

DND Design Standards

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Acknowledgments

City of Boston

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01

Introduction & Purpose

The following DESIGN STANDARDS are intended to promote the construction of affordable residential dwellings of high quality, which are cost-effective to build and operate, use reliable materials and systems, and support the activities of renters and buyers. A major goal of these requirements and guidelines is to encourage the creation of multifamily residential dwellings which:

- Result in prudent and economical construction.
- Are sensitive to existing residential building types, existing massing, setbacks, siting and open space elements of the neighborhood.
- Make intelligent use of the interior and exterior space to enhance the quality of life of residents and neighbors.
- Maximize accessible, welcoming, and safe spaces, with the understanding that people have different needs and abilities that can change over time.
- Encourage sustainability strategies which result in low maintenance costs, energy efficiency, and minimal environmental impact on public infrastructure.

02

Design Review Process

DND Design pursues design excellence with a focus on improving life for the people of the city of Boston, particularly those with the greatest need. Through the Design Review Process, DND partners with development teams to: 1. create affordable, equitable, and sustainable housing for residents and newcomers using design principles that contribute to a high quality of life; 2. Preserve and enhance the urban fabric of the neighborhoods by building and supporting thriving communities; and 3. ensure that public resources are used to help as many people as possible.

DND reviews each project's design and pricing progress at key milestones in the architectural process. These checkpoints serve to ensure that a project is meeting DND's goals and to provide a framework for open communication about project challenges and changes. In order to assist development teams with the Design Review Process, DND provides Design Review Checklists for each review milestone listed below. The checklists are intended to make DND's expectations at each design phase transparent and straightforward. Development teams must review their submission materials, fill out the appropriate checklist, and then submit it along with the past checklists (for reference) and the current design submission. Refer to DND's Design Checklists for more information. The key milestones with checklists are:

- Funding Application (if applying for funding)
- Schematic Design
- Design Development
- Construction Documents & Bid Package
- Bidding/Contractor Selection
- Draft Construction Contract
- Closing (for materials needed for DND's construction staff's use as the project transitions into construction)

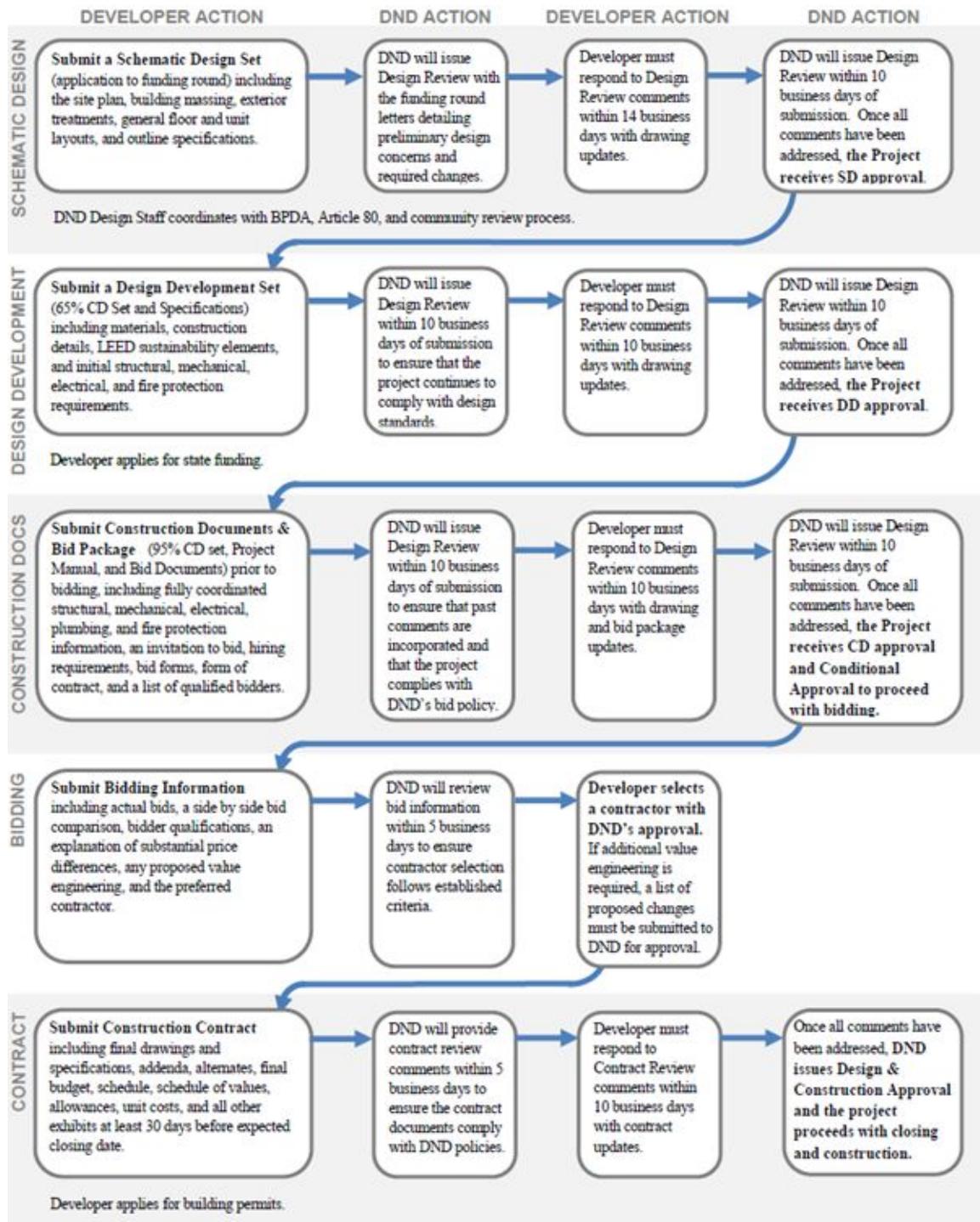
The flowchart below illustrates DND's Design Review Process and should be used in planning the development schedule. A more detailed description of the DND Design Review Process can be found on the DND website at: <https://www.boston.gov/departments/neighborhood-development/neighborhood-development-housing-policies>

Funding Round Design Submission Requirements

At the time of application for funding, the Design Submission is to consist of the following:

- 1 bound schematic design set (of at least 18"x24") and renderings of the proposed design
- 1 set of outline specifications
- 1 usb memory stick with a digital copy of the schematic design drawings, including renderings, and outline specifications

The design submission is to focus on the best description of the physical design of the proposed project. The set is to illustrate the site planning for the development and the building(s)' proposed relationship to contextual features and existing buildings. Documentation should focus on illustrating the massing, how the building will meet the streetscape and provide an overall context in which to understand the scale of the building(s) and their exterior finish. The set is also to include the interior spatial layout of each floor, dimensioned unit layouts, and all building elevations. See Design Checklists for specifics.



03

Rehabilitation & Preservation

Preservation project development teams are to provide a comprehensive rehabilitation strategy, which combines the established 20-year Capital Needs Assessment (C.N.A.) with practical green building and energy performance recommendations. Applicants are to provide a C.N.A. and the replacement reserve analysis which focuses on improving the quality of life of residents, ensuring the long-term stabilization of the building and protecting the health and safety of building occupants. Green building recommendations are to use LEED for Homes, Healthy Homes, and Energy star as a basis and pay particular attention to improving poor indoor air quality, inadequate ventilation and other unhealthy interior conditions for residents. The energy performance assessment is to evaluate where improvements can be made to reduce operating costs by improving the energy and water efficiency of the building(s). Considerable improvements can be obtained by providing workshops to introduce conservation strategies and healthy homes measures to residents. Where unit layout or reconfiguration is proposed the rehabilitation strategy is to address these modifications.

Capital Needs Assessment

The C.N.A. is to project the potential capital costs over a 20-year period using a quantity inventory of building components (including the age and expected life of these components), data on their current cost, assumed rates of inflation and a schedule of replacement. The C.N.A. must have been conducted by a qualified professional less than 2 years prior to the submission to this application for funding. Projects with multiple buildings must complete a C.N.A. for each building.

A complete C.N.A. will include a detailed 20-year capital needs worksheet. A report summarizing the existing property conditions with color photos, a description of projected needs as reflected in the C.N.A. and final replacement recommendations are to accompany the worksheet. In addition applicants are to provide the following:

- A chart or (bar) graph to summarize costs in each building system or major work category between years 1-20 as recommended by the C.N.A.
- A narrative summary of the following priority areas as reflected by the immediate replacement recommendations in the C.N.A. This narrative is also to focus on life safety upgrades required by code:
 - Building Stabilization – exterior envelope, structure, egress
 - Mechanical, Electrical, Plumbing & Fire Protection Systems
 - Hazardous Materials & De-leading
 - Ventilation, Indoor Air Quality – bath, kitchen, common area
 - Interior Quality & Finish – including healthy homes

Replacement Reserves

The replacement reserve analysis is to project the funds required for capital improvements over a 20-year period. The analysis should include the prior 3 to 5 years reserves. Each of the following documents is to include a chart or (bar) graph to illustrate the analysis. Also include capital costs with the chart or graph for comparison:

- A replacement reserve projection based on existing reserves.
- A replacement reserve projection based on the reserves proposed in the rehabilitation strategy.

Green Building & Energy Performance

Operating expenses are to specifically include utility cost for gas, electricity and water. Maintenance costs are to be included as an operating expense, if repairs to fixtures, heating equipment, appliances, lighting, etc. can be quantified. An analysis of existing operating costs should include historical trends 3 to 5 years prior and an energy audit conducted by a qualified energy auditor or home energy rater. More extensive thermal imaging and deconstructive exploration is to be conducted when known deficiencies exist in the building envelope

(roof, floors, exterior walls, etc.) Operating savings are to be determined from identifying where “energy” improvements have the greatest cost benefit (life cycle cost compared to payback period.) These operating savings are to be projected over a 20-year period based on the rehabilitation strategy.

Use LEED for Homes, Healthy Homes and Energy star as a basis for Green building and pay particular attention to improving poor indoor air quality, inadequate ventilation and other unhealthy interior conditions for residents. A complete assessment will include a summary of the “green” and “energy” improvements with a description of expected resident benefits, operating cost reductions including utility savings. Thermal imaging, investigative photos & reports from the energy audit and detailed spreadsheets analyzing existing operating expenses and proposed operating savings (cost benefits) are to be provided. In addition applicants are to provide the following:

- A 20-year projection of operating cost savings based on the rehabilitation strategy.

Rehabilitation Strategy Summary Chart

Please include a chart or (bar) graph, which combines operational savings, replacement reserves and capital needs over a 20-year period in a single illustration. Capital needs improvements are to be broken into categories based on the rehabilitation strategy. This graph is to reflect an understanding of the fund allocation within the capital improvements in comparison to the funds/savings allocated to replacement reserves.

Unit Modification / Reconfiguration

Compliance with DND’s unit size and room dimensions is not required for Moderate Rehabilitation Preservation projects where the interior layout of residential units remains unchanged and systems upgrades are the focus of the proposed project.

Rehabilitation strategies that minimize the reconfiguration of existing units is highly preferred and encouraged by DND. However, DND understands that there are cases where the existing residence serves a program or serves a particular target population and the existing accommodations are no longer adequate for the program. In addition the characteristics of the building (dimensions, window locations, square footage, interior layout, circulation, etc.), provide specific constraints on the configuration of units. In these cases, the development teams are not required to meet the Target Unit Sizes listed in these Design Standards. However, the development team is encouraged to strive to meet the Target Unit Sizes and room dimensional requirements described in these Design Standards in areas that are being reconfigured where it does not greatly increase the scope of work to do so. The team is to schedule a site visit and meet with DND design staff to explain the need for reconfiguration and discuss the approach to reconfiguration prior to submission to a funding round. The development team should reference these Design Standards and local code to assess whether proposed interior rooms are adequately sized.

Accessibility and Relocation

Applicants are to clearly explain any need to modify the existing configuration of units for any reason including accessibility and life safety. Applicants are to determine whether the renovation scope of work (when compared to the building value) triggers compliance with accessibility regulations. A unit inventory listing the unit, unit square footage and number of bedrooms is to be provided in order to assess the impact of reconfiguration on the existing unit mix. Applicants are also to summarize temporary or permanent displacement caused by the reconfiguration of units (Note URA requirements in the Application Process). Provide the following in addition to the narrative explanation described above:

- A unit inventory organized per building listing each unit’s major rooms, their dimensions and square footages is to be provided.

Adaptive Reuse and Gut Renovation

New construction requirements and guidelines described throughout these Design Standards are to be used where an existing building is being adapted from nonresidential use to a residential use and when residential units are proposed to be completely gutted.

When residential units are proposed to be completely gutted, the development team must substantiate the need for this approach. The Rehabilitation Strategy narrative is the place to explain how the development team has verified that the Capital Needs and Useful life of systems and building components have reached the point of complete overhaul.

