

Presentation Outline

Depth

- GSHP
 - Layout
 - Cost
- OA Study

Breadths

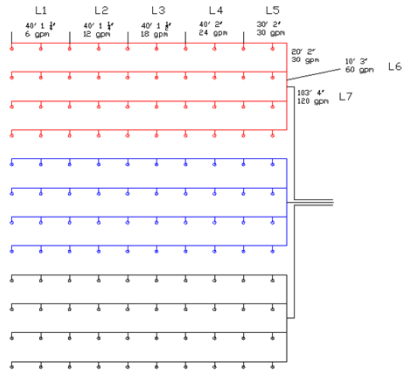
- PV Panels
- Structure

Virtua Replacement Hospital -Voorhees NJ

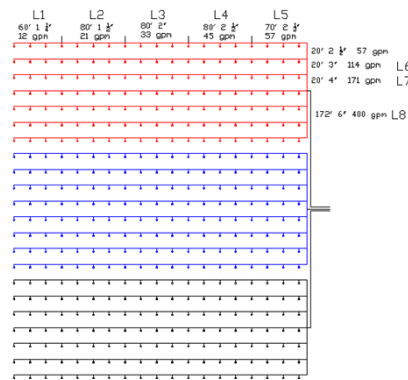


Justin Prior
Mechanical
Advisor - Prof Treado

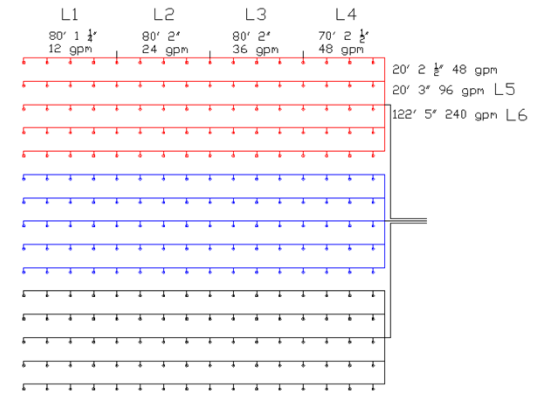
Option 1 - AHU Set 1



GSHP Layout Option 2 - AHU Set 2

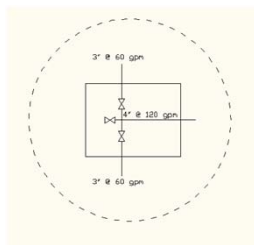
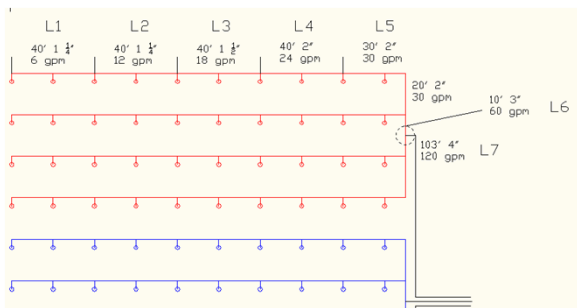


Option 3 - AHU Set 1



Option 1 - AHU Set 1

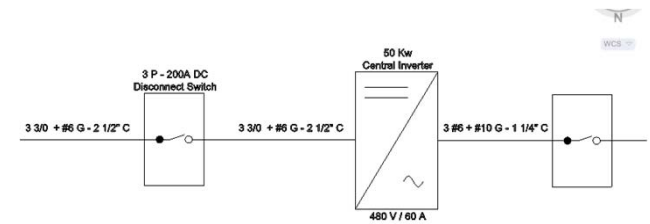
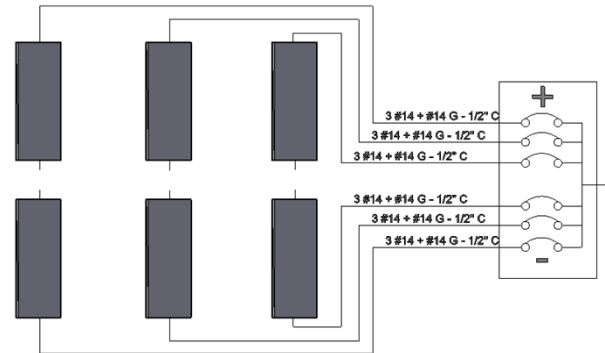
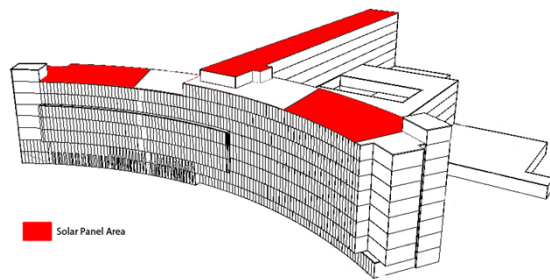
Longest Run



| Section | Length | Size | GPM | Head Loss Eq. | | Head Loss Cost/ft | Cost |
|---------|--------|-------|-----|---------------|--------|-------------------|------|
| | | | | ft/100 ft | Length | | |
| Utube | 600 | 1 | 3 | 0.7 | 622 | | |
| L1 | 80 | 1.25 | 12 | 2.1 | 80 | | |
| L2 | 80 | 2 | 24 | 1.2 | 80 | | |
| L3 | 80 | 2 | 36 | 2.4 | 80 | | |
| L4 | 90 | 2 1/2 | 48 | 1.6 | | | |
| L5 | 20 | 3 | 96 | 2.1 | | | |
| L6 | 122 | 5 | 240 | 1 | | | |

| Section | Fitting | k | Size | Ft | Leq | |
|---------|-----------|----|------|-------|------|--|
| | | | | | | |
| U tube | | | | | 22 | |
| L4 | 90° Bend | 30 | 2.5 | 0.018 | 0.54 | |
| L5 | ST Run | 20 | 3 | 0.018 | 0.36 | |
| L5 | ST Branch | 60 | 3 | 0.018 | 1.08 | |
| L6 | ST Branch | 60 | 5 | 0.016 | 0.96 | |
| L6 | ST Run | 20 | 5 | 0.016 | 0.32 | |
| L6 | 90° Bend | 30 | 5 | 0.016 | 0.48 | |
| L6 | 90° Bend | 30 | 5 | 0.016 | 0.48 | |

PV Panel Array



Left Wing 251 Panels

| Panel Properties | | | Arrangement | | Max Conditions | | Brand |
|------------------|-----|--------------|-------------|----|----------------|-------------|-------|
| Voc | Isc | Adjusted Voc | W | L | Voltage (V) | Current (A) | |
| 43.63 | 7.9 | 49.7 | 10 | 25 | 497 | 138 | |
| 43.63 | 7.9 | 49.7 | 17 | 15 | 846 | 119 | |
| 43.63 | 7.9 | 49.7 | 11 | 23 | 547 | 182 | |