

# Island Housing Trust

## Lake Street Affordable Housing

### Vineyard Haven, MA

PRELIMINARY BID SET SPECIFICATIONS  
April 29, 2011

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General Project Description:

**Island Housing Trust – Lake Street Affordable Housing**  
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The Island Housing Trust (IHT): Lake Street Affordable Housing project, involves two phases. Phase 1 involves the construction of two new wood framed buildings on an undeveloped site in Vineyard Haven, MA (Parcel #25-E-25). Each building consists of two (2) two-bedroom units totaling 2,300sf on the first and second floors with a total of 8 bedrooms. Phase 2 involves the construction of one new wood framed building on the same site, with the same size building as one building in Phase 1. The scope of the housing project includes construction of a silt barrier around the area of work, removal of selected foliage and grubs, excavation for and construction of the two buildings in Phase 1 and one building in Phase 2, new utility lines serving the buildings out of each building, including the final connection from that point to the septic system, well tank and electrical service. The scope of work for the buildings also includes backfilling of the building and rough/final grading as well as seeding of the entire area impacted by the work and removal of silt barrier around the area of work. All landscape construction will be included in this contract.

This specification is a general overview of materials and products to be used, but should not be limited to in order to complete the buildings. All work to be in conformance with the Massachusetts State Building Code, the Town of Tisbury Zoning By-Laws and the Order of Conditions set forth by the Tisbury Zoning Board of Appeals. Verify conditions with IHT.

***Bruce MacNelly, Principal of MacNelly-Cohen Architects, ([bruce@macnellycohen.com](mailto:bruce@macnellycohen.com), 508- 693-4043) will be the main contact for any questions about this project during the bidding process. Please direct any correspondence to his office.***

## **1 General Requirements/General Conditions**

### **1.1 General**

- 1.1.1 The use of the word “provide” in this specification is taken to mean provide and install.
- 1.1.2 The use of the word “Owner” shall refer to The Island Housing Trust (IHT).
- 1.1.3 The use of the word “Homeowner” shall mean purchaser of building Unit and not IHT.

### **1.2 General Conditions**

- 1.2.1 The Contractor is to provide all necessary on-site supervision of all trades to execute the described scope of work.
- 1.2.2 The Contractor is to complete the work with quality and craftsmanship generally associated with high-end residential construction.
- 1.2.3 The Contractor shall provide a written construction schedule. The schedule shall include deadlines for finalizing open design issues and for selection of finish materials.
- 1.2.4 The Contractor is to carry adequate (\$1,000,000) liability insurance and workman’s compensation coverage for all people employed on the jobsite.
- 1.2.5 Subcontractors employed by the Contractor must carry a minimum of \$500,000 General Liability insurance and, if they have employees, complete Workers’ Compensation coverage.
- 1.2.6 The Contractor is responsible for temporary and permanent utilities costs during construction.
- 1.2.7 The Contractor has responsibility for shoring required by demolition or excavation.
- 1.2.8 The Contractor is responsible for providing materials and labor to ensure a complete project, based on drawings and specifications.
- 1.2.9 The Contractor is to include all general construction costs such as rubbish disposal, telephone, fax, and delivery costs.
- 1.2.10 Contractor responsible for maintaining on-site toilet facilities.
- 1.2.11 Contractor responsible for securing the premises for duration of construction.
- 1.2.12 Contractor is responsible for providing a professional cleaning contractor to completely clean areas of construction (and other areas effected by construction or dust) at the end of construction.

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- 1.2.13 Temporary protection; protect all in-place construction and stored materials from the weather, including wind, hail, rain and snow.
- 1.3 Regulations/Permits
  - 1.3.1 The Contractor is responsible for licenses, permits, & inspections. All licenses, permits, and inspections necessary to the performance, completion, and approval of the work shall be secured and paid for by the Contractor.
  - 1.3.2 The Contractor to complete the work in compliance with Massachusetts State Building codes.
- 1.4 Submittals
  - 1.4.1 Data; submit manufacturer's data on the following:
    - Filter fabric
    - Handrail brackets
    - Door hardware
    - Manufactured windows.
    - Light fixtures.
    - Electrical devices.
    - Plumbing fixtures.
    - Toilet accessories.
    - HVAC system components.
    - Sealants.
  - 1.4.2 Shop drawings; submit shop drawings for the following:
    - Metal fabrications.
    - Fabricated casework.
  - 1.4.3 Samples; submit finished samples of the following materials:
    - Metal fabrication components
    - Interior and exterior materials and finishes.
    - Electrical devices and cover plates.
  - 1.4.4 Mock ups; construct mock ups of the following assemblies:
    - TBD
- 1.5 Substitutions
  - 1.5.1 No substitutions shall be made for specified products without permission from IHT and the Architect.
  - 1.5.2 When a substitution is proposed, the contractor is to provide sufficient information to enable the architect to make a comparison between the specified product and the proposed product.
  - 1.5.3 IHT is entitled to make substitutions. Additions or credits in project cost and time shall be determined by the following process:
    - IHT indicates proposed substitution.
    - Contractor will provide a written proposal for changes which includes:
      - (a) Contractor's cost, without markup, of material before change and after change.
      - (b) Cost of labor before change and after change.
      - (c) Incidental credits or expenses related to change.
      - (d) Tabulation of overhead and profit percentage. (Overhead and profit percentage will remain the same for changes. A credit will receive the same percentage as an addition receives.)
    - Architect and IHT will review and approve all proposals prior to the Contractor proceeding with the revised scope of work.
- 1.6 Warranty
  - 1.6.1 The Contractor will provide standard one-year warranty coverage for all work performed from the date of substantial completion or in the case of work or products installed after completion; the date that work was completed and by acceptance of the Island Housing trust. The Architect will review the status of the work to establish the date of substantial completion.

