

Project Information

For: Kasnoff Residence
 15546 E. Telegraph Dr., Fountain Hills, AZ 85268

Design Conditions

Location:

Phoenix/Sky Harbor, AZ, US
 Elevation: 1106 ft
 Latitude: 33°N

Outdoor:

Dry bulb (°F)
 Daily range (°F)
 Wet bulb (°F)
 Wind speed (mph)

Heating

39
 -
 -
 15.0

Cooling

108
 21 (M)
 69
 7.5

Indoor:

Indoor temperature (°F)
 Design TD (°F)
 Relative humidity (%)
 Moisture difference (gr/lb)

Heating

70
 31
 45
 22.4

Cooling

75
 33
 45
 -10.4

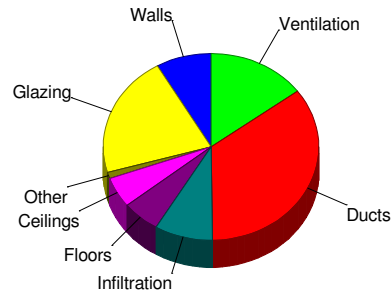
Infiltration:

Method
 Construction quality
 Fireplaces

Simplified
 Average
 0

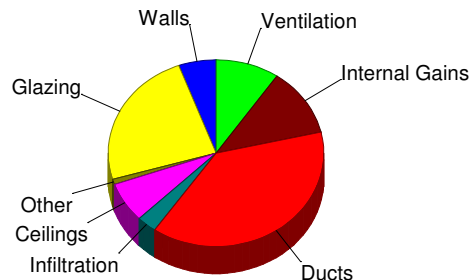
Heating

| Component | Btuh/ft² | Btuh | % of load |
|----------------|----------|--------------|--------------|
| Walls | 1.7 | 2248 | 8.3 |
| Glazing | 12.5 | 5743 | 21.1 |
| Doors | 12.2 | 293 | 1.1 |
| Ceilings | 0.8 | 1429 | 5.3 |
| Floors | 1.3 | 1555 | 5.7 |
| Infiltration | 1.6 | 2372 | 8.7 |
| Ducts | | 9513 | 35.0 |
| Piping | | 0 | 0 |
| Humidification | | 0 | 0 |
| Ventilation | | 4022 | 14.8 |
| Adjustments | | 0 | 0 |
| Total | | 27174 | 100.0 |



Cooling

| Component | Btuh/ft² | Btuh | % of load |
|----------------|----------|--------------|--------------|
| Walls | 1.9 | 2518 | 5.6 |
| Glazing | 23.3 | 10674 | 23.9 |
| Doors | 17.2 | 413 | 0.9 |
| Ceilings | 1.8 | 3088 | 6.9 |
| Floors | 0 | 0 | 0 |
| Infiltration | 0.9 | 1352 | 3.0 |
| Ducts | | 17104 | 38.2 |
| Ventilation | | 4279 | 9.6 |
| Internal gains | | 5290 | 11.8 |
| Blower | | 0 | 0 |
| Adjustments | | 0 | 0 |
| Total | | 44716 | 100.0 |



Latent Cooling Load = 137 Btuh
 Overall U-value = 0.075 Btuh/ft²-°F

WARNING: window to floor area ratio = 26.1% - more than 25%.

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 Wet bulb (°F)
 Wind speed (mph)

Heating

39
 -
 -
 15.0

Cooling

108
 21 (M)
 69
 7.5

Indoor:

Indoor temperature (°F)
 Design TD (°F)
 Relative humidity (%)
 Moisture difference (gr/lb)

Heating

70
 31
 45
 22.4

Cooling

75
 33
 45
 -10.4

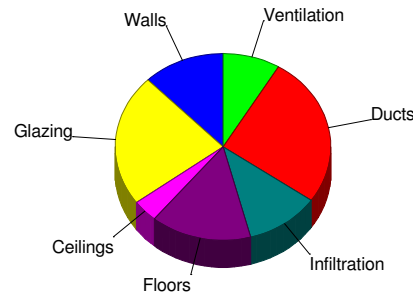
Infiltration:

Method
 Construction quality
 Fireplaces

Simplified
 Average
 0

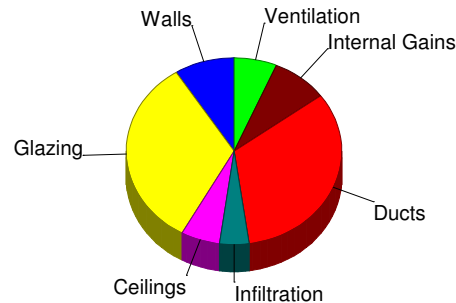
Heating

| Component | Btuh/ft² | Btuh | % of load |
|----------------|----------|--------------|--------------|
| Walls | 2.1 | 3349 | 12.3 |
| Glazing | 12.5 | 6222 | 22.9 |
| Doors | 0 | 0 | 0 |
| Ceilings | 0.8 | 1048 | 3.8 |
| Floors | 5.4 | 4124 | 15.1 |
| Infiltration | 1.6 | 3032 | 11.1 |
| Ducts | | 7111 | 26.1 |
| Piping | | 0 | 0 |
| Humidification | | 0 | 0 |
| Ventilation | | 2345 | 8.6 |
| Adjustments | | 0 | 0 |
| Total | | 27231 | 100.0 |



Cooling

| Component | Btuh/ft² | Btuh | % of load |
|----------------|----------|--------------|--------------|
| Walls | 2.2 | 3505 | 9.0 |
| Glazing | 25.8 | 12811 | 33.0 |
| Doors | 0 | 0 | 0 |
| Ceilings | 1.8 | 2265 | 5.8 |
| Floors | 0 | 0 | 0 |
| Infiltration | 0.9 | 1728 | 4.4 |
| Ducts | | 12783 | 32.9 |
| Ventilation | | 2495 | 6.4 |
| Internal gains | | 3280 | 8.4 |
| Blower | | 0 | 0 |
| Adjustments | | 0 | 0 |
| Total | | 38867 | 100.0 |



Latent Cooling Load = 115 Btuh
 Overall U-value = 0.113 Btuh/ft²-°F

WARNING: window to floor area ratio = 38.6% - more than 25%.
 WARNING: suspicious slab-on-grade floor perimeter in Stairs Down.

