Power Monitoring – Requirements (1)

Provide, install, and commission a Honeywell SXB36 Network Power Meter at each of the following electrical services:

Corner Station Mechanical Room (2000 amp 480/277 volt)
Maintenance Building/Chiller (2000 amp 480/277 volt)
Science Education Center (xxx amp xxx volt)
X West Tunnel (800 amp 480/277 volt)
Y South Tunnel (800 amp 480/277 volt)

Provide, install, and commission five Honeywell WEBs Network Area Controllers to collect data and provide and provide an operator interface for the power meters as follows:

Network Area Controller #1: Corner Station Mechanical Room
Network Area Controller #2: Maintenance Building/Chiller
Network Area Controller #3: Science Education Center
Network Area Controller #4: X West Tunnel
Network Area Controller #5: Y South Tunnel

Power Monitoring – Requirements (2)

* Provide a graphical user interface to allow for real-time data monitoring, historical data trending and report generation, and system critical alarm notification.
(Note: Honeywell WEBs Network Area Controllers provides this user interface.)

* Provide access to the Network Area Controllers from any computer, smart phone or internet appliance with network connectivity and an internet browser. Note: The Honeywell WEBs system does not require any software to be resident on the local access device. Information can be made accessible through the owner's WAN, LAN or through the internet if desired.

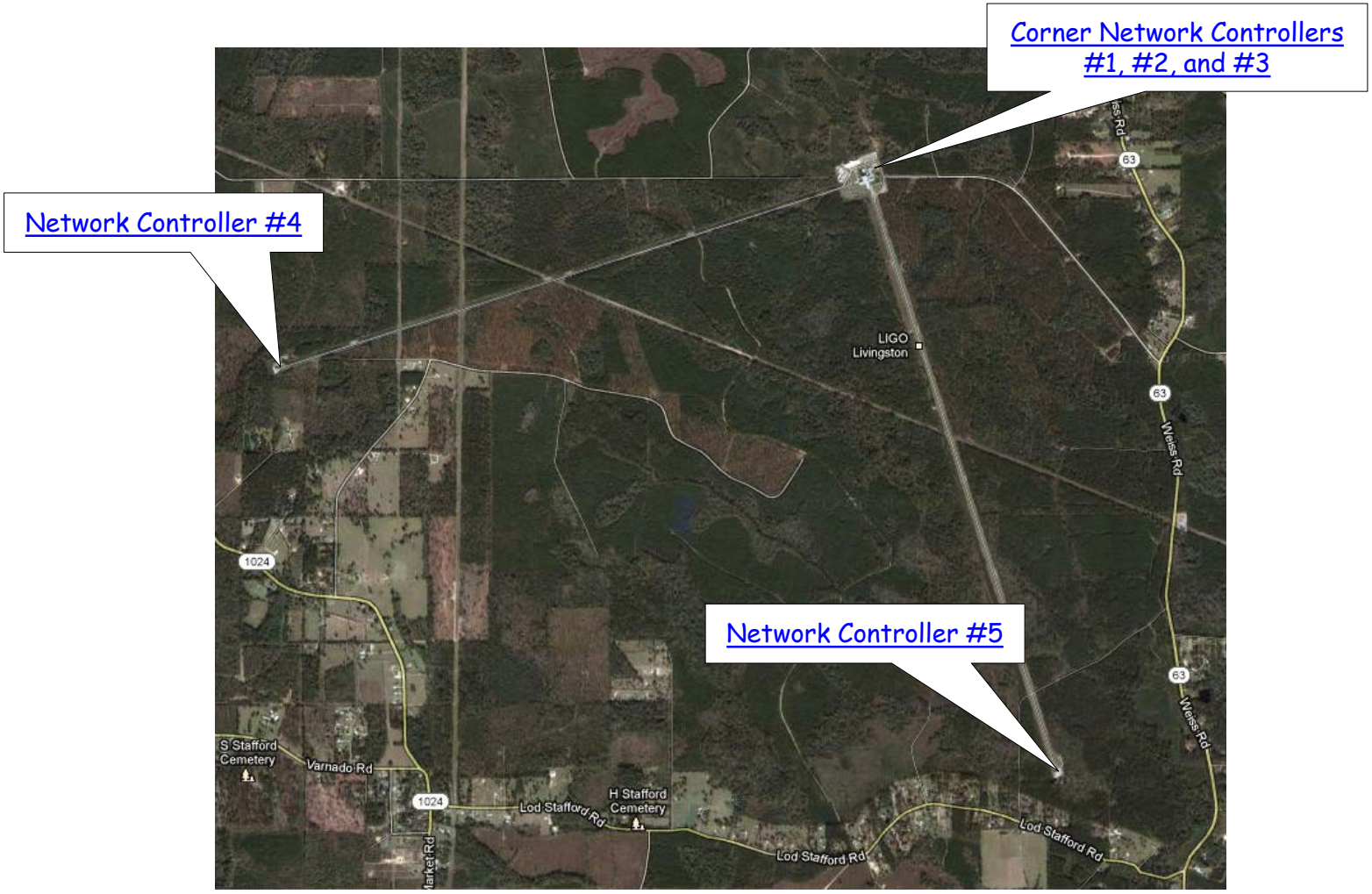
* Provide and pull network transmission wiring from the Staging Building to the Corner Station Mechanical Room in existing underground conduit.

* Provide operator training.

