Northern Marianas Housing Corporation (NMHC)

COMMUNITY DEVELOPMENT BLOCK GRANT - DISASTER RECOVERY PROGRAM

Northern Mariana Islands CDBG-DR Program

Green Building and Construction Policies, Procedures and Standards for Design and Development of Single-Family and Multifamily Housing

Contents

INTRODUCTION:

This document details the Construction Policies, Procedures and Standards of the Northern Mariana Islands CDBG-DR Program. It addresses single family and multifamily housing, and housing new construction, rehabilitation, and reconstruction. Property owners, multifamily housing developers, construction contractors and architectural and/or engineering (A&E) firms that wish to participate in this program, must adhere to the requirements of this document. This document will clearly define when construction standards differ between single-family (which includes 1 to 4 units), and multifamily housing, or between housing new construction, rehabilitation, and reconstruction.

Instances where pre-storm building conditions, or the existence of pre-storm installed components, affect the interpretation of a standard (e.g., appliances), such conditions, or components shall be assessed and documented by NMHC through a combination of signed, owner certifications resulting from owner interviews, and documented site inspections. Pre-storm photographs are an example of acceptable documentation.

Adherence to the requirements of this standard, related to new building components, shall be documented by the housing developers, construction contractors and A&E firms responsible for the work, and such documentation shall be provided to NMHC, upon request. Acceptable documentation includes: manufacturer's specifications, third party certifications (such as ENERGY STAR), ICC-ES Report (International Code Council - Evaluation Service), or other form of documentation approved by NMHC.

GENERAL STANDARDS:

(1) **Exigent Health and Safety (EHS).** All life-threatening deficiencies[1] that present a direct threat to life or well-being, e.g., that are likely to cause severe injury or reduction in physical or mental ability shall be identified and addressed. Examples of EHS life-threatening deficiencies include: locked emergency/fire exit egress, missing/broken electrical cover plates/switches/outlets, inoperable smoke detectors, and exposed wires/missing covers.

(2) **Major Systems.** Requiring that, upon project completion, each major system, as defined by federal regulation, had a remaining useful life of 1 year, or the major system was repaired or replaced as part of the rehabilitation. Major systems are: structural support; roofing; cladding and weatherproofing (e.g., windows, doors, siding, gutters); plumbing; electrical; and heating, ventilation, and air conditioning. For rental housing, the participating jurisdiction's standards must require the participating jurisdiction to estimate (based on age and condition) the remaining useful life of these systems,

[1] **24 CFR 92.251(b)(1)(i)**

upon project completion of each major systems. For multifamily housing projects of 26 units or more, the participating jurisdiction's standards must require the participating jurisdiction to determine the useful life of major systems through a capital needs assessment of the project. For rental housing, if the remaining useful life of one or more major system is less than the applicable period of affordability, the participating jurisdiction's standards must require the participating jurisdiction to ensure that a replacement reserve is established and monthly payments are made to the reserve that are adequate to repair or replace the systems as needed. For homeownership housing, the participating jurisdiction's standards must require, upon project completion, each of the major systems to have a remaining useful life for a minimum of 1 year, or the major systems must be rehabilitated or replaced as part of the rehabilitation work[2].

(3) **Lead-based Paint.** NMHC's standards must conform with HUD's lead-based paint requirements at 24 CFR part 35[3].

(4) **Asbestos.** If Asbestos hazards are identified by environmental testing by an accredited and trained asbestos environmental professional (environmental professional), and the determination is that the asbestos-containing materials would likely to be to disturbed during course of rehabilitation, or that the existing building components containing asbestos are friable, then abatement is required, the specifics of which, whether removal or containment, will be determined by the environmental professional. Asbestos materials may remain in place if the environmental professional determines that it is safe and appropriate to do so.

(5) **Disaster Mitigation** Require the property to meet the disaster mitigation requirements, e.g., housing to be improved to mitigate the impact of potential disasters (e.g., earthquake, hurricanes, flooding, and wildfires) in accordance with State and local codes, ordinances, and requirements[4]. Given CNMI typhoon risks, housing shall be designed to meet 190 MPH wind conditions.

(6) **State and Local Codes, Ordinances, and Zoning Requirements.** NMHC's standards must require the housing to meet all applicable State and local codes, ordinances, and requirements or, in the absence of a State or local building code, applicable sections of the International Existing Building Code or of the International Code Council[5]. The current adopted building code is the 2018 International Building Code. The 2014 CNMI Revised Tropical Energy Code is also in effect as a current building code.

[2] **24 CFR 92.251(b)(1)(ii)**
[3] **24 CFR 92.251.(b)(1)(iii)**
[4] **24 CFR 982.251(b)(1)(vi)**
[5] **24 CFR 92.251(b)(1)(vii)**

(7) **Uniform Physical Conditions Standards.** NMHC's standards must reflect upon completion, the CDBG-DR-assisted project and units will be decent, safe, sanitary, and in good repair as described in 24 CFR 5.703. HUD will establish non-life threatening and minimum deficiencies that must be corrected under NMHC's standards based on inspectable items and inspected areas from HUD-prescribed physical inspection procedures (Uniform Physical Conditions Standards) pursuant to 24 CFR 5.705[6].

(8) **Green Standards**. NMHC seeks to advance green building standards, materials, and practices to support healthy, affordable, resilient, sustainable housing. NMHC will enforce a Green Standard for Housing Rehabilitation and Reconstruction, that focuses on indoor air quality (IAQ), energy conservation for domestic water heating, lighting, appliances, doors, and windows, water conservation, and waste reduction (See Attachment A – Green Building Retrofit Checklist).
The temperate climate data for the Northern Mariana Islands supports NMHC's standard of excluding space conditioning equipment (heating or cooling) from its single-family housing programs, and relying on the significant amount of natural ventilation that is possible with detached housing (single-family or multifamily) to maintain good indoor air quality (IAQ). Therefore, building envelope insulation is also unwarranted.

Because natural ventilation is more challenging for higher density multifamily projects, bathroom exhaust ventilation, vented to the exterior, or balanced ventilation systems such as HRVs or ERVs, is required to maintain good IAQ. An exception to this is a multifamily project composed of detached units, where natural ventilation will suffice.

Highly reflective roof coatings are required to reduce heat gain, and to extend the life of roofing materials for all projects.

Resiliency as a sustainability measure, will be a focus. Pestmanagement, and especially, integrated best management practices (BMP) strategies, stormwater management and erosion control and waste reduction practices will be supported.

For single-family rehabilitation projects, when existing refrigerators have storm damage or present health or safety hazards because of their condition, such refrigerators shall be replaced with ENERGY STAR® Certified units whenever possible. The availability of ENERGY STAR® Certified appliances is inconsistent on Northern Marianas, so availability is not guaranteed. When ENERGY STAR® Certified appliances are not available (and documented by the appliance distributor), the most efficient, in-stock alternative will be acceptable. Additionally, when cooking ranges have documented storm damage or represent health or safety standards because of their condition, such ranges shall be

[6] **24 CFR 92.251(b)(1)(viii)**

replaced. Appliances shall only be provided for single-family reconstruction projects, when it is documented that the owners owned and operated such appliances pre-storm.

