

MOODY•NOLAN LTD.  
300 SPRUCE STREET  
COLUMBUS, OHIO 43215

BID OPENING: December 20, 2023

ADDENDUM DATE: December 7, 2023

## **ADDENDUM NO. 2**

TO THE PLANS AND SPECIFICATIONS FOR:

**Cobblestone Manor**  
1050 Lamplighter Drive  
Grove City, Ohio 43123

TO ALL BIDDERS:

**Addendum No. 2** to the Drawings and Project Manual, dated June 8, 2023, Cobblestone Manor as prepared by Moody Nolan, Inc., 300 Spruce St. Suite 300, Columbus, OH 43215.

This Addendum shall hereby be done and become part of the Contract Documents the same as if originally bound thereto. The following clarifications, amendments, additions, revisions, changes, and modifications change the original Contract Documents only in the amount and to the extent hereinafter specified in this Addendum.

Acknowledge receipt of this Addendum on the Bid Form.

NOTE: Bidders are responsible for becoming familiar with every item of this Addendum.

### **I. GENERAL REVISIONS**

#### **A. General**

1. The Cobblestone Manor project was previously named Seasons Grove. Any incidental reference to Seasons Grove in the project documents is applicable to the Cobblestone Manor project.

#### **B. Response to Questions**

1. *Please provide trim profiles desired for unit, corridor and common area.*

**Response:** Trim to be squared trim with eased exposed edges.

2. *Is Div 12 Furniture an FFE item by owner or by GC?*

**Response:** Furniture is a part of the allowance. All other Division 12 items are a part of the base bid.

3. *ST1 Granite TBD in select amenity tops. Only the Island and Kitchen tops in the Community Room CR-100 being called out as granite tops. Please provide spec for granite or granite group.*

**Response:** No longer using granite. See revised plans.

4. *Please clarify stone type and depth for stone 2a (fine gravel) and 2 b (rough gravel) on drawing L104.*

**Response:** Clarify the correct sheet reference as sheet L104 is not a part of the drawing set.

5. *Please provide a Geotech report.*

**Response:** Geotech report is attached.

6. *Please confirm if EV Chargers are going to be required.*

**Response:** Not required.

7. *Is CACO an acceptable manufacturers for blinds or roller shades?*

**Response:** Submit a substitution request for architect to evaluate during bidding. If acceptable, it will be included in a future Addendum.

8. *Confirm if tack coat shown is asphalt sections are required.*

**Response:** Yes, tack coat is required.

9. *Confirm if all appliances need to be 100% energy star*

**Response:** Refrigerators, Dishwashers, Clothes washers, and exhaust fans need to be Energy Star.

10. *Please provide fluid applied air barrier spec*

**Response:** See attached specification section.

11. *What will the exterior finish be for the vinyl windows.*

**Response:** See updated window specifications.

12. *Confirm whether section 12 56 51 Furniture, Furnishings and Accessories is in the GC scope or not.*

**Response:** Furniture is a part of the allowance.

13. *Confirm what type of duct bank is required for the electrical secondary from the transformer into the building. (Page E002)*

**Response:** Secondary duct banks shall be encased PVC until they are within 10' of the building – these clarifications have been added to the drawings and will be included in Addendum 2.

14. *Please provide a hardware schedule.*

**Response:** See attached hardware specification section.

15. *Spec calls for 1 panel door and elevations shows 2 panel. Which one should be priced?*

**Response:** Provide 2-panel doors. See revised drawings and specifications.

16. *Confirm that white maple pre finished doors are only applicable at amenity areas.*

**Response:** White maple doors are for the amenity areas as well as an alternate for the unit entry doors.

17. *Secondary does not detail what type of duct is required for conduits. Please provide clarity.*

**Response:** Secondary duct banks shall be encased PVC until they are within 10' of the building – these clarifications have been added to the drawings and will be included in Addendum 2.

18. *FRT strips shown at bottom of floor trusses - Not a typical detail. Please clarify if required. (4/A803)*

**Response:** This is not typical and only required where solid blocking is needed to properly secure soffit/wall below.

19. *P. 383 2.1(D) - States use of all MC cable (outside of units) - Will NM cable be acceptable where allowed by NEC?*

**Response:** Type NM is acceptable for all branch circuit wiring where installed indoors and where concealed within walls and ceilings.

