Multi Panel Marina Calculation Report

Example Marina | 123 Marina Way, Coastal City, ST 12345

Project Information

Field	Project Value	Field	Project Value
Project	Example Marina	Report Version	2.1.0
Address	123 Marina Way, Coastal City, ST 12345	Code Basis	2023 NEC
Prepared For	Not entered	Prepared By	Not entered
Marina Basis	New marina / new slips	Generated	7/15/2026
Mode	Multi Panel Marina	Sub-Meters	Yes - qualifying reduction applied
Calculation Boundary	Calculation boundary begins at the low-voltage landside MDP or switchboard feeding multiple dock panels.	Review Status	Independent qualified review required

This report is an informational calculation aid. It is not a sealed design, permit-ready document, or substitute for independent review by a licensed electrical engineer, qualified professional, utility, manufacturer, and local authority having jurisdiction.

Calculation Summary

Multi Panel Marina Calculation Report (continued)

Example Marina | 123 Marina Way, Coastal City, ST 12345

MDP Demand 283.80 kVA	**Dock Panels** 3	**Shore Receptacles** 80	**MDP Demand Factor** 30%
Other Marina Loads 0.00 kVA Local plus MDP-direct	**Boat Lift Motor Demand** 10.20 kVA	**Phase Imbalance** 0.00 A	**MDP Main** 1600A prelim.

MDP Distribution Schedules

MDP-1 downstream feeder and direct-load summary

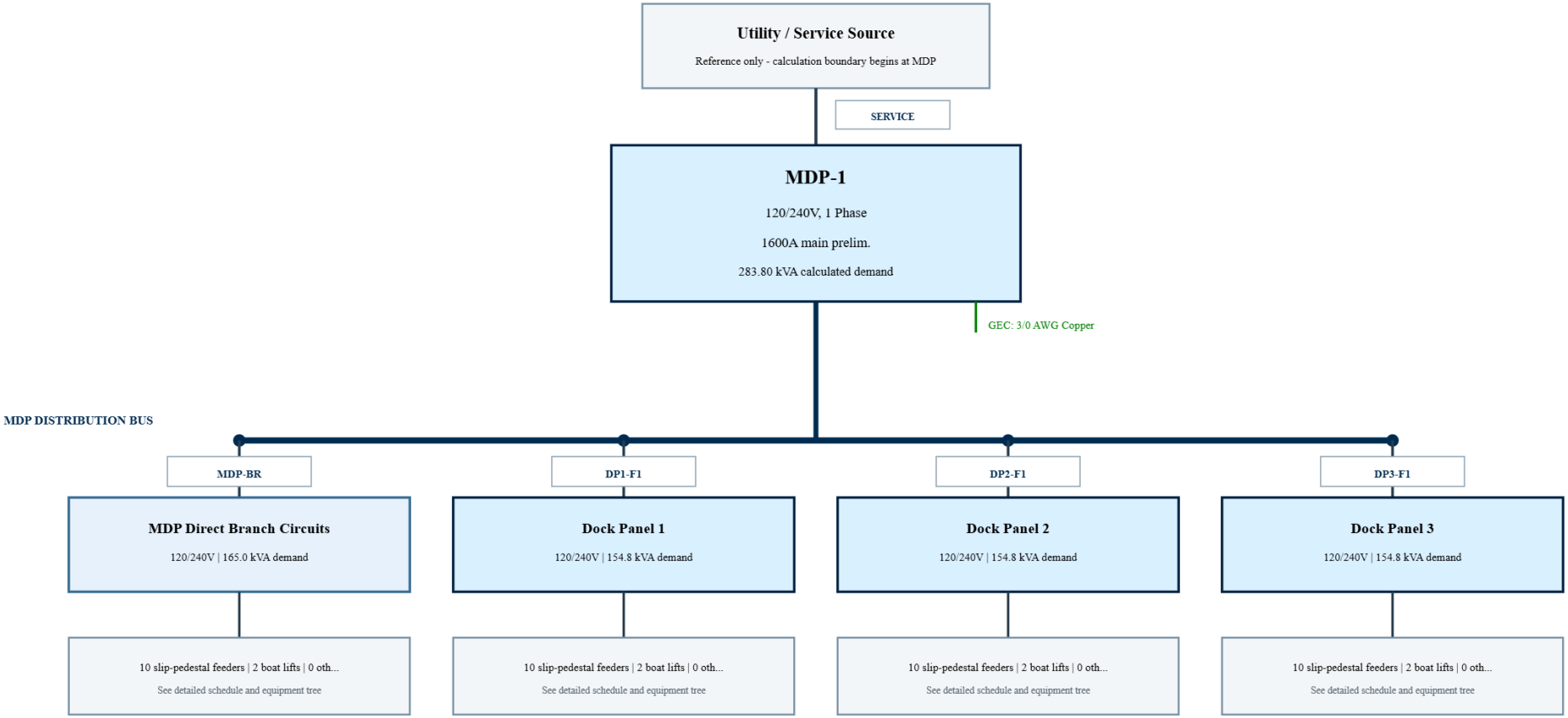
MDP System Basis - MDP-1: 120/240V, 1 Phase | Main: 1600A preliminary; 5 x 400 kcmil (paralleled) Copper; EGC 4/0; GEC 3/0 AWG Copper; VD 0.35% | Phase currents: A 1182.50 A, B 1182.50 A | Raceway: Sch80-THWN-2.

MDP to Dock Panel Feeder Schedule

Tag	Dock Panel	Dock / Area	Voltage	Phase	Demand kVA	Current A	Breaker	Feeder	Material	EGC	Conduit	VD
DP1-F1	Dock Panel 1	Dock 1	120/240V	A-B	154.80	645.00	700A/2PP prelim.	2 x 500 kcmil (paralleled)	Copper	1/0	2 x 3"	0.37%
DP2-F1	Dock Panel 2	Dock 2	120/240V	A-B	154.80	645.00	700A/2PP prelim.	2 x 500 kcmil (paralleled)	Copper	1/0	2 x 3"	0.74%
DP3-F1	Dock Panel 3	Dock 3	120/240V	A-B	154.80	645.00	700A/2PP prelim.	2 x 500 kcmil (paralleled)	Copper	1/0	2 x 3"	1.48%

Multi Panel One-Line Diagram

Vertical project hierarchy from utility/service reference through MDP and downstream equipment



Vertical project hierarchy. Detailed slip-pedestal feeders, boat-lift branches, and other loads are shown on equipment tree pages and schedules.

MDP-1 Direct Branches Calculation

Circuits originating directly at the MDP bus

Calculated Demand
165.00 kVA

Demand Current
687.50 A
120/240V

Branch OCPDs
See schedule
Included in MDP main

Shore Receptacles
20

Other Loads
0.00 kVA
Added at 100%

Grounding Basis
MDP grounding
Branch EGCs shown below

These pedestal and boat-lift branches originate directly at the MDP bus; no separate downstream dock-panel feeder is applied.

Pedestal Circuit Inputs

Circuit	Pedestal Side 1	Pedestal Side 2	Installation	Material	Distance
Ckt 1-3	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	50 ft
Ckt 2-4	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	50 ft
Ckt 5-7	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	100 ft
Ckt 6-8	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	100 ft
Ckt 9-11	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	150 ft
Ckt 10-12	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	150 ft
Ckt 13-15	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	200 ft

MDP-1 Direct Branches Calculation (continued)

Circuits originating directly at the MDP bus

Pedestal Circuit Inputs (continued)

Circuit	Pedestal Side 1	Pedestal Side 2	Installation	Material	Distance
Ckt 14-16	**50A + 30A + 20A GFCI**	**50A + 30A + 20A GFCI**	**Sch40-THWN-2**	**Copper**	**200 ft**
Ckt 17-19	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	250 ft
Ckt 18-20	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	250 ft

MDP Direct Branch Schedule

Circuit	VA A	VA B	Breaker	VD	Distance	Wire	Material	EGC	Conduit
Ckt 1-3	7740	7740	110A/2P	0.81%	50 ft	2 AWG	Copper	6	1 1/4"
Ckt 2-4	7740	7740	110A/2P	0.81%	50 ft	2 AWG	Copper	6	1 1/4"
Ckt 5-7	7740	7740	110A/2P	1.62%	100 ft	2 AWG	Copper	6	1 1/4"
Ckt 6-8	7740	7740	110A/2P	1.62%	100 ft	2 AWG	Copper	6	1 1/4"
Ckt 9-11	7740	7740	110A/2P	2.43%	150 ft	2 AWG	Copper	6	1 1/4"
Ckt 10-12	7740	7740	110A/2P	2.43%	150 ft	2 AWG	Copper	6	1 1/4"
Ckt 13-15	7740	7740	110A/2P	2.57%	200 ft	1 AWG	Copper	4*	1 1/2"
Ckt 14-16	7740	7740	110A/2P	2.57%	200 ft	1 AWG	Copper	4*	1 1/2"
Ckt 17-19	7740	7740	110A/2P	2.54%	250 ft	1/0 AWG	Copper	3*	1 1/2"
Ckt 18-20	7740	7740	110A/2P	2.54%	250 ft	1/0 AWG	Copper	3*	1 1/2"

MDP-1 Direct Branches Calculation (continued)

Circuits originating directly at the MDP bus

MDP Direct Branch Schedule (continued)

Circuit	VA A	VA B	Breaker	VD	Distance	Wire	Material	EGC	Conduit
Ckt 21-23	**2700**	**2700**	**35A/2P prelim.**	**0.93%**	**25 ft**	**12 AWG**	**Copper**	**10**	**1/2"**
Ckt 22-24	2700	2700	35A/2P prelim.	0.93%	25 ft	12 AWG	Copper	10	1/2"

MDP-1 Direct Branches Tagged Feeder Schedule

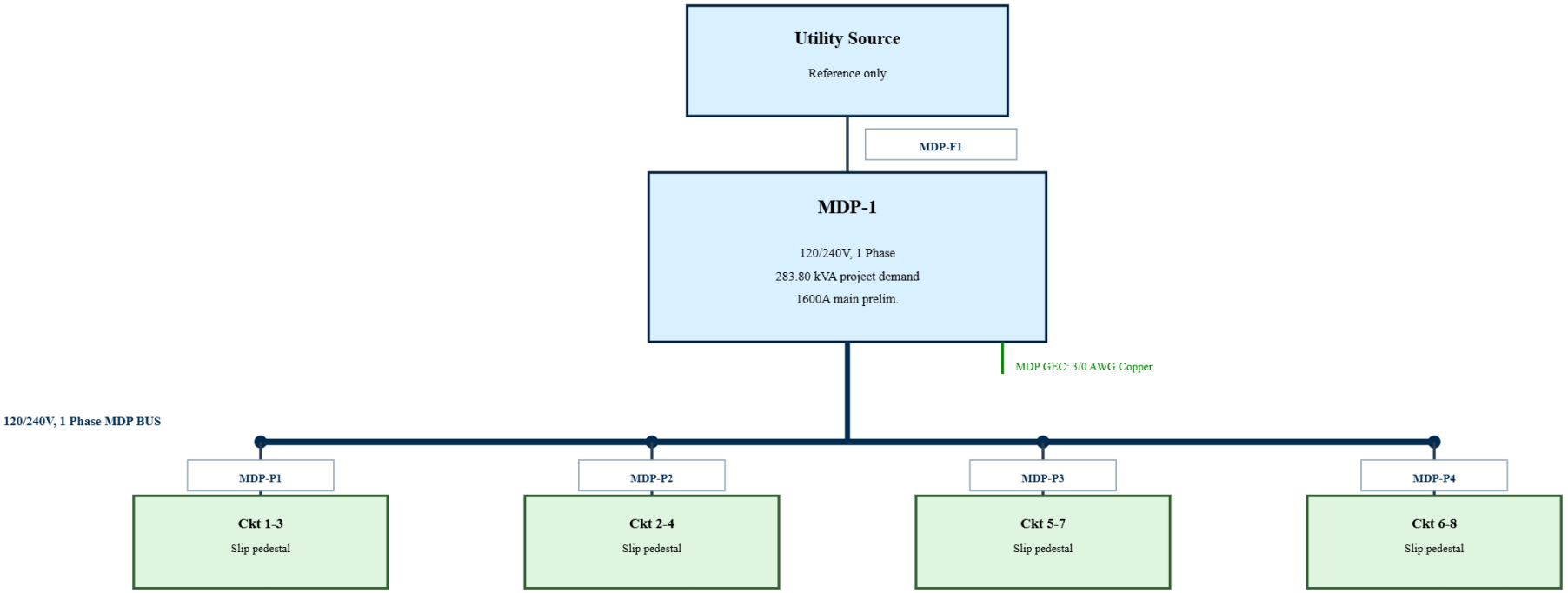
Tags correspond directly to the vertical one-line diagram

