Calculation Cover Sheet

Issue Date:	May 18, 2022 Third Submittal – S3

PROJECT	
Project Name:	Dana Point Harbor
Project #:	7341
Address:	Dana Point, CA

Division:	BMI Southwest
Address:	8810 Sparling Lane Dixon, CA 95620

Only that portion of the structure detailed in these calculations has been reviewed. No other part has been reviewed or considered unless explicitly stated. Bellingham Marine is not responsible for any other part of the structure or for any work designed or performed by others which may impinge on this work.

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Building&Safety: Roshanak Amirazizi 9/15/2022

Permits: BNR21-0604

County of Orange - OC Public Works
OC Development Services
APPROVED

This set of plans and specifications must be kept on the job at all times. It is unlawful to make any changes or alterations to these plans without written permission from OC Public Works, OC Development Services of Orange County. The stamping of these plan specifications SHALL NOT be held to permit or be an approval of the violation of any provisions of any County Ordinance or State law.

Hadi Tabatabaee
BUILDING OFFICIAL

REGISTERED PROFESSIONAL ENGINEER
CRAIG S FUNSTON
S 4878
EXP. 6/30/2023
STRUCTURAL
STATE OF CALIFORNIA

Craig S Funston
2022.05.18
11:59:51-07'00'

1323 Lincoln St.
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DANA POINT HARBOR REVITALIZATION

Design Standards:

2019 CBC, 2018 IBC, ASCE 7-16, ACI 318-14, ACI 440.1R-15, AISC 360-16

Layout Guidelines for Small Craft Berthing Facilities, Prepared by California State Parks Division of Boating and Waterways (DBAW)

City of Newport Beach Waterfront Project Guidelines and Standards, Harbor Design Criteria Commerical and Residential Faciliites, 2017 Edition

Project Summary Data for Structural Design:

Design Freeboard	18	inches ±1 in.	DBAW C3.1
Live Load (uniform)	40 / 65	psf (marina / outer basin)	NBWPGS
Live Load (concentrated)	400	lbs	NBWPGS
Risk Category	II		ASCE 7
Factored Wind Speed	95	mph (3-sec gust)	ASCE 7
Wind Exposure Category	D		ASCE 7
Wind Sheltering Factor	15	% (beam winds)	
Wind Sheltering Factor	20	% (bow-stern winds)	
Factored Wind Pressure	19	psf	See derivation next page
Berthing Impact Velocity	2	fps	see footnote 1
Berthing Impact Angle	10	degrees from centerline of float	
Vessel Displacement	12*L^2	lbs (L in ft)	
Inner Basin:			
Design Wave Height (H_s)	1.00	ft.	see footnote 2
Design Wave Length	30	ft.	
Outer Basin:			
Design Wave Height (H_s)	2.10	ft.	see footnote 3
Design Wave Length	50	ft.	

(1) Berthing loads are not codified, however, the velocity, angle of impact and vessel weight are common specification requirements that have been in use for 20+ years on many US marinas.

(2) Hs 1.0 x L = 30 ft. is a standardized specification used for well protected marinas. Dana Point inner basins meet this definition and prior experience with the existing structures validates the selection of this design criteria.

(3) The outer basin wave height and length arrived at by examination of studies by Everest International Consultants (Subject: Dana Point Harbor Revitalization Commerical Core Project Coastal Engineering Support Services - Wave Uprush Analysis, Date: April 7, 2014)

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Factored wind pressure (W) calculated per ASCE 7-16

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ K_e\ V^2$ (eq. 26.10-1)

$W = F/A_f = q_z\ G\ C_f$ (eq. 29.4-1)

95	= V, ASCE 7-16 3 sec gust @ 33' elev [mph] (Fig. 26.5-1A, risk category II)
D	= Exposure Category (26.7.3)
1.03	= K_z, velocity pressure exposure coeficient (Table 26.10-1, height above ground <15')
1.0	= K_{zt}, topographic factor (26.8)
0.85	= K_d, wind directionality factor (Table 26.6-1)
1.0	= K_e, ground elevation factor (Table 26.9-1, use 1.0 for sea level)
0.85	= G, gust-effect factor (Section 26.11, similar to low-rise building)
1.0	= C_f, force (drag) coefficient (AS 3962, 2001; Uhlmann, 1997)
16.0	= W_{min}, minimum wind pressure [psf] (Section 29.7)
17.2	= W, wind pressure [psf]

Use **19 psf** for design. This exceeds code minimums. 19 psf is the standard wind pressure used by BMI in the California market with many sucessful marina designs.

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Basis of Design

Structural System (Inner Basin and Charter Docks)

The project consists of new prefabricated modular concrete floating docks which replace the existing floating dock system.

The new docks are held in place by steel pipe piles (mooring piles) which are driven into the underlying soils and provide lateral restraint only. There are no vertical loads on the guide piles other than self-weight of the steel pipe. All vertical loads on the floating docks are resisted by buoyancy forces acting through the concrete float modules.

The docks are connected to the mooring piles using freely sliding collars at each pile. These collars (pile guides) allow vertical movement of the docks to accommodate water level changes and vertical loading while providing full restraint for all lateral loads. There is a small gap between the pile faces and guide pads which is necessary to account for construction tolerances and normal dock movement. This gap is considered in the structural analysis of the dock system and does not result in adverse effects. Numeric modelling of the lateral load transfer from the docks to the piles has been performed and is provided in this report.

The walkways consist of individual concrete float modules connected by FRP structural wales. The concrete modules utilize expanded polystyrene (EPS) foam infill for positive buoyancy under all conditions. The FRP wales run longitudinally along each side of the concrete modules, forming a composite beam consisting of FRP flanges and a reinforced concrete center section. The wales are secured to the modules by ¾" diameter fiberglass reinforced threaded rods (FRP thru-rods) which transit the full width of the dock. Thru-rods are spaced as required to transfer loads from the float modules to the wales and other structural elements of the dock system.

The finger piers are single piece concrete float modules connected to the walkways at regular intervals by triangular shaped steel gusset frames. The triangle frames are secured to the walkways and fingers by ¾" diameter FRP thru-rods. The finger piers use FRP facia on both sides to secure the cleats and to attach fendering elements. The fascia is not part of the primary structural system.

All concrete modules are reinforced with solid round fiberglass (FRP) rebar complying with ASTM D7957. FRP is non-ferrous and will not corrode and is an excellent choice for marine construction. Design of the FRP reinforced concrete structure follows the guidance of ACI 440.1R-15 which is referenced in the commentary of ACI 318-14. Per ACI 440.1R-15 minimum cover for FRP reinforcement is ¾".

The attached analysis provides module design capacities based on using minimums for concrete shell thickness and module depth. It is understood that production modules may be slightly stronger due to thicker walls or deeper modules. Specific analysis of the stronger components is not included or necessary.

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Structural System (Outer Basin Post Tensioned Docks)

A portion of the floating docks in the outer basin utilize bonded, post-tensioned segmental concrete construction for the primary structure. The individual segments consist of conventionally reinforced concrete shells around an EPS foam core and are reinforced with galvanized mesh and epoxy coated deformed bar. Each segment is match cast against an adjoining segment to provide structural mating faces. Offset alignment keys are provided to ensure proper mating.

The segments are assembled in the water and joined by full-length tensioned 150 ksi high-strength post-tension bars. After tensioning, the post-tension ducts are flushed with fresh water and grout is pumped into the annulus between the bars and duct walls to provide a fully bonded post-tensioned concrete structure. Bar ends are trimmed after tensioning and protected by grease-filled caps.

Design Loads

Seismic

The floating marina elements are isolated from seismic accelerations by virtue of floating on an interface which is not able to transmit lateral shear. I.E. the water in the basin will not accelerate laterally with the underlying soils and cannot transmit lateral forces to the floating docks. The pile themselves are sufficiently ductile with no seismic mass except for self-weight and are OK by inspection.

Berthing (B)

The docks are designed to resist the loads imparted by vessels as described in the project summary.

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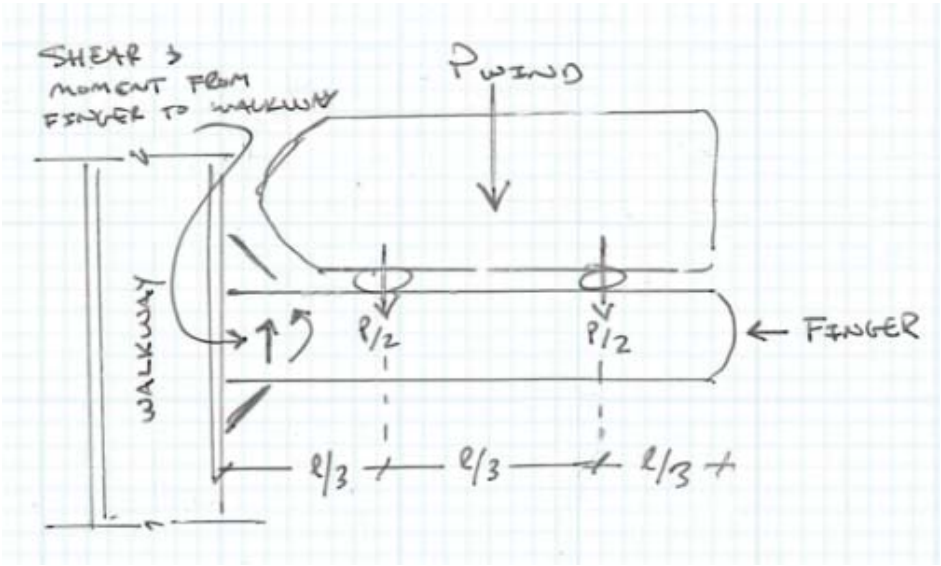
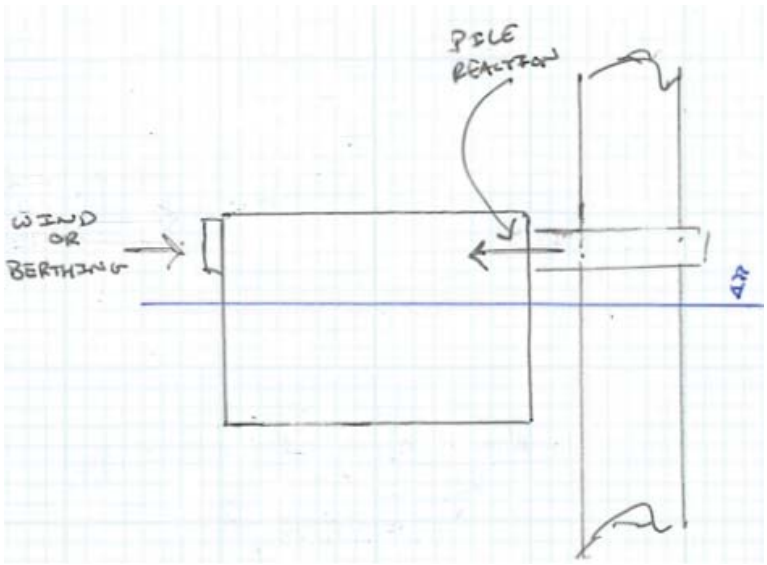
Wind (W)

For lateral analysis, individual finger piers are designed to support full loads as if no sheltering is provided by adjacent vessels. Lateral analysis is also performed for the docks in the fully occupied configuration and sheltering by adjacent vessels is accounted for. Each "dock" (walkway + finger piers) is analyzed individually without consideration of sheltering by adjacent docks. Lateral loads are transferred from the docks into the cantilevered mooring piles. Lateral loads are introduced and reacted just below the deck level, torsional couples are negligible, see diagram below.





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Lateral Wave (LW)

Lateral wave forces are calculated using the methods outlined is British Standard BS 6348-6 Section 2.4.4.3. For the protected inner basin the 1 ft wave produces negligible results and lateral wave is not included in analysis. For the outer basin the lateral wave force is taken as a distributed load applied to the entire face of the dock. This is a conservative simplification as waves are irregular and will not be applied uniformly to the entire dock at the same time.

$$\rho := 64 \ \frac{lb}{ft^3}$$

$$H_{s_1.0} := 1.0 \ ft$$

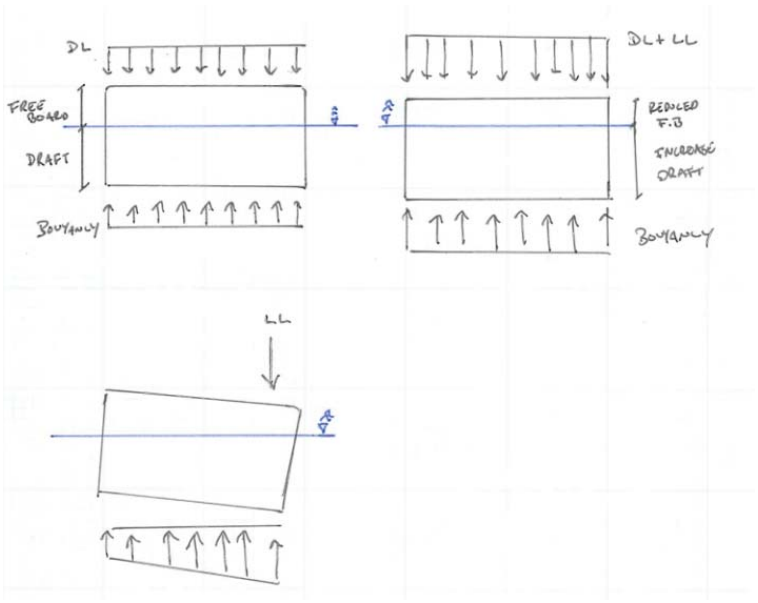
$$WL_{1.0} := \left(\frac{1}{8}\right) \cdot \rho \cdot g \cdot \left(H_{s_1.0}\right)^2 = 8 \ \frac{lbf}{ft}$$

$$H_{s_2.1} := 2.1 \ ft$$

$$WL_{2.1} := \left(\frac{1}{8}\right) \cdot \rho \cdot g \cdot \left(H_{s_2.1}\right)^2 = 35.3 \ \frac{lbf}{ft}$$

Vertical Dead and Live Load (DL, LL)

Vertical loads are resisted by the buoyancy force imparted on submerged portions of the dock. All concrete modules are designed to float at the target freeboard under dead load. As live load is added the draft (displacement) increases to provide compensatingee buoyancy. Offset live load will cause the float to roll slightly. The roll is further mitigated by the attached fingers. Torsion loads are minimal and OK by inspection. See diagrams below:



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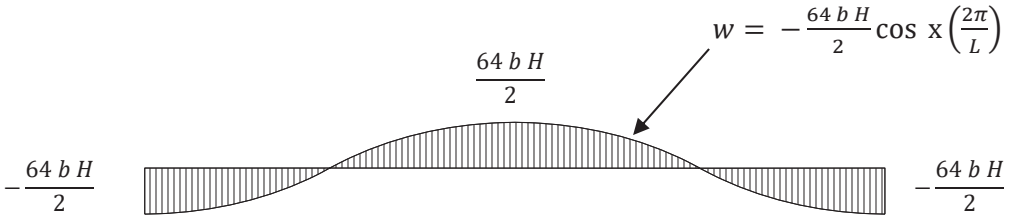
Vertical Wave (VW)

Vertical wave demand is calculated using a quasi-static method using a sinusoidal wave profile with amplitude equal to the significant wave height (Hs).



Load Diagram

Integrate load function to determine shear

$$V = \int -\frac{64\ b\ H}{2}\cos\ \mathrm{x}\left(\frac{2\pi}{L}\right)$$

$$= -\frac{64\ b\ H}{2}\left(\frac{\mathrm{L}}{2\pi}\right)\sin\mathrm{x}\left(\frac{2\pi}{L}\right) + c$$

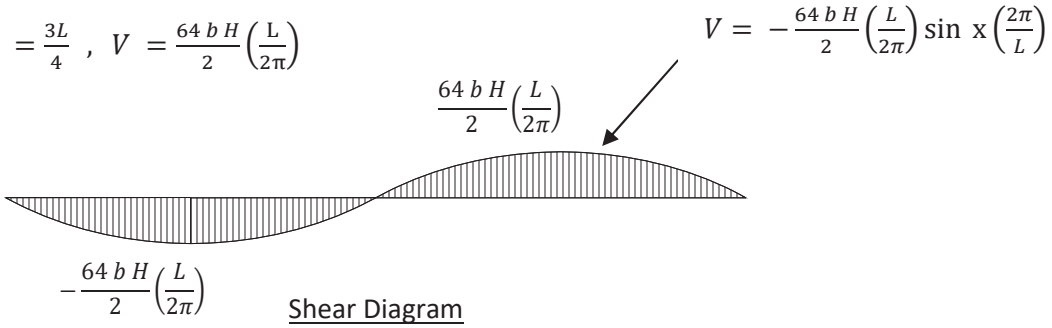
Shear = 0 at ends of float, at x = 0 and x = L, hence c = 0

$$@\ x = 0\ ,\ V = 0$$

$$@\ x = \frac{L}{4}\ ,\ V = -\frac{64\ b\ H}{2}\left(\frac{\mathrm{L}}{2\pi}\right)$$

$$@\ x = \frac{L}{2}\ ,\ V = 0$$

$$@\ x = \frac{3L}{4}\ ,\ V = \frac{64\ b\ H}{2}\left(\frac{\mathrm{L}}{2\pi}\right)$$



Shear Diagram

Integrate shear function to determine moment

$$M = \int -\frac{64\ b\ H}{2}\left(\frac{\mathrm{L}}{2\pi}\right)\sin\mathrm{x}\left(\frac{2\pi}{L}\right)\ dx$$

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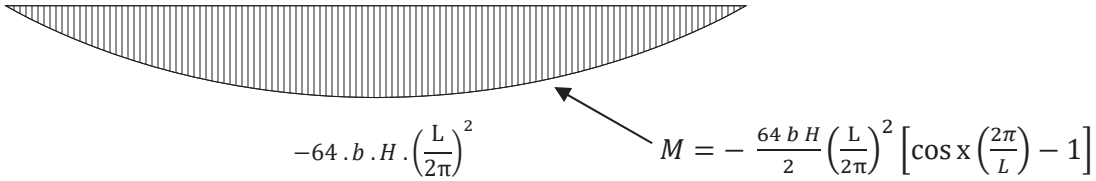
$$= \frac{64\ b\ H}{2}\left(\frac{\mathrm{L}}{2\pi}\right)^2 \cos \mathrm{x}\left(\frac{2\pi}{L}\right) + c$$

Moment = 0 at ends of float, at x = 0 and x = L, hence $c = -\frac{64\ b\ H}{2}\left(\frac{\mathrm{L}}{2\pi}\right)^2$

$$@\ x = 0\ ,\ M = 0$$

$$@\ x = \frac{L}{4}\ ,\ M = -\frac{64\ b\ H}{2}\left(\frac{\mathrm{L}}{2\pi}\right)^2$$

$$@\ x = \frac{L}{2}\ ,\ M = -2\left[\frac{64\ b\ H}{2}\left(\frac{\mathrm{L}}{2\pi}\right)^2\right]$$



Moment Diagram

Load Combinations

Vertical Load Combinations –

a. 1.2DL + 1.6LL
b. 1.6VW

Lateral Load Combinations –

a. 1.0W + 1.6LW
b. 1.6B

Combined Loading –

All load cases checked for combined vertical and lateral loads. The sum of squares check is acceptable given that peak vertical loads and peak lateral loads are unlikely to occur simultaneously for a sustained amount of time. In the following equation D and C are demand and capacity, respectively.

$$\sqrt{\left(\frac{D_{vertical}}{C_{vertical}}\right)^2 + \left(\frac{D_{lateral}}{C_{lateral}}\right)^2} < 1.0$$

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Configuration

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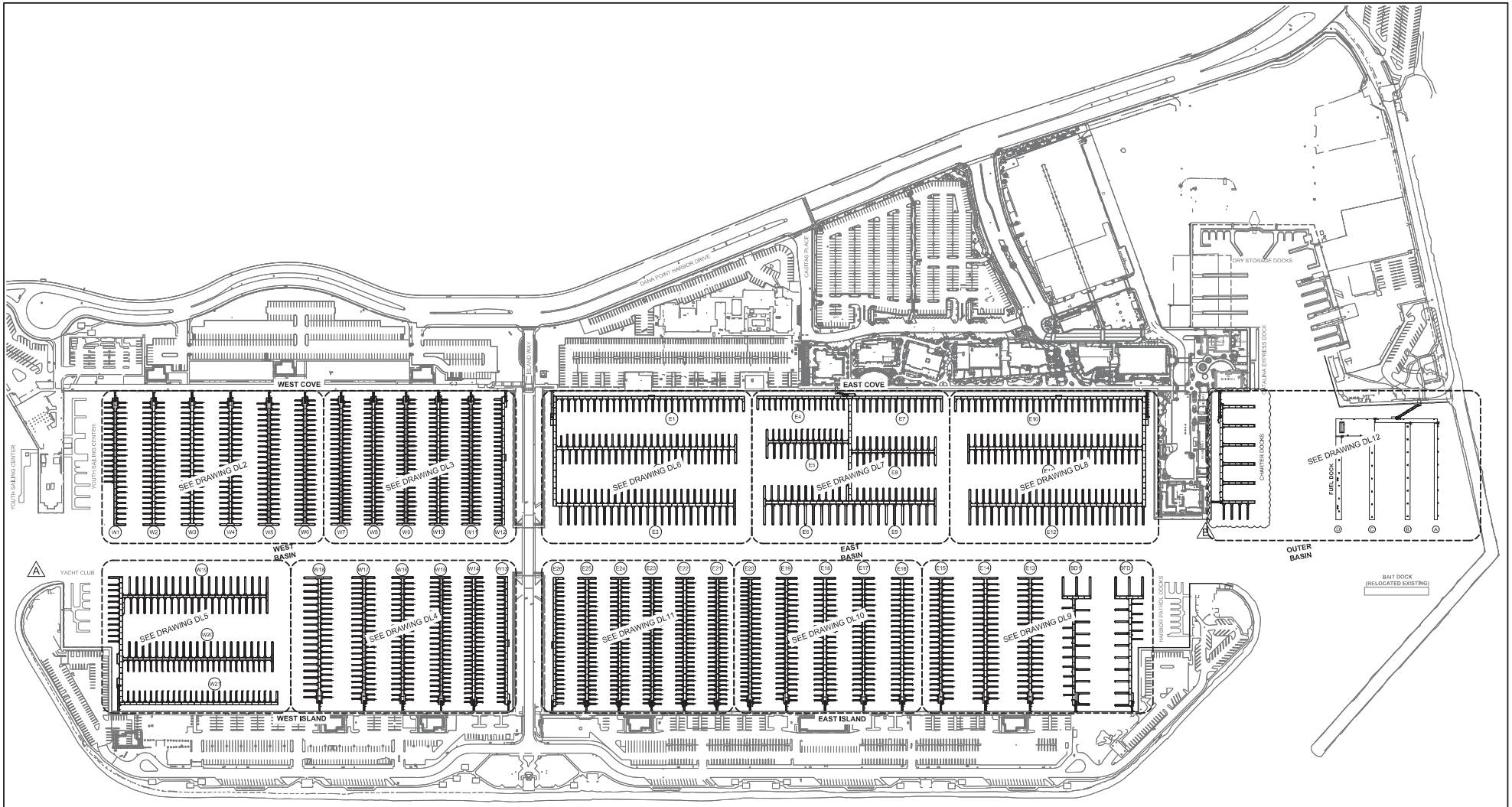

NO.	DATE	DESCRIPTION	BY
B	5-10-22	RECONFIGURED CHARTER DOCKS	KG
A	2-25-22	REMOVED YACHT CLUB	KG

REVISIONS

Bellingham MARINE
THE WORLD'S MOST COMPREHENSIVE MARINA BUILDER

SOUTHWEST DIVISION
CA LICENSE #442499
8810 SPARLING LANE
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PROJECT NUMBER: 7341

ENGINEER / DESIGNER:

PROJECT MANAGER:

CHECKED BY:

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

DIMENSIONAL LAYOUTS INDEX

Craig S Funston
2022.05.13
12:23:18-07'00'

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Bellingham Marine Engineering under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and fits have been included in this review. Bellingham Marine Engineering can not be responsible for the accuracy of information provided by others.

SCALE:	1" = 140' (Sheet Size 24" x 36")
DRAWN BY:	KG
DATE:	5/10/2022
DRAWING:	DL1
SHEET NO.:	6

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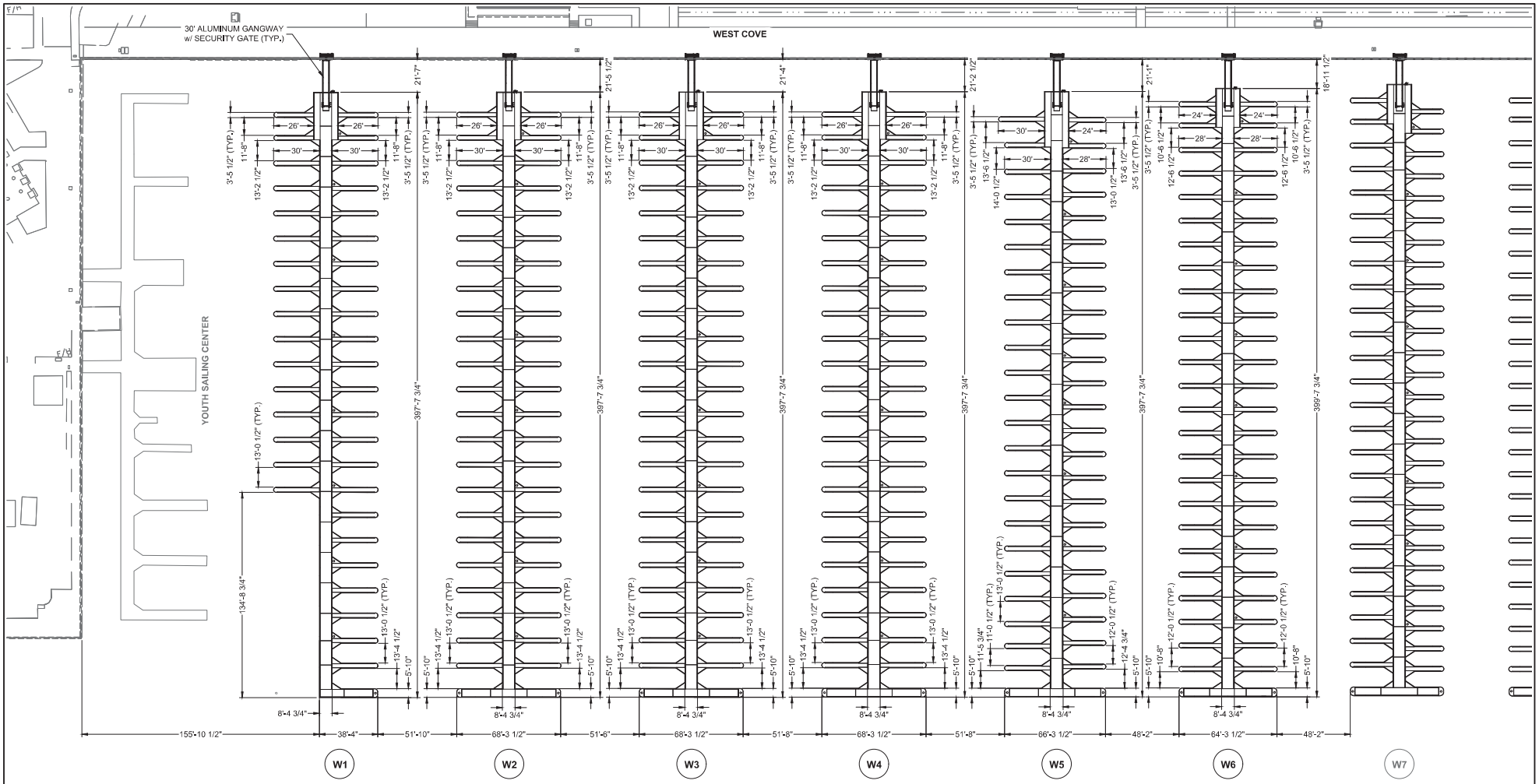

GRAPHIC SCALE
30' 0 20' 40' 60' 100' 180'

NO.	DATE	DESCRIPTION	BY

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Dana Point, CA 92629

DIMENSIONAL LAYOUT FOR DOCKS W1 - W6

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2022.05.13
12:23:29-07'00'

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DATE:	5/10/2022
DRAWING:	DL2
SHEET NO.:	7

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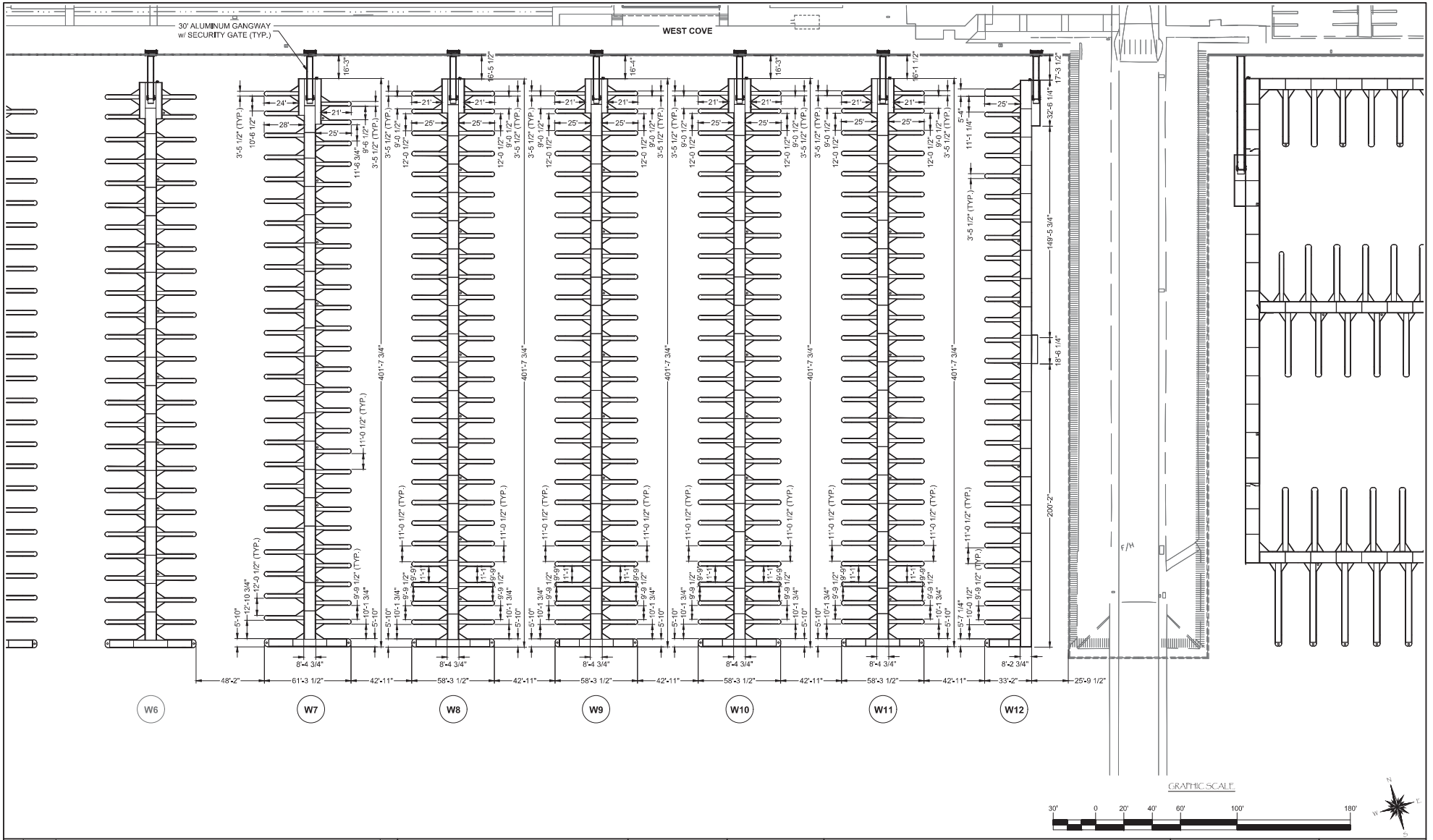

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DIMENSIONAL LAYOUT FOR DOCKS W7 - W12

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2022.05.13
12:23:41-07'00'

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DRAWING:	DL3
SHEET NO.:	8

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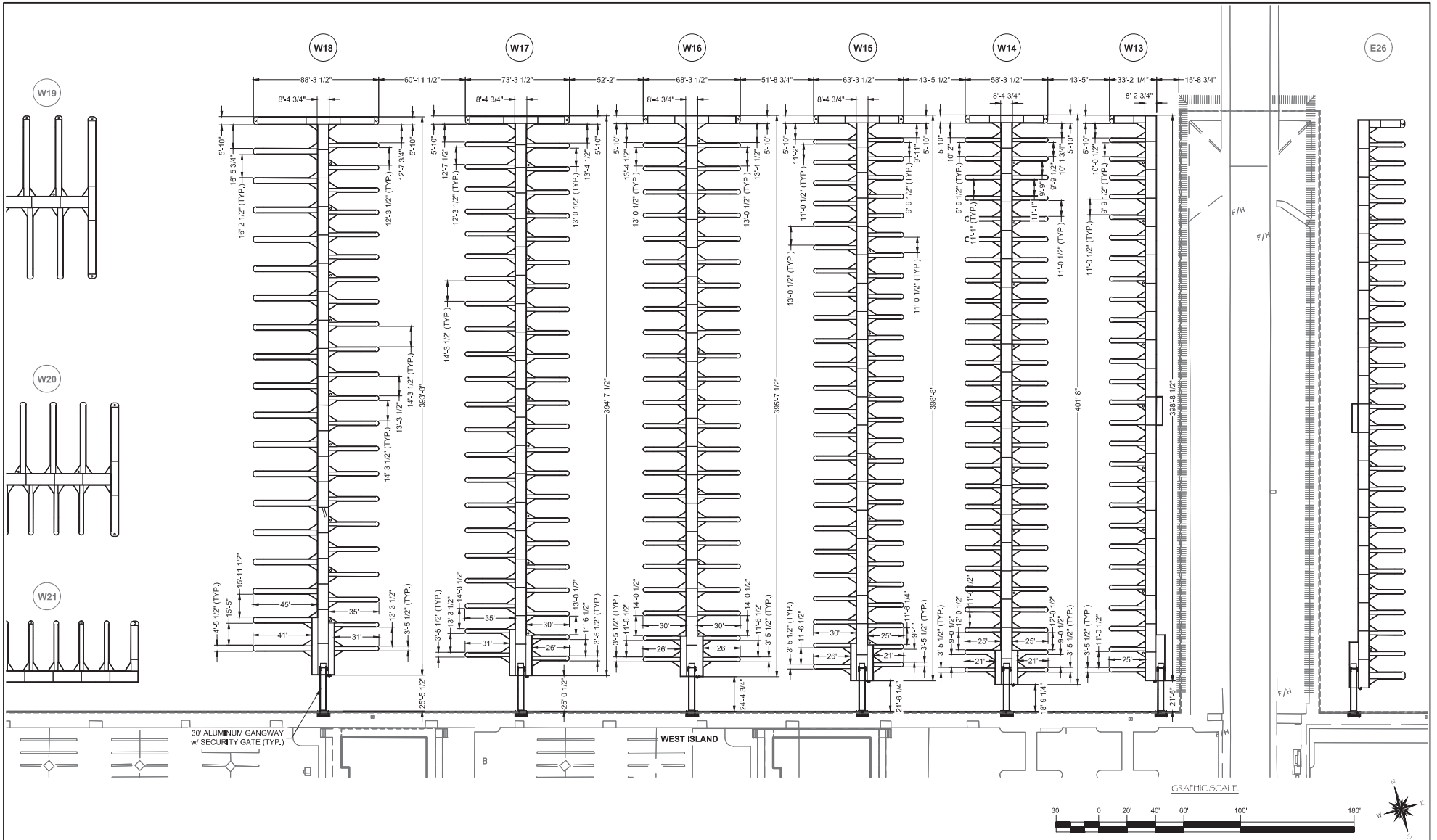

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Dana Point, CA 92629

DIMENSIONAL LAYOUT FOR DOCKS W13 - W18

Craig S Funston
2022.05.13
12:23:53-07'00'

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DATE:	5/10/2022
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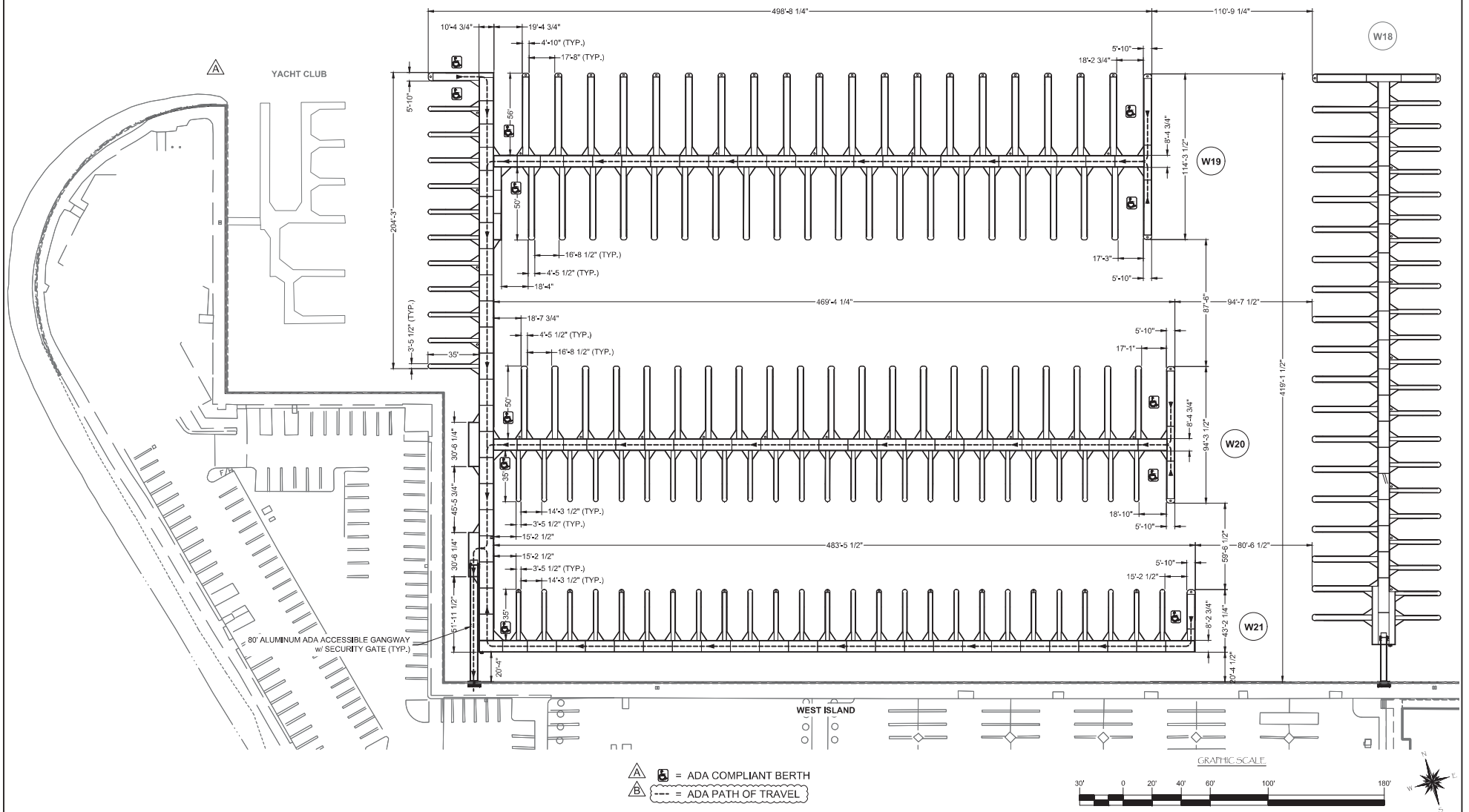

NO.	DATE	DESCRIPTION	BY
B	5-10-22	ADDED ADA PATH OF TRAVEL	KG
A	2-25-22	REMOVED YACHT CLUB/ ADDED ADA BERTHS	KG

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ENGINEER / DESIGNER:

PROJECT MANAGER:

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DIMENSIONAL LAYOUT FOR DOCKS W19 - W21

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2022.05.13
12:24:04-07'00'

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DATE: 5/10/2022
DRAWING: DL5
SHEET NO.: 10

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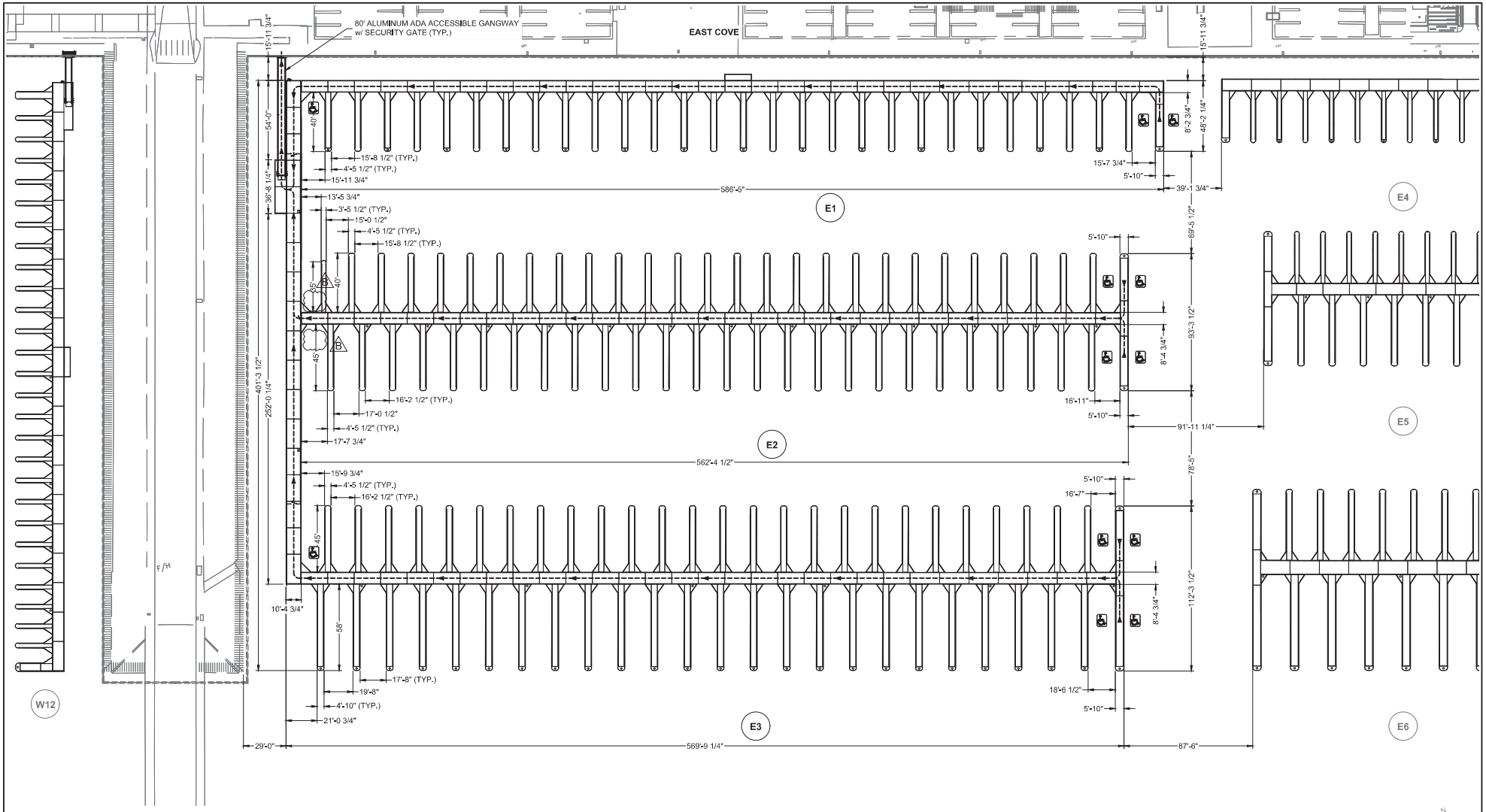

NO.	DATE	DESCRIPTION	BY
B	5-10-22	ADDED ADA PATH OF TRAVEL	KG
A	2-25-22	ADDED ADA BERTHS	KG

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PROJECT NUMBER: 7341

ENGINEER / DESIGNER:

PROJECT MANAGER:

CHECKED BY:

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

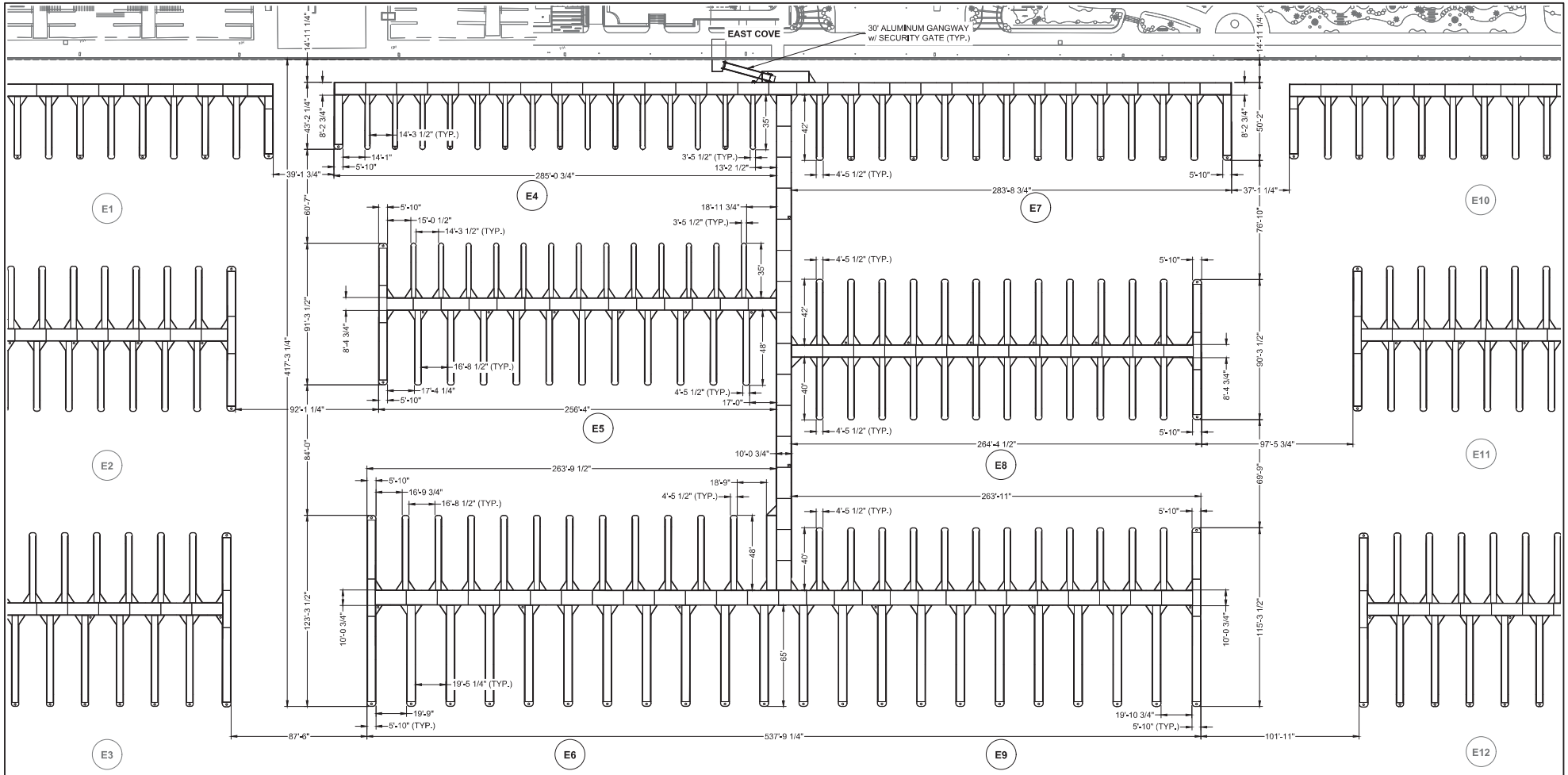
DIMENSIONAL LAYOUT FOR DOCKS E1 - E3

Craig S Funston
2022.05.13
12:24:17-07'00'

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Bellingham Marine Engineering under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and fits have been included in this review. Bellingham Marine Engineering can not be responsible for the accuracy of information provided by others.

SCALE: 1" = 30' (Sheet Size 24" x 36")
DRAWN BY: KG
DATE: 5/10/2022
DRAWING: DL6
SHEET NO.: 11

PERMIT DRAWING



NO.	DATE	DESCRIPTION	BY
-	-	-	-

REVISIONS

Bellingham MARINE
THE WORLD'S MOST COMPREHENSIVE MARINA BUILDER

SOUTHWEST DIVISION
CA LICENSE #442499
8810 SPARLING LANE
DIXON, CA 95620
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PROJECT NUMBER: 7341

ENGINEER / DESIGNER:

PROJECT MANAGER:

CHECKED BY:

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

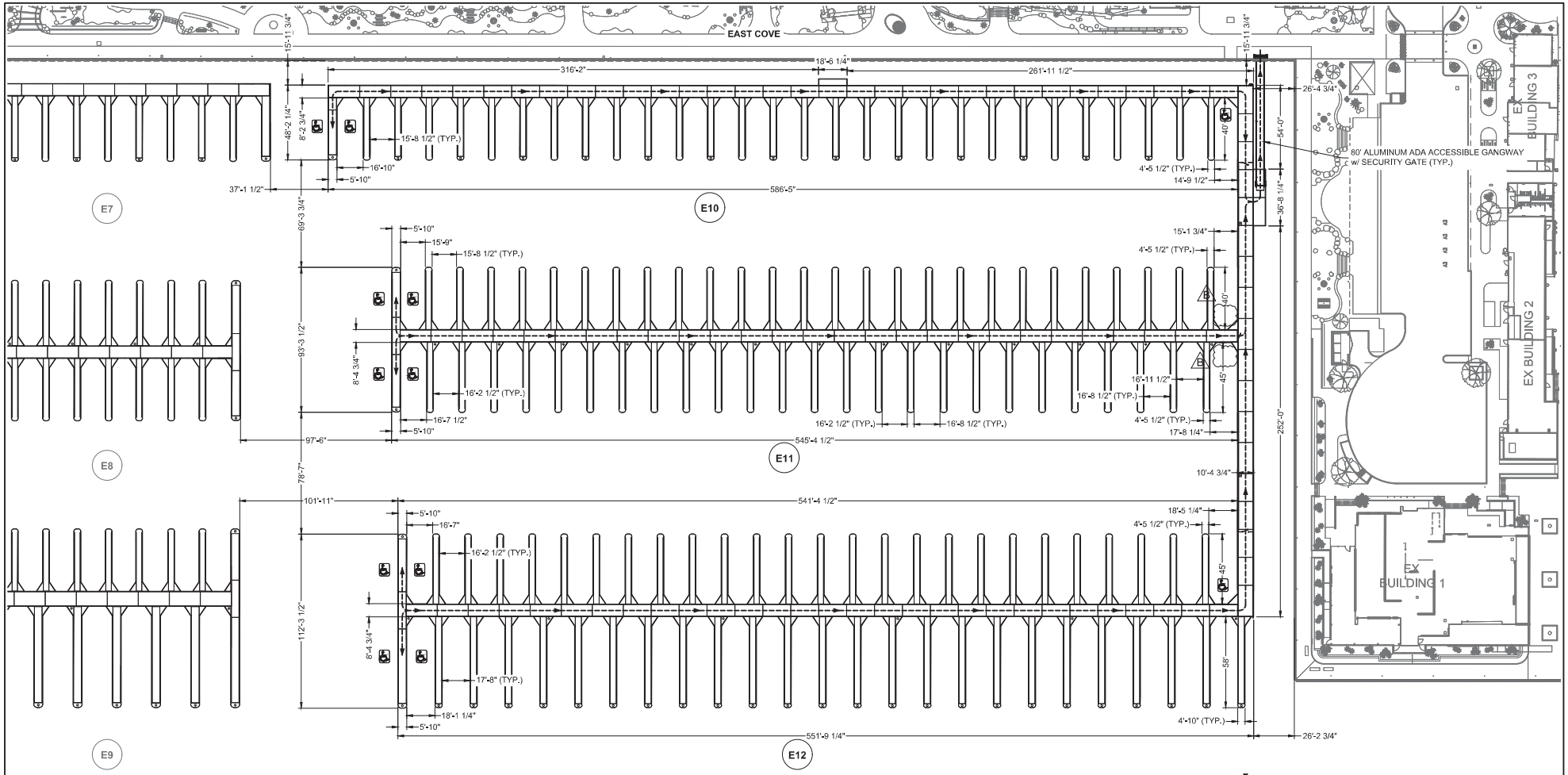
DIMENSIONAL LAYOUT FOR DOCKS E4 - E9

Craig S Funston
2022.05.13
12:24:28-07'00'

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Bellingham Marine Engineering under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and fits have been included in this review. Bellingham Marine Engineering can not be responsible for the accuracy of information provided by others.

SCALE: 1" = 30' (Sheet Size 24" x 36")
DRAWN BY: KG
DATE: 5/10/2022
DRAWING: DL7
SHEET NO.: 12

PERMIT DRAWING



NO.	DATE	DESCRIPTION	BY
B	5-10-22	ADDED ADA PATH OF TRAVEL	KG
A	2-25-22	ADDED ADA BERTHS	KG

REVISIONS

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PROJECT NUMBER:	7341
ENGINEER / DESIGNER:	-
PROJECT MANAGER:	-
CHECKED BY:	-

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

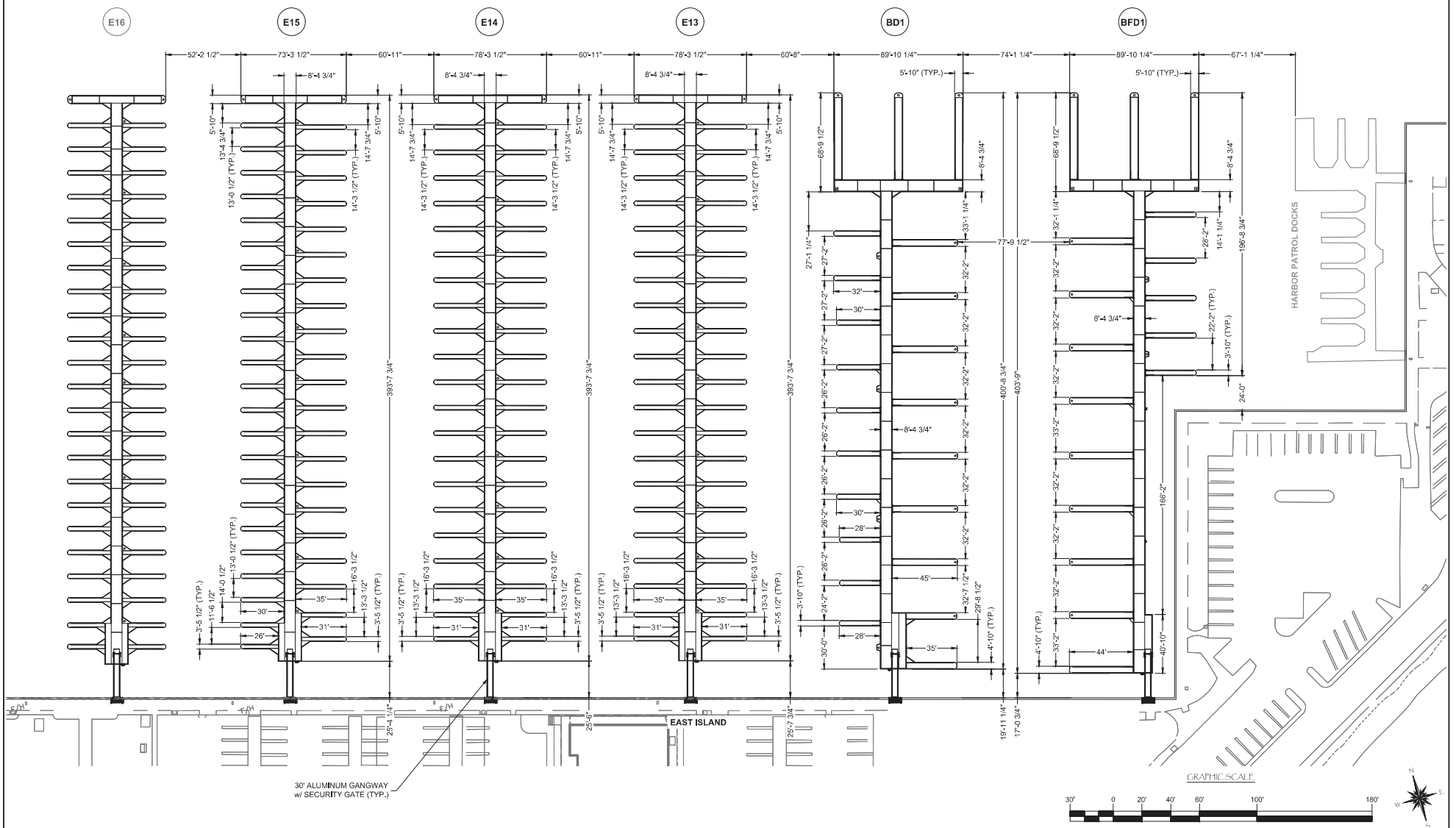
DIMENSIONAL LAYOUT FOR DOCKS E10 - E12

Craig S Funston
2022.05.13
12:24:39-07'00'

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Bellingham Marine Engineering under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and fits have been included in this review. Bellingham Marine Engineering can not be responsible for the accuracy of information provided by others.

SCALE:	1" = 30' (Sheet Size 24" x 36")
DRAWN BY:	KG
DATE:	5/10/2022
DRAWING:	DL8
SHEET NO.:	13

PERMIT DRAWING



NO.	DATE	DESCRIPTION	BY
-	-	-	-

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PROJECT NUMBER: 7341
ENGINEER / DESIGNER: -
PROJECT MANAGER: -
CHECKED BY: -

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

DIMENSIONAL LAYOUT FOR DOCKS BFD1, BD1, & E13 - E15

Craig S Funston
2022.05.13
12:24:50-07'00'

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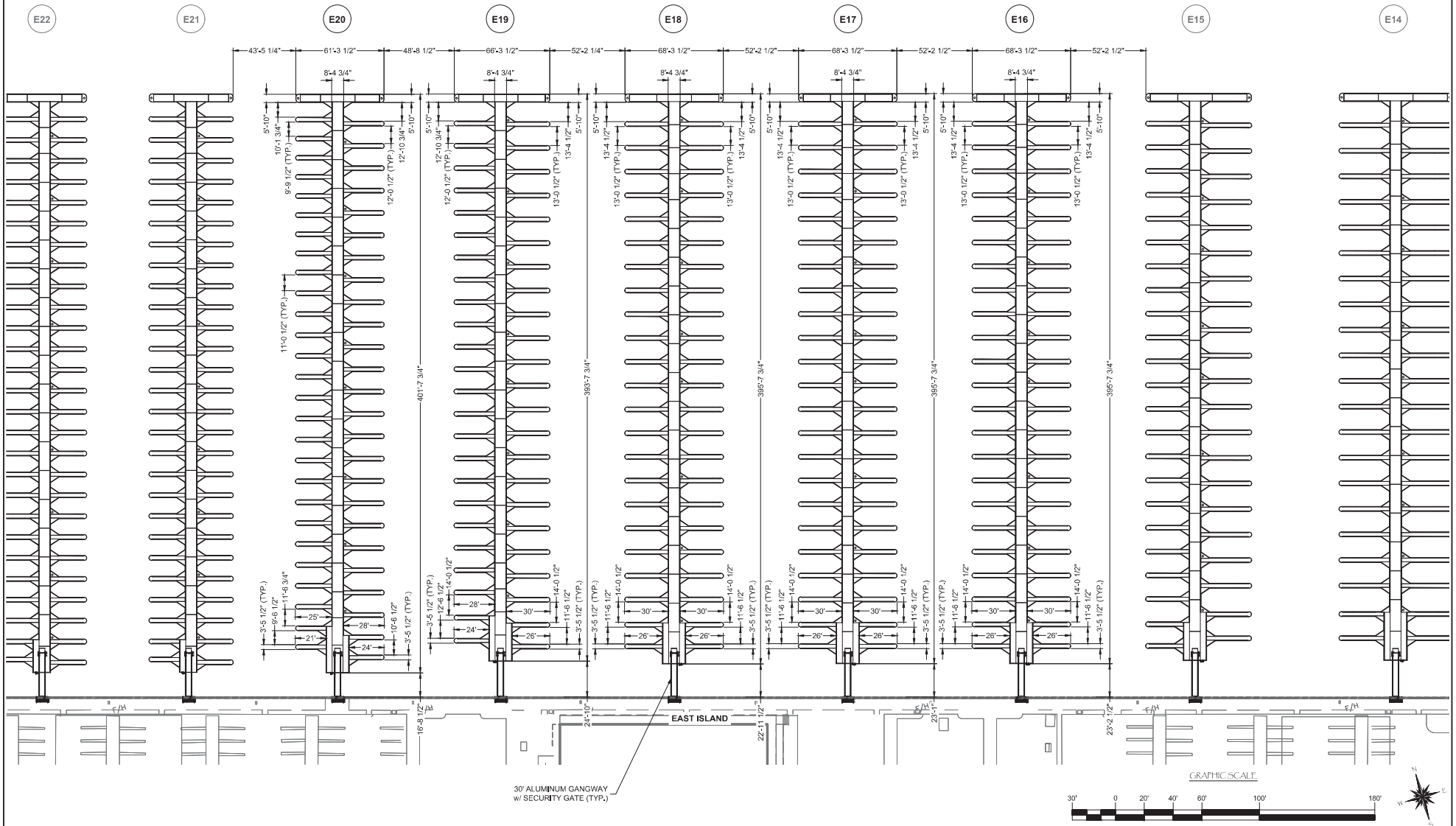
SCALE:	1" = 30' (Sheet Size 24" x 36")
DRAWN BY:	KG
DATE:	5/10/2022
DRAWING:	DL9
SHEET NO.:	14

PERMIT DRAWING



NO.	DATE	DESCRIPTION	BY
-	-	-	-

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PROJECT NUMBER:	7341
ENGINEER / DESIGNER:	
PROJECT MANAGER:	
CHECKED BY:	

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

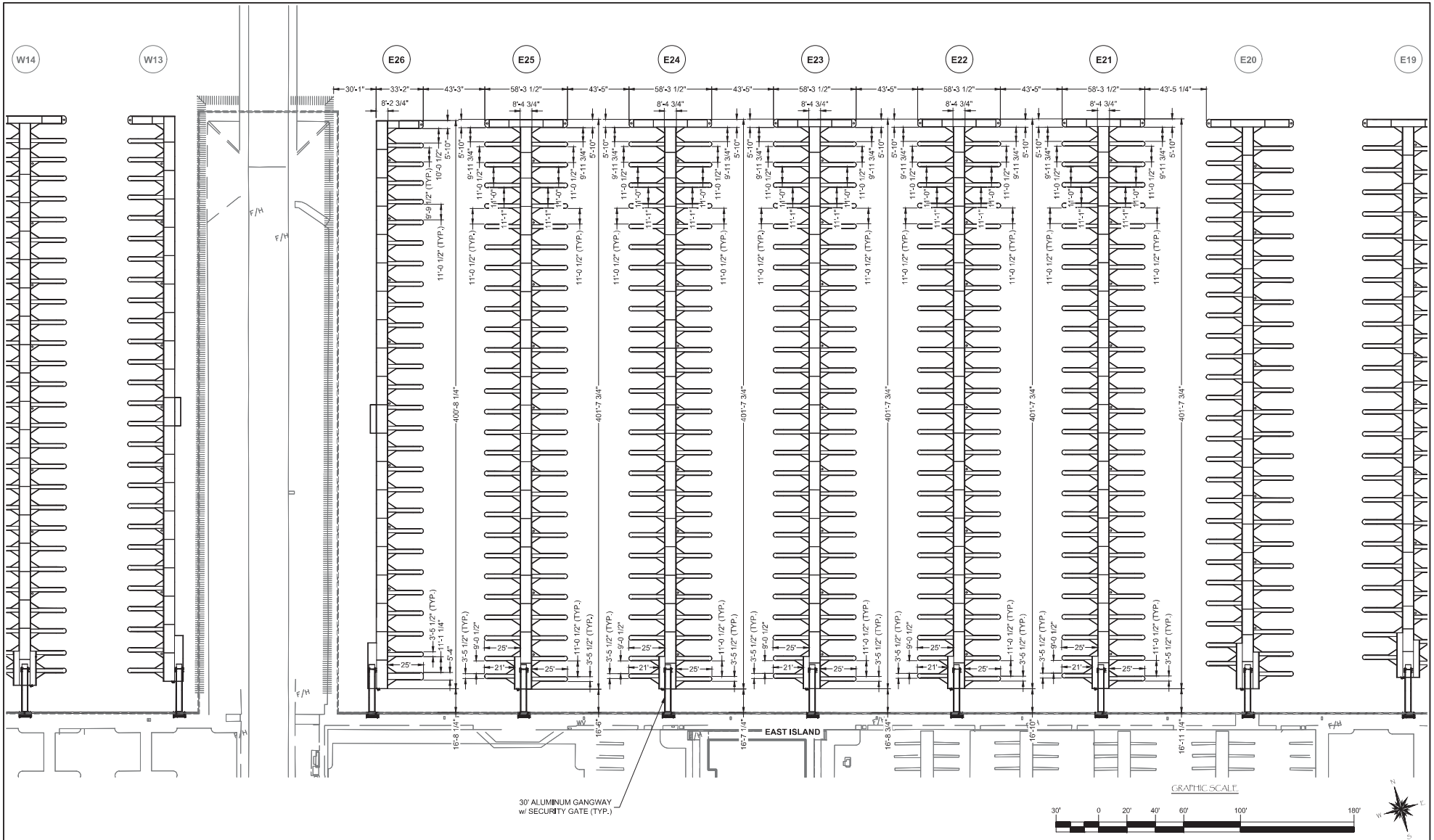
DIMENSIONAL LAYOUT FOR DOCKS E16 - E20

Craig S Funston
2022.05.13
12:25:00-07'00'

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Bellingham Marine Engineering under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and the like have been included in this review. Bellingham Marine Engineering can not be responsible for the accuracy of information provided by others.

SCALE:	1" = 30' (Sheet Size 24" x 36")
DRAWN BY:	KG
DATE:	5/10/2022
DRAWING:	DL10
SHEET NO.:	15

PERMIT DRAWING



NO.	DATE	DESCRIPTION	BY
-	-	-	-

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PROJECT NUMBER:	7341
ENGINEER / DESIGNER:	
PROJECT MANAGER:	
CHECKED BY:	

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

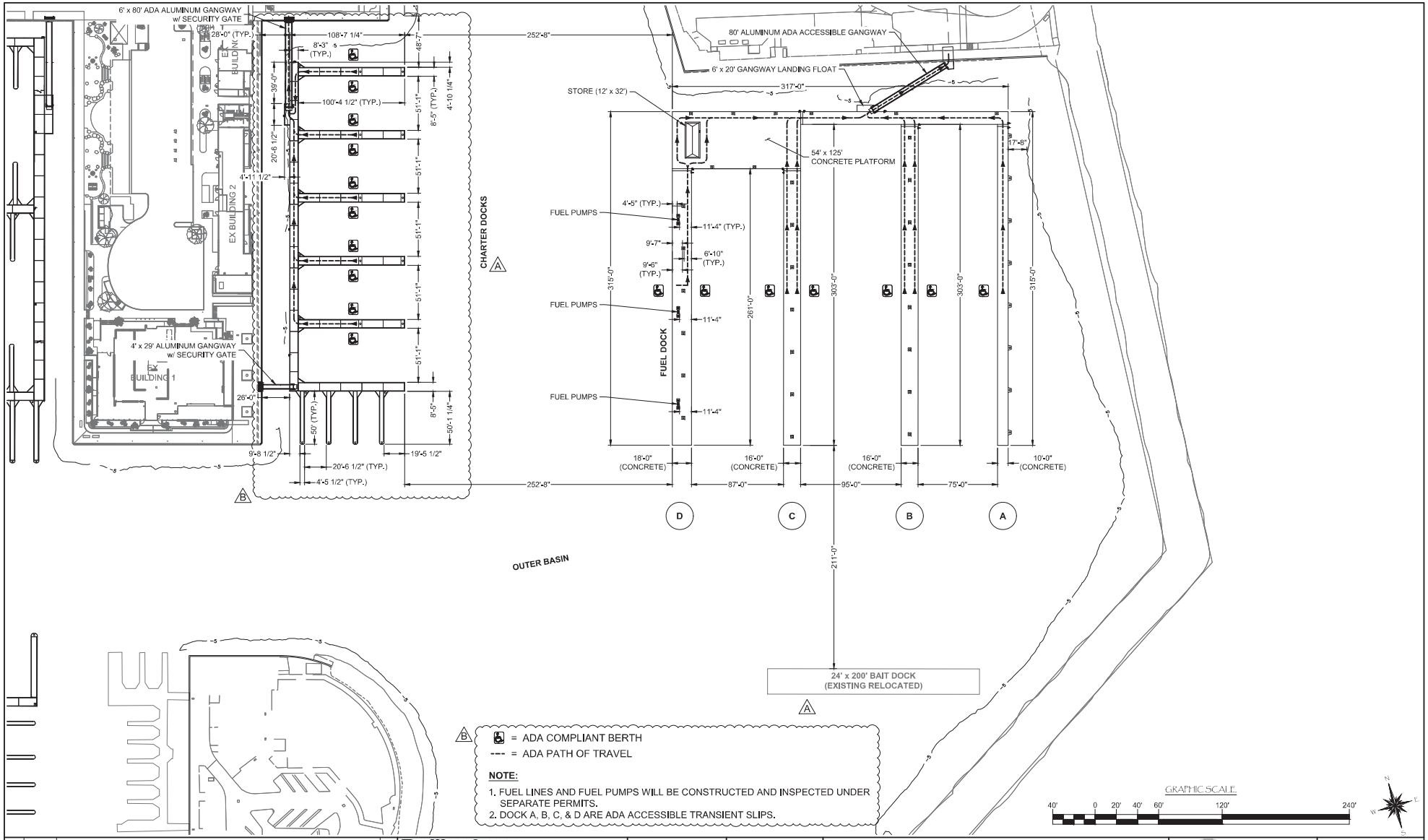
DIMENSIONAL LAYOUT FOR DOCKS E21 - E26

Craig S Funston
2022.05.13
12:25:10-07'00'

The structural system shown on these drawings, including member sizes, layout, and connection has been designed by Bellingham Marine Engineering under my supervision. No other aspects of the design including suitability for use, safety, mechanical, electrical, quantities, cut lengths and like have been included in this review. Bellingham Marine Engineering can not be responsible for the accuracy of information provided by others.

SCALE:	1" = 30' (Sheet Size 24" x 36")
DRAWN BY:	KG
DATE:	5/10/2022
DRAWING:	DL11
SHEET NO.:	16

PERMIT DRAWING



NO.	DATE	DESCRIPTION	BY
B	5-10-22	RECONFIGURED CHARTER DOCKS, ADDED NOTES, ADA , & PATH OF TRAVEL	KG
A	2-25-22	REMOVED SPORTFISHING/ ADDED EXISTING RELOCATED	KG

REVISIONS

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PROJECT NUMBER: 7341
ENGINEER / DESIGNER:
PROJECT MANAGER:
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DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

DIMENSIONAL LAYOUT FOR OUTER BASIN DOCKS

Craig S Funston
2022.05.13
12:25:20-07'00'

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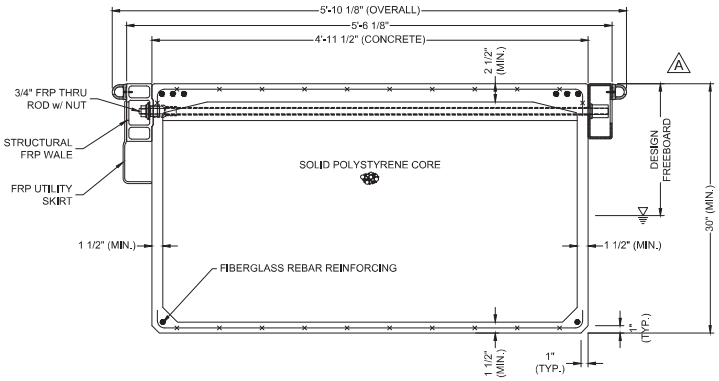
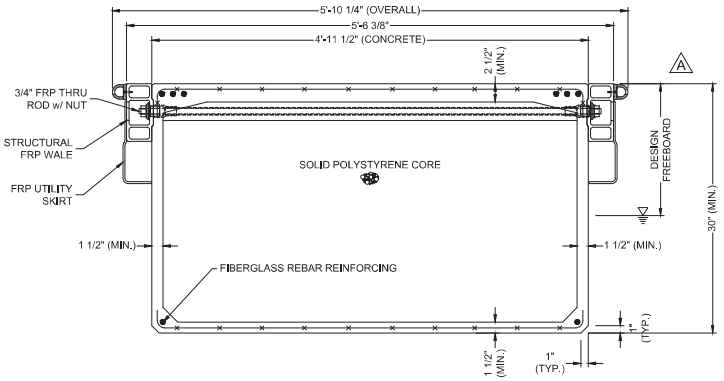
SCALE:	1" = 40' (Sheet Size 24" x 36")
DRAWN BY:	KG
DATE:	5/10/2022
DRAWING:	DL12
SHEET NO.:	17

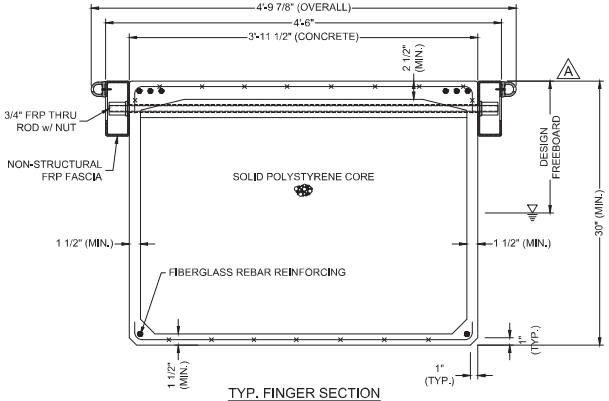
PERMIT DRAWING



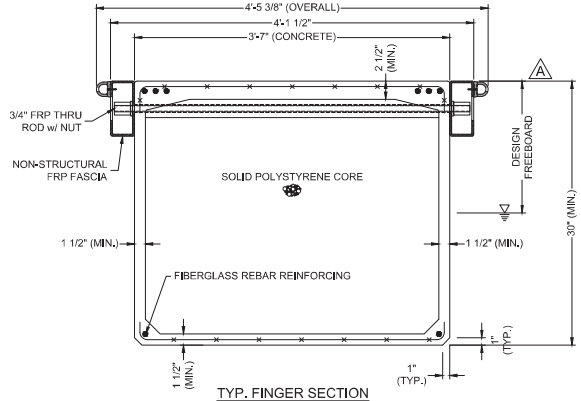
TYP. SINGLE ENDTIE WALKWAY SECTION



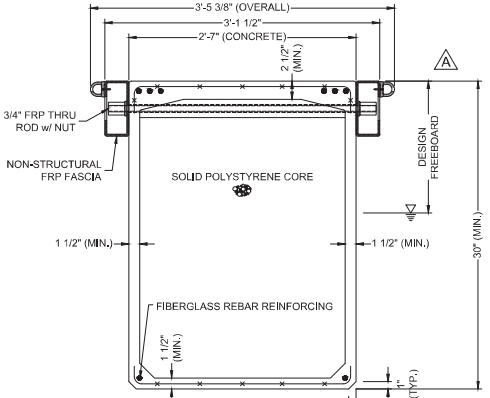
TYP. ENDTIE WALKWAY & 60'-79' LONG FINGER SECTION



TYP. FINGER SECTION
51'-59' LONG



TYP. FINGER SECTION
36'-50' LONG



TYP. FINGER SECTION
UNDER 36' LONG

NO.	DATE	DESCRIPTION	BY
A	2-25-22	ADDED DIMENSIONS	KG

REVISIONS

Bellingham MARINE
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SOUTHWEST DIVISION
CA LICENSE #442499
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DIXON, CA 95620
TEL: (707) 678-2385
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PROJECT NUMBER:	7341
ENGINEER / DESIGNER:	-
PROJECT MANAGER:	-
CHECKED BY:	-

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

DOCK SECTIONS

Craig S Funston
2022.05.13
12:29:34-07'00'

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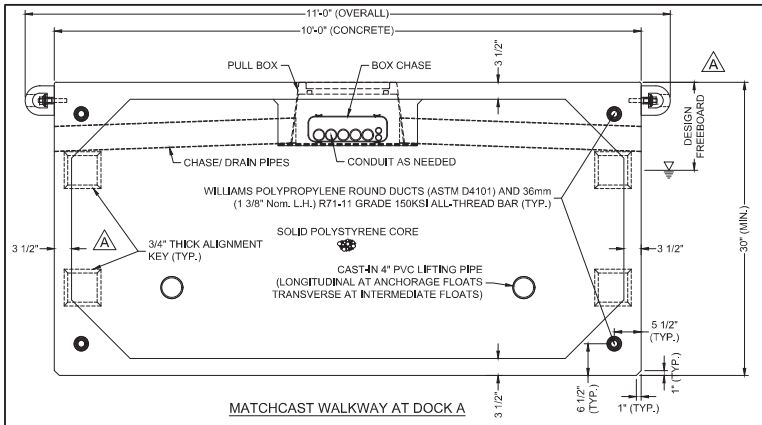
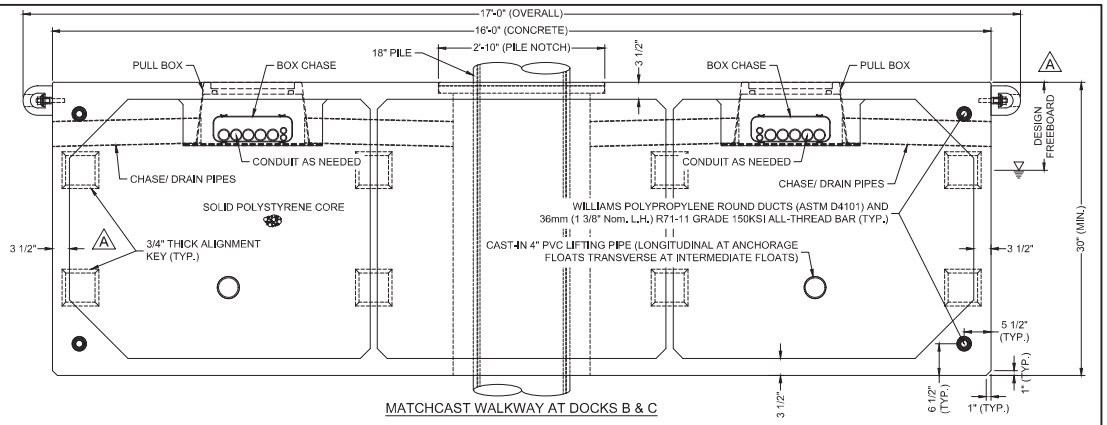
SCALE:	1 1/2" = 1' (Sheet Size 24" x 36")
DRAWN BY:	KG
DATE:	5/10/2022
DRAWING:	DS5
SHEET NO.:	40

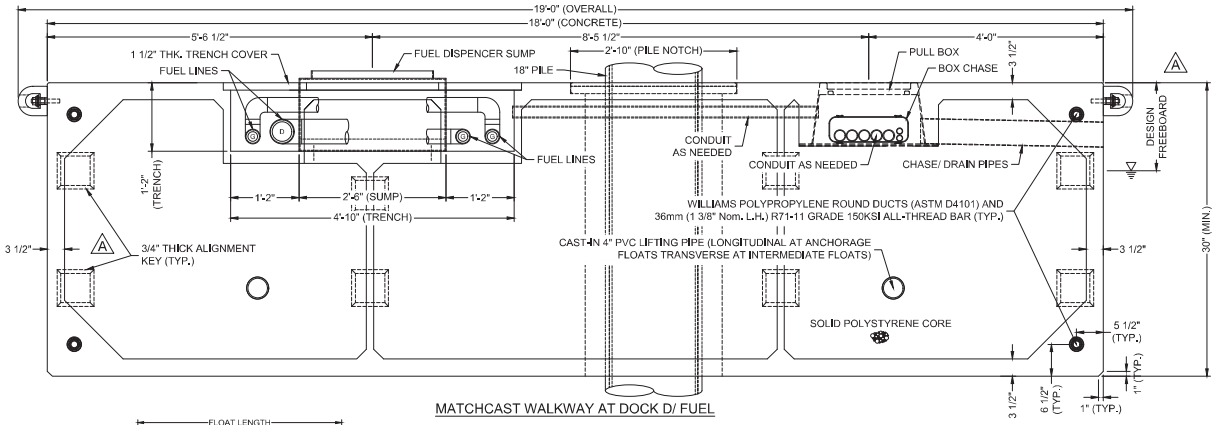
PERMIT DRAWING



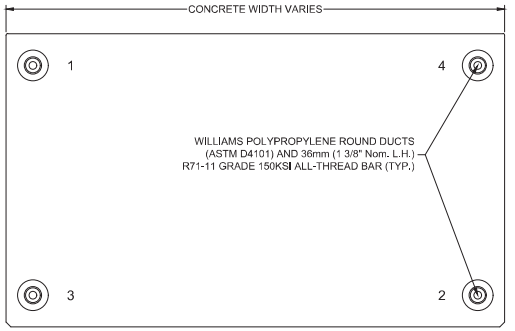
MATCHCAST WALKWAY AT DOCK A



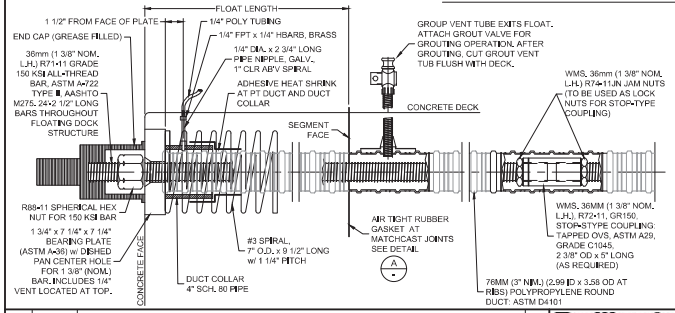
MATCHCAST WALKWAY AT DOCKS B & C

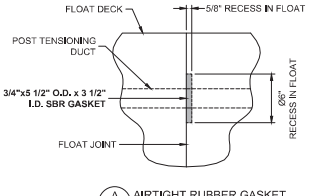


MATCHCAST WALKWAY AT DOCK D/ FUEL

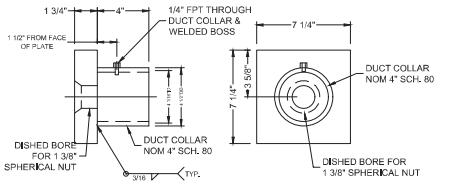


ELEVATION VIEW
TENSIONING SEQUENCE





A AIRTIGHT RUBBER GASKET
SCALE: NTS



BEARING PLATE

TENSIONING PROCEDURE

STAGE 1:
SNUG UP POST-TENSION BARS WHILE ASSURING THAT ALL MODULE SHEAR KEYS AND MATING FACES ARE ALIGNED. ONCE MODULES ARE PROPERLY ALIGNED AND MATING FACES ARE IN FIRM, EVEN CONTACT, TENSION ALL BARS TO 20 KIPS EACH. SEAT ALL SPHERICAL NUTS AND MARK BARS AT SQUARE FACE OF NUT TO RECORD ELONGATIONS PER PT INSTRUCTION SHEET.

STAGE 2:
TENSION ALL BARS TO 90 KIPS USING THE SEQUENCE SHOWN. RE-SEAT SPHERICAL NUTS AND MEASURE TOTAL ELONGATION FROM THE 20 KIP MARK. TOTAL CALCULATED ELONGATION FROM 20 KIPS TO 90 KIPS IS 2.20 in. ± .22 in. IF MEASURED ELONGATION IS OUTSIDE THIS RANGE, CONTACT THE ENGINEER.

STAGE 3:
TENSION ALL BARS TO 166 KIPS USING THE SEQUENCE SHOWN. DO NOT EXCEED 190 KIPS AT ANY TIME DURING JACKING. RE-SEAT SPHERICAL NUTS AND MEASURE TOTAL ELONGATION FROM THE 20 KIP MARK. TOTAL CALCULATED ELONGATION FROM 20 KIPS TO 166 KIPS IS 4.59 in. ± .46 in. IF MEASURED ELONGATION IS OUTSIDE OF THIS RANGE, CONTACT THE ENGINEER.

NO.	DATE	DESCRIPTION	BY
A	2-25-22	DESCRIPTION CHANGED/ ADDED DIMENSIONS	KG

REVISIONS

Bellingham MARINE
THE WORLD'S MOST COMPREHENSIVE MARINA BUILDER

SOUTHWEST DIVISION
CA LICENSE #442499
8810 SPARLING LANE
DIXON, CA 95620
TEL: (707) 678-2385
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PROJECT NUMBER: 7341

ENGINEER / DESIGNER: -

PROJECT MANAGER: -

CHECKED BY: -

DANA POINT HARBOR REVITALIZATION

Harbor Drive
Dana Point, CA 92629

DOCK SECTIONS

Craig S Funston
2022.05.13
12:29:44-07'00'

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SCALE:	1" = 1' (Sheet Size 24" x 36")
DRAWN BY:	KG
DATE:	5/10/2022
DRAWING:	DS6
SHEET NO.:	41

1323 Lincoln St.
Bellingham, WA 98229
T 360.715.0121

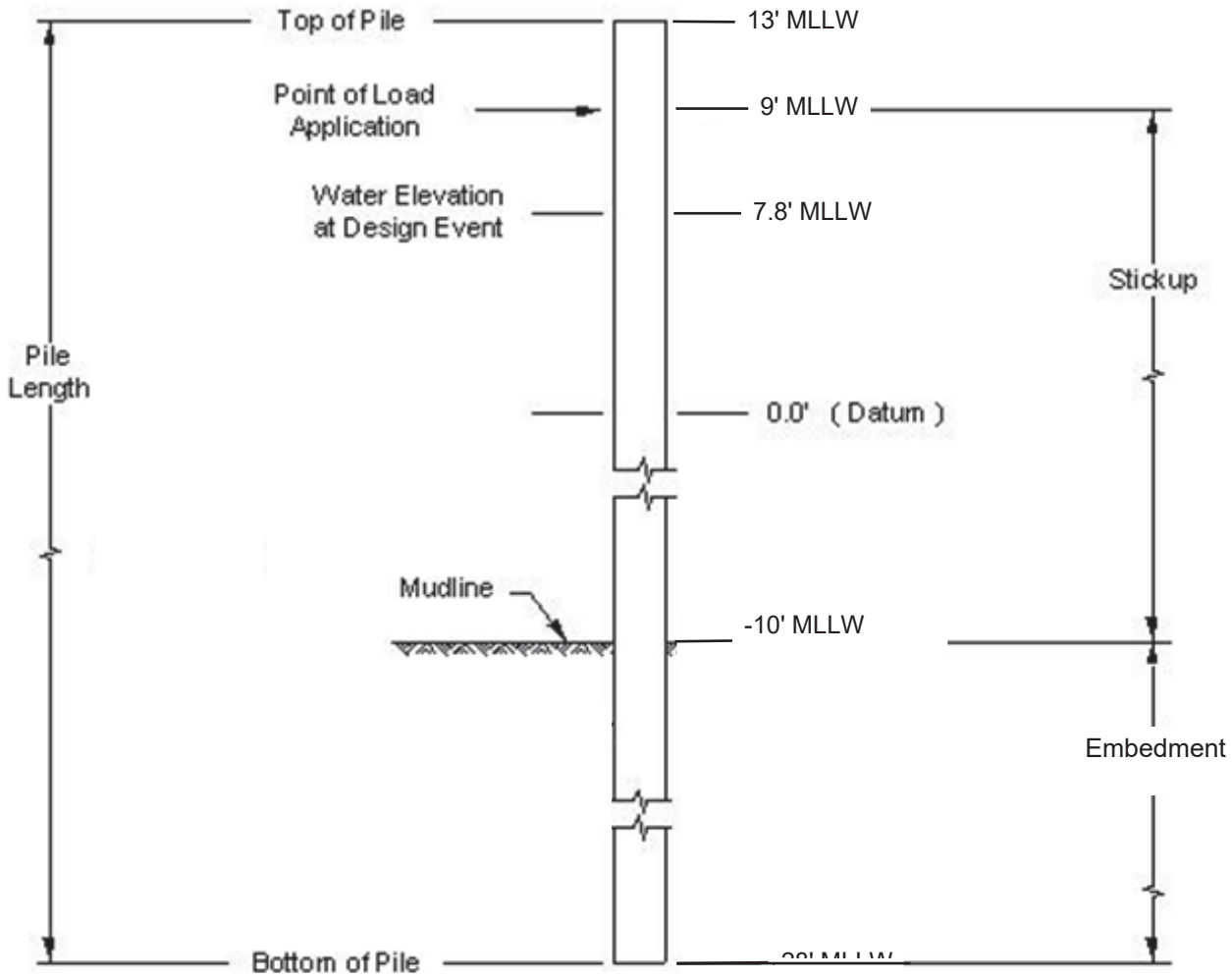
Piles (Inner Basin)

Bellingham MARINE
1323 Lincoln St.
Bellingham, WA 98229
T 360.715.0121

STEEL PIPE PILE BENDING CAPACITIES (Phi-Mn) PER AISC STEEL CONSTRUCTION MANUAL. LATERAL POINT LOAD CAPACITY (Phi-Pn) PROVIDE BY GEOTECH. SEE REVISED ENGEO GEOTECH REPORT DATE FEB. 23, 2022.

General Pile Design and Capacity

Pile Type	Stiffness (k/in)	Min Ult. Moment Capacity (ΦMn) (k-ft)	ΦPn (k)
12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve	1.06	213.3	8.8
14" x 0.5" A252 Steel Pile w/ HDPE sleeve	1.36	259	11.0



ELEVATION VIEW OF TYPICAL MARINA PILE
(N.T.S)

Bellingham MARINE®
1323 Lincoln St.
Bellingham, WA 98229
T 360.715.0121

Data Input		
W =	19	psf
S1 =	1	
S2_P90 =	0.15	
S2_P0 =	0.2	

Vessel					Wind Loads			
					S1		S2	
Length	Height	Bp	A0	A90	P0 (k)	P90 (k)	P0 (k)	P90 (k)
21	3.2	7.5	24	67.2	0.5	1.3	0.1	0.2
24	3.6	9	32.4	86.4	0.6	1.6	0.1	0.2
25	3.8	9.5	36.1	95	0.7	1.8	0.1	0.3
26	3.9	10	39	101.4	0.7	1.9	0.1	0.3
28	4.2	10.5	44.1	117.6	0.8	2.2	0.2	0.3
30	4.5	11.5	51.8	135	1.0	2.6	0.2	0.4
31	4.7	12	56.4	145.7	1.1	2.8	0.2	0.4
32	4.8	12	57.6	153.6	1.1	2.9	0.2	0.4
35	5.3	13	68.9	185.5	1.3	3.5	0.3	0.5
40	6.0	14	84	240	1.6	4.6	0.3	0.7
42	6.3	14	88.2	264.6	1.7	5.0	0.3	0.8
44	6.6	14.5	95.7	290.4	1.8	5.5	0.4	0.8
45	6.8	14.5	98.6	306	1.9	5.8	0.4	0.9
48	7.2	15	108	345.6	2.1	6.6	0.4	1.0
50	7.5	15	112.5	375	2.1	7.1	0.4	1.1
58	8.7	16	139.2	504.6	2.6	9.6	0.5	1.4
60	9.0	16.5	148.5	540	2.8	10.3	0.6	1.5
65	9.8	17	166.6	637	3.2	12.1	0.6	1.8

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Analysis of Dock to be Modeled
Inner Basin

Group 1:	E1
Group 2:	E4,E5,E7,E8
Group 3:	E6, E9
Group 4:	E10
Group 5:	E11
Group 6:	E12
Group 7:	E13
Group 8:	E16
Group 9:	BD1
Group 10:	BFD1
Group 11:	W1
Group 12:	W4
Group 13:	W8
Group 14:	W12
Group 15:	W18
Group 16:	W19
Group 17:	W20

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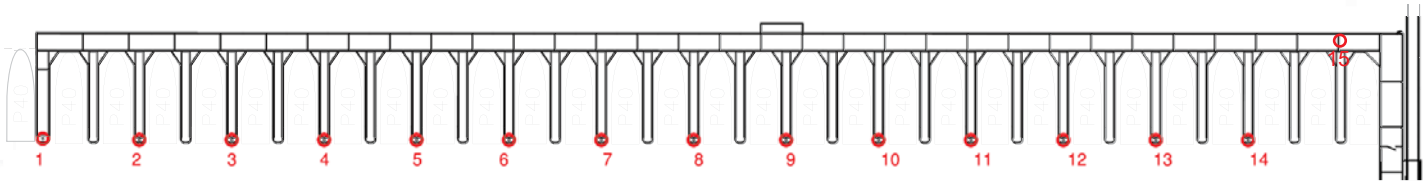
GROUP 1 DOCKS

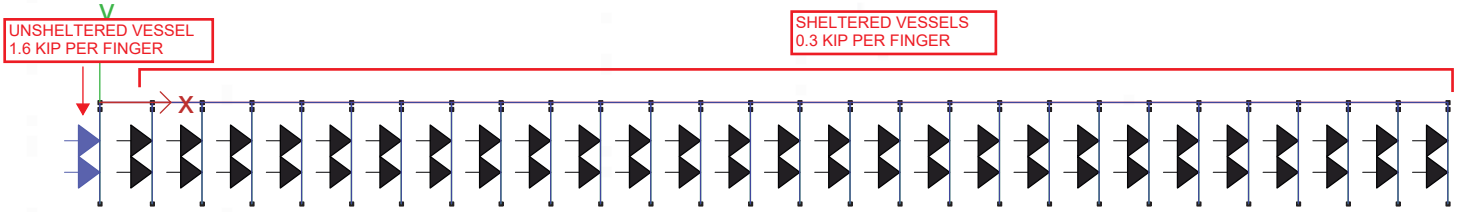
DOCK MODELED: E1



E10

Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PERPENDICULAR TO FINGERS



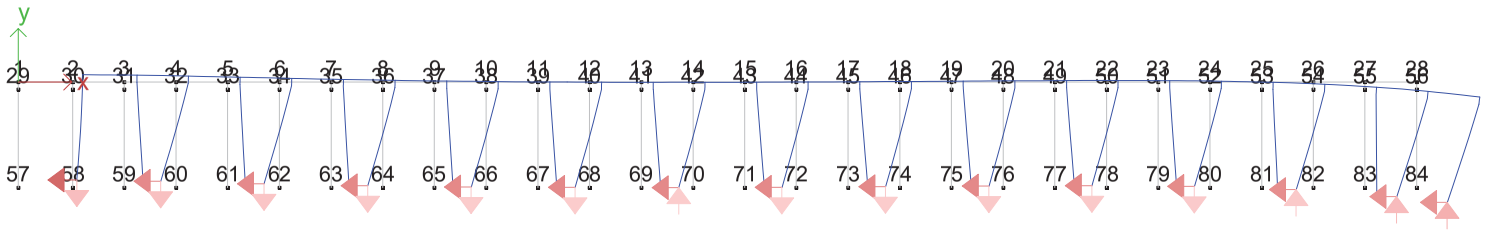
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.4	10.59	Good
2	1.6		Good
3	1.6		Good
4	1.6		Good
5	1.6		Good
6	1.6		Good
7	1.6		Good
8	1.5		Good
9	1.5		Good
10	1.5		Good
11	1.5		Good
12	1.5		Good
13	1.4		Good
14	1.3		Good
15	1.3		Good
Sum	23.5		

GROUP 1 DOCKS

DOCK MODELED: E1

PERPENDICULAR



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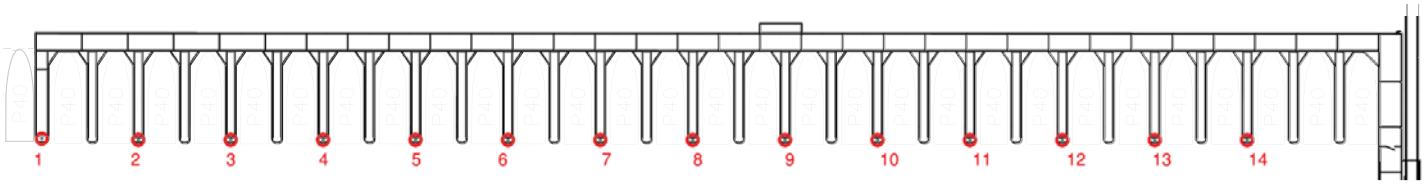
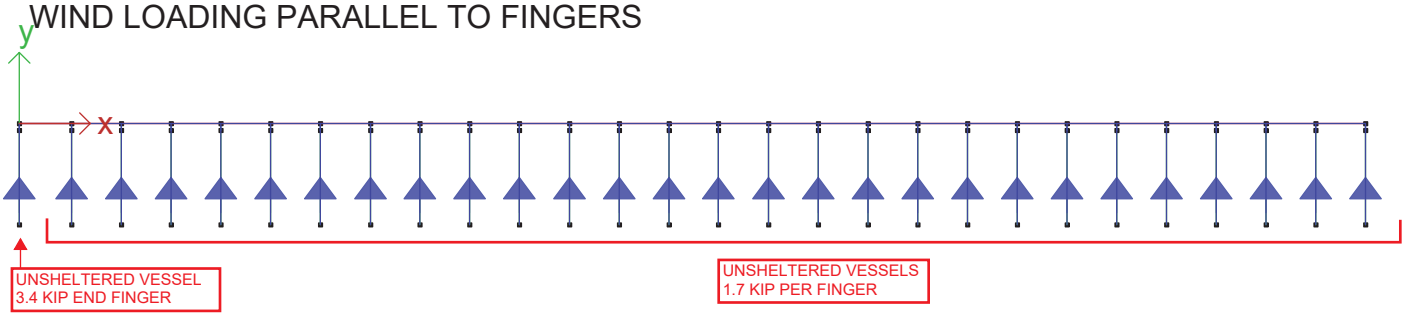
GROUP 1 DOCKS (continued)

DOCK MODELED: E1



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PARALLEL TO FINGERS



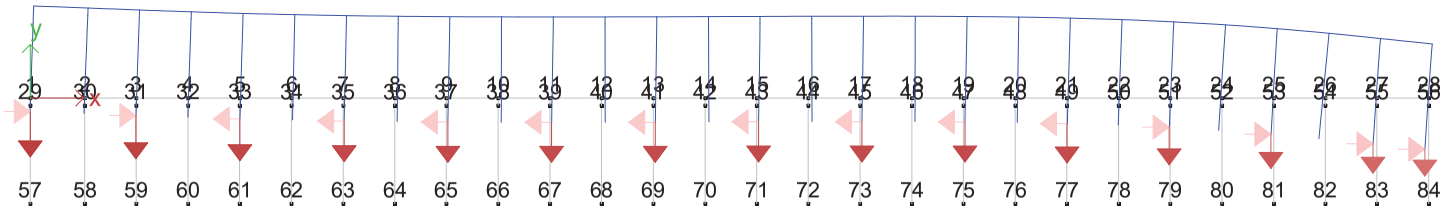
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	3.4	8.8	Good
2	3.4		Good
3	3.4		Good
4	3.4		Good
5	3.4		Good
6	3.4		Good
7	3.5		Good
8	3.4		Good
9	3.6		Good
10	3.2		Good
11	3.7		Good
12	2.9		Good
13	3.9		Good
14	2.5		Good
15	2.3		Good
Sum	49.3		

GROUP 1 DOCKS

DOCK MODELED: E1

PARALLEL



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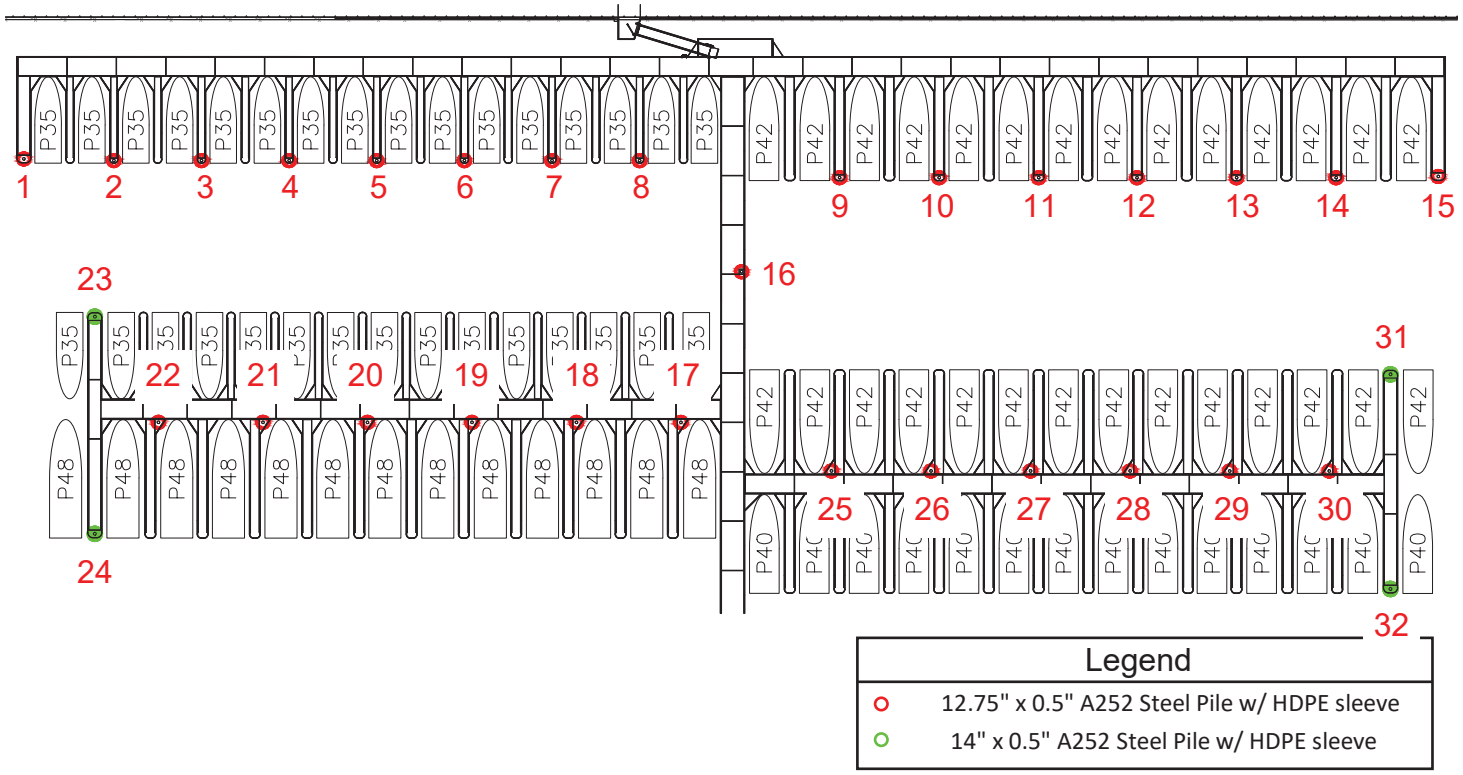
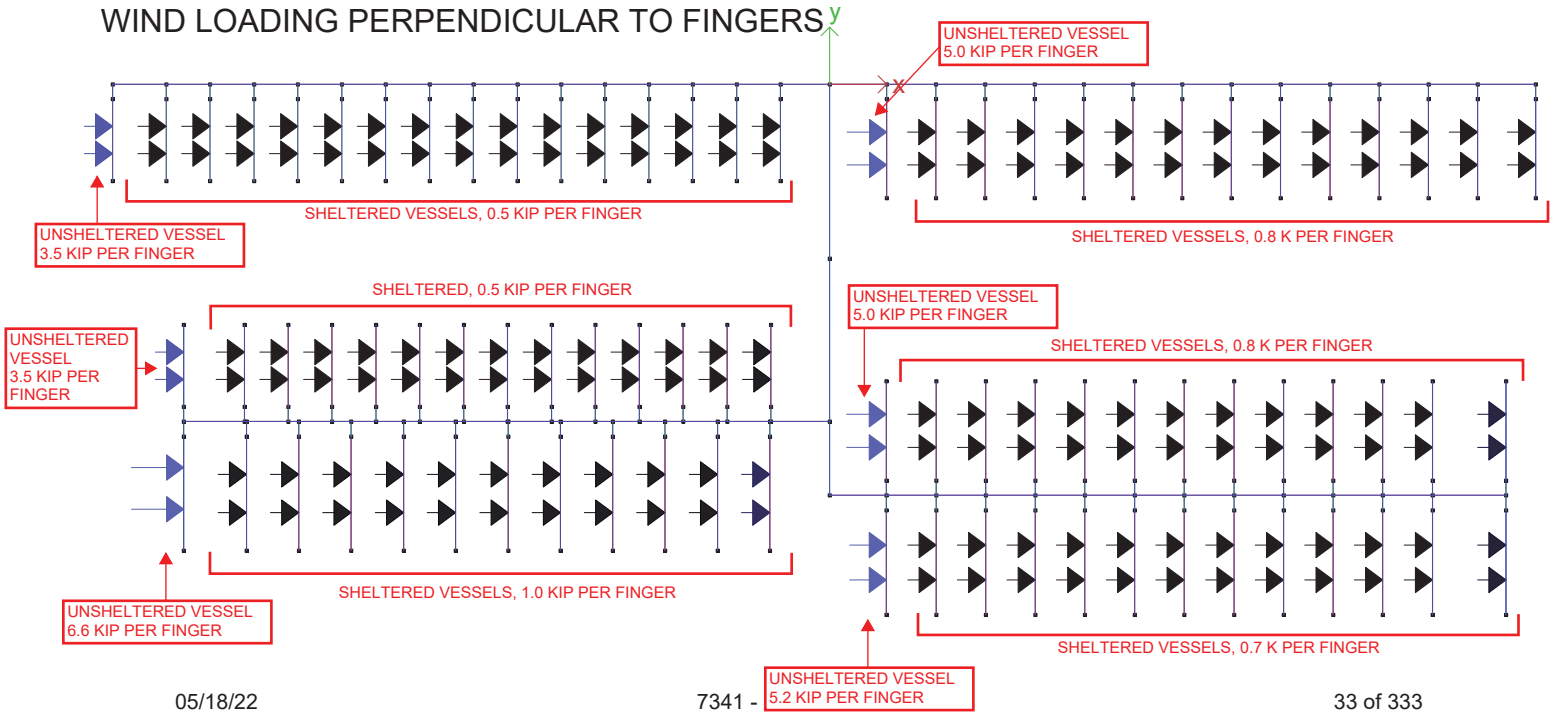
GROUP 2 DOCKS