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Outdoor:

Dry bulb (°F)
 Daily range (°F)
 Wet bulb (°F)
 Wind speed (mph)

Heating

39
 -
 -
 15.0

Cooling

108
 21 (M)
 69
 7.5

Indoor:

Indoor temperature (°F)
 Design TD (°F)
 Relative humidity (%)
 Moisture difference (gr/lb)

Heating

70
 31
 45
 22.4

Cooling

75
 33
 45
 -10.4

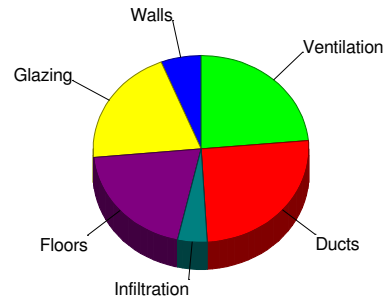
Infiltration:

Method
 Construction quality
 Fireplaces

Simplified
 Average
 0

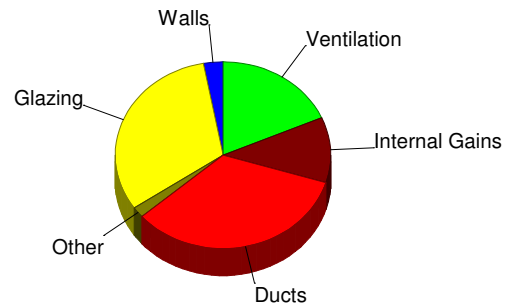
Heating

| Component | Btuh/ft² | Btuh | % of load |
|----------------|----------|--------------|--------------|
| Walls | 1.1 | 1231 | 6.0 |
| Glazing | 17.6 | 4163 | 20.4 |
| Doors | 0 | 0 | 0 |
| Ceilings | 0 | 0 | 0 |
| Floors | 3.9 | 4086 | 20.0 |
| Infiltration | 1.6 | 906 | 4.4 |
| Ducts | | 5204 | 25.5 |
| Piping | | 0 | 0 |
| Humidification | | 0 | 0 |
| Ventilation | | 4807 | 23.6 |
| Adjustments | | 0 | 0 |
| Total | | 20398 | 100.0 |



Cooling

| Component | Btuh/ft² | Btuh | % of load |
|----------------|----------|--------------|--------------|
| Walls | 0.8 | 818 | 2.9 |
| Glazing | 37.2 | 8774 | 31.6 |
| Doors | 0 | 0 | 0 |
| Ceilings | 0 | 0 | 0 |
| Floors | 0 | 0 | 0 |
| Infiltration | 0.9 | 517 | 1.9 |
| Ducts | | 9387 | 33.8 |
| Ventilation | | 5114 | 18.4 |
| Internal gains | | 3140 | 11.3 |
| Blower | | 0 | 0 |
| Adjustments | | 0 | 0 |
| Total | | 27749 | 100.0 |



Latent Cooling Load = 302 Btuh
 Overall U-value = 0.128 Btuh/ft²-°F

Data entries checked.

Project Information

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Notes:

Design Information

Weather: Phoenix/Sky Harbor, AZ, US

Winter Design Conditions

| | |
|------------|-------|
| Outside db | 39 °F |
| Inside db | 70 °F |
| Design TD | 31 °F |

Summer Design Conditions

| | |
|---------------------|-----------|
| Outside db | 108 °F |
| Inside db | 75 °F |
| Design TD | 33 °F |
| Daily range | M |
| Relative humidity | 45 % |
| Moisture difference | -10 gr/lb |

Heating Summary

| | |
|------------------------|------------|
| Structure | 13639 Btuh |
| Ducts | 9513 Btuh |
| Central vent (122 cfm) | 4022 Btuh |
| Outside air | |
| Humidification | 0 Btuh |
| Piping | 0 Btuh |
| Equipment load | 27174 Btuh |

Sensible Cooling Equipment Load Sizing

| | |
|-------------------------|------------|
| Structure | 23334 Btuh |
| Ducts | 17104 Btuh |
| Central vent (122 cfm) | 4279 Btuh |
| Outside air | |
| Blower | 0 Btuh |
| Use manufacturer's data | y |
| Rate/swing multiplier | 1.00 |
| Equipment sensible load | 44716 Btuh |

Infiltration

| | |
|----------------------|------------|
| Method | Simplified |
| Construction quality | Average |
| Fireplaces | 0 |

Latent Cooling Equipment Load Sizing

| | |
|------------------------|-----------|
| Structure | 1338 Btuh |
| Ducts | -373 Btuh |
| Central vent (122 cfm) | -828 Btuh |
| Outside air | |
| Equipment latent load | 137 Btuh |

| | Heating | Cooling |
|---------------------------|---------|---------|
| Area (ft ²) | 1756 | 1756 |
| Volume (ft ³) | 18067 | 18067 |
| Air changes/hour | 0.24 | 0.13 |
| Equiv. AVF (cfm) | 72 | 38 |

| | |
|---------------------------------------|------------|
| Equipment Total Load (Sen+Lat) | 44853 Btuh |
| Req. total capacity at 0.80 SHR | 4.7 ton |

