

Lindsey Beane

Lighting/Electrical
Professor Mistrick
Harris Theater for Music and Dance
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Final Report Appendix B

**The following sections of Appendix B include information for the equipment used.
Below is a description of the organization for this appendix.**

Lighting System Electrical Loads *Panel boards*

Controls Diagrams *Back of House Controls* *Front of House Controls*

Distribution Panels *Existing Panels* *Designed Panels*

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Lighting System Electrical Loads

Voltage: 208Y/120 Main Breaker: 200 A Feeder: (4) 3/0 THW, 2" C
 (#, size wire & conduit)

| Description | LOAD (VA) | | | Brk. Trip (A) | LP 1 | | | | LOAD (VA) | | | Brk. Trip (A) | Description |
|--------------------|-----------|------|------|---------------------|---------------|--------|---------------|-----|-----------|------|------|---------------------|--------------------|
| | A | B | C | | Cond. Size | Ckt. # | Cond. Size | A | B | C | | | |
| Off - Pendants | 1048 | | | 20 | #12 | 1 | 2 | #12 | 1254 | | | 20 | Lby1 - Cove |
| Off - Wall washer | | 1245 | | 20 | #12 | 3 | 4 | #12 | | 1320 | | 20 | Lby1 - Cove |
| Lby2 - Cove | | | 1584 | 20 | #12 | 5 | 6 | #12 | | | 1056 | 20 | Lby1 - Lg Pendant. |
| Lby2 - Cove | 1518 | | | 20 | #12 | 7 | 8 | #12 | 636 | | | 20 | Lby1 - Railing |
| Lby2 - Lg Pendant | | 1452 | | 20 | #12 | 9 | 10 | #12 | | 644 | | 20 | Ent - Track |
| Lby2 - Sml Pendant | | | 732 | 20 | #12 | 11 | 12 | #12 | | | 644 | 20 | Ent - Track |
| | | | | | | 13 | 14 | | | | | | |
| | | | | | | 15 | 16 | | | | | | |
| | | | | | | 17 | 18 | | | | | | |
| | | | | | | 19 | 20 | | | | | | |
| | | | | | | 21 | 22 | | | | | | |
| | | | | | | 23 | 24 | | | | | | |
| | | | | | | 25 | 26 | | | | | | |
| | | | | | | 27 | 28 | | | | | | |
| | | | | | | 29 | 30 | | | | | | |
| | | | | | | 31 | 32 | | | | | | |
| | | | | | | 33 | 34 | | | | | | |
| | | | | | | 35 | 36 | | | | | | |
| | | | | | | 37 | 38 | | | | | | |
| | | | | | | 39 | 40 | | | | | | |
| | | | | | | 41 | 42 | | | | | | |
| | 2566 | 2697 | 2316 | | | | | | 1890 | 1964 | 1700 | | |

Total Load on Phase A: 4456 VA

Total Load on Phase B: 4661 VA

Total Load on Phase C: 4016 VA

Total Load on Panel: 13.133 kVA Demand

109.441667 A

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Lighting System Electrical Loads

Voltage: 208Y/120 Main Breaker: 200 A Feeder: (4) 3/0 THW, 2" C
 (#, size wire & conduit)

