

| TAG | MANUFACTURER | MODEL | WEIGHT (LBS) | FULL LOAD EER | FULL LOAD COP | STAGES | HEATING MBH | COOLING MBH | GEOTHERMAL GPM | LOAD GPM | SUPPLY STATIC | SUPPLY CFM | OUTSIDE AIR CFM | TOTAL UNIT FLTA | TOTAL UNIT MCA | UNIT OCP | V/C/P | NOTES |
|--------|----------------|----------------------|--------------|---------------|---------------|----------|-------------|-------------|----------------|----------|---------------|------------|-----------------|-----------------|----------------|----------|----------|-------------|
| WHP-01 | WATER FURNANCE | UVV060TR071DBEED3833 | 450 | 17.8 | 3.7 | VARIABLE | 45 | 62 | 17 | N/A | 0.5" W.C. | 1,725 | 380 | 27.7 | 32.7 | 50 | 240/60/1 | 1,2,3,4,5,8 |
| WHP-02 | WATER FURNANCE | UVV060T071DBEED3833 | 450 | 17.8 | 3.7 | VARIABLE | 45 | 62 | 17 | N/A | 0.5" W.C. | 1,725 | 380 | 27.7 | 32.7 | 50 | 240/60/1 | 1,2,3,4,5,8 |
| WHP-03 | WATER FURNANCE | UVV024TR071DBEED3833 | 400 | 23.6 | 3.9 | VARIABLE | 17.8 | 25.5 | 6 | N/A | 0.5" W.C. | 1,200 | 204 | 12.3 | 15.4 | 20 | 240/60/1 | 2,3,4,8 |
| WHP-04 | WATER FURNANCE | NBV018TR0B1DADCE3833 | 210 | 18.3 | 3.8 | 1 | 14.5 | 18.5 | 6 | N/A | 0.5" W.C. | 630 | 75 | 12.4 | 14.5 | 20 | 240/60/1 | 2,3,4,7 |
| WHP-01 | WATER FURNANCE | NDW100RDHAT1 | 390 | 16.8 | 3 | 2 | 82 | 100 | 23 | 23 | N/A | N/A | N/A | 26.4 | 33.0 | 50 | 240/60/1 | 3,4,6 |
| WHP-02 | WATER FURNANCE | NDW100RDHAT1 | 390 | 16.8 | 3 | 2 | 82 | 100 | 23 | 23 | N/A | N/A | N/A | 26.4 | 33.0 | 50 | 240/60/1 | 3,4,6 |

- NOTES
1. PROVIDE MODULATING HOT GAS REHEAT OPTION
 2. PROVIDE WATER SIDE ECONOMIZER OPTION WITH MODULATING VALVE
 3. PROVIDE HOSE KIT WITH AUTOMATIC BALANCING VALVE, BALL VALVES, AND Y STRAINER.
 4. PROVIDE AURORA (OR SIMILAR) FACTORY CONTROLS SYSTEM.
 5. PROVIDE TWINNING KIT FOR UNIT.
 6. REQUIRES A DUAL POWER FEED.
 7. PROVIDE MODULATING HOT GAS REHEAT AND HOT GAS BYPASS OPTION
 8. PROVIDE SOUND KIT.

ELECTRIC HEATER SCHEDULE

| TAG | MANUFACTURER | AREA SERVED | MODEL | KW | AMPS | COLOR | V/C/P | NOTES |
|--------|--------------|-------------------------|----------|-----|------|-------|----------|-------|
| ECH-01 | QMARK | BARN STORAGE 06 | OCH1207F | 1.5 | 6.3 | WHITE | 240/60/1 | 1,2,3 |
| ECH-02 | QMARK | BARN FAMILY RR 05F | OCH1207F | 1.5 | 6.3 | WHITE | 240/60/1 | 1,2,3 |
| ECH-03 | QMARK | PROCESSING PUBLIC RR 41 | OCH1207F | 1.5 | 6.3 | WHITE | 240/60/1 | 1,2,3 |
| ECH-04 | QMARK | PROCESSING PUBLIC RR 40 | OCH1207F | 1.5 | 6.3 | WHITE | 240/60/1 | 1,2,3 |
| ERP-01 | QMARK | SEED PROCESSING 32 | CP508F | 0.5 | 2.3 | WHITE | 240/60/1 | 3,4,5 |
| ERP-02 | QMARK | SEED PROCESSING 32 | CP508F | 0.5 | 2.3 | WHITE | 240/60/1 | 3,4,5 |
| ERP-03 | QMARK | SEED PROCESSING 32 | CP508F | 0.5 | 2.3 | WHITE | 240/60/1 | 3,4,5 |
| ERP-04 | QMARK | SEED PROCESSING 32 | CP508F | 0.5 | 2.3 | WHITE | 240/60/1 | 3,4,5 |
| ERP-05 | QMARK | SEED PROCESSING 32 | CP508F | 0.5 | 2.3 | WHITE | 240/60/1 | 3,4,5 |

