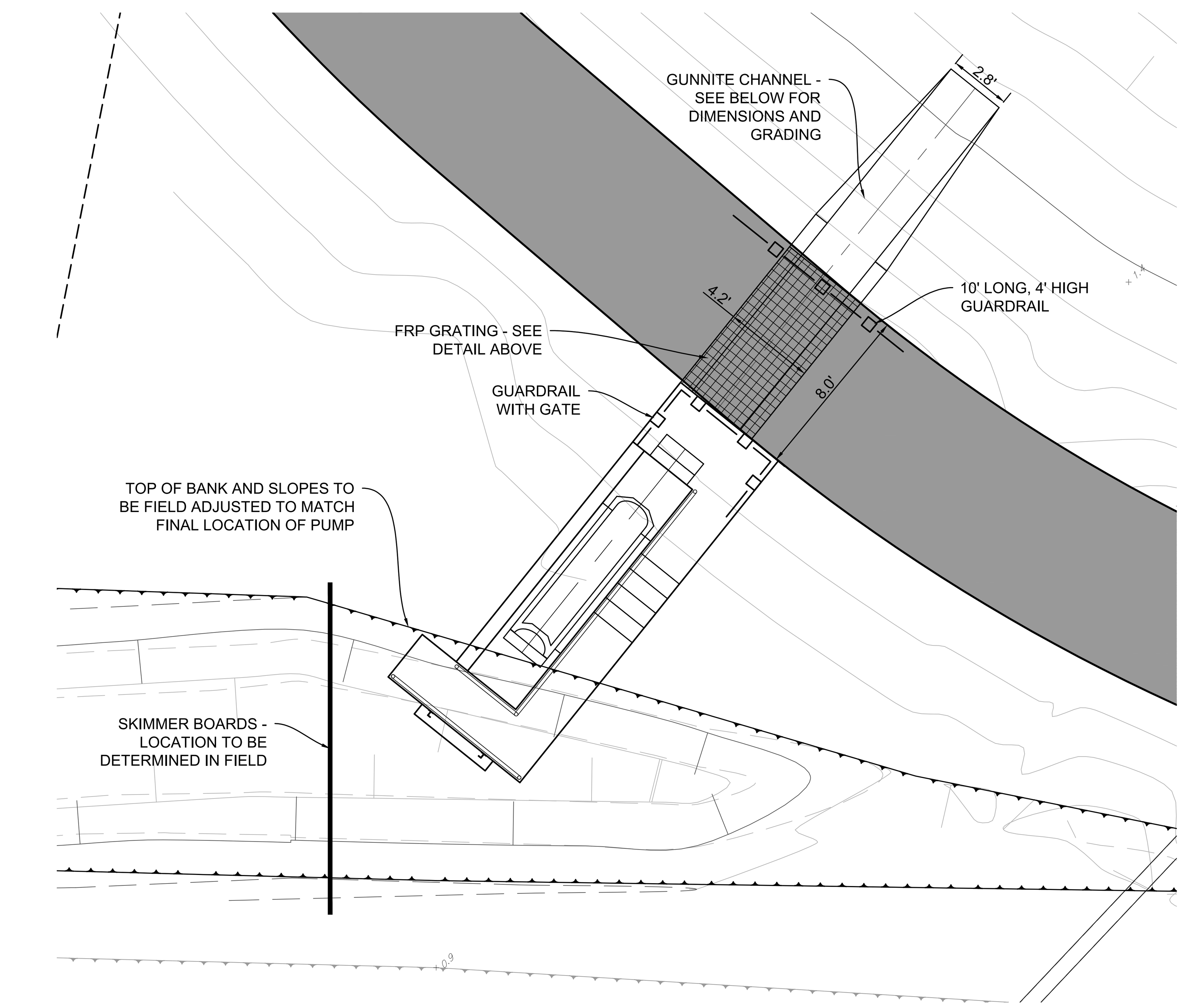
A. PROVIDE OPERATOR TRAINING FOR OWNER'S PERSONNEL AFTER SYSTEM IS OPERATIONAL. TRAINING WILL TAKE PLACE WHILE MANUFACTURER'S REPRESENTATIVE IS AT THE JOB SITE FOR INSPECTION.