DOCK MODELED: E4, E5, E7, E8



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

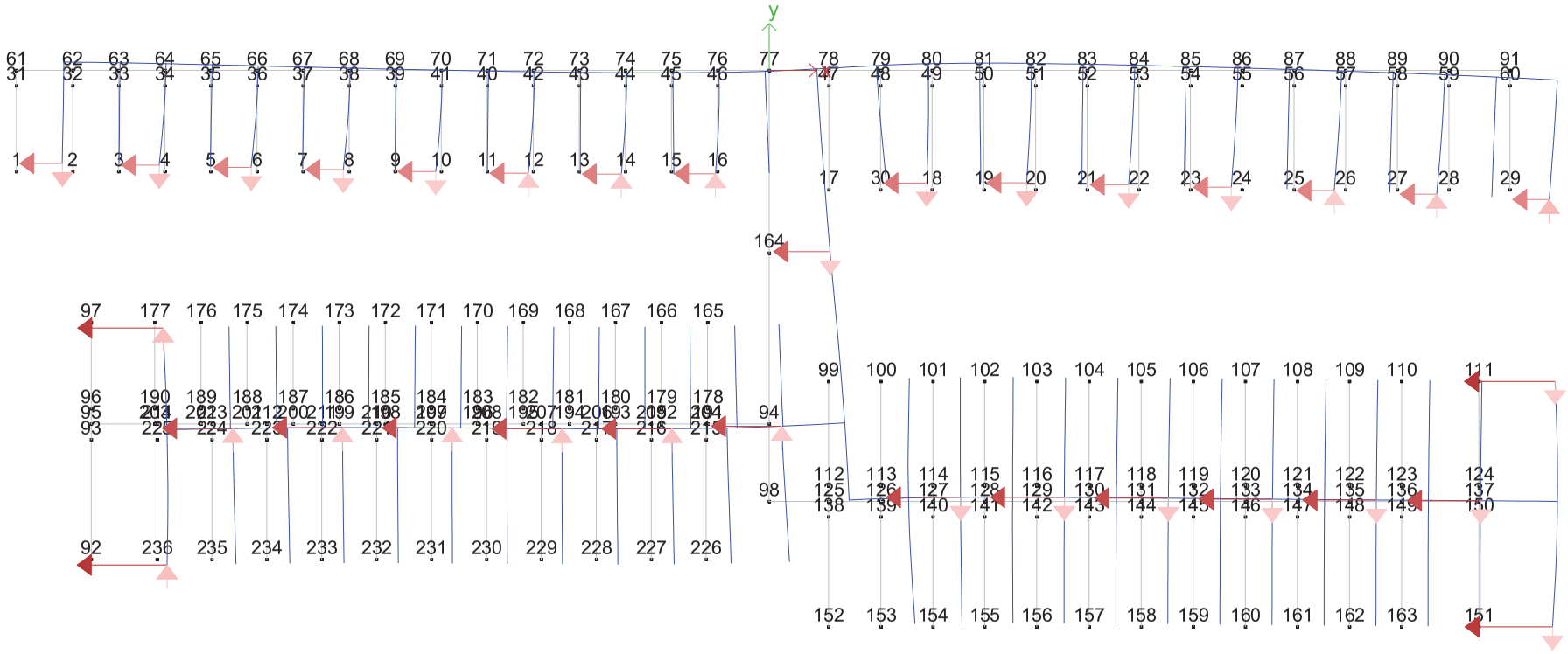
WIND LOADING PERPENDICULAR TO FINGERS



GROUP 2 DOCKS

DOCK MODELED: E4, E5, E7, E8

PERPENDICULAR



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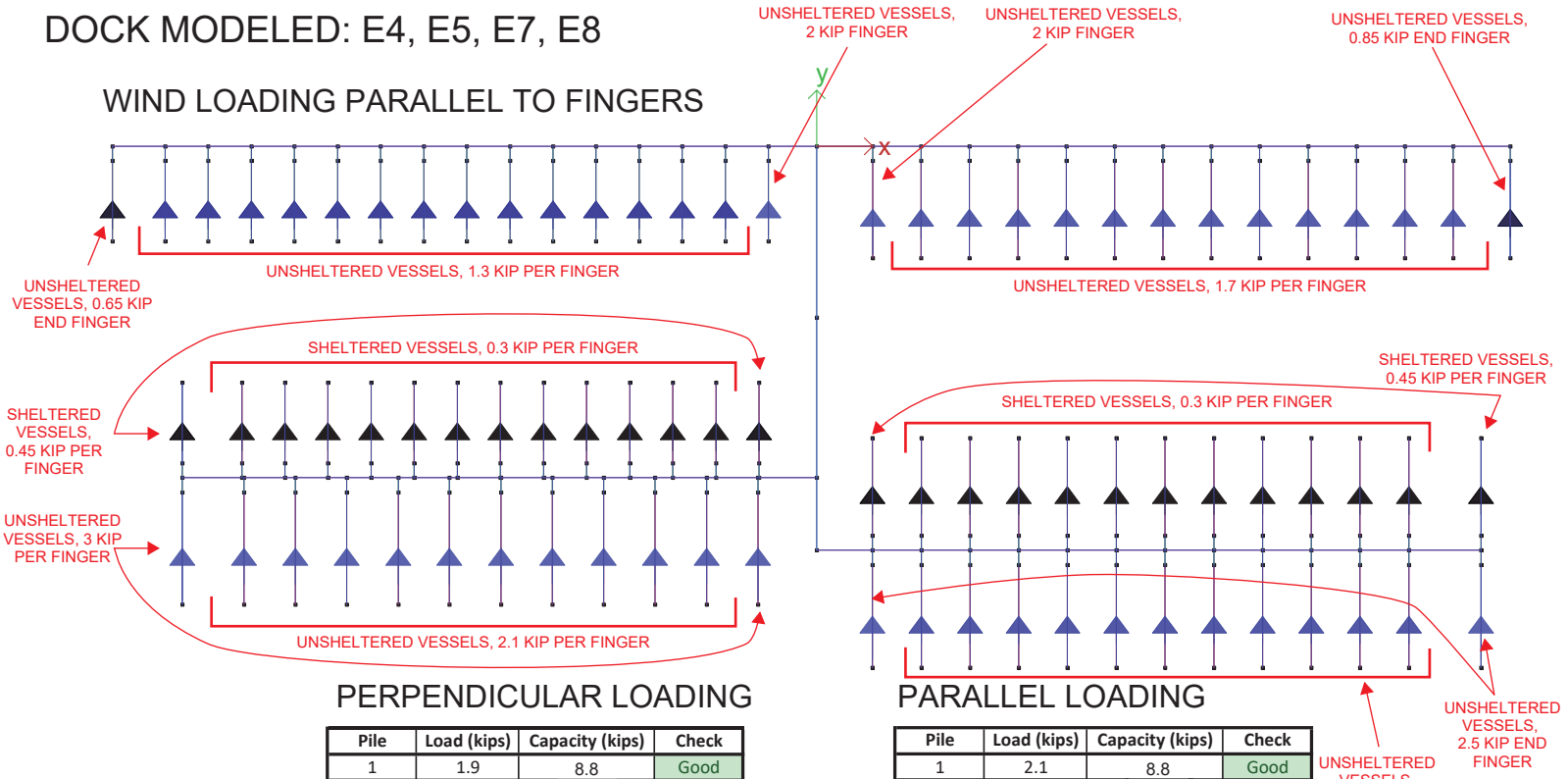
GROUP 2 DOCKS (continued)

DOCK MODELED: E4, E5, E7, E8

WIND LOADING PARALLEL TO FINGERS



PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	1.9	8.8	Good
2	1.7		Good
3	1.7		Good
4	1.7		Good
5	1.7		Good
6	1.7		Good
7	1.8		Good
8	1.9		Good
9	2.0		Good
10	1.8		Good
11	1.8		Good
12	1.7		Good
13	1.7		Good
14	1.7		Good
15	1.7		Good
16	2.6		Good
17	3.2		Good
18	3.2		Good
19	3.2		Good
20	3.2		Good
21	3.2		Good
22	3.2		Good
23	3.9	11.0	Good
24	4.1		Good
25	3.4	8.8	Good
26	3.4		Good
27	3.4		Good
28	3.4		Good
29	3.3		Good
30	3.3		Good
31	4.1	11.0	Good
32	4.0		Good
Sum	84.6		

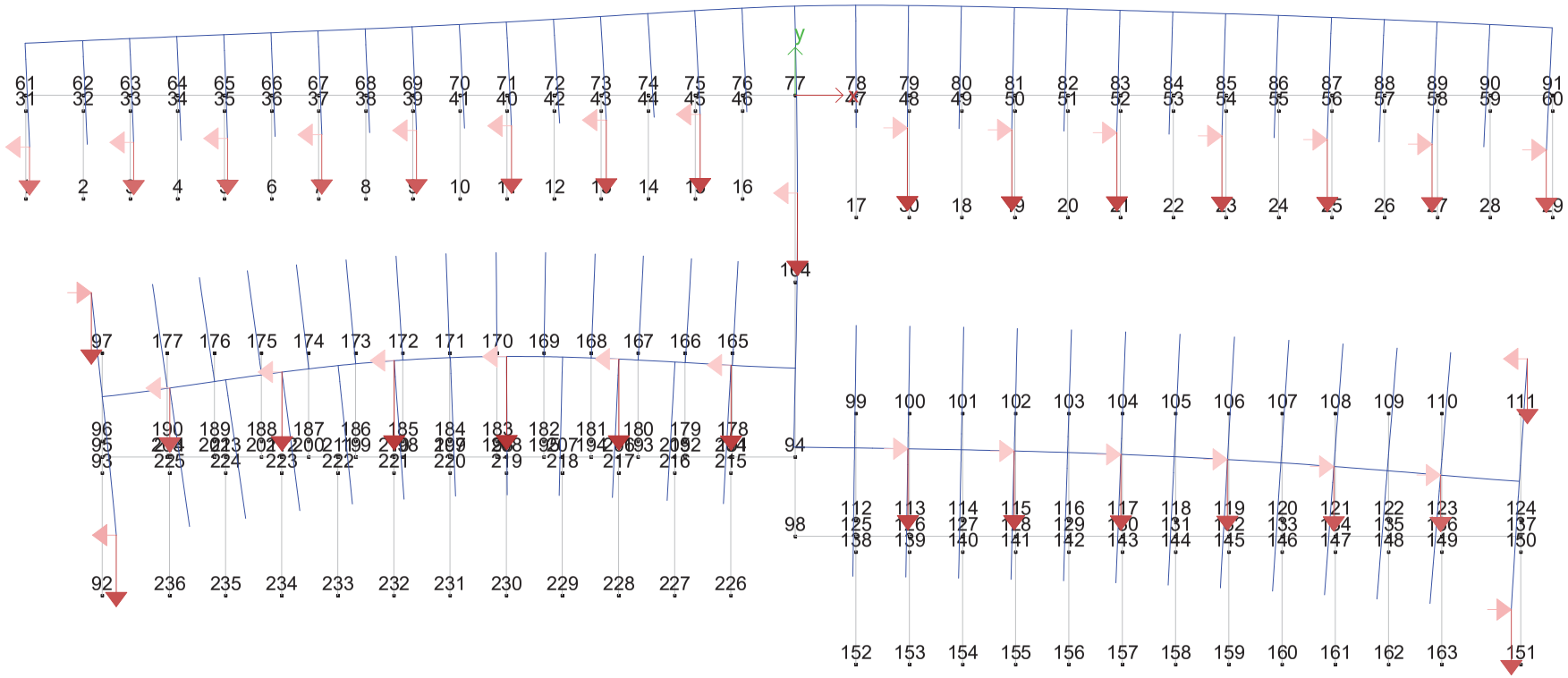
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.1	8.8	Good
2	2.3		Good
3	2.5		Good
4	2.7		Good
5	2.8		Good
6	3.0		Good
7	3.3		Good
8	3.5		Good
9	3.7		Good
10	3.6		Good
11	3.5		Good
12	3.4		Good
13	3.2		Good
14	3.0		Good
15	2.8		Good
16	3.7		Good
17	3.8		Good
18	4.1		Good
19	4.2		Good
20	4.0		Good
21	3.5		Good
22	2.9		Good
23	3.2	11.0	Good
24	3.2		Good
25	3.6	8.8	Good
26	3.5		Good
27	3.4		Good
28	3.2		Good
29	2.9		Good
30	2.5		Good
31	2.9	11.0	Good
32	2.9		Good
Sum	103.0		

GROUP 2 DOCKS

DOCK MODELED: E4, E5, E7, E8

PARALLEL



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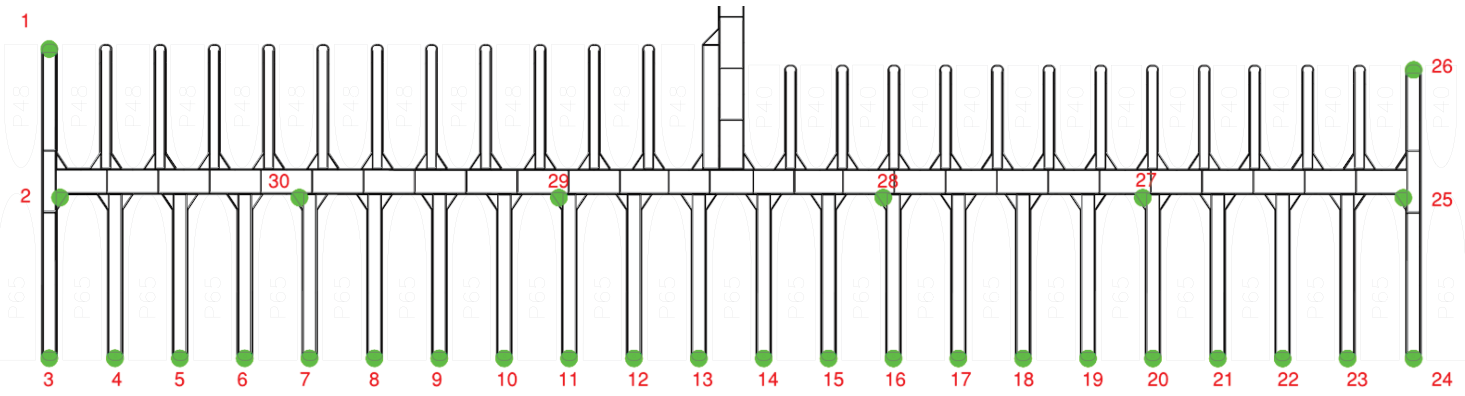
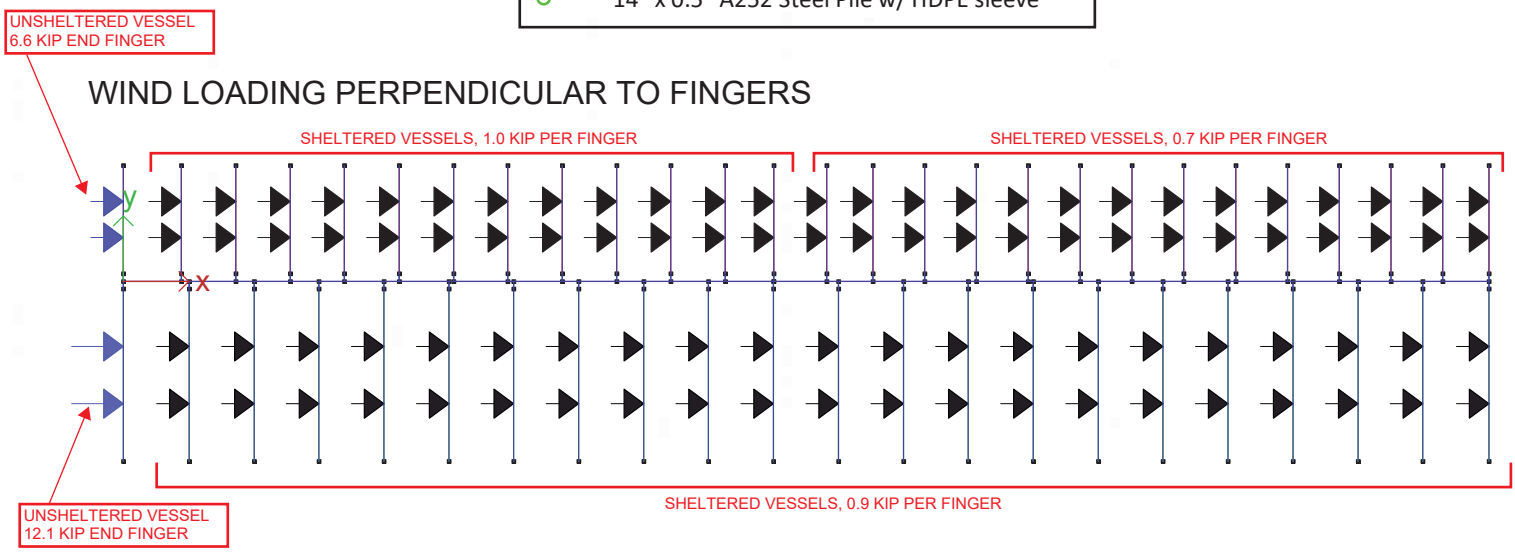
GROUP 3 DOCKS

DOCK MODELED: E6, E9

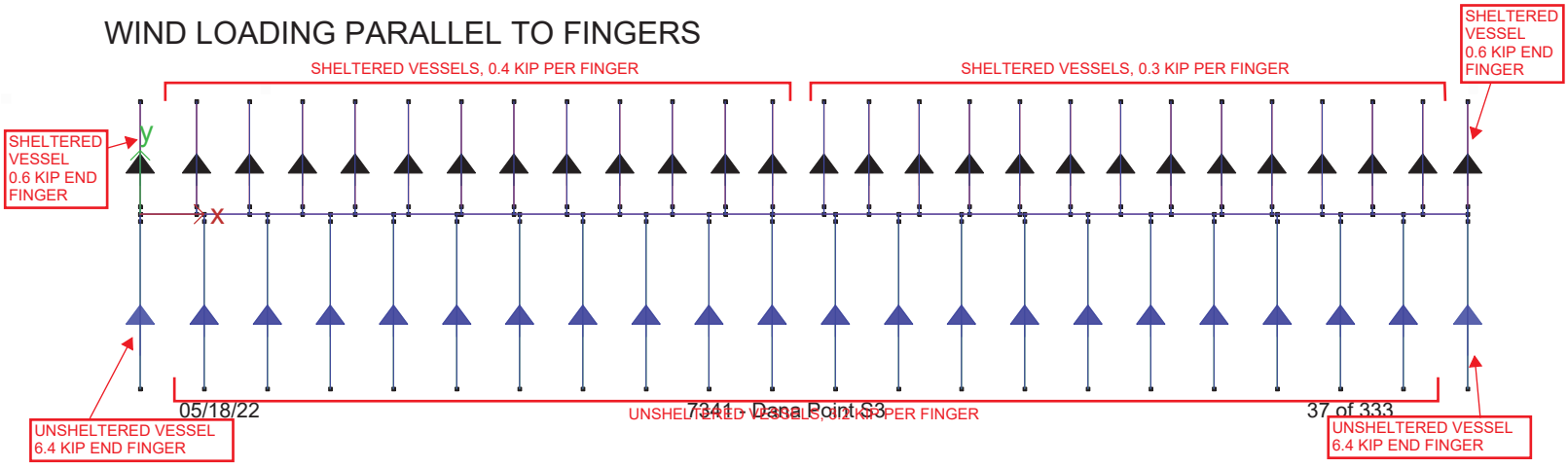


Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PERPENDICULAR TO FINGERS



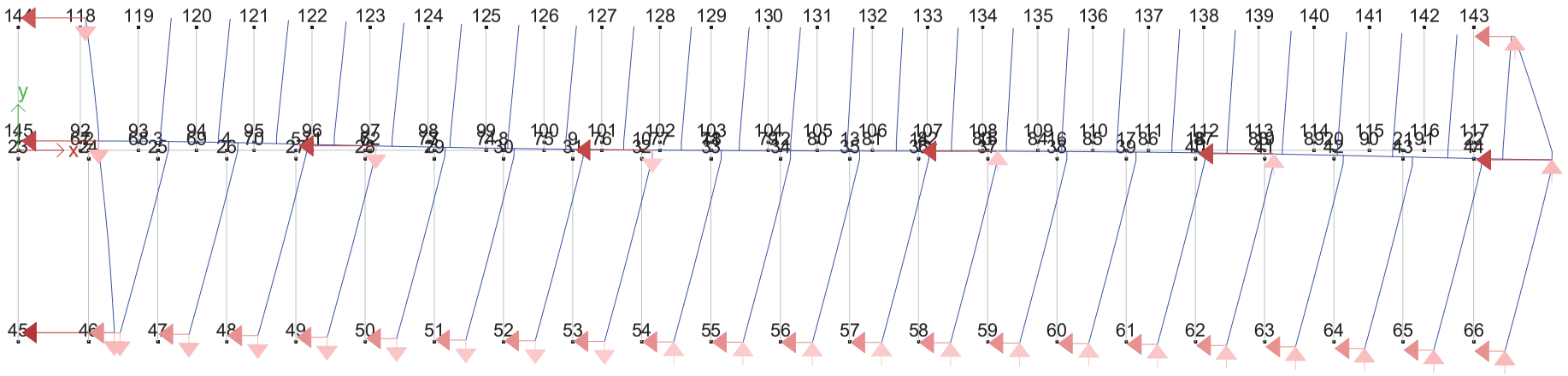
WIND LOADING PARALLEL TO FINGERS



GROUP 3 DOCKS

DOCK MODELED: E6, E9

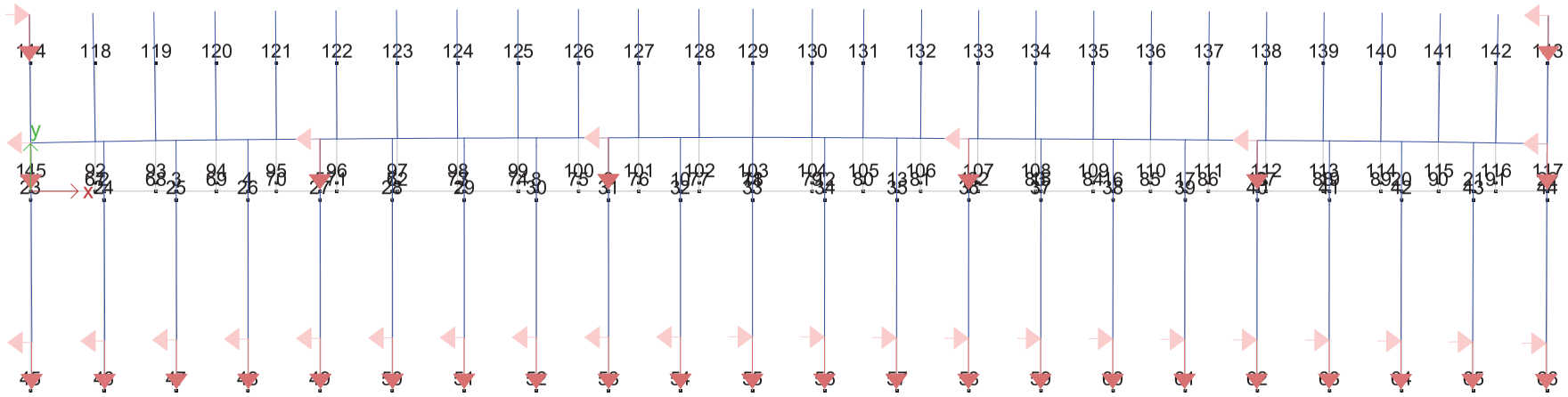
PERPENDICULAR



GROUP 3 DOCKS

DOCK MODELED: E6, E9

PARALLEL



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GROUP 3 DOCKS (continued)

DOCK MODELED: E6, E9

PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	3.9	11.0	Good
2	4.7		Good
3	5.6		Good
4	1.9		Good
5	1.8		Good
6	1.8		Good
7	1.8		Good
8	1.8		Good
9	1.8		Good
10	1.8		Good
11	1.9		Good
12	1.9		Good
13	1.9		Good
14	1.9		Good
15	1.9		Good
16	1.9		Good
17	1.9		Good
18	1.8		Good
19	1.8		Good
20	1.8		Good
21	1.8		Good
22	1.8		Good
23	1.8		Good
24	1.8		Good
25	4.6		Good
26	2.4		Good
27	4.7		Good
28	4.6		Good
29	4.6		Good
30	4.6		Good
Sum	78.3		

PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.7	11.0	Good
2	2.7		Good
3	2.7		Good
4	2.8		Good
5	2.9		Good
6	2.9		Good
7	2.9		Good
8	3.0		Good
9	3.0		Good
10	3.0		Good
11	3.0		Good
12	3.0		Good
13	3.0		Good
14	3.0		Good
15	3.0		Good
16	3.0		Good
17	2.9		Good
18	2.9		Good
19	2.9		Good
20	2.9		Good
21	2.8		Good
22	2.8		Good
23	2.7		Good
24	2.7		Good
25	2.7		Good
26	2.7		Good
27	2.9		Good
28	3.0		Good
29	3.0		Good
30	2.9		Good
sum	86.2		

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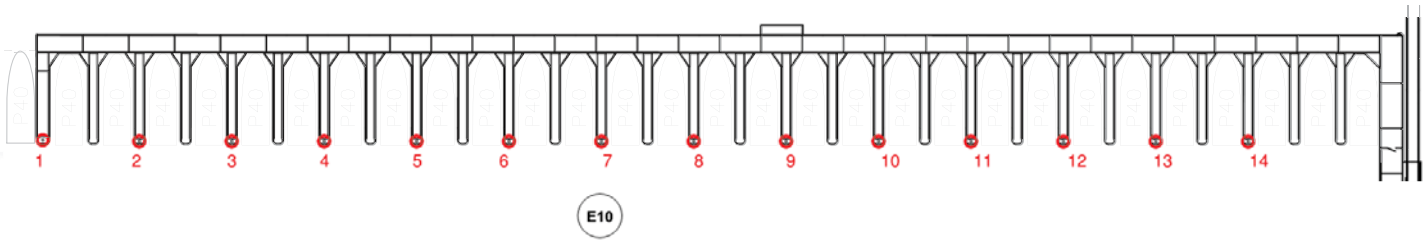
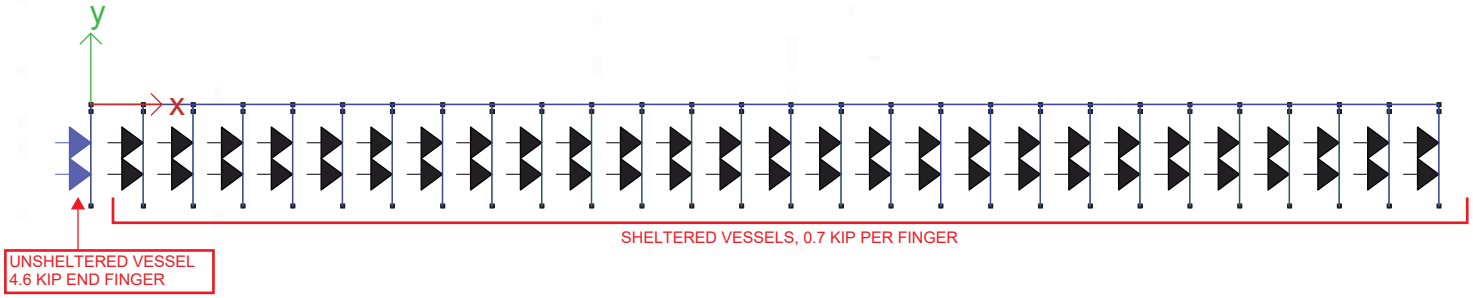
GROUP 4 DOCKS

DOCK MODELED: E10



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PERPENDICULAR TO FINGERS

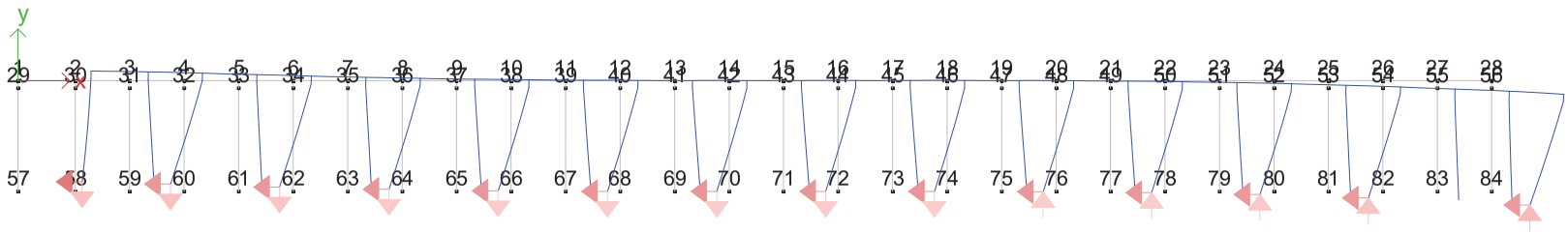


Pile	Load (kips)	Capacity (kips)	Check
1	2.5	8.8	Good
2	1.6		Good
3	1.6		Good
4	1.6		Good
5	1.6		Good
6	1.6		Good
7	1.7		Good
8	1.7		Good
9	1.6		Good
10	1.6		Good
11	1.6		Good
12	1.6		Good
13	1.6		Good
14	1.5		Good
Sum	23.5		

GROUP 4 DOCKS

DOCK MODELED: E10

PERPENDICULAR



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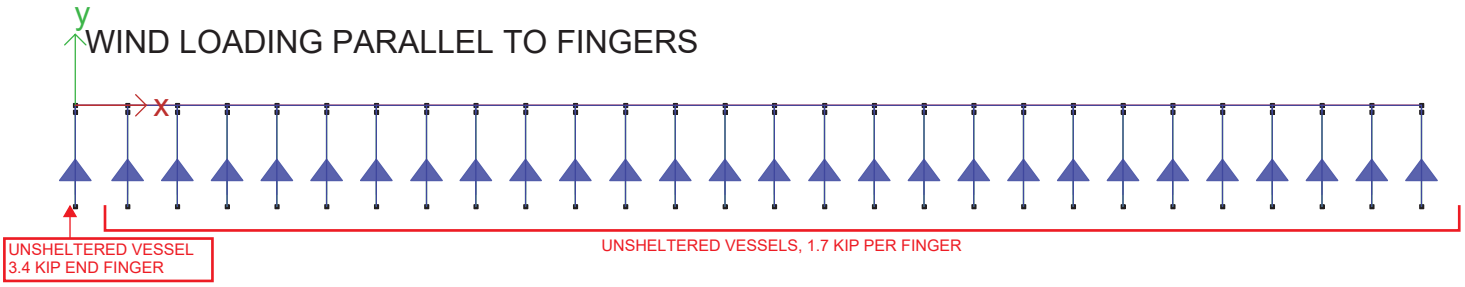
GROUP 4 DOCKS (continued)

DOCK MODELED: E10

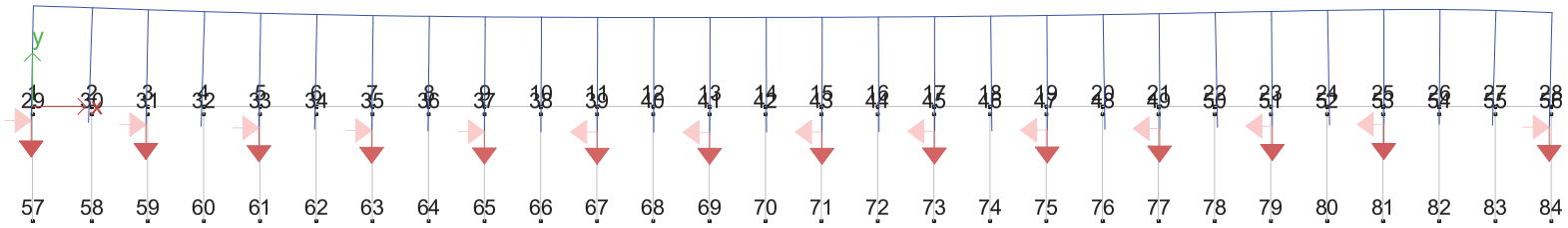


Pile	Load (kips)	Capacity (kips)	Check
1	3.8	8.8	Good
2	3.7		Good
3	3.5		Good
4	3.5		Good
5	3.4		Good
6	3.4		Good
7	3.4		Good
8	3.4		Good
9	3.4		Good
10	3.5		Good
11	3.5		Good
12	3.6		Good
13	3.7		Good
14	3.6		Good
Sum	49.3		

GROUP 4 DOCKS

DOCK MODELED: E10

PARALLEL



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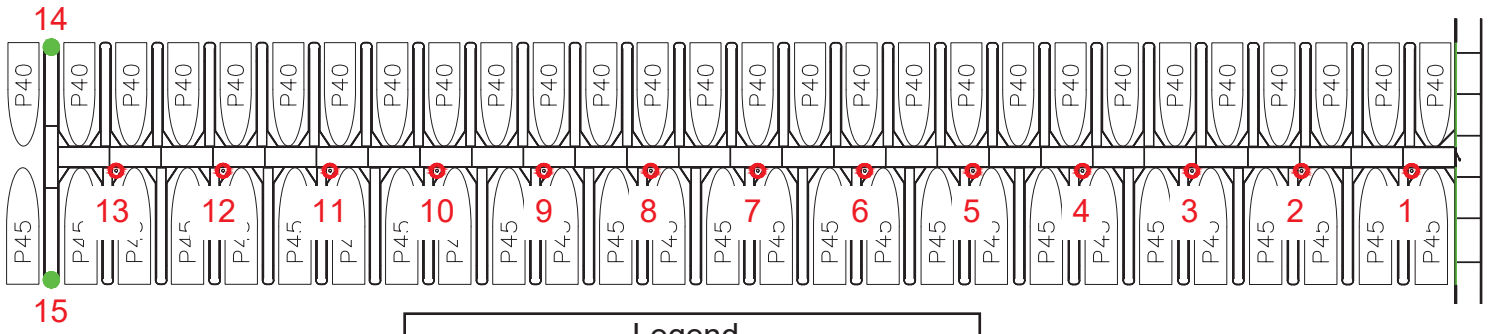
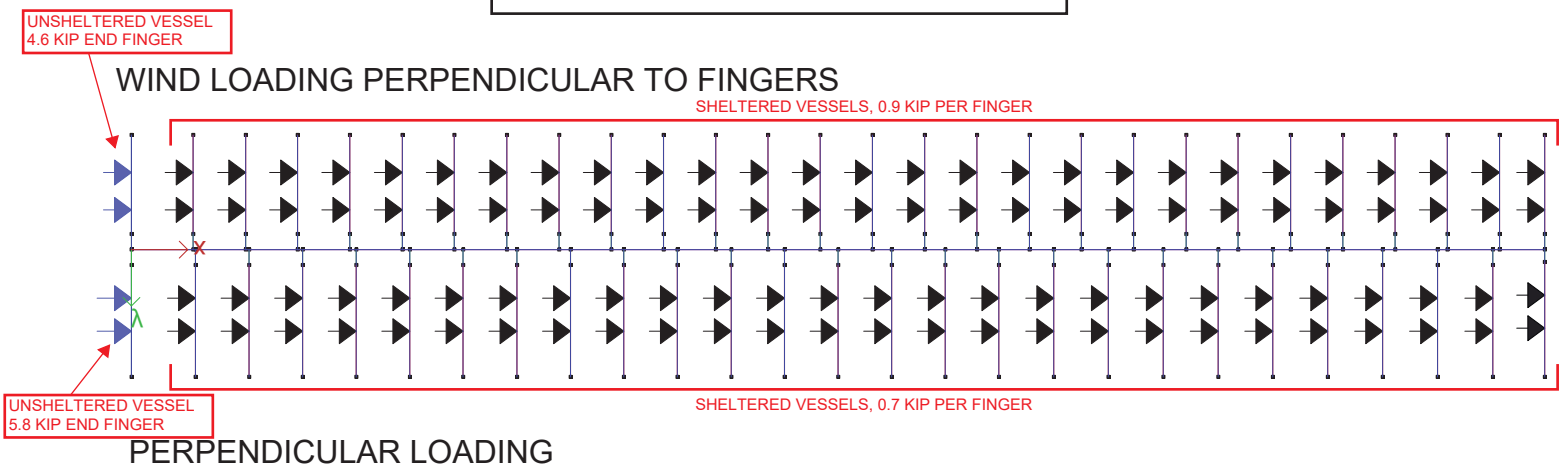
GROUP 5 DOCKS

DOCK MODELED: E11



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PERPENDICULAR TO FINGERS



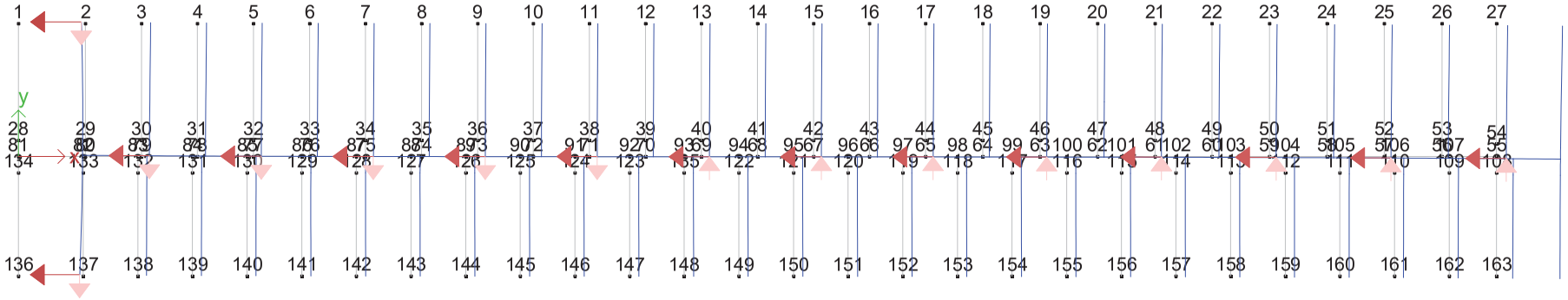
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	3.5	8.8	Good
2	3.5		Good
3	3.5		Good
4	3.5		Good
5	3.5		Good
6	3.5		Good
7	3.5		Good
8	3.5		Good
9	3.5		Good
10	3.5		Good
11	3.5		Good
12	3.5		Good
13	3.5		Good
14	4.4	11.0	Good
15	4.3		Good
Sum	54.3		

GROUP 5 DOCKS

DOCK MODELED: E11

PERPENDICULAR



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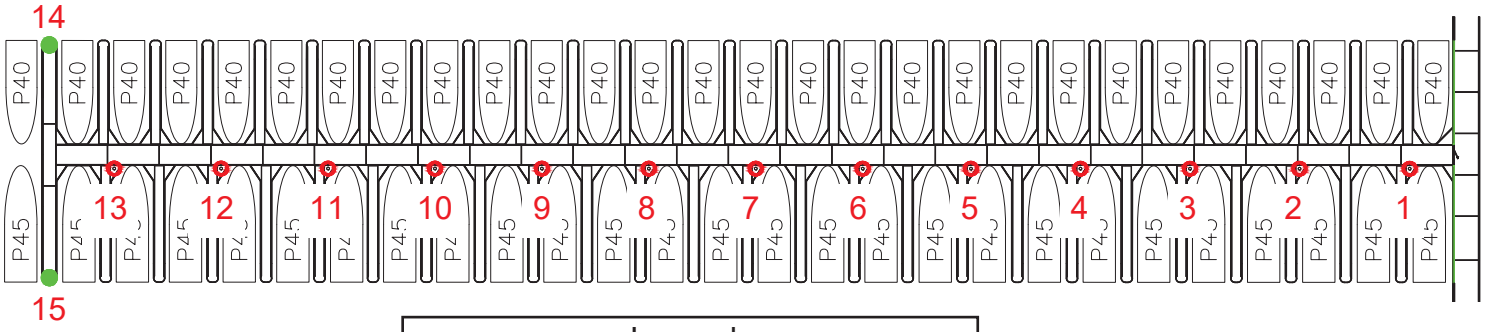
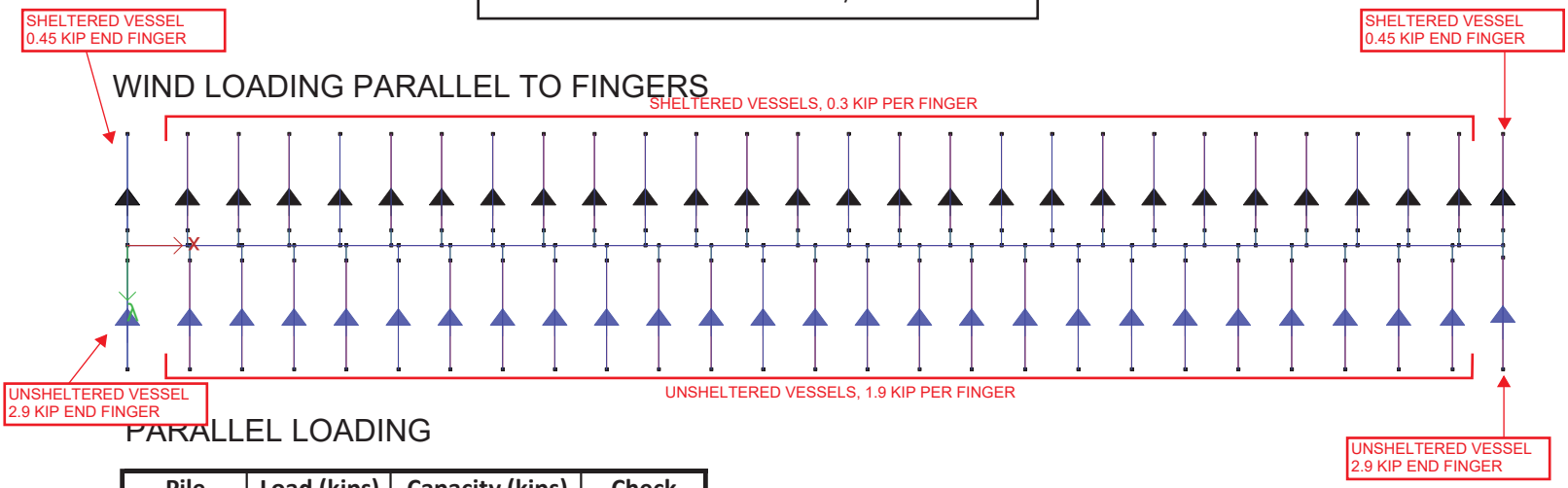
GROUP 5 DOCKS (continued)

DOCK MODELED: E11



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PARALLEL TO FINGERS



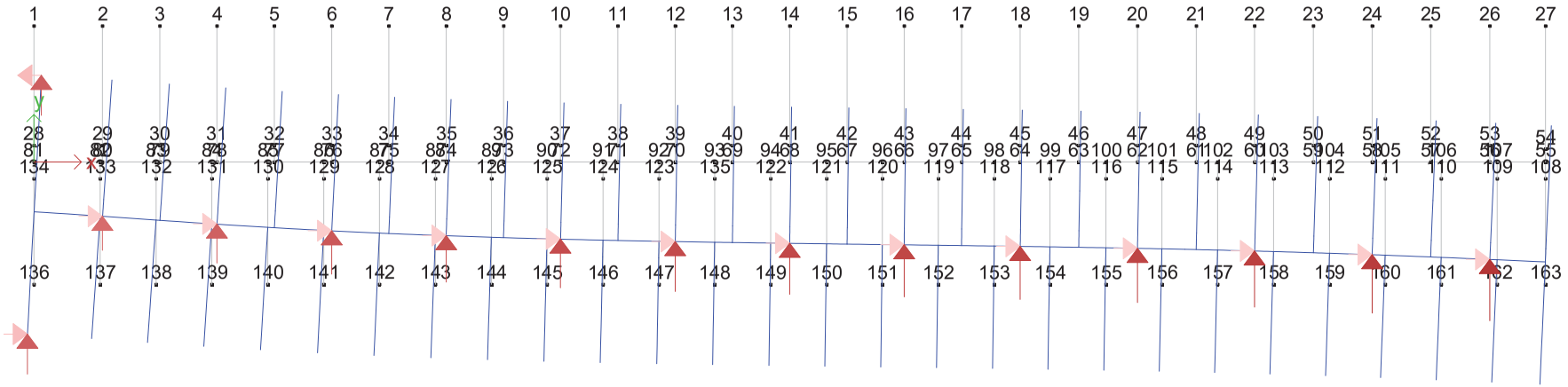
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	5.2	8.8	Good
2	5.0		Good
3	4.8		Good
4	4.6		Good
5	4.5		Good
6	4.4		Good
7	4.4		Good
8	4.3		Good
9	4.1		Good
10	4.0		Bad
11	3.7		Bad
12	3.3		Bad
13	2.9		Bad
14	3.4	11.0	Good
15	3.4		Good
Sum	62		

GROUP 5 DOCKS

DOCK MODELED: E11

PARALLEL



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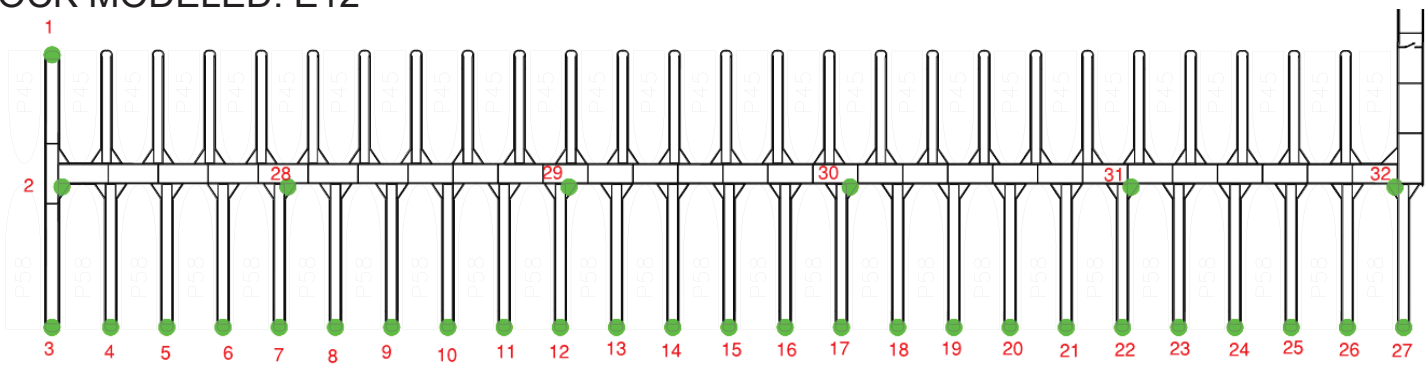
GROUP 6 DOCKS

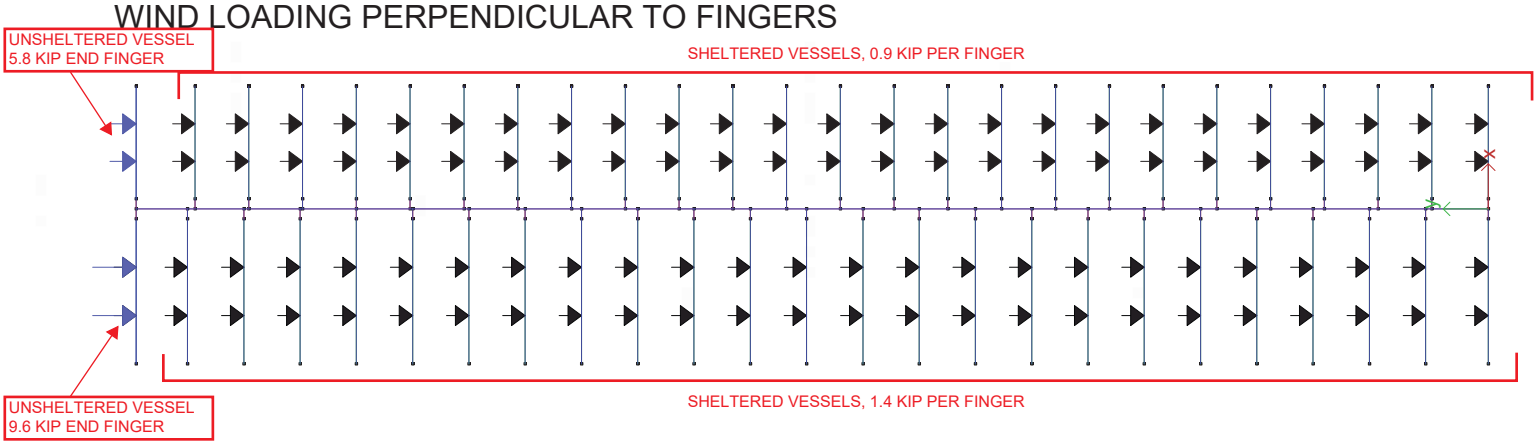
DOCK MODELED: E12



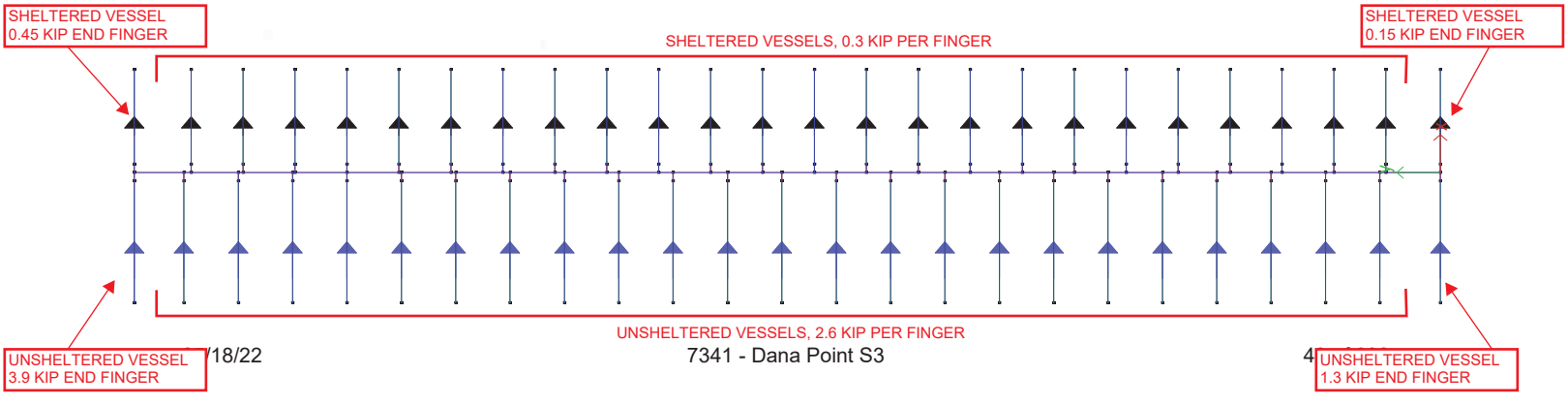
E12

Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PERPENDICULAR TO FINGERS



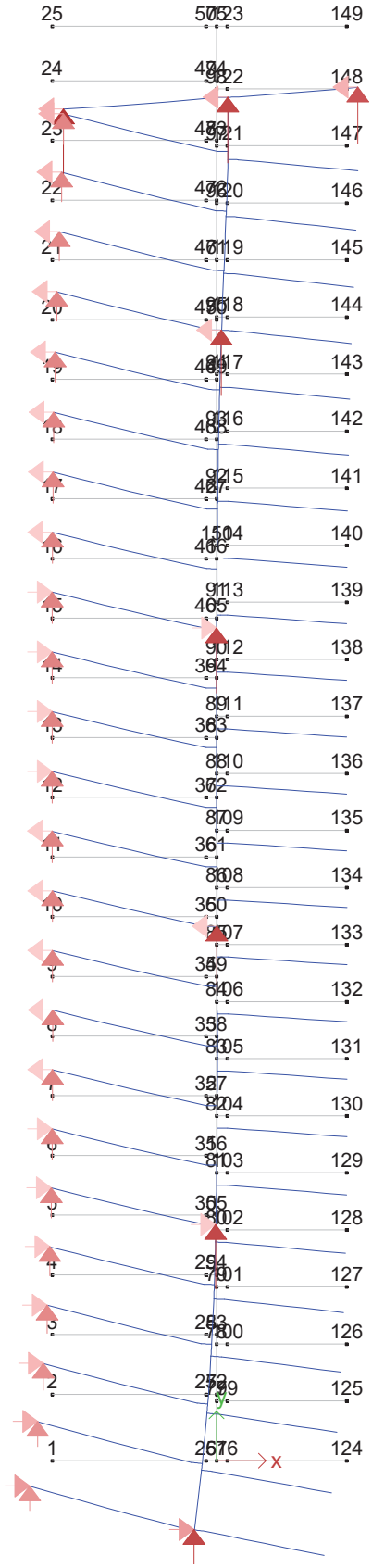
WIND LOADING PARALLEL TO FINGERS



GROUP 6 DOCKS

DOCK MODELED: E12

PERPENDICULAR

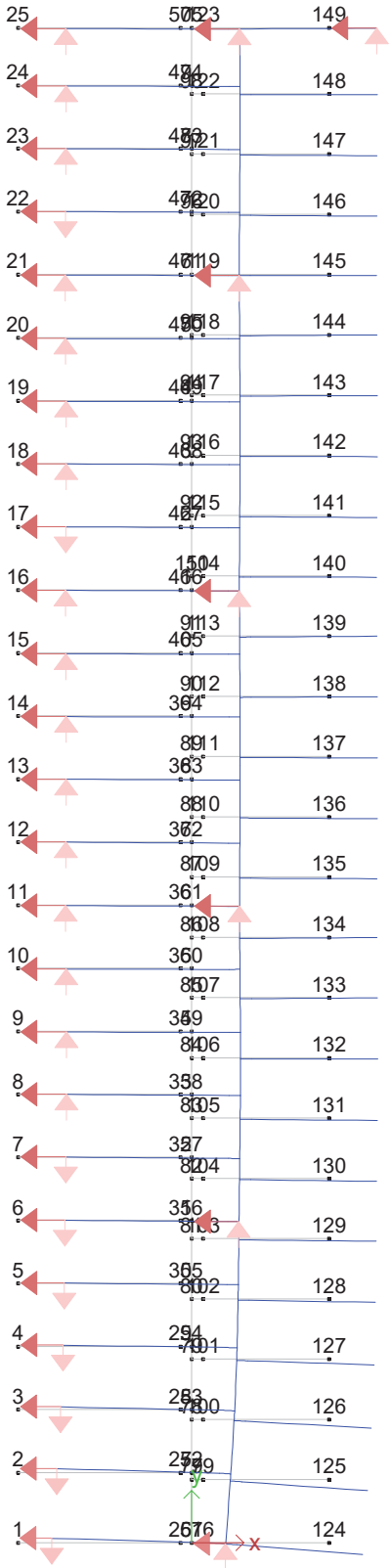


Plot View - Static Case: Perpendicular Defl. (in)

GROUP 6 DOCKS

DOCK MODELED: E12

PARALLEL



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GROUP 6 DOCKS (continued)

DOCK MODELED: E12

PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	4.9	11.0	Good
2	1.8		Good
3	1.7		Good
4	1.7		Good
5	1.7		Good
6	1.8		Good
7	1.8		Good
8	1.8		Good
9	1.8		Good
10	1.8		Good
11	1.8		Good
12	1.8		Good
13	1.8		Good
14	1.8		Good
15	1.8		Good
16	1.8		Good
17	1.8		Good
18	1.8		Good
19	1.8		Good
20	1.8		Good
21	1.7		Good
22	1.6		Good
23	1.6		Good
24	1.5		Good
25	1.4		Good
26	3.9		Good
27	3.2		Good
28	3.8		Good
29	3.8		Good
30	3.8		Good
31	3.8		Good
32	3.8		Good
Sum	72.9		

PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	1.6	11.0	Good
2	1.8		Good
3	2.0		Good
4	2.2		Good
5	2.3		Good
6	2.4		Good
7	2.4		Good
8	2.4		Good
9	2.4		Good
10	2.4		Good
11	2.4		Good
12	2.5		Good
13	2.5		Good
14	2.4		Good
15	2.4		Good
16	2.4		Good
17	2.5		Good
18	2.5		Good
19	2.4		Good
20	2.4		Good
21	2.4		Good
22	2.4		Good
23	2.3		Good
24	2.2		Good
25	2.1		Good
26	1.6		Good
27	1.6		Good
28	2.3		Good
29	2.4		Good
30	2.4		Good
31	2.4		Good
32	2.1		Good
Sum	72.8		

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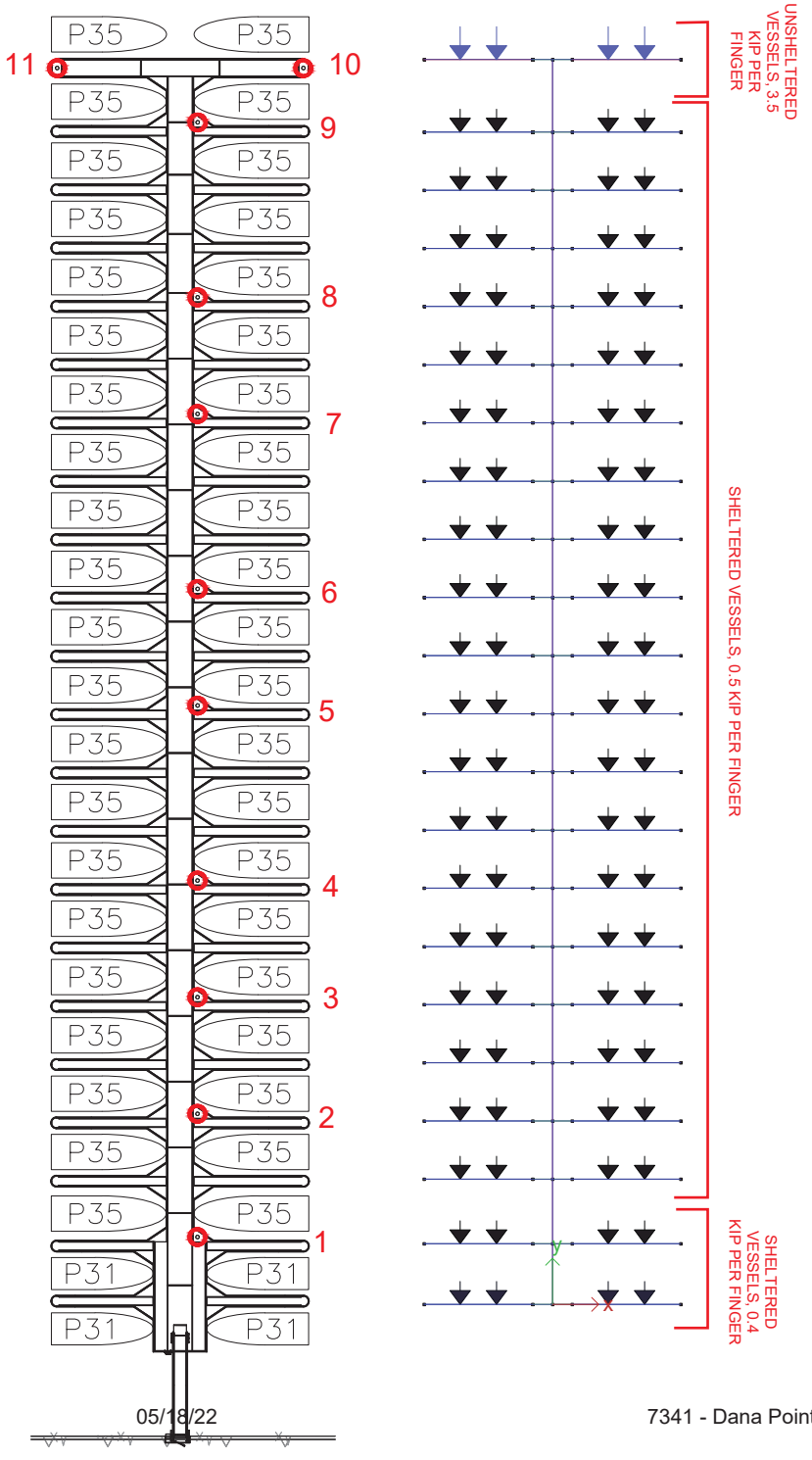
GROUP 7 DOCKS

DOCK MODELED: E13

WIND LOADING PERPENDICULAR TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

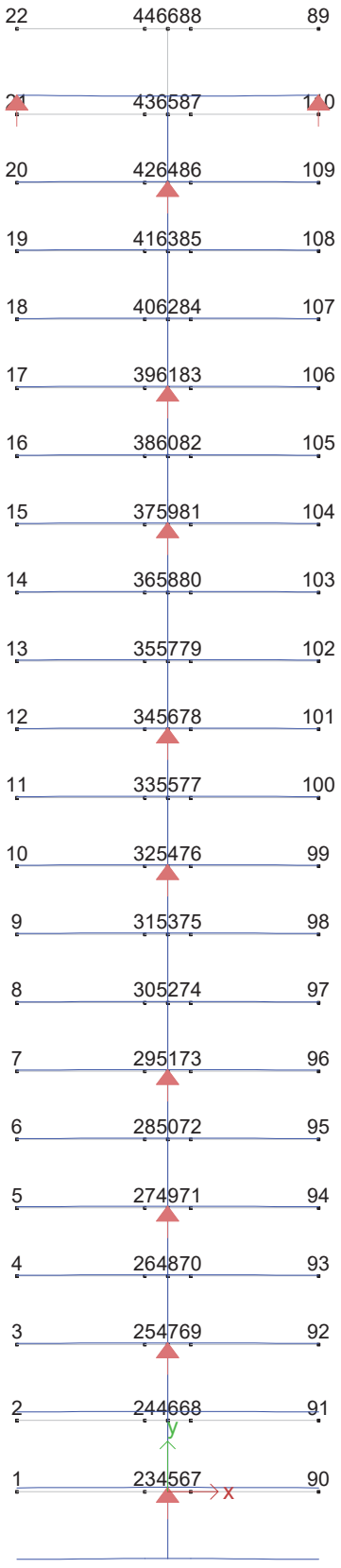
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	3.7	8.8	Good
2	3.7		Good
3	3.6		Good
4	3.6		Good
5	3.6		Good
6	3.5		Good
7	3.4		Good
8	3.1		Good
9	2.7		Good
10	2.6		Good
11	2.6		Good
Sum	36.2		

GROUP 7 DOCKS

DOCK MODELED: E13

PERPENDICULAR



Plot View - Static Case: Perpendicular Defl. (in)

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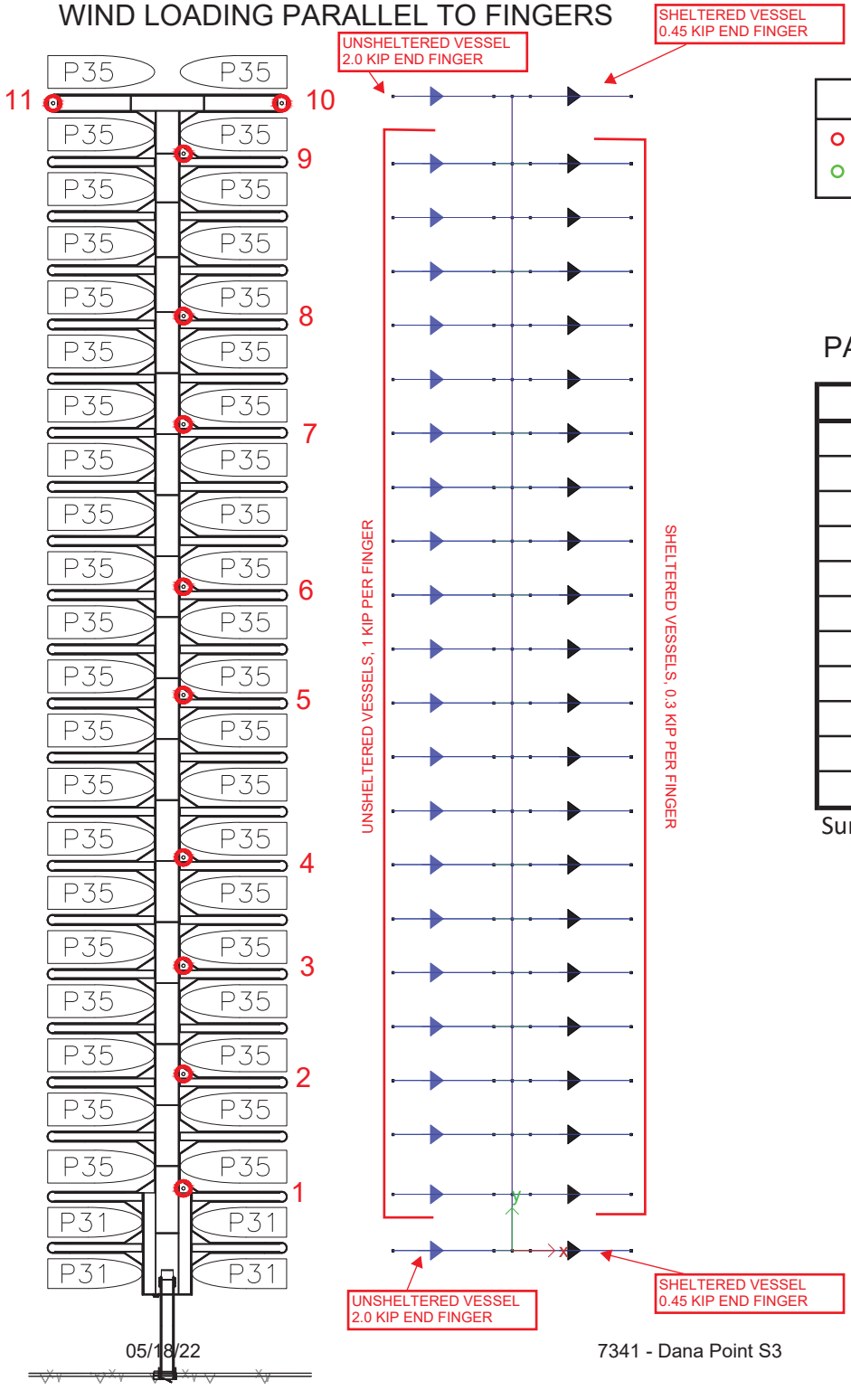
GROUP 7 DOCKS (continued)

DOCK MODELED: E13

WIND LOADING PARALLEL TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

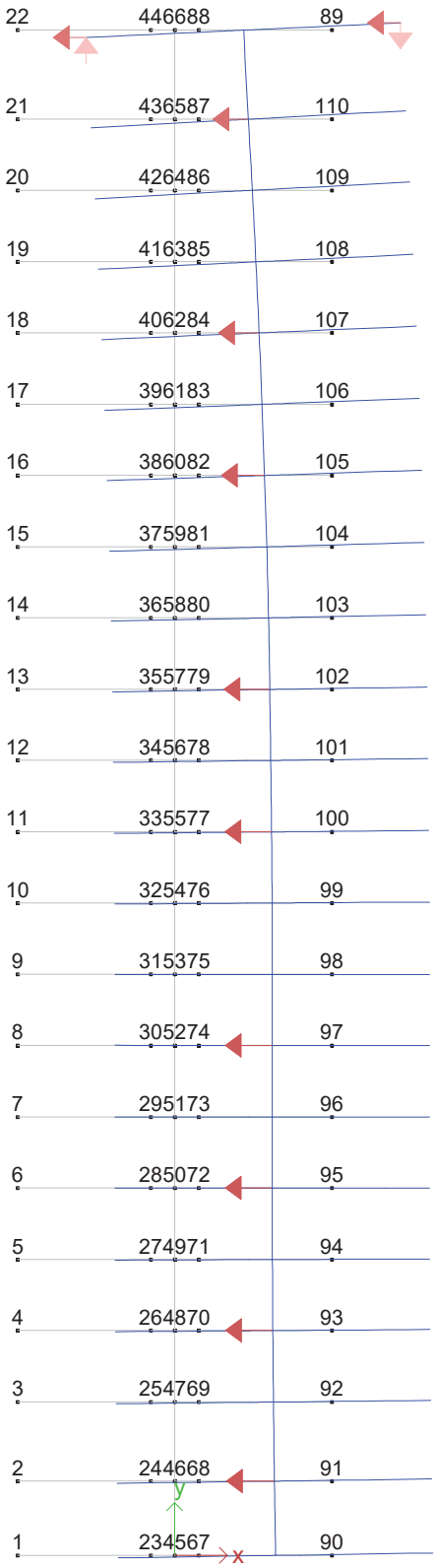
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.6	8.8	Good
2	2.6		Good
3	2.6		Good
4	2.6		Good
5	2.6		Good
6	2.6		Good
7	2.6		Good
8	2.6		Good
9	2.6		Good
10	2.6		Good
11	2.6		Good
Sum	28.6		

GROUP 7 DOCKS

DOCK MODELED: E13

PARALLEL



Plot View - Static Case: Parallel Defl. (in)

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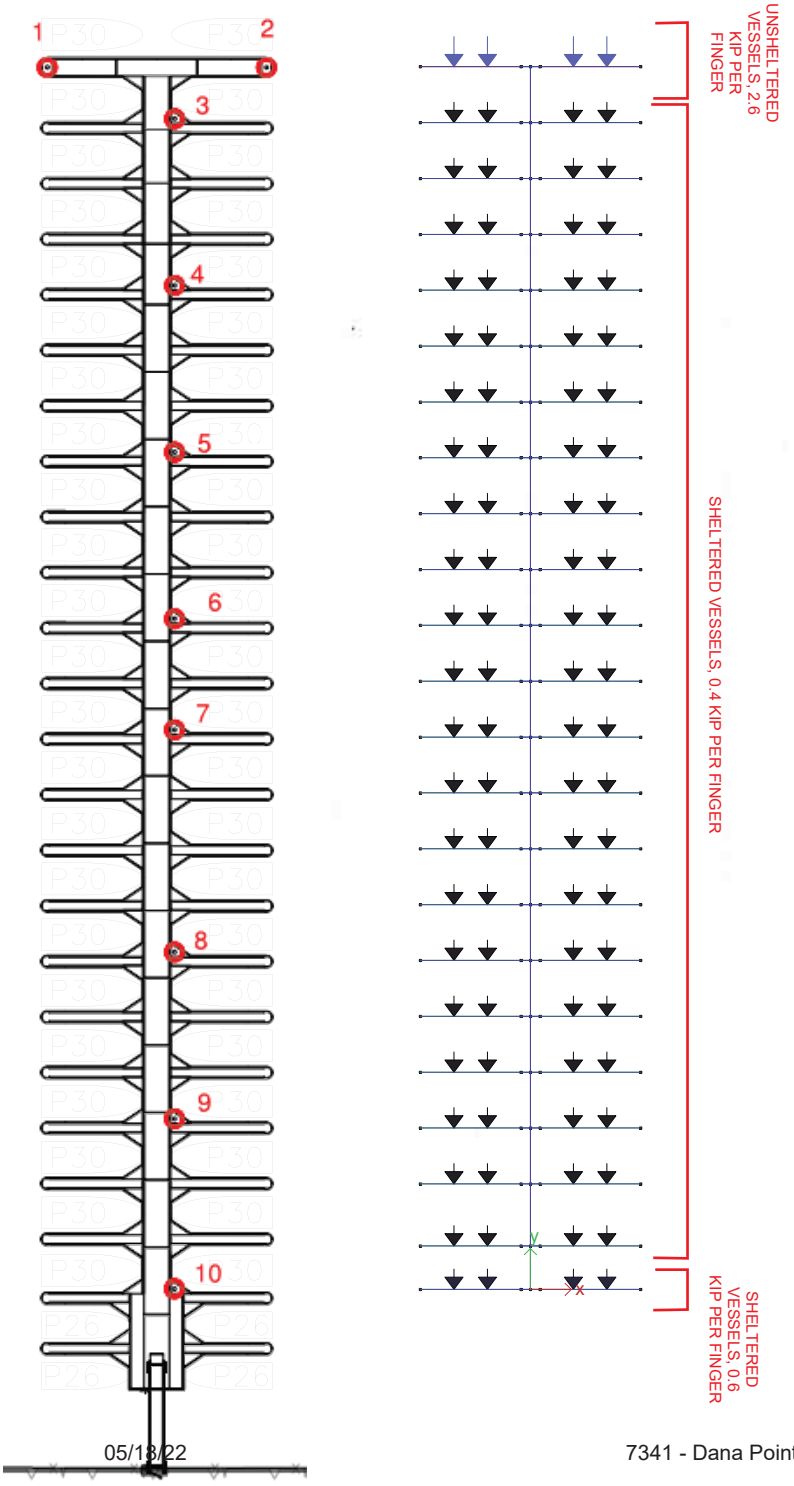
GROUP 8 DOCKS

DOCK MODELED: E16

WIND LOADING PERPENDICULAR TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

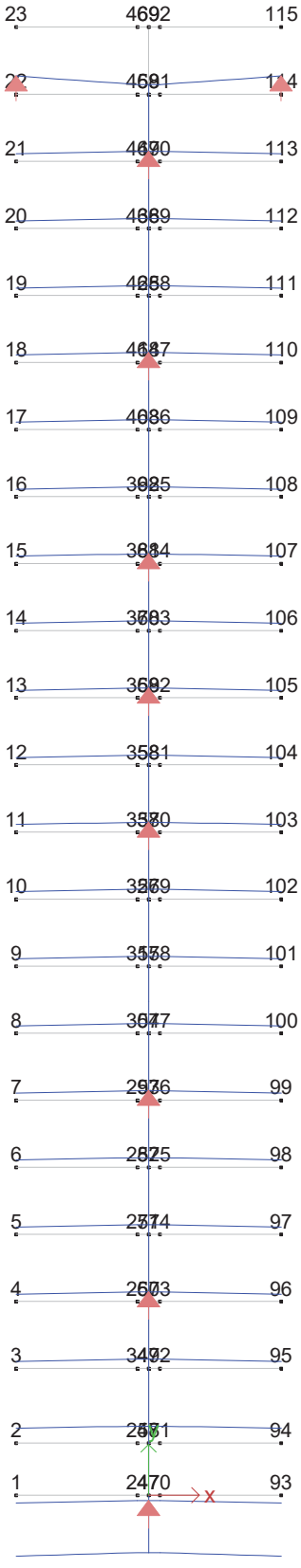
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.0	8.8	Good
2	2.0		Good
3	2.4		Good
4	2.4		Good
5	2.4		Good
6	2.4		Good
7	2.4		Good
8	2.4		Good
9	2.4		Good
10	2.4		Good
Sum	23.2		

GROUP 8 DOCKS

DOCK MODELED: E16

PERPENDICULAR



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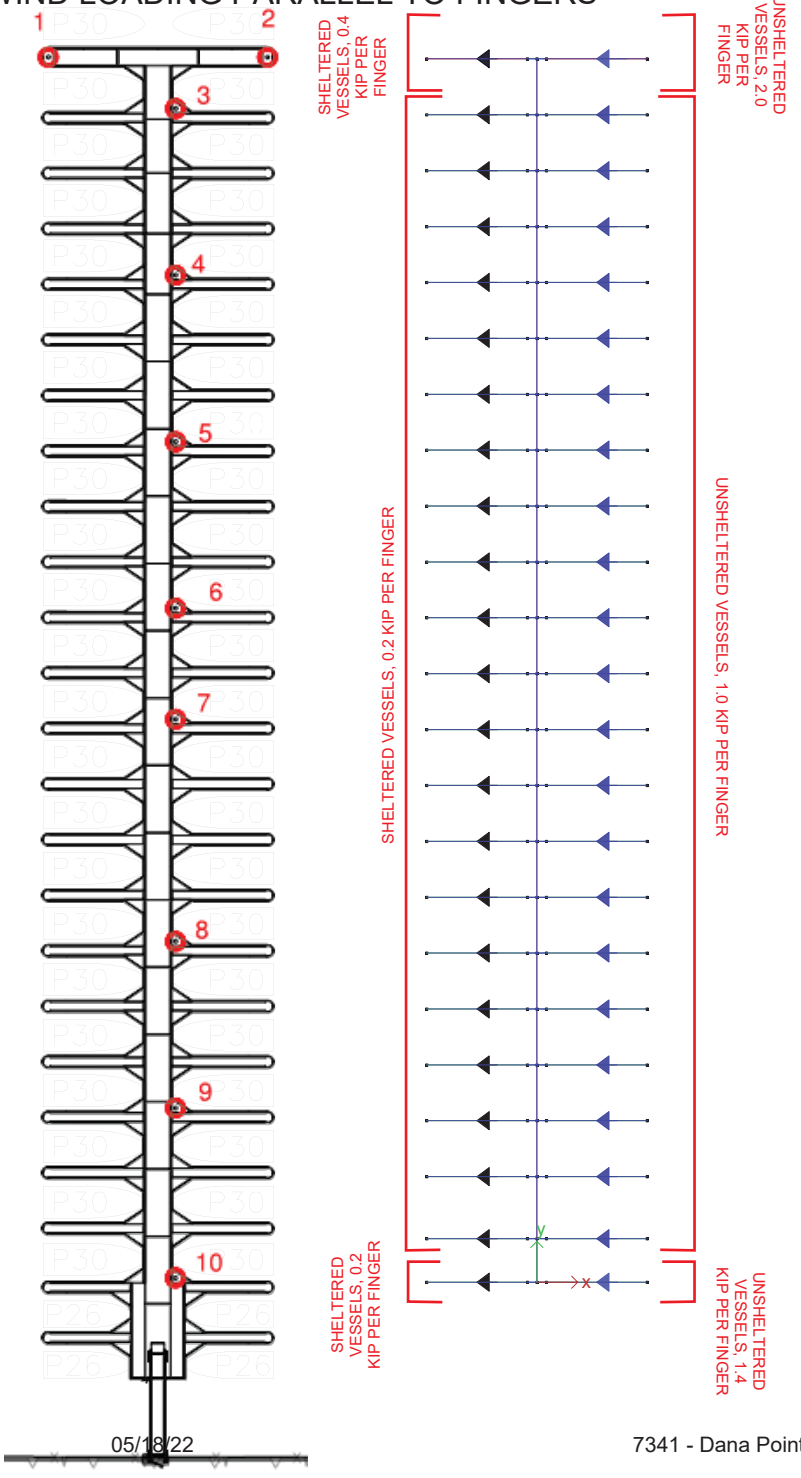
GROUP 8 DOCKS (continued)

DOCK MODELED: E16

WIND LOADING PARALLEL TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

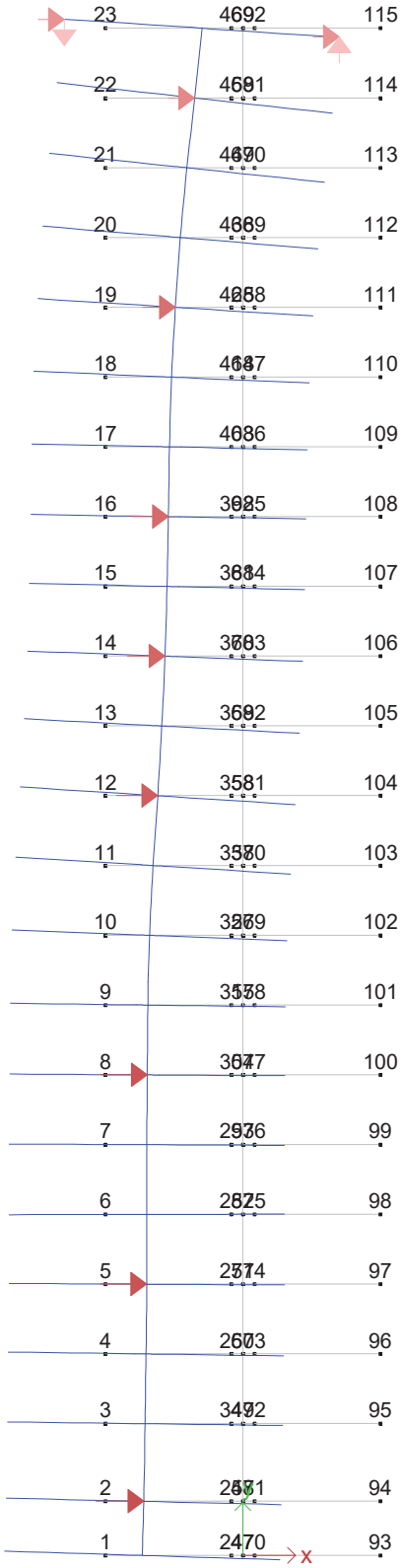
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.0	8.8	Good
2	2.0		Good
3	2.4		Good
4	2.4		Good
5	2.4		Good
6	2.4		Good
7	2.4		Good
8	2.4		Good
9	2.4		Good
10	2.4		Good
Sum	23.2		

GROUP 8 DOCKS

DOCK MODELED: E16

PARALLEL



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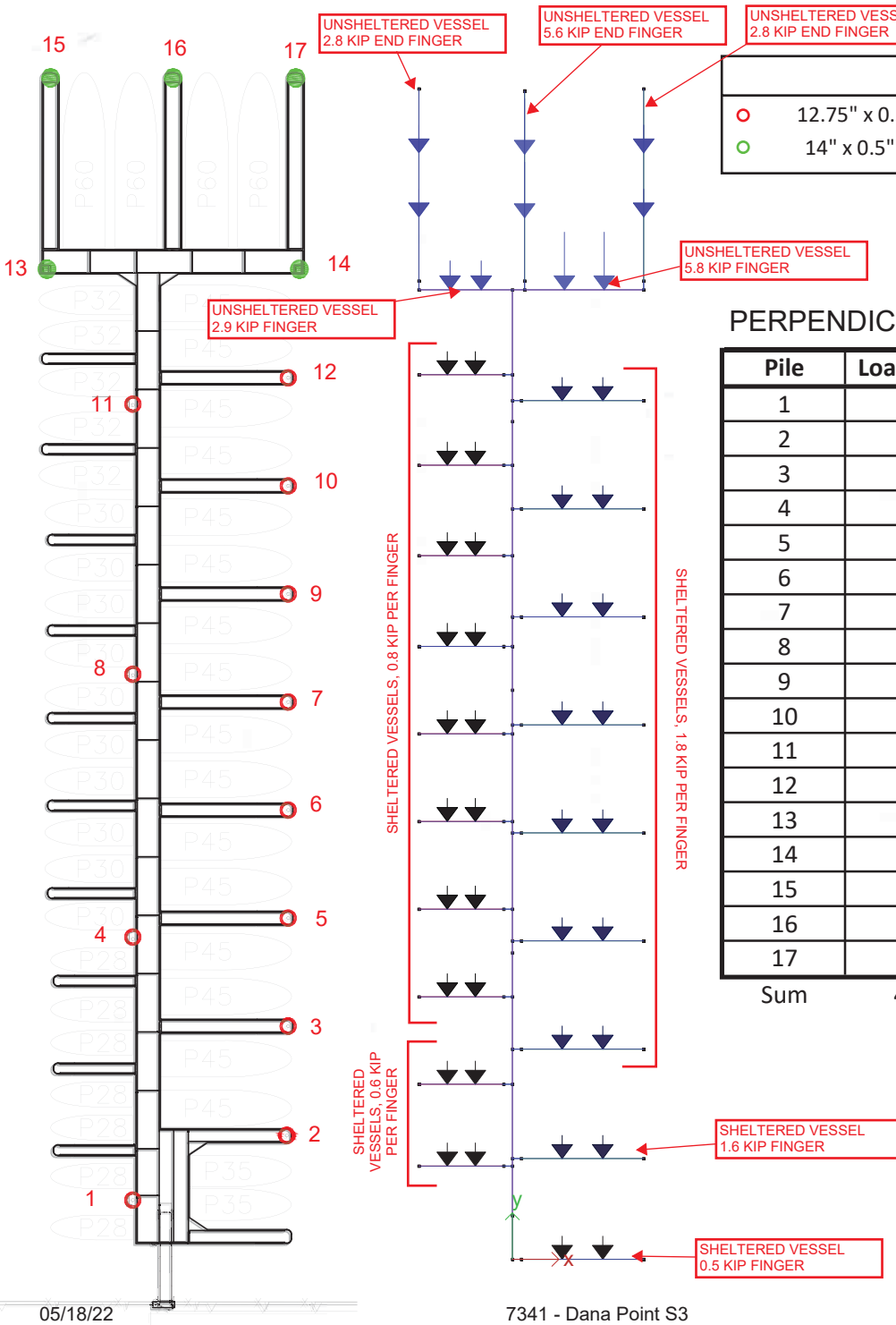
GROUP 9 DOCKS

DOCK MODELED: BD1

WIND LOADING PERPENDICULAR TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

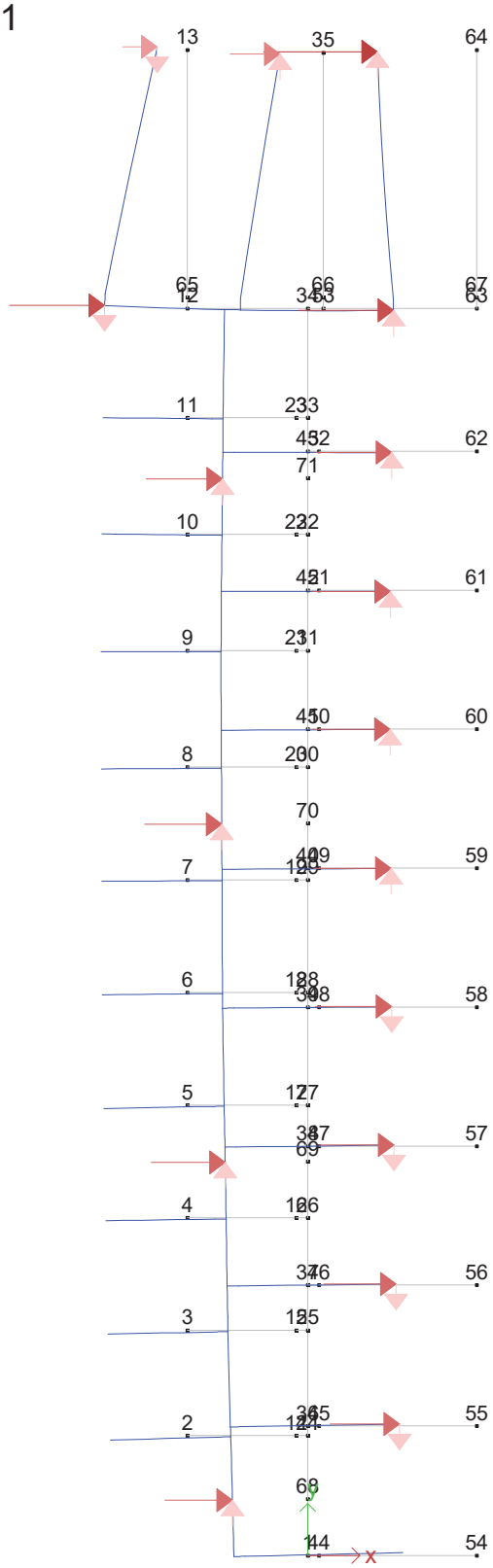
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.7	8.8	Good
2	1.7		Good
3	1.7		Good
4	2.7		Good
5	1.8		Good
6	1.8		Good
7	1.8		Good
8	2.7		Good
9	1.8		Good
10	1.8		Good
11	2.7		Good
12	1.9		Good
13	3.2	11.0	Good
14	3.5		Good
15	3.2		Good
16	3.5		Good
17	3.5		Good
Sum	42.2		

GROUP 9 DOCKS

DOCK MODELED: BD1

PERPENDICULAR



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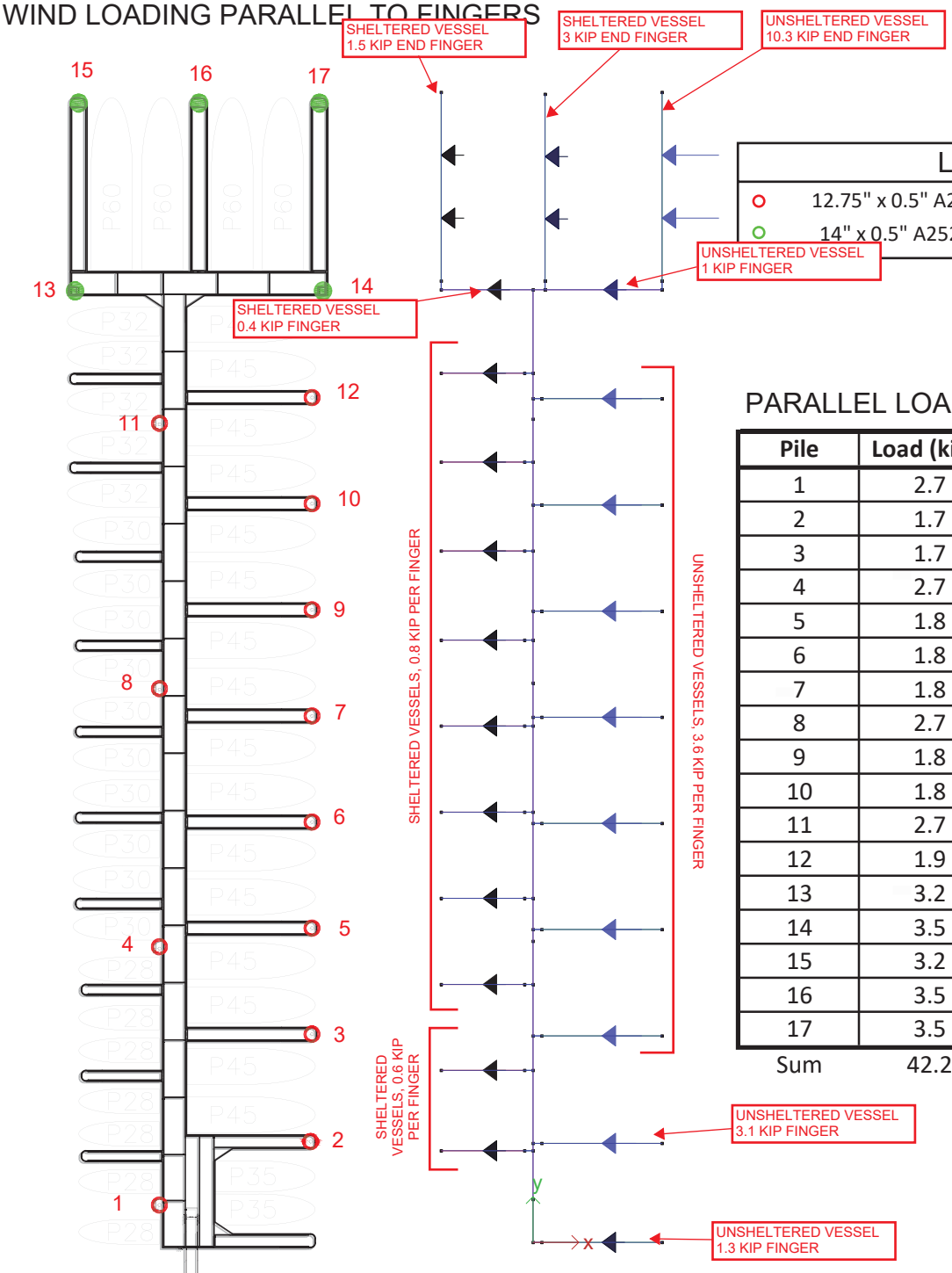
GROUP 9 DOCKS (continued)

DOCK MODELED: BD1

WIND LOADING PARALLEL TO FINGERS



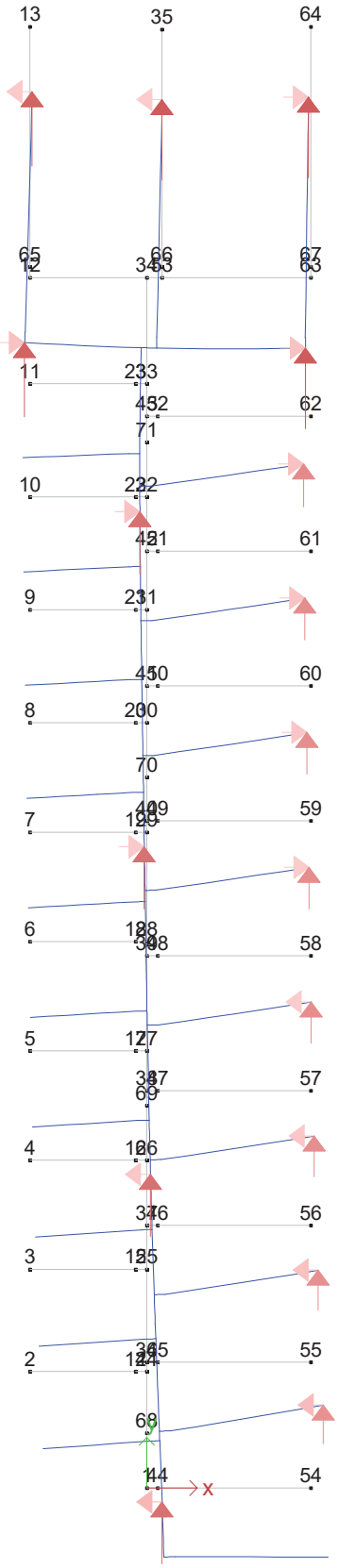
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.7	8.8	Good
2	1.7		Good
3	1.7		Good
4	2.7		Good
5	1.8		Good
6	1.8		Good
7	1.8		Good
8	2.7		Good
9	1.8		Good
10	1.8		Good
11	2.7		Good
12	1.9		Good
13	3.2	11.0	Good
14	3.5		Good
15	3.2		Good
16	3.5		Good
17	3.5		Good
Sum	42.2		

GROUP 9 DOCKS

DOCK MODELED: BD1

PARALLEL



Plot View - Static Case: Perpendicular Defl. (in)

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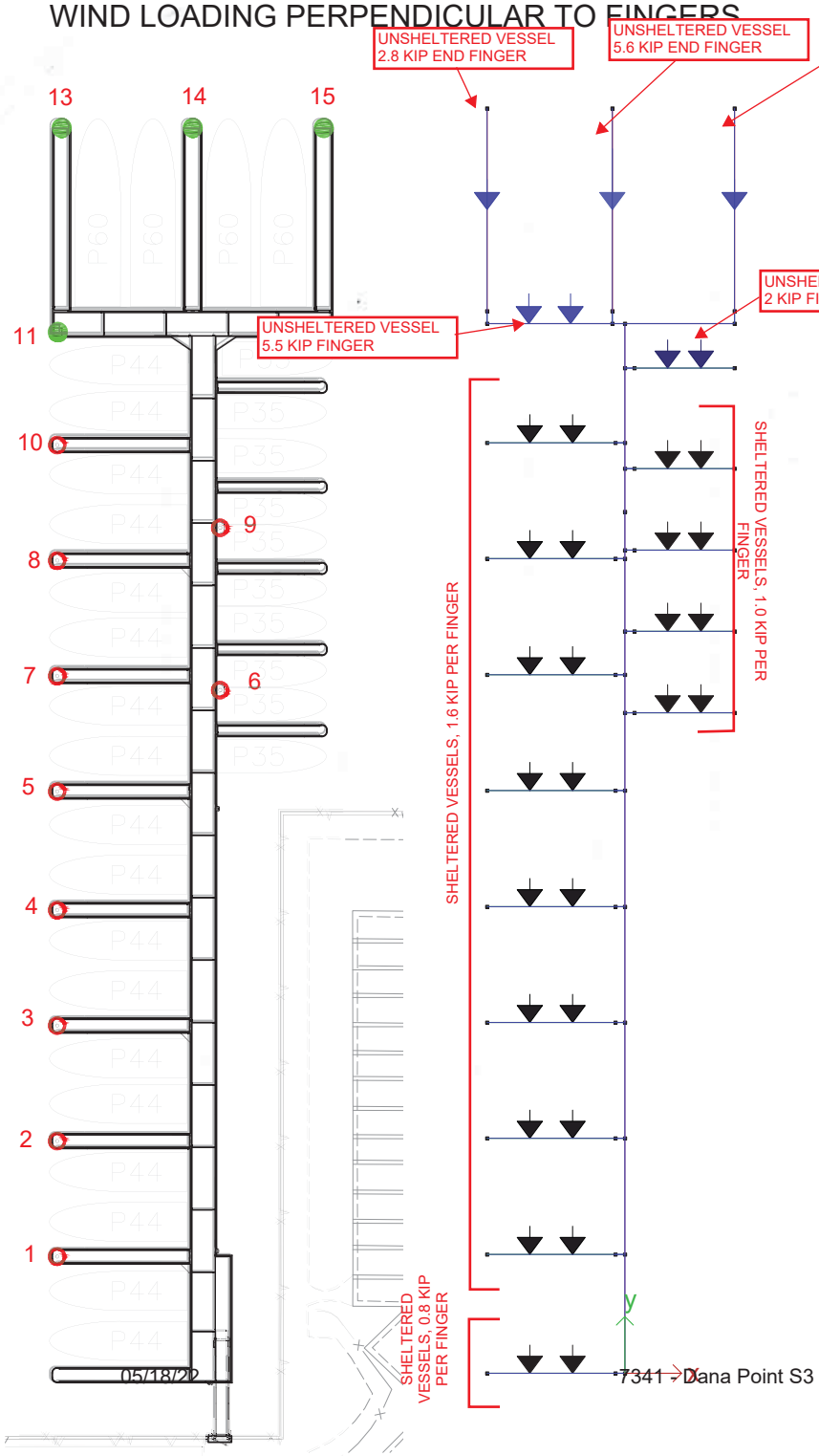
GROUP 10 DOCKS

DOCK MODELED: BFD1

WIND LOADING PERPENDICULAR TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

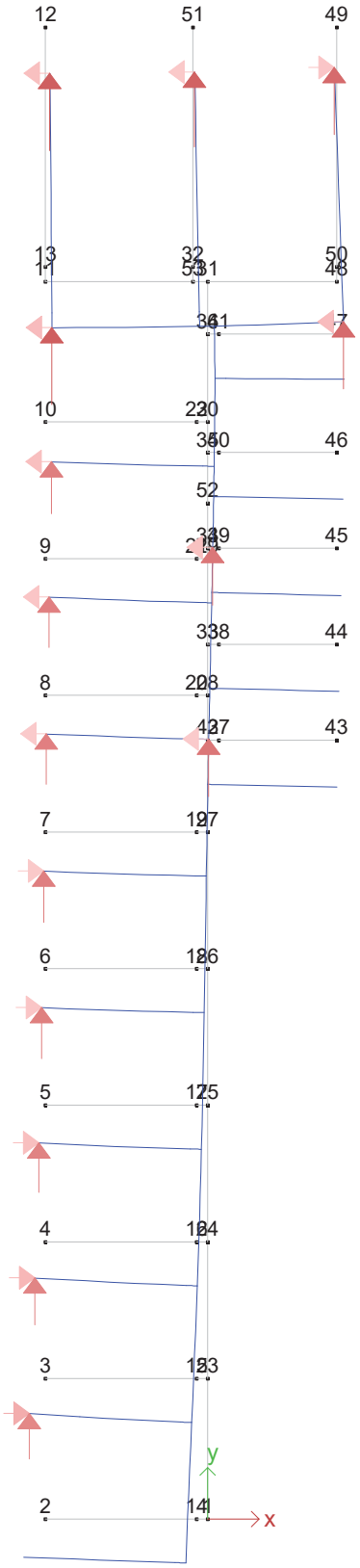
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.0	8.8	Good
2	2.1		Good
3	2.2		Good
4	2.2		Good
5	2.2		Good
6	2.2		Good
7	2.5		Good
8	2.2		Good
9	2.5		Good
10	2.3		Good
11	3.4	11.0	Good
12	3.9		Good
13	3.4		Good
14	3.3		Good
15	2.9		Good
Sum	39.3		

GROUP 10 DOCKS

DOCK MODELED: BFD1

PERPENDICULAR



Plot View - Static Case: Perpendicular Defl. (in)

Bellingham MARINE
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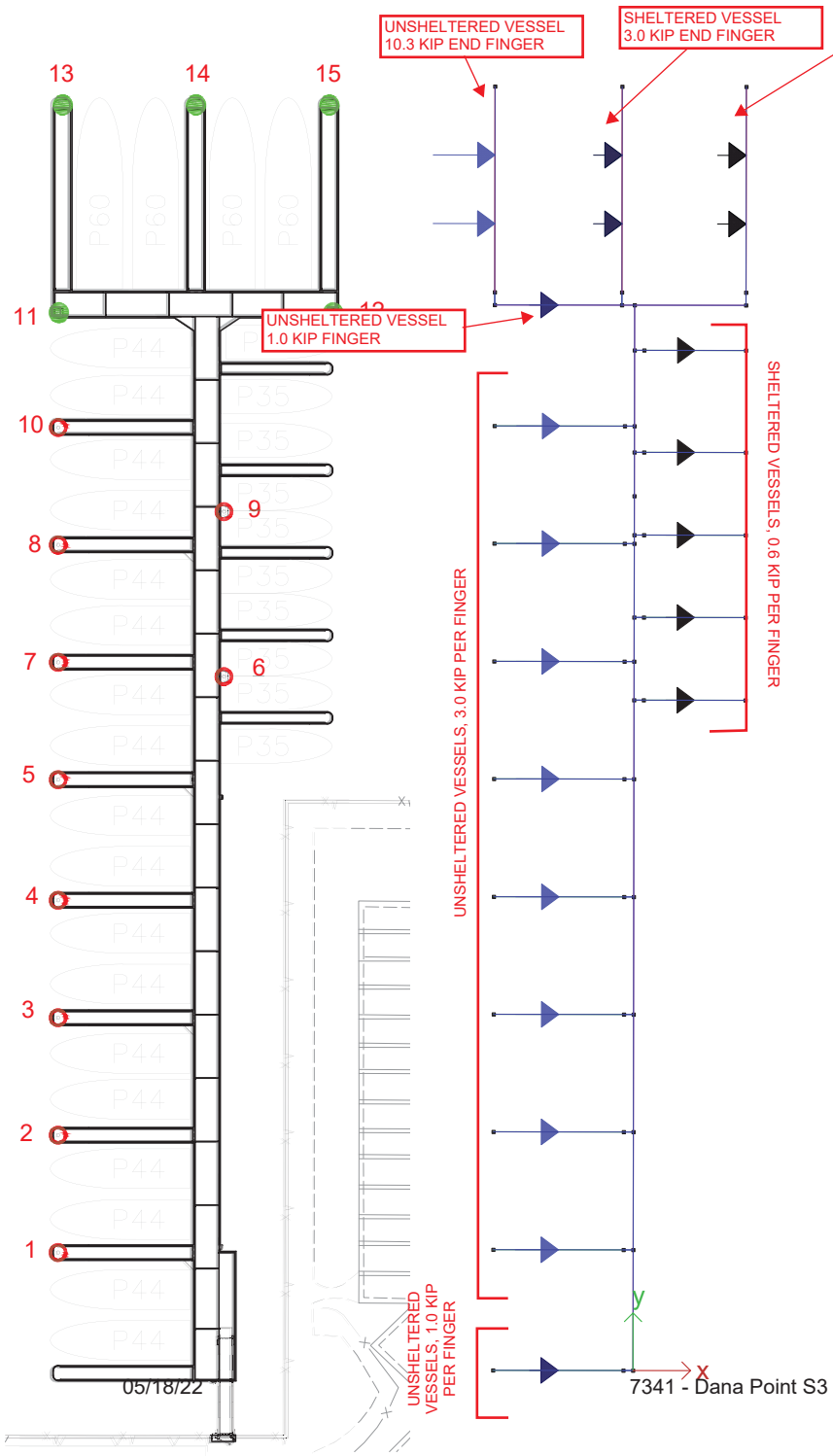
GROUP 10 DOCKS (continued)

DOCK MODELED: BFD1

WIND LOADING PARALLEL TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

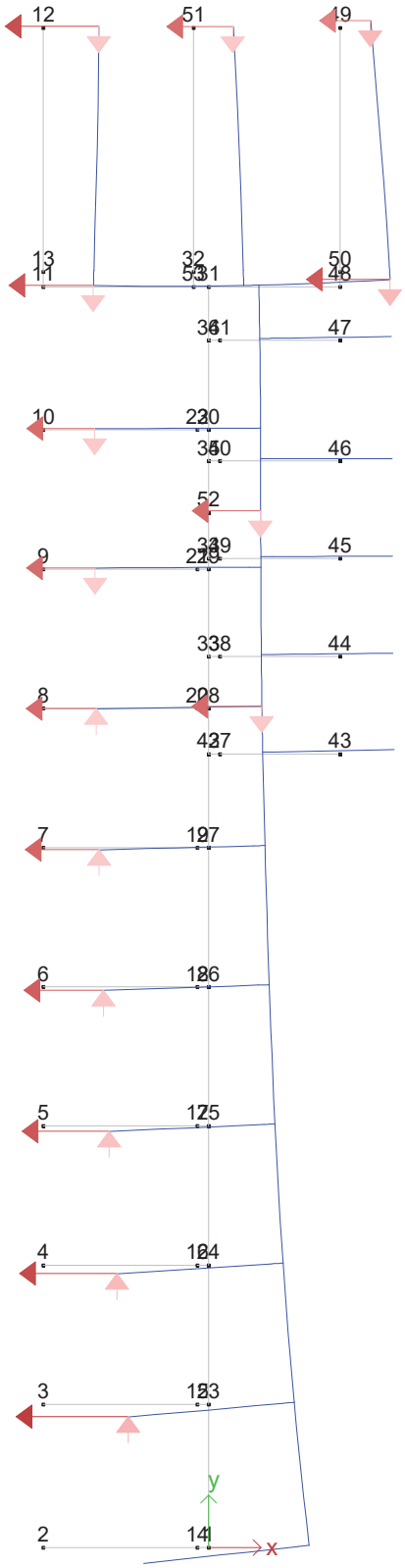
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.0	8.8	Good
2	2.1		Good
3	2.2		Good
4	2.2		Good
5	2.2		Good
6	2.2		Good
7	2.5		Good
8	2.2		Good
9	2.5		Good
10	2.3		Good
11	3.4	11.0	Good
12	3.9		Good
13	3.4		Good
14	3.3		Good
15	2.9		Good
Sum	39.3		

GROUP 10 DOCKS

DOCK MODELED: BFD1

PARALLEL



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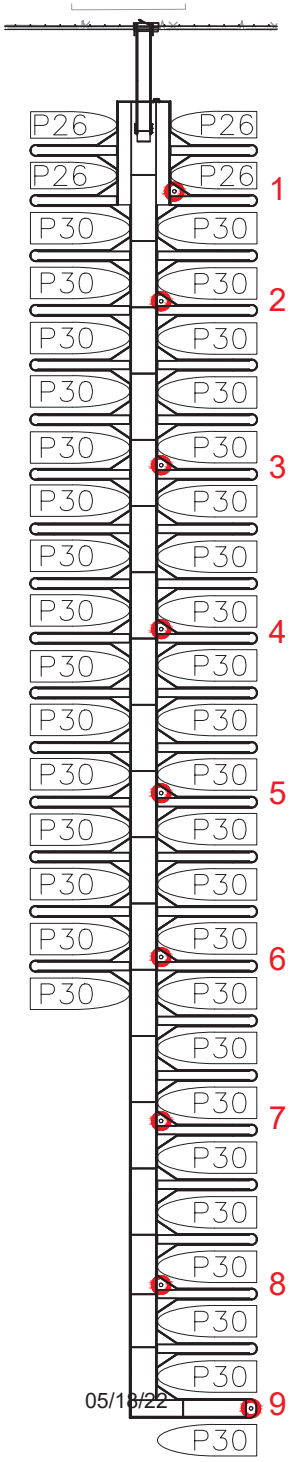
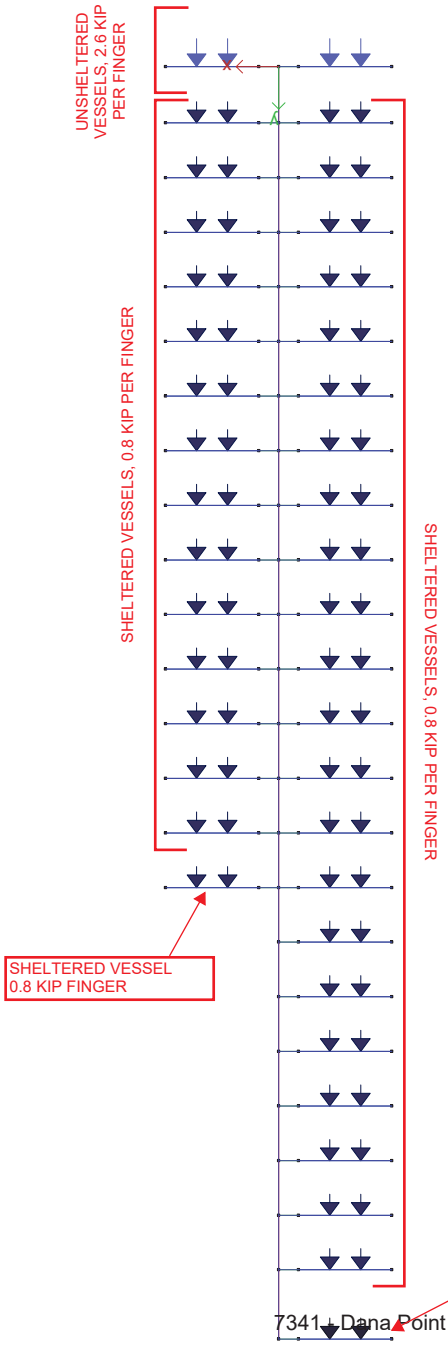
GROUP 11 DOCKS

DOCK MODELED: W1

WIND LOADING PERPENDICULAR TO FINGERS





Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

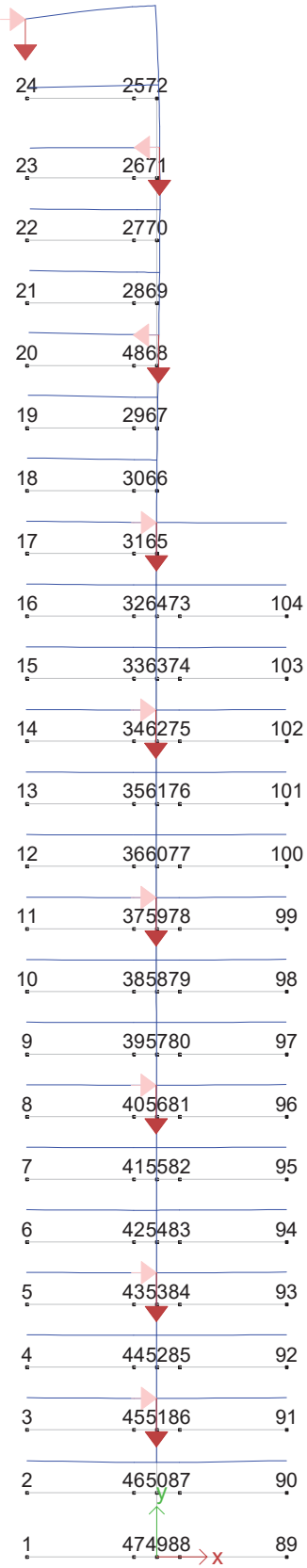
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	4.0	8.8	Good
2	4.0		Good
3	4.0		Good
4	4.0		Good
5	4.0		Good
6	4.0		Good
7	4.0		Good
8	4.0		Good
9	3.4		Good
Sum	35.4		

GROUP 11 DOCKS

DOCK MODELED: W1

PERPENDICULAR



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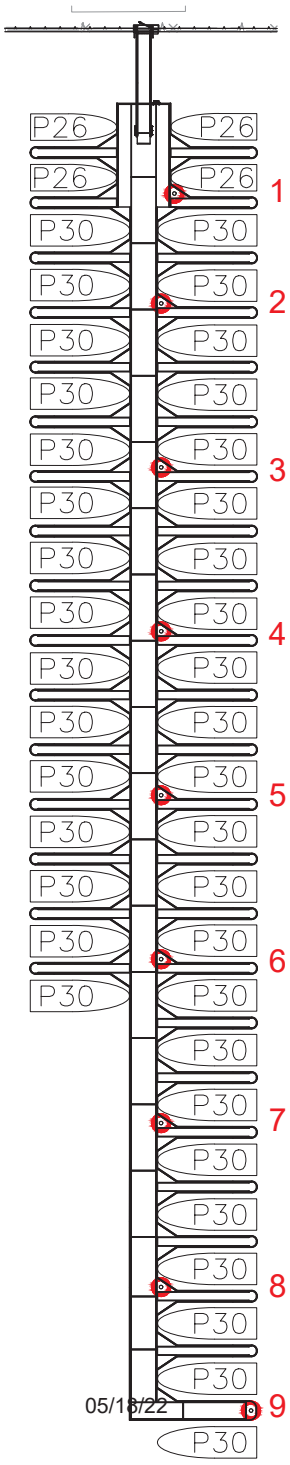
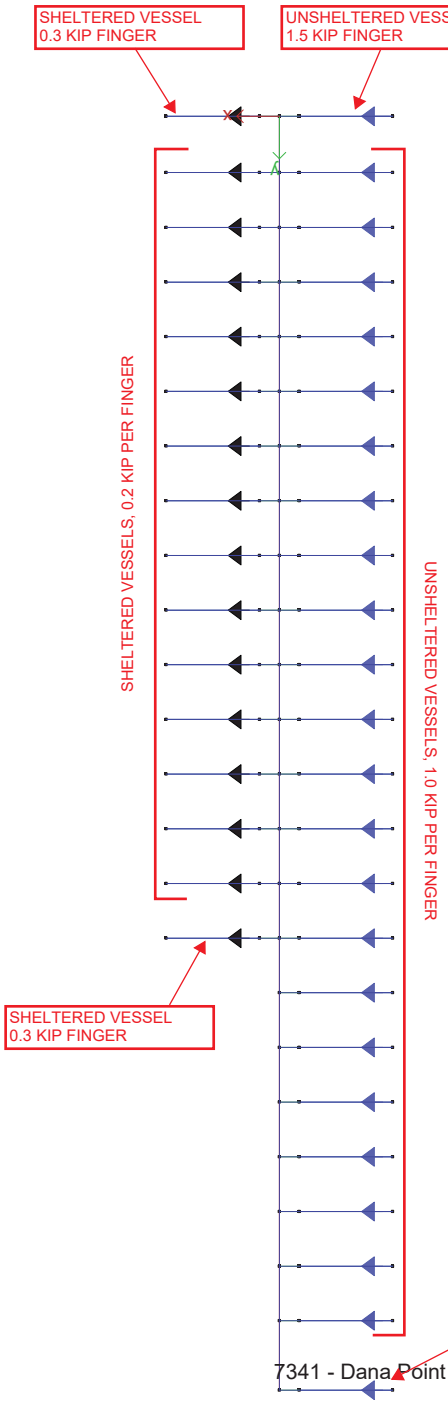
GROUP 11 DOCKS (continued)