Heating Equipment Summary

| | |
|--------------------------------|-------------------|
| Make | Trane |
| Trade | TRANE |
| Model | 4TWR6060H1 |
| AHRI ref | 8858393 |
| Efficiency | 9 HSPF |
| Heating input | |
| Heating output | 55000 Btuh @ 47°F |
| Temperature rise | 27 °F |
| Actual air flow | 1900 cfm |
| Air flow factor | 0.082 cfm/Btuh |
| Static pressure | 0.70 in H2O |
| Space thermostat | |
| Capacity balance point = 19 °F | |

Cooling Equipment Summary

| | |
|--------------------------|--------------------------|
| Make | Trane |
| Trade | TRANE |
| Cond | 4TWR6060H1 |
| Coil | TEM6A0C60H51++TDR+UF/HRZ |
| AHRI ref | 8858393 |
| Efficiency | 12.5 EER, 15 SEER |
| Sensible cooling | 45600 Btuh |
| Latent cooling | 11400 Btuh |
| Total cooling | 57000 Btuh |
| Actual air flow | 1900 cfm |
| Air flow factor | 0.047 cfm/Btuh |
| Static pressure | 0.70 in H2O |
| Load sensible heat ratio | 1.00 |

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

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Notes:

Design Information

Weather: Phoenix/Sky Harbor, AZ, US

Winter Design Conditions

Outside db 39 °F
 Inside db 70 °F
 Design TD 31 °F

Summer Design Conditions

Outside db 108 °F
 Inside db 75 °F
 Design TD 33 °F
 Daily range M
 Relative humidity 45 %
 Moisture difference -10 gr/lb

Heating Summary

Structure 17776 Btuh
 Ducts 7111 Btuh
 Central vent (71 cfm) 2345 Btuh
 Outside air
 Humidification 0 Btuh
 Piping 0 Btuh
 Equipment load 27231 Btuh

Sensible Cooling Equipment Load Sizing

Structure 23590 Btuh
 Ducts 12783 Btuh
 Central vent (71 cfm) 2495 Btuh
 Outside air
 Blower 0 Btuh
 Use manufacturer's data y
 Rate/swing multiplier 1.00
 Equipment sensible load 38867 Btuh

Infiltration

Method Simplified
 Construction quality Average
 Fireplaces 0

Latent Cooling Equipment Load Sizing

Structure 865 Btuh
 Ducts -267 Btuh
 Central vent (71 cfm) -483 Btuh
 Outside air
 Equipment latent load 115 Btuh

| | Heating | Cooling |
|---------------------------|---------|---------|
| Area (ft ²) | 1288 | 1288 |
| Volume (ft ³) | 15712 | 15712 |
| Air changes/hour | 0.35 | 0.19 |
| Equiv. AVF (cfm) | 92 | 49 |

Equipment Total Load (Sen+Lat) 38982 Btuh
 Req. total capacity at 0.80 SHR 4.0 ton

Heating Equipment Summary

Make Trane
 Trade TRANE
 Model 4TWR6048H1
 AHRI ref 8858412

Efficiency 9.6 HSPF
 Heating input
 Heating output 44500 Btuh @ 47°F
 Temperature rise 26 °F
 Actual air flow 1600 cfm
 Air flow factor 0.064 cfm/Btuh
 Static pressure 0.60 in H2O
 Space thermostat
 Capacity balance point = 25 °F

Cooling Equipment Summary

Make Trane
 Trade TRANE
 Cond 4TWR6048H1
 Coil TEM6A0C48H41++TDR+UF/HRZ
 AHRI ref 8858412

Efficiency 13.0 EER, 16.5 SEER
 Sensible cooling 38400 Btuh
 Latent cooling 9600 Btuh
 Total cooling 48000 Btuh
 Actual air flow 1600 cfm
 Air flow factor 0.044 cfm/Btuh
 Static pressure 0.60 in H2O
 Load sensible heat ratio 1.00

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Notes:

Design Information

Weather: Phoenix/Sky Harbor, AZ, US

Winter Design Conditions

Outside db 39 °F
 Inside db 70 °F
 Design TD 31 °F

Summer Design Conditions

Outside db 108 °F
 Inside db 75 °F
 Design TD 33 °F
 Daily range M
 Relative humidity 45 %
 Moisture difference -10 gr/lb

Heating Summary

Structure 10387 Btuh
 Ducts 5204 Btuh
 Central vent (145 cfm) 4807 Btuh
 Outside air
 Humidification 0 Btuh
 Piping 0 Btuh
 Equipment load 20398 Btuh

Sensible Cooling Equipment Load Sizing

Structure 13248 Btuh
 Ducts 9387 Btuh
 Central vent (145 cfm) 5114 Btuh
 Outside air
 Blower 0 Btuh
 Use manufacturer's data y
 Rate/swing multiplier 1.00
 Equipment sensible load 27749 Btuh

Infiltration

Method Simplified
 Construction quality Average
 Fireplaces 0

Latent Cooling Equipment Load Sizing

Structure 1500 Btuh
 Ducts -208 Btuh
 Central vent (145 cfm) -990 Btuh
 Outside air
 Equipment latent load 302 Btuh

| | Heating | Cooling |
|---------------------------|---------|---------|
| Area (ft ²) | 1051 | 1051 |
| Volume (ft ³) | 7100 | 7100 |
| Air changes/hour | 0.23 | 0.12 |
| Equiv. AVF (cfm) | 27 | 15 |

Equipment Total Load (Sen+Lat) 28051 Btuh
 Req. total capacity at 0.80 SHR 2.9 ton

Heating Equipment Summary

Make Trane
 Trade TRANE
 Model 4TWR6036H1
 AHRI ref 7562981

Efficiency 9 HSPF
 Heating input
 Heating output 33000 Btuh @ 47°F
 Temperature rise 27 °F
 Actual air flow 1160 cfm
 Air flow factor 0.074 cfm/Btuh
 Static pressure 0.70 in H2O
 Space thermostat
 Capacity balance point = 26 °F

Cooling Equipment Summary

Make Trane
 Trade TRANE
 Cond 4TWR6036H1
 Coil TEM6A0C36H31++TDR
 AHRI ref 7562981

Efficiency 13.0 EER, 16 SEER
 Sensible cooling 27840 Btuh
 Latent cooling 6960 Btuh
 Total cooling 34800 Btuh
 Actual air flow 1160 cfm
 Air flow factor 0.051 cfm/Btuh
 Static pressure 0.70 in H2O
 Load sensible heat ratio 0.99

Calculations approved by ACCA to meet all requirements of Manual J 8th Ed.