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- 1.6.2 Windows and glazing will be fully guaranteed for two (2) years. All window parts will be guaranteed for ten (10) years and glass will be guaranteed against seal failure as per manufacturer's warranty.
- 1.6.3 The Contractor shall provide all warranty repairs as required under warranty.
- 1.7 Energy Efficiency
  - 1.7.1 It is the goal of the Lake Street project to implement as many energy efficient strategies as possible. The Contractor shall be responsible (at minimum) for the following:
    - Achieve at minimum an Energy Star 2 rating for all living units using the "Performance HERS Rating" path and "Standard" Certification method with a third party HERS Rating Provider.
    - Pass Energy Star's "Thermal Bypass Checklist".
    - Achieve a HERS rating of 60 or better.
- 1.8 Construction Waste Management
  - 1.8.1 Contractor shall provide Construction Waste Management Plan that will employ environmentally responsible construction methods and to minimize resource depletion and waste brought to local landfills. This plan shall include;
    - Analysis of the proposed jobsite waste including types and rough quantities.
    - Contractor's statement of verification that landfills proposed are licensed for the types of waste being deposited and have sufficient capacity to receive the waste.
    - A list of materials to be recycled or re-used including:
      - (a) Cardboard
      - (b) Clean dimensional wood
      - (c) Concrete
      - (d) Metals from framing, ductwork piping, rebar, roofing, and other metal materials
      - (e) Mechanical and Electrical Equipment
      - (f) Building Components that can be removed intact and reused.
      - (g) Packaging Materials (paper)
      - (h) Glass
      - (i) Gypsum wallboard scraps
      - (j) Vegetation, excavated soil and land-clearing debris.
    - Materials handling procedures identifying means by which waste and recycled materials will be separated, stored consistent with requirements of waste and recycling facilities.
    - A description of means of transportation of the separated recyclable materials or whether mixed materials will be collected by a waste hauler.
- 1.9 Project Closeout and Post Occupancy
  - 1.9.1 The Contractor will have the premises professionally cleaned at completion to prepare the buildings for occupancy, including complete house cleaning and window washing. The Site shall be fully cleaned of all construction debris.
  - 1.9.2 Contractor to provide submittals to IHT and the homeowner to include the following:
    - Operation and maintenance data and manuals:
      - (a) Ventilation system
      - (b) Heating system
      - (c) Potable water system
      - (d) Electric power, telephone and cable services
      - (e) Lighting and light bulb information
      - (f) Appliances
      - (g) Plumbing fixtures
      - (h) Paint and finishes
      - (i) Tiles and other special surfaces
    - All Warranties
    - Keys and key schedule

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- Spare parts and paint, maintenance materials and extra materials as necessary for maintaining the property
  - Evidence of compliance with requirements of governmental agencies having jurisdiction including (but not limited to) Occupancy Permits
  - Record Documents
  - Construction photographs keyed to floor plans of all interior walls prior to drywall application.
- 1.9.3 Punch List Requirements:
- The Contractor shall provide one punch list at substantial completion of any incomplete construction items prior to final cleaning and occupancy.
- 1.9.4 Systems Start Up
- The Contractor shall provide and orchestrate a complete start-up of all systems and provide instruction to IHT's personnel in proper operation and routine maintenance of all systems and equipment.
- 1.10 Allowance Summary
- 1.10.1 Cabinetry Allowance (per unit): \$8,000
  - 1.10.2 Countertop Allowance (per unit): \$1,000
  - 1.10.3 Plumbing Allowance (per unit): \$3,000
  - 1.10.4 Landscape all components specified Allowance (per unit): \$10,000

**2 Clearing, Excavation and Site Work**

- 2.1 General
- 2.1.1 General scope; see civil/landscape and architectural plans.
  - 2.1.2 Contractor to coordinate work with Tisbury DPW so that the Town's work on drainage systems does not damage or interfere with Contractor's building, septic or site work.
  - 2.1.3 Contractor to call Dig-Safe to verify the precise location of all utilities on site prior to initiating demolition activities. Contractor shall protect utilities throughout construction.
- 2.2 Construction Activity Pollution Prevention:
- 2.2.1 Contractor shall prevent loss of soil during construction by storm water runoff and/or wind erosion, including protection of topsoil stockpiled for reuse.
  - 2.2.2 Contractor shall prevent sedimentation of wetlands, streams and lakes.
  - 2.2.3 Contractor shall prevent pollution of the air with dust and particulate matter.
- 2.3 Clearing and Grubbing
- 2.3.1 Remove only existing tagged vegetation from area of work. Coordinate marking and removal with Owner and Landscape Architect.
  - 2.3.2 Protect and preserve all existing vegetation not shown to be removed against unnecessary cutting, breaking or skinning of roots or bark.
  - 2.3.3 Strip and stockpile top soil for reuse. Do not stockpile excavated materials within drip line of trees.
  - 2.3.4 Protect trees from vehicular traffic and the parking of vehicles by keeping vehicles outside of drip line of trees.
  - 2.3.5 Install sediment and erosion control measures as necessary.
- 2.4 Excavation
- 2.4.1 Excavate as required for new construction, sub-grade fill, footings, foundation walls, and underground utilities trenches from street to buildings.
  - 2.4.2 Stockpile excavated material for reuse as rough grading – not backfill. Remove excess excavated material from site and dispose of in accordance with local requirements.
  - 2.4.3 Promptly notify Landscape Architect & Civil Engineer of any unexpected sub-surface conditions.
- 2.5 Ledge Removal
- 2.5.1 Assume no removal of ledge associated with building foundation excavation.
- 2.6 Engineered Fill and Backfill
- 2.6.1 Footings; crushed stone fill, compacted in 6" lifts to 95% compaction.

