Site Info – One Lincoln

One Lincoln Center
20 West 64th Street
New York, NY 10023

Site Contact
Sean Pringle
Project Engineer
Aegis Energy Services Inc.
55 Jackson St Holyoke MA, 01040
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springle@aegisenergyservices.com

- CDH was on site October 1, 2015 to install a datalogger, terminate meter wiring, setup communications, and verify sensor readings. Data collection begins.

Summary

CDH provided the data logger. Aegis provided and installed the gas, power, and BTU meters. Aegis performed all the necessary wire pulls and CDH terminated wiring to the data logger and sensors.

Monitored Data Points

No.	Input	Data Point	Description	Units	Sensor	Signal
1	MB-001	WB1	Total Facility Power - Main Service 1	kW/kWh	Veris E50C2A	Modbus RS485
2	MB-002	WB2	Total Facility Power - Main Service 3	kW/kWh	Veris E50C2A	Modbus RS485
5	MB-004	WT1	Gross Generator #1 Power	kW/kWh	Veris H8035-300	Modbus RS485
3	MB-003	WT23	Gross Generator #2 & #3 Power	kW/kWh	Veris H8035-300	Modbus RS485
7	MB-006	WP	Parasitic Loads	kW/kWh	Veris H8035-100	Modbus RS485
8	IN1	FG	Generator Gas Use	CF	Romet RM5000 TC	Pulse
10	IN2	THW1	Recovered Heat Loop - Supply Temp.	deg F	MAMAC 10k Type II thermisor	Resistance
11	MB-007	QU	Useful Heat Recovery - BTU Meter Calculated	Mbtu	Badger 380 BTU meter	Modbus RS485
12	MB-007	THW2	Recovered Heat Loop - Temp. After Useful HX's	deg F		
13	MB-007	THW3	Recovered Heat Loop - Return Temp.	deg F		
14	MB-007	FHW	Recovered Heat Loop Flow	GPM		

IP Info

IP Address:	24.105.158.218:4081
Subnet Mask:	255.255.255.248
Gateway:	24.105.158.217
Primary DNS:	24.29.99.35
Secondary DNS:	24.29.99.36

Procedure

- Power was verified by comparing the cogen unit display to the Veris H8035 modbus reading on the Obvius datalogger.
- Hot water loop flows were verified by comparing the Badger 380 flow reading on the Obvius to measurements taken using a portable Portaflow ultrasonic flowmeter.
- Gas use was verified by checking electrical efficiency and performing a system heat balance using the average gas flow rate as measured by the Obvius datalogger.

Verification Data – October 1, 2015

Generator Power:

WG1	Cogen Panel - WT1 (kW)	Obvius - WT1 (kW)
	0	1.125

WT2 & WT3	Cogen Panel - WT2 (kW)	Cogen Panel - WT3 (kW)	Cogen Panels - WT2+WT3 (kW)	Obvius - WT2+WT3 (kW)
	57	49.3	106.3	99.7
	55.3	45.5	100.8	99.8
	51.9	44.1	96	-
Avg:			*101.0*	*99.8*

Parasitic Loads:

WP	Extech Handheld Power Meter (kW)	Obvius (kW)
	8.89	9.80

Gas:

WT1 (kW)	WT2&3 (kW)	WP (kW)	FHW (gpm)	THW1 (Deg. F)	THW2 (Deg. F)	QU (Mbtu/h)	FG (cfh)	Elec. Eff. (%)	Thermal Eff. (%)	Total Eff. (%)
1.04	76.3	9.8	54.3	179.5	165.9	360.4	1200	21.3%	29.1%	50.4%

Flow:

Obvius (gpm)	Portaflow (gpm)
51.41	50.3
51.95	50.1
52.59	49.8
52.94	52.1
54.21	54
54.13	52.8
Avg: *52.9*	*51.5*

Site Photos

Three (3) Aegen Powerverter (PV-75) cogen units located in cogen room in sub-basement level parking garage.