For multifamily rehabilitation and reconstruction projects, as well as new multifamily construction, developers are required to provide refrigerators and cooking ranges for each apartment. Those refrigerators, and any other types of appliances provided by the developers that are certifiable by ENERGY STAR®, shall be ENERGY STAR® Certified. When ENERGY STAR® Certified appliances are not available, the developer must provide documentation of unavailability to NMHC, and may, with NMHC's approval, provide appliances that are the most efficient, in-stock alternative.

GENERAL NOTES:

1. **Scope Verification.** The construction contractor (contractor) shall field verify locations, sizes, and quantities of work required for the project. Any quantities provided by NMHC need to be field verified for accuracy and exact installation requirements.

   The contractor is responsible for coordinating with an in-house or third-party Architectural and Engineering (A&E) firm for their project design, proposal, and scope of work for review and certification as required.

2. **Tools, Material, and Equipment.** The contractor will supply all tools, materials, and equipment required to perform the Scope of Work unless otherwise specified.

3. **Permits, Inspections, and Testing.** Contractors and Subcontractors shall be responsible for all permits including but not limited to, the Saipan Zoning Office; the Bureau of Environmental and Coastal Quality (BECQ) e.g., stormwater (earthmoving and erosion control), add other BECQ permit requirements; and the Department of Public Works (DPW); inspections, testing, fees and licensing as pertaining to the law, ordinances, and regulations and as required to complete their respective Scopes of Work. The contractor shall pay for the entire cost of any remedial work resulting from a failed inspection.

4. **Taxes.** The contractor shall be responsible for all federal, state, and local taxes imposed directly or indirectly for its Services required to fill this Agreement.

5. **Insurance.** The contractor shall provide and maintain General Liability and Worker's Compensation insurance throughout the Term of this Agreement and Project duration. The contractor shall provide certificates of insurance or other acceptable evidence of insurance (i.e., payment and performance bond) in the amount of 100 percent of the rehabilitation contract sum upon execution of this Agreement.

6. **Clean-Up.** The contractor is responsible for daily cleanup of all areas where work is performed and safe reuse, recycling, or disposal of debris.

NMHC PROJECT POLICIES and PROCEDURES for PROPOSAL SUBMISSIONS:

a) **Assessments of Existing Properties:** Housing Developers, Contractors and/or A&E firms are to conduct assessments of the client's existing housing and property condition, existing structural condition, existing plumbing and drainage system conditions, and existing electrical condition. The Developer, contractor and/or A&E firm will also need to verify the property's existing power pole drop line and water meter locations for planning purposes and reference in the scope of work development.

Also, any potentially life-threatening conditions must be identified and addressed, to include but not limited to the following:

Health & Safety Inspectable Area.

- Electrical Hazards:
  - Exposed wires/Open Panel.
  - Water leaks On or Near Electrical Equipment.
- Air Quality:
  - Mold and/or Mildew Observed.
  - Propane/Natural Gas/Methane Gas detected, and, or lack of ventilation in the area/room where these fuels are used.
  - Sewer Odor Detected.
- Flammable materials:
  - Improperly stored flammable materials, causing potential risk of fire or explosion.
- Emergency/Fire Exits:
  - Blocked/Unusable.
- Garbage and Debris:
  - Indoors; too much garbage has gathered, more than the planned storage capacity or gathered in an area that is not sanctioned for staging or storing garbage or debris.
  - Outdoors; too much garbage has gathered, more than the planned storage capacity or gathered in an area that is not sanctioned for staging or storing garbage or debris.
- Hazards:
  - Sharp edges
  - Tripping

- Uneven walkways, passageways, flooring, or stairs.
- Infestations:
  - Rat or Insect Infestation.

Site Inspectable Area.

- Driveways/Roads:
  - Damaged pavement has made driveway/roads unusable/impassable or creates unsafe conditions for pedestrians & vehicles.

Building Exterior Inspectable Area.

- Doors:
  - Damaged frames/ Threshold/Lintels/Trim - entry doors or fire/emergency doors are not functioning or cannot be locked because of damage to the frame, threshold, lintel, or trim.
  - Damaged Hardware/Locks - Door panic hardware does not function properly and/or fire/emergency door does not function properly or cannot be locked because of damage to the door's hardware.
  - Missing Door
- Foundation:
  - Cracks/Gaps – Large cracks or gaps more than 3/8-inch-wide by 3/8-inch-deep by 6 inches long a possible sign of a serious structural problem.
    - Crack that are the full depth of the wall, providing opportunity for water penetration.
    - Section of wall or floor are broken apart.
    - Land erosion threatening or impacting structure.
  - Spalling/Exposed Rebar – Obvious, significant spalled areas affecting 50% or more of any foundation wall.
    - Spalling that exposes any reinforcing material rebar or other.
- Lighting:
  - Broken Fixtures/Bulbs –Lighting fixtures and bulbs are broken or missing.
    - The condition constitutes an obvious safety hazard.
- Roofs:
  - Damaged/Torn Membrane/Missing Ballast – Sign of damage to the membrane that may result in water penetration.
  - Missing/Damaged Shingles –Shingles missing from roofing areas.
  - Ponding – Evidence of standing water on the roof, causing potential or visible damage to roof surface or underlying materials.
- Walls:

- Cracks/Gaps – A large cracked or gap more than 3/8-inch-wide or deep and 6 inches long, possibly a sign of a serious structural and pest control problem.
  - A crack that is the full depth of the wall, providing opportunity for water penetration.
  - Sections of the wall are broken a part.
- Missing Pieces/Holes/Spalling – Deteriorating that exposes any reinforcing material (rebar)
  - More than one missing piece a few bricks or a section of sliding.
  - A hole of any size that completely penetrates the exterior wall.

Building System Inspectable Area.

- Fire Protection:
  - Missing/Damaged– Missing, expired (expiration date has passed or is within 2 years) or inoperable smoke detectors
- Sanitary System:
  - Missing Drain/Cleanout/Manhole Covers – A protective cover is missing for the sanitary system on the site (If a septic system exists).

Common Areas Inspectable Area.

- Ceiling:
  - Bulging/Buckling – sagging, or a lack of horizontal alignment.
  - Holes/Missing Tiles/Panels/Cracks – A hole or a crack that can be seen through penetrates the area above.
  - Water Stains/Water Damage/Mold/Mildew – Ceiling surface is substantially saturated or damaged by water, mold, or mildew, with cracks, moist areas, mold, or mildew.
    - Ceiling surface may have failed.
- Doors:
  - Damaged Surface: Holes/Paint/Rusting – One door has a hole or holes larger than 1 inch in diameter, significant peeling/cracking or no paint, rust that affects the integrity of the door surface, or broken/ missing glass.
  - Missing Door – A restroom door, sleeping area, entry door, or fire door is missing.
- Electrical System:
  - Frayed Wiring – Any nicks, abrasions, or fraying of the insulation that expose any conducting wire.
- Floors:
  - Bulging/Buckling – sagging, or a problem with alignment

    - Hard floor Covering/Tile Damaged/Missing –Floor surfaces that are affected or the conditions cause a safety problem.
    - Soft Floor Covering Damaged/Missing –Floor coverings are damaged, or damage to the soft floor covering exposes the underlying materials.
    - Rot/Deteriorated Subfloor –Applying weight causes noticeable deflection or likely damage to the finish floor.
    - Water Stains/Water Damage/Mold/Mildew –Floors have been substantially saturated or damaged by water, mold, or mildew.
        - Cracks, mold, and flacking are visible, and the floor surface may have failed.
- Walls:
    - Bulging/Buckling
    - Water Stains/Water Damage/Mold/Mildew
- GFCI:
    - Inoperable

Units Inspectable Area.