| Description | LOAD (VA) | | | Brk. Trip (A) | LP 2 | | | LOAD (VA) | | | Brk. Trip (A) | Description |
|-------------------------|-----------|------|------|---------------|------------|--------|------------|-----------|------|------|---------------|-------------------------|
| | A | B | C | | Cond. Size | Ckt. # | Cond. Size | A | B | C | | |
| HL - CFL Downlight | 1607 | | | 20 | #12 | 1 2 | #12 | 1113 | | | 20 | HL - CFL Downlight |
| HL - Railing | | 1527 | | 20 | #12 | 3 4 | #12 | | 1484 | | 20 | HL - CFL Downlight |
| HL - Aisle | | | 665 | 20 | #12 | 5 6 | #12 | | | 1113 | 20 | HL - CFL Downlight |
| HL - Borderlight Accent | 1000 | | | 20 | #12 | 7 8 | #12 | 1000 | | | 20 | HL - Hal Downlight |
| HL - Borderlight Accent | | 1000 | | 20 | #12 | 9 10 | #12 | | 1000 | | 20 | HL - Borderlight Accent |
| HL - Borderlight Accent | | | 1000 | 20 | #12 | 11 12 | #12 | | | 1000 | 20 | HL - Borderlight Accent |
| HL - Borderlight Accent | 1000 | | | 20 | #12 | 13 14 | #12 | 1000 | | | 20 | HL - Borderlight Accent |
| HL - Borderlight Accent | | 1000 | | 20 | #12 | 15 16 | #12 | | 1000 | | 20 | HL - Borderlight Accent |
| HL - Borderlight Accent | | | 1000 | 20 | #12 | 17 18 | #12 | | | 1000 | 20 | HL - Borderlight Accent |
| Ent - Automated Spot | 700 | | | 20 | #12 | 19 20 | #12 | 1000 | | | 20 | HL - Borderlight Accent |
| | | | | | | 21 22 | | | | | | |
| | | | | | | 23 24 | | | | | | |
| | | | | | | 25 26 | | | | | | |
| | | | | | | 27 28 | | | | | | |
| | | | | | | 29 30 | | | | | | |
| | | | | | | 31 32 | | | | | | |
| | | | | | | 33 34 | | | | | | |
| | | | | | | 35 36 | | | | | | |
| | | | | | | 37 38 | | | | | | |
| | | | | | | 39 40 | | | | | | |
| | | | | | | 41 42 | | | | | | |
| | 4307 | 3527 | 2665 | | | | | 4113 | 3484 | 3113 | | |

Total Load on Phase A: 8420 VA
 Total Load on Phase B: 7011 VA
 Total Load on Phase C: 5778 VA

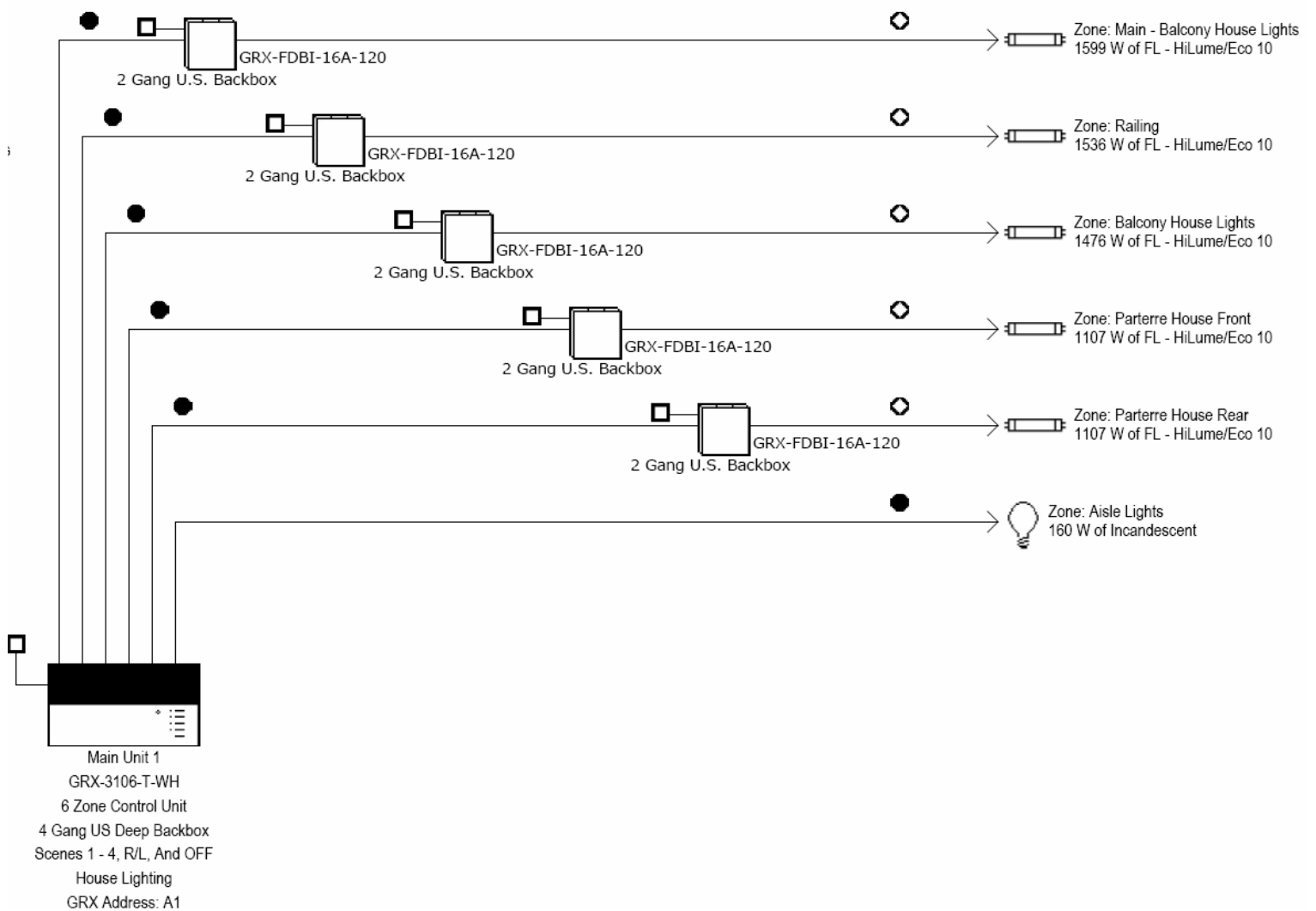
Total Load on Panel: 21.209 kVA Demand
176.741667 A

