

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Distribution Panelboard.
- B. Branch Circuit Panelboards

1.2 REFERENCES

- A. NECA (National Electrical Contractors Association) "Standard of Installation."
- B. NEMA AB 1 - Molded Case Circuit Breakers.
- C. NEMA PB 1 - Panelboards.
- D. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards rated 600 Volts or Less.
- E. NEMA PB 1.2 - Application Guide for Ground-fault Protective Devices for Equipment.
- F. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS

- A. Submit shop drawings for equipment and component devices under provisions of Division 01 and Section 26 00 00.
- B. Include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, and branch circuit breaker quantities and sizes.
- C. Operating and Maintenance Manuals: Provide for panelboards, enclosed circuit breakers and electrical use submeters.

1.4 SPARE PARTS

- A. Panelboard Cover Keys: Furnish 4 each to Owner.

PART 2 – PRODUCTS

2.1 PANELBOARDS

- A. Acceptable Manufacturers.
 - 1. *Square D.*
 - 2. *Cutler-Hammer.*
 - 3. *General Electric.*
 - 4. *Siemens.*
 - 5. Substitutions: None Permitted.

- B. Description
 - 1. Panelboards: NEMA PB1; Circuit breaker type with bolt-on circuit breakers.
 - 2. Enclosures: NEMA PB 1; Type 1.
 - 3. Cabinet Sizes:
 - a. Branch Circuit Panelboards: 5 ¾ inches deep; 20 inches wide.
 - 4. Provide cabinet fronts with concealed trim clamps, concealed hinge and flush lock all keyed alike. Finish in manufacturer's standard gray enamel
 - 5. Provide copper buses for all panels and load centers. Branch circuits panels and load centers shall be rated as scheduled within specification section 26 06 20.16. Service/distribution panel shall be rated as indicated on the single-line diagram in the contract drawings.
 - 6. Minimum Integrated Short Circuit Ratings:
 - a. Branch Circuit Panelboards: 35,000 AIC at 120/240 volts.
 - 7. Molded Case Circuit Breakers: NEMA AB 1; thermal magnetic trip circuit breakers, with common trip handle for all poles. Provide circuit breakers UL listed as Type SWD for lighting circuits.
 - 8. Provide circuit breaker accessory trip units and auxiliary contacts as indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide panelboards as indicated on the Contract Drawings.
- B. Install panelboards plumb and flush with wall finishes, in conformance with NEMA PB 1.1.
- C. Height: 6 feet to top of panelboard.
- D. Clearance: 3 feet front clearance, floor to ceiling with no foreign pipes, ducts, or other system equipment.
- E. Provide filler plates for unused spaces.
- F. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

3.2 FIELD QUALITY CONTROL

- A. Measure state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed 20 percent, rearrange circuits in the panelboard to balance the phase loads within 20 percent. Take care to maintain proper phasing for multi-wire branch circuits.
- B. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers.