Tag	Destination	Breaker	Phase	Conductors	EGC	Conduit	Distance	VD
MDP-F1	MDP-1	1600A/2P prelim.	A-B	5 x 400 kcmil (paralleled) Copper	4/0	5 x 3" PVC80	50 ft	0.35%
MDP-P1	Ckt 1-3	110A/2P	A-B	2 AWG Copper	6	1 1/4" PVC40	50 ft	0.81%
MDP-P2	Ckt 2-4	110A/2P	B-A	2 AWG Copper	6	1 1/4" PVC40	50 ft	0.81%
MDP-P3	Ckt 5-7	110A/2P	A-B	2 AWG Copper	6	1 1/4" PVC40	100 ft	1.62%
MDP-P4	Ckt 6-8	110A/2P	B-A	2 AWG Copper	6	1 1/4" PVC40	100 ft	1.62%
MDP-P5	Ckt 9-11	110A/2P	A-B	2 AWG Copper	6	1 1/4" PVC40	150 ft	2.43%
MDP-P6	Ckt 10-12	110A/2P	B-A	2 AWG Copper	6	1 1/4" PVC40	150 ft	2.43%
MDP-P7	Ckt 13-15	110A/2P	A-B	1 AWG Copper	4 (upsized)	1 1/2" PVC40	200 ft	2.57%
MDP-P8	Ckt 14-16	110A/2P	B-A	1 AWG Copper	4 (upsized)	1 1/2" PVC40	200 ft	2.57%
MDP-P9	Ckt 17-19	110A/2P	A-B	1/0 AWG Copper	3 (upsized)	1 1/2" PVC40	250 ft	2.54%
MDP-P10	Ckt 18-20	110A/2P	B-A	1/0 AWG Copper	3 (upsized)	1 1/2" PVC40	250 ft	2.54%
MDP-L1	Ckt 21-23 - Boat Lift 1	35A/2P max*	A-B	12 AWG Copper + full-size neutral	10 AWG Copper	1/2" PVC80	25 ft	0.93%
MDP-L2	Ckt 22-24 - Boat Lift 2	35A/2P max*	A-B	12 AWG Copper + full-size neutral	10 AWG Copper	1/2" PVC80	25 ft	0.93%

Boat-lift EGCs use the entered actual OCPD, or the reported maximum when unknown, so the EGC can be larger than the controller-supply conductors. Boat-lift raceway fill includes a full-size neutral and one copper EGC in the selected PVC Schedule 40 or Schedule 80 raceway.

MDP-1 Direct Branches One-Line Diagram (1 of 3)

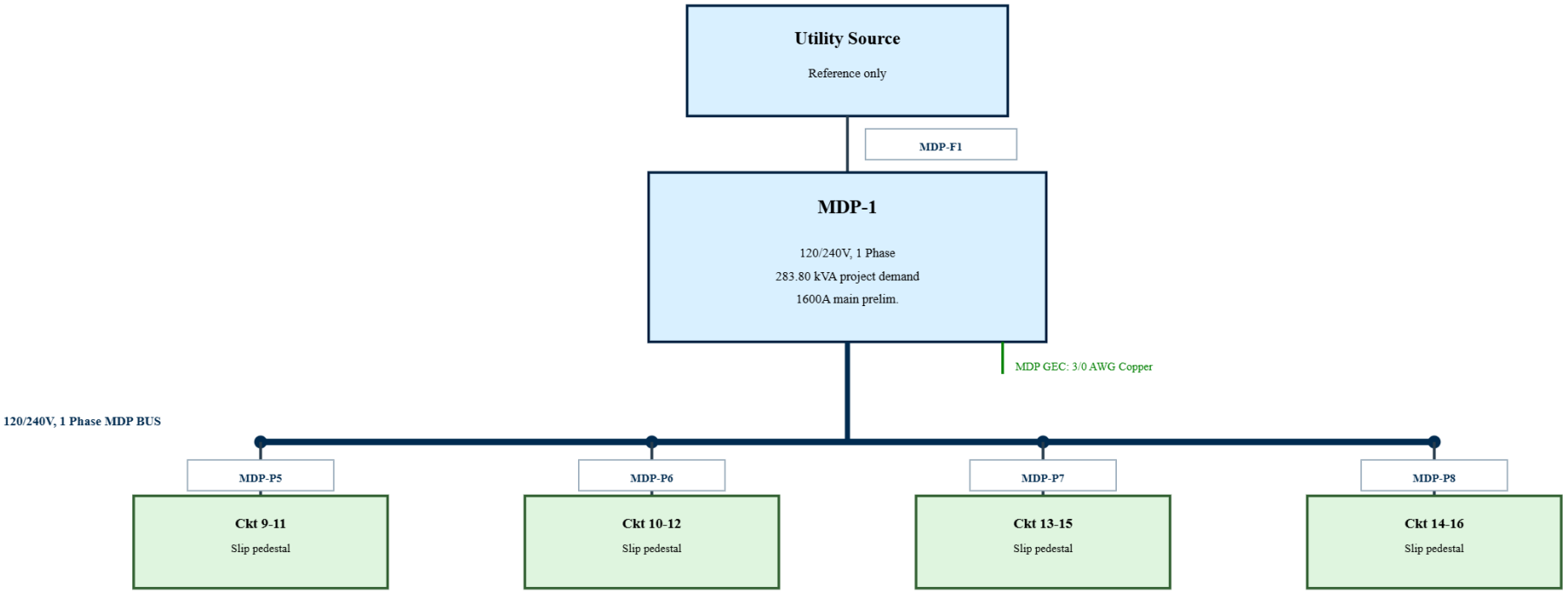
Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

MDP-1 Direct Branches One-Line Diagram (2 of 3)

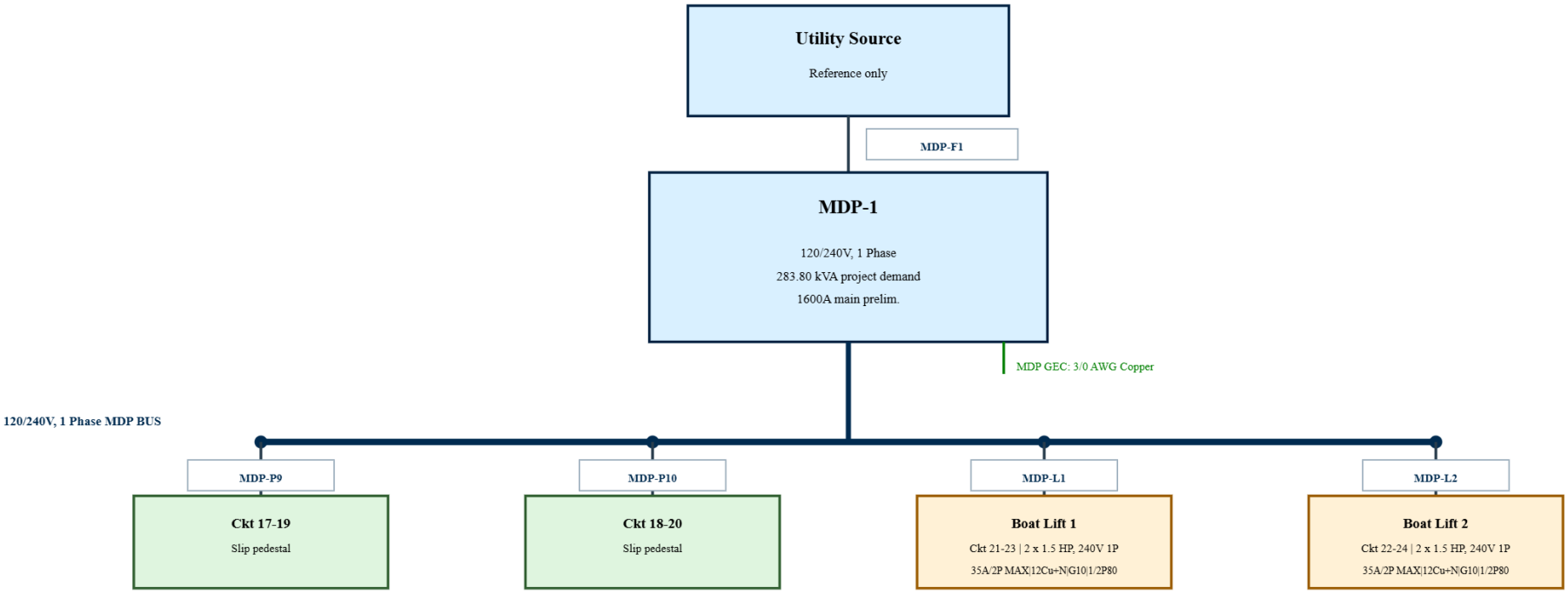
Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

MDP-1 Direct Branches One-Line Diagram (3 of 3)

Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

MDP-1 Direct Branches Boat Lift Schedule

Controller-supply planning values and motor load reconciliation

Tag	Location	Source / Circuit	Motor Load	Branch VA / A	Controller Supply / Neutral	Each Motor	OCPD / EGC	Raceway / Run / VD	Result
Boat Lift 1	Boat Lift 1	Serving MDP Circuit / Ckt 21-23	2 x 1.5 HP, 240V 1P	5400 VA / 22.50 A	Controller supply: 12 AWG Copper; Neutral: 12 AWG Copper (full-size)	Each motor: 12 AWG Copper minimum	35A/2P max* / EGC 10 AWG Copper	PVC Schedule 80 1/2" / 25 ft / 0.93%	MDP branch included in simultaneous feeder set
Boat Lift 2	Boat Lift 2	Serving MDP Circuit / Ckt 22-24	2 x 1.5 HP, 240V 1P	5400 VA / 22.50 A	Controller supply: 12 AWG Copper; Neutral: 12 AWG Copper (full-size)	Each motor: 12 AWG Copper minimum	35A/2P max* / EGC 10 AWG Copper	PVC Schedule 80 1/2" / 25 ft / 0.93%	MDP branch included in simultaneous feeder set

Boat Lift Rows

2

Simultaneous Motor Set

2

Motor Demand

10.20 kVA

Demand Reconciliation

165.00 kVA

Panel total including applicable loads

OCPD values marked as maximum or preliminary require confirmation against the listed controller/equipment marking. Controller-supply and controller-to-motor conductor results are separate. Raceway fill includes a full-size neutral and one copper EGC. See Assumptions and Notes for the complete Article 430 basis.

Panel Main Motor Feeder OCPD Check: NEC 430.24 minimum feeder ampacity is 687.50 A. Across the governing phases and controller branches, the NEC 430.62 motor-only calculation spans 45.00-55.00 A; corresponding standard feeder OCPD ceilings are 45-50A. These boundary cases can be governed by different branches: the lower aggregate is governed by a 25A minimum controller OCPD for Boat Lift 1, while the upper aggregate is governed by the reported 35A maximum controller OCPD for Boat Lift 1 plus the other selected motor currents. 0 of 2 actual controller OCPDs were entered and valid. With 645.00 A nonmotor load on governing Phase A, the NEC 430.63 preliminary breaker range is 700-700A. Reported preliminary selection: 700A. Preliminary selection covers the reported controller-OCPD range; equipment markings and coordination must still be verified. NEC 430.24 feeder ampacity, 430.62 motor-only ceiling, and 430.63 mixed-load rating. Actual listed controller/equipment OCPDs, manufacturer instructions, conductor protection, selective coordination, and AHJ review govern.

Dock Panel 1 Calculation

Dock 1

Calculated Demand

154.80 kVA

Demand Current

645.00 A

120/240V

Panel Main

700A prelim.