- NOTES
1. Disconnect Switch, factory mounted
 2. Provide Integral, Factory Mounted Controls
 3. Provide recess kit
 4. 48" X 24" X 1" Panel
 5. Unit shall be tied to the occupancy sensor for the room and a line voltage thermostat in series.

FAN SCHEDULE

| TAG | MANUFACTURER | AREA SERVED | MODEL | DRIVE TYPE | CFM | TOTAL EXTERNAL SP | FAN RPM | BHP | FLA (AMPS) | V/C/P | SONES | NOTES |
|-------|--------------|---------------------------|--------------------|------------|--------|-------------------|---------|------|------------|----------|-------|---------|
| EF-01 | GREENHECK | BARN STORAGE 06 | CSF-A390VG | DIRECT | 350 | 0.350 | 1,080 | 0.05 | 1.50 | 115/60/1 | 0.9 | 1, 2, 3 |
| EF-02 | GREENHECK | PROCESSING BURN EQUIP. 34 | SP-A90 | DIRECT | 80 | 0.250 | 900 | 0.01 | 0.17 | 115/60/1 | 0.4 | 1, 2, 3 |
| EF-03 | GREENHECK | PROCESSING PUBLIC RR 40 | SP-A90 | DIRECT | 80 | 0.250 | 900 | 0.01 | 0.17 | 115/60/1 | 0.4 | 1, 2, 3 |
| EF-04 | GREENHECK | PROCESSING PUBLIC RR 41 | SP-A90 | DIRECT | 80 | 0.250 | 900 | 0.01 | 0.17 | 115/60/1 | 0.4 | 1, 2, 3 |
| EF-05 | GREENHECK | PROCESSING STAFF RR 38 | SP-A90 | DIRECT | 80 | 0.250 | 900 | 0.01 | 0.17 | 115/60/1 | 0.4 | 1, 2, 3 |
| EF-06 | GREENHECK | SEED PROCESSING | SDPHE-12-3-A4 | DIRECT | 1,253 | 0.157 | 1,750 | 0.14 | 0.87 | 115/60/1 | 13.5 | 1,2,6 |
| EF-07 | GREENHECK | SEED PROCESSING | SDPHE-12-3-A4 | DIRECT | 1,253 | 0.157 | 1,750 | 0.14 | 0.87 | 115/60/1 | 13.5 | 1,2,6 |
| CF-01 | GREENHECK | SEED DRYING 31 | DC-5-12 | DIRECT | 23,885 | 0.010 | 51 | N/A | 5 | 115/60/1 | N/A | 4 |
| CF-02 | GREENHECK | SEED DRYING 31 | DC-5-12 | DIRECT | 23,885 | 0.010 | 51 | N/A | 5 | 115/60/1 | N/A | 4 |
| CF-03 | MINIKA AIRE | PROCESSING PORCH | 84" XTREME H2O WET | DIRECT | 10,989 | 0.010 | N/A | N/A | 0.26 | 115/60/1 | N/A | 5 |
| DF-01 | GREENHECK | BARN EVENT | DDF-14-VG | DIRECT | 784 | 0.010 | 968 | N/A | 0.35 | 115/60/1 | N/A | 7 |
| DF-01 | GREENHECK | BARN EVENT | DDF-14-VG | DIRECT | 784 | 0.010 | 968 | N/A | 0.35 | 115/60/1 | N/A | 7 |

- NOTES
1. Solid State Speed Control, factory mounted
 2. Disconnect Switch, factory mounted
 3. Backdraft damper, gravity
 4. Provide standard touchscreen controller
 5. Control via manual switch
 6. Provide fan guard
 7. Provide Vari-green (or equal) remote dial and tie power to occupancy sensor with relay

