



THE PRINCE GEORGE'S COUNTY GOVERNMENT
Department of Housing and Community Development

CDBG Substantial Rehabilitation
Standards for Single Family Homes
Neighborhood Stabilization Program
GREEN BUILDING STANDARDS ADDENDUM



JANUARY 2012

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Should any provision of the CDBG Substantial Rehabilitation Standards for Single Family Homes Specifications be in conflict with this Green Addendum, applicable provision of the Green Addendum will prevail and supersede the conflicting provision of the CDBG Substantial Rehabilitation Standards for Single Family Homes Specifications.

Introduction

This Green Addendum to the CDBG Substantial Rehabilitation Standards provides Specifications and guidance for implementation of the Green Suitland NSP3 Acquisition and Rehabilitation Activity and other NSP activities to be undertaken.

Definition of Construction Project Types

Substantial Rehabilitation: A project that includes the demolition and removal of all interior components down to bare stud walls, that exposes significant portions of the structure and the building envelope through demolition, that replaces/improves major building systems and finishes, or that includes the treatment of framing subjected to mold and mildew.

Moderate Rehab: A project that through selective demolition, partially exposes the structure and air barrier of the building envelope and/or replaces or improves major building systems.

Minor Rehab: A project that involves only cosmetic repairs, replacements and/or may replace faulty heating, electrical or plumbing equipment.

Decision regarding Project Type will be made by the NSP Construction Manager.

GREEN Addendum Definitions

ACCA (Air Conditioning Contractors of America) The national trade association for HVAC contractors. Also the source of the Most recognized systems for calculating heating and cooling loads, selecting HVAC equipment to meet those loads and for designing ductwork to deliver the appropriate conditioned air to buildings. See Manuals J, S, and D below. ACCA also is the only source at present for training HVAC contractors to meet the requirements of ENERGY STAR Version 3.0.

ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Standard 62.2-2010: Establishes minimum requirements for ventilation and acceptable indoor air quality in low-rise residential building. www.ashrae.org/technology/page/548).

CFM (cubic feet per minute): A standard unit of measurement for airflow that indicates how many cubic feet of air is passing through a fixed point per minute.

ECM (electronically commutated motor): A DC electric motor that uses electricity efficiently, particularly at lower speeds, also known as a "brushless DC motor."

ENERGY STAR: A voluntary labeling program designed to identify and promote energy efficient products to reduce greenhouse gas emissions. Introduced by the EPA in 1992, ENERGY STAR Qualified Homes represent an accepted, national standard for single-family and low-rise residential New Construction projects. Light fixtures and appliances may also be ENERGY STAR Qualified Products and carry the ENERGY STAR label.

Engineered wood products: Wood building materials manufactured by gluing particles, fibers, or veneers to increase strength.

Formaldehyde: A chemical used widely by industry to manufacture building materials and numerous household products. Formaldehyde is also a by-product of combustion and certain other natural processes, and thus may be present in substantial concentrations both indoors and outdoors. Health effects include eye, nose, and throat irritation; wheezing and coughing; fatigue; skin rash; and severe allergic reactions. Formaldehyde is a known carcinogen. www.epa.gov/iaq/formalde.html.

Green Compliant: Examples of green compliant material requirements include but are not limited to the use of the following:

- LOW-or NO VOC paints and sealants
 - Formaldehyde Free
 - Renewable and Sustainable Resource
 - Recycled Material
 - Organic Material
 - Asbestos Free
 - Low Carbon Foot Printing
 - Natural Resource
 - Abundant Resource
 - Biodegradable Material
 - Meets E 1 Standards
 - Meets the Carpet and Rug Institutes Green Label Certification
 - Types Of Flooring – , carpet, concrete, cork, hardwood, laminate, rubber, stone and tile.and sheet vinyl
- Note: Various entities list particular products as “Green” but there is the potential for “Green Washing” by claiming a product is Green without the certification of such by a reputable third party.

HERS Index (Home Energy Rating System Index): A scoring system established by the Residential Energy Services Network (RESNET) in which a home built to the specifications of the HERS Reference Home (based on the 2006 International Energy Conservation Code) scores a HERS Index of 100, while a net zero energy home scores a HERS Index of 0. The lower a home's HERS Index, the more energy efficient it is in comparison to the HERS Reference Home. Each 1-point decrease in the HERS Index corresponds to a 1% reduction in energy consumption compared to the HERS Reference Home; thus a home with a HERS Index of 85 is 15% (or 75 is 25%) more energy efficient than the HERS Reference Home, which has an index of 100.

Manual D: Manual prepared by the Air Conditioning Contractors of America (ACCA) on residential duct design and sizing.

Manual J: Manual prepared by ACCA on residential load calculations.

Manual S: Manual prepared by ACCA on residential equipment selection.

VOCs (Volatile Organic Compounds): A large group of carbon-based chemicals that easily evaporate at room temperature. www.epa.gov/iaq/voc.html

Specifications

The burden of proof is on the contractor to show that all materials, preparation, finishing and workmanship, are compliant with the projects specifications and industry standards.

Prince George's County Building Permits

Mandatory – All Substantial & Moderate Rehab Projects

- Contractor shall provide building permits as required for the rehabilitation project and shall have specialty contractors provide permits for plumbing, heating and air-conditioning and electrical work to be performed. Provide inspection approvals from county inspectors and the NSP Construction Manager before close-in.

Addendums & Warranties

Contractor is to provide a packet containing all manufacturer's manuals and warranties on all the installed equipment, fixtures and appliances, at the time of the Final Inspection. Any/All pre-existing items are exempt unless required in the work write-up. Final invoice will not be processed until packet is provided.

DIVISION 1- GENERAL REQUIREMENTS

DIVISION 1B – General Conditions

Energy Efficiency and Testing

Mandatory – All Substantial Rehabilitation projects

- **Standard:** The target Energy Efficiency performance is to meet or exceed the current ENERGY STAR requirement for the region at the time of project completion. Projects completed by 6/30/2012 will be subject to the ENERGY STAR version 2.5. Projects completed after that date will be subject to ENERGY STAR Version 3.0.
- **Testing:** Testing to determine compliance with ENERGY STAR shall be done by an independent third party, Certified HERS Rater. Moderate and Minor projects will be modeled and tested but will not be held to the ENERGY STAR standard. However energy efficiency to the greatest extent feasible will be a high priority for all projects including Moderate and Minor Rehabs. The NSP Construction Manager will review all projects to ensure that the energy efficiency requirements of this Green Building Standards Addendum are met and are fully addressed in the specifications.
- **Rater(s):** Cost for the HERS Rater should be included in construction budget. Only a Redevelopment Authority approved HERS Rater may be used.

Building Envelope Air Tightness and Testing

Mandatory – All Substantial Rehabilitation projects

- **Standard:** Air tightness of building enclosure (envelope) – 0.40 CFM 50 per sq. ft. of building enclosure (measured at 50 Pascals (Pa)) (The building enclosure includes the floors, walls and ceilings that are part of the building envelope).
- **Testing:** Before a project is determined to be completed by the NSP Construction Manager, the house shall undergo a blower door test by a third party HERS Rater to verify that the air tightness of the building enclosure (envelope) meets the current standard listed above.

HVAC Equipment and Ductwork Installation and Testing

Mandatory – All Substantial & Moderate Rehabilitation projects

- **Standard:** All duct connections shall be sealed with a UL listed low VOC mastic product designed for that purpose.
- **Standard:** New HVAC equipment shall be sized using the current edition of the Air Conditioning Contractors of America (ACCA) Manual J Heat loss calculation tool <https://www.acca.org/store/category.php?cid=2> (calculate manual J based on the post rehab building envelope), and equipment shall be selected for installation using the current edition of the ACCA Manual S. If new ductwork is installed the current edition of the ACCA Manual D shall be required to design and size ductwork. The completed ACCA Manuals J, S and D (when D is required) must be reviewed by the HERS Rater for approval prior to installation.
- **Standard:** Combustion appliances must meet the Building Performance Institute (BPI) standard for Combustion Safety and Carbon Monoxide Protection of occupants as certified by a BPI certified Building Analyst Professional.
- **Testing:** Provide any ACCA Manuals J, S & D reports that are required by the Standard above with first Draw documents to the HERS rater. Combustion safety, balanced delivery of conditioned air per ACCA Manual design, and approved levels of ductwork leakage are required and must be tested by the HERS rater. . The completed ACCA Manuals J, S and D (when D is required) must be reviewed by the HERS Rater for approval prior to installation.

Mandatory – All Substantial Rehabilitation projects

- **Standard:** Duct leakage shall be measured by the HERS rater. Total Rater-measured duct leakage shall be less than 6 CFM25 per 100 sq. ft. of conditioned floor area. Rater -measured duct leakage to outdoors shall be less than 4 CFM25 per 100 sq. ft. of conditioned floor area. (ENERGY STAR requirement)

Lead Safe and Lead Paint Clearance Testing

Mandatory – All Projects

- **Standard:** For all properties constructed prior to 1978, renovation repair and painting shall comply with the EPA Mid-Atlantic Region Lead-Based Paint Renovation, Repair, and Painting Rule, requiring the use of certified /, using certified renovators and workers trained in lead-safe work practices, and the Code Of Maryland Regulations (COMAR 26.02 and 26.16) and OSHA 29CFR 1926.62. **Testing:** For all properties constructed prior to 1978, testing shall be conducted by an inspector & laboratory accredited by the Maryland Department of the Environment.

Inspecting Energy Related Features

Mandatory – All Projects

To verify the installation of energy-related features, such as those listed below in bullets, all homes shall have at least 4 on-site inspections by the Developer's Construction Manager and the NSP Construction Manager

1. After air sealing and mechanical rough-in before insulation installation
2. After the installation of exterior doors and windows while the flashing details are visible
3. After insulation installation
4. At construction completion

The HERS Rater's inspection schedule may differ slightly but ideally would be coordinated these inspections.

Examples of energy efficient components to be inspected include:

- Duct installation and sealing.
- Building envelope air sealing details.
- Proper installation of insulation, including no gaps, voids, or compressions.
- Insulation is accurately fitting cavity
- Windows and doors are to be flashed, caulked, and sealed properly.

Material

Recommended If Locally Available – All Projects

- Use pre-cut or pre-assembled building systems or methods.
- Use building materials that require no additional resources to complete application onsite.
- Use recycled-content building materials.
- Use materials from renewable resources or agricultural byproducts.

Material Protection and Moisture Prevention

Mandatory – All Projects

- Protect unused moisture-sensitive materials from water damage through just-in-time delivery, storing unused materials in a dry area, or tenting materials and storing on a raised platform.
- Maintain moisture content of materials to industry standards.

Integrated Pest Management

Mandatory – All Projects

- Use Integrated Pest Management methods to control pests where and when possible.
- Seal all cracks, holes and crevices on interior surfaces and exterior surfaces to prevent access by pests.
- Place a thin dusting of 98% boric acid under kitchen cabinets, in wall cavities, cracks and crevices in the kitchen.

Accessibility/Universal Design Standards

Recommended if feasible - Substantial Rehabilitation

At least 10% of all NSP funded projects substantially rehabilitated projects by the Developer shall meet the following accessibility standards if feasible:

Zero Step Entry (Units proposed as accessible units)

House should have: If possible and without requiring structural modifications:

- At least one 5' X 5' clear area at the exterior visit-ability/accessibility route entry point of which the interior finished floor level is the same level as the finished exterior ground/porch/deck area. The no-step or zero-step entry can be located at the front or rear of the structure. It can also be located through the garage, provided that the entrance to the garage from the sidewalk or driveway has a maximum slope of 1:20.
- Whenever possible, the entrance should be sheltered. If grading is required, the maximum slope is 1:20. The free/clear area outside the door shall be a minimum turning radius of 5'.
- A maximum threshold rise no greater than 1/2" between the exterior level area and the interior finished floor level.
- A covered, (roofed), entry area, with a minimum 36" overhang.

First Floor Bedroom & Accessible Bathroom Units proposed as accessible))

- Construction of a first floor bedroom and an accessible/usable full bathroom.
- However, when a 1st floor bedroom and a full accessible/usable bathroom are not possible due to limited square footage conditions, build an accessible/usable half bath. If an accessible/usable half bath is not possible, then construct a standard operational half bathroom.

Laundry Room

- Construct a complete laundry room on a habitable floor level where square footage will allow.

Kitchen Floor Design

- Design an Accessible/Usable floor space, using the Fair Housing Act Design Addendum.

Bathroom Floor Design

- Design an Accessible/Usable floor space, using the Fair Housing Act Design Addendum.

Second Floor Stair System

- Width of stairways is to be between 42" to 48" to accommodate a future chair lift installation.

DIVISION 2

DIVISION 2A

Disposal/Recycle

Mandatory – All Projects

- Recycle all cardboard generated by construction and all cardboard trash in the house to the local recycling plant.
- Recycle All construction and demolition debris where possible. (The Construction Materials Recycling Association has a list of companies that recycle construction waste in Maryland. <http://www.cdrecycling.org/find.html>)

DIVISION 2B

Site-Work

Foundation

Mandatory – All Projects

- Provide and grade topsoil to create a minimum slope of 5% (6") for the first 10 ft. away from building.
- All gutter, downspouts and conductors are to divert the water away from the foundation thru underground plastic perforated piping system. Run perforated piping to nearest outfall.
- If site conditions will not allow for the installation of the grading & piping system requirements listed above, the inability to perform the requirements must be approved by the NSP Construction Manager.

Landscaping:

Mandatory – All Substantial Rehab; Suggested for Moderate & Minor

- Landscaping in the front of the home is required to provide a pleasant curb appeal.
- A budget of at least \$3,000 is required for landscaping.
- All **new** plantings of trees and plants are to be native species and 100% appropriate to the site's soil and climate. Do not include any invasive species. Reference the University of MD Extension service as the source for native plants in order to minimize personal interpretations of "native."
<http://extension.umd.edu/> Their Phone # 301-868-9366
 - See "Native Plants of MD" document by Md Cooperative Service — [http://hgic.umd.edu/ media/documents/NativePlantsofMD.pdf](http://hgic.umd.edu/media/documents/NativePlantsofMD.pdf)
 - You may also reference: Native Plant Center of the Chesapeake - <http://www.nativeplantcenter.net/?q=database> –
- Any turf must be listed as drought-tolerant by the University of MD Extension service.
▶▶ **Note:** Plant No Silver Maple Trees

Surface Water Management:

All projects where Feasible and Applicable

- For erosion control, if portions of lot are located on a steep slope, reduce long-term runoff effects through use of terracing and retaining walls.
- For erosion control, plant one tree, four 5-gallon shrubs, or 50 square feet of native groundcover per 500 square of disturbed area
- For runoff from roof, install permanent storm water controls (e.g., vegetated swales, on-site rain garden, dry well, or rain-water cistern) designed to manage runoff from the home.