END SECTION 43 24 41



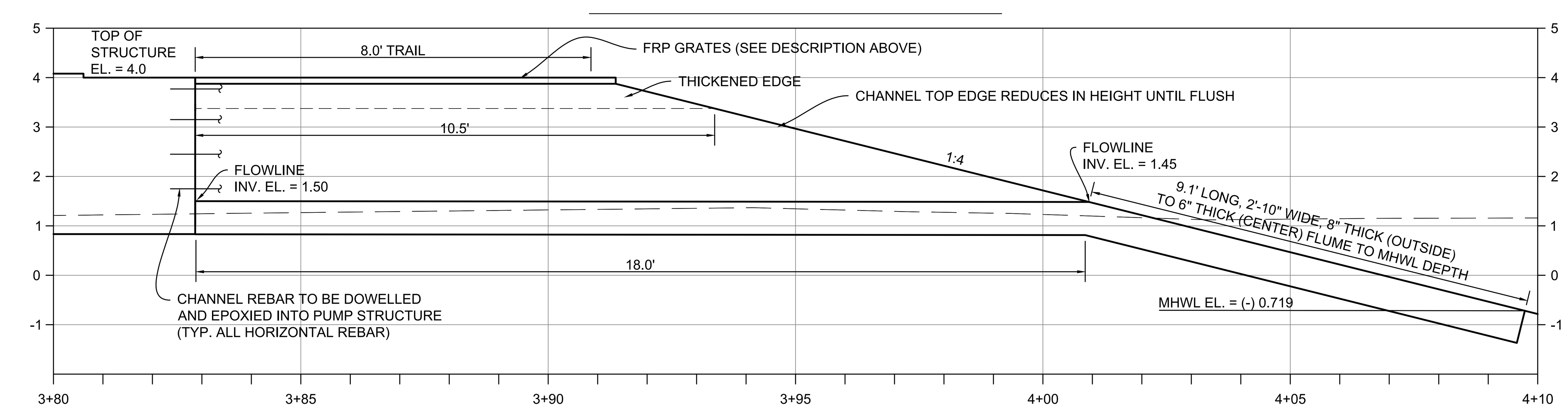
TYPICAL DISCHARGE CHANNEL SECTION

SCALE: 1" = 1'



DISCHARGE CHANNEL PLAN VIEW

SCALE: 1" = 5'



DISCHARGE CHANNEL PROFILE

SCALE: 1" = 2'

P:\18-39 Jones Pier\dwg\18-39e.dwg, C-111 PUMP DETAILS AND SPECIFICATIONS, Clint Rahjes

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FLORIDA LICENSE No. 45813
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SIGNATURE DATE
COA 205 / LB 205

DATE : Nov 2019
PROJ. # : 18-39e
DRAWN BY: KWN
APPD. BY : JHB
PLOT BY : Clint Rahjes
FILE NAME :
REF. # : 20585-C;17-345s
F.B. & PG. : 729/21+;850/56+

Jones Pier
Wetland Restoration and Conservation Improvements
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PUMP DETAILS AND SPECIFICATIONS

