APPENDIX F

Supportive Housing Development Program (SHDP)
Energy Efficiency Standards

New Construction Projects

1. Energy Efficiency Certification

At a minimum, all new construction projects must comply at minimum with Advanced Energy Corporation's **SystemVision™ Residential Supportive Housing Standards** (see Appendix G for standards) or to the standards of an Agency approved energy-related building certification program as verified by an independent, third-party expert who assists with project design, verifies construction quality, and tests completed units. Adaptive re-use and rehabilitation projects must comply to the extent that doing so is economically feasible and, if applicable, as allowed by historic preservation rules.

Applicants are encouraged to attain higher levels of energy efficiency, sustainability and indoor air quality as certified by one of the following nationally recognized building certification programs. NCHFA must review and approve the contract between the applicant and verifier before it will issue a final commitment letter for the project and must receive and approve a Certification from the selected energy efficiency program prior to Loan Closing.

Acceptable programs include the current versions of:

- SystemVision™ for Supportive Housing by Advanced Energy (see Appendix G for standards)
- EarthCraft by Southface
- Enterprise Green Communities
- NGBS Green National Green Building Standard Program
- ENERGY STAR Residential New Construction Program
- NCECC HERO Standards Program by Duke Energy Progress (Only with 2018 NC Building Code in effect)
- LEED by US Green Building Council

Programs with project selected standards must document every standard the project will attain, must receive approval from NCHFA, and must reference SystemVision™ as a baseline in designing their certification strategy.

If the applicant wishes to participate in a different energy efficiency certification program, the program must be reviewed and approved by the Agency prior to the issuance of a Final Commitment Letter.

In regard to energy efficiency code targets for the building envelope/air sealing, insulation/framing, ventilation, water heating, and HVAC equipment, projects should design to attain IECC 2021 or greater levels of efficiency for the respective climate zone of the project. Projects should work with

their energy rater to decide if they will choose an approved certification program for the project, or if they will design the project to meet IECC 2021 energy efficiency prescriptive standards for the building envelope/air sealing, insulation/framing, ventilation, water heating, and HVAC equipment.

2. Minimum Building Component Standards for New Construction, Replacement, and Significant Rehabilitation

At a minimum, any component of the building which is installed or replaced, must meet the following standards:

All Appliances	Energy Star (Contact NCHFA if unable to find available E-star appliances for needs of clients/project)
Windows/Fenestration	Insulated, double pane, U-factor of 0.35 or below and a SHGC of 0.30. Meet IECC 2021 (Table R402.1.2)
Shingles	Algae resistant (AR) with a minimum 30-year warranty
Faucets, Shower heads and Toilets	EPA “Watersense” labeled
Light Fixtures	Initially installed light bulbs in all fixtures must be fluorescent, LED, or pin-based lighting
Cooling	AC w/furnace: SEER 13 Heat Pump: 15 SEER/8.8 HPSF
Heat	Gas: 90% Efficiency or Greater, Heat Pump: 15 SEER/8.8 HPSF
Insulation	Meet IECC 2021 if framing allows
Insulation – Attic	Meet IECC 2021 if framing allows
Insulation - Floor	Meet IECC 2021 if framing allows
Electric Tank Hot Water Heater	At least UEF Value of 0.93 or EF Factor of 0.95

3. Stretch Goals for Projects

When feasible and cost appropriate, projects should consider the following design inclusions based on tenant needs and fit for the project:

a. Consider ceiling fans in all bedrooms and have a switch for operation of light and fan assembly separately.

b. Install raceways for wires in areas where tenants may need to run a wire in areas where technological hardware may be used. Additionally, consider outlets with USB adaptors built in. Would a workstation and foldable work surface/desk increase opportunities to study or work from home?

c. Consider a fully electric project and eliminate combustion appliances (no carbon monoxide generation).

d. Consider over-insulation on the attic plane which may require intentional design of trusses to allow for more.

e. Consider over-insulation in the wall assemblies by increasing the dimensions of walls or adding rigid foam to a traditional 2”x4” framed wall.
f. Explore local sustainability targets for projects if applicable in your area.
g. Consider attaining HERO code certification for energy efficiency (may not be applicable as new codes go into effect).
h. Explore the DSIRE website for a list of energy-based incentives your project may be eligible for.
i. Consider eliminating all step entries (even on non-accessible units) and incorporating universal design features throughout the project.
j. When planning the site, include walkability and bike-ability into your plan to reduce dependence on motorized transportation.
k. Consider whether community garden features or the inclusion of fruit-bearing trees and shrubs on site would be of a benefit to your tenants.
l. Consider whether a private office with telehealth capabilities might increase your clients access to healthcare.

