GENERAL NOTES:

U.S. COAST GUARD NOTIFICATION: Notify the local office of the U.S. Coast Guard at least 30 days prior to beginning of construction of the Fender System.

POLYMERIC PILES – Provide polymeric piles in accordance with Specification Section 471. Installation shall be in accordance with manufacturer's recommendations. All piles shall be plumb.

PLASTIC LUMBER AND STRUCTURAL COMPOSITE LUMBER WALES: Provide only Plastic Lumber and Structural Composite Lumber Wales in accordance with Specification Section 973. Wales shall be continuous and spliced only at locations shown on the plans.

PLASTIC LUMBER DECKING FOR CATWALKS: Provide Plastic Lumber decking for catwalks when called for in the Plans in accordance with Specification Section 973.

Install Plastic Lumber Decking according to manufacturer's recommendations using stainless steel #10 x 3" (minimum) deck screws.

FIBERGLASS OPEN GRATING FOR CATWALKS: Provide Fiberglass Open Grating for catwalks when called for in the Plans. Fiberglass Open Grating shall be a heavy duty design suitable for exterior installations. Maximum gap opening on the walkway surface shall be 1½". Design live loads and deflections shall be a 50 psf uniformly distributed load with a maximum deflection of ⅜" or L/120 at the center of a simple span and a concentrated load of 250 pounds with a maximum deflection of ¼" at the center of a simple span. Color of Fiberglass Open Grating shall be gray or black.

Install Fiberglass Open Grating according to manufacturer's recommendations using stainless steel hardware, screws, bolts, nuts and washers. Attach Fiberglass Open Grating to Wales and Deck Supports at a 2'-0" maximum spacing so as to resist pedestrian live loads and uplift forces from wind, buoyancy and wave action.

CLEARANCE GAUGE AND LIGHT: Clearance Gauge to be furnished by the FDOT and erected by the Contractor. Clearance Gauge width and numeral height is dependant on visibility distance. The required visibility distance shall be determined by the United States Coast Guard District Commander. Provide and install Clearance Gauge Light in accordance with Specification Section 510 and Index No. 21220.

NAVIGATION LIGHTS: Provide and install Navigation Lights in accordance with Specification Section 510, Index No. 21220 and/or project specific details. Provide and maintain Temporary Navigation Lights during construction until permanent Navigation Lights are operational.

BOLTS, THREADED BARS, NUTS, SCREWS AND WASHERS: Furnish stainless steel Bolts in accordance with ASTM F593 Type 316. Furnish stainless steel Threaded Bars in accordance with ASTM A193 Grade B8M. Furnish stainless steel Nuts in accordance with ASTM F594 Type 316. Furnish stainless steel Screws in accordance with ASTM F593 Type 305. Furnish stainless steel Washers compatible with Bolts, Threaded Rods and Nuts under heads and nuts. Torque Nuts on 1" diameter Bolts and Threaded Bars to 150 lb-ft. Keep threads on Bolts, Threaded Bars and Nuts free from dirt, coarse grime and sand to prevent galling and seizing during tightening.

SPLICE PLATES: Furnish Splice Plates in accordance with ASTM A240 Type 316.

GENERAL NOTES

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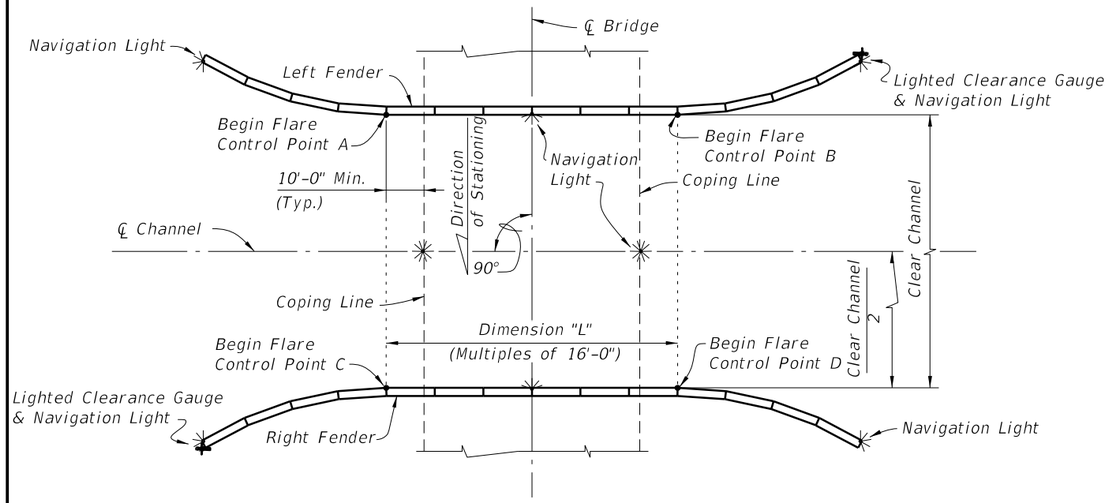
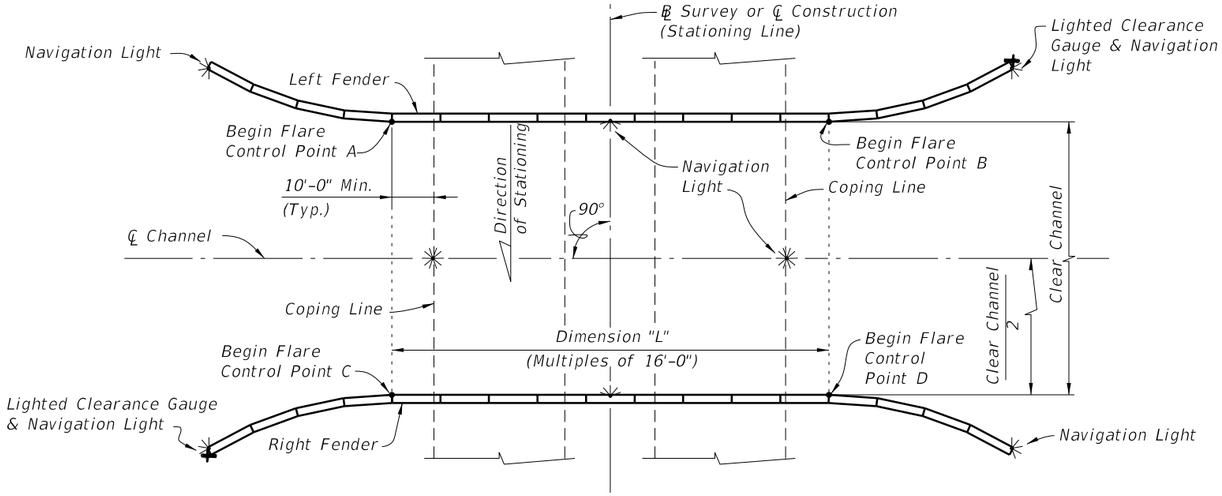
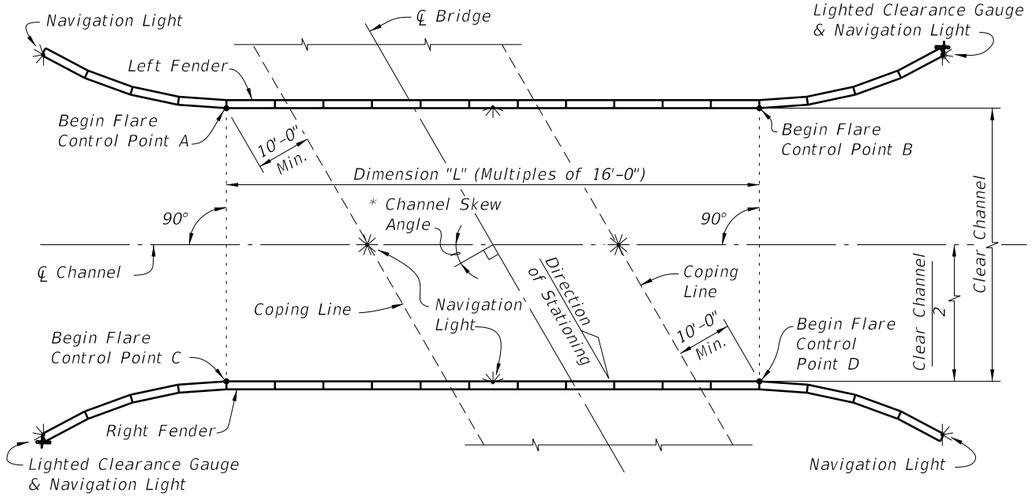


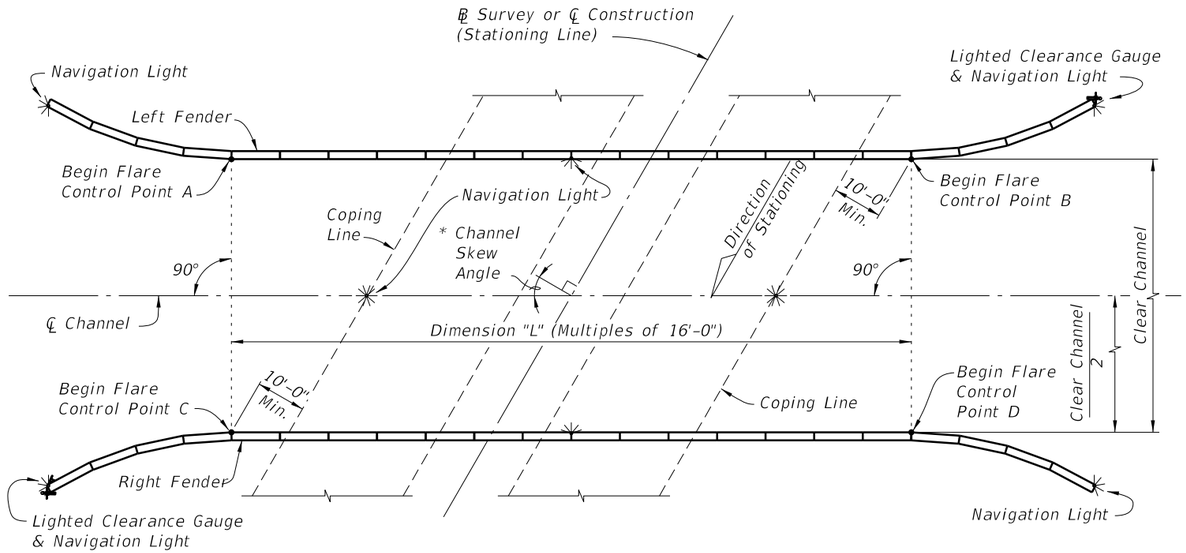
SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF SINGLE FIXED BRIDGE WITH NONSKEWED CHANNEL



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF DUAL FIXED BRIDGES WITH NONSKEWED CHANNEL (PARALLEL DUAL FIXED BRIDGES SHOWN, NONPARALLEL DUAL FIXED BRIDGES SIMILAR)



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF SINGLE FIXED BRIDGE WITH SKEWED CHANNEL



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF DUAL FIXED BRIDGES WITH SKEWED CHANNEL (PARALLEL DUAL FIXED BRIDGES SHOWN, NONPARALLEL DUAL FIXED BRIDGES SIMILAR)

* See Structures Plans, Plan and Elevation and Foundation Layout Sheets for magnitude and orientation of Channel Skew Angle.

CROSS REFERENCES:
For Stations and Offsets of referenced Control Points A, B, C and D, Dimension "L" and Clear Channel Width see Fender System Table of Variables in Structures Plans.
For Navigation Light Details see Design Standards Index 21220.