04

New Construction - Sustainability

DND has led the way with sustainability in affordable housing. Since 2008, DND, working with Boston Planning & Development Agency, Environment Department, energy providers, architects and affordable housing developers, has successfully facilitated a number of activities in pursuit of the City's Green Building Initiatives Program. We have long recognized that building performance, material durability, operating savings, resident comfort and resident health can be significantly improved when appropriate energy conservation and sustainability measures are integrated into the building design.

LEED

All projects must be designed to meet LEED "certifiable" at the Silver level at minimum. Certification by LEED in any way is not required. Compliance with an Environmental Protection Agency (EPA) Energy Star residential program is required as a prerequisite of LEED. Commissioning is required by DND and in-field verification (except where required by LEED or Engerystar) is strongly recommended. Projects complying with Enterprise Green Communities must demonstrate equivalence with LEED sustainability measures. Incentives and rebates through agencies such as the Massachusetts Clean Energy Center (CEC) and MassSave are to be integrated into the sustainability strategy for the project.

Zero Emissions Building (ZEB)

We have expanded the sustainable design and green building practices embodied within the Design Standards to reflect strategies to address climate change and Mayor Martin J. Walsh's 2050 Carbon Neutrality goals.

DND's ZEB requirements are based on the recommendations contained within the 2020 guidebook for Zero Emission Buildings. The guidebook makes specific recommendations which provide a prescriptive path to a ZEB without extensive need for consulting and energy modeling. The following building assembly components were studied because they have the greatest impact on a building's EUI:

- Window U-value Window to wall ratio & Solar Heat Gain Coefficient
- Air Tightness (ACH50/sf² of gross envelope area)
- Heat recovery ventilation efficiency
- Domestic Hot Water System Efficiency (COP)
- Heating + Cooling System Efficiency (COP & SEER/EER)
- Roof, Wall, Floor and Slab R-Value (*including submittals for all insulation and air/vapor materials*)
- Photovoltaic system capacity (KW) and Roof Area percentage

The study team discovered that there is a total construction cost increase in the range of 2.5%. Incentives are available to offset engineering soft costs and utility rebates exist to lower total construction costs per unit. The long term operational savings means lower rents for residents and more sustainable hoa fees (repair & maintenance reserves) for homeowners. We see these requirements as an investment to make housing more economically sustainable for the future and address issues of equity in society. In the field educational and training opportunities partnering with Boston based apprenticeship, high school workforce training programs and simply engaging the immediate stakeholders of the project through social media and dedicated project websites are effective ways to address Equity in the development process. We want projects to build momentum toward the Mayor's 2050 Zero Carbon Vision and adoption of ZEB principles widely.

Co2 Target Budget Requirements

All new DND construction must be designed based on a Co2 target budget of 0.7-1.1 tons/person/year, or 1800kWh per person annually (SITE energy, 5,040 KWH per person SOURCE energy (using a 2.8x multiplier for electricity)* based on an occupancy of 2 occupants per bedroom) and must use electricity and on-site

photovoltaics as the sole (or primary) fuel source. This target relates to the residential portion of a mixed use project. Commercial and significant areas of amenity space within a mixed use or multifamily project must use electricity and on-site photovoltaics as the sole (or primary) fuel source.

**projects must use DND's occupancy for calculation of occupants and miscellaneous electric loads (MELS) which is equivalent to 2 persons per bedroom. Note this will be an increase in occupancy from PHIUS' "number of bedrooms+1" per unit calculation.*

Projects must simply implement the following prescriptive measures to meet the ZEB Requirement.

- A checklist, drawings and specifications documenting these elements
- A HERS checklist from a HERS rater
- Or a Passive House report submitted by a Certified Passive House Consultant

This is all that is required to comply with the Co2 Target Budget requirements. *DND has phased the implementation of this prescriptive path based on feedback received during the study phase for Large projects. Refer to Application of ZEB Requirements for more information on ZEB compliance paths.*

Window U-value Performance, Window To Wall Ratio & Solar Heat Gain Coefficient

All windows are to have a National Fenestration Rating Council (NFRC) rating (and be Energy Star rated.) Wood, wood-clad, aluminum, fiberglass and uPVC windows which meet the performance standards are acceptable for new construction.

Where window to wall ratios exceed these percentages, the window u-value must be determined by energy modelling. Window to Wall Ratio (%) of total surface area and the required u-value & window performance is shown below.

- 15 to 20% requires a window with a u-value of .22 or less
- > 20% requires a (triple glazed) window with a u-value of 0.18 or less
- All windows must have an Energy Star Air Leakage of <0.3 cfm/ft² @ 75 pascals.
- And a Solar Heat Gain Coefficient (SHGC) of .3 or less

Note: DND prioritizes composition of buildings fitting into their context and is an important element of the design review process. DND will work with architects to be certain that the window to wall ratio does not negatively impact the building design.

All windows should be sealed and receive pan flashing including pan flashing at sills, side flashing. Install pan flashing over building paper at sill using an industry approved water management system. For installation using other construction methods refer to the appendix. Caulk all window (and door) units with ethylene copolymer caulk, using backer rod closed cell polyethylene and fill window shim spaces with low-expanding foam sealer as required. The warranty period is to be a minimum of 10 years and be transferable to subsequent owners. *For insulating glass, the warranty period should be 5 years after seal date permanently imprinted on the unit, but not less than 5 years after date of substantial completion.*

Air Tightness (ACH50/sf2 of gross envelope area)

Airtightness plays an essential role in terms of overall building and insulation performance. MA CMR requires all new construction to have air barriers and weather resistant barriers.

- Projects are required to provide third party Quality assurance (QA) and quality control (QC) (at the Project Management level) to ensure an air tightness of 0.06 ACH cfm/sf² of gross envelope area @ 50 pascals is achieved.

Domestic Hot Water System Efficiency (COP)

Domestic Hot Water systems with a Coefficient of Performance (COP) of 1 or greater are required. Domestic Hot Water systems may be centralized or unique to individual units. Options include:

- Instant-electric resistance hot water heaters (COP 1), or
- Heat-pump hot water heaters (COP 2+).

Ventilation

Compartmentalized unit ventilation in conjunction with hrv or erv with direct venting to the exterior is preferred. In the unit erv/hrv may be connected to bathroom and kitchen area ventilation (non-combustion appliance required).

- Semi centralized ventilation per floor may be an acceptable alternative.
- Bathroom ventilation must be continuous and allow for variable control for odors unless the system can be shown to operate in a way to accommodate these conditions.
- Ductless range hoods with charcoal filters are to be Energy Star rated.

Heat Recovery Ventilation

Small multifamily (6+ units)	57% + 0.77 watts per CFM
3 story multifamily (14+ units)	57% + 0.77 watts per CFM
4-5 story multifamily (40+ units)	80% + 0.77 watts per CFM(see large buildings)
6 story multifamily (50+ units)	80% + 0.77 watts per CFM(see large buildings)

Heating System

Small multifamily (6+ units)	Heat pump 1 ton system/unit - ductless (preferred) - 3.0 COP (or more)
3 story multifamily (14+ units)	Heat pump 1 ton system/unit - 3.0 COP (or more)
4-5 story multifamily (40+ units)	see large buildings
6 story multifamily (50+ units)	see large buildings

Ducts should be located entirely within the building thermal envelope. The tested duct leakage rate must meet MA Residential IECC Energy Performance Testing requirements verified by a BPI or HERS Rater. Tested duct leakage should be less than or equal to 4.0 cfm at 25 Pascals per 100 square feet of conditioned floor area (for each installed system).

Cooling System

Energy star rated - ≥ 15 SEER/ ≥ 12.5 EER for split systems

Energy star rated - ≥ 15 SEER/ ≥ 12 EER for single package equipment including electric package units.

Application of Heating, Cooling and Ventilation Requirements (Small Buildings; where applicable)

- Ducting shall run straight to the exterior, pulled tight without kinks or bends, with insulated duct discharging through a galvanized steel or aluminum wall or roof cap with a back draft damper, insect screen and wind hood.
- Range hoods shall be vented to the outdoors
- Bathroom exhaust systems should operate continuously at low speed and include switching to boost discharge ventilation following occupant use by at least 50%
- All bathroom doors shall be undercut 1/2" to promote required air changes throughout the unit.
- Exterior wall caps are to be detailed and located to be as inconspicuous as possible.
- Where central AC is not provided, place 20 amp circuits under windows for AC units in the living room and bedrooms. Through-wall AC units are forbidden.
- If baseboard heating is used, piping must be offset below the floor so that wall space can be kept clear of dummy trim for furniture placement. Heating element locations must be coordinated with functional furniture layouts. In bedrooms, there must be space to place beds against walls without baseboard heating.
- Note: Thermostat Controls - Heat pump thermostat control is to be based on manufacturer requirements. Where wired thermostats are used in multi-unit buildings systems, building level remote control is recommended. Programmable thermostats (in unit control) are to be used per Energy Star requirements.

Roof, Wall, Floor and Slab R-Value - Thermal Bridge Free Shell & Optimized Insulation

Embodied carbon. Teams must examine the selection insulation products with low global warming potential (GWP). Many XPS products and high GWP closed-cell spray foam insulations are of concern. Excellent alternatives exist on the market that use low global warming potential blowing agents. One example includes closed cell spray insulation that uses HFOs as a blowing agent (see appendix.) Cellulose (recycled newsprint), cotton, wool, low-density open-cell polyurethane foam, and recycled-content glass fiberglass are to be fully explored.

Drawings must contain a whole building and wall section diagrams illustrating a continuous insulation and air/vapor barrier without thermal bridges. Insulation values are to be as follows:

- Roof R60
- Walls R36 (R30 - Large Buildings)
- Slab R21

On-site Photovoltaics

Buildings must be placed considering the optimal solar orientation (in addition to wind direction for natural ventilation and wind buffering.) “Solar ready” buildings must indicate the clear roof area free of any obstructions that would hinder future PV installation. This area typically represents at least 75% of the roof area. Where buildings can only implement a portion of the required photovoltaics to reach zero emissions, the remaining percentage must be kept clear in order to increase on-site renewables overtime. Solar ready measures such as chases for conduit runs, structural provisions, space allocation for converters and other equipment, etc. must be included into the construction. Methods for providing summer shading for south-facing walls are to be considered.

The size of the Solar PV system must be indicated in kW to produce a ZEB. At minimum, the project must submit a PV Watts report (see appendix) showing the system capacity (monthly and annual Kwh production.)

Lighting, Appliances and Metering

Lighting and equipment requirements are to be consistent with the PHIUS multifamily calculator. All applicable appliances shall be Energy Star rated and meet Watersense Requirements. Individual electric metering shall be provided for units. Switched ceiling-mounted lighting fixtures are required in all interior unit rooms and in building common areas including stairwells.

Application Of ZEB Requirements

Small Buildings - 6 units or less

ZEB Small buildings will most easily meet the Carbon Neutral targets outlined in these requirements (and underscore the “portfolio concept” described within the study.) Buildings in this category have the ability to produce energy to return to the grid meaning the residents will have little if any electric utility bills. At a small % increase in overall construction cost, these measures can be added within typical DND subsidy limits. The PV system may be the only challenge to development teams. Therefore Buildings 6 units or less (including 1 & 2 Family Dwellings) must factor in solar orientation and PV KW capacity in the conceptual design but are at this phase must be “ZEB ready.”

However where DND Standards are referenced in a request for proposals (RFP) full compliance with ZEB requirements is mandatory. Projects in this category may demonstrate alternative compliance in the following areas, subject to DND Design Review and Approval:

- Roof, Wall, Floor and Slab R-Value
- Window U-value Performance, Window To Wall Ratio & Solar Heat Gain Coefficient

6 to 40 units

Projects between 6 and 40 units must simply implement the prescriptive measures to meet the ZEB Requirement (*that's it.*) If any requirement is not met modelling must be provided to demonstrate this alternative approach to the element complies with the Co2 Target Budget Requirements.

Large buildings - 40+ units. (Alternative ZEB Compliance)

A multifamily building 4 stories or more and 40+ units (and other applicable projects) may demonstrate alternative ZEB compliance with the ZEB Co2 target budget of 0.7-1.1 tons/person/year, or 1800kWh per person annually (SITE energy, 5,040 KWH per person SOURCE energy (using a 2.8x multiplier for electricity)*) by using a performance path. Such building projects must comply with the following:

- Assume 2 occupants per bedroom (not the standard 2+1 approach)
- Modeled results must be produced using WUFI+WUFI Passive or PHPP, or any simulation tool capable of simulating all 8760 hours of building performance such as EnergyPlus, DOE-2, IES-VE or Trane Trace
- Lighting and equipment requirements are to be consistent with the PHIUS multifamily calculator (see Appendix)
- Where electric DHW systems are not integrated into large buildings, the project team is to consider systems which can be adapted in the future for electrification.
- Must submit verified energy model data and a summary (PHIUS or PHI feedback forms. see appendix) based on the general requirements above and the building assembly elements composing the building's Energy Use Intensity (EUI, the building's annual energy use relative to its gross square footage.)
- Are required to provide in the field educational and training opportunities by partnering with Boston based apprenticeship and high school workforce training programs (Equity and Inclusion) . These programs and the ZEB principles being used within the project are to be documented on a publicly accessible website and via social media in order to promote ZEBs.

