# Spaghetti Design Calculations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| U | 1 |  | Annualization factor | 0.25 |  |  |  |  |
| HEX | Q (kW) | Thentry | Thexit | Tcentry | Tcexit | LMTD | Area |  |
| heater | 54 | 300 | 300 | 162 | 180 | 128.7904253 | 0.419285827 |  |
| 1 | 63 | 180 | 150 | 141 | 162 | 12.98425537 | 4.852030264 |  |
| 2 | 21.64 | 150 | 144.59 | 130 | 141 | 11.57082102 | 1.870221651 |  |
| 3 | 11.361 | 150 | 144.59 | 130 | 141 | 11.57082102 | 0.981866367 |  |
| 4 | 210 | 144.59 | 80.328 | 60 | 130 | 17.30069985 | 12.13823728 |  |
| 5 | 47.05 | 144.59 | 80.328 | 60 | 130 | 17.30069985 | 2.719543163 |  |
| 6 | 139.951 | 144.59 | 80.328 | 60 | 130 | 17.30069985 | 8.089325933 |  |
| 7 | 26.85 | 80.328 | 67.54 | 30 | 60 | 28.05963735 | 0.956890485 |  |
| 8 | 51.15 | 80.328 | 67.54 | 30 | 60 | 28.05963735 | 1.822903103 |  |
| cooler | 57.894 | 67.54 | 40 | 15 | 30 | 30.84634047 | 1.876851488 |  |
| cooler | 110.16 | 67.54 | 40 | 15 | 30 | 30.84634047 | 3.571250214 | **HW1 values** |
|  |  |  |  |  |  | **Area Target** | 38.87911995 | 39.01 |
|  |  |  |  |  |  | **Cost Hex** | 459439.56 | 259503.7 |
|  |  |  |  |  |  | **Utility Costs** | 8160.54 | 8160 |
|  |  |  |  |  |  | **Total Cost** | 123020.43 | 73036 |
|  |  |  |  |  |  | **Cost/Area** | 3164.177331 | 1872.238 |

# MER Calculations

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| U | 1 |  | Annualization factor | 0.25 |  |  |  |  |
| HEX | Q (kW) | Thentry | Thexit | Tcentry | Tcexit | LMTD | Area |  |
| heater | 54 | 300 | 300 | 162 | 180 | 128.7904253 | 0.419286 |  |
| 1 | 63 | 180 | 150 | 141 | 162 | 12.98425537 | 4.85203 |  |
| 2 | 231 | 150 | 40 | 30 | 130 | 14.42695041 | 16.0117 |  |
| 3 | 243 | 150 | 81.999 | 60 | 141 | 14.54397082 | 16.70795 |  |
| 4 | 29 | 150 | 81.999 | 30 | 130 | 33.48954552 | 0.865942 |  |
| cooler | 168 | 150 | 81.999 | 15 | 30 | 90.93981194 | 1.847376 | **HW1 values** |
|  |  |  |  |  |  | **Area Target** | 40.70429 | 39.01 |
|  |  |  |  |  |  | **Cost Hex** | 260352.1 | 259503.7 |
|  |  |  |  |  |  | **Utility Costs** | 8160 | 8160 |
|  |  |  |  |  |  | **Total Cost** | 73248.04 | 73036 |
|  |  |  |  |  |  | **Cost/Area** | 1799.516 | 1872.238 |