PUMP SCHEDULE

| TAG | MODEL NUMBER | FLOW RATE | TDH | PUMP SPEED | MOTOR TYPE | MOTOR HP | OPERATING HP | V/C/P | NOTES |
|-----|-------------------|-----------|-------|------------|------------|----------|--------------|----------|-------|
| P-1 | ecocirc XL 70-145 | 46 GPM | 60 FT | 3422 RPM | ECM | 2 | 1.59 | 240/60/1 | |
| P-2 | ecocirc XL 70-145 | 46 GPM | 60 FT | 3422 RPM | ECM | 2 | 1.59 | 240/60/1 | |
| P-3 | ecocirc XL 70-145 | 46 GPM | 60 FT | 3422 RPM | ECM | 2 | 1.59 | 240/60/1 | |
| P-4 | ecocirc XL 70-145 | 46 GPM | 32 FT | 2552 RPM | ECM | 2 | 0.74 | 240/60/1 | |
| P-5 | ecocirc XL 70-145 | 46 GPM | 32 FT | 2552 RPM | ECM | 2 | 0.74 | 240/60/1 | |
| P-6 | ecocirc XL 55-45 | 6 | 22 | 2943 | ECM | 0.5 | 0.132 | 240/60/1 | 1 |

1. PUMP IS INTENDED TO RUN ONLY WHEN THE SYSTEM IS ON EMERGENCY POWER SO THAT THE MAIN GEOTHERMAL PUMPS DO NOT NEED TO RUN.

LOUVER SCHEDULE

| MARK | MANUFACTURER | MODEL # | DEPTH (IN) | CONSTRUCTION | WIDTH (IN) | HEIGHT (IN) | VELOCITY (FPM) | APD (IN. WG.) | BIRD SCREEN | DRAINABLE BLADE | REMARKS |
|-------|--------------|---------|------------|-------------------|------------|-------------|----------------|---------------|-------------|-----------------|---------|
| LV-01 | GREENHECK | ESD-202 | 2 | EXTRUDED ALUMINUM | 8 | 10 | 725 | 0.08 | Yes | Yes | |

REGISTERS, GRILLES, AND DIFFUSERS

| MARK | MANUFACTURER | MODEL # | TYPE | GRILLE SIZE | DUCT INLET SIZE | DUCT BRANCH SIZE | NOISE CRITERIA | THROW PATTERN | REMARKS |
|--------|--------------|----------|------------------------------|-------------|-----------------|------------------|----------------|---------------|---------|
| CD-01 | PRICE | SPD | STEEL SQUARE PLAQUE DIFFUSER | 24"X24" | 10"Ø | 10"Ø | 35 | 4-WAY | |
| CD-02 | PRICE | SPD | STEEL SQUARE PLAQUE DIFFUSER | 24"X24" | 6"Ø | 6"Ø | 35 | 4-WAY | |
| DL-1 | PRICE | HCD | DRUM LOUVER | 18" X 10" | 18" X 10" | 18" X 10" | 33 | 2-WAY SPLIT | |
| EG-01 | PRICE | S30 | STEEL LOUVERED GRILLE | 12"X12" | 6"Ø | 6"Ø | 30 | N/A | |
| RD-01 | PRICE | RPD | ROUND PLAQUE DIFFUSER | N/A | 6"Ø | 6"Ø | 35 | 4-WAY | |
| RG-01 | PRICE | S30 | STEEL LOUVERED GRILLE | 22" X 22" | N/A | N/A | 20 | N/A | |
| RG-02 | PRICE | S30 | STEEL LOUVERED GRILLE | 18" X 18" | 20" X 12" | 20" X 12" | 20 | N/A | |
| RG-03 | PRICE | S30 | STEEL LOUVERED GRILLE | 22" X 10" | 10"Ø | 10"Ø | 20 | N/A | |
| SG-01 | PRICE | 90 | HEAVY DUTY GYM GRILLE | 22" X 22" | N/A | N/A | 20 | N/A | 1 |
| VAV-01 | PRICE | VARTHERM | POWERLESS VAV DIFFUSER | 24"X24" | 8"Ø | 8"Ø | 35 | 4-WAY | |

1. PROVIDE FILTERED GRILLE OPTION

SYSTEM 1 VENTILATION SCHEDULE

Shaker Trace Seed Facility

| System# | Maximum System Population (Ps) | Occupant Diversity (D) | Uncorrected Outdoor Air Intake CFM (Vou) | Total System Primary Air Flow CFM (Vps) | Mixing Ratio Outdoor Air to Primary (Ka) | System Ventilation Efficiency Min/Ev (Ev) | Minimum Outdoor Air Intake CFM Vout/Ev (Vot) | Actual Outdoor Air Intake CFM | Actual Percent Outdoor Air Intake |
|---------|--------------------------------|------------------------|--|---|--|---|--|-------------------------------|-----------------------------------|
| 1 | 16 | 1 | 192 | 1200 | 0.160 | 0.973 | 197 | 204 | 0.170 |