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Back of House Controls

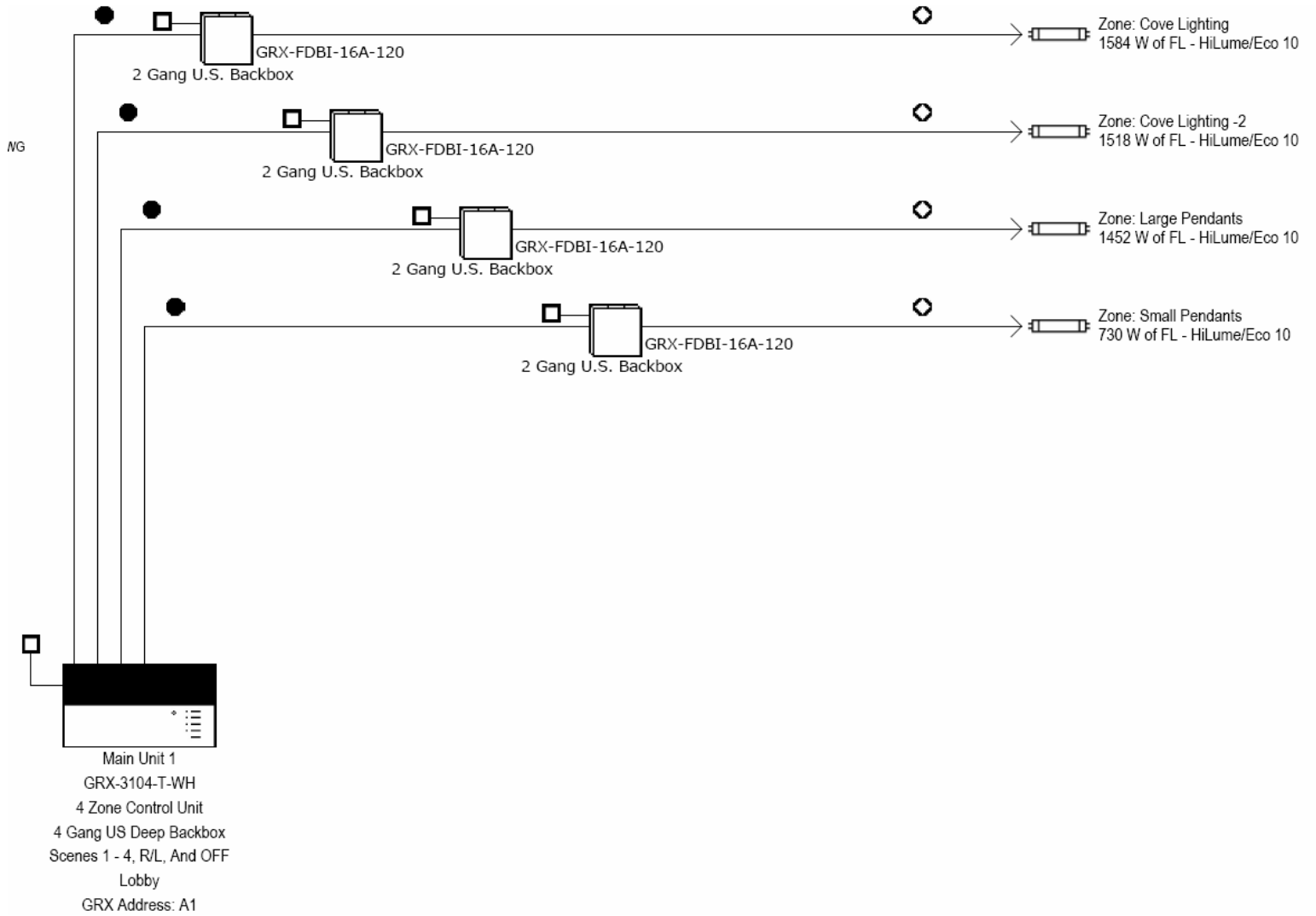


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Front of House Controls Lobby