Shore Receptacles

20

Other Loads

0.00 kVA

Added at 100%

Grounding Electrode

2/0 AWG Copper

MDP feeder DP1-F1: 700A/2PP; 2 x 500 kcmil (paralleled) Copper; EGC 1/0; 2 x 3"; VD 0.37%.

Pedestal Circuit Inputs

Circuit	Pedestal Side 1	Pedestal Side 2	Installation	Material	Distance
Ckt 1-3	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch40-THWN-2	Copper	50 ft
Ckt 2-4	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Copper	50 ft
Ckt 5-7	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Copper	100 ft
Ckt 6-8	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Copper	100 ft
Ckt 9-11	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Copper	125 ft
Ckt 10-12	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Copper	125 ft
Ckt 13-15	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Copper	150 ft

Dock Panel 1 Calculation (continued)

Dock 1

Pedestal Circuit Inputs (continued)

Circuit	Pedestal Side 1	Pedestal Side 2	Installation	Material	Distance
Ckt 14-16	**50A + 30A + 20A GFCI**	**50A + 30A + 20A GFCI**	**Sch80-THWN-2**	**Copper**	**150 ft**
Ckt 17-19	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Copper	175 ft
Ckt 18-20	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Copper	175 ft

Panel Schedule

Circuit	VA A	VA B	Breaker	VD	Distance	Wire	Material	EGC	Conduit
Ckt 1-3	7740	7740	110A/2P prelim.	0.81%	50 ft	2 AWG	Copper	6	1 1/4"
Ckt 2-4	7740	7740	110A/2P	0.81%	50 ft	2 AWG	Copper	6	1 1/4"
Ckt 5-7	7740	7740	110A/2P	1.62%	100 ft	2 AWG	Copper	6	1 1/4"
Ckt 6-8	7740	7740	110A/2P	1.62%	100 ft	2 AWG	Copper	6	1 1/4"
Ckt 9-11	7740	7740	110A/2P	2.02%	125 ft	2 AWG	Copper	6	1 1/4"
Ckt 10-12	7740	7740	110A/2P	2.02%	125 ft	2 AWG	Copper	6	1 1/4"
Ckt 13-15	7740	7740	110A/2P	2.43%	150 ft	2 AWG	Copper	6	1 1/4"
Ckt 14-16	7740	7740	110A/2P	2.43%	150 ft	2 AWG	Copper	6	1 1/4"
Ckt 17-19	7740	7740	110A/2P	2.83%	175 ft	2 AWG	Copper	6	1 1/4"
Ckt 18-20	7740	7740	110A/2P	2.83%	175 ft	2 AWG	Copper	6	1 1/4"

Dock Panel 1 Tagged Feeder Schedule

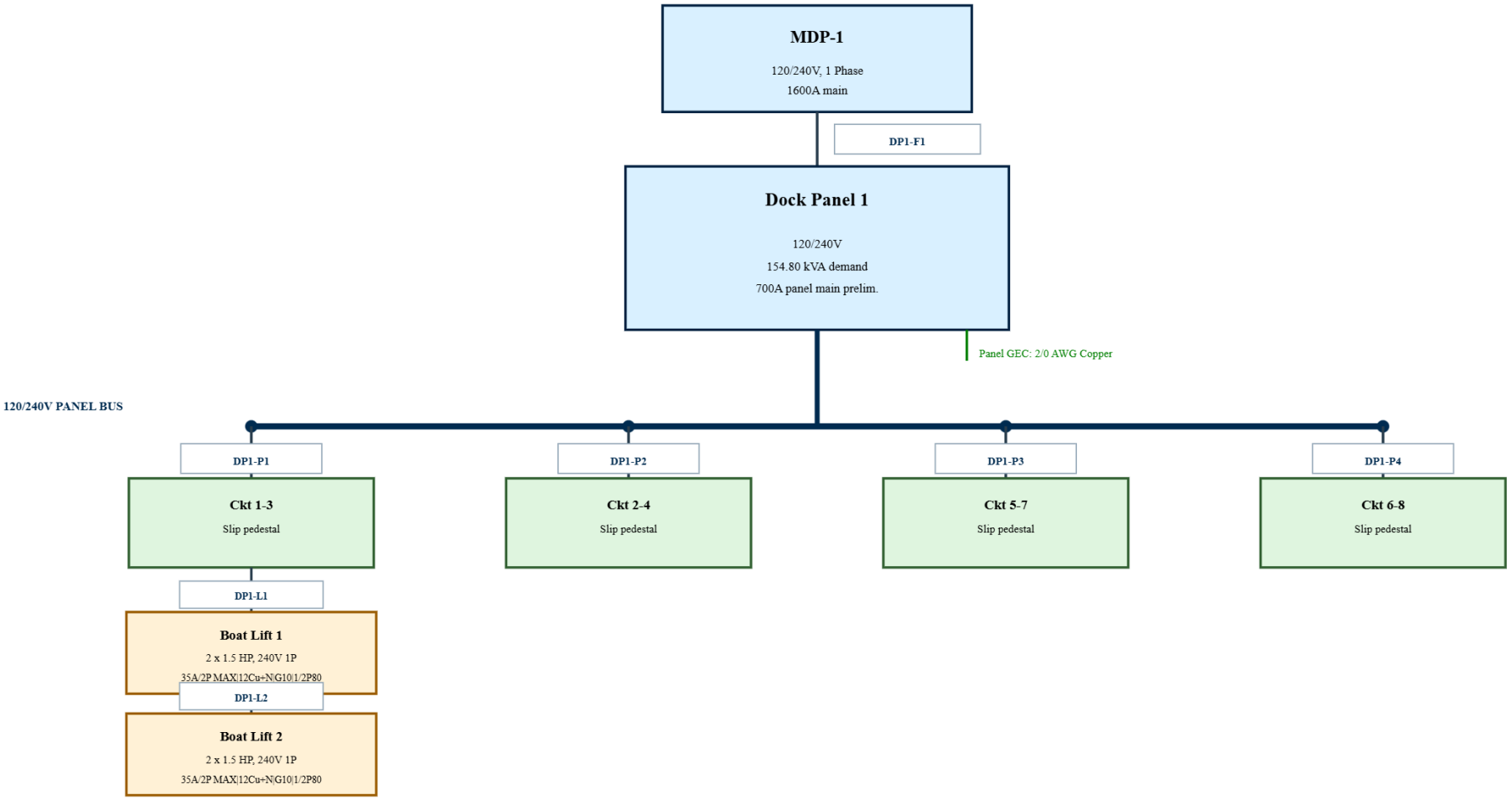
Tags correspond directly to the vertical one-line diagram

Tag	Destination	Breaker	Phase	Conductors	EGC	Conduit	Distance	VD
DP1-F1	Dock Panel 1	700A/2P prelim.	A-B	2 x 500 kcmil (paralleled) Copper	1/0	2 x 3" PVC80	50 ft	0.37%
DP1-P1	Ckt 1-3	110A/2P prelim.	A-B	2 AWG Copper	6	1 1/4" PVC40	50 ft	0.81%
DP1-P2	Ckt 2-4	110A/2P	B-A	2 AWG Copper	6	1 1/4" PVC80	50 ft	0.81%
DP1-P3	Ckt 5-7	110A/2P	A-B	2 AWG Copper	6	1 1/4" PVC80	100 ft	1.62%
DP1-P4	Ckt 6-8	110A/2P	B-A	2 AWG Copper	6	1 1/4" PVC80	100 ft	1.62%
DP1-P5	Ckt 9-11	110A/2P	A-B	2 AWG Copper	6	1 1/4" PVC80	125 ft	2.02%
DP1-P6	Ckt 10-12	110A/2P	B-A	2 AWG Copper	6	1 1/4" PVC80	125 ft	2.02%
DP1-P7	Ckt 13-15	110A/2P	A-B	2 AWG Copper	6	1 1/4" PVC80	150 ft	2.43%
DP1-P8	Ckt 14-16	110A/2P	B-A	2 AWG Copper	6	1 1/4" PVC80	150 ft	2.43%
DP1-P9	Ckt 17-19	110A/2P	A-B	2 AWG Copper	6	1 1/4" PVC80	175 ft	2.83%
DP1-P10	Ckt 18-20	110A/2P	B-A	2 AWG Copper	6	1 1/4" PVC80	175 ft	2.83%
DP1-L1	Ckt 1-3 - Boat Lift 1	35A/2P max*	A-B	12 AWG Copper + full-size neutral	10 AWG Copper	1/2" PVC80	25 ft	0.93%
DP1-L2	Ckt 1-3 - Boat Lift 2	35A/2P max*	A-B	12 AWG Copper + full-size neutral	10 AWG Copper	1/2" PVC80	25 ft	0.93%

Boat-lift EGCs use the entered actual OCPD, or the reported maximum when unknown, so the EGC can be larger than the controller-supply conductors. Boat-lift raceway fill includes a full-size neutral and one copper EGC in the selected PVC Schedule 40 or Schedule 80 raceway.

Dock Panel 1 One-Line Diagram (1 of 3)

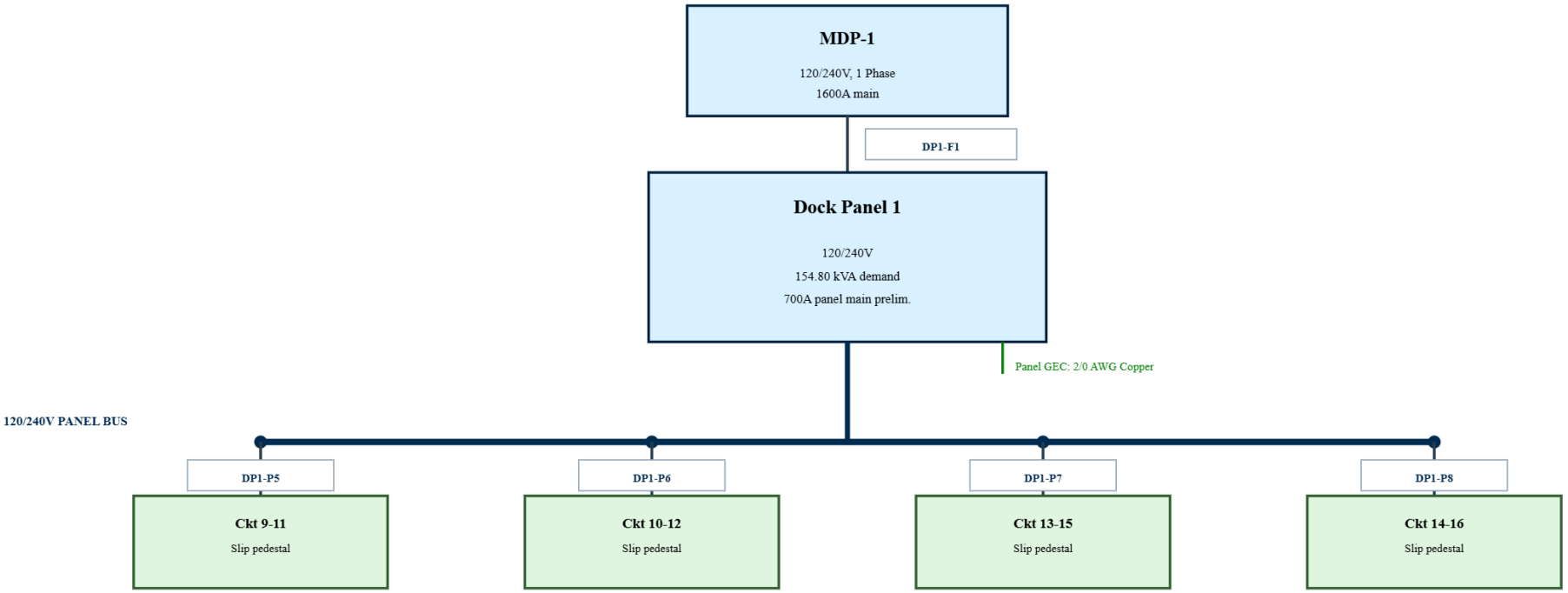
Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 1 One-Line Diagram (2 of 3)