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- 2.6.2 Slabs-on-grade; crushed stone fill, compacted in 12" lifts to 95% compaction.
- 2.6.3 Perimeter foundation drains; crushed stone fill.
- 2.6.4 Foundation backfill; clean well-drained fill, compacted.
- 2.7 Filter Fabric
  - 2.7.1 General scope; provide filter fabric at all foundation and sub-grade drains.
  - 2.7.2 Filter Fabric; light weight, non-woven polypropylene fabric made of recycled fiber where possible as shown on drawings.
- 2.8 Sub-grade and Foundation Drain at Full Basement
  - 2.8.1 4" diameter perforated PVC sub-grade and perimeter drain as shown on foundation drawings. Route all drains to storm water drains. Coordinate final locations with Civil Engineer and Tisbury DPW.
- 2.9 Site Work
  - 2.9.1 Site grading; see Site/Drainage Plan for grading elevations and transitions.
  - 2.9.2 Utilities; Provide excavation, trenching, installation and backfill of all utilities associated with all buildings. Extend utilities from the street to 15'-0" from building perimeters.
- 2.10 Roadways, Parking Surfaces, and Pathways
  - 2.10.1 General scope; All roads and parking areas will be laid out in field by civil engineer or Landscape Architect.
  - 2.10.2 Finish surface; All roads to be prepared with a min. 6" base of suitable compacted fill. Before compactions, prepare with a min. 6" base of recycled asphalt product (R.A.P.) mix. All pathways from driveway to the front entry of the homes to be prepared with 6" brown stone dust.
- 2.11 Electric Service
  - 2.11.1 General scope; extend electric service from the street to all buildings as shown on Civil Engineer's drawings. Confirm final conduit spec and layout with utility company.
- 2.12 Telephone & CATV
  - 2.12.1 General scope; extend one 4" PVC conduit from the street to 15'-0" from building perimeters as shown on Civil Engineer's drawings. Confirm final conduit spec and layout with utility company.
- 2.13 Septic System
  - 2.13.1 General scope; See Civil Engineer drawings for layout and scope. Contractor is responsible for the supply and install of all septic system work.
- 2.14 Water Service:
  - 2.14.1 General scope; extend a domestic water line from the street to 15'-0" from building perimeters as shown on Civil Engineer's drawings. Contractor to coordinate with plumber regarding size and specification.
- 2.15 Landscape
  - 2.15.1 Rough grade; grade to 6" below finish contour elevations as shown on the Site Plan.
  - 2.15.2 Finish grade; finish grading to be completed after building exterior is completed. Care must be taken so that compaction of finish grading layer does not occur by vehicle or personnel. Utilize stockpiled topsoil, ensuring that only clean, loose topsoil with maximum grain size of 1" is utilized. Amend the stockpiled topsoil with organic composted material (brown to black color with no unpleasant odor). Import equivalent topsoil as needed. Grade topsoil for final finish grade as shown on drawings.
  - 2.15.3 Grass Seeding; Seed mixture shall be: 25% hard fescue, 25% chewings fescue, 25% creeping red fescue, 25% sheep fescue. Seeding must be completed between April 30<sup>th</sup> and June 15<sup>th</sup> or September 1<sup>st</sup> and October 15<sup>th</sup>. Rake planting soil (removing all material larger than 1" in diameter), roll entire surface with roller weighing approx. 100 pounds per foot of width. Sow seeds in two directions at 90 degrees to each other, applying approximately 3 pounds of seed per 1,000 sf. Seed area should be watered daily during 1<sup>st</sup> week (in the absence of adequate rainfall). After 1<sup>st</sup> week, water the seeded areas adequately to provide moisture in top 5" soil. Reseed bare or eroded areas as necessary.
  - 2.15.4 Planting; to be provided and installed by Contractor.

2.15.5 Landscape all components specified allowance (per unit): \$10,000.

**3 Concrete**

3.1 Concrete Foundations

- 3.1.1 General scope; See Structural Drawings and specifications for complete scope of concrete materials and work. Coordinate structural scope of work with architectural drawings.
  - 3.1.2 Footings; concrete mix specification and application, reinforcing, size and configuration as shown on structural drawings.
  - 3.1.3 Foundation walls; concrete mix specification and application, reinforcing, size and configuration as shown on structural drawings.
  - 3.1.4 Provide and install sonotube foundations for porches as shown on structural drawings.
  - 3.1.5 Provide and install all utility sleeves necessary to complete work.
  - 3.1.6 Form wedge-shaped P.T. 2x4 blocking into interior face of concrete wall for insulation nailer as shown on drawings. Use half-driven nails to anchor at approximately 24" O.C..
  - 3.1.7 Dampproofing; brush, spray or trowel-applied bituminous to be applied at full-basement foundation walls, damp proofing not required at slab on grade foundation walls.
  - 3.1.8 Vertical Drainage mat; provide and install ½" filter fabric/dimpled plastic or geo-grid composite drainage boards at full-basement foundation walls. Extend from 4" below finish grade to top of footing.
  - 3.1.9 Filter fabric; light weight, non-woven polypropylene fabric made of recycled fiber where possible as shown on drawings.
  - 3.1.10 Anchor bolts; size, type and length as shown on structural drawings.
  - 3.1.11 Foundation insulation; see Division 7 – Thermal & Moisture Protection.
  - 3.1.12 Exposed-to-view concrete foundation finish; the intent is to provide a high quality form finish that will require only nominal finishing. Immediately after removal of forms, chip off all fins and other projections. Voids, honeycombs, air pockets and imperfections shall be patched. Patches shall match the color and texture of surrounding poured surfaces. Remove all ties and patch voids formed by tie rod cones.
  - 3.1.13 Foundation dampproofing; see Division 7 – Thermal & Moisture Protection.
  - 3.1.14 Surfaces to receive dampproofing; immediately after removal of forms and before dampproofing is applied, chip off all fins and other projections. Voids, honeycombs and imperfections shall be patched flush to surface. Remove all ties and patch voids formed by tie rod cones.
  - 3.1.15 Joint filler, Bitumen impregnated fiber board compressible joint filler or approved equal.
- 3.2 Interior Concrete Slabs-On-Grade
- 3.2.1 General scope; reinforced concrete, concrete mix specification, reinforcing, size and configuration as shown on structural drawings.
  - 3.2.2 Reinforcing; as shown on structural drawings.
  - 3.2.3 Control joints; locate control joints as shown on the drawings or as directed by the Architect.
  - 3.2.4 Finish; Provide smooth manganese trowel finish with sealer/hardener.
  - 3.2.5 Moisture barrier; see Division 7 – Thermal & Moisture Protection.
  - 3.2.6 Under-slab insulation; see Division 7 – Thermal & Moisture Protection.
  - 3.2.7 Radon piping; see Division 15 – Mechanical.

**4 Masonry (Division Not Used)**

## 5 Structural Steel and Metal Fabrications

- 5.1 Structural Steel
  - 5.1.1 General scope; See structural drawings and specifications for complete scope of wood framing materials and work.
- 5.2 Metal Flashing
  - 5.2.1 See Division 7 – Thermal & Moisture Protection.

## 6 Wood & Plastics

- 6.1 Temporary Shoring & Bracing
  - 6.1.1 Provide engineered temporary shoring and bracing as required to facilitate new construction as shown on the drawings. Contractor shall utilize a licensed engineer for design of all temporary shoring and bracing.
- 6.2 Rough Framing
  - 6.2.1 General scope; see Structural drawings and specifications for complete scope of wood framing materials and work. Coordinate structural scope of work with Architectural drawings.
  - 6.2.2 Foundation sill plates; preservative-treated, per structural and as shown on the drawings.
  - 6.2.3 Floor framing & decking; see Structural drawings for framing sizes, layout and scope.  $\frac{3}{4}$ " T&G Advantech, or equal, glued and nailed, per structural.
  - 6.2.4 Exterior walls; kiln-dried, per structural and as shown on the drawings.
  - 6.2.5 Ceiling joists; kiln-dried, per structural and as shown on the drawings.
  - 6.2.6 Roof rafters; kiln-dried, per structural and as shown on the drawings.
  - 6.2.7 Beams & headers; kiln-dried, or engineered wood per structural and as shown on the drawings.
  - 6.2.8 Exterior wall sheathing;  $\frac{1}{2}$ " Advantech, Zip System wall sheathing. Install panels in strict accordance with manufacturer's requirements and recommendations. Tape all joints according to manufacturer's requirements. See Division 8 – Windows and Doors for flashing installation.
  - 6.2.9 Exterior roof sheathing;  $\frac{5}{8}$ " Advantech, Zip System roof sheathing. Install panels in strict accordance with manufacturer's requirements and recommendations.
  - 6.2.10 Non load-bearing interior walls; kiln-dried, locally sourced, 2X4 or 2X6 at 1'-4" o.c. or as shown on the drawings.
  - 6.2.11 Wood blocking; kiln-dried, locally sourced, 2X\_ wood blocking as required for firestopping and at all casework, shelving, shelving standards, equipment, door wall stops, accessories requiring blocking support, etc. Provide blocking for future grab bars.
  - 6.2.12 Connectors & hardware; joist hangers, beam hangers, column bases, hurricane clips, etc. as shown on structural drawings and/or structural specifications, hot-dipped galvanized finish.
  - 6.2.13 Plywood electric & tele/data room backing panels;  $\frac{3}{4}$ " thickness, APA trademarked. Length and support as described on the drawings or as required, paint finish.
  - 6.2.14 Sill sealer; see Division 7 - Thermal & Moisture Protection.
  - 6.2.15 Termite shield; see Division 7 - Thermal & Moisture Protection.
- 6.3 Exterior Finish Carpentry
  - 6.3.1 Window/door casings; kiln-dried,  $\frac{5}{4}$  x 4 western red cedar, clear grade, unfinished or approved equivalent. Dimensions, detail and finish as shown on drawings.
  - 6.3.2 Miscellaneous running trim; kiln-dried, western red cedar, clear grade, unfinished or approved equivalent. Dimensions, detail and finish as shown on drawings.
  - 6.3.3 Provide and install hurricane panels constructed of  $\frac{5}{8}$ " CDX plywood. Panels are to be proper size for each window. Panels to be properly labeled for each window.
- 6.4 Exterior Siding
  - 6.4.1 Shingles; #1 18" eastern white cedar r+r shingles, unfinished with 5" exposure.
- 6.5 Exterior Porches & Decks

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- 6.5.1 Deck and porch roof framing; pressure treated per structural and as shown on the drawings.
- 6.5.2 Decking; Timbersil 5/4 x 6 glass infused wood. Pre-drill and attach with stainless steel screws all aligned.
- 6.5.3 Deck railing and newel posts; 1x\_ western red cedar posts, unfinished, balusters as shown on drawings. Newel posts to be 4x4 western red cedar, unfinished as shown on drawings.
- 6.5.4 Porch columns; 1x5 western red cedar flat stock, unfinished, wrapping pressure treated structural post. Provide and install one-piece cap unfinished western red cedar and base. Provide ventilation for column as required.
- 6.6 Interior Finish Carpentry
  - 6.6.1 Door casing; kiln-dried, solid 1x4 poplar head casing, painted, 1x4 poplar side casing, painted as shown and detailed on the drawings.
  - 6.6.2 Window casing; solid 1x\_ poplar jamb extensions, 1x4 poplar side casing, 1x\_ poplar sill, painted, and 1x4 poplar apron, painted.
  - 6.6.3 Wood base; kiln-dried, 1x4 poplar, painted as shown on the drawings. See interior elevations and details for locations.
  - 6.6.4 Miscellaneous trim; kiln-dried, solid 5/4x or 1x poplar trim, painted as shown and detailed on the drawings.
  - 6.6.5 Closets; 12" wide 3/4 maple plywood shelf, painted, w/1 3/8" dia. Clear pine closet pole. Max span: 36". Provide all hardware as required for complete installation.
- 6.7 Interior Finished Stairs
  - 6.7.1 Treads; 1"-thick maple, stained and with 2-coat clear urethane, matte finish.
  - 6.7.2 Risers; 3/4 poplar, painted.
  - 6.7.3 Skirts; 3/4 poplar, painted.
  - 6.7.4 Handrail: wall mounted maple, railing as shown and noted on the drawings, stained and with 2-coat clear urethane, matte finish, brackets as approved by IHT.
- 6.8 Interior Basement Stairs
  - 6.8.1 Stringers: 2x10 or 2x12s as required.
  - 6.8.2 Treads; 2x10 cut to tread depth.
  - 6.8.3 Risers: 2x8 cut to riser height.
- 6.9 Casework
  - 6.9.1 General scope; comply with AWI quality standards.
  - 6.9.2 All cabinets to be installed by Contractor.
  - 6.9.3 All cabinetry to be factory finished, field touch up by Contractor.
  - 6.9.4 All cabinetry to be constructed with non-urea formaldehyde components and low VOC finishes.
  - 6.9.5 Provide stain grade and/or painted solid wood casework in compliance with AWI Custom Grade standards, full overlay construction unless noted otherwise. See drawings for scope.
  - 6.9.6 All cabinetry hardware including (but not limited to) pulls, knobs, latches and hinges to be provided and installed by the Contractor.
  - 6.9.7 **Cabinetry Allowance (per unit): \$8,000 (not including installation).**
- 6.10 Countertops
  - 6.10.1 Provide and install Formica countertops (or IHT approved equal) throughout. Final color and finish to be approved by IHT.
  - 6.10.2 **Countertop Allowance (per unit): \$1,000 (including installation).**