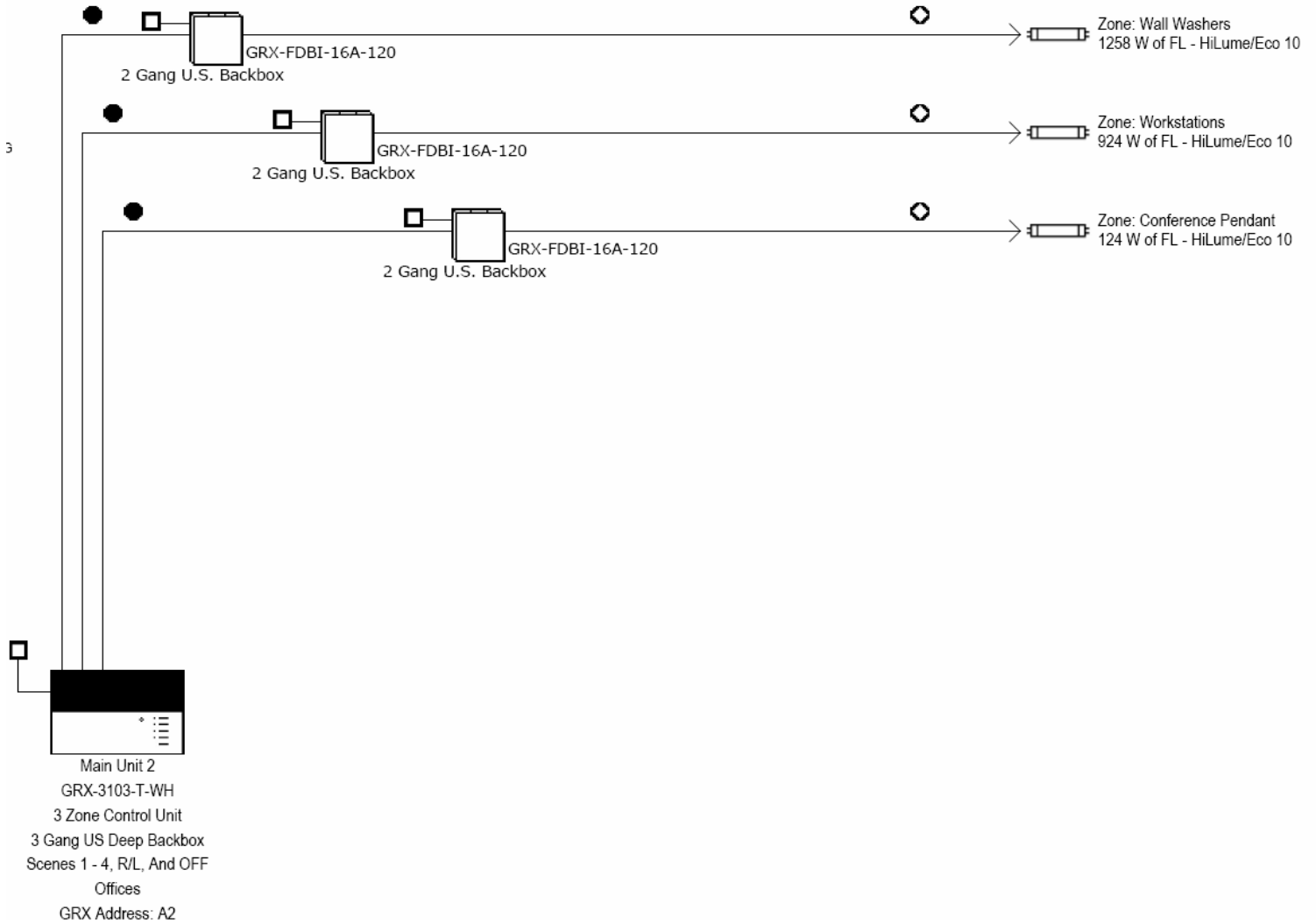


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Front of House Controls Offices