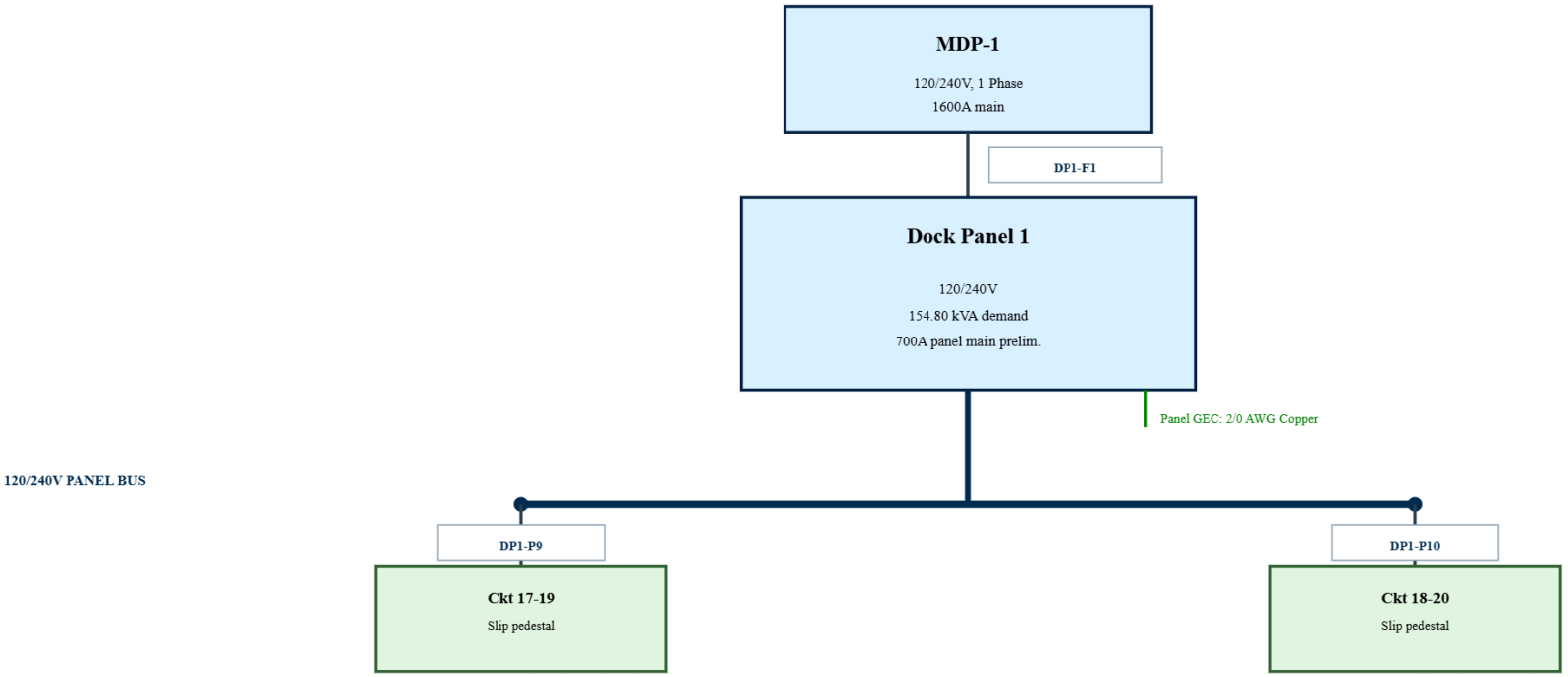
Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 1 One-Line Diagram (3 of 3)

Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 1 Boat Lift Schedule

Controller-supply planning values and motor load reconciliation

Tag	Location	Source / Circuit	Motor Load	Branch VA / A	Controller Supply / Neutral	Each Motor	OCPD / EGC	Raceway / Run / VD	Result
Boat Lift 1	Boat Lift 1	Pedestal Circuit / Ckt 1-3	2 x 1.5 HP, 240V 1P	5400 VA / 22.50 A	Controller supply: 12 AWG Copper; Neutral: 12 AWG Copper (full-size)	Each motor: 12 AWG Copper minimum	35A/2P max* / EGC 10 AWG Copper	PVC Schedule 80 1/2" / 25 ft / 0.93%	Shore Power controls same-slip comparison
Boat Lift 2	Boat Lift 2	Pedestal Circuit / Ckt 1-3	2 x 1.5 HP, 240V 1P	5400 VA / 22.50 A	Controller supply: 12 AWG Copper; Neutral: 12 AWG Copper (full-size)	Each motor: 12 AWG Copper minimum	35A/2P max* / EGC 10 AWG Copper	PVC Schedule 80 1/2" / 25 ft / 0.93%	Shore Power controls same-slip comparison

Boat Lift Rows

2

Simultaneous Motor Set

0

Motor Demand

0.00 kVA

Demand Reconciliation

154.80 kVA

Panel total including applicable loads

OCPD values marked as maximum or preliminary require confirmation against the listed controller/equipment marking. Controller-supply and controller-to-motor conductor results are separate. Raceway fill includes a full-size neutral and one copper EGC. See Assumptions and Notes for the complete Article 430 basis.

Panel Main Motor Feeder OCPD Check: NEC 430.24 minimum feeder ampacity is 687.50 A. Across the governing phases and controller branches, the NEC 430.62 motor-only calculation spans 45.00-55.00 A; corresponding standard feeder OCPD ceilings are 45-50A. These boundary cases can be governed by different branches: the lower aggregate is governed by a 25A minimum controller OCPD for Boat Lift 1, while the upper aggregate is governed by the reported 35A maximum controller OCPD for Boat Lift 1 plus the other selected motor currents. 0 of 2 actual controller OCPDs were entered and valid. With 645.00 A nonmotor load on governing Phase A, the NEC 430.63 preliminary breaker range is 700-700A. Reported preliminary selection: 700A. Preliminary selection covers the reported controller-OCPD range; equipment markings and coordination must still be verified. NEC 430.24 feeder ampacity, 430.62 motor-only ceiling, and 430.63 mixed-load rating. Actual listed controller/equipment OCPDs, manufacturer instructions, conductor protection, selective coordination, and AHJ review govern.

Ckt 1-3 Motor Feeder OCPD Check: NEC 430.24 minimum feeder ampacity is 107.00 A. Across the governing phases and controller branches, the NEC 430.62 motor-only calculation spans 45.00-55.00 A; corresponding standard feeder OCPD ceilings are 45-50A. These boundary cases can be governed by different branches: the lower aggregate is governed by a 25A minimum controller OCPD for Boat Lift 1, while the upper aggregate is governed by the reported 35A maximum controller OCPD for Boat Lift 1 plus the other selected motor currents. 0 of 2 actual controller OCPDs were entered and valid. With 64.50 A nonmotor load on governing Phase A, the NEC 430.63 preliminary breaker range is 110-125A. Reported preliminary selection: 110A. Preliminary selection meets the lower planning bound, but the actual listed controller OCPD is required to finalize the feeder breaker. NEC 430.24 feeder ampacity, 430.62 motor-only ceiling, and 430.63 mixed-load rating. Actual listed controller/equipment OCPDs, manufacturer instructions, conductor protection, selective coordination, and AHJ review govern.

Dock Panel 2 Calculation

Dock 2

Calculated Demand

154.80 kVA

Demand Current

645.00 A

120/240V

Panel Main

700A prelim.

Shore Receptacles

20

Other Loads

0.00 kVA

Added at 100%

Grounding Electrode

2/0 AWG Copper

MDP feeder DP2-F1: 700A/2PP; 2 x 500 kcmil (paralleled) Copper; EGC 1/0; 2 x 3"; VD 0.74%.

Pedestal Circuit Inputs

Circuit	Pedestal Side 1	Pedestal Side 2	Installation	Material	Distance
Ckt 1-3	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	50 ft
Ckt 2-4	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	50 ft
Ckt 5-7	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	100 ft
Ckt 6-8	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	100 ft
Ckt 9-11	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	125 ft
Ckt 10-12	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	125 ft
Ckt 13-15	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	150 ft

Dock Panel 2 Calculation (continued)

Dock 2

Pedestal Circuit Inputs (continued)

Circuit	Pedestal Side 1	Pedestal Side 2	Installation	Material	Distance
Ckt 14-16	**50A + 30A + 20A GFCI**	**50A + 30A + 20A GFCI**	**G-Cable**	**Copper**	**150 ft**
Ckt 17-19	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	175 ft
Ckt 18-20	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	G-Cable	Copper	175 ft

Panel Schedule

Circuit	VA A	VA B	Breaker	VD	Distance	Wire	Material	EGC	Conduit
Ckt 1-3	7740	7740	110A/2P	0.81%	50 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 2-4	7740	7740	110A/2P prelim.	0.81%	50 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 5-7	7740	7740	110A/2P	1.62%	100 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 6-8	7740	7740	110A/2P	1.62%	100 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 9-11	7740	7740	110A/2P	2.02%	125 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 10-12	7740	7740	110A/2P	2.02%	125 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 13-15	7740	7740	110A/2P	2.43%	150 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 14-16	7740	7740	110A/2P	2.43%	150 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 17-19	7740	7740	110A/2P	2.83%	175 ft	2 AWG	Copper	6	N/A (G-Cable)
Ckt 18-20	7740	7740	110A/2P	2.83%	175 ft	2 AWG	Copper	6	N/A (G-Cable)

Dock Panel 2 Tagged Feeder Schedule

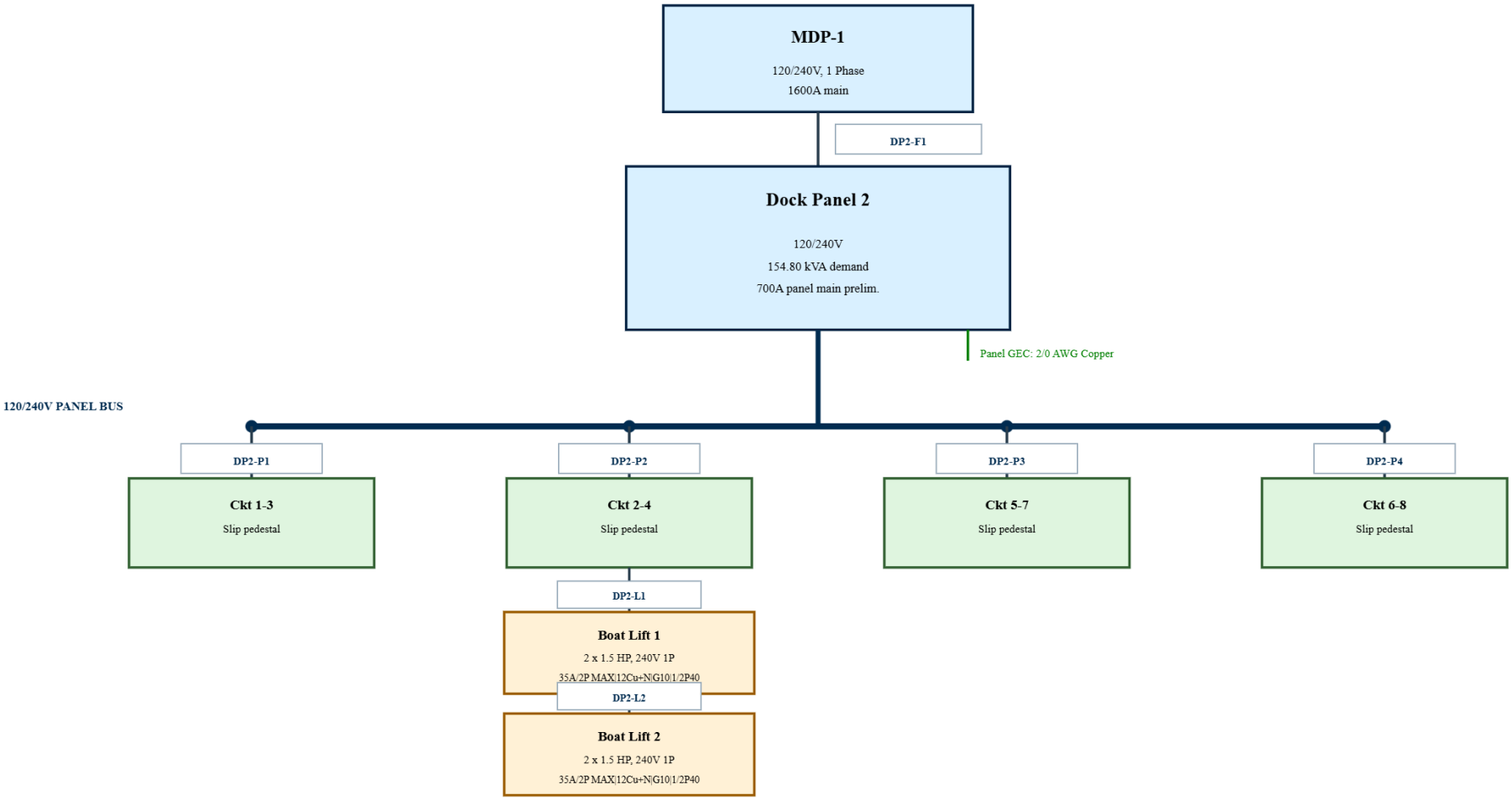
Tags correspond directly to the vertical one-line diagram