- Ceiling:
    - Bulging/Buckling
    - Holes/Missing Tiles/Panels/Cracks
    - Water Stains/Water Damage/Mold/Mildew
- Doors:
    - Damaged Surface, Holes/Paint/Rusting/Glass – Damage that may affect either the surface protection or the strength of the door or may compromise building security.
    - Damaged Frames/Threshold/Lintels/Trim
- Electrical System:
    - Frayed Wiring – Any nicks, abrasions, or fraying of the insulation that expose any conducting wire.
- Floors:
    - Bulging/Buckling.
    - Hard Floor Covering Tile Damaged/Missing.
    - Soft Floor Covering Damaged/Missing.
    - Rot/Deteriorated Subfloor
    - Water Stains/Water Damage/Mold/Mildew
- Hot Water Heater:
    - Leaking Valves/Tanks/Pipes.
- Range/Stove:
    - Missing/Damaged/Inoperable - Unit is missing.
        - Burners not functioning.
        - Oven not functioning.
        - Hood missing or inoperable, if applicable.

- Refrigerator:
  - Missing/Damaged/Inoperable
- Air Conditioning Unit:
  - Present/Inoperable
- Missing Outlets/Switches:
  - An outlet, switch, or both are missing or damaged, or not grounded
- Walls:
  - Bulging/Buckling
  - Water Stains/Water Damage/Mold/Mildew

b) **As-Built Measurements:** The contractor and/or A&E firm is responsible for securing as-built measurements of the home and project site for conversion to AutoCAD format for planning, layout renovation, and development of the rehabilitation scope of work or reconstruction project design. The as-built information shall be shared with NMHC electronically within 30 days of project completion.

c) **Eligible Construction Contractors:** Only contractors on NMHC's approved contractor listing are eligible to work on home loan clients' new or rehab home projects.

Note: Interested contractors not currently listed on NMHC's contractor listing must first submit all documents as listed on the request for qualifications notice to be added to the contractor listing and become eligible to work on home projects.

d) **Permits:** The contractor is responsible for applying for all permits necessary for a new house construction proposal or renovation, extension, rehab project for a regular home, disability home or multifamily project.

e) **Drawings:** The contractor is responsible for having all project design drawings reviewed and certified by a licensed A&E firm. The contractor will utilize the certified drawings to apply for the DPW Building Permit as required.

f) **Dept. of Public Works Building Safety Code:** The contractor is responsible for complying with all DPW Building Safety Code requirements including but not limited to: inspections, report documentation, and testing reports throughout the construction process for new, rehab, renovation home projects for regular home or disability home construction, extensions, or house conversions to disability home compliance projects.

g) **Project Records:** The Contractor is responsible for gathering and maintaining all project records and documentation required by DPW for the issuance of the Certificate of Occupancy upon project completion. Copies of all reports and as-built information are also to be submitted to NMHC.

h) **Final Inspection:** The contractor is required to conduct a pre-final inspection of the project with the homeowner/developer and NMHC officials, before final inspection with NMHC and DPW Building Safety inspectors, to test all the building systems and finishing work.

i) **Major Systems Warranty:** Any major systems, as defined below, installed by the contractor shall have a warranty of no less than 1 year. Such warranty shall be stipulated on the construction contract between the contractor and the homeowner or developer. Should it be determined at any time during the 1-year warranty period that a major system failure was a result of the work completed by the contractor then the contractor will be obligated to repair the failure.

Major systems as defined by 24 CFR 92.251(b)(1)(ii)] – Structural support; roofing; cladding and weatherproofing (e.g., windows, doors, gutters); plumbing; electrical; and heating, ventilation, and air conditioning.

j). **Other Warranties:** All other construction work performed by the contractor, not subject to the requirements under i) Major Systems Warranty, shall have a warranty period of no less than 1 year, beginning on the date of the Certificate of Occupancy issued by the Department of Public Works. Such warranty shall be stipulated on the rehabilitation contract between the contractor and the homeowner.

ZONING REFERENCES AND REQUIREMENTS:

a) Contractors are required to apply for all zoning permit(s)/clearance(s) required for construction projects under this program. Contractors will need to ensure full compliance with all zoning setback requirements.

Example: For any extension in the front of the house, the extension should be 15’ feet away from the front property line to the new front wall extension. For the left or right-side, the zoning setback requirements are 10’ feet away from the boundary line to a new building wall extension. And for the rear setback, zoning requires 20’ feet clearance away from the rear property line. Any failure to meet these requirements may result in the home client having to pay for zoning variance fees.

b) Should a new septic tank and leaching field be required, the DEQ office setback requirements are a minimum, per regulations, at any angle from the property line for both the septic tank and leaching field.

Note: New septic tanks should be constructed, per regulations, from the structure. DEQ also has regulations on Septic tanks and leaching fields that need to be adhered to**.**

CONSTRUCTION STANDARDS:

SITE WORK:

a) All debris including abandoned vehicles, scrap material, metal objects, trash, vegetation, and other objects that pose a safety and/or health threat, as determined by the local jurisdiction or person qualified to make such a determination, must be removed from the property before the start of construction.

b) The contractor must identify lead-based paint or asbestos hazards, and they must be abated by the contractor per BECQ requirements as outlined in EPA's Lead Renovation, Repair, and Painting Program Rule and/or EPA asbestos testing and abatement guidance. EPA recommends asbestos testing be done by an accredited asbestos laboratory under the National Voluntary Laboratory Accreditation Program (NVLAP).

c) Any ground-level hazards i.e., potholes around the home must be backfilled to finish grade elevation to prevent tripping hazards.

Note: Repairing of an existing boundary fence does not alleviate the contractor from installing the required protective hoarding around the house/project site.

PEST CONTROL:

a) Appropriate Integrated Pest Management practices shall be implemented. U.S. EPA recommends ICC/SF Environment Pest Prevention by Design Guidelines.

b) termite control practices shall be applied by a reliable and licensed termite control company familiar with local soils and termite control conditions and licensed by the Division of Environmental Quality.

    a. The contractor shall apply for all permits necessary for pest treatment.

c) The contractor shall attain a certification of 2-year warranty and retreatment should ground nesting of termite occurs within the 2 years at no cost to the property owner.

d) The contractor shall apply termite treatment for any new construction, renovation, rehab, and extension project as required.

e) Holes, gaps and cracks that could allow pest entry (rodents or insects), shall be sealed in a manner that reliably excludes their entry in the long term.