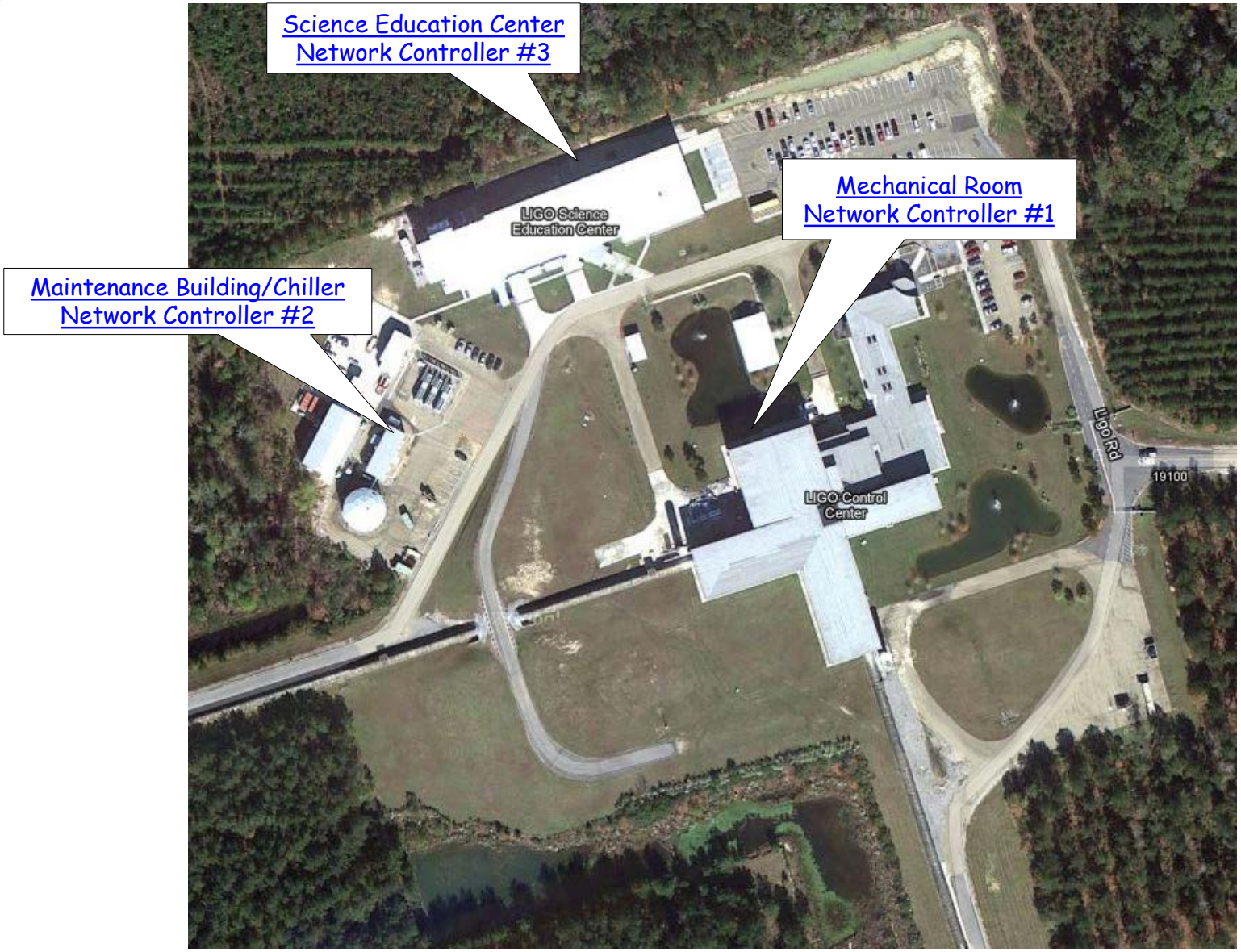
Power Monitoring – Required Parameters

1) Variations in the peak and RMS voltage
2) Spikes, Impulses, or Surges
3) Undervoltage events
4) Overvoltage events
5) Variations in Frequency
6) Variations in Harmonic Content
7) Non-zero Low- and High-frequency Total Load Impedance
8) Total Power Factor

LIGO Livingston Observatory

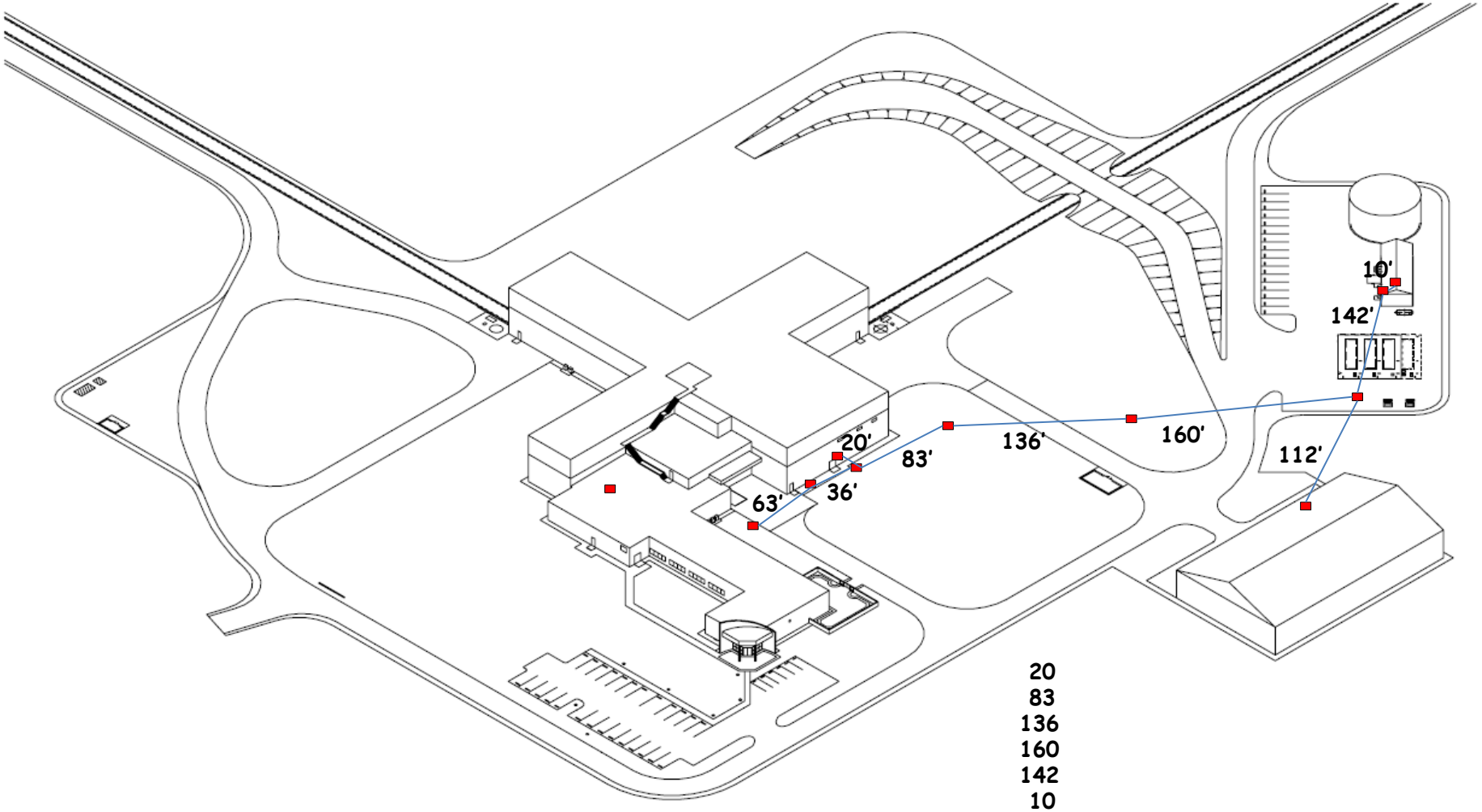


Corner Station



LLO Fiber Optics Cable Run

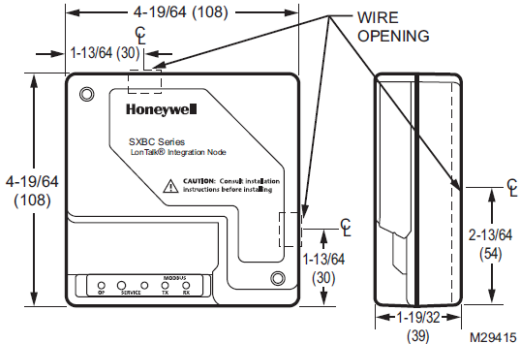
(If no PULL STRING, use ELECTRICAL SNAKE to fish PULL STRING.)
1. Use existing PULL STRING to PULL ROPE.
2. Use PUL ROPE to PULL CABLE and NEW PULL STRING.