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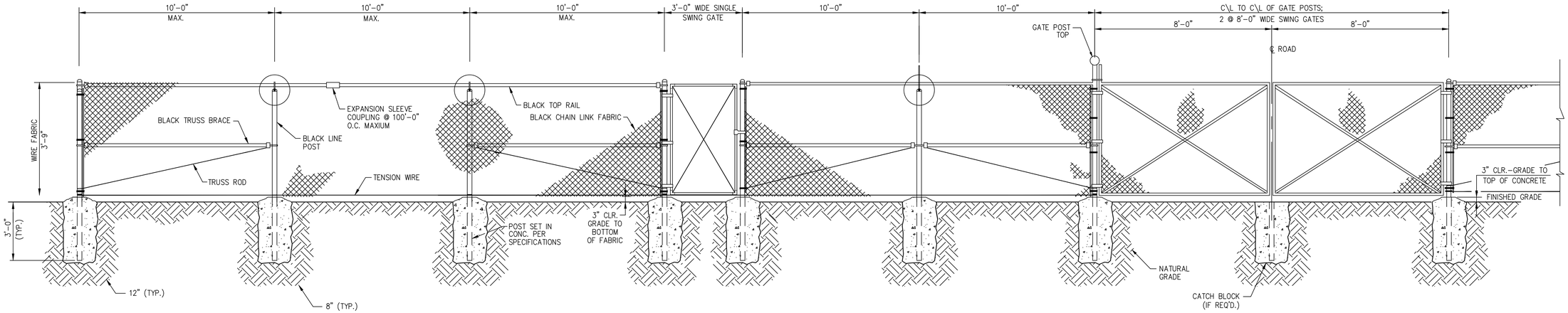
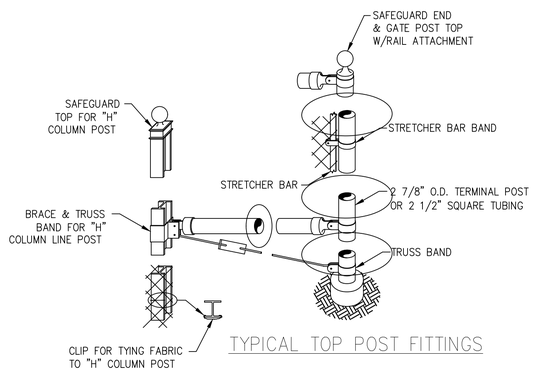
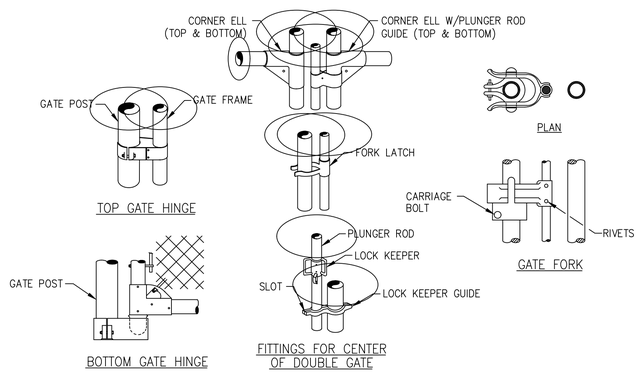


CHAIN LINK FABRIC FENCE ELEVATION



TYPICAL TOP POST FITTINGS

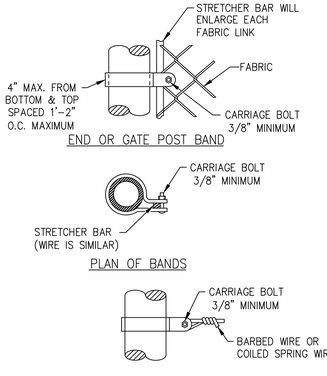


TOP GATE HINGE

BOTTOM GATE HINGE

FITTINGS FOR CENTER OF DOUBLE GATE

TYPICAL GATE FITTINGS



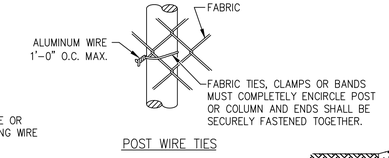
END OR GATE POST BAND

PLAN OF BANDS

WIRE STRETCHING BAND

WIRE & POST BANDS

TOP OR BRACE RAIL WIRE TIES



POST WIRE TIES

WIRE TIES

GATE KEEPER
(HOLDS GATE OPEN)

TRUSS ROD & BAND

NOTES:

PART 1 GENERAL

1.1 SUMMARY

A. THIS SECTION INCLUDES MATERIALS APPLICABLE FOR COMMERCIAL/INDUSTRIAL AND SECURITY CHAIN LINK FENCE AND GATES.
1. POLYMER COATED STEEL CHAIN LINK FABRIC
2. POLYMER COATED GALVANIZED STEEL FRAMEWORK AND FITTINGS
3. GATES: SWING AND CANTILEVER SLIDE
4. INSTALLATION

B. RELATED PROJECT CONTRACT SECTIONS:
1. 01 33 13 CERTIFICATES
2. 01 33 23 SHOP DRAWINGS, PRODUCT DATA
3. 01 43 13 MANUFACTURERS QUALIFICATIONS
4. 01 43 23 INSTALLER QUALIFICATIONS
5. 01 45 00 QUALITY CONTROL
6. 01 65 00 PRODUCT DELIVERY REQUIREMENTS
7. 01 66 00 PRODUCT STORAGE AND HANDLING REQUIREMENTS
8. 03 30 53 MISCELLANEOUS CAST IN PLACE CONCRETE

1.2 REFERENCES

A. ASTM F552 STANDARD TERMINOLOGY RELATING TO CHAIN LINK FENCING
B. ASTM F567 STANDARD PRACTICE FOR INSTALLATION OF CHAIN LINK FENCE
C. ASTM F626 SPECIFICATION FOR FENCE FITTINGS
D. ASTM F668 SPECIFICATION FOR POLYMER COATED CHAIN LINK FENCE FABRIC
E. ASTM F900 SPECIFICATION FOR INDUSTRIAL AND COMMERCIAL SWING GATES
F. ASTM F934 SPECIFICATION FOR STANDARD COLORS FOR POLYMER-COATED CHAIN LINK
G. ASTM F1043 SPECIFICATION FOR STRENGTH AND PROTECTIVE COATINGS OF METAL INDUSTRIAL CHAIN LINK FENCE FRAMEWORK
H. ASTM F1184 SPECIFICATION FOR INDUSTRIAL AND COMMERCIAL HORIZONTAL SLIDE GATES
I. ASTM F1664 SPECIFICATION FOR POLY (VINYL CHLORIDE) (PVC) AND OTHER CONFORMING ORGANIC POLYMER-COATED STEEL TENSION WIRE USED WITH CHAIN-LINK FENCE
J. CLFMI WLG2445 CHAIN LINK FENCE WIND LOAD GUIDE FOR THE SELECTION OF LINE POST AND LINE POST SPACING

1.4 SUBMITTALS

A. SHOP DRAWINGS: SITE PLAN SHOWING LAYOUT OF FENCE LOCATION WITH DIMENSIONS, LOCATION OF GATES AND OPENING SIZE, CLEARED AREA, ELEVATION OF FENCE AND GATES, DETAILS OF ATTACHMENTS AND FOOTINGS.

B. CERTIFICATIONS: MANUFACTURERS MATERIAL CERTIFICATIONS IN COMPLIANCE WITH CURRENT ASTM SPECIFICATIONS.

C. DOMESTIC CERTIFICATIONS: MATERIAL CERTIFICATIONS, MADE IN U.S.A., BUY AMERICAN ACT OR BUY AMERICA WHEN REQUIRED.

D. SPECIFICATION CHANGES: MAY NOT BE MADE AFTER THE DATE OF BID.

1.5 QUALITY ASSURANCE

A. MANUFACTURER: COMPANY OPERATING IN THE UNITED STATES HAVING U.S. MANUFACTURING FACILITY/FACILITIES SPECIALIZING IN MANUFACTURING CHAIN LINK FENCE PRODUCTS WITH AT LEAST 5 YEARS EXPERIENCE.
B. FENCE CONTRACTOR: COMPANY WITH DEMONSTRATED SUCCESSFUL EXPERIENCE INSTALLING SIMILAR PROJECTS AND PRODUCTS IN ACCORDANCE WITH ASTM F567 AND HAVE AT LEAST 5 YEARS EXPERIENCE.
C. TOLERANCES: CURRENT PUBLISHED EDITION OF ASTM SPECIFICATIONS TOLERANCES APPLY. ASTM SPECIFICATION TOLERANCES SUPERSEDE ANY CONFLICTING TOLERANCE.