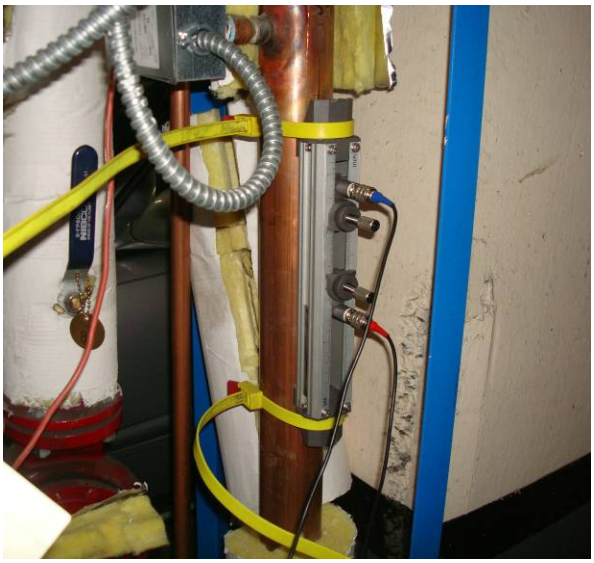
Veris H8035-300 power meter (WT23) located in generator #2 & #3 disconnect in cogen room.

CDH panel containing Obvius data logger and CDH network switch located in cogen room.

Veris H8035-300 power meter (WT3) located in generator #1 disconnect in cogen room.

Recovered heat loop temperature sensor (THW1) located above HX's on load side piping in cogen room.

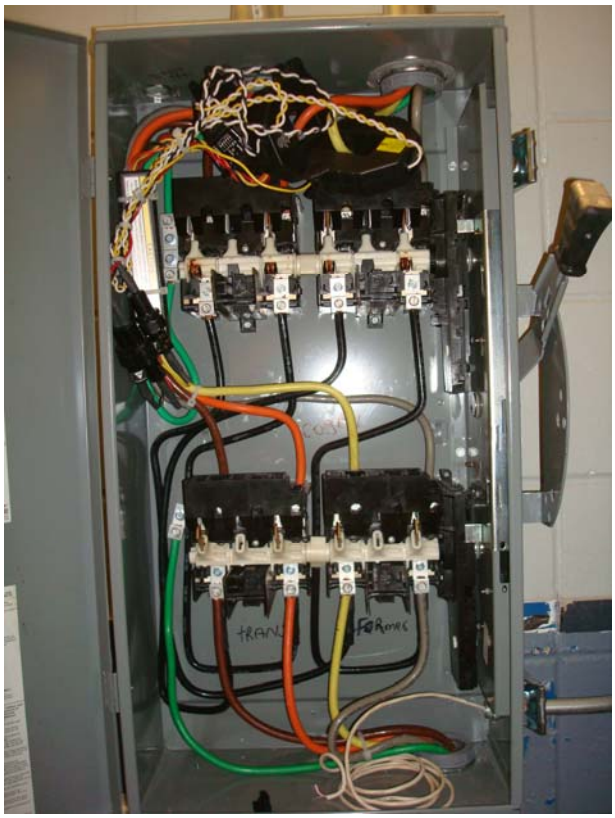
Romet RM5000 rotary gas meter (FG) with pulse output located in sub-basement parking garage outside cogen room.