Passive house certification/precertification complying with the above criteria may be submitted to demonstrate performance with ZEB Co2 target budget at application. Projects pursuing the passive house method of demonstrating compliance must certify their projects using Passive House Institute U.S. (PHIUS) or Passive House International (PHI).

- Project teams at application and during the design review process must submit energy model data and a summary using (PHIUS or PHI feedback forms with the LOI from the PHIUS verifier.)

05

Site & Building Planning

The following section outlines commonly understood principles for the building planning and site design of residential buildings. These principles are not applicable to every context, however they provide specific guidance intended to shape a development team's proposal early in the development process.

Neighborhood Context

It is a primary concern that all housing developments fit into and enhance existing neighborhoods. In general, sites available for development in Boston are infill and set within the context of an existing neighborhood which has developed a unique character over time. Architects will be asked to demonstrate that they have analyzed the typology and composition of other buildings in the immediate vicinity of the site. The design concept should respond to the unique characteristics of this neighborhood analysis. Development proposals are to knit together the residential fabric through the project design. ([see Appendix for Design Principles Illustrations-future add](#))

Building Placement & Orientation

New buildings are to align with existing buildings and face primary and secondary streets. Buildings placed at corners are to consider how the building placement and the location of building or open space uses can enliven the street, both during the day and the evening.

Parking and Mechanicals

Parking and mechanical areas are to be placed at the side or rear of the site away from and concealed from the street. Landscape buffers are to be used to maintain separation and privacy between neighboring properties. Parking layouts are to minimize the area of impervious pavement and curb cuts.

Building Composition

Architects must present a parti or a generative concept diagram for the building design.

Character and Materials

The building's characteristics and materials are to focus on detailing of a high quality material rather than the use of many different materials for the exterior envelope. A single material should compose the majority of the building envelope. Building materials on residential buildings must employ a level of detail that conveys a human scale and residential feel. The character of the building is to be consistent on all sides of the building and offer the same engagement to the pedestrian at the front and the rear where appropriate. Blank, unfenestrated elevations will not be allowed. Materials at the ground floor are to be durable (typically composed of masonry for longevity.) Pitched rooflines are to extend eaves 18 inches to 2 feet and keep water away from the building. Whether contemporary or historical in nature, cornices, parapets and trim detailing must function to terminate the top of the building. All exterior dwelling entrances must have weather-protected entries such as canopies, covered porches or recessed alcoves.

Foundation Wall Height

Wall heights should mirror the foundation wall height of residential buildings within the neighborhood context. Use 1 to 20 grading to lift first floor elevation to 18" to 24" where accessibility is required.

Site Work

Demolition

The removal of all hazardous materials such as asbestos containing materials (ACM's) and lead based paint must be carried out according to all applicable State and Federal regulations, including but not limited to the Massachusetts Department of Public Health, Massachusetts Department of Environmental Protection and U.S. Environmental Protection Agency.

The Developer should have a complete understanding of the scope of shoring or other site or building stabilization should it be required.

Soil Remediation – 21 E's

A summary and an accurate estimate of the 21-E soil remediation plan is to be provided including grading plans and soil tests. The demolition and excavation scope is to include strategies which divert usable soils and debris from landfills through recycling or reuse where acceptable.

PPT Lumber

Preservative pressure treated wood (PPT) should be used at all locations where framing joins exterior concrete. Where PPT lumber is used, this lumber is to be arsenic free. The use of chromated copper arsenate treated wood (CCA) is prohibited.

Foundation

Concrete and soil compaction tests should be performed by a qualified testing lab for all buildings where applicable. Water leakage and/or masonry tests may be required in certain buildings. Provide damp-proofed foundations resting on proper footings on undisturbed or properly compacted soil. Install exterior insulation at foundation wall from the footing to grade level, after damp proofing has dried and prior to backfill.

Basement Slabs

Install basement concrete slab on 4" bed of 0.5" diameter or greater clean or washed gravel, covered with minimum 6 mil polyethylene sheeting lapped minimum of 12" at joints; or alternately a minimum of 4" uniform layer of sand, overlain with a layer or strips of geo-textile drainage matting, covered with polyethylene sheeting lapped a minimum of 12" at joints. Two inch or greater thickness of expanded polystyrene rigid insulation (EPS) or extruded polystyrene insulation (XPS) is to be installed under the entire slab to inhibit heat loss and moisture problems that complies with ZEB requirements.

Control/isolation joints should be provided in basement slabs. A thermal break must be provided between the vertical slab edge and the foundation wall.

Moisture Content

Where flooring is to be installed above concrete or other poured installations (for example to control sound or provide fire protection), the moisture content should meet flooring manufacturers' installation and warranty requirements. Adhesives used in the installation of flooring are subject to failure where concrete moisture content is present. Therefore, high performance concrete admixtures and/or spray moisture barriers free of all volatile organic compounds (VOC's) and mold and bacteria growth inhibitors should be used to ensure moisture content acceptable for all flooring applications anticipated for the project.

Building Enclosure

A drainage plane between exterior cladding and air/vapor membrane is maintained in all conventional rainscreen construction techniques.

Masonry

Masonry rainscreen walls must be designed and constructed in conformance with conventional construction techniques including among other items: 9 gauge corrosion resistant wire ties spaced a minimum of 24" on center vertically and horizontally securely attached to a backup wall (typically wood or metal stud). All penetrations and joints into the air/vapor barriers must be sealed with a membrane or coating. A 2" air space is recommended (1" min.) is to be kept clear of mortar droppings. Flashing must be placed at all locations where the air space is interrupted and must be waterproof, durable and protected against corrosion or degradation. (see appendix.)

Siding

All exterior siding materials are to be back primed as required. All cladding materials are to be installed according to manufacturer's specifications. 5/4" trim must be used with cementitious siding and panel. The use of vinyl siding is forbidden.

Fenestration and Doors

Windows are to have architecturally appropriate exterior detailing based on casings at head and jamb (on 3 sides) and a protruding sill to push water away from the window opening. Windows must be set into the wall assembly to provide depth in the facade.

Aluminium windows, wood windows, windows clad in aluminum or vinyl, fiberglass windows, and uPVC windows with a low u value (and excellent thermal performance) may be used, based on context and building type.

Steel Doors

Provide 18 gauge interior door frame minimum and 16 gauge exterior door frame when set in exterior and interior masonry door sets. Do not use applied decorative molding to exterior doors.

Storm/Screen Combination Exterior Doors

The use of combination storm and screen doors at any exterior entries, front and rear is required for rental units (Boston Sanitary code), including rental units in one-to-three-family owner-occupied houses. Frames are to be caulked (color to match) according to manufacturer instructions.

Rough Carpentry and Roofs

Wood product sheathing is to be installed in strict accordance with manufacturers' exposure, spacing, and span ratings and is to be stamped by a recognized agency to show those ratings.

Pitched Roofs

A self-adhered bituthene product should be used on the first 3'-0" of the roof sheathing on all pitched roof applications as well as 3'-0" to both sides of valleys and cheek walls prior to installing the metal drip edge, felt paper and shingles. Roof pitches less than 5 in 12 should be completely covered with the modified bitumen underlayment.

Provide step flashing at intersections of roof and walls with the exception of continuous flashing at metal and rubber membrane roofs. Use metal kick out flashing at the end of roof/wall intersections to direct water away from the wall. The use of exposed anodized aluminum flashing anywhere other than step flashing at dormer and cheek walls is strongly discouraged. Provide continuous roll flashing at shed roofs. Flashing should be factory painted – no mill finish.

Gutters are to be sized per code requirements and made of seamless 0.032 Ga., factory-painted aluminum (no vinyl) securely fastened with straps of the same material and color as the gutters and sealed per manufacturer's recommendations. Do not discharge water from a gutter directly to the ground not into another gutter nor onto a lower roof below. Size downspouts based on the required roof surface area. Downspouts are to be .027 Ga. minimum aluminum. Downspouts with type 'A' and 'B' elbows should be securely fastened to the sidewall with straps of the same material and color as the downspouts. Downspouts are to divert water away from the building by connection to the stormwater drainage system. Splash blocks, dry wells and other methods to divert water away from entryways or sidewalks may be required by DND where appropriate.

At minimum, fiberglass/asphalt roof shingles or equivalent, with a minimum 25 year warranty are to be used.

Flat Roofing

Flat roof applications should receive light colored, fully adhered compounded rubber sheet elastomeric (EPDM) single membrane 0.060" thick sheets installed by the manufacturer's certified installer, and applied per manufacturer's warranted specifications. Large roof areas may consist of mechanically fastened and ballasted EPDM. Roof parapet cap flashing should be .050 Ga. factory-painted aluminum min.

Sealing Materials

All plumbing, electrical and other penetrations of walls and floors should be sealed with polyurethane caulk. All sealants should consist of low or no VOC's.

Open Space

Open space areas for active and passive outdoor activities such as play space, sitting areas, and areas dedicated for gardening are to be designed into the site planning. These spaces are to be accessible, attractive and inviting to residents, particularly for families and children. Patios, front yards, porches, or balconies are smaller open spaces that assist in creating the community interaction of larger open spaces.

Fencing and Buffers

Fencing, walls, hedges, line of trees, or other landscaping can assist with defining the street edge and perimeter of the site. Fencing and buffering material and height should complement similar elements in the neighborhoods.

If any fencing is used at the street edge and other areas visible from the street, multifamily projects are to use decorative metal fencing and gates at these locations. Heavy-duty vinyl-covered chain link fencing or wood stockade fencing should be restricted to property edges that do not face a public street. Such fencing should be at least 48" high, with 2" diameter, black, hot-dipped galvanized posts no more than 10'-0" apart and set in concrete footings 8" in diameter and at least 30" below finish grade. Provide top and bottom rails as according to manufacturer's requirements. Gates are required at accessways and walkways.

Walkways

Walkways should be 4" thick 4,000 psi (air-entrained) w/ broom finish, set on a 6" base of 3/4" crushed stone at all front entrances.

Retaining Walls

Cast in place concrete, concrete interlocking concrete masonry units or fieldstone may be considered. The use of pressure-treated timbers is not allowed.

Trees and Landscaping

A landscaping plan must be provided. Fencing, planting beds, trees and shrubs (species and sizes) retained and removed, play areas, lighting, seating, and all features adding to the aesthetic quality of the site are to be shown. Developments are to survey the condition of existing trees on (or adjacent to) the site and make every effort to design around existing mature trees. The city places great value on maintaining Boston's tree canopy. Therefore, existing street trees are to be protected and missing trees replaced according to Park's Department and Complete Streets requirements. Typically this is one tree per 25 lineal feet of street frontage and the caliper width is 3" in diameter or greater. Existing mature trees are to be maintained. New trees are to be provided for every tree removed from the site. These new trees are to provide shaded areas and spaced appropriately based on the species.

Graded areas must consist of a 6" minimum deep planting bed of clean loam/topsoil clean screened raked free of 1" or larger stones, building debris and other non-organic materials. All lawns (including the 6" plant cover) must be maintained by the general contractor to establish planting and ensure that washout and erosion does not occur. Terracing and retaining walls may be required.

Stormwater Management

Areas around the building must be graded away from foundations and compacted to ensure proper surface drainage. Swales and drains may be designed to carry water away from the foundation and abutting properties. Landscape strategies designed to reduce the heat island effect, assist in stormwater management, reduce the overall irrigation water demand such as rain gardens, bioswales, and permeable paving are encouraged.

Subsurface drainage systems must comply with BWSC requirements. Perimeter drainage is to be surrounded with washed or clean gravel that is fully wrapped with fabric cloth. Sump pumps if required should have mechanically attached covers with full gasket seal.

06

Interior Building & Unit Layouts

This section sets forth principles for the interior common spaces and layout of units in new construction. They are also applicable, to the extent possible within the existing constraints, to major renovation projects where the common areas or unit layouts are being modified, refer to the Rehabilitation and Preservation section. We have provided interior layout diagrams demonstrating the application of the dimensional and use requirements towards the goal of creating livable, cost effective, quality housing. Furniture plans are required to ensure rooms can be reasonably furnished with clear space to maneuver.

Universal Design

Universal design and accessibility requirements have been incorporated in cooperation with Age + Strong and the Disabilities Commission. These requirements are expressly intended to normalize Universal Design principles in all projects funded by DND over time in order to plan for the long term livability of dwelling units and common areas over the lifetime of residents. (Refer to the Enterprise Aging in Place guidelines in the Appendix)

Accessibility

Accessible units provide essential housing to people with a range of disabilities, not solely those who use wheeled mobility. In order to increase the number of accessible dwelling units in the City of Boston, DND requires a minimum of 10% of units, rounded up, to be fully accessible. New construction rental projects and home ownership projects consisting of 4 or more units must include 10% fully accessible dwelling units. These project dwelling units similarly must comply with 521 CMR 9.4 Group 2 Dwelling Units. In buildings without elevators, all units (not just ground floor units) are required to provide blocking required by Group 1 Bathrooms MAAB for future installation of grab bars and shower seats.