1.6 DELIVERY, STORAGE AND HANDLING

A. DELIVERY: DELIVER PRODUCTS TO SITE PER CONTRACT REQUIREMENTS.
B. STORAGE: STORE AND PROTECT PRODUCTS OFF THE GROUND WHEN REQUIRED.

PART 2 PRODUCTS

2.1 CHAIN LINK FABRIC

A. STEEL CHAIN LINK FABRIC: 2 IN. MESH, 8 GAUGE 4 FOOT HIGH WITH TOP AND BOTTOM KNUCKLE SELVAGE.
1. POLYMER COATED STEEL FABRIC: ASTM F668, THE WIRE GAUGE SPECIFIED FOR POLYMER-COATED WIRE IS THAT OF THE METALLIC COATED STEEL CORE WIRE
a. CLASS 2B FUSED AND ADHERED
b. COLOR: BLACK IN COMPLIANCE WITH ASTM F934
2. FABRIC SELVAGE:
KNUCKLE FINISH TOP AND BOTTOM, K&K.

2.2 STEEL FENCE FRAMEWORK

A. POLYMER COATED FRAMEWORK: POLYMER COATED FRAMEWORK SHALL HAVE A PVC COATING FUSED AND ADHERED TO THE EXTERIOR ZINC COATING OF THE POST OR RAIL. PVC AND POLYOLEFIN COATINGS SHALL HAVE MINIMUM THICKNESS 10-MILS (0.254 MM), POLYESTER COATING MINIMUM THICKNESS 3 MILS (0.0076 MM) PER ASTM F1043. COLOR TO MATCH FABRIC (BLACK) PER ASTM F934.

2.3 TENSION WIRE

A. POLYMER COATED STEEL TENSION WIRE: 7 GAUGE (0.177 IN.) (4.50 MM) WIRE COMPLYING WITH ASTM F1664. WIRE GAUGE SPECIFIED IS THE CORE WIRE GAUGE.
1. CLASS 2B, FUSED AND ADHERED,

B. POLYMER COATED COLOR FITTINGS: IN COMPLIANCE WITH ASTM F626. POLYMER COATING MINIMUM THICKNESS 0.006 IN. (0.152 MM) FUSED AND ADHERED TO ZINC COATED FITTINGS

2.4 TIE WIRE AND HOG RINGS

TIE WIRE AND HOGS RINGS PER ASTM F626. MATCH THE COATING, CLASS AND COLOR TO THAT OF THE CHAIN LINK FABRIC.

2.5 CONCRETE

CONCRETE FOR POST FOOTINGS SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 2,500 PSI.

PART 3 EXECUTION

3.1 FRAMEWORK INSTALLATION

A. POSTS: POSTS SHALL BE SET PLUMB IN CONCRETE FOOTINGS IN ACCORDANCE WITH ASTM F567. MINIMUM FOOTING DEPTH, 24 IN. PLUS AN ADDITIONAL 3 IN. FOR EACH 1 FT. INCREASE IN THE FENCE HEIGHT OVER 4 FT. MINIMUM FOOTING DIAMETER FOUR TIMES THE LARGEST CROSS SECTION OF THE POST UP TO 4.00" O.D. AND THREE TIMES THE LARGEST CROSS SECTION OF POST GREATER THAN 4.00" O.D. TOP OF POST CONCRETE FOOTING TO BE AT GRADE CROWNED TO SHED WATER AWAY FROM THE POST. LINE POSTS INSTALLED AT INTERVALS NOT EXCEEDING 10 FT. ON CENTER.