END OF SECTION 26 24 16

VOLTS: 120/208 AMPS 225
MOUNT: SURFACE PHASE: 3

MAIN: MLO
WIRES: 4

PANEL: HP-1A
LOCATION: FIRST FL ELEC RM

BREAKER		DESCRIPTION	CKT VA	TYPE	CKT NO.	LOAD			CKT NO.	TYPE	CKT VA	DESCRIPTION	BREAKER	
A	P					A	B	C					P	A
20	2	AH-105	96	M	1	192			2	M	96	AH-106	2	20
20	2	AH-105	96	M	3		192		4	M	96	AH-106	2	20
20	2	DHC-1	1000	H	5			1280	6	M	280	HRU-5	2	20
20	2	DHC-1	1000	H	7	1280			8	M	280	HRU-5	2	20
20	1	WH-1	1500	H	9		3000		10	H	1500	WH-1	1	20
20	1	MOTOR OPER DAMPERS	500	M	11			528	12	M	28	HR-1 & HR-2	1	20
20	1	CUH-1	100	H	13	1300			14	R	1200	RECEPTACLES	1	20
20	1	LIGHTING	887	L	15		1387		16	S	500	SPARE	1	20
20	1	SPARE	500	S	17			1000	18	S	500	SPARE	1	20
20	1	SPARE	500	S	19	1000			20	S	500	SPARE	1	20
20	1	SPARE	500	S	21		1000		22	S	500	SPARE	1	20
20	1	SPARE	500	S	23			1000	24	S	500	SPARE	1	20
20	1	SPARE	500	S	25	1000			26	S	500	SPARE	1	20
20	1	SPARE	500	S	27		1000		28	S	500	SPARE	1	20
20	1	SPARE	500	S	29			1000	30	S	500	SPARE	1	20
20	1	SPARE	500	S	31	1000			32	S	500	SPARE	1	20
20	1	SPARE	500	S	33		1000		34	S	500	SPARE	1	20
20	1	SPARE	500	S	35			1000	36	S	500	SPARE	1	20
20	1	SPARE	500	S	37	1000			38	S	500	SPARE	1	20
20	1	SPARE	500	S	39		1000		40	S	500	SPARE	1	20
20	1	SPARE	500	S	41			1000	42	S	500	SPARE	1	20
PHASE TOTALS						6772	8579	6808						

CONNECTED VOLT-AMPERES= 22159
CONNECTED AMPERES= 62
DEMAND VOLT-AMPERES= 14073
DEMAND AMPERES= 39

CIRCUIT TYPE CODES		DEMAND FACTOR
L	LIGHTS	1.0
M	MOTORS	0.5
R	RECEPTACLES	0.5
H	HEAT	1.0
O	OTHER	0.5
S	SPARE	0.5

PROJECT: **Merrill's Wharf First & Second Floor Fit-Up Project**
PROJ. NO: 11-0053
DATE: 12/29/11
STATUS: CONST SET

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
942 WASHINGTON STREET BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

VOLTS: 277/480 AMPS 225
MOUNT: SURFACE PHASE: 3

MAIN: MLO
WIRES: 4

PANEL: EXISTING HP-B2
LOCATION: BASEMENT ELEC 001

BREAKER		DESCRIPTION	CKT VA	TYPE	CKT NO.	LOAD			CKT NO.	TYPE	CKT VA	DESCRIPTION	BREAKER	
A	P					A	B	C					P	A
30	3	OU-11	7483	M	1	13857			2	M	6374	OU-13	3	25
30	3	OU-11	7483	M	3		13857		4	M	6374	OU-13	3	25
30	3	OU-11	7483	M	5			13857	6	M	6374	OU-13	3	25
25	3	OU-12	6374	M	7	12748			8	M	6374	OU-14	3	25
25	3	OU-12	6374	M	9		12748		10	M	6374	OU-14	3	25
25	3	OU-12	6371	M	11			12745	12	M	6374	OU-14	3	25
20	1	SPARE	500	S	13	1000			14	S	500	SPARE	1	20
20	1	SPARE	500	S	15		1000		16	S	500	SPARE	1	20
20	1	SPARE	500	S	17			1000	18	S	500	SPARE	1	20
20	1	LIGHTING	1912	L	19	3592			20	L	1680	EXTERIOR LIGHTS	1	20
20	1	LIGHTING	500	L	21		1000		22	S	500	SPARE	1	20
20	1	SPARE	500	S	23			1000	24	S	500	SPARE	1	20
70	3	PANEL HP-B1	14729		25	34635			26		19906	PANEL HP-B2A	3	70
70	3	PANEL HP-B1	9885		27		29791		28		19906	PANEL HP-B2A	3	70
70	3	PANEL HP-B1	9310		29			29216	30		19906	PANEL HP-B2A	3	70