The percentage of dwelling units required by 521 CMR 9.7 Sleeping Accommodations for Persons who are Deaf or Hard of Hearing remains unchanged at 2% of the project dwelling units. These “sensory” units should be distinct from the “mobility” units in order to best match residents with units; it is less common to find a resident who needs both types of modifications. However, all units must be capable of being adapted (through future modification of the unit) for the hearing and visually impaired.

In addition to the accessibility of the dwelling units, accessibility should be incorporated into the entirety of the project design. (Refer to the Article 80 Accessibility Checklist for specific guidance.)

Broadband Access

All buildings are required to provide broadband (high-speed data network) access in addition to appropriate technology for telephone, data, and other communications within individual units to residents. Residents should be provided choice in terms of the broadband service provider. In response to the challenges experienced with COVID, DND sees that providing whole building broadband/wifi access for seniors, individuals who have lost jobs, and families & students who may need additional bandwidth to work from home or attend school from home is needed building infrastructure. Where the number of units (typically 4-10) require the project to utilize an intercom and closed circuit security camera system to allow unit occupants to observe who is seeking entrance to the building (780 CMR 1010.1.9.12) the project should consider a systems that also provide overall building broadband/wifi access to residents within common areas. Projects may also consider hotspots within the building. These “hotspots” must be indicated on the floor plans or the specification narrative must describe the system/method being used to satisfy the broadband access requirement.

Artist Live Work Considerations

Artist Live Work units are to follow the unit layout target sizes, unit dimensional and use requirements. They are also to have additional space for working if workspace is not provided outside of the units. The considerations below are intended to guide the design of buildings that incorporate artists. They may not be applicable to every artist community therefore. Refer to the Artist Space Standards issued by the Arts Commission for more information.

- Studios, doorways, and hallways shall be oversized in width to accommodate shipping of large works.
- Loading bays shall be located directly adjacent to a direct route to elevators.
- Freight elevators shall be provided to carry oversize/overweight objects; and allow for noise, weekend and late night deliveries.
- Ceiling heights shall allow for the creation of large works and large equipment, including machinery and lighting.
- Wall and floor construction shall have adequate sound insulation to prevent the transmission of sound from machinery, equipment, or repetitive tasks.
- Floors shall be constructed to provide extra weight-bearing capacity.
- Service sinks are to be located with or in proximity of other wet areas.
- Fire protection systems shall include the ability to address industrial accidents.
- Fire insulation shall be adequate for open flames.
- Special ventilation and air handling techniques shall be tailored to ensure the safety and health of residents, visitors, and neighbors. All workspaces shall be vented via the outside wall while providing a central ventilation system to the roof.
- Oversized dumpster capacity shall be provided.
- Containers shall be provided for the disposal of toxic/hazardous materials (turpentine, paints, etc.)
- Common space or meeting space shall include display space for both art work and rehearsal. Access to outdoor work areas shall be provided to all tenants.
- Security systems and entry video systems shall reflect the needs of artists who may have on-site sales, employees, and customers.

Target Unit Sizes

The square footages below represent target sizes. Units significantly larger or smaller than these targets will be questioned in terms of livability or excess cost. The goal of indicating target sizes is to provide guidance without imposing fixed minimum and maximum sizes.

Unit square footage is measured from the inside face of the units' bounding walls and includes usable storage space, stairwells and hallways inside the unit, as well as space occupied by interior walls within the unit. Fifty percent of the area under sloped ceilings with greater than 5'-0" clearance and less than 7'-6" clearance should be included in the unit square footage when considering the following guidelines:

Studio	500 square feet
One bedroom	600 square feet
Two bedroom	750 square feet
Three bedroom	1,000 square feet
Four bedroom	1,100 square feet

Unit Layout Best Practices

- Circulation spaces are to be designed efficiently. Access to bedrooms and bathrooms is only to be from circulation spaces.
- Living, dining, and kitchen areas should be proportional to the number of bedrooms. For example, 3 bedroom units should have larger common living spaces than 2 bedroom units. In family units, the living and dining areas must be distinct spaces.
- Bedrooms and living/dining areas must have direct access to natural light. Kitchens should also have direct access to natural light where possible, but if necessary can receive indirect natural light. Bathrooms and closets/mech. spaces are the best elements to locate farthest from natural light.
- Layout of buildings and units should optimize the use of space, provide spacious, furnishable main living areas, and provide adequate storage. Development teams must provide furniture plans and

demonstrate compliance with general principles for efficient layout of furniture commensurate with the probable number of occupants.

Unit Dimensional & Use Requirements

The dimensions and square footages indicated are required as minimums. Use principles indicated within this section are also requirements.

Bedrooms

Primary Bedroom

- 12' x 10' clear dimension minimum with no obstructions (120 square feet minimum)
- 2 occupants

Secondary Bedrooms

- 10' x 10' clear dimension minimum with no obstructions (100 square feet minimum)
- 2 occupants

Bedroom Closets

- 2' x 4' clear dimension minimum (8 square feet minimum)
- Closet shelving shall allow for a full bearing, white, vinyl coated steel shelf or similar with integral clothes rod.

Application of Bedroom requirements

- Bedrooms may not be located at the street facing corners of multifamily units. Locate bedrooms away from noisy conditions such as driveways and parking areas in 1 to 2 Family dwellings.
- The entry to bedrooms must be oriented to provide privacy and may not open directly into living areas.
- Switched control of one receptacle in a duplex receptacle box for connection to an occupant-furnished lamp.

Living Areas

Living Room

- 12' dimension minimum along exterior window wall. (150 square feet minimum)
- Accommodates a 6 foot couch, 2 easy chairs, coffee table, 2 side tables and a place for a television in a location viewable from the seating.

Dining Room

- 10' x 10' clear dimension minimum (100 square feet minimum)
- Accommodates an 8 person table in 3 bedroom, 6 person table in 2 bedroom, 4 person table in 1 bedroom.

Entry "coat" Closets

- 2' deep dimension minimum (6 square feet minimum)
- Configured for coats and storage. (see bedroom closets)

Application of Living Area requirements

- Locate living and dining areas in the street facing corners of multifamily units.
- In studios, 1 and 2 bedroom units only the dining room may overlap with the living room. The total living and dining square footage must exceed 200 square feet and maintain a 12' clear width. In the Living room specifically, the 12' clear dimension must exist along an exterior wall with access to natural light. Obstructions such as HVAC may obtrude into the living area required as long as a functional furniture layout can be maintained.
- Switched control of one receptacle in a duplex receptacle box for connection to an occupant-furnished lamp.

Kitchens

Provide 18" (15" minimum cabinet size) to 24" minimum linear counter space on both sides of the range and sink. Lazy susans are required in all corner base cabinets. Task lighting accessories should be considered post occupancy to address low light conditions.

A dishwasher is required in three and four bedroom units. Double bowl sinks are required where dishwashers are not provided. A 30" minimum range is required in a 1 to 3+ bedroom unit. Garbage disposals (encourage composting and recycling) and rangehoods are required. The cabinet for the sink must be 30" minimum (36" recommended), and a 20 gauge stainless steel sink size (roughly 22" x 30" x 6") with a single handle faucet with spray attachment must be maximized within that cabinet size. A 18 to 20 Cu ft frost free refrigerator with a separate freezer door is the minimum required. Finish flooring shall continue under refrigerators, stoves, dishwashers, and base cabinets in kitchens. Countertops should be one-piece square-edged, .050" thick minimum high pressure laminate, with 4" integral "post-formed", coved backsplash. Adhesives should be water-based.

Application of Kitchen requirements

- The type and configuration of kitchens in a development are to be standardized to the greatest extent possible in order to create efficiencies for purchasing cabinetry, appliances, equipment, and finishes.
- Unit circulation can not pass through the kitchen work area (except as shown in studio unit diagrams.) The work area (triangle) within the kitchen may not be obstructed by furniture.

Closets and Pantries

A dedicated linen closet is no longer required. Linen storage is to be provided as cabinetry or organized within shelving in another closet. Linen storage of towels is acceptable within a full bathroom. Note: Residents may be reluctant to store other linens there due to moisture concerns even if the bathroom is well-ventilated. Walk in Closets are to have lighting.

Pantries are also not required. When used, a vertical cabinet instead of a closet is recommended as a most cost effective option.

Bathrooms

No more and no less than one full bathroom can be provided in 0, 1, or 2-bedroom units.

One full-bathroom and one half-bathroom are required in 3-bedroom units. If cost effective, a 3-bedroom unit may provide a shower in the half bathroom.

Two full bathrooms are required in 4-bedroom units.

All half and full bathrooms shall receive a vanity cabinet and sink, two 24" towel bars, one robe hook, a shower curtain rod (in a full bath), a toilet paper holder, and a mirror-front medicine cabinet with lighting over the mirror.

Application of Bathroom requirements

- A shower stall may be substituted for one bathtub where 2 full bathrooms are provided.
- All bathrooms must be entered from a common hallway. Entry to the bathroom (full or half) may also be accessed from the bedroom (en suite) if an entry from a common hallway is also provided.
- All bathrooms must comply with Group 1 MAAB.
- Townhouse style units in multifamily buildings and 1 & 2 Family dwellings are subject to and must apply these requirements. In a 2 bedroom townhouse a half bath may be placed on the ground floor and a full bathroom placed on the upper floor.

Laundry

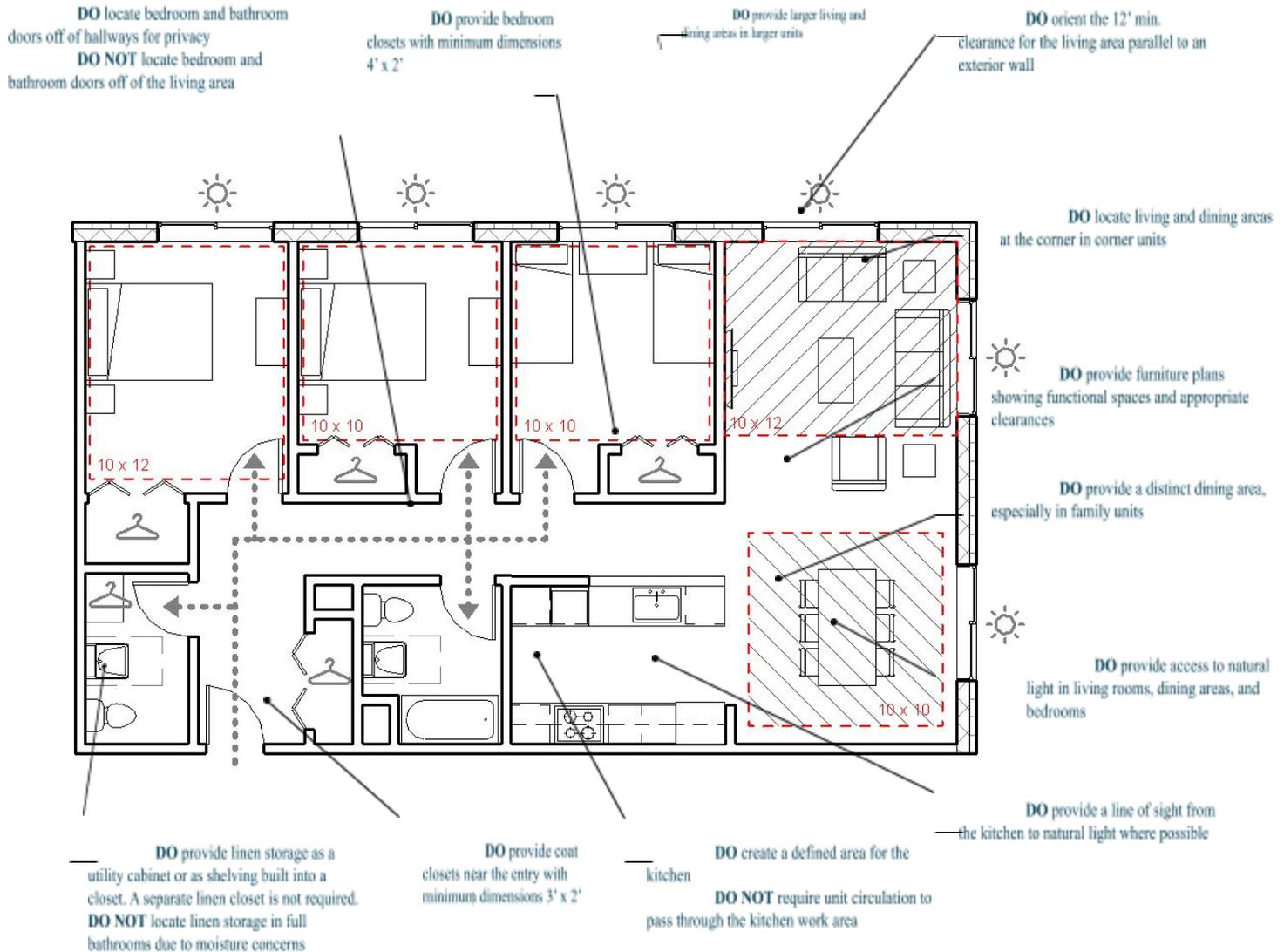
In unit Washers and Dryers are only permitted in Homeownership units. Connections must have stainless steel braided lines to prevent potential overflow and leaking & plumbed drain pans to prevent damage to the unit and other units below. Common area laundries (or laundry services) are to be provided in rental buildings.