DOCK MODELED: W1

WIND LOADING PARALLEL TO FINGERS





Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

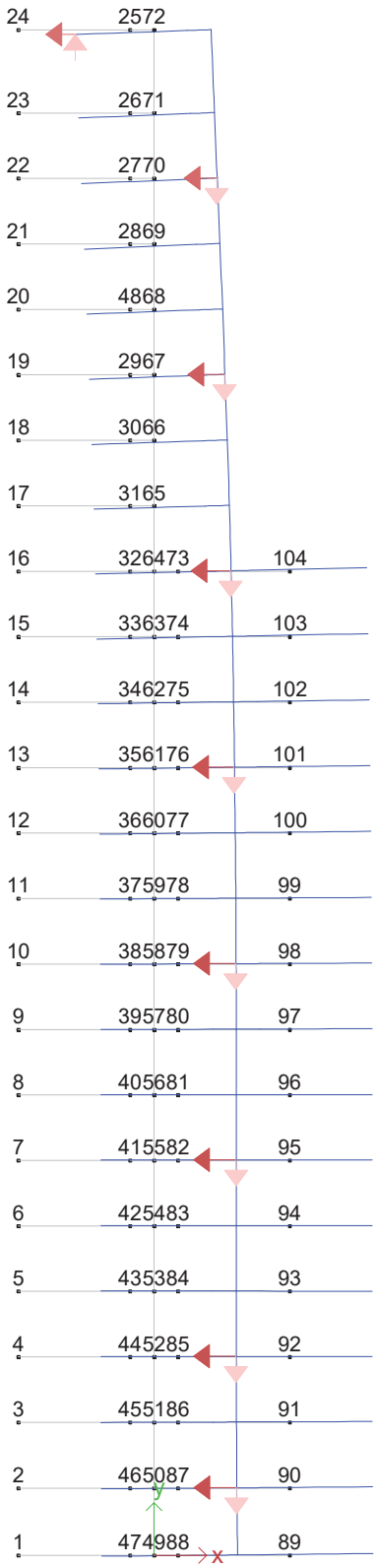
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	3.4	8.8	Good
2	3.4		Good
3	3.4		Good
4	3.3		Good
5	3.3		Good
6	3.1		Good
7	2.9		Good
8	2.6		Good
9	2.3		Good
Sum	27.6		

GROUP 11 DOCKS

DOCK MODELED: W1

PARALLEL



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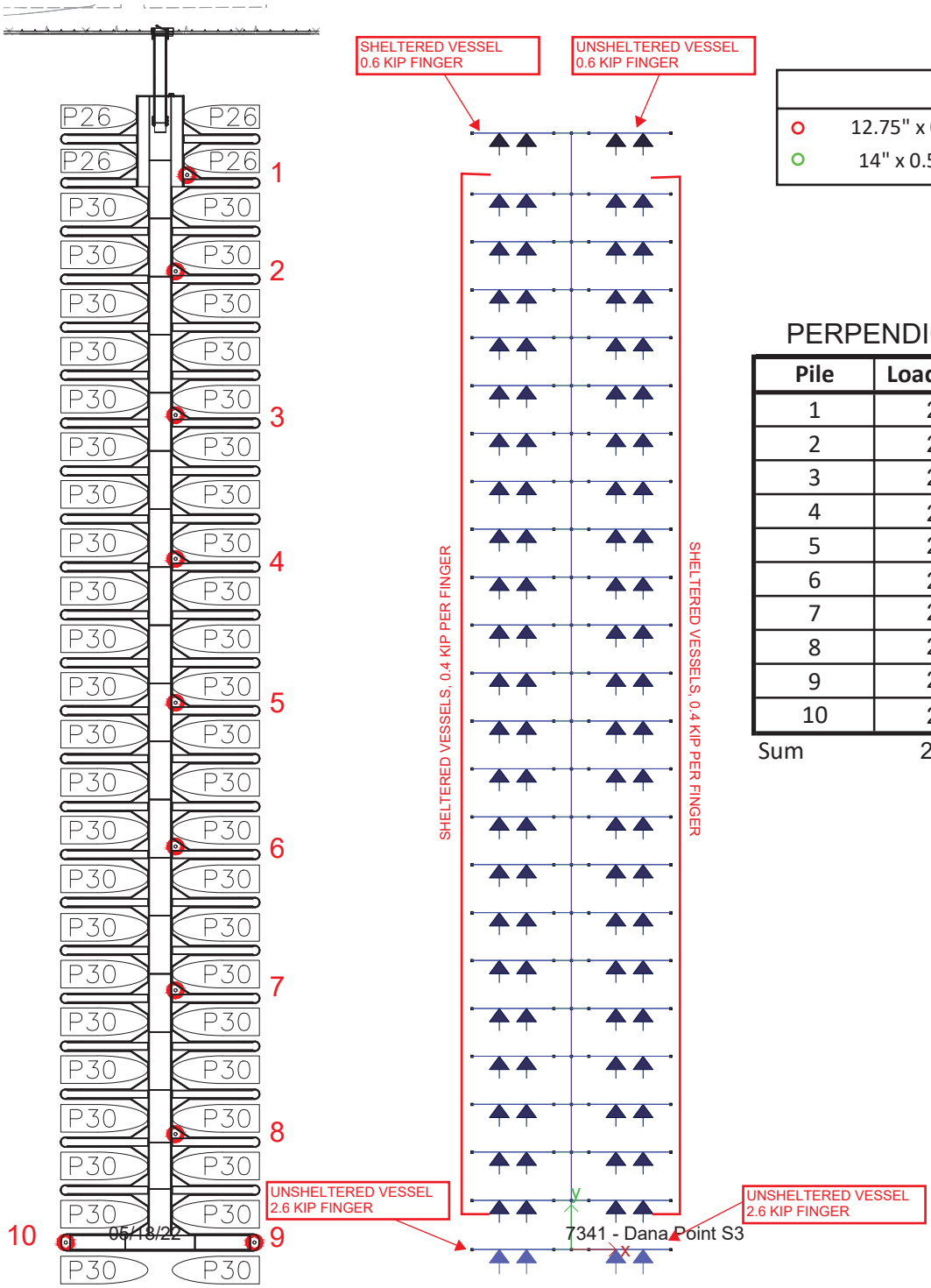
GROUP 12 DOCKS

DOCK MODELED: W4

WIND LOADING PERPENDICULAR TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

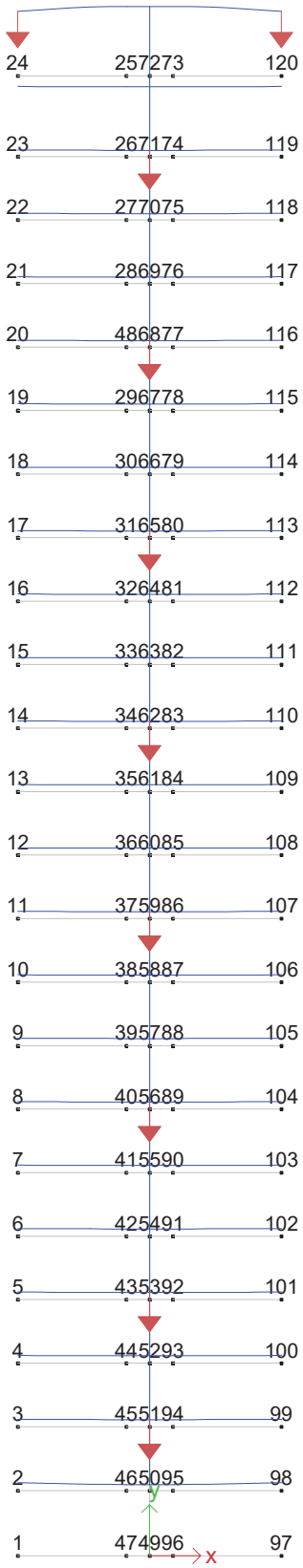
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.5	8.8	Good
2	2.5		Good
3	2.5		Good
4	2.4		Good
5	2.4		Good
6	2.4		Good
7	2.4		Good
8	2.4		Good
9	2.2		Good
10	2.2		Good
Sum	24.0		

GROUP 12 DOCKS

DOCK MODELED: W4

PERPENDICULAR



Bellingham MARINE
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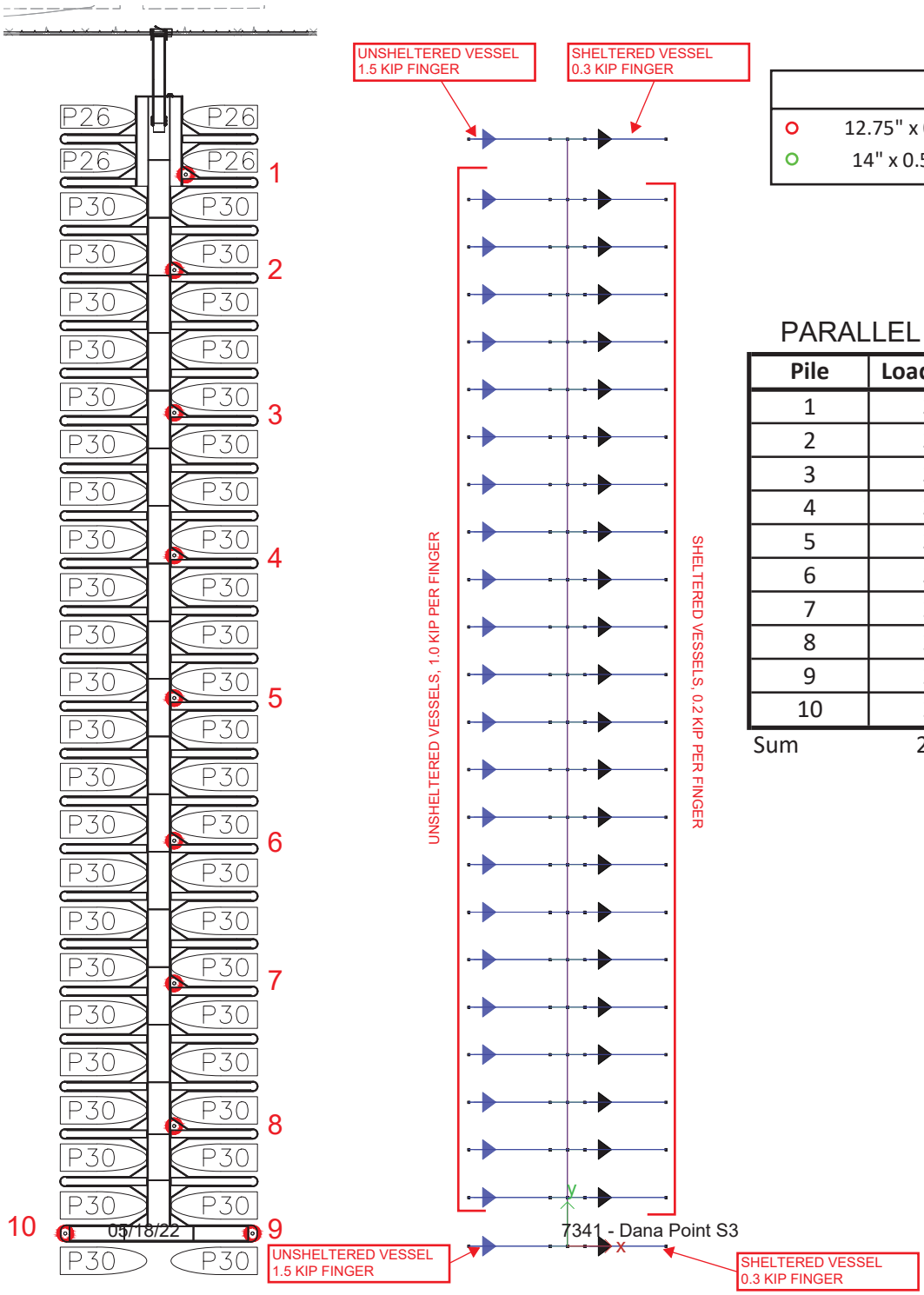
GROUP 12 DOCKS (continued)

DOCK MODELED: W4

WIND LOADING PARALLEL TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

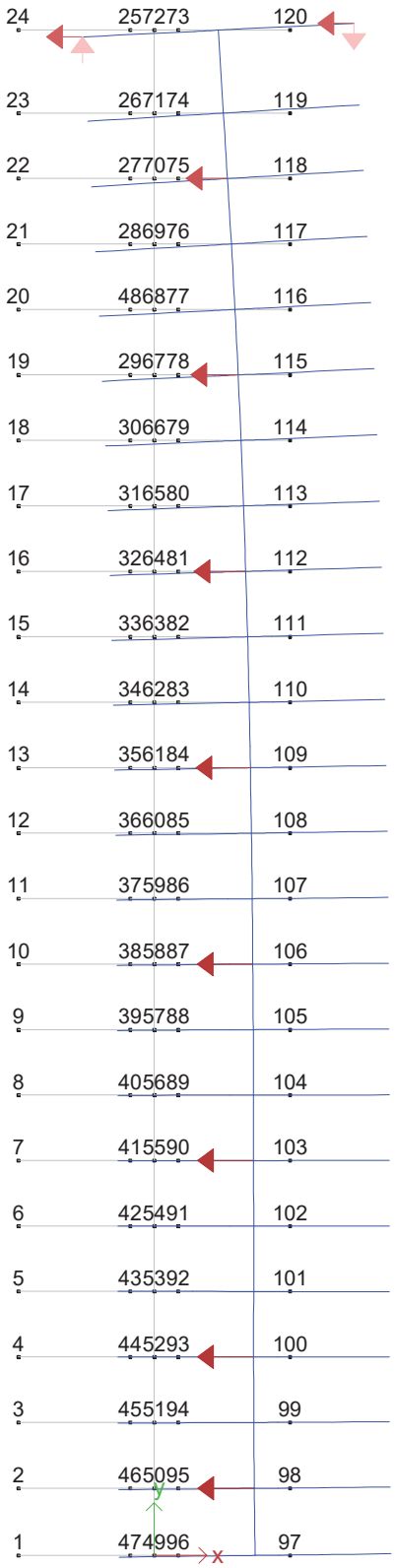
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	3.4	8.8	Good
2	3.3		Good
3	3.3		Good
4	3.3		Good
5	3.2		Good
6	3.1		Good
7	2.8		Good
8	2.5		Good
9	2.2		Good
10	2.2		Good
Sum	29.2		

GROUP 12 DOCKS

DOCK MODELED: W4

PARALLEL



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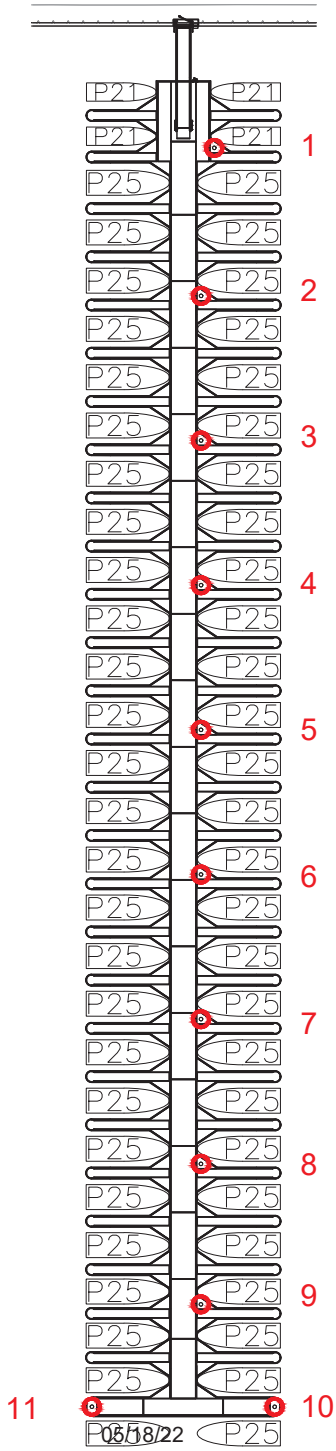
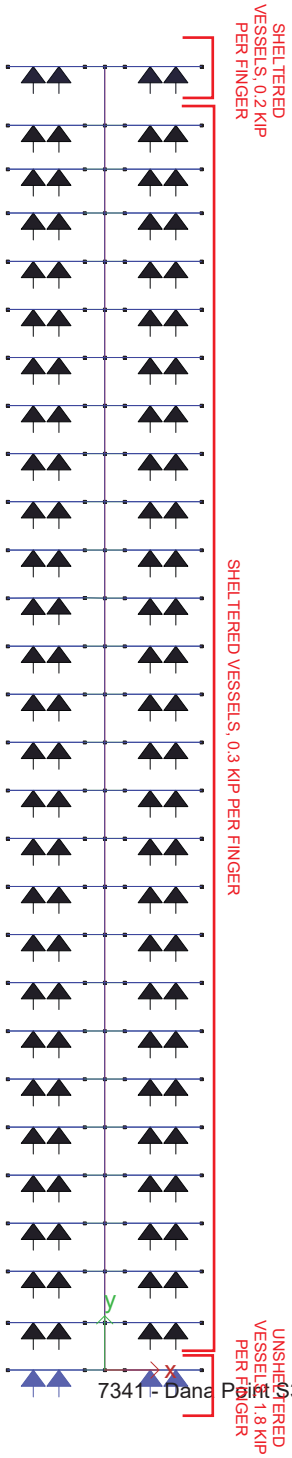
GROUP 13 DOCKS

DOCK MODELED: W8

WIND LOADING PERPENDICULAR TO FINGERS





Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

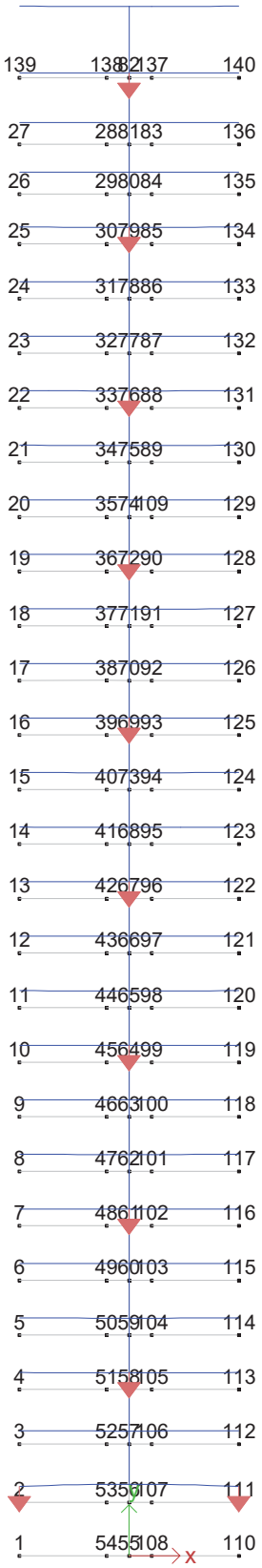
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	1.8	8.8	Good
2	1.8		Good
3	1.8		Good
4	1.8		Good
5	1.8		Good
6	1.8		Good
7	1.8		Good
8	1.8		Good
9	1.8		Good
10	1.8		Good
11	1.8		Good
Sum	20.0		

GROUP 13 DOCKS

DOCK MODELED: W8

PERPENDICULAR



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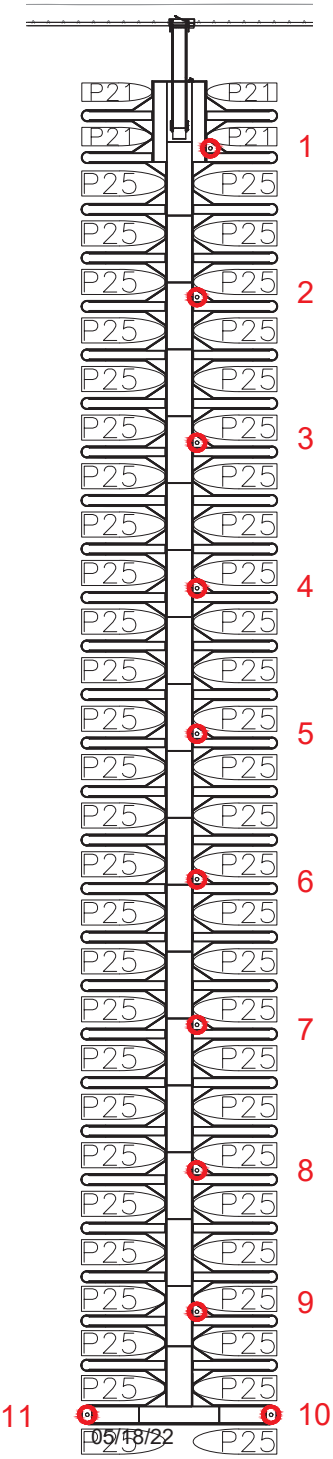
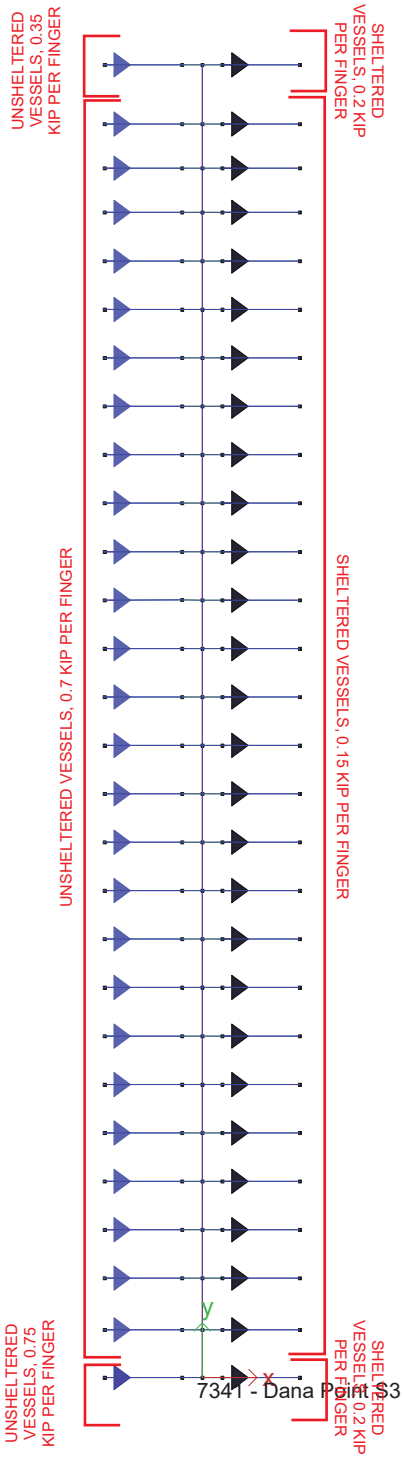
GROUP 13 DOCKS (continued)

DOCK MODELED: W8

WIND LOADING PARALLEL TO FINGERS





Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

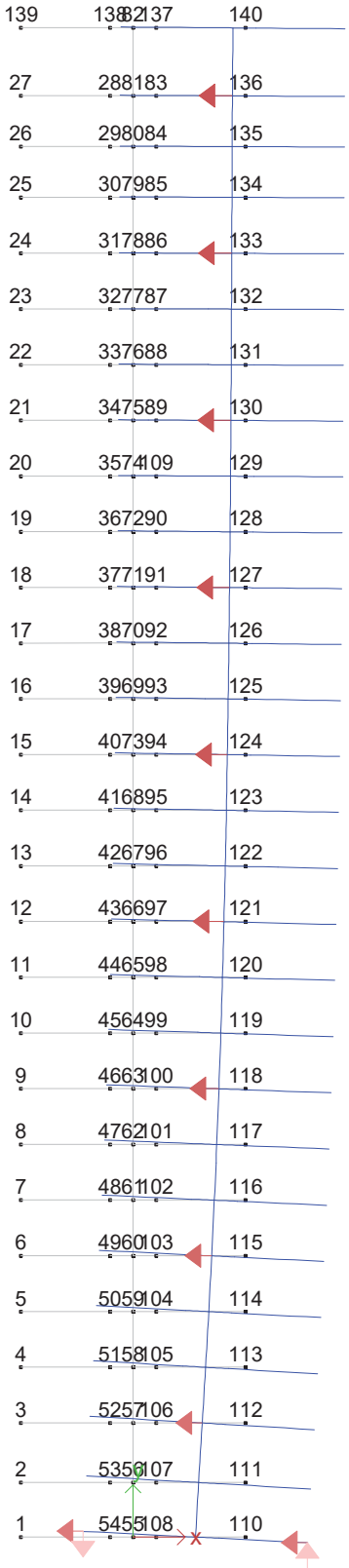
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	1.7	8.8	Good
2	2.0		Good
3	2.1		Good
4	2.3		Good
5	2.4		Good
6	2.4		Good
7	2.4		Good
8	2.5		Good
9	2.5		Good
10	1.6		Good
11	1.6		Good
Sum	23.4		

GROUP 13 DOCKS

DOCK MODELED: W8

PARALLEL



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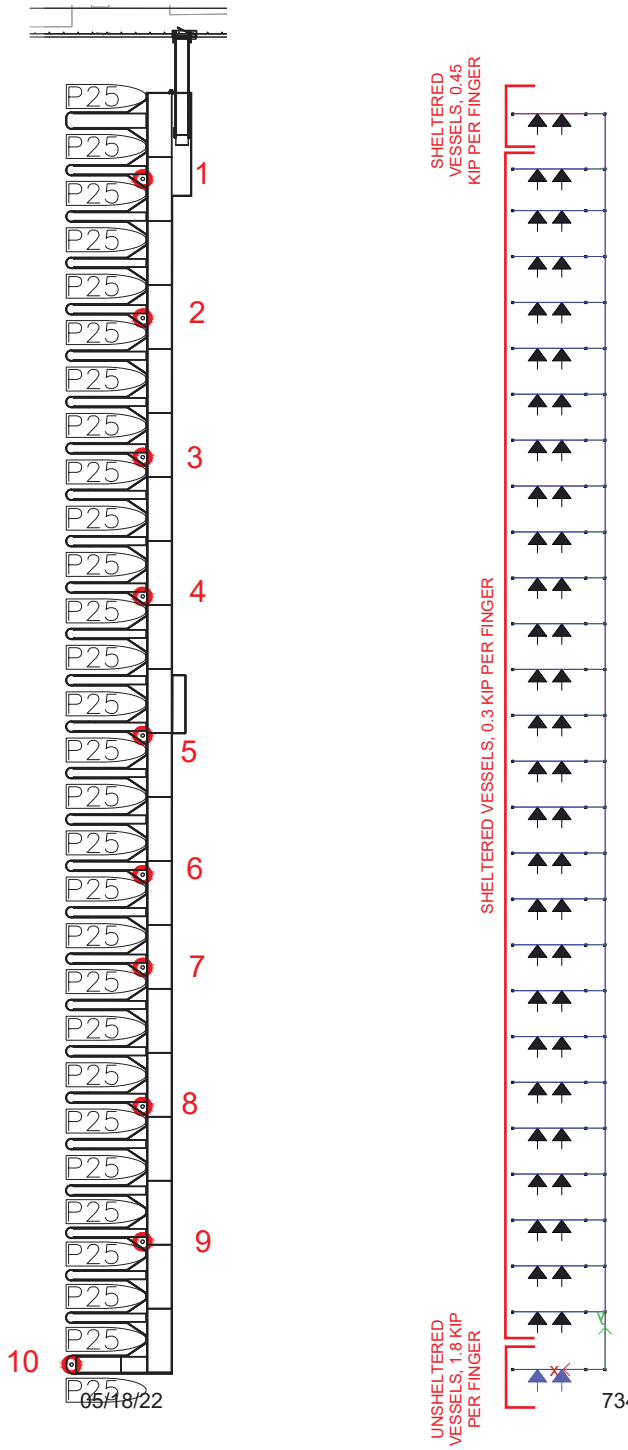
GROUP 14 DOCKS

DOCK MODELED: W12

WIND LOADING PERPENDICULAR TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

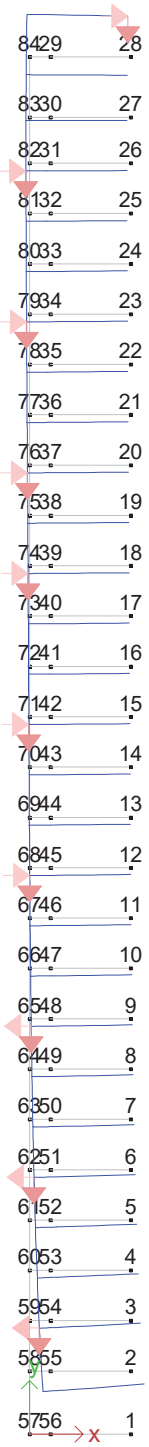
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	1.0	8.8	Good
2	1.0		Good
3	1.0		Good
4	1.0		Good
5	1.0		Good
6	1.0		Good
7	1.0		Good
8	1.0		Good
9	1.0		Good
10	0.9		Good
Sum	9.9		

GROUP 14 DOCKS

DOCK MODELED: W12

PERPENDICULAR



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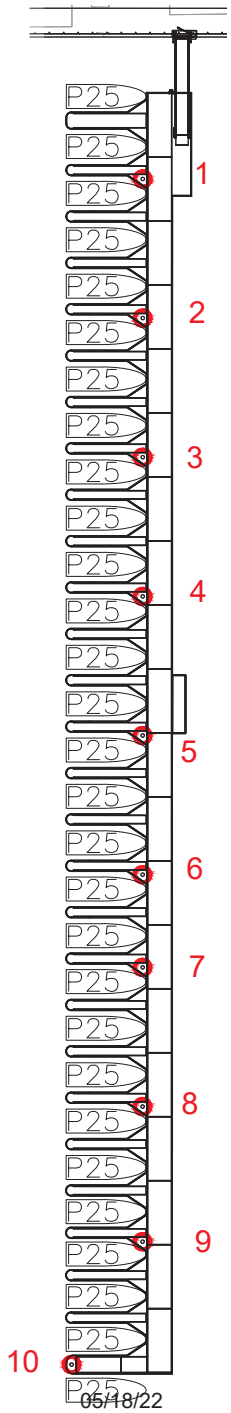
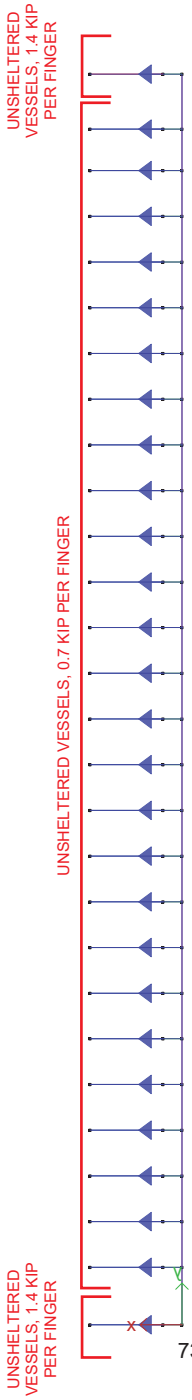
GROUP 14 DOCKS (continued)

DOCK MODELED: W12

WIND LOADING PARALLEL TO FINGERS





Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

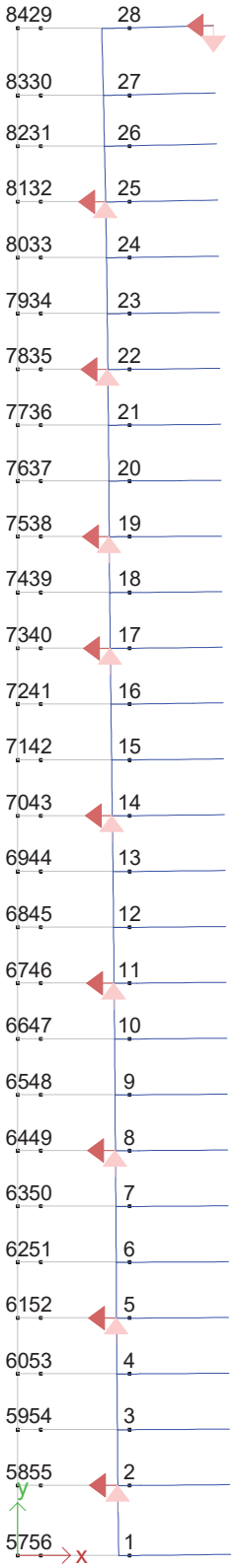
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.1	8.8	Good
2	2.1		Good
3	2.1		Good
4	2.0		Good
5	2.0		Good
6	1.9		Good
7	1.9		Good
8	1.9		Good
9	1.8		Good
10	1.8		Good
Sum	19.6		

GROUP 14 DOCKS

DOCK MODELED: W12

PARALLEL



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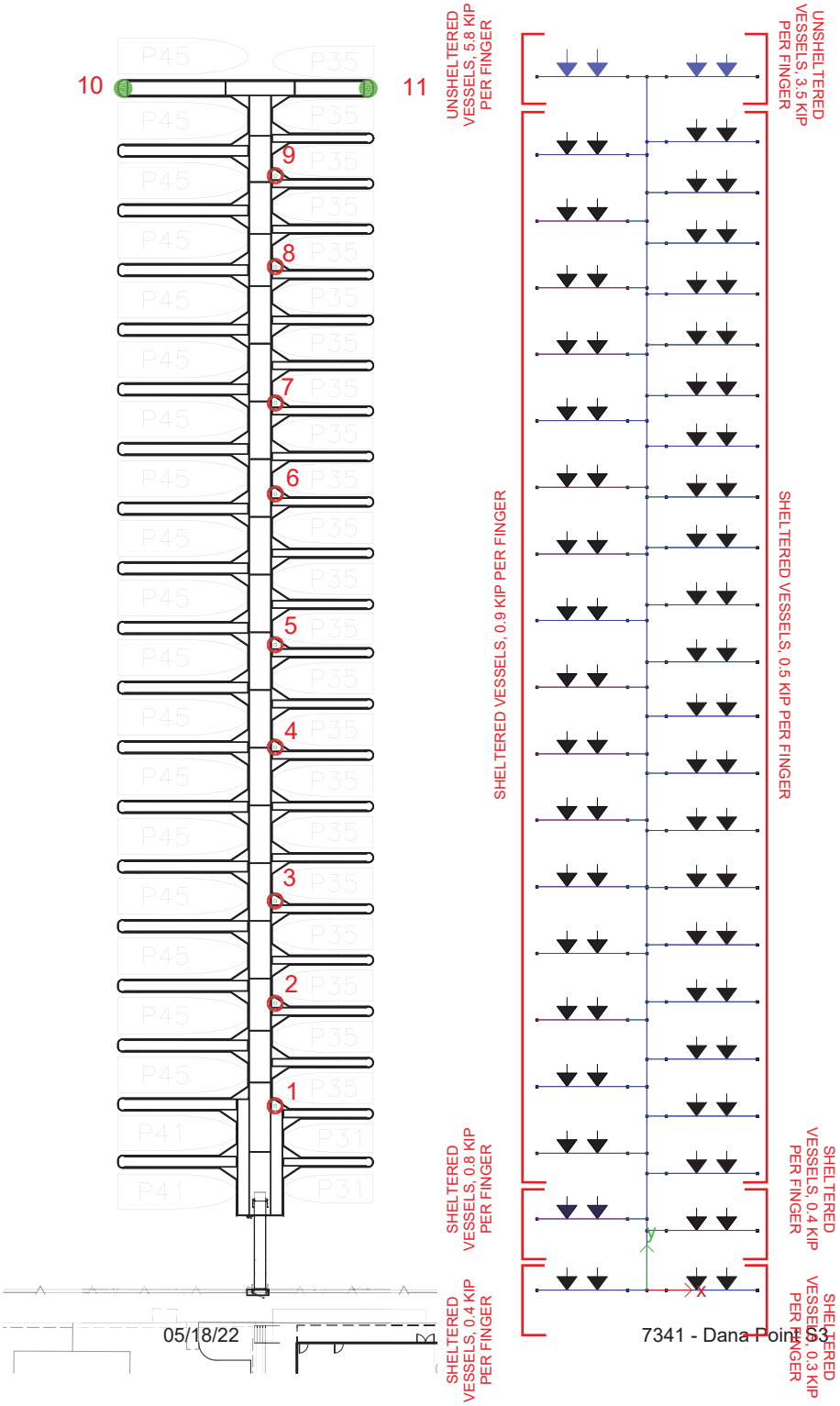
GROUP 15 DOCKS

DOCK MODELED: W18

WIND LOADING PERPENDICULAR TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

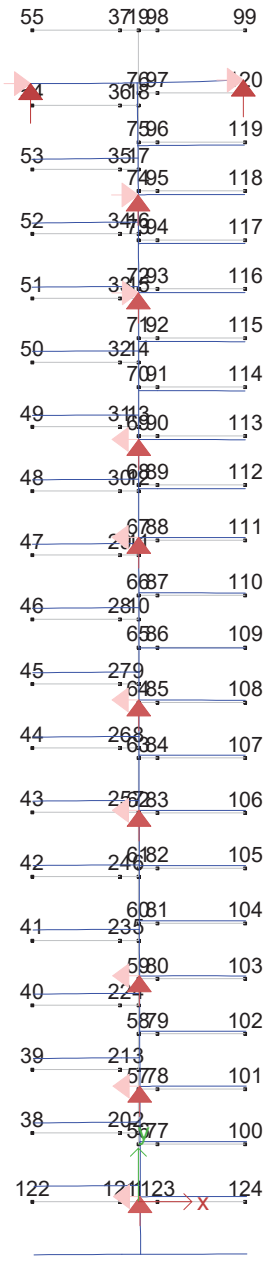
PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	3.1	8.8	Good
2	3.2		Good
3	3.2		Good
4	3.2		Good
5	3.2		Good
6	3.2		Good
7	3.2		Good
8	3.2		Good
9	3.2		Good
10	4.2	11.0	Good
11	3.9		Good
Sum	36.8		

GROUP 15 DOCKS

DOCK MODELED: W18

PERPENDICULAR



Bellingham MARINE
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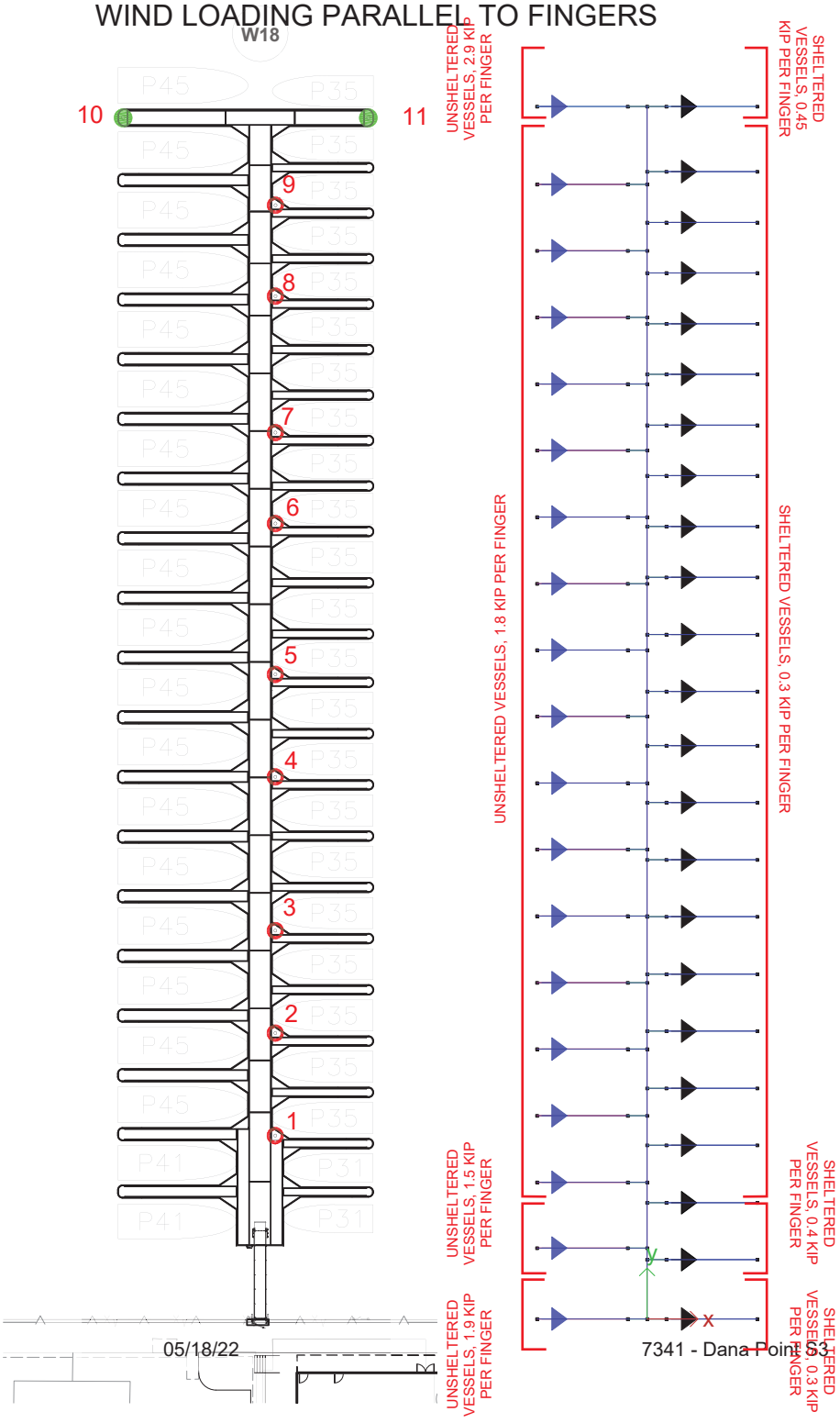
GROUP 15 DOCKS (continued)

DOCK MODELED: W18

W18

WIND LOADING PARALLEL TO FINGERS



Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

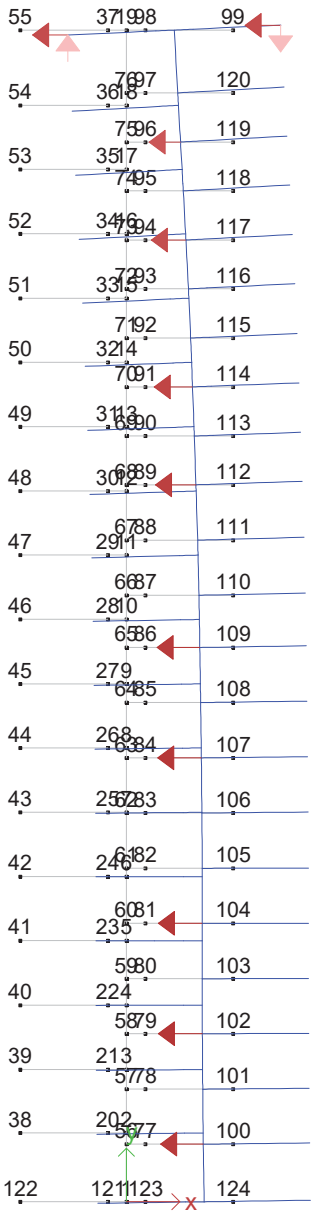
PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	4.6	8.8	Good
2	4.7		Good
3	4.6		Good
4	4.5		Good
5	4.4		Good
6	4.1		Good
7	3.9		Good
8	3.5		Good
9	3.2	↓	Good
10	3.6	11.0	Good
11	3.6	↓	Good
Sum	44.9		

GROUP 15 DOCKS

DOCK MODELED: W18

PARALLEL



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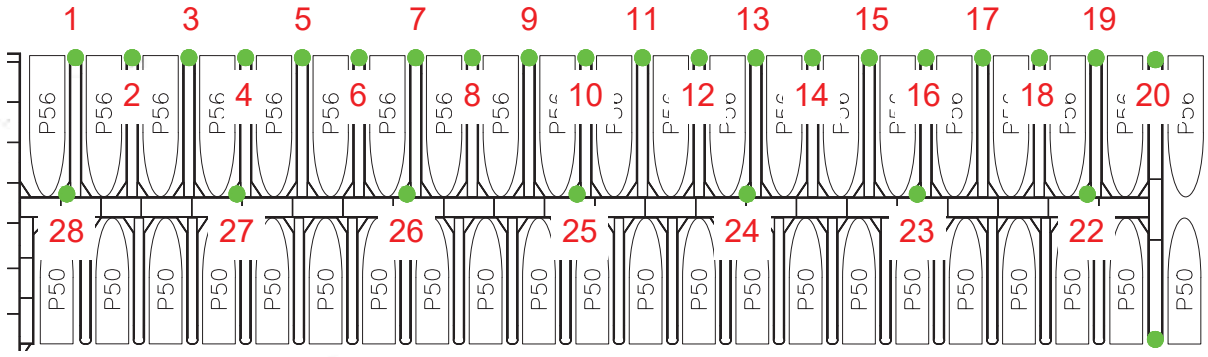
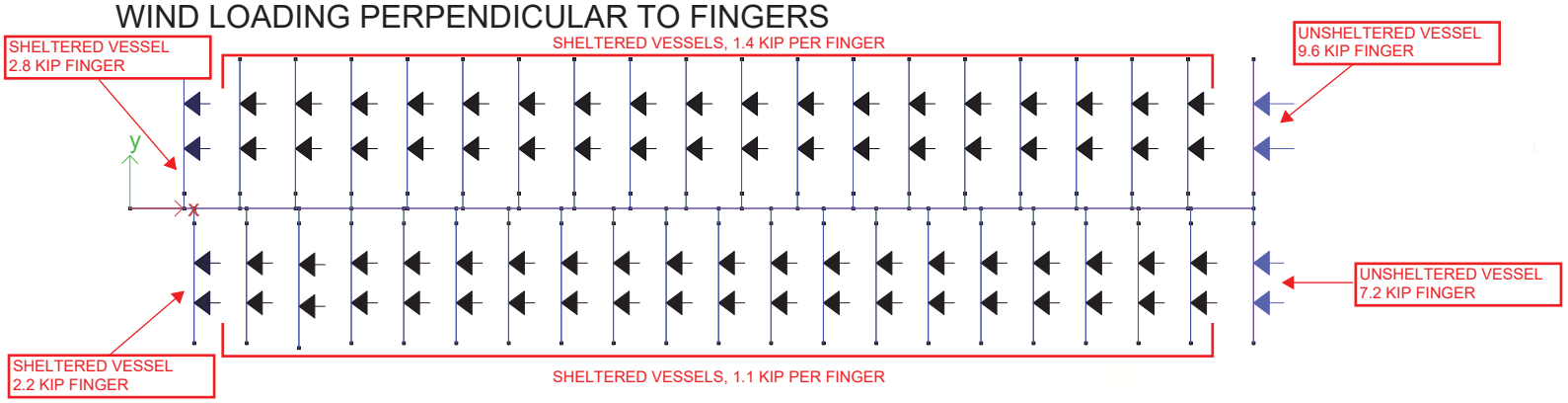
GROUP 16 DOCKS

DOCK MODELED: W19

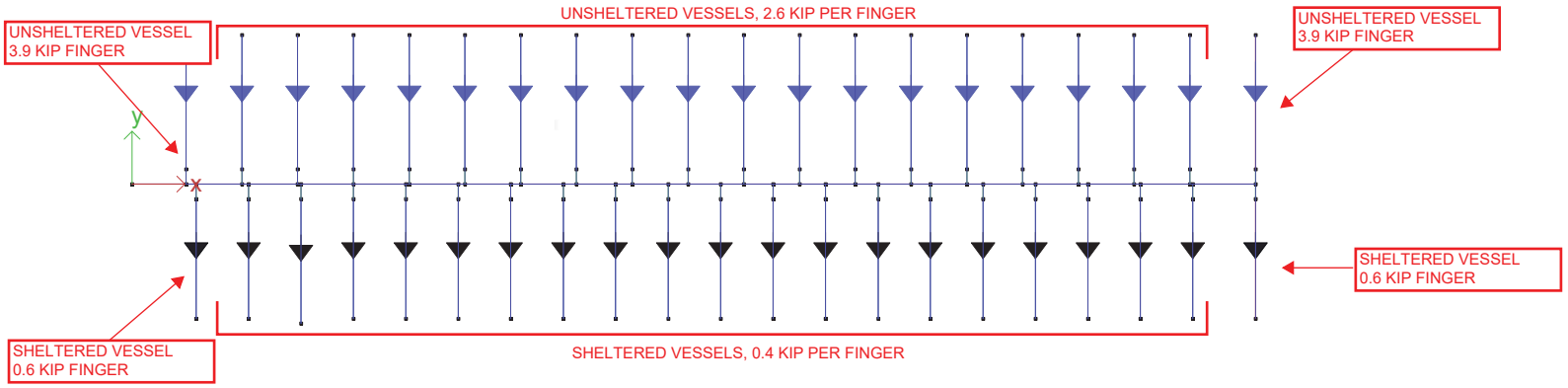


Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PERPENDICULAR TO FINGERS



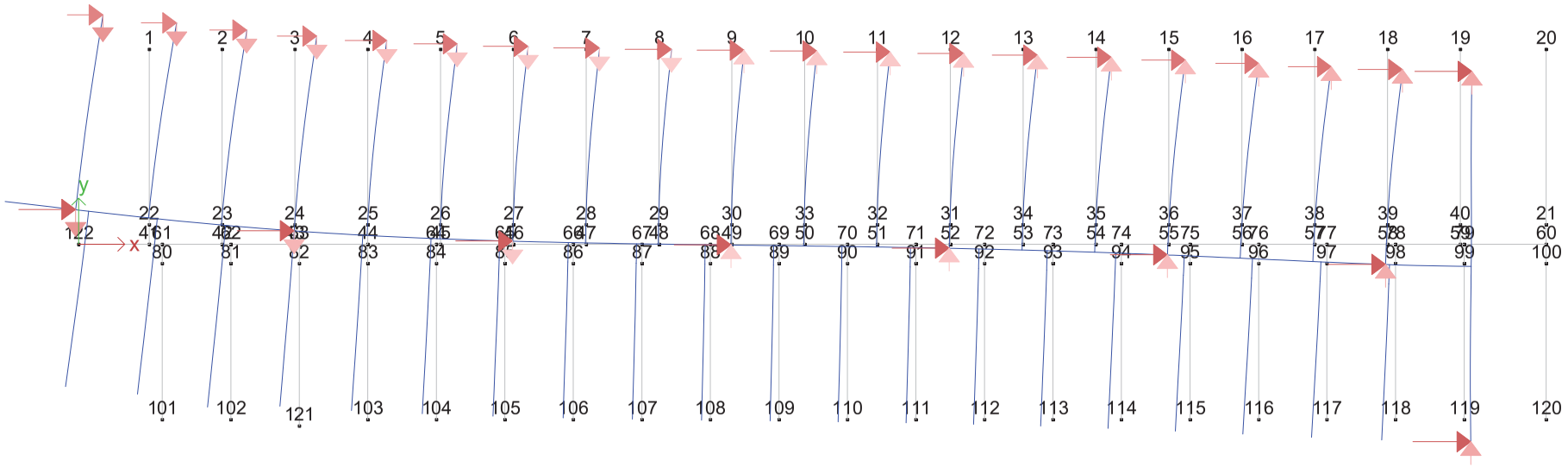
WIND LOADING PARALLEL TO FINGERS



GROUP 16 DOCKS

DOCK MODELED: W19

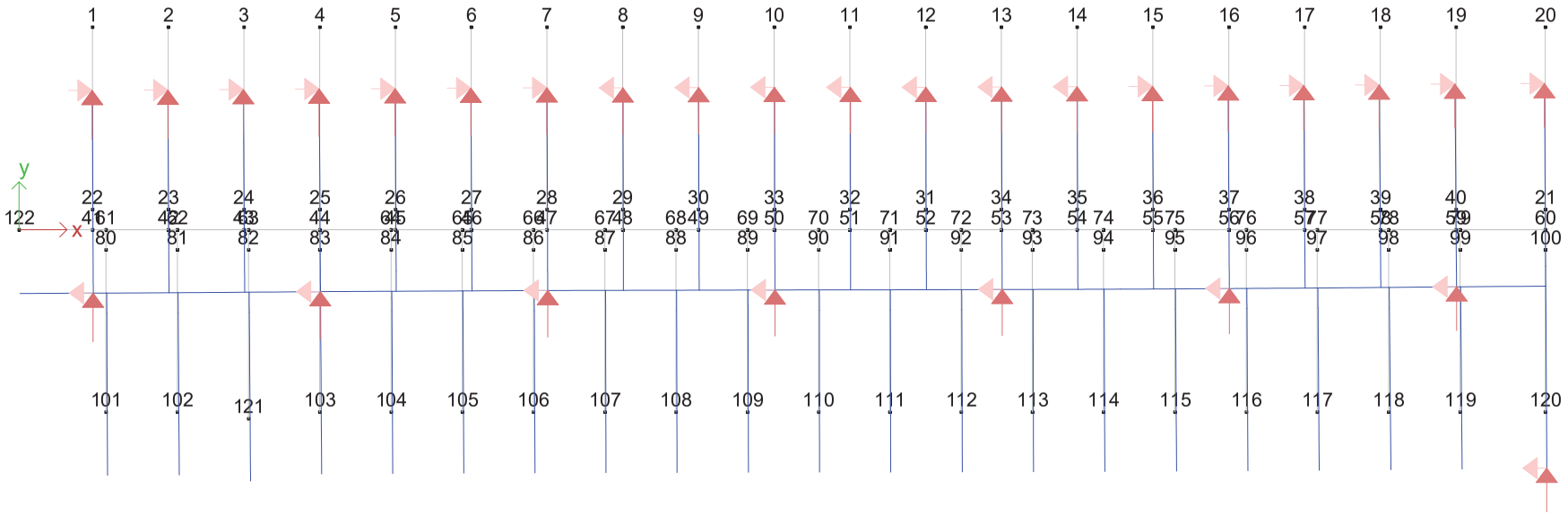
PERPENDICULAR



GROUP 16 DOCKS

DOCK MODELED: W19

PARALLEL



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GROUP 16 DOCKS (continued)

DOCK MODELED: W19

PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	1.8	11.0	Good
2	1.8		Good
3	1.9		Good
4	2.0		Good
5	2.1		Good
6	2.2		Good
7	2.3		Good
8	2.3		Good
9	2.4		Good
10	2.4		Good
11	2.4		Good
12	2.4		Good
13	2.3		Good
14	2.3		Good
15	2.3		Good
16	2.2		Good
17	2.2		Good
18	2.2		Good
19	2.3		Good
20	2.9		Good
21	3.0		Good
22	2.9		Good
23	2.9		Good
24	2.9		Good
25	2.9		Good
26	2.9		Good
27	2.9		Good
28	2.9		Good
Sum	67.9		

PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	2.4	11.0	Good
2	2.4		Good
3	2.4		Good
4	2.3		Good
5	2.3		Good
6	2.3		Good
7	2.3		Good
8	2.3		Good
9	2.3		Good
10	2.3		Good
11	2.3		Good
12	2.3		Good
13	2.3		Good
14	2.2		Good
15	2.2		Good
16	2.2		Good
17	2.2		Good
18	2.2		Good
19	2.2		Good
20	2.1		Good
21	2.1		Good
22	2.2		Good
23	2.2		Good
24	2.3		Good
25	2.3		Good
26	2.3		Good
27	2.3		Good
28	2.4		Good
Sum	63.4		

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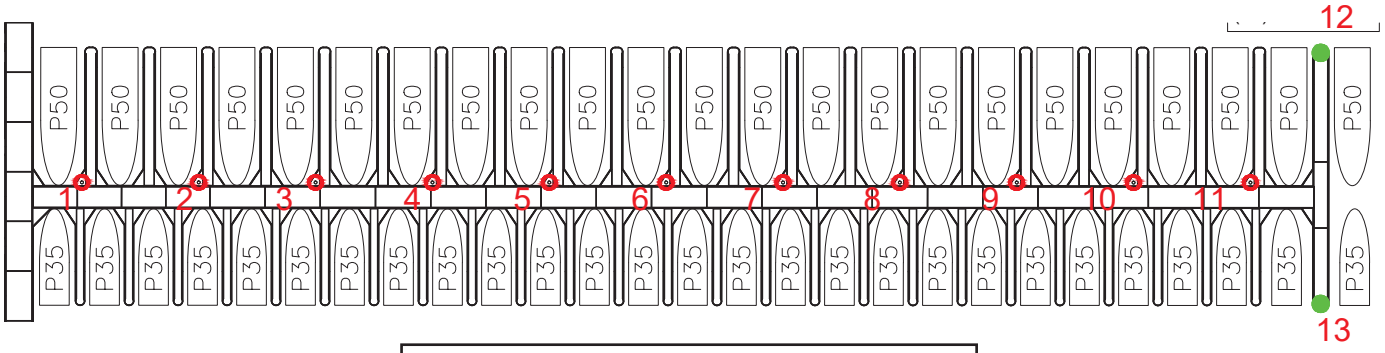
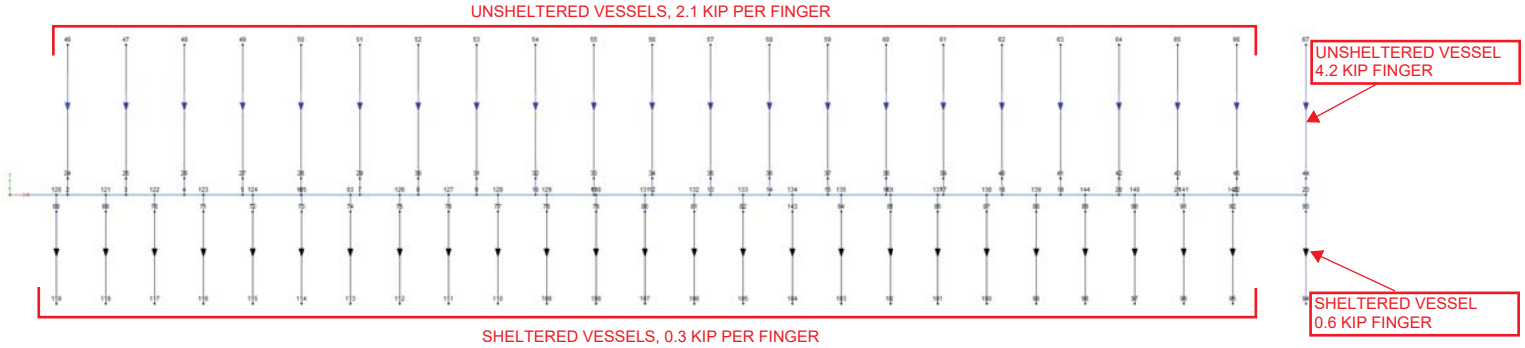
GROUP 17 DOCKS

DOCK MODELED: W20

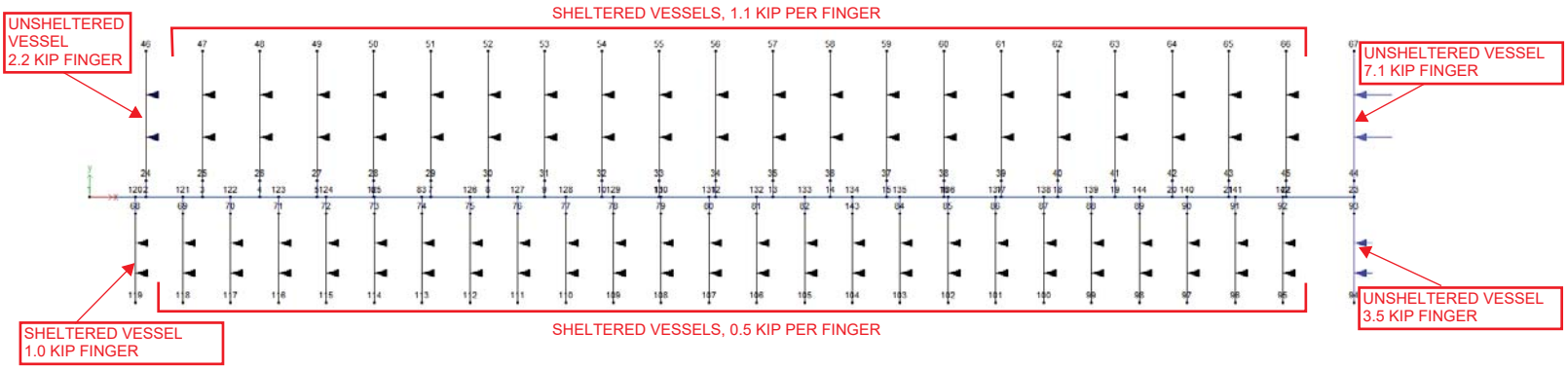


Legend	
○	12.75" x 0.5" A252 Steel Pile w/ HDPE sleeve
○	14" x 0.5" A252 Steel Pile w/ HDPE sleeve

WIND LOADING PARALLEL TO FINGERS



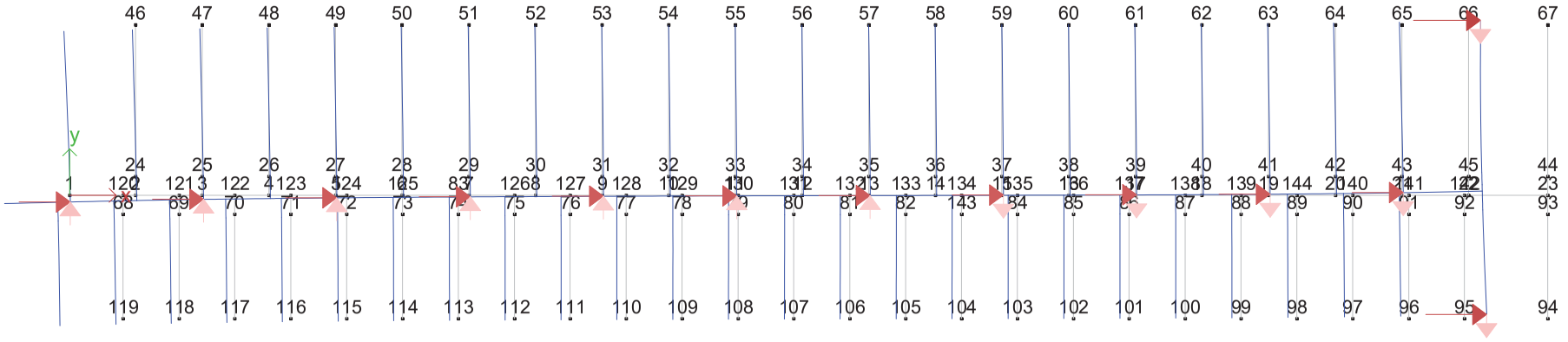
WIND LOADING PERPENDICULAR TO FINGERS



GROUP 17 DOCKS

DOCK MODELED: W20

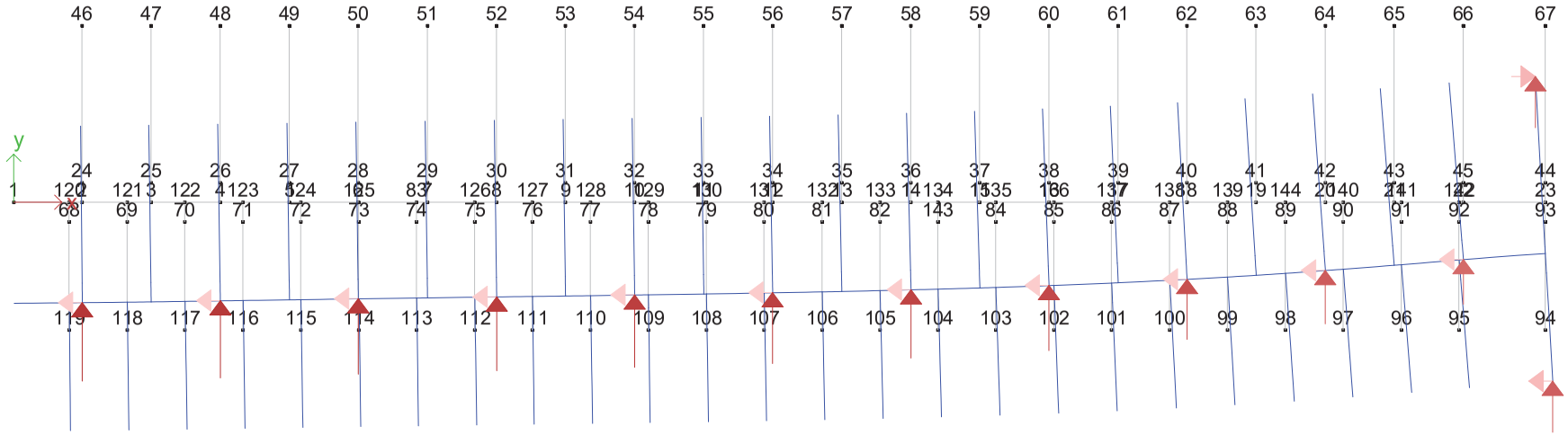
PERPENDICULAR



GROUP 17 DOCKS

DOCK MODELED: W20

PARALLEL



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GROUP 17 DOCKS (continued)

DOCK MODELED: W20

PARALLEL LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	5.3	8.8	Good
2	5.2		Good
3	5		Good
4	5		Good
5	4.9		Good
6	4.7		Good
7	4.6		Good
8	4.4		Good
9	4		Good
10	3.6		Good
11	3		Good
12	3.4	11.0	Good
13	3.4		Good
Sum	56.5		

PERPENDICULAR LOADING

Pile	Load (kips)	Capacity (kips)	Check
1	3.6	8.8	Good
2	3.6		Good
3	3.6		Good
4	3.6		Good
5	3.6		Good
6	3.6		Good
7	3.6		Good
8	3.6		Good
9	3.6		Good
10	3.6		Good
11	3.6		Good
12	3.6	11.0	Good
13	3.6		Good
Sum	46.8		

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Piles (Outer Basin)

Bellingham MARINE
1323 Lincoln St.
Bellingham, WA 98229
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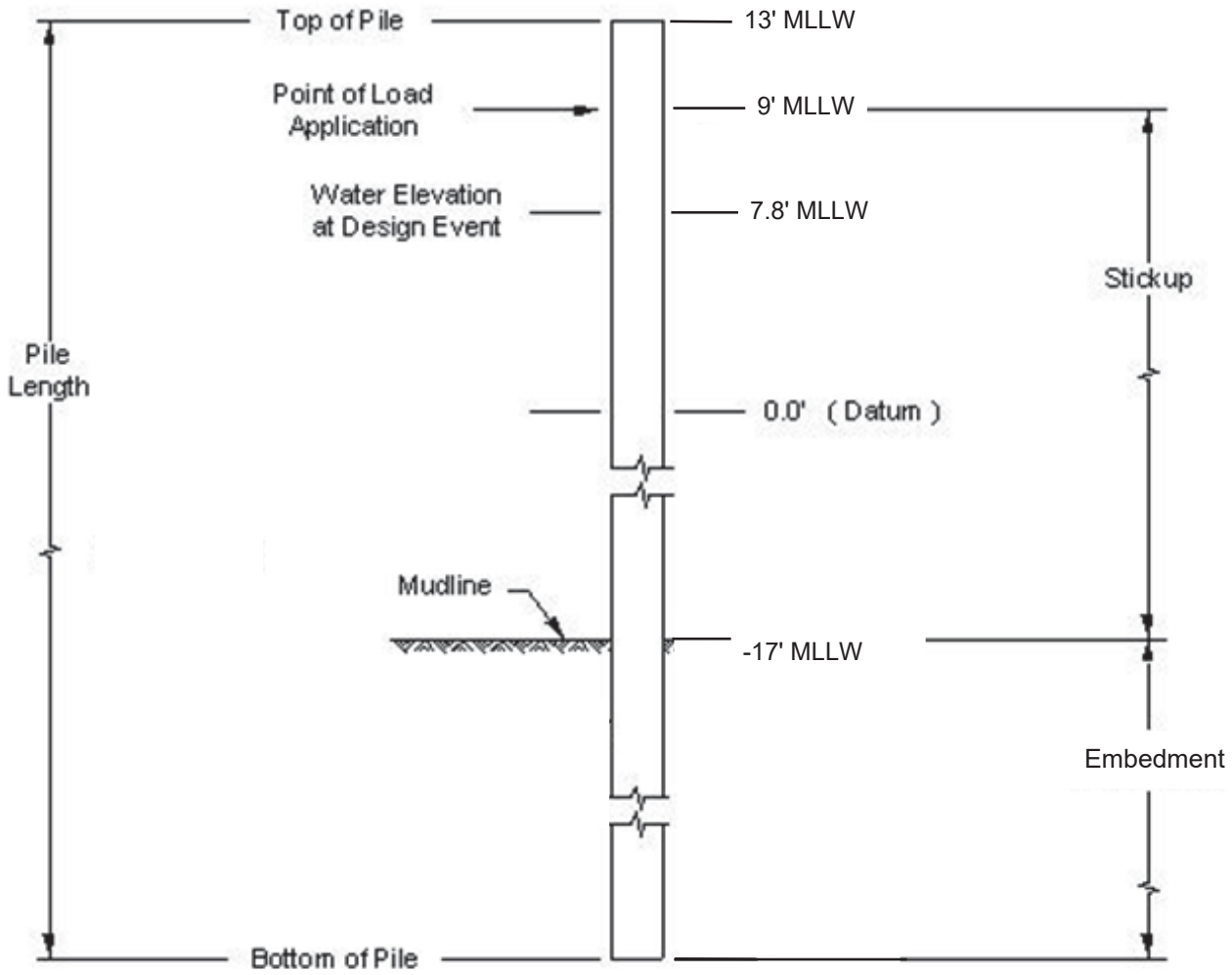
STEEL PIPE PILE BENDING CAPACITIES (Phi-Mn) PER AISC STEEL CONSTRUCTION MANUAL. LATERAL POINT LOAD CAPACITY (Phi-Pn) PROVIDE BY GEOTECH. SEE REVISED ENGEO GEOTECH REPORT DATE FEB. 23, 2022.

General Pile Design and Capacity

Pile Type	Stiffness (k/in)	Min Ult. Moment Capacity (ΦMn) (k-ft)	ΦPn (k)
18" x 0.5" A252 Steel Pile w/ HDPE sleeve	1.4	434	16.4



ELEVATION VIEW OF TYPICAL MARINA PILE
(N.T.S)

Bellingham MARINE®
1323 Lincoln St.
Bellingham, WA 98229
T 360.715.0121

WIND LOADS ON OUTER BASIN DOCKS:

Data Input		
W =	19	psf
S1 =	1	
S2_P90 =	0.15	
S2_P0 =	0.2	

Vessel					Wind Loads			
					S1		S2	
Length	Height	Bp	A0	A90	P0 (k)	P90 (k)	P0 (k)	P90 (k)
50	7.5	15	112.5	375	2.1	7.1	0.4	1.1
60	9.0	16.5	148.5	540	2.8	10.3	0.6	1.5
70	10.5	17.5	183.75	735	3.5	14.0	0.7	2.1
85	12.8	22	281.6	1088	5.4	20.7	1.1	3.1
95	14.3	24	343.2	1358.5	6.5	25.8	1.3	3.9
100	15.0	25	375	1500	7.1	28.5	1.4	4.3
120	18.0	30	540	2160	10.3	41.0	2.1	6.2
160	24.0	33	792	3840	15.0	73.0	3.0	10.9

ADDITIONAL LATERAL WAVE LOADS ON OUTER BASIN DOCKS:

$$\rho := 64 \ \frac{lb}{ft^3}$$

$$H_s := 2.1 \ ft$$

$$w_{WL} := \left(\frac{1}{8}\right) \cdot \rho \cdot g \cdot (H_s)^2 = 35 \ \frac{lbf}{ft}$$

Apply 1.6 load factor

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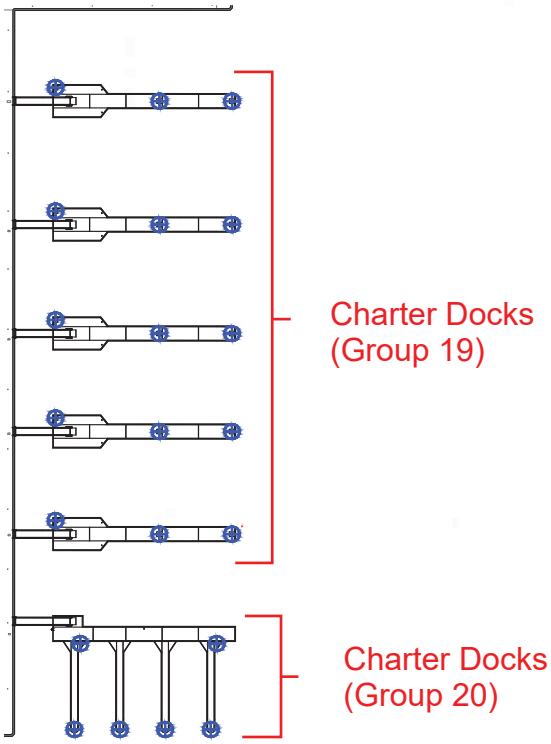
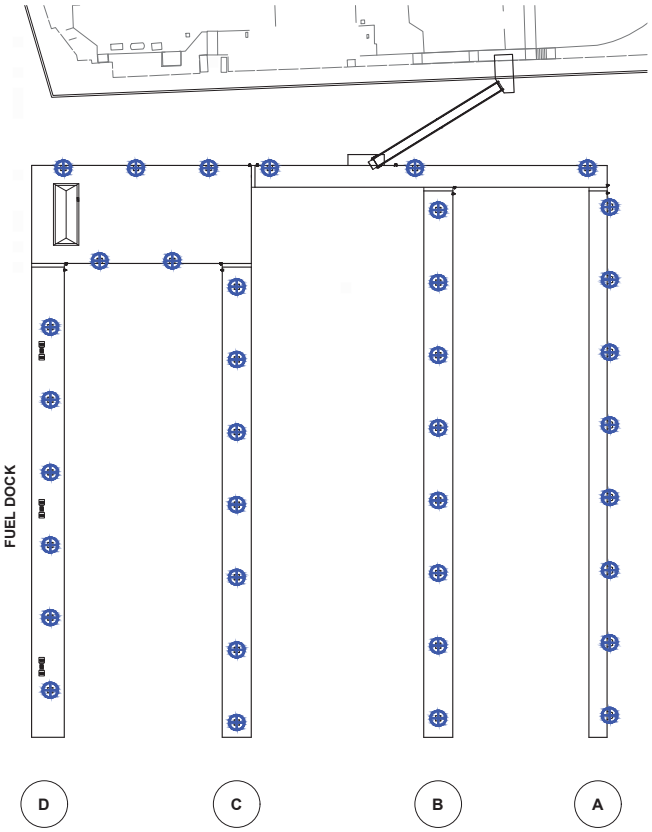
Analysis of Dock to be Modeled
Outer Basin

Group 19:	Charter Docks
Group 20:	Charter Docks
Group 21:	Fuel Dock, A
Group 22:	Fuel Dock, B
Group 23:	Fuel Dock, C
Group 24:	Fuel Dock, D





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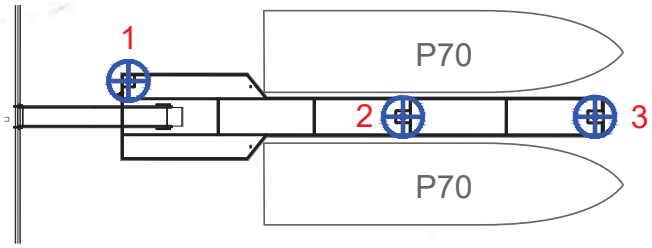
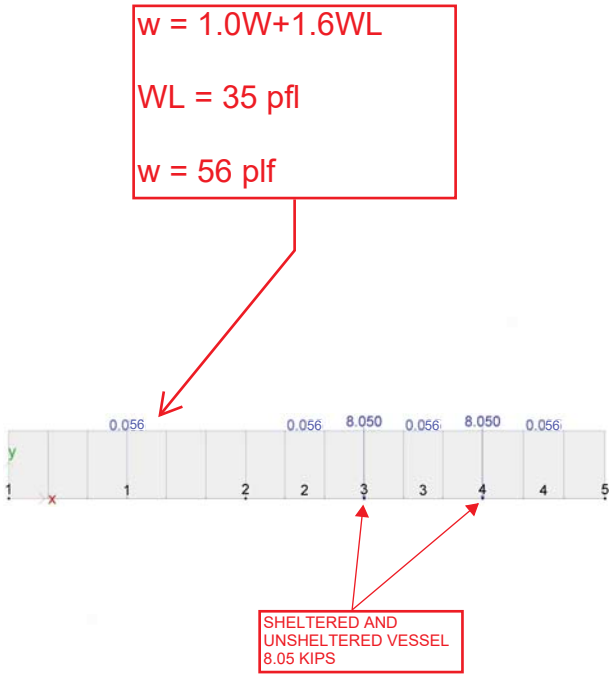
GROUP 19 DOCKS

DOCK MODELED: Charter Docks

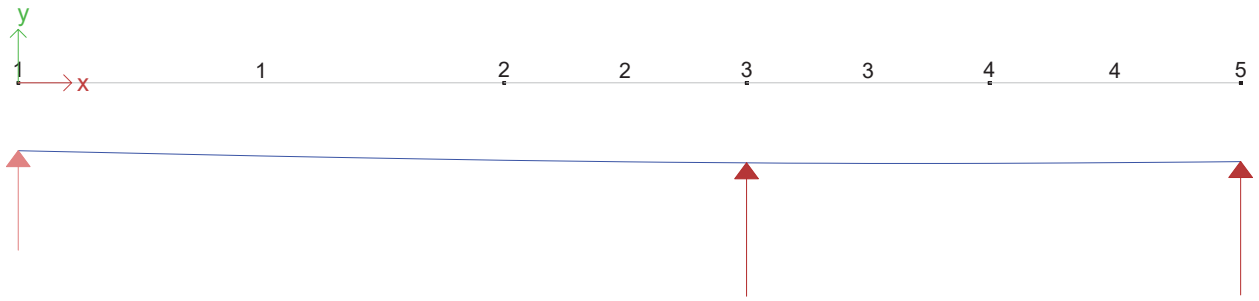
WIND LOADING PERPENDICULAR TO FINGERS





Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

Pile	Load (kips)	Capacity (kips)	Check
1	4.0	16.4	Good
2	9.1		Good
3	8.6		Good
Sum	21.7		



Plot View - Static Case: South Wind Defl. (in)
7341 - Dana Point S3

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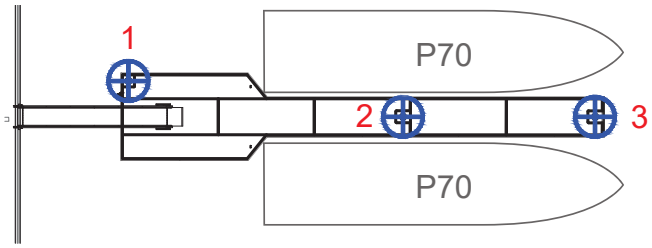
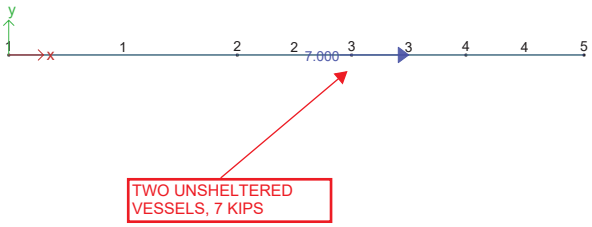
GROUP 19 DOCKS

DOCK MODELED: Charter Docks

WAVE LOAD NEGLIGIBLE IN PARALLLEL DIRECTION.

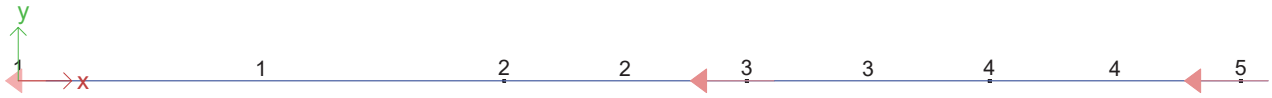
WIND LOADING PARALLEL TO FINGERS





Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

Pile	Load (kips)	Capacity (kips)	Check
1	1.4	16.4	Good
2	2.8		Good
3	2.8		Good
Sum	7.0		


y
x
1
1
2
2
3
3
4
4
5

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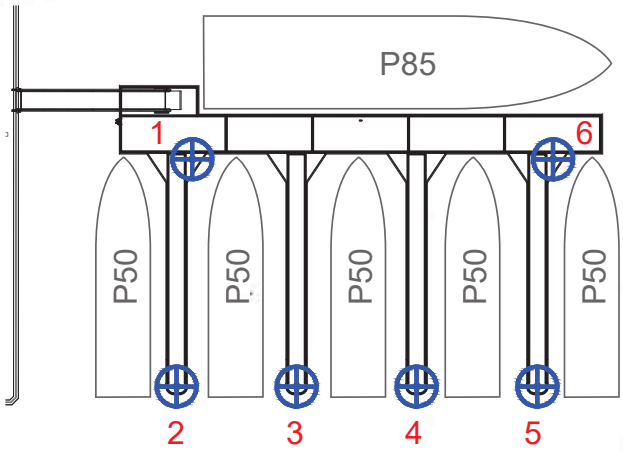
GROUP 20 DOCKS

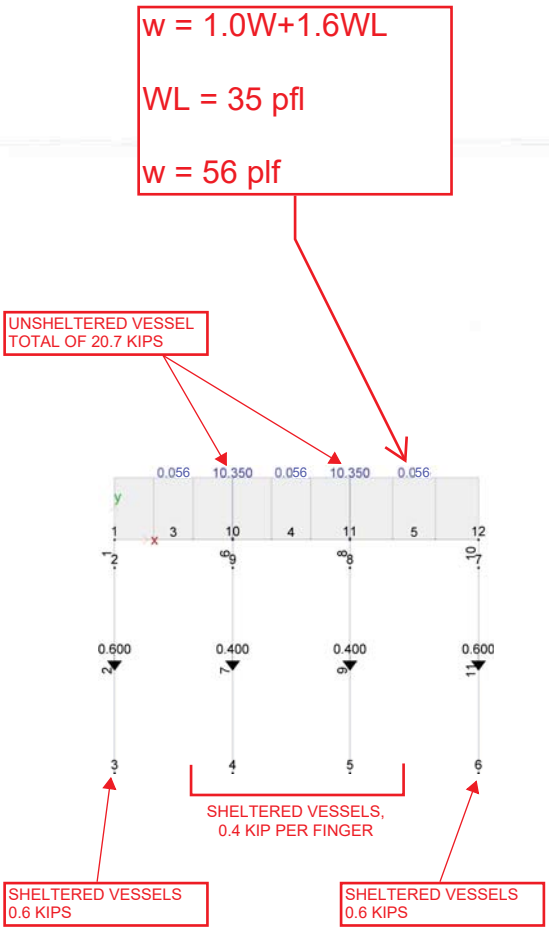
DOCK MODELED: CHARTER DOCKS

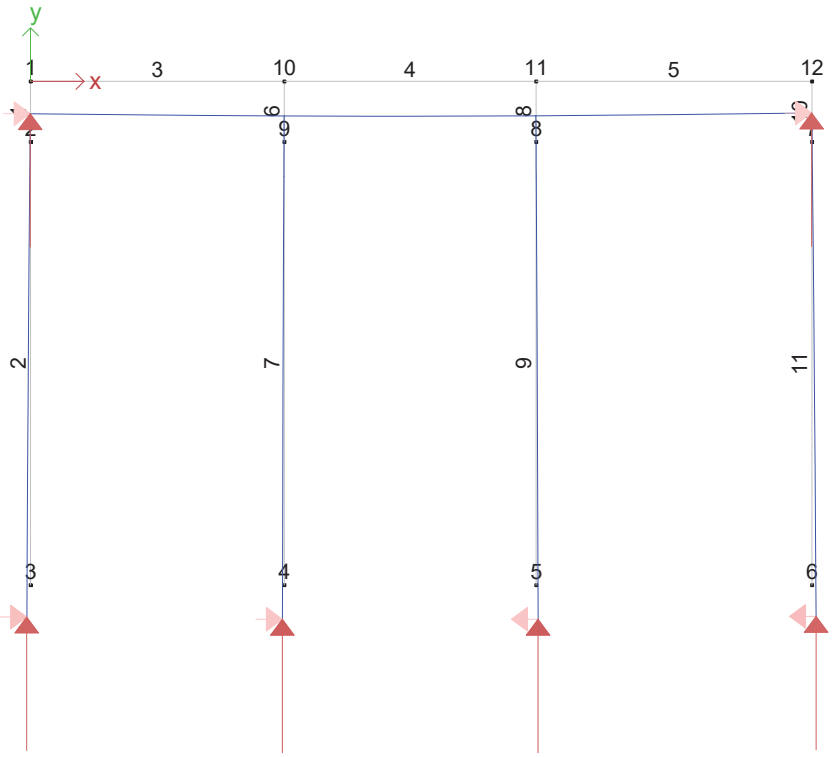
WIND LOADING PERPENDICULAR TO FINGERS



Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

Pile	Load (kips)	Capacity (kips)	Check
1	4.5	16.4	Good
2	4.5		Good
3	4.7		Good
4	4.7		Good
5	4.3		Good
6	4.3		Good
Sum	27.1		




y
x
1
3
10
4
11
5
12
6
8
2
7
9
11
3
4
5
6

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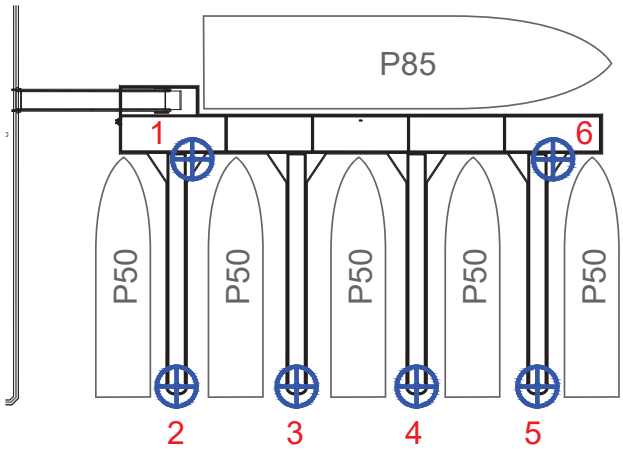
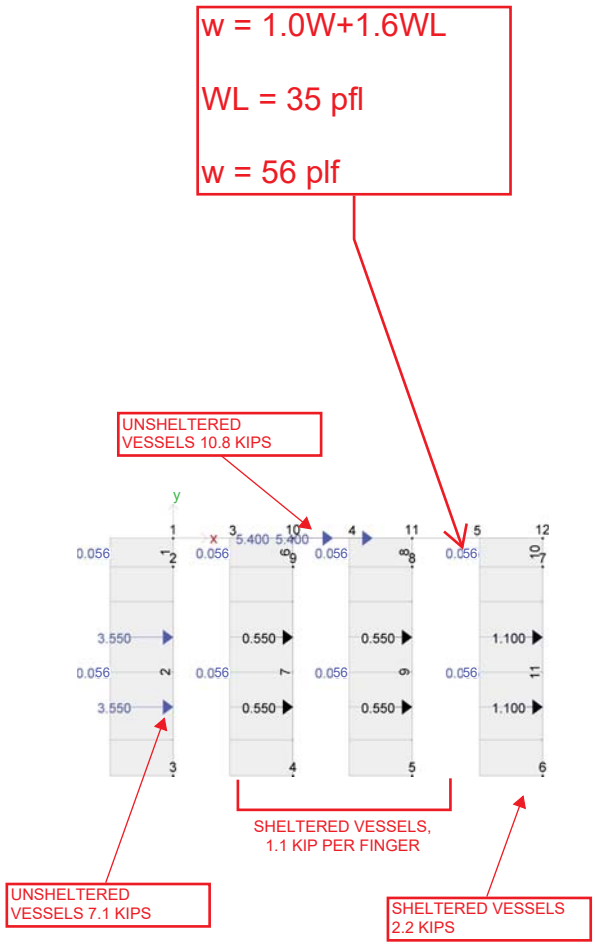
GROUP 20 DOCKS

DOCK MODELED: CHARTER DOCKS

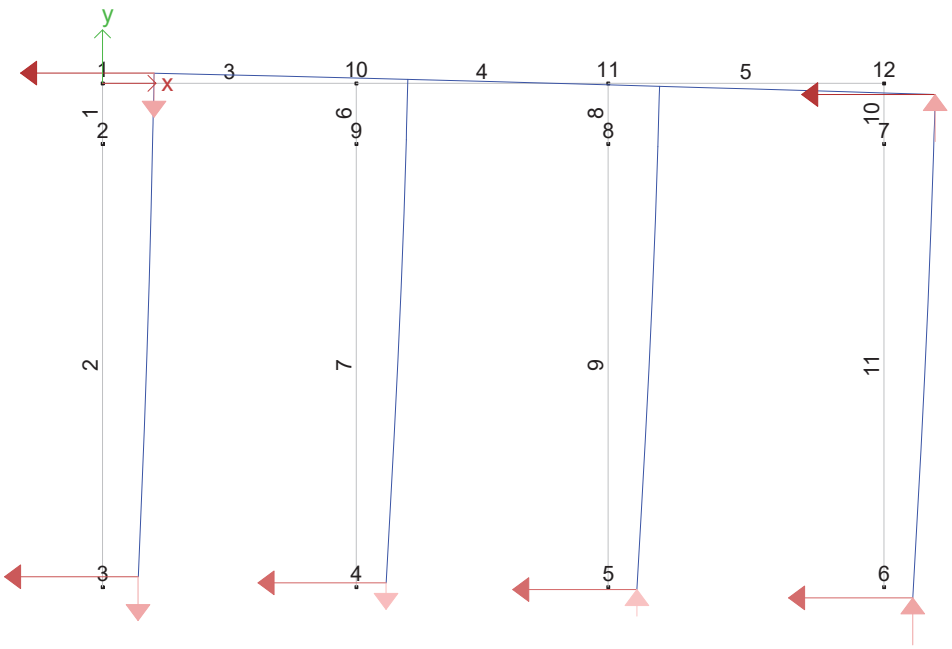
WIND LOADING PARALLEL TO FINGERS





Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

Pile	Load (kips)	Capacity (kips)	Check
1	7.5	16.4	Good
2	5.2		Good
3	4.5		Good
4	4.4		Good
5	4.4		Good
6	7.5		Good
Sum	33.5		


y
x
1
3
10
4
11
5
12
1
2
6
9
8
10
7
2
7
9
11
3
4
5
6

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w = 1.0W+1.6WL

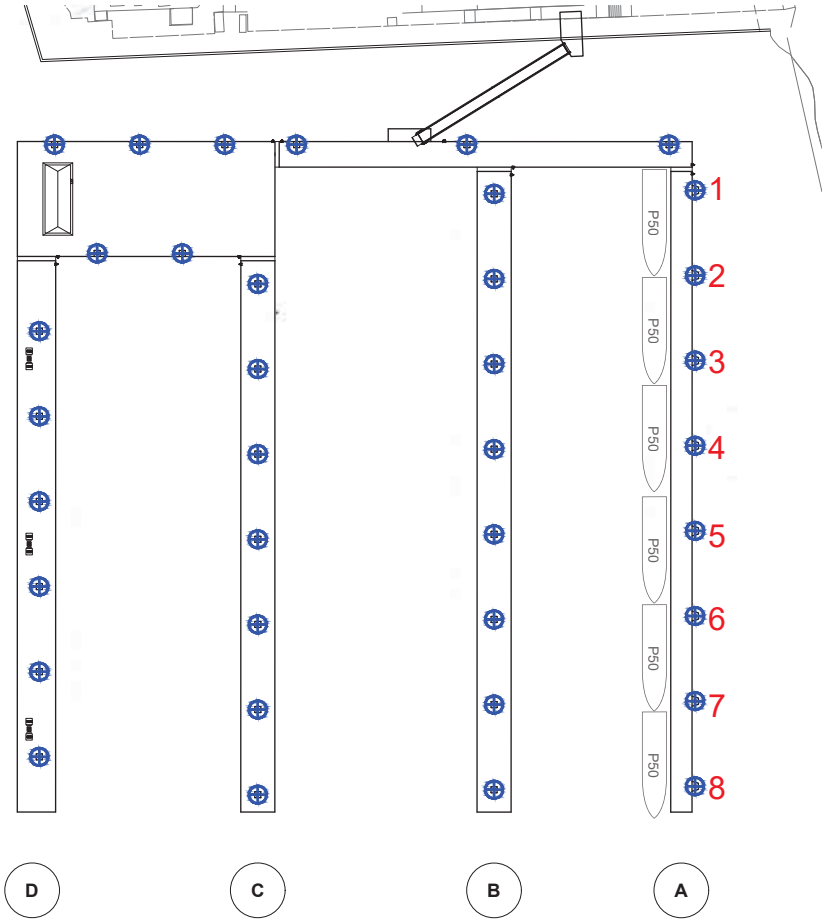
W = P90_50 / 50 ft = 142 plf
WL = 35 pfl

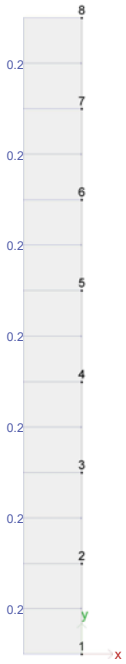
w = 198 plf

GROUP 21 DOCKS

DOCK MODELED: Dock A

WIND LOADING PERPENDICULAR TO FINGERS





Pile	Load (kips)	Capacity (kips)	Check
1	7.3	16.4	Good
2	7.5		Good
3	7.7		Good
4	7.8		Good
5	7.8		Good
6	7.7		Good
7	7.5		Good
8	7.3		Good
Sum	60.6		

Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

8
7
6
5
4
3
2
y
1
x

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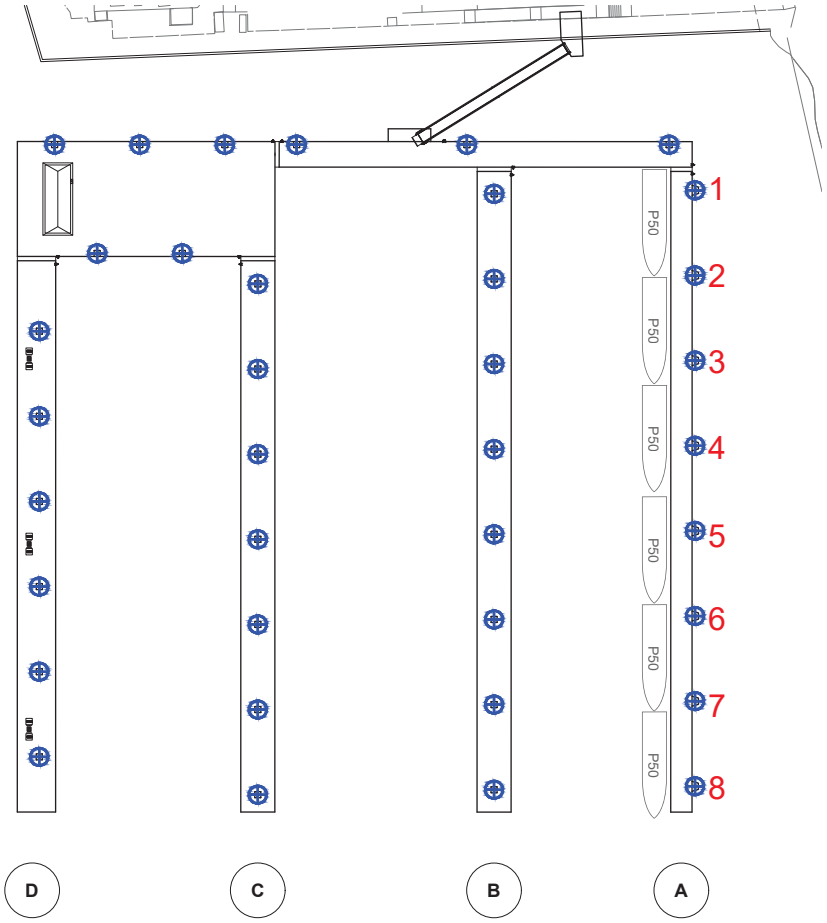
WAVE LOAD NEGLIGIBLE IN PARALLLEL DIRECTION.

GROUP 21 DOCKS

DOCK MODELED: Dock A

WIND LOADING PARALLEL TO FINGERS



Pile	Load (kips)	Capacity (kips)	Check
1	.5	16.4	Good
2	.5		Good
3	.5		Good
4	.5		Good
5	.5		Good
6	.5		Good
7	.5		Good
8	.5		Good
Sum	4.1		

Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

8
7
6
5
4
3
2
y
1
x

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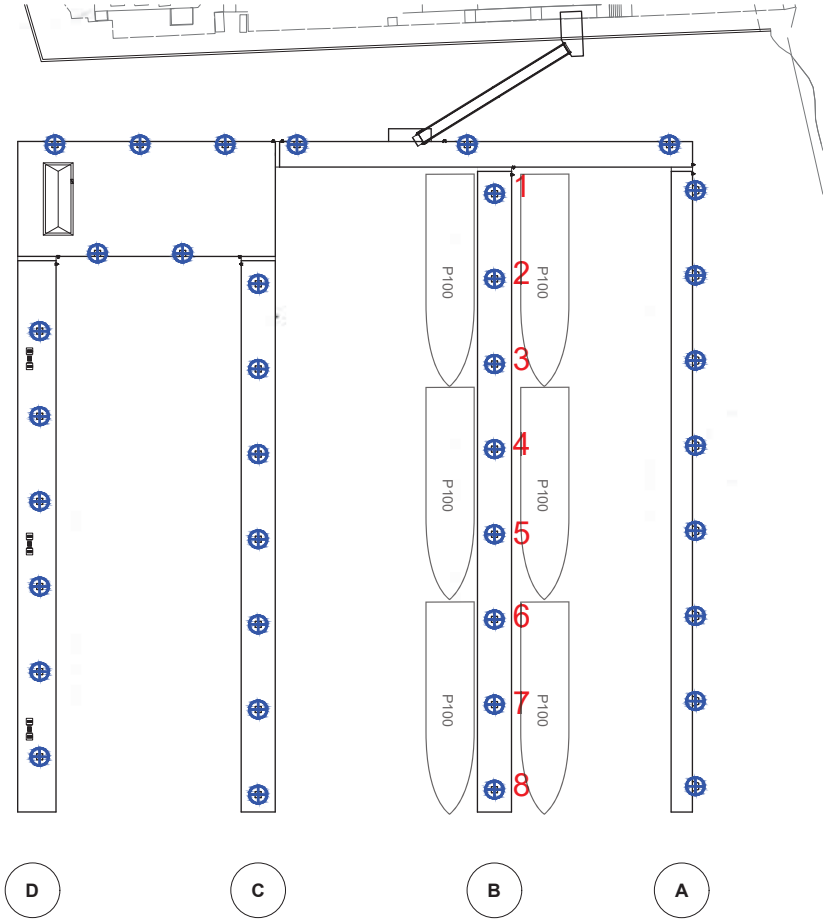
GROUP 22 DOCKS

DOCK MODELED: Dock B

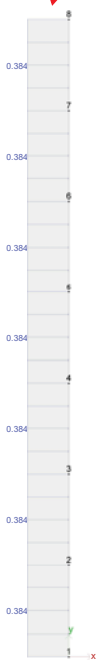
WIND LOADING PERPENDICULAR TO FINGERS



w = 1.0W+1.6WL

W = P90_100 / 100 ft = 326 plf
WL = 35 plf

w = 384 plf



Pile	Load (kips)	Capacity (kips)	Check
1	14.4	16.4	Good
2	14.5		Good
3	14.6		Good
4	14.7		Good
5	14.7		Good
6	14.6		Good
7	14.5		Good
8	14.4		Good
Sum	116.4		

Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

8
7
6
5
4
3
2
y
1
x

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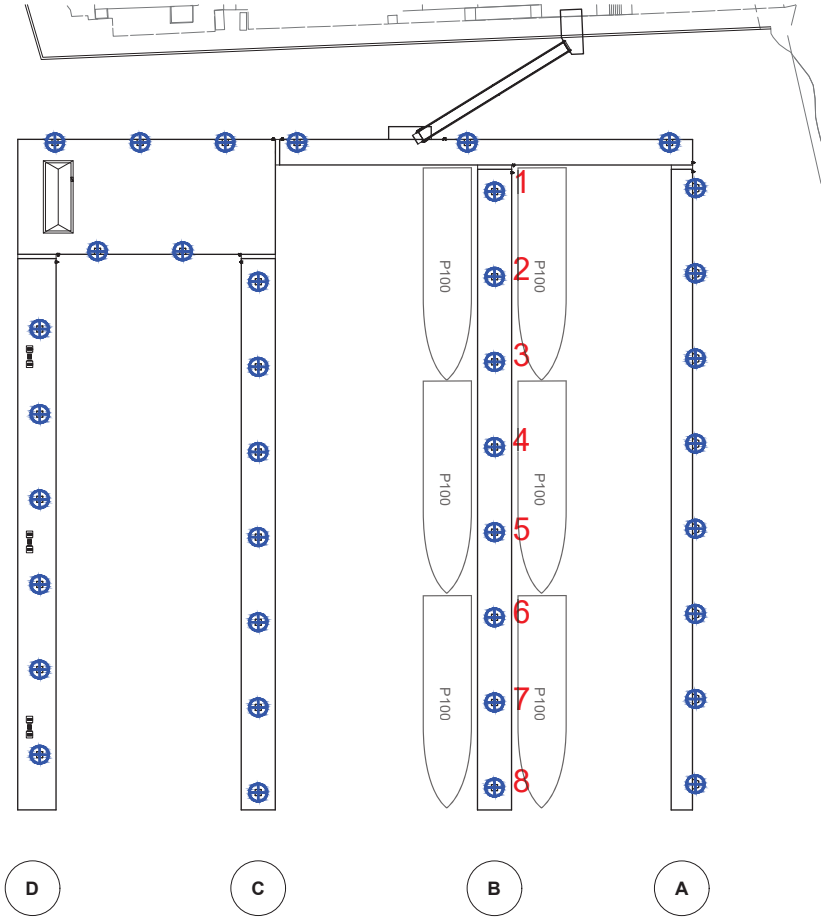
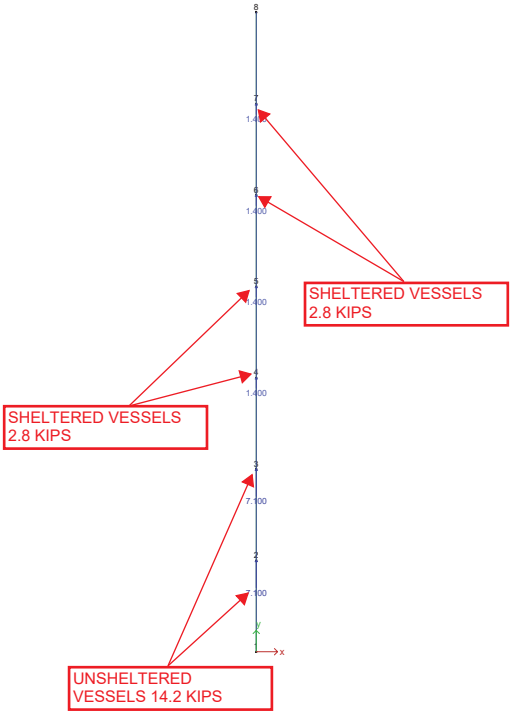
GROUP 22 DOCKS

DOCK MODELED: Dock B

WAVE LOAD NEGLIGIBLE IN PARALLLEL DIRECTION.

WIND LOADING PARALLEL TO FINGERS





Pile	Load (kips)	Capacity (kips)	Check
1	2.5	16.4	Good
2	2.5		Good
3	2.5		Good
4	2.5		Good
5	2.5		Good
6	2.5		Good
7	2.5		Good
8	2.5		Good
Sum	19.8		

Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

Plot View - Static Case: South Wind Defl. (in)

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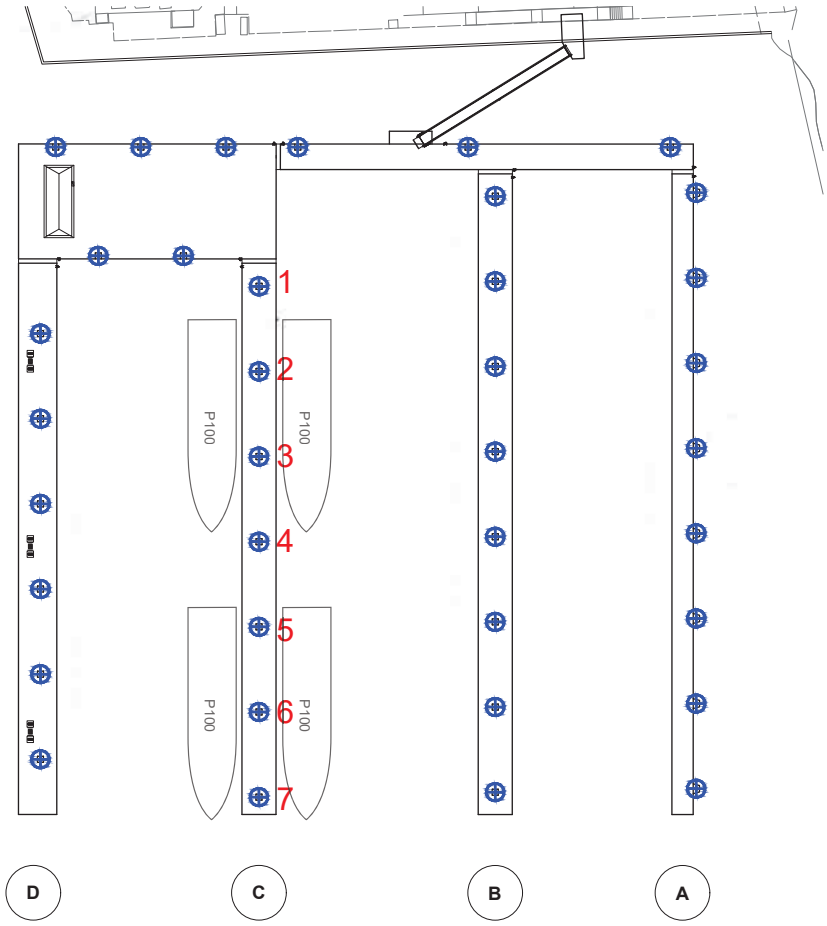
GROUP 23 DOCKS

DOCK MODELED: Dock C

WIND LOADING PERPENDICULAR TO FINGERS



w = 1.0W+1.6WL

W = P90_100 / 100 ft = 326 plf
WL = 35 plf

w = 384 plf

Pile	Load (kips)	Capacity (kips)	Check
1	11.8	16.4	Good
2	11.8		Good
3	11.9		Good
4	11.9		Good
5	11.9		Good
6	11.8		Good
7	11.8		Good
Sum	83		

Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

Plot View - Static Case: East Wind Defl. (in)

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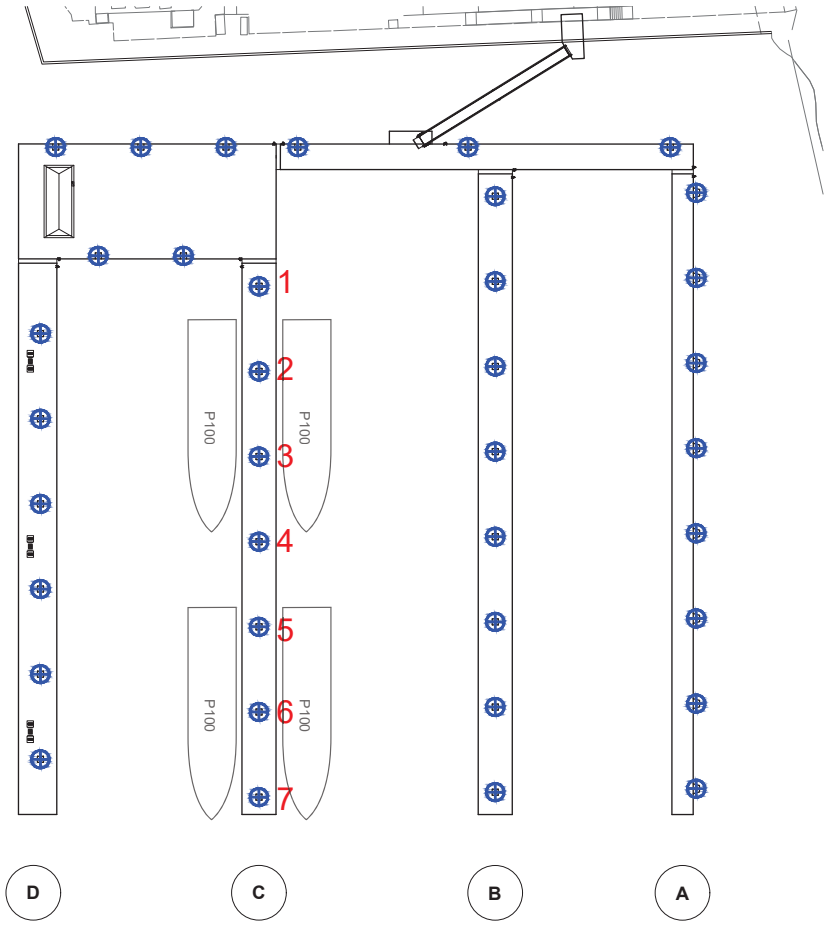
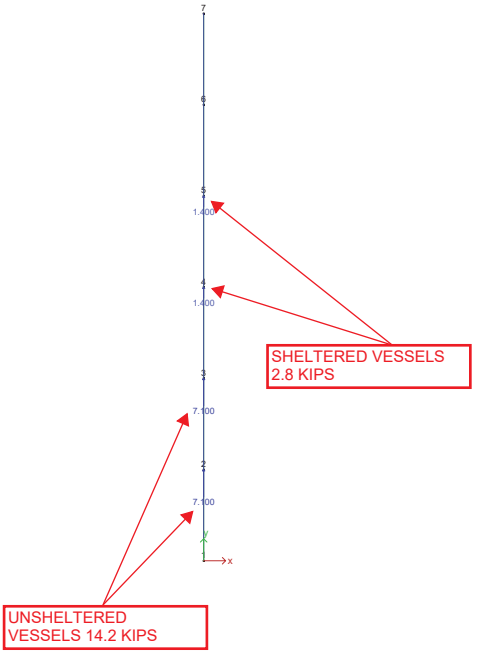
GROUP 23 DOCKS

DOCK MODELED: Dock C

WAVE LOAD NEGLIGIBLE IN PARALLLEL DIRECTION.