MATERIALS AND WASTE MANAGEMENT:

a) Minimize the amount of Construction and Demolition waste generated by such methods as efficient use of materials, appropriate planning, proper storage (e.g., tarp and cap rebar), reuse of concrete forms, prevention of damage to materials, avoidance of excess packaging, and source separation of waste.

b) As much waste materials as economically feasible shall be reused, salvaged, or recycled. Scrap metal, aluminum cans, and white goods must be recycled. Waste disposal in landfills shall be minimized.

EXTERIOR/STRUCTURAL:

FOOTINGS:

c) Footings will be designed for an assumed allowable soil bearing capacity of 3,000 PSI.

d) All structural fill beneath footings and slab-on-grade shall be placed 12 inches thick on 8-inch maximum layers. Foundation Backfill will be compacted to 95% compaction maximum dry density.

e) Any soft spots encountered during excavation operations for foundations shall be over excavated till hard dirt limits, then backfilled with suitable material and properly compacted to 95%.

f) Compaction tests for the foundation shall be required and paid for by the homeowner if not included in the contract after receiving the compaction test result for the record. The tests must be performed by a licensed soil testing firm.

CONCRETE AND REINFORCEMENT:

1. All concrete shall develop a minimum compressive strength at the end of 28 days as follows:

• Foundation	3,000 PSI	Max slump	@4 inches
• Beams, Walls & Columns	3,000 PSI	Max Slump	@4 inches
• Suspended Roof Slab	3,000 PSI	Max Slump	@4 inches
• Slab on Grade	2,500 PSI	Max Slump	@5 inches

- Sidewalk / Pathway 2,000 PSI Max Slump @5 inches
- Driveway & Car Parking 3,000 PSI Max Slump @4 inches

Note: For a concrete flat rooftop on the middle portion, pour 7½" thick concrete slab, sloping to all corners of the house's downspouts or drainage passageways at 5" finish. A 2½" slope to be applied in the middle of the rooftop to prevent water ponding on the rooftop.

TESTING:

1. Compression Tests: All concrete placed for foundations, structural slabs, beams, and columns shall have a minimum of three cylinders taken for every 50 cubic yards of concrete placed or for any one concrete placement. Concrete cylinders shall be tested for compressive strength at a testing laboratory. Two compression tests shall be performed at 14 days and one compression test at 28 days for each set of three cylinders taken.

2. Slump tests @ 5"-6": A slump test shall be taken in the presence of the architect or engineer for each batch of concrete delivered to the job site and shall be taken before placing any concrete. In the event a slump test fails, the entire batch of concrete shall be rejected, including removal of concrete already placed, without cost to the homeowner for the record.

3. Additional water to concrete mixture batch at the job site shall not be permitted.

4. All materials and workmanship shall conform with the latest 2018 International Building Code Requirements for residential projects. All contractors must comply with the code for receiving the finished project's Certificate of Occupancy.

MAINTAIN MINIMUM CONCRETE COVERAGE FOR REINFORCING STEEL AS FOLLOWS:

1. For concrete cast against and permanently exposed to earth @ 3"
2. Concrete exposed to earth or weather no. 5 rebar or smaller @ 1 ½"
3. Concrete not exposed to earth or in contact with ground slabs & walls @ ¾"
4. Concrete not exposed to earth or in contact with beams & columns @ 1 ½"
5. Reinforcement of new walls and columns shall be dowelled to supporting footings, beams, columns and walls with bars of the same size and spacing as vertical and horizontal bars

STRIPPING OF FORMS AND SHORES:

1. For foundation forms, it can be removed after 24 hours after pouring curing time. For Walls and Columns forms, they should be removed after 48 hours minimum. For concrete roof beams and roof slabs, forms should be removed after 14 days minimum.

All forms can be removed after 28 days of the date. Concrete form reuse is encouraged to reduce waste.

2. All concrete shall be kept moist for a minimum of 7 days immediately after placing by the use of wet burlap, fog spraying, curing compounds, and other approved methods an architect or engineer.

3. No heavy construction load is permitted more than 50% of the specified design load within the 28 days of concrete placement. In cases, do not overload more than the specified design load after the 28 days of placement. No concentrated load is permitted except over supporting columns and walls.

CONCRETE BLOCK WALL:

1. Masonry units shall have a factory's minimum compressive strength of 2,000 PSI.
2. Masonry units shall be sound, dry, clean, and free from cracks when placed in the structure.
3. Where masonry unit cutting is necessary, all work should be neat and true.
4. The maximum aggregate size shall be 3/8" for pouring CMU block cells.
5. Concrete block units shall be laid in the common bond pattern unless otherwise shown.
6. For wall thickness 4", 6" and 8", use No. 4 vertical rebars @ 16" on center typical.
7. Horizontal bars are placed at every two layers of blocks all around w/No.3 rebars typical.
8. For all corner walls, vertical bars install three No.5 vertical rebars on each side from the corner out @2' feet typical.
9. For all intersection walls, vertical bars install four No.5 vertical rebars one in center of T and one on each side out @2' feet typical.
10. For all end walls install two No.4 vertical bars w/No.3 bars C-ties @ 12" O.C. typical.

Note: Plaster the sides of the concrete sidewalks, landings, ramps, and garage floorings.

Note: Any new door or window to be opened up on an existing concrete house wall, construct a new lintel beam at 12" out from each side on top by 8" height by wall thickness typical and new 4" thick concrete sidings on both sides of window edging typically for door openings.

11. "Dur-O-Wal" reinforcement shall be continuous around all walls, corners, and intersections and shall lap @ 12" minimum splicing for all vertical rebar extension for all walls to roof beam level as required.
12. All CMU block cells shall be solidly filled with cement grout. Grout all cells below slab on grade. Typical unless noted otherwise.
13. When plastering roof beams and columns. Apply concrete bonding into your cement mixture and paintbrush the portions before plastering.

14. Any hollow sound on existing and newly plastered walls found on walls to be chipped removed out and re-plaster all hollow walls detected to its solid sound plaster condition.

Note: To be inspected and verified for approval for the record.

15. For painted finish. Apply muriatic acid on newly plastered walls. Wash down, dry up before applying two primer coats on newly plastered walls, and then apply two coated final painting finish. For existing concrete wall paint scrape and water blast all bubbling peeling out paint on walls, ceilings, etc. Apply one primer coat on existing dirty/stained washed walls before applying its new final paint color.
16. Any hollow sound on the existing floor, wall and counter ceramics, chip out and remove. Install new floor, wall, and counter ceramic with no hollow sound on the ceramic finishing work.

Note: To be inspected and verified for approval for the record.

CONCRETE WALL AND CONCRETE ROOF STRUCTURE EXTENSION:

a) For rehabbing an existing semi-concrete house to construct a new concrete roof structure on top, the contractor will construct new 8”x12” concrete columns with a 10” thick foundation concrete pouring by 30” square column footings. If the existing house is longer than 20’, the contractor will construct another new column in between or in the middle for more structural support. The specifications are only for a house renovation with concrete roof ceiling height at 8’ to 9’ flooring finish to roof ceiling finish. For a 10’ roof ceiling or over, the contractor will construct a 12”x12” size concrete columns for all with a 10” thick concrete pouring by 36” square column footings. Rebar sizes are standard sizes approved from its building permit plans as specified. See construction drawings for rebar sizes and dimensions.

b) Roof coatings are required and shall be highly reflective, be ENERGY STAR® certified and be certified under the Cool Roof Rating Council (CRRC) standards that are designed for concrete roofs and tropical conditions (e.g., Henry 887 Tropi-Cool 100% Silicone Roof Coating).

c) Provide concrete splash boxes for drainage downspouts, that are positioned and sloped to direct storm water away from the building.