Decoupled Outside Air System

ZONE LEVEL CALCULATION

| System# | Room Number | Room Name | Floor Area Sq.Ft. (Aa) | Zone People (Pa) | Outdoor Air CFM per Person (Rp) | Outdoor Air CFM per Area (Ra) | Zone Effective (Ea) | Outdoor Air to Zone (Voa) | Required Outdoor Air Zone (Vot) | Actual Outdoor Air Zone (Vaz) | Primary Airflow to Zone (Vpz) | Supply Airflow to Zone (Vsdz) | Minimum Supply Discharge (Vdmz) | Outdoor Air Fraction to Zone (Zd) | Primary Air Fraction to Zone (Zp) | Secondary Air Fraction to Zone (Zs) | Supply Source Fraction to Zone (Zfa) | Full Mixed Primary Air (Fb) | Outdoor Air Sources Outside (Fc) | Zone Ventilation Efficiency (Eva) |
|---------|-------------|-------------|------------------------|------------------|---------------------------------|-------------------------------|---------------------|---------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|-----------------------------|----------------------------------|-----------------------------------|
| 1 | 34 | BURN EQUIP | 134 | 0 | 0 | 0.06 | 0.8 | 10 | 13.0 | 14.0 | 80 | 80 | 0.125 | 1 | 0 | 1 | 1 | 1 | 1 | 1.035 |
| 1 | 35 | CORR | 112 | 4 | 5 | 0.06 | 0.8 | 34 | 30.0 | 31.0 | 185 | 185 | 0.184 | 1 | 0 | 1 | 1 | 1 | 1 | 0.976 |
| 1 | 38 | OPEN OFFICE | 670 | 10 | 5 | 0.06 | 0.8 | 112 | 104.0 | 107.0 | 630 | 630 | 0.530 | 1 | 0 | 1 | 1 | 1 | 1 | 0.982 |
| 1 | 37 | BREAK | 130 | 2 | 5 | 0.06 | 0.8 | 22 | 38.0 | 37.0 | 220 | 220 | 0.100 | 1 | 0 | 1 | 1 | 1 | 1 | 1.060 |
| 1 | 38 | STAFF RR | 52 | 0 | 0 | 0 | 0.8 | 0 | 2.0 | 10 | 10 | 10 | 0.000 | 1 | 0 | 1 | 1 | 1 | 1 | 1.160 |
| 1 | 39 | MECH | 181 | 0 | 0 | 0.06 | 0.8 | 14 | 12.0 | 13.0 | 75 | 75 | 0.187 | 1 | 0 | 1 | 1 | 1 | 1 | 0.973 |

SYSTEM 2

| System# | Maximum System Population (Ps) | Occupant Diversity (D) | Uncorrected Outdoor Air Intake CFM (Vou) | Total System Primary Air Flow CFM (Vps) | Mixing Ratio Outdoor Air to Primary (Ka) | System Ventilation Efficiency Min/Ev (Ev) | Minimum Outdoor Air Intake CFM Vout/Ev (Vot) | Actual Outdoor Air Intake CFM | Actual Percent Outdoor Air Intake |
|---------|--------------------------------|------------------------|--|---|--|---|--|-------------------------------|-----------------------------------|
| 2 | 0 | 1 | 71 | 630 | 0.113 | 1.000 | 71 | 0 | 0.000 |

Decoupled Outside Air System

ZONE LEVEL CALCULATION

| System# | Room Number | Room Name | Floor Area Sq.Ft. (Aa) | Zone People (Pa) | Outdoor Air CFM per Person (Rp) | Outdoor Air CFM per Area (Ra) | Zone Effective (Ea) | Outdoor Air to Zone (Voa) | Required Outdoor Air Zone (Vot) | Actual Outdoor Air Zone (Vaz) | Primary Airflow to Zone (Vpz) | Supply Airflow to Zone (Vsdz) | Minimum Supply Discharge (Vdmz) | Outdoor Air Fraction to Zone (Zd) | Primary Air Fraction to Zone (Zp) | Secondary Air Fraction to Zone (Zs) | Supply Source Fraction to Zone (Zfa) | Full Mixed Primary Air (Fb) | Outdoor Air Sources Outside (Fc) | Zone Ventilation Efficiency (Eva) |
|---------|-------------|------------|------------------------|------------------|---------------------------------|-------------------------------|---------------------|---------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|-----------------------------|----------------------------------|-----------------------------------|
| 2 | 33 | SEED VAULT | 953 | 0 | 0 | 0.06 | 0.8 | 71 | 73.0 | 0.0 | 630 | 630 | 0.113 | 1 | 0 | 1 | 1 | 1 | 1 | 1.000 |