Interior Unit Diagrams

Unit Layout Considerations

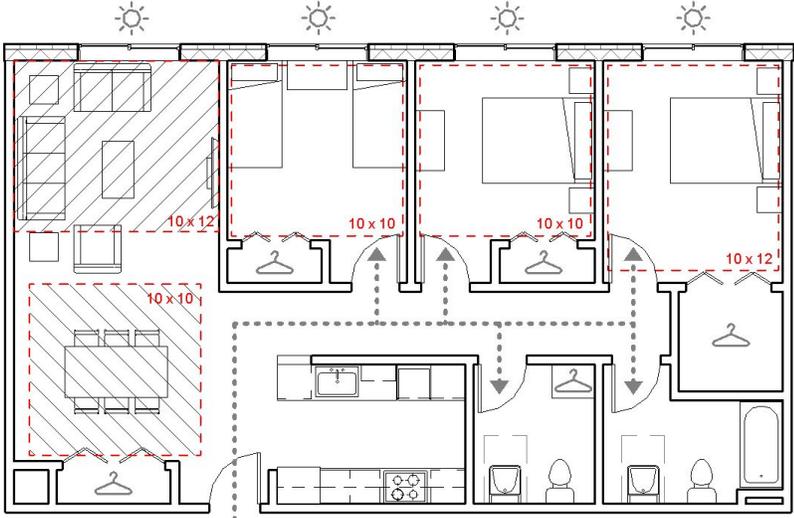
-  Minimum clearances in bedrooms
-  Minimum clearances in living and dining
-  Circulation
-  Access to natural light
-  Storage space

Example Unit (3 Bedroom Corner Unit)

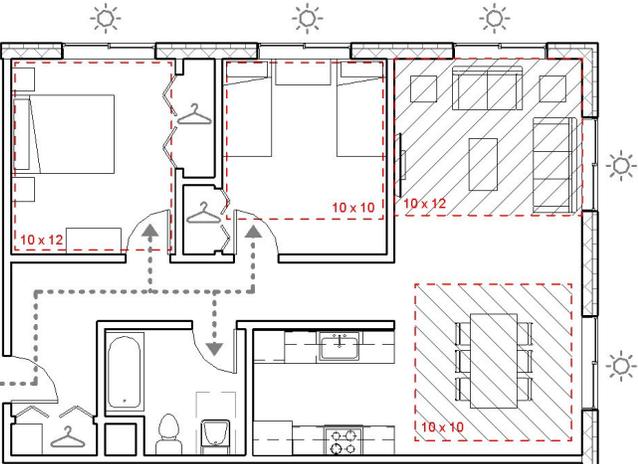


Example Unit Layouts

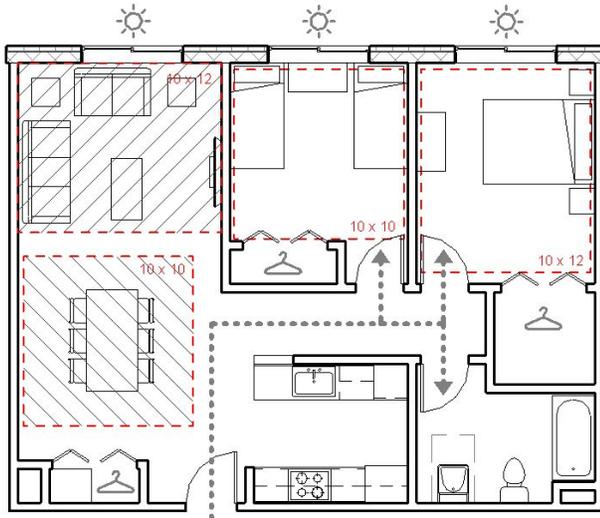
3 Bedroom
Typical Unit



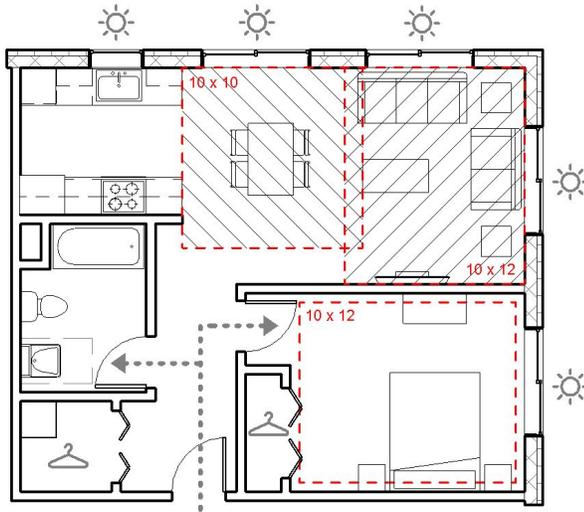
2 Bedroom
Corner Unit



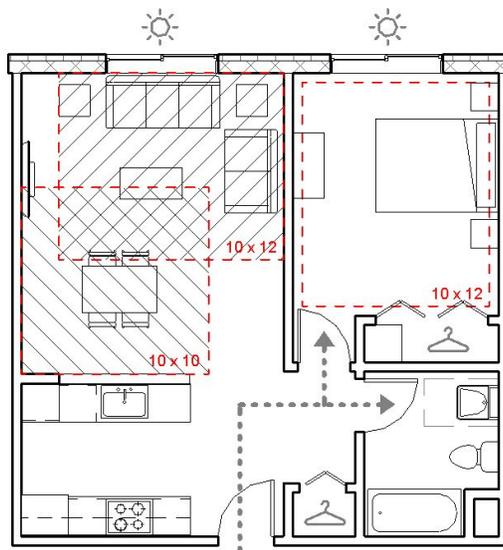
2 Bedroom
Typical Unit



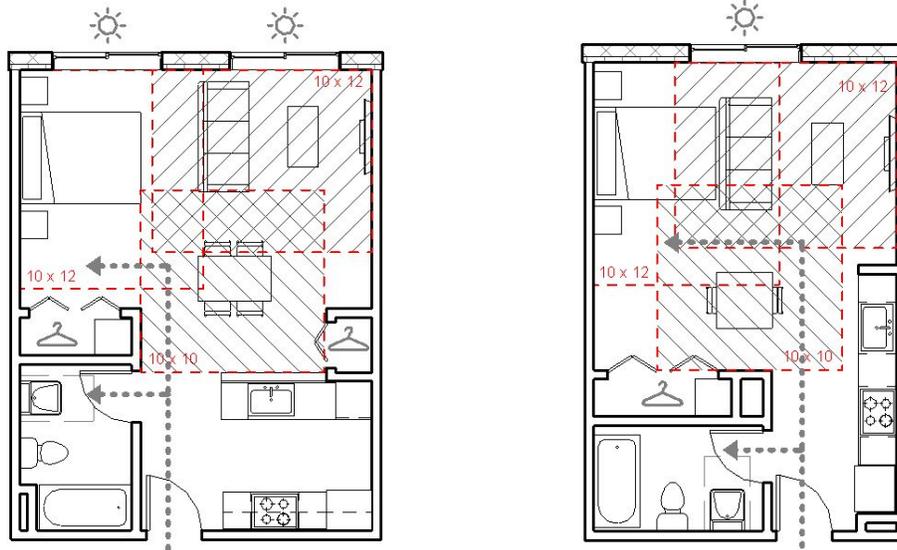
1 Bedroom
Corner Unit



1 Bedroom
Typical Unit



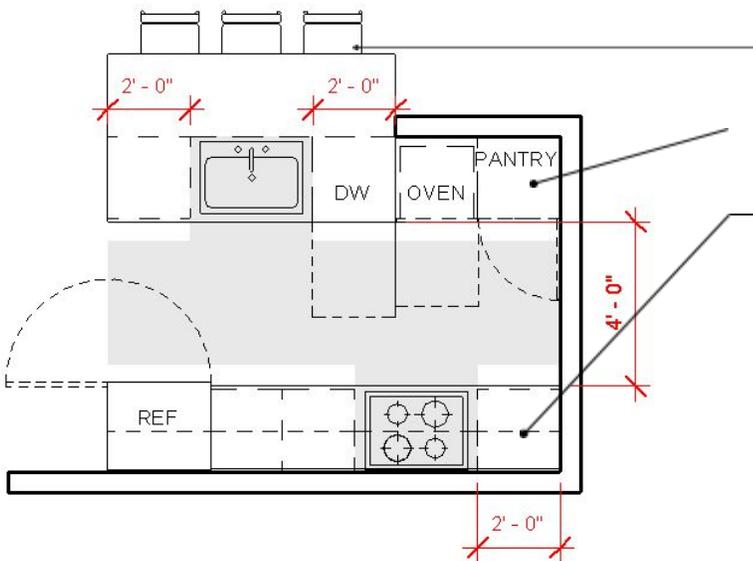
Studio
Typical Unit



Kitchen Design Considerations

- Accessible maneuvering space
- Clearances for appliances

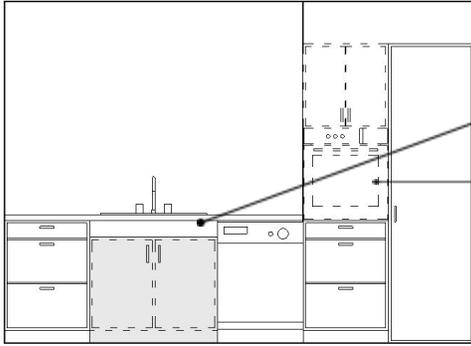
Example Kitchen Layout



DO provide counter seating

DO provide a tall pantry cabinet

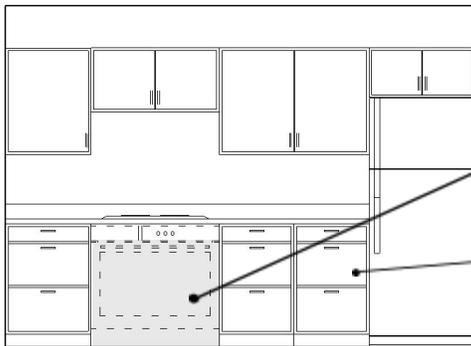
DO provide 18" – 24" linear counter space on both sides of the sink and cooktop



Accessibility

The cabinet below the sink must be removed to ensure maneuvering clearances.

A wall oven must be installed. Note: the location of the wall oven on this elevation is for representational purposes only; its actual height should comply with accessibility requirements.

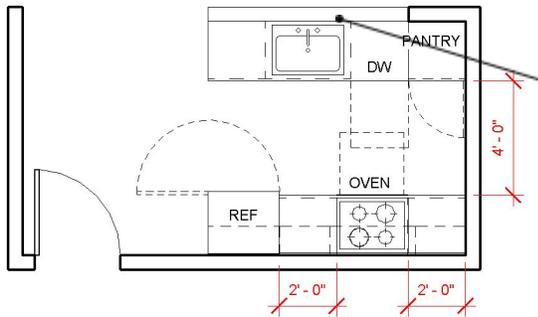


Universal Design

The range must be replaced by a cooktop with clearance below.

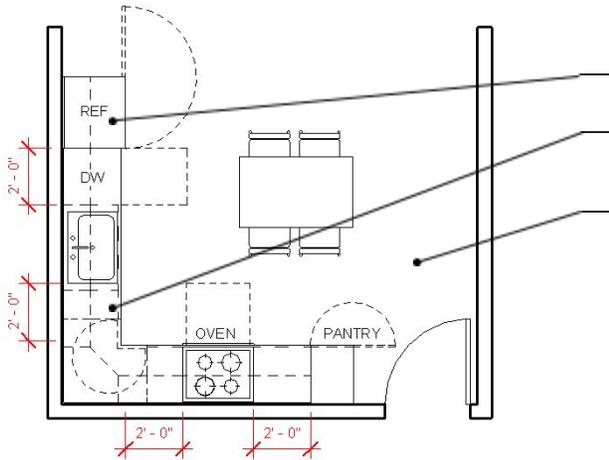
Provide drawers instead of below counter cabinets for more accessible storage.

Note: microwaves, if provided must be at or below counter height.



