APPENDIX F

SystemVision Residential Supportive Housing Standards

Updated 9/1/2022

1. General Requirements
   - 1.1. Building plans must be submitted to Advanced Energy that incorporate all standards into the drawings, details and/or notes. The plans will be reviewed by Advanced Energy for incorporation of standards and project team will be asked to update plans if any items are unclear or missing.
   - 1.2. The general contractor, HVAC contractor and insulation contractor must attend a pre-construction meeting prior to work beginning on project.
2. Air Tightness
   - 2.1. There shall be a continuous, rigid and durable air barrier enclosing the conditioned space. The building plans, and building, shall demonstrate a continuous, unbroken air barrier separating the conditioned space of the building from unconditioned spaces.
   - 2.2. The air barrier will be denoted and labeled as the "air barrier" in the plans on all sections, floor-plans, and appropriate details.
   - 2.3. Living units shall be sealed to reduce air exchange between the apartment and outside as well as the apartment and other adjacent spaces. Unit and/or Building air leakage shall be less than or equal to .30 CFM50 per square foot of conditioned envelope area.
3. Ventilation and Moisture Management
   - 3.1. There must be a whole-house mechanical fresh air ventilation system in compliance with the current effective version of ASHRAE 62.2 for each living unit. Compliant system types include:
     - Supply duct tied into return box or plenum of HVAC system (must contain damper and filter; filter must be easily accessible for service); or
     - Exhaust fan and timing device, wired to run intermittently; or
     - Balanced ventilation (e.g., Energy Recovery Ventilator).
   - 3.2. All common and non-residential space must have a mechanical fresh air ventilation system in compliance with the current effective version of ASHRAE 62.1.
   - 3.3. All bathrooms shall have a fan ducted to the outside which, as installed, exhausts at least 50 CFM intermittently (requires a minimum fan rating of 70 CFM).
   - 3.4. All kitchens shall have a fan ducted to the outside which, as installed, exhausts at least 100 CFM (requires a minimum fan rating of 120 CFM).
   - 3.5. All ventilation ducts in unconditioned spaces, excluding kitchen exhaust ducts, shall be insulated.
   - 3.6. Crawl Spaces: Shall be closed and have the following components:
     - 3.6.1. A sump pump or drain to daylight with a backflow preventer shall be located at the lowest point of the crawl space.
     - 3.6.2. All air leakage paths from conditioned space to the crawl space, and from the crawl space to outside shall be air sealed.
     - 3.6.3. Vapor/Moisture Barrier
       - 3.6.3.1. Walls: vapor/moisture barrier shall be sealed, mechanically fastened, and run up walls to within 3" of mudsill.
       - 3.6.3.2. Floors- vapor/moisture barrier shall be sealed at all seams, penetrations and to wall vapor/moisture barrier.

3.6.4. Drying Mechanism

3.6.4.1. A stand-alone dehumidifier or supply register with backflow preventer that provides 1 CFM/30SF of floor area.

3.6.4.2. Crawl spaces during construction shall have the following:

- A vapor/moisture barrier covering the ground.
- If crawl space vents are used, they will be sealed when construction is complete.
- If crawl space vents are not used, a drying strategy may be needed during construction.

3.7. Slabs: A ground vapor/moisture barrier with a rating of no more than 0.1 perm shall be installed under the slab and have 100% coverage with overlapped seams.

3.8. Drainage: Finished grade shall be sloped away from foundation walls or slab. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard. Lots shall be graded to drain surface water away from foundation walls. The grade shall fall a minimum of 6 inches (152 mm) within the first 10 feet (3048 mm) from the foundation walls. For exceptions, see the NC Residential Building Code Section R401.3.

3.9. All buildings must have gutters that empty into lateral piping that discharges water more than 5ft from foundation or utilize an underground catchment system that does not tie into the foundation drain system that deposits water more than 10ft from foundation.

4. Insulation

4.1. Insulation shall be installed to the Insulation Institute's or manufacturer's specifications, with no gaps, voids, compression or wind intrusion. Insulation and the continuous air barrier shall be installed in physical contact with each other.

4.2. Insulation and the air barrier shall be installed in complete and continuous physical contact with each other. Note that attic insulation may not be "tented" over sprinklers and another acceptable means of freeze protection in accordance with the applicable NFPA 13 is required.

4.3. All insulation values at a minimum must meet the 2012 International Energy Conservation Code. Performance or prescriptive path is acceptable.

5. Heating, Air Conditioning, and Ventilation

5.1. For Non-Commercial HVAC Systems: Residential Equipment Minimum Performance Values:

- Furnaces: at least 90% efficient
- AC: at least 15 SEER
- Heat Pumps: at least 15 SEER and 8.8 HSPF

5.2. Heat pumps shall have an outdoor thermostat installed to prevent supplementary heater operation when the heat pump is capable of meeting the load. The lockout shall be set no lower than 35F and no higher than 40F.

5.3. All duct connections shall be sealed with a UL listed "bucket" mastic product.

5.4. Total duct leakage, measured in cubic feet per minute at 25 pascals, shall not exceed the greater of EITHER 3% of the conditioned square footage OR 25 CFM. Building cavities shall not be used as ducts.

5.5. Heating and cooling systems shall be sized to within 6000 btu (or closest available size) of the whole home ACCA Manual J room-by-room load calculations. Load calculations shall be done using an ASHRAE or ACCA approved method.

The detailed load calculations showing all inputs and equipment specifications must be submitted to Advanced Energy as part of the plan review process. Physical copy of the AHRI certificate shall be attached to air handler unit or submitted to Advanced Energy prior to the final inspection.

5.6. Total system airflow shall be set between 300-400 CFM per ton in cooling, or set to total system airflow as specified by the manufacturer.

6. Pressure Balancing

6.1. All rooms within the conditioned space – except baths and laundry – shall not exceed +/- 3 Pascals pressure differential with respect to the main body when interior doors are closed and the air handler is operating. Returns, transfer grilles or jump ducts may be required to balance each room in addition to door undercuts.

Plumbing

6.2. Water heaters shall have a Uniform Energy Factor (UEF) as indicated in the table:

Water Heater Type	UEF Value
Electric Tank	.93
Gas Tank	.60
Gas Tankless	.61
Heat Pump	Any

6.3. From the water heater, the first three feet of hot and cold pipes shall be insulated to ≥ R-4.

6.4. Toilets shall be 1.3 GPF or less (including dual-flush models). Showerheads shall be 2.25 GPM or less. Kitchen faucets shall be 2.2 GPM or less. Bath faucets shall be 1.5 GPM or less.

7. Appliance and Lighting

7.1. If units are supplied with refrigerators and dishwashers, ENERGY STAR labeled models shall be installed.

7.2. All lighting fixtures shall be ENERGY STAR qualified or have fluorescent or LED lamps installed. T-8 tubular and circular fluorescents are acceptable. No incandescent lights shall be used.

7.3. Recessed lights, if used, shall be air tight and insulation contact (IC) rated.

8. Combustion Safety

8.1. Any *combustion appliance* inside the conditioned space, other than gas ranges and wood fireplaces, must be direct vent or power vented. Vent free gas logs are not allowed.

8.2. One *hard-wired carbon monoxide (CO) detector* shall be installed per bedroom area in buildings which have any combustion appliance within the conditioned space or which have an attached garage. (minimum 1 per floor).