LAYOUT GEOMETRY

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LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
01/01/12			FDOT DESIGN STANDARDS 2013	FENDER SYSTEM -POLYMERIC PILES	21900	2

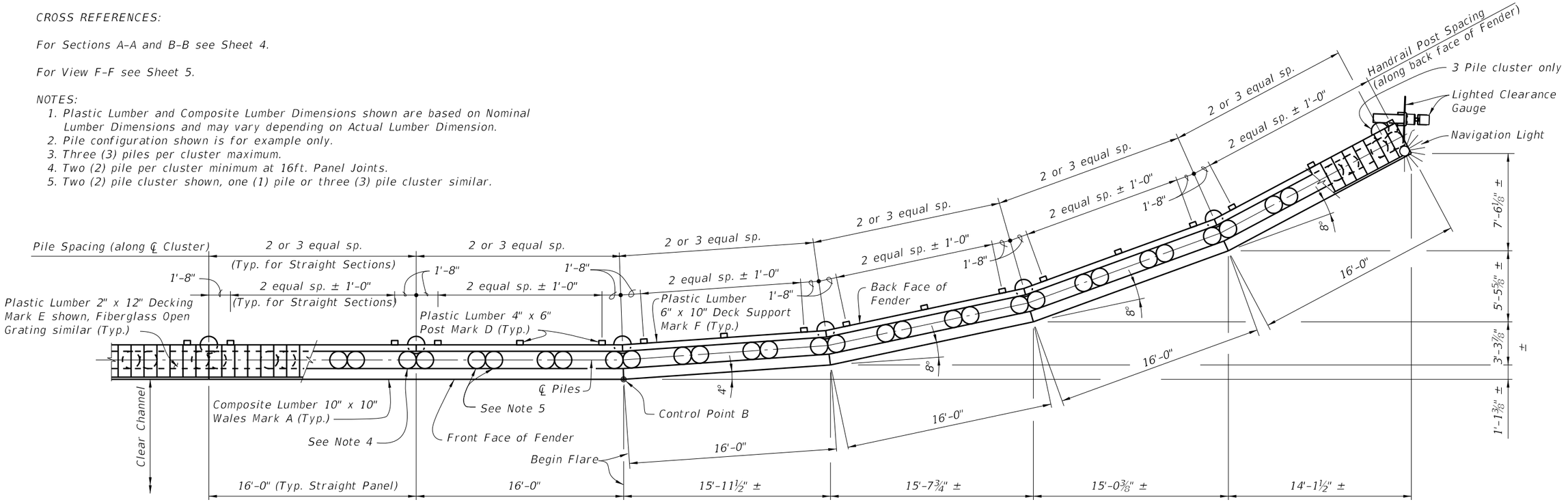
CROSS REFERENCES:

For Sections A–A and B–B see Sheet 4.

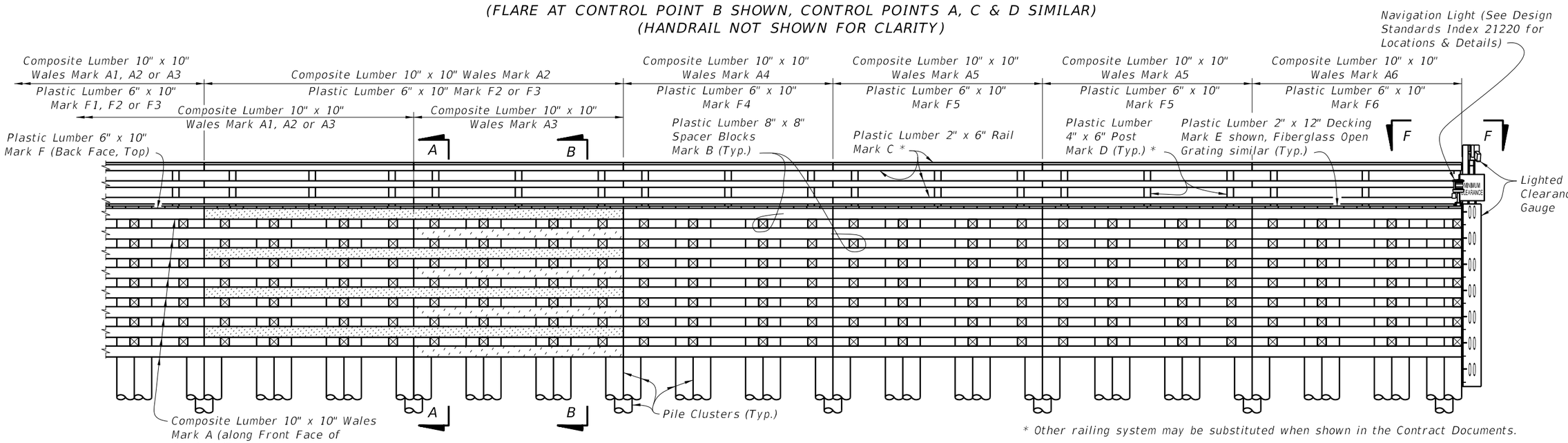
For View F–F see Sheet 5.

NOTES:

1. Plastic Lumber and Composite Lumber Dimensions shown are based on Nominal Lumber Dimensions and may vary depending on Actual Lumber Dimension.
2. Pile configuration shown is for example only.
3. Three (3) piles per cluster maximum.
4. Two (2) pile per cluster minimum at 16ft. Panel Joints.
5. Two (2) pile cluster shown, one (1) pile or three (3) pile cluster similar.



PARTIAL PLAN VIEW (TYPICAL FLARE)
(FLARE AT CONTROL POINT B SHOWN, CONTROL POINTS A, C & D SIMILAR)
(HANDRAIL NOT SHOWN FOR CLARITY)



* Other railing system may be substituted when shown in the Contract Documents.

EXPANDED PARTIAL ELEVATION VIEW

FENDER SYSTEM DETAILS

LAST REVISION	REVISION	DESCRIPTION:		FDOT DESIGN STANDARDS 2013	FENDER SYSTEM -POLYMERIC PILES	INDEX NO.	SHEET NO.
01/01/12						21900	3

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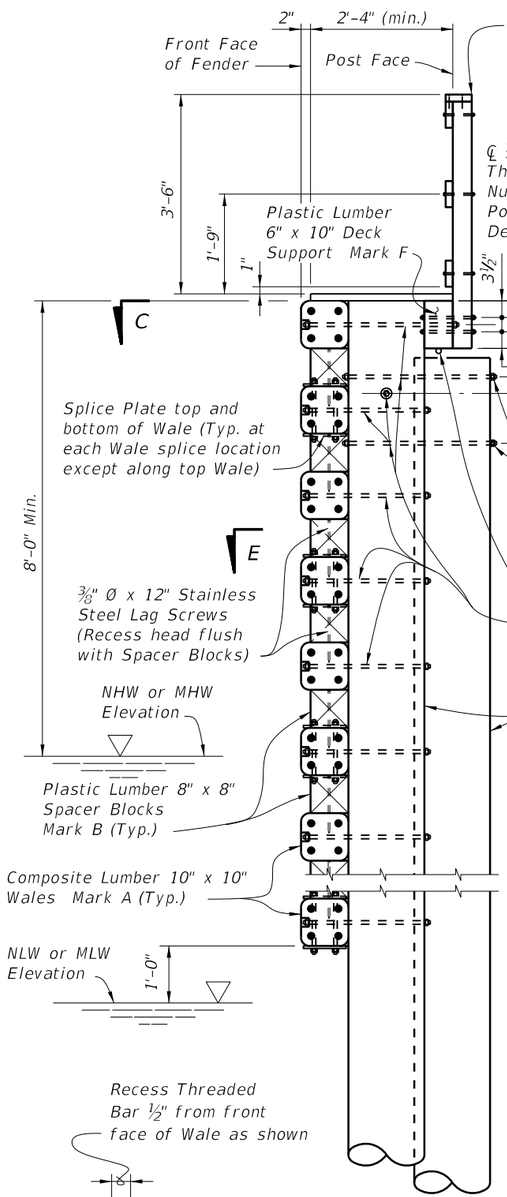
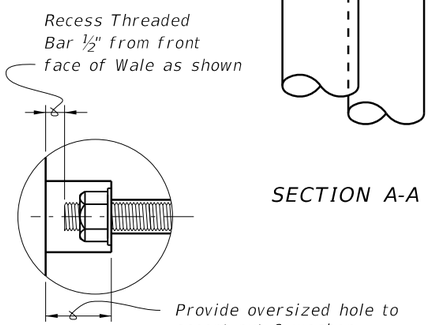
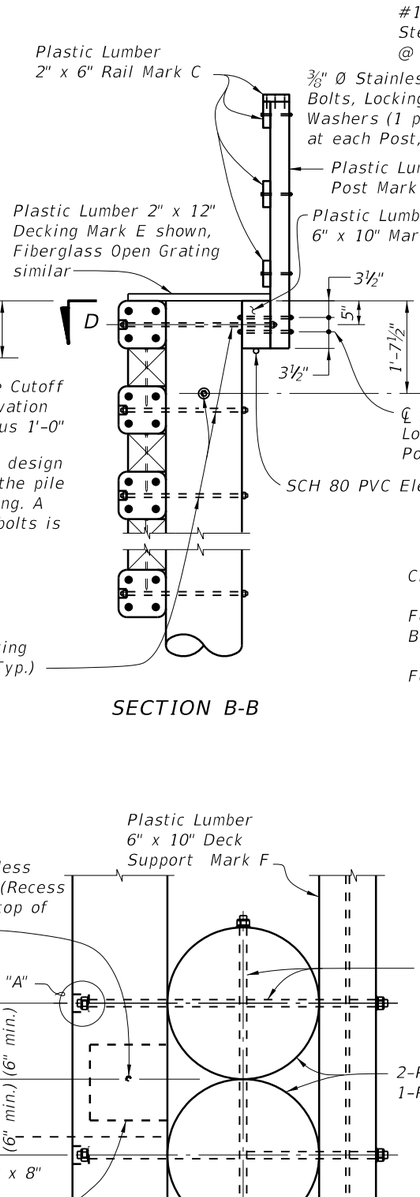


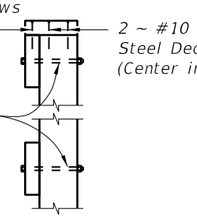
SECTION A-A



DETAIL "A"



SECTION B-B

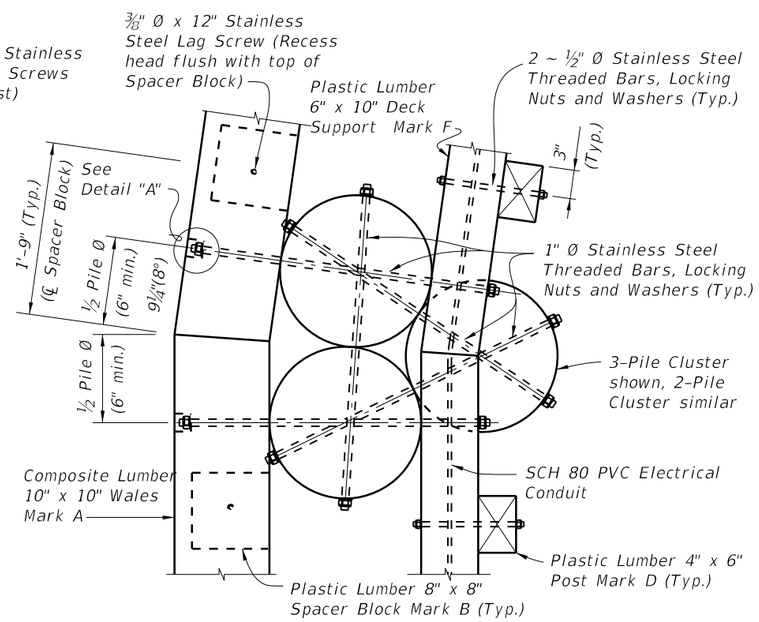


HANDRAIL DETAIL

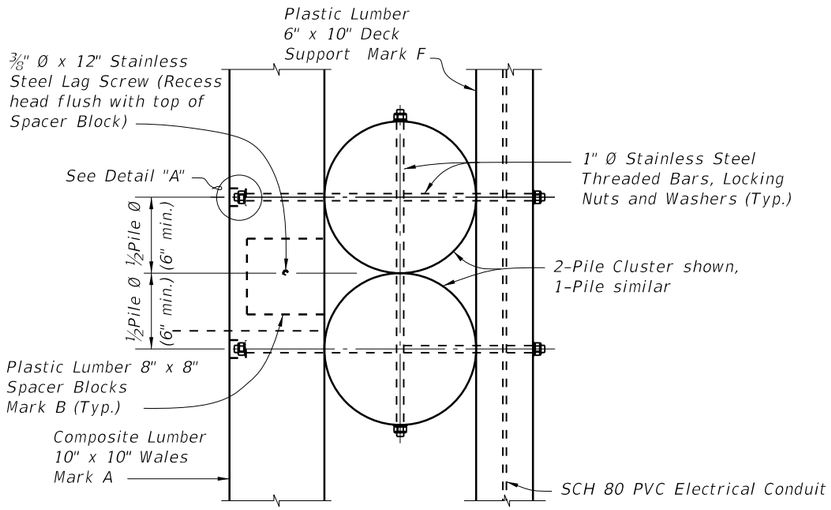
CROSS REFERENCES:

For locations of Sections A-A and B-B see Sheet 3.