Galley Kitchen

DO consider opening kitchen with a half wall or extending the counter

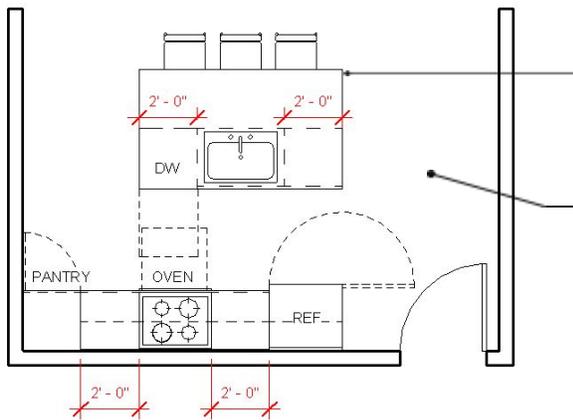


L Shaped Kitchen

DO place refrigerator away from the corner

DO provide a corner lazy Susan base cabinet for more accessible use of below counter space

DO NOT require unit circulation to pass through the kitchen work area. If the dining table is placed within the "L" area, the primary circulation path must not require passing between the dining table and kitchen.

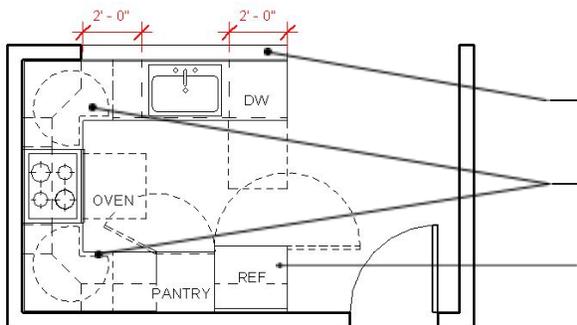


Island Kitchen

DO provide counter height seating at island

DO NOT consider island seating as a replacement for a distinct dining area

DO NOT require unit circulation to pass between the kitchen and island.



U Shaped Kitchen

DO consider opening kitchen with a half wall or extending the counter

DO provide lazy Susan base cabinets in the corners for more accessible use of below counter space

DO place refrigerator away from the corners

DO NOT block natural light with the refrigerator.

Single Person Occupancy Types

This section sets forth the minimum Design Requirements for SPO Units. SPO Housing is defined as a residential property that includes single room dwelling units. Each unit is for occupancy by a single eligible individual.

SPO Types 1, 2 and 3 must contain 150 sf of basic living/sleeping area and are to be furnished with a single bed space, dresser, mirror, nightstand, writing desk, 2 chairs, small table and a shelf with space for tv/radio.

SPO Type 4 must contain 240 sf of basic living/sleeping area and is to be furnished with a single bed space, dresser, mirror, nightstand, writing desk, 2 chairs, a dining table, 4 chairs and a shelf with space for tv/radio.

The four (4) SPO types are described below:

SPO Type 1

SPO Type 1 must contain a closet (15sf), small sink, under counter refrigerator, and microwave oven (may be permitted) within the unit.

- Cooking facilities and a private bath are not contained within the unit.
- Congregate cooking, bath (or shared), dining and support facilities such as TV room, reading areas, community living rooms, etc. must be located on-site.

SPO Type 2

SPO Type 2 must contain a private bath with shower (40sf), a closet (15sf), small sink, under counter refrigerator, and microwave oven (may be permitted) within the unit.

- Cooking facilities are not contained within the unit.
- Congregate cooking, dining and support facilities such as TV room, reading areas, community living rooms, etc. must be located on-site.

SPO Type 3

SPO Type 3 must contain a private bath with shower (40sf), a closet (15sf) and 35 sf of cooking facilities with a sink, 2 linear feet counter, 2 burner stove and an under counter refrigerator. The square footage of the cooking area includes 3' clearance in front of the counter.

- Congregate dining and support facilities such as TV room, reading areas, community living rooms, etc. are not required to be located on-site. Some support facilities are however recommended.

SPO Type 4

SPO Type 4 must contain a full kitchen and a private bath with shower (40sf) and closet (15sf) within the unit.

- 35 sf of cooking facilities with a sink, 2 linear feet counter, a small 4 burner stove and a 12 cu. ft. upright refrigerator. The square footage of the cooking area includes 3' clearance in front of the counter. (This resident may require off site special needs.)
- Congregate dining and support facilities such as TV room, reading areas, community living rooms, etc. are not required to be located on-site. Some support facilities are however recommended.

Interior Unit Specifications

Rough Carpentry - Wood Blocking

Prior to insulating and finishing walls, solid 2" nominal blocking should be installed where accessories such as grab bars, towel bars, soap dishes and toilet paper holders are to be located. Insulation materials should be cut to fit around such blocking. Solid blocking should also be installed for future access accommodations such as installation of grab bars, adjustable counters, and hardware in conformance with FFHAA and MAAB.

Finish Carpentry and Millwork

Cabinetry

Cabinets shall have high pressure laminate or solid wood formaldehyde-free doors and drawers with pulls and frames complying with ANSI/KCMA A161.1 cabinetry specifications. Thermofoil and particle board cabinets are not allowed. All medium-density fiberboard (MDF) used in cabinetry and countertops shall be formaldehyde free. All cabinet interiors should be treated with a water resistant substance

- Cabinet drawers should be full-length (minimum of 18") and designed with a durable, full length, side-mounted, double runner suspension system with manual positive stops. A full-length steel system with nylon wheels is preferred. Monorail systems are not recommended.
- Drawer bottoms should have a minimum thickness of: 1/8" tempered hardboard or plywood, or 1/4" inch hardboard or high-density particle board. Drawer sides should have a minimum thickness of 7/16".
- Cabinet bottoms should have a minimum thickness of: 1/4" tempered hardboard or plywood, or 3/8 if hardboard or high-density particle board. Cabinet sides should have a minimum thickness of 1/2". Toe kicks should be totally enclosed.
- Wall cabinets should have a minimum of two wood nailing strips (top and bottom). Minimum dimensions for nailers should be 3/4" x 1/2".

Sealants

All sealants should consist of low or no VOC's. Seal all wall, floor, and joint penetrations with rodent-proof materials. All visible pipe penetrations through walls, floors, and cabinets (including interiors) should be sealed and covered with escutcheons.

Interior Door & Window Casing

Window aprons and casings should be a painted softwood such as pine. Head and jamb with a minimum dim of 11/16"x2-1/2". All window trim is to be back primed.

Baseboard Trim

One piece softwood such as pine molding, finger-jointed and primed, is preferred. Wood base should be used within units and is acceptable in all areas. "Speed-Base" or approved equal medium-density fiberboard (MDF) is also acceptable for painted applications.

Doors

Unit Entry Doors

- Steel or Solid Wood Unit Entry Doors are acceptable if rated to code and are durable. A peep hole shall be provided.
- Interior unit doors are to be solid core wooden doors.
- Doors opening onto patios or decks should swing in and have flush thresholds for accessibility. Drainage is to be provided at decks to prevent water and snow build up. Sliding doors accessing the exterior are discouraged at ground floor conditions where they pose a security concern.

Door Hardware

- Lever door handles are to be provided throughout for universal design. Peep holes shall be provided.
- Exterior and Interior unit entry doors should be provided with 2-3/4" backset, lever handle hardware locksets, keyed-alike deadbolts; aluminum and hardwood adjustable thresholds and weather-stripping, as appropriate.
- Bathrooms and Primary bedrooms should provide privacy sets. Exterior and interior doors should have a baseboard-mounted stop to prevent damage to wall finishes. Stop finish should match door hardware finish.

Finishes

All finishes should be durable, easy to maintain, provide a long useful life, and eventually be recyclable. In addition, finishes should not contribute to respiratory ailments due to off-gassing over time. All adhesives should consist of low or no VOC's.

Ceramic Tile

Bathroom floors are to be ceramic tile, non-slip glazed or unglazed, and include a ceramic sanitary base (tile trim piece or cap) at all wall and floor junctures.

Ceramic wall tile is to be installed in a thin-set mortar on a cement backer board of 1/2" thick glass fiber-reinforced cement tile backer substrate installed per manufacturer's recommendations. Tiles should be at least 4 1/4" square. moisture resistant drywall (MR board or 'green board') is to be used in areas without wall tile. At bathtubs, the tile should extend a minimum of 6'-0" above the finish floor, complete with all necessary trim pieces and caps, including a soap dish without a grip bar. Seal all openings behind tub and shower enclosures to minimize airflow.

Engineered Wood & Hardwood Flooring

Engineered wood/hardwood floor is allowed throughout the dwelling unit except for the bathroom and is required in homeownership units and is acceptable in rental units. (no laminates)

Linoleum

Within multifamily buildings, linoleum flooring is allowed in common stairs and hallways, the kitchen area, the bathroom, and entry vestibules within dwelling units.

Vinyl Plank and Vinyl Composition Tile (VCT)

High quality vinyl composition plank is allowed in rental units. VCT is only approved for high traffic areas or where VCT is being replaced. Vinyl plank and VCT products should be composed primarily of recycled materials that are easily recycled.

Water based adhesives should be used. VCT adhesives should have VOC content less than or equal to 50 g/L less water. Vinyl composition flooring where provided is recommended to be a minimum 1/8 inch thick in conformance with "high traffic" recommendations of HUD Minimum Property Standards.

Carpet

The use and location of carpeting should be limited sharply due to asthma, respiratory, maintenance, and life cycle concerns. All carpeting and padding should meet the Carpet and Rug Institute (CRI) indoor air quality guidelines and "Green Label Plus Program", refer to the appendix.

Painting

All paint or stains or varnishes should be limited to low (50g/L) or no VOC except as noted below. Paint products should be applied at the rate specified by the manufacturer with the following minimum applications.

- Gypsum Drywall – Ceilings – 1 coat of latex-base primer and 1 coat latex-base interior flat (ceiling white) paint. Kitchens and bathrooms should receive 1 coat primer and 2 coats semi gloss odorless Alkyd enamel. Existing ceilings should receive stain/mold kill primer. Sand finish ceilings should not be applied in kitchens or bathrooms.
- Gypsum Drywall – Walls – 1 coat latex-base primer and 2 coats interior latex-base eggshell paint. Kitchens and bathrooms should receive 1 coat primer and 2 coats semi gloss odorless Alkyd enamel. Existing ceilings should receive stain/mold kill primer.
- Plaster Ceilings – 1 coat latex-base primer and 2 coats latex-based interior flat (ceiling white) paint. Kitchens and bathrooms should receive 1 coat primer and 2 coat semi gloss odorless Alkyd enamel.
- Plaster Walls – 1 coat latex-base primer and 2 coats latex-based eggshell paint.
- Stained Woodwork – 1 coat oil-based interior wood stain and 2 coats satin or semi gloss polyurethane varnish. VOC content less than or equal to 250 g/L. All stains should be low or no VOC.
- Natural Finish Woodwork – 1 coat sanding sealer and 2 coats satin or semi gloss polyurethane varnish. Clear wood finishes should contain VOC content less than or equal to 350 g/L (varnish) and 550 g/L (lacquer). All varnish should be low or no VOC.
- Painted Woodwork – 1 coat interior enamel undercoat and 2 coats interior semi gloss odorless alkyd enamel.
- Ferrous Metal – 1 coat rust-inhibiting (such as by Rust-o-leum or equal) primer, 1 coat interior enamel undercoat and 1 coat interior semi gloss odorless alkyd enamel. Anti Corrosive and anti rust paints applied to interior ferrous metal substrates should contain VOC contents less than or equal to 250 g/L.
- Painted Wood Finish (Exterior) – 1 coat exterior primer and 2 coats semi gloss alkyd enamel. All new exterior trim and siding should be back primed.

- Transparent Wood Finish (Exterior) – 1 coat oil-based sealer and 2 coats spar varnish.
- Zinc Coated Metal – Whenever using galvanized metal, the surfaces should be cleaned with a non-petroleum-based solvent, removing pre-treatment, oil and contaminants from the surface prior to applying 1 coat galvanized metal primer, 1 coat interior enamel undercoat and 1 coat interior semi-gloss odorless alkyd enamel.

Safety & Security

Window treatments must be provided in all units, regardless of affordability. All window treatments must be cordless for child safety. All windows should receive properly-sized window shades: fiberglass-coated, vinyl plastic, fire-retardant, fade-resistant roller shades with large diameter cotton cord attached to slat. Mini-blinds are discouraged since the blinds themselves may pose a choking risk, but if used, it must be verified that the selected product is safe for children.

Exterior security bars and grills are not permitted. Where safety is of concern, provide door and window contacts for security alarm systems at ground floors and easily accessed lower floors.

Window guards must be incorporated. Window limiters may not take the place of window guards. In the City of Boston, special concern must be paid to window guards where children age 6 or under will be living or visiting, which may be any unit. Guards should be operable-type interior aluminum or steel bars, clear window opening should be fully protected with no openings greater than 4 inches, tested to withstand 150 pounds pressure; with quick-release mechanism for emergency exiting without use of tools or force. Guardian Angel Window Guards meet the requirements of the “Kids Can’t Fly” standard and are preferred by some fire departments. Guards should be located where the sill height is accessible to children (either from the ground or from furniture placed against the exterior wall) and is more than 10 Ft. above the finish grade at the window. Heavy gauge “safety” screens do not meet guidelines for fall protection as suggested above. Window limiters that cannot be removed by tenants and that limit the openings to less than 4" are acceptable in lieu of guards.