20. *P. 384 3.1(B) - Service entrance conductors to be Cu - Is Al conductors be allowed?*

**Response:** Revised Addendum drawings are calling for Aluminum, as requested. AEP is confirming the transformer sizes planned can support the use of AL.

21. *P. 385 3.(E) - House power branch circuits in MC - Is the use of NM and/or conduit & THHN acceptable?*

**Response:** Type NM is acceptable for all branch circuit wiring where installed indoors and where concealed within walls and ceilings.

22. *The standard 18" x 6" curb drawing referred to in the drawings shows underdrain. Is underdrain at the curbs required on this project?*

**Response:** Yes.

23. *Can a combination curb/walk be used in areas where sidewalk abuts the curbs?*

**Response:** Yes.

24. *Please confirm if exterior sign allowance is to include the monument sign as per L2.01 including concrete and masonry components.*

**Response:** All work with the exception of the sign cabinet (shaded) is a part of the base bid. The sign cabinet is a part of the allowance.

25. *Please confirm that 3rd party testing and inspection is by owner.*

**Response:** A third party inspector will be hired by the owner for this project.

26. *Please confirm what type of solid surface is required for the window sills.*

**Response:** See the Enlarged Unit Plan sheets, Typical Residential Finish Schedule General Note C for type of solid surface material.

27. *The specifications stated vent free fireplace but listed a vented model and the plans show a vent. Please clarify what is needed.*

**Response:** The fireplace is a vented model as listed in the specifications.

28. *Please confirm if Superior Essex cable and Ortronics connectivity can be used as an approved manufacturer for this project? Please see attached.*

**Response:** Yes, acceptable.

29. *On Page L1.01: Construction Note #2 Calls for a dry-stacked wall: what type of stone is this wall comprised?*

**Response:** A natural limestone wall using large +/-8" slabs is the intent.

30. *On Page L1.01: Construction Note #5 Calls for Outcropping Boulders, is there a specific boulder they are looking for?*

**Response:** Limestone boulders that blend with the cobbles used in the dry creek bed - per character image shown on L1.01.

31. *The access control system appears to show only (1) door of access control. Is that correct? The spec reflects a larger system platform.*

**Response:** Refer to revised plans for door access control locations. Additional controlled doors were added by Addendum. All access control cabling comes back to low voltage backboard in Electrical room E-100. Additional doors required door contact switches, wired.

32. *The camera system only shows (1) camera. Is this correct?*

**Response:** Yes, only one camera is shown, will confirm with CMHA. Provide cat 6 cable back to telecom backboard in E-100.

33. *The plans show (14) door contacts, but no direction on headend or where the contacts will be tied in.*

**Response:** All access control shall be installed in Electric room E100, refer to door rough-in detail on T501.

34. *The spec shows providing a Rescue Assistance System? But nothing is shown on the drawings as far as a design or location?*

**Response:** Detail 3/E502 has the dome light/pull cord system. This system is called out on all unit types for this 55+ community, Refer to coded note 15, 16, 17 for pull cord, dome light, and transformer locations on typ. unit plans.

35. *Drawing L1.01 Note 2 has dry stacked stone walls. Are these part of the landscape scope of work? I do not see a detail or information on these walls. Please advise on how to proceed.*

**Response:** A natural limestone wall using large +/-8" slabs is the intent.

36. *Drawing L1.01 shows what appear to be boulders in the south drainage ditches. I do not see a detail or information on these boulders. Please advise on how to proceed.*

**Response:** Use limestone boulders that blend with the cobbles used in the dry creek bed - per character image shown on L1.01. Partially embed into grade. Boulders to be 2'x2' (min.) in size.

37. *Drawing L1.01 – the highlighted plants and quantities do not match with the line drawn to the plant name. Are there 5 or 6 Karl Foersters? Are there 5 or 6 Gro-Low Sumacs? Please see attached.*

**Response:** Reverse them - the leader lines are pointing to the wrong plants. The intent is for the small symbols to be Karl Foersters with Gro-Low Sumacs behind.