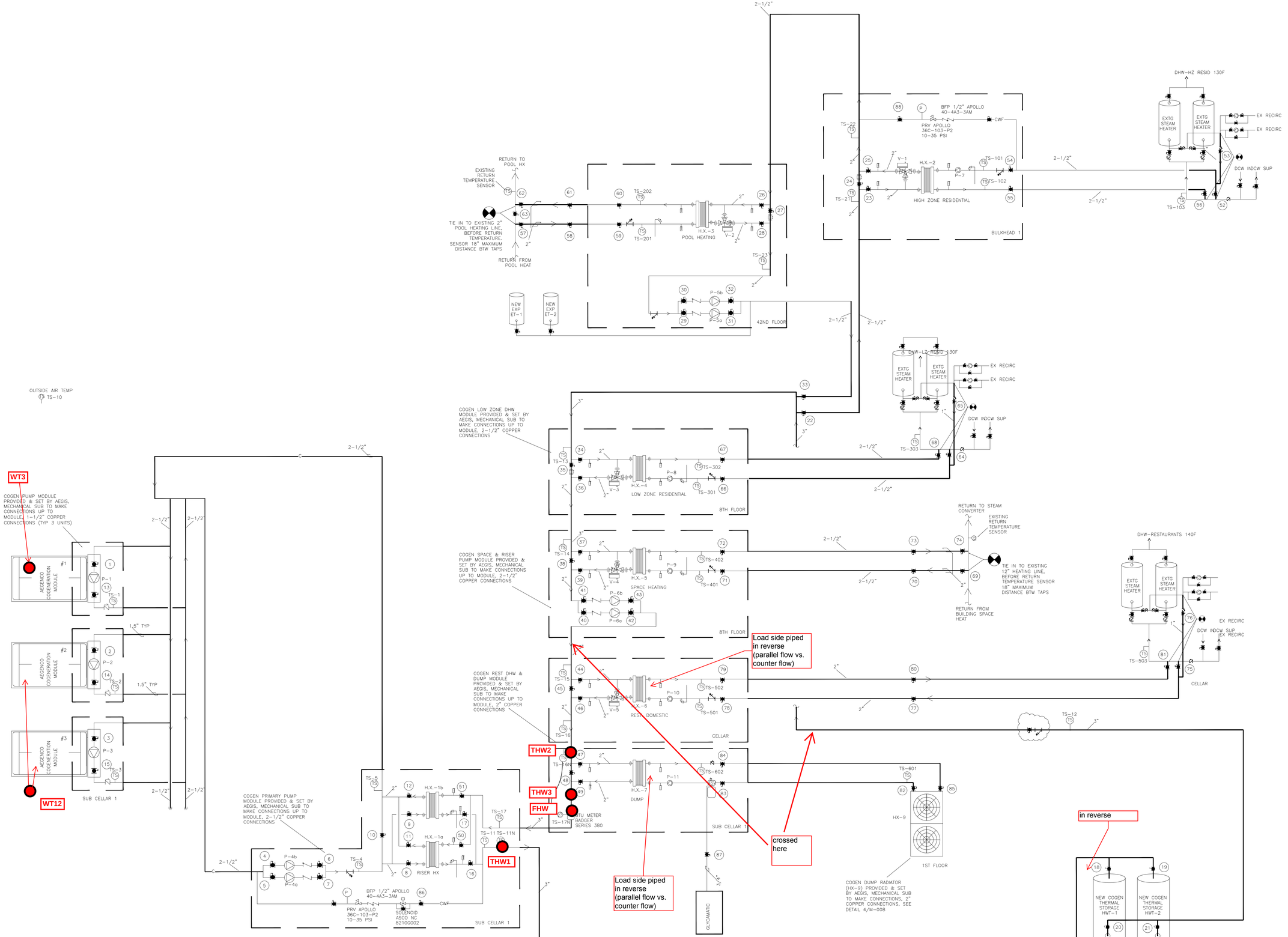
Portaflow ultrasonic flowmeter.

Badger 380 BTU meter (FHW, THW2, THW3) located in sub-basement parking garage outside cogen room.

Veris E50C2A power meter, 1 of 2 typ. (WB1, WB2) located in basement electrical motor room (WB1) and 8th floor mechanical room (WB2).



Veris H8035-100 power meter (WP) located in manual transfer switch in basement hallway.