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Cooling Equipment

Design Conditions

| | | | | | | |
|--------------------|--------|--------------------|-------|------|-------------------|--------|
| Outdoor design DB: | 108°F | Sensible gain: | 44716 | Btuh | Entering coil DB: | 80.6°F |
| Outdoor design WB: | 69.4°F | Latent gain: | 137 | Btuh | Entering coil WB: | 62.6°F |
| Indoor design DB: | 75.0°F | Total gain: | 44853 | Btuh | | |
| Indoor RH: | 45% | Estimated airflow: | 1900 | cfm | | |

Manufacturer's Performance Data at Actual Design Conditions

| | | | | | |
|--------------------|------------|--------|-------------------------------------|---------|----------|
| Equipment type: | Split ASHP | | | | |
| Manufacturer: | Trane | Model: | 4TWR6060H1+TEM6A0C60H51++TDR+UF/HRZ | | |
| Actual airflow: | 1900 | cfm | | | |
| Sensible capacity: | 48362 | Btuh | 108% | of load | |
| Latent capacity: | 1823 | Btuh | 1329% | of load | |
| Total capacity: | 50185 | Btuh | 112% | of load | SHR: 96% |

Heating Equipment

Design Conditions

| | | | | | | |
|--------------------|--------|------------|-------|------|-------------------|--------|
| Outdoor design DB: | 38.7°F | Heat loss: | 27174 | Btuh | Entering coil DB: | 67.0°F |
| Indoor design DB: | 70.0°F | | | | | |

Manufacturer's Performance Data at Actual Design Conditions

| | | | | | |
|-----------------------------|------------|--------|-------------------------------------|---------|--------------------------|
| Equipment type: | Split ASHP | | | | |
| Manufacturer: | Trane | Model: | 4TWR6060H1+TEM6A0C60H51++TDR+UF/HRZ | | |
| Actual airflow: | 1900 | cfm | | | |
| Output capacity: | 47589 | Btuh | 175% | of load | Capacity balance: 19 °F |
| Supplemental heat required: | 0 | Btuh | | | Economic balance: -99 °F |

Meets all requirements of ACCA Manual S.

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Cooling Equipment

Design Conditions

| | | | | | | |
|--------------------|--------|--------------------|-------|------|-------------------|--------|
| Outdoor design DB: | 108°F | Sensible gain: | 38867 | Btuh | Entering coil DB: | 79.6°F |
| Outdoor design WB: | 69.4°F | Latent gain: | 115 | Btuh | Entering coil WB: | 62.3°F |
| Indoor design DB: | 75.0°F | Total gain: | 38982 | Btuh | | |
| Indoor RH: | 45% | Estimated airflow: | 1600 | cfm | | |

Manufacturer's Performance Data at Actual Design Conditions

| | | | | | |
|--------------------|------------|--------|-------------------------------------|---------|----------|
| Equipment type: | Split ASHP | | | | |
| Manufacturer: | Trane | Model: | 4TWR6048H1+TEM6A0C48H41++TDR+UF/HRZ | | |
| Actual airflow: | 1600 | cfm | | | |
| Sensible capacity: | 41597 | Btuh | 107% | of load | |
| Latent capacity: | 156 | Btuh | 136% | of load | |
| Total capacity: | 41753 | Btuh | 107% | of load | SHR: 0k% |

Heating Equipment

Design Conditions

| | | | | | | |
|--------------------|--------|------------|-------|------|-------------------|--------|
| Outdoor design DB: | 38.7°F | Heat loss: | 27231 | Btuh | Entering coil DB: | 67.7°F |
| Indoor design DB: | 70.0°F | | | | | |

Manufacturer's Performance Data at Actual Design Conditions

| | | | | | |
|-----------------------------|------------|--------|-------------------------------------|---------|--------------------------|
| Equipment type: | Split ASHP | | | | |
| Manufacturer: | Trane | Model: | 4TWR6048H1+TEM6A0C48H41++TDR+UF/HRZ | | |
| Actual airflow: | 1600 | cfm | | | |
| Output capacity: | 38112 | Btuh | 140% | of load | Capacity balance: 25 °F |
| Supplemental heat required: | 0 | Btuh | | | Economic balance: -99 °F |

Meets all requirements of ACCA Manual S.

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Cooling Equipment

Design Conditions

| | | | | | | |
|--------------------|--------|--------------------|-------|------|-------------------|--------|
| Outdoor design DB: | 108°F | Sensible gain: | 27749 | Btuh | Entering coil DB: | 82.4°F |
| Outdoor design WB: | 69.4°F | Latent gain: | 302 | Btuh | Entering coil WB: | 63.1°F |
| Indoor design DB: | 75.0°F | Total gain: | 28051 | Btuh | | |
| Indoor RH: | 45% | Estimated airflow: | 1160 | cfm | | |

Manufacturer's Performance Data at Actual Design Conditions

| | | | | |
|--------------------|------------|--------|------------------------------|---------|
| Equipment type: | Split ASHP | | | |
| Manufacturer: | Trane | Model: | 4TWR6036H1+TEM6A0C36H31++TDR | |
| Actual airflow: | 1160 | cfm | | |
| Sensible capacity: | 30583 | Btuh | 110% | of load |
| Latent capacity: | 599 | Btuh | 198% | of load |
| Total capacity: | 31182 | Btuh | 111% | of load |
| | | | SHR: | 98% |