Plumbing

All sanitary lines below floor slabs should be cast iron bell and spigot or equal. PVC is not recommended. Spaces with appliances and equipment that may leak substantial amounts of water such as water heaters and clothes washers should be provided with a floor drain or floor pan and drain. Air cushions should be provided at least every set of fixtures to prevent water hammer.

- Bath lavatory and faucet: 'cultured marble' integral bowl with front overflow and backsplash. U.S. Environmental Protection Agency (EPA) WaterSense labeled single lever chrome washerless faucet with aerator, flow restrictor, lift rod, and pop-up drain. 0.5 gpm is recommended.
- Kitchen faucet: Single handle faucet with spray attachment, 1.75 gpm is recommended.
- Toilet: two piece close-coupled siphon jet vitreous china (white), EPA WaterSense labeled, round bowl toilet, 12" rough, solid plastic closed seat and cover, chrome supply and flexible riser. 750 minimum solid gram removal is recommended.
- Bathtub and fittings: white porcelain finish steel with sound-deadening polymer backing, non-slip bottom, chrome plated drain/waste/overflow with strainer. Enameled steel tubs and fiberglass tubs with integral surrounds are discouraged. EPA WaterSense labeled chrome, pressure-balancing, anti-scald bath/shower valve and diverter, spout, and shower head.

Water Supply

- Underground water service: Type K copper ¾" minimum diameter
- Hot and cold water piping: Type L
- Drain, waste, and vent piping: Type DWV.
- Hose bibs should be of the freeze-proof type and lockable for water conservation

Electrical and Fire Protection

Meters and Type “T” gang boxes at exterior walls should be mounted on backer boards such as molding-trimmed MDO fastened to the sheathing.

Fire Sprinkler Systems drawings are to be fully engineered based upon recent hydrant flow tests and bear the stamp of a licensed fire protection engineer. Standpipes and sprinkler piping are best when not exposed below finished ceilings. Use concealed pendant type sprinkler heads and trim plates.

06

Appendix

This section contains other relevant codes and standards which may be associated with a project. Projects must comply with the design and construction requirements of the most recent prevailing Federal, State and local codes and regulations, as applicable without limitation to the following list. Where there is conflict, the more stringent requirement should be applied. *(DND Design Review Checklist reference-future add)*

Federal

Federal Fair Housing Amendments Act
Section 504 of the Federal Rehabilitation Act
Uniform Federal Accessibility Standards
Americans With Disabilities Act
U. S. Department of Energy
Federal HUD Section 8 Housing Quality Standards
Federal Environmental Protection Agency Regulations

State

MA State Building Codes
MA Department of Environmental Protection
MA Department of Public Health/ State Sanitary Code
State HOME, HSF, FCF, and LIHTC Programs

Local Municipal

Municipal Zoning Ordinances
Inspectional Service Department among other Departments required for permitting.
Zoning Board of Appeals, Article 80 Project Review and Article 37 U.S. Green Building Council's LEED Certification Equivalency)
Arts, Historic and Parks Commission Reviews and Approvals

Existing Buildings/ Structures

Where projects incorporate existing structures, the following also may apply:

Federal Department of the Interior Standards for Rehabilitation
Federal HUD Cost Effective Energy Standards in Rehabilitation Projects
MA Historic Commission, Local Historical Commissions

Universal Design Resources

Boston's Disabilities Commission
Boston's Age Strong Commission

Enterprise's Aging in Place Guidelines - refer to the Example Unit Layout Diagrams and reference the Enterprise Aging in Place guidelines 2016 <https://www.enterprisecommunity.org/resources/aging-place-design-guidelines-18245>

Institute for Human Centered Design (Refer to Data on Disability in States, Cities and Sub-Groups in New England from the Institute of Human Centered Design for more information.)

Article 80 | ACCESSIBILITY CHECKLIST

<http://www.bostonplans.org/getattachment/2b173503-a553-4880-974f-a25270e8ff34>

MA Senior Housing Aging in Place Guidelines

<https://www.mass.gov/service-details/design-construction-guidelines-standards>

Zero Emissions, Building Enclosure & Other References

2020 Guidebook for Zero Emission Buildings

https://www.boston.gov/sites/default/files/file/2020/03/200306_DND%20book_FOR%20WEB.pdf

PHIUS and PHI feedback forms - refer to the guidebooks. The feedback forms are generated per project as part of the process

https://www.phius.org/PHIUS+2018/PHIUS+%20Certification%20Guidebook%20v2.0_final.pdf

https://passiv.de/downloads/03_building_certification_guide.pdf

PHIUS multifamily calculator

This is intended to make the inputs equal between all models and is also based on Energy Star requirements.

http://www.phius.org/Tools-Resources/Protocols-Calculators/PHIUS+2015_Multi-Family_Calculator-04_05_16.xlsx

PV Watts Calculator report <https://pwwatts.nrel.gov>.

- For Reference: Average PV panel generates 250 watts. 4 hours of sunlight (for example) during a day. 1 panel will generate a 1000 watts or 1kwh of electricity. Over 30 days in a month, 1 panel would generate 30kwh of electricity. A 4 panel system would be a 1 KW system.

Windows Installation

For installation using other construction methods, such as remodeling, replacement, and recessed openings refer to “ASTM E2112-19c, Standard Practice for Installation of Exterior Windows, Doors and Skylights,” for installation suggestions. Information for ASTM E2112 can be found on the ASTM website, www.astm.org.

Air Source Heat Pumps

Refer to NEEP's guidelines for ASHP. <https://neep.org/ashp>

Duct Air Leakage

Refer to Resnet standards or ASTM E1554 for air leakage.

<https://www.massave.com/-/media/Files/PDFs/Partners/Duct-Envelope-and-Ventilation-Certificate.pdf?la=en&hash=56A54A118D14FAB2EDA09B4E1F7F13E31E282685>

Closed cell spray insulation that uses HFOs as a blowing agent

<https://www.demilec.com/products/closed-cell-insulation>

Please refer to <http://www.buildingscience.com/resources> and resource within the guidebook for residential wall assemblies.

Thermal Bypass Checklist Guide

https://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/TBC_Guide_062507.pdf

Masonry veneer walls

See the Brick Institute of American Technical Note 28 and 28B.

Carpet

“Green Label Plus Program” and conform with with HUD Bulletin, UM 44-D

(http://portal.hud.gov/hudportal/HUD?src=/program_offices/administration/hudclips/bulletins/umbs):

B DND Design Review Checklists

Funding Application Design Checklist

DND Design pursues design excellence with a focus on improving life for the people of the city of Boston, particularly those with the greatest need. Our role is to partner with development teams to: 1. create affordable, equitable, and sustainable housing for residents and newcomers using design principles that contribute to a high quality of life; 2. Preserve and enhance the urban fabric of the neighborhoods by building and supporting thriving communities; and 3. ensure that public resources are used to help as many people as possible.

At this stage in the design process, it is important to clearly explain the project's vision, design concept, and challenges, so that DND Design can review the submission with those in mind and provide feedback to support the goals and navigate the challenges.

Complete and include this checklist and any previous DND design checklists for this project with your design submission indicating that all requirements are met, all content is included, all project-specific items (if any) have been addressed, and all submission items listed below are included in the submission to DND. Sign and date this document as indicated at the end of the checklist.

Renovations:

For many moderate renovation projects, this is the only section that will need to be completed. Other renovation projects that involve gutting the interior, adaptive reuse, additions, or facade changes will need to complete additional sections as applicable.

- Capital Needs Assessment conducted within 2 years prior to submission
 - 20-year capital needs report
 - Sustainability analysis
 - Rehabilitation strategy
- Interior and exterior photographs of existing conditions
- All unique existing and proposed floor plans and elevations
- Existing and proposed Gross Floor Area
- Preliminary building code review
- Preliminary review of stormwater requirements
- Preliminary MAAB review

Design Principles & Tools:

- Concept diagrams illustrating the project's design principles
- Perspectival views showing the proposal's relationship to the context, abutting buildings, and existing grading
- Preliminary building code review
- Preliminary MAAB review

Site Context & Strategy:

- Preliminary zoning code review describing required and proposed zoning
- Site plan and preliminary landscape design
 - Property lines, streets, and adjacent buildings
 - Any site challenges
 - Proposed usable open space
 - Existing mature trees



B DND Design Review Checklists

- Trees to be preserved and trees to be removed
- Parking (if required) is hidden from the primary street(s) and buffered from abutting neighbors

Building Design:

- Proposed Gross Floor Area
- All unique floor plans
- Typical building sections
- Building elevations
 - No blank areas on the exterior elevations
 - Windows evenly spaced and coordinated with the floor plans
 - Unless otherwise approved by DND, Top of Foundation 3'-0" above grade or minimum, match the typical first floor elevation of surrounding buildings and provide protection against water/snow .
 - Proposed exterior finish materials are described. (No vinyl exterior finish materials i.e. siding, trim, and windows)
- Enlarged elevation and typical exterior wall section
- Window plan and section details with depth to create shadow lines at the opening
- Physical sample board of exterior materials

Residential Units:

- Unit schedule indicating number of bedrooms, number of bathrooms, floor area, and accessibility
 - Unit sizes reasonably close to DND's target sizes: 500sf for studios, 600sf for 1BR units, 750sf for 2BR units, 1,000sf for 3BR units, and 1,100 for 4BR units
 - Number of bathrooms in each unit: no more or less than one full bathroom in studios, 1BR, and 2BR units; one full and one half bathroom (neither en suite) or two full bathrooms (if cost effective) in 3BR units; and two full bathrooms (neither en suite) in 4BR units
 - Unit sizes, amenities, and finishes are comparable between all units, regardless of income level
 - The number of group 2 accessible units is 10% of the total residential units in the project, rounded up
 - The number of sensory units is 2% of the total residential units in the project, rounded up
- Enlarged unit plans labeled with the number of bedrooms, unit floor area, and accessibility (group 1, group 2, or sensory)
- Unit interior dimensioning requirements (dimensions shown)
 - 12' x 10' clear, without obstructions, in primary bedrooms
 - 10' x 10' clear, without obstructions, in secondary bedrooms
 - 4' x 2' bedroom closets
 - 3' x 2' coat closets
 - 2' x 2' linen storage, which could be located inside another closet
 - 150 square feet, with 12' minimum along the exterior window wall, in living rooms
 - 10' x 10' clear, without obstructions, in dining areas
 - 18" linear counter space, measured along the front edge, on both sides of kitchen sinks and ranges



B DND Design Review Checklists

- Unit interior layout
 - Units located in exterior building corners have living/dining spaces located at the exterior corners
 - Units with more bedrooms have living/dining areas and kitchens that are at least as large as those in units with fewer bedrooms
 - For privacy, bedroom and bathroom doors are located off of hallways or in recesses rather than directly off of living/dining areas
 - In-unit laundry facilities are not located within any rental units; a common laundry is provided
 - General unit circulation is not forced through the kitchen work area (possible exception studios)
 - Functional furniture layouts maintaining circulation paths are shown for living/dining areas
 - Bathroom storage is provided
 - Dishwashers (required in units with at least three bedrooms) are located so that someone can stand at the sink while they load dishes into the dishwasher
 - Linen shelving locations are indicated in each unit

Sustainability:

- LEED Silver “certifiable” at minimum
- Preliminary description of the Net Zero Emissions and Energy strategy

Systems:

- Preliminary description of MEP and FP systems

Finishes & Products:

- Window specifications
 - Window guards or limiters that cannot be easily removed by residents
 - No security bars
- Finish schedule
 - For homeownership units, wood flooring throughout except at bathrooms and kitchens
 - Ceramic tile or a sheet product for bathroom flooring
 - Formaldehyde-free cabinets that comply with ANSI/KCMA A101.1.
 - Low- or no-VOC paints
 - Cord-free and child-safe window treatments and window guards
- Plumbing fixture schedule
 - Residential kitchen sink size maximized within a 30” cabinet
- Bathroom accessories schedule
 - Two 24” towel bars in all full and half bathrooms
 - One robe hook in each full and half bathroom
- Appliance schedule
 - Refrigerators of at least 18 cubic feet

Project-specific items:

[applicable as indicated in any design conversations prior to submitting for Schematic Design Review]



B DND Design Review Checklists

Submission items:

- One half-size hard copy of the drawings
- A digital copy of the drawings
- One hard copy of the outline specifications
- A digital copy of the outline specifications
- One hard copy of this completed checklist and any previous checklists for this project
- A digital copy of this completed checklist and any previous checklists for this project

Developer/Owner: _____

Signature

Date

Project Architect: _____

Signature

Date

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DND Staff Architect: _____

Signature

Date



B DND Design Review Checklists

Schematic Design Checklist

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Sustainability:

- LEED Silver “certifiable” at minimum
- Preliminary description of the Net Zero Emissions and Energy strategy

Systems:

- Preliminary description of MEP and FP systems

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 - One robe hook in each full and half bathroom
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Project-specific items:

[applicable as indicated in any design conversations prior to submitting for Schematic Design Review]



B DND Design Review Checklists

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Developer/Owner: _____

Signature

Date

Project Architect: _____

Signature

Date

DND staff will review the submission and sign below when the review is complete and all checklist items for this project phase have been satisfied.

