



NORTHERN MARIANAS HOUSING CORPORATION

Community Development Block Grant – Disaster Recovery (CDBG-DR) Division

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A Rationale for Customizing Our Green Building Standards

A customized Green Building Standard for new construction and rehabilitation projects in the Northern Mariana Islands, is justified, based on our unique climate and housing needs. Our remote location poses several challenges, both in obtaining certified Green materials and equipment, and in procuring the services of accredited consultants necessary to conform with one of the “National” standards that HUD prefers.

ENERGY STAR® certification for instance, is very challenging, because there are no RESNET accredited HERS rating companies or individuals in this area. Valerie Briggs, RESNET Communications Director, confirmed this in communications with our technical assistance providers, ICF. ENERGY STAR® certification requires the engagement of a HERS Rater to complete the application materials, and for various inspections. The same is true for the consultants necessary to be certified by LEED, Green Communities and the ICC-700 National Green Building Standard.

In addition to the challenges related to procuring a certification, our tropical climate negates the need for most space conditioning. Our standard new construction homes are sold without any HVAC equipment for heating or cooling. This means that there is no need for insulation and air sealing of the building envelope. With regard to the building envelope, it is important to note that we have long-held standards related to resiliency, perhaps the most important Green standard for our location. Our structures are concrete, including the roof assembly.

We are very interested in including energy and water conserving features that are appropriate for our situation. The water conservation standards that we are implementing mimic those in the national Green building programs. We have included highly reflective roof coatings in our standards to reduce heat gain. We are researching the potential to require heat pump water heaters, which are extremely efficient. We are also implementing standards for energy efficient lighting.

In an effort to improve indoor air quality, we have also added requirements limiting the introduction of VOCs in our construction materials, again using the national programs typical standards. That said, indoor air quality is not a significant problem in our climate as we employ natural ventilation year-round.



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We propose to edit our existing Housing Rehabilitation Standard, new construction standard drawings and the CPD Green Retrofit Checklist to require the following Green construction materials and methods. The following specific measures are being implemented.

Building Envelope Insulation and Air Sealing

Based on historic averages for high and low temperatures by month in the Northern Marianas, coupled with the fact that space heating or cooling equipment is not typically installed in our housing developments, we propose that the program be exempt from typical Green requirements for building envelope insulation and air sealing.

- The following average temperature tables are from this [Washington Post link](#).

Average High Temperatures													
	Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°F	86	84	84	85	86	87	88	87	86	87	86	86	85

Average Low Temperatures													
	Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°F	77	76	75	76	77	78	79	78	78	78	78	78	77

- For the sake of energy conservation related to the building envelope we will revise the Rehabilitation Standards and the new construction plans to require a reflective roof coating. This is the proposed insertion: “Roof coatings shall be highly reflective, be ENERGY STAR® certified and be certified under the Cool Roof Rating Council (CRRC) standards.”

Lighting, Electrical Distribution and Appliances

- The new construction plans and Rehabilitation Standards will be revised to state existing light fixtures will be upgraded to LED bulbs, or new Energy Star Certified fixtures will be installed.

Water Conservation

- These are typical standard for water conserving plumbing fixtures, and the standards will be revised to require them.
 - Toilets WaterSense-labeled and 1.28 gpf (gallons per flush) or less;
 - Showerheads WaterSense-labeled and 2.0 gpm (gallons per minute) or less;
 - Kitchen faucets 2.0 gpm or less (WaterSense label not available);
 - Lavatory faucets WaterSense-labeled and 1.5 gpm or less.
- We will require that toilets score a minimum of 1,000 points on the MaP toilet testing scale. www.map-testing.com/ This is a performance based standard, certified by an independent third party and will reduce water consumption.

Domestic Water Heating

- If we can find a reliable and affordable source, Heat Pump Water Heaters (HPWH) will be required as water heating equipment. We will require a minimum UEF (Uniform Energy



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Factor) of 3.75 for HPWHs. We are researching this option with our local providers of construction materials, and with the closest Home Depot in Guam.

- Here is a resource page on HPWH from energy.gov
- A calculation on potential annual energy savings based upon the local cost of electricity, the DOE standard assumptions for water usage by a three-person household and the efficiency rates of standard electric tank style water heaters and HPWHs, and the annual savings would be approximately \$685.
- A standard life expectancy for such water heaters is 13 years, which compares favorably with standard water heaters.

Indoor Air Quality

- The typical ventilation requirements of Green Building Certification Programs are not practical or appropriate for the Northern Marianas. Homes are constantly ventilated by open and screened window units. There is no need to implement ventilation standards such as ASHRAE 62.2.
- Low/no VOC paints, caulks and sealants will be required for the sake of indoor air quality.
- Regarding flooring, carpet is not used, flooring is either ceramic tile or vinyl. The following language has been included in our Green standards.
 - All Vinyl flooring shall be FloorScore®, GREENGUARD Gold, SCS Indoor Advantage Gold, or Berkeley Analytical ClearChem standards. In place of vinyl or other PVC-based resilient flooring, natural linoleum, rubber, cork, other PVC-free resilient flooring, ceramic or stone tile, or sealed concrete are approved options.

Documentation

- The “Green Building Retrofit Checklist” included in the CDBG-DR Rehabilitation Standards has been revised for the Northern Mariana Islands DR program. A draft of a revised Green Building Retrofit Checklist is attached as Attachment A.
- A draft of the revised Housing Rehabilitation Standards is also attached. (Will attach when the edits are complete)
- The standard new construction plans will be revised to conform as well. (Will attach when the edits are complete)



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Attachment A:

HUD CPD Green Building Retrofit Checklist for the Northern Mariana Islands

The CPD Green Retrofit Checklist promotes energy efficiency and green building practices for residential retrofit projects. Grantees must follow the checklist in its entirety and apply all measures within the Checklist to the extent applicable to the particular building type being retrofitted. The phrase “when replacing” in the Checklist refers to the mandatory replacement with specified green improvements, products, and fixtures only when replacing those systems during the normal course of the retrofit.

Note: CPD recognizes that not all elements of the checklist will be applicable in all climates and geographies. Because of this, CPD will consider exceptions to these standards based on climate or geography, if a grantee identifies the specific standards that aren't applicable, including offering alternatives if available, and CPD's Office of Environment and Energy accepts the grantee's request.

WATER AND ENERGY CONSERVATION MEASURES

Water-Conserving Fixtures

Install or retrofit water conserving fixtures in any unit and common facility, use the following specifications: Toilets-- 1.28 gpf; Urinals-- 0.5 gpf; Showerheads-- 2.0 gpm; Kitchen faucets-- 2.0 gpm; and Bathroom faucets-- 1.5gpm. [gpf = gallons per flush; gpm = gallons per minute]

Air Sealing: Building Envelope

Seal all accessible gaps and penetrations in the building envelope. If applicable, use low VOC caulk or foam. See Integrated Pest Management requirements below.

Radiant Barriers: Roofing

Use cool roofing reflective coating that are ENERGY STAR® certified and be certified under the Cool Roof Rating Council (CRRC) standards.

Windows

Windows shall have screens for ventilation and indoor air quality, and shall have aluminum Typhoon shutters for resiliency.

Domestic Hot Water Systems

When replacing domestic water heating system(s), ensure the system(s) meet or exceed the efficiency requirements of ENERGY STAR for Homes' Reference Design

Efficient Lighting: Interior Units

Interior lighting must be ENERGY STAR-qualified or have ENERGY STAR-qualified lamps installed.

Efficient Lighting: Common Areas and Emergency Lighting (if applicable to building type)

Common area and emergency lighting must be ENERGY STAR-qualified or have ENERGY STAR-qualified lamps installed.

Efficient Lighting: Exterior

Exterior lighting must be ENERGY STAR-qualified or have ENERGY STAR-qualified lamps installed.



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INDOOR AIR QUALITY

Environmentally Preferable Flooring

All Vinyl flooring shall be FloorScore® certified.

Low/No VOC Paints and Primers

All interior paints and primers must be less than or equal to the following VOC levels: Flats--50 g/L; Non-flats--50 g/L; Floor--100 g/L. [g/L = grams per liter; levels are based on a combination of the Master Painters Institute (MPI) and GreenSeal standards.]

Low/No VOC Adhesives and Sealants

All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. All caulks and sealants must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District.

Clothes Dryer Exhaust

Vent clothes dryers directly to the outdoors using rigid-type duct work.

Mold Inspection and Remediation

Inspect the interior and exterior of the building for evidence of moisture problems. Document the extent and location of the problems, and implement the proposed repairs according to the Moisture section of the EPA Healthy Indoor Environment Protocols for Home Energy Upgrades.

Mold Prevention: Water Heaters

Provide adequate drainage for water heaters that includes drains or catch pans with drains piped to the exterior of the dwelling.

Mold Prevention: Surfaces

When replacing or repairing bathrooms, kitchens, and laundry rooms, use materials that have durable, cleanable surfaces.

Mold Prevention: Tub and Shower Enclosures

When replacing or repairing tub and/or shower enclosures, use non-paper-faced backing materials such as cement board, fiber cement board, or equivalent in bathrooms.

Integrated Pest Management

Seal all wall, floor, and joint penetrations with low-VOC caulking or other appropriate sealing methods to prevent pest entry. [If applicable, provide training to multifamily buildings staff.]

Lead-Safe Work Practices

For properties built before 1978, if the project will involve disturbing painted surfaces or cleaning up lead contaminated dust or soil, use certified renovation or lead abatement contractors and workers using lead-safe work practices and clearance examinations consistent with the more stringent of EPA's Renovation, Repair, and Painting Rule and HUD's Lead Safe Housing Rule.