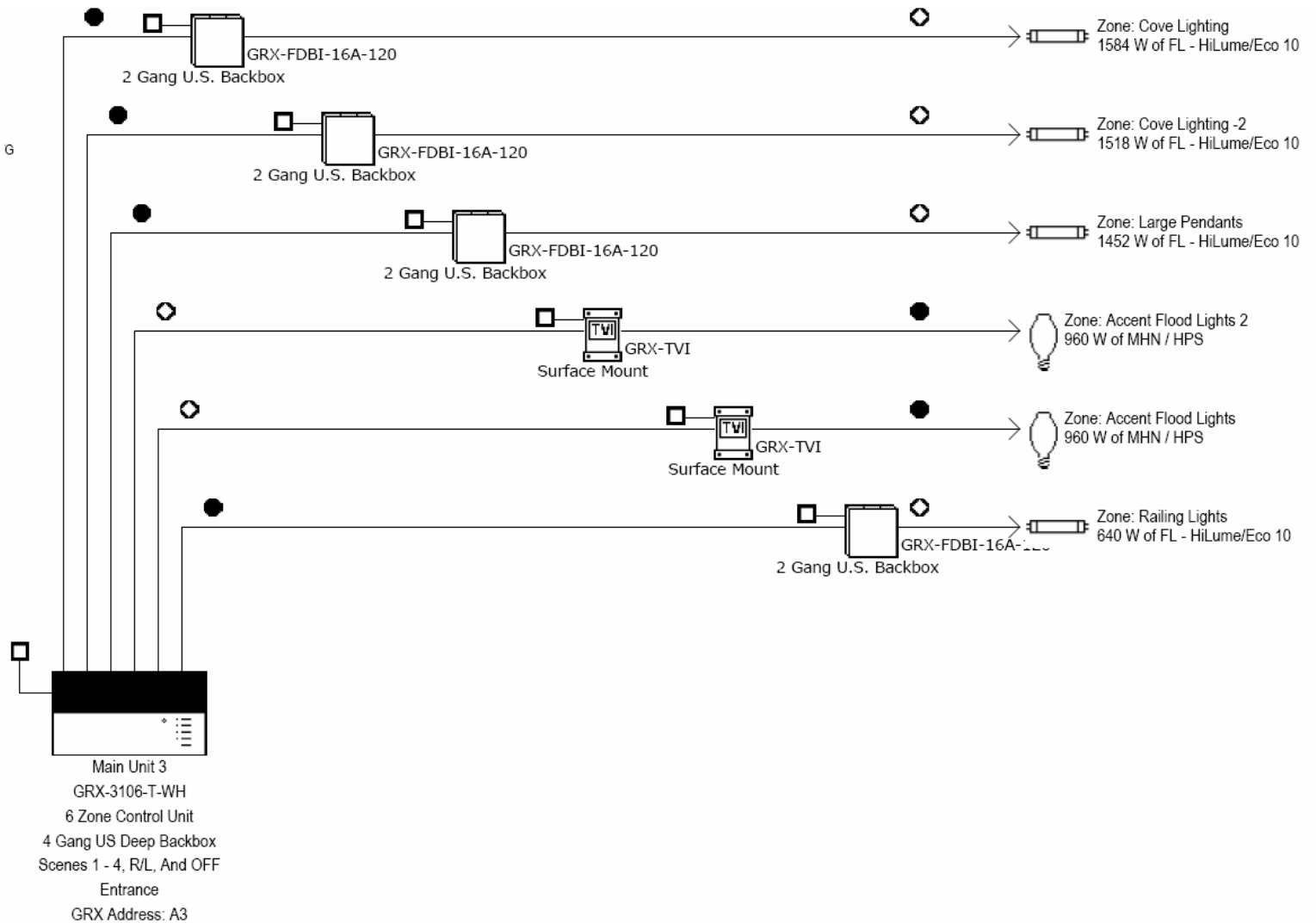


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Front of House Controls Entrance