C. TERMINAL POSTS: END, CORNER, PULL AND GATE POSTS SHALL BE BRACED AND TRUSSED FOR FENCE 6 FT. AND HIGHER AND FOR FENCES 5 FT. (1.5 M) IN HEIGHT NOT HAVING A TOP RAIL. THE HORIZONTAL BRACE RAIL AND DIAGONAL TRUSS ROD SHALL BE INSTALLED IN ACCORDANCE WITH ASTM F567.

D. TENSION WIRE: SHALL BE INSTALLED 4 IN. UP FROM THE BOTTOM OF THE FABRIC. FENCES WITHOUT TOP RAIL SHALL HAVE A TENSION WIRE INSTALLED 4 IN. DOWN FROM THE TOP OF THE FABRIC. TENSION WIRE TO BE STRETCHED TAUT, INDEPENDENTLY AND PRIOR TO THE FABRIC, BETWEEN THE TERMINAL POSTS AND SECURED TO THE TERMINAL POST USING A BRACE BAND. SECURE THE TENSION WIRE TO THE CHAIN LINK FABRIC WITH A 9 GAUGE HOG RINGS 18 IN. (457.2 MM) ON CENTER AND TO EACH LINE POST WITH A TIE WIRE.

3.2 CHAIN LINK FABRIC INSTALLATION

CHAIN LINK FABRIC: INSTALL FABRIC TO THE OUTSIDE OF THE FRAMEWORK. ATTACH FABRIC TO THE TERMINAL POST BY THREADING THE TENSION BAR THROUGH THE FABRIC; SECURE THE TENSION BAR TO THE TERMINAL POST WITH TENSION BANDS AND 5/16 IN. CARRIAGE BOLTS SPACED NO GREATER THAN 12 INCHES ON CENTER. SMALL MESH FABRIC LESS THAN 1 IN. ATTACH TO TERMINAL POST BY SANDWICHING THE MESH BETWEEN THE POST AND A VERTICAL 2 IN. WIDE BY 3/16 IN. STEEL BAR USING CARRIAGE BOLTS, THRU BOLTED THRU THE BAR, MESH AND POST SPACED 15 IN. ON CENTER.

CHAIN LINK FABRIC TO BE STRETCHED TAUT FREE OF SAG. FABRIC TO BE SECURED TO THE LINE POST WITH TIE WIRES SPACED NO GREATER THAN 12 INCHES ON CENTER AND TO RAIL SPACED NO GREATER THAN18 INCHES ON CENTER. SECURE FABRIC TO THE TENSION WIRE WITH HOG RINGS SPACED NO GREATER THAN 18 INCHES APART.

ALUMINUM ALLOY WIRE TIES SHALL BE WRAPPED AROUND THE POST OR RAIL AND ATTACHED TO A FABRIC WIRE PICKET ON EACH SIDE OF THE POST OR RAIL BY TWISTING THE TIE WIRE AROUND THE FABRIC WIRE PICKET TWO FULL TURNS PER ASTM F567. EXCESS WIRE SHALL BE CUT OFF AND BENT OVER TO PREVENT INJURY. THE INSTALLED FABRIC SHALL HAVE A GROUND CLEARANCE ON NO MORE THAN 2 INCHES.

3.3 NUTS AND BOLTS

BOLTS: CARRIAGE BOLTS USED FOR FITTINGS SHALL BE INSTALLED WITH THE HEAD ON THE SECURE SIDE OF THE FENCE. ALL BOLTS SHALL BE PEENED OVER TO PREVENT REMOVAL OF THE NUT.

3.4 CLEAN UP

CLEAN UP: THE AREA OF THE FENCE LINE SHALL BE LEFT NEAT AND FREE OF ANY DEBRIS CAUSED BY THE INSTALLATION OF THE FENCE.

P:\18-39 Jones Pier\dwg\18-39a.dwg, C-112 CHAIN LINK FENCE DETAILS, Clint Rahjes

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John H. Blum, P.E. SIGNATURE DATE
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DATE : Nov 2019
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CHAIN LINK FENCE DETAILS

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