Conserve Existing Onsite Vegetation

Mandatory – All Projects

- Minimize disturbance of and damage to trees and other existing vegetation, except all foundation damaging trees/plants which shall be removed from site.
- Prepare designated existing trees and vegetation for impact of construction by pruning, root pruning, fertilizing and watering.

Minimize Soil Disturbance and Erosion

Mandatory – All Projects

- Schedule construction activities to minimize exposed soil.
- Use alternative means to install utilities, such as, use of smaller equipment, shared trenches or easements.
- Designate limits of clearing and grading.

DIVISION 6

DIVISION 6A

Framing Techniques and Plans

The use of a detailed framing plan reduces material waste wood without compromising the structural integrity.

- Create a framing order waste factor limit. Limit the overall estimated waste factor to 10% or less. Waste factor is defined as the percentage of framing material ordered in excess of the estimated material needed for construction.

Lumber & Wood Alternatives

►► **Note:** Recycled Products, Reclaimed and Composite products with no added urea-formaldehyde resins are preferred.

Building Material

- Use pre-cut or pre-assembled building systems or methods.
- Use building materials that require no additional resources to complete application onsite.
- Use recycled-content building materials.
- Use materials from renewable resources or agricultural byproducts.

Oriented Strand Board (OSB)

Mandatory – All Projects

- Use as an alternative to plywood for sheathing, flooring and roofing unless otherwise specified.

Synthetic Lumber

- Synthetic lumber made from recycled plastic products may be used on the exterior as an alternative to wood in nonstructural applications such as decking and fencing.

DIVISION 6A #5

Mandatory – Substantial Rehab Projects

Exterior Doorways

- Minimum net clear width shall be 36".

Interior Doorways

- All interior doors shall be at least 32" or 34" if unit designated as an accessible unit, with a flush threshold.
- Exception: Any unit that the first floor and/or second floor stairway, cannot meet the Accessible/Universal Design Standard due to design/lot restrictions is exempt from the door standard.

DIVISION 6A #6

Wood Blocking

Mandatory – Substantial & Moderate Rehab If Walls Are Opened/Accessible

- Wood blocking shall be installed in between framing members of the following areas to support all handrails and grab-bars. The blocking shall be nominal 2" thick lumber of a width sufficient to keep all fasteners a minimum 1" from the edge of the blocking. Blocking shall fit snugly between framing members and shall be securely attached to the framing.
 - All bathroom walls.
 - Shower stalls
 - Tub/Shower area
 - In stairway wall to 2nd floor.

DIVISION 6B

Cabinets & Countertops

Mandatory – All New and Replacement Installation

- All base cabinet fronts at sink area must be of the removable style/design for the purpose of accessibility.

Countertop

Mandatory – All New and Replacement Installation

- After field measure for sizing, install a Plastic Laminate or an approved equal or better compliant countertop to a maximum height of 36".
- Seal all exposed composite wood surfaces including the underside of the countertop with a low VOC sealant.
- Screw to base cabinet a square edged plastic laminate counter top.
- Provide end-caps and cutout for sink.
- Caulk countertop to adjoining walls with low VOC caulking to match wall color. Developer's choice of in-stock color and texture.

Mandatory on all 100% Accessible/Universal Design Units Only

- All cabinet doors and drawers shall have loop or U shaped style handles installed as low as possible on wall cabinets and as high as possible on base cabinets.
- Base cabinets are to include a pull out workspace such as a pull out cutting board or an accessible 30 inch AFF work station can be substituted for the pull out work space

Base, Wood Cabinet

Mandatory – All New and Replacement Installation

- Install base cabinets constructed of solid hardwood face-frames, doors and drawer fronts with ½" wood/plywood carcasses and floors.
- Drawer boxes shall be wood or plywood, and joined using wood, metal or plastic corner bracing.
- Use cabinets that are Environmentally Certified under Kitchen Cabinet Manufactures Association's (KCMA) Environmental Stewardship Program (ESP).
- Cabinets shall be of a height to accommodate the countertop height of 36".

Base, Low VOC, Wood Cabinet

Mandatory – All New and Replacement Installation

- Install cabinets constructed of solid hardwood face-frames, doors and drawer fronts. Drawer boxes shall be wood or plywood. Carcasses will be joined using wood, metal or plastic corner bracing.
- Cabinets shall be of a height to accommodate the countertop height of 36".

Base Cabinet Shelves

Suggested

- Install base cabinets with the lower shelves that pull out like drawers.

Wall, Wood Cabinet

Mandatory – All New and Replacement Installation

- Install wall cabinets constructed of solid hardwood face-frames, doors and drawer fronts with ½" wood/plywood carcasses and floors. Carcasses will be joined using wood, metal or plastic corner bracing.
- Use cabinets that are Environmentally Certified under Kitchen Cabinet Manufactures Association's (KCMA) Environmental Stewardship Program (ESP).

Wall, Low VOC, Wood Cabinet

Mandatory – All New and Replacement Installation

- Install wall cabinets constructed of solid hardwood face-frames, doors and drawer fronts. Drawer boxes shall be wood/plywood. Carcasses will be joined using wood, metal or plastic corner bracing.
- All particleboard components shall meet ANSI A208.1 for formaldehyde emission limits or all exposed particleboard shall be sealed with a clear low-VOC sealant or have a factory-applied sealant prior to installation.
- All MDF edges shall meet ANSI A208.2 for formaldehyde emission limits or all exposed MDF edges shall be sealed with a clear low-VOC sealant or have a factory-applied low-VOC sealant prior to installation. Note: Cabinets that meet the KCMA Environmental Stewardship Program

(ESP) requirements and have that logo meet the above listed requirements.

<http://www.greencabinetsource.org/Uploads/file/ESP%2005-12%20Standard.pdf>

Medicine Cabinet (Shelf)

Mandatory – All Projects

- The medicine cabinet shall have at least one usable shelf no higher than 44" above the finished floor.

Medicine Cabinet (Mirror)

Mandatory – All Projects

- The medicine cabinet mirror shall have the bottom reflective edge no higher than 40" above the finished floor.

Wall Mirror

If one is to be installed

- The mirror shall be mounted with the bottom edge of the reflecting surface no higher than 40" above the finished floor.

Doors, Exterior

Mandatory – All New and Replacement Installation

Owner/Developer to choose type/style/color.

Metal

- Install an ENERGY STAR Certified steel insulated door, complete with lockset and deadbolt lockset. All locksets and deadbolt locks shall be keyed alike.
- The door must also include one 180 degree peep hole at 59" above finished floor.
- The threshold is to be no higher than ½" if the entry is at the visit-ability/accessibility route.
- All doors, front/rear/side, shall be 36" wide.

Wood

- Install an ENERGY STAR Certified wood door, complete with lockset and deadbolt lockset. All locksets and deadbolt locks shall be keyed alike.
- The door must also include one 180 degree peep hole at 59" above finished floor
- The threshold is to be no higher than ½" if the entry is at the visit-ability/accessibility route.
- All doors, front/rear/side, shall be 36" wide.

Fiberglass

- Install an ENERGY STAR Certified fiberglass door, complete with lockset and deadbolt lockset. All locksets and deadbolt locks shall be keyed alike. The door must also include one 180 degree peep hole at 59" above finished floor. The threshold is to be no higher than ½" if the entry is at the visit-ability/accessibility route. All doors, front/rear/side, shall be 36" wide

Peep Holes

Mandatory on all 100% Accessible/Universal Design Units Only

- A second 180 degree peep hole shall be installed at 45" above the finished floor.
- All Exterior Entry Doors shall have peep holes, except the following:
 - Exterior doors with clear view side-lite(s).
 - Exterior doors with lite(s).
 - Garage, Service Doors.

French Doors

- Install ENERGY STAR Certified French Doors in lieu of sliding doors if the doorway is at a visit-ability route. Threshold shall be no higher than 1/2" inch.

Garage

Mandatory on all 100% Accessible/Universal Design Units Only

- Overhead Door - All garages shall have an automatic garage door opener with two remote controllers and an exterior surface mounted key-pad.
- ▶▶ **Mandatory Notice:** Must Install Door Flashings
- Effective flashings must be used on all rough openings, including membrane flashing on bottom of all rough openings for windows, (pan flashing with back dam), and doors using adhesives compatible with drainage plane materials . Also install window and door jamb and head flashing that integrates with drainage plane.

DIVISION 6B #6

Floor Coverings

Mandatory – All Projects if replacing

Owner/Developer to choose all brands, colors, finishes, etc.

- All adhesives used shall be no/low VOC products
- All floor tile, sheetgoods and wood flooring in the kitchen must be extended under the base cabinet at the sink area because it shall have a removable front.
- All bathrooms shall have non-slip green compliant flooring that meets the FloorScore® certification. <http://www.scs-certified.com/products/program.php?a=FloorScore>

Floor Coverings

- Install an approved Green Compliant, LEED or Enterprise Green Communities Standards compliant product
 - Tile
 - Sheet Goods
 - Wood

▶▶ **NOTE:** At all entryway floor areas at the exterior doors, must be covered with water-resistant flooring; no carpet. The dimensions shall be a minimum of a 4' X 4' area.

►► **NOTE** : Developers are encouraged not to use carpeting, which can be a harbinger for dust, allergens and other substances that may pose health hazards to susceptible residents. We recommend developers use alternative flooring material such as, ceramic tile, cork, wood or rubber.

Carpet With Padding

If Installing Carpet

- Install FHA approved carpet. Install over ½" medium density pad with a minimum of seams.
- Carpet, carpet adhesives and pad must meet the Carpet and Rug Institutes Green Label certifications.
- Stretch carpet to eliminate puckers, scallops and ripples.
- Include tackles strips, metal edge strips and mending tape.
- Carpet is to cover the entire floor including any closets in the room.
- No carpet in kitchen and bathrooms.

DIVISION 6B #9

Windows

Mandatory - Substantial & Moderate Rehab

- All operable primary windows installed shall have a sill height minimum of 24" and a maximum height of 30" from the finished floor or as required by code. A primary window is defined as a window in a living area above grade. Each room/living space must have at least one primary window.
- Exceptions
 - Kitchen – The height standard does not apply to windows over cabinets.
 - Bathroom – For the reason of privacy, the height standard does not apply, however, if the bathroom window is above the bathtub, the sill height must be 59" above the floor or safety grilles must be installed to prevent falling against the glass sash..
 - Historic structure
 - Existing brick structure
 - Secondary windows

DIVISION 6B#10

Doors, Exterior

Mandatory – All New and Replacement Installation

Owner/Developer to choose type/style/color.

Refer to "Doors, Exterior", above.

Exterior Door Locksets

Mandatory on all 100% Accessible/Universal Design Units Only

- All locksets shall be lever handle style.

DIVISION 6C

Insulation & Air Sealing Structure

Mandatory – All Projects

Air Seal Structure

- The ENERGY STAR Version 3 Thermal Enclosure System Rater Checklist shall be completed to document that the air sealing is complete. See section 3 - Fully-Aligned Air Barriers and Section 5 - Air Sealing.
 - Seal all accessible cracks, gaps and holes in the building envelope (the barrier between the indoor conditioned space and the outside) with either low VOC caulk if less than 1/4" wide or expanding foam if greater than 1/4" wide.
 - Seal all top plate and bottom plate penetrations. If the foundation masonry wall is open core concrete block seal the tops of the block with expanding foam.
 - Seal all penetrations created by plumbing, gas lines, electrical boxes and outlets.
 - Seal large accessible gaps around windows between house framing and window frame – use special care on large sliding-glass doors and vinyl-framed windows. Do not use expansive foam on these.
- **Note:** Take care to seal all joints without excess sealant.
- Seal any gaps in the building envelope adjacent to flues with carefully cut to fit sheet metal that is securely fastened to framing, then sealing all seams and gaps with fire rated caulk.
 - Ensure that any recessed light fixtures in ceilings that are a part of the building envelope are rated for insulation contact (ICAT rated) and properly gasketed (sealed) to the drywall. If they are not, replace them with fixtures rated for insulation contact or remove the fixture(s) and seal the resulting opening(s) with plywood on top of the ceiling finish that is securely fastened to the ceiling and install an electrical box to connect a new surface mounted fixture that will cover the resulting hole.
 - Attic access panels and drop-down stairs will be equipped with a durable $\geq R-10$ insulated cover that is gasketed (i.e. not caulked) to produce continuous airseal when occupant is not accessing the attic.
 - All mechanicals shall have the rough-in inspections signed off first, before any unit can be air sealed.
 - Air sealing must be done and inspected/approved by the NSP Construction Manager, prior to the installation of insulation.

For Attached Garages

- Install an exhaust fan with a minimum capacity of 70 cfm and rated for continuous operation, and install to vent directly to outdoors. Install automatic fan control which will activate whenever the garage is occupied and for at least 1 hour after the garage has been vacated.
- Ensure a tightly-sealed door between the garage and living area. Also, provide continuous air barrier between garage and living areas including air seal penetrations at, walls, ceiling, and floors.
- Area between the garage ceiling and second room floor shall be insulated to an R-30 rating or better. Dense packing with cellulose or fiberglass is recommended. Insulation shall be in continuous contact with the floor of the room above.

Crawl Space Air Seal and Insulate

- Install a 6 mil poly vapor barrier on ground in crawl space and up foundation walls to an end product that will provide a water tight seal between the interior of the crawl space and the walls and floor of the crawl space. All penetrations including but not limited to those created by plumbing, electrical and HVAC equipment will be sealed tight.
- Provide crawlspace vents in accordance with code requirements.

- Insulate the perimeter wall of the crawlspace with foil faced foam and turning it into conditioned space.
- Area to be completed (insulated and sealed) without voids, and any gaps shall be sealed with polyurethane foam sealant.
- Insulation and sealing must be inspected and approved by the NSP Construction Manager, and the HERS rater.

Insulation Performance Standards and Testing

Mandatory – All Projects

- **Standard:** Rim Joists: R-19 minimum
- **Standard:** Exterior Wall System: R-13 minimum.
- **Standard:** Attic: R-38 minimum, or the current ENERGY STAR required level, including the backside of the access panel door. Provide sufficient air-flow area for attic ventilation from soffit vents and provide gable end venting for cross ventilation. Supplement attic venting if needed with turbine-type mechanical vents.
- **Testing:** Developer and NSP Construction Manager inspection of materials and workmanship prior to covering and the HERS rater rough inspection on insulation and airsealing prior to close in.

Existing Walls Not Being Demolished

- Blow-in insulation to meet R-13 value or greater.

Water Lines

Copper Only

- Insulate all exposed and accessible hot and cold water lines with closed cell polyethylene slip on pipe insulation, sized to fit pipe diameter.
- Seal seams with 5 mil pipe insulation sealing tape or closure clips designed for pipe insulation placed every 4".
- Seal all butt joints between sections of pipe with 5 mil pipe insulation sealing tape.
- Neatly miter all angled junctions.

Spray Foam

For Rim/Band Joist Areas (to R-19 minimum)

- After cleaning the area thoroughly, apply Green-compliant, expanding foam either separately or in combination with batt insulation to achieve a minimum R19, and meet building code fire retardancy requirements. Apply to the rim joist at the entire perimeter of the basement and/or crawl space exterior walls. Install to R 19 at a minimum.
- Use a foam product that meets International Residential Code (IRC), Section R314.5.11, and Underwriters Laboratories, Inc. (UL) classification Certificate R7813.
- Insulate and air seal the rim and band area between the first floor subfloor down to the top of the foundation wall and seal all penetrations and the top of the foundation.
- Seal all openings within the area of the rim joist created by plumbing, gas lines, electrical boxes or any other penetrations.
- When exposed through removal of wall, ceiling or floor surfaces, the Rim/Band joist between floors shall be sealed as described above.

DIVISION 6D

Windows

Mandatory – All New and Replacement Installation

All single pane windows MUST be replaced on Substantial & Moderate Rehabilitations

Flashing

- Effective flashings must be used on all rough openings, including membrane flashing on bottom of all rough openings for windows, (pan flashing with back dam), and doors using adhesives compatible with drainage plane materials. Also install window and door jamb and head flashing that integrates with drainage plane.

House Windows: Vinyl, Wood or Fiberglass - Single or Double Hung

- Install only operable windows that have National Fenestration Rating Council (NFRC) ratings that meet or exceed the window requirements for ENERGY STAR Rating for the North Central Climate Zone, which currently has a U-Value rating of less than or equal to 0.32 and a Solar Heat Gain Coefficient (SHGC) of less than or equal to 0.40
- All operable windows are to include screens.

Basement Windows

- Install new vinyl/wood windows with screen.

DIVISION 6F

Sliding Door

- Install only glass doors that have NFRC ratings that meet or exceed the requirements of the ENERGY STAR rating.

Doors, Interior

Interior doors

- Shall be installed complete with passage latch set and use a privacy set on the bathroom(s) and bedroom(s).
- All doors that are not fiberglass, solid wood or pre-finished shall be sealed using a low/no VOC product on all six sides and the pre-drilled lock-set hole(s) shall also be sealed.

Interior Door Latch Sets

Mandatory on all 100% Accessible/Universal Design Units Only

- All latch sets shall be lever handle style

DIVISION 7

Roofing and Roof Elements

Mandatory – All Projects

Every home should have a certification performed by a Maryland licensed roofer before submitting the project budget.

- If the life expectancy is estimated at 10 years or more, the roof will be eligible to remain or to be repaired following the Standards for Replacement and Repair of Roof Coverings below.
- If the life expectancy is estimated at less than 10 years, the entire roof must be replaced per the Standard for Replacement and Repair of Roof Coverings below.

Sheathing

- All sheathing shall be OSB board and of proper thickness for spacing of roof rafters.

►► **NOTE:** The use of light color roofing is encouraged because of its reflectivity of the sun, thus lowering the roof temperature.

Standards for Replacement and Repair of Roof Coverings

Dimensional 30 Year fiberglass or asphalt Shingle Shall Be Used On All Prince George's Funded Projects (total replacement)

For repairs, only the items listed below that are applicable to the necessary repairs will apply:

- If existing sheathing is in poor condition replace with 7/16" OSB sheathing at right angles to rafters; nailed every 10" at center and 6" on edges with 8d common nails. Clean roof deck thoroughly to remove debris and to make ready to accept roof covering. Install minimum of 1 ply, 15 lb. 36" wide asphalt felt with minimum 16" selvage, and 30 year life, 3 tab asphalt or fiberglass shingles, minimum 300 lb class A, shingles in accordance with the shingle manufacturer's written specifications and with a minimum of four (4) nails per shingle.
- Install self-adhesive Ice-Guard (ice dam protection) beneath all flashings and on all edges and ridges and valleys and extend the ice-guard back at least 2' past the interior wall.
- Install new aluminum, enamel-finish drip edge flashing on all edges.
- Install new boot flashings on all vent stacks
- Install new roof ridge vent per manufacturer's printed instructions and install soffit or gable vents to complete the venting system. If house has no existing gable vents, provide soffit vents and mechanical turbine roof ventilators.
- Install new metal flashings; (chimney, counter, step, and valley).

►► **All debris shall be placed in a dumpster at the end of each day.**

Provide roofing materials by manufacturers listed below, or by approved equal manufacturers.

Manufacturer /Style	Color
<input type="checkbox"/> Certain Teed Carriage House (dimensional)	Nickel Gray
<input type="checkbox"/> GAF Slateline (dimensional)	English Gray Slate or Weathered Slate
<input type="checkbox"/> Certain Teed (standard 3-tab)	Nickel Gray
<input type="checkbox"/> GAF Royal Sovereign (standard 3-tab)	Nickel Gray
<input type="checkbox"/> Owens Corning (standard 3-tab)	Estate Gray
<input type="checkbox"/> Tamko (standard 3-tab) Antique	Slate

All debris shall be placed in a dumpster at the end of each day.

►► **Note- All roofing and venting on historic properties are to be compliant with the Historic's Review recommendations.**

Repair Slate Roof

- Existing slate roofing and clay tile roofing to be reviewed by licensed and bonded and insured specialty roofing contractor who shall prepare his assessment of the roof to be repaired or replaced. Remove damaged material, replace to match existing. Or remove complete roof and replace.

DIVISION 7G

Siding/Exterior Finish

Mandatory for All Projects

- In homes where siding is replaced, a minimum ½" foil faced Polyisocyanurate rigid foam insulation board shall be installed behind the new siding. (This is also a requirement for meeting the requirements for rebate eligibility of the upcoming PEPCO Energy Star incentive program.)

The intent on the exterior finish is to make the home as maintenance free as possible and green compliant. If the exterior finish is going to be replaced, Developer may choose one of the following finishes in any color:

- Brick
- Fiber Cement Board
- Wood
- Wood Composite
- Stucco
- Vinyl Siding

DIVISION 9

Adhesives

Mandatory – All Projects

All adhesives used shall comply with the following:

- The volatile organic compound (VOC) content of adhesives, adhesive bonding primers or adhesive primers in this project shall not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications", amended 1 January 2005): South Coast Air Quality Management District (SCAQMD), State of California, <http://www.aqmd.gov/rules/download.html>

DIVISION 9D

Ceramic Tile Surrounds

Mandatory – All Applicable Projects

- Use highly durable, moisture-resistant materials in all tub/shower enclosures such as cement board and fiberglass-reinforced paperless drywall.

►► **Note: Cement Board is required in bathrooms behind tile. Cement Board or Green Board is permitted in kitchens, basement and laundry rooms.**

DIVISION 9F

Paints & Finishes

Mandatory – All Projects

Application

- All paints and finishes shall meet the Green Seal Standard GS-11.
- All colors/finishes shall be selected by owner/developer.
- Application shall be one coat primer and two coats of finish.
- Doors shall be finished on all six sides.

Caulking

Mandatory - All Projects

- All caulking shall be a 25-year or better, paintable Low/No VOC caulk.

DIVISION 10

Dehumidifier

Mandatory – All Projects

- Provide an ENERGY STAR Certified (50 pint minimum) dehumidifier in the basement. Install a drain hose from the dehumidifier to the floor drain to eliminate the need to empty the water storage tank.

Kitchen Range Hood

Mandatory - Rehab & Substantial Rehab and if an over the stove microwave is installed, it must include an exhaust fan that vents outside.

- Install an ENERGY STAR Certified, exterior ducted, enameled range hood with integral minimum 2 speed fan control and filter and light switched separately capable of a minimum 150 cfm at a maximum of 10 sones.
- Attach hood to cabinet and blocking with screws.
- Include metal vent, to the exterior, with all seams sealed with duct mastic, and roof or wall cap/damper assembly flashed appropriately for the exterior finish. Developer's choice of color.

Dishwashers: Must meet the following

- ENERGY STAR Certified (Maximum annual energy use of 324 kWh/yr and a water requirement of 5.8 gallons/cycle.)

DIVISION 10A

Kitchen

Mandatory – All Projects

- Any/All appliances that can be purchased with an ENERGY STAR rating shall be installed.

Mandatory on all 100% Accessible/Universal Design Units Only:

- The refrigerators shall be an accessible style refrigerator per the Fair Housing Act Guidelines.

DIVISION 10B

NSP Eligible Appliances (All appliance manuals to be provided to the NSP Construction Manager)

- Clothes Washers
 - CEE Tier 2 or higher
 - Modified Energy Factor of 2.2 or greater
 - Water factor 4.5 or less
- Clothes Dryers – Natural Gas clothes dryers are highly recommended over electric clothes dryers because of their relative cost of operation.
 - Minimum 7.0 cubic feet capacity
 - Sensor Dry System
 - 5 Temperature Levels – (High, Medium High, Medium, Low and Ultra Low)

DIVISION 11

DIVISION 11A

Floor Drains

Mandatory on all projects, except those with hung sewer lines

- For existing basement floor drains, install back water valves.

Sump Pumps

- If deemed necessary with NSP Construction Manager having the final approval.

Plumbing, Bathroom

Mandatory –Substantial Rehab

►► **Note:** All water lines in Substantial Rehab are to be run inside an insulated conditioned/envelope space.

- Owner/Developer to choose all styles/colors/finishes.

Mandatory on all 100% Accessible/Universal Design Units Only

- All commodes shall have an elongated bowl and a minimum rim height of 16.5", a maximum 1.28 GPF, and tested through the latest Maximum Performance (MaP) testing sponsored by Canadian Water and Wastewater Association (CWWA), the California Urban Water Conservation Council (CUWCC), the U.S.-Canadian Alliance for Water Efficiency (AWE) and Veritec Consulting Inc. that has shown to score 800 or better on the MaP Flush Performance test (grams of solid waste removed in a single flush). www.map-testing.com Include seat, supply pipe, shut-off valve, and wax seal.

Commode

- Install a 1.28 Gallon per Flush (GPF) close coupled commode tested through the latest Maximum Performance (MaP) testing sponsored by Canadian Water and Wastewater Association (CWWA), the California Urban Water Conservation Council (CUWCC), the U.S.-Canadian Alliance for Water

Efficiency (AWE) and Veritec Consulting Inc. that has shown to score 800 or better on the MaP Flush Performance test (grams of solid waste removed in a single flush). www.map-testing.com
Include seat, supply pipe, shut-off valve, and wax seal.

Dual Flush Commode

- Install a Dual Flush, 2 piece, close coupled commode with flow rates of 1.6 and .9 GPF for its respective high and low flushes, tested through the latest Maximum Performance (MaP) testing sponsored by Canadian Water and Wastewater Association (CWWA), the California Urban Water Conservation Council (CUWCC), the U.S.-Canadian Alliance for Water Efficiency (AWE) and Veritec Consulting Inc. that has shown to score 800 or better on the MaP Flush Performance test (grams of solid waste removed in a single flush). www.map-testing.com Include seat, supply pipe, shut-off valve, and wax seal).

Mandatory on all 100% Accessible/Universal Design Units Only

- Lavatory Faucets Shall Have Single Lever or Dual Lever Style Handles

Lavatory Faucets

- Install all metal, washer-less faucet with drain pop-up lever, with a maximum flow rate of 1.5 GPM.
- Installation shall include supply lines and shut off valves.

Bathtub/Shower Unit (Complete)

- Install new tub and surround using one of the following options:
 - A ceramic tub (steel or cast iron) with a ceramic tile surround installed over a cement board substrate using epoxy grout.
 - A single piece fiberglass tub/shower unit.
 - A 4 piece fiberglass tub/shower unit that does not require caulking between the sections (such as the Sterling 4 piece units).
- Install a lever operated pop-up drain and overflow, all drain pipes, shower rod, a single lever shower diverter tub/shower faucet or an approved equal with an anti-scald device and a hand-held adjustable height showerhead with a maximum 2.0 GPM flow rate.
- Shower controls shall be no higher than 48" or lower than 18" from the tub/shower floor.
- All tubs shall have non-slip bottoms and a wide flat edge that can be sat on when entering and exiting the bathtub.

Separate Shower Area and Surrounds

- The shower is to have a low step-up entry and with a floor area of minimum 3' x 4' ,
- Shower control to be no higher than 48" from floor.
- Shower-head shall be an adjustable height spray hand-held model with a maximum 2.0 GPM flow rate.
- The walls are to be finished as green compliant as possible and all adhesives to be low/no VOC.
- All controls shall be single lever style and with an anti-scald device.
- Tub design to have a wide, flat edge that can be sat on when entering and exiting the tub.
- All shower floors shall be of a non-slip material.

Bathroom Sink(s)

Developer to Choose

- Install wall mounted sink. Counter surface is to be no higher than 34" above finished floor. Provide a clearance of at least 29" above the finished floor to the bottom.
- Install pedestal sink with top being no higher than 34" above finished floor.
- Install cantilevered sink, with the top being no higher than a 34" above the finished floor, with a removable cabinet underneath.
- Install a 24" or wider, plywood vanity with cultured marble integrated top, (no higher than 36"), bowl and backsplash and single lever brass bodied chrome faucet with a maximum 2.0 GPM flow rate. Include PVC DWV with Air Admittance Valve, type L copper with brass bodied stops or PEX supply piping, and escutcheon plates on all supply and waste lines.

Plumbing, Kitchen

Mandatory – All Projects

- All water lines in Substantial Rehabs are to be run inside an insulated conditioned/envelope space.

Single Bowl Sink

- Install a 22 gauge, 25"x22"x8" deep, single bowl with self rimming kitchen sink including a steel, metal body faucet rated at 2.0 GPM or less, with a 15 year drip- free warranty, grease trap, supply lines, full port ball type shut-off valves and escutcheon plates on all supply and drain lines.

NOTE: All copper is to be soldered (no compression fittings) and all PVC fittings glued. No exceptions.

Double Bowl Sink

- Install a 22 gauge 33"x22"x8" double bowl with self rimming kitchen sink including a steel, metal body faucet, rated at 2.0 GPM or less, with a 15 year drip- free warranty, grease trap, supply lines, full port ball type shut-off valves and escutcheon plates on all supply and drain lines.

NOTE: All copper is to be soldered (no compression fittings) & all PVC fittings glued. No exceptions.

Mandatory on all 100% Accessible/Universal Design Units Only

- Faucets Shall Have Single Lever or Dual Lever Style Handles

Faucet, w/Sprayer

- Install all metal, washer-less with a maximum flow rate of 2.0 GPM. If using a faucet with a higher rate than 2.0 GPM, It must be Retro-Fitted with a different aerator to accommodate the 2.0 GPM or less standard. Installation shall include supply lines and shut off valves. Sprayer may be separate or Faucet/Sprayer combination style.

Garbage Disposal

- Install a disposal with a minimum ½ hp rating.

Water Heaters

Mandatory – All Projects

Installation

- For safety, set water heater temperatures no higher than 120 degrees Fahrenheit.
- Water heater to be located within 30 feet of pipe run of all bathrooms and kitchen if feasible.

Power Vented Water Heater

Substantial Moderate & Minor Rehabs

- Install an ENERGY STAR Certified, natural gas, 40-gallon, minimum EF of 0.67, glass-lined, power-vented, and insulated to R-7, water heater with a 10 year warranty. Include pressure & temperature relief valve, discharge tube to within 6" of floor, condensate pump, owner's manual & all duct work to power vent to exterior.
- Provide separate electrical circuit & new gas piping from shut-off valve to fixture. If the Water Heater is located in a basement with a floor drain the discharge tube shall be directed to the drain. If it is located on an upper floor or if there is no floor drain, install a catch pan drained to the exterior.

Tankless Water Heater W/Storage Tank

Optional –Substantial Rehabs

Size to the Number of Plumbing Fixtures per manufacturers recommendations

- Install an Energy Star certified, natural gas, interior, tankless water heater system with a minimum 7 gallon per minute flow rate. Include pressure and temperature relief valve, discharge tube to within 6" of floor, owner's manual and all venting, piping.
- Provide separate electrical circuit and gas inlet and water inlet and outlet shut-off valves, to code.

Electric Water Heater

- Only when natural gas is not available to the home.

DIVISION 11B

Whole House Ventilation—Mandatory for all projects.

Provide a Whole House Ventilation System to meet the Current ASHRAE 62.2 Standard, such as:

1. A Bathroom Exhaust Fan with Constant Background Ventilation

Install an ENERGY STAR Certified bathroom exhaust fan that has both a background constant ventilation setting adjustable in CFM to meet the ASHRAE 62.2 ventilation standard, and a boost setting with a minimum 80 CFM rating. Install the fan in a centrally located full bathroom. Switch both the fan and bathroom light together (either the light in the fan, if present, or the main bathroom light). The fan shall also have a time delay setting that will enable the fan to continue its boost run time past the time when it is switched off. The time delay shall be set to 20 minutes. The Panasonic Whisper Green models FV-08VKS3 & FV-08VKSL3 (with light) meet these requirements.

2. Passive Fresh Air Intake:

If blower door testing or combustion safety testing dictates that additional fresh air is required for the safe operation of the whole house ventilation system, install a passive intake vent, installed through the specified exterior wall, flashed to be weathertight, and sealed to the building envelope's air barrier and interior & exterior finishes. The inlet should be carefully located on an outside wall to avoid the addition of contaminants or moisture into the return air system and must be placed a minimum of 10 feet away from sources of auto exhausts, clothes dryer exhaust, outside cooking facilities, laundry dryer vent, exhaust vent of heating units or bath and kitchen exhaust fan vents.

Return Air Transfer System

- In absence of return air ductwork in the bedrooms or bathrooms, install a Return Air Pathway, 12" X 6" or 12" X 12", Sound and Light restricted by-pass grill to balance forced-air system. Install in specified room and common space to provide return air. Seal to wall finish and install flange trim.

Dryer Vent

- Install 4" rigid metal vent tubing from the specified dryer location to a 4" wall mounted dryer vent hood with a back-flow preventer and NO screening.
- Do not fasten with nails, screws or other fasteners that protrude into the interior of the exhaust duct.
- Seal all seams in the system with duct mastic or aluminum foil tape, not duct tape. Secure duct and hood to framing.

Radon Gas

►► **NOTE:** Only a Maryland licensed mitigator can test and treat a home for radon gas.

Mandatory for Substantial Rehabs

- Install a passive radon gas vent system during construction with an electric outlet installed in the attic or basement and install the outlet less than 3 ft from the vent pipe, to make the system an active system if need to be after testing for radon gas.
- After house has been air-sealed, test for radon gas and if test shows elevated levels then install an active system to vent radon and soil gases.

Mandatory for Minor & Moderate

- After all air sealing has been implemented,
- Test home before finalizing construction budget. If it is determined that the home has moderate levels of radon, plan accordingly to install the passive radon gas vent system. Home must not have high levels of radon gas after construction is complete and home is air sealed.

HVAC

Mandatory – All New and Replacement Installation

- Size heating and cooling equipment and design ductwork for distribution in accordance with the Air Conditioning Contractors of America (ACCA) Addendum, Parts J, S and D, to prevent short-cycling of heating or air conditioning and ensure adequate dehumidification. Contractor is to supply copy of their calculation report. Installation of an improper size furnace and or air conditioner will be

replaced by the contractor, at their expense. All reports be reviewed for accuracy by the HERS rater prior to the purchase or installation of any HVAC components, including ductwork.

- HVAC contractor shall perform/verify the following:
 - Start-up procedure according to manufactures instructions.
 - Refrigerant charge verified by super-heat and/or sub-cooling method.
 - Burner set to fire at nameplate input.
 - Air handler setting/fan speed.
 - Total airflow within 10% of design flow.
 - Total external system static should not exceed equipment capability at rated flow.
- NO HVAC DURING CONSTRUCTION – Mask off all HVAC outlets during construction. Avoid any use of the HVAC equipment during construction if at all possible. Otherwise, have all HVAC ducts and coils cleaned by a professional company at the time of completion on the project.

Natural Gas Furnace

- Use the Air Conditioning Contractors of America (ACCA) 8th Edition of their Addendum J Heat loss calculation tool, <https://www.acca.org/store/category.php?cid=2> and use ACCA's Addendum S for equipment selection.

►► **NOTE:** Provide all HVAC design documents (J, S and D) to the HERS Rater for review prior to installation. Size furnace to the living unit considering any areas which may be added or subtracted from the plan.

- Remove existing furnace & dispose of in legal dump. Consider recycling of scrap metal.
- FURNACE: install a 90+ gas fired forced air furnace with minimum AFUE rating of 92% on 2" patio block to existing duct work & gas line.
- New furnace to be vented with PVC piping per manufacturer's specifications.
- New furnace will have minimum limited warranty of: 20 years on the heat exchanger and 5 years on parts.
- Include programmable set back thermostat control, and new shut- off valve.
- Rework cold air return if necessary to ensure easy access, good fit & easy replacement of air filter.
- An exterior return air filter box shall be installed on one side, either sides, or bottom of new furnace.
- Seal all exposed duct joints as a part of this item with Duct Mastic.

►► **Note:** Upon completion of the project and after the ducts and furnace has been cleaned, install a new furnace filter and leave one extra for future homeowner use. Use Nature Air, 3M-Filtrete or any other brand of filter that has at least a MERV 8 rating. Insure a gasketed or substantially airtight filter cover,

Air Conditioner

- For new AC units install an ENERGY STAR, minimum 14 SEER rated air conditioner (SEER, the Seasonal Energy Efficiency Ratio, measures Energy efficiency), the higher the SEER, the greater the level of efficiency.
- Sizing and proper installation are critical to the Energy efficiency and home comfort, so it is important to hire a qualified technician.
- Air Conditioner shall use Puron instead of Freon

Thermostat

- Install a 7 day ENERGY STAR Certified, programmable thermostat with large readable digital numbers.
- Install with the top of the control no higher than 48" at center AFF

Duct Work:

Size and design to meet the requirements of ACCA Manual D

- Install all duct work, cold air returns and floor/wall registers to code. Seal all joints, collars, flex duct, connections and seams in metal duct work, gaps at/on elbows, register boot seams and plenums with a 1/16" coating of UL 181A or UL 181B listed duct mastic over approved fiberglass mesh tape of 9 X 9 minimum weave per inch and a thickness of a minimum of 0.006" .
- Do not install ducts in exterior walls unless extra insulation is added to maintain the overall UA for exterior wall without ducts.
- In standard rehab project, use at least R-6 insulation around ducts in unconditioned spaces.
- In new construction and Substantial Rehabs, all ductwork shall be contained within insulated envelope to prevent conditioned air loss in unconditioned areas.
- Avoid installation of ductwork in walls of the building envelope.
- Ducts in interior wall cavities must be fully ducted (i.e., do not use the wall cavity as the duct).
- THERMO-PAN - can be used in lieu of sheet metal in constructing return air ducts between joists and stud cavities. All connections and seams shall still be sealed with a 1/16" coating of UL 181A or UL 181B listed duct mastic over approved fiberglass mesh tape of 9 X 9 minimum weave per inch and a thickness of a minimum of 0.006". (Back panel and sides shall be inspected and approved by the rehab tech before installing the front sheet metal panel)

Slab Homes

- Duct work shall not be run in or under the slab, due to the possibility of condensation or water infiltration which will cause mold and mildew.

Attic

- Duct work running thru the attic shall have insulated wrap installed to a R-8 before installing attic insulation.

►► **NOTE:** If an old air conditioner is on site the refrigerant must be reclaimed before discarding the unit or have it picked up by an authorized dealer to do so.

DIVISION 12

DIVISION 12A

Main Electric Service Box

- Main electric service box to be installed on first floor if possible.
- It is mandatory that the main electric service box be installed on the first floor for all projects presented as meeting 100% Accessible/Universal Design.
- Main electric service box shall have provisions for at least four, (4), additional circuits.

Electric

Mandatory – All New and Replacement Installation

►► **Owner/Developer to choose all colors and finishes on fixtures and devices.**

Main Service Box

- Install a 200 amp 3 wire service complete with breaker type panel box with all circuits labeled and balanced. Leave provision for at least 4 additional circuits.
- Provide separate appliance circuits in kitchen.
- New service is to have arc fault breakers, per local code. Include new exterior meter panel.
- Service box shall be installed on first floor if possible (*Mandatory on all units being presented as 100% Accessible/Universal Design.*)

Fixtures

Mandatory – All Projects

Smoke Alarms

- Install one interconnected, hard-wired smoke detector with battery back-up in each sleeping room, outside each separate sleeping area in the immediate area of the bedrooms and on each additional story of the dwelling, including basements but not including crawl spaces and uninhabitable attics.
 - **EXCEPTION:** Smoke alarms in existing areas shall not be required to be interconnected and hard wired where the alterations or repairs do not result in the removal or opening-up of interior wall or ceiling exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard wiring and interconnection without the removal of interior finishes.

Carbon Monoxide Detectors

- Install one on each floor area and basement, all to be hardwired and inter-connected.
 - **Exception:** Carbon monoxide detectors in existing areas shall not be required to be interconnected and hard wired where the alterations or repairs do not result in the removal or opening-up of interior wall or ceiling exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard wiring and interconnection without the removal of interior finishes. All homes equipped with combustion appliances or an attached garage shall have a carbon monoxide (CO) alarm installed in a central location in the immediate vicinity of each separate sleeping zone. (e.g. in a hallway adjacent to bedrooms.) See IAP spec for additional details.

Interior Ceiling Light

- Install an ENERGY STAR Certified fluorescent ceiling light fixture.

Interior Recessed Light Fixtures

- Recessed light fixture shall be ENERGY STAR Certified. Do not install recessed light fixtures in ceilings that are part of the building envelope (insulated ceilings).

Interior Wall Light

- Install an ENERGY STAR Certified fluorescent wall fixture.

Kitchen Ceiling Light

- Install an ENERGY STAR Certified fluorescent ceiling light fixture.

Basement Light Fixtures

- Install fluorescent fixtures or
- Install porcelain fixtures with CFL bulbs

Exterior Wall Entry Door/Porch Light Fixture

- Install an ENERGY STAR Certified fixture that has the following features.
- Photo cell that turns light on at dusk and off at dawn.
- Dusk to dawn low level lighting.
- Motion detector that turns on lamp to full brightness.

Bathroom Exhaust Fans, With or Without Light

- Shall be Energy Star certified and no louder than 1.0 sones
- One bathroom shall be a continuous motion fan with motion activated fan boost with the continuous CFM setting adjusted to meet the constant ventilation requirements of ASHRAE Standard 62.2. All other bathrooms shall have fans with a time delay setting.

Ceiling Fan, With or Without Light Fixture

- Install one ENERGY STAR Certified ceiling fan with three (3) speed setting, in all the living/family rooms and one in each bedroom. Length of fan blade is to accommodate the room square footage. If fan has light fixture, use CFL bulbs only in the fixture

Ceiling Fan Switch

- Single pole, 3-speed fan control with light switch. Installed no higher than 42" from the finished floor.

Mandatory on all 100% Accessible/Universal Design Units Only)

- Use slide-to-off ceiling fan switch.

Electric Device Height

Measure To The Center Of Device AFF

- Wall Outlet – 18"
- Wall Switch – 42"
- Phone Jack – 18"
- Cable Connection – 18 "
- Thermostat – 48"
- Door Bell Button – 42"

Mandatory on all 100% Accessible/Universal Design Units Only

- Must use large rocker or touch-sensitive lighted switch instead of standard toggle switch.

►► **NOTE:** If an outlet or switch is obstructed by a base cabinet or countertop, then the maximum height for the switch or outlet shall be 46" above finished floor.

Garages

- Install an additional grounded ceiling mounted outlet as a power source for an automatic overhead garage door opener.