20
83
136
160
142
10
---
551 Mechanical Room to Maintenance Building

CTs and Controller Components

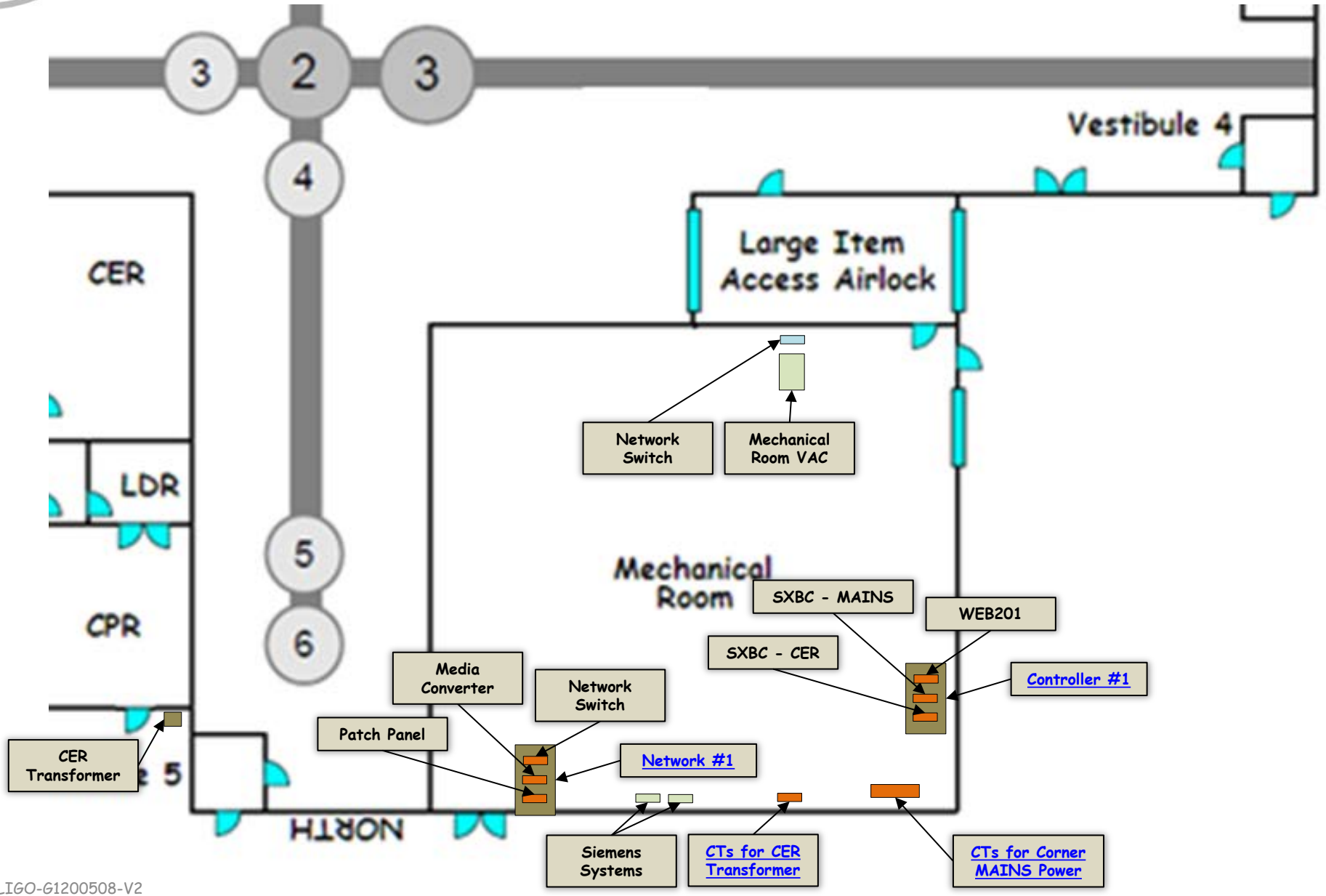
Dimensions (W x H x D):
6.313 in. (16.04 cm) x
4.820 in. (12.24 cm) x
2.483 in. (6.19 cm).



SXBC-1 & SXBC-5 dimensions in in. (mm).

LVEA Access Points

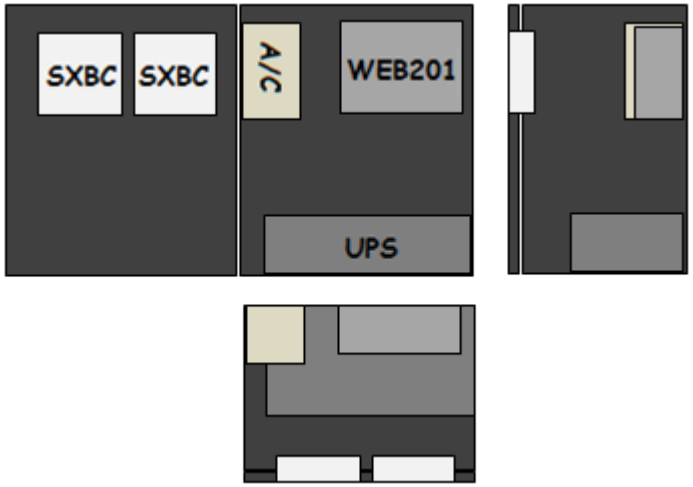
<< LVEA, Corner Station



CTs for Corner MAINS

CTs for CER Transformer

Controller #1 (at C MAINS)



Controller #1 (at Corner MAINS)

6.313 x 4.82 x 2.483

14 x 12 x 8 (plus .5 door depth)

4.14 x 4.14 x 1.2

3 x 5 x 5

3 x 10.75 x 5.75

Network #1 (at Corner MAINS)

Fiber Patch

Mechanical Room		
Port	Left	Right
1	Blue	Orange
2	Green	Brown
3	Gray	White

Network #1 (at Corner MAINS)

14 x 12 x 8 (plus .5 door depth)

