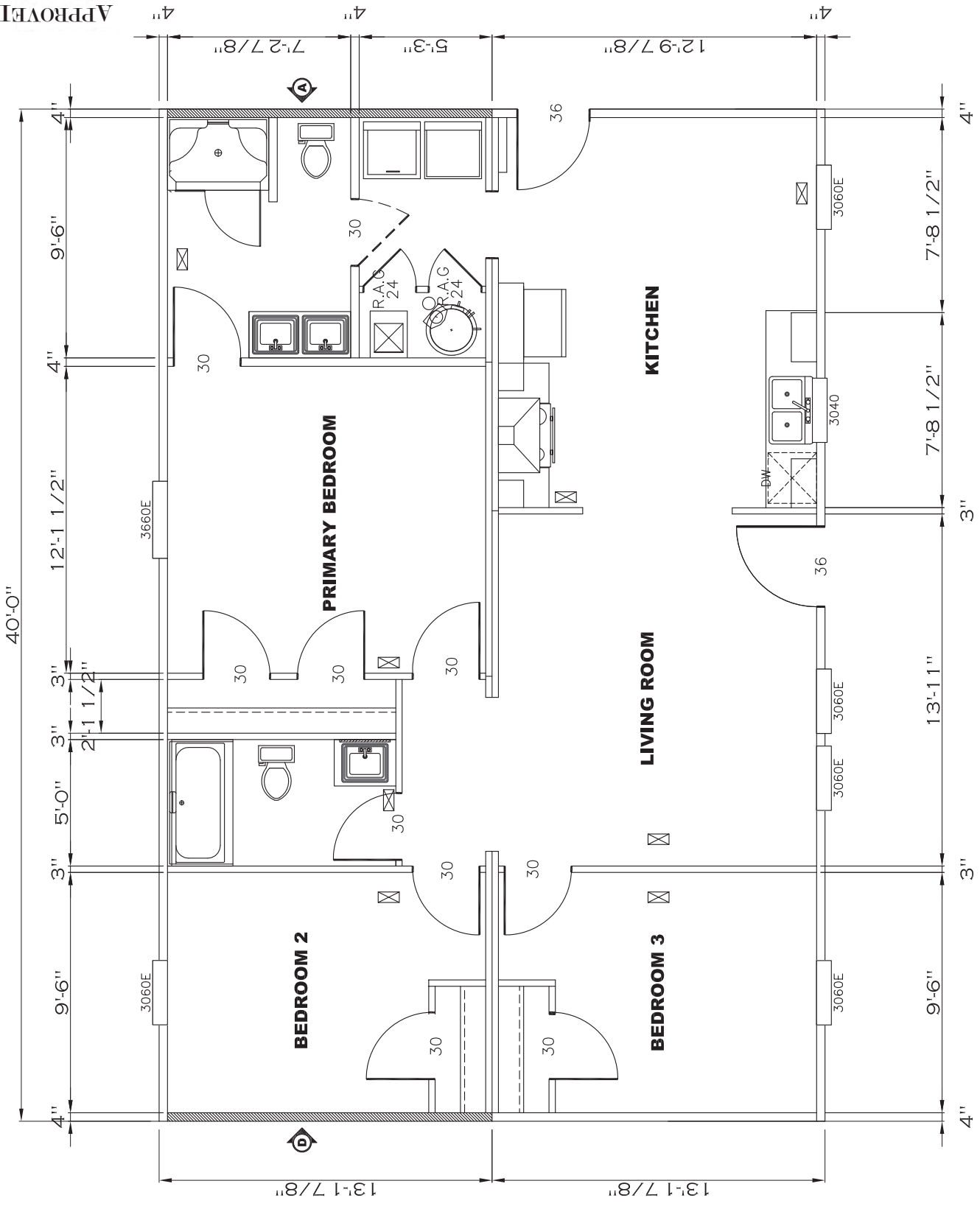


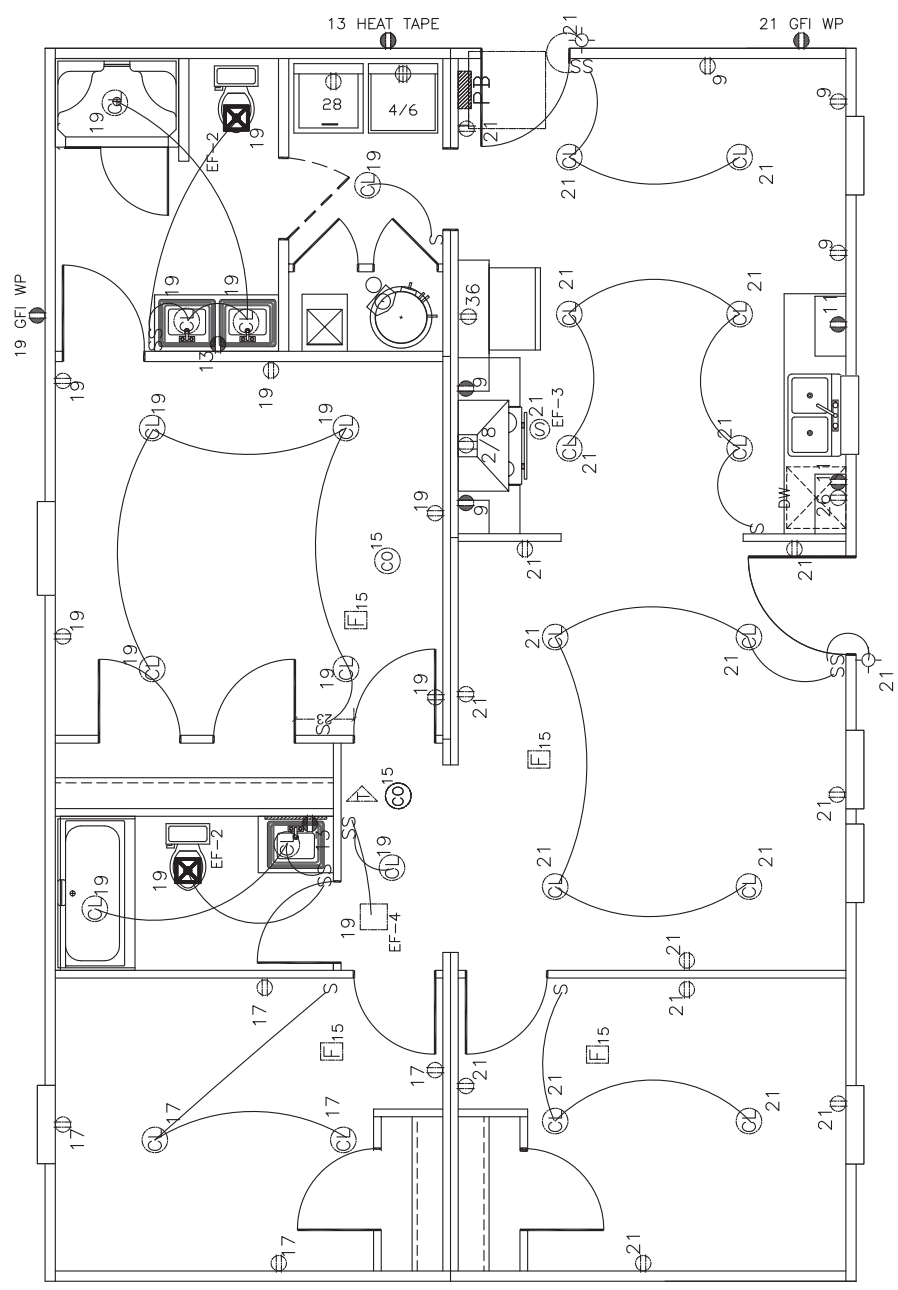


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Federal Manufactured Home Construction And Safety Standards 6

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NOTES:

1. ALL CIRCUITS SHOWN ARE FOR REFERENCE AND MAY BE CHANGED BASED ON OPTIONAL COMPONENTS INSTALLED IN THE HOME.
2. REFER TO DAPIA MANUAL FOR SYMBOL CHART.
3. EITHER LIGHT OR RECEPTACLE MUST CONNECT TO SWITCH.
4. EF-1= 50 CFM EXHAUST FAN REQUIRED FOR THERMAL ZONE III THERMAL ZONES I & II MAY USE FAN OR WINDOW W/1.5 SQ. FT. OPENABLE GLASS.
5. EF-2= 50 CFM EXHAUST FAN REQUIRED THERMAL ZONE I, II, AND III.
6. EF-3= 100 CFM RANGE EXHAUST FAN, SWITCH AT HOOD.
7. EF-4= WHOLE HOUSE VENTILATION REQUIREMENTS PER DAPIA MANUAL.
8. REFER TO DAPIA MANUAL OR THE MFG. INSTALLATION INSTRUCTIONS FOR PROPER WIRE SIZE AND BREAKER SIZE FOR SPECIFIC APPLIANCE AND MODEL BEING INSTALLED.
9. ALL SMOKE ALARMS TO BE LOCATED ON THE CEILING.
10. CARBON MONOXIDE ALARMS ARE ONLY REQUIRED WHEN HOME HAS EITHER FUEL BURNING APPLIANCES, IS GARAGE READY OR IS BASEMENT READY. REFERENCE DAPIA MANUAL FOR ADDITIONAL INFORMATION.
11. DIMENSIONS SHOWN ON PRINT ARE APPROXIMATE AND TO BE USED ONLY AS A GUIDELINE.

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Federal Manufactured
Home Construction 6
And Safety Standards

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Home Construction
And Safety Standards 6

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LEGEND AND SET UP KIT.

VTR - VENT THRU ROOF

(MV) - MECHANICAL VENT

30(3) -3" PIPE

0(2) -2" PIPE

20(1) -1 1/2" PIPE

0 A -3"X2" REDUCER

0 B -3"X1 1/2" REDUCER

1 C -3" ELLT 90°

0 D -3" ELL 45°

2 E -3" LTTY

2 F -3" COUPLING

0 G -3" X 3" X 3" X 2" X 2" ST

0 H -3" X 3" X 2" X 2" ST

0 I -3" X 3" X 2" ST

0 J -3" 3 WAY ELL

0 K -2"X1 1/2" REDUCER

0 L -2" ELLT 90°

0 M -2" ELL 45°

0 N -2" LTTY

0 O -2" COUPLING

0 P -2" X 1 1/2" X 1 1/2" ST

0 Q -2" 3 WAY ELL

0 R -1 1/2" ELLT 90°

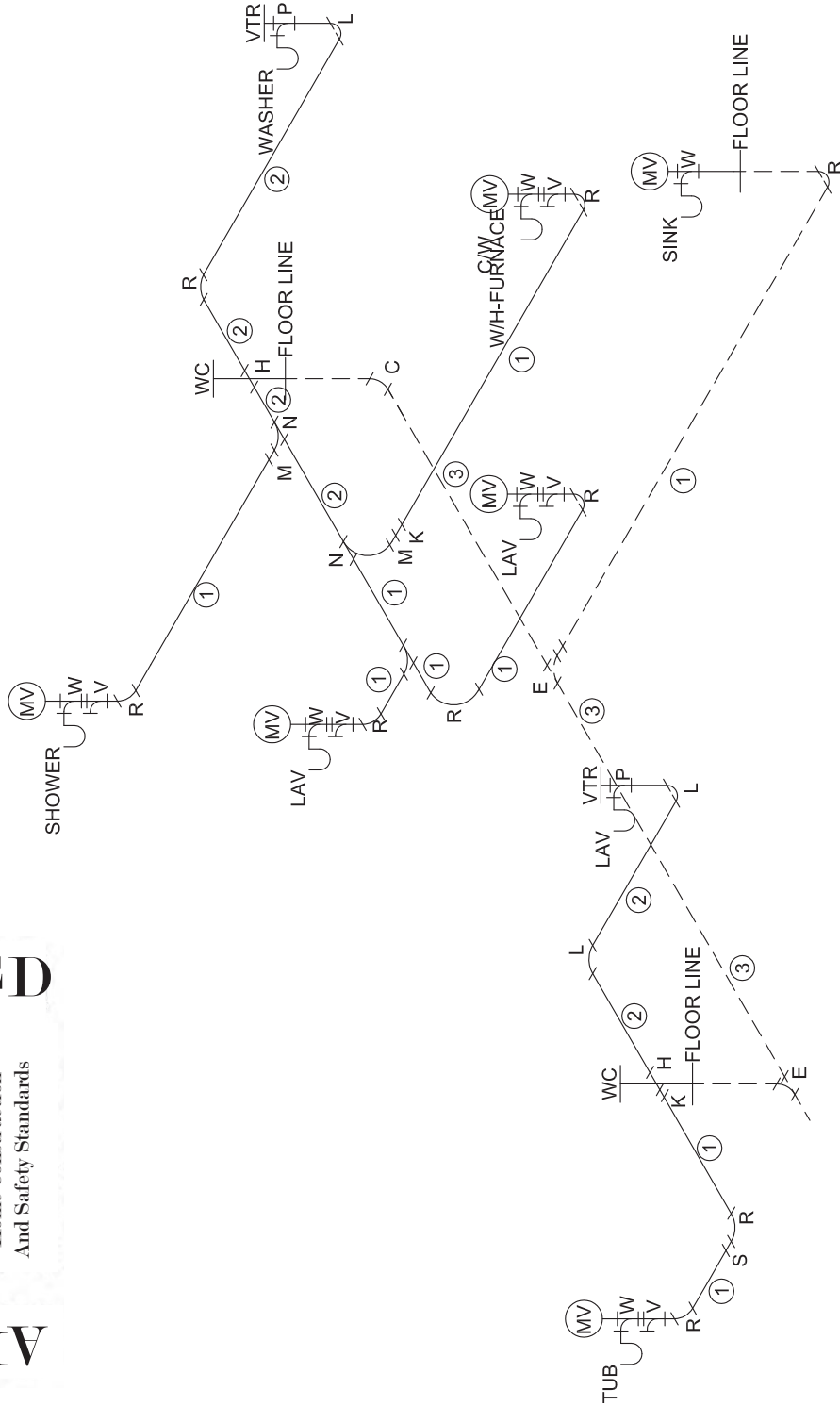
0 S -1 1/2" ELL 45°

0 T -1 1/2" LTTY

1 U -1 1/2" COUPLING

0 V -1 1/2" CLEAN OUT

0 W -1 1/2" SAN TEE



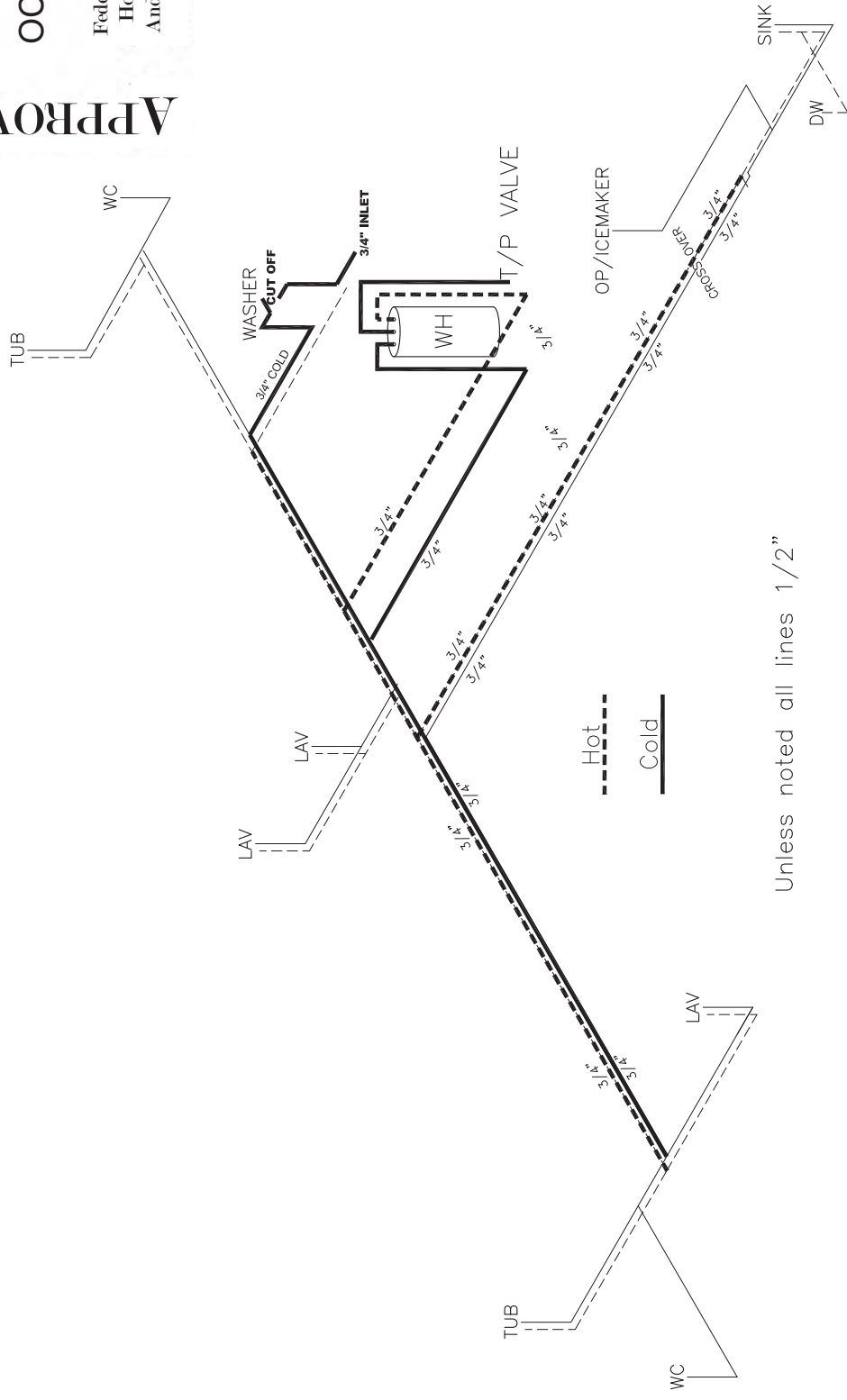
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Federal Manufactured Home Construction And Safety Standards 6

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GILES HOMES	Model #: 46M009-DOE	Drawing #:
405 S. BROAD ST. NEW TAZEWELL, TN 37825	Date: 10/10/23	Scale: N/A
Product Designer: HARVILLE	28X40	
PRESSURE LINES		

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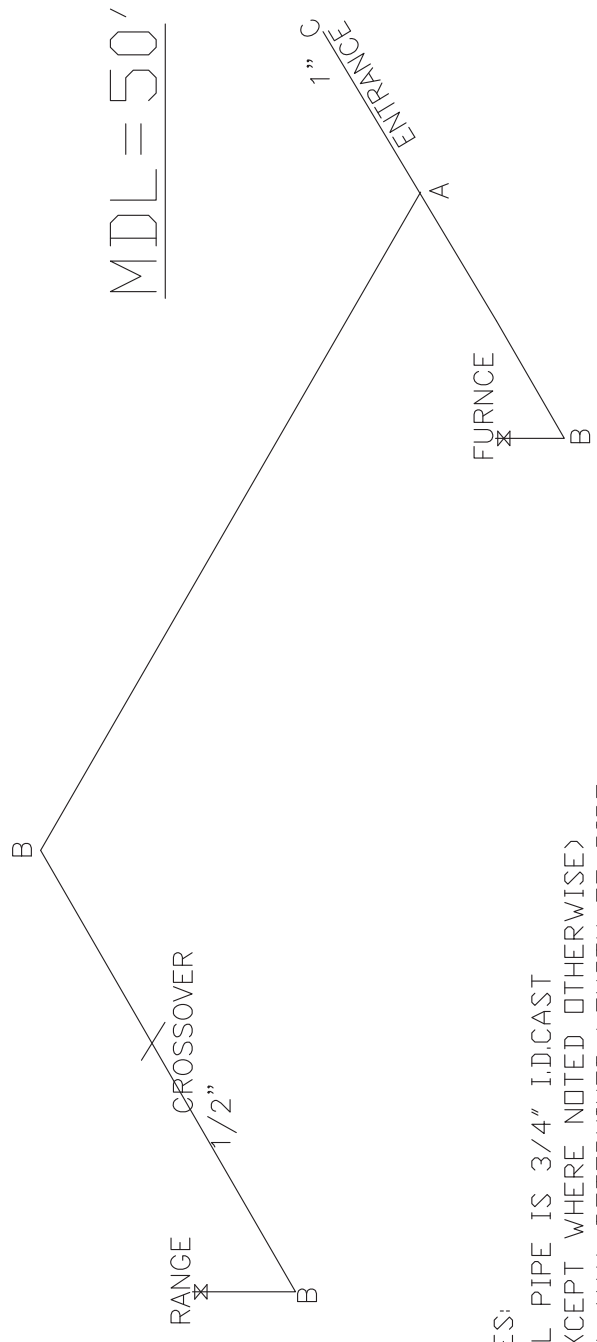


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Federal Manufactured
Home Construction
And Safety Standards 6

LEGEND	APPLIANCE	BTU'S RATINGS	MAX. INPUT
SYM	FURNACE	77,000	BTU'S
A	TEE		
B	90 ELL	56,000	BTU'S
X	VALVE		
C	CAP		



- NOTES:
- 1) ALL PIPE IS 3/4" I.D.CAST
<EXCEPT WHERE NOTED OTHERWISE>
 - 2) MDL=MAX. DETERMINED LENGTH OF PIPE
 - 3) FITTING MAY BE ADDED OR SUBTRACTED
TO TRAVERSE VARIATIONS IN AXLE
QUANTITY, PLACEMENT, AND FRAME TYPE.
 - 4) INLET LOCATION MAY VARY TO STAY WITHIN
MAX. DETERMINED LENGTH

CMH Inc.
SHEARWALL DESIGN - HUD



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OCT 16 2023

Model # 46M009-DOE

Box Width = 158 " Double wide
 Box Length = 40 ft. 95.5" 12" MIN.IBEAM
 No Skylights
 No Porches
 Joist Size = #2 spf 2x6 Lags 9Mx3"

Minimum Joist Spacing 16 "
 No Offset Box
 No Clerestory
 No Origami Dormer
 No Sunken Floor
 No Parapet Roof

Federal Manufactured
Home Construction
And Safety Standards

Version R13.20

Wind Zone 1 Standard Roof		(3/8" sheathing only with 15 gax 1.5" at 5/10" oc. (197 plf) Chords: 2x4 SPF #3 Top Plate spliced w/ 2x4 MCP & 1x6 SPF Rail spliced w/ 12" glue block.				96 inch sidewall
Shearwall	Dist./ Hitch	Length	PLF	# of Joists	Lags	Notes
A	0'	92"	162	2	1/1	
D	40'	92"	162	2	1/1	
Wind Zone 2 Standard Roof		(3/8" sheathing only with 15 gax 1.5" at 5/10" oc. (197 plf) Chords: 2x4 SPF #3 Top Plate spliced w/ 2.5x6 MCP & 2x4 SPF #3 Rail spliced w/ 12" glue block.				96 inch sidewall
Shearwall	Dist./ Hitch	Length	PLF	# of Joists	Lags	Notes
A	0'	60"	162	2	1/1	
B	10'	116"	324	2	3/1	
D	40'	Full	425	2	5/5	
Diaphragm Construction:		(3/8" sheathing only with 15 gax 1.5" at 5/10" oc. (197 plf) Chords: 2x4 SPF #3 Top Plate spliced w/ 2x4 MCP & 1x6 SPF Rail spliced w/ 12" glue block.				
Shearwall	Dist./ Hitch	Length	PLF	# of Joists	Lags	Notes
Diaphragm Construction:		(3/8" sheathing 8d@ 6/12 oc (308) unblocked & (347) blocked Chords: 2x4 SPF #3 Top Plate spliced w/ 3x6 MCP & 2x6 SPF #3 Rail spliced w/ 12" glue block. Block Dist. X=0'				
Shearwall	Dist./ Hitch	Length	PLF	# of Joists	Lags	Notes

Designed by JDN

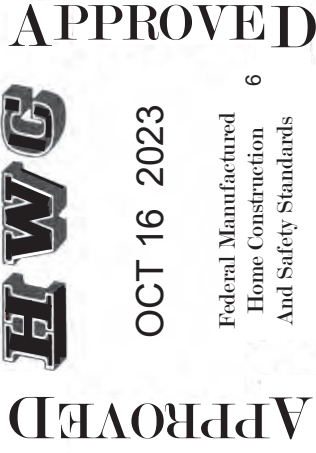
Model # 46M009-DOE

Giles Homes Light and Vent Chart

Room	Floor Area SQFT	Window(s)	Glass Area	% of Floor	Artificial Light	Vent Area	% of Floor	Artificial Vent	Min. Door
Living Room	174	3060 X2	19.8	11.38%		10.4	5.98%		32
Kitchen / DR	193	3060 3040	16.2	8.39%	X	8.5	4.40%	X	36
Primary Bedroom	152	3660	12.2	8.03%	X	6.2	4.08%	X	
Bedroom 2	107	3060	9.9	9.25%		5.2	4.86%		28
Bedroom 3	107	3060	9.9	9.25%		5.2	4.86%		24
Primary Bath	70				X			X	24
Bath 2	45				X			X	24
Utility	33								24

* (X) Artificial Light and Vent has been provided for this room

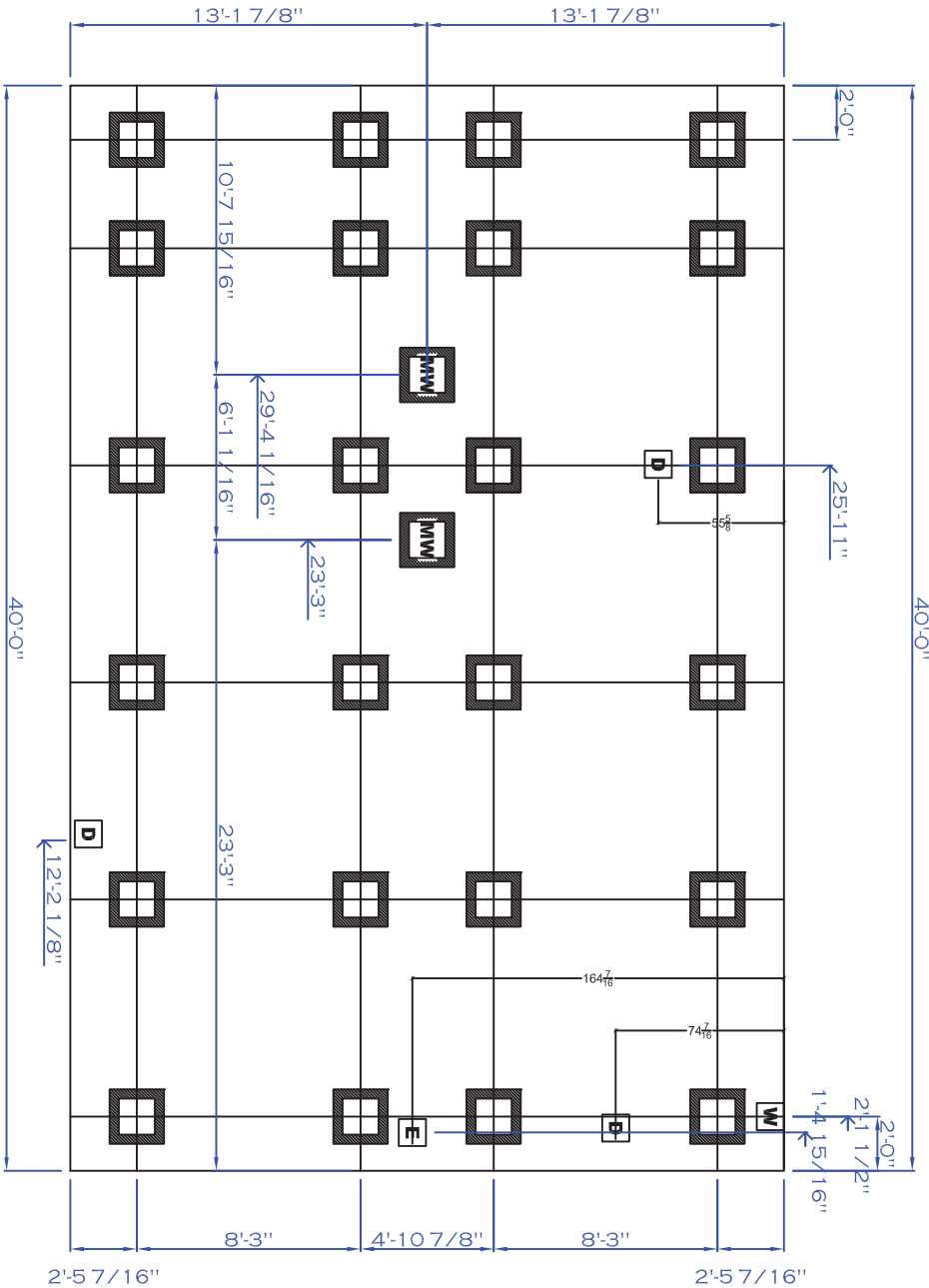
** Note: All window sizes are minimum requirements for rooms. And windows may be added as long as heat loss allows and/or is documented on the floor plan









Data on this submitted
 By: Andy Cupp
 MFG: Giles Industries

REVISION

E.16M009-DOI. 2



*THIS FOOTER DIAGRAM IS FOR STANDARD PRODUCT ONLY
 *FOR PIER SPACING REFER TO SET UP MANUAL

-  MARRIAGE WALL PIER
-  WATER INLET
-  DRAIN
-  ELECTRICAL DROP
-  DOOR PIER
-  REGULAR PIER



Manual S Compliance Report
Entire House
Clayton Homes

Job: 46M009-DOE-FDJ-TZ-I
 Date: Oct 10, 2023
 By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

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Project Information

For: 46M009-DOE-FDJ-TZ-I, GILES

OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

Cooling Equipment

Design Conditions

Outdoor design DB:	91.7°F	Sensible gain:	8354 Btuh	Entering coil DB:	77.6°F
Outdoor design WB:	73.9°F	Latent gain:	2827 Btuh	Entering coil WB:	64.4°F
Indoor design DB:	75.0°F	Total gain:	11181 Btuh		
Indoor RH:	50%	Estimated airflow:	600 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC			
Manufacturer:	Smart Comfort	Model:	R4A5S18*K*WAA*+FEVA0024**+NAVA43601CK	
Actual airflow:	600 cfm			
Sensible capacity:	12600 Btuh	151% of load		
Latent capacity:	5400 Btuh	191% of load		
Total capacity:	18000 Btuh	161% of load	SHR:	70%

Heating Equipment

Design Conditions

Outdoor design DB:	26.4°F	Heat loss:	15607 Btuh	Entering coil DB:	56.3°F
Indoor design DB:	70.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Elec furnace			
Manufacturer:		Model:		
Actual airflow:	292 cfm			
Output capacity:	16000 Btuh	103% of load	Temp. rise:	52 °F

Meets all requirements of ACCA Manual S.



5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

Project Information

For: 46M009-DOE-FDJ-TZ-I, GILES

OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

Design Conditions

Location:

Atlanta Municipal, GA, US
 Elevation: 1027 ft
 Latitude: 34°N

Outdoor:

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

Heating

26
 -
 -
 15.0

Cooling

92
 17 (M)
 74
 7.5

Indoor:

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

Heating

70
 44
 30
 17.0

Cooling

75
 17
 50
 35.3

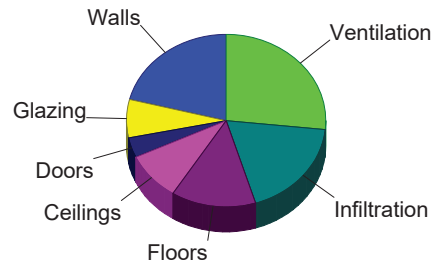
Infiltration:

Method
 Construction quality
 Fireplaces

Simplified
 Average
 0

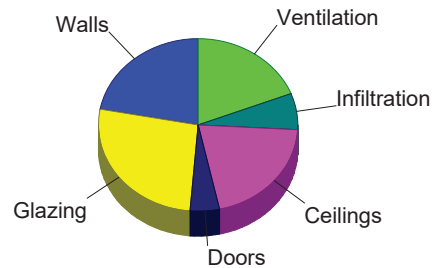
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	3.5	3278	21.0
Glazing	13.1	1123	7.2
Doors	14.0	586	3.8
Ceilings	1.4	1415	9.1
Floors	2.0	2145	13.7
Infiltration	2.7	2902	18.6
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		4159	26.6
Adjustments		0	0
Total		15607	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	2.0	1842	22.0
Glazing	25.9	2226	26.6
Doors	9.5	399	4.8
Ceilings	1.6	1726	20.7
Floors	0	0	0
Infiltration	0.5	568	6.8
Ducts		0	0
Ventilation		1593	19.1
Internal gains		0	0
Blower		0	0
Adjustments		0	0
Total		8354	100.0



Latent Cooling Load = 2827 Btuh
 Overall U-value = 0.062 Btuh/ft²-°F, Window / Floor Area = 8.2 %

Data entries checked.



Component Constructions
Entire House
 Clayton Homes

Job: 46M009-DOE-FDJ-TZ-I
 Date: Oct 10, 2023
 By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

Project Information

For: 46M009-DOE-FDJ-TZ-I, GILES

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OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

Design Conditions

Location:

Atlanta Municipal, GA, US
 Elevation: 1027 ft
 Latitude: 34°N

Outdoor:

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

Heating

26
 -
 -
 15.0

Cooling

92
 17 (M)
 74
 7.5

Indoor:

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

Heating

70
 44
 30
 17.0

Cooling

75
 17
 50
 35.3

Infiltration:

Method
 Construction quality
 Fireplaces

Simplified
 Average
 0

Construction descriptions

Walls

CMH - DW - R-13 Wall - THP502-DOE: Double Wide - R-13 Insulation
 THP502 2x4 Wall-DOE

Or	Area ft²	U-value Btuh/ft²-F	Insul R ft²-F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
n	208	0.082	13.0	3.58	744	2.03	421
e	237	0.082	13.0	3.58	846	2.03	479
s	187	0.082	13.0	3.58	669	2.03	379
w	241	0.082	13.0	3.58	860	2.03	487
all	872	0.082	13.0	3.58	3118	2.03	1766
e	60	0.061	19.0	2.66	160	1.26	75

Partitions

(none)

Windows

Clayton - Thermopane Low-E DOE: Clayton-Thermopane Low-E DOE;
 50% blinds 45°, medium; 50% outdoor insect screen; 6.67 ft head ht

e	28	0.300	0	13.1	360	21.8	599
w	58	0.300	0	13.1	763	21.8	1270
all	86	0.300	0	13.1	1123	21.8	1869

Doors

CMH - Standard Door: CMH - Standard Door - Solid no storm

s	21	0.320	0	14.0	293	9.50	200
w	21	0.320	0	14.0	293	9.50	200
all	42	0.320	0	14.0	586	9.50	399

Ceilings

CMH-DW-158 BOX R38 - THP1244 - DOE: CMH-DW-158 BOX R38-
 THP1244 - DOE

	1047	0.031	38.0	1.35	1415	1.65	1726
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Floors

CMH-DW-158- R22-THP161-DOE: CMH-DW-158-R22-THP161-DOE

	1047	0.045	22.0	2.05	2145	0	0
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Project Information

For: 46M009-DOE-FDJ-TZ-I, GILES

Notes: DUCT CAPACITY 19766

Design Information

Weather: Atlanta Municipal, GA, US

Winter Design Conditions

Outside db	26 °F
Inside db	70 °F
Design TD	44 °F

Summer Design Conditions

Outside db	92 °F
Inside db	75 °F
Design TD	17 °F
Daily range	M
Relative humidity	50 %
Moisture difference	35 gr/lb

Heating Summary

Structure	11448 Btuh
Ducts	0 Btuh
Central vent (90 cfm)	4159 Btuh
Outside air	
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	15607 Btuh

Sensible Cooling Equipment Load Sizing

Structure	6761 Btuh
Ducts	0 Btuh
Central vent (90 cfm)	1593 Btuh
Outside air	
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.97
Equipment sensible load	8078 Btuh

Infiltration

Method	Simplified
Construction quality	Average
Fireplaces	0

Latent Cooling Equipment Load Sizing

Structure	743 Btuh
Ducts	0 Btuh
Central vent (90 cfm)	2084 Btuh
Outside air	
Equipment latent load	2827 Btuh

	Heating	Cooling
Area (ft ²)	1047	1047
Volume (ft ³)	8374	8374
Air changes/hour	0.45	0.23
Equiv. AVF (cfm)	63	32

Equipment Total Load (Sen+Lat)	10905 Btuh
Req. total capacity at 0.70 SHR	1.0 ton

Heating Equipment Summary

Make	
Trade	
Model	
AHRI ref	
Efficiency	100 AFUE
Heating input	4.7 kW
Heating output	16000 Btuh
Temperature rise	52 °F
Actual air flow	292 cfm
Air flow factor	0.026 cfm/Btuh
Static pressure	0.30 in H2O
Space thermostat	

Cooling Equipment Summary

Make	Smart Comfort
Trade	15 SEER2 AC
Cond	R4A5S18*K*WAA*
Coil	FEVA0024**+NAVA43601CK
AHRI ref	0
Efficiency	13.0 EER2, 16 SEER2
Sensible cooling	12600 Btuh
Latent cooling	5400 Btuh
Total cooling	18000 Btuh
Actual air flow	600 cfm
Air flow factor	0.089 cfm/Btuh
Static pressure	0.30 in H2O
Load sensible heat ratio	0.75

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



Duct System Summary
Entire House
Clayton Homes

Job: 46M009-DOE-FDJ-TZ-I
 Date: Oct 10, 2023
 By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

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Project Information

For: 46M009-DOE-FDJ-TZ-I, GILES

OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

	Heating	Cooling
External static pressure	0.30 in H2O	0.30 in H2O
Pressure losses	0 in H2O	0 in H2O
Available static pressure	0.30 in H2O	0.30 in H2O
Supply / return available pressure	0.150 / 0.150 in H2O	0.150 / 0.150 in H2O
Lowest friction rate	0.115 in/100ft	0.115 in/100ft
Actual air flow	292 cfm	600 cfm
Total effective length (TEL)	260 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
BATH	c 252	17	22	0.571	5.0	0x0	VIFx	17.5	35.0	st3
BEDROOM 2	c 985	46	87	0.531	5.0	0x0	VIFx	21.5	35.0	st3
BEDROOM 3	c 984	43	87	0.239	6.0	0x0	VIFx	25.4	100.0	st6
KITCHEN	c 1603	65	142	0.115	8.0	0x0	VIFx	44.9	215.0	st7
LIVING ROOM	c 1417	45	126	0.245	7.0	0x0	VIFx	22.4	100.0	st6
P-BATH	c 646	42	57	0.273	5.0	0x0	VIFx	10.0	100.0	st4
PRIMARY BEDROOM	c 874	34	78	0.645	5.0	0x0	VIFx	11.5	35.0	st3

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st6	Peak AVF	88	213	0.239	438	6.3	5 x 14	ShtMetl	st2
st3	Peak AVF	98	187	0.531	385	4.0	5 x 14	ShtMetl	
st4	Peak AVF	42	57	0.273	118	6.3	5 x 14	ShtMetl	st1
st1	Peak AVF	42	57	0.273	118	4.4	5 x 14	ShtMetl	
st7	Peak AVF	65	142	0.115	293	6.3	5 x 14	ShtMetl	st2
st2	Peak AVF	152	355	0.115	853	7.3	5 x 12	VinIFix	

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
rb1	0x0	292	600	0	0	0	0	0x 0		VIFx	





Manual S Compliance Report
Entire House
Clayton Homes

Job: 46M009-DOE-FDJ-TZ-II
 Date: Oct 10, 2023
 By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000



Project Information

For: 46M009-DOE-FDJ-TZ-II, GILES

OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

Cooling Equipment

Design Conditions

Outdoor design DB:	92.6°F	Sensible gain:	8497 Btuh	Entering coil DB:	77.7°F
Outdoor design WB:	74.3°F	Latent gain:	2902 Btuh	Entering coil WB:	64.4°F
Indoor design DB:	75.0°F	Total gain:	11399 Btuh		
Indoor RH:	50%	Estimated airflow:	600 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC			
Manufacturer:	Smart Comfort	Model:	R4A5S18*K*WAA*+FEVA0024**+NAVA43601CK	
Actual airflow:	600 cfm			
Sensible capacity:	12600 Btuh	148% of load		
Latent capacity:	5400 Btuh	186% of load		
Total capacity:	18000 Btuh	158% of load	SHR:	70%

Heating Equipment

Design Conditions

Outdoor design DB:	15.0°F	Heat loss:	19184 Btuh	Entering coil DB:	52.7°F
Indoor design DB:	70.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Elec furnace			
Manufacturer:		Model:		
Actual airflow:	292 cfm			
Output capacity:	16000 Btuh	83% of load	Temp. rise:	52 °F

Meets all requirements of ACCA Manual S.





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5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

Project Information

For: 46M009-DOE-FDJ-TZ-II, GILES

OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

Design Conditions

Location:

Knoxville McGhee Tyson AP, TN, US
 Elevation: 981 ft
 Latitude: 36°N

Outdoor:

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

Heating

15
 -
 -
 15.0

Cooling

93
 19 (M)
 74
 7.5

Indoor:

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

Heating

70
 55
 30
 24.1

Cooling

75
 18
 50
 36.2

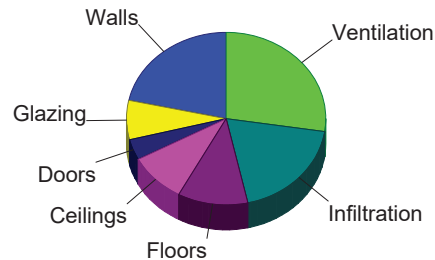
Infiltration:

Method
 Construction quality
 Fireplaces

Simplified
 Average
 0

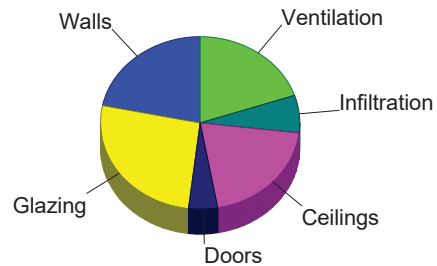
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	4.4	4135	21.6
Glazing	16.5	1416	7.4
Doors	17.6	739	3.9
Ceilings	1.7	1785	9.3
Floors	2.1	2188	11.4
Infiltration	3.5	3667	19.1
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		5255	27.4
Adjustments		0	0
Total		19184	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	2.0	1846	21.7
Glazing	26.1	2242	26.4
Doors	9.5	400	4.7
Ceilings	1.7	1728	20.3
Floors	0	0	0
Infiltration	0.6	600	7.1
Ducts		0	0
Ventilation		1682	19.8
Internal gains		0	0
Blower		0	0
Adjustments		0	0
Total		8497	100.0



Latent Cooling Load = 2902 Btuh
 Overall U-value = 0.059 Btuh/ft²-°F, Window / Floor Area = 8.2 %

Data entries checked.



Component Constructions
Entire House
Clayton Homes

Job: 46M009-DOE-FDJ-TZ-II
Date: Oct 10, 2023
By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

Project Information

For: 46M009-DOE-FDJ-TZ-II, GILES

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OCT 16 2023

Federal Manufactured
Home Construction 6
And Safety Standards

Design Conditions

Location:

Knoxville McGhee Tyson AP, TN, US
Elevation: 981 ft
Latitude: 36°N

Outdoor:

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

Heating

15
-
-
15.0

Cooling

93
19 (M)
74
7.5

Indoor:

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

Heating

70
55
30
24.1

Cooling

75
18
50
36.2

Infiltration:

Method
Construction quality
Fireplaces

Simplified
Average
0

Construction descriptions

Walls

CMH - DW - R-13 Wall - THP502-DOE: Double Wide - R-13 Insulation
THP502 2x4 Wall-DOE

Or	Area ft²	U-value Btuh/ft²-F	Insul R ft²-F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
n	208	0.082	13.0	4.51	938	2.03	422
e	237	0.082	13.0	4.51	1067	2.03	480
s	187	0.082	13.0	4.51	843	2.03	380
w	241	0.082	13.0	4.51	1085	2.03	488
all	872	0.082	13.0	4.51	3933	2.03	1770
e	60	0.061	19.0	3.36	201	1.26	76

Partitions

(none)

Windows

Clayton - Thermopane Low-E DOE: Clayton-Thermopane Low-E DOE;
50% blinds 45°, medium; 50% outdoor insect screen; 6.67 ft head ht

e	28	0.300	0	16.5	454	21.9	603
w	58	0.300	0	16.5	963	21.9	1280
all	86	0.300	0	16.5	1416	21.9	1883

Doors

CMH - Standard Door: CMH - Standard Door - Solid no storm

s	21	0.320	0	17.6	370	9.52	200
w	21	0.320	0	17.6	370	9.52	200
all	42	0.320	0	17.6	739	9.52	400

Ceilings

CMH-DW-158 BOX R38 - THP1244 - DOE: CMH-DW-158 BOX R38-
THP1244 - DOE

1047	0.031	38.0	1.70	1785	1.65	1728
------	-------	------	------	------	------	------

Floors

CMH-DW-158- R33-THP456-DOE: CMH-DW-158-R33-THP456-DOE

1047	0.037	33.0	2.09	2188	0	0
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Project Information

For: 46M009-DOE-FDJ-TZ-II, GILES

Notes: DUCT CAPACITY 19766

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OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

Design Information

Weather: Knoxville McGhee Tyson AP, TN, US

Winter Design Conditions

Outside db 15 °F
 Inside db 70 °F
 Design TD 55 °F

Summer Design Conditions

Outside db 93 °F
 Inside db 75 °F
 Design TD 18 °F
 Daily range M
 Relative humidity 50 %
 Moisture difference 36 gr/lb

Heating Summary

Structure 13930 Btuh
 Ducts 0 Btuh
 Central vent (90 cfm) 5255 Btuh
 Outside air
 Humidification 0 Btuh
 Piping 0 Btuh
 Equipment load 19184 Btuh

Sensible Cooling Equipment Load Sizing

Structure 6815 Btuh
 Ducts 0 Btuh
 Central vent (90 cfm) 1682 Btuh
 Outside air
 Blower 0 Btuh
 Use manufacturer's data n
 Rate/swing multiplier 0.98
 Equipment sensible load 8293 Btuh

Infiltration

Method Simplified
 Construction quality Average
 Fireplaces 0

Latent Cooling Equipment Load Sizing

Structure 763 Btuh
 Ducts 0 Btuh
 Central vent (90 cfm) 2139 Btuh
 Outside air
 Equipment latent load 2902 Btuh

	Heating	Cooling
Area (ft ²)	1047	1047
Volume (ft ³)	8374	8374
Air changes/hour	0.45	0.23
Equiv. AVF (cfm)	63	32

Equipment Total Load (Sen+Lat) 11195 Btuh
 Req. total capacity at 0.70 SHR 1.0 ton

Heating Equipment Summary

Make
 Trade
 Model
 AHRI ref

Efficiency 100 AFUE
 Heating input 4.7 kW
 Heating output 16000 Btuh
 Temperature rise 52 °F
 Actual air flow 292 cfm
 Air flow factor 0.021 cfm/Btuh
 Static pressure 0.30 in H2O
 Space thermostat

Cooling Equipment Summary

Make Smart Comfort
 Trade 15 SEER2 AC
 Cond R4A5S18*K*WAA*
 Coil FEVA0024**+NAVA43601CK
 AHRI ref 0
 Efficiency 13.0 EER2, 16 SEER2

Sensible cooling 12600 Btuh
 Latent cooling 5400 Btuh
 Total cooling 18000 Btuh
 Actual air flow 600 cfm
 Air flow factor 0.088 cfm/Btuh
 Static pressure 0.30 in H2O
 Load sensible heat ratio 0.75

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



Duct System Summary
Entire House
Clayton Homes

Job: 46M009-DOE-FDJ-TZ-II
 Date: Oct 10, 2023
 By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

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Project Information

For: 46M009-DOE-FDJ-TZ-II, GILES

OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

	Heating	Cooling
External static pressure	0.30 in H2O	0.30 in H2O
Pressure losses	0 in H2O	0 in H2O
Available static pressure	0.30 in H2O	0.30 in H2O
Supply / return available pressure	0.150 / 0.150 in H2O	0.150 / 0.150 in H2O
Lowest friction rate	0.115 in/100ft	0.115 in/100ft
Actual air flow	292 cfm	600 cfm
Total effective length (TEL)	260 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
BATH	c 254	17	22	0.571	5.0	0x0	VIFx	17.5	35.0	st3
BEDROOM 2	c 992	46	87	0.531	5.0	0x0	VIFx	21.5	35.0	st3
BEDROOM 3	c 994	43	88	0.239	6.0	0x0	VIFx	25.4	100.0	st6
KITCHEN	c 1617	65	142	0.115	8.0	0x0	VIFx	44.9	215.0	st7
LIVING ROOM	c 1427	45	126	0.245	7.0	0x0	VIFx	22.4	100.0	st6
P-BATH	c 654	42	58	0.273	5.0	0x0	VIFx	10.0	100.0	st4
PRIMARY BEDROOM	c 878	34	77	0.645	5.0	0x0	VIFx	11.5	35.0	st3

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st6	Peak AVF	88	213	0.239	438	6.3	5 x 14	ShtMetl	st2
st3	Peak AVF	97	187	0.531	385	4.0	5 x 14	ShtMetl	
st4	Peak AVF	42	58	0.273	118	6.3	5 x 14	ShtMetl	st1
st1	Peak AVF	42	58	0.273	118	4.4	5 x 14	ShtMetl	
st7	Peak AVF	65	142	0.115	293	6.3	5 x 14	ShtMetl	st2
st2	Peak AVF	153	355	0.115	853	7.3	5 x 12	VinIFix	

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
rb1	0x0	292	600	0	0	0	0	0x 0		VIFx	

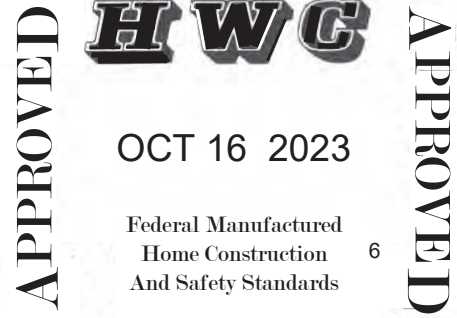




Manual S Compliance Report
Entire House
Clayton Homes

Job: 46M009-DOE-FDJ-TZ-III
 Date: Oct 10, 2023
 By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000



Project Information

For: 46M009-DOE-FDJ-TZ-III, GILES

OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

Cooling Equipment

Design Conditions

Outdoor design DB:	87.6°F	Sensible gain:	7040 Btuh	Entering coil DB:	76.9°F
Outdoor design WB:	71.2°F	Latent gain:	2157 Btuh	Entering coil WB:	63.7°F
Indoor design DB:	75.0°F	Total gain:	9196 Btuh		
Indoor RH:	50%	Estimated airflow:	600 cfm		

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Split AC			
Manufacturer:	Smart Comfort	Model:	R4A5S18*K*WAA*+FEVA0024**+NAVA43601CK	
Actual airflow:	600 cfm			
Sensible capacity:	12600 Btuh		179% of load	
Latent capacity:	5400 Btuh		250% of load	
Total capacity:	18000 Btuh		196% of load	SHR: 70%

Heating Equipment

Design Conditions

Outdoor design DB:	15.8°F	Heat loss:	18203 Btuh	Entering coil DB:	53.0°F
Indoor design DB:	70.0°F				

Manufacturer's Performance Data at Actual Design Conditions

Equipment type:	Elec furnace			
Manufacturer:		Model:		
Actual airflow:	292 cfm			
Output capacity:	16000 Btuh		88% of load	Temp. rise: 54 °F

Meets all requirements of ACCA Manual S.



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Project Information

For: 46M009-DOE-FDJ-TZ-III, GILES

OCT 16 2023

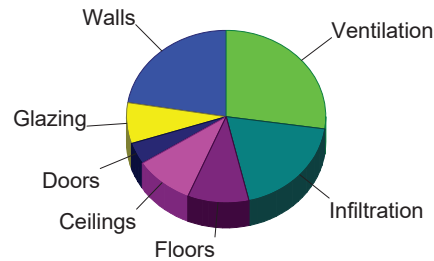
Federal Manufactured
Home Construction 6
And Safety Standards

Design Conditions

Location:				Indoor:	Heating	Cooling
VA-SG22				Indoor temperature (°F)	70	75
Elevation: 2133 ft				Design TD (°F)	54	13
Latitude: 37°N				Relative humidity (%)	30	50
				Moisture difference (gr/lb)	24.8	28.1
Outdoor:		Heating	Cooling	Infiltration:		
Dry bulb (°F)		16	88	Method	Simplified	
Daily range (°F)		-	20 (M)	Construction quality	Average	
Wet bulb (°F)		-	71	Fireplaces	0	
Wind speed (mph)		15.0	7.5			

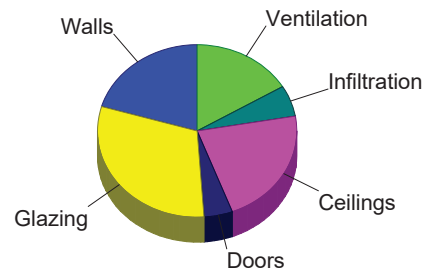
Heating

Component	Btuh/ft²	Btuh	% of load
Walls	4.4	4075	22.4
Glazing	16.3	1396	7.7
Doors	17.3	728	4.0
Ceilings	1.7	1759	9.7
Floors	1.7	1815	10.0
Infiltration	3.3	3465	19.0
Ducts		0	0
Piping		0	0
Humidification		0	0
Ventilation		4965	27.3
Adjustments		0	0
Total		18203	100.0



Cooling

Component	Btuh/ft²	Btuh	% of load
Walls	1.5	1436	20.4
Glazing	25.2	2160	30.7
Doors	7.8	327	4.6
Ceilings	1.5	1551	22.0
Floors	0	0	0
Infiltration	0.4	412	5.8
Ducts		0	0
Ventilation		1154	16.4
Internal gains		0	0
Blower		0	0
Adjustments		0	0
Total		7040	100.0



Latent Cooling Load = 2157 Btuh
Overall U-value = 0.057 Btuh/ft²·°F, Window / Floor Area = 8.2 %

Data entries checked.



Component Constructions
Entire House
Clayton Homes

Job: 46M009-DOE-FDJ-TZ-III
Date: Oct 10, 2023
By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

Project Information

For: 46M009-DOE-FDJ-TZ-III, GILES

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OCT 16 2023

Federal Manufactured
Home Construction 6
And Safety Standards

Design Conditions

Location:

VA-SG22
Elevation: 2133 ft
Latitude: 37°N

Outdoor:

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

Heating

16
-
-
15.0

Cooling

88
20 (M)
71
7.5

Indoor:

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

Infiltration:

Method
Construction quality
Fireplaces

Heating

70
54
30
24.8

Cooling

75
13
50
28.1

Simplified
Average
0

Construction descriptions

Construction descriptions	Or	Area ft²	U-value Btuh/ft²·°F	Insul R ft²·°F/Btuh	Htg HTM Btuh/ft²	Loss Btuh	Clg HTM Btuh/ft²	Gain Btuh
Walls								
CMH - DW - R-13 Wall - THP502-DOE: Double Wide - R-13 Insulation	n	208	0.082	13.0	4.44	924	1.58	329
THP502 2x4 Wall-DOE	e	237	0.082	13.0	4.44	1051	1.58	374
	s	187	0.082	13.0	4.44	831	1.58	296
	w	241	0.082	13.0	4.44	1070	1.58	381
	all	872	0.082	13.0	4.44	3876	1.58	1380
CMH - DW - R-19 Wall - M-TH-23: Double Wide - R-19 Insulation M-TH-23	e	60	0.061	19.0	3.31	198	0.93	56
2x6 Wall								

Partitions

(none)

Windows

Clayton - Thermopane Low-E DOE: Clayton-Thermopane Low-E DOE;	e	28	0.300	0	16.3	447	20.5	565
50% blinds 45°, medium; 50% outdoor insect screen; 6.67 ft head ht	w	58	0.300	0	16.3	949	20.5	1198
	all	86	0.300	0	16.3	1396	20.5	1763

Doors

CMH - Standard Door: CMH - Standard Door - Solid no storm	s	21	0.320	0	17.3	364	7.78	163
	w	21	0.320	0	17.3	364	7.78	163
	all	42	0.320	0	17.3	728	7.78	327

Ceilings

CMH-DW-158 BOX R38 - THP1244 - DOE: CMH-DW-158 BOX R38-THP1244 - DOE		1047	0.031	38.0	1.68	1759	1.48	1551
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Floors

CMH-DW-158- R33-THP221-DOE: CMH-DW-158-R33-THP221-DOE		1047	0.032	33.0	1.73	1815	0	0
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5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

Project Information

For: 46M009-DOE-FDJ-TZ-III, GILES

Notes: DUCT CAPACITY 19766

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OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

Design Information

Weather: VA-SG22

Winter Design Conditions

Outside db 16 °F
 Inside db 70 °F
 Design TD 54 °F

Summer Design Conditions

Outside db 88 °F
 Inside db 75 °F
 Design TD 13 °F
 Daily range M
 Relative humidity 50 %
 Moisture difference 28 gr/lb

Heating Summary

Structure 13238 Btuh
 Ducts 0 Btuh
 Central vent (90 cfm) 4965 Btuh
 Outside air
 Humidification 0 Btuh
 Piping 0 Btuh
 Equipment load 18203 Btuh

Sensible Cooling Equipment Load Sizing

Structure 5885 Btuh
 Ducts 0 Btuh
 Central vent (90 cfm) 1154 Btuh
 Outside air
 Blower 0 Btuh
 Use manufacturer's data n
 Rate/swing multiplier 0.93
 Equipment sensible load 6519 Btuh

Infiltration

Method Simplified
 Construction quality Average
 Fireplaces 0

Latent Cooling Equipment Load Sizing

Structure 567 Btuh
 Ducts 0 Btuh
 Central vent (90 cfm) 1590 Btuh
 Outside air
 Equipment latent load 2157 Btuh

	Heating	Cooling
Area (ft ²)	1047	1047
Volume (ft ³)	8374	8374
Air changes/hour	0.45	0.23
Equiv. AVF (cfm)	63	32

Equipment Total Load (Sen+Lat) 8675 Btuh
 Req. total capacity at 0.70 SHR 0.8 ton

Heating Equipment Summary

Make
 Trade
 Model
 AHRI ref

Efficiency 100 AFUE
 Heating input 4.7 kW
 Heating output 16000 Btuh
 Temperature rise 54 °F
 Actual air flow 292 cfm
 Air flow factor 0.022 cfm/Btuh
 Static pressure 0.30 in H2O
 Space thermostat

Cooling Equipment Summary

Make Smart Comfort
 Trade 15 SEER2 AC
 Cond R4A5S18*K*WAA*
 Coil FEVA0024**+NAVA43601CK
 AHRI ref 0
 Efficiency 13.0 EER2, 16 SEER2
 Sensible cooling 12600 Btuh
 Latent cooling 5400 Btuh
 Total cooling 18000 Btuh
 Actual air flow 600 cfm
 Air flow factor 0.102 cfm/Btuh
 Static pressure 0.30 in H2O
 Load sensible heat ratio 0.77

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



Duct System Summary
Entire House
Clayton Homes

Job: 46M009-DOE-FDJ-TZ-III
 Date: Oct 10, 2023
 By:

5000 Clayton Road, Maryville, TN 37804 Phone: 865-380-3000

APPROVED



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Project Information

For: 46M009-DOE-FDJ-TZ-III, GILES

OCT 16 2023

Federal Manufactured
 Home Construction 6
 And Safety Standards

	Heating	Cooling
External static pressure	0.30 in H2O	0.30 in H2O
Pressure losses	0 in H2O	0 in H2O
Available static pressure	0.30 in H2O	0.30 in H2O
Supply / return available pressure	0.150 / 0.150 in H2O	0.150 / 0.150 in H2O
Lowest friction rate	0.115 in/100ft	0.115 in/100ft
Actual air flow	292 cfm	600 cfm
Total effective length (TEL)	260 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
BATH	c 208	16	21	0.571	5.0	0x0	VIFx	17.5	35.0	st3
BEDROOM 2	c 843	47	86	0.531	5.0	0x0	VIFx	21.5	35.0	st3
BEDROOM 3	c 855	43	87	0.239	6.0	0x0	VIFx	25.4	100.0	st6
KITCHEN	c 1403	65	143	0.115	8.0	0x0	VIFx	44.9	215.0	st7
LIVING ROOM	c 1283	45	131	0.245	7.0	0x0	VIFx	22.4	100.0	st6
P-BATH	c 519	42	53	0.273	5.0	0x0	VIFx	10.0	100.0	st4
PRIMARY BEDROOM	c 776	34	79	0.645	5.0	0x0	VIFx	11.5	35.0	st3

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st6	Peak AVF	88	218	0.239	448	6.3	5 x 14	ShtMetl	st2
st3	Peak AVF	97	186	0.531	383	4.0	5 x 14	ShtMetl	
st4	Peak AVF	42	53	0.273	109	6.3	5 x 14	ShtMetl	st1
st1	Peak AVF	42	53	0.273	109	4.4	5 x 14	ShtMetl	
st7	Peak AVF	65	143	0.115	294	6.3	5 x 14	ShtMetl	st2
st2	Peak AVF	153	361	0.115	866	7.3	5 x 12	VinIFix	

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
rb1	0x0	292	600	0	0	0	0	0x 0		VIFx	



CLAYTON HOME BUILDING GROUP

46M009-DOE-HL-TZ-I

Homestead

Model Number	46M009	Drawing Number	46FND28402AH	M46009 - DOE - TZ1
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BOX SIZE: 26.33 ft. x 40 ft.

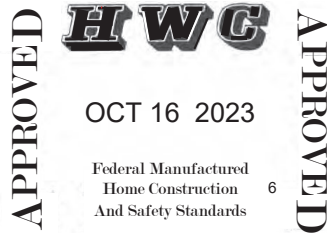
AVG. SIDEWALL HEIGHT = 8 FEET

PERCENTAGE OF CEILING THAT IS VAULTED = 0%

12 INCH DIAMETER XOVER DUCT AREA = 78.5 SQ.FT. MAX. WITH R-8 INSULATION

IN-FLOOR DUCT SYSTEM

	UNHEATED FLOOR	WALL	FLAT ROOF
INSULATION VALUES	R-22 FW	R-13	R-38
DAPIA PAGE	THP-161	THP-502	THP-1244
U VALUE (BTUH/SQ.FT.-F)	0.045	0.0817	0.0306



Overhead Duct	
Diameter	Length
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
14	0
Exterior Supply	Length
14	0
16	0
Exterior Return	Length
14	0
16	0

	Area	U Value	UA
Doors:			
Front	22.00	0.300	6.60
Rear	22.00	0.300	6.60
Other Door	0.00	0.280	0.00
Other Door	0.00	0.330	0.00
OSB	0.00	0.000	0.00
Skylights	0.00	0.330	0.00
Standard	88.00	0.300	26.40
Option	0.00	0.300	0.00
Net:			
Floor	1053.33	0.045	46.87
Wall	929.33	0.082	75.93
Ceiling	1053.33	0.0306	32.23
Th. Zone 1:			
Ext. Duct	78.50	0.242	18.98
Th. Zone 2:			
Ext. Duct	78.50	0.223	17.48
Th. Zone 3:			
Ext. Duct	78.50	0.206	16.14
Overhead TZ 1:			
Supply	0.00	0.000	0.00
Overhead TZ 2:			
Supply	0.00	0.000	0.00
Overhead TZ 3:			
Supply	0.00	0.00	0.00

Energy Star v3 & ZERH Max Glass (sq ft)	
Th. Zone 1	156.4
Th. Zone 2	59.2
Th. Zone 3	0.0

	Outdoor Design Temp (F)	UA	Uo	Heatloss BTUH/F
Thermal Zone 1	11	213.62	0.066	306.50
Thermal Zone 2	0	212.11	0.065	305.00
Thermal Zone 3	-14	210.77	0.065	303.60

Design Temperatures

Furnace Heating Temp (F)	Economy Outdoor Temp (F)	
-41	-8	10kW
-64	-24	12kW
-97	-47	15kW
-61	-21	40k Gas
-126	-67	60k Gas
-191	-113	80k Gas

Thermal Zone	U-Value	Thermal Zone	U-Value	Thermal Zone	U-Value
Energy Star Version 2					
1-EHP-S	0.080	2-EHP-S	0.080	3-EHP-S	0.079
1-GAS-S	0.080	2-GAS-S	0.080	3-GAS-S	0.071
1-ENV-S	0.076	2-ENV-S	0.067	3-ENV-S	0.059
1-EHP-M	0.074	2-EHP-M	0.074	3-EHP-M	0.074
1-GAS-M	0.074	2-GAS-M	0.074	3-GAS-M	0.065
1-ENV-M	0.071	2-ENV-M	0.064	3-ENV-M	0.056

Energy Star Version 3 & ZERH					
1 Single	0.076	2 Single	0.065	3 Single	0.057
1 Double	0.070	2 Double	0.063	3 Double	0.054

CLAYTON HOME BUILDING GROUP

Homestead

Model Number	46M009	Drawing Number	46FND28402AH	M46009 - DOE - T22
---------------------	---------------	-----------------------	---------------------	---------------------------

BOX SIZE: 26.33 ft. x 40 ft.

AVG. SIDEWALL HEIGHT = 8 FEET

PERCENTAGE OF CEILING THAT IS VAULTED = 0%

12 INCH DIAMETER XOVER DUCT AREA = 78.5 SQ.FT. MAX. WITH R-8 INSULATION

IN-FLOOR DUCT SYSTEM

	UNHEATED FLOOR	WALL	FLAT ROOF
INSULATION VALUES	R-22 OR / R-33 BIB	R-13	R-38
DAPIA PAGE	THP-456	THP-502	THP-1244
U VALUE (BTUH/SQ.FT.-F)	0.037	0.0817	0.0306



Overhead Duct	
Diameter	Length
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
14	0
Exterior Supply	Length
14	0
16	0
Exterior Return	Length
14	0
16	0

	Area	U Value	UA
Doors:			
Front	22.00	0.300	6.60
Rear	22.00	0.300	6.60
Other Door	0.00	0.280	0.00
Other Door	0.00	0.330	0.00
OSB	0.00	0.000	0.00
Skylights	0.00	0.330	0.00
Window Glass Area:			
Standard	88.00	0.300	26.40
Option	0.00	0.300	0.00
Net:			
Floor	1053.33	0.037	38.66
Wall	929.33	0.082	75.93
Ceiling	1053.33	0.0306	32.23
Th. Zone 1:			
Ext. Duct	78.50	0.242	18.98
Th. Zone 2:			
Ext. Duct	78.50	0.223	17.48
Th. Zone 3:			
Ext. Duct	78.50	0.206	16.14
Overhead TZ 1:			
Supply	0.00	0.000	0.00
Overhead TZ 2:			
Supply	0.00	0.000	0.00
Overhead TZ 3:			
Supply	0.00	0.00	0.00

Energy Star v3 & ZERH Max Glass (sq ft)	
Th. Zone 1	194.1
Th. Zone 2	96.8
Th. Zone 3	0.0

	Outdoor Design Temp (F)	UA	Uo	Heatloss BTUH/F
Thermal Zone 1	11	205.40	0.063	298.30
Thermal Zone 2	0	203.90	0.063	296.80
Thermal Zone 3	-14	202.55	0.062	295.40

Design Temperatures

Furnace Heating Temp (F)	Economy Outdoor Temp (F)	
-44	-10	10kW
-67	-26	12kW
-102	-50	15kW
-64	-24	40k Gas
-131	-71	60k Gas
-198	-118	80k Gas

Thermal Zone	U-Value	Thermal Zone	U-Value	Thermal Zone	U-Value
Energy Star Version 2					
1-EHP-S	0.080	2-EHP-S	0.080	3-EHP-S	0.079
1-GAS-S	0.080	2-GAS-S	0.080	3-GAS-S	0.071
1-ENV-S	0.076	2-ENV-S	0.067	3-ENV-S	0.059
1-EHP-M	0.074	2-EHP-M	0.074	3-EHP-M	0.074
1-GAS-M	0.074	2-GAS-M	0.074	3-GAS-M	0.065
1-ENV-M	0.071	2-ENV-M	0.064	3-ENV-M	0.056

Energy Star Version 3 & ZERH					
1 Single	0.076	2 Single	0.065	3 Single	0.057
1 Double	0.070	2 Double	0.063	3 Double	0.054

CLAYTON HOME BUILDING GROUP

Homestead

Model Number	46M009	Drawing Number	46FND28402AH	M46009 - DOE - TZ3
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BOX SIZE: 26.33 ft. x 40 ft.

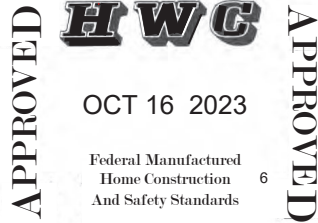
AVG. SIDEWALL HEIGHT = 8 FEET

PERCENTAGE OF CEILING THAT IS VAULTED = 0%

12 INCH DIAMETER XOVER DUCT AREA = 78.5 SQ.FT. MAX. WITH R-8 INSULATION

IN-FLOOR DUCT SYSTEM

	UNHEATED FLOOR	WALL	FLAT ROOF
INSULATION VALUES	R-33 FW	R-21	R-38
DAPIA PAGE	THP-221	THP-510	THP-1244
U VALUE (BTUH/SQ.FT.-F)	0.032	0.0546	0.0306



Overhead Duct	
Diameter	Length
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
14	0
Exterior Supply	Length
14	0
16	0
Exterior Return	Length
14	0
16	0

	Area	U Value	UA
Doors:			
Front	22.00	0.300	6.60
Rear	22.00	0.300	6.60
Other Door	0.00	0.280	0.00
Other Door	0.00	0.330	0.00
OSB	0.00	0.000	0.00
Skylights	0.00	0.330	0.00
Window Glass Area:			
Standard	88.00	0.300	26.40
Option	0.00	0.300	0.00
Net:			
Floor	1053.33	0.032	33.71
Wall	929.33	0.055	50.74
Ceiling	1053.33	0.0306	32.23
Th. Zone 1:			
Ext. Duct	78.50	0.242	18.98
Th. Zone 2:			
Ext. Duct	78.50	0.223	17.48
Th. Zone 3:			
Ext. Duct	78.50	0.206	16.14
Overhead TZ 1:			
Supply	0.00	0.000	0.00
Overhead TZ 2:			
Supply	0.00	0.000	0.00
Overhead TZ 3:			
Supply	0.00	0.00	0.00

Energy Star v3 & ZERH Max Glass (sq ft)	
Th. Zone 1	305.2
Th. Zone 2	218.7
Th. Zone 3	105.1

	Outdoor Design Temp (F)	UA	Uo	Heatloss BTUH/F
Thermal Zone 1	11	175.26	0.054	268.10
Thermal Zone 2	0	173.76	0.054	266.60
Thermal Zone 3	-14	172.42	0.053	265.30

Design Temperatures

Furnace Heating Temp (F)	Economy Outdoor Temp (F)	
-57	-19	10kW
-83	-37	12kW
-121	-64	15kW
-79	-34	40k Gas
-154	-87	60k Gas
-228	-139	80k Gas

Thermal Zone	U-Value	Thermal Zone	U-Value	Thermal Zone	U-Value
Energy Star Version 2					
1-EHP-S	0.080	2-EHP-S	0.080	3-EHP-S	0.079
1-GAS-S	0.080	2-GAS-S	0.080	3-GAS-S	0.071
1-ENV-S	0.076	2-ENV-S	0.067	3-ENV-S	0.059
1-EHP-M	0.074	2-EHP-M	0.074	3-EHP-M	0.074
1-GAS-M	0.074	2-GAS-M	0.074	3-GAS-M	0.065
1-ENV-M	0.071	2-ENV-M	0.064	3-ENV-M	0.056

Energy Star Version 3 & ZERH					
1 Single	0.076	2 Single	0.065	3 Single	0.057
1 Double	0.070	2 Double	0.063	3 Double	0.054

Description of Materials

U.S. Department of Housing
and Urban Development
Department of Veterans Affairs
Farmers Home Administration

OMB Control No. 2502-0313
(exp. 3/31/2024)

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. This agency may not collect this information, and you are not required to complete this form, unless it displays a currently valid OMB control number.

The National Housing Act (12 USC 1703) authorizes insuring financial institutions against default losses on single family mortgages. HUD must evaluate the acceptability and value of properties to be insured. The information collected here will be used to determine if proposed construction meets regulatory requirements and if the property is suitable for mortgage insurance. Response to this information collection is mandatory. No assurance of confidentiality is provided.

Proposed Construction Under Construction No. _____ (To be inserted by HUD, VA or FmHA)
Property address (Include City and State)

Name and address of Mortgagor or Sponsor	Name and address of Contractor or Builder Giles Homes 405 South Broad Street New Tazewell TN 37825
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Instructions

- For additional information on how this form is to be submitted, number of copies, etc., see the instructions applicable to the HUD Application for Mortgage Insurance, VA Request for Determination of Reasonable Value, or FmHA Property Information and Appraisal Report, as the case may be.
- Describe all materials and equipment to be used, whether or not shown on the drawings, by marking an X in each appropriate check-box and entering the information called for each space. If space is inadequate, enter "See misc." and describe under item 27 or on an attached sheet. **The use of paint containing more than the percentage of lead by weight permitted by law is prohibited.**
- Work not specifically described or shown will not be considered unless required, then the minimum acceptable will be assumed. Work exceeding minimum requirements cannot be considered unless specifically described.
- Include no alternates, "or equal" phrases, or contradictory items. (Consideration of a request for acceptance of substitute materials or equipment is not thereby precluded.)
- Include signatures required at the end of this form.
- The construction shall be completed in compliance with the related drawings and specifications, as amended during processing. The specifications include this Description of Materials and the applicable Minimum Property Standards.

1. Excavation

Bearing soil, type _____

2. Foundations

Footings concrete mix _____ strength psi _____ Reinforcing _____

Foundation wall material _____ Reinforcing _____

Interior foundation wall material _____ Party foundation wall _____

Columns material and sizes _____ Piers material and reinforcing _____

Girders material and sizes _____ Sills material _____

Basement entrance areaway _____ Window areaways _____

Waterproofing _____ Footing drains _____

Termite protection _____

Basementless space ground cover _____ insulation _____ foundation vents _____

Special foundations _____

Additional information

3. Chimneys

Material _____ Prefabricated (make and size) _____

Flue lining material _____ Heater flue size _____ Fireplace flue size _____

Vents (material and size) gas or oil heater _____ water heater _____

Additional information

Chimney Kit 58621

4. Fireplaces

Type solid fuel gas-burning circulator (make and size) _____ Ash dump and clean-out _____

Fireplace facing _____ lining _____ hearth 103217 _____ mantel 1032918 _____

Additional information

Fireplace front 1032921

5. Exterior Walls

Wood frame wood grade, and species #3 SPF Corner bracing Building paper or felt _____
 Sheathing OSB thickness 7/16" width 48" solid spaced _____ o.c. diagonal _____
 Siding Horizontal grade Blog type Vinyl size _____ exposure _____ fastening Stapled
 Shingles Fiberglass grade #235 type GAP size 36 exposure 5 1/2" fastening Stapled
 Stucco _____ thickness _____ Lath _____ weight _____ lb.
 Masonry veneer _____ Sills _____ Lintels _____ Base flashing _____
 Masonry solid faced stuccoed total wall thickness _____ facing thickness _____ facing material _____
 Backup material _____ thickness _____ bonding _____
 Door sills _____ Window sills _____ Lintels _____ Base flashing _____
 Interior surfaces dampproofing, _____ coats of _____ furring _____
 Additional information _____
 Exterior painting material _____ number of coats _____
 Gable wall construction same as main walls other construction _____

6. Floor Framing

Joists wood, grade, and species #2 SPF other 16" bridging _____ anchors _____
 Concrete slab basement floor first floor ground supported self-supporting mix _____ thickness _____
 reinforcing _____ insulation _____ membrane _____
 Fill under slab material _____ thickness _____
 Additional information Double 2x6 @ @shearwalls nailed and glued

7. Subflooring (Describe underflooring for special floors under item 21)

Material grade and species 7/16" OSB size _____ type _____
 Laid first floor second floor attic _____ sq. ft. diagonal right angles
 Additional information T&G OSB glued and nailed, sanded @ seams, water proofing in wet areas

8. Finish Flooring (Wood only. Describe other finish flooring under item 21)

Location	Rooms	Grade	Species	Thickness	Width	Bldg. Paper	Finish
First floor							
Second floor							
Attic floor	sq. ft.						

Additional information _____

9. Partition Framing

Studs wood, grade, and species SPF #2 and #3 size and spacing 2x3 and 2x4 Other _____
 Additional information _____

10. Ceiling Framing

Joists wood, grade, and species purchased truss Other _____ Bridging _____
 Additional information _____

11. Roof Framing

Rafters wood, grade, and species purchased truss Roof trusses (see detail) grade and species _____
 Additional information _____

12. Roofing

Sheathing wood, grade, and species OSB 7/16" solid spaced _____ o.c.
 Roofing _____ grade _____ size _____ type _____
 Underlay _____ weight or thickness _____ size _____ fastening _____
 Built-up roofing _____ number of plies _____ surfacing material _____
 Flashing material _____ gage or weight _____ gravel stops snow guards
 Additional information _____

13. Gutters and Downspouts

Gutters material _____ gage or weight 1 1/2" size _____ shape _____
Downspouts material _____ gage or weight _____ size _____ shape _____ number _____
Downspouts connected to Storm sewer sanitary sewer dry-well Splash blocks material and size _____
Additional information _____

14. Lath and Plaster

Lath walls ceilings material _____ weight or thickness _____ Plaster coats _____ finish _____
Dry-wall walls ceilings material _____ thickness _____ finish _____
Joint treatment _____

15. Decorating (Paint, wallpaper, etc.)

Rooms	Wall Finish Material and Application	Ceiling Finish Material and Application
Kitchen		
Bath		
Other		

Additional information _____

16. Interior Doors and Trim

Doors type Hollow core material Masonite board thickness 2"
Door trim type _____ material _____ Base type _____ material _____ size _____
Finish doors _____ trim _____
Other trim (item, type and location) _____
Additional information _____

17. Windows

Windows type Clayton Supply make _____ material _____ sash thickness _____
Glass grade _____ sash weights balances, type _____ head flashing _____
Trim type _____ material _____ Paint _____ number coats _____
Weatherstripping type _____ material _____ Storm sash, number _____
Screens full half type _____ number _____ screen cloth material _____
Basement windows type _____ material _____ screens, number _____ Storm sash, number _____
Special windows _____
Additional information _____

18. Entrances and Exterior Detail

Main entrance door material Elixir width _____ thickness _____ Frame material _____ thickness _____
Other entrance doors material _____ width _____ thickness _____ Frame material _____ thickness _____
Head flashing _____ Weatherstripping type _____ saddles _____
Screen doors thickness _____ number _____ screen cloth material _____ Storm doors thickness _____ number _____
Combination storm and screen doors thickness _____ number _____ screen cloth material _____
Shutters hinged fixed Railings _____ Attic louvers _____
Exterior millwork grade and species _____ Paint _____ number coats _____
Additional information _____

19. Cabinets and Interior Detail

Kitchen cabinets, wall units material 1/2" duracraft lineal feet of shelves _____ shelf width _____
Base units material _____ counter top _____ edging _____
Back and end splash _____ Finish of cabinets _____ number coats _____
Medicine cabinets make _____ model _____
Other cabinets and built-in furniture _____
Additional information _____

20. Stairs

Stair	Treads		Risers		Strings		Handrail		Balusters	
	Material	Thickness	Material	Thickness	Material	Size	Material	Size	Material	Size
Basement										
Main										
Attic										

Disappearing make and model number _____
 Additional information _____

21. Special Floors and Wainscot (Describe Carpet as listed in Certified Products Directory)

Floors	Location	Material, Color, Border, Sizes, Gage, Etc.	Threshold Material	Wall Base Material	Underfloor Material
		Kitchen	Congo Liam		
	Bath	Congo Liam			

Wainscot	Location	Material, Color, Border, Cap. Sizes, Gage, Etc.	Height	Height Over Tub	Height in Showers (From Floor)
		Bath			

Additional information _____

22. Plumbing

Fixture	Number	Location	Make	MFR's Fixture Identification No.	Size	Color
Sink	1	Kitchen			33"x19"x6"	Steel
Lavatory	2	Bath			22"x14"	Plastic
Water closet	2	Bath			Single Bowl	
Bathtub	2	Bath			60"	Fiberglass
Shower over tub						
Stall shower						
Laundry trays						

Bathroom accessories Recessed material _____ number _____ Attached material _____ number _____
 Additional information _____

Curtain rod Door Shower pan material 1 pc fiberglass * (Show and describe individual system in complete detail in separate drawings and specifications according to requirements.)
 Water supply public community system individual (private) system*
 Sewage disposal public community system individual (private) system*
 House drain (inside) cast iron tile other ABS House sewer (outside) cast iron tile other _____
 Water piping galvanized steel copper tubing other PEX Sill cocks, number _____
 Domestic water heater type Heat Pump make and model Rheem heating capacity _____ gph. 100° rise.
 Storage tank material _____ capacity 40 or 50 gallons
 Gas service utility company liq. pet. gas other _____ Gas piping cooking house heating
 Footing drains connected to storm sewer sanitary sewer dry well sump pump make and model _____
 capacity _____ discharges into _____

Additional information _____

23. Heating

Hot water Radiators Radiant panel Circulator Return pump Make and model capacity gpm. Boiler make and model Output Btuh. net rating Btuh.

Additional information Down flow

Warm air Gravity Forced Type of system Duct material supply return Insulation thickness Outside air intake Furnace: make and model Input Btuh. output Btuh.

Additional information

Space heater floor furnace wall heater Input Btuh. output Btuh. number units Make, model

Additional information

Controls make and types

Additional information

Fuel: Coal oil gas liq. pet. gas electric other storage capacity

Additional information

Firing equipment furnished separately Gas burner, conversion type Stoker hopper feed bin feed Oil burner pressure atomizing vaporizing Make and model

Control

Additional information

Electric heating system type Input watts @ volts output Btuh.

Additional information

Ventilating equipment attic fan, make and model capacity cfm. kitchen exhaust fan, make and model

Other heating, ventilating, or cooling equipment

Additional information

24. Electric Wiring

Service overhead underground Panel fuse box circuit-breaker make AMP's No. circuits Wiring conduit armored cable nonmetallic cable knob and tube other Special outlets range water heater other Doorbell Chimes Push-button locations

Additional information

25. Lighting Fixtures

Total number of fixtures Total allowance for fixtures, typical installation, \$

Nontypical installation

Additional information

26. Insulation

Location	Thickness	Material, Type, and Method of Installation	Vapor Barrier
Roof	38	Blown	
Ceiling			
Wall	13 or 16	Batt	Kraft Back
Floor	22, 27 or 33	Rolled	

27. Miscellaneous: (Describe any main dwelling materials, equipment, or construction items not shown elsewhere; or use to provide additional information where the space provided was inadequate. Always reference by item number to correspond to numbering used on this form.)

Hardware (make, material, and finish.)

Special Equipment (State material or make, model and quantity. Include only equipment and appliances which are acceptable by local law, custom and applicable FHA standards. Do not include items which, by established custom, are supplied by occupant and removed when he vacates premises or chattles prohibited by law from becoming realty.)

Porches

Terraces

Garages

Walks and Driveways

Driveway width _____ base material _____ thickness _____ surfacing material _____ thickness _____
 Front walk width _____ material _____ thickness _____ Service walk width _____ material _____ thickness _____
 Steps material _____ treads _____ risers _____ Cheek walls _____

Other Onsite Improvements

(Specify all exterior onsite improvements not described elsewhere, including items such as unusual grading, drainage structures, retaining walls, fence, railings, and accessory structures.)

Landscaping, Planting, and Finish Grading

Topsoil _____ thick front yard side yards rear yard to _____ feet behind main building
 Lawns (seeded, sodded, or sprigged) front yard _____ side yards _____ rear yard _____
 Planting as specified and shown on drawings as follows:
 _____ Shade trees deciduous _____ caliper _____ Evergreen trees _____ to _____ B & B
 _____ Low flowering trees deciduous _____ to _____ _____ Evergreen shrubs _____ to _____ B & B
 _____ High-growing shrubs deciduous _____ to _____ _____ Vines, 2-year _____
 _____ Medium-growing shrubs deciduous _____ to _____ Other _____
 _____ Low-growing shrubs deciduous _____ to _____

Identification—This exhibit shall be identified by the signature of the builder, or sponsor, and/or the proposed mortgagor if the latter is known at the time of application.

Date (mm/dd/yyyy) 10/13/2023 Signature _____

Signature _____