Note: To refurbish/renovate a damaged roof on an existing semi-concrete house, replacing with tin roof or repairing a tin roof will not be accepted as a rehab project. All eligible applicants must have their rooftops converted to solid concrete to mitigate any future disasters as outlined in 24 CFR 92.251(b)(1)(vi) and to comply with the rehab program requirement for homeowner’s insurance. Other proven roofing systems that are compatible or stronger than concrete may also be considered.

Note: The existing CMU walls to be used as existing concrete wall partitions. Do not depend on the existing wall as wall bearing walls for the record. It will only serve as a non-bearing wall. The new concrete columns are designed to carry the new 5" thick concrete roof slab with new 17"x8" or 10" concrete roof beams that are specified in the structural construction drawings for the record.

PLUMBING STANDARD NOTES:

1. Install a new ¾" ball valve at the existing CUC water meter box facing the house. Secure with cover level to the existing grade. (For emergency shut off valve)
2. Run a new ¾" PVC cold water line into the house project. (Following the Plumbing Floor Plans and Specifications). **NOTE:** Ensure PVC pipes are stored properly, covered and out of the sunlight. Pipes that are left out, uncovered can degrade which will shorten their lifespan.
3. For cold water lines, use PVC water pipes and for hot water lines, use CPVC water pipes.
4. For the waste line, use ABS pipes for all drainage waste line.
5. Make sure that the electric water heater has a Pressure Relief valve, with a drip leg outlet at no more than 12" above ground level. This is to ensure that should the water heater tank be over-pressured; the valve opens to relieve the pressure in the tank and prevent tank explosion.
6. Check slopes of waste/soil lines. Pipping below 3" diameter shall be sloped at ¼" per foot. Piping over 3" shall be sloped at 1/8" per foot for the proper sloping waste line to the septic tank as required in the plumbing code.
7. Lay new water lines higher than sewer/waste lines to prevent contamination. Provide sand cushion around any plumbing piping. Keep water lines away from soil/sewer lines if in the same trench by at least 24".
8. Install new air chambers for all fixture supply piping. Use 18" air chamber, one size larger than branch piping.
9. Testing of water lines pressures for 100 PSI for one hour without any drop in water pressure. Retest all leaky joints. Submit all test results together with the rest of the closing reports.
10. Static testing of waste lines and vent lines to 10' static head for at least one hour. Retest all leaky joints when detected until it has no more leak for the record. Submit all test results together with the rest of the closing reports.
11. Always check that the flow of the waste/soil lines is correct. The vent line is directed to the rooftop at 18" above the roofline. For sewer line, use long sweep elbow or tee.
12. Whenever a water closet is installed, make sure there is a minimum 2" vent thru roof at 18" above the rooftop.
13. Provide floor drains on 2nd or higher floors for housekeeping.
14. Clearwater lines and waste lines away from foundation footings, columns, and beams.
15. Do not install/embed water lines in concrete. Provide piping chase or sleeves.
16. Provide shut off valves at strategic points in the water lines.

17. For propane gas lines, use galvanized piping for LPG gas lines. Encased LPG piping in PVC piping, if piping is installed underground. Use a One bigger size PVC pipe to sleeve the galvanized pipe inside before pouring under the slab.
18. For rehabilitation projects, always provide strap around water heaters, gas tanks to prevent it from moving during an earthquake.
19. Provide cushion sleeves around any piping penetrating through concrete walls and floors.
20. Provide 36" standpipe for washer and P-trap shall be above ground readily accessible. Do not install P-trap under the ground.
21. Provide P-traps for floor drains, shower drains, kitchen sinks, and lavatories.
22. Provide ground or floor cleanouts at every 50'. Provide cleanouts to every angle as required in the plumbing code for preventive maintenance.
23. Do not install sewer lines in the same trench as water lines. Where there is crossing, concrete encase the sewer line 10' at 10" around the line to the end of crossing. Sewer lines should be always located deeper than the water lines in a trench.
24. For a long stretch of hot water piping lines, provide a loop comprising of elbows to offset expansion for safety purposes.
25. Provide 2" high overflow piping above a flat rooftop in addition to roof drains.
26. Provide supports for piping under slabs.
27. Provide vent piping 10' away horizontally from any window or door. Preferably, install a vent to terminate above the roof at 18" above finish rooftop.
28. The contractor shall be responsible for chipping existing concrete floors and walls to install new plumbing piping. The contractor is responsible also to restore floor slabs and walls to the original condition. These are part of the rehab and renovation work process. All extra work shall not be an additional cost to the homeowner. Everything should be included in the contract.
29. ENERGY STAR Heat Pump Water Heaters (HPWH) are required for domestic water heating equipment, with a minimum UEF (Uniform Energy Factor) of 3.75. HPWH must have sufficient air circulation around their installed location to meet the manufacturer's specifications, or ductwork must be installed to provide sufficient air, again, per manufacturer's specifications. An approved alternative to HPWHs would be the most energy-efficient in-stock water heater.

30. Standard sizes for water, soil/waste, and vent lines for each fixture are as follows:

Fixture:	**Cold Water:**	**Hot Water:**	**Soil/Waste:**	**Vent:**
Floor Drain			2" ABS	2" ABS
Water Closet	½" PVC		3" or 4" ABS	2" ABS
Urinal	¾" PVC		2" ABS	2" ABS
Kitchen Sink	½" PVC	½" CPVC	2" ABS	2" ABS
Lavatory	½" PVC	½" CPVC	2" ABS	2" ABS
Shower	½" PVC	½" CPVC	2" ABS	2" ABS

Dirty Kitchen Sink	½" PVC	½" CPVC	2" ABS	2" ABS

Note: Always tighten, secure, brace, and clamp all wall-mounted fixtures properly.

31. Water Conservation: The following are the maximum flow rates for faucets in gallons per minute (GPM) and maximum flush volumes for toilets in gallons per flush (GPF) for plumbing fixtures per the Green Building requirements.
    - 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.

32. New toilets must score 1,000 points on the MaP toilet performance test, www.map-testing.com/.

33. Faucet Standards:
    a) Kitchen Sink Faucet to conform to standards outlined above.
    Note: For disability or elderly Home Project to be a lever faucet set type.
    b) Restroom Lavatory Sink Faucet to conform to standards outlined above.
    Note: For disability or elderly Home Project to be a lever faucet set type.

