2009 Ohio Volume Cap
Multifamily Housing Applications

Attachment C5 – Required for Multifamily Housing Projects

Energy Efficiency

Instructions

Attachments A, B, C1, C2, C3, C4 and C5 are required to complete a Notice of Intent and Request for Allocation of State Ceiling under 26 U.S.C. § 146.

As provided in Ohio Administrative Code § 122-4-02 in the event requests for allocation of volume cap in a particular selection round exceed volume cap then available for allocation, the information provided in these attachments will be used by the Ohio Department of Development (ODOD) to evaluate and prioritize projects. ODOD may be assisted in its review of applications by staff of the Ohio Housing Finance Agency (OHFA). In the event the aggregate amount of requests for a selection round is less than the volume cap available, all qualified projects submitted in a selection round will receive an allocation and the required attachments may be used by the ODOD or OHFA staff for data collection and analysis.

A Notice of Intent submitted without any one or more of the required category-specific attachments will be considered for an allocation; however, the Notice of Intent may be treated less favorably than properly completed Notices of Intent. ODOD staff may request additional information in follow up to its review of a Notice of Intent and the required attachments.

IMPORTANT NOTE: Use the most current version of the Required Multifamily Housing Attachments posted at www.odod.state.oh.us/edd/vc. Attachments forms are subject to change by ODOD from time to time. wers, stairs and fireplace enclosures require exterior walls to be pre-insulated and boarded before being built against

Please describe in a maximum of two pages the extent to which the proposed project meets the energy efficient design standards listed below. Source: 2009 Affordable Housing Funding Applications and Forms – Development Features Agreement published by the Ohio Housing Finance Agency (January 22, 2009).

Energy Efficiency
Part A is required for single family and multifamily buildings with three or fewer stories. Part B is required for multifamily buildings with four or more stories.

PART A
Single family and multifamily buildings with three or fewer stories (new construction or rehabilitation) must comply with all applicable codes, including the 2006 Ohio Residential Code and the 2006 International Energy Conservation Code, and also select one of the following options to assure safe, healthy, durable, efficient homes.

____ Option I. Builder Option Package Approach – New Construction

1. Minimum Features:

Attic:	R 30	(with heal truss or air barrier at perimeter)
Ext Wall:	R 13	(in contact with conditioned surface)
Floor / cold:	R 19	(installed against the floor above)
Basement:	R 5	(top to footer)
Crawl:	R 5	(all crawls will be unvented)
Slab on grade:	R 10	(2 feet if <6000 HDD / 4 feet if >6000 HDD)
Windows:	U 0.48	(up to 12% win/wall) <U 0.40 (above12% win/wall)
Heating unit:	90 AFUE	(2 pipe) OR 8.0 HSPF OR 3.0 COP (Elec resistance permitted if design load <30k – see sizing caution above)
AC	13 SEER	
Hot water	Gas direct vent OR 0.91 EF if electric	

2. Inspections:
- (In each project, the 1st unit, 1 of the next 4, and 1/7 of the rest)
- Inspector must be properly certified (e.g. HERS) and not affiliated with builder or agency.
- Foundation – before backfill to note drain and insulation system.
- AIP – before drywall to note duct connections and insulation.
- Verify load calcs have been performed and that equipment is over sized by no more than 15% (exception: where equipment is the next size available) for each model built.

3. Performance tests:
- Blower door for whole house air leak rate; cannot exceed 0.35 ACHnat.
- (Mechanical ventilation required <0.20 ACHnat – must be hard wired, rated for continuous duty, < 1 sone, and use </= 25 watts [typ. Panasonic FV 08VF2].)
- Duct testing using Delta Q or Duct Blaster; leakage rate cannot exceed 6% of the total system airflow to the outside, with deficiencies corrected and retested if necessary.

____ Option II. Builder Option Package Approach – Existing or Rehab Units

1. Minimum Features:

Attic	R 30	(with heal truss or air barrier at perimeter)
Ext Wall:	R 13	(in contact with conditioned surface)
Floor / cold	R 19	(installed against the floor above)
Basement	R 5	(installed a minimum of 4 feet down from top with air sealing at the edges)
Crawl	R 5	(all crawls will be unvented)
Windows	U 0.48	(up to 12% win/wall) <U 0.40 (above12% win/wall)
Heating unit	90 AFUE	(2 pipe) OR 8.0 HSPF Air Source Heat Pump OR 3.0 COP (Elec resistance permitted if design load <30k – see sizing caution below)
AC	13 SEER	
Hot water	Gas direct vent OR > 0.91 EF if electric	

2. Inspections:
Verify load calcs and equipment sizing have been performed for each rehab model after energy upgrade efforts have been applied (maximum oversize is 15% or next available equipment size).

3. Performance tests:
- Blower door testing for whole house air leak rate with a target of 0.35 ACHnat but with a 50% reduction as a minimum.
- (Mechanical ventilation required <0.20 ACHnat – must be hard wired, rated for continuous duty, < 1 sone, and use </= 25 watts [typ. Panasonic FV 08VF2].)
- Duct testing using Delta Q or Duct Blaster; leakage rate cannot exceed 6% of the total system airflow to the outside, with deficiencies corrected and retested if necessary.
- Not required if all ducts are visible in conditioned space – type of ranch on basement units.
- Worst case exhaust testing for all units using open combustion appliances with flagging of backdraft potentials.