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Existing Distribution Panels

| DP-1-H-OL-1 | | 480Y/277 | | | |
|---------------------|-----|----------|--------|-------|--------|
| Label | V | HP | amps | kVA | |
| HUM-1, HUMIDIFIER#1 | 480 | | 99.00 | 47.52 | |
| HUM-2, HUMIDIFIER#2 | 480 | | 50.00 | 24.00 | |
| DP-1-H-UB-1 | 480 | | 150.00 | 72.00 | |
| S-2, E-1 | 480 | | 13.00 | 6.24 | |
| PNL HB-OL-2 | 480 | | 57.00 | 27.36 | |
| PNL HB-ST-2 | 480 | | 20.00 | 9.60 | |
| EHC-4 | 480 | | 84.00 | 40.32 | |
| | | | | | 227.04 |

| DP-1-H-OL-2 | | 480Y/277 | | | |
|-------------------------------|-----|----------|--------|-------|--------|
| Label | V | HP | amps | kVA | |
| PNL HP-UR-1 | 480 | 102.00 | 102.00 | 48.96 | |
| PNL HP-LR-2 | 480 | 40.00 | 40.00 | 19.20 | |
| PNL HP-OL-1, HP-LB-1 | 480 | 62.00 | 62.00 | 29.76 | |
| PNL HP-PT-1, HP-LR-1, HP-ST-1 | 480 | 151.00 | 151.00 | 97.92 | |
| Spare | 480 | | 100 | | |
| | | | | | 195.84 |

| DP-1-H-OL-3 | | 480Y/277 | | | |
|---------------------------|-----|----------|--------|-------|--------|
| Label | V | HP | amps | kVA | |
| PASSENGER ELEVATOR #1 | 480 | 60.00 | 77.00 | 36.96 | |
| PASS ELEV #4, FRT ELEV #1 | 480 | 60, 2@50 | 207.00 | 99.36 | |
| PASSENGER ELEVATOR #5 | 480 | 25.00 | 34.00 | 16.32 | |
| PNL HP-ST-3 | 480 | | 17.00 | 8.16 | |
| Space | 480 | | 60.00 | | |
| Space | 480 | | 100.00 | | |
| | | | | | 160.80 |

| DP-1-H-SL-1 | | 480Y/277 | | | |
|---------------------|-----|----------|--------|--------|--------|
| Label | V | HP | amps | kVA | |
| BP-1 BOOSTER PUMP | 480 | 2@10 | 28.00 | 13.44 | |
| EP-1 SEWAGE EJECTOR | 480 | 2@3 | 10.00 | 4.80 | |
| WH-1 WATER HEATER | 480 | | 217.00 | 104.16 | |
| WH-1 WATER HEATER | 480 | | 217.00 | 104.16 | |
| JOCKEY PUMP | 480 | 1.5 | 3.00 | 1.44 | |
| AC-1 DRY SYS, COMP | 480 | 1 | 2.00 | 228.00 | |
| Spare | 480 | | 30.00 | | |
| Spare | 480 | | 60.00 | | |
| | | | | | 456.00 |