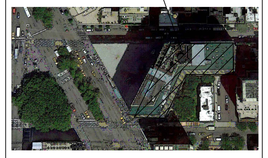
1
M-002

COGENERATION MECHANICAL FLOW DIAGRAM

SCALE: NTS

NO.	DATE	REVISION DESCRIPTION
2	10-01-14	MINOR CONTROLS CHANGES
3	12-22-14	MISC MINOR CHANGES
4	6-19-15	MISC MINOR CHANGES

AREA OF WORK



PROJECT LOCATION MAP

TRUE NORTH

PROJECT NORTH

CLIENT:

AEGIS ENERGY SERVICES, INC
55 JACKSON STREET
HOLYOKE, MA 01040
TEL.: 413-536-1156
FAX: 413-536-1104
ATTN: SEAN PRINGLE

ALL DRAWINGS ARE TO BE READ NOT SCALED.

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BEPC

PROJECT

ONE LINCOLN CENTER
COGENERATION PROJECT
20 WEST 64TH STREET
NEW YORK, NY 10023

DRAWING TITLE:

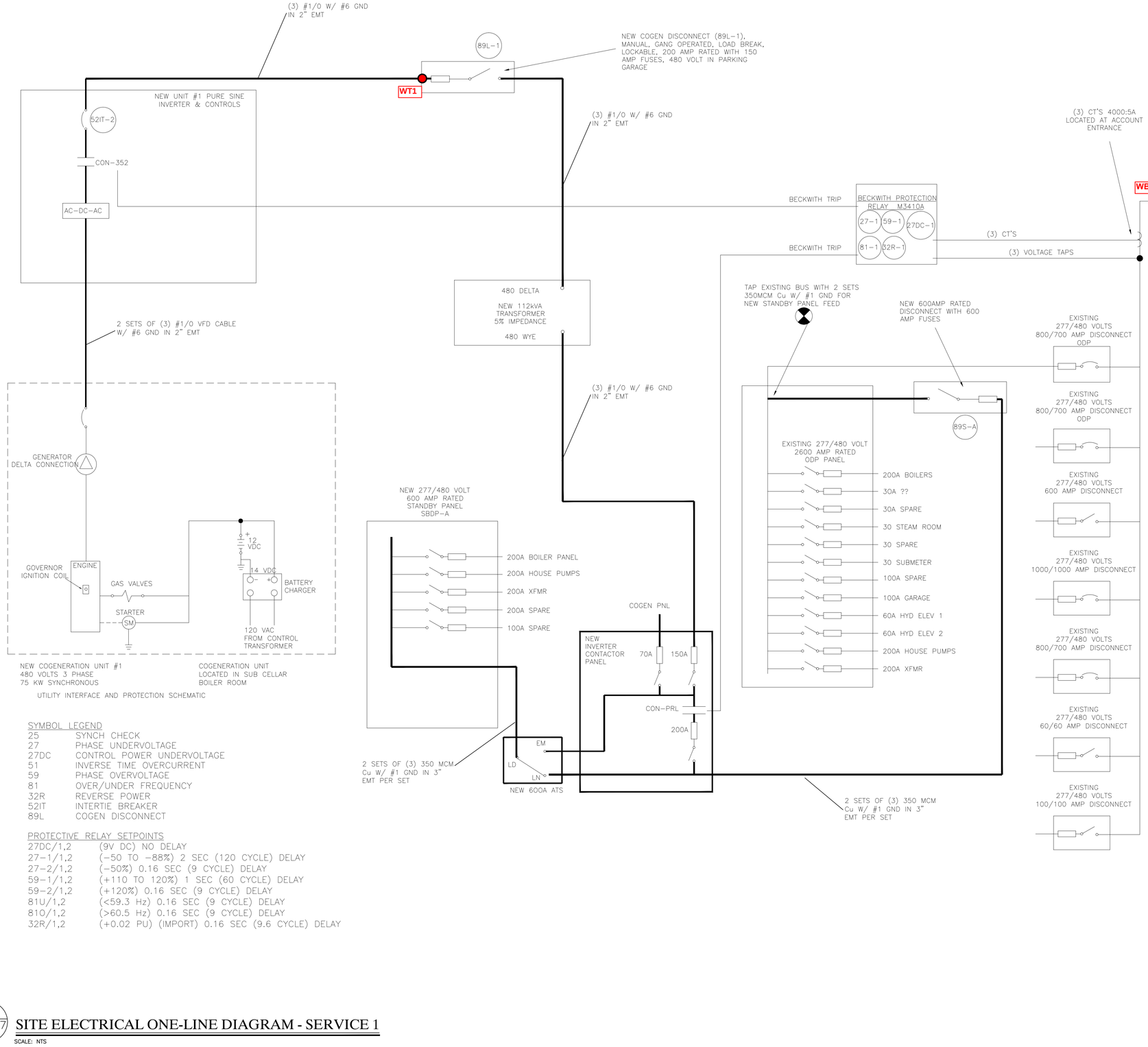
MECHANICAL FLOW DIAGRAM

DESIGN BY:	SP	DATE:	4/22/14
DRN BY:	SP	DATE:	6/17/14
CKD BY:		DATE:	
FINAL CKD BY:		DATE:	
SCALE:	AS NOTED	DATE:	
DWG No.		PAGE 4 OF 22	

M-002.04

PROJECT NO.
60-091

B-SCAN:



UTILITY INTERFACE AND PROTECTION SCHEMATIC

