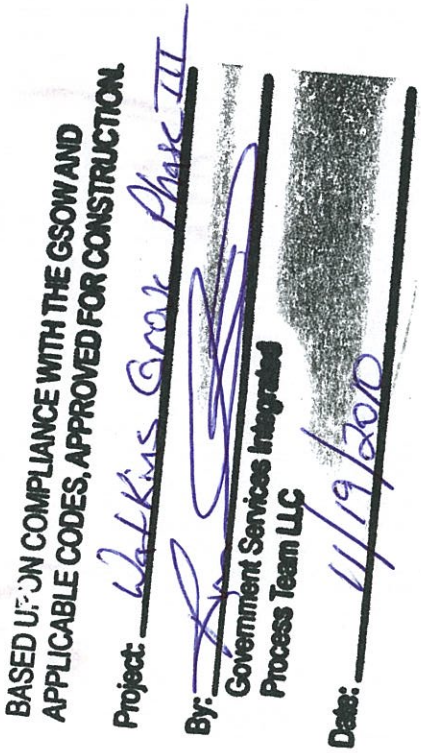
MCAS CAMP LEJEUNE
NORTH CAROLINA

PROJECT MANUAL

Watkins Grove Phase 3
04 November 2010

100% SUBMITTAL



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PROFESSIONAL CERTIFICATION SHEET

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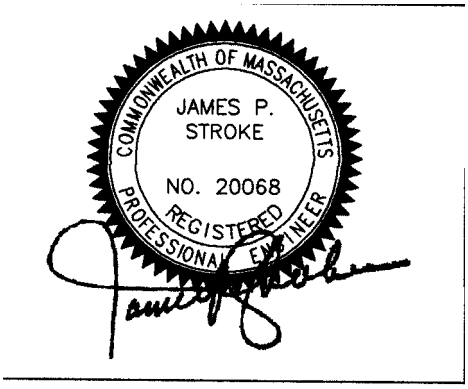


ELECTRICAL ENGINEER

MECHANICAL ENGINEER

SECTION 01100

SPECIAL ADAPTABLE HOUSING REQUIREMENTS

PART 1 GENERAL

1.1 GENERAL INTENTION: **Certain housing units shall be constructed for ready adaptation to enable accessibility to persons with physical disabilities. These "adaptable" units shall be designed on the interior per the guidelines contained in the Uniform Federal Accessibility Standards (UFAS). Exterior accessibility to these units shall be designed per the guidelines contained in the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).**

1.2 GENERAL REQUIREMENTS: All Contractors and subcontractors shall complete their work for the adaptable units in accordance with the Uniform Federal Accessibility Standards (UFAS) (Interior) and the Americans with Disabilities Act (ADA) (Exterior).

1.3 SPECIAL REQUIREMENTS

1.3.1 Circulation and Doors

1.3.1.1 Exterior Accessibility Includes:

1.3.1.1.1 Accessible routes and sidewalks shall be a minimum of 36 inches wide and have a running slope no greater than 1:20. Slopes greater than 1:20 shall meet all requirements for ramps. Nowhere shall the cross slope of accessible routes exceed 1:50.

1.3.1.1.2 Entry walks shall slope up to entry porch slab level. Entry porch slabs shall be flush with unit floor slab (provide slope away from unit for drainage).

1.3.1.2 Door widths and interior dimensions shall be as indicated on the plans.

1.3.1.3 Accessible door thresholds shall not exceed an edge height of 1/4 inch vertical or 1/2 inch overall if first 1/4-inch is vertical and the balance is beveled with a slope of no greater than slope ratio 1:2.

1.3.1.4 Entry door shall have a second viewer at 42 inches above finish floor.

1.3.1.5 All door locksets hardware conforming to UFAS (lever handle).

1.3.2 Built-In Accessibility: Shall be provided in accordance with UFAS and include the following items:

1.3.2.1 Light switches, thermostats and interior and exterior visual and audible warning devices shall be mounted at heights indicated in electrical drawing general notes. Controls shall be mounted at a maximum of 48 inches and a minimum of 18 inches above the floor.

1.3.2.2 Interior and exterior electrical receptacles shall be mounted at 18 inches from floor or other walking surface.

1.3.2.3 Provide, at tub/shower and shower, offset controls in accordance with UFAS Figures 48 and 49 as attached.

1.3.2.4 Provide wall backing in accordance with the drawings at the end of this section in bathrooms and kitchens to reinforce wall areas for installation of grab bars and future adjustment or replacement of counters and plumbing fixtures as follows:

	UFAS Figure As Attached
Water Closet Grab Bars	Figure 47(b)
Bath Tub Grab Bars	Figure 48(a)
Shower Grab Bars	Figure 49(b)
Bathroom Lavatories	Figure 31
Kitchen Counter and Upper Cabinets (30 inch min. width)	Figure 50
Kitchen Sink	Figure 51

1.3.3 Kitchens and Bathrooms

Install cabinets, counter tops and sinks as required to allow for adaptability in accordance with UFAS as follows:

1.3.3.1 Install kitchen base cabinets and portions of countertop at sink and work surface as indicated on interior elevations.

1.3.3.2 Provide bathroom vanity base at lavatory top in locations indicated on interior elevations.

1.3.3.3 Finish flooring shall extend under bathroom vanity base cabinets and sections of kitchen cabinets.

1.3.3.5 Install blocking for grab bars at water closets, tub/showers and showers per Figures 29, 34(a) and 37(b) as attached. Eventual grab bars shall be as required by UFAS, shall not rotate within their fittings, shall be 1-1/4 inch to 1-1/2 inch in diameter and shall be 1-1/2 inch away from the wall. Structural strength of grab bars and the holding capacity of blocking shall be 250 pounds per foot for bending stress, shear stress, and shear stress of fasteners and tensile force.

1.3.4 Plumbing Rough-In

Water supply and drain piping for kitchen sinks and adaptable bathroom lavatories shall be in accordance with UFAS Figures 31 and 51, as attached.

1.3.5 Plumbing Insulation: Hot water and drain pipes under lavatories and kitchen sinks shall be insulated or otherwise covered. There shall be no sharp or abrasive surfaces under sinks.

1.3.5 Garages: Garage floors shall be sloped a maximum of 2 percent for drainage. There shall be at least one accessible route to the dwelling unit from the garage as defined in UFAS.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

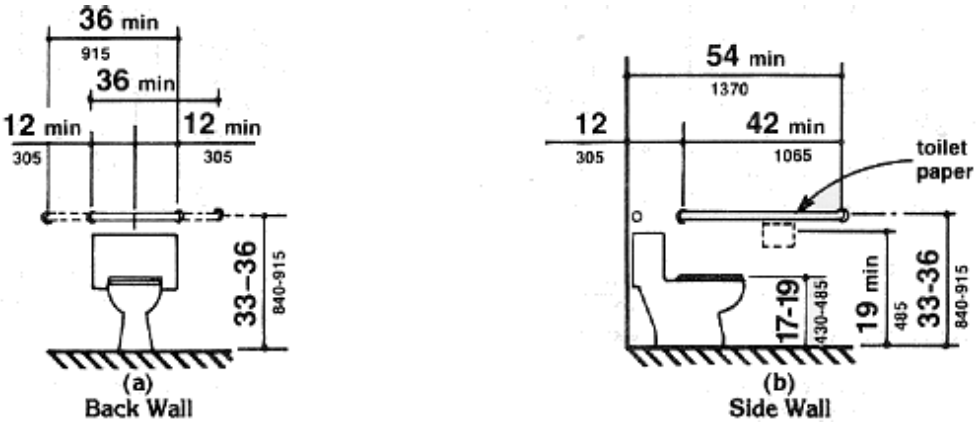


Fig. 29
Grab Bars at Water Closets

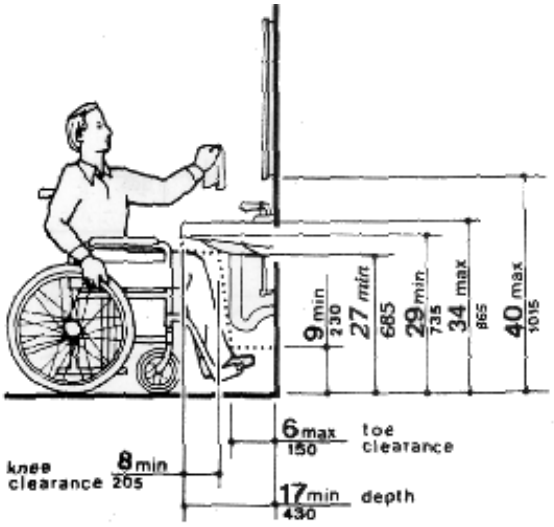


Fig. 31
Lavatory Clearances

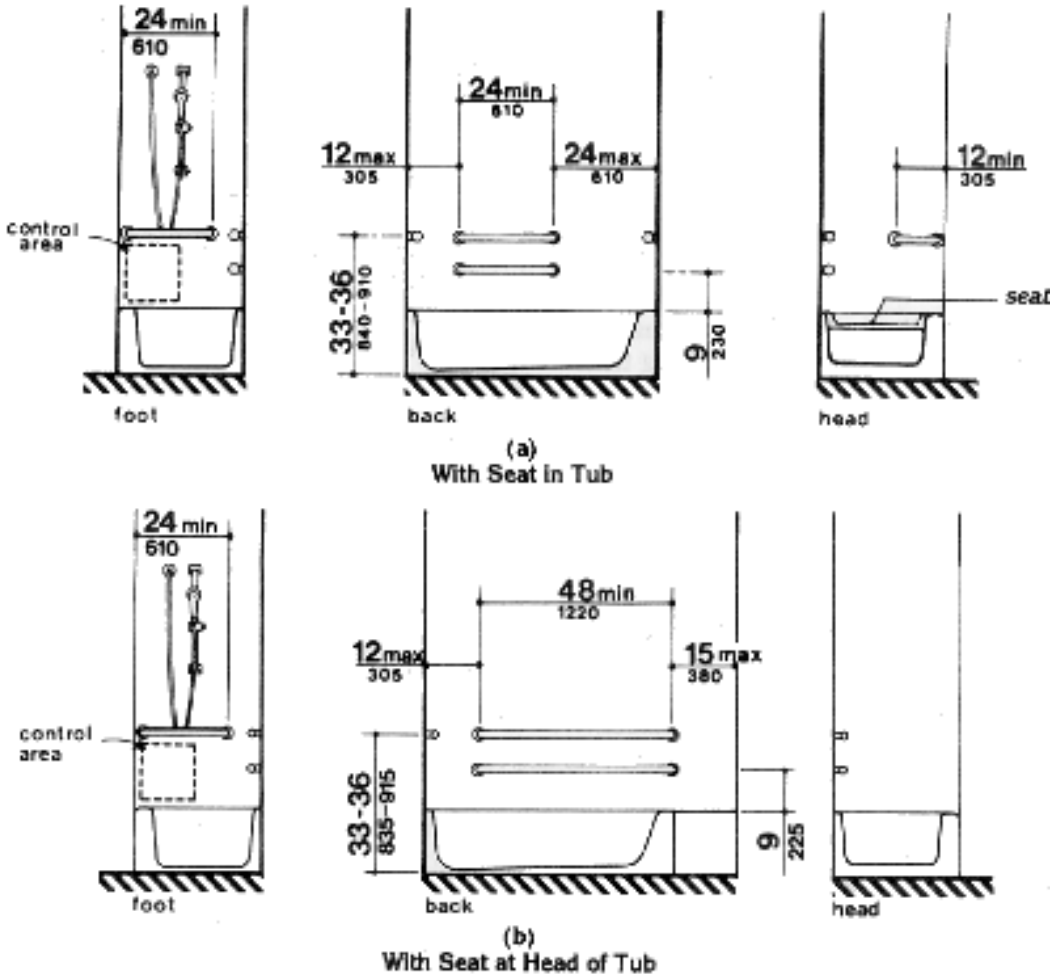


Fig. 34
Grab Bars at Bathtubs

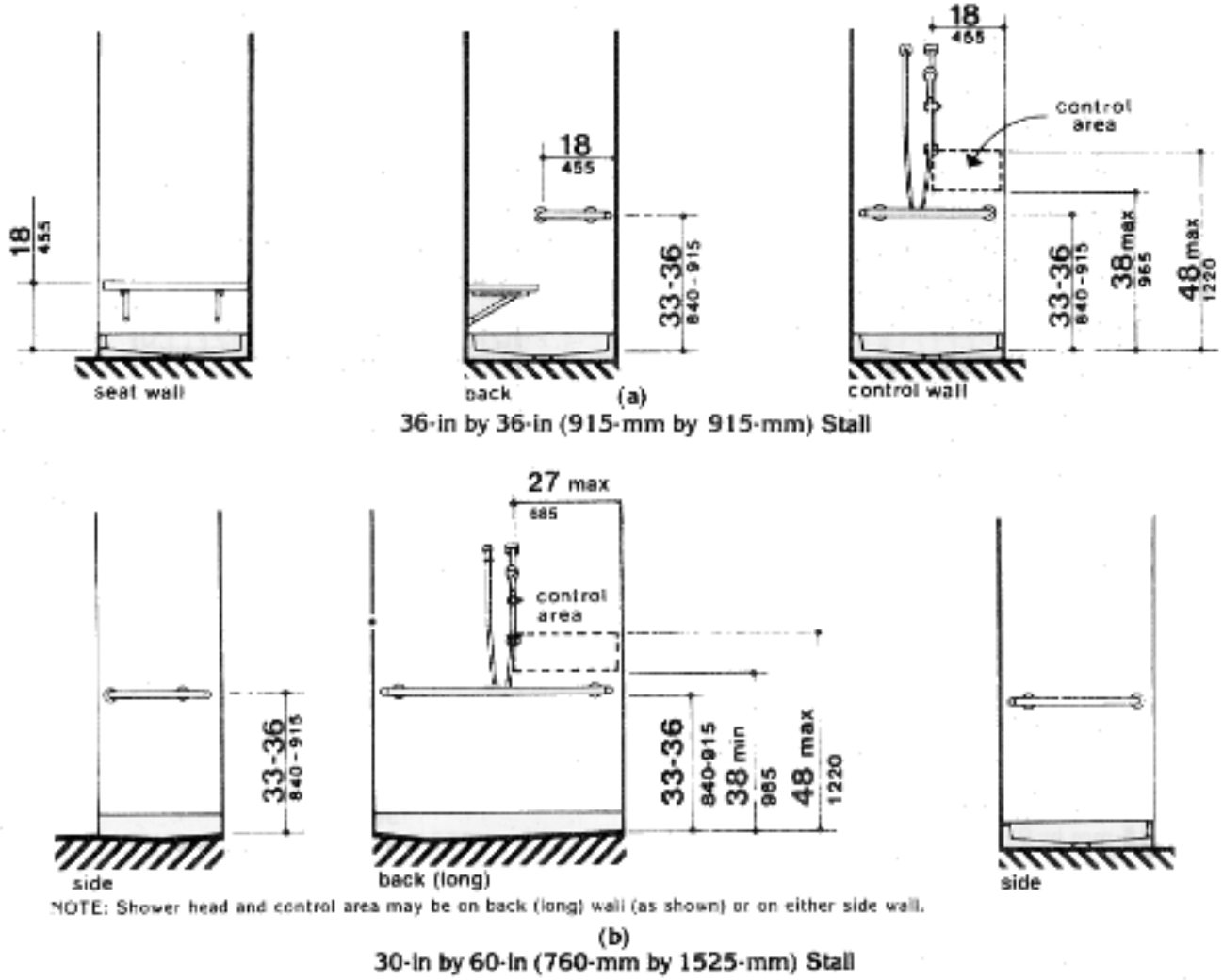
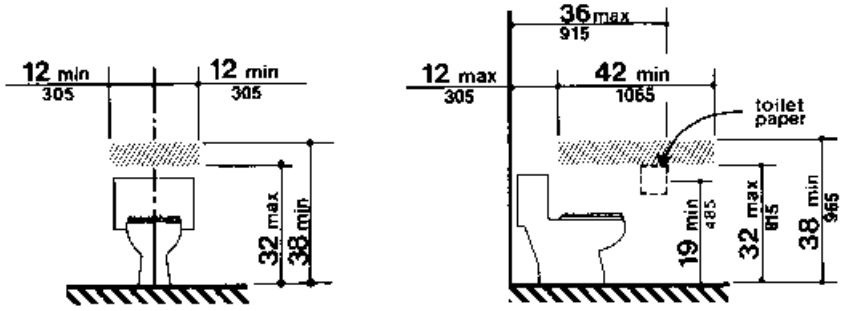
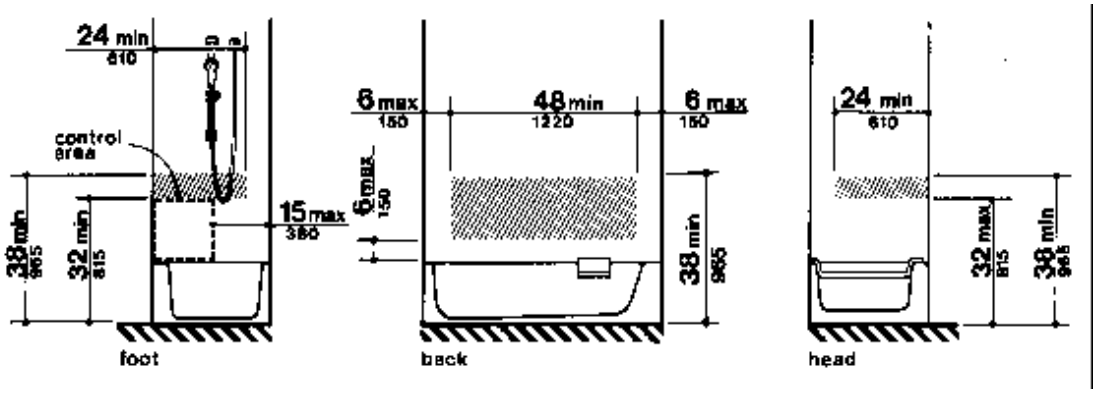


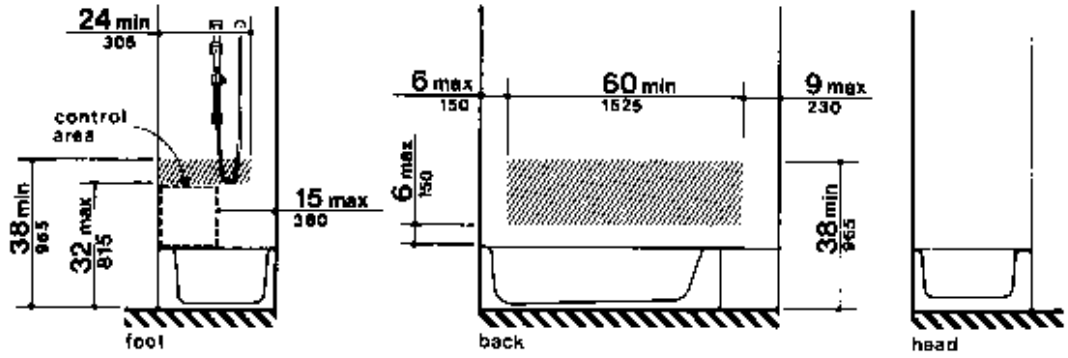
Fig. 37
Grab Bars at Shower Stalls



Reinforced Areas for Installation of Grab Bars
Fig. 47 (b)
Water Closets in Adaptable Bathrooms

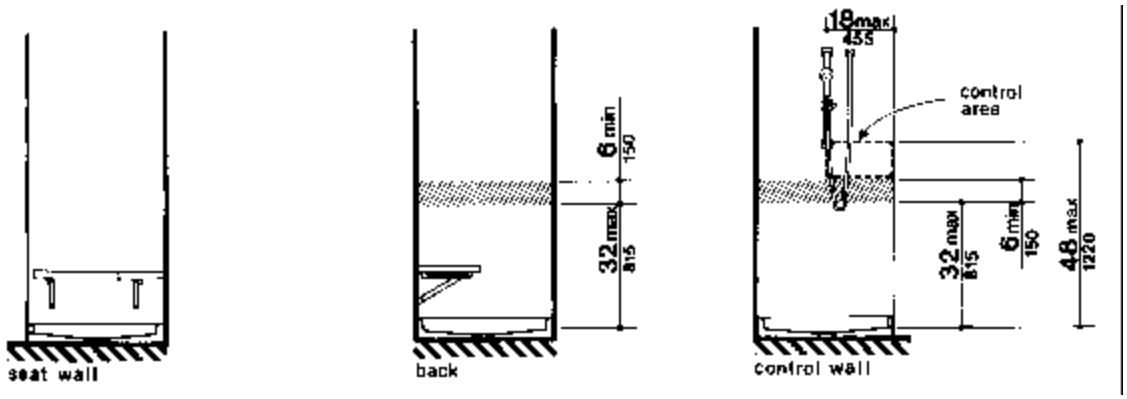


(a)
With Seat in Tub

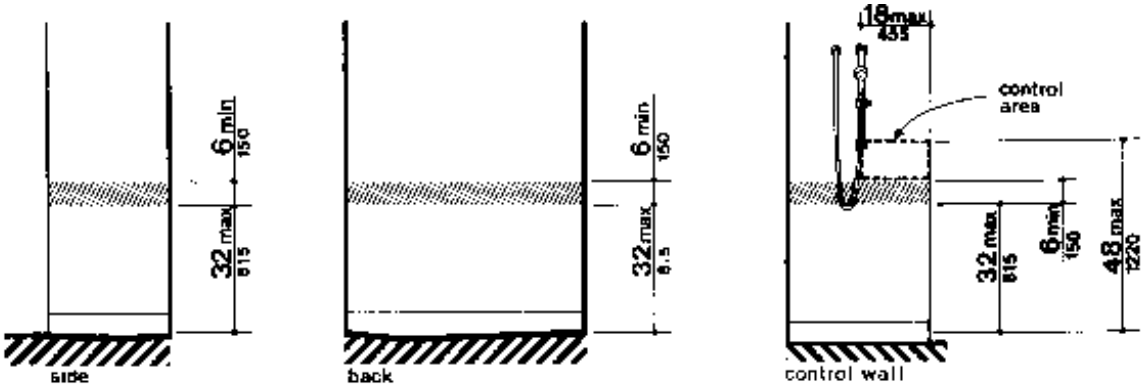


(b)
With Seat at Head of Tub
Note: Hatched areas are reinforced to receive grab bars.

Fig. 48
Location of Grab Bars and Controls of Adaptable Bathtubs



(a)
36-in by 36-in (915-mm by 915-mm) Stall



(b)
30-in by 60-in (750-mm by 1525-mm) Stall

Note: Hatched areas are reinforced to receive grab bars.

Fig. 49
Locations of Grab Bars and Controls at Adaptable Showers

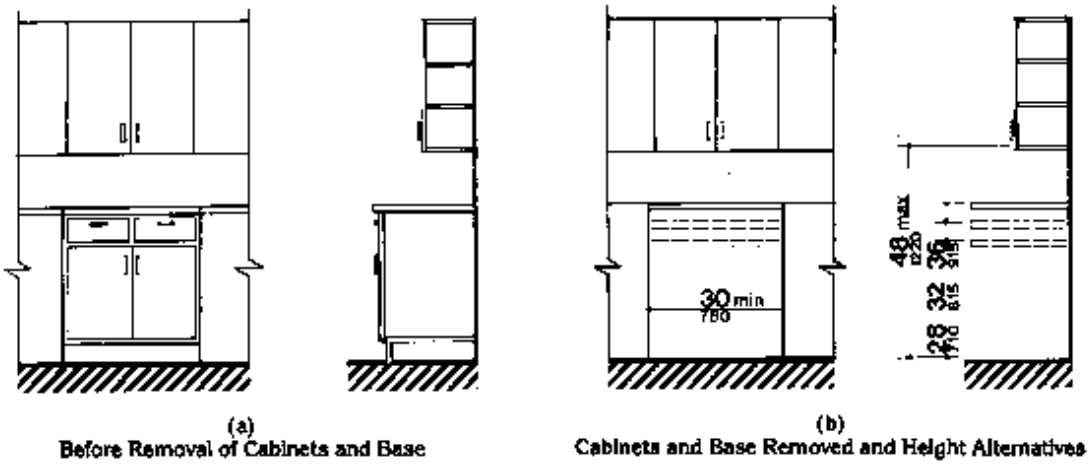


Fig. 50
Counter Work Surface

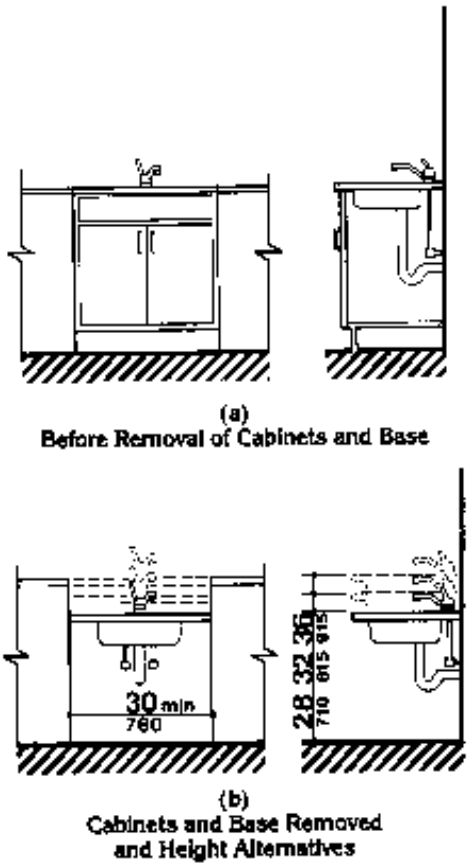
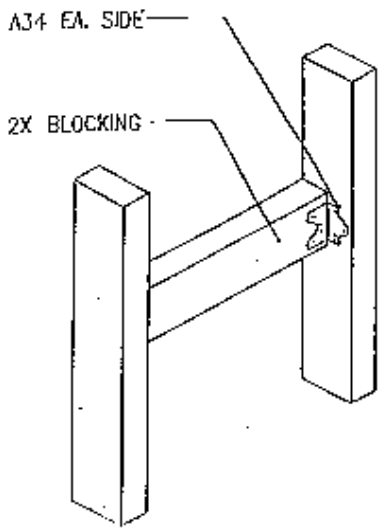
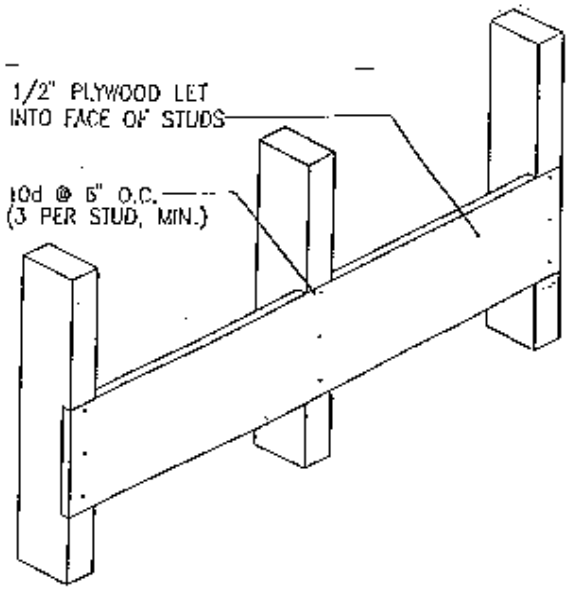


Fig. 51
Kitchen Sink



TYPICAL WALL BLOCKING FOR SMALL AREAS

NOTE: Blocking is structurally designed to comply with UFAS requirements.



ALTERNATE WALL BLOCKING FOR LARGER AREAS

END OF SECTION

SECTION 01352

LEED REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

1.1.1 Section includes general requirements and procedures for compliance with certain USGBC LEED prerequisites and credits needed for Project to obtain LEED certification based on LEED for Homes Rating System, January 2008.

1.1.1.1 Other LEED prerequisites and credits needed to obtain LEED certification depend on material selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.

1.1.1.2 Additional LEED prerequisites and credits needed to obtain the indicated LEED certification depend on Architect's design and other aspects of Project that are not part of the Work of the Contract.

1.1.1.3 A copy of the LEED for Homes Explanation of Project Credits is attached at the end of this Section

1.1.1.4 A copy of the LEED Project Checklist is attached at the end of this Section.

1.1.2 Related Sections:

1.1.2.1 Divisions 1 through 16 Sections for LEED requirements specific to the work of each of these Sections. Requirements may or may not include reference to LEED.

1.2 DEFINITIONS

1.2.1 LEED: Leadership in Energy & Environmental Design.

1.3 SUBMITTALS

1.3.1 General: Submit additional LEED submittals required for the LEED for Homes Explanation of Project Credits and by other Specification Sections.

1.3.2 LEED Documentation submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.

1.3.3 Project Materials Cost Data: Provide statement indicating total cost for materials used for Project and breakout of costs as applicable for LEED credits. Costs exclude labor, overhead, and profit.

1.3.4 LEED Action Plans: Provide Action Plan before start of the work indicating how the following requirements will be met:

1.3.4.1 Credit MR 3: Waste management plan complying with Division 1 Section "Construction Waste Management."

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

LEED for Homes Explanation of Project Credits

ID 1: Integrated Project Planning
Maximum points: 4

Requirements

Prerequisite

1.1 **Preliminary Rating**. As early as practical, conduct a preliminary LEED for Homes meeting, with the participation of the Provider and key members of the project team. As part of the meeting, create an action plan that identifies the following:
- The targeted LEED award level (Certified, Silver, Gold, or Platinum).
- The LEED for Homes credits that have been selected to meet the targeted award level.
- The party accountable for meeting the LEED for Homes requirements for each selected credit.

Credits

1.2 **Integrated Project Team (1 point).** Assemble and involve a project team to meet the three criteria below:

a) Include team members, in addition to the builder and Green Rater, whose capabilities include at least three of the following skill sets:

1. Architecture or residential building design;
2. Mechanical or energy engineering;
3. Building science or performance testing;
4. Green building or sustainable design; and
5. Civil engineering, landscape architecture, habitat restoration, or land-use planning.

b) Actively involve all team members referenced above in at least three of the following phases of the home design and construction process:
   a. Conceptual or schematic design;
   b. LEED planning;
   c. Preliminary design;
   d. Energy and envelope systems analysis or design;
   e. Design development;
   f. Final design, working drawings or specifications; and
   g. Construction.

c) Conduct meetings with the project team at least monthly to review project status, introduce new team members to project goals, discuss problems encountered, formulate solutions, review responsibilities and identify next steps.

1.3 **Professional Credentialed with Respect to LEED for Homes (1 point)**. At least one principal member of the project team shall be a professional who is credentialed with respect to LEED for Homes as determined by the U.S. Green Building Council.

1.4 **Design Charrette** (1 point). No later than the design development phase and preferably during schematic design, conduct at least one full-day integrated design workshop with the project team defined in ID 1.2. Use the workshop to integrate green strategies across all aspects of the building design, drawing on the expertise of all participants.

ID 2: Durability Management Process
Maximum points: 3

Prerequisites

2.1 **Durability Planning**. Prior to construction, the project team shall do the following:
   a. Complete the Durability Risk Evaluation Form to identify all moderate- and high-risk durability issues for the building enclosure.
   b. Develop specific measures to respond to those issues.
   c. Identify and incorporate all the applicable indoor moisture control measures listed in Table 1.
   d. Incorporate the measures from 2.1(b) and (c), above, into project documents (drawings, specifications, and/or scopes of work, as appropriate).
   e. List all the durability measures and indicate their locations in the project documents in a durability inspection checklist. Include the checklist in project documents for use in verification.

2.2 **Durability Management**. During construction, the builder shall have a quality management process in place to ensure installation of the durability measures. This prerequisite can be satisfied by having the builder inspect and check off each measure in the durability inspection checklist created for 2.1 (e), above.

Credits

2.3 **Third-Party Durability Management Verification (3 points).** Have the Green Rater inspect and verify each measure listed in the durability inspection checklist created for 2.1(e), above.

Table 1. Indoor Moisture Control Measures

Location or equipment	Required moisture control measure
Tub, showers, and spa areas	Use non paper-faced backer board on walls.
Kitchen, bathroom, laundry rooms, and spa areas	Use water-resistant flooring; do not install carpet.
Entryway (within 3 feet of exterior door)	Use water-resistant flooring; do not install carpet.
Tank water heater in or over living space	Install drain and drain pan.
Clothes washer in or over living space	Install drain and drain pan, or install accessible single-throw supply valve.
Conventional clothes dryer	Exhaust directly to outdoors.
Condensing clothes dryer	Install drain and drain pan.

LL 2: Site Selection
Maximum points: 2

Credits

6. **Site Selection (2 points)**. Do not develop buildings, built structures, roads or parking areas on portions of sites that meet any of the following criteria:
    a. Land whose elevation is at or below the 100-year floodplain as defined by FEMA.
    b. Land that is specifically identified as habitat for any species on federal or state threatened or endangered lists.
    c. Land within 100 feet of any water, including wetlands as defined by U.S. Code of Federal Regulations 40 CFR, Parts 230-233 and Part 22, and isolated wetlands or areas of special concern identified by state or local rule, or land within distances given in applicable state or local regulations, whichever is more stringent. New wetlands constructed as part of storm water mitigation or other site restoration efforts are exempt from this part of the requirement.
    d. Land that prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (park authority projects are exempt).
    e. Land that contains "prime soils", "unique soils", or "soils of state significance", as identified in state Natural Resources Conversation Service soil surveys. The project civil engineer, wetlands engineer, or biologist should conduct verification of soil types. If no project team member is qualified to verify this requirement, follow the steps laid out in the LEED for Homes Reference Guide. Sites that are previously developed are exempt from this requirement.

LL 3: Preferred Locations
Maximum points: 3

3.3 **Previously Developed (1 point)**. Build on a previously developed lot. In the case of a multi-home new development, each home in the development is awarded this point if at least 75% of the development site is build on previously developed land.

LL 4: Infrastructure
Maximum points: 1

Credits

4. **Existing Infrastructure (1 point)**. Select a lot that is within ½ mile of existing water service lines and sewer service lines. In the case of a multi-home new development, each home in the development is awarded this point if the center of the development site is within ½ mile of existing water service lines and sewer service lines.

LL 6: Access to Open Space
Maximum points: 1

Credits

6. **Access to Open Space (1 point)**. Select a location within ½ mile of a publicly accessible or community-based open space that is at least ¾ acre in size. The open space requirement can be met by either one large open space or two smaller spaces totaling ¾ acre.

   Note: Open spaces must consist predominantly of softscapes such as soil, grass, shrubs, and trees. These include natural open spaces; city, county, and state parks; play areas; and other community open spaces specifically intended for recreational use. Ponds can be counted as open space if they border a walking or bicycle path. Private lands open to the public for passive recreation are also acceptable provided there is deeded public access or a history of allowable public use and anticipated future public use for at least 10 years.

SS 1 Site Stewardship
Maximum points: 1

Requirements

Prerequisites

1.1 **Erosion Controls During Construction.** Prior to construction, design and plan appropriate erosion control measures. During construction, implement these measures. Erosion control measures much include all of the following:

a) Stockpile and protect disturbed topsoil from erosion (for reuse).
b) Control the path and velocity of runoff with silt fencing or comparable measures.
c) Protect on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures.
d) Provide swales to divert surface water from hillsides.
e) If soils in a sloped area (i.e., 24% or 4:1 slope) are disturbed during construction, use tiers, erosion blankets, compost blankets, filter socks and berms, or some comparable approach to keep soil stabilized.

Credits

1.2 **Minimize Disturbed Area of Site (1 point).** Minimize disturbance to the site by meeting the following:

d) Build on site with a lot area of less than 1/7 acre, or with housing density for the project that is equal to or greater than 7 units per acre.

SS 2: Landscaping
Maximum Points: 7

Requirements

Prerequisites

2.1 **No Invasive Plants.** Introduce no invasive plant species into the landscape.

Note: Invasive plant species vary by region. Consult the local Cooperative Extension Service or state agencies. A list of regional resources is available from the U.S. Department of Agriculture, at www.invasivespeciesinfo.gov/unitedstates/states.shtml,. Not all nonnative species are considered invasive.

2.5 Reduce Overall Irrigation Demand by at Least 20% (maximum 6 points, as specified in Table 5).
Design the landscape and irrigation system to reduce overall irrigation water usage. The estimates must be calculated and prepared by a landscape professional, biologist, or other qualified professional using the method outlined below.

Table 5. Reduction in Water Demand

Reduction in estimated irrigation water usage	SS 2.5 points	WE 2.3 points	Total Points
20-24%	2	0	2
25-29%	3	0	3
30-34%	4	0	4
35-39%	5	0	5
40-44%	6	0	6
45-49%	6	1	7
50-54%	6	2	8
55-59%	6	3	9
60% or more	6	4	10

SS 3: Local Heat Island Effects
Maximum points: 1

Credits

3. **Reduce Local Heat Island Effects (1 point)**.

   a. Install light-colored, high –albedo materials or vegetation for at least 50% of sidewalks, patios, and driveways within 50 feet of the home. Acceptable strategies include the following:
      i. White concrete;
      ii. Gray concrete;
      iii. Open pavers (counting only the vegetation, not the pavers); and
      iv. Any material with a solar reflectance index (SRI) of at least 29.

SS 4: Surface Water Management
Maximum points: 7

Requirements

Pre-requisites

None.

Credits

4.1 **Permeable Lot (maximum 4 points, as specified in Table 9)**. Design the lot such that at least 70% of the built environment, not including area under roof, is permeable or designed to capture water runoff for infiltration on-site. Area that can be counted toward the minimum includes the following:

a) Vegetative landscape (e.g., grass, trees, shrubs).
b) Permeable paving, installed by an experienced professional. Permeable paving must include porous aboveground materials (e.g., open pavers, engineered products) and a 6-inch porous sub-base, and the base layer must be designed to ensure proper drainage away from the home.
c) Impermeable surfaces that are designed to direct all runoff toward an appropriate permanent infiltration feature (e.g., vegetated swale, on-site rain garden, or rainwater cistern).

4.2 **Permanent Erosion Controls (1 point)**. Design and install one of the following permanent erosion control measures:

a) If portions of the lot are located on a steep slope, reduce long-term runoff effects through use of terracing and retaining walls.

OR

b) Plant one tree, four 5-gallon shrubs, or 50 square feet of native groundcover per 500 square feet of disturbed lot area (including area under roof).

4.3 **Management of Runoff from Roof (maximum 2 points)**. Design and install one or more of the following runoff control measures:

d) Have the site designed by a licensed or certified landscape design or engineering professional such that all water runoff from the home is managed through an on-site design element **(2 points)**.

Table 9: Permeable Area

Percentage of buildable lot (Excluding area under roof) that is permeable	**Points**
70-79%	1
80-89%	2
90-99%	3
100%	4

SS 5 Nontoxic Pest Control
Maximum points: 2

Requirements

Prerequisites

None.

Credits

5. **Pest Control Alternatives (1/2 point each, maximum 2 points).** Implement one or more of the measures below. All physical actions (for pest management practices) must be noted on construction plans.

b) Seal all external cracks, joints, penetrations, edges, and entry points with caulking. Where openings cannot be caulked or sealed, install rodent- and corrosion-proof screens (e.g., copper or stainless steel mesh). Protect exposed foundation insulation with moisture-resistant, pest-proof cover (e.g., fiber cement board, galvanized insect screen).
c) Separate any exterior wood-to-concrete connections (e.g., at posts, deck supports, stair stringers) with metal or plastic fasteners or dividers.
d) Install landscaping such that all parts of mature plants will be at least 24 inches from the home.
e) Treat all cellulosic material (e.g., wood framing) with a borate product to a minimum of 3 feet above the foundation.

SS 6 Compact Development
Maximum points: 4

Requirements

Prerequisites

None.

Credits

6.1 Moderate Density (2 points). Build homes with an average housing density of 7 or more dwelling units per acre of buildable land. A single home of 1/7-acre buildable lot qualifies.

WE 2: Irrigation System
Maximum points: 4

2.3 Reduce Overall Irrigation Demand by at Least 45% (maximum 4 points, as specified in Table 11).

Design the landscape and irrigation system to reduce the overall irrigation water demand water budget. The estimates must be calculated and prepared by a landscape professional, biologist, or other qualified professional using the method outlined below.

Note: A project must earn full points in SS 2.5 before receiving points for this credit

Table 11: Reduction in Water Demand

Reduction in estimataed irrigation water usage	WE 2.3 points	SS 2.5 points	Total points
45-49%	1	6	7
50-54%	2	6	8
55-59%	3	6	9
60% or more	4	6	10

3.1 High Efficiency Fixtures and Fittngs (1 point each, maximum 3 points). Meet one or more of the following requirements by installing high efficiency fixtures or fittings. A project cannot earn points in both WE 3.1 and WE 3.2 for the same fixture type (e.g., faucet, shower, or toilet).

c. Toilets must be dual-flush and meet the requirements of ASME A112.19.14

3.2 Very High Efficiency Fixtures and Fittngs (2 points each, maximum 6 points). Meet one or more of the following requirements by installing very high efficiency fixtures or fittings. A project cannot earn points in both WE 3.1 and WE 3.2 for the same fixture type (e.g., faucet, shower, or toilet).

a. The average flow rate for all lavatory faucets must be $\leq$ 1.5 gpm OR Lavatory faucets must meet the U.S. EPA WaterSense specification and be certified and labeled accordingly.
b. The average flow rate for all showers must be $\leq$ 1.75 gpm per stall.

Table 15: HERS Index and LEED Points

IECC Climate Zones 1-5	IECC Climate Zones 6-8

HERS Index	Percent Above IECC 2004	LEED for Homes Points	HERS Index	Percent Above IECC 2004	LEED for Homes Points
100	0		100	0	
95	5		95	5	
90	10		90	10	
85	15		85	15	
84	16	2.0	84	16	
83	17	3.0	83	17	
82	18	4.0	82	18	
81	19	5.0	81	19	
80	20	6.0	80	20	
79	21	7.0	79	21	2.0
78	22	7.5	78	22	3.0
77	23	8.5	77	23	4.0
76	24	9.0	76	24	5.0
75	25	10.0	75	25	6.0
74	26	10.5	74	26	6.5
73	27	11.6	73	27	7.5
72	28	12.0	72	28	8.0
71	29	12.5	71	29	9.0
70	30	13.0	70	30	9.5
69	31	14.0	69	31	10.0
68	32	14.5	68	32	11.0
67	33	15.0	67	33	11.5
66	34	15.5	66	34	12.0
65	35	16.0	65	35	12.5
64	36	16.5	64	36	13.5
63	37	17.0	63	37	14.0
62	38	17.5	62	38	14.5
61	39	18.0	61	39	15.0
60	40	18.5	60	40	15.5
55	45	20.5	55	45	18.0
50	50	22.5	50	50	20.0
45	55	24.2	45	55	22.0
40	60	26.0	40	60	24.0
35	65	27.0	35	65	25.5
30	70	28.5	30	70	27.0
25	75	30.0	25	75	28.5
20	80	31.0	20	80	30.0
15	85	32.0	15	85	31.0
10	90	33.0	10	90	32.0
5	95	33.5	5	95	33.0
0	100	34.0	0	100	34.0

EA 1: Optimize Energy Performance
Maximum points: 34

Requirements

Prerequisites

1.1 **Performance of ENERGY STAR for Homes**. Meet the performance requirements of ENERGY STAR labeled homes, including third-party inspections.

Credits

1.2 **Exceptional Energy Performance (maximum 34 points**). Exceed the performance of ENERGY STAR for Homes. Use the equations below relating Home Energy Standards (HERS) Index to the appropriate number of LEED points

South

LEED Pts ={[Log (100 – HERS Index]/0.024} – 48.3

North

LEED Pts = {[Log (100 – HERS Index)]/0.021} – 60.8

EA 11: Optimize Energy Performance
Maximum points: 1

Requirements

Prerequisites

11.1 Refrigerant Charge Test. Provide proof of proper refrigerant charge of the air-conditioning system (unless home has no mechanical cooling system).

Credits

11.2 Appropriate HVAC Refrigerants (1 point).

b) Install an HVAC system with non-HCFC refrigerant (e.g., R-410a).

MR 1: Material-Efficient Framing
Maximum points: 5

Requirements

Prerequisites

1.1 Framing Order Waste Factor Limit. Limit the overall estimated waste factor to 10% or less. If the waste factor on any portion of the framing order exceeds 10%, calculate the overall waste factor as shown in **Table 22.**

Waste factor is defined as the percentage of framing material ordered in excess of the estimated material needed for construction.

Table 22: Sample Framing Order Waste Factor Calculation

Framing Component	**Total Cost**	**Waste Factor**	**Waste Cost**
Random lengths	$1,000	15%	$150
Studs	$2,000	5%	$100
Beams and headers	$500	20%	$100
Roof deck	$2,000	0%	$0
Wall sheathing	$0	0%	$0
Rafters	$2,000	0%	$0
Ceiling joists	$1,500	10%	$150
Cornice work	$3,000	10%	$300
TOTAL	**$12,000**		**$1,000**
Overall waste factor (waste $/cost $)			**8.3%**

1.5 **Off-Site Fabrication (4 points)**. Use either of the following alternatives to on-site framing:

a) Panelized construction. Wall, roof, and floor components are delivered to the job site pre-framed.
b) Modular, prefabricated construction. All principal building sections are delivered to the job site as prefabricated modules.

MR 2: Environmentally Preferable Products
Maximum points: 8

Requirements

Prerequisites

2.1 **FSC Certified Tropical Wood.** Meet the following two requirements, as applicable:

a) Provide all wood product suppliers with a notice containing all the following elements:
   i. A statement that the builder's preference is to purchase products containing tropical wood only if it is FSC-certified;
   ii. A request for the country of manufacture of each product supplied; and
   iii. A request for a list of FSC-certified tropical wood products the vendor can supply.
b) If tropical wood is intentionally used (i.e., specified in purchasing documents), use only FSC-certified tropical wood products. Reused or reclaimed materials are exempt.

Note: A species of wood is considered tropical for the purposes of this prerequisite if it is grown in a country that lies between the Tropics of Cancer and Capricorn.

Credits

2.2 **Environmentally Preferable Products (0.5 point each, maximum 8 points)**. Use building component materials that meet one or more of the criteria below. Except as noted in **Table 24**, a material must make up 90% of the component, by weight or volume. A single component that meets each criterion (i.e., environmentally preferable, low emissions, and local sourcing) can earn points for each.

a) Environmentally preferable products (0.5 point per component). Use products that meet the specifications in **Table 24**.

Note: Recycled content products must contain a minimum of 25% post consumer recycled content, except as noted in Table 24. Postindustrial (pre-consumer) recycled content must be counted at half the rate of post consumer content.

AND/OR

b) Low emissions (0.5 point per component). Use products that meet the emissions specifications in **Table 24**.

AND/OR

c) Local production (0.5 point per component). Use products that were extracted, processed, and manufactured within 500 miles of the home.

Table 24: Environmentally Preferable Products

Assembly	Component	EPP specifications (0.5 point per component)	Emission specification (0.5 point per component)	Local production (0.5 point per component)
Exterior wall	Framing/wall structure	Concrete wall structure: Use 30% fly ash or slag Wood frame: FSC-certified or reclaimed on finger joint studs	N/A	Eligible
Exterior wall	Siding or masonry	Recycled content, reclaimed, or FSC-certified	N/A	Eligible
Floor	Flooring (45% of total floor area)	Linoleum, cork, bamboo, FSC-certified or reclaimed wood, Sealed concrete, recycled-content flooring. Or combination	Carpet & pad: all carpet & pad complies with carpet & rug Insulate Green Label Plus program	Eligible
Floor	Flooring (90% of total floor area)	Meet specifications above to receive *additional 0.5 points*	Hard flooring; automatic ½ point for 100% hard surface flooring Hard flooring: additional ½ point for using a product that is SCS Floor Score certified	Eligible (Additional 0.5 point)
Floor	Framing	FSC-certified or reclaimed	N/A	Eligible
Foundation	Aggregate	N/A	N/A	Eligible
Foundation	Cement	Use 30% fly ash or slag	N/A	Eligible
Interior wall	Framing	FSC-certified or reclaimed	N/A	Eligible
Interior walls AND ceilings	Gypsum board	N/A	N/A	Eligible
Interior walls AND ceilings AND millwork	Paints and coatings	Recycled paint that meets Green Seal standard GS-43	Use products that c comply with applicable standards in Table 25	Eligible
Landscape	Decking or patio material	Recycled content, FSC-certified, or reclaimed		Eligible
Other	Cabinets	Recycled content, FSC-certified, or reclaimed	N/A	Eligible
Other	Counters (Kitchen and bathrooms)	Recycled content, FSC-certified, or reclaimed AND composite materials must contain no added urea-formaldehyde resins	N/A	Eligible
Other	Doors (not including garage or insulated doors)	Recycled content, FSC-certified, or reclaimed AND composite materials must contain no added urea-formaldehyde resins	N/A	Eligible
Other	Trim	Recycled content, FSC-certified, or reclaimed	N/A	Eligible
Other	Adhesives and sealants	N/A	Use products that comply with all applicable standards in Table 26.	Eligible
Other	Window framing	Recycled content, FSC-certified, or reclaimed	N/A	Eligible
Roof	Framing	FSC-certified	N/A	Eligible
Roof	Roofing	Recycled content	N/A	Eligible
Roof AND floor AND wall	Insulation	Recycled content of 20% or more	Comply with California Practice for Testing of VOCs from Building Materials Using Small Chambers. www.dhs.ca.gov/ehb/AQVOCS/practice.htlm	Eligible
Roof, floor, wall (2 of 3)	Sheathing	Recycled content, FSC-certified or reclaimed	N/A	Eligible

Table 25: Standards for Environmentally Preferable Paints and Coatings

Component	Applicable Standard (VOC content)	Reference
Architectural paints, coatings and primers applied to interior walls and ceilings	Flats: 50 g/L Nonflats: 150 g/L	Green Seal Standard GS-11, Paints, 1st Edition, May 20, 1993
Anticorrosive and antitrust paints applied to interior ferrous metal substrates	250 g/L	Green Seal Standard GC-03, Anti-Corrosive Paints, 2nd Edition, January 7, 1997
Clear wood finishes	Varnish: 350 g/L Lacquer: 550 g/L	South Coast Air Quality Management District Rule 1113, Architectural Coatings
Floor coatings	100 g/L	
Sealers	Waterproofing: 250 g/L Sanding: 275 g/L All others: 200 g/L	
Shellacs	Clear: 730 g/L Pigmented: 550 g/L	
Stains	250 g/L	

Table 26: Standards for Low-Emissions Adhesives and Sealants (meet South Coast Air Quality Management District Rule #1168)

	Applicable standard (VOC content, g/L less water)
Architectural applications	
Indoor carpet adhesives	50
Carpet pad adhesives	50
Wood flooring adhesives	100
Rubber floor adhesives	60
Sub floor adhesives	50
VCT and asphalt adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Specialty applications	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special-purpose contact adhesive	250
Structural wood member adhesive	140
Sheet-applied rubber lining operations	850
Top and trim adhesive	250
Substrate-specific applications	
Metal to metal	510
Plastic foams	490
Porous materials (except wood)	325
Wood	250
Fiberglass	550
Sealants	
Architectural	250
Non-membrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
Sealant primers	
Architectural nonporous	250
Architectural porous	775
Other	750

MR 3: Waste Management
Maximum points: 3

Requirements

Prerequisites

3.1 **Construction Waste Management Planning.** Complete the following tasks related to management of construction waste:

a) Investigate and document local options for diversion (e.g. recycling, reuse) of all anticipated major constituents of the project waste stream, including cardboard packaging and household recyclables (e.g., beverage containers).
b) Document the diversion rate for construction waste. Record the diversion rate for land clearing and/or demolition, if applicable (e.g., on gut rehab project), separately from the rate for the new construction phase of the project.

Credits

3.2 **Construction Waste Reduction (maximum 3 points)**. Reduce or divert waste generated from new construction activities from landfills and incinerators to a level below the industry norm. Use either of two options:

a) Reduce construction waste. Generate 2.5 pounds (or 0.016 cubic yards) or less of net waste (not including waste diverted from reclamation or recycling) per square foot of conditioned floor area. (Use column 1 or 2 and column 5 of **Table 27** to determine the socore.[2]
b) Increased waste diversion. Divert 25% of more of the total materials taken off the construction site from landfills and incinerators. Use column 3 or 4 and column 5 of Table 27 to determine the score; calculate the percentage using either weight or volume.

Note: Land clearing and demolition waste (e.g., from removal of preexisting structures on the site) should not be counted in this calculation.

Table 27: Waste Diversion

Amount to landfills and incinerators				**Points**
Reduced construction waste		**Increased water diversion**		
Pounds/ Ft	**Cubic yards/ 1,000 ft**	**Percentage waste**	**Percentage diverted**	
4.0	25.5	100%	0%	0.0
3.5	22.3	88%	13%	0.0
3.0	19.1	75%	25%	0.5
2.5	15.9	63%	38%	1.0
2.0	12.8	50%	50%	1.5
1.5	9.6	38%	63%	2.0
1.0	6.4	25%	75%	2.5
0.5	3.2	13%	88%	3.0

EQ 2: Combustion Venting

[2] The industry average is 4.2 pounds (0.0265 cubic yards) of waste per square foot of conditioned floor area, based on the data provided by the National Association of Home Builders' Research Center.

Maximum points: 2

Requirements

Prerequisites

2.1 Basic Combustion Venting Measures. Meet all the following requirements.

a) No un-vented combustion appliances (e.g., decorative logs) are allowed.
b) A carbon monoxide (CO) monitor must be installed on each floor.
c) All fireplaces and woodstoves must have doors.
d) Space and water heating equipment that involves combustion must meet one of the following. Space heating systems in homes located in IECC-2007 climate zone 1 or 2 are exempt.
   i. It must be designed and installed with closed combustion (i.e., sealed supply air and exhaust ducting);
   ii. It must be designed and installed with power-vented exhaust; or
   iii. It must be located in a detached utility building or open-air facility.

2.2 Enhanced CombustingVenting Measures. (maximum 2 points).Install no fireplace or woodstove.

EQ 3: Moisture Control
Maximum points: 1

Requirements

Credits

3. Moisture Load Control (1point). Install dehumidification equipment with sufficient latent capacity to maintain relative humidity at or below 60%. This must be achieved through one of the following:
   a. Additional dehumidification system(s).
   b. A central HVAC system equipped with additional controls to operate in dehumidification mode.

EQ 4: Outdoor Air Ventilation
Maximum points: 3

Requirements

Prerequisites

4.1 **Basic Outdoor Air Ventilation**. Design and install a whole building ventilation system that compiles with ASHRAE Standard 62.2-2007. A summary of alternatives is provided below, but the HVAC contractor should review and follow the requirements of ASHRAE Standard 62.2-2007, Sections 4 and 7.

a) Mild climate exemption. A home built in a climate with fewer than 4,500 infiltration degree-days is exempt from these prerequisites.

Credits

4.2 **Enhanced Outdoor Air Ventilation (2 points)**. Meet one of the following:

a) In mild climates (fewer than 4,500 infiltration degree-days), install a whole-building active ventilation system that complies with ASHRAE Standard 62.2-2007.

4.3 **Third-Party Performance Testing (1 point)**. Have a third-party test the flow rate of air brought into the home, and verify that the requirements of ASHRAE Standard 62.2-2007 are met. In exhaust-only ventilation systems, install exhaust ducts according to Table 7.1 of ASHRAE Standard 62.2-2007, and either test the flow rate out of the home or conduct air-flow tests to ensure back pressure of $\leq$ 0.20 inches w.c.

EQ 5: Local Exhaust
Maximum points: 2

Requirements

Prerequisites

5.1 **Basic Local Exhaust**. Meet all the following requirements:

a) Design and install local exhaust systems in all bathrooms (including half-baths) and the kitchen to meet the requirements of Section 5 of ASHRAE Standard 62.2-2007. Sample requirements that relate to minimum intermittent local exhaust flow rates are shown in **Table 31**, below.

b) Design and install the fans and ducts to meet the requirements of Section 7 of ASHRAE Standard 62.2-2007.

c) Exhaust air to the outdoors (i.e., exhaust to attics or interstitial spaces is not permitted).

d) Use ENERGY STAR labeled bathroom exhaust fans (except for exhaust fans serving multiple bathrooms).

Credits

5.3 **Third-Party Performance Testing (1 point).** Perform a third-party test of each exhaust airflow rate for compliance with the requirements in Section 5 of ASHRAE Standard 62.2-2007.

Table 31: Minimum Air Flow Requirements for Intermittent Local Exhaust

Location	Minimum air flow
Kitchen	100 cfm; vented range hood required if exhaust fan flow rate is less than 5 kitchen air changes per hour.
Bathroom	50 cfm

EQ 6: Distribution of Space Heating and Cooling
Maximum points: 3

Requirements

A. Forced-Air Systems:

Prerequisites

6.1 **Room-by-Room Load Calculations.** Perform design calculations (using ACCA Manuals J and D, the ASHRAE Handbook of Fundamentals, or an equivalent computation procedure) and install ducts accordingly.

Credits

6.3 Third-**Party Performance Test (2 points).** Have the total supply air flow rates in each room tested using a flow hood with doors closed, or one of the other acceptable methods cited by the ACCA Quality Installation Specifications. Supply airflow rates must be within +/- 15% (or +/- 10 cfm) of calculated values from ACCA Manual J (as required by EA 6.1).

EQ 7: Air Filtering
Maximum points: 2

Requirements

A. Forced-Air Systems:

Prerequisites

7.1 **Good Filters.** Install air filters with a minimum efficiency reporting value (MERV) $\geq$ 8 and ensure that air handlers can maintain adequate pressure and airflow. Air filter housings must be airtight to prevent bypass or leakage.

EQ 8: Air Filtering
Maximum points: 4

Requirements

Prerequisites
None.

Credits

8.1 **Indoor Contaminant Control during Construction (1 point).** Upon installation, seal all permanent ducts and vents to minimize contamination during construction. Remove any seals after all phases of construction are completed.

Credits

8.3 Preoccupancy Flush (1 points). Flush the home with fresh air, according to the following guidelines:

a) Flushes prior to occupancy but after all phases of construction are complete.
b) Flush the entire home, keeping all interior doors open.
c) Flush for 48 total hours; the hours may be nonconsecutive, if necessary.
d) Keep all windows open and run a fan (e.g., HVAC system fan) continuously or flush the home with all HVAC fans and exhaust fans operating continuously at the highest flow rate.
e) Use additional fans to circulate air within he home.
f) Replace or clean HVAC air filter afterward, as necessary.

EQ 9: Radon Protection
Maximum points: 1

Requirements

Prerequisites

9.1 **Radon-Resistant Construction in High-Risk Areas.** If the home is in EPA Radon Zone 1, design and build the home with radon=resistant construction techniques as prescribed by EPA, the International Residential Code, Washington State Ventilation and Indoor Air Quality Code, or some equivalent code or standard.

EQ 10: Garage Pollutant Protection
Maximum points: 3

Requirements

Prerequisites

10.1 No HVAC in Garage. Place all air-handling equipment and ductwork outside the fire-rated envelop of the garage.

Credits

10.2 Minimize Pollutants from Garage (2 points). Tightly seal shared surfaces between garage and conditioned spaces, including all of the following:

a) In conditioned spaces above the garage;
    i. Seal all penetrations;
    ii. Seal all connecting floor and ceiling joist bays; and
    iii. Paint walls and ceilings (carbon monoxide can penetrate unfinished drywall through diffusion).
b) In conditioned spaces next to the garage;
    i. Weather strip all doors;
    ii. Place carbon monoxide detectors in adjacent rooms that share a door with the garage;
    iii. Seal all penetrations; and
    iv. Seal all cracks at the base of the walls.

AE 1: Education of the Homeowner or Tenant
Maximum points: 2

Requirements
Prerequisites

1.1 Basic Operations Training. Provide the home's occupant(s) with the following:

a) An operations and maintenance manual or binder that includes all the following items:
   i. The completed checklist of LEED for Homes features.
   ii. A copy of each signed Accountability Form.
   iii. A copy of the durability inspection checklist.
   iv. The product manufacturers' manuals for all installed equipment, fixtures, and appliances.
   v. General information on efficient use of energy, water, and natural resources.
   vi. Operations and maintenance guidance for any LEED for Homes-related equipment installed in the home, including
      - Space heating and cooling equipment;
      - Mechanical ventilation equipment;
      - Humidity control equipment;
      - Radon protection system;
      - Renewable energy system; and
      - Irrigation, rain water harvesting, and or gray water system.
   vii. Guidance on occupant activities and choices, including the following:
      - Cleaning materials, methods, and suppliers;
      - Water-efficient landscaping;
      - Impacts of chemical fertilizers and pesticides;
      - Irrigation;
      - Lightning selection; and
      - Appliance selection.
   viii. Educational information on "green power".

b) A minimum one-hour walkthrough of the home with the occupant(s), featuring the following:
   i. Identification of all installed equipment.
   ii. Instruction in how to use the measures and operate the equipment.
   iii. Information on how to maintain the measures and equipment.

1.3 Public Awareness (1 point). Promote general public awareness about LEED for Homes by conducting at least three of the following activities:

a) Hold an advertised, attended public open house that lasts at least four hours per day on at least four weekends, or participate in a green building exhibition or tour. The home or building must display at least four informational stations about the LEED for Homes features (and/or offer a guided tour that highlights at least four LEED for Homes features).
b) Publish a website with at least two pages that provides detailed information about the features and benefits of LEED homes.
c) Generate a newspaper article on the LEED for Homes project.
d) Display LEED for Homes signage, measuring six square feet for more, on the exterior of the home or building.

LEED for Homes Project Checklist

for Homes

Builder Name:	
Project Team Leader:	
Home Address (Street/City/State):	

Project Description

Building Type:

# of Bedrooms: ***3***

Project type: ***Military***

Floor Area: ***1,659***

Adjusted Certification Thresholds

Certified: ***41.5*** Gold: ***71.5***

Silver: ***56.5*** Platinum: ***86.5***

Project Point Total

Prelim: ***67 + 0 maybe pts*** **Final:** ***65***

Certification Level

Prelim: ***Silver*** **Final:** ***Silver***

Final Credit Category Point Totals

ID: 6 ***SS: 13*** ***EA: 14*** ***EQ: 8***

LL: 5 ***WE: 6*** ***MR: 11*** ***AE: 2***

Date Most Recently Updated: *3/31/2011* *Updated by:* *Marty Vanderburg*

✍ ***Indicates that an Accountability Form is required.***

	Max Pts. Available	Preliminary Rating Y / Pts	Maybe	No		Project Points
Innovation & Design Process (ID) (Minimum 0 ID Points Required)	***Max: 11***	***Y:8***	***M:0***		**Notes**	***Final: 6***
1. Integrated Project Planning						
1.1 Preliminary Rating	***Prereq.***	***Y***			*22-Mar-11*	***Y***
Target performance tier:						
1.2 Integrated Project Team *(meet all of the following)*	***1***	***1***	*0*			***1***
☑ a) Individuals or organizations with necessary capabilities		☐ c) Regular meetings held with project team				
☐ b) All team members involved in various project phases						
1.3 Professional Credentialed with Respect to LEED for Homes	***1***	***1***	*0*		*Marty and Chris are LEED H AP*	***1***
1.4 Design Charrette	***1***	***1***	*0*		*Charette performed in April 2010*	***1***
1.5 Building Orientation for Solar Design *(meet all of the following)*	***1***	***0***	*0*			***0***
☐ a) Glazing area on north/south walls 50% greater than on east/west walls		☐ c) At least 450 sq. ft. of south-facing roof area, oriented for solar applications				
☐ b) East-west axis is within 15 degrees of due east-west		☐ d) 90% of south-facing glazing is shaded in summer, unshaded in winter				
2. Quality Management for Durability						
2.1 Durability Planning *(meet all of the following)*	***Prereq.***	***Y***				***Y***
☐ a) Durability evaluation completed		☐ d) Durability strategies incorporated into project documentation				
☐ b) Strategies developed to address durability issues		☐ e) Durability measures listed in durability inspection checklist				
☐ c) Moisture control measures from Table 1 incorporated						
2.2 Durability Management *(meet one of the following)*	***Prereq.***	***Y***				***Y***
☐ Builder has a quality management process in place		☐ Builder conducted inspection using durability inspection checklist				
2.3 Third-Party Durability Management Verification	***3***	***3***	*0*			***3***

3. Innovative or Regional Design

3.1	✍ Innovation 1 (ruling #):	***panelized walls***	***1***	***2***	*0*		***0***
3.2	✍ Innovation 2 (ruling #):		***1***	***0***	*0*		***0***
3.3	✍ Innovation 3 (ruling #):		***1***	***0***	*0*		***0***
3.4	✍ Innovation 4 (ruling #):		***1***	***0***	*0*		***0***

Location & Linkages (LL) (Minimum 0 LL Points Required)

Max: 10 ***Y:5*** *M:0* ***Notes*** ***Final: 5***

1. LEED for Neighborhood Development

1	LEED for Neighborhood Development	***10***	***0***	*0*		***0***

2. Site Selection

2	✍ Site Selection *(meet all of the following)*	***2***	***2***	*0*		***2***

- ☑ a) Built above 100-year floodplain defined by FEMA
- ☐ b) Not built on habitat for threatened or endangered species
- ☐ c) Not built within 100 ft of water, including wetlands
- ☐ d) Not built on land that was public parkland prior to acquisition
- ☐ e) Not built on land with prime soils, unique soils, or soils of state significance

3. Preferred Locations

	3.1	Edge Development	***1***	***1***	*0*	*Watkins borders existing neighborhoods; Knox is pr*	***1***
OR	3.2	Infill	***2***	***0***	*0*		***0***
AND/OR	3.3	Previously Developed	***1***	***0***	*0*		***0***

4. Infrastructure

4	Existing Infrastructure	***1***	***1***	*0*		***1***

5. Community Resources / Transit

5.1	Basic Community Resources / Transit *(meet one of the following)*	***1***	***0***	*0*		***0***

- ☐ a) Within 1/4 mile of 4 basic community resources
- ☐ b) Within 1/2 mile of 7 basic community resources
- ☐ c) Within 1/2 mile of transit services providing 30 rides per weekday

OR	5.2	Extensive Community Resources / Transit *(meet one of the following)*	***2***	***0***	*0*		***0***

- ☐ a) Within 1/4 mile of 7 basic community resources
- ☐ b) Within 1/2 mile of 11 basic community resources
- ☐ c) Within 1/2 mile of transit services providing 60 rides per weekday

OR	5.3	Outstanding Community Resources / Transit *(meet one of the following)*	***3***	***0***	*0*		***0***

- ☐ a) Within 1/4 mile of 11 basic community resources
- ☐ b) Within 1/2 mile of 14 basic community resources
- ☐ c) Within 1/2 mile of transit services providing 125 rides per weekday

6. Access to Open Space

6	Access to Open Space	***1***	***1***	*0*		***1***

Sustainable Sites (SS) (Minimum 5 SS Points Required)	Max: 22	Y:13	M:0	Notes	Final: 13

1. Site Stewardship

1.1	Erosion Controls During Construction *(meet all of the following)*	Prereq.	Y		

☑ a) Stockpile and protect disturbed topsoil from erosion.
☐ b) Control the path and velocity of runoff with silt fencing or equivalent.
☐ c) Protect sewer inlets, streams, and lakes with straw bales, silt fencing, etc.
☐ d) Provide swales to divert surface water from hillsides
☐ e) Use tiers, erosion blankets, compost blankets, etc. on sloped areas.

1.2	Minimize Disturbed Area of Site *(meet the appropriate requirements)*	1	1	0	1

Where the site is not previously developed, meet all the following:
☐ a) Develop tree / plant preservation plan with "no-disturbance" zones
☐ b) Leave 40% of buildable lot area, not including area under roof, undisturbed

OR Where the site is previously developed, meet all the following:
☐ c) Develop tree / plant preservation plan with "no-disturbance" zones AND
☐ Rehabilitate lot; undo soil compaction and remove invasive plants AND
☐ Meet the requirements of SS 2.2

OR ☐ d) Build on a lot of 1/7 acre or less, or 7 units per acre.

2. Landscaping

2.1	✍ No Invasive Plants	Prereq.	Y			
2.2	✍ Basic Landscaping Design *(meet all of the following)*	2	2	0	bring in more than 6" of finished topsoil at end of proje	2

☐ a) Any turf must be drought-tolerant.
☐ b) Do not use turf in densely shaded areas.
☐ c) Do not use turf in areas with slope of 25%
☐ d) Add mulch or soil amendments as appropriate.
☐ e) All compacted soil must be tilled to at least 6 inches.

AND/OR	2.3 ✍ Limit Conventional Turf	3	0	0		0

[ ] Percentage of designed landscape softscape area that is turf

AND/OR	2.4 ✍ Drought-Tolerant Plants	2	2	0		2

[99%] Percentage of installed plants that are drought-tolerant

OR	2.5 ✍ Reduce Overall Irrigation Demand by at Least 20%	6	0	0		0

[ ] Percentage reduction in estimated irrigation water demand *(calculate)*

3. Reduce Local Heat Island Effects

3	✍ Reduce Local Heat Island Effects *(meet one of the following)*	1	0	0		0

☐ a) Locate trees / plantings to provide shade for 50% of hardscapes
☐ b) Install light-colored, high-albedo materials for 50% of hardscapes

4. Surface Water Management

4.1	✍ Permeable Lot	4	2	0	2

80% vegetative landscape

0% permeable paving

2% impermeable surfaces directed to infiltration features

18% other impermeable surfaces (areas not counted towards credit)

4.2	Permanent Erosion Controls *(meet one of the following)*	1	0	0	0

☐ a) For portions of lot on steep slope, use terracing and retaining walls

☐ b) Plant trees, shrubs, or groundcover

4.3	✍ Management of Runoff from Roof *(meet any, see Rating System for pts)*	2	2	0	2

☐ a) Install permanent stormwater controls to manage runoff from the home

☐ b) Install vegetated roof to cover 50% of roof area

☐ c) Install vegetated roof to cover 100% of roof area

☐ d) Have lot designed by professional to manage runoff from home on-site

5. Nontoxic Pest Control

5	Pest Control Alternatives *(meet any of the following, 1/2 pt each)*	2	2	0	2

☐ a) Keep all exterior wood at least 12" above soil

☐ b) Seal external cracks, joints, etc. with caulking and install pest-proof screens

☐ c) Include no wood-to-concrete connections, or separate connections with dividers

☐ d) Install landscaping so mature plants are 24" from home

e) In 'moderate' to 'very heavy' termite risk areas:

☐ i) Treat all cellulosic material with borate product to 3' above foundation

☐ ii) Install sand or diatomaceous earth barrier

☐ iii) Install steel mesh barrier termite control system

☐ iv) Install non-toxic termite bait system

☐ v) Use noncellulosic wall structure

☐ vi) Use solid concrete foundation walls or pest-proof masonry wall design

6. Compact Development

6.1	Moderate Density	2	2	0	2

2 # of total units on the lot | *0.3* lot size (acres) | *7.1* density (units/acre)

OR 6.2	High Density	3	0	0	0
OR 6.3	Very High Density	4	0	0	0

Water Efficiency (WE) (Minimum 3 WE Points Required)

Max: 15 *Y:6* *M:0* *Notes* *Final: 6*

1. Water Reuse

1.1	Rainwater Harvesting System	4	0	0	0

☐ Percentage of roof area used for harvesting

☐ Application

AND/OR 1.2	Graywater Reuse System	1	0	0	0
OR 1.3	Use of Municipal Recycled Water System	3	0	0	0

2. Irrigation System

	2.1	✍ High-Efficiency Irrigation System *(meet any of the following, 1 pt each)*	*3*	*0*	*0*	*0*

- ☐ a) Irrigation system designed by EPA Water Sense certified professional
- ☐ b) Irrigation system with head-to-head coverage
- ☐ c) Install central shut-off valve
- ☐ d) Install submeter for the irrigation system
- ☐ e) Use drip irrigation for 50% of planting beds
- ☐ f) Create separate zones for each type of bedding
- ☐ g) Install timer or controller for each watering zone
- ☐ h) Install pressure-regulating devices
- ☐ i) High-efficiency nozzles with distribution uniformity of at least 0.70.
- ☐ j) Install check valves in heads
- ☐ k) Install moisture sensor or rain delay controller

AND/OR	2.2	Third-party Inspection	*1*	*0*	*0*	*0*
OR	2.3	✍ Reduce Overall Irrigation Demand by at Least 45%	*4*	*0*	*0*	*0*

☐ Percentage reduction in estimated irrigation water demand *(calculate)*

3. Indoor Water Use

	3.1	High-Efficiency Fixtures and Fittings *(meet any of the following, 1 pt each)*	*3*	*0*	*0*	*0*

- ☐ a) Average flow rate of lavatory faucets is ≤ 2.00 gpm
- ☐ b) Average flow rate for all showers is ≤ 2.00 gpm per stall
- ☐ c) Average flow rate for all toilets is ≤ 1.30 gpf; OR
  ☐ Toilets are dual-flush; OR
  ☐ Toilets meet the EPA Water Sense specification

	3.2	Very High-Efficiency Fixtures and Fittings *(meet any, 2 pts each)*	*6*	*6*	*0*	*6*

- ☐ a) Average flow rate of lavatory faucets is ≤ 1.50 gpm; OR
  ☐ Lavatory faucets meet the EPA Water Sense specification
- ☐ b) Average flow rate for all showers ≤ 1.75 gpm per stall
- ☐ c) Average flow rate for all toilets is ≤ 1.10 gpf

Energy & Atmosphere (EA) (Minimum 0 EA Points Required)

Max: 38 Y:14 M:0 **Notes** ***Final: 14***

1. Optimize Energy Performance

	1.1	Performance of ENERGY STAR for Homes	*Prereq.*	*Y*		*Y*
	1.2	Exceptional Energy Performance	*34*	*13*	*0*	*13*

3 IECC climate zone *70* HERS Index

7. Water Heating

	7.1	✍ Efficient Hot Water Distribution System *(meet one of the following)*	*2*	*0*	*0*	*0*

- ☐ a) Structured plumbing system
- ☐ b) Central manifold distribution system
- ☐ c) Compact design of conventional system

	7.2	Pipe Insulation	*1*	*0*	*0*	*0*

11. Residential Refrigerant Management

	11.1	Refrigerant Charge Test	*Prereq.*	*Y*		*Y*
	11.2	Appropriate HVAC Refrigerants *(meet one of the following)*	*1*	*1*	*0*	*1*

- ☐ a) Use no refrigerants
- ☐ b) Use non-HCFC refrigerants
- ☐ c) Use refrigerants that complies with global warming potential equation

Materials & Resources (MR) (Minimum 2 MR Points Required)

Max: 16 | Y:11 | M:0 | Notes | Final: 11

1. Material-Efficient Framing

	1.1 Framing Order Waste Factor	Prereq.	Y			Y
	1.2 Detailed Framing Documents	1	1	0	precut framing package	1
AND/OR	1.3 Detailed Cut List and Lumber Order	1	1	0	precut framing package	1

☐ Requirements of MR 1.2 have been met

☐ Detailed cut list and lumber order corresponding to framing plans or scopes

AND/OR	1.4 Framing Efficiencies *(meet any of the following, see Rating System for pts)*	3	3	0		3

☐ Precut framing packages
☐ Open-web floor trusses
☐ Structural insulated panel walls
☐ Structural insulated panel roof
☐ Structural insulated panel floors

☐ Stud spacing greater than 16" on center
☐ Ceiling joist spacing greater than 16" on center
☐ Floor joist spacing greater than 16" on center
☐ Roof rafter spacing greater than 16" on center
☐ Two of the following: Size headers for loads; ladder blocking; drywall clips; 2-stud corners

OR	1.5 Off-site Fabrication *(meet one of the following)*	4	0	0		0

☐ a) Panelized construction

☐ b) Modular, prefabricated construction

2. Environmentally Preferable Products

	2.1 ✍ FSC Certified Tropical Wood *(meet all of the following)*	Prereq.	Y			Y

☐ a) Provide suppliers with a notice of preference for FSC products; AND
☐ Request country of manufacture for each wood product

☐ b) No tropical wood installed (exceptions for FSC-certified or reclaimed wood)

	2.2 ✍ Environmentally Preferable Products *(meet any, 1/2 pt each)*	8	4.5	0		4.5

Assembly : component	(a) EPP			(b) Low emission		(c) Local production	
Exterior wall: framing	☐		type:			☐	
Exterior wall: siding or masonry	☐		type:			☐	
Floor: flooring	☐	(45%)	type:	☐	90% hard flooring	☐	(45%)
Floor: flooring	☐	(90%)	type:	☐	SCS FloorScore	☐	(90%)
Floor: flooring				☐	Green Label Plus		
Floor: framing	☐		type:			☐	
Foundation: aggregate	☐		type:			☐	
Foundation: cement	☐		type:			☐	
Interior wall: framing	☐		type:			☐	
Interior wall, ceiling: gypsum board	☐		type: maybe			☐	
Interior wall, ceiling, millwork: paint	☐		type:	☐	type: Sherwin Wiliams		
Landscape: decking and patio	☐		type:			☐	
Other: cabinet	☐		type:			☐	
Other: counter	☐		type: check recycled content of countertops			☐	
Other: door	☐		type:			☐	
Other : interior trim	☐		type:			☐	
Other : adhesive, sealant				☐	type:		
Other : window frame	☐		type:			☐	
Roof: framing	☐		type:			☐	
Roof: roofing	☐		type:			☐	
Roof, floor, wall: cavity insulation	☐		type: maybe w Certainteed	☐	type: maybe	☐	
Roof, floor, wall (2 of 3): sheathing	☐		type:			☐	
Other: water supply piping	☑		type: pex				
Other: driveway	☑		type: 30% fly ash				

3. Waste Management

3.1	Construction Waste Management Planning *(meet both of the following)*	*Prereq.*	*Y*			*Y*

☐ a) Investigate local options for waste diversion ☐ b) Document diversion rate for construction waste

3.2	Construction Waste Reduction *(use one of the following methods)*	*3*	*1.5*	*0*		*1.5*

☐ a) pounds waste / square foot

☐ cubic yards waste / 1,000 square feet

52% b) percentage of waste diverted

Indoor Environmental Quality (EQ) (Minimum 6 EQ Points Required)

Max: 21 ***Y:8*** ***M:0*** ***Notes*** ***Final: 8***

1. ENERGY STAR with Indoor Air Package

1	ENERGY STAR with Indoor Air Package	*13*	*0*	*0*		*0*

2. Combustion Venting

2.1	Basic Combustion Venting Measures (meet all of the following)	*Prereq.*	*Y*			*Y*

☐ a) no unvented combustion appliances ☐ d) space, water heating equipment designed with closed combustion; OR

☐ b) carbon monoxide monitors on each floor ☐ space and water heating equipment has power-vented exhaust; OR

☐ c) no fireplace installed, OR ☐ space and water heating equipment located in detached or open-air facility; OR

☐ all fireplaces and woodstoves have doors ☐ no space- or water-heating equipment with combustion

2.2	Enhanced Combustion Venting Measures (meet one of the following)	*2*	*2*	*0*		*2*

Type of Fireplace or stove	*Better practice (1 pt)*	*Best practice (2 pts) (must also meet Better Practice)*
None		☐ granted automatically
Masonry wood-burning fireplace	☐ masonry heater	☐ back-draft potential test
Factory-built wood-burning fireplace	☐ listed by testing lab and meets EPA standards	☐ back-draft potential test
Woodstove and fireplace insert	☐ listed by testing lab and meets EPA standards	☐ back-draft potential test
Natural gas, propane, or alcohol stove	☐ listed, power- or direct-vented, fixed doors	☐ electronic pilot
Pellet stove	☐ EPA certified or meets safety requirements	☐ power- or direct-venting

3. Moisture Control

3	Moisture Load Control (meet one of the following)	*1*	*0*	*0*		*0*

☐ a) Additional dehumidification system ☐ b) Central HVAC system equipped with additional dehumidification mode

4. Outdoor Air Ventilation

4.1	Basic Outdoor Air Ventilation (meet one of the following)	*Prereq.*	*Y*			*Y*

☐ a) Qualifies under ASHRAE Std. 62.2-2007 climate exemption. ☐ c) Intermittent ventilation

☐ b) Continuous ventilation ☐ d) Passive ventilation

4.2	Enhanced Outdoor Air Ventilation *(meet one of the following)*	*2*	*0*	*0*		*0*

☐ a) Meets EQ 4.1 part (a), active ventilation system installed ☐ b) Install heat recovery system

4.3	Third-Party Performance Testing	*1*	*0*	*0*	*not currently testing at this time (going out the roof)*	*0*

5. Local Exhaust

5.1	✍	Basic Local Exhaust (meet all of the following)	*Prereq.*	*Y*		*Y*

- ☑ a) Bathroom and kitchen exhaust meets ASHRAE Std. 62.2 air flow requirement
- ☐ b) Fans and ducts designed and installed to ASHRAE Std. 62.2
- ☐ c) Air exhausted to outdoors
- ☐ d) ENERGY STAR labeled bathroom exhaust fans

5.2		Enhanced Local Exhaust *(meet one of the following)*	*1*	*0*	*0*	*0*

- ☐ a) Occupancy sensor
- ☐ b) Automatic humidistat controller
- ☐ c) Automatic timer tied to switch to operate fan for 20+ minutes post-occupancy
- ☐ d) Continuously operating exhaust fan

5.3		Third-Party Performance Testing	*1*	*0*	*0*	*must pull 50 cfm when tested to receive pts*	*0*

6. Distribution of Space Heating and Cooling

6.1	✍	Room-by-Room Load Calculations	*Prereq.*	*Y*		*Y*
6.2		Return Air Flow / Room-by-Room Controls (meet one of the following)	*1*	*0*	*0*	*0*

A. Forced-Air Systems

- ☐ a) Return air opening of 1 sq. inch per cfm of supply
- ☐ b) Limited pressure differential between closed room and adjacent spaces

B. Nonducted HVAC Systems

- ☐ Flow control valves on every radiator; OR
- ☐ Radiant floor system with thermostatic controls in every room

6.3		Third-Party Performance Test / Multiple Zones (meet one of the following)	*2*	*2*	*0*	*2*

A. Forced-Air Systems

- ☐ Have supply air flow rates in each room tested and confirmed

B. Nonducted HVAC Systems

- ☐ Install at least two distinct zones with independent thermostat control

7. Air Filtering

7.1		Good Filters	*Prereq.*	*Y*		*Y*
7.2		Better Filters	*1*	*0*	*0*	*0*
OR 7.3		Best Filters	*2*	*0*	*0*	*0*

8. Contaminant Control

8.1	✍	Indoor Contaminant Control during Construction	*1*	*1*	*0*	*1*
8.2		Indoor Contaminant Control *(meet any of the following, 1 pt each)*	*2*	*0*	*0*	*0*

- ☐ a) Design and install permanent walk-off mats at each entry
- ☐ b) Design shoe removal and storage space near primary entryway
- ☐ c) Install central vacuum system with exhaust to ourdoors

8.3	✍	Preoccupancy Flush	*1*	*1*	*0*	*1*

9. Radon Protection

9.1	✍	Radon-Resistant Construction in High-Risk Areas	*Prereq.*	*N/A*		
9.2	✍	Radon-Resistant Construction in Moderate-Risk Areas	*1*	*0*	*0*	*0*

10. Garage Pollutant Protection

10.1	No HVAC in Garage	*Prereq.*	*Y*		*Y*
10.2	Minimize Pollutants from Garage (meet all of the following)	*2*	*2*	*0*	*2*

a) In conditioned spaces above garage:

- ☑ Seal all penetrations and connecting floor and ceiling joist bays

b) In conditioned spaces next to garage

- ☐ Weather-strip all doors
- ☐ Carbon monoxide detectors in rooms that share a door with garage
- ☐ Seal all penetrations and cracks at the base of walls

AND/OR 10.3	Exhaust Fan in Garage (meet one of the following)	*1*	*0*	*0*	*0*

- ☐ a) Fan runs continuously
- ☐ b) Fan designed with automatic timer control

OR 10.4	Detached Garage or No Garage	*3*	*0*	*0*	*0*

Awareness & Education (AE) (Minimum 0 AE Points Required)

Max: 3 *Y:2* *M:0* **Notes** *Final: 2*

1. Education of the Homeowner or Tenant

1.1	✍ Basic Operations Training *(meet both of the following)*	*Prereq.*	*Y*	*Proivde manuals to the leasing office; trainng perform*	*Y*

- ☐ a) Operations and training manual
- ☐ b) One-hour walkthrough with occupant(s)

1.2	✍ Enhanced Training	*1*	*0*	*0*	*0*
1.3	Public Awareness *(meet three of the following)*	*1*	*1*	*0*	*1*

- ☐ a) Open house on at least four weekends
- ☐ b) Website about features and benefits of LEED homes
- ☐ c) Newspaper article on the project
- ☐ d) Display LEED signage on the exterior of the home

2. Education of the Building Manager

2	✍ Education of the Building Manager *(meet both of the following)*	*1*	*1*	*0*	*1*

- ☐ a) Operations and training manual
- ☐ b) One-hour walkthrough with building manager

Durability Inspection Checklist Template

(for prerequisite ID 2.1 & 2.2 and credit ID 2.3)

Builder Name:	***Actus Lend Lease***
Project Team Leader:	***Martin Vanderburg LEED AP Homes, Actus Lend Lease***
Home Address:	***See Attached Address List, Camp Lejeune, NC 28547, North Carolina***

For each risk type below, list the durability strategies used in the home to help mitigate those risks. For each of the high and moderate risk areas indicated in the Risk Evaluation Form, please include at least three strategies, in addition the ones already mandated by LEED for Homes. Where necessary, add additional rows or remove strategies that are not relevant. Refer to the Example Durability Strategies page for sample strategies that may be applicable.

Have the builder or trade indicate where the strategy is included in the drawings, specification, or scopes of work, and then sign-off that the durability strategies were incorporated into the home. If ID 2.3 is being pursued, have the Green Rater sign-off that the strategies were verified in the home.

Durability Strategies by Issue Type	Location in Drawings, Specifications, and/or Scopes of Work	Sign-off by Responsible Party (initial below)	
		Prerequisite ID 2.2 (Builder/trade)	Credit ID 2.3 (Green Rater)
Exterior Water / Moisture			
Interior Water / Moisture			
Nonpaper-faced backer board used in all tubs, showers, and spa areas. (see ID 2.1)			
Water-resistant flooring in the kitchen, bathroom, laundry rooms, and spa areas. (see ID 2.1)			
Water-resistant flooring within 3 feet of all exterior doors. (see ID 2.1)			
Drain and drain pan installed for any tank water heaters in or over living spaces. (see ID 2.1)			
Drain and drain pan OR single-throw supply valve installed for any clothes washers in or over living spaces. (see ID 2.1)			
Conventional clothes dryers exhausted directly to outdoors; Condensing clothes dryer has drain and drain pan. (see ID 2.1)			
Whole house ventilation and local kitchen and bathroom exhaust systems that comply with ASHRAE Std. 62.2 (see EQ 4.1 / 5.1)			
Air Infiltration			
Thermal bypass inspection checklist passed (see EA 1.1 / 2.1)			

Durability Inspection Checklist Template

(for prerequisite ID 2.1 & 2.2 and credit ID 2.3)

Builder Name:	***Actus Lend Lease***
Project Team Leader:	***Martin Vanderburg LEED AP Homes, Actus Lend Lease***
Home Address:	***See Attached Address List, Camp Lejeune, NC 28547, North Carolina***

Interstitial Condensation			
All local exhaust systems vented directly to the outdoors. (see EQ 5.1)			
Interstitial spaces are never used to supply or return forced air. (see EA 5.1)			
Duct leakage to the outdoors limited to 6 cfm / 100 sq.ft. (see EA 1.1 / 5.1)			
Pests			
Heat Loss			
Climate zone 4-8: Exposed concrete slab edge insulated. (see EA 1.1 / 2.1)			
Ultraviolet Radiation			
Natural Disasters			
Other			
Refrigerant charge test conducted. (see EA 11.1)			
Builder Declaration for ID prerequisite 2.1 & 2.2			

Durability Inspection Checklist Template

(for prerequisite ID 2.1 & 2.2 and credit ID 2.3)

Builder Name:	***Actus Lend Lease***
Project Team Leader:	***Martin Vanderburg LEED AP Homes, Actus Lend Lease***
Home Address:	***See Attached Address List, Camp Lejeune, NC 28547, North Carolina***

I hereby declare and affirm to USGBC that I have evaluated this project's durability risks, completed the Durability Risk Evaluation Form, and incorporated appropriate durability measures into the design to adequately address the moderate and high risks. The construction drawings and specifications have been updated accordingly, and the the measures were verified to be completed appropriately.

Name: _____

Title: _____

Signature: _____

Date: _____

SECTION 01524

CONSTRUCTION WASTE MANAGEMENT

PART 1 GENERAL

1.1 SUMMARY

1.1.1 This Section includes administrative and procedural requirements for the following:

1.1.1.1 Recycling nonhazardous construction waste as coordinated with D/B contractor.

1.1.1.2 Disposing of nonhazardous construction waste as coordinated with D/B contractor.

1.2 DEFINITIONS

1.2.1 Construction Waste: Building and site improvement materials and other solid waste resulting from construction operations. Construction waste includes packaging.

1.2.2 Disposal: Removal off-site of construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

1.2.3 Recycle: Recovery of construction waste for subsequent processing in preparation for reuse.

1.3 PERFORMANCE GOALS

1.3.1 General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 38 percent by weight of total waste generated by the Work.

1.3.2 Salvage/Recycle Goals: The goal is to salvage and recycle as much nonhazardous construction waste as possible including the following materials:

1.3.2.1 Construction Waste:

1.3.2.1.1 Site-clearing waste.
1.3.2.1.2 Wood materials.
1.3.2.1.3 Metals, including flashing, piping and conduit.
1.3.2.1.4 Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

1.3.2.1.4.1 Paper.
1.3.2.1.4.2 Cardboard.
1.3.2.1.4.3 Boxes.
1.3.2.1.4.4 “Household” recyclables (beverage containers, plastic containers)

1.4 SUBMITTALS

1.4.1 Waste Management Plan: Submit plan of waste separation, recycling and disposal.

1.4.2 Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable

waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.4.3 Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.4.4 LEED Submittal: LEED documentation for Credit MR 3.

1.5 QUALITY ASSURANCE

1.5.1 Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.6 WASTE MANAGEMENT PLAN

1.6.1 General: Develop plan consisting of waste identification and waste reduction work plan. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

1.6.2 Waste Identification: Indicate anticipated types of construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

1.6.3 Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, handling and transportation procedures.

1.6.3.1 Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

1.6.3.2 Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

1.6.3.3 Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PLAN IMPLEMENTATION

3.1.1 General: Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

3.1.2 Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

3.1.2.1 Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

3.2.1 General: Recycle all cardboard and paper. Recycle beverage containers used by on-site workers.

3.2.2 Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

3.2.2.1 Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

3.2.2.1.1 Inspect containers and bins for contamination and remove contaminated materials if found.

3.2.2.2 Store components off the ground and protect from the weather.

3.2.2.3 Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.3 DISPOSAL OF WASTE

3.3.1 General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

3.3.1.1 Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

3.3.1.2 Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3.3.2 Burning: Do not burn waste materials at the site.

3.3.3 Disposal: Transport waste materials off Owner's property and legally dispose of them.

3.4 FIELD QUALITY CONTROL

3.4.1 The Contractor shall comply with the QC Plan, Contractor Testing Plan and with the following:

3.4.2 A preparatory meeting shall be held with the QC personnel, the General Contractor’s field representative and the Subcontractor’s field representatives for each trade in attendance. Review each type of waste and whether it will be recycled or disposed of in landfill or incinerator. Include points of waste generation, handling and transportation procedures.

3.4.3 Comply with all LEED requirements and procedures applicable to this Section.

END OF SECTION

SECTION 02362

TERMITE CONTROL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

1.2.1 This Section includes the following: Chemical treatment for termites applied to interior and exterior wood framing, wall sheathing, pipe penetrations, bath traps, and concrete slabs.

1.2.2 Related Sections include the following:

1.2.2.1 Division 1 Section “LEED Requirements” for LEED requirements and documentation.

1.2.2.1.1 See LEED Credits SS for additional requirements.

1.2.2.1.2 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.2.2 Division 3 Section “Cast-In-Place Concrete”.

1.2.2.3 Division 6 Section "Rough Carpentry" for wood preservative treatment by pressure process.

1.3 GENERAL REQUIREMENTS

1.3.1 All contractors shall comply with Actus Buy American Policy.

1.3.2 Applicator shall be licensed by State of North Carolina for application of appropriate categories of chemicals and shall directly supervise applications. All personnel shall carry certification for appropriate category of pest control.

1.3.3 Insect treatment shall be in accordance with HUD 4910.1 for wood pre-treatment.

1.4 SUBMITTALS

1.4.1 Product Data: For termiticide.

1.4.2 EPA-Registered Label for termiticide products. Submit labeling information to Quality Control Manager not less than 7 days in advance of application.

1.4.3 Product Certificates: For termite control products, signed by product manufacturer.

1.4.4 Submit manufacturer's standard printed instructions detailing ingredients, storage, handling, proportioning, mixing, application and safety precautions.

1.4.5 Submit certificate of compliance from the manufacturer stating that the agent used contains only ingredients that comply with current EPA regulations.

1.4.6 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits. Include borate termiticide product for Credit SS 5. Indicate application locations and height for LEED credit compliance.

1.5 QUALITY ASSURANCE

1.5.1 Treatment materials and procedures for protection against termites shall be in accordance with manufacturer's requirements, (EPA) guidelines and applicable agencies of the State of North Carolina and the label.

1.5.2 Qualifications of Applicators: Principal business of applicator shall be pest control. Applicator must provide evidence, prior to award of contract, of State license and certification by EPA for structural pest control.

1.6 WARRANTY

1.6.1 Warranty: Provide written 5 year warranty against infestation and reinfestation by subterranean termites of the buildings constructed under this contract.

1.6.2 Provide written certification that methods and rates of application comply with specified standards and manufacturer's instructions.

PART 2 PRODUCTS

2.1 Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.

2.2 Product: Nisus Corporation; Bora-Care, or approved equal.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Deliver pesticides to the site in manufacturer's sealed and labeled containers in good condition. All containers shall have labels containing manufacturer's warnings on handling and use of material as well as evidence of registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

3.2 SAFETY REQUIREMENTS

3.2.1 Formulate, treat, use, store, and dispose of pesticides and containers in accordance with label directions. Disposal shall be off Government property, in a lawful manner and in accordance with EPA regulations.

3.2.2 Draw water for formulating only from source(s) designated by Contractor and fit filling hose or line with backflow prevention device meeting local plumbing codes or standards. Conduct filling operations only under direct and continuous observation of Contractor representative to prevent overflow. Avoid any activities which could allow chemicals to enter water supplies, systems or aquifiers and protect against exposure to plants or animals.

3.2.3 Secure pesticides and related materials under lock and key when not attended.

3.2.4 Proper protective clothing and equipment shall be utilized during all phases of pesticide preparation and application.

3.3 METHODS

3.3.1 All application rates, quantities and procedures shall be in accordance with the manufacturer's label directions for the products utilized, and in accordance with all applicable federal, state and local regulations, and in accordance with HUD 4910.1.

3.3.2 Maximum 1:1 solution label application rates for the intended purpose shall be utilized. Any conflict between EPA and label directions shall be resolved in favor of label.

3.3.3 At time of application surfaces shall be clean and dry. Material shall be kept dry and protected from rain for 48 hours after application.

3.3.4 Before installation of electrical and insulation, treat to 3 feet above slab per LEED requirements at all interior and exterior wood framing, including sill plates and studs, both sides of wood sheathing, pipe and conduit penetrations, bond out openings in slabs at drain traps and similar slab openings, slab surfaces out 2 to 8 inches horizontally from the sill plates. Sill plates shall receive 2 coats, allowing manufacturer’s prescribed time between coats.

3.3.4.1 For LEED Credit SS 5, treatment shall be 3 feet above slab surface.

3.4 FIELD QUALITY CONTROL

3.4.1 Prior to the acceptance of the above specified work, comply with all testing and/or inspections required by the the QC Plan and with the following:

3.4.2 Hold a preparatory meeting with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.4.3 Comply with all codes and procedures applicable to this Section.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Formwork, reinforcement, accessories, cast-in-place concrete, finishing and curing.

1.1.1.1 Vapor barrier, capillary barrier (granular fill base course) under concrete slabs.

1.1.1.2 Pricing Option 1: Submit separate pricing for option indicated. See paragraph 2.3.1.1 for description.

1.1.1.3 Pricing Option 2: Submit separate pricing for option indicated. See paragraph 2.3.9.1 for description.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See LEED Credits SS for additional requirements.

1.2.2.2 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.3 See Section 02361 for termite control.

1.2.4 See Section 16500 for Rebar (Ufer) ground.

1.2.5 See Geotechnical Engineering Report dated August 1, 2007, prepared by Terracon, 5240 Green’s Dairy Road, Raleigh, NC, for existing conditions at site. Follow all applicable recommendations.

1.2.6 Notice to Vendors: This company prefers to purchase concrete with aggregates regionally obtained within 500 miles of the project site. Provide supply source and distance source location is from the project site.

1.3 DEFINITIONS

Capillary Barrier: The granular base course occurring below the slab and vapor barrier, which is in contact with the vapor barrier above and placed on the structural building pad prepared by others.

Sub grade: the structural building pad prepared by others under separate contract.

1.4 SUBMITTALS

1.4.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.4.2 Concrete mix design by an independent commercial laboratory for each class of concrete used on the job shall be submitted to Quality Control (QC) personnel. Included shall be a certified test report by the laboratory of the material to be used including gradation, absorption, soundness, abrasion and deleterious substances to include any materials that are deleteriously reactive with the alkalis in the cement in amounts sufficient to cause excessive expansion. Certify that the mix design was prepared in accordance with the specifications.

1.4.3 Curing Compound technical literature, compatibility with flooring adhesives and flooring materials, application instructions and warranty information.

1.4.5 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits.

1.5 QUALITY ASSURANCE

1.5.1 Construct and erect concrete formwork, reinforcing work and cast-in-place concrete work in accordance with ACI 301 unless specified otherwise in this Section. Concrete shall comply with ACI 318 unless specified otherwise in this Section.

1.5.1.1 Coordinate control joints in concrete work with Section 06100 load bearing framing.

1.5.2 Concrete supplier shall certify that all deliveries comply with the approved mix designs, including gradation of fine and coarse aggregates.

PART 2 PRODUCTS

2.1 FORM MATERIALS

2.1.1 Plywood, metal, metal-framed, aluminum, reinforced fiberglass or plywood faced with smooth face suitable to provide for continuous straight, smooth lines, grades and exposed surfaces.

2.2 REINFORCEMENT MATERIALS

2.2.1 Reinforcing Steel: ASTM A615, 60 yield grade (#3 bars may be grade 40), deformed billet steel bars, plain finish, welded wire fabric or prefabricated steel mats.

2.2.2 Welded Wire Fabric: ASTM A185

2.2.3 Reinforcement Supports: “wire dobies” or other approved chairs.

2.2.4 Wire Ties: Shall be 16 gage or heavier black annealed steel wire.

2.3 CONCRETE MATERIALS

2.3.1 Portland Cement: ASTM C150, Type I or Type II, low alkali (0.6 percent or less).

2.3.1.1 Pricing Option 1: Provide price for portland cement that is extracted, processed and manufactured regionally within 500 miles of the project site.

2.3.2 Fine Aggregate: ASTM C33, obtained from natural sand, locally available materials, in accordance with mix design.

2.3.3 Coarse Aggregate: ASTM C33, locally available materials, in accordance with mix design, 1.0 to 1.5 inch maximum with appropriate gradation specifications. Follow ACI guidelines for use of well graded aggregates.

2.3.4 Aggregate specification may not be modified.

2.3.5 Water: Clear and free from oil, organic materials and other substances deleterious to Portland Cement concrete. Water/cement ratio shall not exceed 0.58.

2.3.6 Mix Design: Shall provide minimum compressive strength of 3,000 p.s.i. at 28 days, maximum slump of 4 inches, +/- 1 inch. Ready-mix concrete shall conform to ASTM C94, as applicable.

2.3.6.1 Adjust mix design, including maximum allowable slump, as recommended by independent commercial laboratory for concrete to be placed during abnormal weather conditions.

2.3.7 Air Entraining Admixture: ASTM C260, to result in 4 percent, plus or minus 1 percent, air.

2.3.8 Flowing Concrete Admixture: ASTM C1017, Type 1 or 2.

2.3.9 Fly Ash: ASTM C618, Class F. Fly ash may be used to replace a portion of the portland cement. The volume of fly ash shall not exceed 30% of the volume of portland cement plus fly ash.

2.3.9.1 Pricing Option 2: Provide price for mandatory use of fly ash at 30% of the volume of cementitious material, instead of the cementitious material included in the base bid. Include with the pricing option, what the cementitious material composition is included in the base bid.

2.3.10 No water shall be added to concrete deliveries after leaving plant.

2.3.11 Shrinking-Compensating cements: ACI 223 guidelines.

2.4 MISCELLANEOUS MATERIALS

2.4.1 Embedded steel used as anchors shall be galvanized. Anchor bolts shall conform to ASTM A307. Sill anchors shall be Simpson MAS, Silver Fast 5, or equal, galvanized. Sill anchors and anchor bolts shall be corrosion-resistant for continuous contact with concrete and CBA-A or CA-B preservative treated lumber. Submit corrosion resistance data.

2.4.2 Expansion Joints: Bituminous type conforming to ASTM D1751 or non-bituminous type conforming to ASTM D1752; 1/2-inch minimum thickness by full width and depth of concrete.

2.4.3 Vapor Barrier: 10 mil thick polyethylene film, type recommended for below grade installation, under unit and garage floor slabs over capillary barrier.

2.4.3.1 Vapor barrier is not required under exterior slabs.

2.4.5 Capillary Barrier: 4-inch layer of clean sand (SW, SP, SC, SM) compacted to 95 percent of the maximum dry density of the material per ASTM D 698, below interior slabs.

2.4.6 Isolation Joints: Between driveway slab and garage slab, at locations where exterior concrete flatwork is contiguous to unit slabs, and between walkway and entry stoop, install a strip of 30# asphalt saturated felt, full depth - except where expansion joints occur.

2.4.7 Curing Compound: ASTM C309, Type 1, liquid membrane type. Curing compound shall be compatible with flooring adhesives and flooring materials.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Subgrade (structural building pad) has been prepared by others under separate contract. It shall be inspected by this contractor for suitability prior to placing forms for concrete. Actus QC personnel shall be notified of any discrepancies noted. Starting the placement of concrete shall be deemed an acceptance of the subgrade and conditions by this contractor.

3.2 PLACEMENT OF CAPILARY BARRIER

3.2.1 Do not place capillary barrier on subgrade that contains frost, mud or is frozen.

3.2 FORMWORK ERECTION

3.2.1 Erect formwork, shoring and bracing to achieve shapes, sizes, lines, dimensions and design requirements with accurate alignment, location, grades, levels, plumbness. Confirm finish floor elevation, utility layout, and locations of all embedded structural items prior to pouring concrete.

3.2.2 Provide bracing to ensure stability of formwork.

3.3 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

3.3.1 Provide openings where required for work to be embedded in and passing through concrete.

3.3.2 Coordinate with work of all other related trades for forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts. Locate and cast all anchor bolts as indicated for attachment of structural components. Where anchor bolts are required that have not been cast into the concrete as indicated, chemical anchors will be furnished and installed under Section 06100, and the cost will be documented for reimbursement from the responsible party failing to install the required anchors, including failing to install in the correct location.

3.3.3 Install concrete accessories straight, level and plumb.

3.4 REINFORCEMENT PLACEMENT

3.4.1 Place reinforcement, supported and secured against displacement. Provide minimum concrete cover of 1-1/2 inches within slabs-on-grade, 3 inches where footing is poured in contact with a soil surface, 2 inches where concrete is exposed to weather, and 1-1/2 inches for other points. Verify rebar UFER electrode placement location.

3.4.2 Support welded wire fabric on chairs. Do not lift welded wire fabric in wet concrete.

3.4.3 Ensure reinforcing is clean, free of loose scale, dirt or other foreign coatings.

3.5 PLACING CONCRETE

3.5.1 Place vapor barrier with care to maintain integrity and continuity of the membrane. Lap edges of vapor barrier 12 inches minimum. Tape vapor barrier at all pipe and conduit penetrations to the pipe or conduit.

3.5.2 Concrete shall not be placed during inclement weather unless appropriate measures are taken to assure the protection of the ultimate strength and finish of the concrete placed. Concrete shall not be placed on frozen substrates. Follow ACI recommendations for placement of concrete during abnormal weather conditions.

3.5.3 Concrete shall be transported and placed in a manner to facilitate rapid placement and avoid segregation or loss of ingredients.

3.5.3 Place concrete continuously between predetermined expansion, control and construction joints.

3.5.4 Screed slabs to a maximum variance of 1/8 inch from the intended true plane when tested with a 10 foot straight edge.

3.5.6 Screed and float exterior concrete slabs to provide positive drainage away from building.

3.5.7 Dispose of all surplus materials and debris at an approved off-post disposal area.

3.6 FORM REMOVAL

3.6.1 Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads. Remove formwork progressively; and in accordance with code requirements.

3.7 FINISHING

3.7.1 Uniformly spread, screed, and float concrete.

3.7.2 Interior slabs shall be finished with steel trowel, by hand or mechanical means, to provide a finish suitable for installation of flooring material or a hard, smooth finish where exposed.

3.7.3 Exterior slabs, stoops and walkways shall be finished with a light non-slip broom finish.

3.7.4 Maintain surface flatness, with maximum variation of 1/8-inch in 10 feet, 1/4-inch in 20 feet and 3/8-inch in 40 feet.

3.7.5 Exposed outside edges of finished concrete slabs shall be rounded to 1/2-inch radius and contact joints or expansion joints shall be rounded to 1/4-inch radius.

3.7.6 Garage floors shall receive a smooth steel trowel finish.

3.7.7 Seal all slab penetrations with one-part polyurethane sealant.

3.7.8 Seal all slab joints, cracks, and other entry points in concrete with acceptable sealant to prevent the entrance of insects for compliance with LEED Credit SS5.

3.8 CURING

3.8.1 Seven (7) day wet mat moist curing or approved curing compound shall be utilized. If curing compound is used, apply in accordance with manufacturer's directions per ACI 301-05. Verify compatibility with flooring adhesives and flooring materials as required by the manufacturers.

3.10 FIELD QUALITY CONTROL

Prior to acceptance of the above specified work, comply with the Actus Quality Control Plan, Contractor Quality Control and Inspection Plan and with the following:

3.10.1 Hold a preparatory meeting with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.10.1.1 Comply with all codes and procedures applicable to this Section.

3.10.1.2 Verify approval of concrete mix and materials conformance with QC personnel.

3.10.1.3 Verify satisfactory placement and alignment of forms with QC personnel.

3.10.1.4 Verify approved disposal site with QC personnel.

3.10.1.5 Verify slump conformance to ACI 301 with tests per ASTM C143 Standard Test Procedures, one per each 150 cubic yards of concrete placed, with a minimum of one test per day, per building.

3.10.1.6 Verify air content with tests per ASTM C 231, one per each 150 cubic yards of concrete placed with a minimum of one test per day.

3.10.1.7 Verify satisfactory completion of work with QC personnel, including concrete finishing, control joints, form removal and clean-up.

3.10.1.8 Testing will be performed by an approved independent commercial laboratory as follows:

3.10.1.9 Concrete cylinders per ASTM C39 Standard Test Procedures, one set of three cylinders per 150 cubic yards placed, with a minimum of one set of three cylinders per day, per building.

3.10.1.10 Test results shall be delivered promptly to the QC personnel.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Wall, floor and roof framing; prefabricated floor and roof trusses; subfloor, wall and roof sheathing; preservative treatment; sill sealer; blocking and backing; wood furring and grounds; fascias; stair stringers.

1.1.2 Visually graded dimension lumber.

1.1.3 Installation of exterior doors and frames, vinyl window frames, access panels, paper and metal flashings, self-adhesive flashings and water-resistive barrier.

1.1.4 Fall arrest anchors.

1.1.5 Pricing Option: Submit separate pricing for option indicated. See paragraph 2.2.1 for description.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01100 for special adaptable housing requirements.

1.2.4 See Section 01352 for LEED requirements and documentation.

1.2.4.1 See LEED Credits SS and MR for additional requirements.

1.2.4.2 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.4.3 Notice to Vendors: This company does not accept tropical wood products. Provide the country of manufacture of each product you expect to supply. Also provide a list of FSC-certified products you can supply.

1.2.4.3.1 This company prefers prefabricated (panelized) wall, roof, and floor components delivered to the site instead of on site framing. Provide details of intended method of construction.

1.2.5 See Section 07200 for air infiltration and insulation requirements.

1.2.6 See Section 10200 for attic vents.

1.2.7 See Appendix A for “Energy Star” construction requirements.

1.2.7 Exposed exterior wood, wood trim, and lumber in contact with the ground or foundation/floor slab shall be pressure treated to deter damage from moisture decay and insect infestation.

1.2.7.1 Moisture content of all 2x lumber shall be 19% maximum. Moisture content of 4x and larger lumber shall be 25% maximum.

1.2.7.2 Laminated veneer lumber may be used. Products shall have National Research Board approval.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 Submit engineered roof and floor truss system shop drawings for approval prior to conctruction. Drawings and calculations shall be signed by a registered Structural Engineer.

1.3.3 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits.

1.4 QUALITY ASSURANCE

1.4.1 Wood panel sheathing shall conform to U.S. Department of Commerce Voluntary Product Standard PS 1-95 for Construction and Industrial Plywood or Voluntary Product Standard PS 2-92 for Wood-Based Structural-Use Panels or APA Performance Standards PRP-108. The standard of compliance, as appropriate, shall be shown on the trademark which shall appear on each panel.

1.4.2 All lumber and wood panels shall be graded and bear the official trademark and grade mark of the manufacturer's association under whose rules the lumber and wood panels have been manufactured and graded. Pressure preservatively treated lumber and wood panels shall bear the quality mark of an approved inspection agency which maintains continuing supervision, testing and inspection over the quality of the product per NCRC 2006.

1.4.3 Coordinate load bearing framing with Section 03300 control joint locations in concrete work.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

2.1.1 Vertical Wall Framing (less than 5-7/8-inches wide): Vertical (load bearing and non-load bearing) wall framing shall be as indicated on Drawings with load bearing walls having single sole and double top plates. Wood may be any species listed in the *National Design Specification for Wood Construction, 2002 edition,* which meets the following values:

(1) Fb (extreme fiber stress in bending): Single member use: 675 psi minimum
Repetitive member use: 775 psi minimum

(2) E (modulus of elasticity): 1,200,000 psi minimum

2.1.2 Structural Framing (Other than vertical wall framing less than 5-7/8-inches wide): Wood may be any species listed in the *National Design Specification for Wood Construction, 2002 edition,* which meets the following values:

(1) Fb (extreme fiber stress in bending): Single member use: 875 psi minimum
Repetitive member use: 1,000 psi minimum

(2) E (modulus of elasticity): 1,600,000 psi minimum

2.1.3 Sills on concrete within 18 inches of the ground shall be pressure treated with water-borne preservatives for above ground use and in accordance with AWPA Standard U1. Where treated lumber is cut, dip or brush-treat exposed ends per AWPA recommendations.

2.1.4 Beams, Headers and Posts: Douglas Fir-Larch or Southern Yellow Pine #2 and better, or as noted on Structural Drawings.

2.1.5 Manufactured Beams: Paralams (PSL), Microlams (LVL) or TimberStrand (LSL) as noted on plans, by TrusJoist Macmillan (iLevel by Weyerhaeuser), or approved equal, complying with ASTM D 5456 and ASTM D 5055.

2.1.6 Blocking, Backing and Bracing: Same as noted for vertical wall framing.

2.1.7 Fascia: Hem Fir #3 or better, dry, or Spruce-Pine-Fir #3 and better, dry (to receive sheet metal cover).

2.1.8 Roof and floor trusses: Wood shall be stress-graded lumber; species, size and grade shall be as required by the fabricator's design and as indicated on the shop drawings. Spacing shall be 24 inches on center.

2.1.8.1 Rafter seat at locations with insulated ceilings shall permit minimum of 5-1/2-inch thick fiberglass insulation between top of wall plate and the underside of the eave ventilation troughs.

2.1.9 Decorative porch column covers: See Section 06455.

2.2 PLYWOOD AND SHEATHING MATERIALS

2.2.1 Pricing Option: Provide price for floor, roof and wall sheathing that complies structurally with the specified standards below, which contain 20% recycled content by weight or volume. 1/4 of the recycled content must be postconsumer. The remainder of the recycled content may be postindustrial (preconsumer). Postindustrial content is counted at one-half the rate of postconsumer content.

2.2.2 Roof: 19/32"APA-rated sheathing, exposure 1, with panel clips, with a span index of 32/16.

2.2.2.1 Radiant Barrier Roof Sheathing shall be foil backed Louisiana Pacific Techshield radiant barrier roof sheathing, 19/32"APA-rated sheathing, exposure 1, with panel clips, with a span index of 32/16, or equal, provide over all insulated attic areas as designated on the drawings.

2.2.3 Floor: 23/32" APA rated Sturd-I-Floor, exposure 1, with a span index of 24 O.C.

2.2.4 Wall Sheathing: 15/32-inch APA rated sheathing, exposure 1.

2.2.5 Plywood Underlayment: DOC PS 1, APA Underlayment, Exposure 1 with fully sanded face, thickness as indicated but not less than 11/32-inch.

2.3 ACCESSORIES

2.3.1 Water-Resistive Barrier: Install over sheathing – refer to section 07200.

2.3.2 Flashing: "Moist-seal" or equal self-adhering bituminous flashing (refer to Section 07200). Product shall be chemically compatible with and shall firmly adhere to abutting surfaces.

2.3.3 Nails and Fasteners: In accordance with NER 272 requirements. Staples shall not be used for the connection of structural components. Coordinate gun nail fasteners with engineer of record.

2.3.3.1 Nails in contact with preservative treated lumber shall be stainless steel or double hot-dipped galvanized per treated lumber manufacturer's recommendations.

2.3.4 Truss Connector Plates: Grade A, galvanized steel.

2.3.5 Rough Carpentry Hardware: Simpson or Silver, galvanized where embedded in concrete.

2.3.6 Glue: Conforming to ASTM C-557 for interior and exterior use.

2.3.7 Ground floor sill plates at all exterior and interior walls separating conditioned spaces from non-conditioned spaces (such as between dwelling unit and garage), walls around mechanical room, and exterior walls of garages shall be set on a bed of continous foam sill sealer or closed cell polyethylene foam gasket.

2.3.8 Fall Arrest Anchors: Super Anchor Safety, RetroFit Anchor, Guardian Fall Protection, Rige-It Anchors, or approved equal for use with ridge ventialtion, arrest anchors complying with OSHA/ANSI standards for fall arrest.

2.3.8.1 Manufacturer of anchor type and design being used shall provide OSHA compliant layout for each building type.

2.3.8.2 Air Barrier Sheathing (behind tubs/showers): Ludlow Coated Products; Energy Brace Sheathing. or approved equal 0.106-inch thick, vapor permeable sheet.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Coordinate with all trades having work related to rough carpentry and obtain their requirements for grounds, backups, openings, blocking and similar work included in this section. Be responsible for all corrections required due to failure to obtain necessary information.

3.1.2 Where anchor bolts are required that have not been cast into the concrete as indicated, chemical anchors will be furnished and installed under Section 06100, and the cost will be documented for reimbursement from the responsible party failing to install the required anchors, including failing to install in the correct location.

3.2 METHODS

3.2.1 Framing, sheathing, joint construction, strapping, nailing and other fastening shall be done in accordance with the drawings and the details and schedules therein. Where construction methods are not indicated, the minimum acceptable practices shall be in accordance with industry standards.

3.2.2 Space plywood sheathing 1/16-inch at panel ends and 1/8 inch at panel edges. See structural drawings for nailing.

3.2.3 Provide solid wood blocking and backing for bath and kitchen accessories, cabinets, window treatments, handicapped adaptability provisions (refer to section 01100 and drawings), storage and closet shelving, stair and railing construction, finish carpentry items, ceiling fans and other accessories.

3.2.4 Where necessary, structural members may be drilled, cut or notched in accordance with structural details and/or applicable building codes. Do not drill, cut or notch posts, beams or trusses without prior approval of the structural engineer.

3.2.5 Roof trusses shall be handled, stored, installed and braced in accordance with the Truss Plate Institute publication, HIB-91, *Handling, Bracing and Installing Metal Plate Connected Wood Trusses*.

3.2.6 Fabricate and install trusses in accordance with the structural drawings and the shop drawings. Top chords shall not be notched for installation of outlookers. Outlookers shall be installed on top of top chord.

3.2.7 Install structural sheathing on exterior walls in accordance with the structural drawings. See structural drawings for nailing.

3.2.8 Window and doors shall be installed per manufacturer's written installation instructions.

3.2.9 Minimize ceiling and wall penetrations.

3.2.10 Install underlayment below second floor sheet vinyl areas.

3.2.11 Maintain continuity of, and avoid damage to water-resistive barrier.

3.2.12 Dispose of all surplus materials and debris at an approved off-post disposal area.

3.2.13 Provide air barrier sheathing behind tubs/showers, attached to the interior face of insulated exterior walls.

3.2.14 Install water resistive barrier in accordance with manufacturer's written instructions. Seal seams, edges, fasteners, and penetrations. Cover sheathing with water-resistant barrier, providing continuous water tight protection behind siding and trim. Maintain continuity of, and avoid damage to water resistive barrier.

3.2.15 Install fall arrest anchors in accordance with manufacturer's installation and location requirements.

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.1 Hold a preparatory meeting with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Review fall arrest layout designed by system manufacturer to comply with OSHA regulations. Verify locations for each building type.

3.3.3 Comply with all codes and procedures applicable to this Section.

3.3.4 Verify approved disposal site with QC personnel.

3.3.5 Verify materials conformance with the QC personnel.

3.3.6 Verify compliance with all procedures applicable to this section as required by the QC personnel.

3.3.7 Verify satisfactory completion of wood preservative treatment with the QC personnel.

3.3.8 Verify satisfactory completion of blocking and backing with the QC personnel.

3.3.9 Verify satisfactory completion of all rough carpentry work and installation procedures with the QC personnel, including job clean-up.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Finish carpentry items, other than shop manufactured cabinets; hardware and attachment accessories.

1.1.2 Installation of interior doors and door units and all finish hardware (supplied under Sections 08210 and 08710).

1.1.3 See Section 01100 for special adaptable housing door hardware requirements.

1.1.4 See Section 07920 for joints and sealer requirements.

1.1.5 See Section 06455 for simulated wood products.

1.1.6 See Section 09900 for field finishing of trim, stair components and shelving.

1.1.7 See Section 12350 for cabinets and countertops.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.3.2 Notice to Vendors: This company does not accept tropical wood products. Provide the country of manufacture of each product you expect to supply. Also provide a list of FSC-certified products you can supply.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

2.1.1 Grading in accordance with West Coast Lumberman's Inspection Bureau or the Southern Pine Inspection Bureau (latest edition) rules for finished grade lumber, with a moisture content not to exceed 19 percent.

2.1.2 Pattern numbers referenced are as indicated in the "WM/SERIES WOOD MOULDING PATTERN" booklet published by the Wood Moulding and Millwork Producers Association.

2.1.2.1 Window Stools and Apron: 3/4-inch paint grade finger joint Ponderosa Pine or MDF, pre-primed, with eased edges. Window stool apron: WM 346 finger-jointed pine or MDF, 5/8 x 2-1/4 inches, factory primed.

2.1.2.2 Wood Base: WM 633 finger-jointed pine or MDF, 7/16-inch x 3-1/4 inch, factory primed.

2.1.2.3 Interior Door Casing: WM346 finger-jointed pine or MDF, 5/8 by 2-1/4 inches, factory primed.

2.1.2.4 Base shoe molding: WM129 required at all kitchen base cabinets and bathroom vanity cabinets where they meet the finish floor. Stain shall match cabinetry color (refer to Section 12350).

2.1.2.5 Shelf Cleats: 1-1/2 inch wide medium density fiberboard or Ponderosa Pine, Engleman Spruce #2, pre-primed.

2.1.2.6 Attic Access Trim: WM346 finger-jointed pine or MDF, 5/8 x 2-1/4 inches, factory primed.

2.1.2.7 Wall Caps and Apron: Finger-jointed paint grade Ponderosa Pine or MDF caps at half walls, pre-primed. Wall cap aprons: WM346 finger-jointed pine or MDF, 5/8 x 2-1/4 inches, factory primed.

2.1.2.8 Stair Handrails: Standard 1-1/4 inch by 1-1/2 inch stain grade hardwood handrail, no splices, with standard duty brackets. Ends shall be returned to wall or shall terminate in newell posts or safety terminals. Stain hardwood handrails to match flooring color.

2.1.2.9 Stair Treads: 1-inch thick MDF, round nosing, one-piece full width and depth of tread.

2.1.2.9.1 Risers: 5/8-inch thick plywood. Option: 3/4-inch thick Ponderosa Pine or Engleman Spruce #2.

2.2 SHELVING

2.2.1 Wire Shelving: ClosetMaid or approved equal, vinyl-coated wire shelving. Depth of shelving and numbers of shelves as indicated on drawings. Screw attach all end and intermediate supports, spaced not to exceed manufacturer's recommendations, to framing members or provide solid blocking in wall. Cover exposed shelf ends (outside corners and exposed ends that are not against a wall) with end caps. Provide support brackets, spaced not greater than 36-inches on-center, located at studs.

2.2.1.1 Bedroom Closets and Entry Coat Closets: Vinyl-coated clothes rods integral with vinyl-coated wire shelving. Use ClosetMaid "Shelf & Rod" style or approved equal. Provide closet organizer shelving system at Bedrooms as indicated on drawings.

2.2.1.1.1 Linen Closets: Use ClosetMaid "Linen" style or approved equal.

2.2.1.2 Interior and Exterior Bulk Storage Areas: Heavy duty vinyl-coated wire shelving shall be capable of supporting a load of not less that 50 pounds per linear foot with not more than 1/2-inch deflection at mid-span. Provide supports not more than 24 inches on center.

2.2.3 Shelving Accessories: Provide brackets within 4-inches of each end of shelf, and equally spaced along length of shelf, with a maximum spacing of 24-inches on center. Provide shelf brackets to match depth of shelf. Provide screw attachment of brackets to wood studs or blocking.

2.3.3.1 Shelving Option: Exterior Bulk Storage; Provide 3/4-inch thick medium density fiberboard with uniformly eased edges to receive paint under Section 09900, or 3/4-inch thick medium density fiberboard with melamine finish on all faces and PVC edgeband all edges(includes ends and both edges). Shelving shall be one piece, full length of shelf for lengths 8 feet or less.

2.3 EXTERIOR VINYL PORCH ENTRY RAILING

2.3.1 Extruded PVC top rail cap with metal rail reinforcement; solid extruded PVC balusters, 1-3/16-inch square, spaced at 5-3/16 inches on center. Provide "Quick-Go Rail Brackets" to attach top and bottom rails to columns and walls.

2.3.1.1 Railing shall be capable of supporting horizontal loads as follows:

2.3.1.1.1 Top Rail: 200 pounds at mid-span or at the ends.

2.3.1.1.2 Top Rail: 50 pounds per linear foot uniformly distributed along the entire length.

2.3.1.1.3 Infill (balusters): 50 pounds per square foot, at any single 1-square-foot area.

2.3.1.2 Railing shall be as manufactured by Outdoor Technologies, Inc., Heritage Vinyl Products, Traditional, or equal, with square balusters.

2.4 LATTICE

2.4.1 Vinyl Lattice: Everlast Outdoor Products, Privacy Square Style, 1-3/4 inch square opening, heavy duty, impact resistant plastic. Provide aluminum or stainless steel fasteners, head color to match lattice.

2.5 ACCESSORIES

2.5.1 Fasteners: Size and type to suit application and not used in a manner beyond their rated capacity; galvanized where exposed to the exterior.

2.5.2 Interior Handrail Brackets: Ives, No. BP59 26D finish, furnished complete with all required fasteners. Spacing as required to support not less than 200 pounds at any point along the handrail.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Substrates shall be inspected for suitability to receive finish carpentry and hardware work. The QC personnel shall be notified of any discrepancies noted.

3.1.2 Coordinate blocking size and locations to receive finish carpentry items.

3.2 INSTALLATION

3.2.1 Protect all materials stored on site from weather and physical damage.

3.2.2 Install all finish carpentry in accordance with the best practices of the trade; correctly manufactured, cut and fitted; free from tool marks, rough grain or other surface defects. Countersink all nails, staples or other fasteners and make joints smooth for finishing.

3.2.3 Install all trim with mitered exterior corners and tight joints.

3.2.4 Install doors, door frames and finish hardware in accordance with manufacturers instructions and templates to assure proper fit and operation. Test locks and latches for proper operation.

3.2.5 Undercut doors 3/4-inch to clear floor coverings used, unless directed otherwise by D/B Contractor.

3.2.6 Dispose of all surplus materials and debris at an off-post disposal area as specified in Division 1.

3.2.7 Provide clear sealant between wood base and finish floor in all wet areas.

3.2.8 Where kitchen base cabinets and bathroom vanities are to be removable or replaceable as indicated in Drawings to provide for “adaptability” (refer to section 01100), flooring will extend to wall under those cabinet sections. Install wood base in this area under cabinets; install shoe molding along surface of adjacent cabinetry that will remain after removal of cabinet sections.

3.2.9 Install lattice in maximum sizes possible, full width and height of opening. Size panels to permit expansion and contraction. Frame shall be provided snug but loosely enough to hold lattice in place and permit expansion and contraction of lattice without restraint that could cause buckling.

3.3 FINISH HARDWARE INSTALLATION

3.3.1 Install hardware and specialties in accordance with manufacturer's directions.

3.3.2 Use templates provided by hardware item manufacturer.

3.3.3 Adjust and refit hardware as required for proper operation.

3.4 FIELD QUALITY CONTROL

3.4.1 Prior to acceptance of the above specified work, comply with the Actus QC Plan, Contractor QC and Inspection Plan and with the following:

3.4.2 Hold a preparatory meeting with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.4.3 Comply with all codes and procedures applicable to this Section.

3.4.4 Verify approved disposal site with QC personnel.

3.4.4.1 Verify satisfactory completion of work with QC personnel, including materials conformance, installation procedures and operation of all finish hardware.

END OF SECTION

SECTION 06455

SIMULATED WOOD TRIM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 Simulated wood trim for exterior conditions.

1.2.3 Related Sections include the following:

1.2.3.1 See Section 01352 for LEED requirements and documentation.

1.2.3.1.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.3.2 Division 6 Section “Rough Carpentry”

1.2.3.3 Division 7 Section “Sealants”

1.2.3.4 Division 9 Section “Painting”

1.3 SUBMITTALS

1.3.1 General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

1.3.2 Product Data: Submit product data for specified products.

1.3.2.1 Submit product data for fasteners and adhesives.

1.4 QUALITY ASSURANCE

1.4.1 Regulatory Requirements: Local Building Code for installation requirements.

1.4.2 Allowable Tolerances:

1.4.2.1 Variation in component width: ± 1/16 inch

1.4.2.2 Variation in component thickness: ± 1/16 inch

1.4.2.3 Variation in component edge cut: ± 2 degrees

1.4.2.4 Variation in Density: –0 percent + 10 percent

1.4.3 Workmanship, Finish, and Appearance:

1.4.3.1 Cellular PVC shall be homogeneous and free of voids, holes, cracks, and foreign inclusions, or other defects. Edges must be square, and top and bottom surfaces shall be flat with no convex or concave deviation.

1.4.3.2 Uniform surface free from cupping, warping, and twisting.

1.5 DELIVERY, STORAGE AND HANDLING

1.5.1 Trim materials should be stored on a flat and level surface on a full shipping pallet.

1.5.2 Handle materials to prevent damage to product edges and corners. Store materials under a protective covering to prevent dirt and construction site residue from collecting on the boards.

1.6 WARRANTY

1.6.1 Provide manufacturer's 20-year warranty against defects in manufacturing that cause the products to rot, corrode, blister, peel, delaminate, or excessively swell from moisture. The warranty will not apply to paint coatings or sealants.

PART 2 PRODUCTS

2.1 SYNTHETIC TRIM

2.1.1 Acceptable products:

2.1.1.1 AZEK™ manufactured by Vycom Corporation.

2.1.1.2 Koma Trimboards, by Kommerling.

2.1.1.3 "Perma-TrimBoards" by Edge Building Products, Inc.

2.1.1.4 "Synboard" by Synboard America

2.1.2 Material: Expanded rigid polyvinyl chloride material with a small-cell microstructure. The skin shall be smooth and hard on 4 surfaces.

2.2 Column Wrap (At front porches)

2.2.1 ColumnWRAP, by Advanced TrimWright, Inc., or equal. Square or Custom Raised Panel as indicated on drawings

2.3 ACCESSORY PRODUCTS

2.3.1 Fasteners for Exterior Finish Carpentry: Provide nails or screws of the following materials, in sufficient length to penetrate minimum of 1-1/2 inches into substrate, unless otherwise recommended by manufacturer:

2.3.1.1 Stainless steel.

2.3.1.2 Hot-dip galvanized steel.

2.3.1.3 Aluminum.

2.3.2 Adhesives:

2.3.2.1 Bonding Cellular PVC to Cellular PVC: Adhesive systems used for rigid PVC. Type as recommended by the cellular PVC manufacturer for the application.

2.3.2.1.1 Adhesive and Filler: Bond & Fill, Advances TrimWorks, Inc., 877-822-7745 or approved equal.

2.3.2.2 Bonding Cellular PVC to Various Substrates: Type as recommended by the cellular PVC manufacturer for the application. Use contact cement, epoxy, rubber based and urethane adhesives as appropriate for the application and substrate. Test each adhesive for suitability for the proposed application.

2.3.3 Sealants: Urethane, polyurethane or acrylic based sealants without silicone.

2.4 FINISH

2.4.1 Preparation: Fill nail holes with a polyurethane or acrylic based sealant.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Do not use manufactured units with defective surfaces, sizes, or patterns.

3.1.2 Manufacturer's Instructions: Comply with manufacturers product catalog installation instructions and product technical bulletin instructions.

3.1.3 Trim: install with minimum number of joints practical, using full-length pieces from maximum lengths of material available. Do not use pieces less than 24 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. End-to-end joints shall be glued. Place ripped edges up to be hidden by flashings, or place cut edge against adjacent material to hide to the maximum extent possible.

3.1.3.1 Trim longer than 18 feet shall be installed with a 1/8-inch gap per 18 foot length, allowing for expansion and contraction. Shiplap ends of trim to eliminate open through-joint to substrate.

3.1.3.2 Decorative Column Wrap and Beam: To be installed around structural posts, per manufacturers instructions. Shim all sides to prevent displacement of column wrap.

3.1.3.3 Fit exterior joints to exclude water.

3.1.3.4 Fastening: Exterior simulated wood trim products shall be installed with stainless steel or hot-dip galvanized fasteners, spaced as recommended by manufacturer. Do not fasten trim within 3/8-inch of product edge. Prevent over-tightening or overdriving of fasteners. Fill fastener holes with specified bond and fill material; do not smear onto face. After bond and fill material dries, sand surface smooth. Allow bond and fill material to cure 24 hours before application of paint.

3.1.4 Linear Thermal Expansion and Contraction: Allow for 1/8-inch movement for each 18-foot long board.

END OF SECTION

SECTION 07200

BUILDING INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Thermal insulation above the slab level, acoustical insulation, ventilation baffles, moisture protection, and water-resistive barrier, including foam crack and gap filler.

1.1.2 Pricing Option 1: Submit separate pricing for option indicated. See paragraph 2.1.2.5 for description.

1.1.3 Pricing Option 2: Submit separate pricing for option indicated. See paragraph 2.1.2.6 for description.

1.1.4 Pricing Option 3: Submit separate pricing for option indicated. See paragraph 2.1.2.7 for description.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See LEED Credits SS, EA, and IEQ for additional requirements.

1.2.3.2 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.4 See Section 07840 for fire stopping.

1.2.5 See Appendix A for Energy Star construction requirements.

1.2.6 Notice to Vendors: This company prefers regionally obtained material manufacturered within 500 miles of the project site. Provide product source and distance source location is from the project site.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.1 Tests for airborne sound shall be in compliance with ASTM E336 and in compliance with ASTM E1007 for impact sound.

1.3.2 Water-Resistive Barrier: Manufacturer’s field inspection reports of installed barrier system.

1.3.3 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits.

1.4 QUALITY ASSURANCE

1.4.1 Water-Resistive Barrier: Manufacturer of water resistive barrier shall provide field installation training for proper installation of barrier, including tapes, flashing, terminations, and openings.

1.4.1.1 Water-Resistive Barrier Inspection: Manufacturer of water-resistive barrier shall provide an initial site visit upon completion of the first 3 units after the training. Manufacturer shall provide an inspection report of the initial site visit.

1.4.1.2 Manufacturer of water-resistive barrier shall provide random periodic site visits and inspection reports for not less than 10 percent of the constructed units, uniformly spread out over the construction schedule. Manufacturer shall provide an inspection report of the site visits.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Thermal insulation shall have a flame-spread rating of 25 or less and a smoke-development rating of 50 or less, when tested in accordance with ASTM E84. Fiberglass insulation shall be manufactured with partial recycled glass content.

2.1.2 Building Thermal Insulation:

2.1.2.1 Exterior Walls and Walls Between Garage and Living Space: R-19 unfaced batts at habitable spaces, equal to Owens Corning Thermal Batt Insulation.

2.1.2.2 Party Walls: 3 ½" unfaced acoustic batts, equal to Owens Corning Acoustic Batt Insulation.

2.1.2.3 Attics Above Conditioned Spaces (insulation is not required in attics above non-conditioned spaces): R-30 unfaced fiberglass batts or R-30 blown-in.

2.1.2.4 Pricing Option 1: Provide price for fiberglass insulation which contain 20% recycled content by weight or volume. 1/4 of the recycled content must be postconsumer. The remainder of the recycled content may be postindustrial (preconsumer). Postindustrial content is counted at one-half the rate of postconsumer content.

2.1.2.5 Pricing Option 2: Provide price for fiberglass insulation complying with California Department of Health "Standard Practice for Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers" including 2004 Addenda.

2.1.2.6 Pricing Option 3: Provide price for fiberglass insulation extracted, processed and manufactured regionally within 500 miles of the project site

2.1.3 Fire-Resistance-Rated Assemblies: Comply with insulation requirements of listed design standard.

2.1.4 Acoustic or Sound Insulation: Owens-Corning Fiberglass, 3-1/2 inch unfaced fiberglass batts, or approved equal

2.1.5 Eave Ventilation Troughs ("insulation baffles"): Preformed, rigid fiberboard, polystyrene, or plastic sheets designed and sized to fit between roof framing members to avoid having insulation block cross-ventilation between vented eave systems and attic spaces.

2.1.6 Water-Resistive Barrier: Typar HouseWrap, spunbonded polypropylene weather membrane with a microporous coating, non-woven, nonperforated, shall be provided over all exterior wall sheathing**.**

2.1.6.1 Building Wrap Tape: Typar Construction Tape.

2.1.6.2 Bituminous Flashing Tape: Typar Peel & Stick Flashing.

2.1.6.3 Fasteners: Plastic capped nails or plastic cap staples.

2.1.7 Polyurethane Foam (minimal-expansive):

2.1.7.1 Single-or two-component UL-classified sealant, to insulate, seal, fill, and stop air infiltration. Meet ASTM E-84. Shall not expand to the point to cause pressure on window and door jambs.

2.1.7.1.1 Density: 1.2 pounds per cubic foot. R-value not less than 4.0 per inch of thickness.

2.1.7.1.2 Flame spread - 25; Smoke developed - 50.

2.1.7.2 Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following manufacturers:

2.1.7.2.1 Insta-Foam Products Inc., 1500 Cedarwood Drive, Joliet, IL 60435, (800) 800-FOAM

2.1.7.2.2 Fomo Products Inc., 2775 Barber Rd., Norton, OH 44203, (800) 321-5585.

2.1.7.2.3 Convenience Products, 866 Horan Drive, Fenton, MO 63026, (800) 325-6180.

2.1.8 Header Insulation: Expanded polystyrene insulation board, ASTM C578 Type I ot Type VIII, minimum R-value of 3.6 per inch, thicknesses as required to fill cavity, cut to fit full width, depth and height of header framing.

PART 3 EXECUTION

3.1 METHODS

3.1.1 All insulation shall be stored under cover in a well ventilated and dry space upon delivery. Every precaution shall be taken to avoid damage while stored on site. Replace insulation damaged due to improper handling or storage.

3.1.2 Insulation shall be installed in accordance with manufacturer's directions. Hold insulation at horizontal applications, tight to underside of floor sheathing, secured in place with insulation support wires.

3.1.3 Insulation shall be installed to assure a continuous seal and prevent air infiltration. Pack insulation tight around ducts, pipes and conduits where they penetrate insulation within attic spaces. Seal penetrations to prevent air infiltration. Install insulation in stud cavities, compressed full height, preventing settlement and sliding down in cavity from vibration during siding and wallboard insulation that would result in a gap between insulation and top plate.

3.1.4 Fire Blocking: Mineral wool or glass fiber.

3.1.5 Insulation shall be installed in floor space between conditioned spaces occurring above unconditioned spaces.

3.1.6 Install insulation baffles per manufacturer's directions.

3.1.7 At attic access panels, glue batt insulation to attic side of access panels.

3.1.8 Provide acoustic insulation at interior walls as indicated on drawings.

3.2 AIR INFILTRATION

3.2.1 To limit air infiltration, buildings will be sealed with sealant and self-adhering flexible flashing, installed in accordance with the manufacturer’s recommendations. The building envelope shall be caulked, gasketed, weather-stripped or otherwise sealed around window and door frames, at utility penetrations through walls, floors, and roofs, and at any other exterior envelope joint that may be a source of air leakage.

3.2.2 To minimize air infiltration, the following joints and gaps in the building envelope shall be foamed-in, caulked, gasketed, weather-stripped, or otherwise permanently sealed:

3.2.2.1 Around window and door frames; use minimal-expanding foam with low pressure and expansion properties to prevent bowing of frames.

3.2.2.2 If wall panels are used, all panel joints shall be caulked or foamed.

3.2.2.3 At access doors/panels in walls or ceilings between conditioned and unconditioned space.

3.2.2.4 At all pipe, conduit, or other utility penetrations from the interior to the exterior of the building envelope, including at party walls, at ceilings below attics and at garage ceilings below occupied spaces.

3.2.2.5 Sill plates at exterior walls and at interior walls forming the thermal envelope of the building, penetrations through sill or top plates, butt joints in sill and top plates, and joints in the corners of sill and top plates.

3.2.2.6 Penetrations (i.e. pipes, wiring, ducts etc.) through walls and ceilings between conditioned and unconditioned spaces, and at party walls.

3.2.3 Electrical boxes at exterior walls and party walls shall be sealed around the perimeter between the wall board and the box and all holes or penetrations into the box from the wall cavity and ceilings below attics.

3.2.4 Install water-resistive barrier in accordance with manufacturer's installation instructions. Starting from low to high in shingle fashion to shed water, overlapping edges and ends 6 inches. Attach with plastic washers and non-corrosive fasteners to permanently hold in place. Seal end and side laps with seam tape. Lap building wrap over metal flashings and seal with continuous seam tape to form a watertight barrier. Materials shall not be left exposed for longer than 4 months. Seal top and bottom end terminations, setting building wrap in continuous bead of non-silicone based acoustical sealant.

3.2.4.1 Cut water-resistive barrier and wrap around jambs and head of window and door openings approximately 3 inches. Pan bituminous flashing tape at window sills, turning flashing tape down over exterior 3 inches, running material back across sill, turning up on back side (interior side) of window sill flashing, and turned up at ends to form end dams. Tape or flash all seams and flanges securely to be water tight. Window and door penetrations shall be flashed and sealed per ASTM E 2112 and manufacturer's instructions.

3.3 FIELD QUALITY CONTROL

3.3.1 Prior to the acceptance of the above specified work, comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.2 Hold a preparatory meeting with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.3 Comply with all codes and procedures applicable to this Section.

3.3.4 Water-resistive barrier manufacturer shall meet with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative during each periodic water-resistive barrier installation inspection visit.

3.3.5 Verify approved disposal site with QC personnel.

3.3.6 Verify materials conformance with the QC personnel.

3.3.7 Verify satisfactory completion of installation with the QC personnel, including insulation at utility penetrations and depression of insulation at roof eave vents.

3.3.8 See Appendix A, Energy Star Construction Guidelines, for testing requirements.

END OF SECTION

SECTION 07311

ASPHALT SHINGLES

PART I GENERAL

1.1 SECTION INCLUDES

1.1.1 Glass fiber shingles with underlayment, valley and protective flashings.

1.1.2 See Section 07411 for metal roof panels.

1.1.3 See Section 07600 for sheet metal items.

1.1.4 See Section 07710 for gutters, downspouts and fascia covers.

1.1.5 See Section 09900 for painting of sheet metal items.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer’s data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer’s data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable.

1.3.2 Submit color samples of each color selected.

PART 2 PRODUCTS

2.1 ROOFING MATERIALS

2.1.1 Shingles: Asphalt Fiberglass Shingles, CertainTeed Landmark 30 AR algae-resistant, or equal. Conforming to ASTM D 3018 Type I –Self Sealing; UL Certification of ASTM D 3462 and exceeds Federal Spec. SS-001534.

2.1.2 Underlayment: No. 15 unperforated asphalt saturated felt, ASTM D226 Type 1, or as recommended by the roofing manufacturer.

2.1.4 Drip Edges: Fabricate from minimum .019 inch thick prefinished aluminum sheet metal in lengths not exceeding 10 feet with 2-inch roof deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

2.1.4.1 Provide aluminum nails with aluminum sheet metal.

2.1.4.2 Drip edge sheet metal shall be pre-finished to match gutters and down spouts.

2.1.5 Fasteners: 12 gage aluminum or hot dipped galvanized nails with 3/8-inch minimum flat head size or 16 gage galvanized staples with 1-inch crown, .062-inch width and 1-1/4-inch length. Fasteners shall be compatible with flashing.

2.1.6 Vent Pipe Flashings: Refer to Section 15400 – Plumbing.

2.1.7 Valley Flashing: One layer 55 pound smooth surface roll roofing, 36 inches wide, used with closed or woven strip shingle valley treatment, each strip to extend at least 12 inches beyond center of valley.

2.1.8 Ridge Vents: Roof ventilation shall be Lomanco "Lo-OmniRoll" LOR-30 rigid ridge vent with external deflector baffles, or equal 11 square inches of free area per lineal foot. 30-year manufacturer's warranty.

2.1.9 Rooftop Vents: Factory-painted aluminum roof-top attic vent, 60 square inches of free area. Equal to Lomanco Model 600. Color to be selected from manufacturer's standard colors.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Inspect roof substrates for acceptance of sheathing, nailing, roof penetrations, flashings, and weather sealing prior to installation of roof.

3.2 METHODS

3.2.1 Installation of underlayment and roofing shingles shall be in accordance with manufacturer's directions and comply with the North Carolina Residential Building Code. Storm nail with 6 nails per shingle. Lap felts minimum 6 inches on both sides of all hips and ridges and extend a minimum of 6 inches up the sides of all adjacent walls. Provide double layer of underlayment on roofs and crickets with a slope of 4/12 or less per North Carolina Building Code, NC R905.2.7.

3.2.2 Installation of drip edge sheet metal shall be as follows: at eaves, drip metal shall be attached to roof sheathing and shall occur beneath underlayment; at rakes, drip metal shall be attached on top of underlayment.

3.2.3 Coordinate flashing of all pipe penetrations with plumbing subcontractor. Seal all joints with mastic.

3.2.4 Dispose of all refuse in accordance with applicable regulations and laws at an approved off-station site as specified in Division 1.

3.3 FIELD QUALITY CONTROL

A manufacturer's representative shall instruct the installer of the shingles, appurtenances, and accessories as to the manufacturer's required installation procedures. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Testing Plan and with the following:

3.3.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site with QC personnel.

3.3.4 Materials specified herein shall be delivered in unbroken packages with the manufacturer's name and materials type listed on each package for verification of material conformance with QC personnel.

3.3.5 Verify satisfactory completion of all work with the QC personnel, including underlayment, flashing, joint sealing, and job clean-up.

END OF SECTION

SECTION 07411

METAL ROOF PANELS

PART I GENERAL

1.1 SECTION INCLUDES

1.1.1 Exposed-fastener, lap-seam metal roof panels and trim.

1.1.2 See Section 07710 for gutters, downspouts and fascia covers.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer’s data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer’s data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable.

1.3.2 Submit fastening requirements to demonstrate compliance with building code wind load requirements.

PART 2 PRODUCTS

2.1 MANUFACTURER

2.1.1 McElroy Metal, Inc. 5-V Crimp, Union Corrugating Company 5-V or equal.

2.2 MATERIALS

2.1.1 Roof Panel: 26 gage steel with Galvalume Plus aluminum-zinc alloy coating complying with ASTM A792 and clear acrylic top-coat. Panels shall be one piece, full length of run from ridge to eave. Lap joints not permitted.

2.1.2 Metal Flashing: Same material, gage and finish as roofing. Provide roof edge eave and rake trim, preformed valleys, and transition flashing with hemmed edge. Provide gutter at front porch eave, same material, gage, and finish as roofing. Coordinate with Section 07710.

2.1.3 Miscellaneous Accessories: Provide closure strip to seal off between ridge transition flashing and panel. Provide 3/8 inch wide butyl caulk tape for side lap sealing.

2.1.4 Underlayment: No. 30 unperforated asphalt saturated felt, ASTM D226 Type II, or as recommended by the roofing manufacturer.

2.1.5 Panel Fasteners: Non-corrosive self-tapping screws and other suitable fasteners designed to withstand wind loads. Provide exposed fasteners with heads matching color and finish of metal roof panels. Provide fasteners with sealing washers.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Inspect roof substrates for acceptance of sheathing for roofing attachment.

3.1.2 Substrate shall be clean, smooth, free of sharp edges, loose debris.

3.2 INSTALLATION

3.2.1 Installation of roofing, flashing and accessories shall be in accordance with manufacturer's installation requirements. Fastening of panels shall resist wind uplift in compliance with North Carolina Building Code and roofing manufacturer's requirements.

3.2.2 Felt Underlayment: Install over entire roof in shingle fashion to shed water, with side lapped joints of not less than 2 inches and end laps of not less than 6 inches. Turn underlayment up walls 8 inches minimum.

3.2.3 Provide roof edge sheet metal trim at roof eaves.

3.2.4 Apply panels and associated items for neat and permanent weather tight installation. Place cut ends at peak, and conceal with termination flashing.

3.2.5 Apply continuous butyl caulk tape at all side laps. Place tape at location required by manufacturer so siphon channel is not blocked. Seal panels at valleys and panel ends as needed to make panels weatherproof to driving rains.

3.2.6 Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without damage of washer or screw. Do not dimple panels.

3.2.7 Apply matching rake trim, with continuous butyl caulk tape at side laps to resist wind uplift.

3.2.8 Install closure strip and butyl sealant to seal off between ridge transition flashing and panel.

3.2.9 Dispose of all refuse in accordance with Division 1 requirements.

3.3 FIELD QUALITY CONTROL

A manufacturer's representative shall instruct the installer of the roof panels and accessories as to the manufacturer's required installation procedures. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Testing Plan and with the following:

3.3.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site with QC personnel.

3.3.4 Materials specified herein shall be delivered in unbroken packages with the manufacturer's name and materials type listed on each package for verification of material conformance with QC personnel.

3.3.5 Verify satisfactory completion of all work with the QC personnel, including underlayment, roof panels, flashing, trim, joint sealing, and job clean-up.

END OF SECTION

SECTION 07460

VINYL SIDING, SOFFITS AND TRIM

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Vinyl siding, soffit panels and trim.

1.1.2 See Section 06100 for exterior wall sheathing.

1.1.3 See Section 06455 for simulated wood decorative column covers.

1.1.4 See Section 07200 for water-resistive barrier.

1.1.5 See Section 07710 for aluminum gutters, downspouts and fascia covers.

1.1.6 See Section 08390 for screen doors and patio screening system.

1.1.7 See Section 10001 for exterior window shutters.

1.1.8 See Section 06200 for vinyl porch entry railings.

1.1.9 See Section 10200 for attic vents.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer’s data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer’s data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable.

1.3.1.1 Submit nailing requirements to demonstrate 130 mph wind load design.

1.3.2 Submit color samples of each color selected.

PART 2 PRODUCTS

2.1 Vinyl Siding and Trim: Norandex, "Great Barrier" Vinyl Siding, or equal, 0.044-inch thickness, inside and outside corner posts, integral "J" mold, lineal trim, crown molding, all moldings, accessories, metal starter strip, miscellaneous trim and flashings as indicated or required for a complete installation. Comply with ASTM D 3679, Class 2, E84 five test rating.

2.1.1 Double 4-inch Clapboard, rough cedar finish.

2.1.2 Colors to be submitted and approved by the D/B Contractor and Project Company prior to ordering and installation.

2.2 Vinyl Soffit Panels: Norandex, Triple 4" fully vented soffit panels or approved equal, triple four-inch width, 0.040-inch thickness, perforated for attic ventilation. Perforated soffit panels shall provide a minimum of 5.7 square inches of net free ventilating area per square foot, for attic ventilation.

2.3 Board and Batten Vertical Siding: Norandex "Board & Batten", or equal, white, 0.044-inch thickness, inside and outside corner posts integral "J" mold, all moldings, accessories, metal starter strip, miscellaneous trim and flashings as indicated or required for a complete installation. Comply with ASTM D 3679, Class 2, E84 five test rating.

2.4 Accessories: Mid-America "MountMaster – Slimline" accessories, or approved equal, light mounts, hose bibb mounts, rail mounts, receptacles, dryer vents and miscellaneous trim and flashings as indicated, shall be consistent with the shape, color, size and properties of the siding and/or soffits.

2.5 Fasteners: Corrosion-resistant nails and other fasteners in accordance with manufacturer's instructions.

2.6 Caulk/Sealant: As recommended by siding manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Verify proper conditions and substrates for installation of siding.

3.2 METHODS

3.2.1 Installation and workmanship in accordance with manufacturer's written instructions, providing 130 mph wind resistant installation.

3.2.1.1 Vinyl Trim (J-trim, Lineals - all widths, Corners) - All trim shall be attached to nailable sheathing (minimum 7/16-inch thick OSB) or solid wood blocking/studs, 3/8-inch headed nails spaced 8-inches to 10-inches max full length of trim. Provide undersill and J-trim to conceal all cut edges and ends. Install starter strip to allow bottom edge of siding to be below the bottom edge of the wall sheathing to conceal from view.

3.2.1.2 Siding: Nail to studs spaced 24-inches on center maximum with 3/8-inch headed nails. Nails shall go through sheathing and penetrate stud 1-1/4-inches minimum. Each end shall be nailed in the closest accessible full slot against trim into nailable sheathing or solid wood blocking/studs. Each siding lap joint shall be nailed each side of joint into a stud, nailable sheathing or solid wood blocking. Do not nail siding too tight or too loose per manufacturer's requirements, allowing unrestricted expansion and contraction. Siding and trim shall be installed plumb and level, providing a neat, straight, uniform appearance, free of buckles and bulges.

3.2.1.3 Vinyl Soffits: Soffits 12-inches and less in width, attached with an f-channel on the wall, with soffit concealed nailed into the underside of fascia board. Soffits greater than 12-inches, provide an intermediate nailer 12-inches on center to attach the soffit panel.

3.2.2 A manufacturer's representative shall instruct the installer of the siding, appurtenances, and accessories as to the manufacturer's required installation procedures. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

3.2.3 Provide for expansion and contraction of all members installed under this Section.

3.2.4 Install caulk/sealant in manner and locations as recommended by siding manufacturer. Unless otherwise recommended by manufacturer, install caulk/sealant only at obstructions such as water faucets.

3.3 FIELD QUALITY CONTROL

3.3.1 Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Testing Plan and with the following:

3.3.2 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance. Review blocking and sheathing for attachment of siding and trim.

3.3.3 Comply with all codes and procedures applicable to this Section.

3.3.4 Verify approved disposal site with QC personnel.

END OF SECTION

SECTION 07600

SHEET METAL AND ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Sheet metal flashings and counter-flashings.

1.1.2 See Section 07311 for roof drip edge metal.

1.1.3 See Section 07710 for gutters, downspouts and fascia covers.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 "Construction Waste Management" for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this section. Where manufacturer's data is not available, affidavits and certificates of compliance, which state that all products and materials comply with these specifications will be acceptable.

PART 2 PRODUCTS

2.1 SHEET METALS

2.1.1 Aluminum Sheet: ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:

2.1.1.1 Siliconized-Polyester Coating: Primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.

2.1.1.1.1 Color: As selected by D/B contractor from manufacturer's full range.

2.1.1.1.1.1 Drip Edge, Flashing and Trim – General Use: White as selected from manufacturer's range of white hues.

2.1.1.1.1.2 Apron, Step and Rain Diverter Flashing: Dark color selected to blend with shingle color.

2.2 FLASHING

2.2.1. Exposed Flashings: .019-inch

2.2.2 Roof to Wall Step Flashings: .019-inch (7 by 8 inch)

2.2.3 Roof Edge Metal and Other Flashings: Aluminum .019-inch (roof edge)

2.2.4 Vent Flashings: Aluminum (0.019-inch) with neoprene membrane collar

2.2.7 Nails and fittings to match sheet metal materials.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Verify proper conditions and substrates for installation of Sheet Metal Work.

3.2 METHODS

3.2.1 Installation and workmanship shall be performed in accordance with manufacturer's directions.

3.2.2 Flashing and nailing performed in manner to eliminate leakage.

3.2.3 Install flashing at the junction of roofs with vertical surfaces and at all points as shown or necessary to make the work watertight. Install flashing as roofing work proceeds. Flashing shall extend a minimum of 4 inches up wall and extend a minimum of 4 inches on to roofing, or as detailed. Provide a minimum 3-inch head lap where one piece flashing is not used.

3.2.4 Provide for expansion and contraction in completed work.

3.2.5 Do not allow aluminum flashing to come in contact with preservative treated lumber. Provide isolation self-adhering membrane material or similar as required.

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above-specified work, the Contractor shall comply with the Actus QC Plan, Contractor QC and Testing Plan and with the following:

3.3.1 A preparatory meeting shall be held with the Actus QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes, regulations and procedures applicable to this section.

3.3.3 Verify approved disposal site with QC personnel.

3.3.4 Verify materials conformance with QC personnel.

3.3.5 Verify satisfactory installation with the QC personnel, including fastening and joint sealing.

END OF SECTION

SECTION 07710

GUTTERS, DOWNSPOUTS AND FASCIA COVERS

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Prefinished coated aluminum gutters, downspouts and fascia covers.

1.1.2 Gutter at front porch eave to match metal roof panels.

1.1.3 Precast concrete splash blocks.

1.1.4 See Section 07460 for vinyl siding, soffits and trim.

1.1.5 Metal or plastic splash deflectors (for downspouts spilling onto lower roofs).

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 Submit color samples of each color selected.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Gutters and Downspouts: equal to Berger Bros. Co. “5K” Style Gutter, 5-inch width, 3-5/8-inch depth, prefinished baked polyester or acrylic emulsion coated continuous aluminum sheet metal not less than 27 gauge, with fittings and accessories as recommended by manufacturer. One standard color will be selected from the manufacturer’s available colors.

2.1.1.1 Gutter and Downspouts at Front Porch Eave: “5K” Style Gutter, 5-inch width, 3-5/8-inch depth, with GalvalumePlus aluminum-zinc alloy coating and clear acrylic top-coat to match metal roof panels.

2.1.2 Aluminum Fascia/Rake Covers: Reynolds or equal, factory polymer P-5000 finish, 24 gauge, in standard colors as selected. One standard color will be selected from the manufacturer's available colors.

2.1.2.1 Accessories: Miscellaneous trim and flashings as indicated or required for straight, stable, even, water-tight installation. Color and material to match fascia covers.

2.1.2.2 Fasteners: Corrosion-resistant nails and other fasteners in accordance with manufacturer's instructions. Finish on all exposed fasteners shall match material being fastened.

2.1.2.3 Caulk sealant at joints, fittings, and intersections as recommended by gutter manufacturer.

2.1.3 Splash Blocks: Precast concrete 8 inches by 16 inches minimum size at each downspout discharging at grade in an unpaved area.

2.1.4 Splash Deflector: Plastic or aluminum at each downspout discharging onto lower roofs. Color to be selected from manufacturer's standard colors.

PART 3 EXECUTION

3.1 METHODS

3.1.1 Installation and workmanship in accordance with manufacturer's directions. Attach gutters with galvanized nail and spacer as provided by manufacturer (minimum spacing 4 feet, maximum spacing 6 feet; or as recommended by manufacturer's instructions) or with hangers nailed to facia. Provide downspots at all gutter runs. Attach downspouts to wall surfaces, where applicable, with expansion shields and screws.

3.1.2 Provide aluminum or plastic splash deflectors for downspouts draining onto a lower roof.

3.2 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, comply with the Actus Quality Control Plan and with the following:

3.2.1 Hold a preparatory meeting with the Actus QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.2.2 Comply with all codes and procedures applicable to this Section.

3.2.3 Verify approved disposal site with QC personnel.

3.2.4 Verify with QC personnel suitability of materials and installation procedures.

3.2.5 Verify location of splash blocks and proper pitch of gutters.

END OF SECTION

SECTION 07840

FIRE STOPPING

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Preparing substrates.

1.1.2 Fire stopping at rated penetrations.

1.1.3 Fire blocking in concealed spaces.

1.2 RELATED WORK

1.2.1 See Section 01352 for LEED requirements and documentation.

1.2.1.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.2 See Section 06100 for rough carpentry.

1.2.3 See Section 07200 for insulation.

1.2.4 See Section 07920 for sealants and caulking.

1.2.5 See Section 15400 for plumbing.

1.2.6 See Section 16500 for building electrical.

1.3 GENERAL REQUIREMENTS

1.3.1 All contractors shall comply with Actus Buy American Policy.

1.3.2 General Requirements, Division 1, are part of this Section.

1.3.3 Placement of fire stopping at rated penetrations and fire blocking in concealed spaces shall be in accordance with 2006 North Carolina Residential Code for One- and Two-Family Dwellings.

1.4 SUBMITTALS

1.4.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance that state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.4.2 Submit shop drawings of approved, tested, fire-rated assembly for membrane and through-penetrations.

1.5 QUALITY ASSURANCE

1.5.1 Perform work in accordance with sealant manufacturer's recommendations for preparation of surfaces and materials installation.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.2 Fire Blocking: 2x lumber, mineral fiber or glass fiber securely fastened, and other materials as allowed by the 2006 North Carolina Residential Code for One- and Two-Family Dwellings.

2.1.3 Fire stopping at Fire Rated Wall Penetrations:

2.1.3.1 Fire stopping products shall have been tested per UL 1479, or ASTM E 814 Fire Tests of Through-Penetration Fire Stops.

2.1.3.2 Fire stopping products shall be labeled "UL Classified" for the intended uses.

2.1.3.3 3M Fire Barrier Moldable Putty, 3M Fire Barrier Plastic Pipe Devices and 3M Fire Barrier CP 25WB caulk.

2.1.3.4 Hilti CP 617 Firestop Putty Pad, Hilti FS-ONE Intumescent Firestop Sealant, and Hilti CP 643 Firestop Collars.

2.1.3.5 Other products as specified in tested, approved fire-rated penetration assemblies.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

3.1.1 Verify that surfaces are ready to receive work, and that joint measurements, annular spaces and surface conditions are as recommended by the fire caulking or putty manufacturer.

3.1.2 Remove loose materials and foreign matter that may impair adhesion of caulk or putty.

3.2 INSTALLATION

3.2.1 Install fire caulking, fire putty and devices in accordance with manufacturer's instructions.

3.2.2 Install fire blocking in concealed spaces as shown on Drawings. Fire blocking material shall be packed tightly between framing members or otherwise securely fastened in place to form a draft stop.

3.2.3 Apply caulking within recommended application temperature ranges.

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above-specified work, the Contractor will comply with all testing and/or inspections required by the QC Plan and with the following:

3.3.1 A preparatory meeting will be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

END OF SECTION

SECTION 07920

JOINT SEALERS AND CAULKING

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Preparing substrates.

1.1.2 Placement of joint fillers, backing and sealants.

1.1.3 See Section 01352 for LEED requirements and documentation.

1.1.3.1 See LEED Credits SS and IEQ for additional requirements.

1.1.3.2 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.1.4 See Section 07200 for foam crack and gap filler.

1.1.5 See Section 07840 for fire stopping.

1.1.6 See Section 09260 for gypsum drywall.

1.1.7 See Appendix A for Energy Star construction requirements.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer. Provide data indicating that product is acceptable for specific application.

1.3.2 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits.

1.4 QUALITY ASSURANCE

1.4.1 Perform work in accordance with sealant manufacturer's recommendations for preparation of surfaces and materials installation.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Sealant: Acrylic emulsion latex, acrylic, silicone or polyurethane type as appropriate for application, substrate conditions, and recommendations of manufacturer.

2.1.2 Sanitary Sealant: One-Part Mildew-Resistant Silicone Sealant at perimeter of tubs and shower units; equal to "Dow Corning 786"; Dow Corning Corp., "SCS 1702 Sanitary"; General Electric Co., "898 #345 White"; Pecora Corp., or equal.

2.1.3 Primer: As recommended by sealant manufacturer to suit application.

2.1.4 Joint Backing: As recommended by sealant manufacturer to suit application.

2.1.5 At Fire Rated Wall Penetrations: Fire stopping products shall have been tested per ANSI/UL 263 Fire Tests of Building Construction and Materials. Refer to Section 07840 for products.

2.1.6 At Sound Rated Walls: Acrylic latex caulk with silicone, conforming to ASTM C 834.

2.1.7 Between Wood Base and Finish Floor in All Wet Areas: Provide clear sealant.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

3.1.1 Verify that surfaces are ready to receive work, and that joint measurements and surface conditions are as recommended by the sealant manufacturer.

3.1.2 Remove loose materials and foreign matter which may impair adhesion of sealant.

3.2 INSTALLATION

3.2.1 Install sealant in accordance with manufacturer's instructions.

3.2.2 Install joint backing to achieve a neck thickness dimension no greater than 1/3 the joint width.

3.2.3 Apply sealant within recommended application temperature ranges.

3.2.4 Apply sealant to gaps at the perimeter of window frames, at counter tops, vanity tops, and backsplash.

3.2.4.1 Install sanitary sealant at perimeter of tubs and shower units.

3.3 FIELD QUALITY CONTROL

3.3.1 Prior to the acceptance of the above specified work, comply with all testing and/or inspections required by the QC Plan and with the following:

3.3.1.1 Hold a preparatory meeting with the Actus QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.1.2 Comply with all codes and procedures applicable to this Section.

END OF SECTION

SECTION 08210

DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Interior and exterior doors, patio doors, frames and hinges.

1.1.2 Doors installed under Sections 06100 and 06200.

1.1.3 See Section 01100 for special adaptable housing requirements.

1.1.4 See Section 08360 for garage doors.

1.1.5 See Section 08710 for finish hardware.

1.1.6 See Section 08390 for screen doors.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See LEED Credits IEQ for additional requirements.

1.2.3.2 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.3.3 Notice to Vendors: This company does not accept tropical wood products. Provide the country of manufacture of each product you expect to supply. Also provide a list of FSC-certified products you can supply.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Exterior Doors: Provide doors and frames, weather-stripping, gaskets, and thresholds (UFAS compliant thresholds at accessible units), configured to provide the performance criteria specified for in-swing and out-swing direction, as indicated.

2.1.1.1 Exterior Unit Entrance Doors: Therma-Tru "Smooth Star", or approved equal, 1-3/4 inch thick, fiberglass, wood stiles, insulated foam core, raised panel design, factory-primed. R-value 5.0 minimum. Provide 1-1/2 pairs hinges equal to Hager RC1279, 4 x 4, stainless steel finish. Two door viewers (non-corrosive finish) will be provided at each door. Frame: Endura "Frame Saver", or approved equal, fully primed pine jambs with finger-jointed composite bottoms suitable for exterior applications, with brickmold and factory-installed Aluminum Threshold: Endura "Z series", or approved equal, pre-fitted and prepared to receive locking hardware.

2.1.1.2 Storm Door on Entrance Doors: Aluminum or white vinyl frame pre-hung full view storm doors with 1-1/4-inch x minimum 2-3/8-inch extruded aluminum frame with baked enamel finish, tempered glass insert with wool pile weatherstripping to reduce sound and air transmission, head and jamb weatherstripping, color as selected by D/B Contractor from manufacturer's standard palette.

2.1.1.2.1 Storm Door Accessories and Hardware: Provide adjustable bottom expander with weatherstripping to seal to entrance door threshold, closer kit, chain stop with spring cushion and all hardware as necessary for a complete installation per manufacturer's requirements.

2.1.1.3 Mechanical Room Doors: Double leaf Therma-Tru, Construction Series Insulated Steel Door, or approved equal, 1-3/4 inch thick, .018-inch thick (25 gauge) galvanized steel smooth flush faces, wood stiles, insulated foam core. R-5.0 minimum. Self-closing spring-hinges provided by door supplier. Provide astragal and flush mount bolt system. Refer to plans for active panel placement. Frame: Endura "Frame Saver", or approved equal, fully primed pine jambs with finger-jointed composite bottoms suitable for exterior applications, with factory-installed Aluminum Threshold, Endura "Z series", or approved equal, pre-fitted and prepared to receive locking hardware.

2.1.1.4 Garage to Unit Doors: Therma-Tru, Construction Series Insulated Steel Door, or approved equal, with 20 minute fire rating, 6 panel, 1-3/4 inch thick, .018-inch thick (25 gauge) galvanized steel faces, wood stiles, insulated foam core. R-5.0 minimum. Self-closing spring-hinges provided by door supplier. Frame: fully primed pine jambs with factory-installed Aluminum Threshold, Endura "Z series", or approved equal, pre-fitted and prepared to receive locking hardware.

2.1.1.4.1 Mechanical Room Doors and Garage-to-Unit Doors:

2.1.1.4.2.1 Spring hinges equal to Bommer 4300 Series UL-Listed, US26D finish.

2.1.1.5 Patio Doors: Patio door Therma-Tru "Smooth Star", or approved equal,1-3/4 inch thick, fiberglass, wood stiles, insulated foam core, fully primed, prefitted and prepared to receive hardware, fully tempered dual glazed with low "e". Frame: Endura "Frame Saver", or approved equal, fully primed pine jambs with finger-jointed composite bottoms suitable for exterior applications, with factory-installed Aluminum Threshold, Endura "Z series", or approved equal, pre-fitted and prepared to receive locking hardware. Provide 1-1/2 pairs hinges equal to Hager RC1279, 4 x 4, stainless steel finish.

2.1.1.5.1 Safety Glazing: Comply with testing requirements in 16 CFR 1201 (safety), and NFRC 100.

2.1.1.5.2 Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency or manufacturer acceptable to authorities having jurisdiction.

2.1.1.6 ADA Patio Doors: Entry door, double, full lite, Therma-Tru "Smooth Star", or approved equal, 1 ¾ inch thick, fiberglass, wood stiles, insulated foam core, fully primed, prefitted and prepared to receive hardware, fully tempered dual glazed with low "e". Frame: Endura "Frame Saver", or approved equal, fully primed pine jambs with finger-jointed composite bottoms suitable for exterior applications, with factory-installed Aluminum Threshold: Therma-Tru Public Access Sill; max. ¼ inch high or max. ½ inch beveled high, or approved equal, pre-fitted and prepared to receive locking hardware. Provide 3 pairs hinges equal to Hager RC 1279, 4x4 stainless steel finish.

2.1.1.6.1 Safety Glazing: Comply with testing requirements in 16 CFR 1201 (safety), and NFRC 100.

2.1.1.6.2 Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency or manufacturer acceptable to authorities having jurisdiction.

2.1.2 Interior Doors: Haley Brothers "Colonist", 1-3/8-inch thick, 6-panel design, hollow core wood with factory primed, simulated wood grain hardboard doorskins. Provide 1 pair Hager 1279, 3-1/2 x 3-1/2 hinges with US26D finish, per hinged door.

2.2 DOOR FRAMES

2.2.1 Interior Door Frames: Factory primed medium density fiberboard frame and jambs, prefitted. Applied stop shall be finger jointed pine.

2.2.2 Exterior Door Frames: Endura "Frame Saver", or approved equal, factory-primed paint grade pine frame and jambs with finger-jointed composite bottoms to provide resistance against rot and insect damage, 2-1/4 inch wood casing (see section 06200), brick mold and factory-installed Aluminum Threshold: Endura "Z series", or approved equal.

2.3 Hinges: Manufacturer's standard for doors provided, complying with ANSI A156.1. Garage-to-unit door shall have UL-Listed ball-bearing hinges and be rated for 45 minute assembly. Finish shall be US26D, US 32D for stainless steel. Provide non-removable pins at out-swinging doors.

2.4 Thresholds for entry doors of handicap units shall not exceed an edge height of 1/4 inch or 1/2-inch if edge is beveled with a slope of no greater than 1:2 ratio. All exterior doors to be provided with exterior brickmold trim on one side and interior casing on one side. Garage/unit door has casing on both sides.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Inspect substrates for suitability of installation of doors and frames. Notify QC personnel of any discrepancies found.

3.2 METHODS

3.2.1 Installation shall be in accordance with manufacturer's instructions including minimum 2-1/2-inch screws in each jamb and hinge at metal and fiberglass doors. Set perimeter brick mold and threshold in bed of urethane sealant. Follow manufacturer's instructions for frame installation to achieve 20 minute fire rating for fire rated doors.

3.2.2. Undercut all interior doors above floor finish as directed by the D/B Contractor or as indicated.

3.2.3 Doors with surface defects or warped doors shall be replaced.

3.2.4 Install storm doors in accordance with manufacturer's instructions. Set head and jambs of frame in concealed bead of caulk. Perimeter of door shall be in full contact with frame weatherstripping to reduce sound transmission. Install bottom expander sweep to be in light contact with entrance door threshold to seal.

3.3 FIELD QUALITY CONTROL

3.3.1 A manufacturer's representative shall instruct the installer of the interior and exterior doors as to the manufacturer's required installation procedures. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

3.3.2 Prior to the acceptance of the above specified work, comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.2.1 Hold a preparatory meeting with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2.2 Comply with all codes and procedures applicable to this Section.

3.3.2.3 Verify approved disposal site with QC personnel.

3.3.2.4 Verify materials conformance with QC personnel.

3.3.2.5 Verify satisfactory surface condition of doors and replacement of warped doors with the QC personnel.

END OF SECTION

SECTION 08360

OVERHEAD GARAGE DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Overhead sectional steel garage doors.

1.1.2 Garage door openers.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Doors: Overhead Door Company Model 194, or equal; sectional metal, prefinished, raised steel panel design, wood grain textured, torsion springs, limited 10-year warranty, vinyl bottom seal, and tongue and groove joint details per manufacturer's standard construction. Wind load design, 130 mph, Exposure C, 3-second gust.

2.1.2 Hardware: Manufacturer's standard, complete with tracks, rollers and all mounting hardware.

2.1.3 Garage Door Openers: Liftmaster Model 1255R complying with UL 325, 1/2 HP or equal, chain driven, automatic safety reverse, with two remote controllers per door.

PART 3 EXECUTION

3.1 METHODS

3.1.1 Install door and hardware in accordance with manufacturer's directions.

3.1.2 Hardware shall be adjusted for proper operation and refitted if necessary.

3.2 FIELD QUALITY CONTROL

A manufacturer's representative shall instruct the installer of the overhead garage doors as to the manufacturer's required installation procedures and requirements. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

Prior to the acceptance of the above specified work, comply with all testing and/or inspections required by the Actus QC Plan and with the following:

3.2.1 Hold a preparatory meeting with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.2.2 Comply with all codes and procedures applicable to this Section.

3.2.3 Verify satisfactory completion of all work with QC personnel.

END OF SECTION

SECTION 08390

SCREEN DOORS AND PATIO SCREENING SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Screen doors.

1.1.2 Vinyl porch screening system.

1.1.2.1 Fiberglass screen.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 "Construction Waste Management" for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this section. Where manufacturer's data is not available, affidavits and certificates of compliance, which state that all products and materials comply with these specifications will be acceptable.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Screen Door: 32" x 80" aluminum pre-hung screen doors with 1-1/4" x 2-3/8" extruded aluminum frame with baked enamel finish, color as selected by D/B Contractor from manufacturer's standard palette, 8-inch high minimum solid bottom kick, fiberglass screen cloth, Model 940, by MI Windows and Doors or approved equal.

2.1.2 Screen Door Option: 32" x 80" solid vinyl pre-hung screen doors, color as selected by D/B Contractor from manufacturer's standard palette, 8 inch solid bottom kick, fiberglass screen cloth, as manufactured by Screen Tight or approved equal.

2.1.3 Screen door accessories and hardware: provide closer kit and all hardware as necessary for a complete installation per manufacturer's requirements.

2.1.4 Vinyl Porch Screening System: As manufactured by Screen Tight or approved equal (800-768-7325). Provide all components and hardware as required for a complete and finished installation per manufacturer's requirements. Color shall be as selected by D/B Contractor from manufacturer's standard palette.

2.1.5 Insect Screen: Fiberglass, charcoal gray.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Install doors in accordance with manufacturer's directions.

3.1.2 Hardware shall be adjusted for proper operation and refitted if necessary.

3.1.3 Install screened porch system and screens in accordance with manufacturer's directions. Screens shall not sag or contain folds or creases.

3.2 FIELD QUALITY CONTROL

Prior to the acceptance of the above-specified work, the Contractor shall comply with the QC Plan, Contractor Testing Plan and with the following:

3.2.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.2.2 Comply with all codes, regulations and procedures applicable to this section.

3.2.3 Verify satisfactory completion of all work with QC personnel.

END OF SECTION

SECTION 08510

WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Vinyl windows, insect screens and glazing.

1.1.2 See Appendix A for Energy Star construction requirements.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.4 See LEED Credits EA and MR for additional requirements.

1.2.4.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Vinyl Windows - Single Hung:**MI Windows 3500 SH Series**, DP 40 min., vinyl with ¾ Insulated glass, internal window grids where shown on plans, tilt lower sash, Cam locks, integral **3/4" J Channel for expansion and contraction** for windows that do not receive lineal trim, weather-stripping. Air infiltration: 0.27 cfm/sq. ft., Low-“E” Glass: U Value less than or equal to 0.35, solar heat gain coefficient less than or equal to 0.33, window unit STC rating **26 minimum**. Windows shall conform to Energy Star requirements and bear the Energy Star Label. Gang windows shall be factory mulled, providing water and air-tight joint between window units.

2.1.1.1 Provide removable vinyl mesh insect screens, conforming to AAMA 1002.10, at all operable sashes. Screens shall be secured with interior metal clips.

2.1.3 Finish: Manufacturer's standard white.

2.1.4 A minimum of one window per bedroom shall conform to North Carolina Building Code for One- and Two-Family Dwellings, 2006 edition for emergency escape and rescue.

2.1.5 Glazing: Glass of domestic manufacture.

2.1.5.1 Glazing in fixed or operable windows within the same plane as a door where the nearest exposed edge of the glazing is within a 24-inch arc of either vertical edge of the door in a closed position, and where the bottom exposed edge of the glazing is less than 60 inches above the walking surface, shall be safety glazing.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Inspect substrates and frames prior to installation, and notify QC personnel of any discrepancies found.

3.2 METHODS

3.2.1 Store windows carefully to avoid damage to finish prior to installation.

3.2.2 Install windows and screens in accordance with manufacturer's instructions, unless indicated otherwise and check after installation to insure proper operation of locking devices and correctness of fit.

3.2.2.1 Install window units with corrosion resistant wafer head screws, 3/8-inch head dimeter by #10, of sufficient length to penetrate wood studs a minimum of 1-inch.

3.2.3 Replace broken, defective, or damaged windows and screens.

3.2.4 Clean all glass and frames after installation. Factory applied NFRC rating label shall remain affixed until such time as directed by D/B Contractor.

3.3 FIELD QUALITY CONTROL

A manufacturer’s representative shall instruct the installer of the windows and accessories as to the manufacturer’s required installation procedures and requirements. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

Prior to the acceptance of the above specified work, comply with all testing and/or inspections required by the Actus QC Plan and with the following:

3.3.1 Hold a preparatory meeting with the Actus QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site with QC personnel.

END OF SECTION

SECTION 08710

FINISH HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Finish hardware for doors and hardware specialties. Hinges furnished by door supplier in Section 08210.

1.1.2 See Section 01100 for special adaptable housing requirements.

1.1.3 See Section 06100 for backing and blocking.

1.1.4 See Section 06200 for installation of hardware.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit hardware schedule, templates and manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.4 COORDINATION

1.4.1 Coordinate work of this Section with sections which require integral reinforcement or preparation for hardware. Provide manufacturer's templates for installation of hardware under Section 06200. Coordinate keying with D/B Contractor.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 General: For adaptable units provide door hardware with lever handles at all doors (except mechanical room door).

2.1.2 Hardware shall comply with A156.2, grade 2 or 3 as noted. Master keying system shall be provided which will allow emergency access to each unit.

2.1.3 Entrance, Patio, ADA Patio and Exterior Garage Access Door:

2.1.3.1 Latchset: Equal to Yale "Horizon" knob series; "Norwood Grade 2" lever series at Adaptable Units; ANSI A156.2 Series 4000, Grade 3; Passage Lever Latchset. Latchbolt operated by either knob or lever at all times. Finish shall be non-corrosive.

2.1.3.2 Deadbolt: Equal to Yale YH Series "YH82", A156.5 Grade 2, Single cylinder deadbolt with replaceable core. Deadbolt operated by key on outside; by T-turn on inside. Finish shall be non-corrosive.

2.1.3.2.1 Hinges (non-corrosive finish), threshold, and weather-stripping for doors provided by door manufacturer.

2.1.3.3 Door Viewer (Door No. 2 Only): 160 degree view. Equal to Rockwood No. 620, non-corrosive US26 Chrome finish. Provide two viewers in each unit entrance door. One mounted at 56 inches above the floor and a second viewer at 36 inches above the floor, except at UFAS-adaptable units where the second viewer shall be placed at 42 inches above the finished floor.

2.1.3.4 ADA Patio Door – Provide astragal and flush mount bolt system. Refer to plans for active panel placement.

2.1.4 Mechanical Closets: Pair of exterior fiberglass doors. Provide 2 manual surface bolts on inactive leaf, equal to Rockwood #580 or Glynn-Johnson #1700. Finish shall be stainless steel. Bolt shall project 1-inch into the head of the door frame. Provide chain-stops at the top of each leaf – Stanley CD1707 or equal. Deadbolt equal to Yale YH Series "YH82", A156.5 Grade 2, Single cylinder deadbolt with replaceable core. Deadbolt operated by key on outside; by T-turn on inside. Finish shall be non-corrosive.

2.1.4.1 Key all Mechanical Rooms alike, under one separate master key for all villages.

2.1.5 Garage-to-Unit Door:

2.1.5.1 Latchset: Equal to Yale "Horizon" knob series; "Woodland" lever series at Adaptable Units; ANSI A156.2 Series 4000, Grade 3. Latchbolt operated by either knob or lever at all times.

2.1.5.2 Deadbolt: Equal to Yale YH Series "YH82", A156.5 Grade 2, Single cylinder deadbolt with replaceable core. Deadbolt operated by key on outside; by T-turn on inside. Finish shall be non-corrosive.

2.1.5.3 Self-closing spring hinges provided by door supplier.

2.1.6 Closet Doors – Pairs: Pair of dummy knobs or levers, matching adjacent operable latchsets. Roller latches at the top of each leaf, equal to Stanley 31 0540, Finish shall be non-corrosive. .

2.1.7 Keying: Locks at each Unit entry door, patio door, ADA patio door and Garage/Unit door in each unit shall be keyed alike, and keyed differently from other units. Provide four copies of each Unit key. Provide one extra set of cores for each 50 units and furnish two control keys. Provide construction keying as directed by the D/B Contractor.

2.1.7.2 Master Key: All locks for all doors in each village shall be on one master key. Provide 4 master keys.

2.1.7.3 Provide construction cores.

2.1.8 Interior Latchsets: Yale New Traditions Series, "Horizon" style knob, passage sets for all utility rooms, closets, pantry, and closets.

2.1.8.1 Privacy sets for bedrooms, powder rooms, and bathrooms.

2.1.9 Interior Latchsets in Adaptable Units: Yale New Traditions "Woodland" style lever sets. Latch functions are same as typical Units.

2.1.10 Hardware Finish: Locks, latches, knobs, levers, escutcheons, and miscellaneous door hardware - BHMA 626, US26D Satin Chrome or 32D, unless noted otherwise.

2.1.11 Door Stops: Provide baseboard spring-type or wall-type. Use baseboard spring type wherever practical. Provide backing for wall type when used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Verify that doors and frames are prepared to receive hardware.

3.2 INSTALLATION

3.2.1 See Section 06200 for installation.

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.1 Hold a preparatory meeting with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site with QC personnel.

3.3.4 Verify materials conformance with the QC personnel.

3.3.5 Verify installation locations and procedures with the QC personnel.

3.3.6 Verify satisfactory completion of all Work with the QC personnel.

END OF SECTION

SECTION 09260

GYPSUM BOARD SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Gypsum board with taped and sanded joint treatment.

1.1.2 Gypsum board with untaped joint treatment.

1.1.3 Standard, Type 'X' and moisture resistant board types.

1.1.4 **Tub/Shower surround moisture barrier backer board.**

1.1.5 Sprayed-in texture on walls and ceilings as scheduled.

1.1.6 Fire rated assemblies as indicated.

1.1.7 See Section 07840 for fire stopping.

1.1.8 See Section 07920 for acoustical sound caulking.

1.1.9 See Appendix A for Energy Star construction requirements.

1.1.10 Pricing Option 1: Submit separate pricing for option indicated. See paragraph 2.1.1.5 for description.

1.1.11 Pricing Option 2: Submit separate pricing for option indicated. See paragraph 2.1.1.6 for description

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 Submit 4-foot by 4-foot sample of wall texture for approval.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Gypsum Board: National Gypsum Company "Gold Bond", or equal, and as required by the tested, rated, fire-resistive assemblies indicated.

2.1.1.1 Standard Type: ANSI /ASTM C36, Type Regular, 1/2-inch thickness for all non-fire-rated wall locations, including garage walls.

2.1.1.2 Fire Rated Type: ANSI /ASTM C36, fire resistive (Type 'X'), 5/8-inch thickness for all fire-rated wall locations.

2.1.1.3 Moisture Resistant Type: ASTM C630, **at wet locations**. Do not apply moisture-resistant wall board to ceilings.

2.1.1.4 Ceiling Board: 5/8-inch thickness, (Type 'X') for all fire-rated ceiling locations.

2.1.1.5 Pricing Option 1: Provide price for gypsum board extracted, processed and manufactured regionally within 500 miles of the project site.

2.1.1.6 Pricing Option 2: Provide price for gypsum board which contain 20% recycled content by weight or volume. 1/4 of the recycled content must be postconsumer. The remainder of the recycled content may be postindustrial (preconsumer). Postindustrial content is counted at one-half the rate of postconsumer content.

2.1.2 Joint Materials: Comply with ASTM C 475, reinforcing tape, joint compound, adhesive and water; as recommended by board manufacturer.

2.1.3 Edge Trim and Corner Beads: Plastic or metal, installed as recommended by the manufacturer. Gypsum wallboard around windows and walls shall have angled corners.

2.1.4 Fasteners: Conform to board manufacturer's directions for non-fire-rated construction. Provide the type of fasteners listed in the fire-rated design assembly referenced in the Drawings where fire-resistive construction is indicated.

2.1.5 Dry Wall Stops: C 1010 cold rolled electroplated steel, .023-.030 thick, meeting or exceeding specifications for materials noted in ASTM C 1047 for accessory products.

2.1.6 Wall and Ceiling Texture: USG "Tuf-Tex" Wall and Ceiling Texture, or Gold Bond "Perfect Spray HF" by National Gypsum Co., or approved equal.

2.1.7 Tub/Shower surround moisture barrier backer board: Thermo-ply Sheathing or approved equal, foil faced 1/8" thick long fibered, pressure laminated, water and weather resistant plies. Manufacturer standard size sheets. Install at tub and shower surrounds, between surround and wood studs or gypsum board where occurs as indicated in the drawings.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Verify that surfaces and site conditions are ready to receive Work.

3.1.2 Provide positive protection for windows, doors and other finished surfaces.

3.2 METHODS

3.2.1 Deliver materials in original, sealed bundles or containers bearing brand name, name of manufacturer and manufacturer's instructions.

3.2.2 Install wallboard in accordance with ASTM C 840-84 and manufacturer's instructions. Cut wallboard by scoring and breaking or by sawing in a manner to provide clean, neat edges for joining. Request gypsum board screwing/nailing inspection from Actus QC Representative.

3.2.2.1 All receptacle boxes and electrical switches shall be masked prior to gypsum board taping to prevent gypsum wallboard cement from entering electrical boxes or touching sheathing on electrical sheathed cable.

3.2.2.2 Provide bead of sealant at ceiling joints of interior partition walls.

3.2.3 Field Joints: Apply a 3-inch wide uniform coating of compound, centered over the joint. Center tape over the joint and embed in compound. Allow to dry and sand smooth without scuffing paper. Apply 2 coats of compound over tape, extending each coat slightly beyond preceding one. Allow each coat to dry and sand smooth. Treat nail dimples in a like manner.

3.2.3.1 Taping of joints which are backed by 2-inch wood framing or gypsum board is not required in unfinished areas such as attics.

3.2.4 Treat inside corners and angles as for field joints, except fold tape in middle to provide a clean sharp corner, fully embedded.

3.2.5 Outside Angles: Corner beads, butt spliced and securely nailed or crimped to studs, set in and finished with compound as for joints.

3.2.6 All joints and corners at walls and ceilings in garages shall be taped, sanded and prepared for paint application.

3.2.8 Apply texture coats in light spatter, knockdown, or orange peel, as selected by the D/B Contractor, in accordance with manufacturer’s directions. Provide samples of textures for D/B Contractor’s review and approval. No texture coat shall be provided at garages or mechanical rooms.

3.2.9 Dispose of all excess materials and debris at an off-post disposal area as specified in Division 1.

3.2.10 Upon completion, all adjacent surfaces shall be thoroughly cleaned and free of deposits.

3.2.11 Where penetrations of gypsum board by work of others occurs, seal openings completely and thoroughly to prevent air infiltration. Fill all penetrations in fire walls with approved fire-rated filler (refer to section 07840).

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site and waste management plan with QC personnel.

3.3.4 Verify materials conformance with QC personnel.

3.3.5 Verify installation location of wallboard types and procedures with QC personnel.

3.3.6 Verify texture approval and locations with the QC personnel.

3.3.7 Verify satisfactory completion of work with QC personnel, including joint finishing, texturing and job clean-up.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Plank vinyl.

1.1.3 See Section 06200 for wood base and shoe mold

1.1.4 See Section 06100 for plywood underlayment.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See LEED Credits ID for additional requirements.

1.2.3.2 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 Submit samples of each color and pattern.

1.3.3 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Plank Vinyl: Amtico, Spacia series as indicated in finish schedule on the drawings,or equal.

2.1.2 Primers and Adhesives: Waterproof, clear, low VOC, type recommended by floor material manufacturer.

2.1.3 Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based on blended hydraulic cement based formulation provided or approved by resilient product manufacturer for applications indicated.

2.1.4 Caulking: Acrylic latex caulking compound.

2.1.5 Thresholds: Non-ferrous where interior materials or floor levels change. Install approximately centered under door when door is in closed position.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Verify suitability of substrates and notify QC personnel of any major discrepancies found.

3.1.2 Perform minor repairs to substrate if required.

3.1.3 Clean substrates and apply primer if recommended by manufacturer.

3.2 INSTALLATION

3.2.1 Deliver materials in original, sealed bundles or containers bearing brand name, name of manufacturer and installation instructions.

3.2.2 Install all materials in accordance with manufacturer's instructions.

3.2.3 Flooring shall be laid in rooms having a temperature of not less than 55 degrees F, 48 hours prior to, during and 48 hours after flooring is laid, and in accordance with manufacturer's instructions.

3.2.4 Surface to receive flooring shall be free from moisture, paint, oil and wax.

3.2.5 Plank vinyl shall be installed seamless in wet areas and minimized in all other areas.

3.2.6 Immediately upon completion of installation, floors and adjacent surfaces shall be cleaned.

3.2.7 Dispose of all refuse in accordance with Division 1 requirements.

3.3 FIELD QUALITY CONTROL

A manufacturer’s representative shall instruct the installer of the sheet vinyl and as to the manufacturer’s required preparation, substrate and installation procedures and requirements. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site with QC personnel and waste management plan.

3.3.4 Verify materials conformance with the QC personnel.

3.3.5 Verify approval of color selection and location with QC personnel.

3.3.6 Verify conditions of substrates with QC personnel prior to starting Work.

3.3.7 Verify satisfactory completion of all Work with the QC personnel, including seam fitting, caulking and job clean-up.

END OF SECTION

SECTION 09680

CARPET

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Carpeting and padding as scheduled.

1.1.2 See Section 06200 for wood base.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 "Construction Waste Management" for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable.

1.3.2 Submit samples of each color for approval. Samples shall be approved for use prior to ordering of any materials.

1.3.3 Submit verification that bonded polyurethane foam padding will not cause discoloration of carpet.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Carpet: As selected by the D/B Contractor from the manufacturer's standard palette; 28 ounces per square yard, continuous filament. Carpet yarn shall be multi colored, 100% first quality, bulk continuous filament nylon type.

2.1.2 Carpet shall be provided with a 10-year stain and soil protection warranty

2.1.3 Carpet shall comply with Fed. Spec. DDD-C-0095A Type IV, Class 1, Subclass A and Consumer Product Safety Commission CFR 16-1630 and shall have a minimum average critical radiant flux of 0.25 watts per square centimeter when tested in accordance with ASTM E648.

2.1.4 Carpet Color: Colors as indicated on drawings.

2.1.5 Carpet Pad: Leggett & Platt "Crushguard #BU0097", or approved equal, bonded

polyurethane foam, 7/16-inch-thick, 5 pounds per cubic foot density.

2.1.6 Accessories: Edge strips (finish as selected by D/B Contractor from manufacturer's standard palette), binder bars, grippers and attachment devices type recommended by carpet manufacturer to suit application.

2.1.7 Grippers: Minimum of Douglas Fir-Larch plywood, 1-1/8-inch-wide by 9/32-inch-thick, with two rows of staggered pins.

2.1.8 Binder Bars: 1-5/8-inch floor flange x 11/16-inch face.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Verify that substrate surfaces are clean, smooth, flat, without voids or holes and are ready to receive work.

3.2 INSTALLATION

3.2.1 Carpet shall be laid in accordance with manufacturer's recommendations, taking care to properly stretch carpet using equipment well suited for such purpose. Carpet shall be securely installed leaving no threads or loose carpet exposed. Provide threshold strip at carpet transition.

3.2.2 Carpet Seams: Number of seams shall be minimized. Match carpet pile direction at seams. Locate seams at doorways parallel to and centered directly under doors. Do not seam at doors perpendicular to door or at pivot points.

3.2.3 Protect wall base from damage during installation.

3.3 FIELD QUALITY CONTROL

A manufacturer's representative shall instruct the installer of the carpet, pad and accessories as to the manufacturer's required installation procedures and requirements. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

Prior to the acceptance of the above-specified work, the Contractor shall comply with the QC Plan, Contractor Testing Plan and with the following:

3.3.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this section.

3.3.3 Verify approved disposal site with QC personnel and waste management plan.

3.3.4 Verify materials conformance with the QC personnel.

3.3.5 Verify approval of color selections and unit locations with the QC personnel.

3.3.6 Verify satisfactory completion of all work with the QC personnel, including seam fitting,

protection of carpet and job clean up.

END OF SECTION

SECTION 09900

PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Surface preparation, priming, painting and finishing.

1.1.2 Final paint coat on exposed roof penetrations and flashings will be performed under Section 07600.

1.1.3 See Section 07920 for caulking and sealing.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 Submit color samples of each color.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Paint: Shall be Sherwin Williams, Porter Paints, PPG, ICI Paints or approved equal.

2.1.2 All interior walls and ceilings, except in garages, shall be painted with one prime coat and two finish coats of latex enamel, eggshell or semi-gloss sheen as indicated on Drawings. Interior walls and ceilings of garages shall be painted with one prime coat. Colors shall be as selected by the D/B Contractor from manufacturer’s standard palette.

2.1.3 Stain grade interior components shall be finished with one coat of stain and two coats semi-gloss polyurethane. Colors shall be as selected by the D/B Contractor.

2.1.4 Prime non-factory primed trim and balusters with one prime coat. Paint interior wood field and factory-primed trim with two coats of latex semi-gloss enamel. Colors shall be as selected by the D/B Contractor from manufacturer’s standard palette.

2.1.5 Paint interior factory-primed wood doors with two coats of latex semi-gloss enamel.

2.1.6 Paint medium density fiberboard shelving with one prime coat and two topcoats of acrylic semi-gloss enamel, all faces and edges (includes ends and both edges). Verify if unfinished MDF shelving is being provided under Section 06200, or if melamine covered MDF or prefinished wire shelving is being provided.

2.1.7 Exterior steel and fiberglass doors shall receive two finish coats of exterior acrylic enamel trim paint over factory primer. Touch-up scratched primer prior to painting. Colors shall be as selected by the D/B Contractor from manufacturer's standard palette.

2.1.8 Exterior exposed wood will receive one prime coat, be back primed, and receive two finish coats of acrylic satin enamel. Colors shall be as selected by the D/B Contractor from manufacturer's standard palette.

2.1.9 Exterior Simulated Wood Trim: Leave unpainted if allowed by manufacturer. Otherwise, provide acrylic satin enamel, one or two coats as recommended by manufacturer. Colors shall be as selected by the D/B Contractor from manufacturer's standard palette.

2.1.10 Exterior steel and fiberglass doors shall receive two finish coats of exterior acrylic enamel trim paint over factory primer. Touch-up scratched primer prior to painting. Colors shall be as selected by the D/B Contractor from manufacturer's standard palette.

2.1.11 Interior and exterior metals, except prefinished metal and nonferrous flashings, will receive primer wash, one prime coat and one finish coat. Colors shall be as selected by the D/B Contractor from manufacturer's standard palette.

2.1.12 Accessory Materials: Thinners and other materials required to achieve finishes specified, in accordance with paint manufacturer's recommendation.

2.1.13 Volatile Organic Compound (VOC) Content: Paints shall comply with applicable state and local laws enacted to insure compliance with Federal Clean Air Standards. When the materials specified in paragraph 7i(5), Federal and Military Specifications, do not meet the applicable VOC content limitations, the Contractor shall notify the Construction Consultant prior to commencing work, informing the Construction Consultant of proposed substitute materials. Substitute materials may be proprietary paint materials of the same type, color, and which are equivalent in performance of the types specified in paragraph 7i(5) and which meet the VOC content requirements. Equivalent performance is defined as being within 10 percent of the values for the percent of pigment, the percent of solid content (percent of pigment by weight and the percent of nonvolatile vehicle by weight), the viscosity (in K.U.'s), the gloss, and the drying times for set-to-tough, recoating, and dry hard. Coatings shall have the date of manufacture clearly marked on each container.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Inspect all substrates to receive the application of finishing materials. Notify QC personnel of any discrepancies found. Do not proceed with work until any unsatisfactory conditions have been properly corrected.

3.2 METHODS

3.2.1 The number of coats specified is minimum to be applied. It is intended that paint finishes be of even, uniform color, free from cloudy or mottled surfaces and result in a completely covered uniform application. Colors to accurately match color schedule selections.

3.2.2 Remove all materials subject to combustion from building at the completion of each days work.

3.2.3 Mixing and thinning of finishes in accordance with the manufacturer's recommendations.

3.2.4 Protect all hardware, equipment, floors, prefinished surfaces, paving and other material surfaces and be responsible for the removal of overspray, paint spots, and soiling occasioned by this work. Protect newly finished work immediately upon completion and post "wet paint" signs where necessary.

3.2.4.1 Protect all electrical boxes to prevent entry of paint.

3.2.5 Fill all open joints, cracks and nail holes in finish woodwork full and flush. When completely dry, sand to a smooth finish.

3.2.6 Galvanized metal work not having a shop prime coat shall be thoroughly cleaned with commercial phosphoric acid solution, or other prepared product recommended by the paint manufacturer, prior to the application of the primer coat.

3.2.7 Uncoated ferrous metal work shall be cleaned of rust, mill scale, oil, grease and other foreign matter using rotary brushes, solvents, or sand blasting as necessary, prior to application of primer coat.

3.2.8 Gypsum board drywall surfaces shall have been left smooth and flush, with a textured coating except at garages. Raised or depressed surfaces, or scuffed paper finish, shall be corrected and spot primed prior to application of prime coat.

3.2.9 Interior walls and ceilings to be painted shall receive a minimum of one primer coat and two finish coats, except garages which will receive prime coat only.

3.2.10 Allow manufacturer's recommended drying time before recoating any surface.

3.2.11 An inspection shall be made of the finished job, and surfaces found deficient shall be touched up as required for final acceptance.

3.2.11 All interior trim and interior and exterior doors will be factory primed. Doors shall not be allowed to warp after painting. Cabinets will be factory finished.

3.3 FIELD QUALITY CONTROL

3.3.1 A manufacturer's representative shall instruct the installer of the paint as to the manufacturer's required installation procedures and requirements. The Actus Quality Control and Government construction inspectors responsible for the job shall be included in their instruction.

3.3.2 Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.3 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.4 Comply with all codes and procedures applicable to this Section.

3.3.5 Verify that colors are approved by D/B contractor.

3.3.6 Verify approved disposal site with QC personnel.

3.3.7 Verify with QC personnel, conformance as follows:

3.3.7.1 Materials:

3.3.7.2 Cleaning, preparation and pretreatment of surface.

3.3.7.3 Painting application, each coat.

3.3.7.4 Provide QC personnel with samples from sealed containers at the job site for each type of finish paint, primer or undercoat representing a lot shipment.

3.3.7.5 Verify satisfactory completion of all work with the QC personnel, including required touch-ups or rework coverage and color density, and completion of job clean-up.

END OF SECTION

SECTION 10001

MISCELLANEOUS SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Building signs.

1.1.2 See Section 06200 for vinyl porch entry railings.

1.1.3 See Section 16500 for lighted house address numbers.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Building Signs

2.1.1.1 House Numbers: See Section 16500. The house identification shall be mounted in a location visible to vehicular circulation. House numbers will be assigned by the Project Company.

PART 3 EXECUTION

3.1 METHODS

3.1.1 All equipment shall be installed in accordance with the manufacturer’s instructions.

3.2 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, comply with the QC Plan, Contractor Inspection Plan and with the following:

3.2.1 Comply with all codes and procedures applicable to this Section.

3.2.2 Verify equipment conformance and installation procedures with the QC personnel.

3.2.3 Verify satisfactory completion of installation with QC personnel, including approval of operation and surface condition of exposed appliances.

END OF SECTION

SECTION 10800

BATH ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Bathroom accessories.

1.1.2 See Section 06100 for blocking and backing.

1.1.3 See Section 01100 for special adaptable housing requirements.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

PART 2 PRODUCTS

2.1 MEDICINE CABINET: (Solar Group) Triangle Home Products Model Horizon B7733-85, or equal, plastic construction, plastic shelves, frameless beveled-edge glass mirror. Locations as shown on drawings.

2.2 MISCELLANEOUS: Delaney Inc. "Chelsea" or equal, brushed nickel:

2.2.1 Toilet Paper Holder:

2.2.1.1 No. 502001B.

2.2.2 Double Robe Hook:

2.2.2.1 No. 502012B.

2.2.3 Towel Bars,– 18-inch length:

2.2.3.1 No. 572018BK.

2.2.4 Towel Ring:

2.2.4.1 No. 502022B.

2.2.5 Shower Curtain Rods, No. 504050K 5-foot aluminum rod, 504052 exposed screw flanges; brushed nickel finish.

2.3 Lavatory Mirrors: Gardner Glass or equal, 42-inches high, width 2-inches narrower than lavatory countertop, polished edges, 3/16-inch float glass.

2.3.1 Powder Room Mirror: Gardner Glass or equal, 20-inches wide by 30 inches high, polished edges, 3/16-inch float glass.

2.4 Fasteners: As supplied by accessory manufacturer, or suitable screw fastener for the accessory being installed.

2.5 Caulk: Acrylic latex compound.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Install all accessories in accordance with manufacturer's instructions, true and plumb to surface receiving accessory. Attach securely through to wood backing by others.

3.1.2 Install accessories in accordance with manufacturer's instructions.

3.1.3 Mount mirror with decorative mechanical mirror fasteners, uniformly spaced, screwed to wood blocking.

3.1.4 Dispose of all refuse in accordance with Division 1 requirements.

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site with QC personnel and waste management plan.

3.3.4 Verify materials conformance with the QC personnel.

3.3.5 Verify satisfactory completion of installation and operation of all accessories with the QC personnel.

END OF SECTION

SECTION 11450

RESIDENTIAL EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Furnishing and installation of residential equipment and appliances (by the General Contractor).

1.1.2 See Section 15400 for water heater and garbage disposer.

1.1.4 See Section 16500 for smoke detector.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 Submit manufacturer's standard operating manual and warranty for all appliances and equipment.

1.3.3 LEED Submittals: Submit documentation for applicable LEED prerequisites and credits.

1.3.3 A maintenance label shall be affixed to all equipment requiring preventative maintenance, and a copy of the maintenance instructions shall be provided for owner's use.

1.4 RELATED WORK

1.4.1 Plumbing specified in Section 15400.

1.4.2 Ventilation specified in Section 15500.

1.4.3 Electrical specified in Section 16500.

PART 2 PRODUCTS

2.1 KITCHEN APPLIANCES

2.1.1 Refrigerator: General Electric GSH265JFBB, or equal; 24.6 cubic foot, top freezer, ice maker, Energy Star qualified, frost-free. Provide water hose tubing kit and clamps for connecting icemaker to domestic water line fitting.

2.1.1.1 Refrigerator (Adaptable Units): General Electric GSH25JFRBB, or equal; 25 cubic foot, Energy Star qualified, side-by-side refrigerator/ freezer, automatic ice maker with in-door dispenser of cubes and water, frost-free. Provide water hose tubing kit and clamps for connecting icemaker to domestic water line fitting.

2.1.2 Range: General Electric model JBP66DMBB, or equal; ceramic top, 5.2 cf self-cleaning oven, free standing.

2.1.3 Range (Adaptable Units): General Electric model JSP46DPBB, or equal; ceramic top, self-cleaning oven, slide-in.

2.1.4 Electric Dishwasher:

2.1.4.1 General Electric, Model GSD4000BB or equal; Energy Star qualified, Quiet Power Sound Package, built-in dishwasher. Provide drain hose and clamps for connecting dishwasher drain to disposal fitting.

2.1.5 Microwave Oven/Range Hood:

2.1.6 General Electric Model JVM01730BB, or equal; 1.6 cf, 1000 watts, vent and light.

2.1.7 Range Hood (Adaptable Units): General Electric Model JV347HBB, or equal; vent and light.

2.1.7.1 Microwave in Adaptable Units: General Electric Model JE1860CB, or equal; 1.8 cf. capacity, 1100 watt, 10 power levels.

PART 3 EXECUTION

3.1 METHODS

3.1.1 Dishwashers and icemaker water supply will be connected under Section 15400.

3.1.2 Electrical connections will be under Section 16500.

3.1.3 All equipment shall be installed in accordance with the manufacturer's instructions and tested for proper operation.

3.2 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Inspection Plan and with the following:

3.2.1 Comply with all codes and procedures applicable to this Section.

3.2.2 Verify equipment conformance and installation procedures with the QC personnel.

3.2.3 Verify satisfactory completion of installation with QC personnel, including approval of operation and surface condition of exposed appliances.

END OF SECTION

SECTION 12350

RESIDENTIAL CASEWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Cabinets for kitchens and bathrooms.

1.1.2 Countertops for kitchens and utility tables.

1.1.3 See Section 06200 for shoe molding in kitchens and bathrooms.

1.1.4 See Section 07920 for caulking and sealants.

1.1.5 See Section 15400 for cultured marble countertops in bathrooms.

1.1.6 See Section 01100 and Drawings for special adaptable housing requirements for countertop heights and removeable/replaceable cabinets at kitchens and bathrooms.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.3.2 Notice to Vendors: This company does not accept tropical wood products. Provide the country of manufacture of each product you expect to supply. Also provide a list of FSC-certified products you can supply.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer if provided by the actual product manufacturer.

1.3.2 Submit shop drawings and one sample kitchen cabinet. Submit kitchen layout drawings of cabinet sizes, types and configurations in accordance with the Drawings, indicating manufacturer’s product designations for all components, including scribes, fillers and moldings.

1.3.3 Submit wood species, cabinet finishes and countertop finishes for selection.

1.4 QUALITY ASSURANCE

1.4.1 Comply with ANSI A1.61.1, Recommended Performance and Construction Standards for Kitchen and Vanity Cabinets, except as otherwise indicated hereinafter.

1.4.2 Wall and base cabinets shall be essentially of the same construction and appearance. Cabinets and countertops shall have a flame spread rating that does not exceed 200 when tested in accordance with AST E84 and ASTM E162 test method for surface flammability of materials using a radiant heat energy source.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Kitchen and Vanity Cabinets: Cabinets shall be factory manufactured and shall comply with the Kitchen Cabinet Manufacturer's Association (KCMA) and ANSI A161.1. Wall, base and pantry cabinets shall be essentially of the same construction and appearance, and shall be selected by D/B contractor from manufacturer's standard colors.

2.1.2 Cabinets: Construct cabinets with frame fronts and solid ends, or of frame construction throughout. Frame members shall be mortised and tenoned, dove-tailed or doweled, and glued together. Brace top and bottom corners with hardwood blocks that are glued with water-resistant glue and nailed or screwed in place.

2.1.3 Provide blind corner wall and base cabinets for all corner cabinets, extending full depth to wall.

2.1.4 Cabinet Materials and Dimensions: Materials and minimum dimensions and thicknesses for cabinet construction materials shall comply with the following:

2.1.4.1 Face Frame Members: 3/4-inch-thick solid kiln-dried hardwood suitable for natural stained finish with mortise and tenon joints, glued and nailed under pressure.

2.1.4.2 Base Cabinet Toe Space: 2-1/2-inches deep x 4 inches high (minimum) (base cabinets).

2.1.4.3 Cabinets Tops and Bottoms: 1/2-inch industrial grade particleboard with white or wood grain vinyl overlay both sides for wall cabinets, one side only for base cabinets. Cabinet tops and bottoms shall be dadoed into the sides.

2.1.4.4 Back Panels: 1/8-inch- thick hardboard fastened to rear edge of end panels and to top and bottom rails.

2.1.4.4.1 Contractor's Optional Back Panels: 3/16-inch- thick plywood fastened to rear edge of end panels and to top and bottom rails.

2.1.4.5 Cabinet Ends: 1/2-inch industrial grade particleboard or MDF with white or wood grain vinyl overlay on the inside surface, and on the outside surface where exposed.

2.1.4.6 Exposed ends, sides and backs of base and wall cabinets shall be finished where exposed to view and where adjacent to installed appliances such as refrigerators and ranges. Some portions of cabinetry in kitchens and bathrooms shall be removeable for adaptability purposes. Refer to Drawings. Sides of cabinets-to-remain, which are adjacent to these removeable cabinets, including inside side of rear panel, shall be finished.

2.1.4.7 Doors: Five-piece mortise and tenon construction, 3/4-inch kiln-dried hardwood suitable for natural stained finish with a 1/4-inch captive recessed center panel. Doors shall be

finished with a durable process that consists of stain, 2 sealer coats and a conversion varnish topcoat. Edges of cabinet doors shall have contoured lip to eliminate the need for pull hardware.

2.1.4.8 Drawers:

2.1.4.8.1 Guides: Bottom side mounted, epoxy coated captive roller, 100 pound load rated by MELPA or equal.

2.1.4.8.2 Fronts: 3/4-inch kiln-dried hardwood suitable for natural stained finish to match the cabinet doors and attached to the drawer box with screws. Edges of cabinet drawers shall have contoured lip to eliminate the need for pull hardware.

2.1.4.8.3 Box: Four sided ½-inch industrial grade particleboard with captive 1/8-inch bottoms, doweled, glued and stapled with white or wood grain vinyl overlay.

2.1.4.9 Hinges: Fully or semi-concealed, self-closing, 110 degree to 176 degree opening by AMEROCK or equal.

2.1.4.10 Shelves: 5/8-inch industrial grade particleboard with white or wood grain vinyl overlay and exposed edge banded with matching PVC. All shelves shall be full-depth and only wall hung cabinet shelves shall be fully adjustable using metal locking clips into bored holes. 30-inch high wall cabinets shall have 2 adjustable shelves. Base cabinet shelves shall be half -depth and fixed.

2.1.4.11 Finish: Exposed cabinet surfaces shall be finished with a durable process that consists of stain, sealer coat and a conversion varnish topcoat that is KCMA certified.

2.1.4.12 Exposed Hardwood and Color: Oak, maple or birch species, stain color as indicated on the drawings in the color palette. Color to be approved by D/B Contractor.

2.1.5 Scribe Mold: Furnish, install, and finish as required to match cabinets.

2.2 COUNTERTOPS

2.2.1 Kitchens: Engineered solid surfacing. Homogenous solid sheets of filled plastic resin complying with material and performance in ANSI Z124.3, for Type 6, without a pre-coat finish.

2.2.1.1 Product: Corian, Hanex , or equal.

2.2.1.2 Color will be selected by the D/B Contractor from the manufacturer's available standard colors.

2.2.1.3 Solid surface material with 1-inch face width drop nosing, radiused drip edge, and silicone applied 4-inch high one piece backsplash with scribe strip with edges and ends finished where exposed to view. Provide underlayment sufficient to support overhang.

2.2.1.4 Counter top fabrication shall be in accordance with manufacturer's recommendations. Provide shop cut-outs for sinks and holes for plumbing fixtures. All edges shall be slightly eased.

2.2.1.5 Sealants and adhesives shall be compatible with countertop materials, in color to blend with surfaces. Color to be approved by the D/B Contractor.

2.2.2 Utility Tables: Fabricate with particleboard, glued and screwed to form an integral unit. Bond laminated plastic under pressure to exposed surfaces, using type of glue recommended by plastic manufacturer. Countertop unit shall be post-formed type with no-drip nose, cove moulding, and Style A back splash, and covered with NEMA LD 3, Grade PF 42 plastic. Back splash shall be not less than 3-1/2-inches nor more than 4-1/2-inches high. Provide wood support brackets, fabricated to detail, capable of supporting minimum 200 pound load.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Base shoe molding: WM129 required at all kitchen base cabinets and bathroom vanity cabinets where they meet the finish floor. Stain shall match cabinetry color (refer to Section 06200).

2.3.2 Countertop Bracket Supports: Solid wood, decorative "S" curve shape, projection sufficient for countertop support and permit leg clearance, finish to match cabinets. Brackets located at both ends of countertop, with intermediate brackets spaced 24 inches on center. Provide at cantilevered countertops where indicated on drawings.

PART 3 EXECUTION

3.1 METHODS

3.1.1 Cabinets and countertops in accordance with the Drawings.

3.1.2 Cabinets shall be installed neat, level and true to line. Adjust doors to operate freely without binding.

3.1.3 Cabinets furnished complete with all hardware.

3.1.4 Cabinets shall be left clean and without scratches or surface defects.

3.1.5 Cabinets shall be provided with precut holes for outlets and vents if required by General Contractor.

3.1.6 All cabinets shall be secured to wall framing or solid backing with wood screws, top and bottom of wall cabinets, and top of base cabinet.

3.1.7 Some portions of cabinetry in kitchens and bathrooms shall be removeable for adaptability purposes. Refer to Drawings. Removeable cabinets shall be attached only to underside of countertop, or shall be attached to adjacent cabinetry in such manner as to not leave marks or holes or signs of visible attachment on adjacent cabinetry-to-remain.

3.1.8 Scribe countertops to wall surface where necessary to provide maximum gap tolerance of 1/16-inch.

3.1.9 Provide precut sink cutouts, sized to 1/16-inch of templates.

3.1.10 Dispose of all excess materials, waste and debris at disposal area as specified in Division 1.

3.1.11 Caulk all countertops along backs and sides to conceal gaps.

3.2 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Inspection Plan and with the following:

3.2.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.2.2 Comply with all codes and procedures applicable to this Section.

3.2.3 Verify materials conformance and color selections with the QC personnel.

3.2.3 Verify satisfactory completion of installation with QC personnel, including surface condition of cabinets and operation of drawers, doors and latches.

END OF SECTION

SECTION 12500

WINDOW TREATMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Vertical blinds.

1.2 GENERAL REQUIREMENTS

1.2.1 All contractors shall comply with Actus Buy American Policy.

1.2.2 General Requirements, Division 1, are part of this Section.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer if provided by the actual product manufacturer.

1.3.2 Submit color samples of blinds.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 All Windows: . 3.5 inches vertical extruded solid curve smooth PVC vanes, metal headrail, valance, and wind control. All products must meet Actus Lend Lease’s “Buy American” Policy

2.1.2 PVC blinds shall be certified as lead free. Color shall be manufacturer’s standard white.

PART 3 EXECUTION

3.1 METHODS

3.1.1 Installation of window blinds shall be in accordance with the manufacturer’s instructions.

3.1.2 Use fasteners provided with the product or fasteners as recommended by the manufacturer. Fasteners shall be well founded in wood backing.

3.1.3 Check for proper operation of rods and blinds after installation.

3.2 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor Inspection Plan and with the following:

3.2.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.2.2 Comply with all codes and procedures applicable to this Section.

3.2.3 Verify materials conformance with the QC personnel.

3.2.3 Verify satisfactory completion of all work with the QC personnel, including seam fitting, protection of carpet and job clean-up.

END OF SECTION

SECTION 15400

PLUMBING

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Pipe, pipe fittings and valves for all water, waste, vent, and condensate systems.

1.1.2 Plumbing Specialties: Drains, cleanouts, water hammer arrestors and hose bibbs.

1.1.3 Plumbing fixtures and trim.

1.1.4 Plumbing equipment, sleeves, hangers, strappings and flashings.

1.1.5 Connections to dishwashers and icemaker boxes (furnished under Section 11450).

1.1.6 Excavation and compacted backfill as required, in accordance with Geotechnical Report recommendations.

1.1.7 See Section 01100 for special adaptable housing unit rough-in requirements.

1.1.8 See Section 06100 for blocking and backing.

1.1.9 See Section 07840 for fire-stopping at rated through-penetrations.

1.1.10 See Section 07600 for sheet metal and accessories.

1.1.11 See Section 07920 for joint sealing and caulking.

1.1.12 See Section 12350 for countertops and sink cut-out requirement.

1.1.13 See Appendix A for Energy Star construction requirements.

1.2 GENERAL REQUIREMENTS

1.2.1 General Requirements, Division 1, are part of this Section.

1.2.2 See Section 01352 for LEED requirements and documentation.

1.2.3 See LEED Credits ID, SS, WE, and IEQ for additional requirements.

1.2.4 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.5 See Geotechnical Report for existing conditions at site. Follow all applicable recommendations.

1.2.4 Conform to North Carolina Residential Code – 2006 & North Carolina Plumbing Code – 2006 and the 2006 NC amendments, for design, inspection, and testing.

1.2.5 All contractors shall comply wirth Actus “Buy American” Policy.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 LEED Submittals: Submit documentation for applicable LEED prerequisites and credits.

1.3.3 Maintain one set of as-built record prints for submission to General Contractor upon completion of work.

PART 2 PRODUCTS

2.1 MATERIALS AND FIXTURES GENERAL: All plumbing fixtures shall be the standard catalogued product of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest standard design. Faucet handles shall be of the same design in all bathrooms. Exposed fittings and trimmings shall be brushed nickel-plated brass, except where concealed in cabinets . Traps for sink and lavatories shall be plastic (ABS). All trim shall have alloys not exceeding 16 percent zinc. Aluminum trim will not be permitted. All fixtures and trim shall have matching finishes where applicable.

2.1.1 Tub and shower units shall be coordinated so that right-hand and left-hand units are provided as indicated. Model numbers scheduled are not intended to specify handing of units.

2.2 WATER CLOSET: General Use: Caroma Royale 305 vitreous china, white, close coupled tank, dual flush 1.6/0.8 gpf, round bowl, conforming to ASME A112.19.14-2006, floor outlet with wax gasket, 12" rough-in, with manufacturer supplied round toilet seat. Closet shall have an average flush rate of less than or equal to 1.1 gpf. Provide stop on water supply. ADAPTABLE WATER CLOSET: Caroma Caravelle vitreous china, white, close coupled tank, dual flush 1.6/.08 gpf, elongated bowl, conforming to ASME A112.19.14-2006, 270 ADA and ANSI 117.1, floor outlet with wax gasket, 12" rough-in, with manufacturer supplied elongated toilet seat. Provide stop on water supply.

2.3 LAVATORY WITH ACRYLIC MOLDED INTEGRAL BOWL: Bathroom: Starrow Enterprises, oval "Unilav", cultured marble or equal, white-on-white, with Moen Model #47711BN brushed nickel faucet assembly, centerset single lever control, with aerator, Type I pop-up metal drain, stops and 1.5 gpm flow restrictor. Plastic (ABS) adjustable P-trap, concealed in vanity cabinet.

2.4 PEDESTAL LAVATORY: Powder Room: Gerber Model #22-504 pedestal lavatory, white, Moen Model # 40711BN brushed nickel faucet assembly, centerset single lever control, with aerator, Type I pop-up metal drain, stops and 1.5 gpm flow restrictor. Brushed nickel plated brass adjustable P-trap

2.5 BATHTUB/SHOWER UNIT: Kohler Sterling 'P Accord Series, model number 71140110 or 71140125, 60"x30"x72", tile textured tub around, 3-piece, conforming to the North Carolina Plumbing Code - 2006. Tub/Shower Faucet: Moen 1.75 gpm flow Model 40311CBNGR, single lever, pop up, brushed nickel faucet. Valve to be designed to function safely at the reduced flow rate. Install unit over air barrier sheathing where occurs at exterior wall

2.6 BATHTUB/SHOWER UNIT FOR ADAPTABLE UNITS: Kohler Sterling "Acclaim" model number 71090115 or 71909125, 60"x30"x75", tile textured tub surround, 3-piece with built in grab bars and removable seat, conforming to the North Carolina Plumbing Code - 2006. Tub/Shower Faucet: Moen 1.75 gpm flow single lever, pop up, brushed nickel faucet. Valve to be designed to function safely at the reduced flow rate. Install unit over air barrier sheathing where occurs at exterior wall.

2.7 ROLL-IN SHOWER UNIT FOR ADAPTABLE UNITS: Kohler Sterling model number 62050115 or 620501125, 39"x40"x73", white, tile textured tub surround ,4-piece with built in grab bars and folding transfer seat, conforming to the North Carolina Plumbing Code - 2006. Shower Faucet: Moen 1.75 gpm flow single lever, brushed nickel shower controls. Valve to be designed to function safely at the reduced flow rate. Install unit over air barrier sheathing where occurs at exterior wall.

2.8 KITCHEN SINK: Elkay Model #DD23322-4, 33"x22", 6 ½" depth, 22 gauge, double bowl, type 302, sound deadened, aerator, crumb-cup strainer, ABS plastic P-trap, supply lines, stops, dishwasher waste connection shall be on the garbage disposer, drain suitable for installation of garbage disposer, with Moen Model #47513 brushed nickel faucet, lever type, single control, pull out spray handle, black, w/water connection supply for dishwasher, conforming to North Carolina Plumbing Code – 2006.

2.8.1 KITCHEN SINK FOR ADAPTABLE UNITS: Elkay Model #D23322-4, 33"x22", 6 ½" depth, 22 gauge, double bowl, type 302, sound deadened, aerator, crumb-cup strainer, ABS plastic P-trap, supply lines, stops, dishwasher waste connection shall be on the garbage disposer, drain suitable for installation of garbage disposer, with Moen Model #47513 brushed nickel faucet, lever type, single control, pull out spray handle, black, w/water connection supply for dishwasher, conforming to North Carolina Plumbing Code – 2006.

2.9 GARBAGE DISPOSER: General Electric Model GFC720T 3/4 horsepower with pigtail, w/dishwasher waste connection.

2.10 ELECTRIC WATER HEATER: (Mark EWH-1) A.O Smith Model PXHT-52 or approved equal, 240/3/60, (2) 4.5 KW elements, non-simultaneous, 50 gallon storage, 20.5 GPH recovery at 90 degrees F, 10 year warranty, 95% efficient. Provide 60 gallon storage electric water heater at 4 bedroom units. Hot water and cold water piping shall be insulated. Discharge relief valve as per North Carolina Plumbing Code - 2006. Water heater energy factors shall meet or exceed the minimum requirements of Energy Star. DRAIN PAN: Oatey Model #34058, 26" round, plastic w/1" PVC fitting for connection to hose.

2.11 HOSE BIBBS: Arrowhead Model 486BFP or equal, self draining, freeze-resistant: Anti-siphon vacuum breaker type. See plans for locations.

2.12 WASHING MACHINE OUTLET BOX: Oatey, Model 38545 or equal, plastic box, for recessed installation, drain outlet, hot and cold water supply valves w/single turn valve hub shut-off and 3/4-inch hose threads. Outlet box to be installed in accessible location. Provide receptacles for washer as indicated. A duplex receptacle, 20 ampere, 125 volts, two pole, three wire, grounded type NEMA 5-20R, shall be provided for washer and dryer.

2.13 LAUNDRY TUB: Mustee Model 14 Utilatub, molded freestanding, PVC, white. Moen Model #40812 faucet, 2-handle, swivel spout, brushed nickel on 4" centers.

2.14 ICEMAKER OUTLET BOX: Oatey, Model 38739, plastic box, for recessed installation, suitable for refrigerator connection. Provide shutoff valve for water supply behind refrigerator.

2.15 BACKFLOW PREVENTOR: Use upstream of ice-maker connection box. Watts, Cu7 Coper body dual check valve.

2.16 TRAP PRIMER: Use at floor drains. PPP, Model PR-500 automatic trap primer.

2.17 CLEANOUTS: Provide where indicated on drawings and where required by code. Cleanou plug: Zurn, CO2490

2.18 WATER PIPING: (removed below slab copper tubing) Water piping under concrete slabs shall be cross-linked polyethylene tubing. Joints under the slabs are prohibited. Under slab water piping shall be limited to service entrance and supplies to kitchen sink and dishwasher at cabinet island conditions. Where tubing penetrates the floor slab, it shall be sleeved in CPVC piping and the annular space sealed. Water piping in exterior walls shall be located on the warm side of the insulation and shall be wrapped in insulation. Provide nailing protection for piping subject to damage from nails or screws.

2.18.1 ABOVE-SLAB WATER PIPING: PEX cross-linked polyethylene tubing, sized as indicated on the drawings, fittings, and connections compatible with tubing in accordance with the manufacturer's requirements. Metallic lock rings and insert fittings complying with ASTM F 1974.

2.19 WATER HAMMER ARRESTOR: Sioux Chief, Mini-Rester, Model 660SB or equal, at clothes washer and dishwasher supplies.

2.20 FLOOR DRAIN: Floor drain with round strainer and integral funnel. Zurn, Model Z400E

2.21 SOIL, WASTE, VENT AND DRAIN LINES

2.21.1 Soil, Waste and Vent Lines: PVC pipe, Schedule 40, and fittings conforming to ASTM D 2665 with material per ASTM D 1784, Class 12453B (old Type I, Class 1).

2.21.2 Temperature/Pressure Relief Valve Drain Line: CPVC-ASTM D2846 or PB-ASTM D2666.

2.21.3 Condensate Drain Line: Same as soil, waste and vent lines.

2.21.4 Provide surface or wall cleanouts for each unit with plastic escutcheon.

2.21.5 Where PVC waste piping penetrates the floor slab provide sleeve or wrap to prohibit contact with concrete. Seal annular space.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Inspect all substrates to receive plumbing installation and fixtures for suitability. Notify QC personnel of discrepancies found.

3.2 METHODS

3.2.1 All materials, installation and workmanship shall be in accordance with the manufacturer's recommendations and the North Carolina Plumbing Code - 2006.

3.2.2 Notching and boring of studs and joists shall be limited in accordance with the structural drawings. Notching or boring of beams or posts is prohibited.

3.2.3 Piping:

3.2.3.1 Pipe rough-in work shall proceed as rapidly as general construction of the building will permit. Complete and test pipe rough-in before completing other work.

3.2.3.2 Adequately support all piping throughout the building, both horizontally and vertically, with clamps or hangers sized to fit the piping and properly support their weight.

3.2.3.3 All piping in finished areas shall be concealed.

3.2.3.4 Stops shall be provided for all water supply pipes to all plumbing fixtures.

3.2.3.5 Provide trenching and backfill in accordance with Geotechnical Report recommendations.

3.2.3.6 Cleanout plugs shall be installed to be flush with interior and exterior finished surfaces and shall be clearly visible.

3.2.3.7 Supply and waste lines for kitchen sink shall be concealed within sink cabinet. Provide water supply piping for dishwasher connection.

3.2.3.8 Provide necessary waste piping and fittings for discharge from garbage disposer through a single PVC trap. Install disposer complete with sink flange and connection to waste piping. Connect waste piping from dishwasher to garbage disposer connection.

3.2.3.9 Each fixture and piece of equipment, except water closets, requiring connection to the drainage system shall be equipped with a trap.

3.2.3.10 All unfinished plumbing work such as cleanouts, fittings, etc., exposed to finished rooms or spaces, shall be concealed by a painted plastic escutcheon plate or similar finished device.

3.2.3.11 At copper tube solder joints prepare joint by removing burrs and cleaning with sand cloth, steel wool or wire brush. Apply flux and solder joint using 95-5 tin-antimony solder. No lead solder permitted.

3.2.4 Piping Insulation:

3.2.4.1 Piping shall be wrapped with pipe insulation in accordance with the North Carolina Plumbing Code – 2006 and as specified.

3.2.5 All fixtures and equipment with finished surfaces shall be carefully protected prior to installation, during installation and after installation where subject to damage from on-going construction.

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, the Contractor shall comply with the Actus QC Plan, Contractor QC and Inspection Plan and with the following:

3.3.1 A preparatory meeting shall be held with the QC personnel, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site with QC personnel.

3.3.4 Verify with QC personnel, the suitability of materials and installation procedures.

3.3.5 Inspect and test all fixtures and equipment for proper operation after installation is complete.

3.3.6 Inspection for proper slope to main lines prior to backfill.

3.3.7 Leak test for all interior plumbing after rough-in:

3.3.7.1 Water supply piping shall be tested and inspected in accordance with the North Carolina Plumbing Code - 2006.

3.3.7.2 Sanitary Piping: Before the installation of any fixtures, the ends of the system shall be capped and all lines filled with water to the roof and allowed to stand until a thorough inspection has been made.

3.3.8 Inspect backing and supports prior to installation of tubs and showers.

3.3.9 Verify proper operation of all fixtures and equipment installed under this section.

3.3.10 Sterilization of water system shall be performed in accordance with D/B Contractor Testing Plan and in accordance with NC Plumbing Code 610.1: Purging of Potable Water Systems.

END OF SECTION

SECTION 15500

HEATING, VENTILATING AND AIR CONDITIONING

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Heating, ventilation and air conditioning.

1.1.2 Systems complete with equipment, thermostatic controls, duct work, plenums, supply and return grilles and diffusers.

1.1.3 Bathroom and laundry room exhaust fan and duct, range hood and duct, intake and exhaust air ducts, as required.

1.1.4 Dryer vent and duct.

1.1.5 See Section 15400 for condensate drains and drain connections.

1.1.6 See Section 16500 for ceiling fan/light fixtures.

1.1.7 See Appendix A for Energy Star construction requirements.

1.1.8 Pricing Option: Submit separate pricing for option indicated. See paragraph 2.7.1 for description.

1.2 GENERAL REQUIREMENTS

1.2.1 General Requirements, Division 1, are part of this Section.

1.2.2 Conform to North Carolina Residential Code – 2006 & North Carolina Mechanical Code – 2006 and the 2006 NC amendments, for design, installation, and testing.

1.2.3 See Section 01352 for LEED requirements and documentation.

1.2.3.1 See LEED Credits EA and IEQ for additional requirements.

1.2.3.2 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.4 See Geotechnical Report for existing conditions at site. Follow all applicable recommendations.

1.2.5 All equipment and work shall comply with the applicable requirements of the UMC, IBC, IMC, ASHRAE, NFPA, SMACNA, IGSHPA, NEMA, AGA, ARI, UL, and ANSI. All heating and cooling equipment installed shall bear the “Energy Star” label.

1.2.6 All contractors shall comply wirth Actus “Buy American” Policy.

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data

is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer.

1.3.2 Maintain one set of as-built record prints for submission to the D/B contractor upon completion of work.

1.3.3 LEED Submittal: Submit documentation for applicable LEED prerequisites and credits.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT GENERAL: Standard cataloged products of manufacturers regularly engaged in production of such materials and equipment and shall be manufacturer's latest standard design.

2.2 SUPPLY AND RETURN DUCTS

2.2.1 Rigid Ducts: Min. 26 gauge galvanized steel conforming to UL 181, Class 1. Where located in unconditioned spaces, provide a minimum of 2 inch thick (R-8 minimum) fiberglass insulation faced with a vapor barrier having a permeance rating not to exceed 1.0 perm. Where located within conditioned space, provide a minimum of 1.5 inch thick (R-4 minimum) fiberglass insulation faced with a vapor barrier having a permeance rating not to exceed 1.0 perm.

Insulation, vapor barrier and closure system shall be non-combustible, as defined in ASTM 255, with a flame spread rating of not more than 25, and a smoke development rating of not more than 50, as defined in ASTM E84. All duct seams and joints shall be sealed using glass fabric with mastic. Duct tape shall not be used to seal seams and joints. Duct within unconditioned space shall meet test requirements called for by Energy Star, subject to verification following construction.

2.2.2 Dryer Vents: Galvanized sheet metal with smooth interior finish and joints running in the direction of the air flow.

2.2.3 Flexible Ducts: Spring steel wire helix, fully lined, conforming to UL 181, Class 1, with a minimum of 2 inch thick, (or as specified), fiberglass insulation and a vapor barrier having a permeance rating not to exceed 1.0. Materials and closure system shall be non-combustible as defined in ASTM 255, with flame spread rating of not more than 25, and a smoke development rating of not more than 50, as defined in ASTM E84.

2.2.4 Flexible Aluminum Ducts: Ducts shall conform to UL 181. Flexible aluminum ducts shall be used for exhaust fans only.

2.2.5 Supply and Return Air Plenums: Galvanized 26 gauge steel with 2 inch thick (R-8 minimum) insulation.

2.3 KITCHEN EXHAUST HOOD DUCT

Ductwork shall be galvanized steel with smooth inner walls and shall be air tight and equipped with a backdraft damper.

2.4 AIR REGISTERS

2.4.1 Registers: Ceiling Applications: Steel with louvered face and integral damper operable from front of register, prefinished off-white, corrosion-resistant, anti-smudge type, with sponge rubber gasket between ceiling or wall and duct collar. Floor Applications: Aluminum with fixed deflection blade operable from front of register, prefinished off-white, corrosion-resistant, anti-smudge type, with sponge rubber gasket between floor and duct collar.Size as indicated on plans.

2.4.2 Return Air Registers: Steel with fixed directional fins, prefinished off-white, corrosion-resistant, anti-smudge type with sponge rubber gasket between wall or ceiling Size indicated on plans.

2.5 THERMOSTAT: Honeywell, RTH6400D, low voltage type conforming to NEMA DC3 with the following selector switches for the system: COOL - OFF - HEAT and FAN: AUTO - ON.

2.5.1 Protective housing of corrosion resistant metal or high impact resistant plastic. Mounting plate shall be thermal insulating material and support the thermal element not less than 1/4 inch from the wall.

2.5.2 The control unit shall consist of a temperature sensing element, control switch and anticipating heater. The sensing element shall activate the control switch and anticipator heater to provide single or multistage control for heating and/or cooling equipment as required. Control switch shall be hermetically sealed.

2.5.3 The thermostat shall provide an operating differential per stage of not less than 0.8 degrees F for cooling and not more than 2 degrees F for both heating and cooling. The thermostat shall have provisions for calibrating the unit to the accuracy specified in NEMA DC 3. The design shall prevent calibration adjustment with ordinary tools, such as a screwdriver or pliers.

2.5.4 Heating-Cooling thermostats shall have two separate control units or other proven means integral to the thermostatic control switch designed to prevent simultaneous activation of the heating and cooling circuits. Switches shall have manual changeover from heating to cooling. The heating control unit shall have an adjustable heat anticipator, or other means of maintaining the operating differentials, and the cooling control unit shall have fixed cooling anticipator, or other means of maintaining operating differentials. The system selector switch and fan selector switch shall be integral with the thermostat.

2.5.5 Thermostats shall have a replaceable battery to maintain timing and schedule in memory for one year in the event of a power outage, and bear the “Energy Star” label.

2.6 HEAT PUMP UNIT: Equipment shall have at a minimum a hermetically sealed compressor, high and low compressor protection, filter dryer, compressor with built-in overloads and locked rotor protection, electric crankable heater and anti-short cycle timer. Unit shall provide a minimum of a 13 SEER rating. Coordinate installation with electrical. Refer to sheet M6.01 of the HVAC drawings for the equipment schedule.

2.7 SPLIT SYSTEM AIR-HANDLING UNIT: Equipment shall have at a minimum a model matching heat pump unit (HP) and air-handling unit (AHU), liquid strainer expansion device, pre-insulated housing, minimum MERV 8 filter assembly with manufacturer provided gasket. Air handling unit shall be mounted on prefabricated, insulated metal plenum box. AHU stand supports shall keep plenum box at least 1-1/2” off of slab.

Coordinate installation with electrical. Refer to sheet M6.01 of the HVAC drawings for the equipment schedule. Provide with supplemental electric heater. Refer to schedule on drawing M6.01 for electric heater sizes.

BATHROOM/POWDER/LAUNDRY ROOM FAN:. Recessed ceiling type. Full bath – 70 CFM, Progress PV020-30 80 cfm. Half bath and laundry exhaust – 50 CFM, Progress PV020-30 80 cfm. Fans shall conform to the requirements of ASHRAE 62.2. and shall be Energy Star rated and labeled. Exhaust shall be ducted directly to the outside

2.8 Refrigerant Lines: Seamless copper tubing, hard drawn type K or L conforming to ASTM B88. Insulate entire length of suction lines and exterior portion of liquid line with a minimum of 1 inch closed cell pipe insulation. Protect external insulation with aluminum or PVC jacket, sized to match insulated pipe.

2.9 FILTRATION: Provide MERV 8 filter and filter-rack for AHUs.

2.10 EQUIPMENT PAD: (Outdoor compressor unit) Provide equipment pad of reinforced concrete or composite material of proper size necessary for equipment dimensions.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Inspect all substrates for installation of heating and air conditioning equipment and notify QC representative of any discrepancies found.

3.1.2 Inspect substrates for installation of bathroom fans, range hoods, registers, and notify QC representative of any discrepancies found.

3.2 METHODS

3.2.1 Install systems and related equipment in strict accordance with the manufacturer's instructions. Equipment shall be installed in a manner to facilitate replacement without the need to dismantle adjacent piping, equipment or any fixed construction.

3.2.2 Duct work shall be installed with an adequate number of straps, hangers and other devices necessary to insure a tight fit, proper alignment and adequate support. All ductwork shall be kept sealed during construction to prevent contamination from dust and debris.

3.2.3 Registers shall be installed plumb and true, adequately secured to prevent displacement and air leakage.

3.2.4 Furnish and install controls, thermostats and thermostat wiring.

3.2.5 Install bathroom and utility room fans and range hoods with ducts, per manufacturer's directions.

3.2.6 Dryer Vents: A 4-inch diameter dryer vent shall discharge to the exterior, and provide connection to occupant-owned dryer (one dryer per vent). The vents shall be sheet metal and shall have a smooth interior finish with joints running in the direction of the air flow and teriminate at exterior wall with exterior wall cap and backdraft damper. Vent pipes shall be a maximum of 25 feet long, minus 5 feet for each 90 degree bend, (2.5 feet for each 45 degree bend), not including the transition duct, or as recommended by the

appliance manufacturer. Dryer vents shall not exhaust near the air conditioning condensing unit, entry doors, patio or garages. Dryer vents shall not run through non-accessible spaces or garages.

3.2.7 All vent openings shall have a corrosion resistant rodent screen.

3.2.8 Electrical connections will be provided under Section 16500.

3.2.9 Testing and balancing of HVAC systems shall be performed on ten percent of the project buildings, but not to exceed ten buildings, which have been randomly selected by the QC Representative. At least one of each building type shall be tested. If buildings are turned over in phases, testing shall be performed on ten percent of the buildings completed in each phase, but not it exceed ten buildings per phase. No additional testing will be required if at least 90 percent of the tested buildings pass the test requirements. If less than 90 percent of the tested buildings pass the test, an additional ten percent of the project buildings, not to exceed ten buildings, shall be tested. This process shall continue until ninety percent of the total number of tested buildings pass. Balance system to within plus or minus 10 percent of the value shown on the drawings and provide test data. Record settings of all grilles and registers for each unit type and set all other matching units accordingly throughout the project.

3.2.9.1 AABC-MN-1 or NEBB-01 of SMACNA-07 or ASHRAE III shall be used as the standard for providing testing of air and water systems. The selected standard shall be used throughout the project.

3.2.9.2 Testing shall be accomplished by a firm certified for testing by the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB). Prior to testing, adjusting and balancing the Contractor shall verify that the systems have been installed and are operating as specified. Testing shall not commence until approved by the QC Representative.

3.2.9.3 Following final acceptance of the certified reports by the QC Representative, the setting of all HVAC adjustment devices shall be permanently marked by the balancing engineer so that adjustment can be restored if disturbed at any time.

3.2.10 See Appendix A, Energy Star construction requirements, for air infiltration and duct leakage methods and testing criteria. All methods and testing shall exceed the requirements of these specifications.

3.2.11 After balancing and acceptance each home shall be flushed with a continous flow of fresh air for a minimum of 48 hours with all windows open and the HVAC system fan running continuously. Upon completion the filter is to be changed.

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Plan, Contractor's Testing Plan and with the following:

3.3.1 A preparatory meeting shall be held with the representative, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Verify approved disposal site with QC representative.

3.3.4 Verify with QC representative the suitability of materials and installation procedures.

3.3.5 Verify with QC representative compliance with standards required herein for installation of ductwork.

END OF SECTION

SECTION 16500

BUILDING ELECTRICAL

PART 1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Building service equipment, unit load centers, 120/240 V, single phase, three wire.

1.1.2 Branch circuit wiring, outlets, switches, receptacles, fixtures, lamps, plates, smoke detectors.

1.1.3 Ground fault protection for kitchen, bathroom, garage and outdoor convenience outlets.

1.1.4 Outlets and connections for line voltage equipment furnished and installed by others, except as specifically excluded herein.

1.1.5 See Section 01100 for special handicapped electrical requirements.

1.1.6 Telephone, data, and television systems within buildings, including coordination with utility companies.

1.1.7 See Section 03300 for coordination of Rebar (Ufer) ground.

1.1.8 See Section 07200 for sealing of penetration to stop air infiltration.

1.1.9 See Section 07840 for fire-stopping rated penetrations.

1.1.10 Supports, sleeves, cutting and patching as required.

1.1.11 See Section 07920 for sealants.

1.1.12 See Section 11450 for residential equipment.

1.1.13 See Section 15500 for mechanical equipment.

1.1.14 See Appendix A for Energy Star construction requirements.

1.1.15 See specification Section 10001 special requirements.

1.1.16 Pricing Option: Submit separate pricing for option indicated. See paragraph 2.16.2 for description

1.2 GENERAL REQUIREMENTS

1.2.1 General Requirements, Division 1, are hereby made part of this Section.

1.2.2 See Section 01352 for LEED requirements and documentation.

1.2.3 All Contractors shall comply with Actus Buy American Policy.

1.2.4 Where a conflict exists between the contract drawings and these specifications, the most stringent requirement shall be adhered to unless directed otherwise by the Architect.

1.2.5 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.6 See Geotechnical Report for existing conditions at site. Follow all applicable recommendations.

1.2.7 All electrical work shall meet the requirements of the latest editions of the following standards and codes:

1. NFPA 70, National Electrical Code, 2008 Edition
2. ANSI A117.1, Buildings and Facilities - Providing Accessibility and Usability for Physically Handicapped People
3. Uniform Federal Accessibility Standards
4. UL 268, Smoke Detectors for Fire Protective Signaling System.
5. NFPA 72- National Fire Alarm Code
6. NFPA 101- Life Safety Code

1.3 SUBMITTALS

1.3.1 Submit test data and/or manufacturer's data and specifications for all products and materials to be furnished and/or installed under this Section. Where manufacturer's data is not available, affidavits and certificates of compliance which state that all products and materials comply with these specifications will be acceptable if provided by the actual product manufacturer. All submittals to contain manufacturer’s contact and telephone number.

1.3.2 Submit documentation for applicable LEED prerequisites and credits.

1.3.3 Maintain one set of as-built record prints for submission to the General Contractor upon completion of Work. Show all circuits as actually installed to each switch and outlet and revised panel schedules if applicable.

PART 2 PRODUCTS

2.1 MATERIAL AND EQUIPMENT GENERAL: All materials, equipment and devices shall meet the requirements of a recognized NRTL, e.g. Underwriters' Laboratories, Inc. (UL) where NRTL standards are established for those items, and the requirements of the NFPA 70. All items shall be new unless specified or indicated otherwise.

2.2 SERVICE ENTRANCE EQUIPMENT

2.2.1 Equipment shall be dead front, suitable for exterior use, surface mounted NEMA 3R lockable 120/240 volt, single phase, 3 wire with separate neutral bus and ground bus. Service Entrance equipment shall be painted galvanized steel.

2.2.2 Current carrying and insulating devices and parts shall conform to the latest standards specified in related sections of NEMA and ANSI standards. Bus and circuit breakers shall have an interrupting capacity of 10,000 amperes RMS symmetrical minimum, unless otherwise noted. Disconnects to be rated 150 Amperes.

2.2.3 Circuit breakers shall be of thermal magnetic, full size molded case bolt-on type unless otherwise noted.

2.2.4 Multi-unit service equipment shall have an underground pull section with lockable main circuit breaker disconnect and meter socket for each housing unit equal to Cutler-Hammer 1MP2204R series for duplex units and CMBEB200BTF for single family units with main terminal ground lug, aluminum bus, and socket covers. Mark housing unit identification adjacent to each meter socket. Meter drop shall be connected ahead of the disconnect.

2.2.5 Metering: Remote metering system installed by others under separate contract.

2.3 LOAD CENTERS

2.3.1 Load centers shall be dead front, flush-mounted, one piece front, in NEMA 1 enclosure 120/240 volt, single phase, 3-wire with separate neutral bus and bonded equipment ground bus. Load centers shall be rated 150A, 10k AIC. 3 spare circuit spaces, main lugs only.

2.3.2 Current carrying and insulating devices and parts shall conform to latest standards specified in related sections of NEMA and ANSI standards. Bus and circuit breakers shall have an interrupting capacity of 10,000 amperes RMS symmetrical minimum, unless otherwise noted.

2.3.3 Circuit breakers shall be of thermal magnetic, full-size molded case plug-on type unless otherwise noted. Multiple breakers shall be common trip with single handle. Minimum size breaker shall be 15 amperes. Breakers connections to be rated 75 degrees Celsius.

2.3.4 Load centers shall be recessed, with flush fronts and hinged doors. Load centers shall occupy a clear horizontal space of 30 inches. A minimum of 36 inches of clear and unobstructed space in front of the load center shall be provided. Clear front space shall be floor to ceiling. Tandem circuit breakers shall not be used. Contractor shall provide and install printed labels, in the load center, for all installed circuits. No recessed load centers are to be located in party walls or fire walls.

2.3.5 The living unit load center shall be located in the utility room, hallway or attached garage.

2.4 CONDUIT STUB-OUTS: Schedule 80 where exposed and Schedule 40 PVC where protected, unless noted otherwise. Radius of bend shall be not less than 6 times trade size of conduit.

2.4.1 Conductors shall be installed in conduit where indicated on the Drawings and where specifically required by the NEC.

2.4.2 Minimum conduit size shall be 1/2 inch.

2.5 CONDUCTORS

2.5.1 Conductors shall be copper and not smaller than No. 14 AWG, conductors shall be 600 volt, 75 degree C, UL listed. Conductors No. 10 AWG and smaller shall be solid, and those No. 8 AWG and larger shall be stranded.

2.5.2 Branch circuit conductors shall be non-metallic sheathed cable, type NM-B for dry applications and type UF-B for wet applications, with grounding conductor unless noted otherwise.

2.5.3 Unit load center feeders shall be type SE cable, style SER (three conductor, plus ground, insulated neutral). Install in steel metal conduit where exposed.

2.5.4 Unless indicated otherwise, all power and lighting wires, installed in conduit or electrical metallic tubing, shall be type THWN-THHN, XHHW, or RHW.

2.6 GROUNDING

2.6.1 Grounding Electrode System shall be a Rebar (Ufer) ground. #4 CU solid Grounding Electrode Conductor connected with a listed connector to a #4 rebar placed 2 inches from the bottom of the foundation encased in concrete.

2.6.2 Bare grounding cable shall be annealed, concentric lay, stranded copper.

2.6.3 Equipment grounding cable, EGC, shall be of the same type and material as the conductors it accompanies.

2.7 OUTLET BOXES: Metal or plastic, sized as required by the NEC for the conductors and devices contained in each. Mount boxes per NEC 314-20 in finished areas and provide with plaster rings where required by the type of box and wall finish. Offset back-to-back boxes in fire-rated walls by one stud space, caulk and seal as required. Do not use plastic boxes in fire-rated wall unless box is use-specific rated for that location.

2.8 TOGGLE SWITCHES: Quiet AC type, white finish, minimum 20-ampere rating at 120 VAC, horsepower rated thermal switch where used for motor control. Provide single-pole, 3-way, or other types as required.

2.9 RECEPTACLES

2.9.1 Convenience Outlets: Duplex, wall-mounted, white finish, rated 15-amperes, 125 volts, 2-pole, 3-wire, grounding type, NEMA 5-15R or as noted on the plans.

2.9.1.1 Receptacle for electric clothes dryer shall be 30 ampere, NEMA 14-30R, three pole, four-wire receptacle (provided with washer wall box by plumber). Provide separate neutral and ground conductors.

2.9.1.2 Wiring Terminations and Devices: Receptacles and plugs shall be residential grade. Devices on dedicated circuits shall be connected with side wired screw terminals. Stranded conductors shall be connected with rigid wire nuts. Solid conductors shall use spring-type wire nuts.

2.9.1.3 Plugs and Cords: Cords, with plugs, shall be installed for all contractor provided appliances, including the garbage disposal, dishwasher, cooking range, and gas water heater (if provided with an electric igniter).

2.9.1.4 Appliance Outlets: Kitchen appliance circuits and other individual separate circuits for appliances shall be 20-ampere circuits. Such outlets served from 20-ampere circuit breakers shall be duplex, wall-mounted, white finish, rated 20-amperes, 125 volts, 2-pole, 3-wire, grounding type, NEMA 5-20R.

2.10 GROUND FAULT AND ARC FAULT PROTECTION

2.10.1 Outlets in each housing unit shall be ground fault protected (using arc-fault type circuit breakers) where indicated and as required by NEC 70, 2008 which includes all outlets except kitchen outlets.

2.10.2 Ground fault protection shall serve only those receptacles so indicated. First receptacle on the circuit shall be the ground fault circuit interrupting type.

2.11 DEVICE PLATES AND COVERS: Smooth white plastic for flush outlets, corrosion resistant hinged lift cover type with gasket for weatherproof outlet in accordance with NFPA 70, 406.8(B), and any switch or receptacle plate on exterior wall for air infiltration. Exterior receptacles shall have weatherproof "in-use" type covers.

2.12 LIGHT FIXTURES

2.12.1 Light fixtures shall be as specified on the drawings.

2.12.2 Fixtures shall be complete with glassware, lamps, fittings, sockets, reflectors, ballasts, wiring, hangers, poles and accessories for complete installation.

2.12.3 EXTERIOR LIGHTING AND OUTLETS. Exterior fixtures shall be metal. Fixtures shall be anodized aluminum or metal with powder coated finish. Painted steel or brass plating are not acceptable. Exterior lights shall be mounted no more than 9 feet above finished grade.

2.12.4 Outdoor fixtures shall be NRTL listed for wet locations.

2.12.5 House numbers shall be illuminated. Utilize a low voltage high visibility system as scheduled or approved equal. Provide each house number plaque with five high impact UV resistant high heat polycarbonate number tiles, with 4-inch high numbers. House numbers will be assigned by the Project Company.

2.12.6 Provide one house number sign for each dwelling unit (two house number plaques per duplex building).

2.13 INTERIOR LIGHTING

2.13.1 Provide lamps and CFL's of the exact type, wattage and voltage rating, specified on the drawings for Energy Star compliance.

2.13.2 Light fixtures shall be as shown on the plans, or approved equal.

2.13.3 Ballasts shall be electronic for all fluorescent lamps.

2.14 EQUIPMENT CONNECTIONS: Provide appropriate connections for all equipment.

2.14.1 CEILING FAN OUTLET BOXES: Provide approved ceiling fan outlet boxes for ceiling mounted light fixture in all bedrooms, living room, dining room, and family room.

2.15 SMOKE AND CARBON MONOXIDE DETECTORS

2.15.1 SMOKE ALARMS: Electric type, 120 VAC, direct wired, photoelectric type, interconnected to provide that all SMOKE AND CO alarm stations will be activated if one station goes into alarm mode (multiple station). The smoke alarms shall be equipped with battery backup, batteries shall be furnished with the detectors. Smoke detectors and installation to comply with NFPA 72 and NFPA 101.

2.15.2 Smoke detectors in handicapped units shall have visual annunciation where indicated. Visual alarms shall comply with ADA requirements and have 177 candela strobes.

2.15.3 Circuit breaker shall be clearly labeled with warning not to shut off and painted red.

2.15.4 Smoke alarms shall be wired to a dedicated circuit.

2.15.5 Smoke detectors shall be located in bedrooms between the center of the room and the door opening. Smoke detector shall be located in bedroom hallway just outside bedroom doors (within 10 feet). Smoke detector on a non sleeping floor shall be located near the stairwell. Smoke detectors shall be installed per NFPA 72.

2.16 SMOKE ALARM/CARBON MONOXIDE (CO) DETECTOR COMBINATION: Provide detectors in accordance with NFPA 72 and NFPA 101. CO detector portion shall be electro chemical type, have digital display, peak level memory and minimum 80db alarm. The detectors shall be equipped with voice alarm that distinguishes between smoke and CO alarm. Detectors shall be 120V, multiple station type interconnected with smoke detector system. Units shall have visual readout indicating that the unit is in service. Devices shall be UL listed and equipped with battery backup (batteries supplied with the detector unit).

2.16.1 Combination detectors shall be installed as shown on the plans.

2.16.2 Unit Pricing Option: Provide deduct price to delete one smoke/carbon monoxide detector combination and install a multiple station smoke detector only in place thereof.

2.16 TELEPHONE SYSTEM

2.16.2 Telephone demarcation cabinets shall be provided and installed by the telephone company.

2.16.3 Telephone jacks shall be modular (i.e. 525B1 wall flush type outlet). Wiring and jacks shall comply with EIA/TIA standard 570. Cable and jacks shall be Category 5e per TIA/EIA 568A and shall be gray in color. Use 8-pin modular, RJ-45. All wiring shall be home runs, no loop wiring allowed. All home runs shall be identified by unit number and location. Telephone wiring shall terminate in a type 66 telephone block in the telephone service cabinet. Electrical Contractor to supply and wire telephone block.

2.16.4 All telephone equipment, materials and installation methods shall meet the requirements of the telephone company.

2.16.5 Wall plate: 2 port, 1 gang, white P&S #TPD2-W. 1 port Telephone and 1 port data.

2.16.5 Provide outlets in kitchen, dining or family area, living room and all bedrooms of each housing unit. Eight position modular jack connectors shall be provided at all outlets. Dual jacks shall be provided in bedrooms and family area.

2.17 TELEVISION SYSTEM

2.17.3 Television cable shall be 75 Ohm, type RG-6, 60% braid coaxial type. Cable shall be submitted to CATV Company for approval. All runs from outlets shall be home runs. Wiring shall be such that occupant can connect to a satellite dish. All connectors shall be Corning Gilbert Ulttra Ease compression type connectors.

2.17.5 All television equipment and materials shall meet the requirements of the CATV Company.

2.17.6 Wall plate: 2 port, 1 gang, white P&S #TPD2-W; Wall jack: P&S #SFF-W

2.17.7 Each home run cable shall be tagged with the unit number and outlet location.

2.18 DATA SYSTEM

2.18.1 Cat 5e cable and shall be blue in color. All wiring shall be home runs, no loop wiring allowed. All home runs shall be identified by unit number and location. Wallplate: 2 port, 1 gang, white P&S #TPD2-W; Wall jack: Cat 5e Universal T568a/b P&S #AC-C5EKEY-WH

2.18.2 Provide a jack as a second port in every telephone outlet.

2.18.3 Each home run cable shall be tagged with the unit number and outlet location.

2.19 DOORBELL: Electric type, 120 VAC supply, with push-button, wall-mounted chime and transformer. Low voltage wiring per manufacturer's instructions. Handicapped adaptable dwelling units shall have a visual indicator unit located above the front door tied to doorbell.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Inspect points of connection to service entrance feeders and telephone and television services. Notify D/B Contractor of discrepancies.

3.2 METHODS

3.2.1 Support outlet boxes by attachment direct to building structural members or use galvanized steel bar hangers for outlet boxes located between building structural members. Offset back-to-back outlet boxes one stud space in party walls. Fire stop by caulking or other approved means in fire rated walls. Fire stopping products shall have been tested per ASTM E-814 and UL 1479 and UL listed in the Building Materials Directory.

3.2.2 Route branch circuit cables to avoid damage from screws, nailing or other construction activities. Protect exposed wiring in accordance with the applicable requirements of Article 334 of the National Electrical Code.

3.2.3 Make all conductor splices and terminations in accordance with the conductor and connector manufacturer's instructions.

3.2.4 Within housing units, install all cables concealed in walls or above ceilings except in unfinished areas or unless otherwise noted. Do not install cables directly in earth, in concrete or in outdoor locations. In these locations, use conduit with approved pull-in type conductors having insulation rated minimum 75 degrees C for both wet and dry locations.

3.2.5 Where conduit passes through party walls provide U.L. listed fire stops.

3.2.6 In below-grade locations, use Schedule 40 PVC conduits, or as noted on drawings. Provide an insulated copper equipment grounding conductor in each nonmetallic conduit.

3.2.7 Conduit shall not be run in concrete slabs-on-grade. When in direct contact with earth or fill, conduit shall be coated rigid steel thickwall conduit, coated intermediate metal conduit, Schedule 40, or Schedule 80, polyvinyl chloride (PVC) type. Elsewhere, conduit where required shall be either galvanized thickwall conduit, intermediate metal conduit, or electrical metallic tubing (EMT) type, except that EMT shall not be installed in concrete, exposed to the weather or in other wet locations.

3.2.8 If conduit is required elsewhere within buildings, use galvanized steel electrical metallic tubing or ENT where allowed by NEC.

3.2.9 Above grade in outdoor or other wet locations, use threaded galvanized rigid steel conduit unless noted otherwise and die cast aluminum boxes with weatherproof covers. Use galvanized steel, PVC jacketed liquid-tight flexible metal conduit for connection to motors, outdoors. Run separate ground wire.

3.2.10 Install branch circuits in accordance with the panel schedules. Panel directories shall be complete and typewritten. Multi-wire branch circuits with common neutral are not allowed. Provide engraved labels for service entrance disconnects, meters and subpanels, labels to identify units served.

3.2.11 Grounding:

3.2.11.1 The assembly of all equipment shall be such that all exposed non-current carrying metallic parts of electrical equipment such as enclosures, ferrous and/or aluminum conduits, junction boxes, fixtures, all machinery and all other apparatus are permanently and effectively grounded. Grounding bushings shall be used wherever conduits are grounded.

3.2.11.2 All embedded and buried ground connections shall be CADD welded type (exothermic process) or a listed compression type connector.

3.2.11.3 Service entrance equipment shall be grounded to a rebar (Ufer) Grounding Electrode System per NEC requirements.

3.2.11.4 Grounding electrode conductor shall be size #4 AWG and conduit protected.

3.2.12 Mounting heights for outlets and controls shall be in accordance with drawings.

3.2.13 Smoke detector installation shall conform to the requirements of NFPA 72 and NFPA 101. Smoke detector shall be installed in accordance with manufacturer's directions and recommendations.

3.2.14 Light Fixtures:

3.2.14.1 Deliver lamps to the project in their original cartons and install in the fixtures just prior to the completion of the project. After construction of the project is completed, clean fixtures and lamps.

3.2.14.2 The electrical box for all ceiling light fixtures in bedrooms, living room, dining room and family room shall be rated for ceiling fan installation.

3.2.14.3 The address light shall be connected to the door bell system low voltage transformer. The exact location for this fixture is to be coordinated with the building owner representative.

3.2.15 Telephone System:

3.2.15.1 Station installation shall be in accordance with standard practice and the requirements of the telephone company.

3.2.15.2 An empty two-inch conduit with pull wire shall be extended from the telephone cabinet to the underground utilities distribution system.

3.2.15.3 Provide a No. 6 copper ground wire from the building grounding system to the telephone enclosures.

3.2.15.4 Pre-wire units in accordance with the plans and telephone company requirements.

3.2.15.5 Coordinate with telephone utility and comply with their requirements.

3.2.15.6 Wiring shall be home run style.

3.2.16 Television System

3.2.16.1 An empty two-inch conduit with pull wire shall be extended from the television cabinet to the underground utilities distribution system.

3.2.16.2 Pre-wire units in accordance with utility requirements.

3.2.16.3 Coordinate with television utility and comply with their requirements.

3.2.16.4 Cables shall have no splices or splits. Wiring shall be home run style.

3.2.16.5 All television outlets shall be pre-wired and pre-tested.

3.2.17 Install doorbell push-button, chime and low voltage wiring in accordance with the manufacturer's directions.

3.2.18 All electrical equipment shall be rigidly attached to foundation or other adequate support to prevent lateral and vertical displacement in accordance with manufacturer's directions.

3.2.19 Clean all equipment of construction debris. Dispose of debris at an approved off-site location.

3.2.20 Maintenance and Operating Instructions:

3.2.20.1 Furnish the D/B Contractor with complete sets of operating and maintenance instructions. Each shall be bound and indexed with quantities as directed by QC personnel.

3.2.20.2 The instruction manual shall include manufacturer's certifications or directions for products installed under this section.

3.3 FIELD QUALITY CONTROL

Prior to the acceptance of the above specified work, the Contractor shall comply with the QC Personnel and with the following:

3.3.1 Hold a pre-construction meeting with the QC Personnel, the General Contractor's field representative, the Subcontractor's field representative, CATV and telephone representatives in attendance.

3.3.2 Comply with all codes and procedures applicable to this Section.

3.3.3 Dispose of surplus materials and debris as specified in Division 1.

3.3.4 Verify approved disposal site with QC Personnel.

3.3.5 Testing: As an exception to requirements that may be stated elsewhere in the contract, the D/B Contractor shall be given 5 working days notice prior to each test.

3.3.5.1 Conduct operating tests of all electrical equipment and systems. Correct any defects found for work done under this Section, or notify the D/B Contractor of improper performance of electrical equipment furnished under other Sections.

3.3.5.2 Provide manufacturer's instructions for test equipment to the D/B Contractor prior to testing.

3.3.5.3 Ground Electrode Test: Test ground electrodes for resistance value before any wire is connected. Make tests using a portable megger equipped with a meter reading directly in ohms. Perform tests in accordance with the instructions of the instrument manufacturer. Provide one copy of the directions for the use of the observing inspectors. Submit a written report listing the values measured at each building. The test report shall be dated and signed by the person performing the tests. A Quality Control Representative shall witness the ground resistance reading for the Grounding Electrode System.

3.3.5.5 After the telephone cable and modular jacks have been installed, the system shall be tested for continuity and short circuits. A signed tag shall be attached to the end of the cable, inside the telephone box, indicating the location of the outlet served and the date of the test. Conform to utility company requirements.

3.3.5.6 After the television cable and outlets have been installed, the system shall be tested for continuity and short circuits. A signed tag shall be attached to the end of the cable, inside television box, indicating the location of the outlet served and the date of the test. Conform to utility company requirements.

3.3.5.7 After smoke detector installation, test all detectors with a smoke source per manufacturer’s recommendations and submit a written test report to the D/B Contractor.

3.3.5.8 Devices Subject to Manual Operation: Each device subject to manual operation shall be operated at least five times, demonstrating satisfactory operation each time.

END OF SECTION

APPENDIX A

ENERGY STAR CONSTRUCTION GUIDELINES

PART 1 GENERAL

1.1 ENERGY STAR

1.1.1 For a home to qualify as Energy Star, it must meet certain criteria as determined by the EPA and the U.S. Department of Energy:

1.1.1.1 It must be designed and built following either a prescriptive path or, based upon calculations provided by RESNET-accredited rating software, demonstrate an energy performance equal to or better than that demonstrated by the prescriptive path. These documents have been prepared based upon the Performance path.

1.1.1.2 It must be verified and field-tested according to the Home Energy Rating System (HERS) Guidelines by a RESNET-accredited provider.

1.1.1.3 It must meet all state and local codes.

1.1.2 References to other sections:

1.1.2.1 Section 06100 Rough Carpentry

1.1.2.2 Section 07200 Insulation

1.1.2.3 Section 07920 Sealants

1.1.2.4 Section 08510 Windows

1.1.2.5 Section 09260 Gypsum Board

1.1.2.6 Section 15400 Plumbing

1.1.2.7 Section 15500 HVAC

1.1.2.8 Section 16500 Building Electrical

1.2 GENERAL REQUIREMENTS

1.2.1 General Requirements, Division 1, are part of this Section.

1.2.2 See Section 01352 for LEED requirements and documentation.

1.2.2.1 See Division 1 Section 01524 “Construction Waste Management” for waste recycling and disposal requirements.

1.2.2.2 Provide documentation for LEED Credits EA 1.1, 1.2, 2.1, 3.1, and 5.1 and Credit IEQ 1.

PART 2 INSPECTION

2.1 Actus' Quality Control Representative shall verify that all construction materials and methods follow the criteria described in the Drawings and Specifications (Documents). The Energy Star Provider shall verify requirements as necessary.

2.1.1.1 Any discrepancy found not to comply with the construction documents shall be brought to the attention of the Quality Control Representative.

2.1.1.2 Such discrepancies shall be corrected to the satisfaction of the Quality Control Representative and the Energy Star Provider.

2.2 A sampling of new homes will be tested for Energy Star compliance by a certified Energy Star Provider, following the criteria contained in the Energy Star Sampling Protocol Guidelines. These tests will be for:

2.2.1 Building envelope compliance.

2.2.2 Ductwork leakage.

PART 3 VERIFICATION AND TESTING

3.1 BUILDING ENVELOPE:

3.1.1 Insulation levels shall be as determined by performance path.

3.1.2 Checklist for thermal bypass shall be verified.

3.1.3 Infiltration: Blower Door Test, performed in accordance with ASTM E779, measuring the leakage by the pressurization method, shall be performed on a select percentage of housing units as described in the Energy Star Sampling Protocol Guidelines by a certified Energy Star Provider. The following shall occur:

3.1.3.1 All combustion devices shall be turned off.

3.1.3.2 All intentional openings in the building envelope (i.e., A/C supply and return registers, dryer vent, bathroom and kitchen exhausts) shall be sealed.

3.1.3.3 All sinks, tubs, toilets and washer drain shall be plugged or filled to prevent leakage through plumbing vents.

3.1.3.4 All doors and windows shall be closed and latched.

3.1.4 To pass the Blower Door Test, the building shall have an air tightness rating within the range dictated by the RESNET calculations.

3.1.5 Energy Star Sampling Protocol dictates the frequency of re-testing requirements based on percentage of units that do not pass the blower door test. If an unacceptable percentage of failures occur on the randomly selected units, then an additional number of randomly selected units will be tested until an acceptable passing rate is achieved.

3.2 DUCTWORK LEAKAGE

3.2.1 Overall ductwork system leakage testing shall be performed.

3.2.2 All plenums and ducts shall be included in duct leakage test.

3.2.3 Return-air ducts shall be included in the leakage test.

3.2.4 Equipment shall be included in the leakage test.

3.2.5 If duct blaster is used, the following method shall be used:

3.2.5.1 To pass the duct leakage test, maximum HVAC leakage shall be as dictated by the RESNET calculations.

3.2.5.2 The Contractor shall correct all housing units not found in compliance, and shall be responsible for all labor and materials required to reduce air leakage to within the calculated parameters.

3.2.5.3 Any measures taken to reduce the air leakage to acceptable values shall be permanent and shall be implemented on all similar housing units.

3.3 FIELD QUALITY CONTROL

3.3.1 Prior to the acceptance of the above-specified work, the Contractor shall comply with the QC Plan, Contractor Inspection Plan and with the following:

3.3.1.1 A preparatory meeting shall be held with the QC personnel, the Energy Star Provider, the General Contractor's field representative and the Subcontractor's field representative in attendance.

3.3.1.2 Comply with all codes and procedures applicable to this Section.

3.3.1.3 Verify materials conformance with the QC personnel.

3.3.1.4 Verify satisfactory completion of all work with the QC personnel, including job clean-up.

END OF SECTION