Heating Equipment

Design Conditions

| | | | | | | |
|--------------------|--------|------------|-------|------|-------------------|--------|
| Outdoor design DB: | 38.7°F | Heat loss: | 20398 | Btuh | Entering coil DB: | 65.1°F |
| Indoor design DB: | 70.0°F | | | | | |

Manufacturer's Performance Data at Actual Design Conditions

| | | | | |
|-----------------------------|------------|--------|------------------------------|---------|
| Equipment type: | Split ASHP | | | |
| Manufacturer: | Trane | Model: | 4TWR6036H1+TEM6A0C36H31++TDR | |
| Actual airflow: | 1160 | cfm | | |
| Output capacity: | 28359 | Btuh | 139% | of load |
| Supplemental heat required: | 0 | Btuh | | |
| | | | Capacity balance: | 26 °F |
| | | | Economic balance: | -99 °F |

Meets all requirements of ACCA Manual S.



Duct System Summary

AC-1: Kitchen

Mechanical Design Services, LLC

Job: Kasnoff
 Date:
 By:

19718 W. Amelia Ave., Buckeye, AZ 85396 Phone: 602-628-2061 Email: chriscline@cox.net

Project Information

For: Kasnoff Residence
 15546 E. Telegraph Dr., Fountain Hills, AZ 85268

| | Heating | Cooling |
|------------------------------------|----------------------|----------------------|
| External static pressure | 0.70 in H2O | 0.70 in H2O |
| Pressure losses | 0.15 in H2O | 0.15 in H2O |
| Available static pressure | 0.55 in H2O | 0.55 in H2O |
| Supply / return available pressure | 0.326 / 0.224 in H2O | 0.326 / 0.224 in H2O |
| Lowest friction rate | 0.123 in/100ft | 0.123 in/100ft |
| Actual air flow | 1900 cfm | 1900 cfm |
| Total effective length (TEL) | 446 ft | |

Supply Branch Detail Table

| Name | Design (Btuh) | Htg (cfm) | Clg (cfm) | Design FR | Diam (in) | H x W (in) | Duct Matl | Actual Ln (ft) | Ftg.Eqv Ln (ft) | Trunk |
|------------------|---------------|-----------|-----------|-----------|-----------|------------|-----------|----------------|-----------------|-------|
| Dining | h 1820 | 149 | 146 | 0.243 | 7.0 | 0x0 | VIFx | 19.0 | 115.0 | st3 |
| Dining-A | h 1820 | 149 | 146 | 0.239 | 7.0 | 0x0 | VIFx | 21.5 | 115.0 | st3 |
| Dining-B | h 1820 | 149 | 146 | 0.241 | 7.0 | 0x0 | VIFx | 10.0 | 125.0 | st3 |
| Her WIC | h 791 | 65 | 38 | 0.179 | 5.0 | 0x0 | VIFx | 37.1 | 145.0 | st9 |
| His WIC | c 236 | 10 | 11 | 0.175 | 4.0 | 0x0 | VIFx | 35.5 | 150.0 | st9 |
| Kitchen Area | c 3492 | 106 | 164 | 0.207 | 8.0 | 0x0 | VIFx | 32.0 | 125.0 | st7 |
| Kitchen Area-A | c 3492 | 106 | 164 | 0.237 | 8.0 | 0x0 | VIFx | 17.5 | 120.0 | st12 |
| Kitchen Area-B | c 3492 | 106 | 164 | 0.178 | 8.0 | 0x0 | VIFx | 27.5 | 155.0 | st12 |
| Kitchen Area-C | c 3492 | 106 | 164 | 0.189 | 8.0 | 0x0 | VIFx | 42.0 | 130.0 | st7 |
| Laundry | h 1535 | 126 | 95 | 0.261 | 7.0 | 0x0 | VIFx | 19.5 | 105.0 | st14 |
| M. Bath | h 1935 | 159 | 120 | 0.157 | 8.0 | 0x0 | VIFx | 42.5 | 165.0 | st10 |
| M. WC | h 248 | 20 | 12 | 0.164 | 4.0 | 0x0 | VIFx | 38.2 | 160.0 | st9 |
| Master Bedroom | h 1718 | 141 | 118 | 0.124 | 8.0 | 0x0 | VIFx | 63.0 | 200.0 | st10A |
| Master Bedroom-A | h 1718 | 141 | 118 | 0.157 | 7.0 | 0x0 | VIFx | 53.0 | 155.0 | st10 |
| Master Bedroom-B | h 1718 | 141 | 118 | 0.123 | 8.0 | 0x0 | VIFx | 64.0 | 200.0 | st10A |
| Master Bedroom-C | h 1718 | 141 | 118 | 0.157 | 7.0 | 0x0 | VIFx | 52.0 | 155.0 | st10 |
| Mud Rm. | h 934 | 77 | 47 | 0.269 | 5.0 | 0x0 | VIFx | 16.0 | 105.0 | st14 |
| Pantry | c 203 | 9 | 10 | 0.227 | 4.0 | 0x0 | VIFx | 13.5 | 130.0 | st11 |