Tag	Destination	Breaker	Phase	Conductors	EGC	Conduit	Distance	VD
DP2-F1	Dock Panel 2	700A/2P prelim.	A-B	2 x 500 kcmil (paralleled) Copper	1/0	2 x 3" PVC80	100 ft	0.74%
DP2-P1	Ckt 1-3	110A/2P	A-B	2 AWG Copper	6	N/A G-Cable	50 ft	0.81%
DP2-P2	Ckt 2-4	110A/2P prelim.	B-A	2 AWG Copper	6	N/A G-Cable	50 ft	0.81%
DP2-P3	Ckt 5-7	110A/2P	A-B	2 AWG Copper	6	N/A G-Cable	100 ft	1.62%
DP2-P4	Ckt 6-8	110A/2P	B-A	2 AWG Copper	6	N/A G-Cable	100 ft	1.62%
DP2-P5	Ckt 9-11	110A/2P	A-B	2 AWG Copper	6	N/A G-Cable	125 ft	2.02%
DP2-P6	Ckt 10-12	110A/2P	B-A	2 AWG Copper	6	N/A G-Cable	125 ft	2.02%
DP2-P7	Ckt 13-15	110A/2P	A-B	2 AWG Copper	6	N/A G-Cable	150 ft	2.43%
DP2-P8	Ckt 14-16	110A/2P	B-A	2 AWG Copper	6	N/A G-Cable	150 ft	2.43%
DP2-P9	Ckt 17-19	110A/2P	A-B	2 AWG Copper	6	N/A G-Cable	175 ft	2.83%
DP2-P10	Ckt 18-20	110A/2P	B-A	2 AWG Copper	6	N/A G-Cable	175 ft	2.83%
DP2-L1	Ckt 2-4 - Boat Lift 1	35A/2P max*	B-A	12 AWG Copper + full-size neutral	10 AWG Copper	1/2" PVC40	25 ft	0.93%
DP2-L2	Ckt 2-4 - Boat Lift 2	35A/2P max*	B-A	12 AWG Copper + full-size neutral	10 AWG Copper	1/2" PVC40	25 ft	0.93%

Boat-lift EGCs use the entered actual OCPD, or the reported maximum when unknown, so the EGC can be larger than the controller-supply conductors. Boat-lift raceway fill includes a full-size neutral and one copper EGC in the selected PVC Schedule 40 or Schedule 80 raceway.

Dock Panel 2 One-Line Diagram (1 of 3)

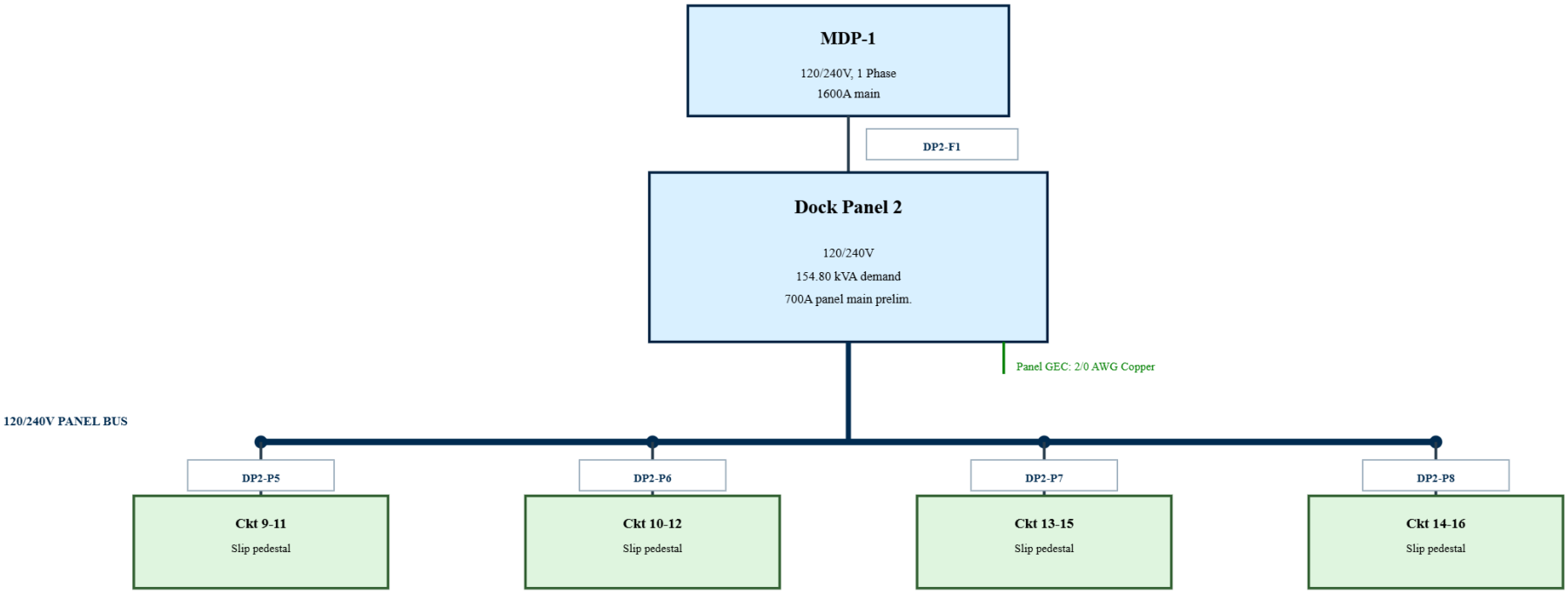
Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 2 One-Line Diagram (2 of 3)

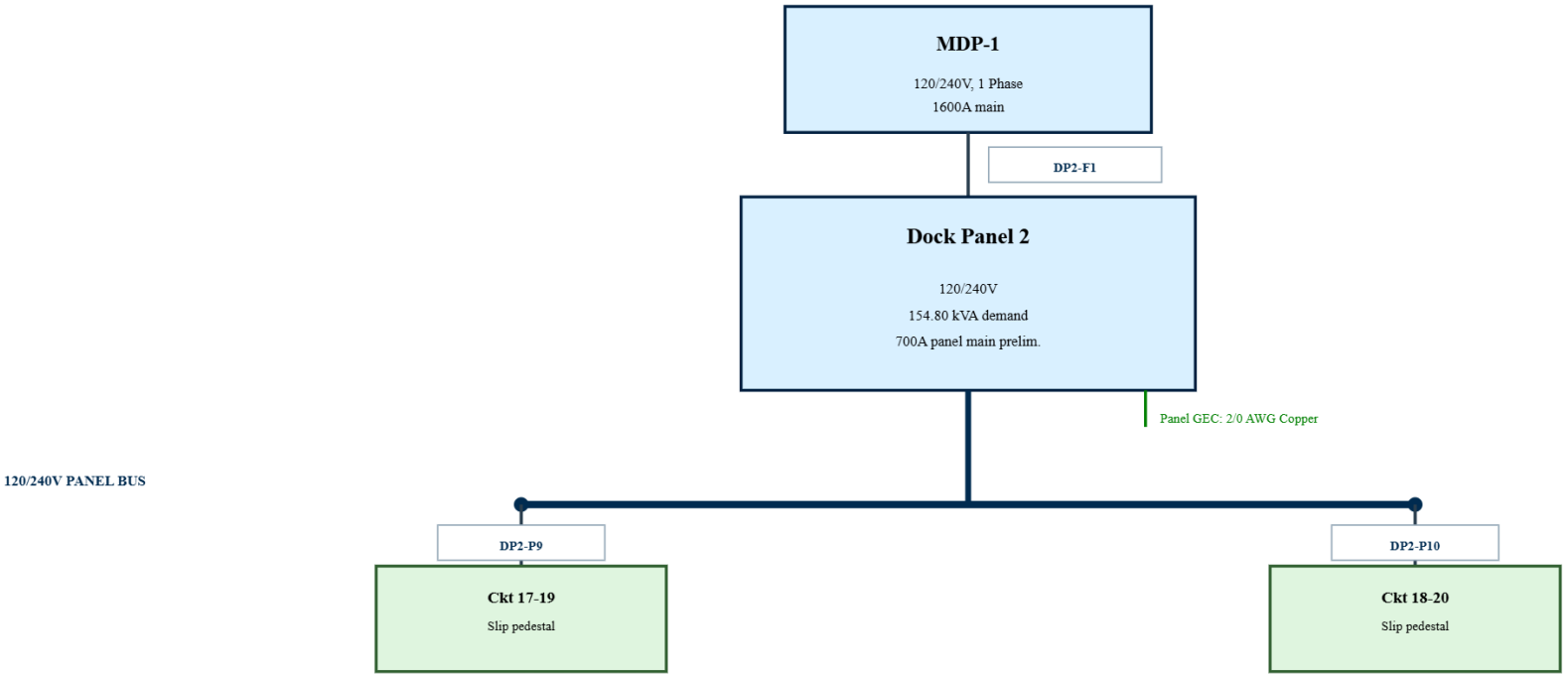
Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 2 One-Line Diagram (3 of 3)

Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 2 Boat Lift Schedule

Controller-supply planning values and motor load reconciliation

Tag	Location	Source / Circuit	Motor Load	Branch VA / A	Controller Supply / Neutral	Each Motor	OCPD / EGC	Raceway / Run / VD	Result
Boat Lift 1	Boat Lift 1	Pedestal Circuit / Ckt 2-4	2 x 1.5 HP, 240V 1P	5400 VA / 22.50 A	Controller supply: 12 AWG Copper; Neutral: 12 AWG Copper (full-size)	Each motor: 12 AWG Copper minimum	35A/2P max* / EGC 10 AWG Copper	PVC Schedule 40 1/2" / 25 ft / 0.93%	Shore Power controls same-slip comparison
Boat Lift 2	Boat Lift 2	Pedestal Circuit / Ckt 2-4	2 x 1.5 HP, 240V 1P	5400 VA / 22.50 A	Controller supply: 12 AWG Copper; Neutral: 12 AWG Copper (full-size)	Each motor: 12 AWG Copper minimum	35A/2P max* / EGC 10 AWG Copper	PVC Schedule 40 1/2" / 25 ft / 0.93%	Shore Power controls same-slip comparison

Boat Lift Rows

2

Simultaneous Motor Set

0

Motor Demand

0.00 kVA

Demand Reconciliation

154.80 kVA

Panel total including applicable loads

OCPD values marked as maximum or preliminary require confirmation against the listed controller/equipment marking. Controller-supply and controller-to-motor conductor results are separate. Raceway fill includes a full-size neutral and one copper EGC. See Assumptions and Notes for the complete Article 430 basis.

Panel Main Motor Feeder OCPD Check: NEC 430.24 minimum feeder ampacity is 687.50 A. Across the governing phases and controller branches, the NEC 430.62 motor-only calculation spans 45.00-55.00 A; corresponding standard feeder OCPD ceilings are 45-50A. These boundary cases can be governed by different branches: the lower aggregate is governed by a 25A minimum controller OCPD for Boat Lift 1, while the upper aggregate is governed by the reported 35A maximum controller OCPD for Boat Lift 1 plus the other selected motor currents. 0 of 2 actual controller OCPDs were entered and valid. With 645.00 A nonmotor load on governing Phase A, the NEC 430.63 preliminary breaker range is 700-700A. Reported preliminary selection: 700A. Preliminary selection covers the reported controller-OCPD range; equipment markings and coordination must still be verified. NEC 430.24 feeder ampacity, 430.62 motor-only ceiling, and 430.63 mixed-load rating. Actual listed controller/equipment OCPDs, manufacturer instructions, conductor protection, selective coordination, and AHJ review govern.