ELECTRICAL STANDARD NOTES:

1. The contractor is responsible for obtaining permits for temporary power hook up including applying and paying hookup and monthly use fees for their use for the project without cost to homeowners for the record.
2. GFCI outlets to be installed in any kitchen counter at 4' min. away from all sinks.
3. Use the GFCI outlet for the restroom wall outlet. Do not use a regular outlet.
4. Use the GFCI outlet for the outside wall outlet with a weatherproof cover typical.
5. Design for outlets should be limited to 8 outlets for a 20-amp single pole breaker.
6. Design for lights should be limited to 8 lights for a 20-amp single pole breaker.
7. Provide at least one outlet in the hallway for housekeeping use.
8. Installing new electrical boxes shall include an adapter, lock nut, and bushing. Bushing shall be insulated.
9. The service entrance conduit shall be galvanized steel per CUC requirements.
10. Conduits underground shall be PVC.
11. For any exposed conduits it shall be a rigid aluminum or galvanized steel.
12. Conduits inside building in-ceiling or exposed may be electrical metallic tubing-EMT.
13. Minimum size for homerun shall be ¾" conduit for easy pulling.
14. For computer circuits, make sure the ground wire is isolated.
15. All power circuit conduit shall have ground wire.
16. Follow electrical wires standard color-coding per National Electrical Code. For residential rehab, projects shall be a 120/240 Volt system, 1 phase:

Phase A-color Black Phase B-color Red Neutral color: White Ground color: Green

Note: The neutral and grounding colors shall be the correct color wire throughout without any exception. Avoid color coding with electrical tape. Electrical hazard.

17. Splicing shall be the plastic pressure type connectors. For larger wires, splicing shall be terminal lugs type.
18. Any conduit crossing roadways or in traffic areas shall be embedded in concrete, or located per NEC. The minimum conduit depth is 18" to top of the conduit.
19. Separate communications conduits from power conduits by at least 12" laterally. The minimum conduit size shall be ¾" conduit. Provide pull wire in every empty communications conduit extending 12" at both ends for computer and TV. line connections.
20. Contractor to coordinate with telephone/internet company to seek the advice of where hand holes or access panels may be located for ease of pulling and service.
21. Be sure to apply rust spray paint to all electrical boxes before embedding them in concrete.
22. Position outlets on a horizontal orientation.
23. Where to put new light switches, place them right after opening a door on the closest wall at 4' height typical.
24. Light switches to be set on a vertical position at 4' height center of electrical boxes.
25. Conduits underground outside the house building shall have warning tape at 12" below grade.
26. Maximum bends in conduits shall be limited to three (3).
27. Standard Breaker amp size and its proper wire size use to prevent power shortage and fire for health and safety measures.
28. For reference, a 20-amp circuit breaker has a total of 1,920 Watts.
29. For a single-pole 20-amp circuit breaker, use No. 12 solid wires. Separate outlets and lights circuit breaker switch.
30. Use No. 12 solid wires for receptacle outlets. A limit of 8-outlets per 20-amp single pole circuit breaker switch.
31. Use No. 12 solid wires for light fixtures. A limit of 8-lights per 20amp single pole circuit breaker switch.
32. Use a 20-amp single pole circuit breaker with a No. 12 solid wire. For 110 volts air conditioning separately, use a ½" electrical conduit from the panel box to outlet location.
33. Use a 30-amp double pole circuit breaker with a No. 10 solid wire. For 220 volts air conditioning separately, use a ¾" electrical conduit from the panel box to the outlet location
34. Use a 50-amp double pole circuit breaker with No. 6 stranded wires in a 1" electrical conduit for electrical range.
35. Use a 20-amp single pole circuit breaker with a No. 12 solid wire. For a refrigerator separately, use a ½" electrical conduit from the panel box to outlet location.

36. Use a 20-amp single pole circuit breaker with a No. 12 solid wire, for computer station separately, use a ½" electrical conduit from the panel box to outlet location.
37. Use a 30-amp double pole circuit breaker with a No. 10 solid wire. For 220 volts Electric Water Heater separately, use a ¾" electrical conduit from the panel box to outlet location.
38. Use a 30-amp double pole circuit breaker with a No. 10 solid wire. For 220 volts Electric Clothes Dryer separately, use a ¾" electrical conduit from the panel box to outlet location.
39. For new construction and reconstruction, install a four (4) inch smooth rigid metal clothes dryer vent at the clothes location, venting to the exterior with a code approved outlet.
40. For reference information, using a 100amp double pole circuit breaker use a # 2 wire.
41. A 125-amp double pole circuit breaker uses a # 1 wire.
42. A 150-amp double pole circuit breaker uses a # 1/0 wire.
43. A 175-amp double pole circuit breaker uses a # 2/0 wire.
44. A 200-amp double pole circuit breaker uses a # 3/0 wire.
45. Make sure any electrical splicing to be connected uses an electrical connector, not electrical tape.
46. Make sure to tighten all loose connections properly.
47. For rehabilitation projects, provide 4" high concrete pad for mounting an electrical water heater equipment. Allow for 4" extra distance on the width and length of the water heater.
48. Exposed conduits in exposed areas shall be painted to match the adjacent wall finish.
49. All equipment and disconnect switch in weather shall be sealed waterproof.
50. All testing work shall be performed by the contractor and the contractor shall pay for all water, fuel, electricity, instrument, and personal.
51. The contractor shall submit a written guarantee certificate warranting all materials and workmanship free of defects for one year from the date of acceptance.
52. The contractor must submit As-Built drawings of the electrical system after project along with Certificate of Occupancy
53. All new light fixtures shall be ENERGY STAR® certified. All bulbs replaced shall be LED.

MOUNTING HEIGHT REQUIREMENTS FOR ELECTRICAL:

1.	Meter Box Height	5'-6" from finish grade to center of the meter box
2.	Panel Box Height	5'-0" from finish floor to top of the panel box
3.	Light Switches Height	48" from finish floor to center of the elect. Box
4.	Outlet Height	12" from fin. floor, for ADA outlet height 15" to 48"
5.	Fire Alarm Height	5'-6" from finish floor to center of the pull box
6.	Fire Alarm Horn/Bell Height	7'-6" from finish floor to center of the box
7.	Disconnect Switch	5'-6" from finish floor to the center of the box

ELECTRICAL GENERAL NOTES:

1. All electrical work shall be per the applicable sections of the National Electrical Code (NEC) latest edition, and the rules and regulations of the Dept. of Public Works and the Commonwealth Utilities Corporation.
2. All equipment and materials shall be UL listed where the listing is available for that type of equipment or conform to ANSI or NEMA standards.
3. Workmanship shall conform to the construction practices recommended by the American Electricians, Handbook by Croft, and shall be subject to the approval of the agency who has jurisdiction and the electrical engineer.
4. Conduit shall be EMT (indoor dry) locations concealed above ground, rigid aluminum (exposed installations, PVC (underfloor slab or grade, and inside concrete). Flexible conduit shall be jacketed type and per NEC 350.
5. Wiring shall be typed THWN, THW, XHHN, 600 volts. The conductor shall be copper.
6. Minimum size conduit shall be ½" inch diameter unless otherwise noted; minimum wire size shall be #12 AWG. Do Not Use #14 wires.
7. Electrical work shall be under the full supervision of a master electrician or a professional electrical engineer licensed to practice in the CNMI.
8. Panelboard shall be complete with bus bars, enclosure trim, molded case circuit breakers, bolt-on type branch circuit breakers, grounding, and neutral terminal lugs, panel board director, and keys. The laminated nameplate shall be provided on the front cover of the panel board or transformer.
9. All electrical devices and equipment exposed to weather shall be weatherproof.
10. Any device may be relocated within 10' of the location shown in the plans subject to the direction by the electrical engineer. Any such relocation shall be performed without additional cost to the homeowner.
11. The electrical contractor shall coordinate with a mechanical contractor for exact locations of water lines and waste lines before rough-in work.
12. Grounding:

    a. Metallic enclosures, raceways, and electrical shall be grounded per NEC 250. Provide green ground wire in every raceway per NEC Table 250-95.
    b. Grounding connection of the grounded circuit conductor (Neutral) shall be made only at the service disconnection means per NEC 250-23(a). Grounding on the neutral shall not be made on the load side of the service disconnect. The neutral shall not be made on the load side of the service disconnect. The neutral conductor shall be insulated from all equipment enclosures or any grounded parts. Bonding of the neutral bus to the ground bus in sub-panels shall be removed.