Bold/italic values have been manually overridden



Supply Trunk Detail Table

| Name | Trunk Type | Htg (cfm) | Clg (cfm) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Duct Material | Trunk |
|-------|------------|-----------|-----------|-----------|-------------|-----------|------------|---------------|-------|
| st3 | Peak AVF | 448 | 439 | 0.239 | 645 | 8.6 | 10 x 10 | ShtMetl | |
| st11 | Peak AVF | 1038 | 991 | 0.123 | 680 | 13.4 | 10 x 22 | ShtMetl | st13 |
| st7 | Peak AVF | 211 | 328 | 0.189 | 602 | 10.0 | 0 x 0 | VinIFlx | st11 |
| st8 | Peak AVF | 818 | 653 | 0.123 | 655 | 12.2 | 10 x 18 | ShtMetl | st11 |
| st12 | Peak AVF | 211 | 328 | 0.178 | 602 | 10.0 | 0 x 0 | VinIFlx | st13 |
| st13 | Peak AVF | 1249 | 1319 | 0.123 | 688 | 14.6 | 12 x 23 | ShtMetl | st2 |
| st9 | Peak AVF | 95 | 61 | 0.164 | 700 | 5.0 | 0 x 0 | VinIFlx | st8 |
| st10 | Peak AVF | 723 | 592 | 0.123 | 650 | 11.7 | 10 x 16 | ShtMetl | st8 |
| st14 | Peak AVF | 203 | 142 | 0.261 | 580 | 8.0 | 0 x 0 | VinIFlx | st2 |
| st2 | Peak AVF | 1452 | 1461 | 0.123 | 674 | 15.2 | 12 x 26 | ShtMetl | |
| st10A | Peak AVF | 282 | 236 | 0.123 | 677 | 8.2 | 10 x 6 | ShtMetl | st10 |

Return Branch Detail Table

| Name | Grille Size (in) | Htg (cfm) | Clg (cfm) | TEL (ft) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Stud/Joist Opening (in) | Duct Matl | Trunk |
|------|------------------|-----------|-----------|----------|-----------|-------------|-----------|------------|-------------------------|-----------|-------|
| rb7 | 0x 0 | 1030 | 805 | 181.5 | 0.124 | 659 | 13.3 | 15x 15 | | ShMt | rt2 |
| rb9 | 0x 0 | 870 | 1095 | 182.0 | 0.123 | 701 | 13.7 | 15x 15 | | ShMt | rt2 |

Return Trunk Detail Table

| Name | Trunk Type | Htg (cfm) | Clg (cfm) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Duct Material | Trunk |
|------|------------|-----------|-----------|-----------|-------------|-----------|------------|---------------|-------|
| rt2 | Peak AVF | 1900 | 1900 | 0.123 | 782 | 16.8 | 14 x 25 | ShtMetl | |

Project Information

For: Kasnoff Residence
15546 E. Telegraph Dr., Fountain Hills, AZ 85268

| | Heating | Cooling |
|------------------------------------|----------------------|----------------------|
| External static pressure | 0.60 in H2O | 0.60 in H2O |
| Pressure losses | 0.15 in H2O | 0.15 in H2O |
| Available static pressure | 0.45 in H2O | 0.45 in H2O |
| Supply / return available pressure | 0.378 / 0.072 in H2O | 0.378 / 0.072 in H2O |
| Lowest friction rate | 0.131 in/100ft | 0.131 in/100ft |
| Actual air flow | 1600 cfm | 1600 cfm |
| Total effective length (TEL) | 343 ft | |

Supply Branch Detail Table

| Name | Design (Btuh) | Htg (cfm) | Clg (cfm) | Design FR | Diam (in) | H x W (in) | Duct Matl | Actual Ln (ft) | Ftg.Eqv Ln (ft) | Trunk |
|-------------|---------------|-----------|-----------|-----------|------------|------------|-----------|----------------|-----------------|-------|
| Bath2 | h 1601 | 103 | 43 | 0.156 | 6.0 | 0x0 | VIFx | 32.0 | 210.0 | st16 |
| Bedroom 2-A | h 3744 | 241 | 190 | 0.154 | 9.0 | 0x0 | VIFx | 25.5 | 220.0 | st16 |
| Family | c 4280 | 114 | 188 | 0.176 | 8.0 | 0x0 | VIFx | 35.5 | 180.0 | st15 |
| Family-A | c 4280 | 114 | 188 | 0.131 | 9.0 | 0x0 | VIFx | 53.0 | 235.0 | st15A |
| Family-C | c 4280 | 114 | 188 | 0.170 | 8.0 | 0x0 | VIFx | 42.0 | 180.0 | st15 |
| Family-E | c 4280 | 114 | 188 | 0.134 | 8.0 | 0x0 | VIFx | 46.5 | 235.0 | st15A |
| Foyer | h 3845 | 247 | 218 | 0.132 | 9.0 | 0x0 | VIFx | 61.9 | 225.0 | st15 |
| Office-A | h 3976 | 256 | 228 | 0.145 | 9.0 | 0x0 | VIFx | 40.5 | 220.0 | st16A |
| Powder | c 104 | 3 | 5 | 0.151 | 4.0 | 0x0 | VIFx | 21.0 | 230.0 | st16 |
| Stairs Down | h 4132 | 266 | 146 | 0.173 | 9.0 | 0x0 | VIFx | 28.5 | 190.0 | st15 |
| WIC 2 | h 460 | 30 | 17 | 0.146 | 4.0 | 0x0 | VIFx | 18.5 | 240.0 | st16 |

Supply Trunk Detail Table

| Name | Trunk Type | Htg (cfm) | Clg (cfm) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Duct Material | Trunk |
|-------|------------|-----------|-----------|-----------|-------------|-----------|------------|---------------|-------|
| st15 | Peak AVF | 968 | 1117 | 0.131 | 670 | 13.6 | 12 x 20 | ShtMetl | st4 |
| st15A | Peak AVF | 228 | 377 | 0.131 | 678 | 9.0 | 10 x 8 | ShtMetl | st15 |
| st16 | Peak AVF | 632 | 483 | 0.145 | 650 | 10.8 | 10 x 14 | ShtMetl | st4 |
| st16A | Peak AVF | 256 | 228 | 0.145 | 613 | 7.7 | 10 x 6 | ShtMetl | st16 |
| st4 | Peak AVF | 1600 | 1600 | 0.131 | 686 | 15.5 | 12 x 28 | ShtMetl | |