DND Staff Architect: _____

Signature

Date



B DND Design Review Checklists

Design Development Checklist

This stage in the design process is focused on systems and technical coordination. It will be important to pay attention to the details of DND's design requirements as more information is compiled and decisions are made. DND Design will perform a progress review to ensure a smooth review at the next submission prior to bidding.

Complete and include this checklist and all previous DND design checklists for this project with your design submission indicating that all baseline requirements are met, all content is included, all project-specific items have been addressed, and all submission items listed below are included in the submission to DND. Sign and date this document as indicated at the end of the checklist.

Content to be included:

In addition to the content described on the Schematic Design Checklist, DND will check for the following items in the Design Development submission.

- Architectural drawings
 - Towel bars spaced/located such that each bar can accommodate bath towels. If wall space is limited, at minimum one can accommodate a bath towel and the other a typically-sized hand towel
- Civil drawings
 - Proposed utility connection locations
- Landscape drawings
 - No chain link fences in any street-facing yards
 - Transformers, condensers, and other equipment screened from view (located to be inconspicuous)
- Structural drawings
- Mechanical drawings
 - Method of mechanically-supplied fresh air
 - Dryers directly-vented to the exterior
 - If baseboard heating is used, piping is offset below the floor to keep wall space clear
 - No through-wall air-conditioning units
- Plumbing drawings
- Electrical drawings
 - At minimum one light fixture or switched outlet in each living/dining area and bedroom
 - Intercom locations indicated
- Fire protection drawings
 - Appropriate fire protection equipment in sensory units
- Updated Net Zero Emissions and Energy strategy

Project-specific items:

- [applicable as indicated in previous design conversations or reviews]



B DND Design Review Checklists

Submission items:

- One half-size hard copy of the drawings
- A digital copy of the drawings
- One hard copy of the specifications
- A digital copy of the specifications
- One hard copy of this completed checklist and all previous checklists for this project
- A digital copy of this completed checklist and all previous checklists for this project

Developer/Owner: _____
Signature *Date*

Project Architect: _____
Signature *Date*

DND staff will review the submission and sign below when the review is complete and all checklist items for this project phase have been satisfied.

DND Staff Architect: _____
Signature *Date*



B DND Design Review Checklists

Construction Documents & Bid Package Checklist

At this stage in the design process, the submission consists of a nearly-complete set of drawings and specifications and a set of bid package documents explaining the project and bidding process to a set of prospective contractors. DND Design will be looking to see that the construction documents are complete enough and coordinated enough to be accurately priced, and that the bid package content is all included.

Complete and include this checklist and all previous DND design checklists for this project with your design submission indicating that all requirements are met, all content is included, all project-specific items have been addressed, and all submission items listed below are included in the submission to DND. Sign and date this document as indicated at the end of the checklist.

Bid package content that must be included:

- 95% coordinated architectural, civil, landscape, structural, mechanical, plumbing, electrical, and fire protection drawings and specifications
- Invitation to bid
- Instructions to bidders
- Contractor selection criteria
- Bid forms
- A copy of the most current Boston Residents Jobs Policy Pre-Construction Packet
- If Section 3 is applicable, copies of the eight Section 3 documents found on the Neighborhood Development Housing Policies website
<https://www.boston.gov/departments/neighborhood-development/neighborhood-development-housing-policies>
- Davis Bacon Wage Rates, if applicable
- Form of construction contract (AIA A101, AIA A201 and Exhibits) may not be a Guaranteed Maximum Price
- A copy of DND's Contract Proviso
- Any other referenced attachments

Project-specific items:

- [*applicable as indicated in previous design conversations or reviews*]



B DND Design Review Checklists

Submission items:

- One half-size hard copy of the drawings
- A digital copy of the drawings
- One hard copy of the specifications
- A digital copy of the specifications
- One hard copy of the bid package content
- A digital copy of the bid package content
- A list of qualified contractors to receive the bid package
- One hard copy of this completed checklist and all previous checklists for this project
- A digital copy of this completed checklist and all previous checklists for this project

Developer/Owner: _____

Signature

Date

Project Architect: _____

Signature

Date

DND staff will review the submission and sign below when the review is complete and all checklist items for this project phase have been satisfied.

DND Staff Architect: _____

Signature

Date



B DND Design Review Checklists

Bidding/Contractor Selection Checklist

This submission provides DND Design with documentation of the fair and open bid process and proposed contractor selection. DND Design will approve the selection of the lowest reasonable bidder. A higher bidder may alternatively be approved if the selection rationale is reasonable.

Complete and include this checklist and all previous DND design checklists for this project with your submission indicating that all content is included and all submission items listed below are included in the submission to DND. Sign and date this document as indicated at the end of the checklist.

Bidding documentation that must be included:

- Any additional information provided to contractors during bidding
- Brief narrative describing the selection rationale and preferred contractor
- Bid proposal copies
- Bid proposal side-by-side comparison of trade values

Submission items:

- A digital copy of the bidding documentation described above
- A digital copy of this completed checklist and all previous checklists for this project

Developer/Owner: _____

Signature

Date

Project Architect: _____

Signature

Date

DND staff will review the submission and sign below when the review is complete and all checklist items for this project phase have been satisfied.

DND Staff Architect: _____

Signature

Date



B DND Design Review Checklists

Draft Construction Contract Checklist

DND's Contract Proviso contains DND's policy content as it applies to the construction contract and construction procedures, and the project team should review these requirements to ensure consistency within the contract documents and exhibits. DND Design will review this submission for coordination and completeness of content.

Complete and include this checklist and all previous DND design checklists for this project with your submission indicating that all content is included and all submission items listed below are included in the submission to DND. Sign and date this document as indicated at the end of the checklist.

Construction contract content that must be included:

- Draft construction contract (often AIA A101 and AIA A201; should not be a Guaranteed Maximum Price)
- A copy of DND's Contract Proviso
- A copy of the most current Boston Residents Jobs Policy Pre-Construction Packet
- If Section 3 is applicable, copies of the eight Section 3 documents found on the Neighborhood Development Housing Policies website
<https://www.boston.gov/departments/neighborhood-development/neighborhood-development-housing-policies>
- Completed Model Section 3 Plan (see Section 3 documents mentioned above)
- Davis Bacon Wage Rates, if applicable
- Schedule of Values
- Construction Schedule
- List of drawing sheets and specification sections including drawing sheet titles and numbers, specification section titles and numbers, and the most recent date found on each sheet and specification section
- LEED checklist and narrative describing that at minimum Silver certifiable will be achieved
- Unit prices (for soils, if applicable, at minimum)
- Any alternates
- Any allowances
- Any addenda
- Any other attachments referenced in the draft contract



B DND Design Review Checklists

Submission items:

- One hard copy of the construction contract and all exhibits, organized with tabs separating documents
- A digital copy of the construction contract and all exhibits
- One hard copy of the drawings that are listed in the construction contract
- A digital copy of the drawings that are listed in the construction contract
- One hard copy of the specifications that are listed in the construction contract
- A digital copy of the specifications that are listed in the construction contract
- One hard copy of this completed checklist and all previous checklists for this project
- A digital copy of this completed checklist and all previous checklists for this project

Developer/Owner: _____

Signature

Date

Project Architect: _____

Signature

Date

DND staff will review the submission and sign below when the review is complete and all checklist items for this project phase have been satisfied.

DND Staff Architect: _____

Signature

Date



B DND Design Review Checklists

Closing Design Checklist

This submission is important because it provides documentation of the final construction contract and construction documents. DND Design staff will use these documents to assign a Construction Specialist to the project who will assist with quality and cost control during construction.

Complete and include this checklist and all previous DND design checklists for this project with your submission indicating that all submission items listed below are included in the submission to DND. Sign and date this document as indicated at the end of the checklist.

Submission items:

- Two hard copies of the executed construction contract
- A digital copy of the executed construction contract
- One half-size hard copy of the drawings listed in the construction contract
- One hard copy of the specifications listed in the construction contract
- One hard copy of this completed checklist and all previous checklists for this project
- A digital copy of this completed checklist and all previous checklists for this project

Developer/Owner: _____

Signature

Date

Project Architect: _____

Signature

Date

DND staff will review the submission and sign below when the review is complete and all checklist items for this project phase have been satisfied.

DND Staff Architect: _____

Signature

Date



For insertion in Document A101/A201

ARTICLE 16 – STANDARD PROVISIONS

The following are hereby incorporated herein by reference with the same force and effect as though fully set forth herein. To the extent that the terms contained in Article 16 are inconsistent with the terms contained in other Articles within A101 and A201, the terms set forth in Article 16 herein shall apply.

16. STANDARD PROVISIONS

16.1. Employment Provisions - Based upon dnd housing policies the owner shall attach the following employment provisions to the contract as exhibits. In the case that the owner has excluded any of these provisions from the contract they are hereby attached to the contract by reference as indicated in article 16.1

16.1.1. The Boston Residency and Jobs Policy (current version), attached as Appendix A.

16.1.2. Davis Bacon Prevailing Wages, attached as Appendix B.

16.1.3. Section 3 documents, attached as Appendix C.

16.1.3.1. Section 3 Model Plan Template - If the template provided has not been revised and submitted by the owner, the contract shall be amended to include a completed section 3 model plan within 5 days of the signing of the contract.

16.2. Progress Payments - The amount of each progress payment shall include:

16.2.1. That portion of the Construction Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner and the Owner's Lenders, suitably stored off the site at a location agreed upon in writing, provided that amounts payable on account of stored material not yet incorporated in the Work, but insured and stored separately, shall be limited to Contractor's actual out-of-pocket costs for such materials; and stored materials are to be incorporated in the Work within 45 days.

16.2.2. The amount of General conditions allocated with each progress payment will represent the percentage of the completed work approved by the Owner and the Owner's Lenders.

16.3. Retainage - For each progress payment made prior to Substantial Completion of the Work, the Owner will withhold 5% of the payment as retainage, from the payment.

- 16.3.1. For projects under 3 million dollars, the owner will withhold 10% of the payment as retainage until 50% complete at which point the retainage percentage will be reduced to 5%.
- 16.3.2. Retainage will not be released until the project is 100% complete.
- 16.3.3. Upon Substantial Completion of the Work, retainage will be reduced to one hundred fifty percent (150%) of the value of the uncompleted work as determined by the Architect and the Owner's Lenders in a monetized Punch List.

16.4. Final Payment

- 16.4.1. Owner's Lenders' approval is required for Final payment. An executed Certificate of Completion is required for DND to release final payment.

16.5. Enumeration of Contract Documents

- 16.5.1. The Contract Documents exclude contractor qualifications & assumptions, the advertisement or invitation to bid, instructions to bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.
- 16.5.2. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral.
- 16.5.3. The Specifications are to be referred to in the Contract with an Exhibit to the Agreement in a list form indicating the Section number, Title and most recent date (or revision date).
- 16.5.4. The Drawings are to be referred to in the Contract with an Exhibit to the Agreement in a list form indicating the Drawing number, Title and most recent date (or revision date).
- 16.5.5. Where the reference list in the Specifications Exhibit and the Drawings Exhibit does not match the actual specification and actual drawings, the DND approved drawings and specifications will supersede the exhibit within the contract.

16.6. Change Orders

- 16.6.1. Methods used in determining adjustments to the Contract Sum will include the following, and may not exceed following percentages, if not enumerated in the Contract:
 - 16.6.1.1. The Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit which shall be

calculated as follows: For additions to the Contract Sum, the Contractor shall add to the cost of additional Work to be performed by Contractor a percentage fee for overhead and profit of no more than [eight] percent ([8]%) (which fee shall be inclusive of any additional insurance costs) plus any additional payment, performance and lien bond costs attributable to additional Work, charged at the same rate as the bonds attributable to the other aspects of the Work. For additional Work to be performed by Subcontractors and/or Sub-subcontractors, the Contractor shall add to the cost of the additional Work a percentage fee for overhead and profit of no more than [eighteen] percent ([18]%) in the aggregate (inclusive of all overhead and profits of the contractor and of Subcontractors or Sub-subcontractors, and of any additional insurance costs), plus any additional payment, performance, and lien bond costs attributable to additional Work, charged at the same rate as the bonds attributable to the other aspects of the Work.

- 16.6.1.2. General conditions will be excluded on change orders and change order directives without a determination by the Owner's Lenders that the additional work impacts the critical path and/or represents new programmatic scope not accounted for in the Contract Documents.