4.7 x 3.5 x 1

3.7 x 4.1 x 1.1

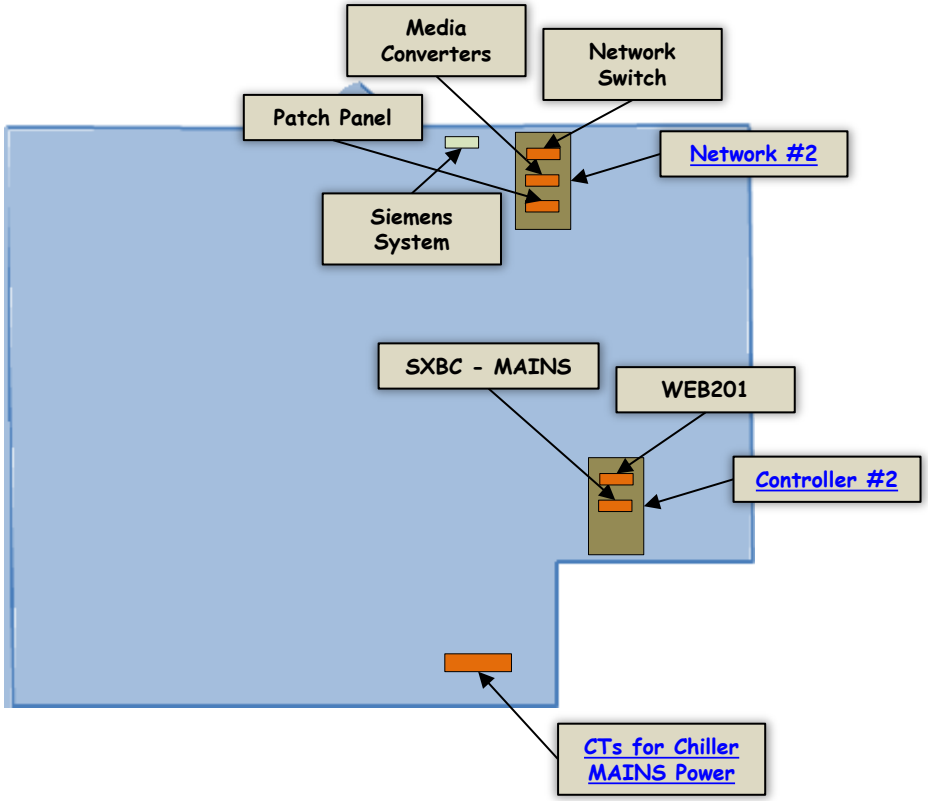
6.3 x 5.5 x 2

3 x 5 x 5

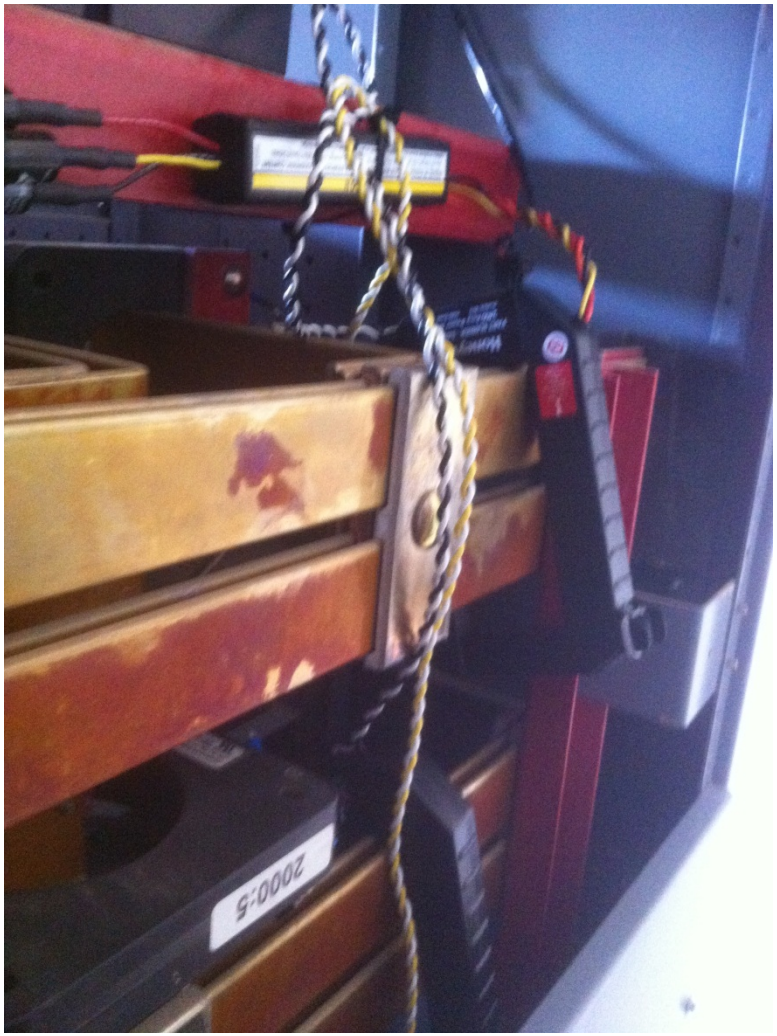
3 x 10.75 x 5.75

Chiller Access Points

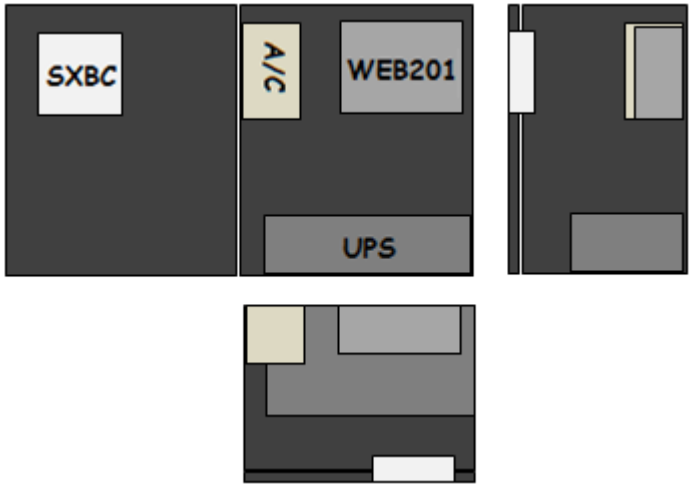
<< LVEA, Corner Station



CTs for Chiller MAINS



Controller #2 (at Chiller MAINS)



Controller #2 (at Chiller MAINS)

6.313 x 4.82 x 2.483

14 x 12 x 8 (plus .5 door depth)

4.14 x 4.14 x 1.2

3 x 5 x 5

3 x 10.75 x 5.75

Network #2 (at Chiller MAINS)

Fiber Patch

Chiller Room		
Port	Left	Right
1	Blue	Orange
2	Green	Brown
3	Gray	White

Network #2 (at Chiller MAINS)

14 x 12 x 8 (plus .5 door depth)