PHASE TOTALS 65832 58396 57818

CONNECTED VOLT-AMPERES= 182046
CONNECTED AMPERES= 219
DEMAND VOLT-AMPERES= 110031
DEMAND AMPERES= 132

EXISTING PANEL - PROVIDE NEW CB #26,28,30

CIRCUIT TYPE CODES		DEMAND FACTOR
L	LIGHTS	1.0
M	MOTORS	0.5
R	RECEPTACLES	0.5
H	HEAT	1.0
O	OTHER	0.5
S	SPARE	0.5

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MOUNT: SURFACE PHASE: 3

MAIN: MLO
WIRES: 4

PANEL: HP-B2A
LOCATION: BASEMENT ELEC 001

BREAKER		DESCRIPTION	CKT VA	TYPE	CKT NO.	LOAD			CKT NO.	TYPE	CKT VA	DESCRIPTION	BREAKER	
A	P					A	B	C					P	A
40	3	OU-21A	8869	M	1	16906			2	M	8037	OU-21B	3	35
40	3	OU-21A	8869	M	3		16906		4	M	8037	OU-21B	3	35
40	3	OU-21A	8869	M	5			16906	6	M	8037	OU-21B	3	35
20	1	SPARE	500	S	7	1000			8	S	500	SPARE	1	20
20	1	SPARE	500	S	9		1000		10	S	500	SPARE	1	20
20	1	SPARE	500	S	11			1000	12	S	500	SPARE	1	20
20	1	SPARE	500	S	13	1000			14	S	500	SPARE	1	20
20	1	SPARE	500	S	15		1000		16	S	500	SPARE	1	20
20	1	SPARE	500	S	17			1000	18	S	500	SPARE	1	20
20	1	SPARE	500	S	19	1000			20	S	500	SPARE	1	20
20	1	SPARE	500	S	21		1000		22	S	500	SPARE	1	20
20	1	SPARE	500	S	23			1000	24	S	500	SPARE	1	20

PHASE TOTALS 19906 19906 19906

CONNECTED VOLT-AMPERES= 59718
CONNECTED AMPERES= 72
DEMAND VOLT-AMPERES= 29859
DEMAND AMPERES= 36

CIRCUIT TYPE CODES DEMAND FACTOR
L LIGHTS 1.0
M MOTORS 0.5
R RECEPTACLES 0.5
H HEAT 1.0
O OTHER 0.5
S SPARE 0.5

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VOLTS: 120/208 AMPS 100
MOUNT: SURFACE PHASE: 3

MAIN: MLO
WIRES: 4

PANEL: TP-1C
LOCATION: FIRST FL ELEC RM

BREAKER		DESCRIPTION	CKT VA	TYPE	CKT NO.	LOAD			CKT NO.	TYPE	CKT VA	DESCRIPTION	BREAKER	
A	P					A	B	C					P	A
20	2	AH-104	240	M	1	2740			2	H	2500	DHC-4	2	30
20	2	AH-104	240	M	3		2740		4	H	2500	DHC-4	2	30
20	2	HR-3	7	H	5			807	6	R	800	RECEPTACLES	1	20
20	2	HR-3	7	H	7	807			8	R	800	RECEPTACLES	1	20
20	1	LIGHTING	960	L	9		1960		10	R	1000	RECEPTACLES	1	20
20	1	SPARE	500	S	11			1700	12	R	1200	RECEPTACLES	1	20
20	1	SPARE	500	S	13	1000			14	S	500	SPARE	1	20
20	1	SPARE	500	S	15		1000		16	S	500	SPARE	1	20
20	1	SPARE	500	S	17			1000	18	S	500	SPARE	1	20
20	1	SPARE	500	S	19	1000			20	S	500	SPARE	1	20
20	1	SPARE	500	S	21		1000		22	S	500	SPARE	1	20
20	1	SPARE	500	S	23			1000	24	S	500	SPARE	1	20
PHASE TOTALS						5547	6700	4507						

CONNECTED VOLT-AMPERES= 16754
CONNECTED AMPERES= 47
DEMAND VOLT-AMPERES= 11364
DEMAND AMPERES= 32

CIRCUIT TYPE CODES		DEMAND FACTOR
L	LIGHTS	1.0
M	MOTORS	0.5
R	RECEPTACLES	0.5
H	HEAT	1.0
O	OTHER	0.5
S	SPARE	0.5

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VOLTS: 120/208 AMPS 100
MOUNT: SURFACE PHASE: 3