13. The electrical panel board and main switchboard, power meter box shall be furnished completely assembled from the factory.

14. Contractor to provide all labor, materials, equipment, tools, and all necessary materials including wire connectors, tapes, markers, etc. to accomplish the work shown in the plans. The cost of permits shall be the contractor's responsibility.
15. Minimum service clearance in front of the main switchboard shall be 4'.
16. Testing: Operation, Insulation Resistance, Grounding Tests.

FINISH MATERIAL STANDARDS:

FLOORING STANDARDS:

a) For the living room, dining room, kitchen room, hallways, and bedrooms floor, the finish is to be plastered level with a vinyl tile or ceramic tile finish

b) Bathroom flooring, to be a ceramic finish with white cement grouted finish. If the bathroom floor is ceramic tile, it must be an approved nonslip type of finish.

Note: Ceramic color should be the client's choice of ceramic color on the contractor's approved standard min. ceramic size.

c). For all concrete stoops, landings and sidewalks floor finish, to be plastered sweep finish and for the carport, floor finish to be plastered fine finish.

d) PVC-free resilient flooring shall be ceramic or stone tile or natural linoleum., cork,

Note: Flooring color should be the client's choice of options from the contractor's approved standard flooring options.

PAINT, CAULK AND SEALANT STANDARDS:

a) Paints Caulks shall meet the SCAQMD 1113 VOC limits (see chart below).

b) Sealants shall meet the SCAQMD 1168 VOC limits (see chart below).

PRODUCT TYPE	MAXIMUM VOC LIMIT (G/L)
Primers, sealers, and undercoating	100
Coatings, flats and non-flats, and floor	50
Rust-preventive coatings	100
Wood coatings	275
Stains, interior	250
Tub and tile refinishing coatings	420

Architectural Applications	VOC Limits (g/L)
Clear, Paintable, and Immediately Water-Resistant Sealant	250
Foam Insulation	250
Foam Sealant	250
Grout	250
Roadway Sealant 250	250
Non-Staining Plumbing Putty	250
Potable Water Sealant 250 100	250
Roofing	
Single Ply Roof Membrane Sealant	450
All Other Roof Sealants	300
All Other Architectural Sealants	250
Marine Deck Sealant	760
All Other Sealants	420

DOOR STANDARDS:

a) For the exterior front entry door, use a 1¾" thick x 36"x 6'-8" solid core decorative door with heavy-duty door hinges, regular doorknob, deadbolt with keys, painted varnish finish, and door bottom with threshold and a door stopper on the back.

Note: Use a lever-type doorknob for a disability or elderly home project.

b) For any exterior exit door, use a 1¾" thick x 32"x 6'-8" min. regular solid core door with heavy-duty door hinges, regular doorknob with a deadbolt, painted varnish finish, and door bottom with threshold and a door stopper on the back.

Note: For disability or elderly home project, use a lever type doorknob with keys and a 36" size regular solid core door.

c) For bedroom doors, use a 1½" thick x 36", 34", 32", or 30"x 6'-8" min. regular hollow-core door with light-duty door hinges and regular doorknob w/no key type and door painted with a varnish finish and a door stopper installed on the back.

d) All aluminum typhoon shutters shall meet or exceed the wind rating outlined in the 2018 International Building Code (IBC).

e) **Note:** For a disability home project, use a lever type door knob with keys only on 36" door size.

WINDOW STANDARDS:

a) All exterior windows shall be ENERGY STAR® certified. When ENERGY STAR® Certified exterior windows are not available nor can be manufactured (and documented to that effect), the most efficient, in-stock alternative will be acceptable, especially when used in conjunction with shutters.
b) Living room window min. size 4'x4' sliding glass window with a ¼" thick safety tempered glass with aluminum frame. 4 screws on each side.
c) Kitchen window min. size 3'x3' sliding glass window with a ¼" thick safety tempered glass window with aluminum frame. 3 screws on each side.
d) Dining room window min. size 3'x 4' Height with a ¼" thick safety tempered sliding glass window with aluminum frame. 3 screws on each side and 4 screws each on top and bottom.
e) Bedroom window must have at least one set 4'x4' sliding glass window (For egress, in case of fire) with a ¼" thick safety tempered glass window with aluminum frame. 4 screws on each side.
f) Restroom window min. standard size. 2'x2' sliding glass window with a ¼" thick safety tempered glass window with aluminum frame. 2 screws on each side.
g) Seal all window edgings inside and outside
h) All windows shall also include window screens
i) Frame Color to be Client's choice of color
j) Install new typhoon metal brackets at the outside walls for all windows w/painted finish
k) Use 3"x1/4" screws to bolt the sliding windows to the concrete wall. The minimum number of screws per window is mentioned above.
l) Install Aluminum Typhoon Shutters. Install accordion style aluminum typhoon shutters, or a retractable typhoon shutter design approved in advance by NMHC, on all housing unit windows.

- Typhoon shutters must be accordion-type with lock and key.
- Use 3"x1/4" screws to bolt the typhoon shutters to the concrete wall. The minimum number of screws is 3 per side.

Note: All aluminum typhoon shutters shall meet or exceed the wind rating outlined in the 2018 International Building Code (IBC).

REGULAR AND DISABILITY REHAB OR RECONSTRUCTION PROJECTS, STANDARD FINISHES:

a) For disability, concrete sidewalk & landing size requirements. Concrete sidewalk width 36" min. and for landing size 5' sq. no less.

Note: Sidewalks and landings that are higher than 7" above existing grade during rehab work, requires all sides to be backfilled at 4" finish grade at 1' level and

slope out at 4’ on both sides to existing grade elevation, otherwise install new aluminum hand railings within 33” to 36” height along the hazard sidewalk, ramps and landings pathway.