Ckt 2-4 Motor Feeder OCPD Check: NEC 430.24 minimum feeder ampacity is 107.00 A. Across the governing phases and controller branches, the NEC 430.62 motor-only calculation spans 45.00-55.00 A; corresponding standard feeder OCPD ceilings are 45-50A. These boundary cases can be governed by different branches: the lower aggregate is governed by a 25A minimum controller OCPD for Boat Lift 1, while the upper aggregate is governed by the reported 35A maximum controller OCPD for Boat Lift 1 plus the other selected motor currents. 0 of 2 actual controller OCPDs were entered and valid. With 64.50 A nonmotor load on governing Phase A, the NEC 430.63 preliminary breaker range is 110-125A. Reported preliminary selection: 110A. Preliminary selection meets the lower planning bound, but the actual listed controller OCPD is required to finalize the feeder breaker. NEC 430.24 feeder ampacity, 430.62 motor-only ceiling, and 430.63 mixed-load rating. Actual listed controller/equipment OCPDs, manufacturer instructions, conductor protection, selective coordination, and AHJ review govern.

Dock Panel 3 Calculation

Dock 3

Calculated Demand

154.80 kVA

Demand Current

645.00 A

120/240V

Panel Main

700A prelim.

Shore Receptacles

20

Other Loads

0.00 kVA

Added at 100%

Grounding Electrode

2/0 AWG Copper

MDP feeder DP3-F1: 700A/2PP; 2 x 500 kcmil (paralleled) Copper; EGC 1/0; 2 x 3"; VD 1.48%.

Pedestal Circuit Inputs

Circuit	Pedestal Side 1	Pedestal Side 2	Installation	Material	Distance
Ckt 1-3	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	50 ft
Ckt 2-4	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	50 ft
Ckt 5-7	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	100 ft
Ckt 6-8	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	100 ft
Ckt 9-11	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	125 ft
Ckt 10-12	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	125 ft
Ckt 13-15	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	150 ft

Dock Panel 3 Calculation (continued)

Dock 3

Pedestal Circuit Inputs (continued)

Circuit	Pedestal Side 1	Pedestal Side 2	Installation	Material	Distance
Ckt 14-16	**50A + 30A + 20A GFCI**	**50A + 30A + 20A GFCI**	**Sch80-THWN-2**	**Aluminum**	**150 ft**
Ckt 17-19	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	175 ft
Ckt 18-20	50A + 30A + 20A GFCI	50A + 30A + 20A GFCI	Sch80-THWN-2	Aluminum	175 ft

Panel Schedule

Circuit	VA A	VA B	Breaker	VD	Distance	Wire	Material	EGC	Conduit
Ckt 1-3	7740	7740	110A/2P	0.84%	50 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 2-4	7740	7740	110A/2P	0.84%	50 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 5-7	7740	7740	110A/2P prelim.	1.68%	100 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 6-8	7740	7740	110A/2P	1.68%	100 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 9-11	7740	7740	110A/2P	2.09%	125 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 10-12	7740	7740	110A/2P	2.09%	125 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 13-15	7740	7740	110A/2P	2.51%	150 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 14-16	7740	7740	110A/2P	2.51%	150 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 17-19	7740	7740	110A/2P	2.93%	175 ft	1/0 AWG	Aluminum	6	1 1/2"
Ckt 18-20	7740	7740	110A/2P	2.93%	175 ft	1/0 AWG	Aluminum	6	1 1/2"

Dock Panel 3 Tagged Feeder Schedule

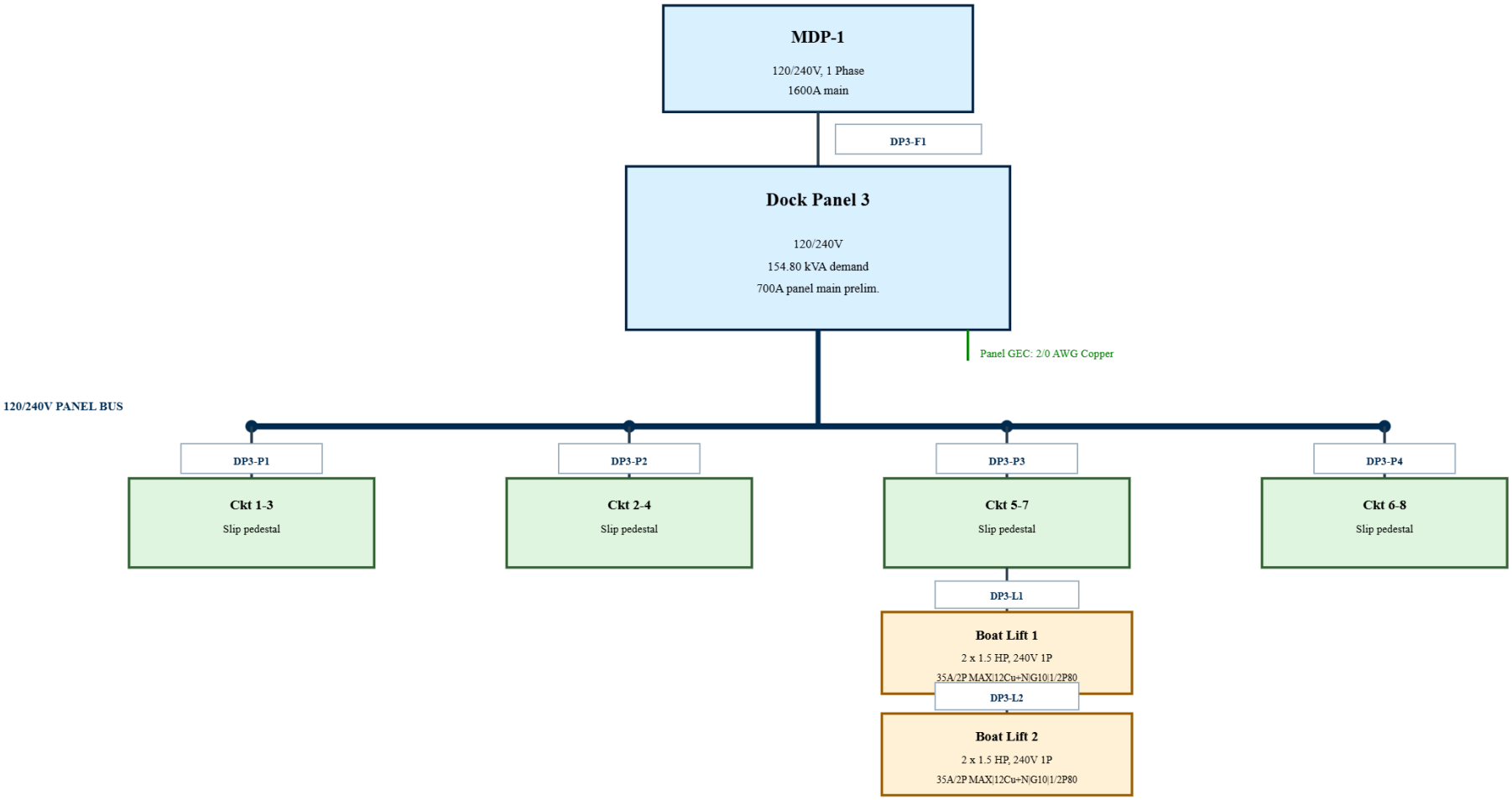
Tags correspond directly to the vertical one-line diagram

Tag	Destination	Breaker	Phase	Conductors	EGC	Conduit	Distance	VD
DP3-F1	Dock Panel 3	700A/2P prelim.	A-B	2 x 500 kcmil (paralleled) Copper	1/0	2 x 3" PVC80	200 ft	1.48%
DP3-P1	Ckt 1-3	110A/2P	A-B	1/0 AWG Aluminum	6	1 1/2" PVC80	50 ft	0.84%
DP3-P2	Ckt 2-4	110A/2P	B-A	1/0 AWG Aluminum	6	1 1/2" PVC80	50 ft	0.84%
DP3-P3	Ckt 5-7	110A/2P prelim.	A-B	1/0 AWG Aluminum	6	1 1/2" PVC80	100 ft	1.68%
DP3-P4	Ckt 6-8	110A/2P	B-A	1/0 AWG Aluminum	6	1 1/2" PVC80	100 ft	1.68%
DP3-P5	Ckt 9-11	110A/2P	A-B	1/0 AWG Aluminum	6	1 1/2" PVC80	125 ft	2.09%
DP3-P6	Ckt 10-12	110A/2P	B-A	1/0 AWG Aluminum	6	1 1/2" PVC80	125 ft	2.09%
DP3-P7	Ckt 13-15	110A/2P	A-B	1/0 AWG Aluminum	6	1 1/2" PVC80	150 ft	2.51%
DP3-P8	Ckt 14-16	110A/2P	B-A	1/0 AWG Aluminum	6	1 1/2" PVC80	150 ft	2.51%
DP3-P9	Ckt 17-19	110A/2P	A-B	1/0 AWG Aluminum	6	1 1/2" PVC80	175 ft	2.93%
DP3-P10	Ckt 18-20	110A/2P	B-A	1/0 AWG Aluminum	6	1 1/2" PVC80	175 ft	2.93%
DP3-L1	Ckt 5-7 - Boat Lift 1	35A/2P max*	A-B	12 AWG Copper + full-size neutral	10 AWG Copper	1/2" PVC80	25 ft	0.93%
DP3-L2	Ckt 5-7 - Boat Lift 2	35A/2P max*	A-B	12 AWG Copper + full-size neutral	10 AWG Copper	1/2" PVC80	25 ft	0.93%

Boat-lift EGCs use the entered actual OCPD, or the reported maximum when unknown, so the EGC can be larger than the controller-supply conductors. Boat-lift raceway fill includes a full-size neutral and one copper EGC in the selected PVC Schedule 40 or Schedule 80 raceway.

Dock Panel 3 One-Line Diagram (1 of 3)

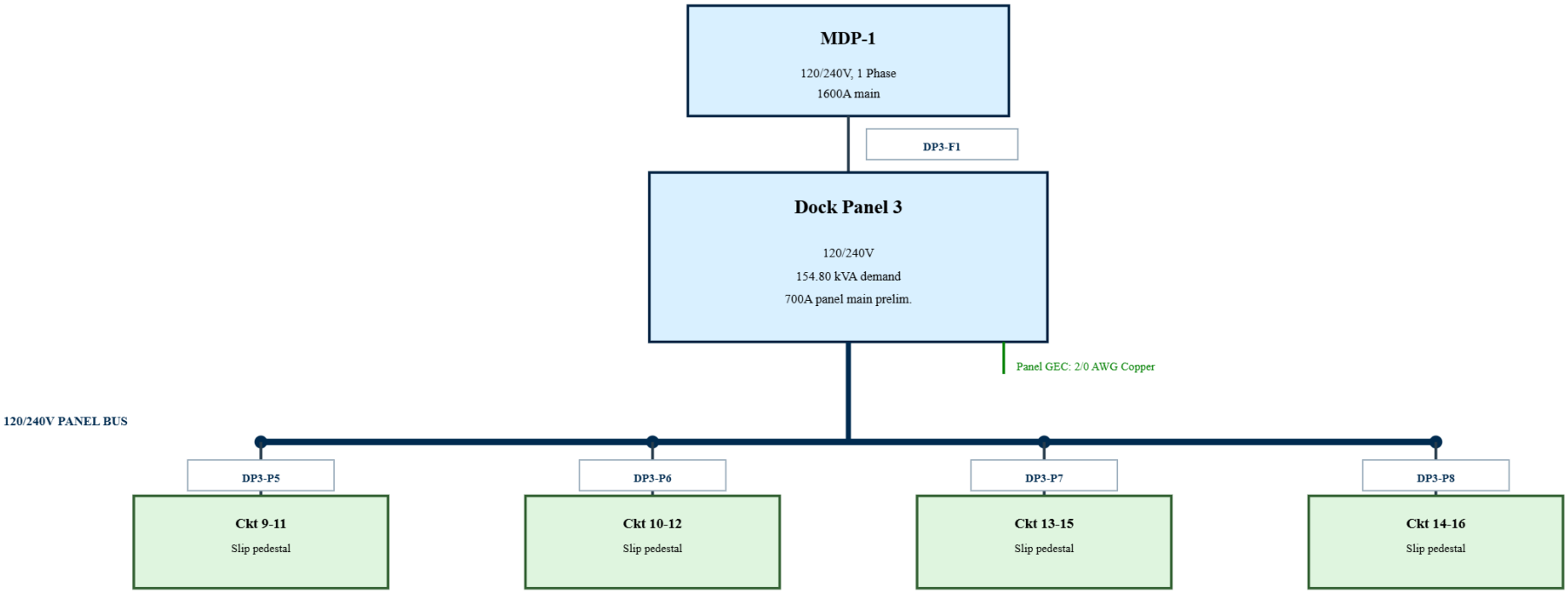
Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 3 One-Line Diagram (2 of 3)