MAIN: MLO
WIRES: 4

PANEL: TP-1D
LOCATION: FIRST FL ELEC RM

BREAKER		DESCRIPTION	CKT VA	TYPE	CKT NO.	LOAD			CKT NO.	TYPE	CKT VA	DESCRIPTION	BREAKER	
A	P					A	B	C					P	A
20	2	AH-107	240	M	1	480			2	M	240	AH-108	1	20
20	2	AH-107	240	M	3		480		4	M	240	AH-108	1	20
30	2	DHC-5	2500	H	5			3500	6	R	1000	RECEPTACLES	1	20
30	2	DHC-5	2500	H	7	3500			8	R	1000	RECEPTACLES	1	20
20	1	LIGHTING	1120	L	9		2120		10	R	1000	RECEPTACLES	1	20
20	1	SPARE	500	S	11			1300	12	R	800	RECEPTACLES	1	20
20	1	SPARE	500	S	13	1300			14	R	800	RECEPTACLES	1	20
20	1	SPARE	500	S	15		1300		16	R	800	RECEPTACLES	1	20
20	1	SPARE	500	S	17			1000	18	S	500	SPARE	1	20
20	1	SPARE	500	S	19	1000			20	S	500	SPARE	1	20
20	1	SPARE	500	S	21		1000		22	S	500	SPARE	1	20
20	1	SPARE	500	S	23			1000	24	S	500	SPARE	1	20
PHASE TOTALS						6280	4900	6800						

CONNECTED VOLT-AMPERES= 17980
CONNECTED AMPERES= 50
DEMAND VOLT-AMPERES= 12050
DEMAND AMPERES= 33

CIRCUIT TYPE CODES		DEMAND FACTOR
L	LIGHTS	1.0
M	MOTORS	0.5
R	RECEPTACLES	0.5
H	HEAT	1.0
O	OTHER	0.5
S	SPARE	0.5

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VOLTS: 120/208 AMPS 225
MOUNT: SURFACE PHASE: 3

MAIN: MLO
WIRES: 4

PANEL: TP-2B SECTION 1
LOCATION: FIRST FL ELEC RM

BREAKER		DESCRIPTION	CKT VA	TYPE	CKT NO.	LOAD			CKT NO.	TYPE	CKT VA	DESCRIPTION	BREAKER	
A	P					A	B	C					P	A
20	1	DATA NETWORK RACK	1000	O	1	1800			2	R	800	RECEPTACLES	1	20
20	1	TELECOM EQUIPMENT	500	O	3		1300		4	R	800	RECEPTACLES	1	20
20	1	TELECOM RECEP	400	R	5			1200	6	R	800	RECEPTACLES	1	20
20	1	REFRIGERATOR	1500	R	7	2500			8	R	1000	RECEPTACLES	1	20
20	1	KITCHEN RECEPTACLES	400	R	9		1200		10	R	800	RECEPTACLES	1	20
20	1	KITCHEN RECEPTACLES	400	R	11			1200	12	R	800	RECEPTACLES	1	20
20	1	RECEPTACLES	800	R	13	1600			14	R	800	RECEPTACLES	1	20
20	1	RECEPTACLES	800	R	15		1600		16	R	800	RECEPTACLES	1	20
20	1	RECEPTACLES	1000	R	17			1800	18	R	800	RECEPTACLES	1	20
20	1	RECEPTACLES	800	R	19	3300			20	O	2500	COPIER	2	30
20	1	RECEPTACLES	800	R	21		3300		22	O	2500	COPIER	2	30
20	1	RECEPTACLES	800	R	23			2300	24	O	1500	COPIER	1	20
20	1	RECEPTACLES	800	R	25	1800			26	R	1000	RECEPTACLES	1	20
20	1	RECEPTACLES	1000	R	27		2000		28	R	1000	RECEPTACLES	1	20
20	1	RECEPTACLES	1000	R	29			2200	30	R	1200	RECEPTACLES	1	20
20	1	RECEPTACLES	1000	R	31	1800			32	R	800	RECEPTACLES	1	20
20	1	SPARE	500	S	33		1500		34	R	1000	RECEPTACLES	1	20
20	1	SPARE	500	S	35			1503	36	L	1003	LIGHTING	1	20
100	3	PANEL TP-2B SECTION 2	11796		37	12463			38	L	667	LIGHTING	1	20
100	3	PANEL TP-2B SECTION 2	13650		39		14725		40	L	1075	LIGHTING	1	20
100	3	PANEL TP-2B SECTION 2	9670		41			10869	42	L	1199	LIGHTING	1	20
PHASE TOTALS						25263	25625	21072						