____ Option III. Energy Star Home ® Approach

ENERGY STAR HOME ® certification by an accredited HERS Rater that must include:

- Design – A rating from plans for each model done in Ohio worst case configuration.
- Inspection – Perform a successful EPA thermal bypass checklist.
- Audit – Perform all mandated air leak and duct system leak testing.
- The minimum requirement in each of these approaches includes the attached Construction Guidelines and Inspections / Performance testing performed by an accredited independent third party.
- Performance testing will be done on each Single Family unit; multifamily units can be tested at the One in Four rate if the builder maintains consistent production quality, first measured

by initial successful audits of four units. Failures require testing two additional units for the failed item, corrective action to bring the failed unit up to standards, and may require retesting for the failed component. Three or more failures in a subdivision require full audits for that subdivision.

PART B

Multifamily buildings with four or more stories must comply with all applicable codes, including the 2006 Ohio Residential Code and the 2006 International Energy Conservation Code, and also select one of the following options to assure safe, healthy, durable, efficient homes.

____ Option I. New Construction

1. Minimum Energy Standard:
- Buildings must be constructed that use 20% less energy than that required by the energy requirements of ASHRAE 90.1 2004 or the IECC 2006. A modeling approach based on the Performance Rating Methodology (Appendix G) of ASHRAE Standard 90.1 2004 must be used to demonstrate compliance.

2. Inspections:
- Verify design plans will result in a building that uses 20% less energy than required by Code.
- Verify load calcs have been performed and that equipment is over sized by no more than 15% (exception: where equipment is the next size available) for each model built.
- Foundation – before backfill to note drain and insulation system.
- AIP – before drywall to note duct connections and insulation, airsealing details as required by the code.
- Final – verify correct HVAC, appliances, lighting, windows installed.

3. Performance tests:
- Infrared scans of exterior surfaces are recommended.
- HVAC efficiency and system flows; to include safety testing of combustion appliances, ventilation system flows, duct system flows, heating and A/C temperature drops are mandatory.

____ Option II. Rehabilitation

1. Minimum Energy Standard:
- Rehabilitated multifamily buildings must meet the thermal (Ua) requirements of ASHRAE 90.1 2004 or the IECC 2006 and have Energy Star® HVAC systems, appliances and lighting installed.

2. Inspections:
- Verify design plans will result in a building that meets the Ua requirements of the appropriate compliance path.
- Verify load calcs have been performed and that equipment is over sized by no more than 15% (exception: where equipment is the next size available) for each model built.
- Foundation – before backfill to note drain and insulation system.
- AIP – before drywall to note duct connections and insulation, airsealing details as required by the code.
- Final – verify correct HVAC, appliances, lighting, windows installed.

3. Performance tests:
- Infrared scans of exterior surfaces are recommended.
- HVAC efficiency and system flows; to include safety testing of combustion appliances, ventilation system flows, duct system flows, heating and A/C temperature drops are mandatory.

Construction Notes – Minimum Guidelines for all New construction:

<u>Water management</u> Keep it out & let it out

<u>House wrap</u>
- Flashed at all openings including window sill panning (a Drained System)
- Extends above wall to cover gable ends
- Kick out flashing on shed roofs
- Grade away from foundation (grade slope away guaranteed 1 year)
- Granular fill or drain board against foundation
- Bitumen spray or damp proofing on below grade walls
- Footer tile (below top of footer) to daylight or to interior tile/ sump

<u>Insulation</u>
- Adjacent, enclosed, & kept dry – installed attic to footer
- Foundations – place insulation:
- On the exterior, before backfill
- Top to footer
- Or, grade down, if…
- On poured walls – interior insulation above grade (overlaps by 1')
- On block walls – above grade foam filled block (overlaps by one block)

<u>Walls</u>
- Install insulation against conditioned surface (face staple batts)
- Enclose insulation on all six sides – protected from air wash

<u>Ceilings</u>
- Even depth (blow bags, not inches to reach R 30 min)
- Soffit chutes are to be full cavity with tabs to protect edge of perimeter insulation
- Guarantee depth 1 year after occupancy
- Floors over cold space
- Bonus room
- Seal floor from adjacent attics and outside air
- Place insulation against floor above
- Cantilevers
- Seal from conditioned space
- Place insulation against floor above

<u>Vapor Barrier</u>: Use a smart vapor barrier

- Kraft backed fiberglass insulation
- Or CertainTeed MemBrain over insulation
- Or drywall with two coats of paint

- Over damp spray cellulose
- Or over any dense packed, cavity filled insulation

Air barrier Continuous, rigid, & durable

Exterior
- Continuous, sealed exterior sheathing at all joints, top and bottom edges
- Or house wrap taped on all seams, including top and bottom edges

Interior
- Seal the drywall
- Seal recessed can lips, utility boxes, door jambs
- Glue drywall to top plate on all walls adjacent to cold space above
- Kneewalls need top & bottom plates and covered backside
- Framing return air cavities will be in interior walls with drywall glued on all eight faces
- Tubs, showers, stairs and fireplace enclosures require exterior walls to be pre insulated and boarded before being built against