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Design for Consolidated Distribution Panels

| DP-1-H-OL-3/DP-1-H-SL-1 | | 480Y/277 | | |
|---------------------------|-----|----------|--------|--------|
| Label | V | HP | amps | kVA |
| PASSENGER ELEVATOR #1 | 480 | 60.00 | 77.00 | 36.96 |
| PASS ELEV #4, FRT ELEV #1 | 480 | 60, 2@50 | 207.00 | 99.36 |
| PASSENGER ELEVATOR #5 | 480 | 25.00 | 34.00 | 16.32 |
| PNL HP-ST-3 | 480 | | 17.00 | 8.16 |
| Space | 480 | | 60.00 | 28.80 |
| Space | 480 | | 100.00 | 48.00 |
| BP-1 BOOSTER PUMP | 480 | 2@10 | 28.00 | 13.44 |
| EP-1 SEWAGE EJECTOR | 480 | 2@3 | 10.00 | 4.80 |
| WH-1 WATER HEATER | 480 | | 217.00 | 104.16 |
| WH-1 WATER HEATER | 480 | | 217.00 | 104.16 |
| JOCKEY PUMP | 480 | 1.5 | 3.00 | 1.44 |
| AC-1 DRY SYS, COMP | 480 | 1 | 2.00 | 228.00 |
| Spare | 480 | | 30.00 | 14.40 |
| Spare | 480 | | 60.00 | 28.80 |
| | | | | 736.80 |

The empty spaces on this distribution panel were not included in the sizing calculation. The listed denotes the frame size available.

| DP-1-H-OL-1/2 | | 480Y/277 | | |
|-------------------------------|-----|----------|--------|--------|
| Label | V | HP | amps | kVA |
| HUM-1, HUMIDIFIER#1 | 480 | | 99.00 | 47.52 |
| HUM-2, HUMIDIFIER#2 | 480 | | 50.00 | 24.00 |
| DP-1-H-UB-1 | 480 | | 150.00 | 72.00 |
| S-2, E-1 | 480 | | 13.00 | 6.24 |
| PNL HB-OL-2 | 480 | | 57.00 | 27.36 |
| PNL HB-ST-2 | 480 | | 20.00 | 9.60 |
| EHC-4 | 480 | | 84.00 | 40.32 |
| PNL HP-UR-1 | 480 | 102.00 | 102.00 | 48.96 |
| PNL HP-LR-2 | 480 | 40.00 | 40.00 | 19.20 |
| PNL HP-OL-1, HP-LB-1 | 480 | 62.00 | 62.00 | 29.76 |
| PNL HP-PT-1, HP-LR-1, HP-ST-1 | 480 | 151.00 | 151.00 | 97.92 |
| Spare | 480 | | 100 | 48.00 |
| | | | | 470.88 |

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Table 14-29. Base Prices — PRL4 Main Fusible Switches

| Ampere Rating | Interrupting Rating (kA Symmetrical) | | Device Type | Price U.S. \$ | | |
|---|--------------------------------------|---------|-------------|----------------|--------------------------------|----------------|
| | 240 Vac | 480 Vac | | 3-Phase 4-Wire | 1-Phase 3-Wire, 1-Phase 2-Wire | 3-Phase 3-Wire |
| Main Fusible Switch 240 Vac, 250 Vdc ⑧⑨⑩ | | | | | | |
| 200 | See Table 14-32 | | FDPB | 2,144. | 1,783. | 1,943. |
| 400 | | | FDPW | 4,217. | 3,353. | 3,939. |
| 600 ⑧ | | | FDPW | 6,050. | 5,105. | 5,673. |
| 800 ⑧ | | | FDPW | 9,570. | 8,109. | 9,031. |
| 1200 ⑧ | | | FDPW | 11,251. | 8,644. | 10,636. |
| Main Fusible Switch 600 Vac ⑧⑨ | | | | | | |
| 200 | See Table 14-32 | | FDPB | 2,510. | 1,896. | 2,304. |
| 400 | | | FDPW | 5,008. | 3,802. | 4,754. |
| 600 ⑧ | | | FDPW | 6,585. | 5,152. | 6,071. |
| 800 ⑧ | | | FDPW | 9,570. | 8,109. | 9,031. |
| 1200 ⑧ | | | FDPW | 11,251. | 8,644. | 10,636. |

- ⑧ For ground fault protection on main devices, see **Modification 15, Page 14-46.**
- ⑨ Fuses not included. **Specify required fuse clips on all switches. For T fuse clips, add \$308. per switch.**
- ⑩ Class J Fuse provisions are applicable only to 600 volt units. When required, use price and dimensions of 600 volt units for all voltages 600 and below.
- ⑪ No dc rating on 600, 800 and 1200 ampere switches.

Discount Symbol CE9