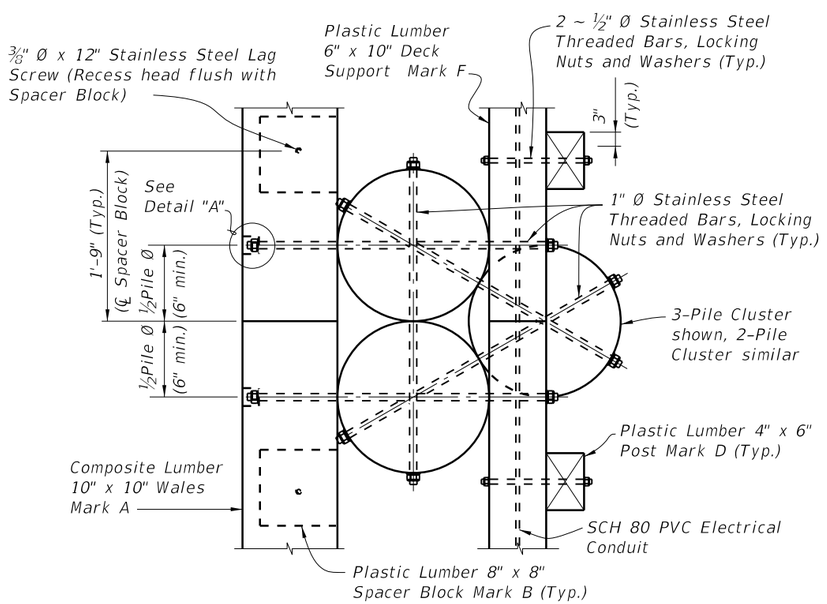
For Section E-E see Sheet 5.



SECTION C-C
TYPICAL FLARED SECTION
(8° TURN SHOWN, 4° TURN SIMILAR)



SECTION D-D
TYPICAL AT INTERMEDIATE PILES



SECTION C-C
TYPICAL STRAIGHT SECTION

FENDER SYSTEM DETAILS

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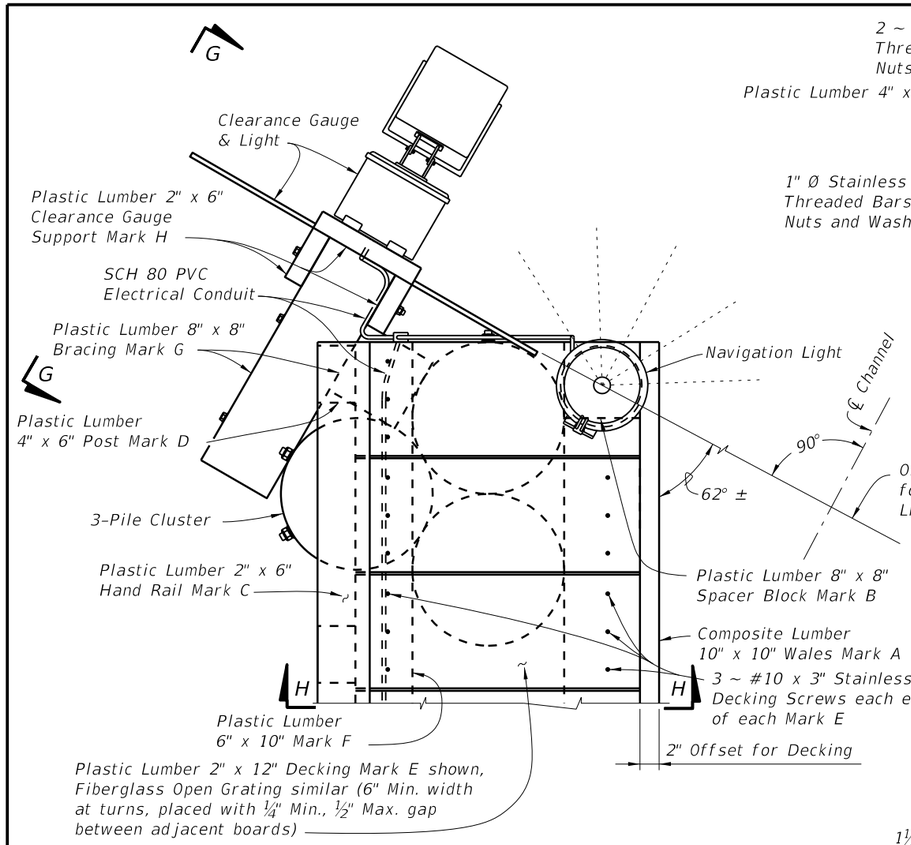
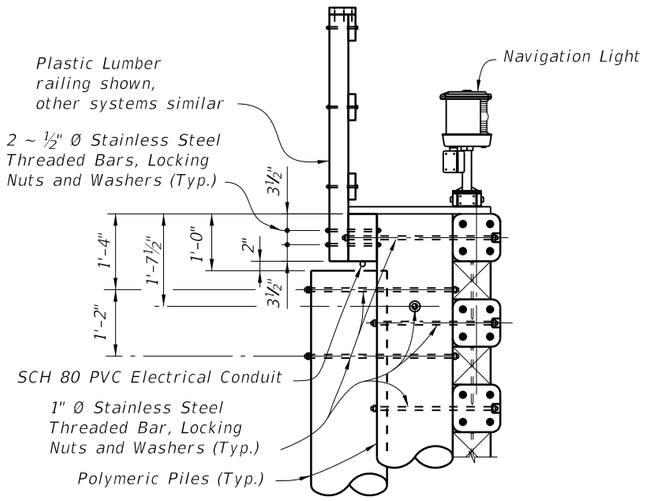
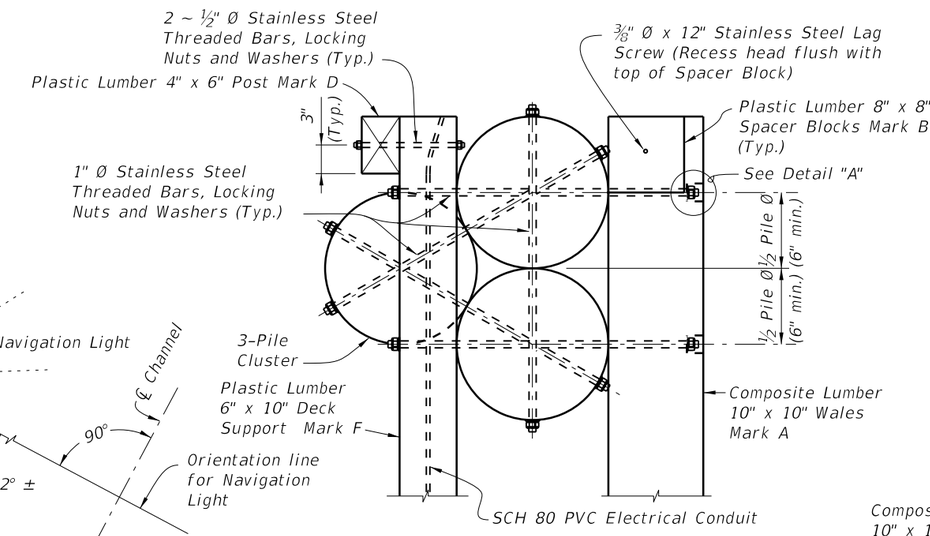
LAST REVISION	REVISION	DESCRIPTION:				
01/01/12			FDOT DESIGN STANDARDS 2013	FENDER SYSTEM -POLYMERIC PILES	INDEX NO. 21900	SHEET NO. 4



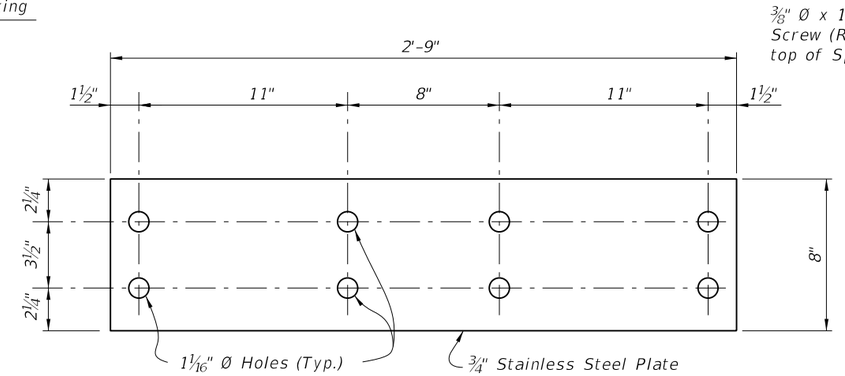
VIEW F-F
(SHOWING FENDER END WITH CLEARANCE GAUGE; FENDER END WITHOUT CLEARANCE GAUGE SIMILAR)



SECTION H-H
(CLEARANCE GAUGE NOT SHOWN FOR CLARITY)



VIEW F-F
(SHOWING FENDER END; DECKING, HANDRAIL AND CLEARANCE GAUGE NOT SHOWN FOR CLARITY)



SPLICE PLATE DETAIL

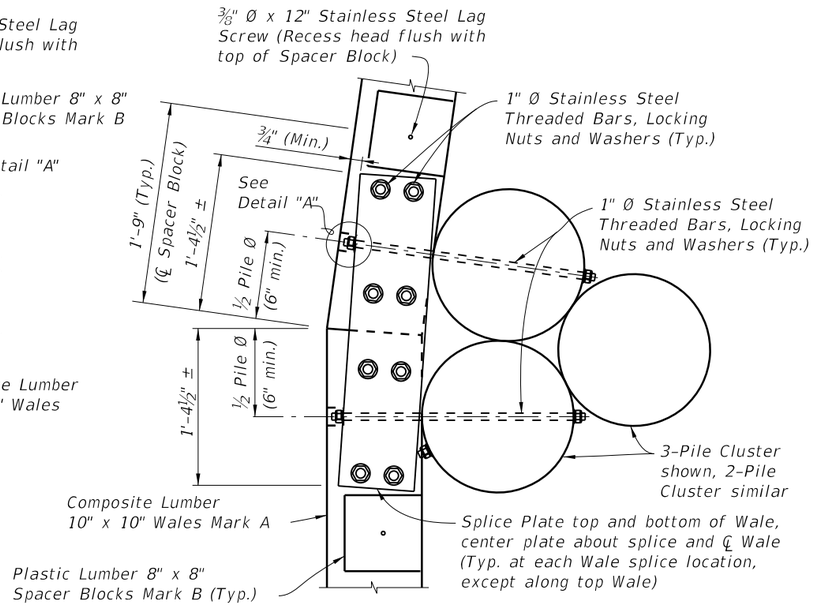
CROSS REFERENCES:

For Navigation Lights and SCH 80 PVC Electrical Conduit Details see Design Standard Index 21220.

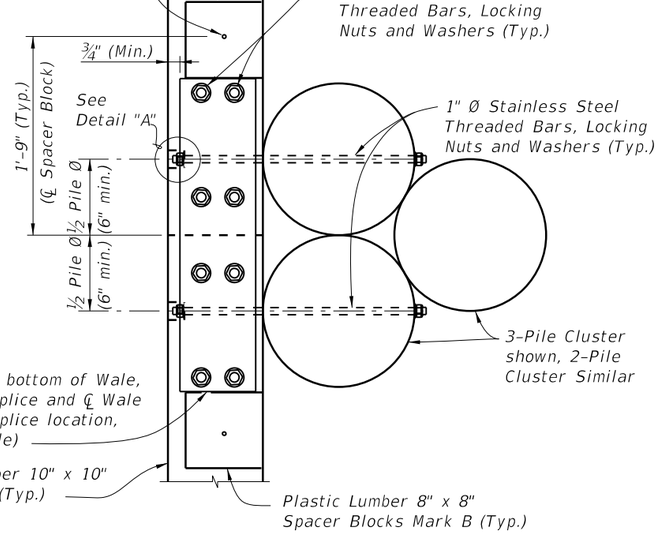
For Clearance Gauge Details and View G–G see Sheet 6.

For location of View F–F see Sheet 3.

For location of Section E–E see Sheet 4.



SECTION E-E
TYPICAL FLARED SECTION
(8° TURN SHOWN, 4° TURN SIMILAR)



SECTION E-E
TYPICAL STRAIGHT SECTION

FENDER SYSTEM DETAILS

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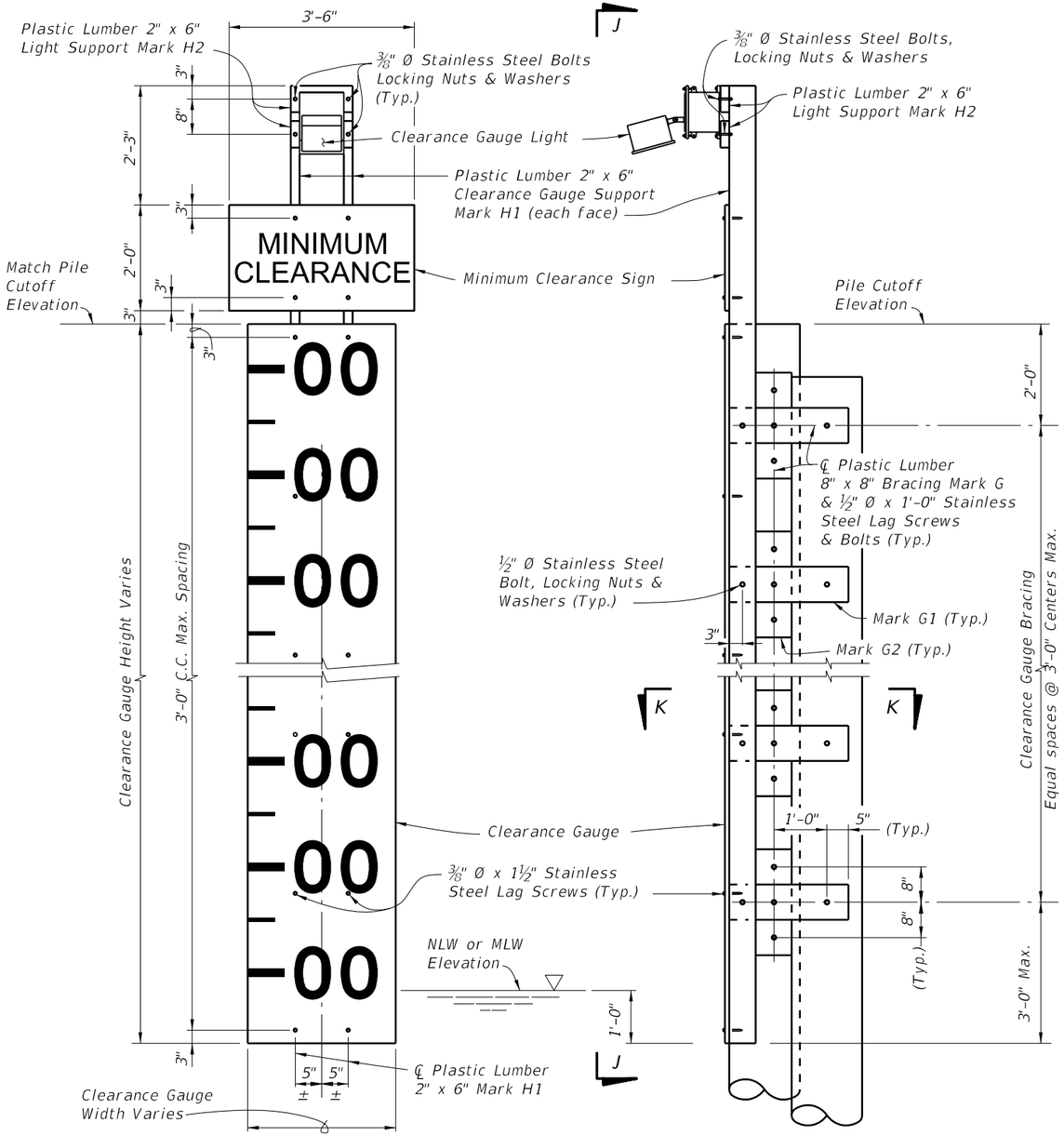
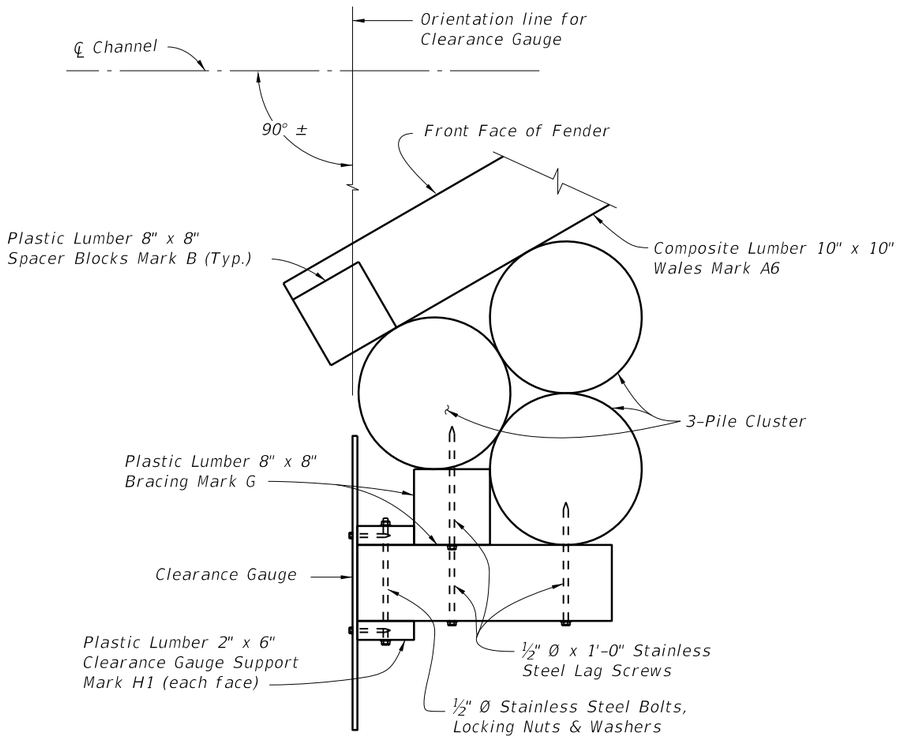
LAST REVISION	REVISION	DESCRIPTION:				
07/01/11			FDOT DESIGN STANDARDS 2013	FENDER SYSTEM -POLYMERIC PILES	INDEX NO. 21900	SHEET NO. 5



VIEW J-J
(WALES, PILES AND BRACING
NOT SHOW FOR CLARITY)

VIEW G-G
(WALES, DECKING AND HANDRAIL
NOT SHOWN FOR CLARITY)

CLEARANCE GAUGE DETAILS



SECTION K-K

CROSS REFERENCES:

For Structural Composite and Plastic Lumber Bill of Materials Quantities and Fender System Table of Variables see Structures Plans.

For location of View G-G see Sheet 5.

FENDER SYSTEM DETAILS

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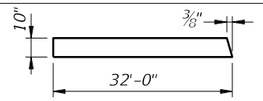
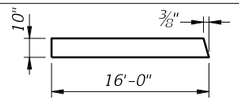
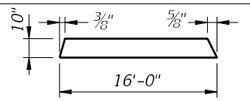
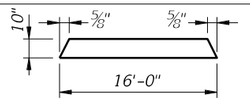
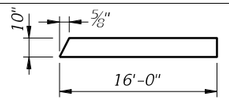
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
01/01/12			FDOT DESIGN STANDARDS 2013	FENDER SYSTEM -POLYMERIC PILES	21900	6

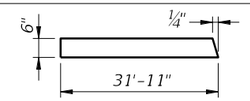
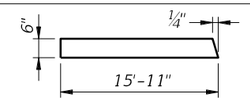
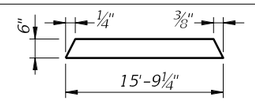
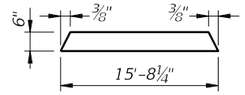
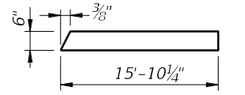
* STRUCTURAL COMPOSITE LUMBER BILL OF MATERIALS

MARK	SIZE (NOMINAL)	DIMENSIONS	BOARD FT. PER EACH	NO. REQD.	QUANTITY
A1	10" X 10" COMPOSITE LUMBER	32'-0" (STRAIGHT)	266.6	See Estimated Structural Composite and Plastic Lumber Bill of Materials Table in Structures Plans	
A2	10" X 10" COMPOSITE LUMBER		266.6		
A3	10" X 10" COMPOSITE LUMBER		133.3		
A4	10" X 10" COMPOSITE LUMBER		133.3		
A5	10" X 10" COMPOSITE LUMBER		133.3		
A6	10" X 10" COMPOSITE LUMBER		133.3		

* All Plastic Lumber and Composite Lumber Dimensions and Quantities shown are based on Nominal Lumber Dimensions and may vary depending on Actual Lumber Dimension.

** Provide Fiberglass Open Grating in lieu of 2" X 12" Plastic Lumber when called for in the Plans. Mounting hardware shall be Stainless Steel, install per Manufacturer's recommendations. See Structures Plans for Notes and Details.

* PLASTIC LUMBER BILL OF MATERIALS

MARK	SIZE (NOMINAL)	DIMENSIONS	BOARD FT. PER EACH	NO. REQD.	QUANTITY
B	8" X 8" PLASTIC LUMBER	8" (STRAIGHT)	3.6	See Estimated Structural Composite and Plastic Lumber Bill of Materials Table in Structures Plans	
C	2" X 6" PLASTIC LUMBER	16'-0" (STRAIGHT) (Trim & Miter Ends as required)	16.0		
D	4" X 6" PLASTIC LUMBER	4'-4" (STRAIGHT)	8.7		
** E	2" X 12" PLASTIC LUMBER	2'-6" (STRAIGHT) (Miter as required)	5.0		
F1	6" X 10" PLASTIC LUMBER	32'-0" (STRAIGHT)	160.0		
F2	6" X 10" PLASTIC LUMBER		159.6		
F3	6" X 10" PLASTIC LUMBER		79.6		
F4	6" X 10" PLASTIC LUMBER		78.8		
F5	6" X 10" PLASTIC LUMBER		78.4		
F6	6" X 10" PLASTIC LUMBER		79.2		
G1	8" X 8" PLASTIC LUMBER	2'-3" (STRAIGHT)	12.0		
G2	8" X 8" PLASTIC LUMBER	2'-0" (STRAIGHT)	10.7		
H1	2" X 6" PLASTIC LUMBER	PILE CUTOFF ELEV. MINUS NLW OR MLW ELEV. PLUS 5'-6" (STRAIGHT)	1.0 PER LF EACH		
H2	2" X 6" PLASTIC LUMBER	1'-0" (STRAIGHT)	1.0		

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GENERAL NOTES:

U.S. COAST GUARD NOTIFICATION: Notify the local office of the U.S. Coast Guard at least 30 days prior to beginning of construction of the Fender System.

14" SQUARE PRESTRESSED CONCRETE PILES – Provide 14" Square Prestressed Concrete Piles of sufficient length to achieve a minimum embedment of 20' into soil having a blow count greater than or equal to 6 (N ≥ 6). Pile splices and build-ups are not permitted. Use only 14" Square Prestressed Concrete Piles with 8 – ½" diameter Low Relaxation Strands fabricated in accordance with Index No. 20614.

PLASTIC LUMBER AND STRUCTURAL COMPOSITE LUMBER WALES: Provide only Plastic Lumber and Structural Composite Lumber Wales in accordance with Specification Section 973. Wales shall be continuous and spliced only at locations shown on the plans.

PLASTIC LUMBER DECKING FOR CATWALKS: Provide Plastic Lumber decking for catwalks when called for in the Plans in accordance with Specification Section 973.

Install Plastic Lumber Decking according to manufacturer's recommendations using stainless steel #10 x 3" (minimum) deck screws.

FIBERGLASS OPEN GRATING FOR CATWALKS: Provide Fiberglass Open Grating for catwalks when called for in the Plans. Fiberglass Open Grating shall be a heavy duty design suitable for exterior installations. Maximum gap opening on the walkway surface shall be 1½". Design live loads and deflections shall be a 50 psf uniformly distributed load with a maximum deflection of ⅜" or L/120 at the center of a simple span and a concentrated load of 250 pounds with a maximum deflection of ¼" at the center of a simple span. Color of Fiberglass Open Grating shall be gray or black.

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CLEARANCE GAUGE AND LIGHT: Clearance Gauge to be furnished by the FDOT and erected by the Contractor. Clearance Gauge width and numeral height is dependant on visibility distance. The required visibility distance shall be determined by the United States Coast Guard District Commander. Provide and install Clearance Gauge Light in accordance with Specification Section 510 and Index No. 21220.

NAVIGATION LIGHTS: Provide and install Navigation Lights in accordance with Specification Section 510, Index No. 21220 and/or project specific details. Provide and maintain Temporary Navigation Lights during construction until permanent Navigation Lights are operational.

BOLTS, THREADED BARS, NUTS, SCREWS AND WASHERS: Furnish stainless steel Bolts in accordance with ASTM F593 Type 316. Furnish stainless steel Threaded Bars in accordance with ASTM A193 Grade B8M. Furnish stainless steel Nuts in accordance with ASTM F594 Type 316. Furnish stainless steel Screws in accordance with ASTM F593 Type 305. Furnish stainless steel Washers compatible with Bolts, Threaded Rods and Nuts under heads and nuts. Torque Nuts on 1" diameter Bolts and Threaded Bars to 150 lb-ft. Keep threads on Bolts, Threaded Bars and Nuts free from dirt, coarse grime and sand to prevent galling and seizing during tightening.

SPLICE PLATES: Furnish Splice Plates in accordance with ASTM A240 Type 316.

WIRE ROPE: Provide wire rope meeting one of the following requirements:

1. ½" diameter 6x19, 6x25 or 6x37 class IWRC Type 316 stainless steel wire rope with a minimum breaking strength of 18,000 lbs.

2. ½" diameter 6x19 galvanized wire rope with ultraviolet ray resistant polypropylene impregnation having an outside diameter of 5/8" with a minimum breaking strength of 22,000 lbs. Protect all ends with heat shrinkable end caps compatible with the rope's polypropylene that provide an effective water-tight seal.

FENDER SYSTEM ENERGY CAPACITY:
Energy Capacity = 38 ft-k

GENERAL NOTES

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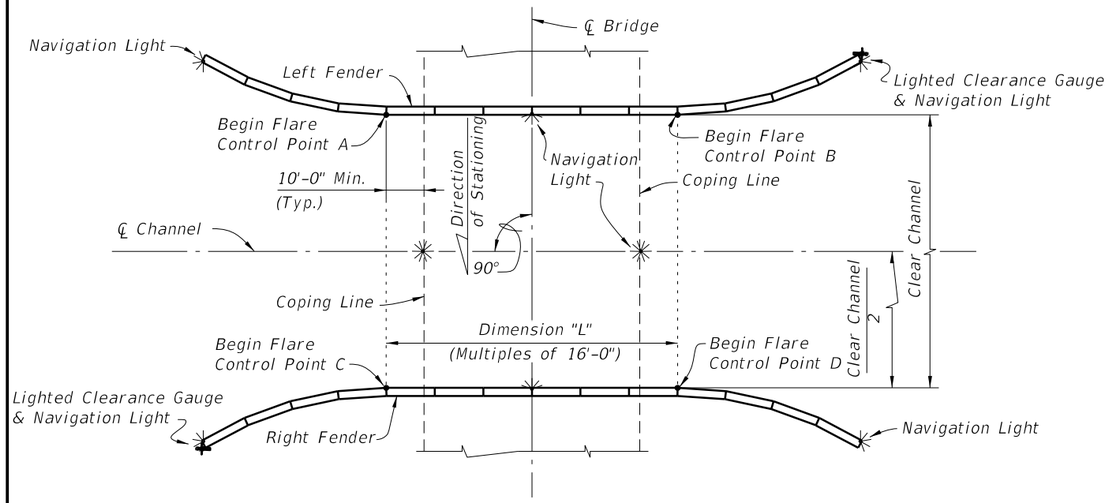
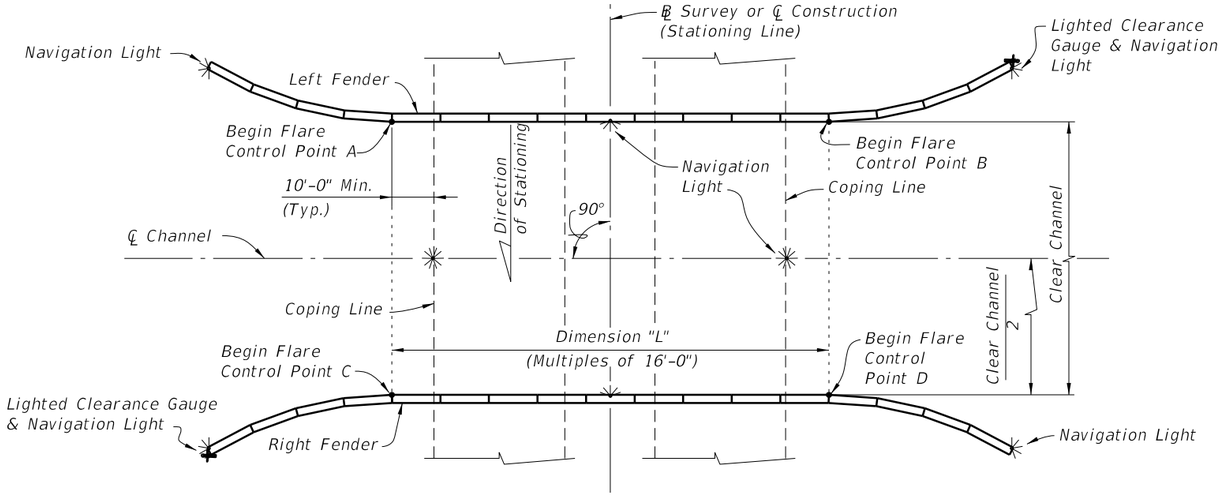
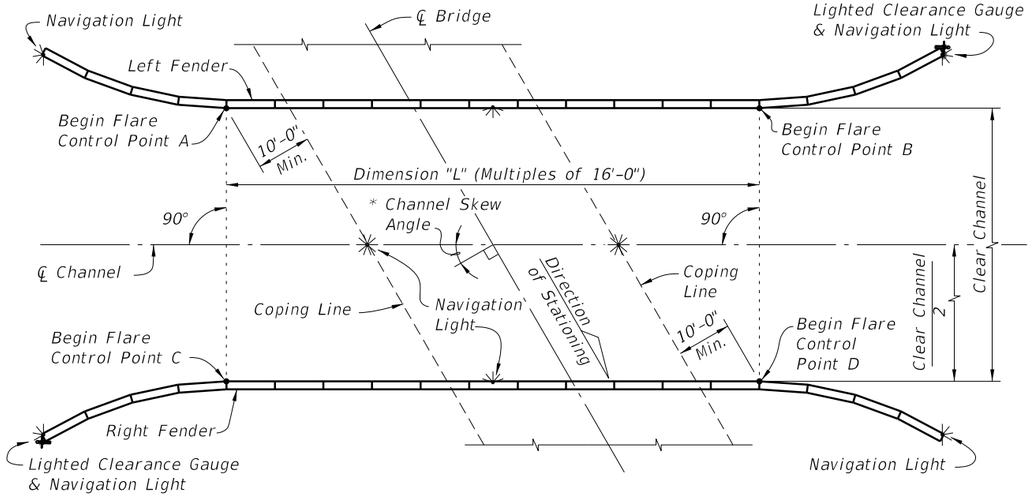


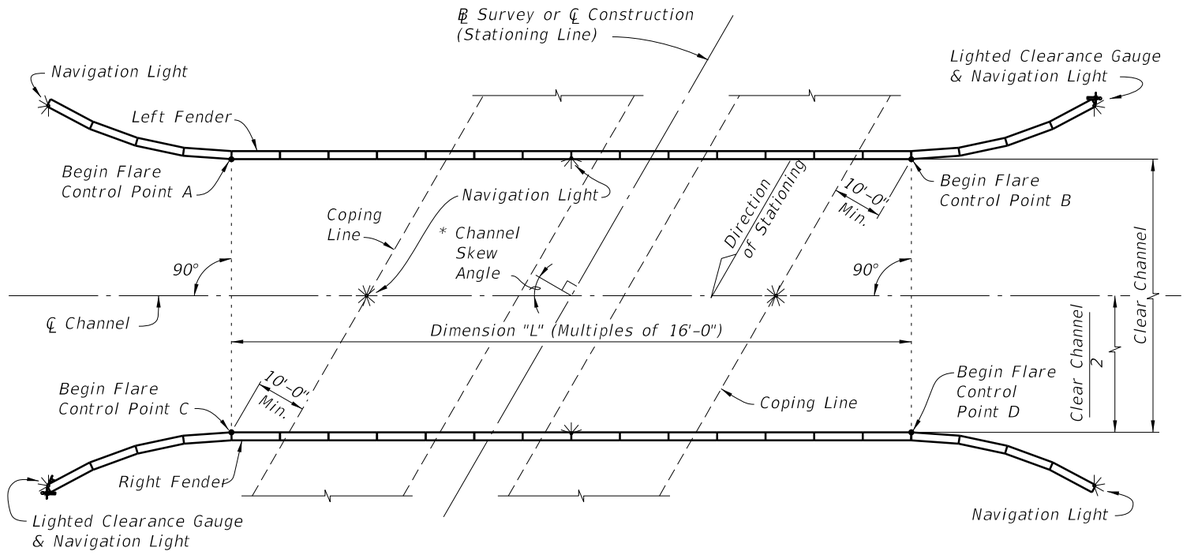
SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF SINGLE FIXED BRIDGE WITH NONSKEWED CHANNEL



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF DUAL FIXED BRIDGES WITH NONSKEWED CHANNEL (PARALLEL DUAL FIXED BRIDGES SHOWN, NONPARALLEL DUAL FIXED BRIDGES SIMILAR)



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF SINGLE FIXED BRIDGE WITH SKEWED CHANNEL



SCHEMATIC OF FENDER SYSTEM SHOWING TREATMENT OF DUAL FIXED BRIDGES WITH SKEWED CHANNEL (PARALLEL DUAL FIXED BRIDGES SHOWN, NONPARALLEL DUAL FIXED BRIDGES SIMILAR)

* See Structures Plans, Plan and Elevation and Foundation Layout Sheets for magnitude and orientation of Channel Skew Angle.

CROSS REFERENCES:
For Stations and Offsets of referenced Control Points A, B, C and D, Dimension "L" and Clear Channel Width see Fender System Table of Variables in Structures Plans.
For Navigation Light Details see Design Standards Index 21220.

LAYOUT GEOMETRY

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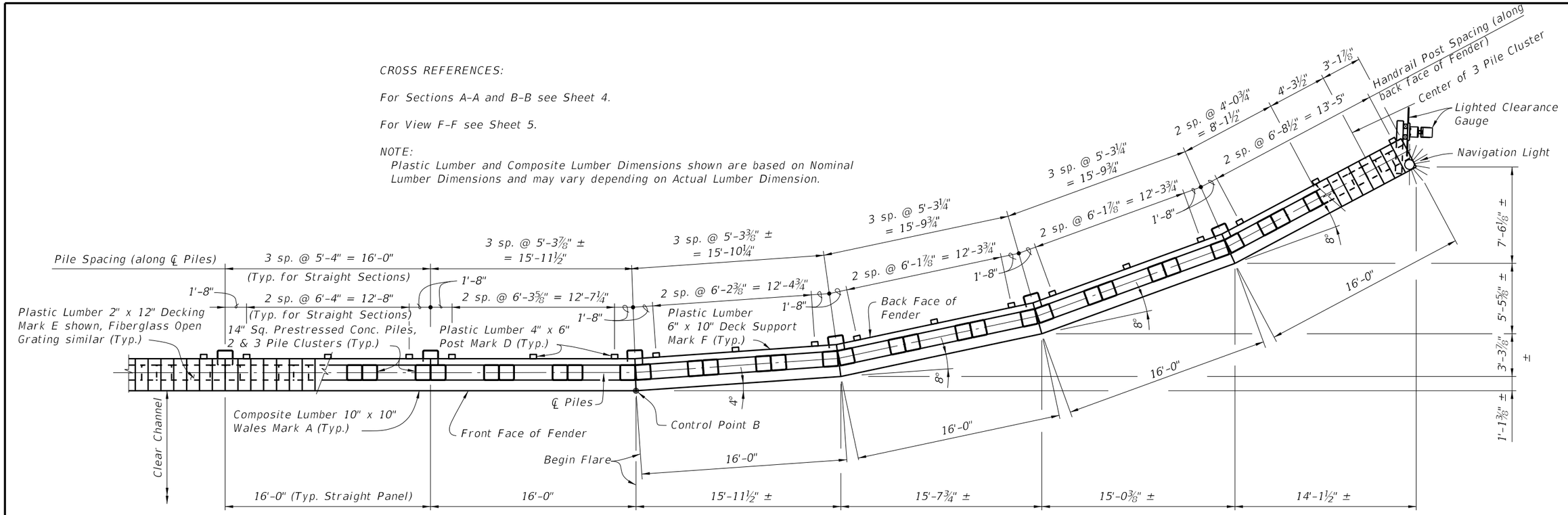
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
07/01/11			FDOT DESIGN STANDARDS 2013	FENDER SYSTEM - PRESTRESSED CONCRETE PILES	21930	2

CROSS REFERENCES:

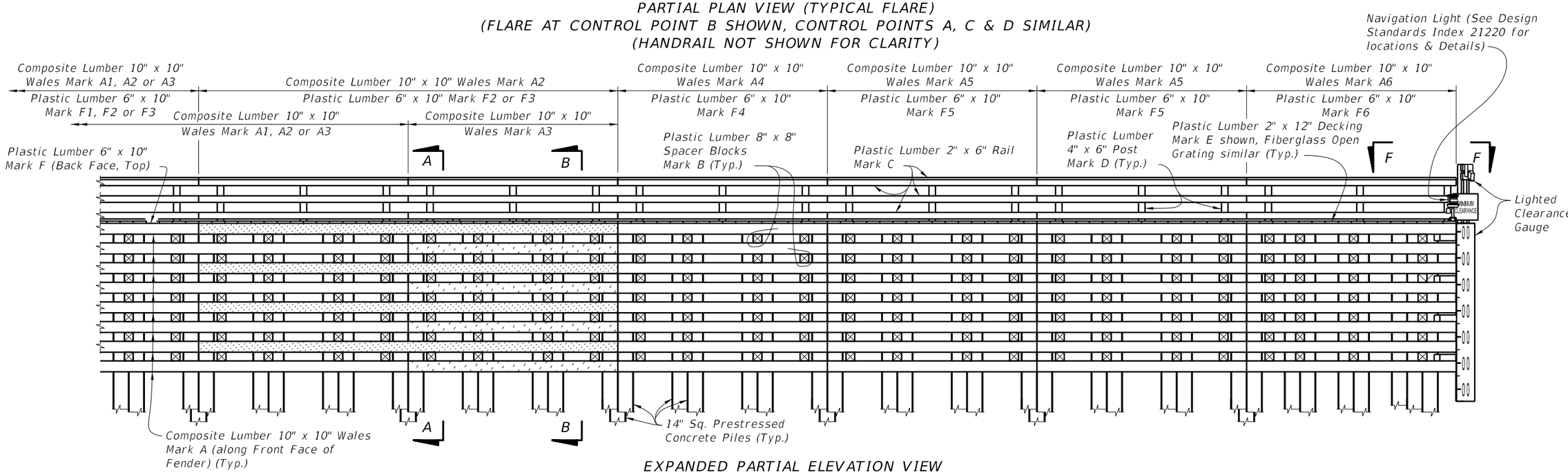
For Sections A–A and B–B see Sheet 4.

For View F–F see Sheet 5.

NOTE:
Plastic Lumber and Composite Lumber Dimensions shown are based on Nominal Lumber Dimensions and may vary depending on Actual Lumber Dimension.



PARTIAL PLAN VIEW (TYPICAL FLARE)
(FLARE AT CONTROL POINT B SHOWN, CONTROL POINTS A, C & D SIMILAR)
(HANDRAIL NOT SHOWN FOR CLARITY)



EXPANDED PARTIAL ELEVATION VIEW

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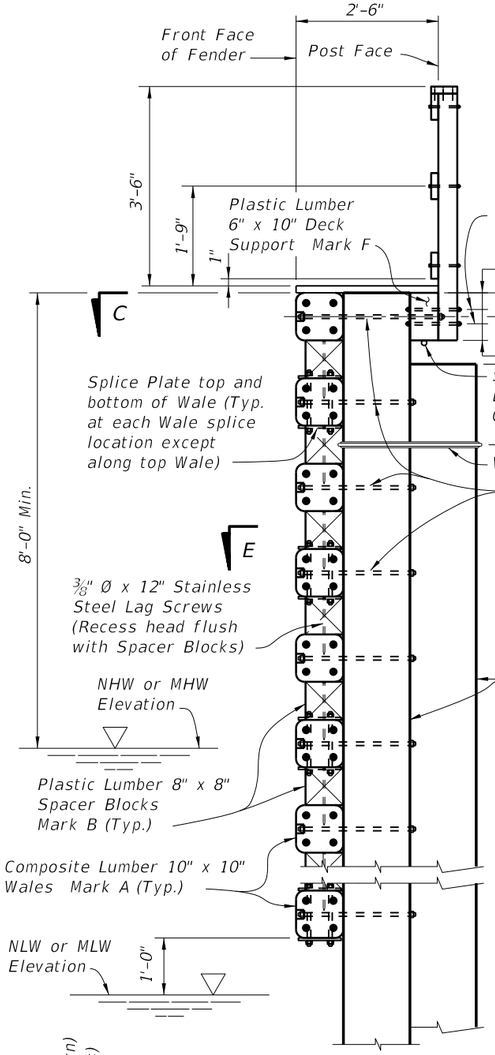
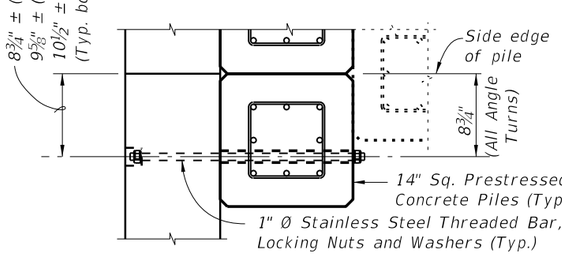
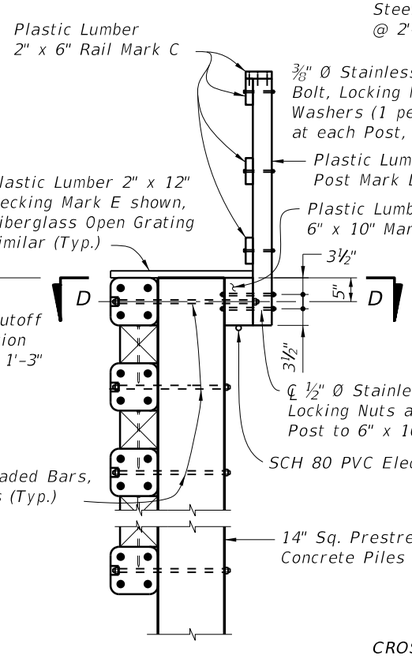
LAST REVISION	REVISION	DESCRIPTION:		FDOT DESIGN STANDARDS 2013	FENDER SYSTEM - PRESTRESSED CONCRETE PILES	INDEX NO.	SHEET NO.
01/01/12						21930	3



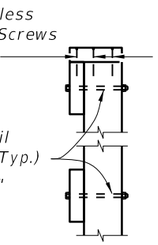
SECTION A-A



DETAIL "B" (SHOWING THREADED BAR LOCATION/RELATIONSHIP TO PILE PRESTRESSING STRANDS)



SECTION B-B

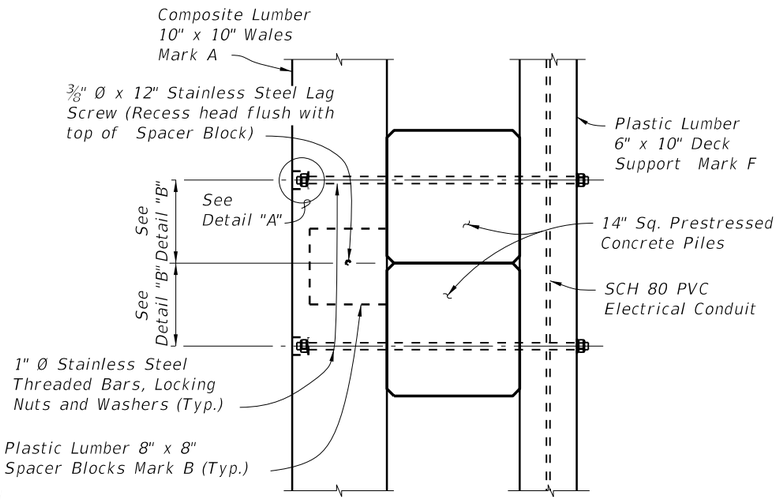


HANDRAIL DETAIL

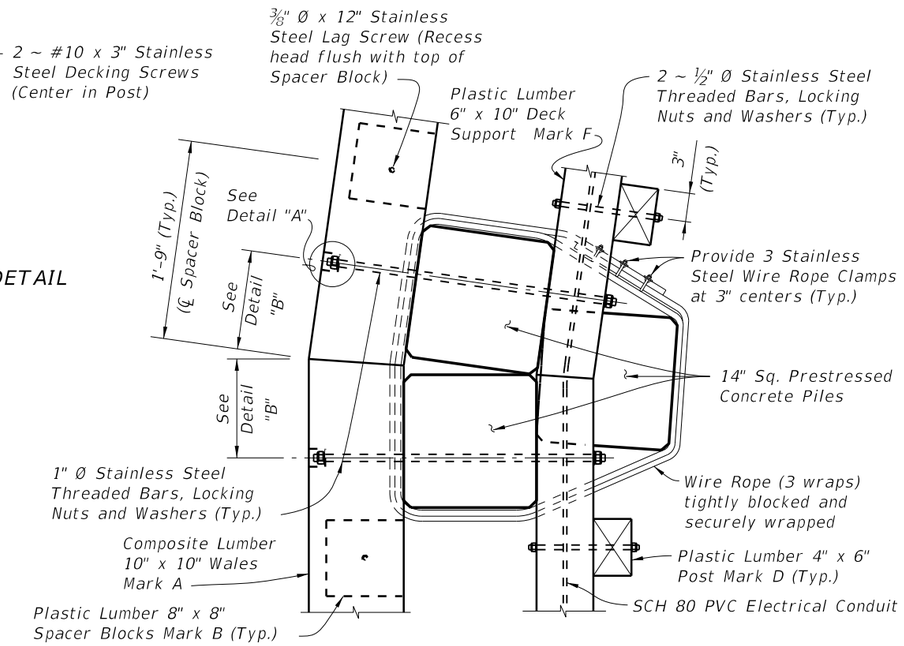
CROSS REFERENCES:

For location of Sections A-A and B-B see Sheet 3.

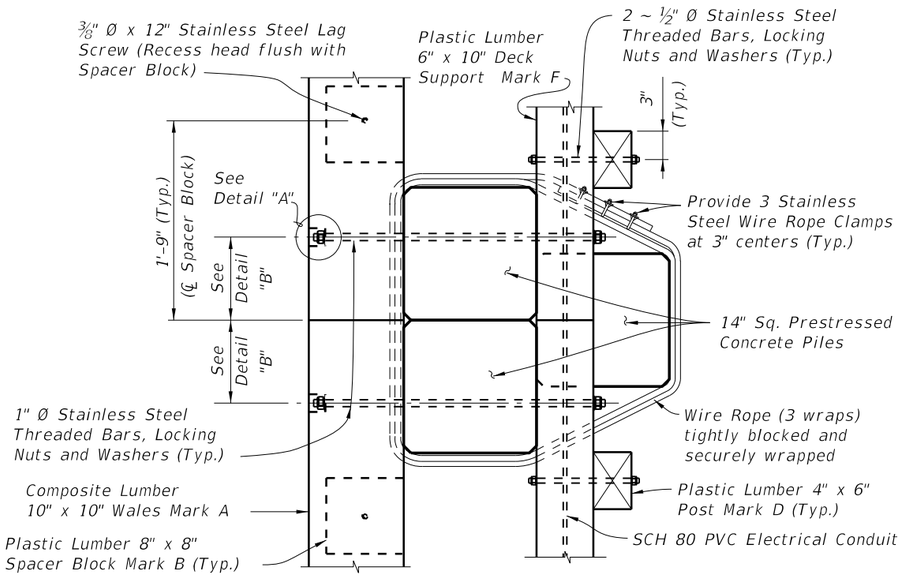
For Section E-E and Detail "A" see Sheet 5.



SECTION D-D
TYPICAL AT INTERMEDIATE PILES



SECTION C-C
TYPICAL FLARED SECTION
(8° TURN SHOWN, 4° TURN SIMILAR)



SECTION C-C
TYPICAL STRAIGHT SECTION

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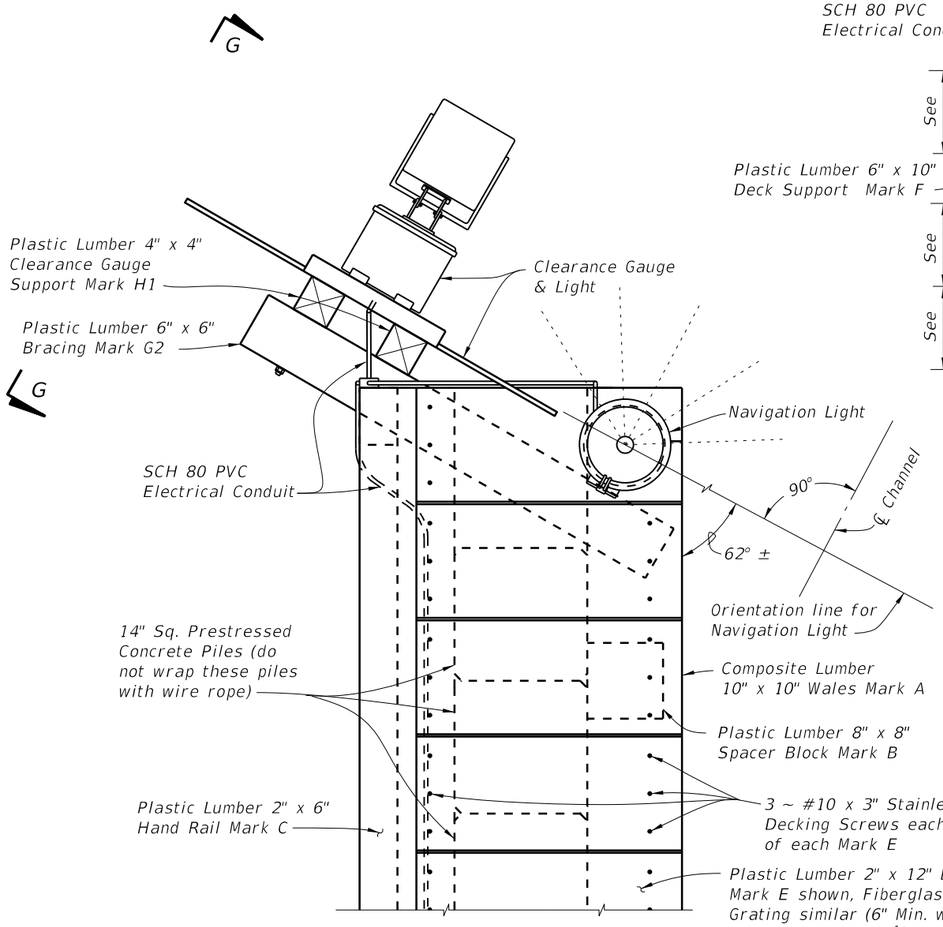
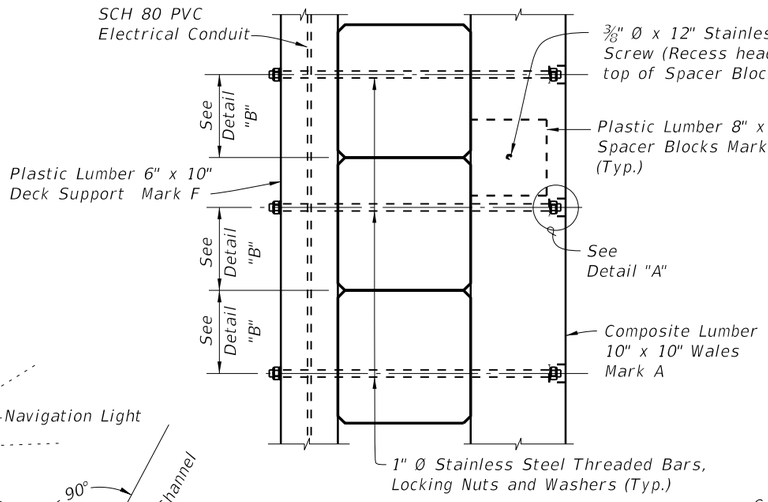
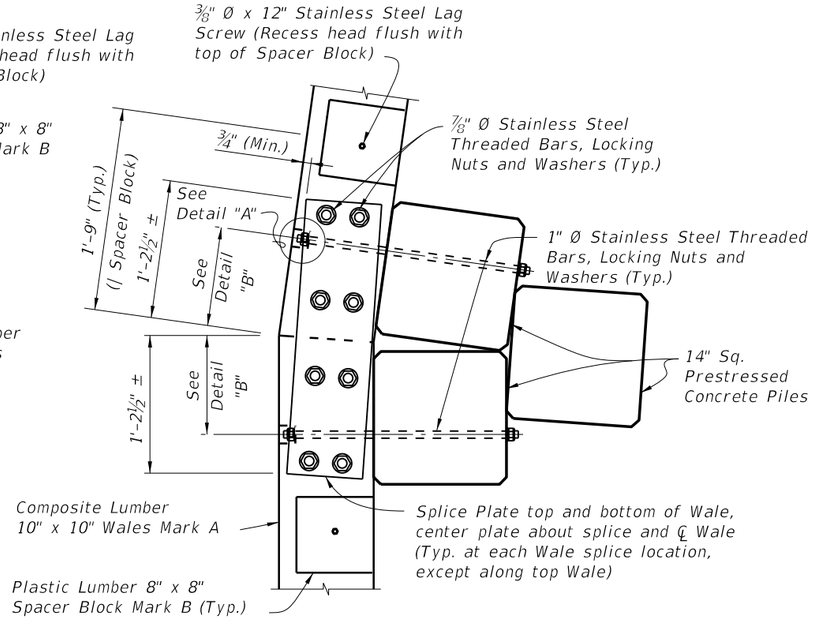
LAST REVISION	REVISION	DESCRIPTION:	FDOT DESIGN STANDARDS 2013	FENDER SYSTEM - PRESTRESSED CONCRETE PILES	INDEX NO.	SHEET NO.
01/01/12					21930	4



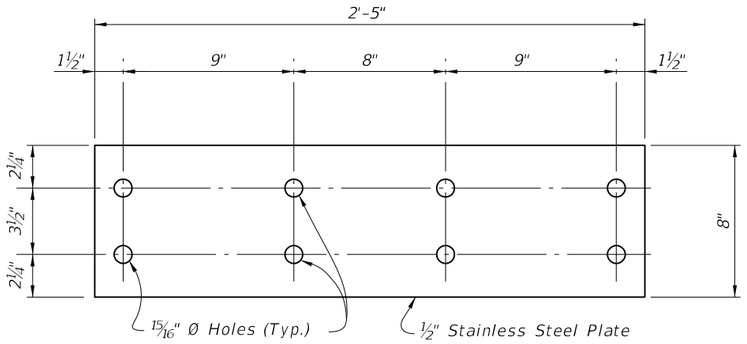
VIEW F-F
(SHOWING FENDER END WITH CLEARANCE GAUGE)



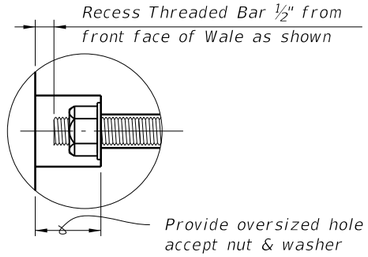
PARTIAL VIEW F-F
(SHOWING FENDER END; DECKING
AND HANDRAIL NOT SHOWN
FOR CLARITY)



SECTION E-E
TYPICAL FLARED SECTION
(8° TURN SHOWN, 4° TURN SIMILAR)



SPLICE PLATE DETAIL



DETAIL "A"

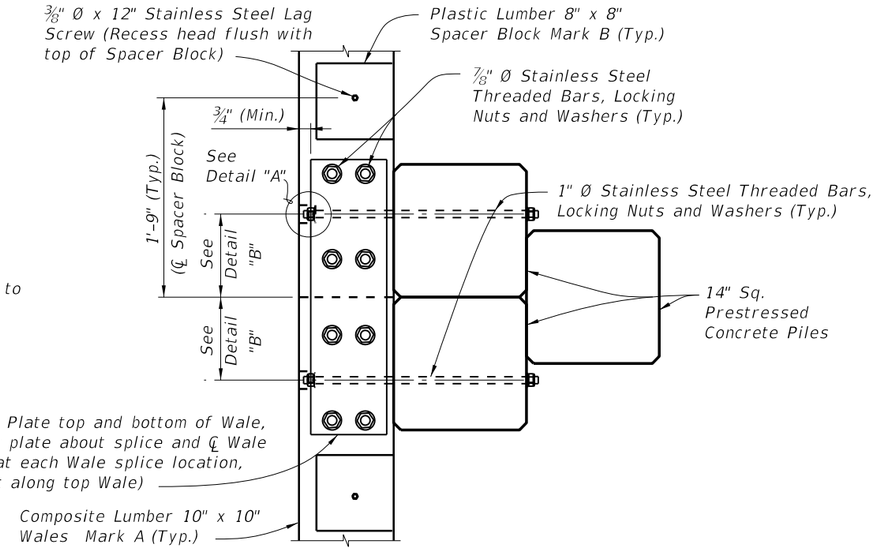
CROSS REFERENCES:

For Navigation Lights and SCH 80 PVC Electrical Conduit Details see Design Standard Index 21220.

For View G-G and Clearance Gauge Details see Sheet 4.

For Detail "B" and location of Section E-E see Sheet 2.

For location of View F-F see Sheet 1.



SECTION E-E
TYPICAL STRAIGHT SECTION

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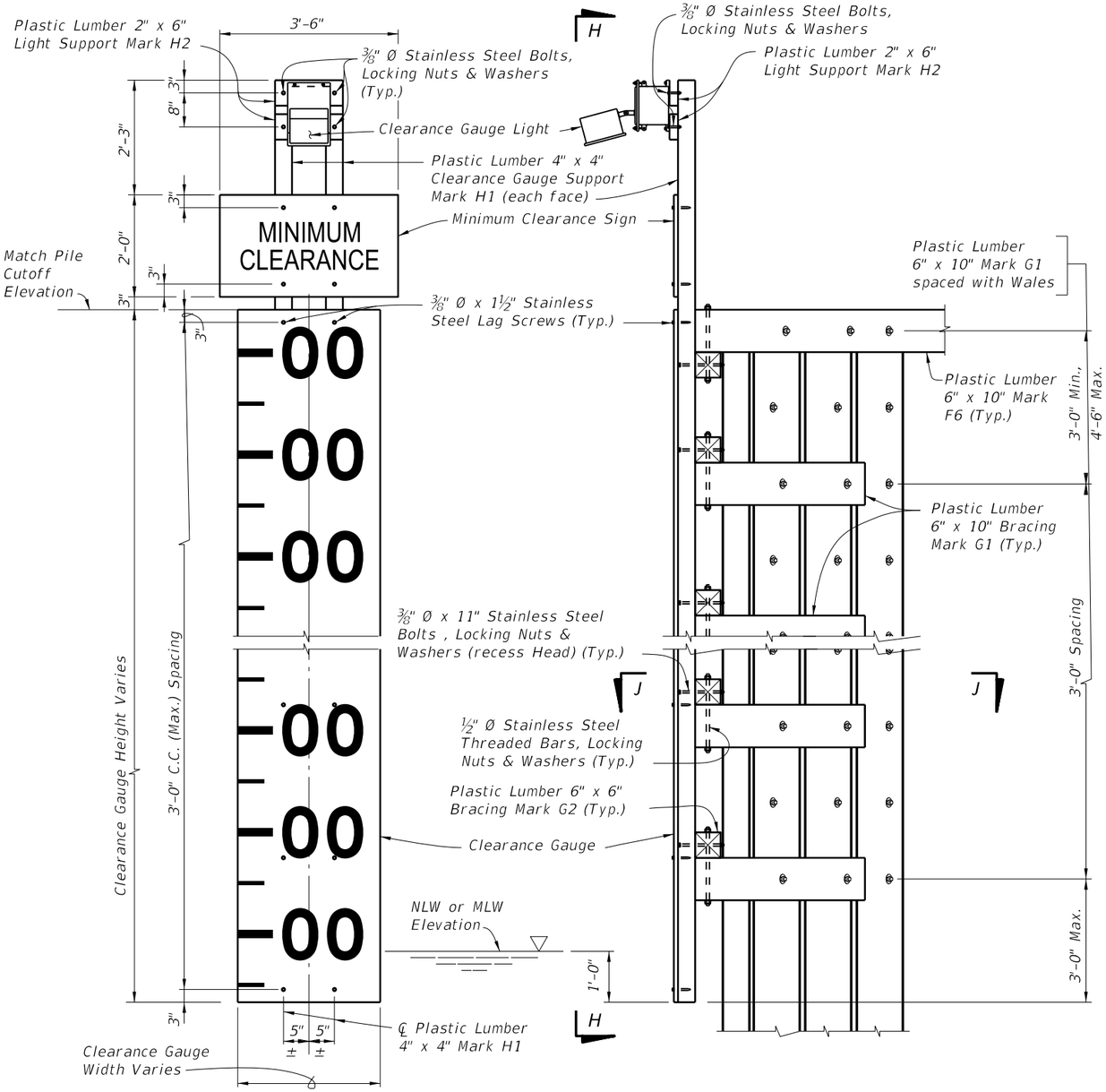
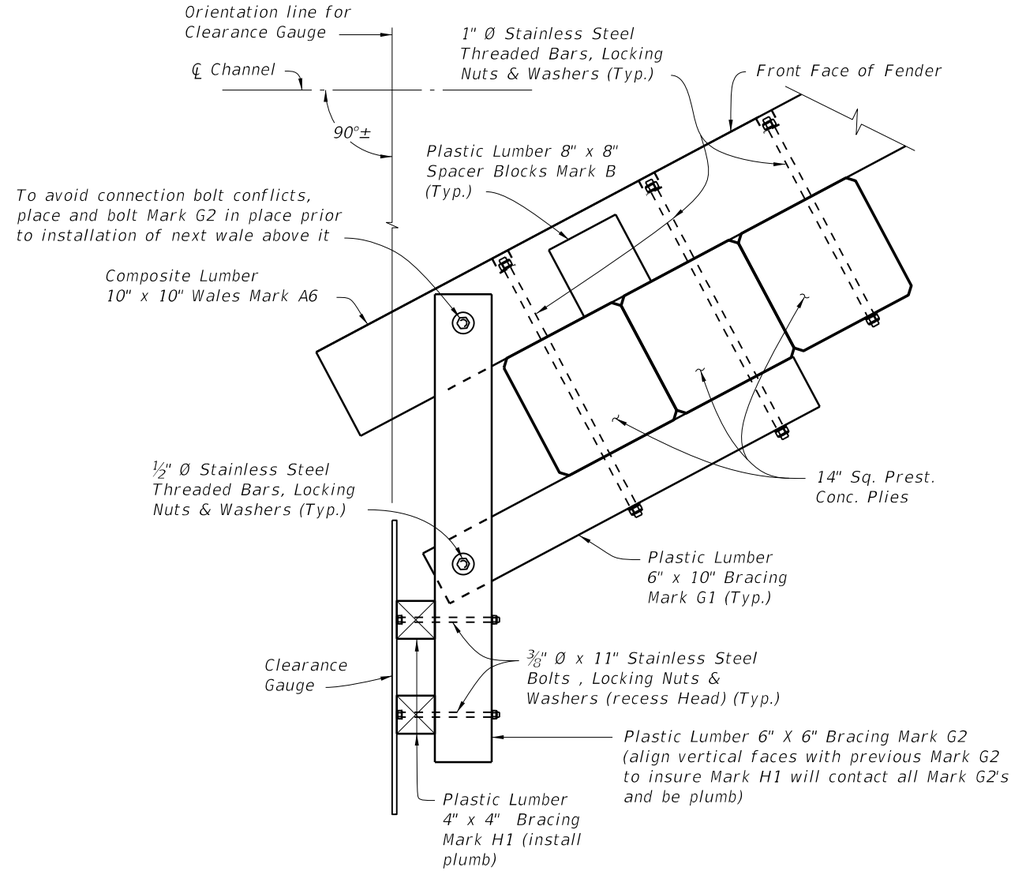
LAST REVISION	REVISION	DESCRIPTION:				
07/01/11			FDOT DESIGN STANDARDS 2013	FENDER SYSTEM - PRESTRESSED CONCRETE PILES	INDEX NO. 21930	SHEET NO. 5



VIEW H-H
(WALES, PILES AND BRACING
NOT SHOWN FOR CLARITY)

VIEW G-G
(WALES, DECKING AND HANDRAIL
NOT SHOWN FOR CLARITY)



SECTION J-J

CROSS REFERENCES:

For Estimated Structural Composite and Plastic Lumber Bill of Materials Quantities and Fender System Table of Variables see Structures Plans.

For location of View G-G see Sheet 5.

CLEARANCE GAUGE DETAILS

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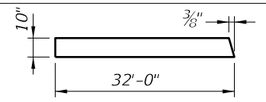
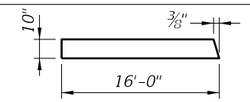
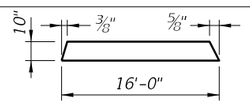
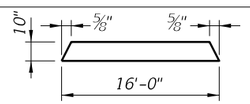
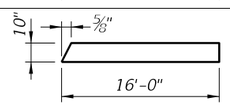
LAST REVISION	REVISION	DESCRIPTION:			INDEX NO.	SHEET NO.
01/01/12			FDOT DESIGN STANDARDS 2013	FENDER SYSTEM - PRESTRESSED CONCRETE PILES	21930	6

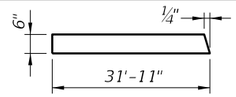
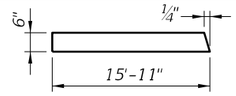
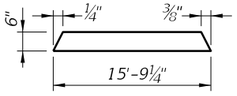
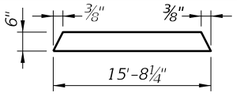
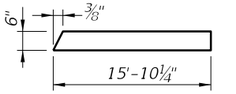
* STRUCTURAL COMPOSITE LUMBER BILL OF MATERIALS

MARK	SIZE (NOMINAL)	DIMENSIONS	BOARD FT. PER EACH	NO. REQD.	QUANTITY
A1	10" X 10" COMPOSITE LUMBER	32'-0" (STRAIGHT)	266.6	See Estimated Structural Composite and Plastic Lumber Bill of Materials Table in Structures Plans	
A2	10" X 10" COMPOSITE LUMBER		266.6		
A3	10" X 10" COMPOSITE LUMBER		133.3		
A4	10" X 10" COMPOSITE LUMBER		133.3		
A5	10" X 10" COMPOSITE LUMBER		133.3		
A6	10" X 10" COMPOSITE LUMBER		133.3		

* All Plastic Lumber and Composite Lumber Dimensions and Quantities shown are based on Nominal Lumber Dimensions and may vary depending on Actual Lumber Dimension.

** Provide Fiberglass Open Grating in lieu of 2" X 12" Plastic Lumber when called for in the Plans. Mounting hardware shall be Stainless Steel, install per Manufacturer's recommendations. See Structures Plans for Notes and Details.

* PLASTIC LUMBER BILL OF MATERIALS

MARK	SIZE (NOMINAL)	DIMENSIONS	BOARD FT. PER EACH	NO. REQD.	QUANTITY
B	8" X 8" PLASTIC LUMBER	8" (STRAIGHT)	3.6	See Estimated Structural Composite and Plastic Lumber Bill of Materials Table in Structures Plans	
C	2" X 6" PLASTIC LUMBER	16'-0" (STRAIGHT) (Trim & Miter Ends as required)	16.0		
D	4" X 6" PLASTIC LUMBER	4'-4" (STRAIGHT)	8.7		
** E	2" X 12" PLASTIC LUMBER	2'-6" (STRAIGHT) (Miter as required, 6" Min. width)	5.0		
F1	6" X 10" PLASTIC LUMBER	32'-0" (STRAIGHT)	160.0		
F2	6" X 10" PLASTIC LUMBER		159.6		
F3	6" X 10" PLASTIC LUMBER		79.6		
F4	6" X 10" PLASTIC LUMBER		78.8		
F5	6" X 10" PLASTIC LUMBER		78.4		
F6	6" X 10" PLASTIC LUMBER		79.3		
G1	6" X 10" PLASTIC LUMBER	3'-8" (STRAIGHT)	18.3		
G2	6" X 6" PLASTIC LUMBER	4'-1" (STRAIGHT)	12.3		
H1	4" X 4" PLASTIC LUMBER	PILE CUTOFF ELEV. MINUS NLW OR MLW ELEV. PLUS 5'-6" (STRAIGHT)	1.3 PER LF EACH		
H2	2" X 6" PLASTIC LUMBER	1'-2" (STRAIGHT)	1.2		

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