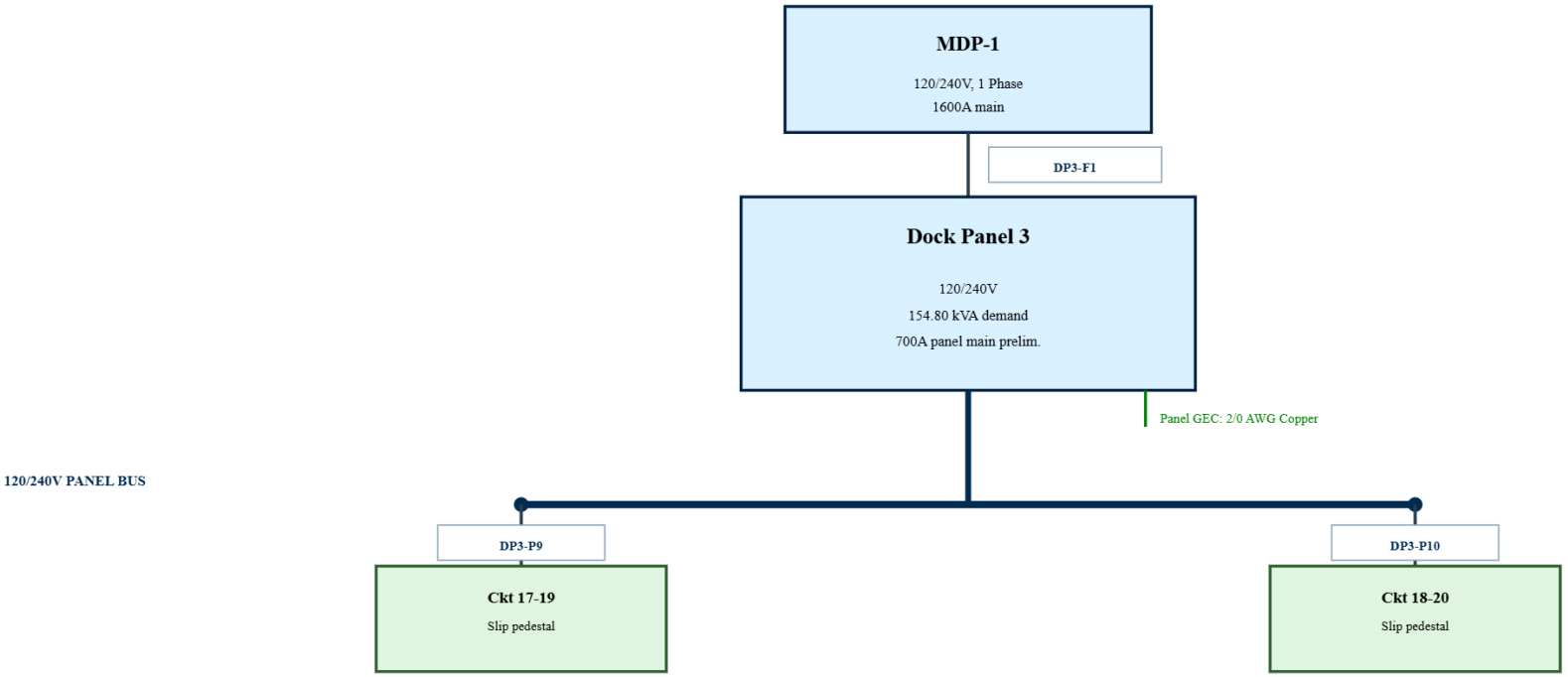
Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 3 One-Line Diagram (3 of 3)

Vertical source-to-load hierarchy; feeder tags link to the tagged schedule



Vertical source-to-load hierarchy. Feeder tags link to the tagged feeder schedule; Other Load branch values are for planning and require equipment verification.

Dock Panel 3 Boat Lift Schedule

Controller-supply planning values and motor load reconciliation

Tag	Location	Source / Circuit	Motor Load	Branch VA / A	Controller Supply / Neutral	Each Motor	OCPD / EGC	Raceway / Run / VD	Result
Boat Lift 1	Boat Lift 1	Pedestal Circuit / Ckt 5-7	2 x 1.5 HP, 240V 1P	5400 VA / 22.50 A	Controller supply: 12 AWG Copper; Neutral: 12 AWG Copper (full-size)	Each motor: 12 AWG Copper minimum	35A/2P max* / EGC 10 AWG Copper	PVC Schedule 80 1/2" / 25 ft / 0.93%	Shore Power controls same-slip comparison
Boat Lift 2	Boat Lift 2	Pedestal Circuit / Ckt 5-7	2 x 1.5 HP, 240V 1P	5400 VA / 22.50 A	Controller supply: 12 AWG Copper; Neutral: 12 AWG Copper (full-size)	Each motor: 12 AWG Copper minimum	35A/2P max* / EGC 10 AWG Copper	PVC Schedule 80 1/2" / 25 ft / 0.93%	Shore Power controls same-slip comparison

Boat Lift Rows

2

Simultaneous Motor Set

0

Motor Demand

0.00 kVA

Demand Reconciliation

154.80 kVA

Panel total including applicable loads

OCPD values marked as maximum or preliminary require confirmation against the listed controller/equipment marking. Controller-supply and controller-to-motor conductor results are separate. Raceway fill includes a full-size neutral and one copper EGC. See Assumptions and Notes for the complete Article 430 basis.

Panel Main Motor Feeder OCPD Check: NEC 430.24 minimum feeder ampacity is 687.50 A. Across the governing phases and controller branches, the NEC 430.62 motor-only calculation spans 45.00-55.00 A; corresponding standard feeder OCPD ceilings are 45-50A. These boundary cases can be governed by different branches: the lower aggregate is governed by a 25A minimum controller OCPD for Boat Lift 1, while the upper aggregate is governed by the reported 35A maximum controller OCPD for Boat Lift 1 plus the other selected motor currents. 0 of 2 actual controller OCPDs were entered and valid. With 645.00 A nonmotor load on governing Phase A, the NEC 430.63 preliminary breaker range is 700-700A. Reported preliminary selection: 700A. Preliminary selection covers the reported controller-OCPD range; equipment markings and coordination must still be verified. NEC 430.24 feeder ampacity, 430.62 motor-only ceiling, and 430.63 mixed-load rating. Actual listed controller/equipment OCPDs, manufacturer instructions, conductor protection, selective coordination, and AHJ review govern.

Ckt 5-7 Motor Feeder OCPD Check: NEC 430.24 minimum feeder ampacity is 107.00 A. Across the governing phases and controller branches, the NEC 430.62 motor-only calculation spans 45.00-55.00 A; corresponding standard feeder OCPD ceilings are 45-50A. These boundary cases can be governed by different branches: the lower aggregate is governed by a 25A minimum controller OCPD for Boat Lift 1, while the upper aggregate is governed by the reported 35A maximum controller OCPD for Boat Lift 1 plus the other selected motor currents. 0 of 2 actual controller OCPDs were entered and valid. With 64.50 A nonmotor load on governing Phase A, the NEC 430.63 preliminary breaker range is 110-125A. Reported preliminary selection: 110A. Preliminary selection meets the lower planning bound, but the actual listed controller OCPD is required to finalize the feeder breaker. NEC 430.24 feeder ampacity, 430.62 motor-only ceiling, and 430.63 mixed-load rating. Actual listed controller/equipment OCPDs, manufacturer instructions, conductor protection, selective coordination, and AHJ review govern.

Assumptions, Notes, and Limitations

These pages are part of the calculation report and must remain with the schedules and one-lines

ShorePowerCalc is provided "as is" as an informational calculation aid only. It is not a licensed electrical engineer, does not exercise engineering judgment, and does not create sealed, permit-ready, or construction-ready documents. Calculations are based on user-entered information, selected assumptions, embedded tables, and selected NEC code-basis labels, and may contain errors, omissions, or inaccuracies. Outputs are estimates only and are not guaranteed to comply with the adopted NEC edition, local amendments, utility requirements, manufacturer instructions, project specifications, or site-specific conditions. A licensed electrical engineer, qualified professional, utility, manufacturer, and local authority having jurisdiction (AHJ), as applicable, must independently review and approve all inputs, calculations, assumptions, equipment selections, grounding and bonding, GFCI/GFPE settings, construction documents, and installations before permitting, procurement, construction, or energizing. Use of this tool is at your own risk, and Southern Electrical Solutions assumes no liability for damages, injuries, losses, rejected permits, rework, non-compliance, or unsafe installations arising from use of or reliance on the tool.

General and Single Panel Assumptions

- Outputs are only as accurate as the information entered by the user. Verify all receptacle quantities, voltages, distances, conductor materials, raceways, equipment ratings, environmental conditions, and field routing before relying on any result.

- Results are calculation aids only and are not a substitute for sealed engineering documents, utility coordination, manufacturer instructions, field verification, plan review, inspection, or AHJ approval.

- 20A and 30A receptacles are assumed to be 120V; 50A, 100A, and 200A receptacles are assumed to be 240V per NEC 220.5(A).

- Voltage-drop sizing uses a 3% branch/feeder design target in this tool. This is a planning criterion, not a guarantee of NEC compliance; verify project specifications, total feeder-plus-branch drop, actual conductor characteristics, and AHJ requirements. For mixed 120V and 240V loads, voltage drop is evaluated per leg using the applicable voltage.

- Neutral sizing: Ensure neutral conductor is sized per NEC 220.61, typically matching phase conductors for non-linear loads.

- Equipment grounding conductor: The base copper EGC is selected from NEC Table 250.122 using the feeder or branch-circuit OCPD. Where phase conductors are increased beyond the corrected/adjusted ampacity minimum, the EGC is increased proportionately under the selected edition's NEC 250.122 provisions, without exceeding the largest ungrounded conductor in that raceway.

- Raceway sizing uses NEC Chapter 9 Table 4 PVC Schedule 40 or 80 areas, Chapter 9 conductor areas, a full-size neutral where applicable, one insulated copper EGC in each raceway, and the normal 40% fill limit. Every parallel set is modeled in its own identical raceway; the reported format "2 x 2 1/2\"" means two raceways of that trade size with one complete set in each. For service-segment calculations, verify whether an EGC is required in the specific segment.

- Service entrance conductors sized per NEC 230.42, ampacity not less than calculated demand load, using 75 deg C column, with voltage drop calculation if distance provided (2% max recommended).

- Ambient temperature correction uses the 75 C factors in NEC Table 310.15(B)(1)(1) based on the selected range and caps the effective multiplier at 1.0 so corrected ampacity never exceeds the applicable termination-temperature column. The grouped 20 C-or-less option therefore does not increase base ampacity.

- General feeder, service, pedestal distribution, and local boat-lift controller and motor branch ampacity calculations use the 75 C column from NEC Table 310.16 (formerly 310.15(B)(16)). The tool assumes the associated equipment terminals are listed and identified for 75 C conductors. If any terminal is limited to a lower temperature, recalculate that circuit using the lower column. Never use 90 C conductor ampacity as the final termination ampacity.

- For 4-wire, 3-phase wye distribution raceways, the neutral is conservatively counted as a current-carrying conductor because marina loads are treated as predominantly nonlinear. Four current-carrying conductors therefore receive the 80% adjustment factor from NEC Table 310.15(C)(1). A single-phase neutral carrying only imbalance is not counted. Verify the actual load characteristics and conductor grouping for the project.

- For nonmotor general circuits, the small-conductor overcurrent limits in NEC 240.4(D) are enforced in addition to 75 C ampacity: 12 AWG aluminum is limited to 15A, 12 AWG copper to 20A, 10 AWG aluminum to 25A, and 10 AWG copper to 30A. Article 430 motor-circuit exceptions are evaluated separately.

- For an OCPD rated over 800A, the corrected and adjusted conductor ampacity is never selected below the OCPD rating. The next-size allowance for devices rated 800A or less is not applied above 800A.

- Installation type does not change the base ampacity table, but it does set supported/minimum conductor sizes and whether the tool calculates raceway fill. Verify the actual cable or raceway listing and installation conditions.

- For G-Cable, wire sizes are limited to 8 AWG through 500 kcmil; paralleling uses the smallest conductor size that meets the ampacity with the minimal number of conductors.

Assumptions, Notes, and Limitations (continued)

These pages are part of the calculation report and must remain with the schedules and one-lines

- For PVC Schedule 40 and Schedule 80 raceways with wet-location-rated THWN-2 conductors, wire sizes are limited to 12 AWG through 500 kcmil; paralleling uses the smallest conductor size that meets the ampacity with the minimal number conductors when exceeding 500 kcmil.

- For high loads exceeding single wire ampacity, paralleled conductors are recommended using the smallest size that allows the least number of conductors.

- Parallel conductors must comply with NEC 310.10(G), including the general 1/0 AWG minimum and identical length, material, circular-mil area, insulation, and termination method. Each raceway is assumed to contain the same number of conductors and the same electrical characteristics, with all circuit conductors and one EGC grouped as a complete set.

- For PVC Schedule 40 and Schedule 80 THWN-2 installations, the smallest wire size used is 12 AWG.

- For G-Cable installations, the smallest wire size used is 8 AWG.

- 20A GFCI receptacles are treated as accessory/convenience receptacles and are not included in the shore power receptacle count for demand factors; their load is calculated at 180 VA (1.5 A x 120 V) per NEC 220 and added at 100% demand.

- The tool assumes that pedestals have individual branch circuit breakers for each receptacle, so the circuits shown are feeders sized from the selected-edition marina demand calculation rather than the sum of all receptacle ratings.

- To loop multiple pedestals on a single feeder, enter the same circuit ID for each pedestal row. Provide the distance from the supply panel to the first pedestal, then list the span between each subsequent pedestal (unless explicitly labeled as a total run); the tool sums these spans, surfaces conflicts, and reports the feeder length in the loop notes.

- Looped pedestal circuits are identified on the one-line diagram by the count shown below each pedestal symbol; confirm each looped segment length and conductor size in the field.

- Each side of a pedestal is considered an individual slip when applying the selected-edition NEC marina demand table.

- Where qualifying individual sub-meters are present, selecting "Yes" applies the permitted 10% reduction to qualifying shore-power demand under Note 2 of the selected-edition NEC marina demand table.

- Under Note 1 of the selected-edition NEC marina demand table, a slip with exactly two shore-power receptacles of different voltages includes only the receptacle with the higher kVA rating. This is applied per pedestal side.

- For balancing, 120V loads (accessory and non-accessory) on side 1 are assigned starting with phase A and on side 2 starting with phase B when identical layouts are used.

Boat Lift Load Assumptions

- Boat lift motor FLC values use NEC Table 430.248 for single-phase motors and Table 430.250 for three-phase motors unless the user enters a manual override. Every motor on each selected complete lift is included at 100%, with one 25% largest-motor adder at each calculated feeder level.

- Motor-voltage choices follow the selected serving equipment. A 120/240V single-phase source offers 115/120V and 230/240V single-phase motors; a 120/208V source offers only the compatible 115/120V and 208V choices for its phase configuration; and a direct 480/277V MDP circuit offers 460/480V three-phase motors. Unusual motor ratings require a compatible source plus separately verified nameplate and manufacturer data.

- Boat lift controller-supply conductors are sized for 125% of the highest-rated motor plus the full-load current of the other motors under NEC 430.24. These local branch results default to wet-location-rated copper THWN-2, use the 75 C ampacity column based on the assumed 75 C controller and motor terminals, and do not inherit the pedestal or panel feeder material. Each local lift branch is assumed to occupy its own selected PVC Schedule 40 or Schedule 80 raceway. Raceway fill includes the controller-supply phase conductors, one full-size neutral matching the controller-supply conductor, and one copper EGC. The ampacity calculation assumes no more than three current-carrying conductors; verify neutral loading and apply the NEC 310.15(C)(1) adjustment when the neutral must be counted or multiple branch circuits are grouped. Separate controller-to-motor conductor results are sized at 125% of one motor FLC under NEC 430.22 and are shown independently from the controller supply. Voltage drop applies only to the entered source-to-controller run. The reported maximum inverse-time circuit breaker is based on NEC 430.52 and, for multiple motors, 430.53(C)(4), assuming a listed group motor controller. The Actual OCPD input also assumes an inverse-time circuit breaker; fuses, instantaneous-trip devices, and other protection types require separate engineering review. A valid actual controller/equipment OCPD entered by the user replaces that calculated maximum in the branch and feeder review. Equipment markings and manufacturer instructions always govern, including any terminal temperature rating below 75 C. The copper EGC is sized from the entered actual OCPD when valid, otherwise from the reported maximum, using NEC Table 250.122.

Assumptions, Notes, and Limitations (continued)

These pages are part of the calculation report and must remain with the schedules and one-lines

- Feeders supplying boat-lift motors are not reduced below the Article 430.24 motor-feeder ampacity calculation. Breaker values marked "prelim." are planning values. The Motor Feeder OCPD Review applies NEC 430.62 and 430.63 only to feeders with valid downstream motor branches. It applies each valid user-entered actual lift-controller OCPD; missing or invalid entries retain a calculated lower-to-maximum range. Equipment markings, conductor protection, selective coordinat manufacturer instructions, and AHJ review govern the final feeder breaker.

- Where a boat lift and shore power serve the same slip, the tool compares both calculated loads and uses the larger load under Note 3 of the selected-edition NEC marina demand table. The lift is still modeled with its own appropriately protected branch from the pedestal.

- A Pedestal Circuit automatically uses the larger lift or shore-power load for that slip under Note 3 of the applicable marina demand table. If the pedestal has no qualifying shore-power receptacle, the complete lift motor load is included on the selected pedestal feeder.

- The Extra 20A Recs field is only for accessory receptacles not already entered in the selected pedestal layout. These loads remain additional. The tool warns when a pedestal layout and lift row both contain accessory receptacles so possible duplicate entry can be reviewed.

- A Serving Panel Circuit is assigned its own panel circuit number and does not require a pedestal selection. Extra 20A receptacles on that row are assigned a separate 20A branch circuit and are not combined with the motor branch.

- Lift motor loads outside the automatic same-slip comparison do not receive the shore-power receptacle demand factor. All motors on one lift are treated as operating together. A Maximum Simultaneous Lifts limit applies only between separate complete lifts, and one governing 25% largest-motor adder is applied at each calculated feeder level. Any limit below the connected lift count is a user-entered NEC 430.26 operating assumption requiring supporting documentation and AHJ acceptance.

Other Marina Load Assumptions

- Other Loads are added at 100% of the user-entered calculated volt-amperes and are not included in the shore-power receptacle count or marina demand factor.

- The entered VA must already include all applicable continuous-load multipliers, equipment-specific demand factors, motor requirements, lighting calculations, nonlinear loading, and other code or project adjustments. Do not enter unadjusted nameplate values unless that is the correct calculated load for the equipment.

- Panel or Substation loads are included in the selected downstream equipment demand and its upstream feeder. MDP Direct loads bypass the selected downstream panel or substation and are added only at the project MDP.

- Each Other Loads row represents one branch circuit. Quantity is the number of entered load units served by that circuit, so branch load equals Calculated VA Each multiplied by Qty on Circuit. Enter separate rows when the equipment is divided among separate branch circuits.

- Automatic phase assignment balances entered loads against the calculated phase loading. Line-to-neutral loads use a one-pole branch, line-to-line loads use a two-pole branch, and three-phase loads use a three-pole branch. For a three-phase load, selecting a neutral includes four insulated conductors and conservatively counts all four as current-carrying for adjustment.

- Other-load branch planning uses the selected copper or aluminum phase conductors, PVC raceway, entered branch distance, source ambient temperature, assumed 75 C terminations, and a 3% voltage-drop target. The copper EGC is sized from the planning OCPD and is proportionately increased when phase conductors are increased for voltage drop.

- The reported branch OCPD, conductors, EGC, raceway, and voltage drop are planning values. Listed equipment MCA/MOCP, nameplate OCPD, disconnect, controller, neutral, harmonic, fault-current, conductor-temperature, manufacturer, utility, local amendment, and AHJ requirements always govern the final circuit. Pumps, HVAC/mechanical equipment, EV charging equipment, buildings, and similar loads can require additional equipment-specific calculations not derived from entered VA alone.

Multi Panel Mode Assumptions

- Multi Panel mode starts the calculation boundary at the low-voltage landside MDP/switchboard and models downstream dock panels and pedestal loads. It does not model utility transformers or 480V marine substations.

Assumptions, Notes, and Limitations (continued)

These pages are part of the calculation report and must remain with the schedules and one-lines

- Multi Panel outputs are planning-level calculation aids only. They do not replace engineered service studies, fault-current studies, coordination studies, utility service requirements, manufacturer submittals, stamped construction drawings, or A review.
- MDP demand is calculated from all downstream shore power receptacles served by the MDP, not by simply adding individual dock-panel demands.
- Dock-panel feeders are sized from each dock panel's calculated demand and reported as calculation aids. Final feeder, panelboard, overcurrent, neutral, grounding, bonding, and voltage-drop decisions must be reviewed by the engineer of record and AHJ.
- For 120/208V three-phase MDPs, single-phase dock-panel feeders are automatically assigned across A-B, B-C, and C-A to reduce phase imbalance. Three-phase dock panels retain their calculated A/B/C load split.
- The Multi Panel feeder schedule reports equipment grounding conductors (EGC) for feeders. The one-line and summary also show grounding electrode conductor (GEC) values for the MDP and dock panels as calculation aids.
- When 2026 NEC is selected, the report applies the demand percentages in Table 120.120. Verify the locally adopted edition, effective date, local amendments, and project-specific requirements.

Ground-Fault Protection (NEC Article 555.35)

Local AHJ must be consulted prior to material purchase to ensure compliance with NEC Articles 555 and 220, including ground-fault protection requirements and any local amendments.

- Ground-fault protection, leakage-current coordination, bonding, grounding, and corrosion-related requirements are life-safety items and must be reviewed by the engineer of record, equipment manufacturer, and AHJ.
- Article 555 ground-fault requirements vary by adopted NEC edition, receptacle type, feeder or branch-circuit location, equipment rating, marina configuration, device coordination, and local amendments. Verify exact GFPE/GFCI thresholds, testing, location, and coordination requirements with the adopted NEC edition and AHJ.
- Do not rely on this app to select, set, locate, or coordinate GFPE/GFCI devices. Manufacturer data, engineered coordination review, field testing requirements, and AHJ direction must control.
- Ground-fault protection devices should be installed in locations to minimize nuisance tripping and must be accessible for testing and maintenance.
- Consult the local AHJ to confirm specific ground-fault protection requirements, as they may impose additional or more stringent rules.

Legal and Liability Disclaimer

- By using this tool, you agree to indemnify and hold harmless Southern Electrical Solutions from any claims, liabilities, or expenses related to its use.
- This tool does not constitute professional engineering, legal, consulting, utility, manufacturer, or AHJ advice, and no attorney-client, engineer-client, or other professional relationship is formed.
- All outputs are estimates and calculation aids; actual installations must be designed, reviewed, approved, inspected, and accepted by qualified professionals and authorities with jurisdiction.
- Do not use any output for permitting, procurement, construction, installation, or energizing until it has been independently verified and approved for the specific project and jurisdiction.
- In the event of any conflict between this tool and official NEC or local codes, the official sources prevail.