Rehabilitation Projects

Rehabilitation projects shall incorporate components meeting the Minimum Building Component Standards stated above to the extent that doing so is economically feasible and, if applicable, as allowed by historic preservation rules. Components that will not be made accessible by rehabilitation, or for which costs will not allow replacement of them and they are in good working order, are not expected to be replaced for the purpose of meeting these standards.

1. General

a. Where feasible and applicable, the Department of Energy Single Family Work Specifications (see Standard Work Specifications at https://sws.nrel.gov/) shall be referenced.
b. All major structural and durability concerns must be addressed.

2. Attic - Ceiling & Knee Walls

When made easily accessible by rehabilitation and when applicable or when a related building component is replaced it shall be replaced according to this standard:

a. There shall be a continuous, durable air barrier enclosing the conditioned space. This includes features such as chases, knee walls, soffits, garage interfaces, intersecting walls and dropped ceilings.
b. Air sealing shall be required at the attic plane - Any visible hole or crack leading from the attic into the building or building cavities shall be sealed (e.g., plumbing penetrations, electrical penetrations, chases, dropped soffits, chimney penetrations, top plate-to-drywall connections, bonus room floors, balloon framing).
c. Insulation shall be installed at walls and ceilings to manufacturer specifications with no gaps, voids, compression or wind intrusion.
d. Insulation and the air barrier shall be installed in physical contact with each other.
e. Accessible attics shall be insulated to R-38 or greater.

f. Knee walls shall be insulated and backed with support material.

g. Attic accesses will be insulated to a minimum of R-30. This will require an insulated box be constructed for attic pull-down stairs.

3. Exterior Walls - Including Windows & Doors

When made easily accessible by rehabilitation and when applicable or when a related building component is replaced it shall be replaced according to this standard:

a. There shall be a continuous, durable air barrier enclosing the conditioned space. This includes features at garage & storage interfaces and attached porches.

b. Air sealing shall be required at the exterior walls - Windows, doors, and any visible hole or crack leading from the building to the exterior shall be weather-stripped or sealed.

c. When installed insulation shall be to manufacturer specifications with no gaps, voids, compression or wind intrusion. Insulation shall be insulated to R5 or greater.

d. When installed, insulation and the air barrier shall be in physical contact with each other.

e. Replacement windows, if installed, shall be ENERGY STAR labeled (Contact NCHFA is E-Star is unavailable). At a minimum, replacement windows shall be insulated, double pane, U-factor of 0.35 or below and a SHGC of 0.30.

4. Foundation- Crawl Space and Basement

When made easily accessible by rehabilitation and when applicable or when a related building component is replaced it shall be replaced according to this standard:

a. There shall be a continuous, durable air barrier enclosing the conditioned space.

b. Air sealing shall be required at the subfloor - All penetrations between conditioned and unconditioned space shall be sealed.

c. Insulation shall be installed and/or fixed in floors to manufacturer specifications with no gaps, voids, or compression.

d. For vented crawls, floors must be insulated to meet code. For closed crawl spaces, foundation wall or floors shall be insulated to code.

e. Insulation and the subfloor shall be installed and/or fixed to be in physical contact with each other.

f. All crawl spaces shall have a 100 percent ground cover as required by the NC building code.

g. Buildings with crawl spaces that show signs of standing water shall not be included in the program unless drainage is a part of the scope of work.

5. Heating & Cooling- Equipment & Ductwork

When made easily accessible by other rehabilitation or when a related building component is replaced it shall be replaced according to this standard:

a. All accessible duct connections shall be sealed with a UL-listed bucket mastic product.

b. All uninsulated ductwork outside the conditioned envelope shall be insulated to R-8.

c. Replacement heating and cooling systems shall be rated at or above the following efficiencies:

Furnace	90%
AC (w/furnace)	15 SEER
Heat Pumps	15 EER/8.8 HSP

6. Lighting and Appliances

a. All light fixtures shall utilize fluorescent lamps (CFLs), light emitting diodes (LEDs) or Pin bulbs.

b. Appliances (e.g. refrigerator, dishwasher, clothes washer), if installed, shall be ENERGY STAR labeled.

c. New water heaters shall have a Minimum UEF as indicated in the table:

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

7. Combustion Safety

a. If existing gas equipment will remain atmospherically vented and scope of work includes air-sealing of the building envelope, BPI protocol or other combustion safety testing protocol must be completed to verify appliances are not backdrafting into the building.

b. Buildings containing vent-free gas logs or gas/kerosene space heaters shall not be retrofitted until units are permanently removed.

c. If gas equipment is replaced and gas appliances are installed inside of the conditioned space, other than gas ranges, the new appliances shall be direct-vent or power-vented.

d. If any gas appliances remain inside the building envelope, one carbon monoxide (CO) detector shall be installed outside of each bedroom or sleeping area and according to manufacturer specifications.