SYSTEM 3

| System# | Maximum System Population (Ps) | Occupant Diversity (D) | Uncorrected Outdoor Air Intake CFM (Vou) | Total System Primary Air Flow CFM (Vps) | Mixing Ratio Outdoor Air to Primary (Ka) | System Ventilation Efficiency Min/Ev (Ev) | Minimum Outdoor Air Intake CFM Vout/Ev (Vot) | Actual Outdoor Air Intake CFM | Actual Percent Outdoor Air Intake |
|---------|--------------------------------|------------------------|--|---|--|---|--|-------------------------------|-----------------------------------|
| 3 | 77 | 1 | 730 | 3450 | 0.212 | 0.978 | 746 | 759 | 0.220 |

Decoupled Outside Air System

ZONE LEVEL CALCULATION

| System# | Room Number | Room Name | Floor Area Sq.Ft. (Aa) | Zone People (Pa) | Outdoor Air CFM per Person (Rp) | Outdoor Air CFM per Area (Ra) | Zone Effective (Ea) | Outdoor Air to Zone (Voa) | Required Outdoor Air Zone (Vot) | Actual Outdoor Air Zone (Vaz) | Primary Airflow to Zone (Vpz) | Supply Airflow to Zone (Vsdz) | Minimum Supply Discharge (Vdmz) | Outdoor Air Fraction to Zone (Zd) | Primary Air Fraction to Zone (Zp) | Secondary Air Fraction to Zone (Zs) | Supply Source Fraction to Zone (Zfa) | Full Mixed Primary Air (Fb) | Outdoor Air Sources Outside (Fc) | Zone Ventilation Efficiency (Eva) |
|---------|-------------|-------------|------------------------|------------------|---------------------------------|-------------------------------|---------------------|---------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|-----------------------------|----------------------------------|-----------------------------------|
| 3 | 01 | EVENT | 2365 | 75 | 5 | 0.06 | 0.8 | 646 | 601.0 | 612.0 | 2780 | 2780 | 0.232 | 1 | 0 | 1 | 1 | 1 | 1 | 0.979 |
| 3 | 02 | PREP | 207 | 2 | 5 | 0.06 | 0.8 | 28 | 61.0 | 62.0 | 280 | 280 | 0.100 | 1 | 0 | 1 | 1 | 1 | 1 | 1.112 |
| 3 | 03 | STORAGE | 190 | 0 | 0 | 0.06 | 0.8 | 14 | 13.0 | 13.0 | 60 | 60 | 0.233 | 1 | 0 | 1 | 1 | 1 | 1 | 0.978 |
| 3 | 04 | MECH | 208 | 0 | 0 | 0.06 | 0.8 | 15 | 38.0 | 26.0 | 120 | 120 | 0.125 | 1 | 0 | 1 | 1 | 1 | 1 | 1.087 |
| 3 | 05 | HANDWASHING | 224 | 0 | 0 | 0.06 | 0.8 | 16 | 22.0 | 22.0 | 100 | 100 | 0.160 | 1 | 0 | 1 | 1 | 1 | 1 | 1.052 |
| 3 | 05F | FAMILY RR | 231 | 0 | 0 | 0 | 0.8 | 0 | 13.0 | 13.0 | 60 | 60 | 0.000 | 1 | 0 | 1 | 1 | 1 | 1 | 1.212 |
| 3 | 06 | STORAGE | 151 | 0 | 0 | 0.06 | 0.8 | 11 | 11.0 | 11.0 | 50 | 50 | 0.220 | 1 | 0 | 1 | 1 | 1 | 1 | 0.992 |

HX-01

| Performance of One Unit: | AP20 PN: BY5444 | Units Connected in Parallel: | 1 |
|--------------------------|----------------------------|------------------------------|---|
| Fluid Name | Propylene Glycol 30.0% v/v | Propylene Glycol 30.0% v/v | |