38. *Irrigation – Do we have drawings for irrigation limits or specs for products?*

**Response:** Irrigation is not specified for this project. It is not required by the PUD zoning text.

39. *I have not been able to locate colors or specific U Values / SHGC # in the drawings or the vinyl window specs. Are these windows to have a black or bronze exterior? Are colors supposed to be consistent across the building or will they vary when placed against brick or fiber cement?*

**Response:** See updated specifications for color selection.

40. *The spec book is missing Division 08 71 10 for door hardware, can this be provided?*

**Response:** See attached door hardware specification section.

41. *In SECTION 00 31 32 GEOTECHNICAL INVESTIGATIONS, it states "Test borings have been made at the site of the improvements. Logs of the test borings are included." This log doesn't seem to be included in any of the 4 files posted here. Is this available for us to view?*

**Response:** See attached Geotechnical Exploration Report.

## II. SPECIFICATION REVISIONS

### A. 00 01 10 TABLE OF CONTENTS

1. **ADD** specification section 10 11 00 Visual Display Surfaces to Table of Contents.
2. **ADD** specification section 12 56 51 Furniture, Furnishings and Accessories to Table of Contents.

### B. 00 31 32 GEOTECHNICAL INVESTIGATIONS

1. **ADD** Geotechnical Exploration Report to the Project Manual.

### C. 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS

1. **REPLACE** specification section in its entirety. Name "Seasons Grove" was replaced with the correct project name.

### D. 05 50 00 METAL FABRICATIONS

1. **REPLACE** specification section in its entirety.

### E. 06 40 00 ARCHITECTURAL WOODWORK

1. **REPLACE** specification section in its entirety.

### F. 07 21 00 THERMAL INSULATION

1. **REPLACE** specification section in its entirety.

### G. 07 22 19.13 NAILABLE WALL INSULATION

1. **REPLACE** specification section in its entirety.

### H. 07 27 26 FLUID-APPLIED MEMBRANE AIR BARRIERS

1. **REPLACE** specification section in its entirety.

### I. 07 41 13 METAL ROOF PANELS

1. **REPLACE** specification section in its entirety.

- J. 08 19 00 INTERIOR DOORS
  - 1. **REPLACE** specification section in its entirety.
- K. 08 41 13 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
  - 1. **REPLACE** specification section in its entirety.
- L. 08 43 14 INTERIOR ALUMINUM STOREFRONT
  - 1. **REPLACE** specification section in its entirety.
- M. 08 53 13 VINYL WINDOWS AND PATIO DOORS
  - 1. **REPLACE** specification section in its entirety.
- N. 08 71 00 DOOR HARDWARE
  - 1. **ADD** Door Hardware specifications to the Project Manual.
- O. 10 11 00 VISUAL DISPLAY SURFACES
  - 1. **ADD** specification section in its entirety.
- P. 23 21 13 HYDRONIC PIPING
  - 1. **ADD** 3.1.A.1 and 3.1.A.2 indicating what piping materials are allowed in return air plenums.
- Q. 28 31 11 DIGITAL ADDRESSABLE FIRE ALARM SYSTEM
  - 1. **ADD** Potter Fire as an approved fire alarm control panel and remote device vendor.

### III. DRAWING REVISIONS

- a. A101 LEVEL 01 - FLOOR PLAN - OVERALL
  - 1. **CHANGE** door TR-101C to a double door.
  - 2. **DELETE** door TR-101B.
- b. A101B LEVEL 01 - FLOOR PLAN - AREA 'B'
  - 1. **CHANGE** door TR-101C to a double door.
  - 2. **DELETE** door TR-101B.
- c. A104 ROOF PLAN - OVERALL
  - 1. **ADD** coded note #15
- d. A501 ENLARGED UNIT PLANS - 1BED (TYPE A)
  - 1. **CHANGE** soffit dimensions in RCP 2, typical all unit kitchen soffits.
  - 2. **CHANGE** door panel type for all Unit Entry and Interior unit doors where clouded in Elevations and Door Schedule\_Units, typical all unit plan sheets.
  - 3. **CHANGE** Typical Residential Unit Finish Schedule as clouded, typical all unit plan sheets.
- e. A502 ENLARGED UNIT PLANS - 1BED (TYPE B)
  - 1. See Sheet A501 revisions for description of changes, typical all unit plan sheets.

- f. A503 ENLARGED UNIT PLANS - 2BED (TYPE A)
  - 1. See Sheet A501 revisions for description of changes, typical all unit plan sheets.
- g. A504 ENLARGED UNIT PLANS - 2BED (TYPE B)
  - 1. See Sheet A501 revisions for description of changes, typical all unit plan sheets.
- h. A505 ENLARGED UNIT PLANS - 2BED (TYPE B)
  - 1. See Sheet A501 revisions for description of changes, typical all unit plan sheets.
- i. A701 DOOR SCHEDULES & ELEVATIONS
  - 1. **CHANGE** hardware sets and door changes noted on other sheets.
- j. A711 DOOR DETAILS - EXTERIOR
  - 1. **CHANGE** hollow metal frame infill to insulation.
- k. A712 DOOR DETAILS - INTERIOR
  - 1. **CHANGE** hollow metal frame infill to insulation.
- l. A803 INTERIOR DETAILS
  - 1. **CHANGE** Detail 2 to show dimension at soffit overhang.
- m. A820 TYPICAL PROJECT DETAILS
  - 1. **CHANGE** Detail 9 to reflect changes to Typical Unit Entry door panels.
  - 2. **CHANGE** Detail 10 to reflect clarifications to corridor wall base trim.
- n. A900 FINISH LEGEND
  - 1. **CHANGE** Revisions to overall FINISH LEGEND and ROOM FINISH SCHEDULE.
- o. A901 LEVEL 01 - FLOOR FINISH PLAN OVERALL
  - 1. **CHANGE** Revisions to finishes/notes as clouded.
- p. A902 LEVEL 02 - FLOOR FINISH PLAN OVERALL - TYP. @ LEVEL 03
  - 1. **CHANGE** Revisions to finishes/notes as clouded.
- q. P101A FIRST FLOOR PLAN – AREA A – PLUMBING
  - 1. **ADD** a General Note as follows:
    - a. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPERATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.
- r. P101B FIRST FLOOR PLAN – AREA B – PLUMBING
  - 1. **ADD** a General Note as follows:
    - a. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPERATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.
- s. P102A SECOND FLOOR PLAN – AREA A – PLUMBING
  - 1. **ADD** a General Note as follows:
    - a. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPERATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.

- t. P102B SECOND FLOOR PLAN – AREA B – PLUMBING
  - 1. **ADD** a General Note as follows:
    - a. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPERATE PROTECTION IS PROVED TO PROVIDED 25/50 SMOKE/FLAME RATING.
- u. P103A THIRD FLOOR PLAN – AREA A – PLUMBING
  - 1. **ADD** a General Note as follows:
    - a. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPERATE PROTECTION IS PROVED TO PROVIDED 25/50 SMOKE/FLAME RATING.
- v. P103B SECOND FLOOR PLAN – AREA B – PLUMBING
  - 1. **ADD** a General Note as follows:
    - a. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPERATE PROTECTION IS PROVED TO PROVIDED 25/50 SMOKE/FLAME RATING.
- w. P401 ENLARGED PLANS – PLUMBING
  - 1. **ADD** a General Note as follows:
    - a. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPERATE PROTECTION IS PROVED TO PROVIDED 25/50 SMOKE/FLAME RATING.
- x. M101A FIRST FLOOR PLAN - MECHANICAL - AREA A
  - 1. **ADJUST** exhaust duct to new hood location.
- y. E002 SITE PLAN – ELECTRICAL
  - 1. **ADD** power connection to monument sign and associated note per owner’s request.
  - 2. **ADD** clarification to secondary service duct banks and include duct bank detail reference. Secondary service conductors have been changed to aluminum.
  - 3. **CLARIFY** the location of the storm easement along the west property line, adjust Utility Xfmr-1 so that it falls outside of the storm easement.
  - 4. **ADD** bollards at Xfmr-1.
- z. E201A LEVEL – 1 – FLOOR PLAN – POWER – AREA A
  - 1. **ADD** power connection to access control per owner’s request.
  - 2. **REVISE** kitchen layout per owner requested architectural changes.
- aa. E201B Level – 1 – Floor Plan – Power – Area B
  - 1. **ADD** power connection to access control at end door and associated note per owner’s request.
- bb. E601 Lighting Schedules – Electrical
  - 1. **ADD** monument sign to relay control panel schedule.

- cc. E603 Panel Schedules – Electrical
  - 1. **REVISE** panel schedules.
- dd. E701 Single-Line Diagram - Electrical
  - 1. **REVISE** secondary service conductor sizes to show Aluminum conductors.
- ee. T101A Level – 1 – Floor Plan – Systems – Area A
  - 1. **ADD** access control per owner’s request.
- ff. T101B Level – 1 – Floor Plan – Systems – Area B
  - 1. **ADD** access control per owner’s request.