Bold/italic values have been manually overridden

Return Branch Detail Table

| Name | Grille Size (in) | Htg (cfm) | Clg (cfm) | TEL (ft) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Stud/Joist Opening (in) | Duct Matl | Trunk |
|------|---------------------|--------------|--------------|-------------|--------------|----------------|--------------|---------------|----------------------------|--------------|-------|
| rb6 | 0x0 | 1600 | 1600 | 54.5 | 0.131 | 686 | 15.5 | 12x 28 | | ShMt | |

Project Information

For: Kasnoff Residence
15546 E. Telegraph Dr., Fountain Hills, AZ 85268

| | Heating | Cooling |
|------------------------------------|----------------------|----------------------|
| External static pressure | 0.70 in H2O | 0.70 in H2O |
| Pressure losses | 0.15 in H2O | 0.15 in H2O |
| Available static pressure | 0.55 in H2O | 0.55 in H2O |
| Supply / return available pressure | 0.440 / 0.110 in H2O | 0.440 / 0.110 in H2O |
| Lowest friction rate | 0.135 in/100ft | 0.135 in/100ft |
| Actual air flow | 1160 cfm | 1160 cfm |
| Total effective length (TEL) | | 407 ft |

Supply Branch Detail Table

| Name | Design (Btuh) | Htg (cfm) | Clg (cfm) | Design FR | Diam (in) | H x W (in) | Duct Matl | Actual Ln (ft) | Ftg.Eqv Ln (ft) | Trunk |
|-------------|---------------|-----------|-----------|-----------|-----------|------------|-----------|----------------|-----------------|-------|
| Bath3 | h 1712 | 127 | 9 | 0.215 | 7.0 | 0x0 | VIFx | 25.0 | 180.0 | st5 |
| Bedroom3 | c 4191 | 208 | 215 | 0.192 | 9.0 | 0x0 | VIFx | 23.5 | 205.0 | st5 |
| Bedroom4 | h 3234 | 241 | 206 | 0.182 | 9.0 | 0x0 | VIFx | 27.0 | 215.0 | st5A |
| Game Room | c 3562 | 146 | 183 | 0.192 | 8.0 | 0x0 | VIFx | 29.5 | 200.0 | st6 |
| Game Room-A | c 3562 | 146 | 183 | 0.135 | 8.0 | 0x0 | VIFx | 40.0 | 285.0 | st6 |
| Game Room-B | c 3562 | 146 | 183 | 0.135 | 8.0 | 0x0 | VIFx | 40.0 | 285.0 | st6 |
| Game Room-C | c 3562 | 146 | 183 | 0.192 | 8.0 | 0x0 | VIFx | 29.5 | 200.0 | st6 |

Supply Trunk Detail Table

| Name | Trunk Type | Htg (cfm) | Clg (cfm) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Duct Material | Trunk |
|------|------------|-----------|-----------|-----------|-------------|-----------|------------|---------------|-------|
| st5 | Peak AVF | 576 | 430 | 0.182 | 691 | 9.9 | 10 x 12 | ShtMetl | st1 |
| st5A | Peak AVF | 241 | 206 | 0.182 | 578 | 7.2 | 10 x 6 | ShtMetl | st5 |
| st6 | Peak AVF | 584 | 730 | 0.135 | 657 | 11.5 | 10 x 16 | ShtMetl | st1 |
| st1 | Peak AVF | 1160 | 1160 | 0.135 | 696 | 13.7 | 16 x 15 | ShtMetl | |

Return Branch Detail Table

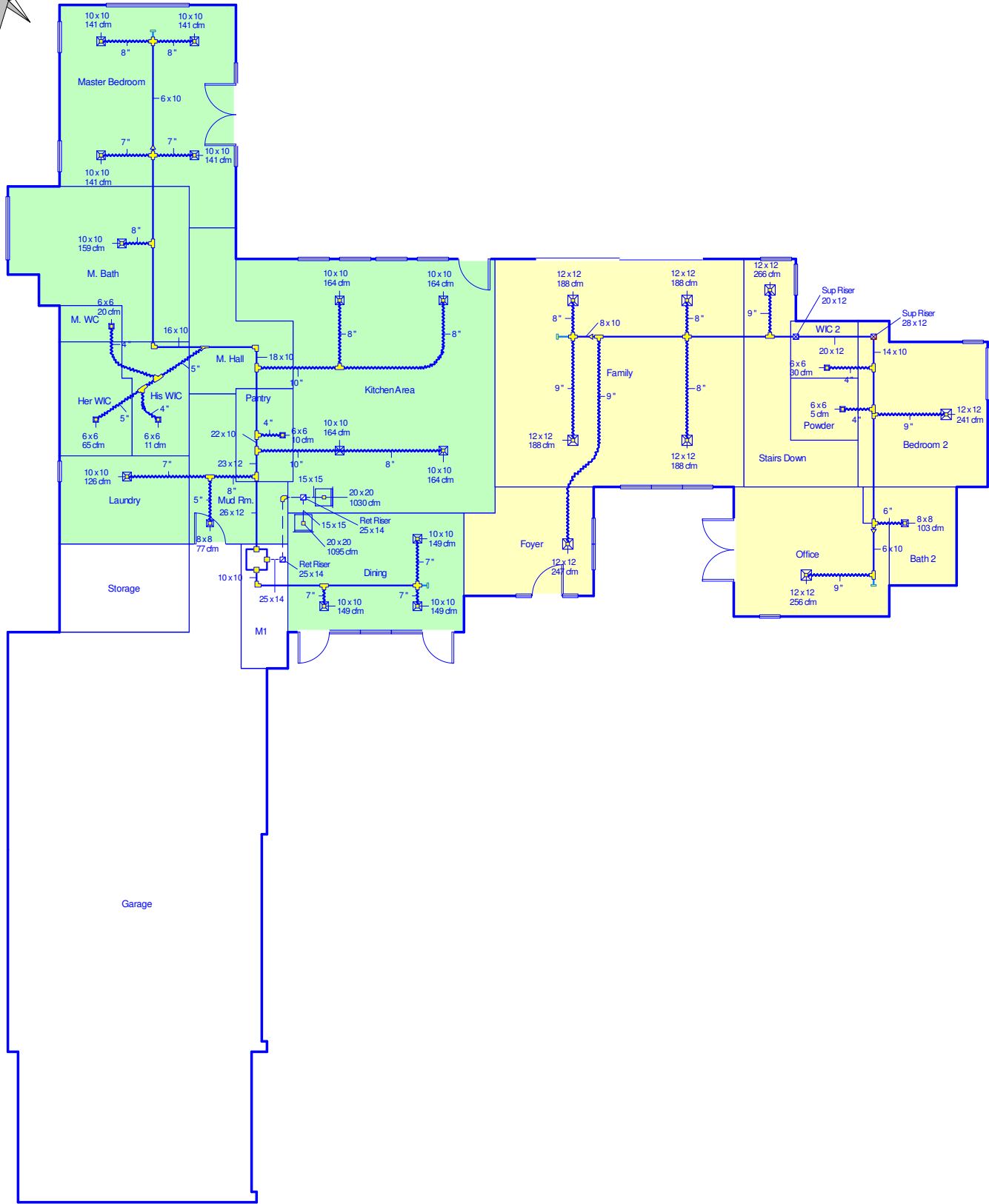
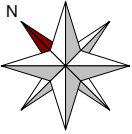
| Name | Grille Size (in) | Htg (cfm) | Clg (cfm) | TEL (ft) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Stud/Joist Opening (in) | Duct Matl | Trunk |
|------|------------------|-----------|-----------|----------|-----------|-------------|-----------|------------|-------------------------|-----------|-------|
| rb8 | 0x0 | 1160 | 1160 | 81.5 | 0.135 | 696 | 13.7 | 16x 15 | | ShMt | rrs1 |