4.7 x 3.5 x 1

3.7 x 4.1 x 1.1

6.3 x 5.5 x 2

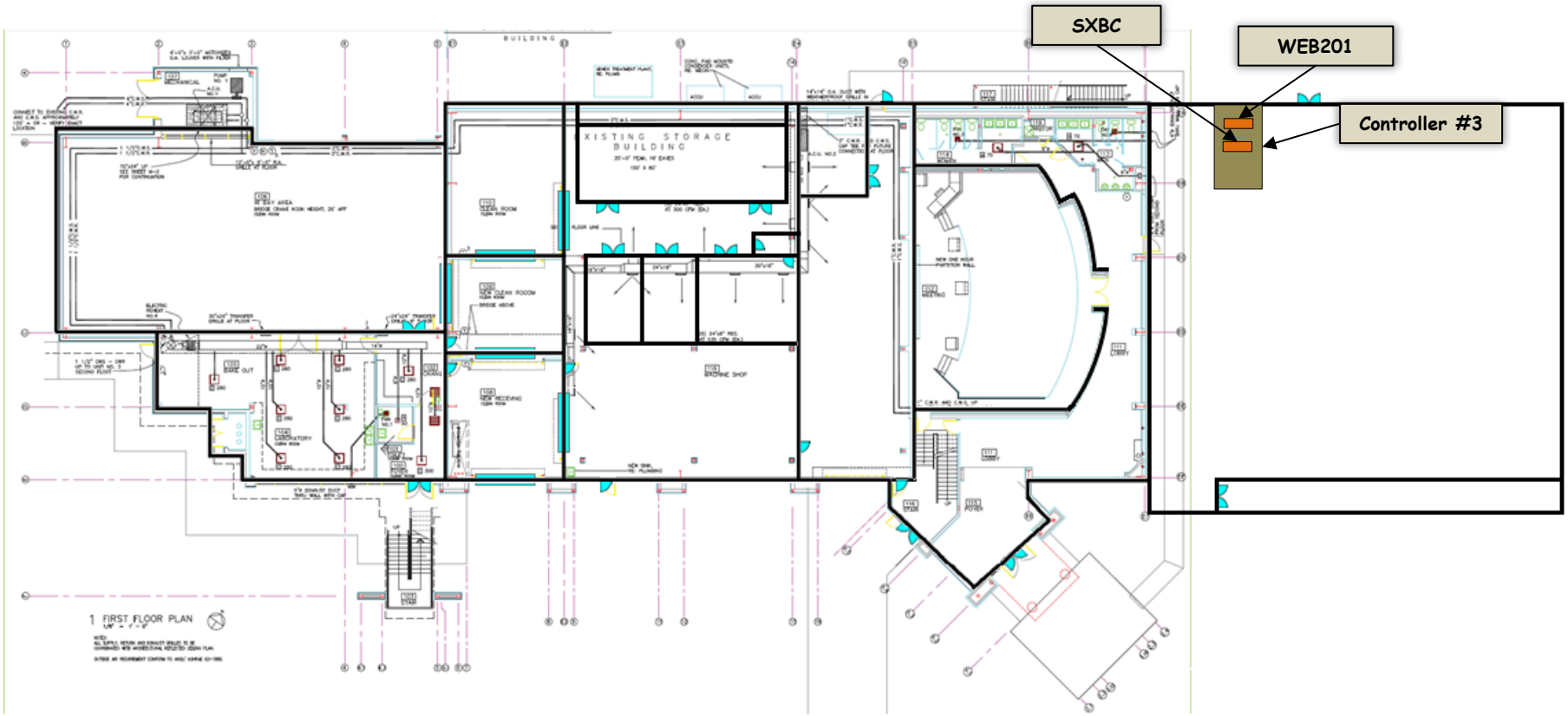
3 x 5 x 5

3 x 10.75 x 5.75

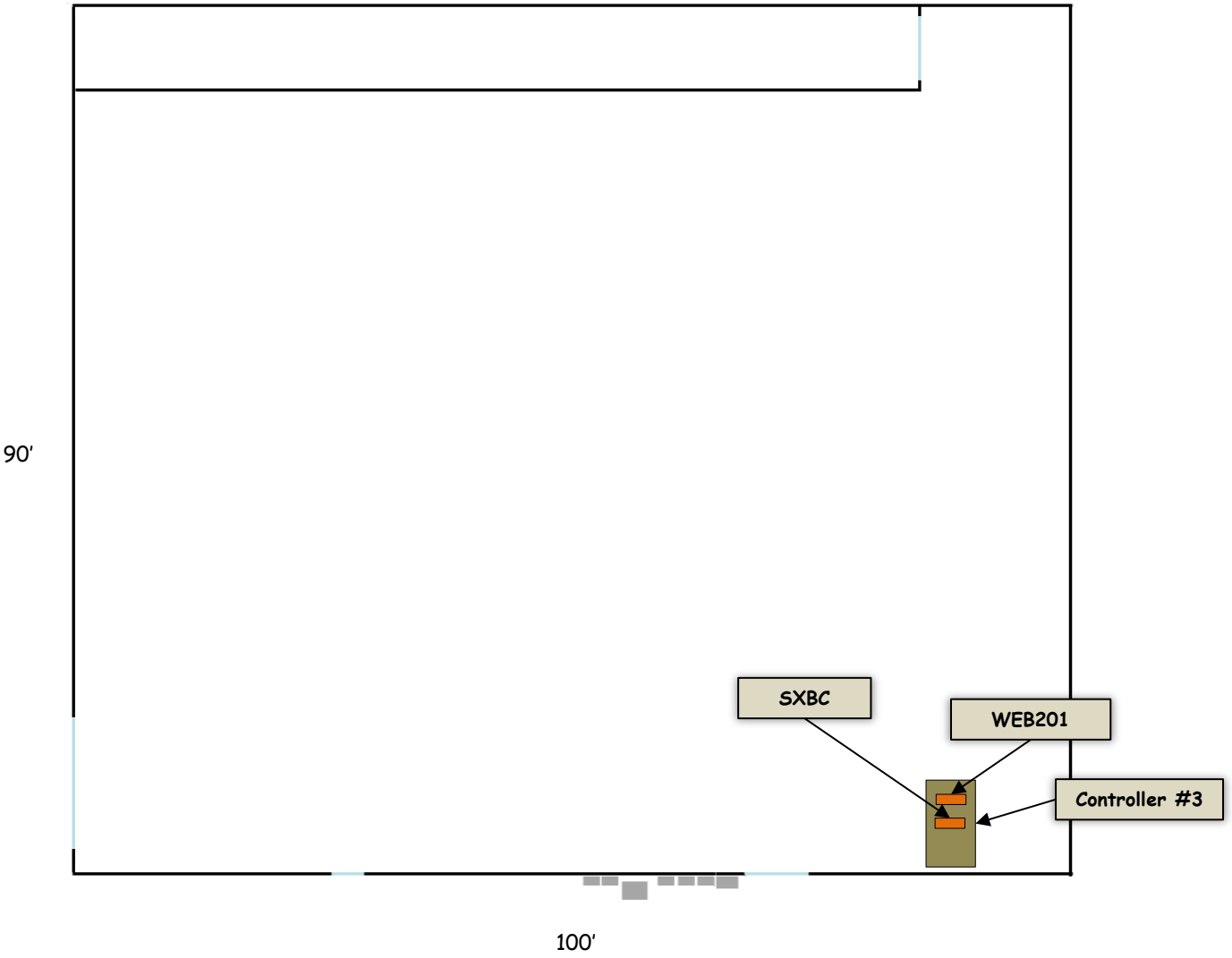
Staging Building, HPLF, SEC As Built

[<< LVEA, Corner Station]

LIGO-D000294



SEC As Built



CTs for SEC

Controller #3 (at SEC)

6.313 x 4.82 x 2.483

4.14 x 4.14 x 1.2

14 x 12 x 8 (plus .5 door depth)