CONNECTED VOLT-AMPERES= 71960
CONNECTED AMPERES= 200
DEMAND VOLT-AMPERES= 50203
DEMAND AMPERES= 139

CIRCUIT TYPE CODES		DEMAND FACTOR
L	LIGHTS	1.0
M	MOTORS	0.5
R	RECEPTACLES	0.5
H	HEAT	1.0
O	OTHER	0.5
S	SPARE	0.5

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VOLTS: 120/208 AMPS 100
MOUNT: SURFACE PHASE: 3

MAIN: MLO
WIRES: 4

PANEL: TP-2B SECTION 2
LOCATION: FIRST FL ELEC RM

BREAKER		DESCRIPTION	CKT VA	TYPE	CKT NO.	LOAD			CKT NO.	TYPE	CKT VA	DESCRIPTION	BREAKER	
A	P					A	B	C					P	A
30	2	DHC-4	2500	H	43	3500			44	H	1000	DHC-1	2	20
30	2	DHC-4	2500	H	45		3500		46	H	1000	DHC-1	2	20
20	2	AH-225	240	M	47			336	48	M	96	AH-228	2	20
20	2	AH-225	240	M	49	336			50	M	96	AH-228	2	20
20	2	HR-4 & HR-5	28	M	51		124		52	M	96	AH-227	2	20
20	2	HR-4 & HR-5	28	M	53			124	54	M	96	AH-227	2	20
20	2	AH-223	96	M	55	192			56	M	96	AH-226	2	20
20	2	AH-223	96	M	57		192		58	M	96	AH-226	2	20
20	2	AH-224	96	M	59			376	60	M	280	HRU-6	2	20
20	2	AH-224	96	M	61	376			62	M	280	HRU-6	2	20
60	3	DHC-5	5334	H	63		6834		64	H	1500	WH-1	1	20
60	3	DHC-5	5334	H	65			5834	66	M	500	MOTOR OPER DAMPERS	1	20
60	3	DHC-5	5334	H	67	5392			68	M	58	EF-14	1	20
20	1	SPARE	500	S	69		1000		70	S	500	SPARE	1	20
20	1	SPARE	500	S	71			1000	72	S	500	SPARE	1	20
20	1	SPARE	500	S	73	1000			74	S	500	SPARE	1	20
20	1	SPARE	500	S	75		1000		76	S	500	SPARE	1	20
20	1	SPARE	500	S	77			1000	78	S	500	SPARE	1	20
20	1	SPARE	500	S	79	1000			80	S	500	SPARE	1	20
20	1	SPARE	500	S	81		1000		82	S	500	SPARE	1	20
20	1	SPARE	500	S	83			1000	84	S	500	SPARE	1	20
PHASE TOTALS						11796	13650	9670						

CONNECTED VOLT-AMPERES= 35116
CONNECTED AMPERES= 97
DEMAND VOLT-AMPERES= 29809
DEMAND AMPERES= 83

CIRCUIT TYPE CODES		DEMAND FACTOR
L	LIGHTS	1.0
M	MOTORS	0.5
R	RECEPTACLES	0.5
H	HEAT	1.0
O	OTHER	0.5
S	SPARE	0.5

PROJECT: **Merrill's Wharf First & Second Floor Fit-Up Project**
PROJ. NO: 11-0053
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