Bold/italic values have been manually overridden

Return Trunk Detail Table

| Name | Trunk Type | Htg (cfm) | Clg (cfm) | Design FR | Veloc (fpm) | Diam (in) | H x W (in) | Duct Material | Trunk |
|------|------------|-----------|-----------|-----------|-------------|-----------|------------|---------------|-------|
| rrs1 | Peak AVF | 1160 | 1160 | 0.135 | 773 | 13.7 | 12 x 18 | ShtMetl | rt1 |
| rt1 | Peak AVF | 1160 | 1160 | 0.135 | 773 | 13.7 | 12 x 18 | ShtMetl | |

Main floor

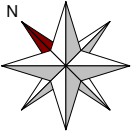


Job #: Kasnoff
Performed for:
Kasnoff Residence
15546 E. Telegraph Dr.
Fountain Hills, AZ 85268

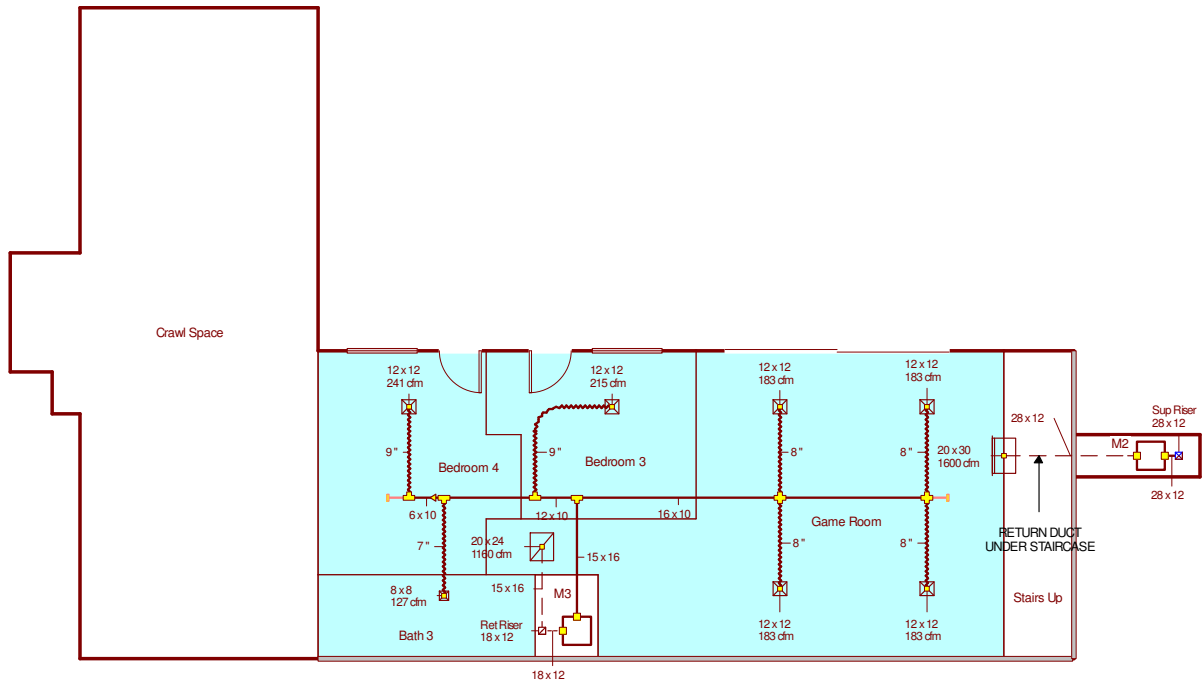
Mechanical Design Services, LLC

19718 W. Amelia Ave.
Buckeye, AZ 85396
Phone: 602-628-2061
chriscline@cox.net

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Basement



**Job #: Kasnoff
Performed for:**

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15546 E. Telegraph Dr.
Fountain Hills, AZ 85268

Mechanical Design Services, LLC

19718 W. Amelia Ave.
Buckeye, AZ 85396
Phone: 602-628-2061
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