SYMBOL LEGEND

25	SYNCH CHECK
27	PHASE UNDERVOLTAGE
27DC	CONTROL POWER UNDERVOLTAGE
51	INVERSE TIME OVERCURRENT
59	PHASE OVERVOLTAGE
81	OVER/UNDER FREQUENCY
32R	REVERSE POWER
52IT	INTERTIE BREAKER
89L	COGEN DISCONNECT

PROTECTIVE RELAY SETPOINTS

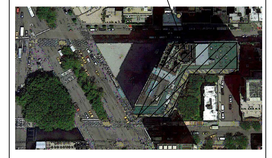
27DC/1,2	(9V DC) NO DELAY
27-1/1,2	(-50 TO -88%) 2 SEC (120 CYCLE) DELAY
27-2/1,2	(-50%) 0.16 SEC (9 CYCLE) DELAY
59-1/1,2	(+110 TO 120%) 1 SEC (60 CYCLE) DELAY
59-2/1,2	(+120%) 0.16 SEC (9 CYCLE) DELAY
81U/1,2	(<59.3 Hz) 0.16 SEC (9 CYCLE) DELAY
81O/1,2	(>60.5 Hz) 0.16 SEC (9 CYCLE) DELAY
32R/1,2	(+0.02 PU) (IMPORT) 0.16 SEC (9.6 CYCLE) DELAY

1 / E-007 SITE ELECTRICAL ONE-LINE DIAGRAM - SERVICE 1

SCALE: NTS

NO.	DATE	REVISION DESCRIPTION

AREA OF WORK



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PROJECT

ONE LINCOLN CENTER
COGENERATION PROJECT
20 WEST 64TH STREET
NEW YORK, NY 10023

DRAWING TITLE:

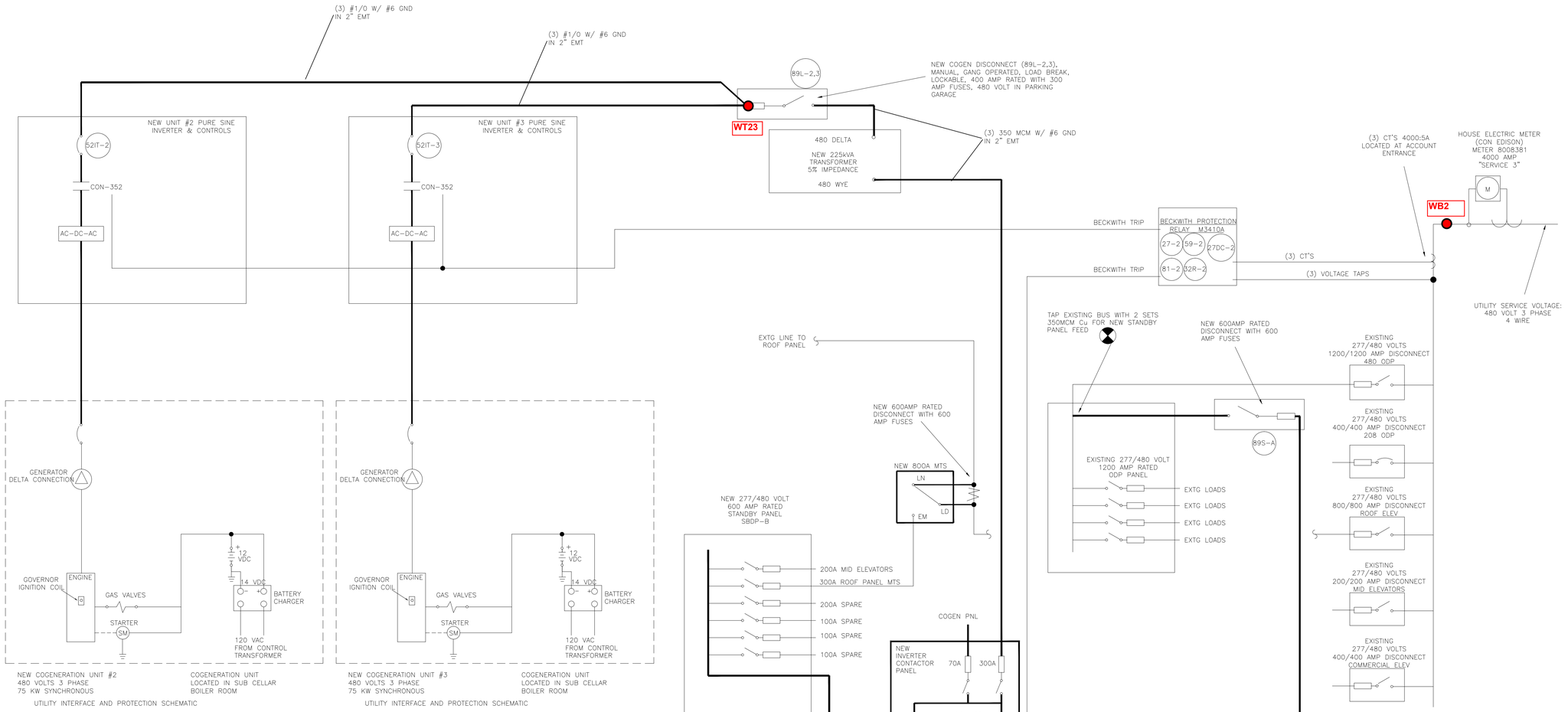
ELECTRICAL ONELINE DIAGRAM - CELLAR

DESIGN BY:	SP	DATE:	4/22/14
DRN BY:	SP	DATE:	6/17/14
CKD BY:		DATE:	
FINAL CKD BY:		DATE:	
SCALE:	AS NOTED	DATE:	
DWG No.	PAGE 21 OF 22		

E-007.00

PROJECT NO.
60-091

B-SCAN:



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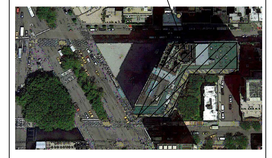
1 / E-008 **SITE ELECTRICAL ONE-LINE DIAGRAM - SERVICE 3**

SCALE: NTS

NO.	DATE	REVISION DESCRIPTION

AREA OF WORK



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PROJECT

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COGENERATION PROJECT
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NEW YORK, NY 10023

DRAWING TITLE:

ELECTRICAL ONELINE DIAGRAM - 8TH FL

DESIGN BY:	SP	DATE:	4/22/14
DRN BY:	SP	DATE:	6/17/14
CKD BY:		DATE:	
FINAL CKD BY:		DATE:	
SCALE:	AS NOTED	DATE:	
DWG No.		PAGE 22 OF 22	

E-008.00

PROJECT NO.
60-091

B-SCAN: