Alamance Consulting Engineers
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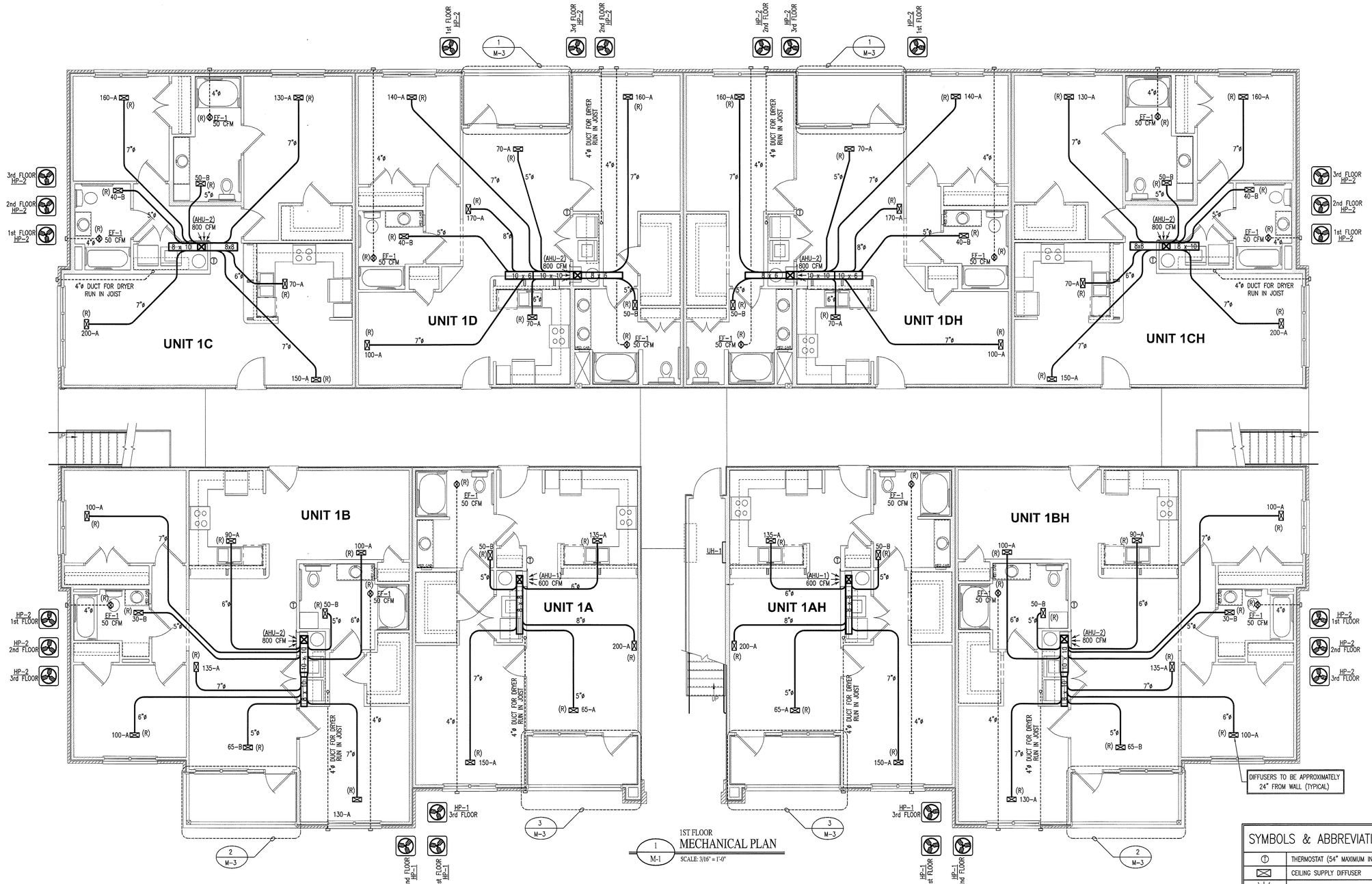
BRADLEY & BALL ARCHITECTS
5921-H WEST FRIENDLY AVE
GREENSBORO, N.C. 27410



1ST FLOOR
MECHANICAL PLAN
SCALE: 3/16" = 1'-0"

SYMBOLS & ABBREVIATIONS LEGEND	
T	THERMOSTAT (54" MAXIMUM IN HANDICAP UNIT)
⊠	CEILING SUPPLY DIFFUSER
≡	RETURN AIR FILTER GRILLE/ACCESS PANEL
CFM	CUBIC FEET PER MINUTE
ø	DIAMETER OR POWER PHASE
R.A.	RETURN AIR
S.A.	SUPPLY AIR
A.F.F.	ABOVE FINISHED FLOOR
(R)	RADIATION DAMPER
⊗	EXHAUST FAN

BLUE RIDGE PROJECT NUMBER 071-04A-NC

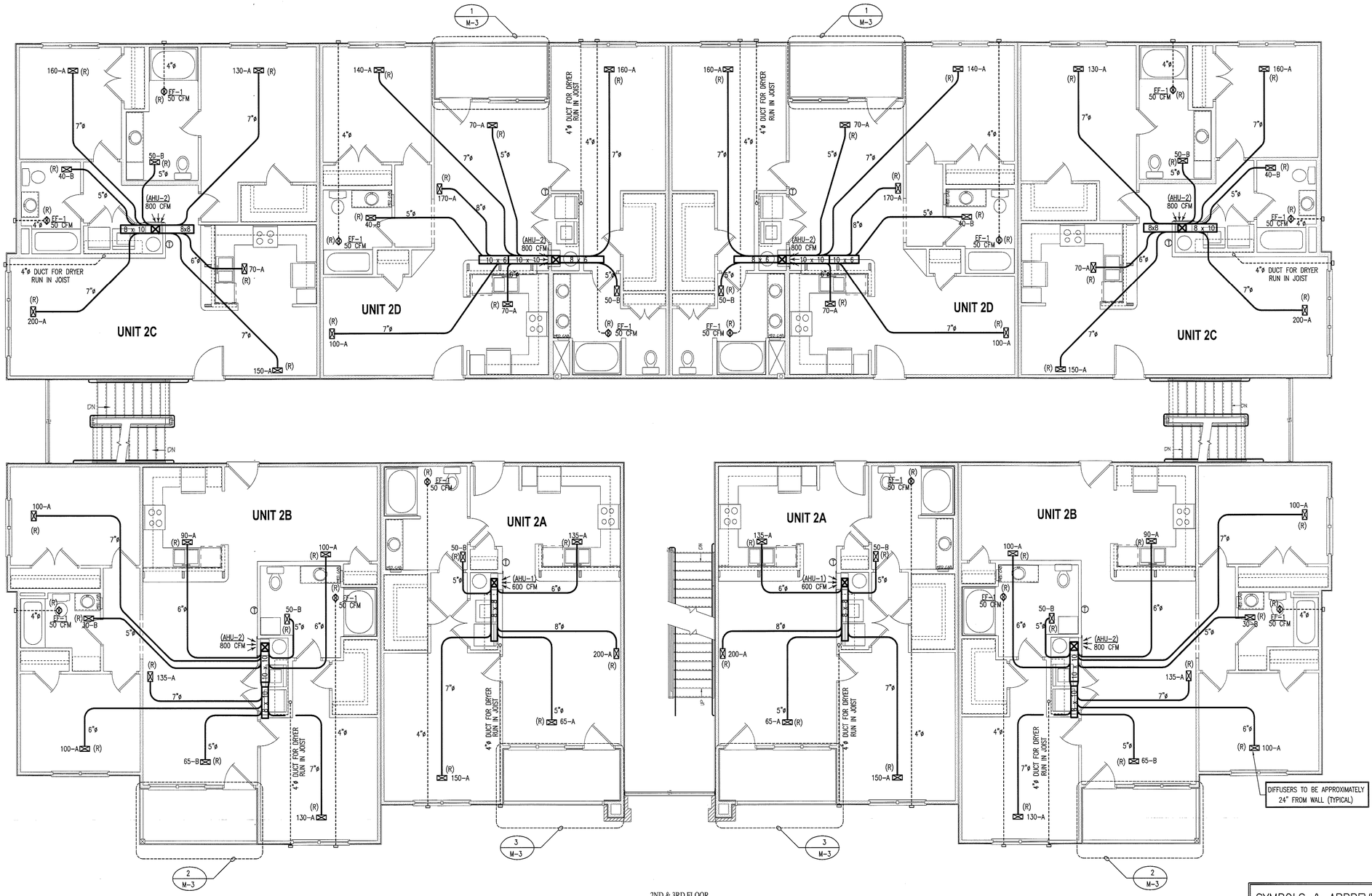
LEGACY AT CAROLINA FOREST
"A" BUILDING-1/2/3 BEDROOM APT.

JACKSONVILLE TOWNSHIP — JACKSONVILLE, NC

DRAWING NAME
1ST FLOOR MECHANICAL PLAN

NORTH CAROLINA PROFESSIONAL SEAL 25043 ENGINEER KEVIN BENGEL
5/5/09

DRAWN: CCM
CHECKED:
DATE: 5/5/09
SCALE: AS NOTED
JOB NO.: 9006
SHEET: M-1



2ND & 3RD FLOOR
MECHANICAL PLAN
1 / M-2
SCALE: 3/16" = 1'-0"

SYMBOLS & ABBREVIATIONS LEGEND	
T	THERMOSTAT (54" MAXIMUM IN HANDICAP UNIT)
⊠	CEILING SUPPLY DIFFUSER
	RETURN AIR FILTER GRILLE/ACCESS PANEL
CFM	CUBIC FEET PER MINUTE
ø	DIAMETER OR POWER PHASE
R.A.	RETURN AIR
S.A.	SUPPLY AIR
A.F.F.	ABOVE FINISHED FLOOR
(R)	RADIATION DAMPER
Ⓔ	EXHAUST FAN

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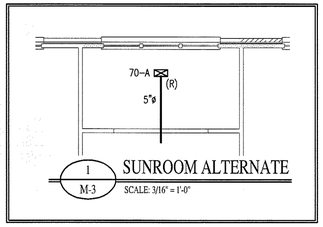
BLUE RIDGE PROJECT NUMBER 071-04A-NC
LEGACY AT CAROLINA FOREST
"A" BUILDING-1/2/3 BEDROOM APT.
JACKSONVILLE TOWNSHIP — JACKSONVILLE, NC

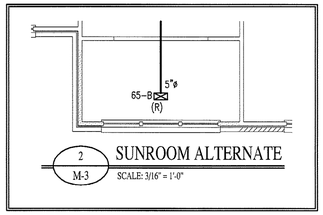
DRAWING NAME
2ND & 3RD FLOOR MECHANICAL PLAN

NORTH CAROLINA PROFESSIONAL SEAL 25043 ENGINEER GARY W. BALL
5/5/09

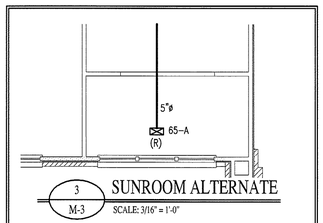
DRAWN	CCM
CHECKED	MMK
DATE	5/5/09
SCALE	AS NOTED
JOB NO.	9006
SHEET	M-2



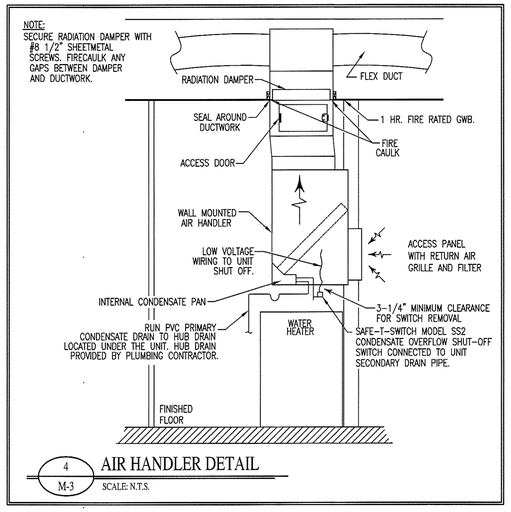
1 M-3 SUNROOM ALTERNATE
SCALE: 3/16" = 1'-0"



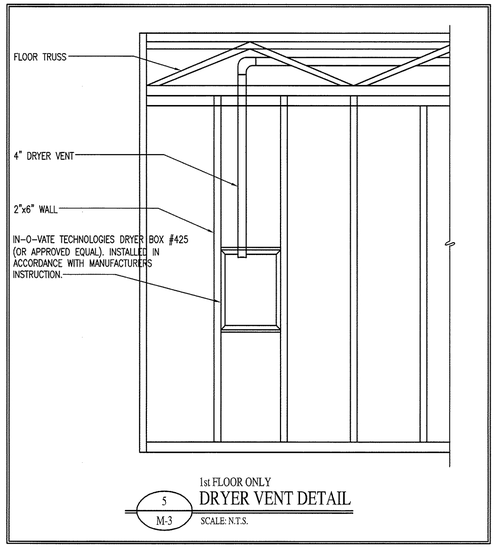
2 M-3 SUNROOM ALTERNATE
SCALE: 3/16" = 1'-0"



3 M-3 SUNROOM ALTERNATE
SCALE: 3/16" = 1'-0"

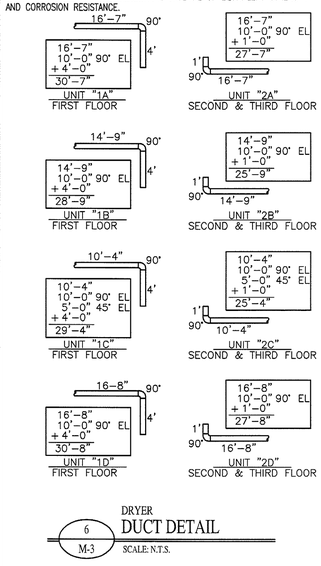


4 M-3 AIR HANDLER DETAIL
SCALE: N.T.S.

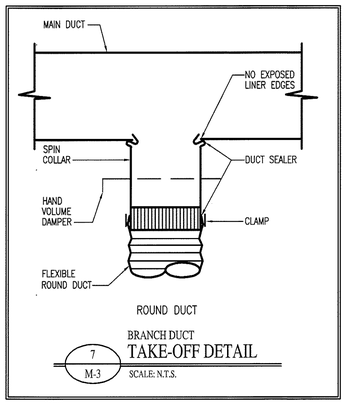


1st FLOOR ONLY
5 M-3 DRYER VENT DETAIL
SCALE: N.T.S.

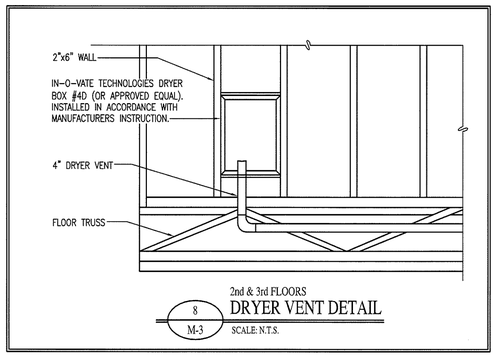
NOTE:
ALL DRYER DUCTS SHALL BE 4"ø IN SIZE, AND CONSTRUCTED OF 0.0157" GALVANIZED STEEL OR NONCOMBUSTIBLE MATERIAL OF EQUIVALENT STRENGTH AND CORROSION RESISTANCE.



DRYER
6 M-3 DUCT DETAIL
SCALE: N.T.S.



ROUND DUCT
BRANCH DUCT
7 M-3 TAKE-OFF DETAIL
SCALE: N.T.S.



2nd & 3rd FLOORS
8 M-3 DRYER VENT DETAIL
SCALE: N.T.S.

UNIT HEATER SCHEDULE

MARK	MANUFACTURER	MODEL NO.	BTUH	POWER	AMPS
UH-1	Q MARK	WHT500	1,706	120/1	4.2

AIR DISTRIBUTION SCHEDULE

MARK	MANUFACTURER	PANEL SIZE	USE	MODEL	REMARK
A	HART & COOLEY	10 x 6	SUPPLY	661	EQUIPPED W/ CEILING RADIATION DAMPER *
B	HART & COOLEY	12 x 6	SUPPLY	661	EQUIPPED W/ CEILING RADIATION DAMPER *

* RUSKIN CFD2/3 OR EQUAL MODEL

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	CFM	SP	POWER	SONES	WATTS	CONTROL	REMARK
EF-1	GREENHECK	SP-A50	BATHROOM EXHAUST	50	0.1" W.G.	120/1	0.7	18	SWITCH	EQUIPPED W/ FUSIBLE LINK RADIATION DAMPER

SPLIT SYSTEM A/C WITH HEAT PUMP

MARK	TONS	MANUFACTURER	INDOOR UNIT					OUTDOOR UNIT				FAN DATA				COOLING CAPACITY			HEAT PUMP HEATING CAP. @ 47°F	MINIMUM ELECTRIC HEAT CAPACITY	MINIMUM HEAT EFFICIENCY
			MODEL NO.	POWER	MCA	MCB	STRIP HEAT	MODEL NO.	POWER	MCA	MCB	AIR FLOW	R.A. FLOW	E.S.P.	MOTOR SIZE	SENSIBLE	TOTAL	MIN. EFF.			
AHU-1/HP-1	1.5	*CARRIER	FF1ENP018005	230/1	26.9	30	5 KW	25HBA318A003	230/1	12	20	600	600	.5" W.G.	1/5	13,100	17,100	13 SEER	18,000	1.2 KW	7.7 HSPF
AHU-2/HP-2	2	*CARRIER	FF1ENP024005	230/1	26.9	30	5 KW	25HBA324A003	230/1	16.8	25	800	800	.5" W.G.	1/5	18,500	22,800	13 SEER	24,000	1.5 KW	8.2 HSPF

*OR APPROVED EQUAL

MECHANICAL NOTES:

1. ALL HVAC EQUIPMENT AND DUCTWORK TO BE INSTALLED IN ACCORDANCE WITH STATE AND LOCAL CODES.

2. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL DUCTWORK, PIPING, AND ELECTRICAL REQUIREMENTS WITH ALL OTHER TRADES PRIOR TO BEGINNING INSTALLATION TO AVOID CONFLICTS AND INTERFERENCE WITH OTHER TRADES.

3. ALL EQUIPMENT TO BE INSTALLED AS SUGGESTED BY MANUFACTURER.

4. INSULATE SUPPLY AND RETURN DUCTWORK LOCATED IN UNCONDITIONED SPACES BY WRAPPING WITH INSULATION WITH A MINIMUM INSTALLED R-VALUE OF 8.0. DIMENSIONS SHOWN ARE INSIDE CLEAR AREA DIMENSIONS.

5. EQUIP RETURN AIR GRILLES WITH FILTERS.

6. MECHANICAL SYSTEM TO BE BALANCED AND TESTED AFTER INSTALLATION TO ASSURE PROPER OPERATION.

7. COORDINATE EXACT LOCATION OF THERMOSTATS WITH OWNER.

8. BATHROOM EXHAUST FANS ARE TO BE FURNISHED, INSTALLED AND DUCTED TO OUTDOORS BY THE MECHANICAL CONTRACTOR. EXHAUST FAN TO BE WIRED BY THE ELECTRICAL CONTRACTOR.

9. EXHAUST FAN DISCHARGE TO BE AT LEAST TEN FEET AWAY FROM HVAC FRESH AIR IN-TAKE.

10. FINAL UTILITY CONNECTIONS (GAS, ELECTRIC, ETC.) TO EQUIPMENT SHALL BE MADE BY THE CONTRACTOR INSTALLING THE EQUIPMENT REQUIRING THE UTILITIES.

11. DUCT DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW THE INTENT OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY ADDITIONAL TRANSITIONS, OFFSETS, OR TURNS, IN THE DUCTWORK AND/OR PIPING, NOT SHOWN BUT REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

12. ALL DUCTWORK SHALL BE INSTALLED TIGHT AGAINST THE STRUCTURE UNLESS OTHERWISE NOTED OR SHOWN.

13. AIR DISTRIBUTION LOCATIONS SHOWN ON MECHANICAL PLANS ARE APPROXIMATE. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR ACTUAL LOCATIONS.

14. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONED LOCATIONS OF WALLS AND PARTITIONS AND FOR PARTITION THICKNESS AND CONSTRUCTION MATERIALS.

15. FLEXIBLE DUCTWORK SHALL BE UL-181, CLASS 1 CERTIFIED.

16. REFRIGERANT LINES TO BE SIZED BY MANUFACTURER FOR LENGTH OF RUN BETWEEN COIL AND CONDENSER. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ENSURING ANY REQUIRED ACCESSORIES FOR LONG REFRIGERANT LINES ARE INSTALLED AS SPECIFIED BY EQUIPMENT MANUFACTURER.

17. FIRST AND SECOND FLOOR EXHAUST FANS ARE TO BE DUCTED TO OUTDOORS IN THE CEILING/FLOOR JOIST TO A WALL CAP. THIRD FLOOR EXHAUST FANS ARE TO BE DUCTED TO OUTDOORS THROUGH THE SOFFIT WITH A VENT CAP.

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BLUE RIDGE PROJECT NUMBER 071-04A-NC

LEGACY AT CAROLINA FOREST
"A" BUILDING-1/2/3 BEDROOM APT.

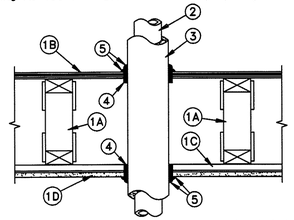
JACKSONVILLE TOWNSHIP — JACKSONVILLE, NC

DRAWING NAME
MECHANICAL NOTES AND DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 25043 ENGINEER BRYAN BENGE
5/5/09

DRAWN: CCM
CHECKED: MK
DATE: 5/5/09
SCALE: AS NOTED
JOB NO.: 9006
SHEET: M-3

SYSTEM NO. FC5002
(Formerly System No. 454)
F Rating – 1 Hr
T Rating – 1 Hr
L Rating At Ambient – 7 CFM/sq ft (See Item 5)
L Rating At 400 F – Less Than 1 CFM/sq ft (See Item 5)



1. **FLOOR ASSEMBLY** – The fire rated wood truss or combination wood and steel truss Floor–Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory and shall include the following construction features:
   A. **TRUSSES** – Min 12" deep parallel chord trusses fabricated from nominal 2"X4" lumber in conjunction with galvanized steel truss plates or **STRUCTURAL WOOD MEMBERS*** with bridging as required.
   B. **FLOORING** – Nominal 3/4" thick plywood flooring with or without **FLOOR TOPPING MIXTURE*** Max. diameter of hole–sawed opening in flooring is 7".
   C. **FURRING CHANNELS** – Rigid or resilllient galvanized steel furring channels installed perpendicular bottom chord of trusses.
   D. **WALLBOARD, GYPSUM*** – Nominal 4" wide by 5/8" thick, screw–attached to furring channels. Max. diameter of hole–sawed opening in gypsum wallboard ceiling is 7".
2. **PIPE** – Nominal 4" diameter (or smaller) Schedule 10 (or heavier) steel pipe or nominal 3" diameter (or smaller) Type L (or heavier) copper pipe. Pipe to be installed approximately midway between joists or trusses and centered in circular cutouts in flooring (Item 1B) and gypsum wallboard ceiling (Item 1D). Diameter of circular cutouts in flooring and gypsum wallboard ceiling to be 1/2" to 3/4" larger than outside diameter of pipe covering (Item 3) or tube insulation (Item 3A) on pipe. Pipe to be rigidly supported on both sides of Floor–Ceiling assembly.
3. **PIPE COVERING*** – Nominal 1" thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber 1/2" or 5/8" thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in fasteners or factory–applied self–sealing lap tape. Transverse joints secured with metal fastners or with butt strip tape supplied with the product.
   See Pipe and Equipment Covering – Materials* (BRGU) category in Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

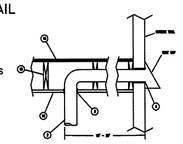
3A. **TUBE INSULATION – PLASTICS+** – As an alternate to the glass fiber pipe covering (Item 3), nominal 1/2" or 5/8" thick acrylonitrile butadiene/polyvinyl chloride (AB/PVC) flexible foam furnished in the form of tubing with skin may be used.
   See Plastics (QMFZ2) category in the Recognized Component Directory for names of manufacturers. Any Recognized Component tube insulation material meeting the above specifications and having a UL 94 Flammability Classification of 94–5 VA may be used.
4. **FILL,VOID OR CAVITY MATERIALS* – WRAP STRIP** – Nominal 1/4" thick intumescent elastometric material faced on one side with aluminum foil, supplied in 2" wide strips. Nominal 2" wide strip tightly wrapped around pipe covering or tube insulation (foil side exposed), secured with two steel tie wires and slid into hole–sawed opening in flooring (Item 1B) and in gypsum wallboard (Item 1D). Bottom edge of wrap strip to project 9/16" to 11/16" below bottom surface of flooring and below bottom (ceiling) surface of gypsum wallboard.
   Minnesota Mining & Mfg. Co. – Types FS–195, FS–195+
5. **FILL, VOID OR CAVITY MATERIALS* – CAULK** – Nominal 1/4" thickness of caulk to be applied to the exposed edge of the wrap strip layer (top of flooring and bottom of gypsum wallboard ceiling). Generous application of caulk to be applied to fill all gaps at the wrap strip/flooring and wrap strip/gypsum wallboard ceiling interfaces.
   Minnesota Mining & Mfg. Co. – Types CP–25 WB, CP–25 WB+. (Note: L Ratings apply only when Type CP–25 WB+ caulk is used.)

* Bearing the UL Classification Marking.

1 M-4 PENETRATION DETAILS
SCALE: N.T.S.

DRYER DUCT FIRE PENETRATION DETAIL

NOTES
1. DESIGN APPROVED BY UL LETTER DATED 1/11/00. LETTER AVAILABLE UPON REQUEST.
2. DUCT TO BE SUPPORTED WITH STEEL SUPPORTS IN THE JOIST CAVITY ABOVE THE CEILING.

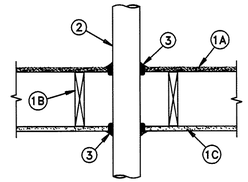


1. **FLOOR CEILING ASSEMBLY** – The fire–rated wood joist floor–ceiling assembly shall be constructed of the materials and in the manner specified in Design No. L501, L512, L537 in the UL Fire Resistance Directory, as summarized below:
   A. **FLOORING SYSTEM** – Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor–Ceiling Design. Max diameter of opening is 5".
   B. **WOOD JOISTS** – Nominal 2"x10" lumber joists spaced 16" OC with nominal 1"x3" lumber bridging and with ends firestopped.
   C. **WALLBOARD GYPSUM*** – Nominal 4' wide by 5/8" thick as specified in the individual Floor–Ceiling Design.

1.1 **CHASE WALL (OPTIONAL, NOT SHOWN)** – The through penetrants (Item No. 2) may be routed though a fire–rated single or double wood stud/gypsum wallboard chase wall constructed of the materials and in the manner specified in the individual U300 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **STUDS** – Nominal 2"x6" or double nominal 2"x4" lumber studs.
   B. **SOLE PLATE** – Nominal 2"x6" or parallel 2"x4" lumber plates.
   C. **TOP PLATE** – The double top plate shall consist of two nominal 2"x6" or two sets of parallel 2"x4" lumber plates.
   D. **WALLBOARD, GYPSUM*** – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design. When double stud construction is used, each stud cavity containing a pipe (Item 3) shall be lined with wallboard such that the pipe is surrounded on four sides by wallboard.
2. **STEEL VENT DUCT** – Nominal 4" diameter (or smaller) No. 30 gauge (or heavier) galvanized steel vent duct. Diameter of openings to be max 1/2" larger than outside diameter of steel vent duct. Steel vent duct to be installed approximately midway between wood joists and centered in circular openings such that a max 1/4" annular space is present around its perimeter at each through openings location.
3. **FILL, VOID OR CAVITY MATERIALS*** – CAVITY – Caulk fill material forced into annular spaces to fill spaces to max extent possible and with a min 1/4" high by 3/8" wide bead of caulk applied to to the perimeter of the steel vent duct at its egress from the finish floor and ceiling or sole and top plates of chase wall.
   Minnesota Mining & Mfg. Co. – Type CP–25 S/L, CP–25 N/S

* Bearing the UL Classification Marking.

SYSTEM NO. FC7001
(Formerly System No. 169)
F Rating – 1 Hr
T Rating – 1/2 Hr



1. **FLOOR CEILING ASSEMBLY** – The fire–rated wood joist floor–ceiling assembly shall be constructed of the materials and in the manner specified in Design No. L501, L512, L537 in the UL Fire Resistance Directory, as summarized below:
   A. **FLOORING SYSTEM** – Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor–Ceiling Design. Max diameter of opening is 5".
   B. **WOOD JOISTS** – Nominal 2"x10" lumber joists spaced 16" OC with nominal 1"x3" lumber bridging and with ends firestopped.
   C. **WALLBOARD GYPSUM*** – Nominal 4' wide by 5/8" thick as specified in the individual Floor–Ceiling Design.

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   A. **STUDS** – Nominal 2"x6" or double nominal 2"x4" lumber studs.
   B. **SOLE PLATE** – Nominal 2"x6" or parallel 2"x4" lumber plates.
   C. **TOP PLATE** – The double top plate shall consist of two nominal 2"x6" or two sets of parallel 2"x4" lumber plates.
   D. **WALLBOARD, GYPSUM*** – Thickness, type, number of layers and fasteners shall be as specified in individual Wall and Partition Design. When double stud construction is used, each stud cavity containing a pipe (Item 3) shall be lined with wallboard such that the pipe is surrounded on four sides by wallboard.
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   Minnesota Mining & Mfg. Co. – Type CP–25 S/L, CP–25 N/S

* Bearing the UL Classification Marking.

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BLUE RIDGE PROJECT NUMBER 071-04A-NC
LEGACY AT CAROLINA FOREST
"A" BUILDING-1/2/3 BEDROOM APT.
JACKSONVILLE TOWNSHIP
JACKSONVILLE, NC

DRAWING NAME
PENETRATION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 25043 ENGINEER KEVIN BOND
5/5/09

DRAWN	CCM
CHECKED	MK
DATE	5/5/09
SCALE	AS NOTED
JOB NO.	9006
SHEET	M-4