

## The Strand

500 West 43<sup>rd</sup> St.  
New York, NY 10017

### Site Contact

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- CDH was on site March 18, 2015 to verify meter locations and install modbus boards in the InVerde electrical cabinets.
- CDH was on site June 12, 2015 to install a datalogger and terminate meter wiring.
- CDH was on site June 30, 2015 to verify metering and fix communications issues.
- CDH was on site August 18, 2015 to install replacement flowmeter.

### Summary

CDH provided the data logger and enclosure. GEM mechanical installed the metering, CDH's enclosure, and performed all of the necessary wire pulls. CDH terminated wiring to the data logger and sensors and configured all metering.

### Monitored Data Points

Data Point	Description	Sensor	Output	Device
WT	Gross Generator Output	Inverde 100 Modbus Output	Modbus RS 485	MB-002
WP	CHP Parasitic Power	Wattnode WMB	Modbus RS 485	MB-003
FG	CHP Gas Consumption	Con Ed Gas Meter Pulse Output	Pulse	MB-250
FHW	Glycol Loop Flow	Onicon F-1100	4 - 20 mA	MB-250
THW1	Glycol Loop Supply Temp	Veris 10k Type II Thermistor	Resistance	MB-250
THW2	Glycol Loop Temp After DHW-LZ HX	Veris 10k Type II Thermistor	Resistance	MB-001
THW3	Glycol Loop Temp After DHW-HZ HX	Veris 10k Type II Thermistor	Resistance	MB-001
THW4	Glycol Loop Temp After DHW-HC HX	Veris 10k Type II Thermistor	Resistance	MB-001
THW5	Glycol Loop Temp After Pool HX	Veris 10k Type II Thermistor	Resistance	MB-001
THW9	Glycol Loop Return Temp	Veris 10k Type II Thermistor	Resistance	MB-001
THW11	Glycol Loop Temp After Lobby HX-AHU1	Veris 10k Type II Thermistor	Resistance	MB-001
THW12	Glycol Loop Temp After DHW-LZ HX	Veris 10k Type II Thermistor	Resistance	MB-001
FHWD	Dump Loop Flow	Onicon F-1100	4 - 20 mA	MB-001
TDS	Dump Radiator Supply Temperature	Veris 10k Type II Thermistor	Resistance	MB-001
TDR	Dump Radiator Return Temperature	Veris 10k Type II Thermistor	Resistance	MB-001

**Heat Recovery Calculations**

Total Heat Recovery (pure water):  $QT = 0.5 * FHW * (THW1 - THW9)$

Rejected Heat Recovery (~ 20% glycol):  $QR = 0.488 * FHWD * (TDS - TDR)$

Useful Heat Recovery:  $QU = QT - QR$

**IP Info**

External IP:	24.103.59.246:8080
Local IP:	10.0.0.4

**Procedure**

- Parasitic power was verified by comparing the Veris H8035 power meter reading on the Obvius to the measured power using a handheld Fluke-39.
- Hot water loop flows were verified by comparing the Onicon F1100 flow measurement to the flow measured by the Portaflow ultrasonic flowmeter.

**Verification Data – June 30, 2015****Parasitic Power:**

<b>WP</b>	<b>Fluke-39 (kW) Obvius (kW)</b>	
	6.5	6.7

**Flow:**

2" Carbon Steel Pipe

OD:	2.375"
Wall Thickness:	0.154"
Sensor Spacing:	1.487"

<b>FHWD</b>	<b>Portaflow (gpm) Obvius (gpm)</b>	
	36.8	37

Site Photos



Tecogen InVerde 100 kW cogen unit located in basement mechanical room.



CDH panel, located in basement mechanical room.



Modbus board installed in Tecogen InVerde 100 kW cogen unit electrical cabinet (WT) - located in basement mechanical room.



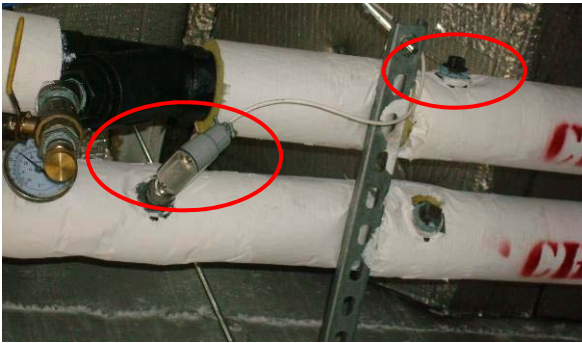
Romet RM2000 utility gas meter w/ pulse output (FG) – located in basement gas meter room.



CDH panel for Obvius expansion board and cogen loop return temperature (THW9) – located in penthouse mechanical room.



Parasitic load panel (left) and Wattnode WMB power meter (WP) – located in penthouse mechanical room.



Recovered heat loop supply temperature sensor THW1 (left) and glycol loop flowmeter (FHW) location – in basement mechanical room.