Note: For regular rehab home projects sidewalks, same at 36” and for landing 36” sq. is allowable.

b) For the front entry and exit doors outside, construct a 5’ sq. concrete stoop floor landing at ½” lower from the finished house floor elevation.
c) The restroom floor elevation should be ½” lower from the inside house flooring. Also, for the shower room flooring is ½” lower than the restroom flooring as required.
d) Install hand railings along any sidewalks or pathways and landings that are higher than 7” above finish grade.
e) Construct a new concrete ramp at a ratio of 1” drop = 1’ slope.
f) Install smoke alarms in bedrooms and hallways as required by Building Safety Code. Smoke alarms must be hard-wired smoke alarms and that the smoke alarms must be interconnected.
g) When warranted, install fire sprinklers with warning fire light signals for impairment of client individuals only.
h) In designing a new rehab disability home layout extension or for reconstructed disability house floor plan design, consider a 3’ clear passage for a wheelchair to maneuver from the entry of the house to the inside of the house. Ensure that in your design layout, take into consideration the furniture space in planning for wheelchair accessibility, through bedrooms, restroom(s), living room, kitchen, dining, and for exiting the exit door to the outside of the house with no hazards along for emergency purposes as required.
i) Disability lavatory height should be set at 34” maximum.
j) disability water closet height from the finished floor to the toilet seat is within 17” to 19”. Note: For regular standard toilet height is 15” from the finished floor to the toilet seat.
k) Install a new 2’ ADA grab bars on the back of ADA toilet centered, 2’ length on shower faucet wall and 42” on the side shower wall at height within 33” to 36”.
l) Install ADA medicine cabinet at 40” from the finished floor to the bottom of the medicine cabinet.

Note: For regular standard medicine cabinet height is 64” from the finished floor to center of the medicine cabinet.

m) Install a towel hanging bar within 36” to 48” for disability or regular restroom.
n) Install a toilet paper holder to the nearest wall at 19” above the finished floor and a maximum of 36” from the rear wall.

o) Rehab finishing projects paint colors to be the home client's choice of paint color for all paint finishing work.

p) Paints, caulks, adhesives and sealants must be low VOC (low in volatile organic compounds) meeting the South Coast Air Quality Management District (SCAQMD) requirements for Architectural Coatings Rule 1113, and Rule 1168 for Caulks, Adhesives and Sealants.

All technical reference information applies to all building systems standard needs for new house construction, rehabilitation project, renovation project and house conversion to disability home compliance project that meet all current CNMI local building code regulations and meet Housing Quality Standards (HQS) and Uniform Physical Condition Standards (UPCS) requirements.

The HUD CPD Green Building Retrofit Checklist will also be included in the rehabilitation standards (Attachment A). "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."

Other building systems may be accepted provided that they meet or exceed the standards mentioned above. Third-party certifications or specific standard testing methods are required to substantiate or validate the claims.

Attachment A – Green Building Retrofit Checklist:

HUD CPD Green Building Retrofit Checklist Customized 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:

The following are the maximum flow rates for faucets in gallons per minute (GPM) and maximum flush volumes for toilets in gallons per flush (GPF) for plumbing fixtures per the Green Building requirements.

- 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.

New toilets must score 1,000 points on the MaP toilet performance test, www.map-testing.com/.

☐ **Air Sealing: Building Envelope**
Seal all accessible gaps and penetrations in the building envelope. If applicable, use low-VOC caulk or foam.

☐ **Domestic Hot Water Systems**
When replacing domestic water heating system(s), install Heat Pump Water Heaters and ensure the system(s) meet or exceed the efficiency requirements of ENERGY STAR for Homes' Reference Design or the most energy-efficient water heating appliance available on-island.

☐ **Efficient Lighting: Interior Units**
When replacing, new fixtures and ceiling fans must meet or exceed ENERGY STAR efficiency levels.

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

Follow the guidance appropriate for the project type: use ENERGY STAR-labeled LED fixtures and bulbs in all common areas; ***OR*** when replacing, new common space and emergency lighting fixtures must meet or exceed ENERGY STAR efficiency levels. For emergency lighting, if installing new or replacing, all exist signs shall meet or exceed LED efficiency levels and conform to local building codes.

☐ **Efficient Lighting: Exterior**
When replacing, install ENERGY STAR LEDs with a minimum efficacy of 45 lumens/watt.

Efficient, Impact-Resistant Exterior Doors and Windows
All exterior doors shall be ENERGY STAR labeled and meet Missile Level D of ASTM E1996-20, Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes. First floor exterior doors shall open outwards to reduce storm-related projectile and flood damage risks. All exterior windows shall be ENERGY STAR® labeled and protected by window shutters where practicable. When ENERGY STAR® Certified window are not available (and documented to that effect), the most efficient, in-stock alternative will be acceptable.

☐ **Roof Coatings**
Roof coatings are required and shall be highly reflective, be ENERGY STAR® certified and be certified under the Cool Roof Rating Council (CRRC) standards that are designed for concrete roofs and tropical conditions (e.g., Henry 887 Tropi-Cool 100% Silicone Roof Coating).

MATERIALS AND WASTE MANAGEMENT

☐ **Waste Minimization**
Minimize the amount of Construction and Demolition waste generated by such methods as efficient use of materials, appropriate planning, proper storage (e.g., cover and store PVC and other plastic pipe and fittings out of sunlight so they will not degrade, tarp and cap rebar, etc.) reuse of concrete forms, prevention of damage to materials, avoidance of excess packaging, and source separation of waste.

☐ **Reuse and Recycling**
As much waste material as economically feasible shall be reused, salvaged, or recycled. Scrap metal, aluminum cans, and white goods must be recycled. Waste disposal in landfills shall be minimized.

INDOOR AIR QUALITY

Composite Wood Products that Emit Low/No Formaldehyde

☐ Composite wood products must be certified compliant with California 93120. If using a composite wood product that does not comply with California 93120, all exposed edges and sides must be sealed with low-VOC sealants.

☐ **Environmentally Preferable Flooring**
Install ceramic tile, stone tile, natural linoleum flooring, or other PVC-free resilient flooring.

Low/No VOC Interior Paints, Coatings, and Primers

☐ All interior paints, coatings, and primers must be less than or equal to the following Voltile Organic Compound (VOC) levels: Flats--50 g/L; Non-flats--50 g/L; Floor--100 g/L. [g/L = grams per liter; levels are based on South Coast Air Quality Management District Rule 1113.

☐ **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, except:

- When the clothes dryer is located outside of the living space, or
- When creating a hole for the vent in a masonry wall is required.

☐ **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 so the drained water flows away from 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 significant cracks, wall, floor, and joint penetrations with low-VOC caulking or other appropriate sealing methods to prevent pest entry. [If applicable, provide Integrated Pest Management training and safe pesticide application with residents and multifamily building 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.

☐ **Asbestos**
Testing, abatement, and safe removal requirement for any disturbance of more than 100 feet of asbestos-containing material. Testing should be done by a lab accredited by the NIST National Voluntary Laboratory Accreditation Program (NVLAP).

☐ **Radon Testing and Mitigation** (if applicable based on building location)

For buildings in EPA Radon Zone 1 or 2, test for radon using the current edition of American Association of Radon Scientists and Technologists (AARST)'s Protocols for Radon Measurement in Homes Standard for Single-Family Housing or Duplexes, or AARST's Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings. To install radon mitigation systems in buildings with radon level of 4 pCi/L or more, use ASTM E 2121 for single-family housing or duplexes, or AARST's Radon Mitigation Standards for Multifamily Buildings. For new construction, use AARST's Reducing Radon in New Construction of 1 & 2 Family Dwellings and Townhouses, or ASTM E 1465.