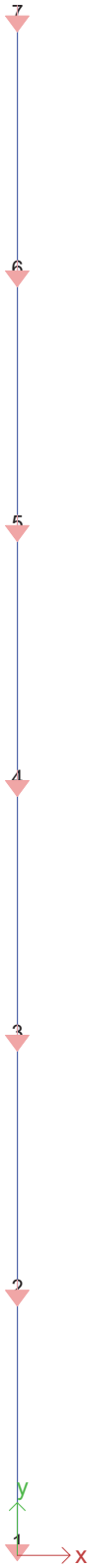
WIND LOADING PARALLEL TO FINGERS





Pile	Load (kips)	Capacity (kips)	Check
1	2.4	16.4	Good
2	2.4		Good
3	2.4		Good
4	2.4		Good
5	2.4		Good
6	2.4		Good
7	2.4		Good
Sum	17		

Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve



Plot View - Static Case: South Wind Defl. (in)

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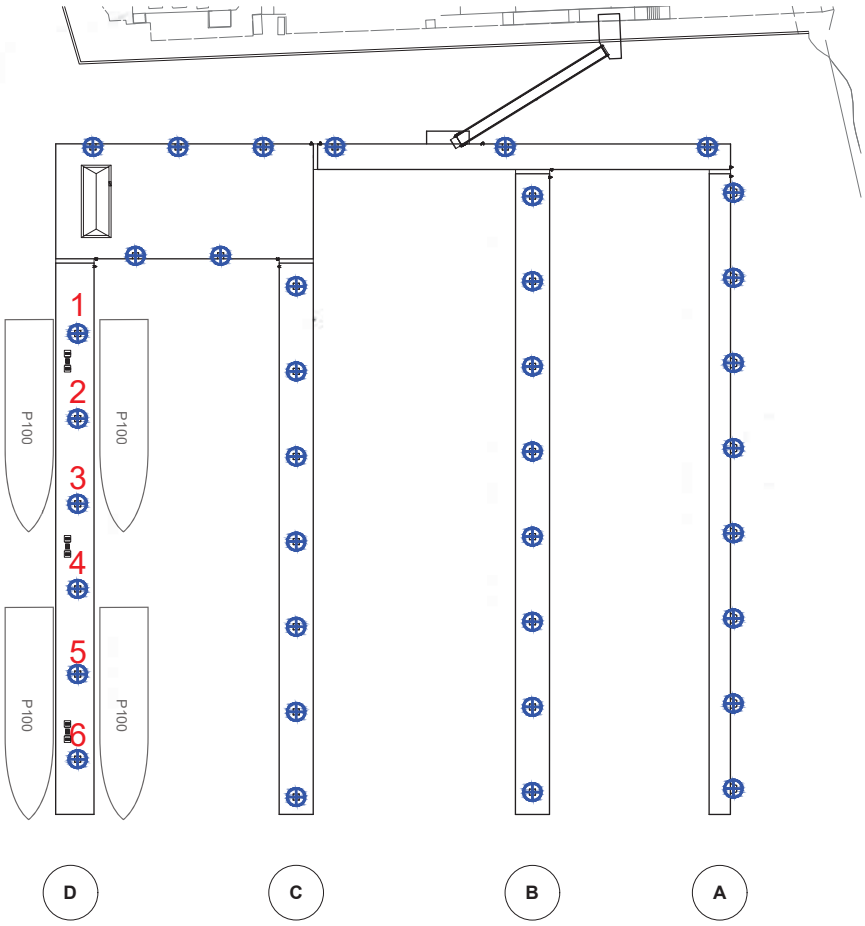
GROUP 24 DOCKS

DOCK MODELED: Fuel Dock D

WIND LOADING PERPENDICULAR TO FINGERS



w = 1.0W+1.6WL

W = P90_100 / 100 ft = 326 plf
WL = 35 plf

w = 384 plf

Pile	Load (kips)	Capacity (kips)	Check
1	13.8	16.4	Good
2	13.8		Good
3	13.8		Good
4	13.8		Good
5	13.8		Good
6	13.8		Good
Sum	83		

Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

8
7
6
5
4
3
2
y
1
x

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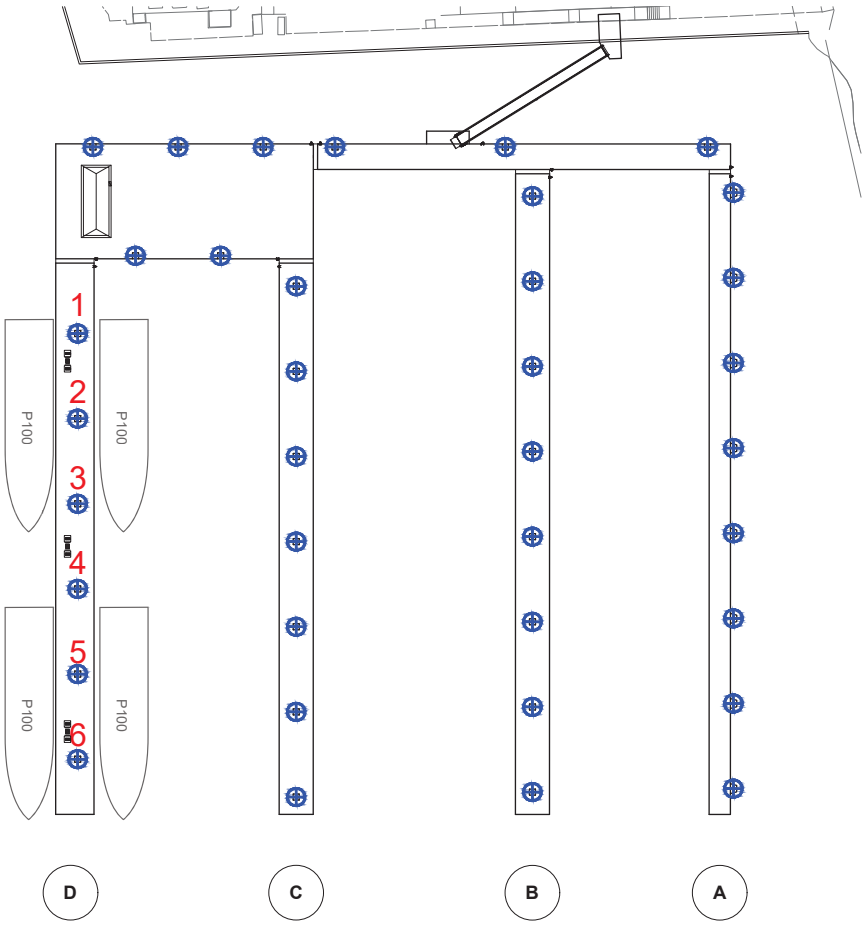
GROUP 24 DOCKS

DOCK MODELED: Fuel Dock D

WAVE LOAD NEGLIGIBLE IN PARALLLEL DIRECTION.

WIND LOADING PARALLEL TO FINGERS



Pile	Load (kips)	Capacity (kips)	Check
1	2.8	16.4	Good
2	2.8		Good
3	2.8		Good
4	2.8		Good
5	2.8		Good
6	2.8		Good
Sum	17		

Legend
⊕ 18" x 0.5" A252 Steel Pile w/ HDPE sleeve

Plot View - Static Case: South Wind Defl. (in)

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Concrete Module Design

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Concrete Module Summary

Concrete Module Width	Concrete Module Length	Module Type	Reinforcement				Bending Demand vs Capacity					Shear Demand vs Capacity				
			Top Bars		Bottom Bars		Lateral		Vertical		Combined Lateral & Vertical	Lateral		Vertical		Combined Lateral & Vertical
			Size	Qty	Size	Qty	Demand	Capacity	Demand	Capacity		Demand	Capacity	Demand	Capacity	
2'-7"	<= 30'	Cant. Finger	#4	2	#4	1	28.5	33.7	6.0	34.9	0.86	2.6	13.3	0.6	3.6	0.26
2'-7"	<= 35'	↓	#5	2	#5	↓	40.1	51.6	6.0	53.5	0.79	3.5	13.3	0.6	↓	0.31
3'-7"	<= 45'	↓	#6	2	#6	↓	95.2	106.3	8.4	74.9	0.90	5.8	18.7	0.9	↓	0.40
3'-7"	<= 50'	↓	#6	3	#6	↓	135.4	148.8	8.4	74.9	0.92	7.1	18.7	0.9	↓	0.45
3'-11 1/2"	<= 55'	End Pile Finger	#5	2	#5	↓	79.0	84.1	9.2	53.5	0.95	4.3	20.8	1.0	↓	0.35
4'-11 1/2"	<= 65'	↓	#6	2	#6	↓	130.4	151.7	11.6	74.9	0.87	6.0	26.2	1.2	↓	0.40
7'-6"	<= 20'	Walkway	#5	2	#5	↓	102.4	166.6	17.5	53.5	0.70	OK by Inspection		2.3	↓	
9'-6"	<= 20'	↓	#5	2	#5	↓	106.0	213.1	22.2	53.5	0.65	OK by Inspection		2.3	↓	

SEE FOLLOWING SHEETS FOR DEMAND AND CAPACITY CALCULATIONS

COMBINED LATERAL AND VERTICAL CALCULATED USING SUM OF SQUARES:

$$\sqrt{\left(\frac{D_{vertical}}{C_{vertical}}\right)^2+\left(\frac{D_{lateral}}{C_{lateral}}\right)^2}<1.0$$

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BERTH LENGTHS BY DOCK LOCATIONS

| Berth | DOCK NAME | | |

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Moment and Shear Capacity of Singlecast Floats for Lateral Loading

Concrete Width	ΦV_n [kips]	ΦM_n [ft-kips] Top Deck Reinforcement per Corner								
		#4			#5			#6		
		1 bar	2 bar	3 bar	1 bar	2 bar	3 bar	1 bar	2 bar	3 bar
2'-7"	13.3	18.3	33.7	46.5	28.2	51.6	70.2	39.7	72.0	
3'-7"	18.7	25.8	48.9	69.4	39.9	75.4	106.5	56.5	106.3	148.8
3'-11.5"	20.8	28.7	54.6	77.8	44.3	84.1	119.6	62.7	118.7	167.5
4'-11.5"	26.2	36.2	69.6	100.3	55.9	107.4	154.4	79.2	151.7	217.1
7'-6"	39.9	55.2	107.7	157.5	85.5	166.6	243.1	121.2	235.6	343.2
9'-6"	50.8	70.3	137.8	202.6	108.8	213.1	312.9	154.2	301.7	442.3

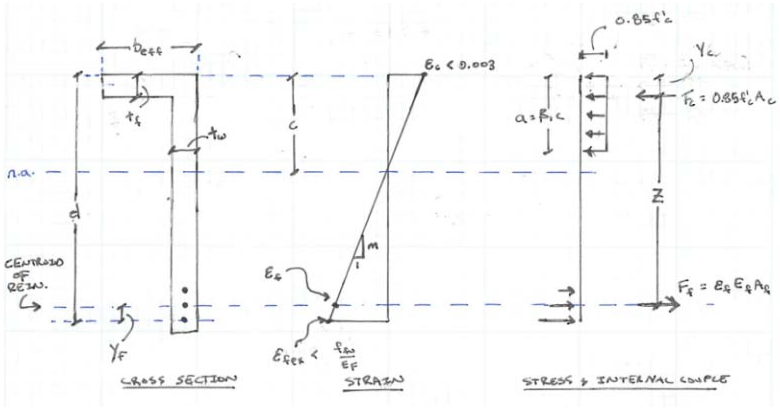
NOMINAL FLEXURAL STRENGTH CALCULATION BASED ON EQUALIBRIUM OF FORCES AND STRAIN COMPATIBILITY AS SHOWN IN THE DIAGRAM.

FAILURE IS GOVERNED BY FRP RUPTURE WHERE ffu = fu* x Ce.

COMPRESSION FORCES ARE APPROXIMATED WITH AN ACI RECTANGULAR STRESS BLOCK.

APPLY A STRENGTH REDUCTION FACTOR, Φ, EQUAL TO 0.55 (ACI 440.1R-15 7.2.3)

TENSILE REINFORCEMENT PROVIDED IS AT LEAST 1/3 GREATER THAN THAT REQUIRED BY ANALYSIS TO SATISFY MINIMUM REINFORCEMENT REQUIREMENTS (ACI 440.1R-15 7.2.4).



NOMINAL SHEAR STRENGTH CALCULATION CONSIDER RESISTANCE FROM TOP DECK ONLY. CONTRIBUTIONS FROM OTHER PORTIONS OF THE THE FLOAT MODULE ARE IGNORED.

APPLY A STRENGTH REDUCTION FACTOR, Φ, EQUAL TO 0.75 (ACI 440.1R-15 8.1.1)

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Moment and Shear Capacity of Singlecast Floats for Vertical Loading

Minimum Concrete Depth	ΦV_n [kips]	ΦM_n [ft-kips] Minimum Reinforcement per Corner					
		#4		#5		#6	
		1 bar	2 bar	1 bar	2 bar	1 bar	
2'-6"	3.6	34.9	68.3	53.5	0.0	74.9	
3'-0"	4.4	42.5	83.9	65.4	128.4	92.0	
3'-6"	5.2	50.1	99.2	77.3	152.1	108.9	

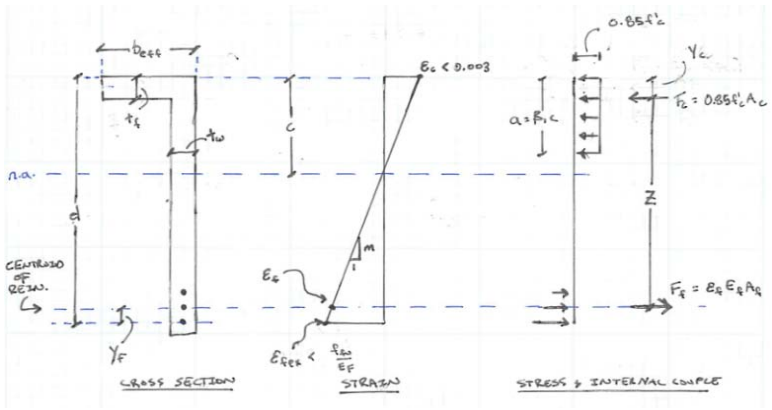
NOMINAL FLEXURAL STRENGTH CALCULATION BASED ON EQUALIBRIUM OF FORCES AND STRAIN COMPATIBILITY AS SHOWN IN THE DIAGRAM.

FAILURE IS GOVERNED BY FRP RUPTURE WHERE ffu = fu* x Ce.

COMPRESSION FORCES ARE APPROXIMATED WITH AN ACI RECTANGULAR STRESS BLOCK.

APPLY A STRENGTH REDUCTION FACTOR, Φ, EQUAL TO 0.55 (ACI 440.1R-15 7.2.3)

TENSILE REINFORCEMENT PROVIDED IS AT LEAST 1/3 GREATER THAN THAT REQUIRED BY ANALYSIS TO SATISFY MINIMUM REINFORCEMENT REQUIREMENTS (ACI 440.1R-15 7.2.4).



NOMINAL SHEAR STRENGTH CALCULATION CONSIDER RESISTANCE FROM SIDE WALLS ONLY. CONTRIBUTIONS FROM OTHER PORTIONS OF THE THE FLOAT MODULE ARE IGNORED.

APPLY A STRENGTH REDUCTION FACTOR, Φ, EQUAL TO 0.75 (ACI 440.1R-15 8.1.1)

REDUCE CAPACITY BY 0.5 SUCH THAT Vu DOES NOT EXCEED ΦVn/2 TO SATISFY MINIMUM REINFORCEMENT REQUIREMENTS (ACI 440.1R-15 8.2.2).

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Horizontal Loads

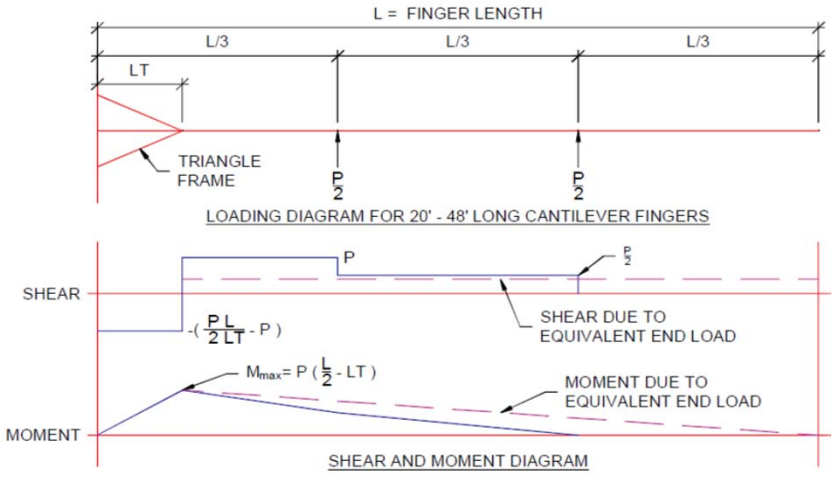
Wind Load Demand - Cantilever Fingers

19 = W [psf]
15% = H, %
6 = L_t [ft]

L [ft]	P_{90} [kips]	$V_{tri,max}$ [kips]	$V_{finger,max}$ [kips]	M_{max} [ft-kips]	V_u [kips]	M_u [ft-kips]
21	1.3	0.9	1.3	5.7	1.3	5.7
25	1.8	1.9	1.8	11.6	1.8	11.6
30	2.6	3.8	2.6	23.1	2.6	23.1
35	3.5	6.7	3.5	40.1	3.5	40.1
40	4.6	10.6	4.6	63.8	4.6	63.8
45	5.8	15.9	5.8	95.2	5.8	95.2
50	7.1	22.6	7.1	135.4	7.1	135.4

W = wind pressure on unsheltered vessels
H = vessel profile height as a percentage of vessel length
L = finger and vessel length
L_T = triangle frame length along finger
M_{max} = moment at end of triangle frame due to loading shown below
V_u = 1.0 x V_{max}
M_u = 1.0 x M_{max}

P_{90} = vessel beam wind load
$V_{tri,max}$ = max. shear within triangle frame zone
$V_{finger,max}$ = max. shear outside of triangle frame zone



* EQUIVALENT END LOAD PRODUCES A MOMENT EQUAL TO THE VESSEL WIND LOAD MOMENT AT THE END OF THE TRIANGLE FRAME
** FINGERS LONGER THAN 48' ARE MODELED WITH THREE POINT LOADS AT THE 1/4 POINTS. EQUIVALENT END LOAD CALCULATION IS THE SAME.

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Horizontal Loads

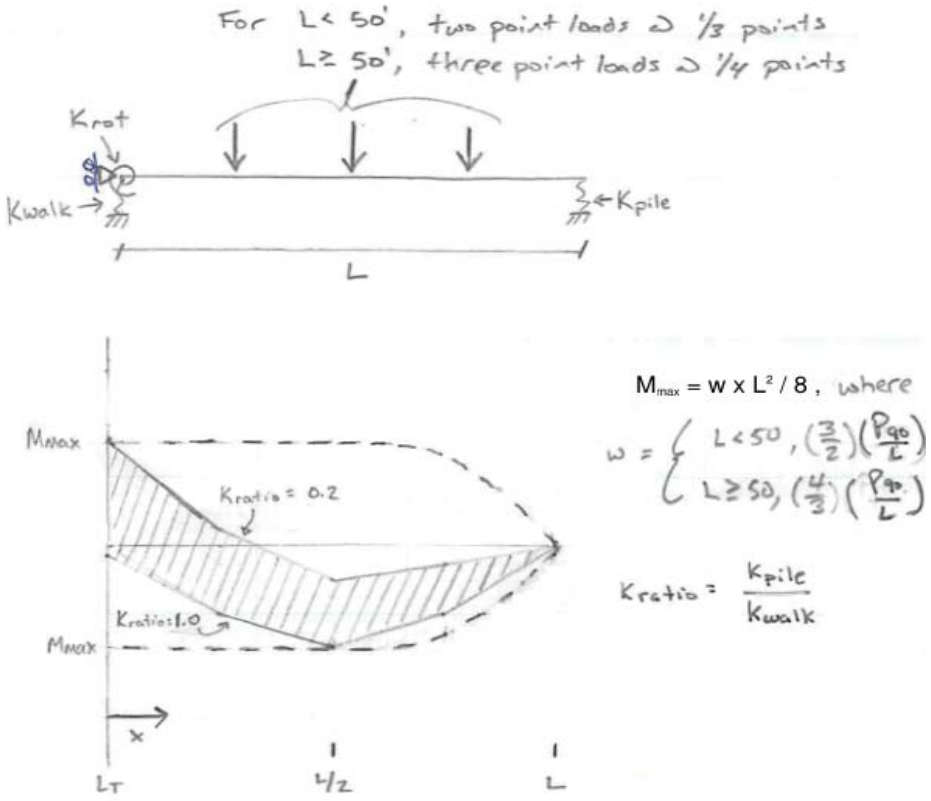
Wind Load Demand - Fingers with End Piles

19 = W [psf]
15% = H, %
6 = L_t [ft]

L [ft]	P_{90} [kips]	$V_{tri,max}$ [kips]	$V_{finger,max}$ [kips]	M_{max} [ft-kips]	V_u [kips]	M_u [ft-kips]
55	8.6	13.2	4.3	79.0	4.3	79.0
60	10.3	17.1	5.1	102.6	5.1	102.6
65	12.0	21.7	6.0	130.4	6.0	130.4

W = wind pressure on unsheltered vessels
H = vessel profile height as a percentage of vessel length
L = finger and vessel length
L_T = triangle frame length along finger
M_{max} = moment at end of triangle frame due to loading shown below
V_u = 1.0 x V_{max}
M_u = 1.0 x M_{max}

P_{90} = vessel beam wind load
$V_{tri,max}$ = max. shear within triangle frame zone
$V_{finger,max}$ = max. shear outside of triangle frame zone



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Horizontal Loads

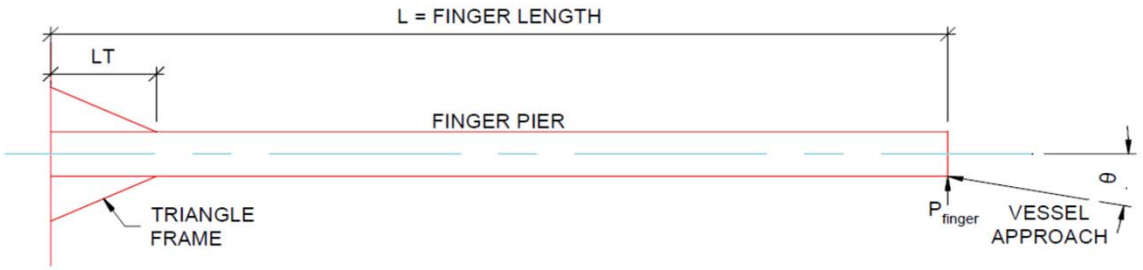
Vessel Berthing Demand

Vessel Data		
V =	1.2	kts
V =	2.0	ft/s
θ =	10	degrees off of centerline of float

Structure Data		
$K_{connection}$	300	ft-kip/deg
L_t	6	ft
E_{finger}	3600	ksi

L [ft]	W_f [ft]	I_{yy} [in^4]	K_{dock} [kips/in]	Wt_v [kips]	P_{finger} [kips]	$V_{finger,max}$ [kips]	M_{max} [ft-kips]	V_u [kips]	M_u [ft-kips]
21	2'-7"	15470	2.48	5.3	0.8	0.8	11.7	1.2	18.7
25	↓	↓	1.67	7.5	0.8	0.8	14.5	1.2	23.1
30	↓	↓	1.10	10.8	0.7	0.7	17.8	1.2	28.5
35	↓	↓	0.77	14.7	0.7	0.7	21.0	1.2	33.5
40	3'-7"	34037	0.71	19.2	0.8	0.8	26.9	1.3	43.0
45	↓	↓	0.54	24.3	0.8	0.8	30.4	1.2	48.7
50	↓	↓	0.43	30.0	0.8	0.8	33.9	1.2	54.2

V = vessel velocity
θ = approach angle
$K_{connection}$ = connection stiffness
E_{finger} = finger modulus of elasticity
L = finger and vessel length
W_f = concrete float width
I_{yy} = I_{gross}/2 to account for cracking. Assumed 36" deep float. Float depths from 30"-42" have neglible effects on the results.
K_{dock} = finger stiffness
P_{finger} = equivalent lateral load to finger end
L_t = triangle frame length
Wt_v = vessel weight
$V_{finger,max}$ = max. shear outside of triangle frame zone
M_{max} = maximum moment
V_u = 1.6 x V_{max}
M_u = 1.6 x M_{max}
Note: berthing calculation based upon conservation of energy principals and dock stiffness



VESSEL BERTHING DIAGRAM FOR CANTILEVER FINGERS

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Vertical Loads - Waves

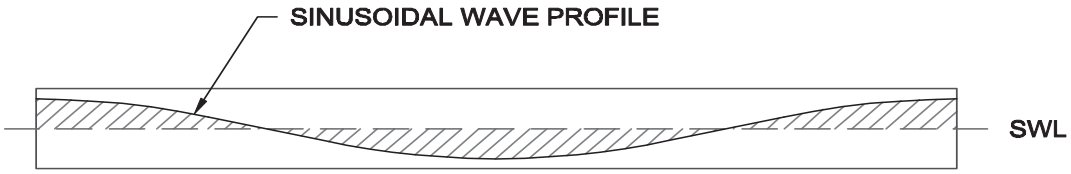
Quasi Static Wave Bending Demand

H_s =	1.0	ft
L_{wave} =	30	ft
ρ_{water} =	64	pcf

W [ft]	V_{max} [kips]	M_{max} [ft-kips]	V_u [kips]	M_u [ft-kips]
2'-7"	0.4	3.8	0.6	6.0
3'-7"	0.5	5.2	0.9	8.4
3'-11.5"	0.6	5.8	1.0	9.2
4'-11.5"	0.8	7.2	1.2	11.6
7'-6"	1.1	10.9	1.8	17.5
9'-6"	1.5	13.9	2.3	22.2

H_{max} = wave height
L_{wave} = wave length
ρ_{water} = salt water density
L = maximum float length
W = concrete float width
V = shear
M = moment

V_u = 1.6*V_{max}
M_u = 1.6*M_{max}



$V_{MAX} = \rho * W * \frac{H}{2} * \frac{L}{2\pi}$

$M_{MAX} = \rho * W * H * (\frac{L}{2\pi})^2$

WAVE LOADING

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Lifting and Handling - Maximum Allowable Float Length

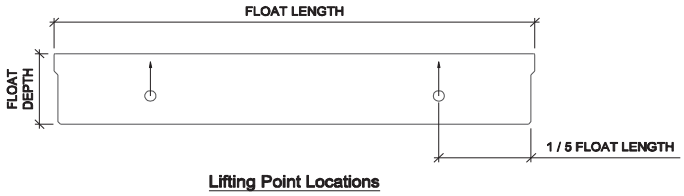
Design Criteria:

- Reinforcing Criteria determines maximum lifting length based on LRFD design.
- Cracking Criteria determines maximum lifting length based on minimum concrete strength and factor of safety = 3.0
- Section properties are derived from minimum wall and deck thicknesses.
- Sections with thicker walls than the minimum values will require deeper float depths to maintain design freeboard.
- Sections with depths greater than the minimum are acceptible because capacity increases faster than demand with increasing depth.
- Concrete strength is minimum value at the time of lifting.

Demand:

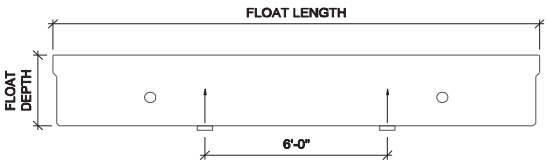
- Two Load Cases

Case 1: floats picked at L / 5 from float end - controls bottom reinforcing



Lifting Point Locations

Case 2: floats picked with fork lift at mid float - controls top reinforcing



Lifting Point Locations

Design Freeboard =	18	in
Water Density =	64	pcf
Concrete Weight γ_c =	125	pcf
Lightweight concrete factor, λ =	0.85	
Load Factor =	1.4	
Impact Factor =	1.8	
Factor of safety for cracking =	3.0	
Strength reduction factor, flexure ϕ_f =	0.9	

Floats

Float width		2'-7"	3'-7"	4'	5'	7'-6"	9'-6"		
Min. Depth	(in)	40	36	34	34	32	32		
Reinf. (per corner)		1 - #4 Bars	1 - #6 Bars	1 - #5 Bars	1 - #6 Bars	1 - #5 Bars	1 - #5 Bars		
Concrete Strength	psi	1500	2000	2500	3000	1500	1500		

Maximum Lifting Length

L_{max} (ft)	Case 1	53	53	56	57	44	39		
	Case 2	28	32	30	32	24	22		

Strength Criteria

L_{max} (ft)	Case 1	54	70	58	61	44	39		
	Case 2	28	35	30	32	24	22		

Cracking Criteria

L_{max} (ft)	Case 1	53	53	56	57	48	47		
	Case 2	30	32	34	35	30	30		

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FRP Wale Design

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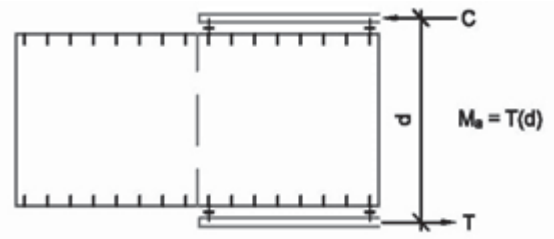
FRP Wale Design Check

The concrete walkway modules are connected by FRP wales secured with 3/4" diameter FRP thru bolts.

Check Lateral Bending:

Lateral bending is resisted by the moment couple between the wales.



Tension/compression in the wales is transferred to the concrete module through the FRP thru bolts. Bearing capacity is the controlling factor for this connection. Testing indicates a strength level bearing capacity at this connection equal to 7.8 kips.

Calculate lateral bending capacity considering the narrowest walkway:

$w := 7\ ft + 6\ in$ minimum walkway width

$d := w$

$n := 2$ minimum number of FRP bolts per wale per float module

$R_b := 7.8\ kip$ bolt bearing capacity

$\phi Mn := w \cdot n \cdot R_b = 117\ ft \cdot kip$ > Mu = 106 ft-kip

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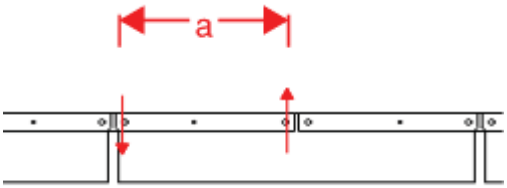
FRP Wale Design Check (cont.)

Check Vertical Bending:

Vertical moment is resisted by major axis bending in the FRP.



Bending in the wale is transferred to the concrete module through the FRP thru bolts. Bearing capacity is the controlling factor for this connection. Testing indicates a strength level bearing capacity at this connection equal to 7.8 kips.

Calculate vertical bending capacity. Compare capacity against demand from the widest walkway:

$a := 6\ ft$	minimum distance between FRP bolts
$R_b := 7.8\ kip$	bolt bearing capacity
$\phi Mn := 2 \cdot a \cdot R_b = 93.6\ ft \cdot kip$	> Mu = 22.2 ft-kip

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Post Tension Outer Basin Dock Design

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10' WIDE PT DOCK

Global Dock Capacities:

Concrete properties:

$f'_c := 5000\ psi$ $\lambda := 0.85$ sand lightweight concrete (optional)

Dock geometry:

$b := 10\ ft$ $h := 5\ ft$ float width and depth

$t_{deck_top} := 3.5\ in$ minimum deck thickness

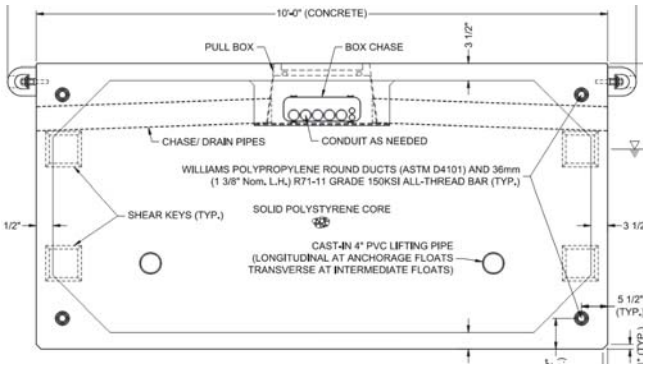
$t_{deck_bot} := 3.5\ in$ minimum bottom thickness

$t_{side_wall} := 3.5\ in$ minimum wall thickness

$A := 1499\ in^2$ cross sectional area

$S_x := 30206\ in^3$ vertical section modulus

$S_y := 51055\ in^3$ lateral section modulus



Post tensioning:

$A_p := 1.58\ in^2$ 1 3/8 150 ksi Williams Bar area

$F_{pu} := 237\ kip$ ultimate strength

$F_{lo} := 0.7\ F_{pu} = 165.9\ kip$ lock off load

$\sigma_{lo} := \frac{F_{lo}}{A_p} = 105\ ksi$ bar stress at lock off load

$\sigma_{loss} := 22\ ksi$ pre-stress loss due to creep and other factors
(ref: CALTRANS Prestress Manual Appendix D)

$\sigma_b := \sigma_{lo} - \sigma_{loss}$ bar stress after losses

$n := 4$ number of bars

$P_{pre} := n \cdot \sigma_b \cdot A_p = 524.6\ kip$ total pre-load

$\sigma_{pre} := \frac{P_{pre}}{A} = 350\ psi$ pre-compression in concrete

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Global Dock Capacities (continued):

Shear capacity across the module joints due to friction:

$\phi_v := 0.75$

$\mu := 0.6$ coefficient of friction, ACI 318-14 Table 22.9.4.2

$\phi V_{n_friction} := \phi_v \cdot P_{pre} \cdot \mu = 236.1\ \textbf{kip}$

Vertical zero tension capacity, no gap at joints:

$M_{0_vert} := \sigma_{pre} \cdot S_x = 881\ \textbf{ft} \cdot \textbf{kip}$

Check compression, limit stress to 0.45 f'c:

$\frac{0.45 \cdot f'_c}{\left(\frac{M_{0_vert}}{S_x}\right)} = 6.4$ OK

Vertical strength level bending capacity:

$\phi_b := 0.9$

$Z_v := h - 6.25\ \textbf{in} = 53.75\ \textbf{in}$

$\phi M_{n_vert} := \phi_b \cdot 2 \cdot F_{pu} \cdot Z_v = 1911\ \textbf{ft} \cdot \textbf{kip}$

Vertical strength level shear capacity:

$\phi_v := 0.75$ calculations per ACI 318-14

$b_w := 2 \cdot t_{side_wall} = 7\ \textbf{in}$

$d_{vertical} := h - \frac{t_{deck_top}}{2} = 58.3\ \textbf{in}$

$V_c := 5 \cdot \lambda \cdot \sqrt{f'_c} \cdot \sqrt{\textbf{psi}} \cdot b_w \cdot d_{vertical} = 122.5\ \textbf{kip}$ prestress beam shear capacity per 22.5.8.2(c)

$A_v := 0.029\ \textbf{in}^2$ $s := 4\ \textbf{in}$ $f_y := 56\ \textbf{ksi}$ 4x4xW2.9 full cage mesh

$V_s := 2 \cdot \frac{A_v \cdot f_y \cdot d_{vertical}}{s} = 47.3\ \textbf{kip}$

$\phi V_{n_vert} := \phi_v \cdot (V_c + V_s) = 127.4\ \textbf{kip}$

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Global Dock Capacities (continued):

Lateral zero tension capacity, no gap at joints:

$M_{0_lat} := \sigma_{pre} \cdot S_y = 1489\ ft \cdot kip$

Check compression, limit stress to 0.45 f'c:

$\frac{0.45 \cdot f'_c}{\left(\frac{M_{0_lat}}{S_x}\right)} = 3.8$ OK

Lateral strength level shear capacity:

$\phi_v := 0.75$ calculations per ACI 318-14

$b_w := t_{deck_top} + t_{deck_bot} = 7\ in$

$d_{lateral} := b - \frac{t_{side_wall}}{2} = 118.25\ in$

$V_c := 5 \cdot \lambda \cdot \sqrt{f'_c} \cdot \sqrt{psi} \cdot b_w \cdot d_{lateral} = 248.8\ kip$ prestressed beam shear capacity per 22.5.8.2(c)

$A_v := 0.029\ in^2$ $s := 4\ in$ $f_y := 56\ ksi$ 4x4xW2.9 full cage mesh

$V_s := 2 \cdot \frac{A_v \cdot f_y \cdot d_{lateral}}{s} = 96.019\ kip$

$\phi V_{n_lat} := \phi_v \cdot (V_c + V_s) = 258.6\ kip$

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Lateral Demand, 1.0W + 1.6WL:

Wind:

$P_{90_50} := 7.1\ kip$ 50 ft vessel

$W := \frac{P_{90_50}}{50\ ft} = 0.1\ klf$

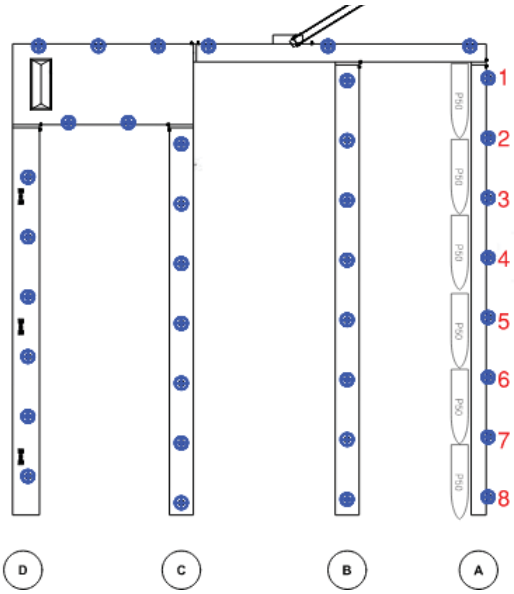
Wave:

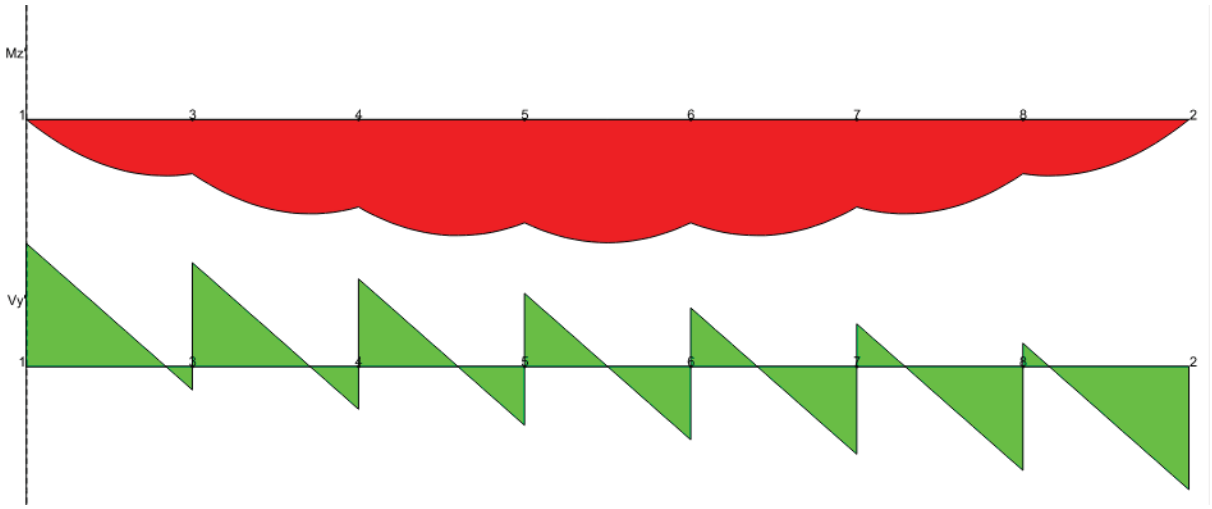
$\rho := 64\ \frac{lb}{ft^3}$ $H_s := 2.1\ ft$

$WL := \left(\frac{1}{8}\right) \cdot \rho \cdot g \cdot (H_s)^2 = 35.3\ \frac{lbf}{ft}$

Combined:

$w := 1.0 \cdot W + 1.6 \cdot WL = 0.2\ klf$





$M_u := 290\ ft \cdot kip$ $\frac{M_u}{M_{0_lat}} = 0.19$ OK

$V_u := 7.3\ kip$ $\frac{V_u}{\phi V_{n_lat}} = 0.03$ OK

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Vertical Wave Demand:

Calculate vertical wave demand using a quasi-static method. Use a sinusoidal wave profile with amplitude equal to the Hs. Apply a load factor of 1.6 and compare to zero tension capacity.

Wave Characteristics:

$\rho_{water} := 64\ pcf$

$H_s := 2.1\ ft$

$L := 50\ ft$

Calculate Vertical Wave Demand:

$M_u := 1.6 \cdot \rho_{water} \cdot b \cdot H_s \cdot \left(\frac{L}{2 \cdot \pi}\right)^2 = 136.2\ ft \cdot kip$

$\frac{M_u}{M_{0_vert}} = 0.15$ OK

$V_u := 1.6 \cdot \rho_{water} \cdot b \cdot \left(\frac{H_s}{2}\right) \cdot \left(\frac{L}{2 \cdot \pi}\right) = 8.6\ kip$

$\frac{V_u}{\phi V_{n_vert}} = 0.07$ OK

Combined Lateral and Vertical:

Bending:

$\sqrt{\left(\frac{M_u}{M_{0_vert}}\right)^2 + \left(\frac{M_u}{M_{0_lat}}\right)^2} = 0.2$ OK

Shear:

$\sqrt{\left(\frac{V_u}{\phi V_{n_vert}}\right)^2 + \left(\frac{V_u}{\phi V_{n_lat}}\right)^2} = 7.5 \cdot 10^{-2}$ OK

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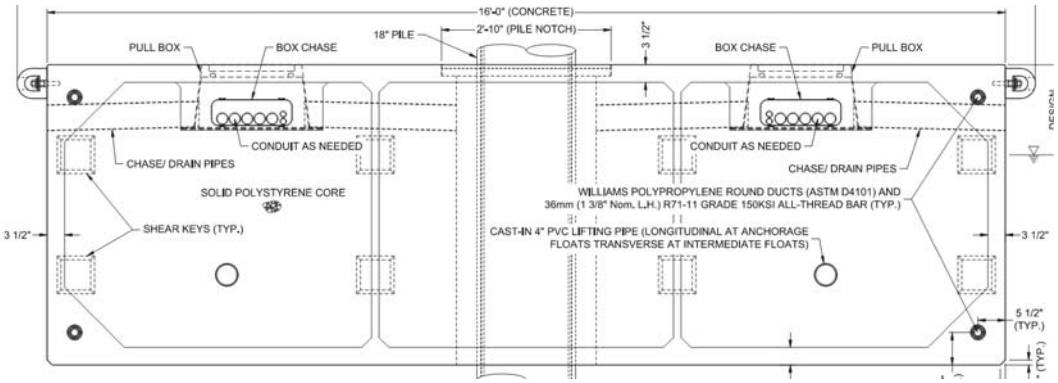
16' WIDE PT DOCK

Global Dock Capacities:



Concrete properties:

$f'_c := 5000\ psi$ $\lambda := 0.85$ sand lightweight concrete (optional)

Dock geometry:

$b := 16\ ft$ $h := 5\ ft$ float width and depth

$t_{deck_top} := 3.5\ in$ $t_{deck_bot} := 3.5\ in$ $t_{side_wall} := 3.5\ in$ minimum deck, bottom and wall thickness

$A := 2003\ in^2$ cross sectional area

$S_x := 43631\ in^3$ $S_y := 100862\ in^3$ vertical and lateral section modulus

Post tensioning:

$A_p := 1.58\ in^2$ 1 3/8 150 ksi Williams Bar area

$F_{pu} := 237\ kip$ ultimate strength

$F_{lo} := 0.7\ F_{pu} = 165.9\ kip$ lock off load

$\sigma_{lo} := \frac{F_{lo}}{A_p} = 105\ ksi$ bar stress at lock off load

$\sigma_{loss} := 22\ ksi$ pre-stress loss due to creep and other factors
(ref: CALTRANS Prestress Manual Appendix D)

$\sigma_b := \sigma_{lo} - \sigma_{loss}$ bar stress after losses

$n := 4$ number of bars

$P_{pre} := n \cdot \sigma_b \cdot A_p = 524.6\ kip$ total pre-load

$\sigma_{pre} := \frac{P_{pre}}{A} = 262\ psi$ pre-compression in concrete

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Global Dock Capacities (continued):

Shear capacity across the module joints due to friction:

$\phi_v := 0.75$

$\mu := 0.6$ coefficient of friction, ACI 318-14 Table 22.9.4.2

$\phi V_{n_friction} := \phi_v \cdot P_{pre} \cdot \mu = 236.1\ \textbf{kip}$

Vertical zero tension capacity, no gap at joints:

$M_{0_vert} := \sigma_{pre} \cdot S_x = 952\ \textbf{ft} \cdot \textbf{kip}$

Check compression, limit stress to 0.45 f'c:

$\frac{0.45 \cdot f'_c}{\left(\frac{M_{0_vert}}{S_x}\right)} = 8.6$ OK

Vertical strength level bending capacity:

$\phi_b := 0.9$

$Z_v := h - 6.25\ \textbf{in} = 53.75\ \textbf{in}$

$\phi M_{n_vert} := \phi_b \cdot 2 \cdot F_{pu} \cdot Z_v = 1911\ \textbf{ft} \cdot \textbf{kip}$

Vertical strength level shear capacity:

$\phi_v := 0.75$ calculations per ACI 318-14

$b_w := 2 \cdot t_{side_wall} = 7\ \textbf{in}$

$d_{vertical} := h - \frac{t_{deck_top}}{2} = 58.3\ \textbf{in}$

$V_c := 5 \cdot \lambda \cdot \sqrt{f'_c} \cdot \sqrt{\textbf{psi}} \cdot b_w \cdot d_{vertical} = 122.5\ \textbf{kip}$ prestress beam shear capacity per 22.5.8.2(c)

$A_v := 0.029\ \textbf{in}^2$ $s := 4\ \textbf{in}$ $f_y := 56\ \textbf{ksi}$ 4x4xW2.9 full cage mesh

$V_s := 2 \cdot \frac{A_v \cdot f_y \cdot d_{vertical}}{s} = 47.3\ \textbf{kip}$

$\phi V_{n_vert} := \phi_v \cdot (V_c + V_s) = 127.4\ \textbf{kip}$

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Global Dock Capacities (continued):

Lateral zero tension capacity, no gap at joints:

$M_{0_lat} := \sigma_{pre} \cdot S_y = 2201\ ft \cdot kip$

Check compression, limit stress to 0.45 f'c:

$\frac{0.45 \cdot f'_c}{\left(\frac{M_{0_lat}}{S_x}\right)} = 3.7$ OK

Lateral strength level shear capacity:

$\phi_v := 0.75$ calculations per ACI 318-14

$b_w := t_{deck_top} + t_{deck_bot} = 7\ in$

$d_{lateral} := b - \frac{t_{side_wall}}{2} = 190.25\ in$

$V_c := 5 \cdot \lambda \cdot \sqrt{f'_c} \cdot \sqrt{psi} \cdot b_w \cdot d_{lateral} = 400.2\ kip$ prestressed beam shear capacity per 22.5.8.2(c)

$A_v := 0.029\ in^2$ $s := 4\ in$ $f_y := 56\ ksi$ 4x4xW2.9 full cage mesh

$V_s := 2 \cdot \frac{A_v \cdot f_y \cdot d_{lateral}}{s} = 154.483\ kip$

$\phi V_{n_lat} := \phi_v \cdot (V_c + V_s) = 416\ kip$

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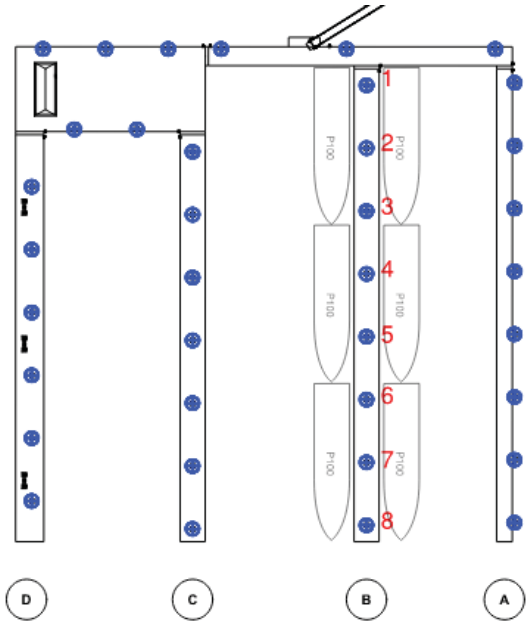
Lateral Demand, 1.0W + 1.6WL:



Wind:

$P_{90_100} := 28.5\ kip$ $P_{90S_100} := 1\ kip$ 100 ft vessel

$W := \frac{1.15\ P_{90_100}}{100\ ft} = 0.3\ klf$

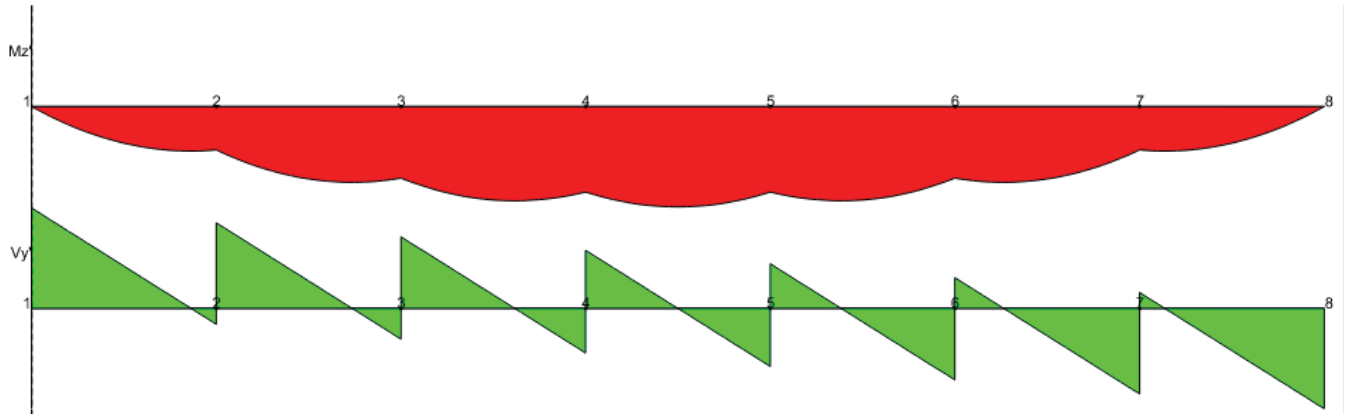
Wave:

$\rho := 64\ \frac{lb}{ft^3}$ $H_s := 2.1\ ft$

$WL := \left(\frac{1}{8}\right) \cdot \rho \cdot g \cdot (H_s)^2 = 35.3\ \frac{lbf}{ft}$

Combined:

$w := 1.0 \cdot W + 1.6 \cdot WL = 0.38\ klf$



$M_u := 598\ ft \cdot kip$ $\frac{M_u}{M_{0_lat}} = 0.27$ OK

$V_u := 14.2\ kip$ $\frac{V_u}{\phi V_{n_lat}} = 0.03$ OK

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Vertical Wave Demand:

Calculate vertical wave demand using a quasi-static method. Use a sinusoidal wave profile with amplitude equal to the Hs. Apply a load factor of 1.6 and compare to zero tension capacity.

Wave Characteristics:

$\rho_{water} := 64\ pcf$

$H_s := 2.1\ ft$

$L := 50\ ft$

Calculate Vertical Wave Demand:

$M_u := 1.6 \cdot \rho_{water} \cdot b \cdot H_s \cdot \left(\frac{L}{2 \cdot \pi}\right)^2 = 217.9\ ft \cdot kip$

$\frac{M_u}{M_{0_vert}} = 0.23$ OK

$V_u := 1.6 \cdot \rho_{water} \cdot b \cdot \left(\frac{H_s}{2}\right) \cdot \left(\frac{L}{2 \cdot \pi}\right) = 13.7\ kip$

$\frac{V_u}{\phi V_{n_vert}} = 0.11$ OK

Combined Lateral and Vertical:

Bending:

$\sqrt{\left(\frac{M_u}{M_{0_vert}}\right)^2 + \left(\frac{M_u}{M_{0_lat}}\right)^2} = 0.2$ OK

Shear:

$\sqrt{\left(\frac{V_u}{\phi V_{n_vert}}\right)^2 + \left(\frac{V_u}{\phi V_{n_lat}}\right)^2} = 0.1$ OK

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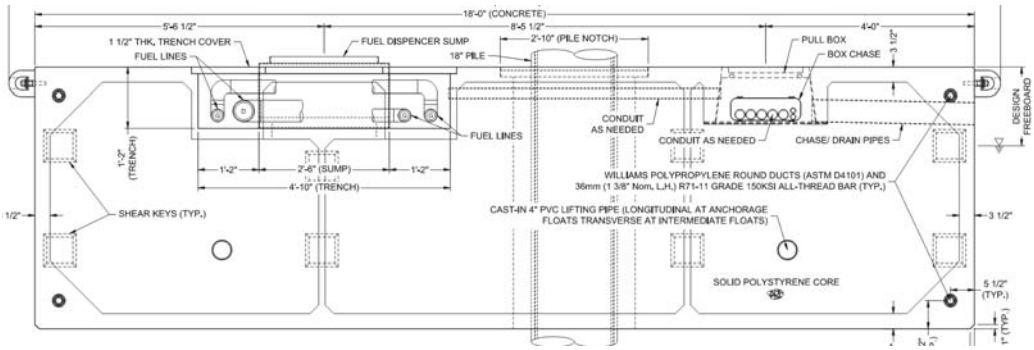
18' WIDE PT DOCK

Global Dock Capacities:



Concrete properties:

$f'_c := 5000\ psi$ $\lambda := 0.85$ sand lightweight concrete (optional)

Dock geometry:

$b := 18\ ft$ $h := 5\ ft$ float width and depth

$t_{deck_top} := 3.5\ in$ $t_{deck_bot} := 3.5\ in$ $t_{side_wall} := 3.5\ in$ minimum deck, bottom and wall thickness

$A := 2171\ in^2$ cross sectional area

$S_x := 48105\ in^3$ $S_y := 120171\ in^3$ vertical and lateral section modulus

Post tensioning:

$A_p := 1.58\ in^2$ 1 3/8 150 ksi Williams Bar area

$F_{pu} := 237\ kip$ ultimate strength

$F_{lo} := 0.7\ F_{pu} = 165.9\ kip$ lock off load

$\sigma_{lo} := \frac{F_{lo}}{A_p} = 105\ ksi$ bar stress at lock off load

$\sigma_{loss} := 22\ ksi$ pre-stress loss due to creep and other factors (ref: CALTRANS Prestress Manual Appendix D)

$\sigma_b := \sigma_{lo} - \sigma_{loss}$ bar stress after losses

$n := 4$ number of bars

$P_{pre} := n \cdot \sigma_b \cdot A_p = 524.6\ kip$ total pre-load

$\sigma_{pre} := \frac{P_{pre}}{A} = 242\ psi$ pre-compression in concrete

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Global Dock Capacities (continued):

Shear capacity across the module joints due to friction:

$\phi_v := 0.75$

$\mu := 0.6$ coefficient of friction, ACI 318-14 Table 22.9.4.2

$\phi V_{n_friction} := \phi_v \cdot P_{pre} \cdot \mu = 236.1\ \textbf{kip}$

Vertical zero tension capacity, no gap at joints:

$M_{0_vert} := \sigma_{pre} \cdot S_x = 969\ \textbf{ft} \cdot \textbf{kip}$

Check compression, limit stress to 0.45 f'c:

$\frac{0.45 \cdot f'_c}{\left(\frac{M_{0_vert}}{S_x}\right)} = 9.3$ OK

Vertical strength level bending capacity:

$\phi_b := 0.9$

$Z_v := h - 6.25\ \textbf{in} = 53.75\ \textbf{in}$

$\phi M_{n_vert} := \phi_b \cdot 2 \cdot F_{pu} \cdot Z_v = 1911\ \textbf{ft} \cdot \textbf{kip}$

Vertical strength level shear capacity:

$\phi_v := 0.75$ calculations per ACI 318-14

$b_w := 2 \cdot t_{side_wall} = 7\ \textbf{in}$

$d_{vertical} := h - \frac{t_{deck_top}}{2} = 58.3\ \textbf{in}$

$V_c := 5 \cdot \lambda \cdot \sqrt{f'_c} \cdot \sqrt{\textbf{psi}} \cdot b_w \cdot d_{vertical} = 122.5\ \textbf{kip}$ prestress beam shear capacity per 22.5.8.2(c)

$A_v := 0.029\ \textbf{in}^2$ $s := 4\ \textbf{in}$ $f_y := 56\ \textbf{ksi}$ 4x4xW2.9 full cage mesh

$V_s := 2 \cdot \frac{A_v \cdot f_y \cdot d_{vertical}}{s} = 47.3\ \textbf{kip}$

$\phi V_{n_vert} := \phi_v \cdot (V_c + V_s) = 127.4\ \textbf{kip}$

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Global Dock Capacities (continued):

Lateral zero tension capacity, no gap at joints:

$M_{0_lat} := \sigma_{pre} \cdot S_y = 2420\ ft \cdot kip$

Check compression, limit stress to 0.45 f'c:

$\frac{0.45 \cdot f'_c}{\left(\frac{M_{0_lat}}{S_x}\right)} = 3.7$ OK

Lateral strength level shear capacity:

$\phi_v := 0.75$ calculations per ACI 318-14

$b_w := t_{deck_top} + t_{deck_bot} = 7\ in$

$d_{lateral} := b - \frac{t_{side_wall}}{2} = 214.25\ in$

$V_c := 5 \cdot \lambda \cdot \sqrt{f'_c} \cdot \sqrt{psi} \cdot b_w \cdot d_{lateral} = 450.7\ kip$ prestressed beam shear capacity per 22.5.8.2(c)

$A_v := 0.029\ in^2$ $s := 4\ in$ $f_y := 56\ ksi$ 4x4xW2.9 full cage mesh

$V_s := 2 \cdot \frac{A_v \cdot f_y \cdot d_{lateral}}{s} = 173.971\ kip$

$\phi V_{n_lat} := \phi_v \cdot (V_c + V_s) = 468.5\ kip$

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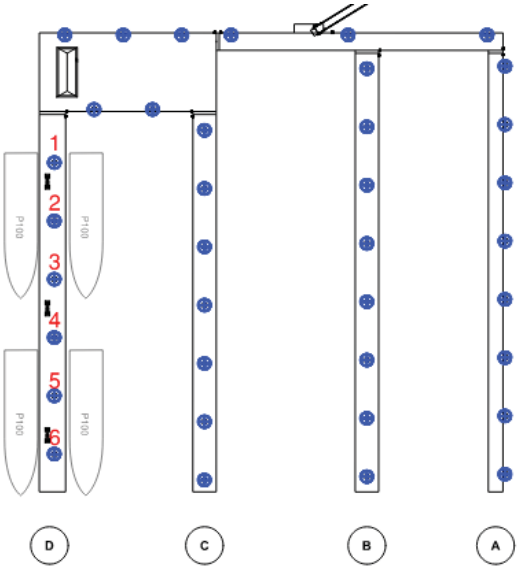
Lateral Demand, 1.0W + 1.6WL:

Wind:

$P_{90_100} := 28.5\ kip$ $P_{90S_100} := 1\ kip$

$W := \frac{1.15\ P_{90_100}}{100\ ft} = 0.3\ klf$



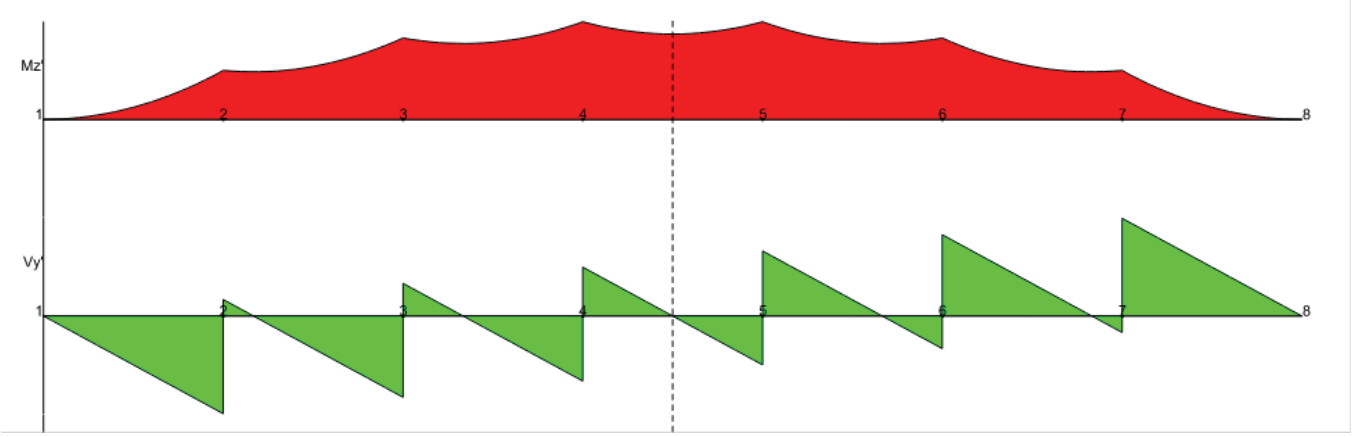
Wave:

$\rho := 64\ \frac{lb}{ft^3}$ $H_s := 2.1\ ft$

$WL := \left(\frac{1}{8}\right) \cdot \rho \cdot g \cdot (H_s)^2 = 35.3\ \frac{lbf}{ft}$

Combined:

$w := 1.0 \cdot W + 1.6 \cdot WL = 0.38\ klf$



$M_u := 361\ ft \cdot kip$ $\frac{M_u}{M_{0_lat}} = 0.15$ OK

$V_u := 11.7\ kip$ $\frac{V_u}{\phi V_{n_lat}} = 0.02$ OK

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Vertical Wave Demand:

Calculate vertical wave demand using a quasi-static method. Use a sinusoidal wave profile with amplitude equal to the Hs. Apply a load factor of 1.6 and compare to zero tension capacity.

Wave Characteristics:

$\rho_{water} := 64\ pcf$

$H_s := 2.1\ ft$

$L := 50\ ft$

Calculate Vertical Wave Demand:

$M_u := 1.6 \cdot \rho_{water} \cdot b \cdot H_s \cdot \left(\frac{L}{2 \cdot \pi}\right)^2 = 245.1\ ft \cdot kip$

$\frac{M_u}{M_{0_vert}} = 0.25$ OK

$V_u := 1.6 \cdot \rho_{water} \cdot b \cdot \left(\frac{H_s}{2}\right) \cdot \left(\frac{L}{2 \cdot \pi}\right) = 15.4\ kip$

$\frac{V_u}{\phi V_{n_vert}} = 0.12$ OK

Combined Lateral and Vertical:

Bending:

$\sqrt{\left(\frac{M_u}{M_{0_vert}}\right)^2 + \left(\frac{M_u}{M_{0_lat}}\right)^2} = 0.3$ OK

Shear:

$\sqrt{\left(\frac{V_u}{\phi V_{n_vert}}\right)^2 + \left(\frac{V_u}{\phi V_{n_lat}}\right)^2} = 0.1$ OK

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Pile Guides and Tri-Frames

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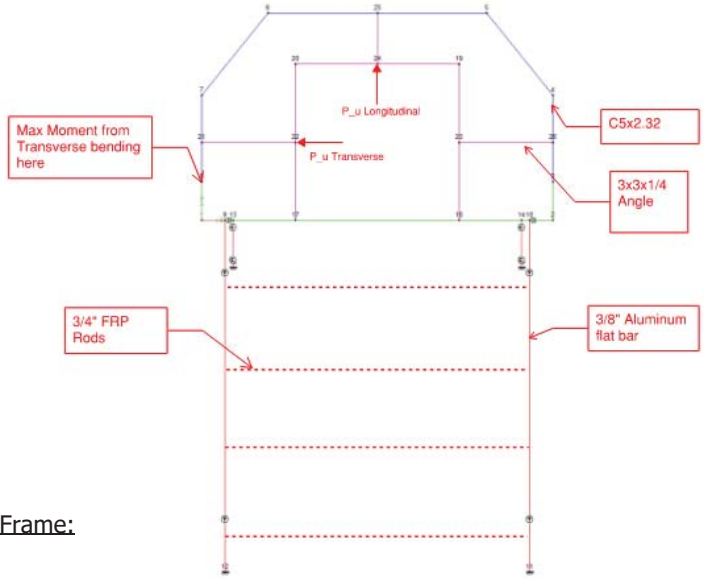
PILE GUIDE DESIGN:

$P_u := 7\ kip$ maximum pile load, see pile analysis in previous section

$\phi := 0.9$



Check Aluminum C-Channel Frame:

$M_{u_c} := 0.78\ ft \cdot kip$ maximum bending demand from model (transverse loading controls)

$Z := 3.55\ in^3$ plastic modulus of C5x2.32 channel

$F_{tuw} := 24\ ksi$ 6061 Al tensile rupture limit state, Welded (Al Design Manual 2020)

$\phi M_{nu} := \phi \cdot Z \cdot F_{tuw} = 6.4\ kip \cdot ft$ C5x2.32 channel flexure capacity OK

Check 3/4" FRP Thru Rods:

$V_u := \frac{(0.5 \cdot P_u)}{4} = 0.9\ kip$ 1/2 P_u load shared between (4) rods

$\phi V_n := \phi \cdot 13.5\ kip = 12.2\ kip$ Pultron 3/4" FRP Rod Shear Capacity OK

Check 3/8" Aluminum Flat Bar

$T_u := \frac{P_u}{(2 \cdot 4)} = 0.9\ kip$ max tensile load per flat bar

$A_e := \left(\left(\frac{3}{8} \cdot 4\right) - \frac{\pi}{4} \cdot 1^2\right) \cdot \left(in^2\right) = 0.7\ in^2$ net area through cross section

$\phi P_{nt} := \phi \cdot F_{tuw} \cdot A_e = 15.44\ kip$ rupture net tensile capacity OK

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PILE GUIDE DESIGN (continued):

Check 3x3x1/4 Angle

$M_{u_a} := 0.5\ kip \cdot ft$ — maximum bending demand from model (longitudinal loading controls)

$Z_a := 1.02\ in^3$ — plastic section modulus

$\phi M_{nu} := \phi \cdot Z_a \cdot F_{tuw} = 1.8\ kip \cdot ft$ — 3x3x1/4 angle channel flexure capacity — OK

$P_x := 4.4\ kip$ — maximum compression demand from model

$F_{cyw} := 15\ ksi$ — compressive yield strength of weld-affected member

$A_g := 1.44\ in^2$ — gross cross sectional area

$\phi P_{nc} := \phi \cdot F_{cyw} \cdot A_g = 19.4\ kip$ — nominal member buckling strength — OK

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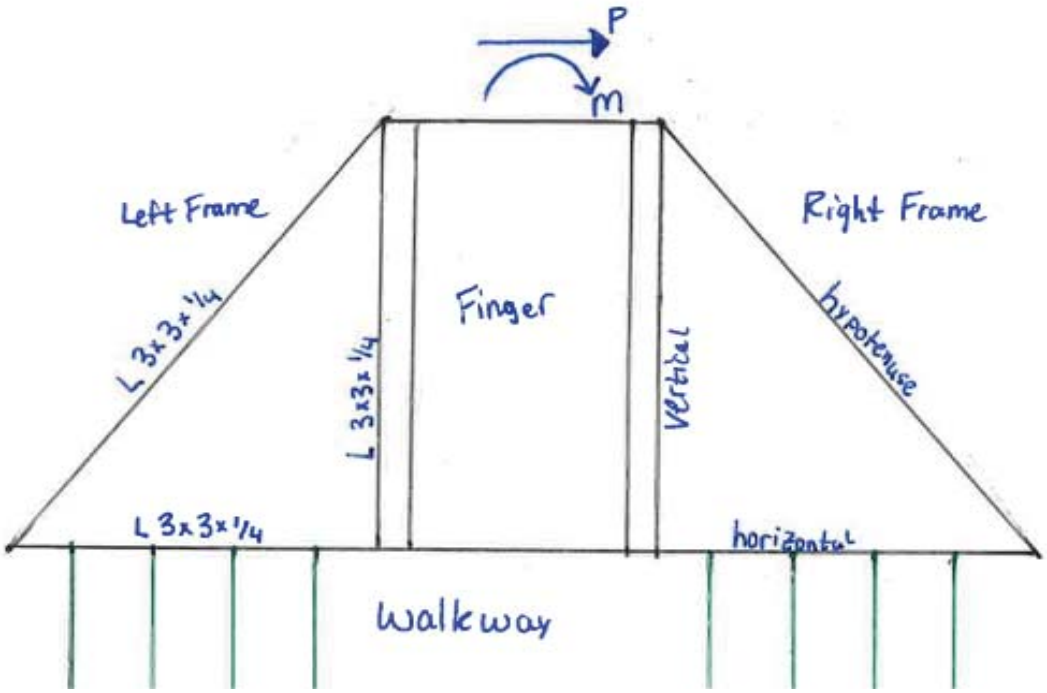
4'x4' Triangle Frame Element Capacity Check

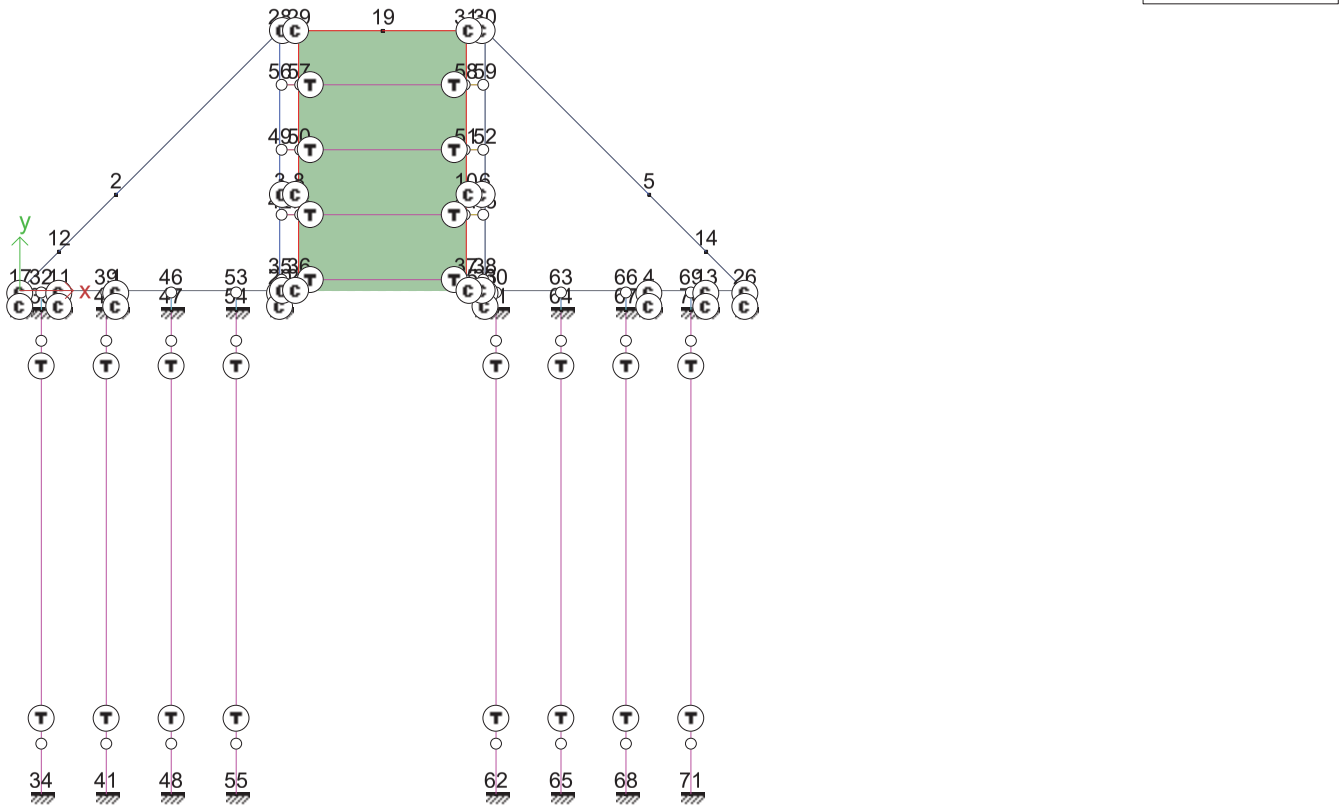
2.6	= P [kips]
28.5	= M [ft-kips]

Maximum load on 30' cantilever finger, see Concrete Module Design in previous section

Element Capacities per AISC 360-16

	Element	M_{max} [ft-kips]	V_{max} [kips]	C_{max} [kips]	T_{max} [kips]	ΦM_n [ft-kips]	ΦV_n [kips]	ΦC_n [kips]	ΦT_n [kips]
Left Frame	Vertical Angle	0.7	1.2	1.0	0.0	2.3	14.6	46.7	46.7
	Horizontal Angle	0.6	1.0	1.1	0.2				
	Hypotenuse Angle	0.2	0.0	0.0	1.5				
Right Frame	Vertical Angle	0.6	1.0	0.0	4.9				
	Horizontal Angle	0.7	3.7	0.0	4.9				
	Hypotenuse Angle	0.2	0.0	6.7	0.0				
Thru Rods	Finger				3.3				14.4
	Walkway				3.2				




Sections
CompressionLink
L3x3x.25
Rigid
ThruRod
WalkwayShear
FingerShear
Patch Material
(No Material)
y
x
2
5
12
14
19
26
34
41
48
55
62
65
68
71

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
1	1		Compressi	1	0.091	0.000	0.000	0.000	0.000	0.000
2	1		Compressi	7	-0.091	0.000	0.000	0.000	0.000	0.000
3	2		Compressi	3	1.476	0.000	0.000	0.000	0.000	0.000
4	2		Compressi	8	-1.476	0.000	0.000	0.000	0.000	0.000
5	3		Compressi	4	0.403	0.000	0.000	0.000	0.000	0.000
6	3		Compressi	9	-0.403	0.000	0.000	0.000	0.000	0.000
7	4		Compressi	6	1.602	0.000	0.000	0.000	0.000	0.000
8	4		Compressi	10	-1.602	0.000	0.000	0.000	0.000	0.000
9	5		Compressi	11	0.000	0.000	0.000	0.000	0.000	0.000
10	5		Compressi	15	0.000	0.000	0.000	0.000	0.000	0.000
11	6		Compressi	13	0.053	0.000	0.000	0.000	0.000	0.000
12	6		Compressi	16	-0.053	0.000	0.000	0.000	0.000	0.000
13	7		L3x3x.25	1	0.995	-0.257	0.000	0.000	0.000	-0.271
14	7		L3x3x.25	39	-0.995	0.257	0.000	0.000	0.000	0.233
15	8		L3x3x.25	56	1.499	-1.581	0.000	0.000	0.000	-0.959
16	8		L3x3x.25	28	-1.499	1.581	0.000	0.000	0.000	-0.358
17	9		L3x3x.25	2	-2.178	0.058	0.000	0.000	0.000	-0.081
18	9		L3x3x.25	12	2.178	-0.058	0.000	0.000	0.000	0.153
19	10		L3x3x.25	20	0.413	-1.089	0.000	0.000	0.000	0.271
20	10		L3x3x.25	53	-0.413	1.089	0.000	0.000	0.000	-0.997
21	11		L3x3x.25	28	-2.178	0.058	0.000	0.000	0.000	-0.153
22	11		L3x3x.25	2	2.178	-0.058	0.000	0.000	0.000	0.358
23	12		L3x3x.25	26	-6.928	0.036	0.000	0.000	0.000	0.007
24	12		L3x3x.25	13	6.928	-0.036	0.000	0.000	0.000	0.015
25	13		L3x3x.25	30	-7.019	1.496	0.000	0.000	0.000	0.901
26	13		L3x3x.25	59	7.019	-1.496	0.000	0.000	0.000	0.345
27	14		L3x3x.25	26	9.862	-0.064	0.000	0.000	0.000	-0.039
28	14		L3x3x.25	14	-9.862	0.064	0.000	0.000	0.000	-0.015
29	15		L3x3x.25	4	-6.561	-0.420	0.000	0.000	0.000	-0.157
30	15		L3x3x.25	66	6.561	0.420	0.000	0.000	0.000	0.009
31	16		L3x3x.25	5	9.862	-0.064	0.000	0.000	0.000	-0.345
32	16		L3x3x.25	30	-9.862	0.064	0.000	0.000	0.000	0.118
33	17		Rigid	57	0.000	0.000	0.000	0.000	0.000	0.000
34	17		Rigid	29	0.000	-0.000	0.000	0.000	0.000	-0.000
35	18		Rigid	58	0.000	0.000	0.000	0.000	0.000	0.000
36	18		Rigid	31	0.000	-0.000	0.000	0.000	0.000	-0.000
37	19		Rigid	19	0.000	-0.000	0.000	0.000	0.000	-0.000
38	19		Rigid	31	0.000	0.000	0.000	0.000	0.000	-0.000
39	20		ThruRod	32	-1.696	0.000	0.000	0.000	0.000	0.000
40	20		ThruRod	34	1.696	0.000	0.000	0.000	0.000	0.000
41	21		WalkwayS	32	-0.000	0.294	0.000	0.000	0.000	0.000
42	21		WalkwayS	33	0.000	-0.294	0.000	0.000	0.000	0.086
43	22		ThruRod	35	-5.259	0.000	0.000	0.000	0.000	0.000
44	22		ThruRod	38	5.259	0.000	0.000	0.000	0.000	0.000

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
45	23		FingerShea	35	-0.000	-0.394	0.000	0.000	0.000	0.000
46	23		FingerShea	36	0.000	0.394	0.000	0.000	0.000	-0.115
47	24		FingerShea	38	-0.000	0.378	0.000	0.000	0.000	0.000
48	24		FingerShea	37	0.000	-0.378	0.000	0.000	0.000	0.110
49	25		Compressi	17	0.000	0.000	0.000	0.000	0.000	0.000
50	25		Compressi	18	0.000	0.000	0.000	0.000	0.000	0.000
51	26		L3x3x.25	32	1.581	1.499	0.000	0.000	0.000	0.032
52	26		L3x3x.25	17	-1.581	-1.499	0.000	0.000	0.000	0.468
53	27		L3x3x.25	20	-0.085	5.536	0.000	0.000	0.000	0.997
54	27		L3x3x.25	35	0.085	-5.536	0.000	0.000	0.000	-0.074
55	28		L3x3x.25	12	-2.178	0.058	0.000	0.000	0.000	-0.032
56	28		L3x3x.25	17	2.178	-0.058	0.000	0.000	0.000	0.081
57	29		L3x3x.25	46	0.995	-0.165	0.000	0.000	0.000	-0.233
58	29		L3x3x.25	1	-0.995	0.165	0.000	0.000	0.000	0.092
59	30		L3x3x.25	69	-6.561	-0.017	0.000	0.000	0.000	-0.009
60	30		L3x3x.25	4	6.561	0.017	0.000	0.000	0.000	-0.003
61	31		L3x3x.25	23	-5.434	-5.496	0.000	0.000	0.000	-1.140
62	31		L3x3x.25	38	5.434	5.496	0.000	0.000	0.000	0.224
63	32		L3x3x.25	14	9.862	-0.064	0.000	0.000	0.000	-0.118
64	32		L3x3x.25	5	-9.862	0.064	0.000	0.000	0.000	0.039
65	33		L3x3x.25	60	-5.496	5.434	0.000	0.000	0.000	1.140
66	33		L3x3x.25	23	5.496	-5.434	0.000	0.000	0.000	-0.234
67	34		Rigid	22	0.000	-0.000	0.000	0.000	0.000	-0.000
68	34		Rigid	36	0.000	0.000	0.000	0.000	0.000	-0.000
69	35		Rigid	25	0.000	-0.000	0.000	0.000	0.000	-0.000
70	35		Rigid	37	0.000	0.000	0.000	0.000	0.000	-0.000
71	36		Rigid	29	0.000	0.000	0.000	0.000	0.000	-0.000
72	36		Rigid	19	0.000	0.000	0.000	0.000	0.000	-0.000
73	37		ThruRod	39	-0.060	0.000	0.000	0.000	0.000	0.000
74	37		ThruRod	41	0.060	0.000	0.000	0.000	0.000	0.000
75	38		WalkwayS	39	-0.000	0.292	0.000	0.000	0.000	0.000
76	38		WalkwayS	40	0.000	-0.292	0.000	0.000	0.000	0.085
77	39		ThruRod	42	-1.145	0.000	0.000	0.000	0.000	0.000
78	39		ThruRod	45	1.145	0.000	0.000	0.000	0.000	0.000
79	40		FingerShea	42	0.000	-0.395	0.000	0.000	0.000	0.000
80	40		FingerShea	43	-0.000	0.395	0.000	0.000	0.000	-0.115
81	41		FingerShea	45	-0.000	0.390	0.000	0.000	0.000	0.000
82	41		FingerShea	44	0.000	-0.390	0.000	0.000	0.000	0.114
83	42		Compressi	20	1.004	0.000	0.000	0.000	0.000	0.000
84	42		Compressi	21	-1.004	0.000	0.000	0.000	0.000	0.000
85	43		L3x3x.25	11	1.287	-0.197	0.000	0.000	0.000	-0.468
86	43		L3x3x.25	32	-1.287	0.197	0.000	0.000	0.000	0.414
87	44		L3x3x.25	35	0.309	0.278	0.000	0.000	0.000	0.074
88	44		L3x3x.25	42	-0.309	-0.278	0.000	0.000	0.000	0.203

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
89	45		L3x3x.25	53	0.704	-0.363	0.000	0.000	0.000	-0.092
90	45		L3x3x.25	46	-0.704	0.363	0.000	0.000	0.000	-0.271
91	46		L3x3x.25	13	-6.928	-0.017	0.000	0.000	0.000	0.003
92	46		L3x3x.25	69	6.928	0.017	0.000	0.000	0.000	-0.007
93	47		L3x3x.25	45	-5.812	-0.237	0.000	0.000	0.000	-0.224
94	47		L3x3x.25	38	5.812	0.237	0.000	0.000	0.000	-0.014
95	48		L3x3x.25	63	-5.845	0.784	0.000	0.000	0.000	0.234
96	48		L3x3x.25	60	5.845	-0.784	0.000	0.000	0.000	0.550
97	49		Rigid	36	0.000	0.000	0.000	0.000	0.000	0.000
98	49		Rigid	43	0.000	-0.000	0.000	0.000	0.000	0.000
99	50		Rigid	37	0.000	0.000	0.000	0.000	0.000	0.000
100	50		Rigid	44	0.000	-0.000	0.000	0.000	0.000	0.000
101	51		ThruRod	46	-0.198	0.000	0.000	0.000	0.000	0.000
102	51		ThruRod	48	0.198	0.000	0.000	0.000	0.000	0.000
103	52		WalkwayS	46	-0.000	0.291	0.000	0.000	0.000	0.000
104	52		WalkwayS	47	0.000	-0.291	0.000	0.000	0.000	0.085
105	53		ThruRod	49	0.000	0.000	0.000	0.000	0.000	0.000
106	53		ThruRod	52	0.000	0.000	0.000	0.000	0.000	0.000
107	54		FingerShea	49	-0.000	-0.396	0.000	0.000	0.000	0.000
108	54		FingerShea	50	0.000	0.396	0.000	0.000	0.000	-0.116
109	55		FingerShea	52	0.000	0.402	0.000	0.000	0.000	0.000
110	55		FingerShea	51	-0.000	-0.402	0.000	0.000	0.000	0.117
111	56		Compressi	20	5.950	0.000	0.000	0.000	0.000	0.000
112	56		Compressi	22	-5.950	0.000	0.000	0.000	0.000	0.000
113	57		L3x3x.25	39	1.287	-0.197	0.000	0.000	0.000	-0.414
114	57		L3x3x.25	11	-1.287	0.197	0.000	0.000	0.000	0.271
115	58		L3x3x.25	42	0.704	-0.868	0.000	0.000	0.000	-0.203
116	58		L3x3x.25	3	-0.704	0.868	0.000	0.000	0.000	-0.068
117	59		L3x3x.25	6	-6.201	0.908	0.000	0.000	0.000	0.014
118	59		L3x3x.25	45	6.201	-0.908	0.000	0.000	0.000	0.270
119	60		L3x3x.25	66	-6.200	-0.393	0.000	0.000	0.000	-0.550
120	60		L3x3x.25	63	6.200	0.393	0.000	0.000	0.000	0.157
121	61		Rigid	43	0.000	-0.000	0.000	0.000	0.000	-0.000
122	61		Rigid	8	0.000	0.000	0.000	0.000	0.000	-0.000
123	62		Rigid	44	0.000	-0.000	0.000	0.000	0.000	-0.000
124	62		Rigid	10	0.000	0.000	0.000	0.000	0.000	-0.000
125	63		ThruRod	53	-0.726	0.000	0.000	0.000	0.000	0.000
126	63		ThruRod	55	0.726	0.000	0.000	0.000	0.000	0.000
127	64		WalkwayS	53	-0.000	0.291	0.000	0.000	0.000	0.000
128	64		WalkwayS	54	0.000	-0.291	0.000	0.000	0.000	0.085
129	65		ThruRod	56	-2.190	0.000	0.000	0.000	0.000	0.000
130	65		ThruRod	59	2.190	0.000	0.000	0.000	0.000	0.000
131	66		FingerShea	56	-0.000	-0.399	0.000	0.000	0.000	0.000
132	66		FingerShea	57	0.000	0.399	0.000	0.000	0.000	-0.116

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
133	67		FingerShea	59	0.000	0.415	0.000	0.000	0.000	0.000
134	67		FingerShea	58	-0.000	-0.415	0.000	0.000	0.000	0.121
135	68		Compressi	23	0.000	0.000	0.000	0.000	0.000	0.000
136	68		Compressi	24	0.000	0.000	0.000	0.000	0.000	0.000
137	69		L3x3x.25	3	0.704	0.609	0.000	0.000	0.000	0.068
138	69		L3x3x.25	49	-0.704	-0.609	0.000	0.000	0.000	0.351
139	70		L3x3x.25	52	-6.201	-0.694	0.000	0.000	0.000	-0.270
140	70		L3x3x.25	6	6.201	0.694	0.000	0.000	0.000	-0.207
141	71		Rigid	8	0.000	-0.000	0.000	0.000	0.000	0.000
142	71		Rigid	50	0.000	0.000	0.000	0.000	0.000	-0.000
143	72		Rigid	10	0.000	-0.000	0.000	0.000	0.000	0.000
144	72		Rigid	51	0.000	0.000	0.000	0.000	0.000	-0.000
145	73		Compressi	23	0.000	0.000	0.000	0.000	0.000	0.000
146	73		Compressi	25	0.000	0.000	0.000	0.000	0.000	0.000
147	74		L3x3x.25	49	1.101	0.609	0.000	0.000	0.000	-0.351
148	74		L3x3x.25	56	-1.101	-0.609	0.000	0.000	0.000	0.959
149	75		L3x3x.25	59	-6.603	-0.694	0.000	0.000	0.000	0.207
150	75		L3x3x.25	52	6.603	0.694	0.000	0.000	0.000	-0.901
151	76		Rigid	50	0.000	-0.000	0.000	0.000	0.000	-0.000
152	76		Rigid	57	0.000	0.000	0.000	0.000	0.000	-0.000
153	77		Rigid	51	0.000	-0.000	0.000	0.000	0.000	-0.000
154	77		Rigid	58	0.000	0.000	0.000	0.000	0.000	-0.000
155	78		Compressi	26	6.983	0.000	0.000	0.000	0.000	0.000
156	78		Compressi	27	-6.983	0.000	0.000	0.000	0.000	0.000
157	79		Compressi	28	0.000	0.000	0.000	0.000	0.000	0.000
158	79		Compressi	29	0.000	0.000	0.000	0.000	0.000	0.000
159	80		ThruRod	60	-4.650	0.000	0.000	0.000	0.000	0.000
160	80		ThruRod	62	4.650	0.000	0.000	0.000	0.000	0.000
161	81		WalkwayS	60	-0.000	0.349	0.000	0.000	0.000	0.000
162	81		WalkwayS	61	0.000	-0.349	0.000	0.000	0.000	0.102
163	82		Compressi	30	8.424	0.000	0.000	0.000	0.000	0.000
164	82		Compressi	31	-8.424	0.000	0.000	0.000	0.000	0.000
165	83		ThruRod	63	-1.177	0.000	0.000	0.000	0.000	0.000
166	83		ThruRod	65	1.177	0.000	0.000	0.000	0.000	0.000
167	84		WalkwayS	63	-0.000	0.355	0.000	0.000	0.000	0.000
168	84		WalkwayS	64	0.000	-0.355	0.000	0.000	0.000	0.103
169	85		ThruRod	66	-0.027	0.000	0.000	0.000	0.000	0.000
170	85		ThruRod	68	0.027	0.000	0.000	0.000	0.000	0.000
171	86		WalkwayS	66	-0.000	0.361	0.000	0.000	0.000	0.000
172	86		WalkwayS	67	0.000	-0.361	0.000	0.000	0.000	0.105
173	87		ThruRod	69	-0.000	0.000	0.000	0.000	0.000	0.000
174	87		ThruRod	71	0.000	0.000	0.000	0.000	0.000	0.000
175	88		WalkwayS	69	-0.000	0.368	0.000	0.000	0.000	0.000
176	88		WalkwayS	70	0.000	-0.368	0.000	0.000	0.000	0.107

Bellingham MARINE ®
1323 Lincoln St.
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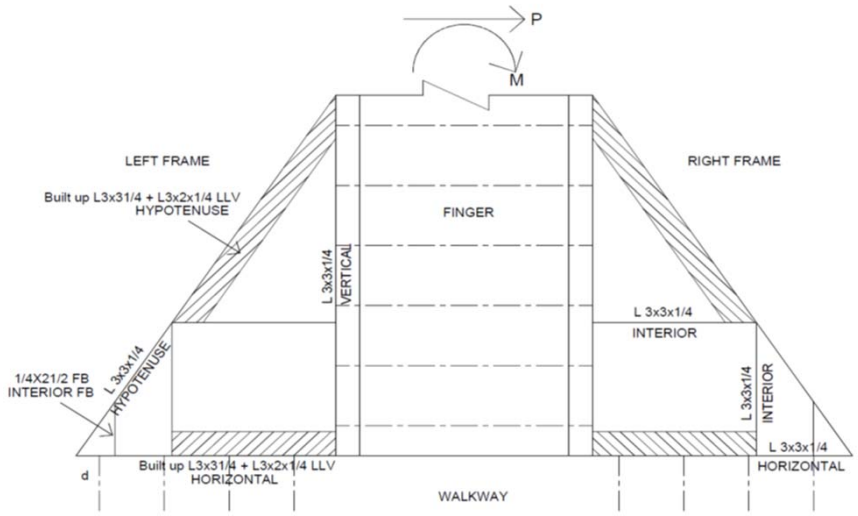
T 360.715.0121

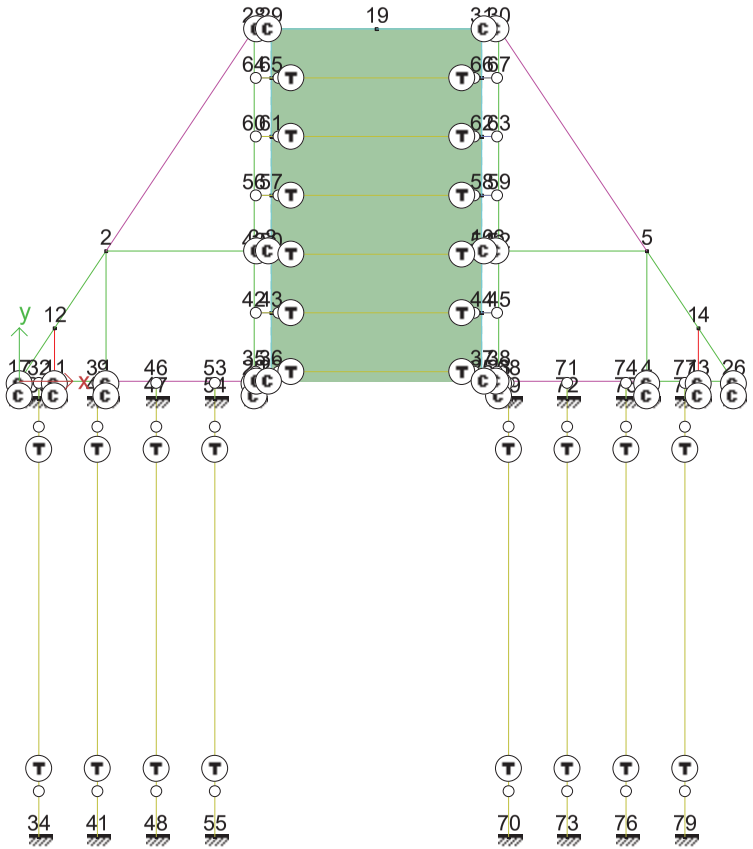
4'x6' Triangle Frame Element Capacity Check

7.1	= P [kips]
135.4	= M [ft-kips]

Maximum load on finger frame, see Concrete Module Design in previous section

	Element	M_{max} [ft-kips]	V_{max} [kips]	C_{max} [kips]	T_{max} [kips]	Element Capacities per AISC 360-16 ΦM_n [ft-kips]	ΦV_n [kips]	ΦC_n [kips]	ΦT_n [kips]
Left Frame	Vertical Angle	4.7	16.2	8.7	0.0	2.3	14.6	46.7	46.7
	Horizontal Angle	1.9	6.4	5.0	0.0	↓	↓	46.7	46.7
	Hypotenuse Angle	0.9	0.7	0.0	10.1	↓	↓	↓	46.7
	Horizontal Built Up Member	4.7	4.2	5.5	0.0	12.7	24.3	85.5	85.5
	Hypotenuse Built Up Member	3.4	0.7	0.0	10.9	↓	↓	↓	↓
	Interior Ver. Angle	2.2	1.8	0.0	1.0	2.3	14.6	44.0	46.7
	Interior Hor. Angle	1.4	1.1	0.0	0.3	↓	↓	↓	↓
	Interior FB			0.0	2.4			7.4	20.3
Right Frame	Vertical Angle	3.5	14.9	0.0	25.0	2.3	14.6	46.7	46.7
	Horizontal Angle	0.6	1.4	0.0	19.1	↓	↓	46.7	46.7
	Hypotenuse Angle	0.5	0.4	34.7	0.0	↓	↓	↓	46.7
	Horizontal Built Up Member	4.0	17.1	0.0	18.1	12.7	24.3	85.5	85.5
	Hypotenuse Built Up Member	3.5	0.7	29.6	0.0	↓	↓	↓	↓
	Interior Ver.	0.3	0.1	0.0	4.1	2.3	14.6	44.0	46.7
	Interior Hor.	0.1	0.1	3.4	0.0	↓	↓	↓	↓
	Interior FB			1.0	0.0			7.4	20.3
Thru Rods	Finger		0.0		13.4		8.6		14.4
	Walkway		0.0		12.9		↓		↓




Sections
L3x3x.25
CompressionLink
.25x2.5 Bar
Built Up Channel
Rigid
ThruRod
WalkwayShear
FingerShear
Patch Material
(No Material)
19
2
5
12
14
26
34
41
48
55
70
73
76
79

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
1	1		L3x3x.25	1	-1.011	1.850	0.000	0.000	0.000	2.224
2	1		L3x3x.25	2	1.011	-1.850	0.000	0.000	0.000	1.881
3	2		L3x3x.25	2	-0.296	-1.094	0.000	0.000	0.000	-1.318
4	2		L3x3x.25	3	0.296	1.094	0.000	0.000	0.000	-1.441
5	3		L3x3x.25	4	-4.062	0.128	0.000	0.000	0.000	0.320
6	3		L3x3x.25	5	4.062	-0.128	0.000	0.000	0.000	-0.036
7	4		L3x3x.25	5	3.404	-0.086	0.000	0.000	0.000	-0.090
8	4		L3x3x.25	6	-3.404	0.086	0.000	0.000	0.000	-0.126
9	5		Compressi	1	0.000	0.000	0.000	0.000	0.000	0.000
10	5		Compressi	7	0.000	0.000	0.000	0.000	0.000	0.000
11	6		Compressi	3	0.976	0.000	0.000	0.000	0.000	0.000
12	6		Compressi	8	-0.976	0.000	0.000	0.000	0.000	0.000
13	7		Compressi	4	0.000	0.000	0.000	0.000	0.000	0.000
14	7		Compressi	9	0.000	0.000	0.000	0.000	0.000	0.000
15	8		Compressi	6	5.951	0.000	0.000	0.000	0.000	0.000
16	8		Compressi	10	-5.951	0.000	0.000	0.000	0.000	0.000
17	9		.25x2.5 Bar	11	-2.428	0.016	0.000	0.000	0.000	0.008
18	9		.25x2.5 Bar	12	2.428	-0.016	0.000	0.000	0.000	0.007
19	10		.25x2.5 Bar	13	0.985	0.010	0.000	0.000	0.000	0.006
20	10		.25x2.5 Bar	14	-0.985	-0.010	0.000	0.000	0.000	0.003
21	11		Compressi	11	0.000	0.000	0.000	0.000	0.000	0.000
22	11		Compressi	15	0.000	0.000	0.000	0.000	0.000	0.000
23	12		Compressi	13	0.000	0.000	0.000	0.000	0.000	0.000
24	12		Compressi	16	0.000	0.000	0.000	0.000	0.000	0.000
25	13		L3x3x.25	39	3.637	-2.838	0.000	0.000	0.000	-1.042
26	13		L3x3x.25	1	-3.637	2.838	0.000	0.000	0.000	0.628
27	14		L3x3x.25	64	8.714	-6.599	0.000	0.000	0.000	-2.089
28	14		L3x3x.25	28	-8.714	6.599	0.000	0.000	0.000	-3.410
29	15		L3x3x.25	12	-10.118	-0.682	0.000	0.000	0.000	-0.937
30	15		L3x3x.25	2	10.118	0.682	0.000	0.000	0.000	-0.139
31	16		Built Up Ch	53	4.105	-4.172	0.000	0.000	0.000	1.904
32	16		Built Up Ch	20	-4.105	4.172	0.000	0.000	0.000	-4.686
33	17		Built Up Ch	2	-10.911	0.657	0.000	0.000	0.000	-0.423
34	17		Built Up Ch	28	10.911	-0.657	0.000	0.000	0.000	3.410
35	18		L3x3x.25	13	-19.096	-1.403	0.000	0.000	0.000	-0.323
36	18		L3x3x.25	26	19.096	1.403	0.000	0.000	0.000	-0.525
37	19		L3x3x.25	67	-24.987	6.609	0.000	0.000	0.000	2.046
38	19		L3x3x.25	30	24.987	-6.609	0.000	0.000	0.000	3.461
39	20		L3x3x.25	14	33.872	0.369	0.000	0.000	0.000	-0.122
40	20		L3x3x.25	26	-33.872	-0.369	0.000	0.000	0.000	0.525
41	21		Built Up Ch	74	-18.120	-4.375	0.000	0.000	0.000	-1.845
42	21		Built Up Ch	4	18.120	4.375	0.000	0.000	0.000	0.296
43	22		Built Up Ch	30	29.571	-0.689	0.000	0.000	0.000	-3.461
44	22		Built Up Ch	5	-29.571	0.689	0.000	0.000	0.000	0.331

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
45	23		Rigid	65	0.000	-0.000	0.000	0.000	0.000	-0.000
46	23		Rigid	29	0.000	0.000	0.000	0.000	0.000	-0.000
47	24		Rigid	66	0.000	-0.000	0.000	0.000	0.000	-0.000
48	24		Rigid	31	0.000	0.000	0.000	0.000	0.000	-0.000
49	25		Rigid	19	0.000	0.000	0.000	0.000	0.000	0.000
50	25		Rigid	31	0.000	0.000	0.000	0.000	0.000	0.000
51	26		ThruRod	32	-9.008	0.000	0.000	0.000	0.000	0.000
52	26		ThruRod	34	9.008	0.000	0.000	0.000	0.000	0.000
53	27		WalkwayS	32	-0.000	0.709	0.000	0.000	0.000	0.000
54	27		WalkwayS	33	0.000	-0.709	0.000	0.000	0.000	0.207
55	28		ThruRod	35	-13.431	0.000	0.000	0.000	0.000	0.000
56	28		ThruRod	38	13.431	0.000	0.000	0.000	0.000	0.000
57	29		FingerShea	35	-0.000	-1.270	0.000	0.000	0.000	0.000
58	29		FingerShea	36	0.000	1.270	0.000	0.000	0.000	-0.370
59	30		FingerShea	38	-0.000	1.192	0.000	0.000	0.000	0.000
60	30		FingerShea	37	0.000	-1.192	0.000	0.000	0.000	0.348
61	31		Compressi	17	0.000	0.000	0.000	0.000	0.000	0.000
62	31		Compressi	18	0.000	0.000	0.000	0.000	0.000	0.000
63	32		L3x3x.25	17	5.029	6.370	0.000	0.000	0.000	0.221
64	32		L3x3x.25	32	-5.029	-6.370	0.000	0.000	0.000	1.902
65	33		L3x3x.25	20	2.050	16.210	0.000	0.000	0.000	4.686
66	33		L3x3x.25	35	-2.050	-16.210	0.000	0.000	0.000	-1.984
67	34		L3x3x.25	17	-8.089	0.651	0.000	0.000	0.000	-0.221
68	34		L3x3x.25	12	8.089	-0.651	0.000	0.000	0.000	0.930
69	35		Built Up Ch	1	5.487	-1.827	0.000	0.000	0.000	-2.852
70	35		Built Up Ch	46	-5.487	1.827	0.000	0.000	0.000	1.291
71	36		L3x3x.25	4	-17.992	-0.313	0.000	0.000	0.000	-0.616
72	36		L3x3x.25	77	17.992	0.313	0.000	0.000	0.000	0.413
73	37		L3x3x.25	23	-17.143	-14.925	0.000	0.000	0.000	-3.163
74	37		L3x3x.25	38	17.143	14.925	0.000	0.000	0.000	0.675
75	38		L3x3x.25	5	34.697	-0.169	0.000	0.000	0.000	-0.385
76	38		L3x3x.25	14	-34.697	0.169	0.000	0.000	0.000	0.119
77	39		Built Up Ch	23	-14.925	17.143	0.000	0.000	0.000	3.163
78	39		Built Up Ch	68	14.925	-17.143	0.000	0.000	0.000	-0.305
79	40		Rigid	22	0.000	0.000	0.000	0.000	0.000	0.000
80	40		Rigid	36	0.000	-0.000	0.000	0.000	0.000	0.000
81	41		Rigid	25	0.000	0.000	0.000	0.000	0.000	0.000
82	41		Rigid	37	0.000	-0.000	0.000	0.000	0.000	0.000
83	42		Rigid	29	0.000	0.000	0.000	0.000	0.000	0.000
84	42		Rigid	19	0.000	-0.000	0.000	0.000	0.000	0.000
85	43		ThruRod	39	-2.627	0.000	0.000	0.000	0.000	0.000
86	43		ThruRod	41	2.627	0.000	0.000	0.000	0.000	0.000
87	44		WalkwayS	39	-0.000	0.700	0.000	0.000	0.000	0.000
88	44		WalkwayS	40	0.000	-0.700	0.000	0.000	0.000	0.204

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
89	45		ThruRod	42	-3.019	0.000	0.000	0.000	0.000	0.000
90	45		ThruRod	45	3.019	0.000	0.000	0.000	0.000	0.000
91	46		FingerShea	42	0.000	-1.277	0.000	0.000	0.000	0.000
92	46		FingerShea	43	-0.000	1.277	0.000	0.000	0.000	-0.372
93	47		FingerShea	45	-0.000	1.229	0.000	0.000	0.000	0.000
94	47		FingerShea	44	0.000	-1.229	0.000	0.000	0.000	0.358
95	48		Compressi	20	6.222	0.000	0.000	0.000	0.000	0.000
96	48		Compressi	21	-6.222	0.000	0.000	0.000	0.000	0.000
97	49		L3x3x.25	32	4.320	-2.639	0.000	0.000	0.000	-1.902
98	49		L3x3x.25	11	-4.320	2.639	0.000	0.000	0.000	1.188
99	50		L3x3x.25	35	3.320	2.779	0.000	0.000	0.000	1.984
100	50		L3x3x.25	42	-3.320	-2.779	0.000	0.000	0.000	0.794
101	51		Built Up Ch	46	4.793	-3.195	0.000	0.000	0.000	-1.291
102	51		Built Up Ch	53	-4.793	3.195	0.000	0.000	0.000	-1.904
103	52		L3x3x.25	77	-19.106	-0.418	0.000	0.000	0.000	-0.413
104	52		L3x3x.25	13	19.106	0.418	0.000	0.000	0.000	0.317
105	53		L3x3x.25	38	-18.336	-1.493	0.000	0.000	0.000	-0.675
106	53		L3x3x.25	45	18.336	1.493	0.000	0.000	0.000	-0.818
107	54		Built Up Ch	68	-15.972	4.279	0.000	0.000	0.000	0.305
108	54		Built Up Ch	71	15.972	-4.279	0.000	0.000	0.000	3.974
109	55		Rigid	36	0.000	0.000	0.000	0.000	0.000	0.000
110	55		Rigid	43	0.000	-0.000	0.000	0.000	0.000	0.000
111	56		Rigid	37	0.000	0.000	0.000	0.000	0.000	0.000
112	56		Rigid	44	0.000	-0.000	0.000	0.000	0.000	0.000
113	57		ThruRod	46	-1.368	0.000	0.000	0.000	0.000	0.000
114	57		ThruRod	48	1.368	0.000	0.000	0.000	0.000	0.000
115	58		WalkwayS	46	-0.000	0.694	0.000	0.000	0.000	0.000
116	58		WalkwayS	47	0.000	-0.694	0.000	0.000	0.000	0.202
117	59		ThruRod	49	-0.018	0.000	0.000	0.000	0.000	0.000
118	59		ThruRod	52	0.018	0.000	0.000	0.000	0.000	0.000
119	60		FingerShea	49	0.000	-1.286	0.000	0.000	0.000	0.000
120	60		FingerShea	50	-0.000	1.286	0.000	0.000	0.000	-0.375
121	61		FingerShea	52	-0.000	1.268	0.000	0.000	0.000	0.000
122	61		FingerShea	51	0.000	-1.268	0.000	0.000	0.000	0.370
123	62		Compressi	20	20.314	0.000	0.000	0.000	0.000	0.000
124	62		Compressi	22	-20.314	0.000	0.000	0.000	0.000	0.000
125	63		L3x3x.25	11	4.336	-0.211	0.000	0.000	0.000	-1.195
126	63		L3x3x.25	39	-4.336	0.211	0.000	0.000	0.000	1.042
127	64		L3x3x.25	42	4.596	-0.240	0.000	0.000	0.000	-0.794
128	64		L3x3x.25	49	-4.596	0.240	0.000	0.000	0.000	0.554
129	65		L3x3x.25	45	-19.565	1.526	0.000	0.000	0.000	0.818
130	65		L3x3x.25	52	19.565	-1.526	0.000	0.000	0.000	0.707
131	66		Built Up Ch	71	-17.037	-2.129	0.000	0.000	0.000	-3.974
132	66		Built Up Ch	74	17.037	2.129	0.000	0.000	0.000	1.845

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
133	67		Rigid	43	0.000	0.000	0.000	0.000	0.000	-0.000
134	67		Rigid	50	0.000	-0.000	0.000	0.000	0.000	0.000
135	68		Rigid	44	0.000	0.000	0.000	0.000	0.000	-0.000
136	68		Rigid	51	0.000	-0.000	0.000	0.000	0.000	0.000
137	69		ThruRod	53	-0.977	0.000	0.000	0.000	0.000	0.000
138	69		ThruRod	55	0.977	0.000	0.000	0.000	0.000	0.000
139	70		WalkwayS	53	-0.000	0.688	0.000	0.000	0.000	0.000
140	70		WalkwayS	54	0.000	-0.688	0.000	0.000	0.000	0.201
141	71		ThruRod	56	0.000	0.000	0.000	0.000	0.000	0.000
142	71		ThruRod	59	0.000	0.000	0.000	0.000	0.000	0.000
143	72		FingerShea	56	-0.000	-1.296	0.000	0.000	0.000	0.000
144	72		FingerShea	57	0.000	1.296	0.000	0.000	0.000	-0.378
145	73		FingerShea	59	0.000	1.311	0.000	0.000	0.000	0.000
146	73		FingerShea	58	-0.000	-1.311	0.000	0.000	0.000	0.382
147	74		Compressi	23	0.000	0.000	0.000	0.000	0.000	0.000
148	74		Compressi	24	0.000	0.000	0.000	0.000	0.000	0.000
149	75		L3x3x.25	49	5.882	-0.258	0.000	0.000	0.000	-0.554
150	75		L3x3x.25	3	-5.882	0.258	0.000	0.000	0.000	0.541
151	76		L3x3x.25	52	-20.833	1.543	0.000	0.000	0.000	-0.707
152	76		L3x3x.25	6	20.833	-1.543	0.000	0.000	0.000	0.788
153	77		Rigid	50	0.000	-0.000	0.000	0.000	0.000	-0.000
154	77		Rigid	8	0.000	0.000	0.000	0.000	0.000	-0.000
155	78		Rigid	51	0.000	-0.000	0.000	0.000	0.000	-0.000
156	78		Rigid	10	0.000	0.000	0.000	0.000	0.000	-0.000
157	79		ThruRod	60	0.000	0.000	0.000	0.000	0.000	0.000
158	79		ThruRod	63	0.000	0.000	0.000	0.000	0.000	0.000
159	80		FingerShea	60	-0.000	-1.308	0.000	0.000	0.000	0.000
160	80		FingerShea	61	0.000	1.308	0.000	0.000	0.000	-0.381
161	81		FingerShea	63	0.000	1.355	0.000	0.000	0.000	0.000
162	81		FingerShea	62	-0.000	-1.355	0.000	0.000	0.000	0.395
163	82		Compressi	23	0.000	0.000	0.000	0.000	0.000	0.000
164	82		Compressi	25	0.000	0.000	0.000	0.000	0.000	0.000
165	83		L3x3x.25	3	4.788	1.014	0.000	0.000	0.000	0.900
166	83		L3x3x.25	56	-4.788	-1.014	0.000	0.000	0.000	0.061
167	84		L3x3x.25	6	-20.919	-1.004	0.000	0.000	0.000	-0.913
168	84		L3x3x.25	59	20.919	1.004	0.000	0.000	0.000	-0.038
169	85		Rigid	8	0.000	0.000	0.000	0.000	0.000	0.000
170	85		Rigid	57	0.000	-0.000	0.000	0.000	0.000	0.000
171	86		Rigid	10	0.000	0.000	0.000	0.000	0.000	0.000
172	86		Rigid	58	0.000	-0.000	0.000	0.000	0.000	0.000
173	87		ThruRod	64	-7.613	0.000	0.000	0.000	0.000	0.000
174	87		ThruRod	67	7.613	0.000	0.000	0.000	0.000	0.000
175	88		FingerShea	64	-0.000	-1.323	0.000	0.000	0.000	0.000
176	88		FingerShea	65	0.000	1.323	0.000	0.000	0.000	-0.386

	Membe	Label	Section	Joint	Px' kip	Vy' kip	Vz' kip	Tx' kip-ft	My' kip-ft	Mz' kip-ft
177	89		FingerShea	67	0.000	1.403	0.000	0.000	0.000	0.000
178	89		FingerShea	66	-0.000	-1.403	0.000	0.000	0.000	0.409
179	90		Compressi	26	29.381	0.000	0.000	0.000	0.000	0.000
180	90		Compressi	27	-29.381	0.000	0.000	0.000	0.000	0.000
181	91		L3x3x.25	56	6.083	1.014	0.000	0.000	0.000	-0.061
182	91		L3x3x.25	60	-6.083	-1.014	0.000	0.000	0.000	1.075
183	92		L3x3x.25	59	-22.229	-1.004	0.000	0.000	0.000	0.038
184	92		L3x3x.25	63	22.229	1.004	0.000	0.000	0.000	-1.042
185	93		Rigid	57	0.000	-0.000	0.000	0.000	0.000	0.000
186	93		Rigid	61	0.000	0.000	0.000	0.000	0.000	0.000
187	94		Rigid	58	0.000	-0.000	0.000	0.000	0.000	0.000
188	94		Rigid	62	0.000	0.000	0.000	0.000	0.000	0.000
189	95		Compressi	28	0.000	0.000	0.000	0.000	0.000	0.000
190	95		Compressi	29	0.000	0.000	0.000	0.000	0.000	0.000
191	96		L3x3x.25	60	7.391	1.014	0.000	0.000	0.000	-1.075
192	96		L3x3x.25	64	-7.391	-1.014	0.000	0.000	0.000	2.089
193	97		L3x3x.25	63	-23.584	-1.004	0.000	0.000	0.000	1.042
194	97		L3x3x.25	67	23.584	1.004	0.000	0.000	0.000	-2.046
195	98		Rigid	61	0.000	-0.000	0.000	0.000	0.000	-0.000
196	98		Rigid	65	0.000	0.000	0.000	0.000	0.000	-0.000
197	99		Rigid	62	0.000	-0.000	0.000	0.000	0.000	-0.000
198	99		Rigid	66	0.000	0.000	0.000	0.000	0.000	-0.000
199	100		Compressi	30	22.439	0.000	0.000	0.000	0.000	0.000
200	100		Compressi	31	-22.439	0.000	0.000	0.000	0.000	0.000
201	101		ThruRod	68	-12.864	0.000	0.000	0.000	0.000	0.000
202	101		ThruRod	70	12.864	0.000	0.000	0.000	0.000	0.000
203	102		WalkwayS	68	-0.000	1.047	0.000	0.000	0.000	0.000
204	102		WalkwayS	69	0.000	-1.047	0.000	0.000	0.000	0.305
205	103		ThruRod	71	-6.408	0.000	0.000	0.000	0.000	0.000
206	103		ThruRod	73	6.408	0.000	0.000	0.000	0.000	0.000
207	104		WalkwayS	71	-0.000	1.065	0.000	0.000	0.000	0.000
208	104		WalkwayS	72	0.000	-1.065	0.000	0.000	0.000	0.311
209	105		ThruRod	74	-2.247	0.000	0.000	0.000	0.000	0.000
210	105		ThruRod	76	2.247	0.000	0.000	0.000	0.000	0.000
211	106		WalkwayS	74	-0.000	1.084	0.000	0.000	0.000	0.000
212	106		WalkwayS	75	0.000	-1.084	0.000	0.000	0.000	0.316
213	107		ThruRod	77	-0.104	0.000	0.000	0.000	0.000	0.000
214	107		ThruRod	79	0.104	0.000	0.000	0.000	0.000	0.000
215	108		WalkwayS	77	-0.000	1.114	0.000	0.000	0.000	0.000
216	108		WalkwayS	78	0.000	-1.114	0.000	0.000	0.000	0.325

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Gangway Attachment

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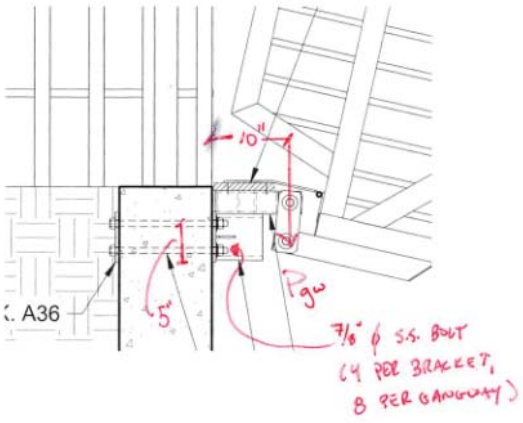
TYPICAL GANGWAY CONNECTION:

GANGWAY CONNECTION TO SEAWALL IS SIMILIAR TO EXISTING. SAME GANGWAY CONNECTION BRACKET IS USED FOR THE 30' AND 80' GANGWAY, DESIGN FOR 80' GANGWAY.

GANGWAYS ARE ATTACHED WITH A SWING SHACKLES WHICH ALLOW FOR ROTATION. GANGWAY IS NOT FIXED AT THE BOTTOM AND IS FREE TO ROLL AND UNABLE TO INDUCE ANY LATERAL LOADS.

FOR DESIGN CONSIDER VERTICAL LOADS ONLY.



$DL := 15\ psf$ Includes weight of structure + utilities, from experience this is a conservative estimate.

$LL := 100\ psf$

$$P_{gw} := (1.2\ DL + 1.6\ LL) \cdot (5\ ft \cdot 80\ ft) \cdot \left(\frac{1}{2}\right) = 35.6\ kip$$

Check Shear on Bolts:

$n := 8$ number of bolts

$$V_u := \frac{P_{gw}}{n} = 4.5\ kip$$

$\phi V_n := 12.2\ kip$ OK, AISC Steel Construction Manual Table 7-1

Check Tension on Bolts:

$n := 8$ number of bolts

$$T_u := P_{gw} \cdot \left(\frac{10\ in}{5\ in}\right) \cdot \left(\frac{2}{n}\right) = 17.8\ kip$$

$\phi T_n := 20.3\ kip$ OK, AISC Steel Construction Manual Table 7-2

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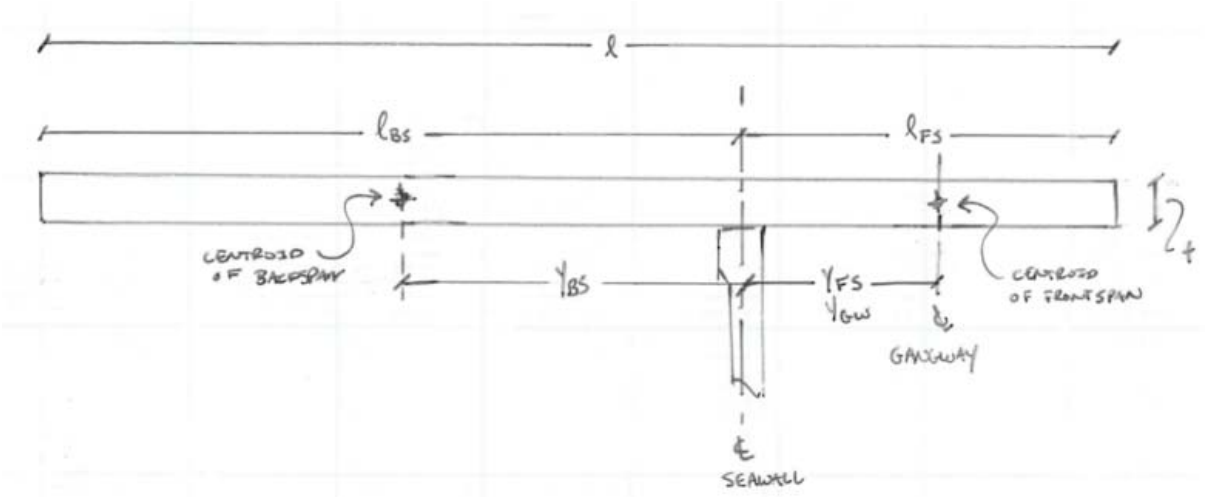
CANTILEVER GANGWAY ABUTMENT:

Check overturning:



$\gamma := 150\ pcf$ density of concrete

$b := 9\ ft$ width of platform

$t := 12\ in$

$l := 21\ ft$

$l_{FS} := 8\ ft$

$l_{BS} := 13\ ft$

$y_{FS} := \frac{l_{FS}}{2} = ?$

$y_{BS} := \frac{l_{BS}}{2} = 6.5\ ft$

$y_{GW} := 4\ ft$

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Check overturning (continued):

calculate weights:

$GW_{DL} := 0.5 \cdot 4\ ft \cdot 30\ ft \cdot 12\ psf = 0.7\ kip$ gangway dead load

$GW_{LL} := 0.5 \cdot 4\ ft \cdot 30\ ft \cdot 100\ psf = 6.0\ kip$ gangway live load

$FS_W := b \cdot t \cdot l_{FS} \cdot \gamma = 10.8\ kip$ front span weight

$BS_W := b \cdot t \cdot l_{BS} \cdot \gamma = 17.6\ kip$ back span weight

check front span moment vs back span moment, consider factored loads on the gangway:

$FS := FS_W \cdot y_{FS} + \left(1.2 \cdot GW_{DL} + 1.6 \cdot GW_{LL}\right) \cdot y_{GW} = 85.1\ ft \cdot kip$

$BS := BS_W \cdot y_{BS} = 114.1\ ft \cdot kip$

$FS < BS = 1.0$ OK

Check reinforcement:

$M_u := 1.2 \cdot FS_W \cdot y_{FS} + \left(1.2 \cdot GW_{DL} + 1.6 \cdot GW_{LL}\right) \cdot y_{GW} = 93.7\ ft \cdot kip$

$A_{s_req} := \frac{M_u}{4 \cdot 10\ in} \cdot \left(\frac{in}{ft \cdot kip}\right) \cdot \left(in^2\right) = 2.3\ in^2$

$A_{s_provided} := 17 \cdot 0.31\ in^2 = 5.3\ in^2$ OK, (17) #5 bars provided

APPENDIX: GROUP 1 DOCKS DATA

GROUP 1 DOCKS
DOCK E1

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	57	P1	Normal	ky'	1.060
2	57	P1	Normal	kx'	1.060
3	59	P2	Normal	ky'	1.060
4	59	P2	Normal	kx'	1.060
5	61	P3	Normal	ky'	1.060
6	61	P3	Normal	kx'	1.060
7	63	P4	Normal	ky'	1.060
8	63	P4	Normal	kx'	1.060
9	65	P5	Normal	ky'	1.060
10	65	P5	Normal	kx'	1.060
11	67	P6	Normal	ky'	1.060
12	67	P6	Normal	kx'	1.060
13	69	P7	Normal	ky'	1.060
14	69	P7	Normal	kx'	1.060
15	71	P8	Normal	ky'	1.060
16	71	P8	Normal	kx'	1.060
17	73	P9	Normal	ky'	1.060
18	73	P9	Normal	kx'	1.060
19	75	P10	Normal	ky'	1.060
20	75	P10	Normal	kx'	1.060
21	77	P11	Normal	ky'	1.060
22	77	P11	Normal	kx'	1.060
23	79	P12	Normal	ky'	1.060
24	79	P12	Normal	kx'	1.060
25	81	P13	Normal	ky'	1.060
26	81	P13	Normal	kx'	1.060
27	83	P14	Normal	ky'	1.060
28	83	P14	Normal	kx'	1.060
29	87	P15	Normal	ky'	1.060
30	87	P15	Normal	kx'	1.060

GROUP 1 DOCKS
DOCK E1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		3.252	0.379	0.000	0.000	0.000	-0.012
2	2		3.247	0.328	0.000	0.000	0.000	-0.010
3	3		3.242	0.263	0.000	0.000	0.000	-0.020
4	4		3.238	0.196	0.000	0.000	0.000	-0.011
5	5		3.233	0.136	0.000	0.000	0.000	-0.017
6	6		3.230	0.087	0.000	0.000	0.000	-0.006
7	7		3.225	0.049	0.000	0.000	0.000	-0.012
8	8		3.222	0.022	0.000	0.000	0.000	-0.002
9	9		3.217	0.004	0.000	0.000	0.000	-0.008
10	10		3.215	-0.007	0.000	0.000	0.000	0.002
11	11		3.211	-0.012	0.000	0.000	0.000	-0.005
12	12		3.208	-0.013	0.000	0.000	0.000	0.003
13	13		3.204	-0.011	0.000	0.000	0.000	-0.004
14	14		3.202	-0.008	0.000	0.000	0.000	0.004
15	15		3.199	-0.002	0.000	0.000	0.000	-0.003
16	16		3.197	0.004	0.000	0.000	0.000	0.005
17	17		3.194	0.012	0.000	0.000	0.000	-0.003
18	18		3.193	0.021	0.000	0.000	0.000	0.005
19	19		3.190	0.030	0.000	0.000	0.000	-0.003
20	20		3.189	0.037	0.000	0.000	0.000	0.005
21	21		3.187	0.041	0.000	0.000	0.000	-0.004
22	22		3.186	0.040	0.000	0.000	0.000	0.002
23	23		3.184	0.028	0.000	0.000	0.000	-0.009
24	24		3.184	0.000	0.000	0.000	0.000	-0.005
25	25		3.183	-0.050	0.000	0.000	0.000	-0.019
26	26		3.182	-0.131	0.000	0.000	0.000	-0.019
27	27		3.181	-0.249	0.000	0.000	0.000	-0.035
28	28		3.181	-0.412	0.000	0.000	0.000	-0.038
29	29		3.244	0.379	0.000	0.000	0.000	-0.012
30	30		3.241	0.328	0.000	0.000	0.000	-0.010
31	31		3.230	0.263	0.000	0.000	0.000	-0.020
32	32		3.232	0.196	0.000	0.000	0.000	-0.011
33	33		3.223	0.136	0.000	0.000	0.000	-0.017
34	34		3.226	0.087	0.000	0.000	0.000	-0.006
35	35		3.218	0.049	0.000	0.000	0.000	-0.012
36	36		3.221	0.022	0.000	0.000	0.000	-0.002
37	37		3.213	0.004	0.000	0.000	0.000	-0.008
38	38		3.216	-0.007	0.000	0.000	0.000	0.002
39	39		3.207	-0.012	0.000	0.000	0.000	-0.005
40	40		3.210	-0.013	0.000	0.000	0.000	0.003
41	41		3.202	-0.011	0.000	0.000	0.000	-0.004
42	42		3.205	-0.008	0.000	0.000	0.000	0.004
43	43		3.197	-0.002	0.000	0.000	0.000	-0.003
44	44		3.200	0.004	0.000	0.000	0.000	0.005
45	45		3.192	0.012	0.000	0.000	0.000	-0.003
46	46		3.196	0.021	0.000	0.000	0.000	0.005
47	47		3.188	0.030	0.000	0.000	0.000	-0.003
48	48		3.192	0.037	0.000	0.000	0.000	0.005
49	49		3.184	0.041	0.000	0.000	0.000	-0.004
50	50		3.188	0.040	0.000	0.000	0.000	0.002
51	51		3.179	0.028	0.000	0.000	0.000	-0.009
52	52		3.181	0.000	0.000	0.000	0.000	-0.005
53	53		3.171	-0.050	0.000	0.000	0.000	-0.019
54	54		3.171	-0.131	0.000	0.000	0.000	-0.019
55	55		3.159	-0.249	0.000	0.000	0.000	-0.035
56	56		3.157	-0.412	0.000	0.000	0.000	-0.038
57	57	P1	2.514	0.379	0.000	0.000	0.000	-0.104
58	58		3.606	0.328	0.000	0.000	0.000	0.044
59	59	P2	1.447	0.263	0.000	0.000	0.000	-0.222
60	60		3.589	0.196	0.000	0.000	0.000	0.043
61	61	P3	1.453	0.136	0.000	0.000	0.000	-0.220

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		3.622	0.087	0.000	0.000	0.000	0.047
63	63	P4	1.469	0.049	0.000	0.000	0.000	-0.218
64	64		3.658	0.022	0.000	0.000	0.000	0.052
65	65	P5	1.481	0.004	0.000	0.000	0.000	-0.216
66	66		3.681	-0.007	0.000	0.000	0.000	0.055
67	67	P6	1.487	-0.012	0.000	0.000	0.000	-0.215
68	68		3.691	-0.013	0.000	0.000	0.000	0.057
69	69	P7	1.490	-0.011	0.000	0.000	0.000	-0.214
70	70		3.693	-0.008	0.000	0.000	0.000	0.058
71	71	P8	1.490	-0.002	0.000	0.000	0.000	-0.214
72	72		3.694	0.004	0.000	0.000	0.000	0.059
73	73	P9	1.490	0.012	0.000	0.000	0.000	-0.213
74	74		3.693	0.021	0.000	0.000	0.000	0.059
75	75	P10	1.489	0.030	0.000	0.000	0.000	-0.213
76	76		3.684	0.037	0.000	0.000	0.000	0.058
77	77	P11	1.482	0.041	0.000	0.000	0.000	-0.213
78	78		3.656	0.040	0.000	0.000	0.000	0.056
79	79	P12	1.464	0.028	0.000	0.000	0.000	-0.214
80	80		3.588	0.000	0.000	0.000	0.000	0.049
81	81	P13	1.425	-0.050	0.000	0.000	0.000	-0.217
82	82		3.462	-0.131	0.000	0.000	0.000	0.035
83	83	P14	1.362	-0.249	0.000	0.000	0.000	-0.223
84	84		3.282	-0.412	0.000	0.000	0.000	0.016
85	85		3.180	-0.618	0.000	0.000	0.000	-0.055
86	86		3.145	-0.618	0.000	0.000	0.000	-0.055
87	87	P15	1.288	-0.617	0.000	0.000	0.000	-0.229
88	88	End Spring 1	0.379	-3.244	0.000	0.000	0.000	-0.062
89	89	End Spring 2	0.328	-3.241	0.000	0.000	0.000	0.038
90	90	End Spring 3	0.263	-3.230	0.000	0.000	0.000	-0.181
91	91	End Spring 4	0.196	-3.232	0.000	0.000	0.000	0.037
92	92	End Spring 5	0.136	-3.223	0.000	0.000	0.000	-0.179
93	93	End Spring 6	0.087	-3.226	0.000	0.000	0.000	0.041
94	94	End Spring 7	0.049	-3.217	0.000	0.000	0.000	-0.177
95	95	End Spring 8	0.022	-3.221	0.000	0.000	0.000	0.046
96	96	End Spring 9	0.004	-3.212	0.000	0.000	0.000	-0.174
97	97	End Spring 10	-0.007	-3.216	0.000	0.000	0.000	0.049
98	98	End Spring 11	-0.012	-3.207	0.000	0.000	0.000	-0.173
99	99	End Spring 12	-0.013	-3.210	0.000	0.000	0.000	0.051
100	100	End Spring 13	-0.011	-3.202	0.000	0.000	0.000	-0.172
101	101	End Spring 14	-0.008	-3.205	0.000	0.000	0.000	0.052
102	102	End Spring 15	-0.002	-3.197	0.000	0.000	0.000	-0.171
103	103	End Spring 16	0.004	-3.200	0.000	0.000	0.000	0.053
104	104	End Spring 17	0.012	-3.192	0.000	0.000	0.000	-0.171
105	105	End Spring 18	0.021	-3.196	0.000	0.000	0.000	0.053
106	106	End Spring 19	0.030	-3.188	0.000	0.000	0.000	-0.171
107	107	End Spring 20	0.037	-3.192	0.000	0.000	0.000	0.052
108	108	End Spring 21	0.041	-3.184	0.000	0.000	0.000	-0.171
109	109	End Spring 22	0.040	-3.188	0.000	0.000	0.000	0.050
110	110	End Spring 23	0.028	-3.179	0.000	0.000	0.000	-0.173
111	111	End Spring 24	0.000	-3.181	0.000	0.000	0.000	0.043
112	112	End Spring 25	-0.050	-3.171	0.000	0.000	0.000	-0.177
113	113	End Spring 26	-0.131	-3.171	0.000	0.000	0.000	0.029
114	114	End Spring 27	-0.249	-3.159	0.000	0.000	0.000	-0.185
115	115	End Spring 28	-0.412	-3.157	0.000	0.000	0.000	0.010
116	116	End Spring 29	-0.617	-3.145	0.000	0.000	0.000	-0.193

GROUP 1 DOCKS
DOCK E1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-0.008	2.513	0.000	0.000	0.000	0.032
2	2		-0.007	2.664	0.000	0.000	0.000	0.029
3	3		-0.007	2.780	0.000	0.000	0.000	0.023
4	4		-0.007	2.877	0.000	0.000	0.000	0.018
5	5		-0.006	2.943	0.000	0.000	0.000	0.013
6	6		-0.006	2.992	0.000	0.000	0.000	0.008
7	7		-0.005	3.019	0.000	0.000	0.000	0.005
8	8		-0.005	3.039	0.000	0.000	0.000	0.003
9	9		-0.004	3.043	0.000	0.000	0.000	0.001
10	10		-0.004	3.048	0.000	0.000	0.000	-0.000
11	11		-0.003	3.044	0.000	0.000	0.000	-0.001
12	12		-0.002	3.044	0.000	0.000	0.000	-0.001
13	13		-0.002	3.038	0.000	0.000	0.000	-0.001
14	14		-0.001	3.039	0.000	0.000	0.000	-0.000
15	15		-0.001	3.035	0.000	0.000	0.000	-0.000
16	16		-0.000	3.039	0.000	0.000	0.000	0.000
17	17		0.001	3.038	0.000	0.000	0.000	0.000
18	18		0.001	3.043	0.000	0.000	0.000	0.001
19	19		0.002	3.043	0.000	0.000	0.000	0.000
20	20		0.002	3.047	0.000	0.000	0.000	-0.000
21	21		0.003	3.042	0.000	0.000	0.000	-0.001
22	22		0.003	3.036	0.000	0.000	0.000	-0.003
23	23		0.004	3.016	0.000	0.000	0.000	-0.005
24	24		0.004	2.989	0.000	0.000	0.000	-0.008
25	25		0.005	2.939	0.000	0.000	0.000	-0.013
26	26		0.005	2.873	0.000	0.000	0.000	-0.018
27	27		0.006	2.778	0.000	0.000	0.000	-0.023
28	28		0.006	2.664	0.000	0.000	0.000	-0.028
29	29		0.013	2.513	0.000	0.000	0.000	0.032
30	30		0.011	2.664	0.000	0.000	0.000	0.029
31	31		0.007	2.780	0.000	0.000	0.000	0.023
32	32		0.005	2.877	0.000	0.000	0.000	0.018
33	33		0.002	2.943	0.000	0.000	0.000	0.013
34	34		-0.001	2.992	0.000	0.000	0.000	0.008
35	35		-0.002	3.019	0.000	0.000	0.000	0.005
36	36		-0.003	3.039	0.000	0.000	0.000	0.003
37	37		-0.004	3.043	0.000	0.000	0.000	0.001
38	38		-0.004	3.048	0.000	0.000	0.000	-0.000
39	39		-0.003	3.044	0.000	0.000	0.000	-0.001
40	40		-0.003	3.044	0.000	0.000	0.000	-0.001
41	41		-0.002	3.038	0.000	0.000	0.000	-0.001
42	42		-0.001	3.039	0.000	0.000	0.000	-0.000
43	43		-0.001	3.035	0.000	0.000	0.000	-0.000
44	44		0.000	3.039	0.000	0.000	0.000	0.000
45	45		0.001	3.038	0.000	0.000	0.000	0.000
46	46		0.001	3.043	0.000	0.000	0.000	0.001
47	47		0.002	3.043	0.000	0.000	0.000	0.000
48	48		0.002	3.047	0.000	0.000	0.000	-0.000
49	49		0.002	3.042	0.000	0.000	0.000	-0.001
50	50		0.002	3.036	0.000	0.000	0.000	-0.003
51	51		0.001	3.016	0.000	0.000	0.000	-0.005
52	52		-0.001	2.989	0.000	0.000	0.000	-0.008
53	53		-0.003	2.939	0.000	0.000	0.000	-0.013
54	54		-0.006	2.873	0.000	0.000	0.000	-0.018
55	55		-0.009	2.778	0.000	0.000	0.000	-0.023
56	56		-0.012	2.664	0.000	0.000	0.000	-0.028
57	57	P1	0.119	2.512	0.000	0.000	0.000	0.011
58	58		0.261	2.665	0.000	0.000	0.000	0.029
59	59	P2	0.086	2.779	0.000	0.000	0.000	0.008
60	60		0.159	2.877	0.000	0.000	0.000	0.018
61	61	P3	0.045	2.941	0.000	0.000	0.000	0.005

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		0.071	2.993	0.000	0.000	0.000	0.008
63	63	P4	0.016	3.018	0.000	0.000	0.000	0.002
64	64		0.019	3.039	0.000	0.000	0.000	0.003
65	65	P5	0.002	3.042	0.000	0.000	0.000	0.001
66	66		-0.004	3.049	0.000	0.000	0.000	-0.000
67	67	P6	-0.003	3.042	0.000	0.000	0.000	0.000
68	68		-0.008	3.044	0.000	0.000	0.000	-0.001
69	69	P7	-0.003	3.036	0.000	0.000	0.000	-0.000
70	70		-0.004	3.040	0.000	0.000	0.000	-0.000
71	71	P8	-0.000	3.034	0.000	0.000	0.000	0.000
72	72		0.003	3.040	0.000	0.000	0.000	0.000
73	73	P9	0.002	3.036	0.000	0.000	0.000	0.000
74	74		0.007	3.044	0.000	0.000	0.000	0.001
75	75	P10	0.002	3.041	0.000	0.000	0.000	0.000
76	76		0.002	3.047	0.000	0.000	0.000	-0.000
77	77	P11	-0.003	3.040	0.000	0.000	0.000	-0.001
78	78		-0.021	3.037	0.000	0.000	0.000	-0.003
79	79	P12	-0.018	3.015	0.000	0.000	0.000	-0.002
80	80		-0.074	2.990	0.000	0.000	0.000	-0.008
81	81	P13	-0.046	2.937	0.000	0.000	0.000	-0.004
82	82		-0.159	2.873	0.000	0.000	0.000	-0.018
83	83	P14	-0.085	2.777	0.000	0.000	0.000	-0.008
84	84		-0.256	2.664	0.000	0.000	0.000	-0.028
85	85		0.006	2.526	0.000	0.000	0.000	-0.031
86	86		-0.013	2.526	0.000	0.000	0.000	-0.031
87	87	P15	-0.116	2.525	0.000	0.000	0.000	-0.011
88	88	End Spring 1	2.513	-0.013	0.000	0.000	0.000	0.015
89	89	End Spring 2	2.664	-0.011	0.000	0.000	0.000	0.029
90	90	End Spring 3	2.780	-0.007	0.000	0.000	0.000	0.011
91	91	End Spring 4	2.877	-0.005	0.000	0.000	0.000	0.018
92	92	End Spring 5	2.942	-0.002	0.000	0.000	0.000	0.006
93	93	End Spring 6	2.993	0.001	0.000	0.000	0.000	0.008
94	94	End Spring 7	3.019	0.002	0.000	0.000	0.000	0.003
95	95	End Spring 8	3.039	0.003	0.000	0.000	0.000	0.003
96	96	End Spring 9	3.043	0.004	0.000	0.000	0.000	0.001
97	97	End Spring 10	3.048	0.004	0.000	0.000	0.000	-0.000
98	98	End Spring 11	3.043	0.003	0.000	0.000	0.000	-0.000
99	99	End Spring 12	3.044	0.003	0.000	0.000	0.000	-0.001
100	100	End Spring 13	3.038	0.002	0.000	0.000	0.000	-0.000
101	101	End Spring 14	3.039	0.001	0.000	0.000	0.000	-0.000
102	102	End Spring 15	3.035	0.001	0.000	0.000	0.000	0.000
103	103	End Spring 16	3.039	-0.000	0.000	0.000	0.000	0.000
104	104	End Spring 17	3.037	-0.001	0.000	0.000	0.000	0.000
105	105	End Spring 18	3.044	-0.001	0.000	0.000	0.000	0.001
106	106	End Spring 19	3.042	-0.002	0.000	0.000	0.000	0.000
107	107	End Spring 20	3.047	-0.002	0.000	0.000	0.000	-0.000
108	108	End Spring 21	3.041	-0.002	0.000	0.000	0.000	-0.001
109	109	End Spring 22	3.037	-0.002	0.000	0.000	0.000	-0.003
110	110	End Spring 23	3.016	-0.001	0.000	0.000	0.000	-0.003
111	111	End Spring 24	2.989	0.001	0.000	0.000	0.000	-0.008
112	112	End Spring 25	2.938	0.003	0.000	0.000	0.000	-0.006
113	113	End Spring 26	2.873	0.006	0.000	0.000	0.000	-0.018
114	114	End Spring 27	2.778	0.009	0.000	0.000	0.000	-0.011
115	115	End Spring 28	2.664	0.012	0.000	0.000	0.000	-0.028
116	116	End Spring 29	2.526	0.013	0.000	0.000	0.000	-0.014

APPENDIX: GROUP 2 DOCKS DATA

GROUP 2 DOCKS
DOCK E4, E5, E7, E8

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1		Normal	ky'	1.060
2	1		Normal	kx'	1.060
3	3		Normal	ky'	1.060
4	3		Normal	kx'	1.060
5	5		Normal	ky'	1.060
6	5		Normal	kx'	1.060
7	7		Normal	ky'	1.060
8	7		Normal	kx'	1.060
9	9		Normal	ky'	1.060
10	9		Normal	kx'	1.060
11	11		Normal	ky'	1.060
12	11		Normal	kx'	1.060
13	13		Normal	ky'	1.060
14	13		Normal	kx'	1.060
15	15		Normal	ky'	1.060
16	15		Normal	kx'	1.060
17	19		Normal	ky'	1.060
18	19		Normal	kx'	1.060
19	21		Normal	ky'	1.060
20	21		Normal	kx'	1.060
21	23		Normal	ky'	1.060
22	23		Normal	kx'	1.060
23	25		Normal	ky'	1.060
24	25		Normal	kx'	1.060
25	27		Normal	ky'	1.060
26	27		Normal	kx'	1.060
27	29		Normal	ky'	1.060
28	29		Normal	kx'	1.060
29	30		Normal	ky'	1.060
30	30		Normal	kx'	1.060
31	92		Normal	ky'	1.360
32	92		Normal	kx'	1.360
33	97		Normal	ky'	1.360
34	97		Normal	kx'	1.360
35	111		Normal	ky'	1.360
36	111		Normal	kx'	1.360
37	126		Normal	ky'	1.060
38	126		Normal	kx'	1.060
39	128		Normal	ky'	1.060
40	128		Normal	kx'	1.060
41	130		Normal	ky'	1.060
42	130		Normal	kx'	1.060
43	132		Normal	ky'	1.060
44	132		Normal	kx'	1.060
45	134		Normal	ky'	1.060
46	134		Normal	kx'	1.060
47	136		Normal	ky'	1.060
48	136		Normal	kx'	1.060
49	151		Normal	ky'	1.360
50	151		Normal	kx'	1.360
51	164		Normal	ky'	1.060
52	164		Normal	kx'	1.060
53	204		Normal	ky'	1.060
54	204		Normal	kx'	1.060
55	206		Normal	ky'	1.060
56	206		Normal	kx'	1.060
57	208		Normal	ky'	1.060
58	208		Normal	kx'	1.060
59	210		Normal	ky'	1.060
60	210		Normal	kx'	1.060

GROUP 2 DOCKS
DOCK E4, E5, E7, E8

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
61	212		Normal	ky'	1.060
62	212		Normal	kx'	1.060
63	214		Normal	ky'	1.060
64	214		Normal	kx'	1.060

GROUP 2 DOCKS
DOCK E4, E5, E7, E8

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		2.223	0.565	0.000	0.000	0.000	-0.101
2	2		2.946	0.460	0.000	0.000	0.000	0.007
3	3		1.541	0.370	0.000	0.000	0.000	-0.203
4	4		2.955	0.283	0.000	0.000	0.000	0.009
5	5		1.557	0.203	0.000	0.000	0.000	-0.201
6	6		2.996	0.133	0.000	0.000	0.000	0.014
7	7		1.580	0.073	0.000	0.000	0.000	-0.199
8	8		3.039	0.022	0.000	0.000	0.000	0.019
9	9		1.600	-0.019	0.000	0.000	0.000	-0.197
10	10		3.075	-0.053	0.000	0.000	0.000	0.023
11	11		1.619	-0.080	0.000	0.000	0.000	-0.196
12	12		3.112	-0.099	0.000	0.000	0.000	0.027
13	13		1.641	-0.109	0.000	0.000	0.000	-0.194
14	14		3.163	-0.109	0.000	0.000	0.000	0.033
15	15		1.675	-0.095	0.000	0.000	0.000	-0.191
16	16		3.250	-0.063	0.000	0.000	0.000	0.043
17	17		6.300	0.120	0.000	0.000	0.000	0.401
18	18		3.509	0.264	0.000	0.000	0.000	0.067
19	19		1.456	0.272	0.000	0.000	0.000	-0.188
20	20		3.394	0.256	0.000	0.000	0.000	0.055
21	21		1.424	0.223	0.000	0.000	0.000	-0.190
22	22		3.341	0.180	0.000	0.000	0.000	0.049
23	23		1.405	0.127	0.000	0.000	0.000	-0.192
24	24		3.295	0.064	0.000	0.000	0.000	0.044
25	25		1.381	-0.011	0.000	0.000	0.000	-0.194
26	26		3.221	-0.103	0.000	0.000	0.000	0.037
27	27		1.342	-0.213	0.000	0.000	0.000	-0.197
28	28		3.116	-0.347	0.000	0.000	0.000	0.026
29	29		1.322	-0.536	0.000	0.000	0.000	-0.191
30	30		1.529	0.219	0.000	0.000	0.000	-0.182
31	31		2.896	0.565	0.000	0.000	0.000	-0.024
32	32		2.897	0.460	0.000	0.000	0.000	-0.022
33	33		2.891	0.370	0.000	0.000	0.000	-0.026
34	34		2.897	0.283	0.000	0.000	0.000	-0.021
35	35		2.894	0.203	0.000	0.000	0.000	-0.023
36	36		2.903	0.133	0.000	0.000	0.000	-0.016
37	37		2.901	0.073	0.000	0.000	0.000	-0.017
38	38		2.910	0.022	0.000	0.000	0.000	-0.011
39	39		2.908	-0.019	0.000	0.000	0.000	-0.013
40	40		2.915	-0.080	0.000	0.000	0.000	-0.009
41	41		2.917	-0.053	0.000	0.000	0.000	-0.006
42	42		2.925	-0.099	0.000	0.000	0.000	-0.002
43	43		2.924	-0.109	0.000	0.000	0.000	-0.004
44	44		2.936	-0.109	0.000	0.000	0.000	0.003
45	45		2.939	-0.095	0.000	0.000	0.000	0.003
46	46		2.955	-0.063	0.000	0.000	0.000	0.013
47	47		2.990	0.120	0.000	0.000	0.000	0.034
48	48		2.964	0.219	0.000	0.000	0.000	0.014
49	49		2.958	0.264	0.000	0.000	0.000	0.008
50	50		2.942	0.272	0.000	0.000	0.000	-0.004
51	51		2.943	0.256	0.000	0.000	0.000	-0.004
52	52		2.933	0.223	0.000	0.000	0.000	-0.012
53	53		2.937	0.180	0.000	0.000	0.000	-0.010
54	54		2.928	0.127	0.000	0.000	0.000	-0.017
55	55		2.931	0.064	0.000	0.000	0.000	-0.014
56	56		2.921	-0.012	0.000	0.000	0.000	-0.022
57	57		2.922	-0.103	0.000	0.000	0.000	-0.022
58	58		2.909	-0.213	0.000	0.000	0.000	-0.032
59	59		2.908	-0.347	0.000	0.000	0.000	-0.033
60	60		2.892	-0.537	0.000	0.000	0.000	-0.045
61	61		2.927	0.565	0.000	0.000	0.000	-0.024

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		2.926	0.460	0.000	0.000	0.000	-0.022
63	63		2.924	0.370	0.000	0.000	0.000	-0.026
64	64		2.924	0.283	0.000	0.000	0.000	-0.021
65	65		2.923	0.203	0.000	0.000	0.000	-0.023
66	66		2.923	0.133	0.000	0.000	0.000	-0.016
67	67		2.923	0.073	0.000	0.000	0.000	-0.017
68	68		2.923	0.022	0.000	0.000	0.000	-0.011
69	69		2.924	-0.019	0.000	0.000	0.000	-0.013
70	70		2.925	-0.053	0.000	0.000	0.000	-0.006
71	71		2.926	-0.080	0.000	0.000	0.000	-0.009
72	72		2.928	-0.099	0.000	0.000	0.000	-0.002
73	73		2.929	-0.109	0.000	0.000	0.000	-0.004
74	74		2.932	-0.109	0.000	0.000	0.000	0.003
75	75		2.934	-0.095	0.000	0.000	0.000	0.003
76	76		2.938	-0.063	0.000	0.000	0.000	0.013
77	77		2.941	-0.000	0.000	0.000	0.000	0.016
78	78		2.947	0.120	0.000	0.000	0.000	0.034
79	79		2.947	0.219	0.000	0.000	0.000	0.014
80	80		2.948	0.264	0.000	0.000	0.000	0.008
81	81		2.948	0.272	0.000	0.000	0.000	-0.004
82	82		2.948	0.256	0.000	0.000	0.000	-0.004
83	83		2.948	0.223	0.000	0.000	0.000	-0.012
84	84		2.949	0.180	0.000	0.000	0.000	-0.010
85	85		2.949	0.127	0.000	0.000	0.000	-0.017
86	86		2.949	0.064	0.000	0.000	0.000	-0.014
87	87		2.949	-0.012	0.000	0.000	0.000	-0.022
88	88		2.949	-0.103	0.000	0.000	0.000	-0.022
89	89		2.949	-0.213	0.000	0.000	0.000	-0.032
90	90		2.949	-0.347	0.000	0.000	0.000	-0.033
91	91		2.948	-0.537	0.000	0.000	0.000	-0.045
92	92		2.670	-0.250	0.000	0.000	0.000	-0.104
93	93		3.547	-0.250	0.000	0.000	0.000	0.023
94	94		3.502	0.005	0.000	0.000	0.000	0.026
95	95		3.518	-0.250	0.000	0.000	0.000	0.023
96	96		3.489	-0.250	0.000	0.000	0.000	0.023
97	97		2.253	-0.250	0.000	0.000	0.000	0.184
98	98		3.657	0.004	0.000	0.000	0.000	0.022
99	99		6.592	0.084	0.000	0.000	0.000	-0.356
100	100		4.091	0.117	0.000	0.000	0.000	-0.054
101	101		4.129	0.128	0.000	0.000	0.000	-0.059
102	102		4.149	0.123	0.000	0.000	0.000	-0.061
103	103		4.159	0.108	0.000	0.000	0.000	-0.063
104	104		4.160	0.089	0.000	0.000	0.000	-0.064
105	105		4.157	0.069	0.000	0.000	0.000	-0.064
106	106		4.149	0.049	0.000	0.000	0.000	-0.064
107	107		4.141	0.030	0.000	0.000	0.000	-0.063
108	108		4.131	0.013	0.000	0.000	0.000	-0.063
109	109		4.124	-0.002	0.000	0.000	0.000	-0.062
110	110		4.115	-0.014	0.000	0.000	0.000	-0.062
111	111		1.741	-0.029	0.000	0.000	0.000	0.229
112	112		3.645	0.084	0.000	0.000	0.000	0.011
113	113		3.645	0.117	0.000	0.000	0.000	0.005
114	114		3.645	0.128	0.000	0.000	0.000	0.000
115	115		3.641	0.123	0.000	0.000	0.000	-0.003
116	116		3.638	0.108	0.000	0.000	0.000	-0.004
117	117		3.632	0.089	0.000	0.000	0.000	-0.005
118	118		3.628	0.069	0.000	0.000	0.000	-0.005
119	119		3.622	0.049	0.000	0.000	0.000	-0.005
120	120		3.618	0.030	0.000	0.000	0.000	-0.004
121	121		3.613	0.013	0.000	0.000	0.000	-0.004
122	122		3.610	-0.002	0.000	0.000	0.000	-0.003

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		3.605	-0.014	0.000	0.000	0.000	-0.003
124	124		3.602	-0.029	0.000	0.000	0.000	-0.002
125	125		3.659	0.084	0.000	0.000	0.000	0.011
126	126		3.651	0.117	0.000	0.000	0.000	0.005
127	127		3.645	0.128	0.000	0.000	0.000	0.000
128	128		3.638	0.123	0.000	0.000	0.000	-0.003
129	129		3.633	0.108	0.000	0.000	0.000	-0.004
130	130		3.626	0.089	0.000	0.000	0.000	-0.005
131	131		3.622	0.069	0.000	0.000	0.000	-0.005
132	132		3.616	0.049	0.000	0.000	0.000	-0.005
133	133		3.613	0.030	0.000	0.000	0.000	-0.004
134	134		3.608	0.013	0.000	0.000	0.000	-0.004
135	135		3.606	-0.002	0.000	0.000	0.000	-0.003
136	136		3.602	-0.014	0.000	0.000	0.000	-0.003
137	137		3.599	-0.029	0.000	0.000	0.000	-0.002
138	138		3.673	0.084	0.000	0.000	0.000	0.011
139	139		3.657	0.117	0.000	0.000	0.000	0.005
140	140		3.645	0.128	0.000	0.000	0.000	0.000
141	141		3.634	0.123	0.000	0.000	0.000	-0.003
142	142		3.627	0.108	0.000	0.000	0.000	-0.004
143	143		3.620	0.089	0.000	0.000	0.000	-0.005
144	144		3.616	0.069	0.000	0.000	0.000	-0.005
145	145		3.610	0.049	0.000	0.000	0.000	-0.005
146	146		3.607	0.030	0.000	0.000	0.000	-0.004
147	147		3.603	0.013	0.000	0.000	0.000	-0.004
148	148		3.601	-0.002	0.000	0.000	0.000	-0.003
149	149		3.598	-0.014	0.000	0.000	0.000	-0.003
150	150		3.597	-0.029	0.000	0.000	0.000	-0.002
151	151		1.601	-0.029	0.000	0.000	0.000	-0.232
152	152		6.898	0.084	0.000	0.000	0.000	0.370
153	153		4.175	0.117	0.000	0.000	0.000	0.059
154	154		4.124	0.128	0.000	0.000	0.000	0.055
155	155		4.088	0.123	0.000	0.000	0.000	0.052
156	156		4.066	0.108	0.000	0.000	0.000	0.050
157	157		4.052	0.089	0.000	0.000	0.000	0.050
158	158		4.047	0.069	0.000	0.000	0.000	0.050
159	159		4.044	0.049	0.000	0.000	0.000	0.050
160	160		4.045	0.030	0.000	0.000	0.000	0.050
161	161		4.045	0.013	0.000	0.000	0.000	0.051
162	162		4.048	-0.002	0.000	0.000	0.000	0.051
163	163		4.049	-0.014	0.000	0.000	0.000	0.052
164	164		3.134	0.002	0.000	0.000	0.000	0.020
165	165		3.781	-0.095	0.000	0.000	0.000	-0.044
166	166		3.649	-0.137	0.000	0.000	0.000	-0.023
167	167		3.703	-0.152	0.000	0.000	0.000	-0.029
168	168		3.737	-0.148	0.000	0.000	0.000	-0.033
169	169		3.756	-0.132	0.000	0.000	0.000	-0.036
170	170		3.759	-0.111	0.000	0.000	0.000	-0.036
171	171		3.752	-0.089	0.000	0.000	0.000	-0.035
172	172		3.744	-0.071	0.000	0.000	0.000	-0.034
173	173		3.728	-0.060	0.000	0.000	0.000	-0.032
174	174		3.703	-0.061	0.000	0.000	0.000	-0.029
175	175		3.671	-0.076	0.000	0.000	0.000	-0.025
176	176		3.634	-0.106	0.000	0.000	0.000	-0.020
177	177		3.590	-0.153	0.000	0.000	0.000	-0.014
178	178		3.482	-0.095	0.000	0.000	0.000	0.016
179	179		3.494	-0.137	0.000	0.000	0.000	0.007
180	180		3.502	-0.152	0.000	0.000	0.000	0.001
181	181		3.508	-0.148	0.000	0.000	0.000	-0.004
182	182		3.511	-0.132	0.000	0.000	0.000	-0.006
183	183		3.512	-0.111	0.000	0.000	0.000	-0.006

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184		3.512	-0.089	0.000	0.000	0.000	-0.005
185	185		3.511	-0.071	0.000	0.000	0.000	-0.004
186	186		3.510	-0.060	0.000	0.000	0.000	-0.002
187	187		3.507	-0.061	0.000	0.000	0.000	0.001
188	188		3.503	-0.076	0.000	0.000	0.000	0.005
189	189		3.500	-0.106	0.000	0.000	0.000	0.010
190	190		3.494	-0.153	0.000	0.000	0.000	0.016
191	191		3.503	-0.095	0.000	0.000	0.000	0.016
192	192		3.503	-0.137	0.000	0.000	0.000	0.007
193	193		3.503	-0.152	0.000	0.000	0.000	0.001
194	194		3.503	-0.148	0.000	0.000	0.000	-0.004
195	195		3.504	-0.132	0.000	0.000	0.000	-0.006
196	196		3.504	-0.111	0.000	0.000	0.000	-0.006
197	197		3.505	-0.089	0.000	0.000	0.000	-0.005
198	198		3.506	-0.071	0.000	0.000	0.000	-0.004
199	199		3.507	-0.060	0.000	0.000	0.000	-0.002
200	200		3.509	-0.061	0.000	0.000	0.000	0.001
201	201		3.510	-0.076	0.000	0.000	0.000	0.005
202	202		3.512	-0.106	0.000	0.000	0.000	0.010
203	203		3.514	-0.153	0.000	0.000	0.000	0.016
204	204		3.503	-0.096	0.000	0.000	0.000	0.016
205	205		3.503	-0.142	0.000	0.000	0.000	0.006
206	206		3.502	-0.152	0.000	0.000	0.000	0.000
207	207		3.504	-0.139	0.000	0.000	0.000	-0.004
208	208		3.503	-0.115	0.000	0.000	0.000	-0.005
209	209		3.505	-0.089	0.000	0.000	0.000	-0.005
210	210		3.506	-0.068	0.000	0.000	0.000	-0.003
211	211		3.508	-0.059	0.000	0.000	0.000	0.001
212	212		3.509	-0.067	0.000	0.000	0.000	0.005
213	213		3.512	-0.097	0.000	0.000	0.000	0.010
214	214		3.513	-0.150	0.000	0.000	0.000	0.016
215	215		3.523	-0.096	0.000	0.000	0.000	0.016
216	216		3.511	-0.142	0.000	0.000	0.000	0.006
217	217		3.502	-0.152	0.000	0.000	0.000	0.000
218	218		3.499	-0.139	0.000	0.000	0.000	-0.004
219	219		3.497	-0.115	0.000	0.000	0.000	-0.005
220	220		3.499	-0.089	0.000	0.000	0.000	-0.005
221	221		3.502	-0.068	0.000	0.000	0.000	-0.003
222	222		3.509	-0.059	0.000	0.000	0.000	0.001
223	223		3.515	-0.067	0.000	0.000	0.000	0.005
224	224		3.525	-0.097	0.000	0.000	0.000	0.010
225	225		3.533	-0.150	0.000	0.000	0.000	0.016
226	226		5.302	-0.096	0.000	0.000	0.000	0.187
227	227		4.386	-0.142	0.000	0.000	0.000	0.092
228	228		4.315	-0.152	0.000	0.000	0.000	0.086
229	229		4.275	-0.139	0.000	0.000	0.000	0.082
230	230		4.258	-0.115	0.000	0.000	0.000	0.080
231	231		4.262	-0.089	0.000	0.000	0.000	0.081
232	232		4.286	-0.068	0.000	0.000	0.000	0.083
233	233		4.326	-0.059	0.000	0.000	0.000	0.086
234	234		4.374	-0.067	0.000	0.000	0.000	0.091
235	235		4.433	-0.097	0.000	0.000	0.000	0.096
236	236		4.496	-0.150	0.000	0.000	0.000	0.101
237	237	End Spring 1	-0.096	-3.523	0.000	0.000	0.000	0.170
238	238	End Spring 2	-0.142	-3.512	0.000	0.000	0.000	0.083
239	239	End Spring 3	-0.152	-3.503	0.000	0.000	0.000	0.077
240	240	End Spring 4	-0.139	-3.499	0.000	0.000	0.000	0.073
241	241	End Spring 5	-0.115	-3.497	0.000	0.000	0.000	0.072
242	242	End Spring 6	-0.089	-3.499	0.000	0.000	0.000	0.072
243	243	End Spring 7	-0.068	-3.502	0.000	0.000	0.000	0.074
244	244	End Spring 8	-0.059	-3.509	0.000	0.000	0.000	0.078

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
245	245	End Spring 9	-0.067	-3.515	0.000	0.000	0.000	0.082
246	246	End Spring 10	-0.097	-3.525	0.000	0.000	0.000	0.087
247	247	End Spring 11	-0.150	-3.533	0.000	0.000	0.000	0.093
248	248	End Spring 12	-0.153	-3.494	0.000	0.000	0.000	-0.012
249	249	End Spring 13	-0.106	-3.500	0.000	0.000	0.000	-0.017
250	250	End Spring 14	-0.076	-3.504	0.000	0.000	0.000	-0.022
251	251	End Spring 15	-0.061	-3.507	0.000	0.000	0.000	-0.026
252	252	End Spring 16	-0.060	-3.510	0.000	0.000	0.000	-0.030
253	253	End Spring 17	-0.071	-3.511	0.000	0.000	0.000	-0.032
254	254	End Spring 18	-0.089	-3.512	0.000	0.000	0.000	-0.033
255	255	End Spring 19	-0.111	-3.512	0.000	0.000	0.000	-0.034
256	256	End Spring 20	-0.132	-3.511	0.000	0.000	0.000	-0.033
257	257	End Spring 21	-0.148	-3.508	0.000	0.000	0.000	-0.031
258	258	End Spring 22	-0.152	-3.502	0.000	0.000	0.000	-0.027
259	259	End Spring 23	-0.137	-3.494	0.000	0.000	0.000	-0.021
260	260	End Spring 24	-0.095	-3.483	0.000	0.000	0.000	-0.039
261	261	End Spring 25	-0.029	-3.596	0.000	0.000	0.000	-0.211
262	262	End Spring 26	-0.014	-3.598	0.000	0.000	0.000	0.047
263	263	End Spring 27	-0.002	-3.602	0.000	0.000	0.000	0.046
264	264	End Spring 28	0.013	-3.603	0.000	0.000	0.000	0.046
265	265	End Spring 29	0.030	-3.608	0.000	0.000	0.000	0.045
266	266	End Spring 30	0.049	-3.610	0.000	0.000	0.000	0.045
267	267	End Spring 31	0.069	-3.616	0.000	0.000	0.000	0.045
268	268	End Spring 32	0.089	-3.620	0.000	0.000	0.000	0.045
269	269	End Spring 33	0.108	-3.628	0.000	0.000	0.000	0.045
270	270	End Spring 34	0.123	-3.635	0.000	0.000	0.000	0.047
271	271	End Spring 35	0.128	-3.646	0.000	0.000	0.000	0.050
272	272	End Spring 36	0.117	-3.657	0.000	0.000	0.000	0.054
273	273	End Spring 37	0.084	-3.674	0.000	0.000	0.000	0.336
274	274	End Spring 38	0.565	-2.896	0.000	0.000	0.000	-0.091
275	275	End Spring 39	0.460	-2.898	0.000	0.000	0.000	0.005
276	276	End Spring 40	0.370	-2.891	0.000	0.000	0.000	-0.179
277	277	End Spring 41	0.283	-2.897	0.000	0.000	0.000	0.007
278	278	End Spring 42	0.203	-2.894	0.000	0.000	0.000	-0.177
279	279	End Spring 43	0.133	-2.903	0.000	0.000	0.000	0.012
280	280	End Spring 44	0.073	-2.901	0.000	0.000	0.000	-0.175
281	281	End Spring 45	0.022	-2.910	0.000	0.000	0.000	0.017
282	282	End Spring 46	-0.019	-2.907	0.000	0.000	0.000	-0.172
283	283	End Spring 47	-0.053	-2.917	0.000	0.000	0.000	0.021
284	284	End Spring 48	-0.080	-2.915	0.000	0.000	0.000	-0.170
285	285	End Spring 49	-0.099	-2.925	0.000	0.000	0.000	0.025
286	286	End Spring 50	-0.109	-2.924	0.000	0.000	0.000	-0.168
287	287	End Spring 51	-0.109	-2.936	0.000	0.000	0.000	0.031
288	288	End Spring 52	-0.095	-2.938	0.000	0.000	0.000	-0.165
289	289	End Spring 53	-0.063	-2.955	0.000	0.000	0.000	0.041
290	290	End Spring 54	-0.537	-2.892	0.000	0.000	0.000	-0.179
291	291	End Spring 55	-0.347	-2.908	0.000	0.000	0.000	0.021
292	292	End Spring 56	-0.213	-2.909	0.000	0.000	0.000	-0.168
293	293	End Spring 57	-0.103	-2.922	0.000	0.000	0.000	0.031
294	294	End Spring 58	-0.012	-2.921	0.000	0.000	0.000	-0.165
295	295	End Spring 59	0.064	-2.931	0.000	0.000	0.000	0.039
296	296	End Spring 60	0.127	-2.928	0.000	0.000	0.000	-0.162
297	297	End Spring 61	0.180	-2.937	0.000	0.000	0.000	0.044
298	298	End Spring 62	0.223	-2.933	0.000	0.000	0.000	-0.160
299	299	End Spring 63	0.256	-2.944	0.000	0.000	0.000	0.049
300	300	End Spring 64	0.272	-2.942	0.000	0.000	0.000	-0.157
301	301	End Spring 65	0.264	-2.958	0.000	0.000	0.000	0.061
302	302	End Spring 66	0.219	-2.964	0.000	0.000	0.000	-0.150
303	303	End Spring 67	0.120	-2.990	0.000	0.000	0.000	0.368
304	304	End Spring 68	-0.029	-3.602	0.000	0.000	0.000	0.208
305	305	End Spring 69	-0.014	-3.605	0.000	0.000	0.000	-0.056

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
306	306	End Spring 70	-0.002	-3.610	0.000	0.000	0.000	-0.057
307	307	End Spring 71	0.013	-3.613	0.000	0.000	0.000	-0.057
308	308	End Spring 72	0.030	-3.618	0.000	0.000	0.000	-0.058
309	309	End Spring 73	0.049	-3.622	0.000	0.000	0.000	-0.058
310	310	End Spring 74	0.069	-3.628	0.000	0.000	0.000	-0.059
311	311	End Spring 75	0.089	-3.632	0.000	0.000	0.000	-0.058
312	312	End Spring 76	0.108	-3.638	0.000	0.000	0.000	-0.058
313	313	End Spring 77	0.123	-3.641	0.000	0.000	0.000	-0.056
314	314	End Spring 78	0.128	-3.645	0.000	0.000	0.000	-0.053
315	315	End Spring 79	0.117	-3.645	0.000	0.000	0.000	-0.049
316	316	End Spring 80	0.084	-3.646	0.000	0.000	0.000	-0.324
317	317	End Spring 81	-0.250	-3.489	0.000	0.000	0.000	0.168
318	318	End Spring 82	-0.250	-3.547	0.000	0.000	0.000	-0.074

GROUP 2 DOCKS
DOCK E4, E5, E7, E8

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		0.155	1.674	0.000	0.000	0.000	0.022
2	2		0.271	1.861	0.000	0.000	0.000	0.040
3	3		0.126	1.999	0.000	0.000	0.000	0.019
4	4		0.207	2.126	0.000	0.000	0.000	0.032
5	5		0.094	2.235	0.000	0.000	0.000	0.015
6	6		0.158	2.336	0.000	0.000	0.000	0.026
7	7		0.079	2.427	0.000	0.000	0.000	0.014
8	8		0.154	2.521	0.000	0.000	0.000	0.025
9	9		0.090	2.614	0.000	0.000	0.000	0.015
10	10		0.199	2.723	0.000	0.000	0.000	0.030
11	11		0.122	2.840	0.000	0.000	0.000	0.018
12	12		0.270	2.980	0.000	0.000	0.000	0.039
13	13		0.158	3.128	0.000	0.000	0.000	0.021
14	14		0.315	3.293	0.000	0.000	0.000	0.044
15	15		0.156	3.451	0.000	0.000	0.000	0.021
16	16		0.231	3.597	0.000	0.000	0.000	0.034
17	17		-0.040	3.744	0.000	0.000	0.000	0.000
18	18		-0.191	3.669	0.000	0.000	0.000	-0.015
19	19		-0.092	3.594	0.000	0.000	0.000	-0.003
20	20		-0.231	3.518	0.000	0.000	0.000	-0.020
21	21		-0.102	3.430	0.000	0.000	0.000	-0.004
22	22		-0.252	3.345	0.000	0.000	0.000	-0.022
23	23		-0.116	3.245	0.000	0.000	0.000	-0.005
24	24		-0.307	3.141	0.000	0.000	0.000	-0.028
25	25		-0.150	3.011	0.000	0.000	0.000	-0.007
26	26		-0.409	2.866	0.000	0.000	0.000	-0.039
27	27		-0.199	2.690	0.000	0.000	0.000	-0.011
28	28		-0.522	2.494	0.000	0.000	0.000	-0.050
29	29		-0.240	2.235	0.000	0.000	0.000	-0.016
30	30		-0.058	3.719	0.000	0.000	0.000	0.000
31	31		-0.001	1.674	0.000	0.000	0.000	0.041
32	32		-0.003	1.861	0.000	0.000	0.000	0.040
33	33		-0.008	2.000	0.000	0.000	0.000	0.036
34	34		-0.012	2.126	0.000	0.000	0.000	0.032
35	35		-0.017	2.236	0.000	0.000	0.000	0.028
36	36		-0.019	2.336	0.000	0.000	0.000	0.026
37	37		-0.021	2.428	0.000	0.000	0.000	0.024
38	38		-0.019	2.520	0.000	0.000	0.000	0.025
39	39		-0.017	2.615	0.000	0.000	0.000	0.027
40	40		-0.006	2.841	0.000	0.000	0.000	0.034
41	41		-0.012	2.723	0.000	0.000	0.000	0.030
42	42		0.000	2.979	0.000	0.000	0.000	0.039
43	43		0.005	3.129	0.000	0.000	0.000	0.042
44	44		0.008	3.293	0.000	0.000	0.000	0.044
45	45		0.006	3.452	0.000	0.000	0.000	0.042
46	46		-0.003	3.597	0.000	0.000	0.000	0.034
47	47		-0.043	3.743	0.000	0.000	0.000	0.000
48	48		-0.054	3.720	0.000	0.000	0.000	-0.010
49	49		-0.061	3.669	0.000	0.000	0.000	-0.015
50	50		-0.063	3.595	0.000	0.000	0.000	-0.018
51	51		-0.064	3.518	0.000	0.000	0.000	-0.020
52	52		-0.064	3.432	0.000	0.000	0.000	-0.020
53	53		-0.066	3.344	0.000	0.000	0.000	-0.022
54	54		-0.067	3.247	0.000	0.000	0.000	-0.024
55	55		-0.072	3.140	0.000	0.000	0.000	-0.028
56	56		-0.076	3.012	0.000	0.000	0.000	-0.032
57	57		-0.084	2.865	0.000	0.000	0.000	-0.039
58	58		-0.090	2.691	0.000	0.000	0.000	-0.044
59	59		-0.098	2.494	0.000	0.000	0.000	-0.050
60	60		-0.100	2.236	0.000	0.000	0.000	-0.052
61	61		-0.053	1.674	0.000	0.000	0.000	0.041

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-0.053	1.861	0.000	0.000	0.000	0.040
63	63		-0.053	2.000	0.000	0.000	0.000	0.036
64	64		-0.052	2.126	0.000	0.000	0.000	0.032
65	65		-0.052	2.236	0.000	0.000	0.000	0.028
66	66		-0.052	2.336	0.000	0.000	0.000	0.026
67	67		-0.051	2.428	0.000	0.000	0.000	0.024
68	68		-0.051	2.520	0.000	0.000	0.000	0.025
69	69		-0.050	2.615	0.000	0.000	0.000	0.027
70	70		-0.050	2.723	0.000	0.000	0.000	0.030
71	71		-0.049	2.841	0.000	0.000	0.000	0.034
72	72		-0.049	2.979	0.000	0.000	0.000	0.039
73	73		-0.048	3.129	0.000	0.000	0.000	0.042
74	74		-0.047	3.293	0.000	0.000	0.000	0.044
75	75		-0.047	3.452	0.000	0.000	0.000	0.042
76	76		-0.046	3.597	0.000	0.000	0.000	0.034
77	77		-0.045	3.702	0.000	0.000	0.000	0.016
78	78		-0.043	3.743	0.000	0.000	0.000	0.000
79	79		-0.042	3.720	0.000	0.000	0.000	-0.010
80	80		-0.041	3.669	0.000	0.000	0.000	-0.015
81	81		-0.040	3.595	0.000	0.000	0.000	-0.018
82	82		-0.039	3.518	0.000	0.000	0.000	-0.020
83	83		-0.039	3.432	0.000	0.000	0.000	-0.020
84	84		-0.038	3.344	0.000	0.000	0.000	-0.022
85	85		-0.037	3.247	0.000	0.000	0.000	-0.024
86	86		-0.036	3.140	0.000	0.000	0.000	-0.028
87	87		-0.036	3.012	0.000	0.000	0.000	-0.032
88	88		-0.035	2.865	0.000	0.000	0.000	-0.039
89	89		-0.035	2.691	0.000	0.000	0.000	-0.044
90	90		-0.035	2.494	0.000	0.000	0.000	-0.050
91	91		-0.034	2.236	0.000	0.000	0.000	-0.052
92	92		0.375	2.059	0.000	0.000	0.000	0.020
93	93		0.155	2.060	0.000	0.000	0.000	0.106
94	94		0.022	3.712	0.000	0.000	0.000	-0.013
95	95		0.022	2.060	0.000	0.000	0.000	0.106
96	96		-0.112	2.060	0.000	0.000	0.000	0.106
97	97		-0.406	2.059	0.000	0.000	0.000	0.041
98	98		-0.032	3.714	0.000	0.000	0.000	-0.005
99	99		-0.027	3.708	0.000	0.000	0.000	-0.000
100	100		-0.017	3.702	0.000	0.000	0.000	-0.002
101	101		0.006	3.693	0.000	0.000	0.000	-0.004
102	102		0.045	3.667	0.000	0.000	0.000	-0.008
103	103		0.102	3.625	0.000	0.000	0.000	-0.014
104	104		0.180	3.549	0.000	0.000	0.000	-0.022
105	105		0.277	3.438	0.000	0.000	0.000	-0.032
106	106		0.393	3.278	0.000	0.000	0.000	-0.044
107	107		0.518	3.068	0.000	0.000	0.000	-0.057
108	108		0.644	2.801	0.000	0.000	0.000	-0.070
109	109		0.748	2.486	0.000	0.000	0.000	-0.080
110	110		0.808	2.130	0.000	0.000	0.000	-0.087
111	111		0.283	1.602	0.000	0.000	0.000	-0.024
112	112		-0.031	3.708	0.000	0.000	0.000	-0.000
113	113		-0.030	3.702	0.000	0.000	0.000	-0.002
114	114		-0.027	3.693	0.000	0.000	0.000	-0.004
115	115		-0.021	3.667	0.000	0.000	0.000	-0.008
116	116		-0.014	3.624	0.000	0.000	0.000	-0.014
117	117		-0.004	3.548	0.000	0.000	0.000	-0.022
118	118		0.009	3.438	0.000	0.000	0.000	-0.032
119	119		0.024	3.278	0.000	0.000	0.000	-0.044
120	120		0.041	3.068	0.000	0.000	0.000	-0.057
121	121		0.057	2.801	0.000	0.000	0.000	-0.070
122	122		0.071	2.485	0.000	0.000	0.000	-0.080

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		0.079	2.130	0.000	0.000	0.000	-0.087
124	124		0.070	1.603	0.000	0.000	0.000	-0.080
125	125		-0.032	3.708	0.000	0.000	0.000	-0.000
126	126		-0.032	3.702	0.000	0.000	0.000	-0.002
127	127		-0.031	3.693	0.000	0.000	0.000	-0.004
128	128		-0.031	3.667	0.000	0.000	0.000	-0.008
129	129		-0.031	3.624	0.000	0.000	0.000	-0.014
130	130		-0.031	3.548	0.000	0.000	0.000	-0.022
131	131		-0.031	3.438	0.000	0.000	0.000	-0.032
132	132		-0.031	3.278	0.000	0.000	0.000	-0.044
133	133		-0.031	3.068	0.000	0.000	0.000	-0.057
134	134		-0.031	2.801	0.000	0.000	0.000	-0.070
135	135		-0.030	2.485	0.000	0.000	0.000	-0.080
136	136		-0.030	2.130	0.000	0.000	0.000	-0.087
137	137		-0.030	1.603	0.000	0.000	0.000	-0.080
138	138		-0.032	3.708	0.000	0.000	0.000	-0.000
139	139		-0.034	3.702	0.000	0.000	0.000	-0.002
140	140		-0.036	3.693	0.000	0.000	0.000	-0.004
141	141		-0.041	3.667	0.000	0.000	0.000	-0.008
142	142		-0.048	3.624	0.000	0.000	0.000	-0.014
143	143		-0.058	3.548	0.000	0.000	0.000	-0.022
144	144		-0.071	3.438	0.000	0.000	0.000	-0.032
145	145		-0.086	3.278	0.000	0.000	0.000	-0.044
146	146		-0.102	3.068	0.000	0.000	0.000	-0.057
147	147		-0.118	2.801	0.000	0.000	0.000	-0.070
148	148		-0.132	2.485	0.000	0.000	0.000	-0.080
149	149		-0.139	2.130	0.000	0.000	0.000	-0.087
150	150		-0.131	1.603	0.000	0.000	0.000	-0.080
151	151		-0.299	1.603	0.000	0.000	0.000	-0.017
152	152		-0.036	3.709	0.000	0.000	0.000	-0.000
153	153		-0.047	3.703	0.000	0.000	0.000	-0.002
154	154		-0.071	3.694	0.000	0.000	0.000	-0.004
155	155		-0.111	3.668	0.000	0.000	0.000	-0.008
156	156		-0.171	3.625	0.000	0.000	0.000	-0.014
157	157		-0.252	3.549	0.000	0.000	0.000	-0.022
158	158		-0.354	3.439	0.000	0.000	0.000	-0.032
159	159		-0.475	3.278	0.000	0.000	0.000	-0.044
160	160		-0.606	3.069	0.000	0.000	0.000	-0.057
161	161		-0.737	2.802	0.000	0.000	0.000	-0.070
162	162		-0.846	2.486	0.000	0.000	0.000	-0.080
163	163		-0.909	2.131	0.000	0.000	0.000	-0.087
164	164		0.092	3.702	0.000	0.000	0.000	0.002
165	165		0.290	3.832	0.000	0.000	0.000	-0.033
166	166		0.319	3.963	0.000	0.000	0.000	-0.036
167	167		0.284	4.090	0.000	0.000	0.000	-0.032
168	168		0.234	4.199	0.000	0.000	0.000	-0.026
169	169		0.125	4.272	0.000	0.000	0.000	-0.013
170	170		0.015	4.293	0.000	0.000	0.000	0.001
171	171		-0.130	4.260	0.000	0.000	0.000	0.018
172	172		-0.287	4.155	0.000	0.000	0.000	0.038
173	173		-0.438	3.982	0.000	0.000	0.000	0.056
174	174		-0.608	3.735	0.000	0.000	0.000	0.077
175	175		-0.739	3.418	0.000	0.000	0.000	0.093
176	176		-0.858	3.047	0.000	0.000	0.000	0.107
177	177		-0.912	2.632	0.000	0.000	0.000	0.114
178	178		0.063	3.832	0.000	0.000	0.000	-0.033
179	179		0.067	3.962	0.000	0.000	0.000	-0.036
180	180		0.062	4.090	0.000	0.000	0.000	-0.032
181	181		0.054	4.199	0.000	0.000	0.000	-0.026
182	182		0.037	4.272	0.000	0.000	0.000	-0.013
183	183		0.021	4.293	0.000	0.000	0.000	0.001

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184		-0.002	4.260	0.000	0.000	0.000	0.018
185	185		-0.026	4.155	0.000	0.000	0.000	0.038
186	186		-0.049	3.981	0.000	0.000	0.000	0.056
187	187		-0.075	3.735	0.000	0.000	0.000	0.077
188	188		-0.095	3.418	0.000	0.000	0.000	0.093
189	189		-0.113	3.047	0.000	0.000	0.000	0.107
190	190		-0.121	2.632	0.000	0.000	0.000	0.114
191	191		0.022	3.832	0.000	0.000	0.000	-0.033
192	192		0.022	3.962	0.000	0.000	0.000	-0.036
193	193		0.022	4.090	0.000	0.000	0.000	-0.032
194	194		0.022	4.199	0.000	0.000	0.000	-0.026
195	195		0.022	4.272	0.000	0.000	0.000	-0.013
196	196		0.022	4.293	0.000	0.000	0.000	0.001
197	197		0.022	4.260	0.000	0.000	0.000	0.018
198	198		0.022	4.155	0.000	0.000	0.000	0.038
199	199		0.022	3.981	0.000	0.000	0.000	0.056
200	200		0.022	3.735	0.000	0.000	0.000	0.077
201	201		0.022	3.418	0.000	0.000	0.000	0.093
202	202		0.022	3.047	0.000	0.000	0.000	0.107
203	203		0.022	2.632	0.000	0.000	0.000	0.114
204	204		0.022	3.835	0.000	0.000	0.000	-0.033
205	205		0.022	3.992	0.000	0.000	0.000	-0.035
206	206		0.022	4.137	0.000	0.000	0.000	-0.030
207	207		0.022	4.249	0.000	0.000	0.000	-0.018
208	208		0.022	4.293	0.000	0.000	0.000	-0.002
209	209		0.022	4.260	0.000	0.000	0.000	0.018
210	210		0.022	4.127	0.000	0.000	0.000	0.041
211	211		0.022	3.899	0.000	0.000	0.000	0.064
212	212		0.022	3.562	0.000	0.000	0.000	0.086
213	213		0.022	3.140	0.000	0.000	0.000	0.104
214	214		0.022	2.653	0.000	0.000	0.000	0.114
215	215		-0.019	3.835	0.000	0.000	0.000	-0.033
216	216		-0.023	3.992	0.000	0.000	0.000	-0.035
217	217		-0.016	4.137	0.000	0.000	0.000	-0.030
218	218		-0.001	4.249	0.000	0.000	0.000	-0.018
219	219		0.019	4.293	0.000	0.000	0.000	-0.002
220	220		0.045	4.260	0.000	0.000	0.000	0.018
221	221		0.073	4.127	0.000	0.000	0.000	0.041
222	222		0.102	3.899	0.000	0.000	0.000	0.064
223	223		0.130	3.562	0.000	0.000	0.000	0.086
224	224		0.152	3.140	0.000	0.000	0.000	0.104
225	225		0.165	2.653	0.000	0.000	0.000	0.114
226	226		-0.338	3.836	0.000	0.000	0.000	-0.033
227	227		-0.366	3.993	0.000	0.000	0.000	-0.035
228	228		-0.307	4.138	0.000	0.000	0.000	-0.030
229	229		-0.178	4.250	0.000	0.000	0.000	-0.018
230	230		0.001	4.294	0.000	0.000	0.000	-0.002
231	231		0.221	4.261	0.000	0.000	0.000	0.018
232	232		0.467	4.128	0.000	0.000	0.000	0.041
233	233		0.720	3.900	0.000	0.000	0.000	0.064
234	234		0.964	3.563	0.000	0.000	0.000	0.086
235	235		1.158	3.141	0.000	0.000	0.000	0.104
236	236		1.264	2.654	0.000	0.000	0.000	0.114
237	237	End Spring 1	3.836	0.019	0.000	0.000	0.000	-0.033
238	238	End Spring 2	3.992	0.023	0.000	0.000	0.000	-0.035
239	239	End Spring 3	4.138	0.016	0.000	0.000	0.000	-0.030
240	240	End Spring 4	4.250	0.001	0.000	0.000	0.000	-0.018
241	241	End Spring 5	4.293	-0.019	0.000	0.000	0.000	-0.002
242	242	End Spring 6	4.261	-0.045	0.000	0.000	0.000	0.018
243	243	End Spring 7	4.128	-0.073	0.000	0.000	0.000	0.041
244	244	End Spring 8	3.899	-0.102	0.000	0.000	0.000	0.064

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
245	245	End Spring 9	3.563	-0.130	0.000	0.000	0.000	0.086
246	246	End Spring 10	3.140	-0.152	0.000	0.000	0.000	0.104
247	247	End Spring 11	2.654	-0.165	0.000	0.000	0.000	0.114
248	248	End Spring 12	2.632	0.121	0.000	0.000	0.000	0.114
249	249	End Spring 13	3.047	0.113	0.000	0.000	0.000	0.107
250	250	End Spring 14	3.418	0.095	0.000	0.000	0.000	0.093
251	251	End Spring 15	3.735	0.075	0.000	0.000	0.000	0.077
252	252	End Spring 16	3.982	0.049	0.000	0.000	0.000	0.056
253	253	End Spring 17	4.155	0.026	0.000	0.000	0.000	0.038
254	254	End Spring 18	4.260	0.002	0.000	0.000	0.000	0.018
255	255	End Spring 19	4.293	-0.021	0.000	0.000	0.000	0.001
256	256	End Spring 20	4.272	-0.037	0.000	0.000	0.000	-0.013
257	257	End Spring 21	4.199	-0.054	0.000	0.000	0.000	-0.026
258	258	End Spring 22	4.090	-0.062	0.000	0.000	0.000	-0.032
259	259	End Spring 23	3.963	-0.067	0.000	0.000	0.000	-0.036
260	260	End Spring 24	3.832	-0.063	0.000	0.000	0.000	-0.033
261	261	End Spring 25	1.603	0.131	0.000	0.000	0.000	-0.022
262	262	End Spring 26	2.130	0.139	0.000	0.000	0.000	-0.087
263	263	End Spring 27	2.486	0.132	0.000	0.000	0.000	-0.080
264	264	End Spring 28	2.802	0.118	0.000	0.000	0.000	-0.070
265	265	End Spring 29	3.068	0.102	0.000	0.000	0.000	-0.057
266	266	End Spring 30	3.278	0.086	0.000	0.000	0.000	-0.044
267	267	End Spring 31	3.438	0.071	0.000	0.000	0.000	-0.032
268	268	End Spring 32	3.549	0.058	0.000	0.000	0.000	-0.022
269	269	End Spring 33	3.625	0.048	0.000	0.000	0.000	-0.014
270	270	End Spring 34	3.668	0.041	0.000	0.000	0.000	-0.008
271	271	End Spring 35	3.694	0.036	0.000	0.000	0.000	-0.004
272	272	End Spring 36	3.702	0.034	0.000	0.000	0.000	-0.002
273	273	End Spring 37	3.708	0.032	0.000	0.000	0.000	-0.000
274	274	End Spring 38	1.674	0.001	0.000	0.000	0.000	0.023
275	275	End Spring 39	1.861	0.003	0.000	0.000	0.000	0.040
276	276	End Spring 40	2.000	0.008	0.000	0.000	0.000	0.021
277	277	End Spring 41	2.126	0.012	0.000	0.000	0.000	0.032
278	278	End Spring 42	2.235	0.017	0.000	0.000	0.000	0.017
279	279	End Spring 43	2.336	0.019	0.000	0.000	0.000	0.026
280	280	End Spring 44	2.427	0.021	0.000	0.000	0.000	0.015
281	281	End Spring 45	2.520	0.019	0.000	0.000	0.000	0.025
282	282	End Spring 46	2.615	0.017	0.000	0.000	0.000	0.016
283	283	End Spring 47	2.723	0.012	0.000	0.000	0.000	0.030
284	284	End Spring 48	2.841	0.006	0.000	0.000	0.000	0.020
285	285	End Spring 49	2.979	-0.000	0.000	0.000	0.000	0.039
286	286	End Spring 50	3.129	-0.005	0.000	0.000	0.000	0.024
287	287	End Spring 51	3.293	-0.008	0.000	0.000	0.000	0.044
288	288	End Spring 52	3.452	-0.006	0.000	0.000	0.000	0.023
289	289	End Spring 53	3.597	0.003	0.000	0.000	0.000	0.034
290	290	End Spring 54	2.235	0.100	0.000	0.000	0.000	-0.018
291	291	End Spring 55	2.494	0.098	0.000	0.000	0.000	-0.050
292	292	End Spring 56	2.691	0.090	0.000	0.000	0.000	-0.016
293	293	End Spring 57	2.866	0.084	0.000	0.000	0.000	-0.039
294	294	End Spring 58	3.012	0.076	0.000	0.000	0.000	-0.011
295	295	End Spring 59	3.140	0.072	0.000	0.000	0.000	-0.028
296	296	End Spring 60	3.246	0.067	0.000	0.000	0.000	-0.008
297	297	End Spring 61	3.345	0.066	0.000	0.000	0.000	-0.022
298	298	End Spring 62	3.431	0.064	0.000	0.000	0.000	-0.006
299	299	End Spring 63	3.518	0.064	0.000	0.000	0.000	-0.020
300	300	End Spring 64	3.595	0.063	0.000	0.000	0.000	-0.005
301	301	End Spring 65	3.669	0.061	0.000	0.000	0.000	-0.015
302	302	End Spring 66	3.720	0.054	0.000	0.000	0.000	-0.001
303	303	End Spring 67	3.744	0.043	0.000	0.000	0.000	0.000
304	304	End Spring 68	1.603	-0.070	0.000	0.000	0.000	-0.028
305	305	End Spring 69	2.130	-0.079	0.000	0.000	0.000	-0.087

APPENDIX: GROUP 3 DOCKS DATA

GROUP 3 DOCKS
DOCK E6, E9

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P2	Normal	ky'	1.360
2	1	P2	Normal	kx'	1.360
3	5	P27	Normal	ky'	1.360
4	5	P27	Normal	kx'	1.360
5	9	P28	Normal	ky'	1.360
6	9	P28	Normal	kx'	1.360
7	14	P29	Normal	ky'	1.360
8	14	P29	Normal	kx'	1.360
9	18	P30	Normal	ky'	1.360
10	18	P30	Normal	kx'	1.360
11	22	P25	Normal	ky'	1.360
12	22	P25	Normal	kx'	1.360
13	45	P3	Normal	ky'	1.360
14	45	P3	Normal	kx'	1.360
15	46	P4	Normal	ky'	1.360
16	46	P4	Normal	kx'	1.360
17	47	P5	Normal	ky'	1.360
18	47	P5	Normal	kx'	1.360
19	48	P6	Normal	ky'	1.360
20	48	P6	Normal	kx'	1.360
21	49	P7	Normal	ky'	1.360
22	49	P7	Normal	kx'	1.360
23	50	P8	Normal	ky'	1.360
24	50	P8	Normal	kx'	1.360
25	51	P9	Normal	ky'	1.360
26	51	P9	Normal	kx'	1.360
27	52	P10	Normal	ky'	1.360
28	52	P10	Normal	kx'	1.360
29	53	P11	Normal	ky'	1.360
30	53	P11	Normal	kx'	1.360
31	54	P12	Normal	ky'	1.360
32	54	P12	Normal	kx'	1.360
33	55	P13	Normal	ky'	1.360
34	55	P13	Normal	kx'	1.360
35	56	P14	Normal	ky'	1.360
36	56	P14	Normal	kx'	1.360
37	57	P15	Normal	ky'	1.360
38	57	P15	Normal	kx'	1.360
39	58	P16	Normal	ky'	1.360
40	58	P16	Normal	kx'	1.360
41	59	P17	Normal	ky'	1.360
42	59	P17	Normal	kx'	1.360
43	60	P18	Normal	ky'	1.360
44	60	P18	Normal	kx'	1.360
45	61	P19	Normal	ky'	1.360
46	61	P19	Normal	kx'	1.360
47	62	P20	Normal	ky'	1.360
48	62	P20	Normal	kx'	1.360
49	63	P21	Normal	ky'	1.360
50	63	P21	Normal	kx'	1.360
51	64	P22	Normal	ky'	1.360
52	64	P22	Normal	kx'	1.360
53	65	P23	Normal	ky'	1.360
54	65	P23	Normal	kx'	1.360
55	66	P24	Normal	ky'	1.360
56	66	P24	Normal	kx'	1.360
57	143	P26	Normal	ky'	1.360
58	143	P26	Normal	kx'	1.360
59	144	P1	Normal	ky'	1.360
60	144	P1	Normal	kx'	1.360

GROUP 3 DOCKS
DOCK E6, E9

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P2	4.135	0.306	0.000	0.000	0.000	0.009
2	2		4.132	0.322	0.000	0.000	0.000	-0.004
3	3		4.127	0.284	0.000	0.000	0.000	-0.011
4	4		4.120	0.222	0.000	0.000	0.000	-0.013
5	5	P27	4.112	0.157	0.000	0.000	0.000	-0.012
6	6		4.109	0.100	0.000	0.000	0.000	-0.010
7	7		4.104	0.055	0.000	0.000	0.000	-0.008
8	8		4.097	0.021	0.000	0.000	0.000	-0.006
9	9	P28	4.089	-0.002	0.000	0.000	0.000	-0.004
10	10		4.085	-0.018	0.000	0.000	0.000	-0.003
11	11		4.080	-0.028	0.000	0.000	0.000	-0.002
12	12		4.073	-0.032	0.000	0.000	0.000	-0.001
13	13		4.066	-0.031	0.000	0.000	0.000	-0.000
14	14	P29	4.057	-0.031	0.000	0.000	0.000	-0.001
15	15		4.052	-0.037	0.000	0.000	0.000	-0.003
16	16		4.047	-0.052	0.000	0.000	0.000	-0.005
17	17		4.040	-0.080	0.000	0.000	0.000	-0.007
18	18	P30	4.032	-0.122	0.000	0.000	0.000	-0.010
19	19		4.029	-0.177	0.000	0.000	0.000	-0.012
20	20		4.025	-0.237	0.000	0.000	0.000	-0.012
21	21		4.019	-0.290	0.000	0.000	0.000	-0.009
22	22	P25	4.012	-0.315	0.000	0.000	0.000	-0.001
23	23		4.141	0.306	0.000	0.000	0.000	0.009
24	24		4.129	0.322	0.000	0.000	0.000	-0.004
25	25		4.120	0.284	0.000	0.000	0.000	-0.011
26	26		4.112	0.222	0.000	0.000	0.000	-0.013
27	27		4.104	0.157	0.000	0.000	0.000	-0.012
28	28		4.102	0.100	0.000	0.000	0.000	-0.010
29	29		4.098	0.055	0.000	0.000	0.000	-0.008
30	30		4.093	0.021	0.000	0.000	0.000	-0.006
31	31		4.086	-0.002	0.000	0.000	0.000	-0.004
32	32		4.083	-0.018	0.000	0.000	0.000	-0.003
33	33		4.079	-0.028	0.000	0.000	0.000	-0.002
34	34		4.073	-0.032	0.000	0.000	0.000	-0.001
35	35		4.065	-0.031	0.000	0.000	0.000	-0.000
36	36		4.056	-0.031	0.000	0.000	0.000	-0.001
37	37		4.051	-0.037	0.000	0.000	0.000	-0.003
38	38		4.044	-0.052	0.000	0.000	0.000	-0.005
39	39		4.036	-0.080	0.000	0.000	0.000	-0.007
40	40		4.026	-0.122	0.000	0.000	0.000	-0.010
41	41		4.022	-0.177	0.000	0.000	0.000	-0.012
42	42		4.017	-0.237	0.000	0.000	0.000	-0.012
43	43		4.014	-0.290	0.000	0.000	0.000	-0.009
44	44		4.012	-0.315	0.000	0.000	0.000	-0.001
45	45	P3	4.199	0.306	0.000	0.000	0.000	-0.085
46	46	P4	1.180	0.321	0.000	0.000	0.000	-0.242
47	47	P5	1.164	0.283	0.000	0.000	0.000	-0.242
48	48	P6	1.157	0.222	0.000	0.000	0.000	-0.241
49	49	P7	1.158	0.157	0.000	0.000	0.000	-0.241
50	50	P8	1.161	0.100	0.000	0.000	0.000	-0.240
51	51	P9	1.166	0.055	0.000	0.000	0.000	-0.240
52	52	P10	1.170	0.021	0.000	0.000	0.000	-0.240
53	53	P11	1.173	-0.002	0.000	0.000	0.000	-0.239
54	54	P12	1.175	-0.018	0.000	0.000	0.000	-0.239
55	55	P13	1.176	-0.028	0.000	0.000	0.000	-0.238
56	56	P14	1.179	-0.032	0.000	0.000	0.000	-0.238
57	57	P15	1.178	-0.031	0.000	0.000	0.000	-0.237
58	58	P16	1.175	-0.031	0.000	0.000	0.000	-0.237
59	59	P17	1.171	-0.037	0.000	0.000	0.000	-0.236
60	60	P18	1.165	-0.052	0.000	0.000	0.000	-0.236
61	61	P19	1.158	-0.080	0.000	0.000	0.000	-0.236

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P20	1.150	-0.122	0.000	0.000	0.000	-0.236
63	63	P21	1.145	-0.177	0.000	0.000	0.000	-0.235
64	64	P22	1.145	-0.237	0.000	0.000	0.000	-0.235
65	65	P23	1.151	-0.290	0.000	0.000	0.000	-0.235
66	66	P24	1.168	-0.315	0.000	0.000	0.000	-0.234
67	67		4.132	0.324	0.000	0.000	0.000	-0.003
68	68		4.128	0.298	0.000	0.000	0.000	-0.009
69	69		4.123	0.251	0.000	0.000	0.000	-0.012
70	70		4.117	0.196	0.000	0.000	0.000	-0.012
71	71		4.112	0.143	0.000	0.000	0.000	-0.012
72	72		4.108	0.097	0.000	0.000	0.000	-0.010
73	73		4.104	0.059	0.000	0.000	0.000	-0.008
74	74		4.099	0.029	0.000	0.000	0.000	-0.006
75	75		4.093	0.007	0.000	0.000	0.000	-0.004
76	76		4.088	-0.010	0.000	0.000	0.000	-0.003
77	77		4.084	-0.022	0.000	0.000	0.000	-0.002
78	78		4.080	-0.029	0.000	0.000	0.000	-0.002
79	79		4.075	-0.031	0.000	0.000	0.000	-0.000
80	80		4.070	-0.031	0.000	0.000	0.000	0.000
81	81		4.063	-0.031	0.000	0.000	0.000	0.000
82	82		4.056	-0.031	0.000	0.000	0.000	-0.001
83	83		4.053	-0.036	0.000	0.000	0.000	-0.002
84	84		4.049	-0.047	0.000	0.000	0.000	-0.003
85	85		4.044	-0.065	0.000	0.000	0.000	-0.005
86	86		4.038	-0.092	0.000	0.000	0.000	-0.007
87	87		4.032	-0.128	0.000	0.000	0.000	-0.010
88	88		4.030	-0.171	0.000	0.000	0.000	-0.012
89	89		4.026	-0.219	0.000	0.000	0.000	-0.012
90	90		4.022	-0.266	0.000	0.000	0.000	-0.010
91	91		4.017	-0.302	0.000	0.000	0.000	-0.006
92	92		4.134	0.324	0.000	0.000	0.000	-0.003
93	93		4.134	0.298	0.000	0.000	0.000	-0.009
94	94		4.131	0.251	0.000	0.000	0.000	-0.012
95	95		4.125	0.196	0.000	0.000	0.000	-0.012
96	96		4.119	0.143	0.000	0.000	0.000	-0.012
97	97		4.115	0.097	0.000	0.000	0.000	-0.010
98	98		4.109	0.059	0.000	0.000	0.000	-0.008
99	99		4.103	0.029	0.000	0.000	0.000	-0.006
100	100		4.095	0.007	0.000	0.000	0.000	-0.004
101	101		4.090	-0.010	0.000	0.000	0.000	-0.003
102	102		4.086	-0.022	0.000	0.000	0.000	-0.002
103	103		4.082	-0.029	0.000	0.000	0.000	-0.002
104	104		4.075	-0.031	0.000	0.000	0.000	-0.000
105	105		4.069	-0.031	0.000	0.000	0.000	0.000
106	106		4.063	-0.031	0.000	0.000	0.000	0.000
107	107		4.057	-0.031	0.000	0.000	0.000	-0.001
108	108		4.054	-0.036	0.000	0.000	0.000	-0.002
109	109		4.051	-0.047	0.000	0.000	0.000	-0.003
110	110		4.047	-0.065	0.000	0.000	0.000	-0.005
111	111		4.043	-0.092	0.000	0.000	0.000	-0.007
112	112		4.038	-0.128	0.000	0.000	0.000	-0.010
113	113		4.037	-0.171	0.000	0.000	0.000	-0.012
114	114		4.034	-0.219	0.000	0.000	0.000	-0.012
115	115		4.029	-0.266	0.000	0.000	0.000	-0.010
116	116		4.021	-0.302	0.000	0.000	0.000	-0.006
117	117		4.013	-0.315	0.000	0.000	0.000	-0.001
118	118		4.828	0.324	0.000	0.000	0.000	-0.081
119	119		4.884	0.298	0.000	0.000	0.000	-0.087
120	120		4.907	0.251	0.000	0.000	0.000	-0.090
121	121		4.906	0.196	0.000	0.000	0.000	-0.090
122	122		4.892	0.143	0.000	0.000	0.000	-0.089

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		4.876	0.097	0.000	0.000	0.000	-0.088
124	124		4.854	0.059	0.000	0.000	0.000	-0.086
125	125		4.828	0.029	0.000	0.000	0.000	-0.084
126	126		4.805	0.007	0.000	0.000	0.000	-0.082
127	127		4.789	-0.010	0.000	0.000	0.000	-0.081
128	128		4.778	-0.022	0.000	0.000	0.000	-0.080
129	129		4.772	-0.029	0.000	0.000	0.000	-0.080
130	130		4.549	-0.031	0.000	0.000	0.000	-0.055
131	131		4.536	-0.031	0.000	0.000	0.000	-0.054
132	132		4.532	-0.031	0.000	0.000	0.000	-0.054
133	133		4.536	-0.031	0.000	0.000	0.000	-0.056
134	134		4.545	-0.036	0.000	0.000	0.000	-0.057
135	135		4.551	-0.047	0.000	0.000	0.000	-0.058
136	136		4.563	-0.065	0.000	0.000	0.000	-0.060
137	137		4.578	-0.092	0.000	0.000	0.000	-0.062
138	138		4.596	-0.128	0.000	0.000	0.000	-0.064
139	139		4.609	-0.171	0.000	0.000	0.000	-0.066
140	140		4.605	-0.219	0.000	0.000	0.000	-0.066
141	141		4.587	-0.266	0.000	0.000	0.000	-0.065
142	142		4.548	-0.302	0.000	0.000	0.000	-0.061
143	143	P26	1.547	-0.315	0.000	0.000	0.000	0.299
144	144	P1	2.922	0.306	0.000	0.000	0.000	0.165
145	145		4.129	0.306	0.000	0.000	0.000	0.009
146	146	End Spring 1	0.306	-4.142	0.000	0.000	0.000	0.085
147	147	End Spring 2	0.322	-4.129	0.000	0.000	0.000	-0.162
148	148	End Spring 3	0.284	-4.120	0.000	0.000	0.000	-0.163
149	149	End Spring 4	0.222	-4.112	0.000	0.000	0.000	-0.163
150	150	End Spring 5	0.157	-4.104	0.000	0.000	0.000	-0.163
151	151	End Spring 6	0.100	-4.102	0.000	0.000	0.000	-0.162
152	152	End Spring 7	0.055	-4.098	0.000	0.000	0.000	-0.161
153	153	End Spring 8	0.021	-4.093	0.000	0.000	0.000	-0.160
154	154	End Spring 9	-0.002	-4.086	0.000	0.000	0.000	-0.160
155	155	End Spring 10	-0.018	-4.083	0.000	0.000	0.000	-0.159
156	156	End Spring 11	-0.028	-4.079	0.000	0.000	0.000	-0.159
157	157	End Spring 12	-0.032	-4.073	0.000	0.000	0.000	-0.158
158	158	End Spring 13	-0.031	-4.065	0.000	0.000	0.000	-0.157
159	159	End Spring 14	-0.031	-4.056	0.000	0.000	0.000	-0.157
160	160	End Spring 15	-0.037	-4.051	0.000	0.000	0.000	-0.157
161	161	End Spring 16	-0.052	-4.044	0.000	0.000	0.000	-0.158
162	162	End Spring 17	-0.080	-4.036	0.000	0.000	0.000	-0.158
163	163	End Spring 18	-0.122	-4.026	0.000	0.000	0.000	-0.158
164	164	End Spring 19	-0.177	-4.022	0.000	0.000	0.000	-0.159
165	165	End Spring 20	-0.237	-4.017	0.000	0.000	0.000	-0.158
166	166	End Spring 21	-0.290	-4.014	0.000	0.000	0.000	-0.157
167	167	End Spring 22	-0.315	-4.012	0.000	0.000	0.000	-0.155
168	168	End Spring 23	0.306	-4.130	0.000	0.000	0.000	0.104
169	169	End Spring 24	0.324	-4.134	0.000	0.000	0.000	-0.073
170	170	End Spring 25	0.298	-4.134	0.000	0.000	0.000	-0.079
171	171	End Spring 26	0.251	-4.131	0.000	0.000	0.000	-0.082
172	172	End Spring 27	0.196	-4.125	0.000	0.000	0.000	-0.082
173	173	End Spring 28	0.143	-4.119	0.000	0.000	0.000	-0.082
174	174	End Spring 29	0.097	-4.115	0.000	0.000	0.000	-0.080
175	175	End Spring 30	0.059	-4.109	0.000	0.000	0.000	-0.078
176	176	End Spring 31	0.029	-4.103	0.000	0.000	0.000	-0.076
177	177	End Spring 32	0.007	-4.095	0.000	0.000	0.000	-0.074
178	178	End Spring 33	-0.010	-4.090	0.000	0.000	0.000	-0.073
179	179	End Spring 34	-0.022	-4.086	0.000	0.000	0.000	-0.072
180	180	End Spring 35	-0.029	-4.082	0.000	0.000	0.000	-0.072
181	181	End Spring 36	-0.031	-4.075	0.000	0.000	0.000	-0.049
182	182	End Spring 37	-0.031	-4.069	0.000	0.000	0.000	-0.049
183	183	End Spring 38	-0.031	-4.063	0.000	0.000	0.000	-0.049

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 39	-0.031	-4.057	0.000	0.000	0.000	-0.050
185	185	End Spring 40	-0.036	-4.054	0.000	0.000	0.000	-0.051
186	186	End Spring 41	-0.047	-4.051	0.000	0.000	0.000	-0.052
187	187	End Spring 42	-0.065	-4.047	0.000	0.000	0.000	-0.054
188	188	End Spring 43	-0.092	-4.043	0.000	0.000	0.000	-0.056
189	189	End Spring 44	-0.128	-4.039	0.000	0.000	0.000	-0.059
190	190	End Spring 45	-0.171	-4.037	0.000	0.000	0.000	-0.061
191	191	End Spring 46	-0.219	-4.034	0.000	0.000	0.000	-0.061
192	192	End Spring 47	-0.266	-4.029	0.000	0.000	0.000	-0.059
193	193	End Spring 48	-0.302	-4.022	0.000	0.000	0.000	-0.055
194	194	End Spring 49	-0.315	-4.013	0.000	0.000	0.000	0.245

GROUP 3 DOCKS
DOCK E6, E9

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P2	0.001	1.975	0.000	0.000	0.000	0.015
2	2		0.001	2.053	0.000	0.000	0.000	0.013
3	3		0.001	2.110	0.000	0.000	0.000	0.008
4	4		0.001	2.143	0.000	0.000	0.000	0.004
5	5	P27	0.001	2.162	0.000	0.000	0.000	0.004
6	6		0.001	2.185	0.000	0.000	0.000	0.004
7	7		0.001	2.202	0.000	0.000	0.000	0.002
8	8		0.001	2.207	0.000	0.000	0.000	0.000
9	9	P28	0.002	2.210	0.000	0.000	0.000	0.002
10	10		0.002	2.224	0.000	0.000	0.000	0.003
11	11		0.002	2.233	0.000	0.000	0.000	0.000
12	12		0.002	2.224	0.000	0.000	0.000	-0.004
13	13		0.002	2.197	0.000	0.000	0.000	-0.006
14	14	P29	0.002	2.170	0.000	0.000	0.000	-0.004
15	15		0.002	2.157	0.000	0.000	0.000	-0.002
16	16		0.002	2.146	0.000	0.000	0.000	-0.003
17	17		0.002	2.127	0.000	0.000	0.000	-0.004
18	18	P30	0.002	2.104	0.000	0.000	0.000	-0.003
19	19		0.002	2.088	0.000	0.000	0.000	-0.003
20	20		0.003	2.061	0.000	0.000	0.000	-0.007
21	21		0.003	2.011	0.000	0.000	0.000	-0.012
22	22	P25	0.003	1.941	0.000	0.000	0.000	-0.013
23	23		0.010	1.975	0.000	0.000	0.000	0.015
24	24		0.009	2.053	0.000	0.000	0.000	0.013
25	25		0.006	2.110	0.000	0.000	0.000	0.008
26	26		0.004	2.143	0.000	0.000	0.000	0.004
27	27		0.004	2.162	0.000	0.000	0.000	0.004
28	28		0.004	2.185	0.000	0.000	0.000	0.004
29	29		0.003	2.202	0.000	0.000	0.000	0.002
30	30		0.002	2.207	0.000	0.000	0.000	0.000
31	31		0.003	2.210	0.000	0.000	0.000	0.002
32	32		0.003	2.224	0.000	0.000	0.000	0.003
33	33		0.002	2.233	0.000	0.000	0.000	0.000
34	34		-0.000	2.224	0.000	0.000	0.000	-0.004
35	35		-0.002	2.197	0.000	0.000	0.000	-0.006
36	36		-0.000	2.170	0.000	0.000	0.000	-0.004
37	37		0.001	2.157	0.000	0.000	0.000	-0.002
38	38		0.001	2.146	0.000	0.000	0.000	-0.003
39	39		-0.000	2.127	0.000	0.000	0.000	-0.004
40	40		0.000	2.104	0.000	0.000	0.000	-0.003
41	41		0.000	2.088	0.000	0.000	0.000	-0.003
42	42		-0.002	2.061	0.000	0.000	0.000	-0.007
43	43		-0.005	2.011	0.000	0.000	0.000	-0.012
44	44		-0.006	1.941	0.000	0.000	0.000	-0.013
45	45	P3	0.035	1.976	0.000	0.000	0.000	0.001
46	46	P4	0.031	2.052	0.000	0.000	0.000	0.001
47	47	P5	0.020	2.109	0.000	0.000	0.000	0.000
48	48	P6	0.010	2.142	0.000	0.000	0.000	0.000
49	49	P7	0.009	2.161	0.000	0.000	0.000	0.000
50	50	P8	0.010	2.184	0.000	0.000	0.000	0.000
51	51	P9	0.005	2.201	0.000	0.000	0.000	0.000
52	52	P10	0.001	2.206	0.000	0.000	0.000	-0.000
53	53	P11	0.004	2.208	0.000	0.000	0.000	-0.000
54	54	P12	0.007	2.223	0.000	0.000	0.000	0.000
55	55	P13	0.001	2.232	0.000	0.000	0.000	-0.000
56	56	P14	-0.008	2.222	0.000	0.000	0.000	-0.000
57	57	P15	-0.013	2.196	0.000	0.000	0.000	-0.000
58	58	P16	-0.009	2.168	0.000	0.000	0.000	-0.000
59	59	P17	-0.004	2.156	0.000	0.000	0.000	-0.000
60	60	P18	-0.006	2.145	0.000	0.000	0.000	-0.000
61	61	P19	-0.010	2.126	0.000	0.000	0.000	-0.000

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P20	-0.008	2.103	0.000	0.000	0.000	-0.000
63	63	P21	-0.008	2.087	0.000	0.000	0.000	-0.000
64	64	P22	-0.017	2.060	0.000	0.000	0.000	-0.000
65	65	P23	-0.027	2.010	0.000	0.000	0.000	-0.001
66	66	P24	-0.031	1.942	0.000	0.000	0.000	-0.001
67	67		0.001	2.044	0.000	0.000	0.000	0.014
68	68		0.001	2.097	0.000	0.000	0.000	0.010
69	69		0.001	2.131	0.000	0.000	0.000	0.006
70	70		0.001	2.150	0.000	0.000	0.000	0.003
71	71		0.001	2.167	0.000	0.000	0.000	0.004
72	72		0.001	2.187	0.000	0.000	0.000	0.004
73	73		0.001	2.201	0.000	0.000	0.000	0.002
74	74		0.001	2.207	0.000	0.000	0.000	0.000
75	75		0.002	2.207	0.000	0.000	0.000	0.000
76	76		0.002	2.215	0.000	0.000	0.000	0.003
77	77		0.002	2.227	0.000	0.000	0.000	0.002
78	78		0.002	2.233	0.000	0.000	0.000	0.000
79	79		0.002	2.227	0.000	0.000	0.000	-0.003
80	80		0.002	2.211	0.000	0.000	0.000	-0.005
81	81		0.002	2.187	0.000	0.000	0.000	-0.006
82	82		0.002	2.167	0.000	0.000	0.000	-0.003
83	83		0.002	2.158	0.000	0.000	0.000	-0.002
84	84		0.002	2.150	0.000	0.000	0.000	-0.002
85	85		0.002	2.137	0.000	0.000	0.000	-0.004
86	86		0.002	2.119	0.000	0.000	0.000	-0.005
87	87		0.002	2.102	0.000	0.000	0.000	-0.003
88	88		0.002	2.090	0.000	0.000	0.000	-0.003
89	89		0.003	2.071	0.000	0.000	0.000	-0.006
90	90		0.003	2.038	0.000	0.000	0.000	-0.010
91	91		0.003	1.991	0.000	0.000	0.000	-0.013
92	92		-0.008	2.044	0.000	0.000	0.000	0.014
93	93		-0.005	2.097	0.000	0.000	0.000	0.010
94	94		-0.003	2.131	0.000	0.000	0.000	0.006
95	95		-0.001	2.150	0.000	0.000	0.000	0.003
96	96		-0.002	2.167	0.000	0.000	0.000	0.004
97	97		-0.001	2.187	0.000	0.000	0.000	0.004
98	98		-0.000	2.201	0.000	0.000	0.000	0.002
99	99		0.001	2.207	0.000	0.000	0.000	0.000
100	100		0.001	2.207	0.000	0.000	0.000	0.000
101	101		-0.000	2.215	0.000	0.000	0.000	0.003
102	102		0.000	2.227	0.000	0.000	0.000	0.002
103	103		0.002	2.233	0.000	0.000	0.000	0.000
104	104		0.004	2.227	0.000	0.000	0.000	-0.003
105	105		0.005	2.211	0.000	0.000	0.000	-0.005
106	106		0.006	2.187	0.000	0.000	0.000	-0.006
107	107		0.004	2.167	0.000	0.000	0.000	-0.003
108	108		0.003	2.158	0.000	0.000	0.000	-0.002
109	109		0.004	2.150	0.000	0.000	0.000	-0.002
110	110		0.005	2.137	0.000	0.000	0.000	-0.004
111	111		0.005	2.119	0.000	0.000	0.000	-0.005
112	112		0.004	2.102	0.000	0.000	0.000	-0.003
113	113		0.004	2.090	0.000	0.000	0.000	-0.003
114	114		0.006	2.071	0.000	0.000	0.000	-0.006
115	115		0.009	2.038	0.000	0.000	0.000	-0.010
116	116		0.011	1.991	0.000	0.000	0.000	-0.013
117	117		0.011	1.941	0.000	0.000	0.000	-0.013
118	118		-0.127	2.045	0.000	0.000	0.000	0.014
119	119		-0.092	2.097	0.000	0.000	0.000	0.010
120	120		-0.053	2.131	0.000	0.000	0.000	0.006
121	121		-0.031	2.151	0.000	0.000	0.000	0.003
122	122		-0.040	2.167	0.000	0.000	0.000	0.004

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		-0.038	2.187	0.000	0.000	0.000	0.004
124	124		-0.020	2.201	0.000	0.000	0.000	0.002
125	125		-0.003	2.207	0.000	0.000	0.000	0.000
126	126		-0.003	2.208	0.000	0.000	0.000	0.000
127	127		-0.025	2.215	0.000	0.000	0.000	0.003
128	128		-0.021	2.228	0.000	0.000	0.000	0.002
129	129		0.001	2.233	0.000	0.000	0.000	0.000
130	130		0.030	2.227	0.000	0.000	0.000	-0.003
131	131		0.050	2.211	0.000	0.000	0.000	-0.005
132	132		0.056	2.187	0.000	0.000	0.000	-0.006
133	133		0.033	2.167	0.000	0.000	0.000	-0.003
134	134		0.018	2.158	0.000	0.000	0.000	-0.002
135	135		0.024	2.150	0.000	0.000	0.000	-0.002
136	136		0.037	2.137	0.000	0.000	0.000	-0.004
137	137		0.045	2.119	0.000	0.000	0.000	-0.005
138	138		0.033	2.102	0.000	0.000	0.000	-0.003
139	139		0.033	2.090	0.000	0.000	0.000	-0.003
140	140		0.058	2.071	0.000	0.000	0.000	-0.006
141	141		0.093	2.038	0.000	0.000	0.000	-0.010
142	142		0.122	1.991	0.000	0.000	0.000	-0.013
143	143	P26	0.044	1.939	0.000	0.000	0.000	-0.003
144	144	P1	-0.048	1.974	0.000	0.000	0.000	0.004
145	145		-0.008	1.975	0.000	0.000	0.000	0.015
146	146	End Spring 1	1.976	-0.010	0.000	0.000	0.000	0.004
147	147	End Spring 2	2.053	-0.009	0.000	0.000	0.000	0.004
148	148	End Spring 3	2.110	-0.006	0.000	0.000	0.000	0.002
149	149	End Spring 4	2.143	-0.004	0.000	0.000	0.000	0.001
150	150	End Spring 5	2.162	-0.004	0.000	0.000	0.000	0.001
151	151	End Spring 6	2.185	-0.004	0.000	0.000	0.000	0.001
152	152	End Spring 7	2.202	-0.003	0.000	0.000	0.000	0.000
153	153	End Spring 8	2.207	-0.002	0.000	0.000	0.000	-0.000
154	154	End Spring 9	2.210	-0.003	0.000	0.000	0.000	0.000
155	155	End Spring 10	2.224	-0.003	0.000	0.000	0.000	0.001
156	156	End Spring 11	2.233	-0.002	0.000	0.000	0.000	-0.000
157	157	End Spring 12	2.224	0.000	0.000	0.000	0.000	-0.001
158	158	End Spring 13	2.197	0.002	0.000	0.000	0.000	-0.002
159	159	End Spring 14	2.170	0.000	0.000	0.000	0.000	-0.001
160	160	End Spring 15	2.157	-0.001	0.000	0.000	0.000	-0.001
161	161	End Spring 16	2.146	-0.001	0.000	0.000	0.000	-0.001
162	162	End Spring 17	2.127	0.000	0.000	0.000	0.000	-0.001
163	163	End Spring 18	2.104	-0.000	0.000	0.000	0.000	-0.001
164	164	End Spring 19	2.088	-0.000	0.000	0.000	0.000	-0.001
165	165	End Spring 20	2.061	0.002	0.000	0.000	0.000	-0.002
166	166	End Spring 21	2.011	0.005	0.000	0.000	0.000	-0.003
167	167	End Spring 22	1.941	0.006	0.000	0.000	0.000	-0.004
168	168	End Spring 23	1.975	0.008	0.000	0.000	0.000	0.006
169	169	End Spring 24	2.044	0.008	0.000	0.000	0.000	0.014
170	170	End Spring 25	2.097	0.005	0.000	0.000	0.000	0.010
171	171	End Spring 26	2.131	0.003	0.000	0.000	0.000	0.006
172	172	End Spring 27	2.151	0.001	0.000	0.000	0.000	0.003
173	173	End Spring 28	2.167	0.002	0.000	0.000	0.000	0.004
174	174	End Spring 29	2.187	0.001	0.000	0.000	0.000	0.004
175	175	End Spring 30	2.201	0.000	0.000	0.000	0.000	0.002
176	176	End Spring 31	2.207	-0.001	0.000	0.000	0.000	0.000
177	177	End Spring 32	2.208	-0.001	0.000	0.000	0.000	0.000
178	178	End Spring 33	2.215	0.000	0.000	0.000	0.000	0.003
179	179	End Spring 34	2.228	-0.000	0.000	0.000	0.000	0.002
180	180	End Spring 35	2.233	-0.002	0.000	0.000	0.000	0.000
181	181	End Spring 36	2.227	-0.004	0.000	0.000	0.000	-0.003
182	182	End Spring 37	2.211	-0.005	0.000	0.000	0.000	-0.005
183	183	End Spring 38	2.187	-0.006	0.000	0.000	0.000	-0.006

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 39	2.167	-0.004	0.000	0.000	0.000	-0.003
185	185	End Spring 40	2.158	-0.003	0.000	0.000	0.000	-0.002
186	186	End Spring 41	2.150	-0.004	0.000	0.000	0.000	-0.002
187	187	End Spring 42	2.137	-0.005	0.000	0.000	0.000	-0.004
188	188	End Spring 43	2.119	-0.005	0.000	0.000	0.000	-0.005
189	189	End Spring 44	2.102	-0.004	0.000	0.000	0.000	-0.003
190	190	End Spring 45	2.090	-0.004	0.000	0.000	0.000	-0.003
191	191	End Spring 46	2.071	-0.006	0.000	0.000	0.000	-0.006
192	192	End Spring 47	2.038	-0.009	0.000	0.000	0.000	-0.010
193	193	End Spring 48	1.991	-0.011	0.000	0.000	0.000	-0.013
194	194	End Spring 49	1.940	-0.011	0.000	0.000	0.000	-0.005

APPENDIX: GROUP 4 DOCKS DATA

GROUP 4 DOCKS
DOCK E10

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	57	P1	Normal	ky'	1.060
2	57	P1	Normal	kx'	1.060
3	59	P2	Normal	ky'	1.060
4	59	P2	Normal	kx'	1.060
5	61	P3	Normal	ky'	1.060
6	61	P3	Normal	kx'	1.060
7	63	P4	Normal	ky'	1.060
8	63	P4	Normal	kx'	1.060
9	65	P5	Normal	ky'	1.060
10	65	P5	Normal	kx'	1.060
11	67	P6	Normal	ky'	1.060
12	67	P6	Normal	kx'	1.060
13	69	P7	Normal	ky'	1.060
14	69	P7	Normal	kx'	1.060
15	71	P8	Normal	ky'	1.060
16	71	P8	Normal	kx'	1.060
17	73	P9	Normal	ky'	1.060
18	73	P9	Normal	kx'	1.060
19	75	P10	Normal	ky'	1.060
20	75	P10	Normal	kx'	1.060
21	77	P11	Normal	ky'	1.060
22	77	P11	Normal	kx'	1.060
23	79	P12	Normal	ky'	1.060
24	79	P12	Normal	kx'	1.060
25	81	P13	Normal	ky'	1.060
26	81	P13	Normal	kx'	1.060
27	83	P14	Normal	ky'	1.060
28	83	P14	Normal	kx'	1.060

GROUP 4 DOCKS
DOCK E10

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		3.487	0.449	0.000	0.000	0.000	-0.018
2	2		3.483	0.376	0.000	0.000	0.000	-0.014
3	3		3.478	0.293	0.000	0.000	0.000	-0.023
4	4		3.474	0.214	0.000	0.000	0.000	-0.013
5	5		3.469	0.145	0.000	0.000	0.000	-0.019
6	6		3.467	0.090	0.000	0.000	0.000	-0.007
7	7		3.462	0.049	0.000	0.000	0.000	-0.013
8	8		3.460	0.021	0.000	0.000	0.000	-0.002
9	9		3.456	0.003	0.000	0.000	0.000	-0.008
10	10		3.454	-0.007	0.000	0.000	0.000	0.002
11	11		3.451	-0.010	0.000	0.000	0.000	-0.005
12	12		3.450	-0.009	0.000	0.000	0.000	0.004
13	13		3.447	-0.005	0.000	0.000	0.000	-0.004
14	14		3.447	-0.000	0.000	0.000	0.000	0.005
15	15		3.445	0.005	0.000	0.000	0.000	-0.004
16	16		3.445	0.010	0.000	0.000	0.000	0.004
17	17		3.443	0.013	0.000	0.000	0.000	-0.005
18	18		3.444	0.013	0.000	0.000	0.000	0.003
19	19		3.443	0.007	0.000	0.000	0.000	-0.007
20	20		3.444	-0.007	0.000	0.000	0.000	-0.001
21	21		3.444	-0.031	0.000	0.000	0.000	-0.012
22	22		3.445	-0.069	0.000	0.000	0.000	-0.007
23	23		3.445	-0.124	0.000	0.000	0.000	-0.019
24	24		3.448	-0.198	0.000	0.000	0.000	-0.015
25	25		3.448	-0.290	0.000	0.000	0.000	-0.027
26	26		3.451	-0.396	0.000	0.000	0.000	-0.021
27	27		3.452	-0.503	0.000	0.000	0.000	-0.028
28	28		3.455	-0.595	0.000	0.000	0.000	-0.013
29	29		3.476	0.449	0.000	0.000	0.000	-0.018
30	30		3.474	0.376	0.000	0.000	0.000	-0.014
31	31		3.463	0.293	0.000	0.000	0.000	-0.023
32	32		3.466	0.214	0.000	0.000	0.000	-0.013
33	33		3.458	0.145	0.000	0.000	0.000	-0.019
34	34		3.462	0.090	0.000	0.000	0.000	-0.007
35	35		3.454	0.049	0.000	0.000	0.000	-0.013
36	36		3.459	0.021	0.000	0.000	0.000	-0.002
37	37		3.451	0.003	0.000	0.000	0.000	-0.008
38	38		3.456	-0.007	0.000	0.000	0.000	0.002
39	39		3.448	-0.010	0.000	0.000	0.000	-0.005
40	40		3.453	-0.009	0.000	0.000	0.000	0.004
41	41		3.445	-0.005	0.000	0.000	0.000	-0.004
42	42		3.450	-0.000	0.000	0.000	0.000	0.005
43	43		3.442	0.005	0.000	0.000	0.000	-0.004
44	44		3.447	0.010	0.000	0.000	0.000	0.004
45	45		3.440	0.013	0.000	0.000	0.000	-0.005
46	46		3.446	0.013	0.000	0.000	0.000	0.003
47	47		3.438	0.007	0.000	0.000	0.000	-0.007
48	48		3.444	-0.007	0.000	0.000	0.000	-0.001
49	49		3.436	-0.031	0.000	0.000	0.000	-0.012
50	50		3.441	-0.069	0.000	0.000	0.000	-0.007
51	51		3.433	-0.124	0.000	0.000	0.000	-0.019
52	52		3.438	-0.198	0.000	0.000	0.000	-0.015
53	53		3.431	-0.290	0.000	0.000	0.000	-0.027
54	54		3.438	-0.396	0.000	0.000	0.000	-0.021
55	55		3.434	-0.503	0.000	0.000	0.000	-0.028
56	56		3.447	-0.595	0.000	0.000	0.000	-0.013
57	57	P1	2.590	0.449	0.000	0.000	0.000	-0.123
58	58		3.804	0.376	0.000	0.000	0.000	0.040
59	59	P2	1.530	0.293	0.000	0.000	0.000	-0.240
60	60		3.804	0.214	0.000	0.000	0.000	0.041
61	61	P3	1.543	0.145	0.000	0.000	0.000	-0.238

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		3.852	0.090	0.000	0.000	0.000	0.047
63	63	P4	1.564	0.049	0.000	0.000	0.000	-0.236
64	64		3.897	0.021	0.000	0.000	0.000	0.052
65	65	P5	1.579	0.003	0.000	0.000	0.000	-0.234
66	66		3.925	-0.007	0.000	0.000	0.000	0.056
67	67	P6	1.587	-0.010	0.000	0.000	0.000	-0.233
68	68		3.938	-0.009	0.000	0.000	0.000	0.058
69	69	P7	1.590	-0.005	0.000	0.000	0.000	-0.232
70	70		3.941	-0.000	0.000	0.000	0.000	0.058
71	71	P8	1.589	0.005	0.000	0.000	0.000	-0.232
72	72		3.937	0.010	0.000	0.000	0.000	0.058
73	73	P9	1.586	0.013	0.000	0.000	0.000	-0.232
74	74		3.922	0.013	0.000	0.000	0.000	0.057
75	75	P10	1.577	0.007	0.000	0.000	0.000	-0.233
76	76		3.889	-0.007	0.000	0.000	0.000	0.053
77	77	P11	1.559	-0.031	0.000	0.000	0.000	-0.234
78	78		3.834	-0.069	0.000	0.000	0.000	0.047
79	79	P12	1.532	-0.124	0.000	0.000	0.000	-0.237
80	80		3.761	-0.198	0.000	0.000	0.000	0.039
81	81	P13	1.503	-0.290	0.000	0.000	0.000	-0.239
82	82		3.709	-0.396	0.000	0.000	0.000	0.033
83	83	P14	1.502	-0.503	0.000	0.000	0.000	-0.240
84	84		3.789	-0.595	0.000	0.000	0.000	0.041
85	85		3.456	-0.635	0.000	0.000	0.000	-0.005
86	86		3.453	-0.635	0.000	0.000	0.000	-0.005
87	87		3.860	-0.635	0.000	0.000	0.000	0.049
88	88	End Spring 1	0.449	-3.476	0.000	0.000	0.000	-0.079
89	89	End Spring 2	0.376	-3.474	0.000	0.000	0.000	0.034
90	90	End Spring 3	0.293	-3.463	0.000	0.000	0.000	-0.197
91	91	End Spring 4	0.214	-3.466	0.000	0.000	0.000	0.035
92	92	End Spring 5	0.145	-3.458	0.000	0.000	0.000	-0.194
93	93	End Spring 6	0.090	-3.462	0.000	0.000	0.000	0.041
94	94	End Spring 7	0.049	-3.454	0.000	0.000	0.000	-0.191
95	95	End Spring 8	0.021	-3.459	0.000	0.000	0.000	0.046
96	96	End Spring 9	0.003	-3.451	0.000	0.000	0.000	-0.189
97	97	End Spring 10	-0.007	-3.456	0.000	0.000	0.000	0.050
98	98	End Spring 11	-0.010	-3.448	0.000	0.000	0.000	-0.187
99	99	End Spring 12	-0.009	-3.453	0.000	0.000	0.000	0.052
100	100	End Spring 13	-0.005	-3.445	0.000	0.000	0.000	-0.187
101	101	End Spring 14	-0.000	-3.450	0.000	0.000	0.000	0.052
102	102	End Spring 15	0.005	-3.442	0.000	0.000	0.000	-0.186
103	103	End Spring 16	0.010	-3.448	0.000	0.000	0.000	0.052
104	104	End Spring 17	0.013	-3.440	0.000	0.000	0.000	-0.187
105	105	End Spring 18	0.013	-3.446	0.000	0.000	0.000	0.051
106	106	End Spring 19	0.007	-3.438	0.000	0.000	0.000	-0.188
107	107	End Spring 20	-0.007	-3.444	0.000	0.000	0.000	0.047
108	108	End Spring 21	-0.031	-3.436	0.000	0.000	0.000	-0.190
109	109	End Spring 22	-0.069	-3.441	0.000	0.000	0.000	0.041
110	110	End Spring 23	-0.124	-3.433	0.000	0.000	0.000	-0.193
111	111	End Spring 24	-0.198	-3.438	0.000	0.000	0.000	0.033
112	112	End Spring 25	-0.290	-3.431	0.000	0.000	0.000	-0.197
113	113	End Spring 26	-0.396	-3.438	0.000	0.000	0.000	0.027
114	114	End Spring 27	-0.503	-3.434	0.000	0.000	0.000	-0.197
115	115	End Spring 28	-0.595	-3.447	0.000	0.000	0.000	0.035
116	116	End Spring 29	-0.635	-3.453	0.000	0.000	0.000	0.043

GROUP 4 DOCKS
DOCK E10

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-0.317	3.529	0.000	0.000	0.000	-0.006
2	2		-0.317	3.488	0.000	0.000	0.000	-0.012
3	3		-0.318	3.430	0.000	0.000	0.000	-0.012
4	4		-0.318	3.378	0.000	0.000	0.000	-0.012
5	5		-0.319	3.327	0.000	0.000	0.000	-0.009
6	6		-0.320	3.290	0.000	0.000	0.000	-0.008
7	7		-0.321	3.257	0.000	0.000	0.000	-0.005
8	8		-0.323	3.238	0.000	0.000	0.000	-0.004
9	9		-0.324	3.219	0.000	0.000	0.000	-0.003
10	10		-0.326	3.209	0.000	0.000	0.000	-0.003
11	11		-0.328	3.193	0.000	0.000	0.000	-0.002
12	12		-0.330	3.181	0.000	0.000	0.000	-0.004
13	13		-0.332	3.158	0.000	0.000	0.000	-0.005
14	14		-0.334	3.135	0.000	0.000	0.000	-0.007
15	15		-0.336	3.097	0.000	0.000	0.000	-0.008
16	16		-0.339	3.059	0.000	0.000	0.000	-0.010
17	17		-0.342	3.009	0.000	0.000	0.000	-0.010
18	18		-0.345	2.967	0.000	0.000	0.000	-0.009
19	19		-0.348	2.932	0.000	0.000	0.000	-0.004
20	20		-0.352	2.932	0.000	0.000	0.000	0.004
21	21		-0.355	2.981	0.000	0.000	0.000	0.020
22	22		-0.359	3.125	0.000	0.000	0.000	0.044
23	23		-0.362	3.390	0.000	0.000	0.000	0.077
24	24		-0.366	3.843	0.000	0.000	0.000	0.123
25	25		-0.369	4.515	0.000	0.000	0.000	0.177
26	26		-0.371	5.471	0.000	0.000	0.000	0.244
27	27		-0.373	6.704	0.000	0.000	0.000	0.304
28	28		-0.373	8.234	0.000	0.000	0.000	0.363
29	29		-0.321	3.529	0.000	0.000	0.000	-0.006
30	30		-0.325	3.488	0.000	0.000	0.000	-0.012
31	31		-0.325	3.430	0.000	0.000	0.000	-0.012
32	32		-0.326	3.378	0.000	0.000	0.000	-0.012
33	33		-0.325	3.327	0.000	0.000	0.000	-0.009
34	34		-0.325	3.290	0.000	0.000	0.000	-0.008
35	35		-0.325	3.257	0.000	0.000	0.000	-0.005
36	36		-0.325	3.238	0.000	0.000	0.000	-0.004
37	37		-0.326	3.219	0.000	0.000	0.000	-0.003
38	38		-0.328	3.209	0.000	0.000	0.000	-0.003
39	39		-0.329	3.193	0.000	0.000	0.000	-0.002
40	40		-0.332	3.181	0.000	0.000	0.000	-0.004
41	41		-0.334	3.158	0.000	0.000	0.000	-0.005
42	42		-0.338	3.135	0.000	0.000	0.000	-0.007
43	43		-0.341	3.097	0.000	0.000	0.000	-0.008
44	44		-0.345	3.059	0.000	0.000	0.000	-0.010
45	45		-0.348	3.009	0.000	0.000	0.000	-0.010
46	46		-0.351	2.967	0.000	0.000	0.000	-0.009
47	47		-0.351	2.932	0.000	0.000	0.000	-0.004
48	48		-0.349	2.932	0.000	0.000	0.000	0.004
49	49		-0.342	2.981	0.000	0.000	0.000	0.020
50	50		-0.331	3.125	0.000	0.000	0.000	0.044
51	51		-0.314	3.390	0.000	0.000	0.000	0.077
52	52		-0.288	3.843	0.000	0.000	0.000	0.123
53	53		-0.258	4.515	0.000	0.000	0.000	0.177
54	54		-0.218	5.471	0.000	0.000	0.000	0.244
55	55		-0.182	6.704	0.000	0.000	0.000	0.304
56	56		-0.145	8.234	0.000	0.000	0.000	0.363
57	57	P1	-0.155	3.528	0.000	0.000	0.000	0.021
58	58		-0.425	3.489	0.000	0.000	0.000	-0.012
59	59	P2	-0.176	3.428	0.000	0.000	0.000	0.019
60	60		-0.428	3.379	0.000	0.000	0.000	-0.012
61	61	P3	-0.166	3.325	0.000	0.000	0.000	0.020

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-0.393	3.291	0.000	0.000	0.000	-0.008
63	63	P4	-0.152	3.255	0.000	0.000	0.000	0.022
64	64		-0.363	3.239	0.000	0.000	0.000	-0.004
65	65	P5	-0.143	3.217	0.000	0.000	0.000	0.023
66	66		-0.353	3.210	0.000	0.000	0.000	-0.003
67	67	P6	-0.144	3.192	0.000	0.000	0.000	0.023
68	68		-0.367	3.182	0.000	0.000	0.000	-0.004
69	69	P7	-0.154	3.157	0.000	0.000	0.000	0.023
70	70		-0.399	3.136	0.000	0.000	0.000	-0.007
71	71	P8	-0.168	3.096	0.000	0.000	0.000	0.022
72	72		-0.433	3.059	0.000	0.000	0.000	-0.010
73	73	P9	-0.178	3.008	0.000	0.000	0.000	0.022
74	74		-0.431	2.968	0.000	0.000	0.000	-0.009
75	75	P10	-0.159	2.930	0.000	0.000	0.000	0.024
76	76		-0.313	2.933	0.000	0.000	0.000	0.004
77	77	P11	-0.070	2.980	0.000	0.000	0.000	0.032
78	78		0.042	3.125	0.000	0.000	0.000	0.044
79	79	P12	0.143	3.389	0.000	0.000	0.000	0.052
80	80		0.767	3.844	0.000	0.000	0.000	0.123
81	81	P13	0.520	4.512	0.000	0.000	0.000	0.085
82	82		1.874	5.472	0.000	0.000	0.000	0.244
83	83	P14	1.002	6.700	0.000	0.000	0.000	0.127
84	84		2.975	8.235	0.000	0.000	0.000	0.363
85	85		-0.373	9.928	0.000	0.000	0.000	0.380
86	86		-0.134	9.928	0.000	0.000	0.000	0.380
87	87		3.130	9.930	0.000	0.000	0.000	0.380
88	88	End Spring 1	3.529	0.321	0.000	0.000	0.000	0.016
89	89	End Spring 2	3.488	0.325	0.000	0.000	0.000	-0.012
90	90	End Spring 3	3.430	0.325	0.000	0.000	0.000	0.014
91	91	End Spring 4	3.379	0.326	0.000	0.000	0.000	-0.012
92	92	End Spring 5	3.326	0.325	0.000	0.000	0.000	0.015
93	93	End Spring 6	3.291	0.325	0.000	0.000	0.000	-0.008
94	94	End Spring 7	3.257	0.324	0.000	0.000	0.000	0.017
95	95	End Spring 8	3.239	0.325	0.000	0.000	0.000	-0.004
96	96	End Spring 9	3.219	0.326	0.000	0.000	0.000	0.018
97	97	End Spring 10	3.210	0.328	0.000	0.000	0.000	-0.003
98	98	End Spring 11	3.193	0.329	0.000	0.000	0.000	0.018
99	99	End Spring 12	3.182	0.332	0.000	0.000	0.000	-0.004
100	100	End Spring 13	3.158	0.334	0.000	0.000	0.000	0.018
101	101	End Spring 14	3.135	0.338	0.000	0.000	0.000	-0.007
102	102	End Spring 15	3.097	0.341	0.000	0.000	0.000	0.016
103	103	End Spring 16	3.059	0.345	0.000	0.000	0.000	-0.010
104	104	End Spring 17	3.009	0.348	0.000	0.000	0.000	0.016
105	105	End Spring 18	2.967	0.351	0.000	0.000	0.000	-0.009
106	106	End Spring 19	2.932	0.351	0.000	0.000	0.000	0.019
107	107	End Spring 20	2.933	0.349	0.000	0.000	0.000	0.004
108	108	End Spring 21	2.981	0.342	0.000	0.000	0.000	0.030
109	109	End Spring 22	3.125	0.331	0.000	0.000	0.000	0.044
110	110	End Spring 23	3.390	0.314	0.000	0.000	0.000	0.056
111	111	End Spring 24	3.843	0.288	0.000	0.000	0.000	0.123
112	112	End Spring 25	4.514	0.258	0.000	0.000	0.000	0.102
113	113	End Spring 26	5.472	0.218	0.000	0.000	0.000	0.244
114	114	End Spring 27	6.703	0.182	0.000	0.000	0.000	0.159
115	115	End Spring 28	8.234	0.145	0.000	0.000	0.000	0.363
116	116	End Spring 29	9.929	0.134	0.000	0.000	0.000	0.380

APPENDIX: GROUP 5 DOCKS DATA

GROUP 5 DOCKS
DOCK E11

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P15	Normal	ky'	1.360
2	1	P15	Normal	kx'	1.360
3	53	P1	Normal	ky'	1.060
4	53	P1	Normal	kx'	1.060
5	55	P2	Normal	ky'	1.060
6	55	P2	Normal	kx'	1.060
7	57	P3	Normal	ky'	1.060
8	57	P3	Normal	kx'	1.060
9	59	P4	Normal	ky'	1.060
10	59	P4	Normal	kx'	1.060
11	61	P5	Normal	ky'	1.060
12	61	P5	Normal	kx'	1.060
13	63	P6	Normal	ky'	1.060
14	63	P6	Normal	kx'	1.060
15	65	P7	Normal	ky'	1.060
16	65	P7	Normal	kx'	1.060
17	67	P8	Normal	ky'	1.060
18	67	P8	Normal	kx'	1.060
19	69	P9	Normal	ky'	1.060
20	69	P9	Normal	kx'	1.060
21	71	P10	Normal	ky'	1.060
22	71	P10	Normal	kx'	1.060
23	73	P11	Normal	ky'	1.060
24	73	P11	Normal	kx'	1.060
25	75	P12	Normal	ky'	1.060
26	75	P12	Normal	kx'	1.060
27	77	P13	Normal	ky'	1.060
28	77	P13	Normal	kx'	1.060
29	132	P14	Normal	ky'	1.360
30	132	P14	Normal	kx'	1.360

GROUP 5 DOCKS
DOCK E11

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P15	2.593	0.193	0.000	0.000	0.000	0.082
2	2		3.969	0.061	0.000	0.000	0.000	-0.083
3	3		3.891	-0.011	0.000	0.000	0.000	-0.076
4	4		3.830	-0.054	0.000	0.000	0.000	-0.070
5	5		3.785	-0.076	0.000	0.000	0.000	-0.066
6	6		3.753	-0.082	0.000	0.000	0.000	-0.063
7	7		3.734	-0.078	0.000	0.000	0.000	-0.061
8	8		3.721	-0.068	0.000	0.000	0.000	-0.060
9	9		3.717	-0.056	0.000	0.000	0.000	-0.060
10	10		3.714	-0.043	0.000	0.000	0.000	-0.060
11	11		3.717	-0.030	0.000	0.000	0.000	-0.060
12	12		3.718	-0.019	0.000	0.000	0.000	-0.061
13	13		3.723	-0.010	0.000	0.000	0.000	-0.061
14	14		3.725	-0.002	0.000	0.000	0.000	-0.062
15	15		3.729	0.003	0.000	0.000	0.000	-0.062
16	16		3.732	0.007	0.000	0.000	0.000	-0.063
17	17		3.736	0.008	0.000	0.000	0.000	-0.063
18	18		3.740	0.008	0.000	0.000	0.000	-0.064
19	19		3.747	0.004	0.000	0.000	0.000	-0.065
20	20		3.756	-0.003	0.000	0.000	0.000	-0.066
21	21		3.768	-0.016	0.000	0.000	0.000	-0.067
22	22		3.781	-0.034	0.000	0.000	0.000	-0.068
23	23		3.797	-0.059	0.000	0.000	0.000	-0.070
24	24		3.811	-0.092	0.000	0.000	0.000	-0.071
25	25		3.823	-0.131	0.000	0.000	0.000	-0.072
26	26		3.828	-0.174	0.000	0.000	0.000	-0.073
27	27		3.241	0.193	0.000	0.000	0.000	-0.032
28	28		3.224	0.061	0.000	0.000	0.000	-0.021
29	29		3.213	-0.011	0.000	0.000	0.000	-0.013
30	30		3.203	-0.054	0.000	0.000	0.000	-0.008
31	31		3.196	-0.076	0.000	0.000	0.000	-0.003
32	32		3.190	-0.082	0.000	0.000	0.000	-0.001
33	33		3.186	-0.078	0.000	0.000	0.000	0.001
34	34		3.182	-0.068	0.000	0.000	0.000	0.002
35	35		3.181	-0.056	0.000	0.000	0.000	0.002
36	36		3.178	-0.043	0.000	0.000	0.000	0.002
37	37		3.178	-0.030	0.000	0.000	0.000	0.002
38	38		3.176	-0.019	0.000	0.000	0.000	0.002
39	39		3.176	-0.010	0.000	0.000	0.000	0.001
40	40		3.174	-0.002	0.000	0.000	0.000	0.001
41	41		3.174	0.003	0.000	0.000	0.000	0.000
42	42		3.172	0.007	0.000	0.000	0.000	-0.000
43	43		3.173	0.008	0.000	0.000	0.000	-0.001
44	44		3.171	0.008	0.000	0.000	0.000	-0.001
45	45		3.172	0.004	0.000	0.000	0.000	-0.002
46	46		3.171	-0.003	0.000	0.000	0.000	-0.003
47	47		3.172	-0.016	0.000	0.000	0.000	-0.004
48	48		3.172	-0.034	0.000	0.000	0.000	-0.006
49	49		3.174	-0.059	0.000	0.000	0.000	-0.007
50	50		3.174	-0.092	0.000	0.000	0.000	-0.009
51	51		3.176	-0.131	0.000	0.000	0.000	-0.010
52	52		3.175	-0.174	0.000	0.000	0.000	-0.010
53	53	P1	3.162	-0.174	0.000	0.000	0.000	-0.010
54	54		3.163	-0.131	0.000	0.000	0.000	-0.010
55	55	P2	3.163	-0.092	0.000	0.000	0.000	-0.009
56	56		3.165	-0.059	0.000	0.000	0.000	-0.007
57	57	P3	3.165	-0.034	0.000	0.000	0.000	-0.006
58	58		3.167	-0.016	0.000	0.000	0.000	-0.004
59	59	P4	3.167	-0.003	0.000	0.000	0.000	-0.003
60	60		3.170	0.004	0.000	0.000	0.000	-0.002
61	61	P5	3.170	0.008	0.000	0.000	0.000	-0.001

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		3.172	0.008	0.000	0.000	0.000	-0.001
63	63	P6	3.172	0.007	0.000	0.000	0.000	-0.000
64	64		3.175	0.003	0.000	0.000	0.000	0.000
65	65	P7	3.175	-0.002	0.000	0.000	0.000	0.001
66	66		3.177	-0.010	0.000	0.000	0.000	0.001
67	67	P8	3.178	-0.019	0.000	0.000	0.000	0.002
68	68		3.181	-0.030	0.000	0.000	0.000	0.002
69	69	P9	3.181	-0.043	0.000	0.000	0.000	0.002
70	70		3.184	-0.056	0.000	0.000	0.000	0.002
71	71	P10	3.185	-0.068	0.000	0.000	0.000	0.002
72	72		3.188	-0.078	0.000	0.000	0.000	0.001
73	73	P11	3.189	-0.082	0.000	0.000	0.000	-0.001
74	74		3.192	-0.076	0.000	0.000	0.000	-0.003
75	75	P12	3.193	-0.054	0.000	0.000	0.000	-0.008
76	76		3.196	-0.011	0.000	0.000	0.000	-0.013
77	77	P13	3.198	0.061	0.000	0.000	0.000	-0.021
78	78		3.202	0.193	0.000	0.000	0.000	-0.032
79	79		3.198	0.065	0.000	0.000	0.000	-0.021
80	80		3.197	-0.007	0.000	0.000	0.000	-0.013
81	81		3.194	-0.051	0.000	0.000	0.000	-0.008
82	82		3.192	-0.074	0.000	0.000	0.000	-0.003
83	83		3.190	-0.082	0.000	0.000	0.000	-0.000
84	84		3.188	-0.079	0.000	0.000	0.000	0.002
85	85		3.186	-0.070	0.000	0.000	0.000	0.003
86	86		3.184	-0.059	0.000	0.000	0.000	0.003
87	87		3.182	-0.046	0.000	0.000	0.000	0.003
88	88		3.181	-0.033	0.000	0.000	0.000	0.003
89	89		3.179	-0.022	0.000	0.000	0.000	0.003
90	90		3.178	-0.012	0.000	0.000	0.000	0.003
91	91		3.176	-0.004	0.000	0.000	0.000	0.002
92	92		3.175	0.001	0.000	0.000	0.000	0.002
93	93		3.173	0.005	0.000	0.000	0.000	0.001
94	94		3.172	0.008	0.000	0.000	0.000	0.001
95	95		3.171	0.008	0.000	0.000	0.000	0.001
96	96		3.170	0.006	0.000	0.000	0.000	-0.000
97	97		3.169	0.001	0.000	0.000	0.000	-0.001
98	98		3.168	-0.008	0.000	0.000	0.000	-0.002
99	99		3.167	-0.022	0.000	0.000	0.000	-0.003
100	100		3.165	-0.042	0.000	0.000	0.000	-0.005
101	101		3.165	-0.068	0.000	0.000	0.000	-0.006
102	102		3.164	-0.100	0.000	0.000	0.000	-0.008
103	103		3.163	-0.138	0.000	0.000	0.000	-0.009
104	104		3.162	-0.180	0.000	0.000	0.000	-0.010
105	105		3.149	-0.180	0.000	0.000	0.000	-0.010
106	106		3.152	-0.138	0.000	0.000	0.000	-0.009
107	107		3.153	-0.100	0.000	0.000	0.000	-0.008
108	108		3.157	-0.068	0.000	0.000	0.000	-0.006
109	109		3.159	-0.042	0.000	0.000	0.000	-0.005
110	110		3.162	-0.022	0.000	0.000	0.000	-0.003
111	111		3.165	-0.008	0.000	0.000	0.000	-0.002
112	112		3.168	0.001	0.000	0.000	0.000	-0.001
113	113		3.170	0.006	0.000	0.000	0.000	-0.000
114	114		3.172	0.008	0.000	0.000	0.000	0.001
115	115		3.173	0.008	0.000	0.000	0.000	0.001
116	116		3.175	0.005	0.000	0.000	0.000	0.001
117	117		3.177	0.001	0.000	0.000	0.000	0.002
118	118		3.179	-0.004	0.000	0.000	0.000	0.002
119	119		3.183	-0.022	0.000	0.000	0.000	0.003
120	120		3.185	-0.033	0.000	0.000	0.000	0.003
121	121		3.187	-0.046	0.000	0.000	0.000	0.003
122	122		3.189	-0.059	0.000	0.000	0.000	0.003

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		3.189	-0.070	0.000	0.000	0.000	0.003
124	124		3.190	-0.079	0.000	0.000	0.000	0.002
125	125		3.189	-0.082	0.000	0.000	0.000	-0.000
126	126		3.188	-0.074	0.000	0.000	0.000	-0.003
127	127		3.184	-0.051	0.000	0.000	0.000	-0.008
128	128		3.180	-0.007	0.000	0.000	0.000	-0.013
129	129		3.172	0.065	0.000	0.000	0.000	-0.021
130	130		3.162	0.193	0.000	0.000	0.000	-0.032
131	131		3.181	-0.012	0.000	0.000	0.000	0.003
132	132	P14	2.791	0.193	0.000	0.000	0.000	-0.056
133	133		3.027	0.065	0.000	0.000	0.000	-0.017
134	134		3.094	-0.007	0.000	0.000	0.000	-0.010
135	135		3.145	-0.051	0.000	0.000	0.000	-0.004
136	136		3.184	-0.074	0.000	0.000	0.000	0.000
137	137		3.209	-0.082	0.000	0.000	0.000	0.003
138	138		3.226	-0.079	0.000	0.000	0.000	0.005
139	139		3.234	-0.070	0.000	0.000	0.000	0.006
140	140		3.237	-0.059	0.000	0.000	0.000	0.007
141	141		3.236	-0.046	0.000	0.000	0.000	0.007
142	142		3.233	-0.033	0.000	0.000	0.000	0.007
143	143		3.228	-0.022	0.000	0.000	0.000	0.006
144	144		3.223	-0.012	0.000	0.000	0.000	0.006
145	145		3.218	-0.004	0.000	0.000	0.000	0.006
146	146		3.213	0.001	0.000	0.000	0.000	0.005
147	147		3.207	0.005	0.000	0.000	0.000	0.005
148	148		3.203	0.008	0.000	0.000	0.000	0.004
149	149		3.197	0.008	0.000	0.000	0.000	0.004
150	150		3.190	0.006	0.000	0.000	0.000	0.003
151	151		3.181	0.001	0.000	0.000	0.000	0.002
152	152		3.170	-0.008	0.000	0.000	0.000	0.001
153	153		3.157	-0.022	0.000	0.000	0.000	-0.000
154	154		3.142	-0.042	0.000	0.000	0.000	-0.002
155	155		3.127	-0.068	0.000	0.000	0.000	-0.003
156	156		3.111	-0.100	0.000	0.000	0.000	-0.005
157	157		3.100	-0.138	0.000	0.000	0.000	-0.006
158	158		3.092	-0.180	0.000	0.000	0.000	-0.007
159	159	End Spring 1	0.193	-3.242	0.000	0.000	0.000	0.059
160	160	End Spring 2	0.061	-3.224	0.000	0.000	0.000	-0.078
161	161	End Spring 3	-0.011	-3.213	0.000	0.000	0.000	-0.071
162	162	End Spring 4	-0.054	-3.203	0.000	0.000	0.000	-0.065
163	163	End Spring 5	-0.076	-3.196	0.000	0.000	0.000	-0.061
164	164	End Spring 6	-0.082	-3.190	0.000	0.000	0.000	-0.058
165	165	End Spring 7	-0.078	-3.187	0.000	0.000	0.000	-0.056
166	166	End Spring 8	-0.068	-3.183	0.000	0.000	0.000	-0.055
167	167	End Spring 9	-0.056	-3.181	0.000	0.000	0.000	-0.055
168	168	End Spring 10	-0.043	-3.179	0.000	0.000	0.000	-0.055
169	169	End Spring 11	-0.030	-3.178	0.000	0.000	0.000	-0.055
170	170	End Spring 12	-0.019	-3.176	0.000	0.000	0.000	-0.056
171	171	End Spring 13	-0.010	-3.176	0.000	0.000	0.000	-0.056
172	172	End Spring 14	-0.002	-3.174	0.000	0.000	0.000	-0.057
173	173	End Spring 15	0.003	-3.174	0.000	0.000	0.000	-0.057
174	174	End Spring 16	0.007	-3.173	0.000	0.000	0.000	-0.057
175	175	End Spring 17	0.008	-3.173	0.000	0.000	0.000	-0.058
176	176	End Spring 18	0.008	-3.171	0.000	0.000	0.000	-0.058
177	177	End Spring 19	0.004	-3.172	0.000	0.000	0.000	-0.059
178	178	End Spring 20	-0.003	-3.171	0.000	0.000	0.000	-0.060
179	179	End Spring 21	-0.016	-3.173	0.000	0.000	0.000	-0.061
180	180	End Spring 22	-0.034	-3.173	0.000	0.000	0.000	-0.063
181	181	End Spring 23	-0.059	-3.174	0.000	0.000	0.000	-0.064
182	182	End Spring 24	-0.092	-3.174	0.000	0.000	0.000	-0.066
183	183	End Spring 25	-0.131	-3.176	0.000	0.000	0.000	-0.067

GROUP 5 DOCKS
DOCK E11

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P15	0.305	-1.942	0.000	0.000	0.000	-0.016
2	2		1.006	-2.403	0.000	0.000	0.000	-0.094
3	3		0.974	-2.807	0.000	0.000	0.000	-0.091
4	4		0.871	-3.177	0.000	0.000	0.000	-0.081
5	5		0.729	-3.501	0.000	0.000	0.000	-0.067
6	6		0.580	-3.758	0.000	0.000	0.000	-0.053
7	7		0.439	-3.957	0.000	0.000	0.000	-0.039
8	8		0.317	-4.098	0.000	0.000	0.000	-0.027
9	9		0.218	-4.197	0.000	0.000	0.000	-0.018
10	10		0.143	-4.254	0.000	0.000	0.000	-0.010
11	11		0.088	-4.289	0.000	0.000	0.000	-0.005
12	12		0.053	-4.301	0.000	0.000	0.000	-0.002
13	13		0.032	-4.306	0.000	0.000	0.000	0.000
14	14		0.020	-4.299	0.000	0.000	0.000	0.001
15	15		0.014	-4.294	0.000	0.000	0.000	0.002
16	16		0.009	-4.283	0.000	0.000	0.000	0.002
17	17		0.002	-4.273	0.000	0.000	0.000	0.003
18	18		-0.012	-4.254	0.000	0.000	0.000	0.005
19	19		-0.035	-4.232	0.000	0.000	0.000	0.007
20	20		-0.070	-4.192	0.000	0.000	0.000	0.010
21	21		-0.117	-4.140	0.000	0.000	0.000	0.015
22	22		-0.177	-4.061	0.000	0.000	0.000	0.020
23	23		-0.246	-3.958	0.000	0.000	0.000	0.027
24	24		-0.320	-3.819	0.000	0.000	0.000	0.034
25	25		-0.385	-3.655	0.000	0.000	0.000	0.041
26	26		-0.431	-3.460	0.000	0.000	0.000	0.045
27	27		0.142	-1.942	0.000	0.000	0.000	-0.081
28	28		0.157	-2.402	0.000	0.000	0.000	-0.094
29	29		0.153	-2.807	0.000	0.000	0.000	-0.091
30	30		0.140	-3.177	0.000	0.000	0.000	-0.081
31	31		0.122	-3.500	0.000	0.000	0.000	-0.067
32	32		0.104	-3.757	0.000	0.000	0.000	-0.053
33	33		0.086	-3.957	0.000	0.000	0.000	-0.039
34	34		0.071	-4.097	0.000	0.000	0.000	-0.027
35	35		0.059	-4.196	0.000	0.000	0.000	-0.018
36	36		0.049	-4.253	0.000	0.000	0.000	-0.010
37	37		0.042	-4.288	0.000	0.000	0.000	-0.005
38	38		0.038	-4.300	0.000	0.000	0.000	-0.002
39	39		0.035	-4.305	0.000	0.000	0.000	0.000
40	40		0.033	-4.299	0.000	0.000	0.000	0.001
41	41		0.032	-4.294	0.000	0.000	0.000	0.002
42	42		0.031	-4.282	0.000	0.000	0.000	0.002
43	43		0.030	-4.272	0.000	0.000	0.000	0.003
44	44		0.028	-4.253	0.000	0.000	0.000	0.005
45	45		0.026	-4.231	0.000	0.000	0.000	0.007
46	46		0.021	-4.192	0.000	0.000	0.000	0.010
47	47		0.015	-4.140	0.000	0.000	0.000	0.015
48	48		0.008	-4.060	0.000	0.000	0.000	0.020
49	49		-0.001	-3.957	0.000	0.000	0.000	0.027
50	50		-0.010	-3.818	0.000	0.000	0.000	0.034
51	51		-0.018	-3.654	0.000	0.000	0.000	0.041
52	52		-0.023	-3.459	0.000	0.000	0.000	0.045
53	53	P1	0.033	-3.459	0.000	0.000	0.000	0.045
54	54		0.033	-3.654	0.000	0.000	0.000	0.041
55	55	P2	0.033	-3.818	0.000	0.000	0.000	0.034
56	56		0.033	-3.957	0.000	0.000	0.000	0.027
57	57	P3	0.034	-4.060	0.000	0.000	0.000	0.020
58	58		0.034	-4.140	0.000	0.000	0.000	0.015
59	59	P4	0.034	-4.192	0.000	0.000	0.000	0.010
60	60		0.034	-4.231	0.000	0.000	0.000	0.007
61	61	P5	0.034	-4.253	0.000	0.000	0.000	0.005

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		0.034	-4.272	0.000	0.000	0.000	0.003
63	63	P6	0.034	-4.282	0.000	0.000	0.000	0.002
64	64		0.035	-4.294	0.000	0.000	0.000	0.002
65	65	P7	0.035	-4.299	0.000	0.000	0.000	0.001
66	66		0.035	-4.305	0.000	0.000	0.000	0.000
67	67	P8	0.035	-4.300	0.000	0.000	0.000	-0.002
68	68		0.036	-4.288	0.000	0.000	0.000	-0.005
69	69	P9	0.036	-4.253	0.000	0.000	0.000	-0.010
70	70		0.036	-4.196	0.000	0.000	0.000	-0.018
71	71	P10	0.037	-4.097	0.000	0.000	0.000	-0.027
72	72		0.037	-3.957	0.000	0.000	0.000	-0.039
73	73	P11	0.038	-3.757	0.000	0.000	0.000	-0.053
74	74		0.038	-3.500	0.000	0.000	0.000	-0.067
75	75	P12	0.038	-3.177	0.000	0.000	0.000	-0.081
76	76		0.039	-2.807	0.000	0.000	0.000	-0.091
77	77	P13	0.039	-2.402	0.000	0.000	0.000	-0.094
78	78		0.040	-1.942	0.000	0.000	0.000	-0.081
79	79		0.039	-2.384	0.000	0.000	0.000	-0.094
80	80		0.039	-2.780	0.000	0.000	0.000	-0.091
81	81		0.038	-3.144	0.000	0.000	0.000	-0.082
82	82		0.038	-3.466	0.000	0.000	0.000	-0.069
83	83		0.038	-3.725	0.000	0.000	0.000	-0.054
84	84		0.037	-3.928	0.000	0.000	0.000	-0.042
85	85		0.037	-4.074	0.000	0.000	0.000	-0.029
86	86		0.037	-4.179	0.000	0.000	0.000	-0.020
87	87		0.036	-4.242	0.000	0.000	0.000	-0.011
88	88		0.036	-4.282	0.000	0.000	0.000	-0.007
89	89		0.036	-4.298	0.000	0.000	0.000	-0.002
90	90		0.035	-4.305	0.000	0.000	0.000	-0.001
91	91		0.035	-4.301	0.000	0.000	0.000	0.002
92	92		0.035	-4.296	0.000	0.000	0.000	0.001
93	93		0.035	-4.286	0.000	0.000	0.000	0.003
94	94		0.034	-4.277	0.000	0.000	0.000	0.002
95	95		0.034	-4.262	0.000	0.000	0.000	0.005
96	96		0.034	-4.243	0.000	0.000	0.000	0.005
97	97		0.034	-4.215	0.000	0.000	0.000	0.009
98	98		0.034	-4.172	0.000	0.000	0.000	0.011
99	99		0.034	-4.114	0.000	0.000	0.000	0.017
100	100		0.034	-4.030	0.000	0.000	0.000	0.022
101	101		0.033	-3.922	0.000	0.000	0.000	0.030
102	102		0.033	-3.784	0.000	0.000	0.000	0.035
103	103		0.033	-3.622	0.000	0.000	0.000	0.042
104	104		0.033	-3.435	0.000	0.000	0.000	0.045
105	105		0.090	-3.435	0.000	0.000	0.000	0.045
106	106		0.086	-3.622	0.000	0.000	0.000	0.042
107	107		0.078	-3.784	0.000	0.000	0.000	0.035
108	108		0.071	-3.922	0.000	0.000	0.000	0.030
109	109		0.061	-4.030	0.000	0.000	0.000	0.022
110	110		0.056	-4.114	0.000	0.000	0.000	0.017
111	111		0.048	-4.172	0.000	0.000	0.000	0.011
112	112		0.045	-4.215	0.000	0.000	0.000	0.009
113	113		0.040	-4.243	0.000	0.000	0.000	0.005
114	114		0.040	-4.262	0.000	0.000	0.000	0.005
115	115		0.037	-4.277	0.000	0.000	0.000	0.002
116	116		0.038	-4.286	0.000	0.000	0.000	0.003
117	117		0.036	-4.296	0.000	0.000	0.000	0.001
118	118		0.037	-4.301	0.000	0.000	0.000	0.002
119	119		0.033	-4.298	0.000	0.000	0.000	-0.002
120	120		0.027	-4.282	0.000	0.000	0.000	-0.007
121	121		0.022	-4.242	0.000	0.000	0.000	-0.011
122	122		0.011	-4.179	0.000	0.000	0.000	-0.020

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		0.001	-4.074	0.000	0.000	0.000	-0.029
124	124		-0.015	-3.928	0.000	0.000	0.000	-0.042
125	125		-0.031	-3.725	0.000	0.000	0.000	-0.054
126	126		-0.049	-3.466	0.000	0.000	0.000	-0.069
127	127		-0.064	-3.144	0.000	0.000	0.000	-0.082
128	128		-0.076	-2.780	0.000	0.000	0.000	-0.091
129	129		-0.078	-2.384	0.000	0.000	0.000	-0.094
130	130		-0.062	-1.942	0.000	0.000	0.000	-0.081
131	131		0.034	-4.305	0.000	0.000	0.000	-0.001
132	132	P14	-0.665	-1.941	0.000	0.000	0.000	-0.072
133	133		-0.827	-2.384	0.000	0.000	0.000	-0.094
134	134		-0.807	-2.780	0.000	0.000	0.000	-0.091
135	135		-0.718	-3.144	0.000	0.000	0.000	-0.082
136	136		-0.601	-3.466	0.000	0.000	0.000	-0.069
137	137		-0.465	-3.725	0.000	0.000	0.000	-0.054
138	138		-0.348	-3.928	0.000	0.000	0.000	-0.042
139	139		-0.230	-4.074	0.000	0.000	0.000	-0.029
140	140		-0.149	-4.179	0.000	0.000	0.000	-0.020
141	141		-0.068	-4.242	0.000	0.000	0.000	-0.011
142	142		-0.028	-4.282	0.000	0.000	0.000	-0.007
143	143		0.019	-4.298	0.000	0.000	0.000	-0.002
144	144		0.027	-4.305	0.000	0.000	0.000	-0.001
145	145		0.053	-4.301	0.000	0.000	0.000	0.002
146	146		0.044	-4.296	0.000	0.000	0.000	0.001
147	147		0.063	-4.286	0.000	0.000	0.000	0.003
148	148		0.053	-4.277	0.000	0.000	0.000	0.002
149	149		0.078	-4.262	0.000	0.000	0.000	0.005
150	150		0.077	-4.243	0.000	0.000	0.000	0.005
151	151		0.117	-4.215	0.000	0.000	0.000	0.009
152	152		0.136	-4.172	0.000	0.000	0.000	0.011
153	153		0.195	-4.114	0.000	0.000	0.000	0.017
154	154		0.235	-4.030	0.000	0.000	0.000	0.022
155	155		0.309	-3.922	0.000	0.000	0.000	0.030
156	156		0.360	-3.784	0.000	0.000	0.000	0.035
157	157		0.423	-3.622	0.000	0.000	0.000	0.042
158	158		0.450	-3.435	0.000	0.000	0.000	0.045
159	159	End Spring 1	-1.942	-0.142	0.000	0.000	0.000	-0.021
160	160	End Spring 2	-2.402	-0.157	0.000	0.000	0.000	-0.094
161	161	End Spring 3	-2.807	-0.153	0.000	0.000	0.000	-0.091
162	162	End Spring 4	-3.177	-0.140	0.000	0.000	0.000	-0.081
163	163	End Spring 5	-3.500	-0.122	0.000	0.000	0.000	-0.067
164	164	End Spring 6	-3.758	-0.104	0.000	0.000	0.000	-0.053
165	165	End Spring 7	-3.957	-0.086	0.000	0.000	0.000	-0.039
166	166	End Spring 8	-4.098	-0.071	0.000	0.000	0.000	-0.027
167	167	End Spring 9	-4.196	-0.059	0.000	0.000	0.000	-0.018
168	168	End Spring 10	-4.253	-0.049	0.000	0.000	0.000	-0.010
169	169	End Spring 11	-4.289	-0.042	0.000	0.000	0.000	-0.005
170	170	End Spring 12	-4.300	-0.038	0.000	0.000	0.000	-0.002
171	171	End Spring 13	-4.305	-0.035	0.000	0.000	0.000	0.000
172	172	End Spring 14	-4.299	-0.033	0.000	0.000	0.000	0.001
173	173	End Spring 15	-4.294	-0.032	0.000	0.000	0.000	0.002
174	174	End Spring 16	-4.282	-0.031	0.000	0.000	0.000	0.002
175	175	End Spring 17	-4.273	-0.030	0.000	0.000	0.000	0.003
176	176	End Spring 18	-4.253	-0.028	0.000	0.000	0.000	0.005
177	177	End Spring 19	-4.231	-0.026	0.000	0.000	0.000	0.007
178	178	End Spring 20	-4.192	-0.021	0.000	0.000	0.000	0.010
179	179	End Spring 21	-4.140	-0.015	0.000	0.000	0.000	0.015
180	180	End Spring 22	-4.060	-0.008	0.000	0.000	0.000	0.020
181	181	End Spring 23	-3.957	0.001	0.000	0.000	0.000	0.027
182	182	End Spring 24	-3.818	0.010	0.000	0.000	0.000	0.034
183	183	End Spring 25	-3.655	0.018	0.000	0.000	0.000	0.041

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 26	-3.459	0.023	0.000	0.000	0.000	0.045

APPENDIX: GROUP 6 DOCKS DATA

GROUP 6 DOCKS
DOCK E12

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P3	Normal	ky'	1.360
2	1	P3	Normal	kx'	1.360
3	3	P2	Normal	ky'	1.360
4	3	P2	Normal	kx'	1.360
5	5	P1	Normal	ky'	1.360
6	5	P1	Normal	kx'	1.360
7	6	P4	Normal	ky'	1.360
8	6	P4	Normal	kx'	1.360
9	9	P5	Normal	ky'	1.360
10	9	P5	Normal	kx'	1.360
11	12	P6	Normal	ky'	1.360
12	12	P6	Normal	kx'	1.360
13	15	P7	Normal	ky'	1.360
14	15	P7	Normal	kx'	1.360
15	17	P28	Normal	ky'	1.360
16	17	P28	Normal	kx'	1.360
17	18	P8	Normal	ky'	1.360
18	18	P8	Normal	kx'	1.360
19	21	P9	Normal	ky'	1.360
20	21	P9	Normal	kx'	1.360
21	24	P10	Normal	ky'	1.360
22	24	P10	Normal	kx'	1.360
23	27	P11	Normal	ky'	1.360
24	27	P11	Normal	kx'	1.360
25	30	P12	Normal	ky'	1.360
26	30	P12	Normal	kx'	1.360
27	32	P29	Normal	ky'	1.360
28	32	P29	Normal	kx'	1.360
29	33	P13	Normal	ky'	1.360
30	33	P13	Normal	kx'	1.360
31	36	P14	Normal	ky'	1.360
32	36	P14	Normal	kx'	1.360
33	39	P15	Normal	ky'	1.360
34	39	P15	Normal	kx'	1.360
35	42	P16	Normal	ky'	1.360
36	42	P16	Normal	kx'	1.360
37	45	P17	Normal	ky'	1.360
38	45	P17	Normal	kx'	1.360
39	47	P30	Normal	ky'	1.360
40	47	P30	Normal	kx'	1.360
41	48	P18	Normal	ky'	1.360
42	48	P18	Normal	kx'	1.360
43	51	P19	Normal	ky'	1.360
44	51	P19	Normal	kx'	1.360
45	54	P20	Normal	ky'	1.360
46	54	P20	Normal	kx'	1.360
47	57	P21	Normal	ky'	1.360
48	57	P21	Normal	kx'	1.360
49	60	P22	Normal	ky'	1.360
50	60	P22	Normal	kx'	1.360
51	62	P31	Normal	ky'	1.360
52	62	P31	Normal	kx'	1.360
53	63	P23	Normal	ky'	1.360
54	63	P23	Normal	kx'	1.360
55	66	P24	Normal	ky'	1.360
56	66	P24	Normal	kx'	1.360
57	69	P25	Normal	ky'	1.360
58	69	P25	Normal	kx'	1.360
59	72	P26	Normal	ky'	1.360
60	72	P26	Normal	kx'	1.360

GROUP 6 DOCKS
DOCK E12

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P3	3.405	0.367	0.000	0.000	0.000	-0.023
2	2		3.279	0.368	0.000	0.000	0.000	0.015
3	3	P2	3.247	0.368	0.000	0.000	0.000	0.015
4	4		3.216	0.368	0.000	0.000	0.000	0.015
5	5	P1	2.465	0.367	0.000	0.000	0.000	0.107
6	6	P4	1.174	0.389	0.000	0.000	0.000	-0.204
7	7		3.228	0.389	0.000	0.000	0.000	-0.007
8	8		3.244	0.389	0.000	0.000	0.000	-0.007
9	9	P5	1.140	0.336	0.000	0.000	0.000	-0.204
10	10		3.203	0.336	0.000	0.000	0.000	-0.017
11	11		3.239	0.336	0.000	0.000	0.000	-0.017
12	12	P6	1.131	0.255	0.000	0.000	0.000	-0.204
13	13		3.193	0.255	0.000	0.000	0.000	-0.019
14	14		3.234	0.255	0.000	0.000	0.000	-0.019
15	15	P7	1.137	0.174	0.000	0.000	0.000	-0.204
16	16		3.191	0.174	0.000	0.000	0.000	-0.017
17	17	P28	3.228	0.174	0.000	0.000	0.000	-0.017
18	18	P8	1.149	0.108	0.000	0.000	0.000	-0.203
19	19		3.197	0.108	0.000	0.000	0.000	-0.013
20	20		3.226	0.108	0.000	0.000	0.000	-0.013
21	21	P9	1.161	0.059	0.000	0.000	0.000	-0.203
22	22		3.202	0.059	0.000	0.000	0.000	-0.010
23	23		3.223	0.059	0.000	0.000	0.000	-0.010
24	24	P10	1.170	0.026	0.000	0.000	0.000	-0.202
25	25		3.205	0.026	0.000	0.000	0.000	-0.007
26	26		3.219	0.026	0.000	0.000	0.000	-0.007
27	27	P11	1.177	0.006	0.000	0.000	0.000	-0.202
28	28		3.206	0.007	0.000	0.000	0.000	-0.004
29	29		3.214	0.007	0.000	0.000	0.000	-0.004
30	30	P12	1.182	-0.004	0.000	0.000	0.000	-0.201
31	31		3.204	-0.004	0.000	0.000	0.000	-0.002
32	32	P29	3.209	-0.004	0.000	0.000	0.000	-0.002
33	33	P13	1.185	-0.007	0.000	0.000	0.000	-0.201
34	34		3.205	-0.007	0.000	0.000	0.000	-0.001
35	35		3.207	-0.007	0.000	0.000	0.000	-0.001
36	36	P14	1.187	-0.006	0.000	0.000	0.000	-0.201
37	37		3.204	-0.006	0.000	0.000	0.000	-0.000
38	38		3.205	-0.006	0.000	0.000	0.000	-0.000
39	39	P15	1.188	-0.002	0.000	0.000	0.000	-0.201
40	40		3.202	-0.002	0.000	0.000	0.000	0.000
41	41		3.202	-0.002	0.000	0.000	0.000	0.000
42	42	P16	1.188	0.005	0.000	0.000	0.000	-0.200
43	43		3.199	0.005	0.000	0.000	0.000	0.000
44	44		3.198	0.005	0.000	0.000	0.000	0.000
45	45	P17	1.187	0.013	0.000	0.000	0.000	-0.200
46	46		3.194	0.013	0.000	0.000	0.000	0.000
47	47	P30	3.193	0.013	0.000	0.000	0.000	0.000
48	48	P18	1.186	0.020	0.000	0.000	0.000	-0.200
49	49		3.193	0.020	0.000	0.000	0.000	0.000
50	50		3.193	0.020	0.000	0.000	0.000	0.000
51	51	P19	1.182	0.025	0.000	0.000	0.000	-0.200
52	52		3.189	0.025	0.000	0.000	0.000	-0.001
53	53		3.191	0.025	0.000	0.000	0.000	-0.001
54	54	P20	1.175	0.024	0.000	0.000	0.000	-0.200
55	55		3.183	0.024	0.000	0.000	0.000	-0.003
56	56		3.189	0.024	0.000	0.000	0.000	-0.003
57	57	P21	1.162	0.011	0.000	0.000	0.000	-0.200
58	58		3.172	0.011	0.000	0.000	0.000	-0.006
59	59		3.186	0.011	0.000	0.000	0.000	-0.006
60	60	P22	1.145	-0.021	0.000	0.000	0.000	-0.200
61	61		3.158	-0.021	0.000	0.000	0.000	-0.011

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P31	3.182	-0.021	0.000	0.000	0.000	-0.011
63	63	P23	1.122	-0.082	0.000	0.000	0.000	-0.200
64	64		3.143	-0.082	0.000	0.000	0.000	-0.018
65	65		3.182	-0.082	0.000	0.000	0.000	-0.018
66	66	P24	1.091	-0.181	0.000	0.000	0.000	-0.201
67	67		3.122	-0.181	0.000	0.000	0.000	-0.027
68	68		3.181	-0.181	0.000	0.000	0.000	-0.027
69	69	P25	1.054	-0.328	0.000	0.000	0.000	-0.201
70	70		3.097	-0.328	0.000	0.000	0.000	-0.038
71	71		3.179	-0.328	0.000	0.000	0.000	-0.038
72	72	P26	1.015	-0.528	0.000	0.000	0.000	-0.202
73	73		3.069	-0.529	0.000	0.000	0.000	-0.050
74	74		3.176	-0.529	0.000	0.000	0.000	-0.050
75	75	P27	0.985	-0.777	0.000	0.000	0.000	-0.202
76	76		3.047	-0.778	0.000	0.000	0.000	-0.058
77	77	P32	3.172	-0.778	0.000	0.000	0.000	-0.058
78	78		3.817	0.391	0.000	0.000	0.000	-0.069
79	79		3.257	0.391	0.000	0.000	0.000	-0.006
80	80		3.244	0.391	0.000	0.000	0.000	-0.006
81	81		3.915	0.345	0.000	0.000	0.000	-0.079
82	82		3.274	0.345	0.000	0.000	0.000	-0.016
83	83		3.240	0.345	0.000	0.000	0.000	-0.016
84	84		3.940	0.270	0.000	0.000	0.000	-0.082
85	85		3.276	0.270	0.000	0.000	0.000	-0.019
86	86		3.235	0.270	0.000	0.000	0.000	-0.019
87	87		3.919	0.192	0.000	0.000	0.000	-0.081
88	88		3.267	0.192	0.000	0.000	0.000	-0.017
89	89		3.229	0.192	0.000	0.000	0.000	-0.017
90	90		3.879	0.125	0.000	0.000	0.000	-0.077
91	91		3.256	0.125	0.000	0.000	0.000	-0.014
92	92		3.227	0.125	0.000	0.000	0.000	-0.014
93	93		3.838	0.074	0.000	0.000	0.000	-0.073
94	94		3.246	0.074	0.000	0.000	0.000	-0.010
95	95		3.224	0.074	0.000	0.000	0.000	-0.010
96	96		3.801	0.038	0.000	0.000	0.000	-0.070
97	97		3.235	0.038	0.000	0.000	0.000	-0.007
98	98		3.221	0.038	0.000	0.000	0.000	-0.007
99	99		3.769	0.014	0.000	0.000	0.000	-0.068
100	100		3.226	0.014	0.000	0.000	0.000	-0.004
101	101		3.217	0.014	0.000	0.000	0.000	-0.004
102	102		3.744	0.000	0.000	0.000	0.000	-0.066
103	103		3.216	0.000	0.000	0.000	0.000	-0.002
104	104		3.212	0.000	0.000	0.000	0.000	-0.002
105	105		3.726	-0.006	0.000	0.000	0.000	-0.064
106	106		3.210	-0.006	0.000	0.000	0.000	-0.001
107	107		3.208	-0.006	0.000	0.000	0.000	-0.001
108	108		3.715	-0.008	0.000	0.000	0.000	-0.063
109	109		3.206	-0.008	0.000	0.000	0.000	0.000
110	110		3.207	-0.008	0.000	0.000	0.000	0.000
111	111		3.706	-0.005	0.000	0.000	0.000	-0.063
112	112		3.203	-0.005	0.000	0.000	0.000	0.001
113	113		3.204	-0.005	0.000	0.000	0.000	0.001
114	114		3.699	-0.000	0.000	0.000	0.000	-0.062
115	115		3.199	-0.000	0.000	0.000	0.000	0.001
116	116		3.201	-0.000	0.000	0.000	0.000	0.001
117	117		3.694	0.006	0.000	0.000	0.000	-0.062
118	118		3.194	0.006	0.000	0.000	0.000	0.001
119	119		3.197	0.006	0.000	0.000	0.000	0.001
120	120		3.692	0.013	0.000	0.000	0.000	-0.062
121	121		3.191	0.013	0.000	0.000	0.000	0.001
122	122		3.193	0.013	0.000	0.000	0.000	0.001

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		3.697	0.020	0.000	0.000	0.000	-0.063
124	124		3.192	0.020	0.000	0.000	0.000	0.000
125	125		3.193	0.020	0.000	0.000	0.000	0.000
126	126		3.708	0.024	0.000	0.000	0.000	-0.064
127	127		3.193	0.024	0.000	0.000	0.000	-0.001
128	128		3.191	0.024	0.000	0.000	0.000	-0.001
129	129		3.728	0.023	0.000	0.000	0.000	-0.066
130	130		3.195	0.023	0.000	0.000	0.000	-0.003
131	131		3.189	0.023	0.000	0.000	0.000	-0.003
132	132		3.761	0.010	0.000	0.000	0.000	-0.070
133	133		3.199	0.010	0.000	0.000	0.000	-0.006
134	134		3.186	0.010	0.000	0.000	0.000	-0.006
135	135		3.805	-0.020	0.000	0.000	0.000	-0.074
136	136		3.205	-0.020	0.000	0.000	0.000	-0.011
137	137		3.182	-0.020	0.000	0.000	0.000	-0.011
138	138		3.870	-0.075	0.000	0.000	0.000	-0.081
139	139		3.219	-0.075	0.000	0.000	0.000	-0.017
140	140		3.182	-0.075	0.000	0.000	0.000	-0.017
141	141		3.956	-0.164	0.000	0.000	0.000	-0.089
142	142		3.236	-0.164	0.000	0.000	0.000	-0.026
143	143		3.181	-0.164	0.000	0.000	0.000	-0.026
144	144		4.059	-0.296	0.000	0.000	0.000	-0.099
145	145		3.256	-0.296	0.000	0.000	0.000	-0.036
146	146		3.179	-0.296	0.000	0.000	0.000	-0.036
147	147		4.168	-0.476	0.000	0.000	0.000	-0.110
148	148		3.277	-0.476	0.000	0.000	0.000	-0.047
149	149		3.177	-0.476	0.000	0.000	0.000	-0.047
150	150		4.261	-0.702	0.000	0.000	0.000	-0.120
151	151		3.293	-0.702	0.000	0.000	0.000	-0.056
152	152		3.173	-0.702	0.000	0.000	0.000	-0.056
153	153	End Spring 1	0.368	-3.216	0.000	0.000	0.000	0.074
154	154	End Spring 2	0.391	-3.257	0.000	0.000	0.000	-0.065
155	155	End Spring 3	0.345	-3.274	0.000	0.000	0.000	-0.075
156	156	End Spring 4	0.270	-3.276	0.000	0.000	0.000	-0.077
157	157	End Spring 5	0.192	-3.267	0.000	0.000	0.000	-0.076
158	158	End Spring 6	0.125	-3.256	0.000	0.000	0.000	-0.072
159	159	End Spring 7	0.074	-3.246	0.000	0.000	0.000	-0.069
160	160	End Spring 8	0.038	-3.235	0.000	0.000	0.000	-0.065
161	161	End Spring 9	0.014	-3.226	0.000	0.000	0.000	-0.063
162	162	End Spring 10	0.000	-3.217	0.000	0.000	0.000	-0.061
163	163	End Spring 11	-0.006	-3.210	0.000	0.000	0.000	-0.059
164	164	End Spring 12	-0.008	-3.207	0.000	0.000	0.000	-0.058
165	165	End Spring 13	-0.005	-3.203	0.000	0.000	0.000	-0.058
166	166	End Spring 14	-0.000	-3.199	0.000	0.000	0.000	-0.057
167	167	End Spring 15	0.006	-3.195	0.000	0.000	0.000	-0.057
168	168	End Spring 16	0.013	-3.191	0.000	0.000	0.000	-0.057
169	169	End Spring 17	0.020	-3.192	0.000	0.000	0.000	-0.058
170	170	End Spring 18	0.024	-3.193	0.000	0.000	0.000	-0.059
171	171	End Spring 19	0.023	-3.195	0.000	0.000	0.000	-0.061
172	172	End Spring 20	0.010	-3.199	0.000	0.000	0.000	-0.065
173	173	End Spring 21	-0.020	-3.206	0.000	0.000	0.000	-0.069
174	174	End Spring 22	-0.075	-3.219	0.000	0.000	0.000	-0.076
175	175	End Spring 23	-0.164	-3.236	0.000	0.000	0.000	-0.084
176	176	End Spring 24	-0.296	-3.256	0.000	0.000	0.000	-0.094
177	177	End Spring 25	-0.476	-3.277	0.000	0.000	0.000	-0.105
178	178	End Spring 26	-0.702	-3.293	0.000	0.000	0.000	-0.115
179	179	End Spring 27	0.368	-3.280	0.000	0.000	0.000	0.044
180	180	End Spring 28	0.389	-3.228	0.000	0.000	0.000	-0.163
181	181	End Spring 29	0.336	-3.203	0.000	0.000	0.000	-0.165
182	182	End Spring 30	0.255	-3.193	0.000	0.000	0.000	-0.165
183	183	End Spring 31	0.174	-3.191	0.000	0.000	0.000	-0.164

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 32	0.108	-3.197	0.000	0.000	0.000	-0.163
185	185	End Spring 33	0.059	-3.202	0.000	0.000	0.000	-0.162
186	186	End Spring 34	0.026	-3.205	0.000	0.000	0.000	-0.161
187	187	End Spring 35	0.007	-3.206	0.000	0.000	0.000	-0.160
188	188	End Spring 36	-0.004	-3.204	0.000	0.000	0.000	-0.160
189	189	End Spring 37	-0.007	-3.205	0.000	0.000	0.000	-0.159
190	190	End Spring 38	-0.006	-3.204	0.000	0.000	0.000	-0.159
191	191	End Spring 39	-0.002	-3.202	0.000	0.000	0.000	-0.159
192	192	End Spring 40	0.005	-3.199	0.000	0.000	0.000	-0.158
193	193	End Spring 41	0.013	-3.194	0.000	0.000	0.000	-0.158
194	194	End Spring 42	0.020	-3.193	0.000	0.000	0.000	-0.158
195	195	End Spring 43	0.025	-3.189	0.000	0.000	0.000	-0.158
196	196	End Spring 44	0.024	-3.183	0.000	0.000	0.000	-0.159
197	197	End Spring 45	0.011	-3.172	0.000	0.000	0.000	-0.159
198	198	End Spring 46	-0.021	-3.158	0.000	0.000	0.000	-0.160
199	199	End Spring 47	-0.082	-3.143	0.000	0.000	0.000	-0.161
200	200	End Spring 48	-0.181	-3.122	0.000	0.000	0.000	-0.163
201	201	End Spring 49	-0.328	-3.097	0.000	0.000	0.000	-0.165
202	202	End Spring 50	-0.529	-3.069	0.000	0.000	0.000	-0.168
203	203	End Spring 51	-0.778	-3.047	0.000	0.000	0.000	-0.169

GROUP 6 DOCKS
DOCK E12

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P3	0.081	1.408	0.000	0.000	0.000	0.000
2	2		0.066	1.408	0.000	0.000	0.000	0.023
3	3	P2	0.016	1.408	0.000	0.000	0.000	0.023
4	4		-0.033	1.408	0.000	0.000	0.000	0.023
5	5	P1	-0.086	1.407	0.000	0.000	0.000	0.006
6	6	P4	0.077	1.523	0.000	0.000	0.000	0.000
7	7		0.063	1.523	0.000	0.000	0.000	0.022
8	8		0.016	1.523	0.000	0.000	0.000	0.022
9	9	P5	0.058	1.612	0.000	0.000	0.000	-0.000
10	10		0.051	1.613	0.000	0.000	0.000	0.016
11	11		0.017	1.613	0.000	0.000	0.000	0.016
12	12	P6	0.039	1.673	0.000	0.000	0.000	-0.001
13	13		0.039	1.674	0.000	0.000	0.000	0.010
14	14		0.017	1.674	0.000	0.000	0.000	0.010
15	15	P7	0.035	1.717	0.000	0.000	0.000	-0.001
16	16		0.037	1.717	0.000	0.000	0.000	0.009
17	17	P28	0.017	1.717	0.000	0.000	0.000	0.009
18	18	P8	0.034	1.761	0.000	0.000	0.000	-0.001
19	19		0.036	1.762	0.000	0.000	0.000	0.009
20	20		0.017	1.762	0.000	0.000	0.000	0.009
21	21	P9	0.020	1.794	0.000	0.000	0.000	-0.001
22	22		0.028	1.794	0.000	0.000	0.000	0.005
23	23		0.018	1.794	0.000	0.000	0.000	0.005
24	24	P10	0.004	1.804	0.000	0.000	0.000	-0.001
25	25		0.018	1.805	0.000	0.000	0.000	-0.000
26	26		0.018	1.805	0.000	0.000	0.000	-0.000
27	27	P11	-0.004	1.797	0.000	0.000	0.000	-0.002
28	28		0.013	1.797	0.000	0.000	0.000	-0.003
29	29		0.019	1.797	0.000	0.000	0.000	-0.003
30	30	P12	0.005	1.788	0.000	0.000	0.000	-0.001
31	31		0.019	1.788	0.000	0.000	0.000	-0.000
32	32	P29	0.019	1.788	0.000	0.000	0.000	-0.000
33	33	P13	0.015	1.797	0.000	0.000	0.000	-0.001
34	34		0.026	1.798	0.000	0.000	0.000	0.003
35	35		0.020	1.798	0.000	0.000	0.000	0.003
36	36	P14	0.010	1.809	0.000	0.000	0.000	-0.001
37	37		0.024	1.809	0.000	0.000	0.000	0.002
38	38		0.020	1.809	0.000	0.000	0.000	0.002
39	39	P15	0.001	1.809	0.000	0.000	0.000	-0.002
40	40		0.018	1.810	0.000	0.000	0.000	-0.001
41	41		0.021	1.810	0.000	0.000	0.000	-0.001
42	42	P16	-0.003	1.799	0.000	0.000	0.000	-0.002
43	43		0.016	1.800	0.000	0.000	0.000	-0.003
44	44		0.021	1.800	0.000	0.000	0.000	-0.003
45	45	P17	0.008	1.792	0.000	0.000	0.000	-0.002
46	46		0.023	1.793	0.000	0.000	0.000	0.001
47	47	P30	0.022	1.793	0.000	0.000	0.000	0.001
48	48	P18	0.018	1.805	0.000	0.000	0.000	-0.001
49	49		0.030	1.806	0.000	0.000	0.000	0.004
50	50		0.022	1.806	0.000	0.000	0.000	0.004
51	51	P19	0.011	1.819	0.000	0.000	0.000	-0.002
52	52		0.026	1.820	0.000	0.000	0.000	0.002
53	53		0.023	1.820	0.000	0.000	0.000	0.002
54	54	P20	-0.003	1.817	0.000	0.000	0.000	-0.002
55	55		0.018	1.817	0.000	0.000	0.000	-0.003
56	56		0.024	1.817	0.000	0.000	0.000	-0.003
57	57	P21	-0.016	1.794	0.000	0.000	0.000	-0.002
58	58		0.010	1.795	0.000	0.000	0.000	-0.007
59	59		0.024	1.795	0.000	0.000	0.000	-0.007
60	60	P22	-0.017	1.761	0.000	0.000	0.000	-0.002
61	61		0.010	1.761	0.000	0.000	0.000	-0.007

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P31	0.025	1.761	0.000	0.000	0.000	-0.007
63	63	P23	-0.024	1.726	0.000	0.000	0.000	-0.002
64	64		0.006	1.726	0.000	0.000	0.000	-0.009
65	65		0.025	1.726	0.000	0.000	0.000	-0.009
66	66	P24	-0.052	1.665	0.000	0.000	0.000	-0.003
67	67		-0.011	1.666	0.000	0.000	0.000	-0.017
68	68		0.026	1.666	0.000	0.000	0.000	-0.017
69	69	P25	-0.088	1.559	0.000	0.000	0.000	-0.004
70	70		-0.034	1.559	0.000	0.000	0.000	-0.028
71	71		0.026	1.559	0.000	0.000	0.000	-0.028
72	72	P26	-0.120	1.402	0.000	0.000	0.000	-0.004
73	73		-0.055	1.402	0.000	0.000	0.000	-0.038
74	74		0.027	1.402	0.000	0.000	0.000	-0.038
75	75	P27	-0.131	1.212	0.000	0.000	0.000	-0.004
76	76		-0.061	1.213	0.000	0.000	0.000	-0.041
77	77	P32	0.027	1.213	0.000	0.000	0.000	-0.041
78	78		-0.214	1.516	0.000	0.000	0.000	0.022
79	79		-0.031	1.516	0.000	0.000	0.000	0.022
80	80		0.016	1.516	0.000	0.000	0.000	0.022
81	81		-0.158	1.604	0.000	0.000	0.000	0.017
82	82		-0.020	1.603	0.000	0.000	0.000	0.017
83	83		0.017	1.603	0.000	0.000	0.000	0.017
84	84		-0.099	1.665	0.000	0.000	0.000	0.011
85	85		-0.007	1.665	0.000	0.000	0.000	0.011
86	86		0.017	1.665	0.000	0.000	0.000	0.011
87	87		-0.076	1.708	0.000	0.000	0.000	0.009
88	88		-0.002	1.708	0.000	0.000	0.000	0.009
89	89		0.017	1.708	0.000	0.000	0.000	0.009
90	90		-0.081	1.750	0.000	0.000	0.000	0.010
91	91		-0.003	1.750	0.000	0.000	0.000	0.010
92	92		0.017	1.750	0.000	0.000	0.000	0.010
93	93		-0.047	1.786	0.000	0.000	0.000	0.006
94	94		0.004	1.786	0.000	0.000	0.000	0.006
95	95		0.018	1.786	0.000	0.000	0.000	0.006
96	96		0.001	1.804	0.000	0.000	0.000	0.002
97	97		0.015	1.804	0.000	0.000	0.000	0.002
98	98		0.018	1.804	0.000	0.000	0.000	0.002
99	99		0.039	1.802	0.000	0.000	0.000	-0.002
100	100		0.023	1.802	0.000	0.000	0.000	-0.002
101	101		0.019	1.802	0.000	0.000	0.000	-0.002
102	102		0.041	1.791	0.000	0.000	0.000	-0.002
103	103		0.024	1.791	0.000	0.000	0.000	-0.002
104	104		0.019	1.791	0.000	0.000	0.000	-0.002
105	105		-0.003	1.791	0.000	0.000	0.000	0.002
106	106		0.015	1.791	0.000	0.000	0.000	0.002
107	107		0.019	1.791	0.000	0.000	0.000	0.002
108	108		-0.008	1.804	0.000	0.000	0.000	0.003
109	109		0.014	1.803	0.000	0.000	0.000	0.003
110	110		0.020	1.803	0.000	0.000	0.000	0.003
111	111		0.015	1.811	0.000	0.000	0.000	0.000
112	112		0.019	1.811	0.000	0.000	0.000	0.000
113	113		0.020	1.811	0.000	0.000	0.000	0.000
114	114		0.042	1.808	0.000	0.000	0.000	-0.002
115	115		0.025	1.807	0.000	0.000	0.000	-0.002
116	116		0.021	1.807	0.000	0.000	0.000	-0.002
117	117		0.045	1.797	0.000	0.000	0.000	-0.002
118	118		0.026	1.797	0.000	0.000	0.000	-0.002
119	119		0.021	1.797	0.000	0.000	0.000	-0.002
120	120		0.002	1.794	0.000	0.000	0.000	0.002
121	121		0.018	1.794	0.000	0.000	0.000	0.002
122	122		0.022	1.794	0.000	0.000	0.000	0.002

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		-0.015	1.809	0.000	0.000	0.000	0.004
124	124		0.015	1.809	0.000	0.000	0.000	0.004
125	125		0.022	1.809	0.000	0.000	0.000	0.004
126	126		0.011	1.820	0.000	0.000	0.000	0.001
127	127		0.021	1.820	0.000	0.000	0.000	0.001
128	128		0.023	1.820	0.000	0.000	0.000	0.001
129	129		0.055	1.817	0.000	0.000	0.000	-0.003
130	130		0.030	1.816	0.000	0.000	0.000	-0.003
131	131		0.024	1.816	0.000	0.000	0.000	-0.003
132	132		0.092	1.795	0.000	0.000	0.000	-0.007
133	133		0.038	1.794	0.000	0.000	0.000	-0.007
134	134		0.024	1.794	0.000	0.000	0.000	-0.007
135	135		0.099	1.763	0.000	0.000	0.000	-0.007
136	136		0.040	1.762	0.000	0.000	0.000	-0.007
137	137		0.025	1.762	0.000	0.000	0.000	-0.007
138	138		0.115	1.730	0.000	0.000	0.000	-0.009
139	139		0.044	1.730	0.000	0.000	0.000	-0.009
140	140		0.025	1.730	0.000	0.000	0.000	-0.009
141	141		0.192	1.677	0.000	0.000	0.000	-0.016
142	142		0.060	1.676	0.000	0.000	0.000	-0.016
143	143		0.026	1.676	0.000	0.000	0.000	-0.016
144	144		0.299	1.583	0.000	0.000	0.000	-0.026
145	145		0.083	1.583	0.000	0.000	0.000	-0.026
146	146		0.026	1.583	0.000	0.000	0.000	-0.026
147	147		0.402	1.443	0.000	0.000	0.000	-0.036
148	148		0.105	1.443	0.000	0.000	0.000	-0.036
149	149		0.027	1.443	0.000	0.000	0.000	-0.036
150	150		0.457	1.268	0.000	0.000	0.000	-0.042
151	151		0.116	1.268	0.000	0.000	0.000	-0.042
152	152		0.027	1.268	0.000	0.000	0.000	-0.042
153	153	End Spring 1	1.408	0.033	0.000	0.000	0.000	0.008
154	154	End Spring 2	1.516	0.031	0.000	0.000	0.000	0.022
155	155	End Spring 3	1.604	0.020	0.000	0.000	0.000	0.017
156	156	End Spring 4	1.665	0.007	0.000	0.000	0.000	0.011
157	157	End Spring 5	1.708	0.002	0.000	0.000	0.000	0.009
158	158	End Spring 6	1.750	0.003	0.000	0.000	0.000	0.010
159	159	End Spring 7	1.786	-0.004	0.000	0.000	0.000	0.006
160	160	End Spring 8	1.804	-0.015	0.000	0.000	0.000	0.002
161	161	End Spring 9	1.802	-0.023	0.000	0.000	0.000	-0.002
162	162	End Spring 10	1.791	-0.024	0.000	0.000	0.000	-0.002
163	163	End Spring 11	1.791	-0.015	0.000	0.000	0.000	0.002
164	164	End Spring 12	1.804	-0.014	0.000	0.000	0.000	0.003
165	165	End Spring 13	1.811	-0.019	0.000	0.000	0.000	0.000
166	166	End Spring 14	1.808	-0.025	0.000	0.000	0.000	-0.002
167	167	End Spring 15	1.797	-0.026	0.000	0.000	0.000	-0.002
168	168	End Spring 16	1.794	-0.018	0.000	0.000	0.000	0.002
169	169	End Spring 17	1.809	-0.015	0.000	0.000	0.000	0.004
170	170	End Spring 18	1.820	-0.021	0.000	0.000	0.000	0.001
171	171	End Spring 19	1.816	-0.030	0.000	0.000	0.000	-0.003
172	172	End Spring 20	1.795	-0.038	0.000	0.000	0.000	-0.007
173	173	End Spring 21	1.762	-0.040	0.000	0.000	0.000	-0.007
174	174	End Spring 22	1.730	-0.044	0.000	0.000	0.000	-0.009
175	175	End Spring 23	1.677	-0.060	0.000	0.000	0.000	-0.016
176	176	End Spring 24	1.583	-0.083	0.000	0.000	0.000	-0.026
177	177	End Spring 25	1.443	-0.105	0.000	0.000	0.000	-0.036
178	178	End Spring 26	1.268	-0.116	0.000	0.000	0.000	-0.042
179	179	End Spring 27	1.408	-0.066	0.000	0.000	0.000	0.004
180	180	End Spring 28	1.523	-0.063	0.000	0.000	0.000	0.004
181	181	End Spring 29	1.613	-0.051	0.000	0.000	0.000	0.002
182	182	End Spring 30	1.674	-0.039	0.000	0.000	0.000	0.001
183	183	End Spring 31	1.717	-0.037	0.000	0.000	0.000	0.001

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 32	1.762	-0.036	0.000	0.000	0.000	0.001
185	185	End Spring 33	1.794	-0.028	0.000	0.000	0.000	-0.000
186	186	End Spring 34	1.805	-0.018	0.000	0.000	0.000	-0.001
187	187	End Spring 35	1.797	-0.013	0.000	0.000	0.000	-0.002
188	188	End Spring 36	1.788	-0.019	0.000	0.000	0.000	-0.001
189	189	End Spring 37	1.798	-0.026	0.000	0.000	0.000	-0.001
190	190	End Spring 38	1.809	-0.024	0.000	0.000	0.000	-0.001
191	191	End Spring 39	1.810	-0.018	0.000	0.000	0.000	-0.002
192	192	End Spring 40	1.800	-0.016	0.000	0.000	0.000	-0.002
193	193	End Spring 41	1.793	-0.023	0.000	0.000	0.000	-0.001
194	194	End Spring 42	1.806	-0.030	0.000	0.000	0.000	-0.001
195	195	End Spring 43	1.820	-0.026	0.000	0.000	0.000	-0.001
196	196	End Spring 44	1.817	-0.018	0.000	0.000	0.000	-0.002
197	197	End Spring 45	1.795	-0.010	0.000	0.000	0.000	-0.003
198	198	End Spring 46	1.761	-0.010	0.000	0.000	0.000	-0.003
199	199	End Spring 47	1.726	-0.006	0.000	0.000	0.000	-0.003
200	200	End Spring 48	1.666	0.011	0.000	0.000	0.000	-0.005
201	201	End Spring 49	1.559	0.034	0.000	0.000	0.000	-0.008
202	202	End Spring 50	1.402	0.055	0.000	0.000	0.000	-0.010
203	203	End Spring 51	1.212	0.061	0.000	0.000	0.000	-0.010

GROUP 6 DOCKS
DOCK E12

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
61	75	P27	Normal	ky'	1.360
62	75	P27	Normal	kx'	1.360
63	77	P32	Normal	ky'	1.360
64	77	P32	Normal	kx'	1.360

APPENDIX: GROUP 7 DOCKS DATA

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	22	P11	Normal	ky'	1.060
2	22	P11	Normal	kx'	1.060
3	46	P1	Normal	ky'	1.060
4	46	P1	Normal	kx'	1.060
5	48	P2	Normal	ky'	1.060
6	48	P2	Normal	kx'	1.060
7	50	P3	Normal	ky'	1.060
8	50	P3	Normal	kx'	1.060
9	52	P4	Normal	ky'	1.060
10	52	P4	Normal	kx'	1.060
11	55	P5	Normal	ky'	1.060
12	55	P5	Normal	kx'	1.060
13	57	P6	Normal	ky'	1.060
14	57	P6	Normal	kx'	1.060
15	60	P7	Normal	ky'	1.060
16	60	P7	Normal	kx'	1.060
17	62	P8	Normal	ky'	1.060
18	62	P8	Normal	kx'	1.060
19	65	P9	Normal	ky'	1.060
20	65	P9	Normal	kx'	1.060
21	89	P10	Normal	ky'	1.060
22	89	P10	Normal	kx'	1.060

GROUP 7 DOCKS
DOCK E13

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		3.793	-0.284	0.000	0.000	0.000	0.035
2	2		3.665	-0.246	0.000	0.000	0.000	0.030
3	3		3.560	-0.175	0.000	0.000	0.000	0.021
4	4		3.496	-0.101	0.000	0.000	0.000	0.012
5	5		3.469	-0.025	0.000	0.000	0.000	0.003
6	6		3.473	0.045	0.000	0.000	0.000	-0.006
7	7		3.508	0.099	0.000	0.000	0.000	-0.012
8	8		3.559	0.130	0.000	0.000	0.000	-0.016
9	9		3.620	0.125	0.000	0.000	0.000	-0.015
10	10		3.666	0.076	0.000	0.000	0.000	-0.009
11	11		3.691	0.040	0.000	0.000	0.000	-0.005
12	12		3.703	0.004	0.000	0.000	0.000	-0.000
13	13		3.693	-0.045	0.000	0.000	0.000	0.005
14	14		3.658	-0.120	0.000	0.000	0.000	0.015
15	15		3.578	-0.234	0.000	0.000	0.000	0.028
16	16		3.449	-0.328	0.000	0.000	0.000	0.040
17	17		3.283	-0.411	0.000	0.000	0.000	0.050
18	18		3.077	-0.492	0.000	0.000	0.000	0.060
19	19		2.838	-0.570	0.000	0.000	0.000	0.069
20	20		2.560	-0.649	0.000	0.000	0.000	0.079
21	21		2.259	-0.669	0.000	0.000	0.000	0.081
22	22	P11	1.897	-0.571	0.000	0.000	0.000	0.067
23	23		3.792	-0.043	0.000	0.000	0.000	0.035
24	24		3.665	-0.038	0.000	0.000	0.000	0.030
25	25		3.560	-0.027	0.000	0.000	0.000	0.021
26	26		3.496	-0.015	0.000	0.000	0.000	0.012
27	27		3.469	-0.004	0.000	0.000	0.000	0.003
28	28		3.473	0.007	0.000	0.000	0.000	-0.006
29	29		3.507	0.015	0.000	0.000	0.000	-0.012
30	30		3.559	0.020	0.000	0.000	0.000	-0.016
31	31		3.619	0.019	0.000	0.000	0.000	-0.015
32	32		3.666	0.012	0.000	0.000	0.000	-0.009
33	33		3.691	0.006	0.000	0.000	0.000	-0.005
34	34		3.702	0.001	0.000	0.000	0.000	-0.000
35	35		3.692	-0.007	0.000	0.000	0.000	0.005
36	36		3.657	-0.018	0.000	0.000	0.000	0.015
37	37		3.578	-0.036	0.000	0.000	0.000	0.028
38	38		3.448	-0.050	0.000	0.000	0.000	0.040
39	39		3.283	-0.063	0.000	0.000	0.000	0.050
40	40		3.076	-0.075	0.000	0.000	0.000	0.060
41	41		2.837	-0.087	0.000	0.000	0.000	0.069
42	42		2.560	-0.099	0.000	0.000	0.000	0.079
43	43		2.259	-0.102	0.000	0.000	0.000	0.081
44	44		1.897	-0.091	0.000	0.000	0.000	0.072
45	45		3.792	-0.000	0.000	0.000	0.000	0.035
46	46	P1	3.665	-0.000	0.000	0.000	0.000	0.030
47	47		3.560	-0.000	0.000	0.000	0.000	0.021
48	48	P2	3.496	-0.000	0.000	0.000	0.000	0.012
49	49		3.469	-0.000	0.000	0.000	0.000	0.003
50	50	P3	3.473	-0.000	0.000	0.000	0.000	-0.006
51	51		3.507	-0.000	0.000	0.000	0.000	-0.012
52	52	P4	3.559	-0.000	0.000	0.000	0.000	-0.016
53	53		3.619	-0.000	0.000	0.000	0.000	-0.015
54	54		3.666	-0.000	0.000	0.000	0.000	-0.009
55	55	P5	3.691	-0.000	0.000	0.000	0.000	-0.005
56	56		3.702	-0.000	0.000	0.000	0.000	-0.000
57	57	P6	3.692	-0.000	0.000	0.000	0.000	0.005
58	58		3.657	-0.000	0.000	0.000	0.000	0.015
59	59		3.578	-0.000	0.000	0.000	0.000	0.028
60	60	P7	3.448	-0.000	0.000	0.000	0.000	0.040
61	61		3.283	-0.000	0.000	0.000	0.000	0.050

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P8	3.076	-0.000	0.000	0.000	0.000	0.060
63	63		2.837	-0.000	0.000	0.000	0.000	0.069
64	64		2.560	-0.000	0.000	0.000	0.000	0.079
65	65	P9	2.259	-0.000	0.000	0.000	0.000	0.081
66	66		1.897	-0.000	0.000	0.000	0.000	0.072
67	67		3.792	0.043	0.000	0.000	0.000	0.035
68	68		3.665	0.038	0.000	0.000	0.000	0.030
69	69		3.560	0.027	0.000	0.000	0.000	0.021
70	70		3.496	0.015	0.000	0.000	0.000	0.012
71	71		3.469	0.004	0.000	0.000	0.000	0.003
72	72		3.473	-0.007	0.000	0.000	0.000	-0.006
73	73		3.507	-0.015	0.000	0.000	0.000	-0.012
74	74		3.559	-0.020	0.000	0.000	0.000	-0.016
75	75		3.619	-0.019	0.000	0.000	0.000	-0.015
76	76		3.666	-0.012	0.000	0.000	0.000	-0.009
77	77		3.691	-0.006	0.000	0.000	0.000	-0.005
78	78		3.702	-0.001	0.000	0.000	0.000	-0.000
79	79		3.692	0.007	0.000	0.000	0.000	0.005
80	80		3.657	0.018	0.000	0.000	0.000	0.015
81	81		3.578	0.036	0.000	0.000	0.000	0.028
82	82		3.448	0.050	0.000	0.000	0.000	0.040
83	83		3.283	0.063	0.000	0.000	0.000	0.050
84	84		3.076	0.075	0.000	0.000	0.000	0.060
85	85		2.837	0.087	0.000	0.000	0.000	0.069
86	86		2.560	0.099	0.000	0.000	0.000	0.079
87	87		2.259	0.102	0.000	0.000	0.000	0.081
88	88		1.897	0.091	0.000	0.000	0.000	0.072
89	89	P10	1.896	0.571	0.000	0.000	0.000	0.067
90	90		3.793	0.284	0.000	0.000	0.000	0.035
91	91		3.665	0.246	0.000	0.000	0.000	0.030
92	92		3.560	0.175	0.000	0.000	0.000	0.021
93	93		3.496	0.101	0.000	0.000	0.000	0.012
94	94		3.469	0.025	0.000	0.000	0.000	0.003
95	95		3.473	-0.045	0.000	0.000	0.000	-0.006
96	96		3.507	-0.099	0.000	0.000	0.000	-0.012
97	97		3.559	-0.130	0.000	0.000	0.000	-0.016
98	98		3.619	-0.125	0.000	0.000	0.000	-0.015
99	99		3.666	-0.076	0.000	0.000	0.000	-0.009
100	100		3.691	-0.040	0.000	0.000	0.000	-0.005
101	101		3.702	-0.004	0.000	0.000	0.000	-0.000
102	102		3.692	0.045	0.000	0.000	0.000	0.005
103	103		3.657	0.120	0.000	0.000	0.000	0.015
104	104		3.578	0.234	0.000	0.000	0.000	0.028
105	105		3.449	0.328	0.000	0.000	0.000	0.040
106	106		3.283	0.411	0.000	0.000	0.000	0.050
107	107		3.076	0.492	0.000	0.000	0.000	0.060
108	108		2.838	0.570	0.000	0.000	0.000	0.069
109	109		2.560	0.649	0.000	0.000	0.000	0.079
110	110		2.259	0.669	0.000	0.000	0.000	0.081

GROUP 7 DOCKS
DOCK E13

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-0.000	-2.506	0.000	0.000	0.000	0.009
2	2		-0.000	-2.486	0.000	0.000	0.000	0.005
3	3		-0.000	-2.487	0.000	0.000	0.000	0.005
4	4		-0.000	-2.486	0.000	0.000	0.000	0.005
5	5		-0.000	-2.486	0.000	0.000	0.000	0.005
6	6		-0.000	-2.486	0.000	0.000	0.000	0.005
7	7		-0.000	-2.487	0.000	0.000	0.000	0.005
8	8		0.000	-2.487	0.000	0.000	0.000	0.005
9	9		0.000	-2.489	0.000	0.000	0.000	0.005
10	10		0.000	-2.489	0.000	0.000	0.000	0.005
11	11		0.000	-2.489	0.000	0.000	0.000	0.005
12	12		-0.000	-2.491	0.000	0.000	0.000	0.005
13	13		-0.000	-2.491	0.000	0.000	0.000	0.005
14	14		-0.000	-2.493	0.000	0.000	0.000	0.005
15	15		-0.000	-2.494	0.000	0.000	0.000	0.005
16	16		-0.000	-2.494	0.000	0.000	0.000	0.005
17	17		-0.000	-2.495	0.000	0.000	0.000	0.005
18	18		-0.000	-2.496	0.000	0.000	0.000	0.005
19	19		0.000	-2.498	0.000	0.000	0.000	0.005
20	20		0.000	-2.499	0.000	0.000	0.000	0.005
21	21		0.000	-2.499	0.000	0.000	0.000	0.005
22	22	P11	0.000	-2.419	0.000	0.000	0.000	-0.013
23	23		-0.000	-2.458	0.000	0.000	0.000	0.000
24	24		-0.000	-2.456	0.000	0.000	0.000	0.000
25	25		-0.000	-2.456	0.000	0.000	0.000	0.000
26	26		-0.000	-2.455	0.000	0.000	0.000	0.000
27	27		-0.000	-2.456	0.000	0.000	0.000	0.000
28	28		-0.000	-2.456	0.000	0.000	0.000	0.000
29	29		-0.000	-2.457	0.000	0.000	0.000	0.000
30	30		0.000	-2.457	0.000	0.000	0.000	0.000
31	31		0.000	-2.459	0.000	0.000	0.000	0.000
32	32		0.000	-2.459	0.000	0.000	0.000	0.000
33	33		0.000	-2.459	0.000	0.000	0.000	0.000
34	34		-0.000	-2.460	0.000	0.000	0.000	0.000
35	35		-0.000	-2.461	0.000	0.000	0.000	0.000
36	36		-0.000	-2.463	0.000	0.000	0.000	0.000
37	37		-0.000	-2.464	0.000	0.000	0.000	0.000
38	38		-0.000	-2.464	0.000	0.000	0.000	0.000
39	39		-0.000	-2.465	0.000	0.000	0.000	0.000
40	40		-0.000	-2.466	0.000	0.000	0.000	0.000
41	41		0.000	-2.468	0.000	0.000	0.000	0.000
42	42		0.000	-2.469	0.000	0.000	0.000	0.000
43	43		0.000	-2.469	0.000	0.000	0.000	0.000
44	44		0.000	-2.471	0.000	0.000	0.000	-0.000
45	45		-0.000	-2.458	0.000	0.000	0.000	-0.000
46	46	P1	-0.000	-2.456	0.000	0.000	0.000	-0.000
47	47		-0.000	-2.456	0.000	0.000	0.000	-0.000
48	48	P2	-0.000	-2.455	0.000	0.000	0.000	-0.000
49	49		-0.000	-2.456	0.000	0.000	0.000	-0.000
50	50	P3	-0.000	-2.456	0.000	0.000	0.000	-0.000
51	51		-0.000	-2.457	0.000	0.000	0.000	-0.000
52	52	P4	0.000	-2.457	0.000	0.000	0.000	-0.000
53	53		0.000	-2.459	0.000	0.000	0.000	-0.000
54	54		0.000	-2.459	0.000	0.000	0.000	0.000
55	55	P5	0.000	-2.459	0.000	0.000	0.000	0.000
56	56		-0.000	-2.460	0.000	0.000	0.000	0.000
57	57	P6	-0.000	-2.461	0.000	0.000	0.000	0.000
58	58		-0.000	-2.463	0.000	0.000	0.000	0.000
59	59		-0.000	-2.464	0.000	0.000	0.000	0.000
60	60	P7	-0.000	-2.464	0.000	0.000	0.000	-0.000
61	61		-0.000	-2.465	0.000	0.000	0.000	-0.000

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P8	-0.000	-2.466	0.000	0.000	0.000	-0.000
63	63		0.000	-2.468	0.000	0.000	0.000	-0.000
64	64		0.000	-2.469	0.000	0.000	0.000	-0.000
65	65	P9	0.000	-2.469	0.000	0.000	0.000	-0.000
66	66		0.000	-2.471	0.000	0.000	0.000	-0.000
67	67		-0.000	-2.458	0.000	0.000	0.000	-0.000
68	68		-0.000	-2.456	0.000	0.000	0.000	-0.000
69	69		-0.000	-2.456	0.000	0.000	0.000	-0.000
70	70		-0.000	-2.455	0.000	0.000	0.000	-0.000
71	71		-0.000	-2.456	0.000	0.000	0.000	-0.000
72	72		-0.000	-2.456	0.000	0.000	0.000	-0.000
73	73		-0.000	-2.457	0.000	0.000	0.000	-0.000
74	74		0.000	-2.457	0.000	0.000	0.000	-0.000
75	75		0.000	-2.459	0.000	0.000	0.000	-0.000
76	76		0.000	-2.459	0.000	0.000	0.000	-0.000
77	77		0.000	-2.459	0.000	0.000	0.000	-0.000
78	78		-0.000	-2.460	0.000	0.000	0.000	-0.000
79	79		-0.000	-2.461	0.000	0.000	0.000	-0.000
80	80		-0.000	-2.463	0.000	0.000	0.000	-0.000
81	81		-0.000	-2.464	0.000	0.000	0.000	-0.000
82	82		-0.000	-2.464	0.000	0.000	0.000	-0.000
83	83		-0.000	-2.465	0.000	0.000	0.000	-0.000
84	84		-0.000	-2.466	0.000	0.000	0.000	-0.000
85	85		0.000	-2.468	0.000	0.000	0.000	-0.000
86	86		0.000	-2.469	0.000	0.000	0.000	-0.000
87	87		0.000	-2.469	0.000	0.000	0.000	-0.000
88	88		0.000	-2.471	0.000	0.000	0.000	0.000
89	89	P10	0.000	-2.419	0.000	0.000	0.000	0.013
90	90		-0.000	-2.506	0.000	0.000	0.000	-0.009
91	91		-0.000	-2.486	0.000	0.000	0.000	-0.005
92	92		-0.000	-2.487	0.000	0.000	0.000	-0.005
93	93		-0.000	-2.486	0.000	0.000	0.000	-0.005
94	94		-0.000	-2.486	0.000	0.000	0.000	-0.005
95	95		-0.000	-2.486	0.000	0.000	0.000	-0.005
96	96		-0.000	-2.487	0.000	0.000	0.000	-0.005
97	97		0.000	-2.487	0.000	0.000	0.000	-0.005
98	98		0.000	-2.489	0.000	0.000	0.000	-0.005
99	99		0.000	-2.489	0.000	0.000	0.000	-0.005
100	100		0.000	-2.489	0.000	0.000	0.000	-0.005
101	101		-0.000	-2.491	0.000	0.000	0.000	-0.005
102	102		-0.000	-2.491	0.000	0.000	0.000	-0.005
103	103		-0.000	-2.493	0.000	0.000	0.000	-0.005
104	104		-0.000	-2.494	0.000	0.000	0.000	-0.005
105	105		-0.000	-2.494	0.000	0.000	0.000	-0.005
106	106		-0.000	-2.495	0.000	0.000	0.000	-0.005
107	107		-0.000	-2.496	0.000	0.000	0.000	-0.005
108	108		0.000	-2.498	0.000	0.000	0.000	-0.005
109	109		0.000	-2.499	0.000	0.000	0.000	-0.005
110	110		0.000	-2.499	0.000	0.000	0.000	-0.005

APPENDIX: GROUP 8 DOCKS DATA

GROUP 8 DOCKS
DOCK E16

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	23	P1	Normal	ky'	1.060
2	23	P1	Normal	kx'	1.060
3	48	P10	Normal	ky'	1.060
4	48	P10	Normal	kx'	1.060
5	51	P9	Normal	ky'	1.060
6	51	P9	Normal	kx'	1.060
7	54	P8	Normal	ky'	1.060
8	54	P8	Normal	kx'	1.060
9	58	P7	Normal	ky'	1.060
10	58	P7	Normal	kx'	1.060
11	60	P6	Normal	ky'	1.060
12	60	P6	Normal	kx'	1.060
13	62	P5	Normal	ky'	1.060
14	62	P5	Normal	kx'	1.060
15	65	P4	Normal	ky'	1.060
16	65	P4	Normal	kx'	1.060
17	68	P3	Normal	ky'	1.060
18	68	P3	Normal	kx'	1.060
19	115	P2	Normal	ky'	1.060
20	115	P2	Normal	kx'	1.060

GROUP 8 DOCKS
DOCK E16

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-0.000	-2.512	0.000	0.000	0.000	0.033
2	2		-0.000	-2.436	0.000	0.000	0.000	0.022
3	3		-0.000	-2.437	0.000	0.000	0.000	0.022
4	4		-0.000	-2.436	0.000	0.000	0.000	0.022
5	5		-0.000	-2.434	0.000	0.000	0.000	0.022
6	6		0.000	-2.435	0.000	0.000	0.000	0.022
7	7		0.000	-2.435	0.000	0.000	0.000	0.022
8	8		0.000	-2.433	0.000	0.000	0.000	0.022
9	9		0.000	-2.433	0.000	0.000	0.000	0.022
10	10		0.000	-2.433	0.000	0.000	0.000	0.022
11	11		0.000	-2.431	0.000	0.000	0.000	0.022
12	12		0.000	-2.428	0.000	0.000	0.000	0.022
13	13		-0.000	-2.427	0.000	0.000	0.000	0.022
14	14		-0.000	-2.425	0.000	0.000	0.000	0.022
15	15		-0.000	-2.426	0.000	0.000	0.000	0.022
16	16		-0.000	-2.426	0.000	0.000	0.000	0.022
17	17		-0.000	-2.428	0.000	0.000	0.000	0.022
18	18		-0.000	-2.429	0.000	0.000	0.000	0.022
19	19		-0.000	-2.428	0.000	0.000	0.000	0.022
20	20		-0.000	-2.431	0.000	0.000	0.000	0.022
21	21		0.000	-2.431	0.000	0.000	0.000	0.022
22	22		0.000	-2.431	0.000	0.000	0.000	0.022
23	23	P1	0.000	-1.815	0.000	0.000	0.000	-0.073
24	24		-0.000	-2.290	0.000	0.000	0.000	0.000
25	25		-0.000	-2.288	0.000	0.000	0.000	0.000
26	26		-0.000	-2.288	0.000	0.000	0.000	0.000
27	27		-0.000	-2.286	0.000	0.000	0.000	0.000
28	28		0.000	-2.287	0.000	0.000	0.000	0.000
29	29		0.000	-2.287	0.000	0.000	0.000	0.000
30	30		0.000	-2.285	0.000	0.000	0.000	0.000
31	31		0.000	-2.285	0.000	0.000	0.000	0.000
32	32		0.000	-2.285	0.000	0.000	0.000	0.000
33	33		0.000	-2.283	0.000	0.000	0.000	0.000
34	34		-0.000	-2.289	0.000	0.000	0.000	0.000
35	35		0.000	-2.280	0.000	0.000	0.000	0.000
36	36		-0.000	-2.279	0.000	0.000	0.000	0.000
37	37		-0.000	-2.277	0.000	0.000	0.000	0.000
38	38		-0.000	-2.278	0.000	0.000	0.000	0.000
39	39		-0.000	-2.278	0.000	0.000	0.000	0.000
40	40		-0.000	-2.280	0.000	0.000	0.000	0.000
41	41		-0.000	-2.281	0.000	0.000	0.000	0.000
42	42		-0.000	-2.280	0.000	0.000	0.000	0.000
43	43		-0.000	-2.283	0.000	0.000	0.000	0.000
44	44		0.000	-2.283	0.000	0.000	0.000	0.000
45	45		0.000	-2.283	0.000	0.000	0.000	0.000
46	46		0.000	-2.285	0.000	0.000	0.000	-0.000
47	47		-0.000	-2.290	0.000	0.000	0.000	-0.000
48	48	P10	-0.000	-2.288	0.000	0.000	0.000	-0.000
49	49		-0.000	-2.289	0.000	0.000	0.000	-0.000
50	50		-0.000	-2.288	0.000	0.000	0.000	-0.000
51	51	P9	-0.000	-2.286	0.000	0.000	0.000	-0.000
52	52		0.000	-2.287	0.000	0.000	0.000	-0.000
53	53		0.000	-2.287	0.000	0.000	0.000	-0.000
54	54	P8	0.000	-2.285	0.000	0.000	0.000	0.000
55	55		0.000	-2.285	0.000	0.000	0.000	0.000
56	56		0.000	-2.285	0.000	0.000	0.000	0.000
57	57		0.000	-2.283	0.000	0.000	0.000	0.000
58	58	P7	0.000	-2.280	0.000	0.000	0.000	0.000
59	59		-0.000	-2.279	0.000	0.000	0.000	0.000
60	60	P6	-0.000	-2.277	0.000	0.000	0.000	0.000
61	61		-0.000	-2.278	0.000	0.000	0.000	0.000

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P5	-0.000	-2.278	0.000	0.000	0.000	0.000
63	63		-0.000	-2.280	0.000	0.000	0.000	0.000
64	64		-0.000	-2.281	0.000	0.000	0.000	-0.000
65	65	P4	-0.000	-2.280	0.000	0.000	0.000	-0.000
66	66		-0.000	-2.283	0.000	0.000	0.000	-0.000
67	67		0.000	-2.283	0.000	0.000	0.000	-0.000
68	68	P3	0.000	-2.283	0.000	0.000	0.000	-0.000
69	69		0.000	-2.285	0.000	0.000	0.000	-0.000
70	70		-0.000	-2.290	0.000	0.000	0.000	-0.000
71	71		-0.000	-2.288	0.000	0.000	0.000	-0.000
72	72		-0.000	-2.289	0.000	0.000	0.000	-0.000
73	73		-0.000	-2.288	0.000	0.000	0.000	-0.000
74	74		-0.000	-2.286	0.000	0.000	0.000	-0.000
75	75		0.000	-2.287	0.000	0.000	0.000	-0.000
76	76		0.000	-2.287	0.000	0.000	0.000	-0.000
77	77		0.000	-2.285	0.000	0.000	0.000	-0.000
78	78		0.000	-2.285	0.000	0.000	0.000	-0.000
79	79		0.000	-2.285	0.000	0.000	0.000	-0.000
80	80		0.000	-2.283	0.000	0.000	0.000	-0.000
81	81		0.000	-2.280	0.000	0.000	0.000	-0.000
82	82		-0.000	-2.279	0.000	0.000	0.000	-0.000
83	83		-0.000	-2.277	0.000	0.000	0.000	-0.000
84	84		-0.000	-2.278	0.000	0.000	0.000	-0.000
85	85		-0.000	-2.278	0.000	0.000	0.000	-0.000
86	86		-0.000	-2.280	0.000	0.000	0.000	-0.000
87	87		-0.000	-2.281	0.000	0.000	0.000	-0.000
88	88		-0.000	-2.280	0.000	0.000	0.000	-0.000
89	89		-0.000	-2.283	0.000	0.000	0.000	-0.000
90	90		0.000	-2.283	0.000	0.000	0.000	-0.000
91	91		0.000	-2.283	0.000	0.000	0.000	-0.000
92	92		0.000	-2.285	0.000	0.000	0.000	0.000
93	93		-0.000	-2.512	0.000	0.000	0.000	-0.033
94	94		-0.000	-2.436	0.000	0.000	0.000	-0.022
95	95		-0.000	-2.437	0.000	0.000	0.000	-0.022
96	96		-0.000	-2.436	0.000	0.000	0.000	-0.022
97	97		-0.000	-2.434	0.000	0.000	0.000	-0.022
98	98		0.000	-2.435	0.000	0.000	0.000	-0.022
99	99		0.000	-2.435	0.000	0.000	0.000	-0.022
100	100		0.000	-2.433	0.000	0.000	0.000	-0.022
101	101		0.000	-2.433	0.000	0.000	0.000	-0.022
102	102		0.000	-2.433	0.000	0.000	0.000	-0.022
103	103		0.000	-2.431	0.000	0.000	0.000	-0.022
104	104		0.000	-2.428	0.000	0.000	0.000	-0.022
105	105		-0.000	-2.427	0.000	0.000	0.000	-0.022
106	106		-0.000	-2.425	0.000	0.000	0.000	-0.022
107	107		-0.000	-2.426	0.000	0.000	0.000	-0.022
108	108		-0.000	-2.426	0.000	0.000	0.000	-0.022
109	109		-0.000	-2.428	0.000	0.000	0.000	-0.022
110	110		-0.000	-2.429	0.000	0.000	0.000	-0.022
111	111		-0.000	-2.428	0.000	0.000	0.000	-0.022
112	112		-0.000	-2.431	0.000	0.000	0.000	-0.022
113	113		0.000	-2.431	0.000	0.000	0.000	-0.022
114	114		0.000	-2.431	0.000	0.000	0.000	-0.022
115	115	P2	0.000	-1.815	0.000	0.000	0.000	0.073
116	116	End Spring 1	0.000	-2.285	0.000	0.000	0.000	0.067
117	117	End Spring 2	0.000	-2.283	0.000	0.000	0.000	-0.021
118	118	End Spring 3	0.000	-2.283	0.000	0.000	0.000	-0.021
119	119	End Spring 4	-0.000	-2.283	0.000	0.000	0.000	-0.021
120	120	End Spring 5	-0.000	-2.280	0.000	0.000	0.000	-0.021
121	121	End Spring 6	-0.000	-2.281	0.000	0.000	0.000	-0.021
122	122	End Spring 7	-0.000	-2.280	0.000	0.000	0.000	-0.021

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123	End Spring 8	-0.000	-2.278	0.000	0.000	0.000	-0.021
124	124	End Spring 9	-0.000	-2.278	0.000	0.000	0.000	-0.021
125	125	End Spring 10	-0.000	-2.277	0.000	0.000	0.000	-0.021
126	126	End Spring 11	-0.000	-2.279	0.000	0.000	0.000	-0.021
127	127	End Spring 12	0.000	-2.280	0.000	0.000	0.000	-0.021
128	128	End Spring 13	0.000	-2.283	0.000	0.000	0.000	-0.021
129	129	End Spring 14	0.000	-2.285	0.000	0.000	0.000	-0.021
130	130	End Spring 15	0.000	-2.285	0.000	0.000	0.000	-0.021
131	131	End Spring 16	0.000	-2.285	0.000	0.000	0.000	-0.021
132	132	End Spring 17	0.000	-2.287	0.000	0.000	0.000	-0.021
133	133	End Spring 18	0.000	-2.287	0.000	0.000	0.000	-0.021
134	134	End Spring 19	-0.000	-2.286	0.000	0.000	0.000	-0.021
135	135	End Spring 20	-0.000	-2.288	0.000	0.000	0.000	-0.021
136	136	End Spring 21	-0.000	-2.289	0.000	0.000	0.000	-0.021
137	137	End Spring 22	-0.000	-2.288	0.000	0.000	0.000	-0.021
138	138	End Spring 23	-0.000	-2.290	0.000	0.000	0.000	-0.032
139	139	End Spring 24	-0.000	-2.290	0.000	0.000	0.000	0.032
140	140	End Spring 25	-0.000	-2.288	0.000	0.000	0.000	0.021
141	141	End Spring 26	-0.000	-2.289	0.000	0.000	0.000	0.021
142	142	End Spring 27	-0.000	-2.288	0.000	0.000	0.000	0.021
143	143	End Spring 28	-0.000	-2.286	0.000	0.000	0.000	0.021
144	144	End Spring 29	0.000	-2.287	0.000	0.000	0.000	0.021
145	145	End Spring 30	0.000	-2.287	0.000	0.000	0.000	0.021
146	146	End Spring 31	0.000	-2.285	0.000	0.000	0.000	0.021
147	147	End Spring 32	0.000	-2.285	0.000	0.000	0.000	0.021
148	148	End Spring 33	0.000	-2.285	0.000	0.000	0.000	0.021
149	149	End Spring 34	0.000	-2.283	0.000	0.000	0.000	0.021
150	150	End Spring 35	0.000	-2.280	0.000	0.000	0.000	0.021
151	151	End Spring 36	-0.000	-2.279	0.000	0.000	0.000	0.021
152	152	End Spring 37	-0.000	-2.277	0.000	0.000	0.000	0.021
153	153	End Spring 38	-0.000	-2.278	0.000	0.000	0.000	0.021
154	154	End Spring 39	-0.000	-2.278	0.000	0.000	0.000	0.021
155	155	End Spring 40	-0.000	-2.280	0.000	0.000	0.000	0.021
156	156	End Spring 41	-0.000	-2.281	0.000	0.000	0.000	0.021
157	157	End Spring 42	-0.000	-2.280	0.000	0.000	0.000	0.021
158	158	End Spring 43	-0.000	-2.283	0.000	0.000	0.000	0.021
159	159	End Spring 44	0.000	-2.283	0.000	0.000	0.000	0.021
160	160	End Spring 45	0.000	-2.283	0.000	0.000	0.000	0.021
161	161	End Spring 46	0.000	-2.285	0.000	0.000	0.000	-0.067

GROUP 8 DOCKS
DOCK E16

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-3.834	0.233	0.000	0.000	0.000	-0.032
2	2		-3.751	0.166	0.000	0.000	0.000	-0.023
3	3		-3.693	0.074	0.000	0.000	0.000	-0.010
4	4		-3.653	0.082	0.000	0.000	0.000	-0.011
5	5		-3.625	0.002	0.000	0.000	0.000	-0.000
6	6		-3.648	-0.064	0.000	0.000	0.000	0.009
7	7		-3.670	-0.015	0.000	0.000	0.000	0.002
8	8		-3.673	-0.020	0.000	0.000	0.000	0.003
9	9		-3.681	0.026	0.000	0.000	0.000	-0.004
10	10		-3.620	0.229	0.000	0.000	0.000	-0.031
11	11		-3.451	0.418	0.000	0.000	0.000	-0.057
12	12		-3.226	0.427	0.000	0.000	0.000	-0.058
13	13		-3.037	0.326	0.000	0.000	0.000	-0.044
14	14		-2.901	0.187	0.000	0.000	0.000	-0.026
15	15		-2.845	0.058	0.000	0.000	0.000	-0.008
16	16		-2.833	-0.015	0.000	0.000	0.000	0.002
17	17		-2.843	0.012	0.000	0.000	0.000	-0.002
18	18		-2.797	0.181	0.000	0.000	0.000	-0.025
19	19		-2.664	0.322	0.000	0.000	0.000	-0.044
20	20		-2.469	0.467	0.000	0.000	0.000	-0.064
21	21		-2.185	0.644	0.000	0.000	0.000	-0.088
22	22		-1.839	0.685	0.000	0.000	0.000	-0.093
23	23	P1	-1.518	0.313	0.000	0.000	0.000	-0.039
24	24		-3.834	0.020	0.000	0.000	0.000	-0.032
25	25		-3.751	0.014	0.000	0.000	0.000	-0.023
26	26		-3.653	0.007	0.000	0.000	0.000	-0.011
27	27		-3.624	0.000	0.000	0.000	0.000	-0.000
28	28		-3.648	-0.005	0.000	0.000	0.000	0.009
29	29		-3.670	-0.001	0.000	0.000	0.000	0.002
30	30		-3.673	-0.002	0.000	0.000	0.000	0.003
31	31		-3.681	0.002	0.000	0.000	0.000	-0.004
32	32		-3.619	0.020	0.000	0.000	0.000	-0.031
33	33		-3.451	0.036	0.000	0.000	0.000	-0.057
34	34		-3.693	0.006	0.000	0.000	0.000	-0.010
35	35		-3.226	0.037	0.000	0.000	0.000	-0.058
36	36		-3.037	0.028	0.000	0.000	0.000	-0.044
37	37		-2.901	0.016	0.000	0.000	0.000	-0.026
38	38		-2.845	0.005	0.000	0.000	0.000	-0.008
39	39		-2.833	-0.001	0.000	0.000	0.000	0.002
40	40		-2.843	0.001	0.000	0.000	0.000	-0.002
41	41		-2.796	0.016	0.000	0.000	0.000	-0.025
42	42		-2.664	0.028	0.000	0.000	0.000	-0.044
43	43		-2.469	0.040	0.000	0.000	0.000	-0.064
44	44		-2.185	0.055	0.000	0.000	0.000	-0.088
45	45		-1.839	0.059	0.000	0.000	0.000	-0.093
46	46		-1.519	0.048	0.000	0.000	0.000	-0.076
47	47		-3.834	0.000	0.000	0.000	0.000	-0.032
48	48	P10	-3.751	0.000	0.000	0.000	0.000	-0.023
49	49		-3.693	0.000	0.000	0.000	0.000	-0.010
50	50		-3.653	0.000	0.000	0.000	0.000	-0.011
51	51	P9	-3.624	0.000	0.000	0.000	0.000	-0.000
52	52		-3.648	0.000	0.000	0.000	0.000	0.009
53	53		-3.670	0.000	0.000	0.000	0.000	0.002
54	54	P8	-3.673	0.000	0.000	0.000	0.000	0.003
55	55		-3.681	0.000	0.000	0.000	0.000	-0.004
56	56		-3.619	0.000	0.000	0.000	0.000	-0.031
57	57		-3.451	0.000	0.000	0.000	0.000	-0.057
58	58	P7	-3.226	0.000	0.000	0.000	0.000	-0.058
59	59		-3.037	0.000	0.000	0.000	0.000	-0.044
60	60	P6	-2.901	0.000	0.000	0.000	0.000	-0.026
61	61		-2.845	0.000	0.000	0.000	0.000	-0.008

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P5	-2.833	0.000	0.000	0.000	0.000	0.002
63	63		-2.843	0.000	0.000	0.000	0.000	-0.002
64	64		-2.796	0.000	0.000	0.000	0.000	-0.025
65	65	P4	-2.664	0.000	0.000	0.000	0.000	-0.044
66	66		-2.469	0.000	0.000	0.000	0.000	-0.064
67	67		-2.185	0.000	0.000	0.000	0.000	-0.088
68	68	P3	-1.839	0.000	0.000	0.000	0.000	-0.093
69	69		-1.519	0.000	0.000	0.000	0.000	-0.076
70	70		-3.834	-0.020	0.000	0.000	0.000	-0.032
71	71		-3.751	-0.014	0.000	0.000	0.000	-0.023
72	72		-3.693	-0.006	0.000	0.000	0.000	-0.010
73	73		-3.653	-0.007	0.000	0.000	0.000	-0.011
74	74		-3.624	-0.000	0.000	0.000	0.000	-0.000
75	75		-3.648	0.005	0.000	0.000	0.000	0.009
76	76		-3.670	0.001	0.000	0.000	0.000	0.002
77	77		-3.673	0.002	0.000	0.000	0.000	0.003
78	78		-3.681	-0.002	0.000	0.000	0.000	-0.004
79	79		-3.619	-0.020	0.000	0.000	0.000	-0.031
80	80		-3.451	-0.036	0.000	0.000	0.000	-0.057
81	81		-3.226	-0.037	0.000	0.000	0.000	-0.058
82	82		-3.037	-0.028	0.000	0.000	0.000	-0.044
83	83		-2.901	-0.016	0.000	0.000	0.000	-0.026
84	84		-2.845	-0.005	0.000	0.000	0.000	-0.008
85	85		-2.833	0.001	0.000	0.000	0.000	0.002
86	86		-2.843	-0.001	0.000	0.000	0.000	-0.002
87	87		-2.796	-0.016	0.000	0.000	0.000	-0.025
88	88		-2.664	-0.028	0.000	0.000	0.000	-0.044
89	89		-2.469	-0.040	0.000	0.000	0.000	-0.064
90	90		-2.185	-0.055	0.000	0.000	0.000	-0.088
91	91		-1.839	-0.059	0.000	0.000	0.000	-0.093
92	92		-1.519	-0.048	0.000	0.000	0.000	-0.076
93	93		-3.834	-0.233	0.000	0.000	0.000	-0.032
94	94		-3.751	-0.166	0.000	0.000	0.000	-0.023
95	95		-3.693	-0.074	0.000	0.000	0.000	-0.010
96	96		-3.653	-0.082	0.000	0.000	0.000	-0.011
97	97		-3.625	-0.002	0.000	0.000	0.000	-0.000
98	98		-3.649	0.064	0.000	0.000	0.000	0.009
99	99		-3.670	0.015	0.000	0.000	0.000	0.002
100	100		-3.673	0.020	0.000	0.000	0.000	0.003
101	101		-3.681	-0.026	0.000	0.000	0.000	-0.004
102	102		-3.620	-0.229	0.000	0.000	0.000	-0.031
103	103		-3.452	-0.418	0.000	0.000	0.000	-0.057
104	104		-3.226	-0.427	0.000	0.000	0.000	-0.058
105	105		-3.037	-0.326	0.000	0.000	0.000	-0.044
106	106		-2.902	-0.187	0.000	0.000	0.000	-0.026
107	107		-2.845	-0.058	0.000	0.000	0.000	-0.008
108	108		-2.833	0.015	0.000	0.000	0.000	0.002
109	109		-2.843	-0.012	0.000	0.000	0.000	-0.002
110	110		-2.797	-0.181	0.000	0.000	0.000	-0.025
111	111		-2.664	-0.322	0.000	0.000	0.000	-0.044
112	112		-2.469	-0.467	0.000	0.000	0.000	-0.064
113	113		-2.185	-0.644	0.000	0.000	0.000	-0.088
114	114		-1.839	-0.685	0.000	0.000	0.000	-0.093
115	115	P2	-1.518	-0.313	0.000	0.000	0.000	-0.039
116	116	End Spring 1	-1.519	-0.048	0.000	0.000	0.000	-0.041
117	117	End Spring 2	-1.839	-0.059	0.000	0.000	0.000	-0.093
118	118	End Spring 3	-2.185	-0.055	0.000	0.000	0.000	-0.088
119	119	End Spring 4	-2.469	-0.040	0.000	0.000	0.000	-0.064
120	120	End Spring 5	-2.664	-0.028	0.000	0.000	0.000	-0.044
121	121	End Spring 6	-2.797	-0.016	0.000	0.000	0.000	-0.025
122	122	End Spring 7	-2.843	-0.001	0.000	0.000	0.000	-0.002

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123	End Spring 8	-2.833	0.001	0.000	0.000	0.000	0.002
124	124	End Spring 9	-2.845	-0.005	0.000	0.000	0.000	-0.008
125	125	End Spring 10	-2.901	-0.016	0.000	0.000	0.000	-0.026
126	126	End Spring 11	-3.037	-0.028	0.000	0.000	0.000	-0.044
127	127	End Spring 12	-3.226	-0.037	0.000	0.000	0.000	-0.058
128	128	End Spring 13	-3.451	-0.036	0.000	0.000	0.000	-0.057
129	129	End Spring 14	-3.620	-0.020	0.000	0.000	0.000	-0.031
130	130	End Spring 15	-3.681	-0.002	0.000	0.000	0.000	-0.004
131	131	End Spring 16	-3.673	0.002	0.000	0.000	0.000	0.003
132	132	End Spring 17	-3.670	0.001	0.000	0.000	0.000	0.002
133	133	End Spring 18	-3.649	0.005	0.000	0.000	0.000	0.009
134	134	End Spring 19	-3.625	-0.000	0.000	0.000	0.000	-0.000
135	135	End Spring 20	-3.653	-0.007	0.000	0.000	0.000	-0.011
136	136	End Spring 21	-3.693	-0.006	0.000	0.000	0.000	-0.010
137	137	End Spring 22	-3.751	-0.014	0.000	0.000	0.000	-0.023
138	138	End Spring 23	-3.834	-0.020	0.000	0.000	0.000	-0.032
139	139	End Spring 24	-3.834	0.020	0.000	0.000	0.000	-0.032
140	140	End Spring 25	-3.751	0.014	0.000	0.000	0.000	-0.023
141	141	End Spring 26	-3.693	0.006	0.000	0.000	0.000	-0.010
142	142	End Spring 27	-3.653	0.007	0.000	0.000	0.000	-0.011
143	143	End Spring 28	-3.624	0.000	0.000	0.000	0.000	-0.000
144	144	End Spring 29	-3.648	-0.005	0.000	0.000	0.000	0.009
145	145	End Spring 30	-3.670	-0.001	0.000	0.000	0.000	0.002
146	146	End Spring 31	-3.673	-0.002	0.000	0.000	0.000	0.003
147	147	End Spring 32	-3.681	0.002	0.000	0.000	0.000	-0.004
148	148	End Spring 33	-3.619	0.020	0.000	0.000	0.000	-0.031
149	149	End Spring 34	-3.451	0.036	0.000	0.000	0.000	-0.057
150	150	End Spring 35	-3.226	0.037	0.000	0.000	0.000	-0.058
151	151	End Spring 36	-3.037	0.028	0.000	0.000	0.000	-0.044
152	152	End Spring 37	-2.901	0.016	0.000	0.000	0.000	-0.026
153	153	End Spring 38	-2.845	0.005	0.000	0.000	0.000	-0.008
154	154	End Spring 39	-2.833	-0.001	0.000	0.000	0.000	0.002
155	155	End Spring 40	-2.843	0.001	0.000	0.000	0.000	-0.002
156	156	End Spring 41	-2.797	0.016	0.000	0.000	0.000	-0.025
157	157	End Spring 42	-2.664	0.028	0.000	0.000	0.000	-0.044
158	158	End Spring 43	-2.469	0.040	0.000	0.000	0.000	-0.064
159	159	End Spring 44	-2.185	0.055	0.000	0.000	0.000	-0.088
160	160	End Spring 45	-1.839	0.059	0.000	0.000	0.000	-0.093
161	161	End Spring 46	-1.518	0.048	0.000	0.000	0.000	-0.041

APPENDIX: GROUP 9 DOCKS DATA

GROUP 9 DOCKS
DOCK BD1

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	12	P13	Normal	ky'	1.360
2	12	P13	Normal	kx'	1.360
3	13	P15	Normal	ky'	1.360
4	13	P15	Normal	kx'	1.360
5	35	P16	Normal	ky'	1.360
6	35	P16	Normal	kx'	1.360
7	55	P2	Normal	ky'	1.060
8	55	P2	Normal	kx'	1.060
9	56	P3	Normal	ky'	1.060
10	56	P3	Normal	kx'	1.060
11	57	P5	Normal	ky'	1.060
12	57	P5	Normal	kx'	1.060
13	58	P6	Normal	ky'	1.060
14	58	P6	Normal	kx'	1.060
15	59	P7	Normal	ky'	1.060
16	59	P7	Normal	kx'	1.060
17	60	P9	Normal	ky'	1.060
18	60	P9	Normal	kx'	1.060
19	61	P10	Normal	ky'	1.060
20	61	P10	Normal	kx'	1.060
21	62	P12	Normal	ky'	1.060
22	62	P12	Normal	kx'	1.060
23	63	P14	Normal	ky'	1.360
24	63	P14	Normal	kx'	1.360
25	64	P17	Normal	ky'	1.360
26	64	P17	Normal	kx'	1.360
27	68	P1	Normal	ky'	1.060
28	68	P1	Normal	kx'	1.060
29	69	P4	Normal	ky'	1.060
30	69	P4	Normal	kx'	1.060
31	70	P8	Normal	ky'	1.060
32	70	P8	Normal	kx'	1.060
33	71	P11	Normal	ky'	1.060
34	71	P11	Normal	kx'	1.060

GROUP 9 DOCKS
DOCK BD1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		0.439	-2.712	0.000	0.000	0.000	0.005
2	2		0.378	-2.996	0.000	0.000	0.000	0.045
3	3		0.291	-3.014	0.000	0.000	0.000	0.047
4	4		0.186	-3.074	0.000	0.000	0.000	0.057
5	5		0.094	-3.057	0.000	0.000	0.000	0.054
6	6		0.024	-3.054	0.000	0.000	0.000	0.053
7	7		-0.032	-3.052	0.000	0.000	0.000	0.052
8	8		-0.091	-3.051	0.000	0.000	0.000	0.051
9	9		-0.158	-3.055	0.000	0.000	0.000	0.051
10	10		-0.221	-3.043	0.000	0.000	0.000	0.049
11	11		-0.249	-2.989	0.000	0.000	0.000	0.040
12	12	P13	-0.176	-2.485	0.000	0.000	0.000	-0.050
13	13	P15	0.093	-2.483	0.000	0.000	0.000	-0.015
14	14		0.378	-2.724	0.000	0.000	0.000	0.014
15	15		0.291	-2.729	0.000	0.000	0.000	0.016
16	16		0.186	-2.731	0.000	0.000	0.000	0.016
17	17		0.094	-2.733	0.000	0.000	0.000	0.013
18	18		0.024	-2.737	0.000	0.000	0.000	0.012
19	19		-0.032	-2.739	0.000	0.000	0.000	0.011
20	20		-0.091	-2.742	0.000	0.000	0.000	0.010
21	21		-0.158	-2.747	0.000	0.000	0.000	0.010
22	22		-0.221	-2.749	0.000	0.000	0.000	0.008
23	23		-0.249	-2.748	0.000	0.000	0.000	-0.001
24	24		0.378	-2.715	0.000	0.000	0.000	0.014
25	25		0.291	-2.719	0.000	0.000	0.000	0.016
26	26		0.186	-2.721	0.000	0.000	0.000	0.016
27	27		0.094	-2.725	0.000	0.000	0.000	0.013
28	28		0.024	-2.730	0.000	0.000	0.000	0.012
29	29		-0.032	-2.732	0.000	0.000	0.000	0.011
30	30		-0.091	-2.736	0.000	0.000	0.000	0.010
31	31		-0.158	-2.741	0.000	0.000	0.000	0.010
32	32		-0.221	-2.744	0.000	0.000	0.000	0.008
33	33		-0.249	-2.748	0.000	0.000	0.000	-0.001
34	34		-0.177	-2.754	0.000	0.000	0.000	-0.021
35	35	P16	0.011	-2.771	0.000	0.000	0.000	-0.013
36	36		0.370	-2.716	0.000	0.000	0.000	0.015
37	37		0.248	-2.720	0.000	0.000	0.000	0.018
38	38		0.126	-2.722	0.000	0.000	0.000	0.016
39	39		0.034	-2.729	0.000	0.000	0.000	0.012
40	40		-0.039	-2.732	0.000	0.000	0.000	0.012
41	41		-0.114	-2.738	0.000	0.000	0.000	0.012
42	42		-0.192	-2.743	0.000	0.000	0.000	0.011
43	43		-0.246	-2.746	0.000	0.000	0.000	0.005
44	44		0.439	-2.709	0.000	0.000	0.000	0.005
45	45		0.370	-2.706	0.000	0.000	0.000	0.015
46	46		0.248	-2.708	0.000	0.000	0.000	0.018
47	47		0.126	-2.712	0.000	0.000	0.000	0.016
48	48		0.034	-2.721	0.000	0.000	0.000	0.012
49	49		-0.039	-2.725	0.000	0.000	0.000	0.012
50	50		-0.114	-2.730	0.000	0.000	0.000	0.012
51	51		-0.192	-2.736	0.000	0.000	0.000	0.011
52	52		-0.246	-2.743	0.000	0.000	0.000	0.005
53	53		-0.177	-2.771	0.000	0.000	0.000	-0.017
54	54		0.439	-2.996	0.000	0.000	0.000	-0.033
55	55	P2	0.369	-1.925	0.000	0.000	0.000	0.096
56	56	P3	0.248	-1.527	0.000	0.000	0.000	0.144
57	57	P5	0.126	-1.539	0.000	0.000	0.000	0.143
58	58	P6	0.034	-1.554	0.000	0.000	0.000	0.143
59	59	P7	-0.039	-1.559	0.000	0.000	0.000	0.143
60	60	P9	-0.114	-1.560	0.000	0.000	0.000	0.143
61	61	P10	-0.192	-1.564	0.000	0.000	0.000	0.143

GROUP 9 DOCKS
DOCK BD1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P12	-0.246	-1.591	0.000	0.000	0.000	0.141
63	63	P14	-0.175	-2.690	0.000	0.000	0.000	0.027
64	64	P17	-0.096	-2.688	0.000	0.000	0.000	-0.009
65	65		-0.145	-2.485	0.000	0.000	0.000	-0.050
66	66		-0.166	-2.771	0.000	0.000	0.000	-0.017
67	67		-0.192	-2.690	0.000	0.000	0.000	0.027
68	68	P1	0.418	-2.711	0.000	0.000	0.000	0.009
69	69	P4	0.139	-2.721	0.000	0.000	0.000	0.015
70	70	P8	-0.063	-2.732	0.000	0.000	0.000	0.008
71	71	P11	-0.239	-2.744	0.000	0.000	0.000	0.005
72	72	End Spring 1	0.439	-2.709	0.000	0.000	0.000	-0.030
73	73	End Spring 2	0.370	-2.706	0.000	0.000	0.000	0.078
74	74	End Spring 3	0.248	-2.709	0.000	0.000	0.000	0.119
75	75	End Spring 4	0.126	-2.712	0.000	0.000	0.000	0.118
76	76	End Spring 5	0.034	-2.721	0.000	0.000	0.000	0.117
77	77	End Spring 6	-0.039	-2.725	0.000	0.000	0.000	0.117
78	78	End Spring 7	-0.114	-2.730	0.000	0.000	0.000	0.117
79	79	End Spring 8	-0.192	-2.736	0.000	0.000	0.000	0.117
80	80	End Spring 9	-0.246	-2.743	0.000	0.000	0.000	0.115
81	81	End Spring 10	0.378	-2.724	0.000	0.000	0.000	0.043
82	82	End Spring 11	0.291	-2.730	0.000	0.000	0.000	0.045
83	83	End Spring 12	0.186	-2.731	0.000	0.000	0.000	0.054
84	84	End Spring 13	0.094	-2.733	0.000	0.000	0.000	0.051
85	85	End Spring 14	0.024	-2.737	0.000	0.000	0.000	0.050
86	86	End Spring 15	-0.032	-2.739	0.000	0.000	0.000	0.050
87	87	End Spring 16	-0.091	-2.742	0.000	0.000	0.000	0.049
88	88	End Spring 17	-0.158	-2.748	0.000	0.000	0.000	0.049
89	89	End Spring 18	-0.221	-2.749	0.000	0.000	0.000	0.047
90	90	End Spring 19	-0.249	-2.748	0.000	0.000	0.000	0.038
91	91	End Spring 20	-2.485	0.145	0.000	0.000	0.000	-0.022
92	92	End Spring 21	-2.771	0.166	0.000	0.000	0.000	-0.014
93	93	End Spring 22	-2.689	0.192	0.000	0.000	0.000	-0.002

GROUP 9 DOCKS
DOCK BD1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-2.613	-0.047	0.000	0.000	0.000	0.016
2	2		-2.743	-0.193	0.000	0.000	0.000	0.022
3	3		-2.855	-0.150	0.000	0.000	0.000	0.015
4	4		-2.924	-0.103	0.000	0.000	0.000	0.008
5	5		-2.992	-0.135	0.000	0.000	0.000	0.013
6	6		-3.057	-0.085	0.000	0.000	0.000	0.006
7	7		-3.066	-0.042	0.000	0.000	0.000	-0.001
8	8		-3.082	-0.088	0.000	0.000	0.000	0.006
9	9		-3.110	-0.051	0.000	0.000	0.000	0.001
10	10		-3.090	-0.015	0.000	0.000	0.000	-0.005
11	11		-3.084	-0.064	0.000	0.000	0.000	0.002
12	12	P13	-3.073	0.044	0.000	0.000	0.000	-0.024
13	13	P15	-0.906	0.044	0.000	0.000	0.000	-0.174
14	14		-2.743	-0.061	0.000	0.000	0.000	0.022
15	15		-2.855	-0.057	0.000	0.000	0.000	0.015
16	16		-2.924	-0.052	0.000	0.000	0.000	0.008
17	17		-2.992	-0.055	0.000	0.000	0.000	0.013
18	18		-3.056	-0.050	0.000	0.000	0.000	0.006
19	19		-3.066	-0.046	0.000	0.000	0.000	-0.001
20	20		-3.082	-0.051	0.000	0.000	0.000	0.006
21	21		-3.109	-0.047	0.000	0.000	0.000	0.001
22	22		-3.090	-0.044	0.000	0.000	0.000	-0.005
23	23		-3.084	-0.049	0.000	0.000	0.000	0.002
24	24		-2.743	-0.047	0.000	0.000	0.000	0.022
25	25		-2.855	-0.047	0.000	0.000	0.000	0.015
26	26		-2.924	-0.047	0.000	0.000	0.000	0.008
27	27		-2.992	-0.047	0.000	0.000	0.000	0.013
28	28		-3.056	-0.047	0.000	0.000	0.000	0.006
29	29		-3.066	-0.047	0.000	0.000	0.000	-0.001
30	30		-3.082	-0.047	0.000	0.000	0.000	0.006
31	31		-3.109	-0.047	0.000	0.000	0.000	0.001
32	32		-3.090	-0.047	0.000	0.000	0.000	-0.005
33	33		-3.084	-0.048	0.000	0.000	0.000	0.002
34	34		-3.085	-0.048	0.000	0.000	0.000	-0.004
35	35	P16	-1.400	-0.051	0.000	0.000	0.000	-0.149
36	36		-2.755	-0.047	0.000	0.000	0.000	0.021
37	37		-2.889	-0.047	0.000	0.000	0.000	0.011
38	38		-2.962	-0.047	0.000	0.000	0.000	0.012
39	39		-3.051	-0.047	0.000	0.000	0.000	0.007
40	40		-3.065	-0.047	0.000	0.000	0.000	-0.001
41	41		-3.095	-0.047	0.000	0.000	0.000	0.005
42	42		-3.104	-0.047	0.000	0.000	0.000	-0.003
43	43		-3.080	-0.048	0.000	0.000	0.000	0.002
44	44		-2.613	-0.037	0.000	0.000	0.000	0.016
45	45		-2.755	-0.034	0.000	0.000	0.000	0.021
46	46		-2.889	-0.040	0.000	0.000	0.000	0.011
47	47		-2.962	-0.039	0.000	0.000	0.000	0.012
48	48		-3.051	-0.042	0.000	0.000	0.000	0.007
49	49		-3.065	-0.047	0.000	0.000	0.000	-0.001
50	50		-3.095	-0.044	0.000	0.000	0.000	0.005
51	51		-3.104	-0.049	0.000	0.000	0.000	-0.003
52	52		-3.080	-0.046	0.000	0.000	0.000	0.002
53	53		-3.086	-0.051	0.000	0.000	0.000	-0.003
54	54		-2.613	0.107	0.000	0.000	0.000	0.016
55	55	P2	-2.754	0.082	0.000	0.000	0.000	0.013
56	56	P3	-2.888	0.024	0.000	0.000	0.000	0.007
57	57	P5	-2.962	0.028	0.000	0.000	0.000	0.007
58	58	P6	-3.051	0.008	0.000	0.000	0.000	0.006
59	59	P7	-3.065	-0.022	0.000	0.000	0.000	0.003
60	60	P9	-3.094	0.002	0.000	0.000	0.000	0.005
61	61	P10	-3.103	-0.032	0.000	0.000	0.000	0.002

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62	P12	-3.079	-0.013	0.000	0.000	0.000	0.004
63	63	P14	-3.095	0.038	0.000	0.000	0.000	0.025
64	64	P17	-3.580	0.037	0.000	0.000	0.000	-0.024
65	65		-3.059	0.044	0.000	0.000	0.000	-0.024
66	66		-3.084	-0.051	0.000	0.000	0.000	-0.003
67	67		-3.110	0.038	0.000	0.000	0.000	0.025
68	68	P1	-2.667	-0.047	0.000	0.000	0.000	0.019
69	69	P4	-2.952	-0.047	0.000	0.000	0.000	0.011
70	70	P8	-3.067	-0.047	0.000	0.000	0.000	0.002
71	71	P11	-3.079	-0.047	0.000	0.000	0.000	-0.001
72	72	End Spring 1	-2.613	-0.037	0.000	0.000	0.000	0.016
73	73	End Spring 2	-2.755	-0.034	0.000	0.000	0.000	0.014
74	74	End Spring 3	-2.889	-0.040	0.000	0.000	0.000	0.008
75	75	End Spring 4	-2.963	-0.039	0.000	0.000	0.000	0.008
76	76	End Spring 5	-3.051	-0.042	0.000	0.000	0.000	0.006
77	77	End Spring 6	-3.065	-0.047	0.000	0.000	0.000	0.003
78	78	End Spring 7	-3.095	-0.044	0.000	0.000	0.000	0.005
79	79	End Spring 8	-3.104	-0.049	0.000	0.000	0.000	0.001
80	80	End Spring 9	-3.080	-0.046	0.000	0.000	0.000	0.004
81	81	End Spring 10	-2.743	-0.061	0.000	0.000	0.000	0.022
82	82	End Spring 11	-2.855	-0.057	0.000	0.000	0.000	0.015
83	83	End Spring 12	-2.924	-0.052	0.000	0.000	0.000	0.008
84	84	End Spring 13	-2.992	-0.055	0.000	0.000	0.000	0.013
85	85	End Spring 14	-3.057	-0.050	0.000	0.000	0.000	0.006
86	86	End Spring 15	-3.066	-0.046	0.000	0.000	0.000	-0.001
87	87	End Spring 16	-3.082	-0.051	0.000	0.000	0.000	0.006
88	88	End Spring 17	-3.109	-0.047	0.000	0.000	0.000	0.001
89	89	End Spring 18	-3.090	-0.044	0.000	0.000	0.000	-0.005
90	90	End Spring 19	-3.084	-0.049	0.000	0.000	0.000	0.002
91	91	End Spring 20	0.044	3.059	0.000	0.000	0.000	-0.129
92	92	End Spring 21	-0.051	3.084	0.000	0.000	0.000	-0.091
93	93	End Spring 22	0.037	3.111	0.000	0.000	0.000	0.087

APPENDIX: GROUP 10 DOCKS DATA

GROUP 10 DOCKS
DOCK BFD1

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	52	P9	Normal	ky'	1.060
2	52	P9	Normal	kx'	1.060
3	9	P8	Normal	ky'	1.060
4	9	P8	Normal	kx'	1.060
5	28	P7	Normal	ky'	1.060
6	28	P7	Normal	kx'	1.060
7	8	P6	Normal	ky'	1.060
8	8	P6	Normal	kx'	1.060
9	7	P5	Normal	ky'	1.060
10	7	P5	Normal	kx'	1.060
11	6	P4	Normal	ky'	1.060
12	6	P4	Normal	kx'	1.060
13	5	P3	Normal	ky'	1.060
14	5	P3	Normal	kx'	1.060
15	4	P2	Normal	ky'	1.060
16	4	P2	Normal	kx'	1.060
17	49	P15	Normal	ky'	1.360
18	49	P15	Normal	kx'	1.360
19	51	P14	Normal	ky'	1.360
20	51	P14	Normal	kx'	1.360
21	12	P13	Normal	ky'	1.360
22	12	P13	Normal	kx'	1.360
23	48	P12	Normal	ky'	1.360
24	48	P12	Normal	kx'	1.360
25	11	P11	Normal	ky'	1.360
26	11	P11	Normal	kx'	1.360
27	10	P10	Normal	ky'	1.060
28	10	P10	Normal	kx'	1.060
29	3	P1	Normal	ky'	1.060
30	3	P1	Normal	kx'	1.060

GROUP 10 DOCKS
DOCK BFD1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-1.186	-2.436	0.000	0.000	0.000	-0.033
2	2		-1.186	-2.162	0.000	0.000	0.000	-0.028
3	3	P1	-0.861	-1.817	0.000	0.000	0.000	-0.080
4	4	P2	-0.538	-1.889	0.000	0.000	0.000	-0.073
5	5	P3	-0.315	-2.001	0.000	0.000	0.000	-0.061
6	6	P4	-0.188	-2.081	0.000	0.000	0.000	-0.054
7	7	P5	-0.105	-2.090	0.000	0.000	0.000	-0.053
8	8	P6	0.016	-2.031	0.000	0.000	0.000	-0.059
9	9	P8	0.187	-2.003	0.000	0.000	0.000	-0.063
10	10	P10	0.362	-2.058	0.000	0.000	0.000	-0.059
11	11	P11	0.390	-2.539	0.000	0.000	0.000	-0.002
12	12	P13	0.257	-2.538	0.000	0.000	0.000	0.016
13	13		0.393	-2.539	0.000	0.000	0.000	-0.002
14	14		-1.186	-2.415	0.000	0.000	0.000	-0.033
15	15		-0.862	-2.402	0.000	0.000	0.000	-0.048
16	16		-0.539	-2.406	0.000	0.000	0.000	-0.039
17	17		-0.315	-2.415	0.000	0.000	0.000	-0.026
18	18		-0.188	-2.422	0.000	0.000	0.000	-0.016
19	19		-0.105	-2.426	0.000	0.000	0.000	-0.015
20	20		0.016	-2.426	0.000	0.000	0.000	-0.023
21	21		0.187	-2.435	0.000	0.000	0.000	-0.028
22	22		0.362	-2.451	0.000	0.000	0.000	-0.022
23	23		-0.862	-2.433	0.000	0.000	0.000	-0.048
24	24		-0.539	-2.431	0.000	0.000	0.000	-0.039
25	25		-0.315	-2.431	0.000	0.000	0.000	-0.026
26	26		-0.188	-2.432	0.000	0.000	0.000	-0.016
27	27		-0.105	-2.436	0.000	0.000	0.000	-0.015
28	28	P7	0.016	-2.441	0.000	0.000	0.000	-0.023
29	29		0.187	-2.452	0.000	0.000	0.000	-0.028
30	30		0.362	-2.465	0.000	0.000	0.000	-0.022
31	31		0.394	-2.476	0.000	0.000	0.000	0.022
32	32		0.376	-2.494	0.000	0.000	0.000	0.021
33	33		0.078	-2.446	0.000	0.000	0.000	-0.021
34	34		0.203	-2.453	0.000	0.000	0.000	-0.027
35	35		0.324	-2.462	0.000	0.000	0.000	-0.022
36	36		0.422	-2.475	0.000	0.000	0.000	-0.004
37	37		-0.033	-2.451	0.000	0.000	0.000	-0.017
38	38		0.078	-2.459	0.000	0.000	0.000	-0.021
39	39		0.203	-2.470	0.000	0.000	0.000	-0.027
40	40		0.324	-2.476	0.000	0.000	0.000	-0.022
41	41		0.422	-2.478	0.000	0.000	0.000	-0.004
42	42		-0.033	-2.440	0.000	0.000	0.000	-0.017
43	43		-0.033	-2.583	0.000	0.000	0.000	-0.021
44	44		0.078	-2.620	0.000	0.000	0.000	-0.025
45	45		0.203	-2.668	0.000	0.000	0.000	-0.030
46	46		0.324	-2.644	0.000	0.000	0.000	-0.026
47	47		0.422	-2.584	0.000	0.000	0.000	-0.019
48	48	P12	0.393	-2.165	0.000	0.000	0.000	0.049
49	49	P15	-0.191	-2.164	0.000	0.000	0.000	0.035
50	50		0.352	-2.165	0.000	0.000	0.000	0.049
51	51	P14	0.056	-2.494	0.000	0.000	0.000	0.025
52	52	P9	0.263	-2.456	0.000	0.000	0.000	-0.021
53	53		0.394	-2.494	0.000	0.000	0.000	0.021

GROUP 10 DOCKS
DOCK BFD1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		5.570	0.117	0.000	0.000	0.000	0.131
2	2		5.570	-1.092	0.000	0.000	0.000	0.131
3	3	P1	4.597	-0.742	0.000	0.000	0.000	0.087
4	4	P2	3.916	-0.466	0.000	0.000	0.000	0.059
5	5	P3	3.472	-0.271	0.000	0.000	0.000	0.039
6	6	P4	3.173	-0.173	0.000	0.000	0.000	0.029
7	7	P5	2.945	-0.123	0.000	0.000	0.000	0.023
8	8	P6	2.785	-0.014	0.000	0.000	0.000	0.011
9	9	P8	2.764	0.100	0.000	0.000	0.000	-0.001
10	10	P10	2.828	0.139	0.000	0.000	0.000	-0.005
11	11	P11	2.828	0.178	0.000	0.000	0.000	-0.047
12	12	P13	3.113	0.178	0.000	0.000	0.000	0.027
13	13		2.867	0.178	0.000	0.000	0.000	-0.047
14	14		5.570	0.035	0.000	0.000	0.000	0.131
15	15		4.598	0.052	0.000	0.000	0.000	0.104
16	16		3.917	0.071	0.000	0.000	0.000	0.070
17	17		3.473	0.082	0.000	0.000	0.000	0.045
18	18		3.174	0.084	0.000	0.000	0.000	0.033
19	19		2.945	0.082	0.000	0.000	0.000	0.026
20	20		2.786	0.085	0.000	0.000	0.000	0.012
21	21		2.765	0.087	0.000	0.000	0.000	-0.003
22	22		2.829	0.085	0.000	0.000	0.000	-0.008
23	23		4.598	0.117	0.000	0.000	0.000	0.104
24	24		3.917	0.115	0.000	0.000	0.000	0.070
25	25		3.473	0.110	0.000	0.000	0.000	0.045
26	26		3.174	0.105	0.000	0.000	0.000	0.033
27	27		2.945	0.098	0.000	0.000	0.000	0.026
28	28	P7	2.786	0.092	0.000	0.000	0.000	0.012
29	29		2.765	0.086	0.000	0.000	0.000	-0.003
30	30		2.829	0.080	0.000	0.000	0.000	-0.008
31	31		2.814	0.075	0.000	0.000	0.000	0.016
32	32		2.803	0.061	0.000	0.000	0.000	0.016
33	33		2.764	0.090	0.000	0.000	0.000	0.004
34	34		2.767	0.085	0.000	0.000	0.000	-0.004
35	35		2.812	0.081	0.000	0.000	0.000	-0.011
36	36		2.844	0.076	0.000	0.000	0.000	0.004
37	37		2.826	0.106	0.000	0.000	0.000	0.019
38	38		2.764	0.092	0.000	0.000	0.000	0.004
39	39		2.767	0.083	0.000	0.000	0.000	-0.004
40	40		2.812	0.074	0.000	0.000	0.000	-0.011
41	41		2.844	0.079	0.000	0.000	0.000	0.004
42	42		2.826	0.094	0.000	0.000	0.000	0.019
43	43		2.826	0.233	0.000	0.000	0.000	0.019
44	44		2.764	0.117	0.000	0.000	0.000	0.004
45	45		2.767	0.057	0.000	0.000	0.000	-0.004
46	46		2.812	0.002	0.000	0.000	0.000	-0.011
47	47		2.844	0.107	0.000	0.000	0.000	0.004
48	48	P12	2.801	0.328	0.000	0.000	0.000	0.057
49	49	P15	1.341	0.327	0.000	0.000	0.000	0.132
50	50		2.753	0.328	0.000	0.000	0.000	0.057
51	51	P14	1.852	0.061	0.000	0.000	0.000	0.106
52	52	P9	2.782	0.083	0.000	0.000	0.000	-0.008
53	53		2.816	0.061	0.000	0.000	0.000	0.016

APPENDIX: GROUP 11 DOCKS DATA

GROUP 11 DOCKS
DOCK W1

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	70	P8	Normal	kx'	1.060
2	70	P8	Normal	ky'	1.060
3	67	P7	Normal	ky'	1.060
4	67	P7	Normal	kx'	1.060
5	64	P6	Normal	ky'	1.060
6	64	P6	Normal	kx'	1.060
7	61	P5	Normal	ky'	1.060
8	61	P5	Normal	kx'	1.060
9	58	P4	Normal	ky'	1.060
10	58	P4	Normal	kx'	1.060
11	55	P3	Normal	ky'	1.060
12	55	P3	Normal	kx'	1.060
13	52	P2	Normal	ky'	1.060
14	52	P2	Normal	kx'	1.060
15	50	P1	Normal	ky'	1.060
16	50	P1	Normal	kx'	1.060
17	24	P9	Normal	ky'	1.060
18	24	P9	Normal	kx'	1.060

GROUP 11 DOCKS
DOCK W1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		0.027	4.765	0.000	0.000	0.000	-0.143
2	2		0.017	4.184	0.000	0.000	0.000	-0.042
3	3		0.008	4.181	0.000	0.000	0.000	-0.042
4	4		-0.002	4.175	0.000	0.000	0.000	-0.042
5	5		-0.013	4.172	0.000	0.000	0.000	-0.042
6	6		-0.024	4.166	0.000	0.000	0.000	-0.041
7	7		-0.037	4.157	0.000	0.000	0.000	-0.041
8	8		-0.052	4.152	0.000	0.000	0.000	-0.040
9	9		-0.068	4.146	0.000	0.000	0.000	-0.040
10	10		-0.085	4.139	0.000	0.000	0.000	-0.040
11	11		-0.102	4.138	0.000	0.000	0.000	-0.040
12	12		-0.116	4.140	0.000	0.000	0.000	-0.041
13	13		-0.126	4.145	0.000	0.000	0.000	-0.043
14	14		-0.129	4.161	0.000	0.000	0.000	-0.045
15	15		-0.120	4.186	0.000	0.000	0.000	-0.050
16	16		-0.094	4.219	0.000	0.000	0.000	-0.055
17	17		-0.045	4.269	0.000	0.000	0.000	-0.063
18	18		0.023	4.290	0.000	0.000	0.000	-0.066
19	19		0.098	4.283	0.000	0.000	0.000	-0.066
20	20		0.165	4.251	0.000	0.000	0.000	-0.062
21	21		0.211	4.186	0.000	0.000	0.000	-0.054
22	22		0.219	4.089	0.000	0.000	0.000	-0.041
23	23		0.174	3.958	0.000	0.000	0.000	-0.023
24	24	P9	0.010	2.134	0.000	0.000	0.000	0.304
25	25		0.010	3.793	0.000	0.000	0.000	0.052
26	26		0.174	3.833	0.000	0.000	0.000	0.022
27	27		0.219	3.857	0.000	0.000	0.000	0.004
28	28		0.211	3.877	0.000	0.000	0.000	-0.009
29	29		0.098	3.899	0.000	0.000	0.000	-0.022
30	30		0.023	3.906	0.000	0.000	0.000	-0.022
31	31		-0.045	3.906	0.000	0.000	0.000	-0.018
32	32		-0.094	3.901	0.000	0.000	0.000	-0.011
33	33		-0.120	3.901	0.000	0.000	0.000	-0.005
34	34		-0.129	3.901	0.000	0.000	0.000	-0.001
35	35		-0.126	3.902	0.000	0.000	0.000	0.002
36	36		-0.116	3.906	0.000	0.000	0.000	0.004
37	37		-0.102	3.909	0.000	0.000	0.000	0.005
38	38		-0.085	3.912	0.000	0.000	0.000	0.005
39	39		-0.068	3.918	0.000	0.000	0.000	0.005
40	40		-0.052	3.922	0.000	0.000	0.000	0.004
41	41		-0.037	3.925	0.000	0.000	0.000	0.004
42	42		-0.024	3.931	0.000	0.000	0.000	0.004
43	43		-0.013	3.935	0.000	0.000	0.000	0.003
44	44		-0.002	3.937	0.000	0.000	0.000	0.003
45	45		0.008	3.941	0.000	0.000	0.000	0.003
46	46		0.017	3.944	0.000	0.000	0.000	0.003
47	47		0.027	3.950	0.000	0.000	0.000	0.003
48	48		0.165	3.891	0.000	0.000	0.000	-0.018
49	49		0.027	3.953	0.000	0.000	0.000	0.003
50	50	P1	0.017	3.948	0.000	0.000	0.000	0.003
51	51		0.008	3.945	0.000	0.000	0.000	0.003
52	52	P2	-0.002	3.940	0.000	0.000	0.000	0.003
53	53		-0.013	3.939	0.000	0.000	0.000	0.003
54	54		-0.024	3.935	0.000	0.000	0.000	0.004
55	55	P3	-0.037	3.930	0.000	0.000	0.000	0.004
56	56		-0.052	3.928	0.000	0.000	0.000	0.004
57	57		-0.068	3.924	0.000	0.000	0.000	0.005
58	58	P4	-0.085	3.918	0.000	0.000	0.000	0.005
59	59		-0.102	3.915	0.000	0.000	0.000	0.005
60	60		-0.116	3.910	0.000	0.000	0.000	0.004
61	61	P5	-0.126	3.904	0.000	0.000	0.000	0.002

GROUP 11 DOCKS
DOCK W1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-0.129	3.900	0.000	0.000	0.000	-0.001
63	63		-0.120	3.895	0.000	0.000	0.000	-0.005
64	64	P6	-0.094	3.888	0.000	0.000	0.000	-0.011
65	65		-0.045	3.883	0.000	0.000	0.000	-0.018
66	66		0.023	3.878	0.000	0.000	0.000	-0.022
67	67	P7	0.098	3.872	0.000	0.000	0.000	-0.022
68	68		0.165	3.869	0.000	0.000	0.000	-0.018
69	69		0.211	3.866	0.000	0.000	0.000	-0.009
70	70	P8	0.219	3.862	0.000	0.000	0.000	0.004
71	71		0.174	3.861	0.000	0.000	0.000	0.022
72	72		0.010	3.859	0.000	0.000	0.000	0.052
73	73		-0.094	3.875	0.000	0.000	0.000	-0.011
74	74		-0.120	3.889	0.000	0.000	0.000	-0.005
75	75		-0.129	3.900	0.000	0.000	0.000	-0.001
76	76		-0.126	3.907	0.000	0.000	0.000	0.002
77	77		-0.116	3.915	0.000	0.000	0.000	0.004
78	78		-0.102	3.921	0.000	0.000	0.000	0.005
79	79		-0.085	3.924	0.000	0.000	0.000	0.005
80	80		-0.068	3.930	0.000	0.000	0.000	0.005
81	81		-0.052	3.934	0.000	0.000	0.000	0.004
82	82		-0.037	3.935	0.000	0.000	0.000	0.004
83	83		-0.024	3.940	0.000	0.000	0.000	0.004
84	84		-0.013	3.943	0.000	0.000	0.000	0.003
85	85		-0.002	3.944	0.000	0.000	0.000	0.003
86	86		0.008	3.948	0.000	0.000	0.000	0.003
87	87		0.017	3.951	0.000	0.000	0.000	0.003
88	88		0.027	3.957	0.000	0.000	0.000	0.003
89	89		0.027	4.804	0.000	0.000	0.000	0.148
90	90		0.017	4.223	0.000	0.000	0.000	0.047
91	91		0.008	4.220	0.000	0.000	0.000	0.047
92	92		-0.002	4.217	0.000	0.000	0.000	0.048
93	93		-0.013	4.217	0.000	0.000	0.000	0.048
94	94		-0.024	4.217	0.000	0.000	0.000	0.048
95	95		-0.037	4.215	0.000	0.000	0.000	0.049
96	96		-0.052	4.216	0.000	0.000	0.000	0.049
97	97		-0.068	4.214	0.000	0.000	0.000	0.049
98	98		-0.085	4.209	0.000	0.000	0.000	0.050
99	99		-0.102	4.204	0.000	0.000	0.000	0.049
100	100		-0.116	4.193	0.000	0.000	0.000	0.048
101	101		-0.126	4.175	0.000	0.000	0.000	0.047
102	102		-0.129	4.151	0.000	0.000	0.000	0.044
103	103		-0.120	4.116	0.000	0.000	0.000	0.040
104	104		-0.094	4.068	0.000	0.000	0.000	0.034
105	105	End Spring 1	0.027	3.957	0.000	0.000	0.000	0.125
106	106	End Spring 2	0.017	3.951	0.000	0.000	0.000	0.040
107	107	End Spring 3	0.008	3.948	0.000	0.000	0.000	0.040
108	108	End Spring 4	-0.002	3.944	0.000	0.000	0.000	0.041
109	109	End Spring 5	-0.013	3.943	0.000	0.000	0.000	0.041
110	110	End Spring 6	-0.024	3.940	0.000	0.000	0.000	0.041
111	111	End Spring 7	-0.037	3.936	0.000	0.000	0.000	0.042
112	112	End Spring 8	-0.052	3.934	0.000	0.000	0.000	0.042
113	113	End Spring 9	-0.068	3.930	0.000	0.000	0.000	0.042
114	114	End Spring 10	-0.085	3.925	0.000	0.000	0.000	0.043
115	115	End Spring 11	-0.102	3.921	0.000	0.000	0.000	0.042
116	116	End Spring 12	-0.116	3.915	0.000	0.000	0.000	0.041
117	117	End Spring 13	-0.126	3.907	0.000	0.000	0.000	0.040
118	118	End Spring 14	-0.129	3.900	0.000	0.000	0.000	0.037
119	119	End Spring 15	-0.120	3.889	0.000	0.000	0.000	0.033
120	120	End Spring 16	-0.094	3.875	0.000	0.000	0.000	0.027
121	121	End Spring 17	0.027	3.950	0.000	0.000	0.000	-0.119
122	122	End Spring 18	0.017	3.944	0.000	0.000	0.000	-0.035

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123	End Spring 19	0.008	3.942	0.000	0.000	0.000	-0.035
124	124	End Spring 20	-0.002	3.937	0.000	0.000	0.000	-0.035
125	125	End Spring 21	-0.013	3.935	0.000	0.000	0.000	-0.034
126	126	End Spring 22	-0.024	3.931	0.000	0.000	0.000	-0.034
127	127	End Spring 23	-0.037	3.925	0.000	0.000	0.000	-0.034
128	128	End Spring 24	-0.052	3.923	0.000	0.000	0.000	-0.033
129	129	End Spring 25	-0.068	3.918	0.000	0.000	0.000	-0.033
130	130	End Spring 26	-0.085	3.912	0.000	0.000	0.000	-0.033
131	131	End Spring 27	-0.102	3.910	0.000	0.000	0.000	-0.033
132	132	End Spring 28	-0.116	3.906	0.000	0.000	0.000	-0.034
133	133	End Spring 29	-0.126	3.902	0.000	0.000	0.000	-0.036
134	134	End Spring 30	-0.129	3.901	0.000	0.000	0.000	-0.038
135	135	End Spring 31	-0.120	3.901	0.000	0.000	0.000	-0.042
136	136	End Spring 32	-0.094	3.901	0.000	0.000	0.000	-0.048
137	137	End Spring 33	-0.045	3.906	0.000	0.000	0.000	-0.056
138	138	End Spring 34	0.023	3.906	0.000	0.000	0.000	-0.059
139	139	End Spring 35	0.098	3.900	0.000	0.000	0.000	-0.059
140	140	End Spring 36	0.165	3.892	0.000	0.000	0.000	-0.055
141	141	End Spring 37	0.211	3.877	0.000	0.000	0.000	-0.047
142	142	End Spring 38	0.219	3.857	0.000	0.000	0.000	-0.034
143	143	End Spring 39	0.174	3.833	0.000	0.000	0.000	-0.015
144	144	End Spring 40	0.010	3.792	0.000	0.000	0.000	0.237

GROUP 11 DOCKS
DOCK W1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		3.332	-0.136	0.000	0.000	0.000	0.023
2	2		3.256	-0.097	0.000	0.000	0.000	0.018
3	3		3.211	-0.033	0.000	0.000	0.000	0.009
4	4		3.195	0.032	0.000	0.000	0.000	-0.000
5	5		3.209	0.078	0.000	0.000	0.000	-0.007
6	6		3.234	0.084	0.000	0.000	0.000	-0.007
7	7		3.262	0.101	0.000	0.000	0.000	-0.010
8	8		3.300	0.106	0.000	0.000	0.000	-0.011
9	9		3.329	0.078	0.000	0.000	0.000	-0.006
10	10		3.347	0.066	0.000	0.000	0.000	-0.005
11	11		3.362	0.048	0.000	0.000	0.000	-0.002
12	12		3.358	-0.003	0.000	0.000	0.000	0.005
13	13		3.332	-0.033	0.000	0.000	0.000	0.009
14	14		3.295	-0.069	0.000	0.000	0.000	0.014
15	15		3.231	-0.133	0.000	0.000	0.000	0.023
16	16		3.139	-0.175	0.000	0.000	0.000	0.029
17	17		3.032	-0.214	0.000	0.000	0.000	0.034
18	18		2.898	-0.275	0.000	0.000	0.000	0.043
19	19		2.739	-0.314	0.000	0.000	0.000	0.048
20	20		2.564	-0.351	0.000	0.000	0.000	0.054
21	21		2.366	-0.405	0.000	0.000	0.000	0.061
22	22		2.145	-0.434	0.000	0.000	0.000	0.065
23	23		1.918	-0.443	0.000	0.000	0.000	0.066
24	24	P9	1.626	-0.253	0.000	0.000	0.000	0.032
25	25		1.626	-0.048	0.000	0.000	0.000	0.066
26	26		1.917	-0.050	0.000	0.000	0.000	0.066
27	27		2.145	-0.049	0.000	0.000	0.000	0.065
28	28		2.365	-0.044	0.000	0.000	0.000	0.061
29	29		2.738	-0.028	0.000	0.000	0.000	0.048
30	30		2.898	-0.021	0.000	0.000	0.000	0.043
31	31		3.031	-0.011	0.000	0.000	0.000	0.034
32	32		3.139	-0.004	0.000	0.000	0.000	0.029
33	33		3.230	0.003	0.000	0.000	0.000	0.023
34	34		3.294	0.014	0.000	0.000	0.000	0.014
35	35		3.332	0.020	0.000	0.000	0.000	0.009
36	36		3.358	0.025	0.000	0.000	0.000	0.005
37	37		3.362	0.034	0.000	0.000	0.000	-0.002
38	38		3.347	0.037	0.000	0.000	0.000	-0.005
39	39		3.329	0.039	0.000	0.000	0.000	-0.006
40	40		3.299	0.044	0.000	0.000	0.000	-0.011
41	41		3.262	0.043	0.000	0.000	0.000	-0.010
42	42		3.233	0.040	0.000	0.000	0.000	-0.007
43	43		3.209	0.039	0.000	0.000	0.000	-0.007
44	44		3.194	0.031	0.000	0.000	0.000	-0.000
45	45		3.210	0.019	0.000	0.000	0.000	0.009
46	46		3.256	0.008	0.000	0.000	0.000	0.018
47	47		3.332	0.001	0.000	0.000	0.000	0.023
48	48		2.564	-0.034	0.000	0.000	0.000	0.054
49	49		3.332	0.031	0.000	0.000	0.000	0.023
50	50	P1	3.256	0.031	0.000	0.000	0.000	0.018
51	51		3.210	0.031	0.000	0.000	0.000	0.009
52	52	P2	3.194	0.031	0.000	0.000	0.000	-0.000
53	53		3.209	0.031	0.000	0.000	0.000	-0.007
54	54		3.233	0.031	0.000	0.000	0.000	-0.007
55	55	P3	3.262	0.031	0.000	0.000	0.000	-0.010
56	56		3.299	0.031	0.000	0.000	0.000	-0.011
57	57		3.329	0.031	0.000	0.000	0.000	-0.006
58	58	P4	3.347	0.031	0.000	0.000	0.000	-0.005
59	59		3.362	0.031	0.000	0.000	0.000	-0.002
60	60		3.358	0.031	0.000	0.000	0.000	0.005
61	61	P5	3.332	0.032	0.000	0.000	0.000	0.009

GROUP 11 DOCKS
DOCK W1

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		3.294	0.032	0.000	0.000	0.000	0.014
63	63		3.230	0.032	0.000	0.000	0.000	0.023
64	64	P6	3.139	0.032	0.000	0.000	0.000	0.029
65	65		3.031	0.032	0.000	0.000	0.000	0.034
66	66		2.898	0.032	0.000	0.000	0.000	0.043
67	67	P7	2.738	0.033	0.000	0.000	0.000	0.048
68	68		2.564	0.033	0.000	0.000	0.000	0.054
69	69		2.365	0.033	0.000	0.000	0.000	0.061
70	70	P8	2.145	0.033	0.000	0.000	0.000	0.065
71	71		1.917	0.034	0.000	0.000	0.000	0.066
72	72		1.626	0.034	0.000	0.000	0.000	0.066
73	73		3.139	0.068	0.000	0.000	0.000	0.029
74	74		3.230	0.061	0.000	0.000	0.000	0.023
75	75		3.294	0.049	0.000	0.000	0.000	0.014
76	76		3.332	0.043	0.000	0.000	0.000	0.009
77	77		3.358	0.037	0.000	0.000	0.000	0.005
78	78		3.362	0.028	0.000	0.000	0.000	-0.002
79	79		3.347	0.025	0.000	0.000	0.000	-0.005
80	80		3.329	0.023	0.000	0.000	0.000	-0.006
81	81		3.299	0.018	0.000	0.000	0.000	-0.011
82	82		3.262	0.019	0.000	0.000	0.000	-0.010
83	83		3.233	0.021	0.000	0.000	0.000	-0.007
84	84		3.209	0.022	0.000	0.000	0.000	-0.007
85	85		3.194	0.030	0.000	0.000	0.000	-0.000
86	86		3.210	0.042	0.000	0.000	0.000	0.009
87	87		3.256	0.053	0.000	0.000	0.000	0.018
88	88		3.332	0.060	0.000	0.000	0.000	0.023
89	89		3.332	0.197	0.000	0.000	0.000	0.023
90	90		3.256	0.158	0.000	0.000	0.000	0.018
91	91		3.211	0.095	0.000	0.000	0.000	0.009
92	92		3.194	0.029	0.000	0.000	0.000	-0.000
93	93		3.209	-0.017	0.000	0.000	0.000	-0.007
94	94		3.233	-0.022	0.000	0.000	0.000	-0.007
95	95		3.262	-0.039	0.000	0.000	0.000	-0.010
96	96		3.299	-0.044	0.000	0.000	0.000	-0.011
97	97		3.329	-0.016	0.000	0.000	0.000	-0.006
98	98		3.347	-0.004	0.000	0.000	0.000	-0.005
99	99		3.362	0.015	0.000	0.000	0.000	-0.002
100	100		3.358	0.065	0.000	0.000	0.000	0.005
101	101		3.332	0.096	0.000	0.000	0.000	0.009
102	102		3.294	0.132	0.000	0.000	0.000	0.014
103	103		3.230	0.197	0.000	0.000	0.000	0.023
104	104		3.139	0.239	0.000	0.000	0.000	0.029
105	105	End Spring 1	3.332	0.060	0.000	0.000	0.000	0.023
106	106	End Spring 2	3.256	0.053	0.000	0.000	0.000	0.018
107	107	End Spring 3	3.210	0.042	0.000	0.000	0.000	0.009
108	108	End Spring 4	3.194	0.030	0.000	0.000	0.000	-0.000
109	109	End Spring 5	3.209	0.022	0.000	0.000	0.000	-0.007
110	110	End Spring 6	3.233	0.021	0.000	0.000	0.000	-0.007
111	111	End Spring 7	3.262	0.019	0.000	0.000	0.000	-0.010
112	112	End Spring 8	3.299	0.018	0.000	0.000	0.000	-0.011
113	113	End Spring 9	3.329	0.023	0.000	0.000	0.000	-0.006
114	114	End Spring 10	3.347	0.025	0.000	0.000	0.000	-0.005
115	115	End Spring 11	3.362	0.028	0.000	0.000	0.000	-0.002
116	116	End Spring 12	3.358	0.037	0.000	0.000	0.000	0.005
117	117	End Spring 13	3.332	0.043	0.000	0.000	0.000	0.009
118	118	End Spring 14	3.294	0.049	0.000	0.000	0.000	0.014
119	119	End Spring 15	3.230	0.061	0.000	0.000	0.000	0.023
120	120	End Spring 16	3.139	0.068	0.000	0.000	0.000	0.029
121	121	End Spring 17	3.332	0.001	0.000	0.000	0.000	0.023
122	122	End Spring 18	3.256	0.008	0.000	0.000	0.000	0.018

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123	End Spring 19	3.211	0.019	0.000	0.000	0.000	0.009
124	124	End Spring 20	3.194	0.031	0.000	0.000	0.000	-0.000
125	125	End Spring 21	3.209	0.039	0.000	0.000	0.000	-0.007
126	126	End Spring 22	3.234	0.040	0.000	0.000	0.000	-0.007
127	127	End Spring 23	3.262	0.043	0.000	0.000	0.000	-0.010
128	128	End Spring 24	3.299	0.044	0.000	0.000	0.000	-0.011
129	129	End Spring 25	3.329	0.039	0.000	0.000	0.000	-0.006
130	130	End Spring 26	3.347	0.037	0.000	0.000	0.000	-0.005
131	131	End Spring 27	3.362	0.034	0.000	0.000	0.000	-0.002
132	132	End Spring 28	3.358	0.025	0.000	0.000	0.000	0.005
133	133	End Spring 29	3.332	0.020	0.000	0.000	0.000	0.009
134	134	End Spring 30	3.294	0.014	0.000	0.000	0.000	0.014
135	135	End Spring 31	3.231	0.003	0.000	0.000	0.000	0.023
136	136	End Spring 32	3.139	-0.004	0.000	0.000	0.000	0.029
137	137	End Spring 33	3.031	-0.011	0.000	0.000	0.000	0.034
138	138	End Spring 34	2.898	-0.021	0.000	0.000	0.000	0.043
139	139	End Spring 35	2.738	-0.028	0.000	0.000	0.000	0.048
140	140	End Spring 36	2.564	-0.034	0.000	0.000	0.000	0.054
141	141	End Spring 37	2.365	-0.044	0.000	0.000	0.000	0.061
142	142	End Spring 38	2.145	-0.049	0.000	0.000	0.000	0.065
143	143	End Spring 39	1.918	-0.050	0.000	0.000	0.000	0.066
144	144	End Spring 40	1.626	-0.048	0.000	0.000	0.000	0.040

APPENDIX: GROUP 12 DOCKS DATA

GROUP 12 DOCKS
DOCK W4

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	24	P9	Normal	ky'	1.060
2	24	P9	Normal	kx'	1.060
3	70	P8	Normal	kx'	1.060
4	70	P8	Normal	ky'	1.060
5	67	P7	Normal	ky'	1.060
6	67	P7	Normal	kx'	1.060
7	64	P6	Normal	ky'	1.060
8	64	P6	Normal	kx'	1.060
9	61	P5	Normal	ky'	1.060
10	61	P5	Normal	kx'	1.060
11	58	P4	Normal	ky'	1.060
12	58	P4	Normal	kx'	1.060
13	55	P3	Normal	ky'	1.060
14	55	P3	Normal	kx'	1.060
15	52	P2	Normal	ky'	1.060
16	52	P2	Normal	kx'	1.060
17	120	P10	Normal	ky'	1.060
18	120	P10	Normal	kx'	1.060
19	50	P1	Normal	ky'	1.060
20	50	P1	Normal	kx'	1.060

GROUP 12 DOCKS
DOCK W4

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		0.000	-2.522	0.000	0.000	0.000	0.030
2	2		0.000	-2.463	0.000	0.000	0.000	0.020
3	3		0.000	-2.463	0.000	0.000	0.000	0.020
4	4		0.000	-2.463	0.000	0.000	0.000	0.020
5	5		0.000	-2.464	0.000	0.000	0.000	0.020
6	6		0.000	-2.465	0.000	0.000	0.000	0.020
7	7		-0.000	-2.464	0.000	0.000	0.000	0.020
8	8		-0.000	-2.466	0.000	0.000	0.000	0.020
9	9		-0.000	-2.466	0.000	0.000	0.000	0.020
10	10		-0.000	-2.466	0.000	0.000	0.000	0.020
11	11		-0.000	-2.468	0.000	0.000	0.000	0.020
12	12		-0.000	-2.469	0.000	0.000	0.000	0.020
13	13		-0.000	-2.469	0.000	0.000	0.000	0.020
14	14		-0.000	-2.470	0.000	0.000	0.000	0.020
15	15		-0.000	-2.471	0.000	0.000	0.000	0.020
16	16		-0.000	-2.471	0.000	0.000	0.000	0.020
17	17		-0.000	-2.473	0.000	0.000	0.000	0.020
18	18		-0.000	-2.474	0.000	0.000	0.000	0.020
19	19		-0.000	-2.474	0.000	0.000	0.000	0.020
20	20		-0.000	-2.476	0.000	0.000	0.000	0.020
21	21		-0.000	-2.477	0.000	0.000	0.000	0.020
22	22		0.000	-2.477	0.000	0.000	0.000	0.020
23	23		0.000	-2.479	0.000	0.000	0.000	0.020
24	24	P9	0.000	-1.913	0.000	0.000	0.000	-0.082
25	25		0.000	-2.364	0.000	0.000	0.000	-0.000
26	26		0.000	-2.362	0.000	0.000	0.000	0.000
27	27		0.000	-2.360	0.000	0.000	0.000	0.000
28	28		-0.000	-2.360	0.000	0.000	0.000	0.000
29	29		-0.000	-2.357	0.000	0.000	0.000	0.000
30	30		-0.000	-2.357	0.000	0.000	0.000	0.000
31	31		-0.000	-2.356	0.000	0.000	0.000	0.000
32	32		-0.000	-2.355	0.000	0.000	0.000	0.000
33	33		-0.000	-2.355	0.000	0.000	0.000	0.000
34	34		-0.000	-2.354	0.000	0.000	0.000	0.000
35	35		-0.000	-2.352	0.000	0.000	0.000	0.000
36	36		-0.000	-2.352	0.000	0.000	0.000	0.000
37	37		-0.000	-2.351	0.000	0.000	0.000	0.000
38	38		-0.000	-2.350	0.000	0.000	0.000	0.000
39	39		-0.000	-2.350	0.000	0.000	0.000	0.000
40	40		-0.000	-2.349	0.000	0.000	0.000	0.000
41	41		-0.000	-2.348	0.000	0.000	0.000	0.000
42	42		0.000	-2.348	0.000	0.000	0.000	0.000
43	43		0.000	-2.348	0.000	0.000	0.000	0.000
44	44		0.000	-2.346	0.000	0.000	0.000	0.000
45	45		0.000	-2.347	0.000	0.000	0.000	0.000
46	46		0.000	-2.346	0.000	0.000	0.000	0.000
47	47		0.000	-2.347	0.000	0.000	0.000	0.000
48	48		-0.000	-2.359	0.000	0.000	0.000	0.000
49	49		0.000	-2.347	0.000	0.000	0.000	-0.000
50	50	P1	0.000	-2.346	0.000	0.000	0.000	0.000
51	51		0.000	-2.347	0.000	0.000	0.000	0.000
52	52	P2	0.000	-2.346	0.000	0.000	0.000	0.000
53	53		0.000	-2.348	0.000	0.000	0.000	0.000
54	54		0.000	-2.348	0.000	0.000	0.000	0.000
55	55	P3	-0.000	-2.348	0.000	0.000	0.000	0.000
56	56		-0.000	-2.349	0.000	0.000	0.000	0.000
57	57		-0.000	-2.350	0.000	0.000	0.000	0.000
58	58	P4	-0.000	-2.350	0.000	0.000	0.000	0.000
59	59		-0.000	-2.351	0.000	0.000	0.000	0.000
60	60		-0.000	-2.352	0.000	0.000	0.000	0.000
61	61	P5	-0.000	-2.352	0.000	0.000	0.000	0.000

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-0.000	-2.354	0.000	0.000	0.000	0.000
63	63		-0.000	-2.355	0.000	0.000	0.000	0.000
64	64	P6	-0.000	-2.355	0.000	0.000	0.000	-0.000
65	65		-0.000	-2.356	0.000	0.000	0.000	-0.000
66	66		-0.000	-2.357	0.000	0.000	0.000	-0.000
67	67	P7	-0.000	-2.357	0.000	0.000	0.000	-0.000
68	68		-0.000	-2.359	0.000	0.000	0.000	-0.000
69	69		-0.000	-2.360	0.000	0.000	0.000	-0.000
70	70	P8	0.000	-2.360	0.000	0.000	0.000	-0.000
71	71		0.000	-2.362	0.000	0.000	0.000	-0.000
72	72		0.000	-2.364	0.000	0.000	0.000	-0.000
73	73		0.000	-2.364	0.000	0.000	0.000	0.000
74	74		0.000	-2.362	0.000	0.000	0.000	-0.000
75	75		0.000	-2.360	0.000	0.000	0.000	-0.000
76	76		-0.000	-2.360	0.000	0.000	0.000	-0.000
77	77		-0.000	-2.359	0.000	0.000	0.000	-0.000
78	78		-0.000	-2.357	0.000	0.000	0.000	-0.000
79	79		-0.000	-2.357	0.000	0.000	0.000	-0.000
80	80		-0.000	-2.356	0.000	0.000	0.000	-0.000
81	81		-0.000	-2.355	0.000	0.000	0.000	-0.000
82	82		-0.000	-2.355	0.000	0.000	0.000	-0.000
83	83		-0.000	-2.354	0.000	0.000	0.000	-0.000
84	84		-0.000	-2.352	0.000	0.000	0.000	-0.000
85	85		-0.000	-2.352	0.000	0.000	0.000	-0.000
86	86		-0.000	-2.351	0.000	0.000	0.000	-0.000
87	87		-0.000	-2.350	0.000	0.000	0.000	-0.000
88	88		-0.000	-2.350	0.000	0.000	0.000	-0.000
89	89		-0.000	-2.349	0.000	0.000	0.000	-0.000
90	90		-0.000	-2.348	0.000	0.000	0.000	-0.000
91	91		0.000	-2.348	0.000	0.000	0.000	-0.000
92	92		0.000	-2.348	0.000	0.000	0.000	-0.000
93	93		0.000	-2.346	0.000	0.000	0.000	-0.000
94	94		0.000	-2.347	0.000	0.000	0.000	-0.000
95	95		0.000	-2.346	0.000	0.000	0.000	-0.000
96	96		0.000	-2.347	0.000	0.000	0.000	-0.000
97	97		0.000	-2.522	0.000	0.000	0.000	-0.030
98	98		0.000	-2.463	0.000	0.000	0.000	-0.020
99	99		0.000	-2.463	0.000	0.000	0.000	-0.020
100	100		0.000	-2.463	0.000	0.000	0.000	-0.020
101	101		0.000	-2.464	0.000	0.000	0.000	-0.020
102	102		0.000	-2.465	0.000	0.000	0.000	-0.020
103	103		-0.000	-2.464	0.000	0.000	0.000	-0.020
104	104		-0.000	-2.466	0.000	0.000	0.000	-0.020
105	105		-0.000	-2.466	0.000	0.000	0.000	-0.020
106	106		-0.000	-2.466	0.000	0.000	0.000	-0.020
107	107		-0.000	-2.468	0.000	0.000	0.000	-0.020
108	108		-0.000	-2.469	0.000	0.000	0.000	-0.020
109	109		-0.000	-2.469	0.000	0.000	0.000	-0.020
110	110		-0.000	-2.470	0.000	0.000	0.000	-0.020
111	111		-0.000	-2.471	0.000	0.000	0.000	-0.020
112	112		-0.000	-2.471	0.000	0.000	0.000	-0.020
113	113		-0.000	-2.473	0.000	0.000	0.000	-0.020
114	114		-0.000	-2.474	0.000	0.000	0.000	-0.020
115	115		-0.000	-2.474	0.000	0.000	0.000	-0.020
116	116		-0.000	-2.476	0.000	0.000	0.000	-0.020
117	117		-0.000	-2.477	0.000	0.000	0.000	-0.020
118	118		0.000	-2.477	0.000	0.000	0.000	-0.020
119	119		0.000	-2.479	0.000	0.000	0.000	-0.020
120	120	P10	0.000	-1.913	0.000	0.000	0.000	0.082
121	121	End Spring 1	0.000	-2.347	0.000	0.000	0.000	0.028
122	122	End Spring 2	0.000	-2.346	0.000	0.000	0.000	0.019

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123	End Spring 3	0.000	-2.347	0.000	0.000	0.000	0.019
124	124	End Spring 4	0.000	-2.346	0.000	0.000	0.000	0.019
125	125	End Spring 5	0.000	-2.348	0.000	0.000	0.000	0.019
126	126	End Spring 6	0.000	-2.348	0.000	0.000	0.000	0.019
127	127	End Spring 7	-0.000	-2.348	0.000	0.000	0.000	0.019
128	128	End Spring 8	-0.000	-2.349	0.000	0.000	0.000	0.019
129	129	End Spring 9	-0.000	-2.350	0.000	0.000	0.000	0.019
130	130	End Spring 10	-0.000	-2.350	0.000	0.000	0.000	0.019
131	131	End Spring 11	-0.000	-2.352	0.000	0.000	0.000	0.019
132	132	End Spring 12	-0.000	-2.352	0.000	0.000	0.000	0.019
133	133	End Spring 13	-0.000	-2.352	0.000	0.000	0.000	0.019
134	134	End Spring 14	-0.000	-2.354	0.000	0.000	0.000	0.019
135	135	End Spring 15	-0.000	-2.355	0.000	0.000	0.000	0.019
136	136	End Spring 16	-0.000	-2.355	0.000	0.000	0.000	0.019
137	137	End Spring 17	-0.000	-2.356	0.000	0.000	0.000	0.019
138	138	End Spring 18	-0.000	-2.357	0.000	0.000	0.000	0.019
139	139	End Spring 19	-0.000	-2.357	0.000	0.000	0.000	0.019
140	140	End Spring 20	-0.000	-2.359	0.000	0.000	0.000	0.019
141	141	End Spring 21	-0.000	-2.360	0.000	0.000	0.000	0.019
142	142	End Spring 22	0.000	-2.360	0.000	0.000	0.000	0.019
143	143	End Spring 23	0.000	-2.362	0.000	0.000	0.000	0.019
144	144	End Spring 24	0.000	-2.364	0.000	0.000	0.000	-0.068
145	145	End Spring 25	0.000	-2.347	0.000	0.000	0.000	-0.028
146	146	End Spring 26	0.000	-2.346	0.000	0.000	0.000	-0.019
147	147	End Spring 27	0.000	-2.347	0.000	0.000	0.000	-0.019
148	148	End Spring 28	0.000	-2.346	0.000	0.000	0.000	-0.019
149	149	End Spring 29	0.000	-2.348	0.000	0.000	0.000	-0.019
150	150	End Spring 30	0.000	-2.348	0.000	0.000	0.000	-0.019
151	151	End Spring 31	-0.000	-2.348	0.000	0.000	0.000	-0.019
152	152	End Spring 32	-0.000	-2.349	0.000	0.000	0.000	-0.019
153	153	End Spring 33	-0.000	-2.350	0.000	0.000	0.000	-0.019
154	154	End Spring 34	-0.000	-2.350	0.000	0.000	0.000	-0.019
155	155	End Spring 35	-0.000	-2.352	0.000	0.000	0.000	-0.019
156	156	End Spring 36	-0.000	-2.352	0.000	0.000	0.000	-0.019
157	157	End Spring 37	-0.000	-2.352	0.000	0.000	0.000	-0.019
158	158	End Spring 38	-0.000	-2.354	0.000	0.000	0.000	-0.019
159	159	End Spring 39	-0.000	-2.355	0.000	0.000	0.000	-0.019
160	160	End Spring 40	-0.000	-2.355	0.000	0.000	0.000	-0.019
161	161	End Spring 41	-0.000	-2.356	0.000	0.000	0.000	-0.019
162	162	End Spring 42	-0.000	-2.357	0.000	0.000	0.000	-0.019
163	163	End Spring 43	-0.000	-2.357	0.000	0.000	0.000	-0.019
164	164	End Spring 44	-0.000	-2.359	0.000	0.000	0.000	-0.019
165	165	End Spring 45	-0.000	-2.360	0.000	0.000	0.000	-0.019
166	166	End Spring 46	0.000	-2.360	0.000	0.000	0.000	-0.019
167	167	End Spring 47	0.000	-2.362	0.000	0.000	0.000	-0.019
168	168	End Spring 48	0.000	-2.364	0.000	0.000	0.000	0.068

GROUP 12 DOCKS
DOCK W4

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		3.342	-0.209	0.000	0.000	0.000	0.029
2	2		3.246	-0.161	0.000	0.000	0.000	0.022
3	3		3.188	-0.082	0.000	0.000	0.000	0.011
4	4		3.167	-0.000	0.000	0.000	0.000	0.000
5	5		3.185	0.059	0.000	0.000	0.000	-0.008
6	6		3.216	0.070	0.000	0.000	0.000	-0.010
7	7		3.255	0.098	0.000	0.000	0.000	-0.014
8	8		3.309	0.114	0.000	0.000	0.000	-0.016
9	9		3.358	0.089	0.000	0.000	0.000	-0.012
10	10		3.399	0.089	0.000	0.000	0.000	-0.012
11	11		3.443	0.081	0.000	0.000	0.000	-0.011
12	12		3.471	0.033	0.000	0.000	0.000	-0.005
13	13		3.478	0.009	0.000	0.000	0.000	-0.001
14	14		3.477	-0.026	0.000	0.000	0.000	0.004
15	15		3.446	-0.105	0.000	0.000	0.000	0.015
16	16		3.379	-0.165	0.000	0.000	0.000	0.023
17	17		3.285	-0.237	0.000	0.000	0.000	0.033
18	18		3.143	-0.353	0.000	0.000	0.000	0.049
19	19		2.948	-0.448	0.000	0.000	0.000	0.063
20	20		2.711	-0.542	0.000	0.000	0.000	0.076
21	21		2.422	-0.655	0.000	0.000	0.000	0.091
22	22		2.087	-0.721	0.000	0.000	0.000	0.101
23	23		1.735	-0.737	0.000	0.000	0.000	0.103
24	24	P9	1.295	-0.415	0.000	0.000	0.000	0.049
25	25		1.296	-0.119	0.000	0.000	0.000	0.095
26	26		1.734	-0.129	0.000	0.000	0.000	0.103
27	27		2.087	-0.127	0.000	0.000	0.000	0.101
28	28		2.422	-0.115	0.000	0.000	0.000	0.091
29	29		2.948	-0.079	0.000	0.000	0.000	0.063
30	30		3.143	-0.062	0.000	0.000	0.000	0.049
31	31		3.285	-0.042	0.000	0.000	0.000	0.033
32	32		3.379	-0.029	0.000	0.000	0.000	0.023
33	33		3.446	-0.018	0.000	0.000	0.000	0.015
34	34		3.477	-0.005	0.000	0.000	0.000	0.004
35	35		3.478	0.002	0.000	0.000	0.000	-0.001
36	36		3.470	0.006	0.000	0.000	0.000	-0.005
37	37		3.443	0.014	0.000	0.000	0.000	-0.011
38	38		3.399	0.016	0.000	0.000	0.000	-0.012
39	39		3.358	0.016	0.000	0.000	0.000	-0.012
40	40		3.309	0.020	0.000	0.000	0.000	-0.016
41	41		3.255	0.017	0.000	0.000	0.000	-0.014
42	42		3.216	0.012	0.000	0.000	0.000	-0.010
43	43		3.184	0.010	0.000	0.000	0.000	-0.008
44	44		3.167	-0.000	0.000	0.000	0.000	0.000
45	45		3.188	-0.014	0.000	0.000	0.000	0.011
46	46		3.246	-0.028	0.000	0.000	0.000	0.022
47	47		3.341	-0.037	0.000	0.000	0.000	0.029
48	48		2.711	-0.095	0.000	0.000	0.000	0.076
49	49		3.341	0.000	0.000	0.000	0.000	0.029
50	50	P1	3.246	0.000	0.000	0.000	0.000	0.022
51	51		3.188	0.000	0.000	0.000	0.000	0.011
52	52	P2	3.167	0.000	0.000	0.000	0.000	0.000
53	53		3.184	0.000	0.000	0.000	0.000	-0.008
54	54		3.216	0.000	0.000	0.000	0.000	-0.010
55	55	P3	3.255	0.000	0.000	0.000	0.000	-0.014
56	56		3.309	0.000	0.000	0.000	0.000	-0.016
57	57		3.358	0.000	0.000	0.000	0.000	-0.012
58	58	P4	3.399	0.000	0.000	0.000	0.000	-0.012
59	59		3.443	0.000	0.000	0.000	0.000	-0.011
60	60		3.470	0.000	0.000	0.000	0.000	-0.005
61	61	P5	3.478	0.000	0.000	0.000	0.000	-0.001

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		3.477	0.000	0.000	0.000	0.000	0.004
63	63		3.446	0.000	0.000	0.000	0.000	0.015
64	64	P6	3.379	0.000	0.000	0.000	0.000	0.023
65	65		3.285	0.000	0.000	0.000	0.000	0.033
66	66		3.143	0.000	0.000	0.000	0.000	0.049
67	67	P7	2.948	0.000	0.000	0.000	0.000	0.063
68	68		2.711	0.000	0.000	0.000	0.000	0.076
69	69		2.422	0.000	0.000	0.000	0.000	0.091
70	70	P8	2.087	0.000	0.000	0.000	0.000	0.101
71	71		1.734	0.000	0.000	0.000	0.000	0.103
72	72		1.296	0.000	0.000	0.000	0.000	0.095
73	73		1.296	0.119	0.000	0.000	0.000	0.095
74	74		1.734	0.129	0.000	0.000	0.000	0.103
75	75		2.087	0.127	0.000	0.000	0.000	0.101
76	76		2.422	0.115	0.000	0.000	0.000	0.091
77	77		2.711	0.095	0.000	0.000	0.000	0.076
78	78		2.948	0.079	0.000	0.000	0.000	0.063
79	79		3.143	0.062	0.000	0.000	0.000	0.049
80	80		3.285	0.042	0.000	0.000	0.000	0.033
81	81		3.379	0.029	0.000	0.000	0.000	0.023
82	82		3.446	0.018	0.000	0.000	0.000	0.015
83	83		3.477	0.005	0.000	0.000	0.000	0.004
84	84		3.478	-0.002	0.000	0.000	0.000	-0.001
85	85		3.470	-0.006	0.000	0.000	0.000	-0.005
86	86		3.443	-0.014	0.000	0.000	0.000	-0.011
87	87		3.399	-0.016	0.000	0.000	0.000	-0.012
88	88		3.358	-0.016	0.000	0.000	0.000	-0.012
89	89		3.309	-0.020	0.000	0.000	0.000	-0.016
90	90		3.255	-0.017	0.000	0.000	0.000	-0.014
91	91		3.216	-0.012	0.000	0.000	0.000	-0.010
92	92		3.184	-0.010	0.000	0.000	0.000	-0.008
93	93		3.167	0.000	0.000	0.000	0.000	0.000
94	94		3.188	0.014	0.000	0.000	0.000	0.011
95	95		3.246	0.028	0.000	0.000	0.000	0.022
96	96		3.341	0.037	0.000	0.000	0.000	0.029
97	97		3.341	0.209	0.000	0.000	0.000	0.029
98	98		3.246	0.161	0.000	0.000	0.000	0.022
99	99		3.188	0.082	0.000	0.000	0.000	0.011
100	100		3.167	0.000	0.000	0.000	0.000	0.000
101	101		3.184	-0.059	0.000	0.000	0.000	-0.008
102	102		3.216	-0.070	0.000	0.000	0.000	-0.010
103	103		3.255	-0.098	0.000	0.000	0.000	-0.014
104	104		3.309	-0.114	0.000	0.000	0.000	-0.016
105	105		3.358	-0.089	0.000	0.000	0.000	-0.012
106	106		3.399	-0.089	0.000	0.000	0.000	-0.012
107	107		3.443	-0.081	0.000	0.000	0.000	-0.011
108	108		3.470	-0.033	0.000	0.000	0.000	-0.005
109	109		3.478	-0.009	0.000	0.000	0.000	-0.001
110	110		3.477	0.026	0.000	0.000	0.000	0.004
111	111		3.446	0.105	0.000	0.000	0.000	0.015
112	112		3.379	0.165	0.000	0.000	0.000	0.023
113	113		3.285	0.237	0.000	0.000	0.000	0.033
114	114		3.143	0.353	0.000	0.000	0.000	0.049
115	115		2.948	0.448	0.000	0.000	0.000	0.063
116	116		2.711	0.542	0.000	0.000	0.000	0.076
117	117		2.422	0.655	0.000	0.000	0.000	0.091
118	118		2.087	0.721	0.000	0.000	0.000	0.101
119	119		1.734	0.737	0.000	0.000	0.000	0.103
120	120	P10	1.295	0.415	0.000	0.000	0.000	0.049
121	121	End Spring 1	3.341	-0.037	0.000	0.000	0.000	0.029
122	122	End Spring 2	3.246	-0.028	0.000	0.000	0.000	0.022

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123	End Spring 3	3.188	-0.014	0.000	0.000	0.000	0.011
124	124	End Spring 4	3.167	-0.000	0.000	0.000	0.000	0.000
125	125	End Spring 5	3.184	0.010	0.000	0.000	0.000	-0.008
126	126	End Spring 6	3.216	0.012	0.000	0.000	0.000	-0.010
127	127	End Spring 7	3.255	0.017	0.000	0.000	0.000	-0.014
128	128	End Spring 8	3.309	0.020	0.000	0.000	0.000	-0.016
129	129	End Spring 9	3.358	0.016	0.000	0.000	0.000	-0.012
130	130	End Spring 10	3.399	0.016	0.000	0.000	0.000	-0.012
131	131	End Spring 11	3.443	0.014	0.000	0.000	0.000	-0.011
132	132	End Spring 12	3.470	0.006	0.000	0.000	0.000	-0.005
133	133	End Spring 13	3.478	0.002	0.000	0.000	0.000	-0.001
134	134	End Spring 14	3.477	-0.005	0.000	0.000	0.000	0.004
135	135	End Spring 15	3.446	-0.018	0.000	0.000	0.000	0.015
136	136	End Spring 16	3.379	-0.029	0.000	0.000	0.000	0.023
137	137	End Spring 17	3.285	-0.042	0.000	0.000	0.000	0.033
138	138	End Spring 18	3.143	-0.062	0.000	0.000	0.000	0.049
139	139	End Spring 19	2.948	-0.079	0.000	0.000	0.000	0.063
140	140	End Spring 20	2.711	-0.095	0.000	0.000	0.000	0.076
141	141	End Spring 21	2.422	-0.115	0.000	0.000	0.000	0.091
142	142	End Spring 22	2.087	-0.127	0.000	0.000	0.000	0.101
143	143	End Spring 23	1.734	-0.129	0.000	0.000	0.000	0.103
144	144	End Spring 24	1.296	-0.119	0.000	0.000	0.000	0.053
145	145	End Spring 25	3.341	0.037	0.000	0.000	0.000	0.029
146	146	End Spring 26	3.246	0.028	0.000	0.000	0.000	0.022
147	147	End Spring 27	3.188	0.014	0.000	0.000	0.000	0.011
148	148	End Spring 28	3.167	0.000	0.000	0.000	0.000	0.000
149	149	End Spring 29	3.184	-0.010	0.000	0.000	0.000	-0.008
150	150	End Spring 30	3.216	-0.012	0.000	0.000	0.000	-0.010
151	151	End Spring 31	3.255	-0.017	0.000	0.000	0.000	-0.014
152	152	End Spring 32	3.309	-0.020	0.000	0.000	0.000	-0.016
153	153	End Spring 33	3.358	-0.016	0.000	0.000	0.000	-0.012
154	154	End Spring 34	3.399	-0.016	0.000	0.000	0.000	-0.012
155	155	End Spring 35	3.443	-0.014	0.000	0.000	0.000	-0.011
156	156	End Spring 36	3.470	-0.006	0.000	0.000	0.000	-0.005
157	157	End Spring 37	3.478	-0.002	0.000	0.000	0.000	-0.001
158	158	End Spring 38	3.477	0.005	0.000	0.000	0.000	0.004
159	159	End Spring 39	3.446	0.018	0.000	0.000	0.000	0.015
160	160	End Spring 40	3.379	0.029	0.000	0.000	0.000	0.023
161	161	End Spring 41	3.285	0.042	0.000	0.000	0.000	0.033
162	162	End Spring 42	3.143	0.062	0.000	0.000	0.000	0.049
163	163	End Spring 43	2.948	0.079	0.000	0.000	0.000	0.063
164	164	End Spring 44	2.711	0.095	0.000	0.000	0.000	0.076
165	165	End Spring 45	2.422	0.115	0.000	0.000	0.000	0.091
166	166	End Spring 46	2.087	0.127	0.000	0.000	0.000	0.101
167	167	End Spring 47	1.734	0.129	0.000	0.000	0.000	0.103
168	168	End Spring 48	1.295	0.119	0.000	0.000	0.000	0.053

APPENDIX: GROUP 13 DOCKS DATA

GROUP 13 DOCKS
DOCK W8

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P10	Normal	ky'	1.060
2	1	P10	Normal	kx'	1.060
3	57	P9	Normal	ky'	1.060
4	57	P9	Normal	kx'	1.060
5	60	P8	Normal	ky'	1.060
6	60	P8	Normal	kx'	1.060
7	63	P7	Normal	ky'	1.060
8	63	P7	Normal	kx'	1.060
9	66	P6	Normal	ky'	1.060
10	66	P6	Normal	kx'	1.060
11	71	P4	Normal	ky'	1.060
12	71	P4	Normal	kx'	1.060
13	73	P5	Normal	ky'	1.060
14	73	P5	Normal	kx'	1.060
15	75	P3	Normal	ky'	1.060
16	75	P3	Normal	kx'	1.060
17	78	P2	Normal	ky'	1.060
18	78	P2	Normal	kx'	1.060
19	81	P1	Normal	ky'	1.060
20	81	P1	Normal	kx'	1.060
21	110	P11	Normal	ky'	1.060
22	110	P11	Normal	kx'	1.060

GROUP 13 DOCKS
DOCK W8

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P10	0.000	1.491	0.000	0.000	0.000	0.060
2	2		0.000	1.827	0.000	0.000	0.000	-0.012
3	3		0.000	1.826	0.000	0.000	0.000	-0.012
4	4		0.000	1.826	0.000	0.000	0.000	-0.012
5	5		0.000	1.826	0.000	0.000	0.000	-0.012
6	6		-0.000	1.825	0.000	0.000	0.000	-0.012
7	7		-0.000	1.825	0.000	0.000	0.000	-0.012
8	8		-0.000	1.825	0.000	0.000	0.000	-0.012
9	9		-0.000	1.824	0.000	0.000	0.000	-0.012
10	10		0.000	1.824	0.000	0.000	0.000	-0.012
11	11		0.000	1.824	0.000	0.000	0.000	-0.012
12	12		0.000	1.824	0.000	0.000	0.000	-0.012
13	13		0.000	1.824	0.000	0.000	0.000	-0.012
14	14		0.000	1.824	0.000	0.000	0.000	-0.012
15	15		0.000	1.823	0.000	0.000	0.000	-0.012
16	16		0.000	1.824	0.000	0.000	0.000	-0.012
17	17		-0.000	1.823	0.000	0.000	0.000	-0.012
18	18		0.000	1.823	0.000	0.000	0.000	-0.012
19	19		0.000	1.823	0.000	0.000	0.000	-0.012
20	20		0.000	1.823	0.000	0.000	0.000	-0.012
21	21		0.000	1.823	0.000	0.000	0.000	-0.012
22	22		0.000	1.823	0.000	0.000	0.000	-0.012
23	23		-0.000	1.823	0.000	0.000	0.000	-0.012
24	24		-0.000	1.823	0.000	0.000	0.000	-0.012
25	25		-0.000	1.824	0.000	0.000	0.000	-0.012
26	26		-0.000	1.824	0.000	0.000	0.000	-0.012
27	27		-0.000	1.823	0.000	0.000	0.000	-0.012
28	28		-0.000	1.765	0.000	0.000	0.000	-0.000
29	29		-0.000	1.765	0.000	0.000	0.000	-0.000
30	30		-0.000	1.765	0.000	0.000	0.000	-0.000
31	31		-0.000	1.764	0.000	0.000	0.000	-0.000
32	32		-0.000	1.765	0.000	0.000	0.000	-0.000
33	33		0.000	1.765	0.000	0.000	0.000	-0.000
34	34		0.000	1.764	0.000	0.000	0.000	-0.000
35	35		0.000	1.765	0.000	0.000	0.000	-0.000
36	36		0.000	1.765	0.000	0.000	0.000	-0.000
37	37		0.000	1.764	0.000	0.000	0.000	-0.000
38	38		0.000	1.765	0.000	0.000	0.000	-0.000
39	39		0.000	1.765	0.000	0.000	0.000	-0.000
40	40		0.000	1.764	0.000	0.000	0.000	-0.000
41	41		0.000	1.765	0.000	0.000	0.000	-0.000
42	42		0.000	1.765	0.000	0.000	0.000	-0.000
43	43		0.000	1.765	0.000	0.000	0.000	-0.000
44	44		0.000	1.766	0.000	0.000	0.000	-0.000
45	45		0.000	1.766	0.000	0.000	0.000	-0.000
46	46		-0.000	1.765	0.000	0.000	0.000	-0.000
47	47		-0.000	1.766	0.000	0.000	0.000	-0.000
48	48		-0.000	1.766	0.000	0.000	0.000	-0.000
49	49		-0.000	1.766	0.000	0.000	0.000	-0.000
50	50		0.000	1.767	0.000	0.000	0.000	-0.000
51	51		0.000	1.767	0.000	0.000	0.000	-0.000
52	52		0.000	1.767	0.000	0.000	0.000	-0.000
53	53		0.000	1.768	0.000	0.000	0.000	-0.000
54	54		0.000	1.768	0.000	0.000	0.000	0.000
55	55		0.000	1.768	0.000	0.000	0.000	0.000
56	56		0.000	1.768	0.000	0.000	0.000	0.000
57	57	P9	0.000	1.767	0.000	0.000	0.000	0.000
58	58		0.000	1.767	0.000	0.000	0.000	0.000
59	59		0.000	1.767	0.000	0.000	0.000	0.000
60	60	P8	-0.000	1.766	0.000	0.000	0.000	0.000
61	61		-0.000	1.766	0.000	0.000	0.000	0.000

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-0.000	1.766	0.000	0.000	0.000	-0.000
63	63	P7	-0.000	1.765	0.000	0.000	0.000	-0.000
64	64		0.000	1.766	0.000	0.000	0.000	-0.000
65	65		0.000	1.766	0.000	0.000	0.000	-0.000
66	66	P6	0.000	1.765	0.000	0.000	0.000	-0.000
67	67		0.000	1.765	0.000	0.000	0.000	-0.000
68	68		0.000	1.765	0.000	0.000	0.000	-0.000
69	69		0.000	1.765	0.000	0.000	0.000	-0.000
70	70		0.000	1.765	0.000	0.000	0.000	-0.000
71	71	P4	0.000	1.764	0.000	0.000	0.000	0.000
72	72		0.000	1.765	0.000	0.000	0.000	0.000
73	73	P5	0.000	1.764	0.000	0.000	0.000	-0.000
74	74		0.000	1.765	0.000	0.000	0.000	0.000
75	75	P3	0.000	1.764	0.000	0.000	0.000	0.000
76	76		0.000	1.765	0.000	0.000	0.000	0.000
77	77		-0.000	1.765	0.000	0.000	0.000	0.000
78	78	P2	-0.000	1.764	0.000	0.000	0.000	0.000
79	79		-0.000	1.765	0.000	0.000	0.000	0.000
80	80		-0.000	1.765	0.000	0.000	0.000	0.000
81	81	P1	-0.000	1.765	0.000	0.000	0.000	0.000
82	82		-0.000	1.766	0.000	0.000	0.000	0.000
83	83		-0.000	1.765	0.000	0.000	0.000	0.000
84	84		-0.000	1.765	0.000	0.000	0.000	0.000
85	85		-0.000	1.765	0.000	0.000	0.000	0.000
86	86		-0.000	1.764	0.000	0.000	0.000	0.000
87	87		-0.000	1.765	0.000	0.000	0.000	0.000
88	88		0.000	1.765	0.000	0.000	0.000	0.000
89	89		0.000	1.764	0.000	0.000	0.000	0.000
90	90		0.000	1.765	0.000	0.000	0.000	0.000
91	91		0.000	1.764	0.000	0.000	0.000	0.000
92	92		0.000	1.765	0.000	0.000	0.000	0.000
93	93		0.000	1.765	0.000	0.000	0.000	0.000
94	94		0.000	1.764	0.000	0.000	0.000	0.000
95	95		0.000	1.765	0.000	0.000	0.000	0.000
96	96		0.000	1.765	0.000	0.000	0.000	0.000
97	97		0.000	1.765	0.000	0.000	0.000	0.000
98	98		0.000	1.766	0.000	0.000	0.000	0.000
99	99		0.000	1.766	0.000	0.000	0.000	0.000
100	100		-0.000	1.765	0.000	0.000	0.000	0.000
101	101		-0.000	1.766	0.000	0.000	0.000	0.000
102	102		-0.000	1.766	0.000	0.000	0.000	0.000
103	103		-0.000	1.766	0.000	0.000	0.000	0.000
104	104		0.000	1.767	0.000	0.000	0.000	0.000
105	105		0.000	1.767	0.000	0.000	0.000	0.000
106	106		0.000	1.767	0.000	0.000	0.000	0.000
107	107		0.000	1.768	0.000	0.000	0.000	0.000
108	108		0.000	1.768	0.000	0.000	0.000	-0.000
109	109		0.000	1.765	0.000	0.000	0.000	0.000
110	110	P11	0.000	1.491	0.000	0.000	0.000	-0.060
111	111		0.000	1.827	0.000	0.000	0.000	0.012
112	112		0.000	1.826	0.000	0.000	0.000	0.012
113	113		0.000	1.826	0.000	0.000	0.000	0.012
114	114		0.000	1.826	0.000	0.000	0.000	0.012
115	115		-0.000	1.825	0.000	0.000	0.000	0.012
116	116		-0.000	1.825	0.000	0.000	0.000	0.012
117	117		-0.000	1.825	0.000	0.000	0.000	0.012
118	118		-0.000	1.824	0.000	0.000	0.000	0.012
119	119		0.000	1.824	0.000	0.000	0.000	0.012
120	120		0.000	1.824	0.000	0.000	0.000	0.012
121	121		0.000	1.824	0.000	0.000	0.000	0.012
122	122		0.000	1.824	0.000	0.000	0.000	0.012

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		0.000	1.824	0.000	0.000	0.000	0.012
124	124		0.000	1.823	0.000	0.000	0.000	0.012
125	125		0.000	1.824	0.000	0.000	0.000	0.012
126	126		0.000	1.823	0.000	0.000	0.000	0.012
127	127		0.000	1.823	0.000	0.000	0.000	0.012
128	128		0.000	1.823	0.000	0.000	0.000	0.012
129	129		0.000	1.823	0.000	0.000	0.000	0.012
130	130		0.000	1.823	0.000	0.000	0.000	0.012
131	131		0.000	1.823	0.000	0.000	0.000	0.012
132	132		-0.000	1.823	0.000	0.000	0.000	0.012
133	133		-0.000	1.823	0.000	0.000	0.000	0.012
134	134		-0.000	1.824	0.000	0.000	0.000	0.012
135	135		-0.000	1.824	0.000	0.000	0.000	0.012
136	136		-0.000	1.823	0.000	0.000	0.000	0.012
137	137		-0.000	1.766	0.000	0.000	0.000	0.000
138	138		-0.000	1.766	0.000	0.000	0.000	-0.000
139	139		-0.000	1.844	0.000	0.000	0.000	-0.016
140	140		-0.000	1.844	0.000	0.000	0.000	0.016
141	141	End Spring 1	0.000	1.768	0.000	0.000	0.000	-0.053
142	142	End Spring 2	0.000	1.768	0.000	0.000	0.000	0.012
143	143	End Spring 3	0.000	1.767	0.000	0.000	0.000	0.012
144	144	End Spring 4	0.000	1.767	0.000	0.000	0.000	0.012
145	145	End Spring 5	0.000	1.767	0.000	0.000	0.000	0.012
146	146	End Spring 6	-0.000	1.766	0.000	0.000	0.000	0.012
147	147	End Spring 7	-0.000	1.767	0.000	0.000	0.000	0.012
148	148	End Spring 8	-0.000	1.766	0.000	0.000	0.000	0.012
149	149	End Spring 9	-0.000	1.765	0.000	0.000	0.000	0.012
150	150	End Spring 10	0.000	1.766	0.000	0.000	0.000	0.012
151	151	End Spring 11	0.000	1.766	0.000	0.000	0.000	0.012
152	152	End Spring 12	0.000	1.765	0.000	0.000	0.000	0.012
153	153	End Spring 13	0.000	1.765	0.000	0.000	0.000	0.012
154	154	End Spring 14	0.000	1.765	0.000	0.000	0.000	0.012
155	155	End Spring 15	0.000	1.765	0.000	0.000	0.000	0.012
156	156	End Spring 16	0.000	1.765	0.000	0.000	0.000	0.012
157	157	End Spring 17	0.000	1.765	0.000	0.000	0.000	0.012
158	158	End Spring 18	0.000	1.764	0.000	0.000	0.000	0.012
159	159	End Spring 19	0.000	1.765	0.000	0.000	0.000	0.012
160	160	End Spring 20	0.000	1.765	0.000	0.000	0.000	0.012
161	161	End Spring 21	0.000	1.764	0.000	0.000	0.000	0.012
162	162	End Spring 22	0.000	1.765	0.000	0.000	0.000	0.012
163	163	End Spring 23	-0.000	1.765	0.000	0.000	0.000	0.012
164	164	End Spring 24	-0.000	1.764	0.000	0.000	0.000	0.012
165	165	End Spring 25	-0.000	1.765	0.000	0.000	0.000	0.012
166	166	End Spring 26	-0.000	1.765	0.000	0.000	0.000	0.012
167	167	End Spring 27	-0.000	1.765	0.000	0.000	0.000	0.012
168	168	End Spring 28	-0.000	1.766	0.000	0.000	0.000	0.015
169	169	End Spring 29	0.000	1.768	0.000	0.000	0.000	0.053
170	170	End Spring 30	0.000	1.768	0.000	0.000	0.000	-0.012
171	171	End Spring 31	0.000	1.767	0.000	0.000	0.000	-0.012
172	172	End Spring 32	0.000	1.767	0.000	0.000	0.000	-0.012
173	173	End Spring 33	0.000	1.767	0.000	0.000	0.000	-0.012
174	174	End Spring 34	-0.000	1.766	0.000	0.000	0.000	-0.012
175	175	End Spring 35	-0.000	1.767	0.000	0.000	0.000	-0.012
176	176	End Spring 36	-0.000	1.766	0.000	0.000	0.000	-0.012
177	177	End Spring 37	-0.000	1.765	0.000	0.000	0.000	-0.012
178	178	End Spring 38	0.000	1.766	0.000	0.000	0.000	-0.012
179	179	End Spring 39	0.000	1.766	0.000	0.000	0.000	-0.012
180	180	End Spring 40	0.000	1.765	0.000	0.000	0.000	-0.012
181	181	End Spring 41	0.000	1.765	0.000	0.000	0.000	-0.012
182	182	End Spring 42	0.000	1.765	0.000	0.000	0.000	-0.012
183	183	End Spring 43	0.000	1.765	0.000	0.000	0.000	-0.012

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 44	0.000	1.765	0.000	0.000	0.000	-0.012
185	185	End Spring 45	0.002	1.765	0.000	0.000	0.000	-0.012
186	186	End Spring 46	0.000	1.764	0.000	0.000	0.000	-0.012
187	187	End Spring 47	0.000	1.765	0.000	0.000	0.000	-0.012
188	188	End Spring 48	0.000	1.765	0.000	0.000	0.000	-0.012
189	189	End Spring 49	0.000	1.764	0.000	0.000	0.000	-0.012
190	190	End Spring 50	0.000	1.765	0.000	0.000	0.000	-0.012
191	191	End Spring 51	-0.000	1.765	0.000	0.000	0.000	-0.012
192	192	End Spring 52	-0.000	1.764	0.000	0.000	0.000	-0.012
193	193	End Spring 53	-0.000	1.765	0.000	0.000	0.000	-0.012
194	194	End Spring 54	-0.000	1.765	0.000	0.000	0.000	-0.012
195	195	End Spring 55	-0.000	1.765	0.000	0.000	0.000	-0.012
196	196	End Spring 56	-0.000	1.766	0.000	0.000	0.000	-0.015

GROUP 13 DOCKS
DOCK W8

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P10	0.882	0.328	0.000	0.000	0.000	-0.047
2	2		1.118	0.492	0.000	0.000	0.000	-0.080
3	3		1.377	0.483	0.000	0.000	0.000	-0.079
4	4		1.610	0.446	0.000	0.000	0.000	-0.073
5	5		1.816	0.383	0.000	0.000	0.000	-0.063
6	6		1.992	0.326	0.000	0.000	0.000	-0.053
7	7		2.140	0.267	0.000	0.000	0.000	-0.044
8	8		2.255	0.198	0.000	0.000	0.000	-0.032
9	9		2.340	0.150	0.000	0.000	0.000	-0.024
10	10		2.405	0.108	0.000	0.000	0.000	-0.018
11	11		2.446	0.060	0.000	0.000	0.000	-0.010
12	12		2.469	0.035	0.000	0.000	0.000	-0.006
13	13		2.482	0.017	0.000	0.000	0.000	-0.003
14	14		2.484	-0.011	0.000	0.000	0.000	0.002
15	15		2.475	-0.017	0.000	0.000	0.000	0.003
16	16		2.467	-0.020	0.000	0.000	0.000	0.003
17	17		2.454	-0.034	0.000	0.000	0.000	0.006
18	18		2.437	-0.030	0.000	0.000	0.000	0.005
19	19		2.425	-0.023	0.000	0.000	0.000	0.004
20	20		2.411	-0.030	0.000	0.000	0.000	0.005
21	21		2.398	-0.019	0.000	0.000	0.000	0.003
22	22		2.393	-0.006	0.000	0.000	0.000	0.001
23	23		2.389	-0.007	0.000	0.000	0.000	0.001
24	24		2.389	0.011	0.000	0.000	0.000	-0.002
25	25		2.401	0.031	0.000	0.000	0.000	-0.005
26	26		2.416	0.037	0.000	0.000	0.000	-0.006
27	27		2.437	0.059	0.000	0.000	0.000	-0.010
28	28		2.437	0.012	0.000	0.000	0.000	-0.010
29	29		2.416	0.008	0.000	0.000	0.000	-0.006
30	30		2.400	0.006	0.000	0.000	0.000	-0.005
31	31		2.389	0.002	0.000	0.000	0.000	-0.002
32	32		2.389	-0.001	0.000	0.000	0.000	0.001
33	33		2.392	-0.001	0.000	0.000	0.000	0.001
34	34		2.398	-0.004	0.000	0.000	0.000	0.003
35	35		2.411	-0.006	0.000	0.000	0.000	0.005
36	36		2.424	-0.005	0.000	0.000	0.000	0.004
37	37		2.436	-0.006	0.000	0.000	0.000	0.005
38	38		2.454	-0.007	0.000	0.000	0.000	0.006
39	39		2.467	-0.004	0.000	0.000	0.000	0.003
40	40		2.475	-0.004	0.000	0.000	0.000	0.003
41	41		2.484	-0.002	0.000	0.000	0.000	0.002
42	42		2.482	0.003	0.000	0.000	0.000	-0.003
43	43		2.468	0.007	0.000	0.000	0.000	-0.006
44	44		2.446	0.012	0.000	0.000	0.000	-0.010
45	45		2.405	0.022	0.000	0.000	0.000	-0.018
46	46		2.340	0.031	0.000	0.000	0.000	-0.024
47	47		2.255	0.041	0.000	0.000	0.000	-0.032
48	48		2.140	0.055	0.000	0.000	0.000	-0.044
49	49		1.991	0.067	0.000	0.000	0.000	-0.053
50	50		1.816	0.079	0.000	0.000	0.000	-0.063
51	51		1.610	0.092	0.000	0.000	0.000	-0.073
52	52		1.377	0.099	0.000	0.000	0.000	-0.079
53	53		1.117	0.101	0.000	0.000	0.000	-0.080
54	54		0.883	0.096	0.000	0.000	0.000	-0.076
55	55		0.883	0.000	0.000	0.000	0.000	-0.076
56	56		1.117	0.000	0.000	0.000	0.000	-0.080
57	57	P9	1.377	0.000	0.000	0.000	0.000	-0.079
58	58		1.610	0.000	0.000	0.000	0.000	-0.073
59	59		1.816	0.000	0.000	0.000	0.000	-0.063
60	60	P8	1.991	0.000	0.000	0.000	0.000	-0.053
61	61		2.140	0.000	0.000	0.000	0.000	-0.044

GROUP 13 DOCKS
DOCK W8

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		2.255	0.000	0.000	0.000	0.000	-0.032
63	63	P7	2.340	0.000	0.000	0.000	0.000	-0.024
64	64		2.405	0.000	0.000	0.000	0.000	-0.018
65	65		2.446	0.000	0.000	0.000	0.000	-0.010
66	66	P6	2.468	0.000	0.000	0.000	0.000	-0.006
67	67		2.482	0.000	0.000	0.000	0.000	-0.003
68	68		2.484	0.000	0.000	0.000	0.000	0.002
69	69		2.467	0.000	0.000	0.000	0.000	0.003
70	70		2.454	0.000	0.000	0.000	0.000	0.006
71	71	P4	2.436	0.000	0.000	0.000	0.000	0.005
72	72		2.424	0.000	0.000	0.000	0.000	0.004
73	73	P5	2.475	0.000	0.000	0.000	0.000	0.003
74	74		2.411	0.000	0.000	0.000	0.000	0.005
75	75	P3	2.398	0.000	0.000	0.000	0.000	0.003
76	76		2.392	0.000	0.000	0.000	0.000	0.001
77	77		2.389	0.000	0.000	0.000	0.000	0.001
78	78	P2	2.389	0.000	0.000	0.000	0.000	-0.002
79	79		2.400	0.000	0.000	0.000	0.000	-0.005
80	80		2.416	0.000	0.000	0.000	0.000	-0.006
81	81	P1	2.437	0.000	0.000	0.000	0.000	-0.010
82	82		2.482	0.000	0.000	0.000	0.000	-0.014
83	83		2.437	-0.012	0.000	0.000	0.000	-0.010
84	84		2.416	-0.008	0.000	0.000	0.000	-0.006
85	85		2.400	-0.006	0.000	0.000	0.000	-0.005
86	86		2.389	-0.002	0.000	0.000	0.000	-0.002
87	87		2.389	0.001	0.000	0.000	0.000	0.001
88	88		2.392	0.001	0.000	0.000	0.000	0.001
89	89		2.398	0.004	0.000	0.000	0.000	0.003
90	90		2.424	0.005	0.000	0.000	0.000	0.004
91	91		2.436	0.006	0.000	0.000	0.000	0.005
92	92		2.454	0.007	0.000	0.000	0.000	0.006
93	93		2.467	0.004	0.000	0.000	0.000	0.003
94	94		2.475	0.004	0.000	0.000	0.000	0.003
95	95		2.484	0.002	0.000	0.000	0.000	0.002
96	96		2.482	-0.003	0.000	0.000	0.000	-0.003
97	97		2.468	-0.007	0.000	0.000	0.000	-0.006
98	98		2.446	-0.012	0.000	0.000	0.000	-0.010
99	99		2.405	-0.022	0.000	0.000	0.000	-0.018
100	100		2.340	-0.031	0.000	0.000	0.000	-0.024
101	101		2.255	-0.041	0.000	0.000	0.000	-0.032
102	102		2.140	-0.055	0.000	0.000	0.000	-0.044
103	103		1.991	-0.067	0.000	0.000	0.000	-0.053
104	104		1.816	-0.079	0.000	0.000	0.000	-0.063
105	105		1.610	-0.092	0.000	0.000	0.000	-0.073
106	106		1.377	-0.099	0.000	0.000	0.000	-0.079
107	107		1.117	-0.101	0.000	0.000	0.000	-0.080
108	108		0.883	-0.096	0.000	0.000	0.000	-0.076
109	109		2.411	0.006	0.000	0.000	0.000	0.005
110	110	P11	0.882	-0.328	0.000	0.000	0.000	-0.047
111	111		1.117	-0.492	0.000	0.000	0.000	-0.080
112	112		1.377	-0.483	0.000	0.000	0.000	-0.079
113	113		1.610	-0.446	0.000	0.000	0.000	-0.073
114	114		1.816	-0.383	0.000	0.000	0.000	-0.063
115	115		1.991	-0.326	0.000	0.000	0.000	-0.053
116	116		2.140	-0.267	0.000	0.000	0.000	-0.044
117	117		2.255	-0.198	0.000	0.000	0.000	-0.032
118	118		2.340	-0.150	0.000	0.000	0.000	-0.024
119	119		2.405	-0.108	0.000	0.000	0.000	-0.018
120	120		2.446	-0.060	0.000	0.000	0.000	-0.010
121	121		2.468	-0.035	0.000	0.000	0.000	-0.006
122	122		2.482	-0.017	0.000	0.000	0.000	-0.003

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		2.484	0.011	0.000	0.000	0.000	0.002
124	124		2.475	0.017	0.000	0.000	0.000	0.003
125	125		2.467	0.020	0.000	0.000	0.000	0.003
126	126		2.454	0.034	0.000	0.000	0.000	0.006
127	127		2.436	0.030	0.000	0.000	0.000	0.005
128	128		2.424	0.023	0.000	0.000	0.000	0.004
129	129		2.411	0.030	0.000	0.000	0.000	0.005
130	130		2.398	0.019	0.000	0.000	0.000	0.003
131	131		2.393	0.006	0.000	0.000	0.000	0.001
132	132		2.389	0.007	0.000	0.000	0.000	0.001
133	133		2.389	-0.011	0.000	0.000	0.000	-0.002
134	134		2.400	-0.031	0.000	0.000	0.000	-0.005
135	135		2.416	-0.037	0.000	0.000	0.000	-0.006
136	136		2.437	-0.059	0.000	0.000	0.000	-0.010
137	137		2.482	-0.017	0.000	0.000	0.000	-0.014
138	138		2.482	0.017	0.000	0.000	0.000	-0.014
139	139		2.482	0.083	0.000	0.000	0.000	-0.014
140	140		2.482	-0.083	0.000	0.000	0.000	-0.014
141	141	End Spring 1	0.882	-0.096	0.000	0.000	0.000	-0.049
142	142	End Spring 2	1.117	-0.101	0.000	0.000	0.000	-0.080
143	143	End Spring 3	1.377	-0.099	0.000	0.000	0.000	-0.079
144	144	End Spring 4	1.610	-0.092	0.000	0.000	0.000	-0.073
145	145	End Spring 5	1.816	-0.079	0.000	0.000	0.000	-0.063
146	146	End Spring 6	1.991	-0.067	0.000	0.000	0.000	-0.053
147	147	End Spring 7	2.140	-0.055	0.000	0.000	0.000	-0.044
148	148	End Spring 8	2.255	-0.041	0.000	0.000	0.000	-0.032
149	149	End Spring 9	2.340	-0.031	0.000	0.000	0.000	-0.024
150	150	End Spring 10	2.405	-0.022	0.000	0.000	0.000	-0.018
151	151	End Spring 11	2.446	-0.012	0.000	0.000	0.000	-0.010
152	152	End Spring 12	2.468	-0.007	0.000	0.000	0.000	-0.006
153	153	End Spring 13	2.482	-0.003	0.000	0.000	0.000	-0.003
154	154	End Spring 14	2.484	0.002	0.000	0.000	0.000	0.002
155	155	End Spring 15	2.475	0.004	0.000	0.000	0.000	0.003
156	156	End Spring 16	2.467	0.004	0.000	0.000	0.000	0.003
157	157	End Spring 17	2.454	0.007	0.000	0.000	0.000	0.006
158	158	End Spring 18	2.436	0.006	0.000	0.000	0.000	0.005
159	159	End Spring 19	2.424	0.005	0.000	0.000	0.000	0.004
160	160	End Spring 20	2.411	0.006	0.000	0.000	0.000	0.005
161	161	End Spring 21	2.398	0.004	0.000	0.000	0.000	0.003
162	162	End Spring 22	2.393	0.001	0.000	0.000	0.000	0.001
163	163	End Spring 23	2.389	0.001	0.000	0.000	0.000	0.001
164	164	End Spring 24	2.389	-0.002	0.000	0.000	0.000	-0.002
165	165	End Spring 25	2.400	-0.006	0.000	0.000	0.000	-0.005
166	166	End Spring 26	2.416	-0.008	0.000	0.000	0.000	-0.006
167	167	End Spring 27	2.437	-0.012	0.000	0.000	0.000	-0.010
168	168	End Spring 28	2.482	-0.017	0.000	0.000	0.000	-0.014
169	169	End Spring 29	0.882	0.096	0.000	0.000	0.000	-0.049
170	170	End Spring 30	1.118	0.101	0.000	0.000	0.000	-0.080
171	171	End Spring 31	1.377	0.099	0.000	0.000	0.000	-0.079
172	172	End Spring 32	1.610	0.092	0.000	0.000	0.000	-0.073
173	173	End Spring 33	1.816	0.079	0.000	0.000	0.000	-0.063
174	174	End Spring 34	1.991	0.067	0.000	0.000	0.000	-0.053
175	175	End Spring 35	2.140	0.055	0.000	0.000	0.000	-0.044
176	176	End Spring 36	2.255	0.041	0.000	0.000	0.000	-0.032
177	177	End Spring 37	2.340	0.031	0.000	0.000	0.000	-0.024
178	178	End Spring 38	2.405	0.022	0.000	0.000	0.000	-0.018
179	179	End Spring 39	2.446	0.012	0.000	0.000	0.000	-0.010
180	180	End Spring 40	2.468	0.007	0.000	0.000	0.000	-0.006
181	181	End Spring 41	2.482	0.003	0.000	0.000	0.000	-0.003
182	182	End Spring 42	2.484	-0.002	0.000	0.000	0.000	0.002
183	183	End Spring 43	2.475	-0.004	0.000	0.000	0.000	0.003

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 44	2.467	-0.004	0.000	0.000	0.000	0.003
185	185	End Spring 45	2.454	-0.010	0.000	0.000	0.000	0.006
186	186	End Spring 46	2.437	-0.006	0.000	0.000	0.000	0.005
187	187	End Spring 47	2.425	-0.005	0.000	0.000	0.000	0.004
188	188	End Spring 48	2.411	-0.006	0.000	0.000	0.000	0.005
189	189	End Spring 49	2.398	-0.004	0.000	0.000	0.000	0.003
190	190	End Spring 50	2.393	-0.001	0.000	0.000	0.000	0.001
191	191	End Spring 51	2.389	-0.001	0.000	0.000	0.000	0.001
192	192	End Spring 52	2.389	0.002	0.000	0.000	0.000	-0.002
193	193	End Spring 53	2.401	0.006	0.000	0.000	0.000	-0.005
194	194	End Spring 54	2.416	0.008	0.000	0.000	0.000	-0.006
195	195	End Spring 55	2.437	0.012	0.000	0.000	0.000	-0.010
196	196	End Spring 56	2.482	0.017	0.000	0.000	0.000	-0.014

APPENDIX: GROUP 14 DOCKS DATA

GROUP 14 DOCKS
DOCK W12

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	28	P10	Normal	ky'	1.060
2	58	P1	Normal	ky'	1.060
3	61	P2	Normal	ky'	1.060
4	64	P3	Normal	ky'	1.060
5	67	P4	Normal	ky'	1.060
6	70	P5	Normal	ky'	1.060
7	73	P6	Normal	ky'	1.060
8	75	P7	Normal	ky'	1.060
9	78	P8	Normal	ky'	1.060
10	81	P9	Normal	ky'	1.060
11	28	P10	Normal	kx'	1.060
12	58	P1	Normal	kx'	1.060
13	61	P2	Normal	kx'	1.060
14	64	P3	Normal	kx'	1.060
15	67	P4	Normal	kx'	1.060
16	70	P5	Normal	kx'	1.060
17	73	P6	Normal	kx'	1.060
18	75	P7	Normal	kx'	1.060
19	78	P8	Normal	kx'	1.060
20	81	P9	Normal	kx'	1.060

GROUP 14 DOCKS
DOCK W12

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		0.630	1.667	0.000	0.000	0.000	0.132
2	2		0.447	1.302	0.000	0.000	0.000	0.057
3	3		0.324	1.260	0.000	0.000	0.000	0.051
4	4		0.220	1.220	0.000	0.000	0.000	0.044
5	5		0.136	1.181	0.000	0.000	0.000	0.038
6	6		0.070	1.147	0.000	0.000	0.000	0.033
7	7		0.020	1.116	0.000	0.000	0.000	0.028
8	8		-0.017	1.090	0.000	0.000	0.000	0.024
9	9		-0.043	1.069	0.000	0.000	0.000	0.020
10	10		-0.059	1.052	0.000	0.000	0.000	0.018
11	11		-0.069	1.039	0.000	0.000	0.000	0.016
12	12		-0.073	1.030	0.000	0.000	0.000	0.014
13	13		-0.074	1.024	0.000	0.000	0.000	0.013
14	14		-0.073	1.020	0.000	0.000	0.000	0.013
15	15		-0.071	1.020	0.000	0.000	0.000	0.013
16	16		-0.070	1.020	0.000	0.000	0.000	0.013
17	17		-0.069	1.022	0.000	0.000	0.000	0.014
18	18		-0.070	1.025	0.000	0.000	0.000	0.014
19	19		-0.073	1.029	0.000	0.000	0.000	0.015
20	20		-0.078	1.032	0.000	0.000	0.000	0.015
21	21		-0.085	1.034	0.000	0.000	0.000	0.016
22	22		-0.092	1.035	0.000	0.000	0.000	0.016
23	23		-0.099	1.034	0.000	0.000	0.000	0.016
24	24		-0.105	1.030	0.000	0.000	0.000	0.015
25	25		-0.108	1.023	0.000	0.000	0.000	0.014
26	26		-0.108	1.012	0.000	0.000	0.000	0.012
27	27		-0.101	0.998	0.000	0.000	0.000	0.010
28	28	P10	-0.081	0.686	0.000	0.000	0.000	-0.055
29	29		-0.081	0.946	0.000	0.000	0.000	-0.007
30	30		-0.101	0.952	0.000	0.000	0.000	-0.003
31	31		-0.108	0.955	0.000	0.000	0.000	-0.001
32	32		-0.108	0.957	0.000	0.000	0.000	0.001
33	33		-0.105	0.958	0.000	0.000	0.000	0.002
34	34		-0.099	0.959	0.000	0.000	0.000	0.002
35	35		-0.092	0.960	0.000	0.000	0.000	0.003
36	36		-0.085	0.960	0.000	0.000	0.000	0.002
37	37		-0.078	0.960	0.000	0.000	0.000	0.002
38	38		-0.073	0.959	0.000	0.000	0.000	0.001
39	39		-0.070	0.959	0.000	0.000	0.000	0.001
40	40		-0.069	0.958	0.000	0.000	0.000	0.000
41	41		-0.070	0.959	0.000	0.000	0.000	-0.000
42	42		-0.071	0.959	0.000	0.000	0.000	-0.000
43	43		-0.073	0.960	0.000	0.000	0.000	-0.000
44	44		-0.074	0.961	0.000	0.000	0.000	-0.000
45	45		-0.073	0.963	0.000	0.000	0.000	0.001
46	46		-0.069	0.965	0.000	0.000	0.000	0.002
47	47		-0.059	0.969	0.000	0.000	0.000	0.004
48	48		-0.043	0.973	0.000	0.000	0.000	0.007
49	49		-0.017	0.978	0.000	0.000	0.000	0.010
50	50		0.020	0.984	0.000	0.000	0.000	0.014
51	51		0.070	0.991	0.000	0.000	0.000	0.019
52	52		0.136	0.999	0.000	0.000	0.000	0.025
53	53		0.220	1.008	0.000	0.000	0.000	0.031
54	54		0.324	1.017	0.000	0.000	0.000	0.037
55	55		0.447	1.026	0.000	0.000	0.000	0.044
56	56		0.630	1.038	0.000	0.000	0.000	0.052
57	57		0.630	0.972	0.000	0.000	0.000	0.052
58	58	P1	0.447	0.971	0.000	0.000	0.000	0.044
59	59		0.324	0.970	0.000	0.000	0.000	0.037
60	60		0.220	0.969	0.000	0.000	0.000	0.031
61	61	P2	0.136	0.968	0.000	0.000	0.000	0.025

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		0.070	0.967	0.000	0.000	0.000	0.019
63	63		0.020	0.966	0.000	0.000	0.000	0.014
64	64	P3	-0.017	0.965	0.000	0.000	0.000	0.010
65	65		-0.043	0.964	0.000	0.000	0.000	0.007
66	66		-0.059	0.963	0.000	0.000	0.000	0.004
67	67	P4	-0.069	0.962	0.000	0.000	0.000	0.002
68	68		-0.073	0.962	0.000	0.000	0.000	0.001
69	69		-0.074	0.961	0.000	0.000	0.000	-0.000
70	70	P5	-0.073	0.960	0.000	0.000	0.000	-0.000
71	71		-0.071	0.960	0.000	0.000	0.000	-0.000
72	72		-0.070	0.959	0.000	0.000	0.000	-0.000
73	73	P6	-0.069	0.958	0.000	0.000	0.000	0.000
74	74		-0.070	0.958	0.000	0.000	0.000	0.001
75	75	P7	-0.073	0.957	0.000	0.000	0.000	0.001
76	76		-0.078	0.957	0.000	0.000	0.000	0.002
77	77		-0.085	0.957	0.000	0.000	0.000	0.002
78	78	P8	-0.092	0.956	0.000	0.000	0.000	0.003
79	79		-0.099	0.956	0.000	0.000	0.000	0.002
80	80		-0.105	0.956	0.000	0.000	0.000	0.002
81	81	P9	-0.108	0.956	0.000	0.000	0.000	0.001
82	82		-0.108	0.956	0.000	0.000	0.000	-0.001
83	83		-0.101	0.956	0.000	0.000	0.000	-0.003
84	84		-0.081	0.956	0.000	0.000	0.000	-0.007
85	85	End Spring 1	0.630	1.038	0.000	0.000	0.000	0.121
86	86	End Spring 2	0.447	1.026	0.000	0.000	0.000	0.056
87	87	End Spring 3	0.324	1.017	0.000	0.000	0.000	0.049
88	88	End Spring 4	0.220	1.008	0.000	0.000	0.000	0.042
89	89	End Spring 5	0.136	0.999	0.000	0.000	0.000	0.036
90	90	End Spring 6	0.070	0.991	0.000	0.000	0.000	0.031
91	91	End Spring 7	0.020	0.984	0.000	0.000	0.000	0.026
92	92	End Spring 8	-0.017	0.978	0.000	0.000	0.000	0.022
93	93	End Spring 9	-0.043	0.973	0.000	0.000	0.000	0.018
94	94	End Spring 10	-0.059	0.969	0.000	0.000	0.000	0.016
95	95	End Spring 11	-0.069	0.965	0.000	0.000	0.000	0.014
96	96	End Spring 12	-0.073	0.963	0.000	0.000	0.000	0.012
97	97	End Spring 13	-0.074	0.961	0.000	0.000	0.000	0.012
98	98	End Spring 14	-0.073	0.960	0.000	0.000	0.000	0.011
99	99	End Spring 15	-0.071	0.959	0.000	0.000	0.000	0.011
100	100	End Spring 16	-0.070	0.959	0.000	0.000	0.000	0.011
101	101	End Spring 17	-0.069	0.958	0.000	0.000	0.000	0.012
102	102	End Spring 18	-0.070	0.959	0.000	0.000	0.000	0.012
103	103	End Spring 19	-0.073	0.959	0.000	0.000	0.000	0.013
104	104	End Spring 20	-0.078	0.960	0.000	0.000	0.000	0.014
105	105	End Spring 21	-0.085	0.960	0.000	0.000	0.000	0.014
106	106	End Spring 22	-0.092	0.960	0.000	0.000	0.000	0.014
107	107	End Spring 23	-0.099	0.960	0.000	0.000	0.000	0.014
108	108	End Spring 24	-0.105	0.959	0.000	0.000	0.000	0.013
109	109	End Spring 25	-0.108	0.957	0.000	0.000	0.000	0.012
110	110	End Spring 26	-0.108	0.955	0.000	0.000	0.000	0.010
111	111	End Spring 27	-0.101	0.952	0.000	0.000	0.000	0.008
112	112	End Spring 28	-0.081	0.946	0.000	0.000	0.000	-0.052

GROUP 14 DOCKS
DOCK W12

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		2.071	0.043	0.000	0.000	0.000	0.009
2	2		2.040	0.033	0.000	0.000	0.000	0.007
3	3		2.022	0.024	0.000	0.000	0.000	0.006
4	4		2.006	0.023	0.000	0.000	0.000	0.005
5	5		1.991	0.016	0.000	0.000	0.000	0.004
6	6		1.980	0.011	0.000	0.000	0.000	0.003
7	7		1.970	0.013	0.000	0.000	0.000	0.004
8	8		1.959	0.010	0.000	0.000	0.000	0.003
9	9		1.950	0.008	0.000	0.000	0.000	0.003
10	10		1.940	0.014	0.000	0.000	0.000	0.004
11	11		1.928	0.014	0.000	0.000	0.000	0.004
12	12		1.918	0.014	0.000	0.000	0.000	0.004
13	13		1.904	0.020	0.000	0.000	0.000	0.005
14	14		1.889	0.020	0.000	0.000	0.000	0.005
15	15		1.875	0.019	0.000	0.000	0.000	0.005
16	16		1.860	0.023	0.000	0.000	0.000	0.005
17	17		1.844	0.018	0.000	0.000	0.000	0.005
18	18		1.833	0.010	0.000	0.000	0.000	0.003
19	19		1.824	0.004	0.000	0.000	0.000	0.002
20	20		1.818	0.005	0.000	0.000	0.000	0.002
21	21		1.808	0.016	0.000	0.000	0.000	0.004
22	22		1.792	0.027	0.000	0.000	0.000	0.006
23	23		1.771	0.041	0.000	0.000	0.000	0.008
24	24		1.741	0.062	0.000	0.000	0.000	0.012
25	25		1.700	0.079	0.000	0.000	0.000	0.015
26	26		1.652	0.095	0.000	0.000	0.000	0.017
27	27		1.601	0.111	0.000	0.000	0.000	0.020
28	28	P10	1.524	0.084	0.000	0.000	0.000	0.014
29	29		1.525	0.017	0.000	0.000	0.000	0.021
30	30		1.601	0.015	0.000	0.000	0.000	0.020
31	31		1.652	0.012	0.000	0.000	0.000	0.017
32	32		1.700	0.008	0.000	0.000	0.000	0.015
33	33		1.740	0.005	0.000	0.000	0.000	0.012
34	34		1.771	0.001	0.000	0.000	0.000	0.008
35	35		1.792	-0.002	0.000	0.000	0.000	0.006
36	36		1.808	-0.004	0.000	0.000	0.000	0.004
37	37		1.818	-0.007	0.000	0.000	0.000	0.002
38	38		1.824	-0.007	0.000	0.000	0.000	0.002
39	39		1.832	-0.005	0.000	0.000	0.000	0.003
40	40		1.844	-0.004	0.000	0.000	0.000	0.005
41	41		1.859	-0.003	0.000	0.000	0.000	0.005
42	42		1.875	-0.003	0.000	0.000	0.000	0.005
43	43		1.889	-0.003	0.000	0.000	0.000	0.005
44	44		1.904	-0.003	0.000	0.000	0.000	0.005
45	45		1.917	-0.004	0.000	0.000	0.000	0.004
46	46		1.928	-0.005	0.000	0.000	0.000	0.004
47	47		1.940	-0.004	0.000	0.000	0.000	0.004
48	48		1.950	-0.006	0.000	0.000	0.000	0.003
49	49		1.959	-0.005	0.000	0.000	0.000	0.003
50	50		1.969	-0.005	0.000	0.000	0.000	0.004
51	51		1.980	-0.005	0.000	0.000	0.000	0.003
52	52		1.991	-0.004	0.000	0.000	0.000	0.004
53	53		2.005	-0.002	0.000	0.000	0.000	0.005
54	54		2.022	-0.002	0.000	0.000	0.000	0.006
55	55		2.040	-0.000	0.000	0.000	0.000	0.007
56	56		2.071	0.002	0.000	0.000	0.000	0.009
57	57		2.071	-0.009	0.000	0.000	0.000	0.009
58	58	P1	2.040	-0.009	0.000	0.000	0.000	0.007
59	59		2.022	-0.009	0.000	0.000	0.000	0.006
60	60		2.005	-0.009	0.000	0.000	0.000	0.005
61	61	P2	1.991	-0.009	0.000	0.000	0.000	0.004

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		1.980	-0.009	0.000	0.000	0.000	0.003
63	63		1.969	-0.009	0.000	0.000	0.000	0.004
64	64	P3	1.959	-0.009	0.000	0.000	0.000	0.003
65	65		1.950	-0.009	0.000	0.000	0.000	0.003
66	66		1.940	-0.009	0.000	0.000	0.000	0.004
67	67	P4	1.928	-0.009	0.000	0.000	0.000	0.004
68	68		1.917	-0.009	0.000	0.000	0.000	0.004
69	69		1.904	-0.009	0.000	0.000	0.000	0.005
70	70	P5	1.889	-0.009	0.000	0.000	0.000	0.005
71	71		1.875	-0.009	0.000	0.000	0.000	0.005
72	72		1.859	-0.009	0.000	0.000	0.000	0.005
73	73	P6	1.844	-0.009	0.000	0.000	0.000	0.005
74	74		1.832	-0.009	0.000	0.000	0.000	0.003
75	75	P7	1.824	-0.010	0.000	0.000	0.000	0.002
76	76		1.818	-0.010	0.000	0.000	0.000	0.002
77	77		1.808	-0.010	0.000	0.000	0.000	0.004
78	78	P8	1.792	-0.010	0.000	0.000	0.000	0.006
79	79		1.771	-0.010	0.000	0.000	0.000	0.008
80	80		1.740	-0.010	0.000	0.000	0.000	0.012
81	81	P9	1.700	-0.010	0.000	0.000	0.000	0.015
82	82		1.652	-0.010	0.000	0.000	0.000	0.017
83	83		1.601	-0.010	0.000	0.000	0.000	0.020
84	84		1.525	-0.010	0.000	0.000	0.000	0.021
85	85	End Spring 1	2.071	0.002	0.000	0.000	0.000	0.009
86	86	End Spring 2	2.040	-0.000	0.000	0.000	0.000	0.007
87	87	End Spring 3	2.022	-0.002	0.000	0.000	0.000	0.006
88	88	End Spring 4	2.006	-0.002	0.000	0.000	0.000	0.005
89	89	End Spring 5	1.991	-0.004	0.000	0.000	0.000	0.004
90	90	End Spring 6	1.980	-0.005	0.000	0.000	0.000	0.003
91	91	End Spring 7	1.970	-0.005	0.000	0.000	0.000	0.004
92	92	End Spring 8	1.959	-0.005	0.000	0.000	0.000	0.003
93	93	End Spring 9	1.950	-0.006	0.000	0.000	0.000	0.003
94	94	End Spring 10	1.940	-0.004	0.000	0.000	0.000	0.004
95	95	End Spring 11	1.928	-0.005	0.000	0.000	0.000	0.004
96	96	End Spring 12	1.917	-0.004	0.000	0.000	0.000	0.004
97	97	End Spring 13	1.904	-0.003	0.000	0.000	0.000	0.005
98	98	End Spring 14	1.889	-0.003	0.000	0.000	0.000	0.005
99	99	End Spring 15	1.875	-0.003	0.000	0.000	0.000	0.005
100	100	End Spring 16	1.860	-0.003	0.000	0.000	0.000	0.005
101	101	End Spring 17	1.844	-0.004	0.000	0.000	0.000	0.005
102	102	End Spring 18	1.833	-0.005	0.000	0.000	0.000	0.003
103	103	End Spring 19	1.824	-0.007	0.000	0.000	0.000	0.002
104	104	End Spring 20	1.818	-0.007	0.000	0.000	0.000	0.002
105	105	End Spring 21	1.808	-0.004	0.000	0.000	0.000	0.004
106	106	End Spring 22	1.792	-0.002	0.000	0.000	0.000	0.006
107	107	End Spring 23	1.771	0.001	0.000	0.000	0.000	0.008
108	108	End Spring 24	1.740	0.005	0.000	0.000	0.000	0.012
109	109	End Spring 25	1.700	0.008	0.000	0.000	0.000	0.015
110	110	End Spring 26	1.652	0.012	0.000	0.000	0.000	0.017
111	111	End Spring 27	1.601	0.015	0.000	0.000	0.000	0.020
112	112	End Spring 28	1.525	0.017	0.000	0.000	0.000	0.014

APPENDIX: GROUP 15 DOCKS DATA

GROUP 15 DOCKS
DOCK W18

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	99	P11	Normal	ky'	1.360
2	99	P11	Normal	kx'	1.360
3	75	P9	Normal	ky'	1.060
4	75	P9	Normal	kx'	1.060
5	73	P8	Normal	ky'	1.060
6	73	P8	Normal	kx'	1.060
7	70	P7	Normal	ky'	1.060
8	70	P7	Normal	kx'	1.060
9	68	P6	Normal	ky'	1.060
10	68	P6	Normal	kx'	1.060
11	65	P5	Normal	ky'	1.060
12	65	P5	Normal	kx'	1.060
13	63	P4	Normal	ky'	1.060
14	63	P4	Normal	kx'	1.060
15	60	P3	Normal	ky'	1.060
16	60	P3	Normal	kx'	1.060
17	58	P2	Normal	ky'	1.060
18	58	P2	Normal	kx'	1.060
19	56	P1	Normal	ky'	1.060
20	56	P1	Normal	kx'	1.060
21	55	P10	Normal	ky'	1.360
22	55	P10	Normal	kx'	1.360

GROUP 15 DOCKS
DOCK W18

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		0.280	-2.899	0.000	0.000	0.000	0.018
2	2		0.198	-2.899	0.000	0.000	0.000	0.018
3	3		0.131	-2.900	0.000	0.000	0.000	0.016
4	4		0.075	-2.901	0.000	0.000	0.000	0.012
5	5		0.033	-2.902	0.000	0.000	0.000	0.009
6	6		0.005	-2.905	0.000	0.000	0.000	0.006
7	7		-0.012	-2.906	0.000	0.000	0.000	0.003
8	8		-0.019	-2.907	0.000	0.000	0.000	0.002
9	9		-0.019	-2.908	0.000	0.000	0.000	0.000
10	10		-0.012	-2.910	0.000	0.000	0.000	-0.001
11	11		-0.001	-2.911	0.000	0.000	0.000	-0.002
12	12		0.013	-2.911	0.000	0.000	0.000	-0.003
13	13		0.030	-2.913	0.000	0.000	0.000	-0.003
14	14		0.046	-2.914	0.000	0.000	0.000	-0.002
15	15		0.054	-2.916	0.000	0.000	0.000	0.000
16	16		0.049	-2.917	0.000	0.000	0.000	0.004
17	17		0.021	-2.918	0.000	0.000	0.000	0.011
18	18		-0.037	-2.921	0.000	0.000	0.000	0.019
19	19		-0.158	-2.923	0.000	0.000	0.000	0.031
20	20		0.198	-2.921	0.000	0.000	0.000	0.018
21	21		0.131	-2.919	0.000	0.000	0.000	0.016
22	22		0.075	-2.916	0.000	0.000	0.000	0.012
23	23		0.033	-2.914	0.000	0.000	0.000	0.009
24	24		0.005	-2.912	0.000	0.000	0.000	0.006
25	25		-0.012	-2.910	0.000	0.000	0.000	0.003
26	26		-0.019	-2.908	0.000	0.000	0.000	0.002
27	27		-0.019	-2.908	0.000	0.000	0.000	0.000
28	28		-0.012	-2.908	0.000	0.000	0.000	-0.001
29	29		-0.001	-2.909	0.000	0.000	0.000	-0.002
30	30		0.013	-2.908	0.000	0.000	0.000	-0.003
31	31		0.030	-2.909	0.000	0.000	0.000	-0.003
32	32		0.046	-2.912	0.000	0.000	0.000	-0.002
33	33		0.054	-2.917	0.000	0.000	0.000	0.000
34	34		0.049	-2.922	0.000	0.000	0.000	0.004
35	35		0.021	-2.932	0.000	0.000	0.000	0.011
36	36		-0.037	-2.944	0.000	0.000	0.000	0.019
37	37		-0.158	-2.962	0.000	0.000	0.000	0.031
38	38		0.198	-3.036	0.000	0.000	0.000	0.020
39	39		0.131	-3.023	0.000	0.000	0.000	0.018
40	40		0.075	-3.001	0.000	0.000	0.000	0.015
41	41		0.033	-2.979	0.000	0.000	0.000	0.012
42	42		0.005	-2.959	0.000	0.000	0.000	0.008
43	43		-0.012	-2.941	0.000	0.000	0.000	0.006
44	44		-0.019	-2.929	0.000	0.000	0.000	0.004
45	45		-0.019	-2.921	0.000	0.000	0.000	0.003
46	46		-0.012	-2.914	0.000	0.000	0.000	0.001
47	47		-0.001	-2.909	0.000	0.000	0.000	0.001
48	48		0.013	-2.902	0.000	0.000	0.000	-0.000
49	49		0.030	-2.902	0.000	0.000	0.000	-0.001
50	50		0.046	-2.912	0.000	0.000	0.000	0.001
51	51		0.054	-2.930	0.000	0.000	0.000	0.003
52	52		0.049	-2.959	0.000	0.000	0.000	0.007
53	53		0.021	-3.006	0.000	0.000	0.000	0.013
54	54		-0.037	-3.066	0.000	0.000	0.000	0.021
55	55	P10	-0.158	-3.112	0.000	0.000	0.000	0.021
56	56	P1	0.212	-2.898	0.000	0.000	0.000	0.017
57	57		0.151	-2.900	0.000	0.000	0.000	0.015
58	58	P2	0.098	-2.900	0.000	0.000	0.000	0.012
59	59		0.056	-2.902	0.000	0.000	0.000	0.009
60	60	P3	0.024	-2.902	0.000	0.000	0.000	0.007
61	61		0.002	-2.905	0.000	0.000	0.000	0.005

GROUP 15 DOCKS
DOCK W18

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-0.012	-2.906	0.000	0.000	0.000	0.003
63	63	P4	-0.018	-2.906	0.000	0.000	0.000	0.001
64	64		-0.019	-2.908	0.000	0.000	0.000	-0.001
65	65	P5	-0.016	-2.908	0.000	0.000	0.000	-0.002
66	66		-0.009	-2.910	0.000	0.000	0.000	-0.003
67	67		0.001	-2.912	0.000	0.000	0.000	-0.004
68	68	P6	0.014	-2.911	0.000	0.000	0.000	-0.004
69	69		0.028	-2.913	0.000	0.000	0.000	-0.004
70	70	P7	0.040	-2.913	0.000	0.000	0.000	-0.004
71	71		0.050	-2.915	0.000	0.000	0.000	-0.003
72	72		0.054	-2.916	0.000	0.000	0.000	-0.000
73	73	P8	0.050	-2.916	0.000	0.000	0.000	0.003
74	74		0.034	-2.918	0.000	0.000	0.000	0.007
75	75	P9	0.001	-2.919	0.000	0.000	0.000	0.012
76	76		-0.053	-2.921	0.000	0.000	0.000	0.019
77	77		0.212	-2.877	0.000	0.000	0.000	0.017
78	78		0.151	-2.881	0.000	0.000	0.000	0.015
79	79		0.098	-2.885	0.000	0.000	0.000	0.012
80	80		0.056	-2.890	0.000	0.000	0.000	0.009
81	81		0.024	-2.894	0.000	0.000	0.000	0.007
82	82		0.002	-2.899	0.000	0.000	0.000	0.005
83	83		-0.012	-2.902	0.000	0.000	0.000	0.003
84	84		-0.018	-2.905	0.000	0.000	0.000	0.001
85	85		-0.019	-2.909	0.000	0.000	0.000	-0.001
86	86		-0.016	-2.911	0.000	0.000	0.000	-0.002
87	87		-0.009	-2.914	0.000	0.000	0.000	-0.003
88	88		0.001	-2.916	0.000	0.000	0.000	-0.004
89	89		0.014	-2.916	0.000	0.000	0.000	-0.004
90	90		0.028	-2.918	0.000	0.000	0.000	-0.004
91	91		0.040	-2.918	0.000	0.000	0.000	-0.004
92	92		0.050	-2.919	0.000	0.000	0.000	-0.003
93	93		0.054	-2.917	0.000	0.000	0.000	-0.000
94	94		0.050	-2.912	0.000	0.000	0.000	0.003
95	95		0.034	-2.910	0.000	0.000	0.000	0.007
96	96		0.001	-2.903	0.000	0.000	0.000	0.012
97	97		-0.053	-2.897	0.000	0.000	0.000	0.019
98	98		-0.158	-2.884	0.000	0.000	0.000	0.031
99	99	P11	-0.158	-2.665	0.000	0.000	0.000	0.041
100	100		0.212	-2.781	0.000	0.000	0.000	0.016
101	101		0.151	-2.801	0.000	0.000	0.000	0.013
102	102		0.098	-2.821	0.000	0.000	0.000	0.011
103	103		0.056	-2.843	0.000	0.000	0.000	0.008
104	104		0.024	-2.862	0.000	0.000	0.000	0.005
105	105		0.002	-2.879	0.000	0.000	0.000	0.003
106	106		-0.012	-2.891	0.000	0.000	0.000	0.002
107	107		-0.018	-2.907	0.000	0.000	0.000	-0.001
108	108		-0.019	-2.922	0.000	0.000	0.000	-0.002
109	109		-0.016	-2.932	0.000	0.000	0.000	-0.004
110	110		-0.009	-2.940	0.000	0.000	0.000	-0.005
111	111		0.001	-2.944	0.000	0.000	0.000	-0.005
112	112		0.014	-2.945	0.000	0.000	0.000	-0.005
113	113		0.028	-2.949	0.000	0.000	0.000	-0.006
114	114		0.040	-2.950	0.000	0.000	0.000	-0.006
115	115		0.050	-2.943	0.000	0.000	0.000	-0.004
116	116		0.054	-2.925	0.000	0.000	0.000	-0.002
117	117		0.050	-2.901	0.000	0.000	0.000	0.002
118	118		0.034	-2.877	0.000	0.000	0.000	0.005
119	119		0.001	-2.839	0.000	0.000	0.000	0.011
120	120		-0.053	-2.789	0.000	0.000	0.000	0.018
121	121		0.280	-2.922	0.000	0.000	0.000	0.018
122	122		0.280	-3.034	0.000	0.000	0.000	0.019

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		0.280	-2.876	0.000	0.000	0.000	0.018
124	124		0.280	-2.773	0.000	0.000	0.000	0.017

GROUP 15 DOCKS
DOCK W18

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		4.490	0.000	0.000	0.000	0.000	0.043
2	2		4.312	0.000	0.000	0.000	0.000	0.029
3	3		4.223	0.000	0.000	0.000	0.000	0.013
4	4		4.209	0.000	0.000	0.000	0.000	-0.007
5	5		4.262	0.000	0.000	0.000	0.000	-0.017
6	6		4.355	0.000	0.000	0.000	0.000	-0.022
7	7		4.430	0.000	0.000	0.000	0.000	-0.011
8	8		4.466	0.000	0.000	0.000	0.000	-0.008
9	9		4.495	0.000	0.000	0.000	0.000	-0.004
10	10		4.507	0.000	0.000	0.000	0.000	-0.000
11	11		4.472	0.000	0.000	0.000	0.000	0.018
12	12		4.354	0.000	0.000	0.000	0.000	0.034
13	13		4.190	0.000	0.000	0.000	0.000	0.043
14	14		3.981	0.000	0.000	0.000	0.000	0.054
15	15		3.705	0.000	0.000	0.000	0.000	0.076
16	16		3.331	0.000	0.000	0.000	0.000	0.094
17	17		2.902	0.000	0.000	0.000	0.000	0.104
18	18		2.453	0.000	0.000	0.000	0.000	0.103
19	19		1.969	0.000	0.000	0.000	0.000	0.083
20	20		4.312	-0.037	0.000	0.000	0.000	0.029
21	21		4.223	-0.017	0.000	0.000	0.000	0.013
22	22		4.209	0.008	0.000	0.000	0.000	-0.007
23	23		4.262	0.022	0.000	0.000	0.000	-0.017
24	24		4.355	0.028	0.000	0.000	0.000	-0.022
25	25		4.430	0.014	0.000	0.000	0.000	-0.011
26	26		4.466	0.010	0.000	0.000	0.000	-0.008
27	27		4.495	0.005	0.000	0.000	0.000	-0.004
28	28		4.507	0.001	0.000	0.000	0.000	-0.000
29	29		4.472	-0.023	0.000	0.000	0.000	0.018
30	30		4.354	-0.043	0.000	0.000	0.000	0.034
31	31		4.190	-0.054	0.000	0.000	0.000	0.043
32	32		3.981	-0.067	0.000	0.000	0.000	0.054
33	33		3.705	-0.096	0.000	0.000	0.000	0.076
34	34		3.331	-0.118	0.000	0.000	0.000	0.094
35	35		2.902	-0.130	0.000	0.000	0.000	0.104
36	36		2.453	-0.129	0.000	0.000	0.000	0.103
37	37		1.969	-0.104	0.000	0.000	0.000	0.083
38	38		4.312	-0.210	0.000	0.000	0.000	0.029
39	39		4.223	-0.094	0.000	0.000	0.000	0.013
40	40		4.209	0.048	0.000	0.000	0.000	-0.007
41	41		4.263	0.123	0.000	0.000	0.000	-0.017
42	42		4.355	0.160	0.000	0.000	0.000	-0.022
43	43		4.430	0.082	0.000	0.000	0.000	-0.011
44	44		4.466	0.059	0.000	0.000	0.000	-0.008
45	45		4.496	0.030	0.000	0.000	0.000	-0.004
46	46		4.507	0.003	0.000	0.000	0.000	-0.000
47	47		4.473	-0.130	0.000	0.000	0.000	0.018
48	48		4.354	-0.244	0.000	0.000	0.000	0.034
49	49		4.191	-0.309	0.000	0.000	0.000	0.043
50	50		3.982	-0.384	0.000	0.000	0.000	0.054
51	51		3.705	-0.544	0.000	0.000	0.000	0.076
52	52		3.331	-0.670	0.000	0.000	0.000	0.094
53	53		2.902	-0.744	0.000	0.000	0.000	0.104
54	54		2.453	-0.734	0.000	0.000	0.000	0.103
55	55	P10	1.969	-0.583	0.000	0.000	0.000	0.080
56	56	P1	4.335	0.000	0.000	0.000	0.000	0.033
57	57		4.243	0.000	0.000	0.000	0.000	0.018
58	58	P2	4.203	0.000	0.000	0.000	0.000	0.002
59	59		4.225	0.000	0.000	0.000	0.000	-0.012
60	60	P3	4.284	0.000	0.000	0.000	0.000	-0.020
61	61		4.367	0.000	0.000	0.000	0.000	-0.021

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		4.429	0.000	0.000	0.000	0.000	-0.012
63	63	P4	4.461	0.000	0.000	0.000	0.000	-0.008
64	64		4.489	0.000	0.000	0.000	0.000	-0.006
65	65	P5	4.503	0.000	0.000	0.000	0.000	-0.003
66	66		4.503	0.000	0.000	0.000	0.000	0.005
67	67		4.451	0.000	0.000	0.000	0.000	0.023
68	68	P6	4.340	0.000	0.000	0.000	0.000	0.035
69	69		4.217	0.000	0.000	0.000	0.000	0.041
70	70	P7	4.066	0.000	0.000	0.000	0.000	0.049
71	71		3.888	0.000	0.000	0.000	0.000	0.061
72	72		3.656	0.000	0.000	0.000	0.000	0.080
73	73	P8	3.370	0.000	0.000	0.000	0.000	0.093
74	74		3.049	0.000	0.000	0.000	0.000	0.101
75	75	P9	2.709	0.000	0.000	0.000	0.000	0.105
76	76		2.367	0.000	0.000	0.000	0.000	0.101
77	77		4.335	0.041	0.000	0.000	0.000	0.033
78	78		4.243	0.022	0.000	0.000	0.000	0.018
79	79		4.203	0.002	0.000	0.000	0.000	0.002
80	80		4.225	-0.015	0.000	0.000	0.000	-0.012
81	81		4.284	-0.025	0.000	0.000	0.000	-0.020
82	82		4.367	-0.027	0.000	0.000	0.000	-0.021
83	83		4.429	-0.014	0.000	0.000	0.000	-0.012
84	84		4.461	-0.010	0.000	0.000	0.000	-0.008
85	85		4.489	-0.008	0.000	0.000	0.000	-0.006
86	86		4.503	-0.003	0.000	0.000	0.000	-0.003
87	87		4.503	0.007	0.000	0.000	0.000	0.005
88	88		4.451	0.029	0.000	0.000	0.000	0.023
89	89		4.340	0.044	0.000	0.000	0.000	0.035
90	90		4.217	0.052	0.000	0.000	0.000	0.041
91	91		4.066	0.062	0.000	0.000	0.000	0.049
92	92		3.888	0.077	0.000	0.000	0.000	0.061
93	93		3.656	0.100	0.000	0.000	0.000	0.080
94	94		3.370	0.116	0.000	0.000	0.000	0.093
95	95		3.049	0.127	0.000	0.000	0.000	0.101
96	96		2.709	0.131	0.000	0.000	0.000	0.105
97	97		2.367	0.128	0.000	0.000	0.000	0.101
98	98		1.969	0.104	0.000	0.000	0.000	0.083
99	99	P11	1.968	0.583	0.000	0.000	0.000	0.080
100	100		4.335	0.236	0.000	0.000	0.000	0.033
101	101		4.243	0.127	0.000	0.000	0.000	0.018
102	102		4.203	0.014	0.000	0.000	0.000	0.002
103	103		4.225	-0.083	0.000	0.000	0.000	-0.012
104	104		4.284	-0.145	0.000	0.000	0.000	-0.020
105	105		4.367	-0.152	0.000	0.000	0.000	-0.021
106	106		4.429	-0.083	0.000	0.000	0.000	-0.012
107	107		4.461	-0.056	0.000	0.000	0.000	-0.008
108	108		4.489	-0.044	0.000	0.000	0.000	-0.006
109	109		4.503	-0.020	0.000	0.000	0.000	-0.003
110	110		4.503	0.038	0.000	0.000	0.000	0.005
111	111		4.451	0.166	0.000	0.000	0.000	0.023
112	112		4.340	0.248	0.000	0.000	0.000	0.035
113	113		4.217	0.295	0.000	0.000	0.000	0.041
114	114		4.066	0.352	0.000	0.000	0.000	0.049
115	115		3.888	0.438	0.000	0.000	0.000	0.061
116	116		3.656	0.571	0.000	0.000	0.000	0.080
117	117		3.370	0.663	0.000	0.000	0.000	0.093
118	118		3.050	0.722	0.000	0.000	0.000	0.101
119	119		2.709	0.749	0.000	0.000	0.000	0.105
120	120		2.367	0.727	0.000	0.000	0.000	0.101
121	121		4.490	-0.054	0.000	0.000	0.000	0.043
122	122		4.490	-0.310	0.000	0.000	0.000	0.043

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		4.490	0.054	0.000	0.000	0.000	0.043
124	124		4.490	0.310	0.000	0.000	0.000	0.043

APPENDIX: GROUP 16 DOCKS DATA

GROUP 16 DOCKS
DOCK W19

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P1	Normal	ky'	1.360
2	1	P1	Normal	kx'	1.360
3	2	P2	Normal	ky'	1.360
4	2	P2	Normal	kx'	1.360
5	3	P3	Normal	ky'	1.360
6	3	P3	Normal	kx'	1.360
7	4	P4	Normal	ky'	1.360
8	4	P4	Normal	kx'	1.360
9	5	P5	Normal	ky'	1.360
10	5	P5	Normal	kx'	1.360
11	6	P6	Normal	ky'	1.360
12	6	P6	Normal	kx'	1.360
13	7	P7	Normal	ky'	1.360
14	7	P7	Normal	kx'	1.360
15	8	P8	Normal	ky'	1.360
16	8	P8	Normal	kx'	1.360
17	9	P9	Normal	ky'	1.360
18	9	P9	Normal	kx'	1.360
19	10	P10	Normal	ky'	1.360
20	10	P10	Normal	kx'	1.360
21	11	P11	Normal	ky'	1.360
22	11	P11	Normal	kx'	1.360
23	12	P12	Normal	ky'	1.360
24	12	P12	Normal	kx'	1.360
25	13	P13	Normal	ky'	1.360
26	13	P13	Normal	kx'	1.360
27	14	P14	Normal	ky'	1.360
28	14	P14	Normal	kx'	1.360
29	15	P15	Normal	ky'	1.360
30	15	P15	Normal	kx'	1.360
31	16	P16	Normal	ky'	1.360
32	16	P16	Normal	kx'	1.360
33	17	P17	Normal	ky'	1.360
34	17	P17	Normal	kx'	1.360
35	18	P18	Normal	ky'	1.360
36	18	P18	Normal	kx'	1.360
37	19	P19	Normal	ky'	1.360
38	19	P19	Normal	kx'	1.360
39	20	P20	Normal	ky'	1.360
40	20	P20	Normal	kx'	1.360
41	41	P28	Normal	ky'	1.360
42	41	P28	Normal	kx'	1.360
43	44	P27	Normal	ky'	1.360
44	44	P27	Normal	kx'	1.360
45	47	P26	Normal	ky'	1.360
46	47	P26	Normal	kx'	1.360
47	50	P25	Normal	ky'	1.360
48	50	P25	Normal	kx'	1.360
49	53	P24	Normal	ky'	1.360
50	53	P24	Normal	kx'	1.360
51	56	P23	Normal	ky'	1.360
52	56	P23	Normal	kx'	1.360
53	59	P22	Normal	ky'	1.360
54	59	P22	Normal	kx'	1.360
55	120	P21	Normal	ky'	1.360
56	120	P21	Normal	kx'	1.360

GROUP 16 DOCKS
DOCK W19

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P1	-1.281	1.011	0.000	0.000	0.000	-0.096
2	2	P2	-1.238	0.745	0.000	0.000	0.000	-0.102
3	3	P3	-1.324	0.518	0.000	0.000	0.000	-0.097
4	4	P4	-1.417	0.339	0.000	0.000	0.000	-0.091
5	5	P5	-1.505	0.208	0.000	0.000	0.000	-0.086
6	6	P6	-1.575	0.118	0.000	0.000	0.000	-0.082
7	7	P7	-1.626	0.059	0.000	0.000	0.000	-0.079
8	8	P8	-1.663	0.022	0.000	0.000	0.000	-0.077
9	9	P9	-1.684	-0.000	0.000	0.000	0.000	-0.076
10	10	P10	-1.692	-0.016	0.000	0.000	0.000	-0.076
11	11	P11	-1.690	-0.032	0.000	0.000	0.000	-0.076
12	12	P12	-1.677	-0.053	0.000	0.000	0.000	-0.077
13	13	P13	-1.655	-0.084	0.000	0.000	0.000	-0.078
14	14	P14	-1.625	-0.130	0.000	0.000	0.000	-0.081
15	15	P15	-1.592	-0.193	0.000	0.000	0.000	-0.083
16	16	P16	-1.557	-0.277	0.000	0.000	0.000	-0.085
17	17	P17	-1.534	-0.378	0.000	0.000	0.000	-0.087
18	18	P18	-1.541	-0.485	0.000	0.000	0.000	-0.087
19	19	P19	-1.597	-0.579	0.000	0.000	0.000	-0.084
20	20	P20	-2.324	-0.623	0.000	0.000	0.000	-0.010
21	21		-2.311	-0.624	0.000	0.000	0.000	0.001
22	22		-2.185	1.012	0.000	0.000	0.000	-0.060
23	23		-2.192	0.745	0.000	0.000	0.000	-0.054
24	24		-2.204	0.518	0.000	0.000	0.000	-0.044
25	25		-2.216	0.339	0.000	0.000	0.000	-0.034
26	26		-2.228	0.208	0.000	0.000	0.000	-0.024
27	27		-2.238	0.118	0.000	0.000	0.000	-0.017
28	28		-2.245	0.059	0.000	0.000	0.000	-0.011
29	29		-2.251	0.022	0.000	0.000	0.000	-0.007
30	30		-2.256	-0.000	0.000	0.000	0.000	-0.005
31	31		-2.261	-0.053	0.000	0.000	0.000	-0.006
32	32		-2.260	-0.032	0.000	0.000	0.000	-0.005
33	33		-2.258	-0.016	0.000	0.000	0.000	-0.004
34	34		-2.261	-0.084	0.000	0.000	0.000	-0.009
35	35		-2.261	-0.130	0.000	0.000	0.000	-0.013
36	36		-2.260	-0.194	0.000	0.000	0.000	-0.017
37	37		-2.259	-0.277	0.000	0.000	0.000	-0.021
38	38		-2.261	-0.378	0.000	0.000	0.000	-0.024
39	39		-2.267	-0.486	0.000	0.000	0.000	-0.023
40	40		-2.280	-0.579	0.000	0.000	0.000	-0.018
41	41	P28	-2.260	1.012	0.000	0.000	0.000	-0.060
42	42		-2.260	0.745	0.000	0.000	0.000	-0.054
43	43		-2.259	0.518	0.000	0.000	0.000	-0.044
44	44	P27	-2.258	0.339	0.000	0.000	0.000	-0.034
45	45		-2.259	0.208	0.000	0.000	0.000	-0.024
46	46		-2.259	0.118	0.000	0.000	0.000	-0.017
47	47	P26	-2.259	0.059	0.000	0.000	0.000	-0.011
48	48		-2.261	0.022	0.000	0.000	0.000	-0.007
49	49		-2.262	-0.000	0.000	0.000	0.000	-0.005
50	50	P25	-2.263	-0.016	0.000	0.000	0.000	-0.004
51	51		-2.266	-0.032	0.000	0.000	0.000	-0.005
52	52		-2.269	-0.053	0.000	0.000	0.000	-0.006
53	53	P24	-2.272	-0.084	0.000	0.000	0.000	-0.009
54	54		-2.277	-0.130	0.000	0.000	0.000	-0.013
55	55		-2.281	-0.194	0.000	0.000	0.000	-0.017
56	56	P23	-2.285	-0.277	0.000	0.000	0.000	-0.021
57	57		-2.291	-0.378	0.000	0.000	0.000	-0.024
58	58		-2.297	-0.486	0.000	0.000	0.000	-0.023
59	59	P22	-2.302	-0.579	0.000	0.000	0.000	-0.018
60	60		-2.310	-0.624	0.000	0.000	0.000	0.001
61	61		-2.260	0.963	0.000	0.000	0.000	-0.059

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-2.260	0.715	0.000	0.000	0.000	-0.053
63	63		-2.259	0.506	0.000	0.000	0.000	-0.044
64	64		-2.259	0.215	0.000	0.000	0.000	-0.025
65	65		-2.259	0.128	0.000	0.000	0.000	-0.017
66	66		-2.259	0.068	0.000	0.000	0.000	-0.011
67	67		-2.260	0.030	0.000	0.000	0.000	-0.007
68	68		-2.262	0.006	0.000	0.000	0.000	-0.004
69	69		-2.263	-0.011	0.000	0.000	0.000	-0.003
70	70		-2.265	-0.025	0.000	0.000	0.000	-0.003
71	71		-2.268	-0.042	0.000	0.000	0.000	-0.004
72	72		-2.271	-0.066	0.000	0.000	0.000	-0.006
73	73		-2.274	-0.101	0.000	0.000	0.000	-0.009
74	74		-2.278	-0.150	0.000	0.000	0.000	-0.013
75	75		-2.282	-0.216	0.000	0.000	0.000	-0.017
76	76		-2.287	-0.300	0.000	0.000	0.000	-0.021
77	77		-2.292	-0.397	0.000	0.000	0.000	-0.023
78	78		-2.297	-0.498	0.000	0.000	0.000	-0.023
79	79		-2.302	-0.584	0.000	0.000	0.000	-0.017
80	80		-2.335	0.963	0.000	0.000	0.000	-0.059
81	81		-2.326	0.715	0.000	0.000	0.000	-0.053
82	82		-2.314	0.506	0.000	0.000	0.000	-0.044
83	83		-2.301	0.339	0.000	0.000	0.000	-0.034
84	84		-2.290	0.215	0.000	0.000	0.000	-0.025
85	85		-2.281	0.128	0.000	0.000	0.000	-0.017
86	86		-2.273	0.068	0.000	0.000	0.000	-0.011
87	87		-2.269	0.030	0.000	0.000	0.000	-0.007
88	88		-2.267	0.006	0.000	0.000	0.000	-0.004
89	89		-2.267	-0.011	0.000	0.000	0.000	-0.003
90	90		-2.269	-0.025	0.000	0.000	0.000	-0.003
91	91		-2.273	-0.042	0.000	0.000	0.000	-0.004
92	92		-2.279	-0.066	0.000	0.000	0.000	-0.006
93	93		-2.286	-0.101	0.000	0.000	0.000	-0.009
94	94		-2.295	-0.150	0.000	0.000	0.000	-0.013
95	95		-2.304	-0.216	0.000	0.000	0.000	-0.017
96	96		-2.313	-0.300	0.000	0.000	0.000	-0.021
97	97		-2.322	-0.397	0.000	0.000	0.000	-0.023
98	98		-2.326	-0.498	0.000	0.000	0.000	-0.023
99	99		-2.324	-0.584	0.000	0.000	0.000	-0.017
100	100		-2.309	-0.624	0.000	0.000	0.000	0.001
101	101		-3.080	0.963	0.000	0.000	0.000	-0.077
102	102		-2.929	0.715	0.000	0.000	0.000	-0.062
103	103		-2.718	0.339	0.000	0.000	0.000	-0.043
104	104		-2.612	0.215	0.000	0.000	0.000	-0.034
105	105		-2.527	0.128	0.000	0.000	0.000	-0.026
106	106		-2.460	0.068	0.000	0.000	0.000	-0.020
107	107		-2.414	0.030	0.000	0.000	0.000	-0.016
108	108		-2.385	0.006	0.000	0.000	0.000	-0.013
109	109		-2.372	-0.011	0.000	0.000	0.000	-0.012
110	110		-2.374	-0.025	0.000	0.000	0.000	-0.012
111	111		-2.389	-0.042	0.000	0.000	0.000	-0.013
112	112		-2.415	-0.066	0.000	0.000	0.000	-0.015
113	113		-2.453	-0.101	0.000	0.000	0.000	-0.018
114	114		-2.498	-0.150	0.000	0.000	0.000	-0.022
115	115		-2.548	-0.216	0.000	0.000	0.000	-0.026
116	116		-2.598	-0.300	0.000	0.000	0.000	-0.030
117	117		-2.632	-0.397	0.000	0.000	0.000	-0.033
118	118		-2.629	-0.498	0.000	0.000	0.000	-0.032
119	119		-2.568	-0.584	0.000	0.000	0.000	-0.026
120	120	P21	-2.231	-0.623	0.000	0.000	0.000	0.018
121	121		-2.855	0.506	0.000	0.000	0.000	-0.053
122	122		-2.260	1.284	0.000	0.000	0.000	-0.060

GROUP 16 DOCKS
DOCK W19

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P1	-0.004	-1.761	0.000	0.000	0.000	0.002
2	2	P2	-0.013	-1.750	0.000	0.000	0.000	0.002
3	3	P3	-0.024	-1.734	0.000	0.000	0.000	0.003
4	4	P4	-0.017	-1.715	0.000	0.000	0.000	0.002
5	5	P5	-0.008	-1.703	0.000	0.000	0.000	0.002
6	6	P6	-0.011	-1.692	0.000	0.000	0.000	0.002
7	7	P7	-0.002	-1.682	0.000	0.000	0.000	0.001
8	8	P8	0.007	-1.678	0.000	0.000	0.000	0.001
9	9	P9	0.001	-1.674	0.000	0.000	0.000	0.001
10	10	P10	0.007	-1.669	0.000	0.000	0.000	0.001
11	11	P11	0.011	-1.669	0.000	0.000	0.000	0.001
12	12	P12	0.002	-1.666	0.000	0.000	0.000	0.001
13	13	P13	0.003	-1.660	0.000	0.000	0.000	0.001
14	14	P14	0.002	-1.656	0.000	0.000	0.000	0.001
15	15	P15	-0.011	-1.647	0.000	0.000	0.000	0.002
16	16	P16	-0.014	-1.634	0.000	0.000	0.000	0.002
17	17	P17	-0.016	-1.620	0.000	0.000	0.000	0.002
18	18	P18	-0.029	-1.602	0.000	0.000	0.000	0.003
19	19	P19	-0.026	-1.580	0.000	0.000	0.000	0.003
20	20	P20	-0.015	-1.561	0.000	0.000	0.000	0.002
21	21		0.013	-1.562	0.000	0.000	0.000	0.003
22	22		0.015	-1.761	0.000	0.000	0.000	0.002
23	23		0.013	-1.751	0.000	0.000	0.000	0.003
24	24		0.012	-1.734	0.000	0.000	0.000	0.004
25	25		0.013	-1.716	0.000	0.000	0.000	0.003
26	26		0.014	-1.704	0.000	0.000	0.000	0.002
27	27		0.014	-1.693	0.000	0.000	0.000	0.002
28	28		0.015	-1.683	0.000	0.000	0.000	0.001
29	29		0.016	-1.679	0.000	0.000	0.000	0.001
30	30		0.015	-1.675	0.000	0.000	0.000	0.001
31	31		0.015	-1.666	0.000	0.000	0.000	0.001
32	32		0.016	-1.669	0.000	0.000	0.000	0.000
33	33		0.016	-1.670	0.000	0.000	0.000	0.001
34	34		0.015	-1.660	0.000	0.000	0.000	0.001
35	35		0.015	-1.656	0.000	0.000	0.000	0.001
36	36		0.014	-1.648	0.000	0.000	0.000	0.003
37	37		0.013	-1.634	0.000	0.000	0.000	0.003
38	38		0.013	-1.621	0.000	0.000	0.000	0.003
39	39		0.011	-1.603	0.000	0.000	0.000	0.005
40	40		0.011	-1.580	0.000	0.000	0.000	0.004
41	41	P28	0.017	-1.761	0.000	0.000	0.000	0.002
42	42		0.017	-1.751	0.000	0.000	0.000	0.003
43	43		0.017	-1.734	0.000	0.000	0.000	0.004
44	44	P27	0.017	-1.716	0.000	0.000	0.000	0.003
45	45		0.017	-1.704	0.000	0.000	0.000	0.002
46	46		0.017	-1.693	0.000	0.000	0.000	0.002
47	47	P26	0.017	-1.683	0.000	0.000	0.000	0.001
48	48		0.017	-1.679	0.000	0.000	0.000	0.001
49	49		0.017	-1.675	0.000	0.000	0.000	0.001
50	50	P25	0.017	-1.670	0.000	0.000	0.000	0.001
51	51		0.017	-1.669	0.000	0.000	0.000	0.000
52	52		0.017	-1.666	0.000	0.000	0.000	0.001
53	53	P24	0.017	-1.660	0.000	0.000	0.000	0.001
54	54		0.017	-1.656	0.000	0.000	0.000	0.001
55	55		0.017	-1.648	0.000	0.000	0.000	0.003
56	56	P23	0.017	-1.634	0.000	0.000	0.000	0.003
57	57		0.017	-1.621	0.000	0.000	0.000	0.003
58	58		0.017	-1.603	0.000	0.000	0.000	0.005
59	59	P22	0.017	-1.580	0.000	0.000	0.000	0.004
60	60		0.017	-1.562	0.000	0.000	0.000	0.003
61	61		0.017	-1.759	0.000	0.000	0.000	0.002

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		0.017	-1.749	0.000	0.000	0.000	0.003
63	63		0.017	-1.733	0.000	0.000	0.000	0.004
64	64		0.017	-1.705	0.000	0.000	0.000	0.002
65	65		0.017	-1.694	0.000	0.000	0.000	0.002
66	66		0.017	-1.684	0.000	0.000	0.000	0.002
67	67		0.017	-1.679	0.000	0.000	0.000	0.001
68	68		0.017	-1.676	0.000	0.000	0.000	0.001
69	69		0.017	-1.671	0.000	0.000	0.000	0.001
70	70		0.017	-1.669	0.000	0.000	0.000	-0.000
71	71		0.017	-1.668	0.000	0.000	0.000	0.001
72	72		0.017	-1.663	0.000	0.000	0.000	0.001
73	73		0.017	-1.659	0.000	0.000	0.000	0.001
74	74		0.017	-1.654	0.000	0.000	0.000	0.002
75	75		0.017	-1.644	0.000	0.000	0.000	0.003
76	76		0.017	-1.631	0.000	0.000	0.000	0.003
77	77		0.017	-1.618	0.000	0.000	0.000	0.003
78	78		0.017	-1.600	0.000	0.000	0.000	0.005
79	79		0.017	-1.579	0.000	0.000	0.000	0.004
80	80		0.019	-1.759	0.000	0.000	0.000	0.002
81	81		0.020	-1.749	0.000	0.000	0.000	0.003
82	82		0.022	-1.733	0.000	0.000	0.000	0.004
83	83		0.021	-1.716	0.000	0.000	0.000	0.003
84	84		0.020	-1.705	0.000	0.000	0.000	0.002
85	85		0.020	-1.694	0.000	0.000	0.000	0.002
86	86		0.019	-1.684	0.000	0.000	0.000	0.002
87	87		0.017	-1.679	0.000	0.000	0.000	0.001
88	88		0.018	-1.676	0.000	0.000	0.000	0.001
89	89		0.018	-1.671	0.000	0.000	0.000	0.001
90	90		0.017	-1.669	0.000	0.000	0.000	-0.000
91	91		0.017	-1.668	0.000	0.000	0.000	0.001
92	92		0.018	-1.663	0.000	0.000	0.000	0.001
93	93		0.018	-1.659	0.000	0.000	0.000	0.001
94	94		0.019	-1.654	0.000	0.000	0.000	0.002
95	95		0.020	-1.644	0.000	0.000	0.000	0.003
96	96		0.020	-1.631	0.000	0.000	0.000	0.003
97	97		0.021	-1.618	0.000	0.000	0.000	0.003
98	98		0.023	-1.600	0.000	0.000	0.000	0.005
99	99		0.022	-1.579	0.000	0.000	0.000	0.004
100	100		0.020	-1.562	0.000	0.000	0.000	0.003
101	101		0.038	-1.759	0.000	0.000	0.000	0.002
102	102		0.050	-1.749	0.000	0.000	0.000	0.003
103	103		0.053	-1.716	0.000	0.000	0.000	0.003
104	104		0.042	-1.705	0.000	0.000	0.000	0.002
105	105		0.045	-1.695	0.000	0.000	0.000	0.002
106	106		0.038	-1.684	0.000	0.000	0.000	0.002
107	107		0.023	-1.680	0.000	0.000	0.000	0.001
108	108		0.028	-1.676	0.000	0.000	0.000	0.001
109	109		0.029	-1.671	0.000	0.000	0.000	0.001
110	110		0.016	-1.669	0.000	0.000	0.000	-0.000
111	111		0.024	-1.668	0.000	0.000	0.000	0.001
112	112		0.033	-1.664	0.000	0.000	0.000	0.001
113	113		0.024	-1.659	0.000	0.000	0.000	0.001
114	114		0.034	-1.654	0.000	0.000	0.000	0.002
115	115		0.050	-1.644	0.000	0.000	0.000	0.003
116	116		0.047	-1.631	0.000	0.000	0.000	0.003
117	117		0.056	-1.618	0.000	0.000	0.000	0.003
118	118		0.070	-1.600	0.000	0.000	0.000	0.005
119	119		0.064	-1.579	0.000	0.000	0.000	0.004
120	120	P21	0.042	-1.561	0.000	0.000	0.000	0.002
121	121		0.064	-1.733	0.000	0.000	0.000	0.004
122	122		0.017	-1.769	0.000	0.000	0.000	0.002

APPENDIX: GROUP 17 DOCKS DATA

GROUP 17 DOCKS
DOCK W20

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	2	P1	Normal	ky'	1.060
2	2	P1	Normal	kx'	1.060
3	20	P10	Normal	ky'	1.060
4	20	P10	Normal	kx'	1.060
5	22	P11	Normal	ky'	1.060
6	22	P11	Normal	kx'	1.060
7	67	P12	Normal	ky'	1.360
8	67	P12	Normal	kx'	1.360
9	94	P13	Normal	ky'	1.360
10	94	P13	Normal	kx'	1.360
11	4	P2	Normal	ky'	1.060
12	4	P2	Normal	kx'	1.060
13	6	P3	Normal	ky'	1.060
14	6	P3	Normal	kx'	1.060
15	8	P4	Normal	ky'	1.060
16	8	P4	Normal	kx'	1.060
17	10	P5	Normal	ky'	1.060
18	10	P5	Normal	kx'	1.060
19	12	P6	Normal	ky'	1.060
20	12	P6	Normal	kx'	1.060
21	14	P7	Normal	ky'	1.060
22	14	P7	Normal	kx'	1.060
23	16	P8	Normal	ky'	1.060
24	16	P8	Normal	kx'	1.060
25	18	P9	Normal	ky'	1.060
26	18	P9	Normal	kx'	1.060

GROUP 17 DOCKS
DOCK W20

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-3.491	-1.145	0.000	0.000	0.000	0.074
2	2	P1	-3.491	-0.821	0.000	0.000	0.000	0.076
3	3		-3.491	-0.523	0.000	0.000	0.000	0.062
4	4	P2	-3.490	-0.289	0.000	0.000	0.000	0.047
5	5		-3.491	-0.121	0.000	0.000	0.000	0.032
6	6	P3	-3.489	-0.010	0.000	0.000	0.000	0.020
7	7		-3.490	0.055	0.000	0.000	0.000	0.012
8	8	P4	-3.489	0.085	0.000	0.000	0.000	0.005
9	9		-3.491	0.092	0.000	0.000	0.000	0.001
10	10	P5	-3.491	0.082	0.000	0.000	0.000	-0.002
11	11		-3.493	0.064	0.000	0.000	0.000	-0.004
12	12	P6	-3.492	0.041	0.000	0.000	0.000	-0.004
13	13		-3.495	0.016	0.000	0.000	0.000	-0.004
14	14	P7	-3.495	-0.008	0.000	0.000	0.000	-0.004
15	15		-3.498	-0.029	0.000	0.000	0.000	-0.003
16	16	P8	-3.499	-0.046	0.000	0.000	0.000	-0.002
17	17		-3.502	-0.057	0.000	0.000	0.000	-0.000
18	18	P9	-3.503	-0.056	0.000	0.000	0.000	0.003
19	19		-3.507	-0.041	0.000	0.000	0.000	0.007
20	20	P10	-3.509	-0.004	0.000	0.000	0.000	0.013
21	21		-3.513	0.062	0.000	0.000	0.000	0.020
22	22	P11	-3.515	0.163	0.000	0.000	0.000	0.028
23	23		-3.520	0.336	0.000	0.000	0.000	0.040
24	24		-3.586	-0.821	0.000	0.000	0.000	0.076
25	25		-3.569	-0.523	0.000	0.000	0.000	0.062
26	26		-3.548	-0.289	0.000	0.000	0.000	0.047
27	27		-3.531	-0.121	0.000	0.000	0.000	0.032
28	28		-3.515	-0.010	0.000	0.000	0.000	0.020
29	29		-3.505	0.055	0.000	0.000	0.000	0.012
30	30		-3.496	0.085	0.000	0.000	0.000	0.005
31	31		-3.492	0.092	0.000	0.000	0.000	0.001
32	32		-3.488	0.082	0.000	0.000	0.000	-0.002
33	33		-3.488	0.064	0.000	0.000	0.000	-0.004
34	34		-3.487	0.041	0.000	0.000	0.000	-0.004
35	35		-3.490	0.016	0.000	0.000	0.000	-0.004
36	36		-3.491	-0.008	0.000	0.000	0.000	-0.004
37	37		-3.494	-0.029	0.000	0.000	0.000	-0.003
38	38		-3.496	-0.046	0.000	0.000	0.000	-0.002
39	39		-3.502	-0.057	0.000	0.000	0.000	-0.000
40	40		-3.507	-0.056	0.000	0.000	0.000	0.003
41	41		-3.516	-0.041	0.000	0.000	0.000	0.007
42	42		-3.525	-0.004	0.000	0.000	0.000	0.013
43	43		-3.537	0.062	0.000	0.000	0.000	0.020
44	44		-3.570	0.336	0.000	0.000	0.000	0.040
45	45		-3.550	0.163	0.000	0.000	0.000	0.028
46	46		-6.283	-0.821	0.000	0.000	0.000	0.271
47	47		-5.156	-0.523	0.000	0.000	0.000	0.159
48	48		-4.983	-0.289	0.000	0.000	0.000	0.144
49	49		-4.822	-0.121	0.000	0.000	0.000	0.130
50	50		-4.686	-0.010	0.000	0.000	0.000	0.118
51	51		-4.587	0.055	0.000	0.000	0.000	0.109
52	52		-4.514	0.085	0.000	0.000	0.000	0.103
53	53		-4.466	0.092	0.000	0.000	0.000	0.098
54	54		-4.433	0.082	0.000	0.000	0.000	0.095
55	55		-4.415	0.064	0.000	0.000	0.000	0.094
56	56		-4.409	0.041	0.000	0.000	0.000	0.093
57	57		-4.413	0.016	0.000	0.000	0.000	0.093
58	58		-4.418	-0.008	0.000	0.000	0.000	0.094
59	59		-4.428	-0.029	0.000	0.000	0.000	0.094
60	60		-4.440	-0.046	0.000	0.000	0.000	0.095
61	61		-4.465	-0.057	0.000	0.000	0.000	0.097

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-4.502	-0.056	0.000	0.000	0.000	0.100
63	63		-4.553	-0.041	0.000	0.000	0.000	0.105
64	64		-4.618	-0.004	0.000	0.000	0.000	0.110
65	65		-4.701	0.062	0.000	0.000	0.000	0.117
66	66		-4.802	0.163	0.000	0.000	0.000	0.126
67	67	P12	-2.980	0.336	0.000	0.000	0.000	-0.073
68	68		-3.398	-0.884	0.000	0.000	0.000	0.074
69	69		-3.411	-0.619	0.000	0.000	0.000	0.064
70	70		-3.426	-0.400	0.000	0.000	0.000	0.052
71	71		-3.441	-0.226	0.000	0.000	0.000	0.039
72	72		-3.454	-0.098	0.000	0.000	0.000	0.029
73	73		-3.464	-0.009	0.000	0.000	0.000	0.020
74	74		-3.476	0.047	0.000	0.000	0.000	0.011
75	75		-3.484	0.078	0.000	0.000	0.000	0.005
76	76		-3.490	0.091	0.000	0.000	0.000	0.000
77	77		-3.494	0.090	0.000	0.000	0.000	-0.003
78	78		-3.496	0.080	0.000	0.000	0.000	-0.004
79	79		-3.498	0.063	0.000	0.000	0.000	-0.004
80	80		-3.499	0.043	0.000	0.000	0.000	-0.005
81	81		-3.502	0.023	0.000	0.000	0.000	-0.006
82	82		-3.503	0.003	0.000	0.000	0.000	-0.006
83	83		-3.490	0.047	0.000	0.000	0.000	0.011
84	84		-3.504	-0.033	0.000	0.000	0.000	-0.005
85	85		-3.503	-0.047	0.000	0.000	0.000	-0.003
86	86		-3.503	-0.056	0.000	0.000	0.000	-0.001
87	87		-3.503	-0.058	0.000	0.000	0.000	0.000
88	88		-3.502	-0.050	0.000	0.000	0.000	0.003
89	89		-3.499	-0.028	0.000	0.000	0.000	0.007
90	90		-3.494	0.011	0.000	0.000	0.000	0.013
91	91		-3.488	0.071	0.000	0.000	0.000	0.020
92	92		-3.480	0.155	0.000	0.000	0.000	0.027
93	93		-3.471	0.336	0.000	0.000	0.000	0.040
94	94	P13	-2.189	0.336	0.000	0.000	0.000	0.190
95	95		-3.494	0.155	0.000	0.000	0.000	-0.002
96	96		-3.556	0.071	0.000	0.000	0.000	-0.010
97	97		-3.610	0.011	0.000	0.000	0.000	-0.017
98	98		-3.654	-0.028	0.000	0.000	0.000	-0.023
99	99		-3.686	-0.050	0.000	0.000	0.000	-0.027
100	100		-3.704	-0.058	0.000	0.000	0.000	-0.029
101	101		-3.716	-0.056	0.000	0.000	0.000	-0.031
102	102		-3.725	-0.047	0.000	0.000	0.000	-0.032
103	103		-3.740	-0.033	0.000	0.000	0.000	-0.034
104	104		-3.748	-0.016	0.000	0.000	0.000	-0.035
105	105		-3.751	0.003	0.000	0.000	0.000	-0.036
106	106		-3.749	0.023	0.000	0.000	0.000	-0.036
107	107		-3.740	0.043	0.000	0.000	0.000	-0.035
108	108		-3.730	0.063	0.000	0.000	0.000	-0.034
109	109		-3.727	0.080	0.000	0.000	0.000	-0.034
110	110		-3.716	0.090	0.000	0.000	0.000	-0.032
111	111		-3.691	0.091	0.000	0.000	0.000	-0.029
112	112		-3.654	0.078	0.000	0.000	0.000	-0.025
113	113		-3.600	0.047	0.000	0.000	0.000	-0.018
114	114		-3.527	-0.009	0.000	0.000	0.000	-0.009
115	115		-3.457	-0.098	0.000	0.000	0.000	-0.001
116	116		-3.370	-0.226	0.000	0.000	0.000	0.010
117	117		-3.269	-0.400	0.000	0.000	0.000	0.022
118	118		-3.166	-0.619	0.000	0.000	0.000	0.035
119	119		-3.291	-0.884	0.000	0.000	0.000	0.015
120	120		-3.491	-0.884	0.000	0.000	0.000	0.074
121	121		-3.491	-0.619	0.000	0.000	0.000	0.064
122	122		-3.491	-0.400	0.000	0.000	0.000	0.052

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		-3.490	-0.226	0.000	0.000	0.000	0.039
124	124		-3.490	-0.098	0.000	0.000	0.000	0.029
125	125		-3.489	-0.009	0.000	0.000	0.000	0.020
126	126		-3.490	0.078	0.000	0.000	0.000	0.005
127	127		-3.490	0.091	0.000	0.000	0.000	0.000
128	128		-3.491	0.090	0.000	0.000	0.000	-0.003
129	129		-3.491	0.080	0.000	0.000	0.000	-0.004
130	130		-3.493	0.063	0.000	0.000	0.000	-0.004
131	131		-3.493	0.043	0.000	0.000	0.000	-0.005
132	132		-3.494	0.023	0.000	0.000	0.000	-0.006
133	133		-3.495	0.003	0.000	0.000	0.000	-0.006
134	134		-3.496	-0.016	0.000	0.000	0.000	-0.006
135	135		-3.498	-0.033	0.000	0.000	0.000	-0.005
136	136		-3.499	-0.047	0.000	0.000	0.000	-0.003
137	137		-3.502	-0.056	0.000	0.000	0.000	-0.001
138	138		-3.503	-0.058	0.000	0.000	0.000	0.000
139	139		-3.506	-0.050	0.000	0.000	0.000	0.003
140	140		-3.510	0.011	0.000	0.000	0.000	0.013
141	141		-3.513	0.071	0.000	0.000	0.000	0.020
142	142		-3.515	0.155	0.000	0.000	0.000	0.027
143	143		-3.504	-0.016	0.000	0.000	0.000	-0.006
144	144		-3.508	-0.028	0.000	0.000	0.000	0.007
145	145	End Spring 1	-0.821	3.587	0.000	0.000	0.000	0.253
146	146	End Spring 2	-0.523	3.569	0.000	0.000	0.000	0.150
147	147	End Spring 3	-0.289	3.548	0.000	0.000	0.000	0.135
148	148	End Spring 4	-0.121	3.531	0.000	0.000	0.000	0.121
149	149	End Spring 5	-0.010	3.515	0.000	0.000	0.000	0.109
150	150	End Spring 6	0.055	3.505	0.000	0.000	0.000	0.100
151	151	End Spring 7	0.085	3.496	0.000	0.000	0.000	0.094
152	152	End Spring 8	0.092	3.492	0.000	0.000	0.000	0.089
153	153	End Spring 9	0.082	3.488	0.000	0.000	0.000	0.086
154	154	End Spring 10	0.064	3.488	0.000	0.000	0.000	0.085
155	155	End Spring 11	0.041	3.487	0.000	0.000	0.000	0.084
156	156	End Spring 12	0.016	3.490	0.000	0.000	0.000	0.084
157	157	End Spring 13	-0.008	3.491	0.000	0.000	0.000	0.085
158	158	End Spring 14	-0.029	3.494	0.000	0.000	0.000	0.085
159	159	End Spring 15	-0.046	3.496	0.000	0.000	0.000	0.086
160	160	End Spring 16	-0.057	3.502	0.000	0.000	0.000	0.088
161	161	End Spring 17	-0.056	3.507	0.000	0.000	0.000	0.091
162	162	End Spring 18	-0.041	3.516	0.000	0.000	0.000	0.096
163	163	End Spring 19	-0.004	3.525	0.000	0.000	0.000	0.101
164	164	End Spring 20	0.062	3.538	0.000	0.000	0.000	0.108
165	165	End Spring 21	0.336	3.571	0.000	0.000	0.000	-0.041
166	166	End Spring 22	0.163	3.551	0.000	0.000	0.000	0.117
167	167	End Spring 23	-0.884	3.399	0.000	0.000	0.000	0.019
168	168	End Spring 24	-0.619	3.411	0.000	0.000	0.000	0.037
169	169	End Spring 25	-0.400	3.426	0.000	0.000	0.000	0.024
170	170	End Spring 26	-0.226	3.441	0.000	0.000	0.000	0.012
171	171	End Spring 27	-0.098	3.454	0.000	0.000	0.000	0.001
172	172	End Spring 28	-0.009	3.464	0.000	0.000	0.000	-0.007
173	173	End Spring 29	0.047	3.476	0.000	0.000	0.000	-0.016
174	174	End Spring 30	0.078	3.484	0.000	0.000	0.000	-0.023
175	175	End Spring 31	0.091	3.490	0.000	0.000	0.000	-0.027
176	176	End Spring 32	0.090	3.494	0.000	0.000	0.000	-0.030
177	177	End Spring 33	0.080	3.496	0.000	0.000	0.000	-0.032
178	178	End Spring 34	0.063	3.498	0.000	0.000	0.000	-0.032
179	179	End Spring 35	0.043	3.499	0.000	0.000	0.000	-0.033
180	180	End Spring 36	0.023	3.502	0.000	0.000	0.000	-0.034
181	181	End Spring 37	0.003	3.503	0.000	0.000	0.000	-0.034
182	182	End Spring 38	-0.033	3.504	0.000	0.000	0.000	-0.032
183	183	End Spring 39	-0.047	3.503	0.000	0.000	0.000	-0.030

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 40	-0.056	3.504	0.000	0.000	0.000	-0.029
185	185	End Spring 41	-0.058	3.503	0.000	0.000	0.000	-0.027
186	186	End Spring 42	-0.050	3.502	0.000	0.000	0.000	-0.025
187	187	End Spring 43	0.011	3.494	0.000	0.000	0.000	-0.015
188	188	End Spring 44	0.071	3.488	0.000	0.000	0.000	-0.008
189	189	End Spring 45	0.336	3.471	0.000	0.000	0.000	0.175
190	190	End Spring 46	0.155	3.480	0.000	0.000	0.000	-0.000
191	191	End Spring 47	-0.016	3.504	0.000	0.000	0.000	-0.034
192	192	End Spring 48	-0.028	3.499	0.000	0.000	0.000	-0.021

GROUP 17 DOCKS
DOCK W20

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1		-0.007	-5.427	0.000	0.000	0.000	0.030
2	2	P1	-0.007	-5.297	0.000	0.000	0.000	0.030
3	3		-0.007	-5.162	0.000	0.000	0.000	0.032
4	4	P2	-0.007	-5.017	0.000	0.000	0.000	0.030
5	5		-0.007	-4.900	0.000	0.000	0.000	0.025
6	6	P3	-0.007	-4.801	0.000	0.000	0.000	0.018
7	7		-0.007	-4.740	0.000	0.000	0.000	0.012
8	8	P4	-0.007	-4.698	0.000	0.000	0.000	0.006
9	9		-0.007	-4.689	0.000	0.000	0.000	0.001
10	10	P5	-0.007	-4.691	0.000	0.000	0.000	-0.003
11	11		-0.007	-4.715	0.000	0.000	0.000	-0.005
12	12	P6	-0.007	-4.735	0.000	0.000	0.000	-0.006
13	13		-0.007	-4.761	0.000	0.000	0.000	-0.003
14	14	P7	-0.007	-4.761	0.000	0.000	0.000	0.002
15	15		-0.007	-4.742	0.000	0.000	0.000	0.010
16	16	P8	-0.007	-4.666	0.000	0.000	0.000	0.023
17	17		-0.007	-4.533	0.000	0.000	0.000	0.040
18	18	P9	-0.007	-4.306	0.000	0.000	0.000	0.061
19	19		-0.007	-3.984	0.000	0.000	0.000	0.086
20	20	P10	-0.008	-3.543	0.000	0.000	0.000	0.111
21	21		-0.008	-3.007	0.000	0.000	0.000	0.132
22	22	P11	-0.008	-2.391	0.000	0.000	0.000	0.142
23	23		-0.008	-1.677	0.000	0.000	0.000	0.125
24	24		-0.044	-5.297	0.000	0.000	0.000	0.030
25	25		-0.047	-5.162	0.000	0.000	0.000	0.032
26	26		-0.044	-5.017	0.000	0.000	0.000	0.030
27	27		-0.038	-4.900	0.000	0.000	0.000	0.025
28	28		-0.030	-4.801	0.000	0.000	0.000	0.018
29	29		-0.021	-4.740	0.000	0.000	0.000	0.012
30	30		-0.014	-4.698	0.000	0.000	0.000	0.006
31	31		-0.008	-4.689	0.000	0.000	0.000	0.001
32	32		-0.003	-4.691	0.000	0.000	0.000	-0.003
33	33		-0.000	-4.715	0.000	0.000	0.000	-0.005
34	34		0.000	-4.735	0.000	0.000	0.000	-0.006
35	35		-0.003	-4.761	0.000	0.000	0.000	-0.003
36	36		-0.009	-4.761	0.000	0.000	0.000	0.002
37	37		-0.020	-4.742	0.000	0.000	0.000	0.010
38	38		-0.036	-4.666	0.000	0.000	0.000	0.023
39	39		-0.057	-4.533	0.000	0.000	0.000	0.040
40	40		-0.085	-4.306	0.000	0.000	0.000	0.061
41	41		-0.115	-3.984	0.000	0.000	0.000	0.086
42	42		-0.147	-3.543	0.000	0.000	0.000	0.111
43	43		-0.173	-3.007	0.000	0.000	0.000	0.132
44	44		-0.165	-1.677	0.000	0.000	0.000	0.125
45	45		-0.186	-2.391	0.000	0.000	0.000	0.142
46	46		-0.343	-5.299	0.000	0.000	0.000	0.030
47	47		-0.374	-5.163	0.000	0.000	0.000	0.032
48	48		-0.347	-5.018	0.000	0.000	0.000	0.030
49	49		-0.286	-4.901	0.000	0.000	0.000	0.025
50	50		-0.213	-4.802	0.000	0.000	0.000	0.018
51	51		-0.138	-4.741	0.000	0.000	0.000	0.012
52	52		-0.070	-4.699	0.000	0.000	0.000	0.006
53	53		-0.013	-4.690	0.000	0.000	0.000	0.001
54	54		0.029	-4.692	0.000	0.000	0.000	-0.003
55	55		0.054	-4.716	0.000	0.000	0.000	-0.005
56	56		0.056	-4.736	0.000	0.000	0.000	-0.006
57	57		0.032	-4.762	0.000	0.000	0.000	-0.003
58	58		-0.025	-4.762	0.000	0.000	0.000	0.002
59	59		-0.121	-4.743	0.000	0.000	0.000	0.010
60	60		-0.266	-4.667	0.000	0.000	0.000	0.023
61	61		-0.460	-4.534	0.000	0.000	0.000	0.040

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
62	62		-0.704	-4.307	0.000	0.000	0.000	0.061
63	63		-0.981	-3.985	0.000	0.000	0.000	0.086
64	64		-1.269	-3.544	0.000	0.000	0.000	0.111
65	65		-1.502	-3.008	0.000	0.000	0.000	0.132
66	66		-1.617	-2.392	0.000	0.000	0.000	0.142
67	67	P12	-0.426	-1.677	0.000	0.000	0.000	0.023
68	68		0.031	-5.322	0.000	0.000	0.000	0.030
69	69		0.032	-5.210	0.000	0.000	0.000	0.031
70	70		0.035	-5.090	0.000	0.000	0.000	0.033
71	71		0.027	-4.976	0.000	0.000	0.000	0.027
72	72		0.024	-4.882	0.000	0.000	0.000	0.024
73	73		0.016	-4.800	0.000	0.000	0.000	0.018
74	74		0.008	-4.748	0.000	0.000	0.000	0.012
75	75		0.004	-4.708	0.000	0.000	0.000	0.009
76	76		-0.005	-4.691	0.000	0.000	0.000	0.001
77	77		-0.006	-4.688	0.000	0.000	0.000	0.000
78	78		-0.013	-4.694	0.000	0.000	0.000	-0.005
79	79		-0.013	-4.716	0.000	0.000	0.000	-0.005
80	80		-0.013	-4.732	0.000	0.000	0.000	-0.005
81	81		-0.014	-4.755	0.000	0.000	0.000	-0.006
82	82		-0.006	-4.764	0.000	0.000	0.000	0.000
83	83		-0.007	-4.748	0.000	0.000	0.000	0.012
84	84		0.010	-4.729	0.000	0.000	0.000	0.014
85	85		0.022	-4.658	0.000	0.000	0.000	0.023
86	86		0.040	-4.549	0.000	0.000	0.000	0.038
87	87		0.064	-4.372	0.000	0.000	0.000	0.057
88	88		0.086	-4.131	0.000	0.000	0.000	0.074
89	89		0.116	-3.811	0.000	0.000	0.000	0.098
90	90		0.139	-3.412	0.000	0.000	0.000	0.116
91	91		0.160	-2.946	0.000	0.000	0.000	0.134
92	92		0.171	-2.430	0.000	0.000	0.000	0.142
93	93		0.149	-1.677	0.000	0.000	0.000	0.125
94	94	P13	0.486	-1.676	0.000	0.000	0.000	0.047
95	95		1.157	-2.430	0.000	0.000	0.000	0.142
96	96		1.091	-2.946	0.000	0.000	0.000	0.134
97	97		0.947	-3.412	0.000	0.000	0.000	0.116
98	98		0.796	-3.811	0.000	0.000	0.000	0.098
99	99		0.601	-4.131	0.000	0.000	0.000	0.074
100	100		0.458	-4.372	0.000	0.000	0.000	0.057
101	101		0.301	-4.549	0.000	0.000	0.000	0.038
102	102		0.185	-4.659	0.000	0.000	0.000	0.023
103	103		0.105	-4.730	0.000	0.000	0.000	0.014
104	104		0.017	-4.758	0.000	0.000	0.000	0.003
105	105		-0.003	-4.764	0.000	0.000	0.000	0.000
106	106		-0.053	-4.755	0.000	0.000	0.000	-0.006
107	107		-0.048	-4.732	0.000	0.000	0.000	-0.005
108	108		-0.049	-4.716	0.000	0.000	0.000	-0.005
109	109		-0.046	-4.694	0.000	0.000	0.000	-0.005
110	110		-0.003	-4.688	0.000	0.000	0.000	0.000
111	111		0.004	-4.691	0.000	0.000	0.000	0.001
112	112		0.065	-4.708	0.000	0.000	0.000	0.009
113	113		0.090	-4.748	0.000	0.000	0.000	0.012
114	114		0.141	-4.800	0.000	0.000	0.000	0.018
115	115		0.194	-4.883	0.000	0.000	0.000	0.024
116	116		0.215	-4.976	0.000	0.000	0.000	0.027
117	117		0.267	-5.090	0.000	0.000	0.000	0.033
118	118		0.245	-5.210	0.000	0.000	0.000	0.031
119	119		0.238	-5.322	0.000	0.000	0.000	0.030
120	120		-0.007	-5.322	0.000	0.000	0.000	0.030
121	121		-0.007	-5.210	0.000	0.000	0.000	0.031
122	122		-0.007	-5.090	0.000	0.000	0.000	0.033

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
123	123		-0.007	-4.976	0.000	0.000	0.000	0.027
124	124		-0.007	-4.882	0.000	0.000	0.000	0.024
125	125		-0.007	-4.800	0.000	0.000	0.000	0.018
126	126		-0.007	-4.708	0.000	0.000	0.000	0.009
127	127		-0.007	-4.691	0.000	0.000	0.000	0.001
128	128		-0.007	-4.688	0.000	0.000	0.000	0.000
129	129		-0.007	-4.694	0.000	0.000	0.000	-0.005
130	130		-0.007	-4.716	0.000	0.000	0.000	-0.005
131	131		-0.007	-4.732	0.000	0.000	0.000	-0.005
132	132		-0.007	-4.755	0.000	0.000	0.000	-0.006
133	133		-0.007	-4.764	0.000	0.000	0.000	0.000
134	134		-0.007	-4.758	0.000	0.000	0.000	0.003
135	135		-0.007	-4.729	0.000	0.000	0.000	0.014
136	136		-0.007	-4.658	0.000	0.000	0.000	0.023
137	137		-0.007	-4.549	0.000	0.000	0.000	0.038
138	138		-0.007	-4.372	0.000	0.000	0.000	0.057
139	139		-0.007	-4.131	0.000	0.000	0.000	0.074
140	140		-0.008	-3.412	0.000	0.000	0.000	0.116
141	141		-0.008	-2.946	0.000	0.000	0.000	0.134
142	142		-0.008	-2.430	0.000	0.000	0.000	0.142
143	143		-0.003	-4.758	0.000	0.000	0.000	0.003
144	144		-0.007	-3.811	0.000	0.000	0.000	0.098
145	145	End Spring 1	-5.297	0.044	0.000	0.000	0.000	0.030
146	146	End Spring 2	-5.163	0.047	0.000	0.000	0.000	0.032
147	147	End Spring 3	-5.018	0.044	0.000	0.000	0.000	0.030
148	148	End Spring 4	-4.901	0.038	0.000	0.000	0.000	0.025
149	149	End Spring 5	-4.801	0.030	0.000	0.000	0.000	0.018
150	150	End Spring 6	-4.740	0.021	0.000	0.000	0.000	0.012
151	151	End Spring 7	-4.698	0.014	0.000	0.000	0.000	0.006
152	152	End Spring 8	-4.689	0.008	0.000	0.000	0.000	0.001
153	153	End Spring 9	-4.691	0.003	0.000	0.000	0.000	-0.003
154	154	End Spring 10	-4.715	0.000	0.000	0.000	0.000	-0.005
155	155	End Spring 11	-4.735	-0.000	0.000	0.000	0.000	-0.006
156	156	End Spring 12	-4.761	0.003	0.000	0.000	0.000	-0.003
157	157	End Spring 13	-4.762	0.009	0.000	0.000	0.000	0.002
158	158	End Spring 14	-4.742	0.020	0.000	0.000	0.000	0.010
159	159	End Spring 15	-4.666	0.036	0.000	0.000	0.000	0.023
160	160	End Spring 16	-4.533	0.057	0.000	0.000	0.000	0.040
161	161	End Spring 17	-4.306	0.085	0.000	0.000	0.000	0.061
162	162	End Spring 18	-3.985	0.115	0.000	0.000	0.000	0.086
163	163	End Spring 19	-3.543	0.147	0.000	0.000	0.000	0.111
164	164	End Spring 20	-3.007	0.173	0.000	0.000	0.000	0.132
165	165	End Spring 21	-1.677	0.165	0.000	0.000	0.000	0.032
166	166	End Spring 22	-2.392	0.186	0.000	0.000	0.000	0.142
167	167	End Spring 23	-5.322	-0.031	0.000	0.000	0.000	0.030
168	168	End Spring 24	-5.210	-0.032	0.000	0.000	0.000	0.031
169	169	End Spring 25	-5.090	-0.035	0.000	0.000	0.000	0.033
170	170	End Spring 26	-4.976	-0.027	0.000	0.000	0.000	0.027
171	171	End Spring 27	-4.882	-0.024	0.000	0.000	0.000	0.024
172	172	End Spring 28	-4.800	-0.016	0.000	0.000	0.000	0.018
173	173	End Spring 29	-4.748	-0.008	0.000	0.000	0.000	0.012
174	174	End Spring 30	-4.708	-0.004	0.000	0.000	0.000	0.009
175	175	End Spring 31	-4.691	0.005	0.000	0.000	0.000	0.001
176	176	End Spring 32	-4.688	0.006	0.000	0.000	0.000	0.000
177	177	End Spring 33	-4.694	0.013	0.000	0.000	0.000	-0.005
178	178	End Spring 34	-4.716	0.013	0.000	0.000	0.000	-0.005
179	179	End Spring 35	-4.732	0.013	0.000	0.000	0.000	-0.005
180	180	End Spring 36	-4.755	0.014	0.000	0.000	0.000	-0.006
181	181	End Spring 37	-4.764	0.006	0.000	0.000	0.000	0.000
182	182	End Spring 38	-4.729	-0.010	0.000	0.000	0.000	0.014
183	183	End Spring 39	-4.658	-0.022	0.000	0.000	0.000	0.023

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
184	184	End Spring 40	-4.549	-0.040	0.000	0.000	0.000	0.038
185	185	End Spring 41	-4.372	-0.064	0.000	0.000	0.000	0.057
186	186	End Spring 42	-4.131	-0.086	0.000	0.000	0.000	0.074
187	187	End Spring 43	-3.412	-0.139	0.000	0.000	0.000	0.116
188	188	End Spring 44	-2.946	-0.160	0.000	0.000	0.000	0.134
189	189	End Spring 45	-1.677	-0.149	0.000	0.000	0.000	0.052
190	190	End Spring 46	-2.430	-0.171	0.000	0.000	0.000	0.142
191	191	End Spring 47	-4.758	0.003	0.000	0.000	0.000	0.003
192	192	End Spring 48	-3.811	-0.116	0.000	0.000	0.000	0.098

APPENDIX: GROUP 19 DOCKS DATA

GROUP 19 DOCKS
DOCK CHARTER DOCK

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P1	Normal	ky'	1.400
2	1	P1	Normal	kx'	1.400
3	3	P2	Normal	ky'	1.400
4	3	P2	Normal	kx'	1.400
5	5	P3	Normal	ky'	1.400
6	5	P3	Normal	kx'	1.400

GROUP 19 DOCKS
DOCK CHARTER DOCK

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P1	1.664	0.000	0.000	0.000	0.000	0.000
2	2		1.667	0.000	0.000	0.000	0.000	0.000
3	3	P2	1.668	0.000	0.000	0.000	0.000	0.000
4	4		1.669	0.000	0.000	0.000	0.000	0.000
5	5	P3	1.668	0.000	0.000	0.000	0.000	0.000

GROUP 19 DOCKS
DOCK CHARTER DOCK

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P1	0.000	-3.267	0.000	0.000	0.000	-0.200
2	2		0.000	-4.875	0.000	0.000	0.000	-0.178
3	3	P2	0.000	-5.573	0.000	0.000	0.000	-0.155
4	4		0.000	-6.168	0.000	0.000	0.000	-0.129
5	5	P3	0.000	-6.688	0.000	0.000	0.000	-0.115

APPENDIX: GROUP 20 DOCKS DATA

GROUP 20 DOCKS
DOCK CHARTER DOCK

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P1	Normal	ky'	1.400
2	1	P1	Normal	kx'	1.400
3	3	P2	Normal	ky'	1.400
4	3	P2	Normal	kx'	1.400
5	4	P3	Normal	ky'	1.400
6	4	P3	Normal	kx'	1.400
7	5	P4	Normal	ky'	1.400
8	5	P4	Normal	kx'	1.400
9	6	P5	Normal	ky'	1.400
10	6	P5	Normal	kx'	1.400
11	12	P6	Normal	ky'	1.400
12	12	P6	Normal	kx'	1.400

GROUP 20 DOCKS
DOCK CHARTER DOCK

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P1	6.207	0.878	0.000	0.000	0.000	-0.104
2	2		6.076	0.878	0.000	0.000	0.000	-0.104
3	3	P2	3.891	0.877	0.000	0.000	0.000	-0.267
4	4	P3	2.472	0.320	0.000	0.000	0.000	-0.413
5	5	P4	2.458	-0.255	0.000	0.000	0.000	-0.413
6	6	P5	2.698	-0.909	0.000	0.000	0.000	-0.387
7	7		6.055	-0.910	0.000	0.000	0.000	-0.117
8	8		6.067	-0.255	0.000	0.000	0.000	-0.113
9	9		6.073	0.320	0.000	0.000	0.000	-0.109
10	10		6.210	0.320	0.000	0.000	0.000	-0.109
11	11		6.209	-0.255	0.000	0.000	0.000	-0.113
12	12	P6	6.203	-0.910	0.000	0.000	0.000	-0.117
13	13	End Spring 1	0.878	-6.077	0.000	0.000	0.000	-0.202
14	14	End Spring 2	0.320	-6.073	0.000	0.000	0.000	-0.355
15	15	End Spring 3	-0.255	-6.067	0.000	0.000	0.000	-0.356
16	16	End Spring 4	-0.910	-6.055	0.000	0.000	0.000	-0.330

GROUP 20 DOCKS
DOCK CHARTER DOCK

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P1	-0.020	-3.215	0.000	0.000	0.000	-0.029
2	2		-0.057	-3.215	0.000	0.000	0.000	-0.029
3	3	P2	-0.105	-3.212	0.000	0.000	0.000	-0.004
4	4	P3	-0.049	-3.337	0.000	0.000	0.000	-0.001
5	5	P4	0.066	-3.314	0.000	0.000	0.000	0.006
6	6	P5	0.129	-3.119	0.000	0.000	0.000	0.009
7	7		0.030	-3.121	0.000	0.000	0.000	0.040
8	8		0.006	-3.317	0.000	0.000	0.000	0.021
9	9		-0.036	-3.340	0.000	0.000	0.000	-0.012
10	10		-0.020	-3.340	0.000	0.000	0.000	-0.012
11	11		-0.021	-3.317	0.000	0.000	0.000	0.021
12	12	P6	-0.021	-3.121	0.000	0.000	0.000	0.040
13	13	End Spring 1	-3.214	0.057	0.000	0.000	0.000	-0.008
14	14	End Spring 2	-3.340	0.036	0.000	0.000	0.000	-0.002
15	15	End Spring 3	-3.317	-0.006	0.000	0.000	0.000	0.008
16	16	End Spring 4	-3.121	-0.030	0.000	0.000	0.000	0.014

APPENDIX: GROUP 21 DOCKS DATA

GROUP 21 DOCKS
DOCK A

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P1	Normal	ky'	1.400
2	1	P1	Normal	kx'	1.400
3	2	P2	Normal	ky'	1.400
4	2	P2	Normal	kx'	1.400
5	3	P3	Normal	ky'	1.400
6	3	P3	Normal	kx'	1.400
7	4	P4	Normal	ky'	1.400
8	4	P4	Normal	kx'	1.400
9	5	P5	Normal	ky'	1.400
10	5	P5	Normal	kx'	1.400
11	6	P6	Normal	ky'	1.400
12	6	P6	Normal	kx'	1.400
13	7	P7	Normal	ky'	1.400
14	7	P7	Normal	kx'	1.400
15	8	P8	Normal	ky'	1.400
16	8	P8	Normal	kx'	1.400

GROUP 21 DOCKS
DOCK A

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P1	5.199	0.000	0.000	0.000	0.000	-0.020
2	2	P2	5.370	0.000	0.000	0.000	0.000	-0.017
3	3	P3	5.502	0.000	0.000	0.000	0.000	-0.011
4	4	P4	5.573	0.000	0.000	0.000	0.000	-0.004
5	5	P5	5.573	0.000	0.000	0.000	0.000	0.004
6	6	P6	5.502	0.000	0.000	0.000	0.000	0.011
7	7	P7	5.370	0.000	0.000	0.000	0.000	0.017
8	8	P8	5.199	0.000	0.000	0.000	0.000	0.020

GROUP 21 DOCKS
DOCK A

	Joint	Label	dx' in	dy' in	dz' in	Øx' deg	Øy' deg	Øz' deg
1	1	P1	0.000	0.366	0.000	0.000	0.000	0.000
2	2	P2	0.000	0.366	0.000	0.000	0.000	0.000
3	3	P3	0.000	0.366	0.000	0.000	0.000	0.000
4	4	P4	0.000	0.366	0.000	0.000	0.000	0.000
5	5	P5	0.000	0.366	0.000	0.000	0.000	0.000
6	6	P6	0.000	0.366	0.000	0.000	0.000	0.000
7	7	P7	0.000	0.366	0.000	0.000	0.000	0.000
8	8	P8	0.000	0.366	0.000	0.000	0.000	0.000

APPENDIX: GROUP 21 DOCKS DATA

GROUP 22 DOCKS
DOCK B

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P1	Normal	ky'	1.400
2	1	P1	Normal	kx'	1.400
3	2	P2	Normal	ky'	1.400
4	2	P2	Normal	kx'	1.400
5	3	P3	Normal	ky'	1.400
6	3	P3	Normal	kx'	1.400
7	4	P4	Normal	ky'	1.400
8	4	P4	Normal	kx'	1.400
9	5	P5	Normal	ky'	1.400
10	5	P5	Normal	kx'	1.400
11	6	P6	Normal	ky'	1.400
12	6	P6	Normal	kx'	1.400
13	7	P7	Normal	ky'	1.400
14	7	P7	Normal	kx'	1.400
15	8	P8	Normal	ky'	1.400
16	8	P8	Normal	kx'	1.400

GROUP 22 DOCKS
DOCK B

	Joint	Label	Rx' kip	Ry' kip	Rz' kip	Mx' kip-ft	My' kip-ft	Mz' kip-ft
1	1	P1	-14.349	0.000	0.000	0.000	0.000	0.000
2	2	P2	-14.506	0.000	0.000	0.000	0.000	0.000
3	3	P3	-14.628	0.000	0.000	0.000	0.000	0.000
4	4	P4	-14.693	0.000	0.000	0.000	0.000	0.000
5	5	P5	-14.693	0.000	0.000	0.000	0.000	-0.000
6	6	P6	-14.628	0.000	0.000	0.000	0.000	0.000
7	7	P7	-14.506	0.000	0.000	0.000	0.000	0.000
8	8	P8	-14.349	0.000	0.000	0.000	0.000	0.000
9	**Total**	**(Global)**	**Rx=-116.353**	**Ry=0.000**	**Rz=0.00**			

GROUP 22 DOCKS
DOCK B

	Joint	Label	Rx' kip	Ry' kip	Rz' kip	Mx' kip-ft	My' kip-ft	Mz' kip-ft
1	1	P1	0.000	-2.476	0.000	0.000	0.000	0.000
2	2	P2	0.000	-2.476	0.000	0.000	0.000	0.000
3	3	P3	0.000	-2.476	0.000	0.000	0.000	0.000
4	4	P4	0.000	-2.475	0.000	0.000	0.000	0.000
5	5	P5	0.000	-2.475	0.000	0.000	0.000	0.000
6	6	P6	0.000	-2.474	0.000	0.000	0.000	0.000
7	7	P7	0.000	-2.474	0.000	0.000	0.000	0.000
8	8	P8	0.000	-2.474	0.000	0.000	0.000	0.000
9	**Total**	**(Global)**	**Rx=0.000**	**Ry=-19.800**	**Rz=0.00**			

APPENDIX: GROUP 23 DOCKS DATA

GROUP 23 DOCKS
DOCK C

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	1	P1	Normal	ky'	1.400
2	1	P1	Normal	kx'	1.400
3	2	P2	Normal	ky'	1.400
4	2	P2	Normal	kx'	1.400
5	3	P3	Normal	ky'	1.400
6	3	P3	Normal	kx'	1.400
7	4	P4	Normal	ky'	1.400
8	4	P4	Normal	kx'	1.400
9	5	P5	Normal	ky'	1.400
10	5	P5	Normal	kx'	1.400
11	6	P6	Normal	kx'	1.400
12	6	P6	Normal	ky'	1.400
13	7	P7	Normal	ky'	1.400
14	7	P7	Normal	kx'	1.400

GROUP 23 DOCKS
DOCK C

	Joint	Label	Rx' kip	Ry' kip	Rz' kip	Mx' kip-ft	My' kip-ft	Mz' kip-ft
1	1	P1	-11.791	0.000	0.000	0.000	0.000	-0.000
2	2	P2	-11.846	0.000	0.000	0.000	0.000	-0.000
3	3	P3	-11.885	0.000	0.000	0.000	0.000	0.000
4	4	P4	-11.899	0.000	0.000	0.000	0.000	-0.000
5	5	P5	-11.885	0.000	0.000	0.000	0.000	0.000
6	6	P6	-11.846	0.000	0.000	0.000	0.000	-0.000
7	7	P7	-11.791	0.000	0.000	0.000	0.000	-0.000
8	**Total**	**(Global)**	**Rx=-82.945**	**Ry=0.000**	**Rz=0.00**			

GROUP 23 DOCKS
DOCK C

	Joint	Label	Rx' kip	Ry' kip	Rz' kip	Mx' kip-ft	My' kip-ft	Mz' kip-ft
1	1	P1	0.000	-2.429	0.000	0.000	0.000	0.000
2	2	P2	0.000	-2.429	0.000	0.000	0.000	0.000
3	3	P3	0.000	-2.429	0.000	0.000	0.000	0.000
4	4	P4	0.000	-2.429	0.000	0.000	0.000	0.000
5	5	P5	0.000	-2.428	0.000	0.000	0.000	0.000
6	6	P6	0.000	-2.428	0.000	0.000	0.000	0.000
7	7	P7	0.000	-2.428	0.000	0.000	0.000	0.000
8	**Total**	**(Global)**	**Rx=0.000**	**Ry=-17.000**	**Rz=0.00**			

APPENDIX: GROUP 12 DOCKS DATA

GROUP 24 DOCKS
DOCK D

	Joint	Label	Type	Direction	Stiffness kip/in,kip-ft/deg
1	2	P1	Normal	ky'	1.400
2	2	P1	Normal	kx'	1.400
3	3	P2	Normal	ky'	1.400
4	3	P2	Normal	kx'	1.400
5	4	P3	Normal	ky'	1.400
6	4	P3	Normal	kx'	1.400
7	5	P4	Normal	ky'	1.400
8	5	P4	Normal	kx'	1.400
9	6	P5	Normal	ky'	1.400
10	6	P5	Normal	kx'	1.400
11	7	P6	Normal	ky'	1.400
12	7	P6	Normal	kx'	1.400

GROUP 24 DOCKS
DOCK D

	Joint	Label	Rx' kip	Ry' kip	Rz' kip	Mx' kip-ft	My' kip-ft	Mz' kip-ft
1	1		0.000	0.000	0.000	0.000	0.000	-0.000
2	2	P1	-13.846	0.000	0.000	0.000	0.000	-0.000
3	3	P2	-13.820	0.000	0.000	0.000	0.000	-0.000
4	4	P3	-13.806	0.000	0.000	0.000	0.000	-0.000
5	5	P4	-13.806	0.000	0.000	0.000	0.000	-0.000
6	6	P5	-13.820	0.000	0.000	0.000	0.000	-0.000
7	7	P6	-13.846	0.000	0.000	0.000	0.000	-0.000
8	8		-0.000	0.000	0.000	0.000	0.000	-0.000
9	**Total**	**(Global)**	**Rx=-82.945**	**Ry=0.000**	**Rz=0.00**			

GROUP 24 DOCKS
DOCK D

	Joint	Label	Rx' kip	Ry' kip	Rz' kip	Mx' kip-ft	My' kip-ft	Mz' kip-ft
1	1		0.000	0.000	0.000	0.000	0.000	0.000
2	2	P1	0.000	-2.834	0.000	0.000	0.000	0.000
3	3	P2	0.000	-2.834	0.000	0.000	0.000	0.000
4	4	P3	0.000	-2.833	0.000	0.000	0.000	0.000
5	5	P4	0.000	-2.833	0.000	0.000	0.000	0.000
6	6	P5	0.000	-2.833	0.000	0.000	0.000	0.000
7	7	P6	0.000	-2.833	0.000	0.000	0.000	0.000
8	8		0.000	0.000	0.000	0.000	0.000	0.000
9	**Total**	**(Global)**	**Rx=0.000**	**Ry=-17.000**	**Rz=0.00**			