



Procurement Office
495 Upper Falls Blvd.
Rochester, NY 14605
Fax: 585-697-7164
WWW.ROCHESTERHOUSING.ORG

November 17, 2017

ADDENDUM 1

To: Potential Bidders

RE: Rochester Housing Authority,
New Construction or Modular home 43 Eiffel Place

33 pages including cover

See Attached

Acknowledgement:

I have received the above referenced Addendum # 1 and have used it in the calculation/preparation of this bid.

Contractor



1. Remove and replace complete the existing HUD-51000 form with the attached HUD- 51000 form.
2. Remove and replace complete the existing Deduct Alternate sheet and replace with the attached deduct Alternate sheet.
3. Remove and replace the existing Project Manuel cover sheet and replace with the attached Project Manuel cover sheet.

Master List of Items

Item No.	Division of Work	Item No.	Division of Work	Item No.	Division of Work
1	Bond	20	Rough Carpentry		
2	General Conditions \\1	21	Metal Bucks	44	Site Improvements
3	Demolition & Clearing	22	Caulking	45	Retaining Walls
		23	Weatherstripping	46	Storm Sewers
		24	Lath & Plastering-Drywall	47	Sanitary Sewers
		25	Stucco	48	Water Distribution System
		26	Finish Carpentry	49	Gas Distribution System
		27	Finish Hardware	50	Electrical Distribution System
		28	Glass & Glazing	51	Street & Yard Lighting
		29	Metal Doors	52	Fire & Police Alarm System
		30	Metal Base & Trim	53	Fire Protection System
		31	Toilet Partitions	54	Street Work
		32	Floors	55	Yard Work
		33	Painting & Decorating	56	(Other)
		34	Screens		(Other)
		35	Plumbing		
		36	Heating		
		37	Ventilating System	57	Equipment
		38	Electrical	58	Shades & Drapery Rods
		39	Elevators	59	Ranges
		40	Elevator Enclosures-Metal	60	Refrigerators
		41	Incinerators-Masonry & Parts	61	Kitchen Cabinets & Work Tables
		42	(Other)	62	Laundry Equipment
		43	(Other)	63	(Other)
				64	Punch List \\2
					Lawns & Planting

1 General Conditions should be 3% to 5% of contract amount. 2 Punch List should be approximately 1/2 of 1% or \$30 per dwelling unit, whichever is greater.



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Deduct Alternates

Deduct Alternate #1: Proposal for the amount to be deducted from the Base Bid amount to delete Air Conditioning from the HVAC system, including cooling coils, refrigerant piping and condensing unit and related electrical work as specified and indicated on the drawings.
Base Bid shall include complete air conditioning system in conjunction with the specified HVAC system.

\$ _____

Deduct Alternate #2 Proposal for the amount to be deducted from the Base Bid amount to change the specified composite decking to pressure treated 5/4 x 6 decking at rear (south) deck only.
Base Bid shall include specified composite decking.

\$ _____

Deduct Alternate #3 Proposal for the amount to be deducted from the Base Bid amount to delete the stone veneer on the North Elevation and ramp area and substitute parged concrete foundation wall.
Base Bid shall include the stone veneer as indicated.

\$ _____

**This page must be included in your bid package or
your bid may be deemed non-responsive**

Project Manual

**ROCHESTER HOUSING AUTHORITY
SINGLE FAMILY MODULAR RESIDENCE
43 EIFFEL PLACE
ROCHESTER, NEW YORK 14621**



**ISSUED FOR BID
October 25, 2017**

ARCHITECT'S PROJECT NO. 1931-01

LOTHROP ASSOCIATES ^{LLP} ARCHITECTS

333 Westchester Avenue, New York 10604 (914) 741-1115

510 Clinton Square, Rochester, New York 14604 (585) 939-7576

125 Half Mile Road, Suite 200, Red Bank, New Jersey 07701 (732) 933-2734

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www.lothropassociates.com

**ROCHESTER HOUSING AUTHORITY
SINGLE FAMILY MODULAR RESIDENCE
43 EIFFEL PLACE
ROCHESTER, NEW YORK 14621**

Rochester Housing Authority
675 West Main Street
Rochester, New York 14611

ADDENDUM No. 1

Date: December 4, 2017

LAA Project No. 1931-01

This Addendum forms part of the Contract Documents and amends the original Bidding Documents dated October 25, 2017 only in the following particulars. Original provisions of the Contract Documents shall remain in effect except as specifically amended by this Addendum. Bidders shall consider amendments and the resulting cost differences shall be included in all bids. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the bidder to disqualification.

GENERAL:

A. Project Guarantee:

Project shall be guaranteed for a period of two (2) years from date of Substantial Completion. This statement overrides any other statement in the Contract Documents for a lesser time period.

SPECIFICATIONS

A. Section 000001 "Title and Directory":

1. Revise Architect's Project No. at bottom of page to **1931-01**.

B. Section 087110 "Door Hardware":

1. Delete Section 087100 in its entirety and replace with revised **Section 087110R** included in this Addendum.

C. New **Section 113013 "Residential Appliances"** is issued herewith and included in this Addendum.

D. New **Section 122113 "Horizontal Louver Blinds"** is issued herewith and included in this Addendum.

E. Section 220100 "Basic Project Plumbing & Mechanical Requirements":

1. Delete Section 220100 in its entirety and replace with revised **Section 220100R, retitled "Basic Plumbing and HVAC Requirements"** included in this Addendum.

DRAWINGS

A. Drawings C-001, C-002, C-003: Revise zip code on left hand title box from 14611 to **14621**.

B. Drawing A-050:

1. Add to note #1: **...and ICC A117.1-2009 "Americans with Disabilities Act (ADA). First Floor and site of this project shall be ADA compliant.**
2. Add General Note :
12. Site built frame construction ("stick built") will be considered as an acceptable substitute for the specified Modular Building, subject to compliance with the Contract Documents. In such case, the Contractor shall be responsible for complete design of the structural frame and all structural elements above the foundation and submit structural drawings signed and sealed by a qualified Professional Engineer licensed in the State of New York.
3. Delete Modular Building Noted in their entirety and replace with Revised Modular Building Notes included in this Addendum.

C. Drawing A-200:

1. South and West Elevation- note that First Floor and finished deck elevation are the same (+1'-5").
2. West Elevation- Add shutters to window at Kitchen area.
3. North Elevation- Add shutters to window at Dining area.
4. North and South Elevation- Add note at roof extension above deck:
Provide carrying beam and 2- 6x6 PT posts to support roof. Approximate size: 12" D. LVL, to be confirmed by Modular Building Manufacturer.

D. Drawing A-301:

1. Detail 1/A-301- revise detail title to read: **Typical Deck Section.**
2. Detail 3/A-301- **Add 3'4" AFF** dimension to railing height.
3. Detail 2/A-301- add **"pressure treated"** (PT) note to 2 x 8 ledger.

E. Drawing A-600:

1. Elevation 1 – Delete section marker indicating Section 6/A602.
2. Elevation 2 - Add note to plastic laminate adjustable shelves- **...with heavy duty knife brackets and standards.**
3. Elevation 4 – **Add 2'10" AFF** height dimension to lavatory rim.
4. **Elevation 4 – Add 1'5" min. AFF** height dimension to water closet rim.
5. Elevation 5 - Delete shower head note and replace with- **Fixed shower head and hand held shower with slide bar and control valve.**
6. Add note to First Floor Bathroom Enlarged Plan title: **(ADA Compliant).**
7. **Add line to Toilet Accessory Schedule: TB-1 – Towel Bar – Bradley – 24" - Chrome - #927-24.**

(Provide 2 towel bars per bathroom. Locate as directed by Architect).

F. Drawing A-601:

1. Add note to Enlarged Kitchen Plan title: **(ADA Compliant)**.
2. Enlarged Kitchen Plan:
 - a. Revise peninsula 6'2" dimension to **6'3"**.
 - b. Revise corner base cabinet dimension from 4'2" to **4'0"**.
3. Elevation 5 – Note that left drawer unit is incorrect. This is part of corner base cabinet and should match corresponding front on Elevation 4.
4. Elevation 5 – Add note vicinity of refrigerator; **Provide 1" thick panel surround at refrigerator.**

G. Drawing A-602

1. Section 2 – Add note to upper cabinet and pointing to item; **Under Cabinet Light.**

H. Drawing A-800:

1. Finish Notes- Add the following:
 - a. Add to note 1; **Provide 1 accent color wall in each room, except closets and bathrooms.**
 - b. Add note; **13. Paint all doors- 6 sides.**
2. Finish Legend- **GWB-3; Revise Resistance to Resistant.**

I. Drawing A-801:

1. Typical Door and Frame Schedule- Refer to revised Door Hardware Specification included in this Addendum for Hardware Set assignments.

J. Drawing S-001:

1. Foundation Plan:
 - a. Add note at south end, intersection with framed deck to indicate **Pressure treated ledger. See architectural details.**
 - b. Add note applicable to foundation perimeter; **2 x 10 rim joists at perimeter. See Sections.**
 - c. Revise last 2 lines of note pertaining to foundation vents at bottom of plan to read:
**Each Vent = 32"x16"= 521 square inches or 204 square inches free area.
815 Square inches required. 815/204 = 3.99 units. 4 vents provided.**
2. Section 2- Revise title to read – **Concrete Pier Detail**
3. Section 3- Revise title to read- **Typical Foundation Wall Detail**
4. Enlarged Entrance Porch Plan- add note at bearing end of girder; **16" x 16" concrete pier, reinforce similar to detail 2/S-001.**
5. Section 4- Add note to 3 foundation walls shown; **See 3/ S-001 for reinforcing.**
6. Section 4 – Delete vertical line shown in the center of the 2 walls with brick shelf.
7. Section 2 – (Concrete Pier Detail) Add note; **2 ½" dia. galvanized anchor bolts, min 24" long.**
8. Section 3 – (Typ. Foundation wall Detail) – Add note; **2x8 pressure treated sill plate.**

K. Drawing ME-101:

1. Legend: Adjacent to Smoke-CO Detector symbol add: **Kidde #KN-COSM combination smoke/CO detector, hard wired and battery backup (Or approved equal).**
2. Legend: Adjacent to Smoke Detector symbol add: **Kidde #I-4618 smoke detector, hard wired and battery backup.**

Attachments:

1. Revised Modular Building Notes (2 pages).
2. Specification Section 087110R "Door Hardware" (7pages)
3. Specification Section 113013 "Residential Appliances" (3 pages)
4. Specification Section 122113 "Horizontal Louver Blinds" (3 pages)
5. Revised Specification Section 220100R "Basic Plumbing and HVAC requirements" (8 pages)

END ADDENDUM # 1

ADDENDUM NO. 1

12.4.17

DRAWING A050 – REVISED NOTES

REVISED MODULAR BUILDING NOTES:

1. This building above the foundation shall be a manufactured Modular Building.
2. The Modular Building may be a sub-contracted vendor to the General Contractor.
3. Divisions of modular units on the drawings are shown for general configuration only and are subject to minor adjustments by the successful bidder/manufacturer's standards.
4. The Modular Building shall generally conform to the overall design, configuration, site placement, structural configuration and foundation design shown on the Contract and bid Documents
5. Delegated Design: The Modular Building Manufacturer shall be responsible for the design of the building structure above the foundation, and its connections to the foundations, in complete conformance with applicable provisions of Appendix 'E' – "Manufactured Housing Used As Dwellings", in the New York State IBC 2015 Residential Building Code.
6. Delegated Design Submittal:
 - A. Letter of Design Certification: Signed and sealed by a qualified professional engineer, licensed in the State of New York.
 - B. Include the following:
 1. Name and location of Project.
 2. Order number.
 3. Name of manufacturer.
 4. Name of Contractor.
 5. Building dimensions including width, length, height, and roof slope.
 6. Governing building code and year of edition.
 7. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads if any.
 8. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
 9. Building-Use Category: Indicate category of building use and its effect on load importance factors.
7. Modular Building Manufacturer shall be responsible for all certifications, filings, transportation approvals and fees, required by authorities having jurisdiction.

8. Factory built Modular Building shall include all work shown on the Contract and Bid Documents, including but not limited to:
- a. Complete finished interior, including wall, floor and ceiling finishes.
 - b. Complete Kitchen and Bathrooms.
 - c. Complete finished exterior, including roof, siding, trim, windows.
 - d. Complete structure ready to install on foundation.
 - e. All Plumbing, HVAC, Electrical and Telcom/Data systems internal to the Modular Building, installed, arranged and ready for connections to site utilities and services.

END OF REVISED MODULAR BUILDING NOTES

SECTION 087100R - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
1. Mechanical door hardware for the following:
 - a. Swinging doors.

1.2 ACTION SUBMITTALS

- A. Other Action Submittals:
1. Door Hardware Schedule: Prepared by or under the supervision of Supplier, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - a. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
 - b. Content: Include the following information:
 - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
 - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
 - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
 - 4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
- B. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion for locks and latches.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled on Drawings.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products complying with BHMA designations referenced.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
 - 1. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

2.2 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on wood doors and frames.
 - 1. McKinney
 - 2. An Approved equal

2.3 MECHANICAL LOCKS AND LATCHES

- A. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
 - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 - 3. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
- B. Bored Locks: BHMA A156.2; Grade 2 Series 4000.

- C. Mortise Locks: BHMA A156.13; Grade 2; stamped steel case with steel or brass parts; Series 880.
 - 1. Yale
 - 2. An approved equal

2.4 AUXILIARY LOCKS

- A. Bored Auxiliary Locks: BHMA A156.5: Grade 2; with strike that suits frame.
 - 1. Yale
 - 2. An approved equal

2.5 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
 - 1. Manufacturer: Best

2.6 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix
 - 1. No Master Key System: Only change keys operate cylinder.
- B. Keys:
 - 1. Quantity: In addition to one extra key blank for each lock, provide the following:
 - a. Cylinder Change Keys: Three

2.7 OPERATING TRIM

- A. Operating Trim: BHMA A156.6; See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. Retain one of two subparagraphs and list of manufacturers below. See Section 016000 "Product Requirements."

2.8 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16.
 - 1. Rockwood
 - 2. An approved equal

2.9 DOOR GASKETING

- A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
 - 1. Pemco
 - 2. An approved equal

2.10 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
 - 1. Pemko
 - 2. An approved equal

2.11 AUXILIARY DOOR HARDWARE

- A. Auxiliary Hardware: BHMA A156.16.

2.12 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 - 2. Fire-Rated Applications:
 - a. Wood or Machine Screws: For the following:
 - 1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
 - 2) Strike plates to frames.
 - 3) Closers to doors and frames.
 - 3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
 - 4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
 - 5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.13 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
- C. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- D. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- E. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- F. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Replace construction cores with permanent cores.
- G. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

- H. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- I. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- J. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- K. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- L. Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

4.0 HARDWARE SCHEDULE

- A. The hardware sets listed below are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the Architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. Manufacturer's Abbreviations:
 - 1. YA - Yale
 - 2. RO - Rockwood
 - 3. MK - McKinney
 - 4. PE - Pemko

Hardware Sets

Set: 1.0

Description: Doors 107,109,201,202,204 (Bath, Bedroom)

3 Hinge	TA 2714	US26D	MK
1 Privacy Lock (Lever Handle)	PB 4602LN MCP238R 71S	626	YA
1 Wall Stop	409 or 528 as required	US32D	RO
3 Silencer	609		RO

Set: 2.0

Description: Doors 102 (Closet Single)

3 Hinge	TA 2714	US26D	MK
1 Passage Latch (Lever Handle)	PB 4601LN MCP238R 71S	626	YA
1 Wall Stop	409 or 528 as required	US32D	RO
3 Silencer	609		RO

Set: 3.0

Description: Doors 103,108,203,205 (Closet; Laundry pair)

6 Hinge	TA2714	US26D	MK
2 Dummy (Lever Handle)	PB 4655LN	626	YA
2 Magnetic Catch	901	ALM	RO
2 Hinge Pin Stop	528	NP	RO
2 Silencer	609		RO

Set: 4.0

Description: Doors 101,104 (Entry Doors)

3 Hinge	TA 2314 NRP	US32D	MK
1 Deadbolt	D211-A600 (Best Cylinder)	626	YA
1 Entry Lock-Mortise (Lever Handle)	PB 8800 Series (Best Cylinder)	626	YA
1 Wall Stop	409	US32D	RO
1 Threshold	252X3	Alum	PE
1 Door Bottom Shoe	209	Gray/ Alum.	PE
1 Gasket	S88D (Head & Jambs)		PE
1 Viewer	627	CRM	RO

Notes: Viewer at front door only.

Set: 5.0

Description: Doors 105,110 (Storage; Utility)

3 Hinge	TA 2714	US26D	MK
1 Cylindrical Lock (Lever Handle)	AU 4606LN MCP238R 71S A600 (Best Cylinder)	626	YA
1 Wall Stop	409 or 528 as required	US32D	RO
3 Silencer	609		RO

END OF SECTION 087100

SECTION 113013 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Cooking appliances.
 2. Kitchen exhaust ventilation.
 3. Refrigeration appliances.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 WARRANTY

- A. Special Warranties: Manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Gas-Fueled Appliances: Certified by a qualified testing agency for each type of gas-fueled appliance according to ANSI Z21 Series standards.

2.2 RANGES

- A. Gas Range: Freestanding, range with one oven(s).
1. Manufacturer: Hotpoint- Model No. RGB526DEHWW or an approved equal.
 2. Gas Burners: Four.
 3. Anti-Tip Device: Manufacturer's standard.
 4. Material: Porcelain-enameled steel with manufacturer's standard cooktop.
 5. Color: White.

2.3 KITCHEN EXHAUST VENTILATION

- A. Overhead Exhaust Hood
1. Manufacturer: Broan-30" Model No. BKDEG130WW-300 CFM or an approved equal.
 2. Type: Wall-mounted, exhaust-hood system.
 3. Exhaust Fan: Three-speed fan built into hood and with manufacturer's standard 300-cfm capacity.
 4. Venting: 7 inch diameter vent to outside through wall.
 5. Finish: Baked enamel
 6. Color: White.
 7. Built-in light fixture.

2.4 REFRIGERATOR/FREEZERS

- A. Refrigerator/Freezer: Two-door refrigerator/freezer with freezer on top. and complying with AHAM HRF-1.
1. Manufacturer: General Electric Model No. GTE21GTHCC or an approved equal.
 2. Type: Freestanding.
 3. Storage Capacity:
 4. a. Refrigeration Compartment Volume: 15.10 cu. ft.
a. Freezer Volume: 6.10 cu. ft.
 5. General Features:
 - a. Interior light in refrigeration compartment.
 - b. Automatic defrost.
 - c. Interior light in freezer compartment.
 - d. Automatic icemaker and storage bin.
 6. ENERGY STAR: Provide appliances that qualify for the EPA/DOE ENERGY STAR product-labeling program.
 7. Front Panel(s): Manufacturer's standard.
 8. Color: White

PART 3 - EXECUTION

3.1 INSTALLATION

- A. **Built-in Equipment:** Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- B. **Freestanding Equipment:** Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- C. **Range Anti-Tip Device:** Install at each range according to manufacturer's written instructions.

3.2 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
 - 2. **Leak Test:** After installation, test for leaks. Repair leaks and retest until no leaks exist.
 - 3. **Operational Test:** After installation, start units to confirm proper operation.
 - 4. **Test and adjust controls and safeties.** Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 113013

SECTION 122113 - HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Horizontal louver blinds with polymer slats.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For horizontal louver blinds, include fabrication and installation details.
- C. Samples: For each exposed product and for each color and texture specified, 12 inches long.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 HORIZONTAL LOUVER BLINDS, POLYMER SLATS

- A. Manufacturer: Subject to compliance with requirements, provide products by on of the following:
 - 1. Hunter Douglas –“Everwood”
 - 2. An approved equal
- B. Flame-Resistance Rating: Comply with NFPA 701; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- C. Slats: Polymers that are lead free, UV stabilized, integrally colored, opaque, and will not crack or yellow; antistatic, dust-repellent treated.

1. Width: 2 inches.
 2. Thickness: 0.105 inch
 3. Features:
 - a. Lift-Cord Rout Holes: [Minimum size required for lift cord and located near back (outside) edge of slat to maximize slat overlap and minimize light gaps between slats.
- D. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrail fully encloses operating mechanisms on three sides and ends.
- a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within full operating range equipped with ring pull not more than 4 inches long
 - b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
2. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
 - a. Tilt: Full.
 - b. Operator: Clear-plastic wand.
 3. Manual Lift-Operator and Tilt-Operator Lengths: Full length of blind when blind is fully closed.
 4. Manual Lift-Operator and Tilt-Operator Locations: Right side and left side of headrail, respectively unless otherwise indicated.
- E. Bottom Rail: Secures and protects ends of ladders and lift cords.
1. Type: Formed-steel or extruded-aluminum tube, with plastic or metal capped ends.
- F. Ladders: Braided cord.
- G. Valance: Manufacturer's standard.
- H. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
- I. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.
- J. Colors, Textures, Patterns, and Gloss:
1. Slats: As selected by Architect from manufacturer's full range.
 2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.2 HORIZONTAL LOUVER BLIND FABRICATION

- A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F.
 - 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch per side or 1/2 inch total, plus or minus 1/8 inch . Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch , plus or minus 1/8 inch.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Locate so exterior slat edges are not closer than 1 inch from interior faces of glass and not closer than 1/2 inch from interior faces of glazing frames through full operating ranges of blinds.
 - 2. Install mounting and intermediate brackets to prevent deflection of headrails.
 - 3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.
- B. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.
- C. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

END OF SECTION 122113

SECTION 220100R BASIC PLUMBING & HVAC REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes all Basic Plumbing and HVAC work.
- B. Work under this section includes providing all labor, materials, equipment and services, and performing all operations required for complete Plumbing and HVAC systems as hereinafter specified and/or shown on the drawings.
- C. Piping materials shall conform in all respects to requirements set forth in this section of specifications and accompanying drawings.

1.2 GENERAL REQUIREMENTS

- A. In general all interior plumbing and HVAC work is factory installed as part of the Modular Building assembly. Refer to Modular Building requirements specified elsewhere.
- B. Provide all connections to site utilities.
- C. Refer to drawings for information regarding construction. Review drawings in addition to work and determine that furnished and installed equipment and materials are complete and systems are in satisfactory working order.
- D. Submittal of bid indicates that Contractor has the examined site as it relates to all visible existing conditions and all drawings including all required allowances in his bid. Contractor shall allow for minor unforeseen conditions and circumstances requiring reasonable changes at no additional cost. No allowances shall be made for any error resulting from Contractor's failure to visit job sites and to review drawings.
- E. Locations shown for piping, outlets, etc. are approximate and Architect reserves right to make reasonable changes, without additional cost, before roughing-in. Refer to architectural drawings for exact height and location.
- F. All materials shall be new, standard products of specified manufacturer. All products comply with ANSI, ASTM, AWWA, CS or MSS Standards specified herein.

1.3 LAWS, PERMITS AND FEES

- A. Plumbing and HVAC work shall be installed in accordance with applicable Mechanical and Plumbing Codes in effect during time of construction whether shown and specified or not. This includes modifications required by authorities having jurisdiction. Codes apply as a minimum standard for work.

1.4 DRAWINGS

- A. General arrangement of work is indicated on the drawings. Carefully examine for proper fitting and operation of materials and equipment. Locations of equipment, piping and ductwork may be shown in certain positions, Contractor shall be guided by conditions on job and architectural details; correlating this work with that of others. Discrepancies which prevent systems from functioning properly shall be brought to the attention of the Architect prior to bid submittal.
- B. Due to small scale of drawings, it is not possible to indicate offsets, fittings and accessories required. Carefully investigate conditions affecting work and arrange such work accordingly, furnishing fittings, valves, traps and accessories to meet conditions.
- C. Drawings limit, explain and define conditions, specify requirements, show piping and equipment sizes and locations, and general arrangement of systems. Conditions may require certain deviations from arrangement shown. These deviations are permissible and made, but specified sizes and requirements necessary for operation as specified to remain unchanged. Changes shall be reviewed with Architect before proceeding. Extra charges shall not allowed for these changes.

1.5 GUARANTEE

- A. Workmanship and material shall be guaranteed for period of two (2) years from date of Substantial Completion. Unless greater warrantee period is provided by individual equipment manufacturers. Guarantee shall cover any adjustments, replacements and corrections necessary to restore project to first-class condition if deficiency is due to faulty workmanship or materials.

PART 2 - PRODUCTS

2.1 PLUMBING MATERIALS AND EQUIPMENT

- A. Manufacturer: Subject to compliance with requirements, provide materials and equipment as specified below or an approved equal.
 1. Plumbing Insulation : Cellular Foam pipe insulation: ASTM C534; flexible black polyolefin / polyethylene, pre-slit and pre-glued on both sides, one-inch wall thickness. R Value of R-4. Manufacturers: Armacell Engineered Foams "Tubolite Self Seal".
 2. Domestic Water Piping : Copper Tubing: ASTM B88, Type L, hard drawn. Fittings: ASME B16.18, cast bronze or ASME B16.22, wrought copper and bronze. Joints: ASTM B32, solder, Grade 95TA. Provide Type K Copper for underground installations.
 3. Domestic Water Piping Specialties Pipe Size 2 inches and Under: Bronze unions for copper piping, solder joints.
 4. Valves: Two-Piece, Full-Port, Brass Ball Valves with Brass Trim: Hammond Valve Model 8911 or approved equal. Hand lever, For quarter-turn valves NPS 6 and smaller except plug valves.

5. Non Freeze Wall Hydrant: Mifab # MHY-108 or approved equal; 12 inch overall length, self-draining type with chrome plated wall plate, male threaded hose connection spout. Heavy duty brass casting, hardened bronze operating stem with neoprene plunger. Removable key and anti siphon vacuum breaker. One operating key to be furnished with each hydrant.
6. Escutcheons: ID sized to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening, with polished chrome-plated finish. One-Piece, Deep-Pattern Type-deep-drawn, box-shaped brass One-Piece. Cast-Brass Type- with set screw Split-Casting. Cast-Brass Type- with concealed hinge and set screw.
7. Sanitary Waste and Vent Piping: Interior waste and vent piping including piping in concealed space and in wall and floor cavities : Schedule 40 PVC Pipe, ASTM D2665 or ASTM D3034 with PVC fittings and socket weld joints. Provide Schedule 80 ABS piping for underground installations.
8. Gas Piping: Schedule 40 black steel pipe sized in accordance with code requirements.
9. Hot Water Heater: Domestic tankless 40 gallon gas fired hot water heater, 38,000 BTUH input; Mfgr.-Rheem .

B. RESIDENTIAL PLUMBING FIXTURES

1. Bathtub: Porcelain-enameled steel, recessed tub with slip resistant bottom, integral apron and tiling flange. Dimensions 60" long, 30" wide, 14" high. Color: White. American Standard "Princeton" #2391.202 ICH right hand outlet .
Bathtub Drain and Overflow: Gerber # 41-812, 17 gauge brass tubing, 1 1/2" diameter with red brass coupling nuts. Self-retaining head gasket. Heavy duty cast red brass head, tee and shoe with cast brass shoe plug, cast brass plunger. Chrome plated stamped brass domed strainer and faceplate. Shower-Valve-Tub filler Assembly: Delta #T17T455 Chrome finish.
2. Integral Counter Lavatory: Molded synthetic material, high gloss finish with integral sink bowl and backsplash. Color: white. Glacier Bay # N2522GB-W.
Lavatory Faucet: Delta # 2520-MPU , 2-handle, 4" centers, pop up waste.
Accessories: Schedule 40 PVC P-trap and arm with escutcheon. Wheel handle stops. Flexible stainless steel supplies.
3. Lavatory: ADA compliant- Wall hung vitreous china lavatory. Color: White, 8" faucet holes, American Standard-Lucerne #0356.015 with wall hanger; Faucet: Delta #B3596LF Chrome finish.
4. Kitchen Sink: ADA compliant- Double Compartment Bowl (8" deep), 18-gauge type 302 stainless steel, self-rimming and undercoated, drop ledge with raised faucet deck. 3 1/2 inch drain openings and chromed brass drains with gaskets, ledge back drilled three holes centered for faucet. Sink shall come complete basket strainers Elkay #LR 3322PD 4 hole. Basket strainers shall be deep locking cup strainers with stainless steel body and basket, rubber stopper with snap in basket Sink Faucet: Two handle deck mount (three hole) faucet with metal drain pop up type fitting with plated flange and stopper. Solid brass construction with 4 inch centers. 3-7/16 inch long spout. interchangeable hot and cold stems. Control mechanism shall be of the cylinder type with stainless plate and 180

degree rotation with replaceable non-metallic seats operating in stainless steel lined sockets. Male threaded inlets shall be ½ inch diameter. Delta # 21996LF with separate spray accessory.

5. **Water Closet:** ADA compliant (16 ½”H) tank type, Floor mounted, 12” rough, elongated front vitreous china, close-coupled closet combination with pressure assist flushing, Chrome plated metal trip lever, 1.6 Gallons of water per flush, bolt caps. American Standard-Cadet Pro- Right Height #215BA.104.020. Color: White.
Seat: Solid white plastic, closed front with cover for regular bowl; Bemis 1200SLOWT.
7. **Shower Enclosure:** ADA compliant Nom. 38” x 38” x 81” H. Best Bath Model# 4LSS403038A5B ; right plumbing .Shower and Valve Assembly: Delta #T17T255 Chrome finish, with accessory hand held shower and slide bar.
8. **Utility Sink:** 24” x 18” polypropelene service sink., floor mounted. Mustee #21CP. Color: White. Faucet: Delta # 27C2944 swivel gooseneck spout.
9. **Washing Machine Outlet Box:** Unit shall allow for the mounting of supply lines from top or bottom on the left or right side. Adjustable metal support bracket shall be installed on top and bottom of unit for support in stud wall. ¼ turn brass ball valves, copper sweat. 2” drain with ¼ turn test cap. Oatey # 38470.

2.2 HVAC EQUIPMENT

- A. Manufacturer: Subject to compliance with requirements, provide materials and equipment as specified below or an approved equal.
 1. **Gas fired Forced Air Furnace:** Provide HVAC unit meeting the following minimum requirements. Manufacturer: Trane XT90 model #TUX1B060A9H31B.
 - a. High-efficiency blower motor
 - b. Self-diagnostic microelectronic controller
 - c. Durable adaptive silicon Nitride hot surface igniter
 - d. Sealed Combustion – 100% Outside air option
 - e. Enclosed burner box
 - f. Multi-port, in-shot burners
 - g. One-Piece Heat Exchanger with No Welds
 - h. Prepainted galvanized steel cabinet
 - i. AL29-4C (TM) Stainless Steel Secondary Heat Exchanger
 - j. Insulated heavy steel cabinet
 - k. Integral cooling coil for 2 ½ ton air conditioning.
 - l. 2-1/2 ton ground mounted condensing unit, connected to HVAC unit. Set condensing unit on a level concrete housekeeping pad of appropriate size, and minimum 4” above finish grade.
 2. **Controls:** Provide programmable thermostat for HVAC system meeting the following minimum requirements. Manufacturer: Trane XL600 Series 5/2 Programmable model #TCONT600.
 - a. 5/2 Programming—Set different schedules for weekdays and weekends.

- b. Simultaneous Display -View the indoor temperature and set temperatures without pushing more buttons.
 - c. Plain Language, no symbols, easy battery access, soft key controls.
 - d. 5-year limited warranty.
3. **Ductwork:** Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1. Galvanized Sheet Steel complying with ASTM A 653 Galvanized Coating Designation: G90.
Vent dryer duct to exterior and supply insect proof dryer vent housing.
4. **Bathroom Exhaust Fans:** Manufacturer: Delta BreezGreenBuilder G2 #GBR80MHL
Bathroom Exhaust Fan/Light: 2-speed automatic operation by integral humidity and motion with the ability to delay and cycle the fan even when the room is not occupied; 120VAC; 40/80 CFM; 0.8/1.3 sones; 4" diameter duct outlet; 26 watt GU24CFL lamp. Duct exhaust fans to exterior
5. **Diffusers, Registers & Grilles:** Manufacturers: Hart & Cooley Inc.
Material: Steel. Finish: Baked enamel, white. Damper Type: Adjustable blade.

2.3 MATERIALS, EQUIPMENT AND INSTALLATION

A. GENERAL

1. Unless otherwise specified, equipment or materials of same type or classification, shall be used for the same purpose. Specific reference to materials and equipment by name, make or catalog number shall be interpreted as establishing a standard of quality and not construed to limiting competition. Minor deviations shall be permitted to allow other manufacturers to bid on equivalent equipment that equals or exceeds basic performance and conditions indicated. Where two or more units of equipment are required, these units shall be products of a single manufacturer; however, component parts of systems need not be products of same manufacturer. No products shall be proposed or submitted that has not been in standard production with complete catalog data available for at least five years prior to bid date.

B. DESIGN

1. Equipment and accessories not specifically described or identified by manufacturer's catalog numbers shall be designed in accordance with ASME, AIEE or other applicable technical standard, suitable for maximum working pressure and have neat and finished appearance.

C. INSTALLATION

1. Erect equipment and piping in neat and workmanlike manner; align and adjust for

satisfactory operation. Install so that connecting and disconnecting of piping and accessories can be made readily, and so that parts are easily accessible for inspection, operation, maintenance and repair. Workmanship shall be of highest quality.

D. EQUIPMENT LIMITATIONS

1. Review project drawings to be fully aware of space limitations and equipment applications. Verify that all items to be furnished will fit space available and make necessary measurements to ascertain space requirements prior to ordering equipment.
2. Agents supplying equipment shall confirm space requirements and size of equipment prior to installation verifying proper installation according to manufacturer's recommendations. If the application of specified equipment is in doubt, Contractor or Agent shall bring issues to the Architect's attention and clarify prior to bidding. Misapplied equipment shall not be proposed or provided.

E. INTERFERENCES

1. Drawings are generally diagrammatic and Contractor shall coordinate the work so interferences of equipment, piping, etc., are avoided. In the event interferences occur, Architect shall decide which equipment, piping, etc., is relocated regardless of sequence of installation.

E. PIPES AND FITTING

1. Copper: Type 'L' hard copper water tubing (ASTM Spec. B-88-55) with wrought copper solder type fittings (ANSI Std. B16.22-1951). Type 'DWV' hard drawn copper tubing (ASTM Spec. B-88-55) with cast solder (ANSI B16.23-1960) or wrought solder (MSS SP-64-1961) copper drainage fittings.
2. Steel: Schedule 40 black steel pipe (ASTM A53 and A102), T & C, for sizes 2-1/2" and less. Fittings shall be cast iron (ANSI B16.12) for hot water heating lines and malleable iron (ANSI B16.3) for gas and water, 125 psi, threaded. Piping 2-1/2" and larger shall be Schedule 40 black steel (ASTM-A120), plain ends for welded fittings. Fittings shall be forged steel butt welding fittings (ASTM A234). Where galvanized pipe is called for in other sections of these specifications it shall be understood that fittings are also galvanized.

F. VALVES

1. Valves shall conform to the following types for water service. Valves shall be 125 psi unless otherwise noted.
2. Ball valves may be used for water piping in lieu of gate valves in sizes up through 2". Ball valves shall be rated to 150 psi SWP/600 psi WOG with bronze stem and body, chrome-plated bronze ball, reinforced TFE seats and lever handle, equivalent to NIBCO T-580-70. Valves used in insulated service shall have extended stems constructed of non-conductive material to prevent condensate formation equivalent to NIBCO NIB-SEAL.

3. Butterfly valves may be used to replace gate and globe valves 2-1/2" and larger and shall be rated 200 psi/225 F. Butterfly valves replacing globe valves and balancing valves (when approved) shall have 10-position lever handles for 2"-6" and gear operators for 8" and larger. Valves shall be constructed of drilled and tapped ductile iron lugged bodies, aluminum bronze discs, stainless steel blow-out proof stems, EPDM seat liners and rated to 200 psi in dead end services. Valves shall be equivalent to NIBCO LD-2000.

G. PIPING SPECIALTIES

1. Nipples shall be of the same material as piping with ends threaded, for soldered connections or for welding.
2. Unions shall be malleable iron, ground joint, three piece type for use on threaded steel pipe for sizes up to 3". Over 3", flanges shall be used. On copper tubing, use copper to copper type unions with soldered ends. All unions shall be for not less than 150 psi.
3. Flanges shall be forged steel screw type for pipes 2" and less and welding neck for 2-1/2" and larger. Flanges shall be long neck, where possible, and for 150 psi.

H. LOW PRESSURE SHEET METAL DUCTWORK

1. Low Pressure Sheet Metal Work: Standard galvanized gauge open hearth steel.
2. Duct Wrap: Minimum two (2) inch thickness coated duct liner having minimum of 2 lbs. density. Duct liner to have average K factor of 0.27 at 70 deg. mean temperature and noise reduction coefficient of 0.70 or better. Duct liner shall meet ASTM C1071 Standard for Thermal and Acoustical Insulation and NAIMA's Fibrous Duct Liner Standard.
3. Flexible Duct Connections: Fire and mildew-resistant flexible materials of canvas or other approved materials. Connections have suitable metal collar frame at each end. Flexible connections to be heat resistant to 500 Deg. F. continuously and meet UL Test Procedure UL-214.
4. Flexible duct for medium pressure ceiling diffuser runouts: Flexible duct shall be Thermaflex model MK-E, General Flex or equivalent listed by Underwriters' Laboratories under UL 181 standards as Class I flexible Air Duct Material and complying with NFPA Standards 90A and 90B. Duct shall be rated for a maximum pressure of 6" WG positive and 2" WG negative (sizes 10 inches ID and smaller) or 4" WG positive, 2" WG negative (sizes 12 inches ID and larger). Duct shall be factory fabricated assembly composed of polymeric inner duct bonded permanently to coated spring steel wire helix and supporting thick fiberglass insulating blanket. Low permeability outer vapor barrier of fiberglass reinforced film laminate shall complete assembly. Pressure drop not to exceed .1" SP @ 500 fpm through 6" or larger duct. Flexible duct clamps shall be equivalent to Ideal "5900" Series Strap clamps Wiremold No. 310, roll band type clamp, with Harccast Irongrip or Wiremold No. 330 industrial cement. Flexible duct runouts shall not exceed five feet.

I. GRILLES, REGISTERS, DIFFUSERS AND AIR DISTRIBUTION DEVICES

1. All supply diffusers and registers have volume control externally adjustable and deflecting grids extending into ducts. Exhaust registers also have external volume control. All supply diffusers and registers have sponge rubber gaskets. All outlets to be of aluminum.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Fixtures and equipment shall be tightly covered and protected against dirt, water, chemical and mechanical injury. Pipe openings closed with caps or plugs during construction to prevent foreign objects from getting into systems. Electric motors properly oiled and wrapped with oil cloth.
- B. Materials, equipment and fixtures shall be thoroughly cleaned upon completion of work before acceptance of project.

3.2 INSTRUCTION AND OPERATING MANUAL

- A. Provide operating and instruction manuals and other documentation in accordance with Section 017200 "Project record Documents" including but not limited to the following:
 1. Operating instructions.
 2. Parts listed by name, number and diagram.
 3. Shop drawings.
 4. Final balancing report.
- B. Provide a typed set of operating, maintenance and oiling instructions placed in frame with glass front. Instructions shall be hung in accessible location as directed by Architect.

3.3 GUARANTEE

- A. Workmanship and material shall be guaranteed for period of two years from the date of Substantial Completion unless otherwise stated in the Contract Documents. Contractor shall be responsible for any adjustments, replacements and corrections necessary to restore project to first-class condition if deficiency is due to faulty workmanship or materials.

END OF SECTION 220100