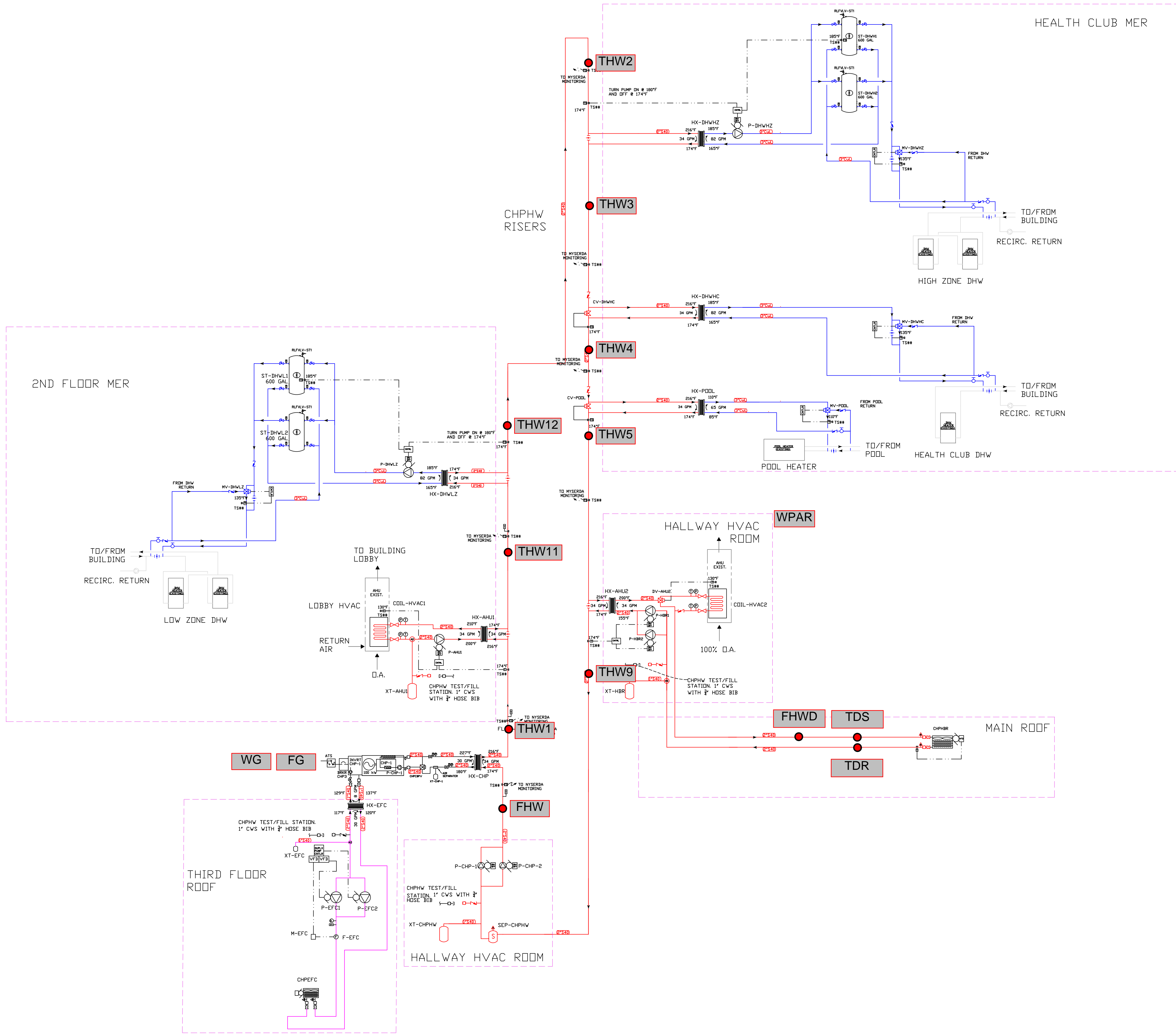
Dump radiator loop flow meter (FHWD) – in penthouse mechanical room.



Dump loop supply and return temperature sensors (TDS, TDR) – located on penthouse roof.



Portaflow ultrasonic flow verification location for dump loop flow (FHWD).



NOTES:

- GENERAL NOTES:  
 1. DO NOT SCALE DRAWINGS  
 2. ALL DIMENSIONS AND LOCATIONS TO BE VERIFIED IN THE FIELD  
 3. DRAWINGS ARE PROVIDED FOR THE PURPOSE OF CONSTRUCTION. DRAWINGS ARE SUBJECT TO MODIFICATIONS AFTER FINAL FIELD MEASUREMENTS AS DIRECTED BY THE ENGINEER.

- DRAWING NOTES:  
 1. DRAWING PROVIDES GENERAL SCHEMATIC SYSTEM INFORMATION. CHECK ALL PROJECT DRAWINGS AND PROJECT SPECIFICATION(S) FOR ADDITIONAL INSTALLATION DETAILS AND INFORMATION  
 2. DETAILS FOR INSTALLATION OF COMPONENTS, PIPING, SYSTEM EQUIPMENT ARE NOT SHOWN IN THIS DRAWING.  
 3. DIMENSIONS AS SHOWN ARE APPROXIMATE ONLY AND TO BE VERIFIED IN FIELD BY CONTRACTOR  
 4. DRAWING DOES NOT SHOW ALL DEMOLITION WORK TO BE DONE  
 5. REFER TO STRUCTURAL CONSULTANTS DRAWINGS FOR ADDL DEMOLITION DETAILS AND ANY REQUIRED REINFORCEMENT

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NO.	REVISION	DESCRIPTION	DATE

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 "Low Carbon" Engineering Specialists  
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Project Name and Address  
**MECHANICAL SCHEMATIC**  
**THE STRAND**  
**CHCP DEMONSTRATION PROJECT**  
**500 WEST 43RD STREET**  
**NEW YORK, NY 10017**  
 BLOCK: **01071** LOT: **0029**

Project No.	Drawing Number:
Date: 12/01/12	<b>M-300.00</b>
Scale: NTS	
Drawn by: SM	Approved by: JA
Sheet #:	of