## 7 Thermal and Moisture Protection

- 7.1 Insulation
  - 7.1.1 Foundation wall insulation; 2" minimum extruded polystyrene board (R value 10 minimum), located on inside face of foundation wall, stagger and tape joints.
  - 7.1.2 Under-slab insulation; 4" extruded polystyrene board (R value 20 minimum), tape joints.

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- 7.1.3 Exterior stud cavity wall insulation; 5 ½” low density spray foam insulation (Icynene or approved equal), full depth (R value 20 minimum).
- 7.1.4 Exterior rim joist cavity insulation; 5 ½” low density spray foam insulation (R value 20 minimum), cover web stiffener completely.
- 7.1.5 Acoustical wall insulation; 3-1/2” rock wool batts tightly fitted between wall studs, minimum 75% post-industrial recycled content, extend from floor to ceiling at all bathrooms and common unit walls.
- 7.1.6 Fire-rated wall insulation; 3-1/2” rock wool batts tightly fitted between wall studs, minimum 75% post-industrial recycled content, extend from floor to ceiling at common unit wall.
- 7.1.7 Roof insulation; 9 ¼” low density spray foam insulation (Icynene or approved equal), full depth (R value 34 minimum).
- 7.1.8 Miscellaneous exterior openings; spray-type closed-cell urethane insulation, install around all exterior wall penetrations, gaps between insulation boards and wood floor framing, sill plate gaps, utility penetrations, and window and door shim spaces, fill all voids to create a continuous air barrier.
- 7.2 Dampproofing
  - 7.2.1 Foundation; Apply Tremco Tuff-N-Dri H8 basement waterproofing system (or architect approved equal) to exterior face of all new foundation walls to within 6” of finished grade. System to include membrane thickness of 40 mils and 2-3/8” Warm-n-Dri foundation board.
- 7.3 Ice and Water Membrane
  - 7.3.1 General scope; install membrane at roof deck surfaces as shown on the drawings. Extend 24” minimum vertically behind wall & step flashings.
  - 7.3.2 Membrane; WR Grace Ice and Water Shield or approved equal.
- 7.4 Under-Slab Moisture Barrier
  - 7.4.1 Moisture barrier; 6 mil reinforced polyethylene sheet.
- 7.5 Window and Door Flashing
  - 7.5.1 Window and door flashing; WR Grace “Vycor” V40 self-adhesive membrane flashing system or approved equal.
  - 7.5.2 Installation; Install flashing in accordance with manufacturer’s recommendations and as shown on the drawings including head, jamb and sill conditions. Flashing shall be integrated with sheathing and weather barrier system for a complete, air tight installation of sheathing, doors and windows. Provide pan flashing at window sills.
  - 7.5.3 See Division 6 – Wood and Plastics for exterior wall sheathing system.
- 7.6 Asphalt Shingle Roofing
  - 7.6.1 Shingles; 30 year architectural asphalt shingles. Final color to be selected by architect.
  - 7.6.2 Underlayment; 30# roofing felt.
  - 7.6.3 Ice barrier: WR Grace “Ice and Water Shield” install in accordance with manufacturer’s recommendations and on all eaves extending from drip edge to 36” up roof from inside edge of exterior walls. 24” up wall at roof/wall intersections; at valleys, ridges, crickets, roof windows, roof slope transitions, roof penetrations and where shown on drawings.
  - 7.6.4 Fasteners; stainless steel and per manufacturer’s requirements for 30 year warranty.
  - 7.6.5 Provide manufacturer’s 30 year warranty.
  - 7.6.6 Flashing; ridge, valley, wall and step flashings, installed in strict accordance with manufacturer approved detailing, specifications and recommended procedures.
  - 7.6.7 Flashing and accessories; aluminum, see drawings for locations, detail and flashing profiles.
  - 7.6.8 See Division 7 – Thermal and Moisture Protection for eave and rake drip flashing, step flashing wall flashing and valley flashing.
- 7.7 Roofing Accessories
  - 7.7.1 Plumbing vent boot; standard fabricated watertight aluminum cladding at vent pipe, seal boot to clip seam panel w/acoustical sealant, allow thermal movement.

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- 7.7.2 Flue flashing (if required by manufacturer); coordinate flue manufacturer's counter flashing collar with flashing configurations for a watertight installation.
- 7.7.3 Roof Crickets; form crickets where shown and detailed on the drawings. Make watertight transitions to the adjacent roofing system and exterior finishes.
- 7.8 Flashing
  - 7.8.1 General scope; comply with SMACNA recommendations and standards for sheet metal selection, forming, fabricating and installation, coordinate with roofing system flashing.
  - 7.8.2 Eave drip; aluminum 0.040 inch-thick, standard-fabricated as required.
  - 7.8.3 Rake drip; aluminum 0.040 inch-thick, standard-fabricated as required.
  - 7.8.4 Step flashing; copper 0.040 inch-thick, standard-fabricated as required.
  - 7.8.5 Window pan flashing; painted aluminum with folded and sealed corners. Sides and back of pan flashing shall turn up 1" and drip edge shall be flashed into Vycor window flashing system.
  - 7.8.6 Finish; 3-coat Kynar paint system, color to be manufacturer's standard white, final color to be approved by the Architect.
- 7.9 Gutters & Downspouts
  - 7.9.1 Gutters; 5" K-style, painted aluminum, location, profile & detail as shown on drawings.
  - 7.9.2 Scuppers; painted aluminum, location, profile & detail as shown on drawings.
  - 7.9.3 Downspouts; painted aluminum, location, profile & detail as shown on drawings.
  - 7.9.4 Downspout hangers; painted aluminum at 4'-0" o.c.
  - 7.9.5 Connect downspouts to required PVC drainage system. See Civil drawings for scope and requirements.
- 7.10 Vapor & Air Sealing
  - 7.10.1 All buildings to have a blower door test conducted per Energy Star requirements. A total of three tests are to be conducted. Final results shall have a natural infiltration rate that does not exceed 0.10 CFM/50 per square foot of building shell:
    - Upon completion of the air-sealed shell
    - Upon completion of insulation prior to installation of sheetrock
    - After installation of sheetrock.
  - 7.10.2 Sill sealer; polyethylene foam gasket between sill plate and concrete foundation, caulk foundation/sill plate joint for air infiltration barrier.
  - 7.10.3 Zip System sheathing to provide air barrier for buildings. Install per manufacturer's requirements to create a fully sealed, continuous air barrier.
  - 7.10.4 Seal all Zip System wall and roof sheathing per manufacturers specifications including all corners, wall plates, sills, and openings with manufacturer approved sealant gaskets or tape.
  - 7.10.5 Miscellaneous exterior openings; spray-type closed-cell urethane insulation, install around all exterior wall penetrations, gaps between insulation boards and wood floor framing, sill plate gaps, utility penetrations, and window and door shim spaces, fill all voids to create a continuous air barrier.
- 7.11 Water Resistant Barrier (WRB) and Air Barrier
  - 7.11.1 General scope; install a continuous air and water-tight barrier as shown on the drawings, coordinate the installation of window, door and wall flashings for a complete air and water-tight installation.
  - 7.11.2 Ventilating WRB and air barrier; Benjamin Obdyke, Inc., "Home Slicker Plus Typar" or approved equal, install continuously under siding and trim, install in strict accordance with manufacturer's requirements and recommendations, Typar joints, penetrations and edges are to be fully supported, lapped and sealed or taped, maintain ventilation gap at top and bottom of walls with insect screen infestation barriers, seal or tape Typar edges to adjacent construction including foundations and roof sheathing for an air and water-tight installation.
  - 7.11.3 Tape, sealant and adhesive; as recommended by the manufacturer.
- 7.12 Sealants

- 7.12.1 General scope; provide sealants as required, use sealants appropriate to application, Tremco or approved equal.
- 7.12.2 Submit all sealants to Architect for review and approval.

## 8 Doors and Windows

- 8.1 General Scope
  - 8.1.1 All doors and windows should be designed and selected for energy efficiency, universal access attributes (sizes of openings, low thresholds, lever handles, etc) and durability.
- 8.2 Exterior Fiberglass Casement
  - 8.2.1 General scope; See exterior elevations and window schedules for window type, size and divided light patterns.
  - 8.2.2 Window manufacturer to be Andersen 400 Series casement windows.
  - 8.2.3 Casement windows; Andersen 400 Series Energy Star rated windows, simulated divided lights, Low E4 insulating glazing.
  - 8.2.4 Exterior Window Finishes: Factory finished. Color to be Terratone.
  - 8.2.5 Window hardware (casement): manufacturer's standard contemporary hardware, satin nickel.
  - 8.2.6 Insect screens; Conventional Insect Screen per manufacturer.
  - 8.2.7 See Division 6 – Wood & Plastics for exterior and interior casings & Sill.
  - 8.2.8 See Division 7 – Thermal and Moisture Protection for flashing.
- 8.3 Exterior doors
  - 8.3.1 Main Entrance Door; Thermatru Classic-Craft American Fiberglass entry door, model CCA240, clear glass, painted.
  - 8.3.2 Back Porch Door; Andersen 400 Series Energy Star rated door, simulated divided lights, low E insulating glazing.
  - 8.3.3 Door and frame finish; Ext: paint, color to match window cladding, see Division 9 – Finishes for paint. Int: factory primed finish; low VOC stain and 2 coats low-VOC matte clear urethane finish.
  - 8.3.4 Weatherstripping & threshold; supplied by door manufacturer.
  - 8.3.5 Hardware; see hardware sets.
- 8.4 Basement Access
  - 8.4.1 To be determined.
- 8.5 Interior Doors
  - 8.5.1 Non-rated doors; pre-hung Jeld-Wen "Cambridge" style molded, solid core wood fiber door, 1-3/8" thickness, ovolo sticking, pre-primed, pre-hung, standard bore. See Division 8 – Doors and Windows for hardware.
  - 8.5.2 Finish; low VOC stain and 2 coats low-VOC matte clear urethane finish.
- 8.6 Door Hardware
  - 8.6.1 Entrance sets: Schlage Manhattan Keyed Entry Set with Schlage B-360 deadbolt or equivalent door levers (no knobs).
  - 8.6.2 Latchsets; cylinder style, Schlage Manhattan lever (no knobs) or approved equal. See hardware sets for function and trim style.
  - 8.6.3 Trim; see hardware sets, mounting height 3'-6".
  - 8.6.4 Butt hinges; bright brass, manufacturer TBD by IHT.
  - 8.6.5 Door stops; bright brass, manufacturer and location TBD by IHT.
  - 8.6.6 Roller latches for closets; Ives.
  - 8.6.7 Finishes; bright brass, to be confirmed by IHT.
- 8.7 Hardware Sets
  - 8.7.1 Hardware set 1; Exterior Main Entrance
    - Lockset; entrance function with keyed dead bolt.
    - Trim; Schlage Manhattan levers, standard finish (chrome).
    - Hinges; three (3) chrome butt.
    - Closer; inside.
    - Kick plate, interior side.

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- Door bottom; manufacturer.
- Threshold; manufacturer.
- Weatherstripping; manufacturer.
- 8.7.2 Hardware set 2; Exterior Back Porch
  - Lockset; entrance function.
  - Trim; manufacturer levers, standard finish (satin nickel).
  - Hinges; manufacturer, standard finish (satin nickel).
  - Closer; inside.
  - Kick plate, interior side.
  - Door bottom; manufacturer.
  - Threshold; manufacturer.
  - Weatherstripping; manufacturer.
- 8.7.3 Hardware set 3; Interior doors
  - Lockset; passage function.
  - Trim; Schlage Manhattan levers, standard finish (chrome).
  - Hinges; three (3) standard chrome butt.
  - Door stop; floor mounted.
- 8.7.4 Hardware set 4; Bathrooms, Bedrooms
  - Lockset; privacy function.
  - Trim; Schlage Manhattan levers, standard finish (chrome).
  - Hinges; three (3) standard chrome butt.
  - Door stop; floor mounted.

**9 Finishes**

- 9.1 Wall Board
  - 9.1.1 General Scope; wall and ceiling finishes.
  - 9.1.2 Sheetrock; 1/2" sheetrock, taped, coated, sanded and primed.
  - 9.1.3 Fire-rated wall board (Type 'X'); Sheetrock Brand Gypsum Panels, Fire Code C Core or approved equal, 5/8"-thick.
  - 9.1.4 Edge & corner trim; metal corner & edge beads as detailed and as required for a proper installation.
- 9.2 Ceramic Floor & Wall Tile (Tub/showers & wet locations)
  - 9.2.1 General scope; Contractor to provide and install all floor and wall tile.
  - 9.2.2 Floor tile; tile selection TBD by IHT. Contractor to provide \$8 per square foot for all tile.
  - 9.2.3 Setting method; thin set adhesive; install according to manufacturer's requirements and recommendations.
  - 9.2.4 Grout; color to be selected by Owner.
  - 9.2.5 Waterproof membrane; troweled-on thin-set waterproofing membrane at wall & wall base tile installation.
  - 9.2.6 Cementitious backer board; USG Durock, thickness - 1/2" glued and screwed.
- 9.3 Interior Wood Finishes
  - 9.3.1 See Division 6 – Wood and Plastics for wood wall, wall base and ceiling finishes.
- 9.4 Wood Flooring
  - 9.4.1 Provide and install 3-4" wide 3/4" maple T&G prefinished flooring.
  - 9.4.2 Final finish and appearance to be approved by IHT prior to purchase and installation.
  - 9.4.3 All unfinished flooring to receive 3 coats of Low VOC polyurethane, satin.
  - 9.4.4 Contractor to protect all finished wood floors during construction.
- 9.5 Interior Carpet Flooring (bedrooms)
  - 9.5.1 Provide and install polypropylene carpet (100% recycled content) with 5/16" Safe Step Residential carpet pad. Assume \$15 per square yard for all carpet.
  - 9.5.2 Final carpet specification to be selected by IHT.
- 9.6 Interior Painting
  - 9.6.1 General scope; prepare substrates and apply paint in strict accordance with paint manufacturer's requirements and recommendations.

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- 9.6.2 All paints to be Greenguard certified low odor/low VOC or equivalent.
- 9.6.3 Sheetrock application; Benjamin Moore Aura, two finish coats minimum, color TBD:
  - Walls: eggshell finish
  - Trim: semi-gloss finish
  - Ceiling: flat finish
- 9.6.4 Primers; use manufactures recommended primers. One coat on walls, trim and ceiling.
- 9.6.5 See Division 6 – Wood and Plastics for wood wall, wall base and ceiling finishes.
- 9.6.6 See Division 8 – Doors and Windows for door finishes.
- 9.7 Exterior Painting
  - 9.7.1 General scope; prepare substrates and apply paint in strict accordance with paint manufacturer’s requirements and recommendations.
  - 9.7.2 Door; all surfaces pre-primed with Cabot “problem solver” acrylic primer before installation, minimum two finish coats exterior latex semi-gloss enamel. Final color TBD by IHT.

**10 Specialties**

- 10.1 Bath Accessories
  - 10.1.1 General scope; provide accessories as follows. Accessories are to be mounted in accordance with accessibility requirements.
  - 10.1.2 Final selection of bath accessories to be determined by IHT.
  - 10.1.3 Provide blocking for future grab bars.
  - 10.1.4 Each bath shall receive the following:
    - Toilet paper dispenser (1).
    - Towel Bars (2).
    - Curved shower curtain rod (1), shower curtain by homeowner.
    - Robe Hooks (3).
    - Medicine Cabinet (1).

**11 Equipment**

- 11.1 Appliances
  - 11.1.1 General scope; appliances are to be provided by IHT.
  - 11.1.2 The Contractor is to provide all utility connections as required and install appliances.
  - 11.1.3 Contractor to install all appliances in accordance to manufacturer’s specifications.
  - 11.1.4 All appliances shall qualify for Energy Star rating. Appliances will be energy efficient and water efficient, if applicable.
  - 11.1.5 Appliances
    - Clothes Washer: Whirlpool WFW8300SW, Energy Star, 24” wide, white.
    - Clothes Dryer: Whirlpool WED5000VQ, Energy Star, white, electric.
    - Dishwasher: Whirlpool DU1300XTVQ, Energy Star, 24” wide, white.
    - Refrigerator: Whirlpool GR9FHMXPQ, Energy Star, 30” wide, white.
    - Range/Oven: Whirlpool WFE301LVQ, 30” wide, white, electric, self-cleaning.
    - Hood: TBD, 30” wide.
- 11.2 Pull Down Attic Stair
  - 11.2.1 General scope; Brosco Excel Slimline 8’-5” Folding Access Stair or approved equal. See drawings for location. Coordinate ceiling framing, Install per manufacturer’s requirements.

**12 Furnishings (Division Not Used)**

**13 Special Construction (Division Not Used)**

**14 Conveying Systems (Division Not Used)**

**15 Mechanical**

- 15.1 Heating, Ventilating, Air Conditioning (HVAC)
  - 15.1.1 Final HVAC scope to be determined by IHT.
  - 15.1.2 IHT to provide building energy model calculations to Contractor.
  - 15.1.3 Provide air-to-air heat pump system as energy model results recommend.
  - 15.1.4 Provide and install two (2) zone heating and cooling system, one zone per floor.
  - 15.1.5 Provide and install boost switches in all baths and one (1) programmable percentage-of-capacity timer.
  - 15.1.6 Provide and install Renewair EV130 Energy Recovery Ventilator (ERV) and all necessary ductwork, equipment and controls to operate system, per manufacturer's requirements.
  - 15.1.7 Ductwork; Provide and install all ductwork per manufacturer's instructions necessary for project. All ducts to be rigid metal with all joints sealed with mastic or mastic tape compliant with UL181B-FX. Ductwork includes (but is not limited to) rigid duct (round, oval, rectilinear), plenums, stack-heads.
  - 15.1.8 All new ductwork to be insulated on the exterior if located in unconditioned basement space.
  - 15.1.9 Insulate all heat piping. Acceptable insulation systems are Rubbertex or Amorflex, with a minimum of R-4.
  - 15.1.10 Provide and install supply grills for all bedrooms. IHT and Architect to coordinate final location.
  - 15.1.11 Provide and install systems exhausts to run from each bathroom and be balanced so that exhaust flow is proportional to volumes of each exhausted space: Powder Room - 50% capacity, Upstairs Bathroom - 50% capacity.
  - 15.1.12 Duct & plenum finish; paint all interior duct and plenum surfaces visible through registers flat black.
  - 15.1.13 Registers and diffusers; all registers and diffusers to be Hart & Cooley, or approved equal. Submit all register and diffuser locations to Architect for final review and selection. Register & diffuser finish; white on walls, black on floors.
  - 15.1.14 Provide and install balancing dampers as necessary.
  - 15.1.15 Provide and install vent and ductwork for dryer to exterior venting location. Contractor to coordinate hook-up.
  - 15.1.16 Mechanical penetrations; see Division 7 - Thermal and Moisture Protection for grounding cable penetrations of standing seam metal roofing.
- 15.2 Plumbing
  - 15.2.1 Contractor to provide and install plumbing system as required by the architectural drawings. Provide design-build services for all new and renovated rough plumbing.
  - 15.2.2 All plumbing to meet all federal and state codes and regulations for proper installation.
  - 15.2.3 All water supply lines to be PEX or architect approved equal. All hot water pipes to be fully insulated. Acceptable insulation systems are Rubbertex or Amorflex, with a minimum of R-4.
  - 15.2.4 Hot water piping to be designed and installed to minimize pipe.
  - 15.2.5 Domestic Hot Water; GE GeoSpring Water Heater, 50 gallon Electric Heat Pump Water Heater.
  - 15.2.6 All waste lines to be schedule 40 grade PVC.
  - 15.2.7 Waste stacks; vertical and horizontal runs to be PVC. Insulate and isolate pipes for sound. No PVC should touch framing.
  - 15.2.8 All fixture shut-off valves to be stainless steel ball type.
  - 15.2.9 Provide and install one (1) frost-free exterior hose bib for each unit, four (4) in the first phase and two (2) units in the second phase. Locations TBD by IHT.

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- 15.2.10 Contractor to provide and install radon mitigation preparation. Install one (1) 3” schedule 40 grade PVC pipe from basement ceiling to attic for future mitigation system.
- 15.2.11 Install insulated piping to attic for future solar hot water heating: two (2) ¾” pex pipes from basement to accessible location in attic.
- 15.2.12 Plumbing penetrations; see Division 7 – Thermal and Moisture Protection for grounding cable penetrations of standing seam metal roofing.
- 15.2.13 Plumbing fixtures; TBD by IHT. Contractor to install all plumbing fixtures.
- 15.2.14 **Plumbing Fixture Allowance (per unit): \$3,000 (not including installation)**

**16 Electric**

- 16.1 General
  - 16.1.1 General scope; See Electrical drawings and specifications for full Electrical scope description.
- 16.2 Electrical Service
  - 16.2.1 Contractor to provide and install all utilities required for the project.
  - 16.2.2 Provide and install primary service (in coordination with NStar) from street to all buildings on civil drawings. Including all associated trenching.
  - 16.2.3 Contractor to provide and install new 150-amp service from ganged meter pedestal location to each building unit, four (4) units in the first phase and two (2) units in the second phase.
- 16.3 Rough Electrical
  - 16.3.1 General scope; provide electrical system on a design/build basis. Provide all engineering as required by state and local code and to achieve electrical and lighting layouts. Provide rough wiring for switches, power outlets, telephone, cable, lighting and hard-wired smoke alarms (as required by state and local building code). Include panels, and sub-panels. See electrical plans for outlet and switch locations. See Division 17 – Information Technology for coordination with data systems.
  - 16.3.2 Device and cover plate finishes; white, unless noted otherwise.
  - 16.3.3 All smoke alarms to be hardwired with battery back-up. Install CO detectors as required per code.
  - 16.3.4 Thermostats shall have no mercury. Smoke detectors shall have not radioactive materials.
  - 16.3.5 Provide two exterior wet-protected outlets per building unit as shown on architectural plans.
  - 16.3.6 Install all light switches 42” above finish floor with easy touch rocker switches.
  - 16.3.7 Install programmable thermostats 48” maximum above finish floor.
- 16.4 Lighting Fixtures
  - 16.4.1 General scope; see light fixture schedule and electrical plans.
  - 16.4.2 Provide 6” Energy Star, recessed compact fluorescent downlight fixtures.
  - 16.4.3 Submit all light fixtures for final finish review and selection by IHT.
  - 16.4.4 Homeowner to provide compact fluorescent bulbs for all fixtures.
- 16.5 Future Solar Electric
  - 16.5.1 Provide and install 3” PVC conduit from basement to attic for future solar photovoltaic roof panels.

**17 Information Technology**

- 17.1 Data
  - 17.1.1 General scope; See Electrical drawings and specifications for information technology scope of work. IHT to confirm final structured cable locations.
  - 17.1.2 Structured cable; structured cable should consist of one category 5e cable and one RG6 cable.

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**END OF SPECIFICATION**