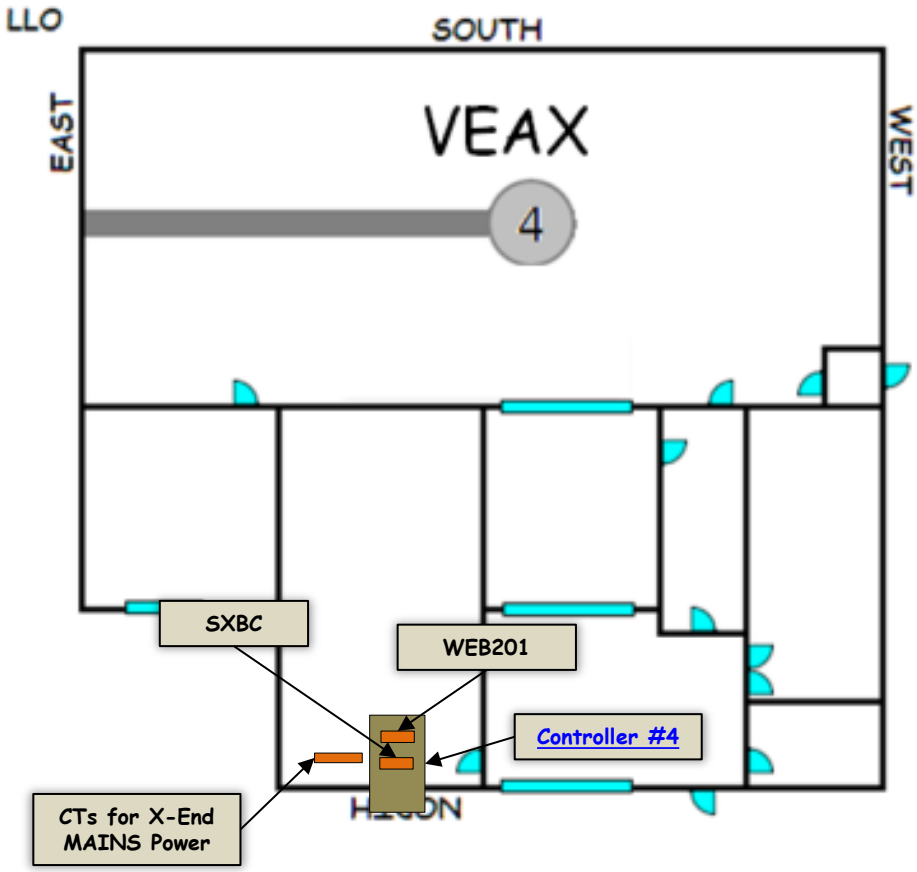
3 x 5 x 5

3 x 10.75 x 5.75

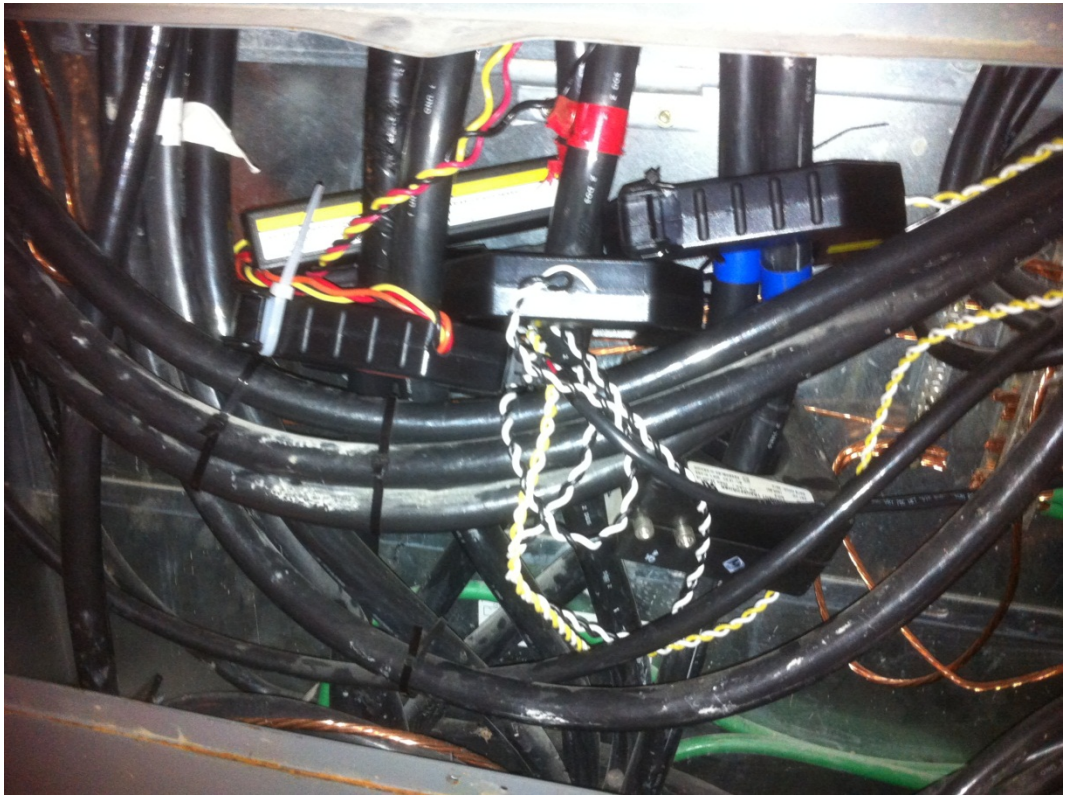
X-End Station (West)

VEAX Access Control Locations

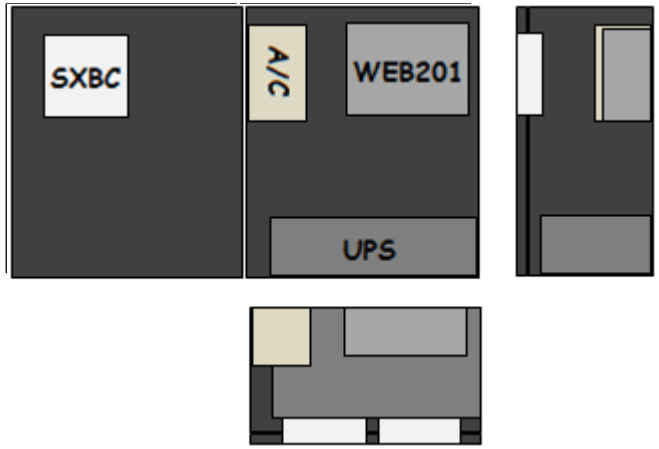
[<< X-End, VEAX]



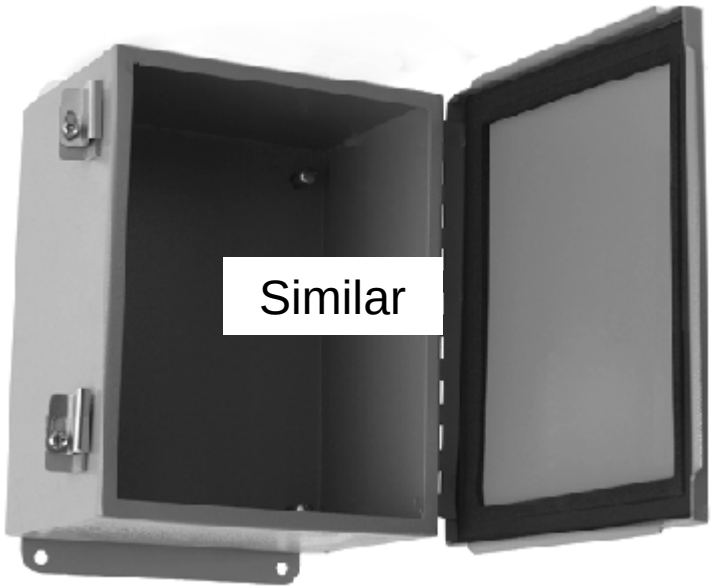
CTs for X-End MAINS



Controller #4 (at X-End MAINS)



Controller #4 (at X-End MAINS)



12 x 14 x 6.5 (plus .5 door depth)

6.313 x 4.82 x 2.483

4.14 x 4.14 x 1.2

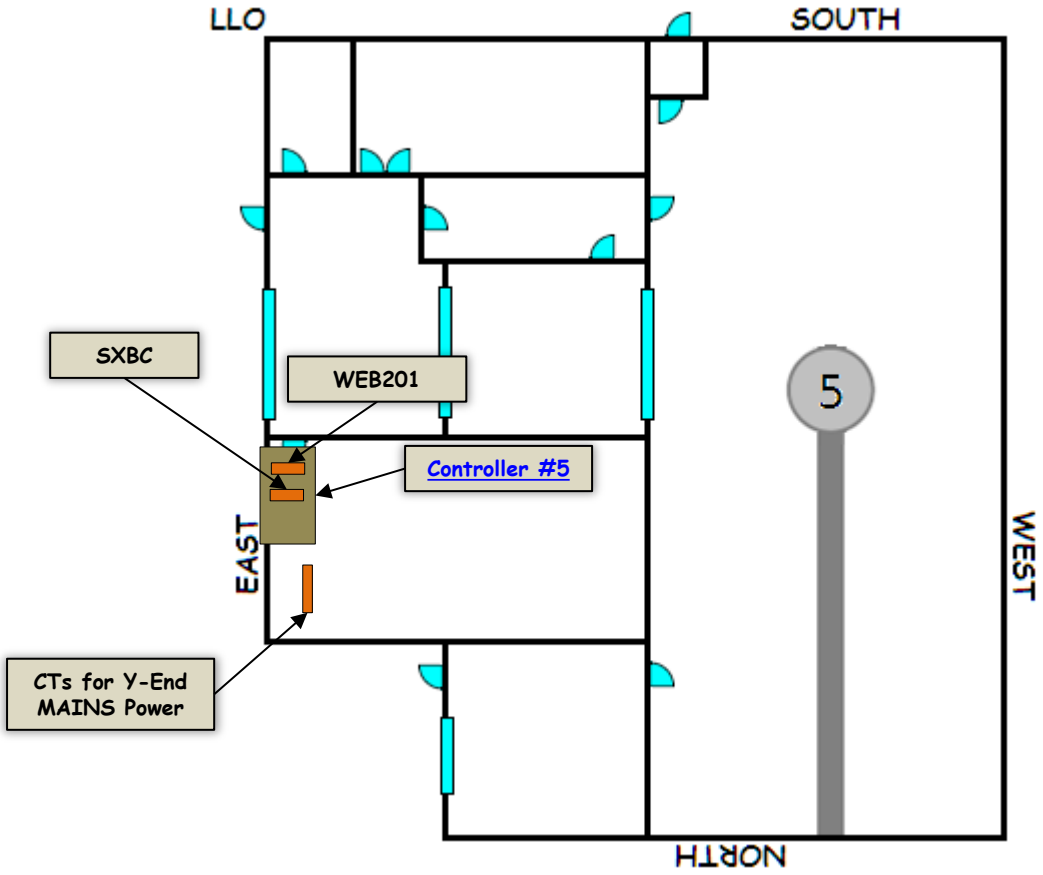
3 x 5 x 5

3 x 10.75 x 5.75

Y-End Station (South)

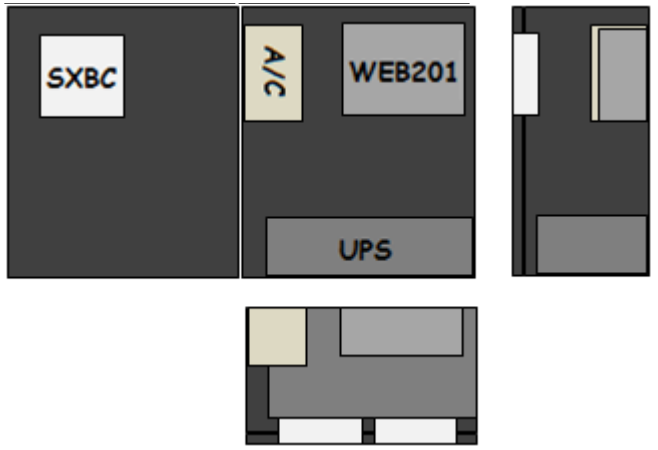
Y-End Access Points

[<< Y-End, VEAY]

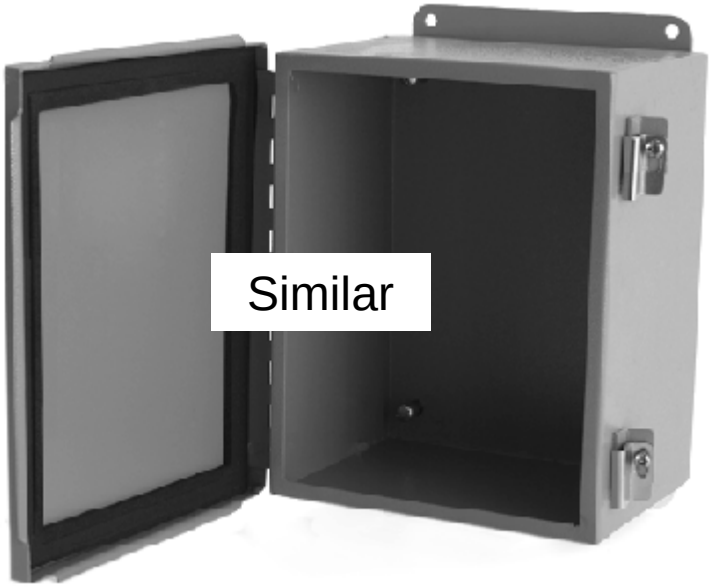


CTs for Y-End MAINS

Controller #5 (at Y-End MAINS)



Controller #5 (at Y-End MAINS)



12 x 14 x 6.5 (plus .5 door depth)

6.313 x 4.82 x 2.483

4.14 x 4.14 x 1.2

3 x 5 x 5

3 x 10.75 x 5.75

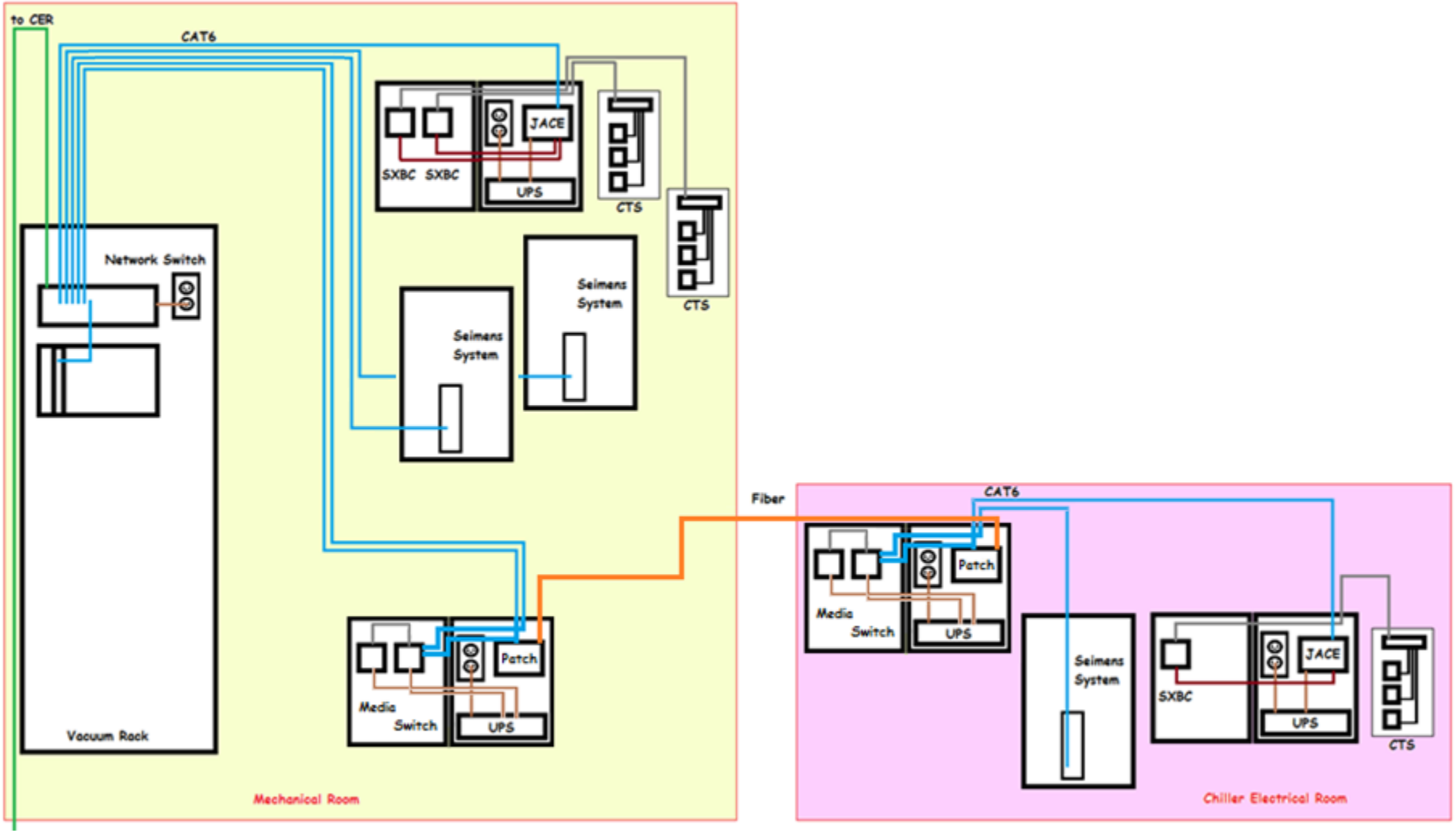
UPS Systems

Tripp-Lite ECO650LCD

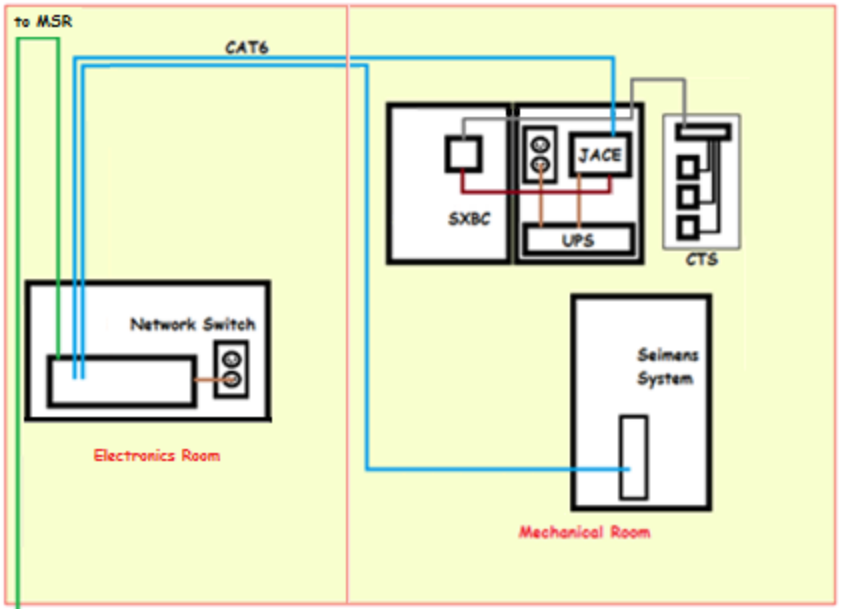
Model:	ECO650LCD
Voltage compatibility:	120 VAC
Frequency compatibility:	60 Hz
VA/Wattage Capacity:	650/325
Battery runtimes (half/full):	10 min./3 min.
Outlet quantity/type:	8 x 5-15R (4 UPS/surge, 3 ECO/surge, 1 surge only)
Signal line protection:	RJ11 tel/modem jacks (1 set)
Communications ports:	1 x HID-compliant USB
Input cord:	6 ft.
Input plug:	5-15P right-angle
Switches/LEDs/alarms:	On/Off switch Mute/Select Switch LCD Display Audible alarm
Dimensions (HWD):	3.5 x 10.75 x 5.75 in.
Weight:	6.25 lb.
UPS housing material:	Plastic
Agency approvals:	UL 1778 (US) / CSA (Canada) NOM (Mexico) FCC Part 15 Category B (EMI) FCC Part 68 / Industrie Canada (telecom) RoHS

Location	Model	Serial Number
Corner MAINS	ECO650LCD	2225EYOBC794100399
Corner Network	ECO650LCD	2225EYOBC7941xxxxx
Chiller MAINS	ECO650LCD	2225EYOBC794100055
Chiller Network	ECO650LCD	2225EYOBC7941xxxxx
X-End MAINS	ECO650LCD	2225EYOBC794100400
Y-End MAINS	ECO650LCD	2225EYOBC794100386

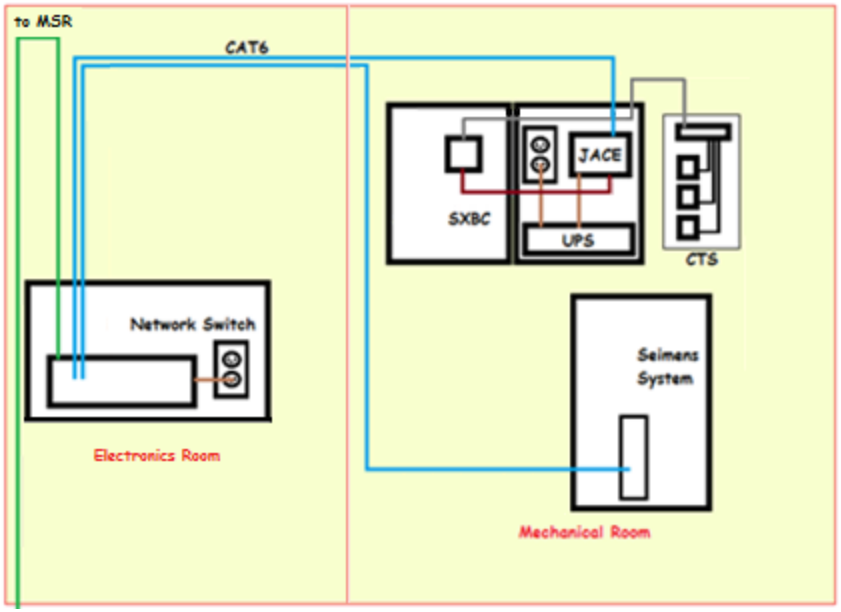
Network Integration – LLO Corner



Network Integration – LLO X-End



Network Integration – LLO Y-End



IP Addresses

Entity	IP Address
WEB201 – Mechanical Room	
WEB201 – Maintenance Building	
WEB201 – Science Education Center	
WEB201 – End X Mechanical Room	10.110.70.10
WEB201 – End Y Mechanical Room	10.110.70.30
Mechanical Room Siemens 1	
Mechanical Room Siemens 2	
Maintenance Building Siemens	
End X Siemens	10.110.70.11
End Y Siemens	10.110.70.31
Gateway	10.110.70.1
Network	255.255.255.6