#### IV. ATTACHMENTS

##### A. Specifications:

- a. 00 01 10 Table of Contents
- b. 01 81 13 Sustainable Design Requirements
- c. 05 50 00 Metal Fabrications
- d. 06 40 00 Architectural Woodwork
- e. 07 21 00 Thermal Insulation
- f. 07 22 19.13 Nailable Wall Insulation
- g. 07 27 26 Fluid-Applied Membrane Air Barriers
- h. 07 41 13 Metal Roof Panels
- i. 08 19 00 Interior Doors
- j. 08 41 13 Aluminum-Framed Entrances and Storefronts
- k. 08 43 14 Interior Aluminum Storefront
- l. 08 53 13 Vinyl Windows and Patio Doors
- m. 08 71 00 Door Hardware
- n. 10 11 00 Visual Display Surfaces
- o. 23 21 13 Hydronic Piping
- p. 28 31 11 Digital Addressable Fire Alarm System

##### B. Drawings:

- a. A101, A101B, A104
- b. A501, A502, A503, A504, A505
- c. A701, A711, A712
- d. A803, A820
- e. A900, A901, A902
- f. P101A, P101B, P102A, P102B, P103A, P103B, P401
- g. M101A
- h. E002, E201A, E201B, E601, E603, E701
- i. T101A, T101B

##### C. Other:

- a. Geotechnical Exploration Report (To be added to 00 31 32 Geotechnical Investigations)
- b. Phase 1 Environmental Site Assessment – For Information Only

END OF ADDENDUM NO. 2

# **TABLE OF CONTENTS**

## **CMHA Cobblestone Manor**

Cover Sheet  
Table of Contents

### **VOLUME 1**

#### **DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS**

00 31 32	Geotechnical Investigations
00 43 25	Substitution Procedures Substitution Form

#### **DIVISION 01 - GENERAL REQUIREMENTS**

01 31 00	Project Management and Coordination
01 31 19	Project Meetings
01 32 16	Construction Schedules
01 33 23	Shop Drawings, Product Data, Samples
01 50 00	Temporary Facilities and Controls
01 60 00	Product Requirements
01 73 00	Execution Requirements
01 73 29	Cutting and Patching
01 74 00	Cleaning
01 74 19	Construction Waste Management and Disposal
01 81 13	Sustainable Design Requirements

#### **DIVISION 03 - CONCRETE**

03 30 00	Cast-In-Place Concrete
03 35 30	Concrete Cleaning and Sealing
03 54 13	Gypsum Underlayment

#### **DIVISION 04 - MASONRY**

04 00 00	Masonry
04 72 00	Cast Stone
04 73 10	Manufactured Stone Veneer

#### **DIVISION 05 - METALS**

05 12 00	Structural Steel
05 50 00	Metal Fabrications

#### **DIVISION 06 – WOOD, PLASTICS AND COMPOSITES**

06 10 00	Rough Carpentry
06 10 50	Wood Blocking
06 17 53	Shop-Fabricated Wood Trusses
06 10 50	Wood Blocking
06 20 00	Finish Carpentry
06 40 00	Architectural Woodwork
06 61 00	Cast Polymer Fabrications
06 83 16	Fiberglass Reinforced Paneling

#### DIVISION 07 - THERMAL & MOISTURE PROTECTION

07 10 00	Waterproofing
07 21 00	Thermal Insulation
07 27 16	Plastic Sheet Air Barriers
07 31 13	Roofing Shingles
07 41 13	Metal Roof Panels
07 46 46	Mineral Fiber Cement Siding
07 54 23	Thermoplastic Polyolefin Roofing
07 62 00	Sheet Metal Flashing and Trim
07 72 33	Roof Hatch
07 81 10	Spray-Applied Fireproofing
07 81 23	Intumescent Fireproofing
07 84 00	Firestopping
07 92 00	Joint Sealants

#### DIVISION 08 - DOORS & WINDOWS

08 11 13	Hollow Metal Doors and Frames
08 14 00	Wood Doors
08 19 00	Interior Doors
08 41 13	Aluminum-Framed Entrances and Storefronts
08 43 14	Interior Aluminum Storefront
08 53 13	Vinyl Windows and Patio Doors
08 56 59	Pass-Through Window
08 71 10	Door Hardware
08 81 00	Glass and Glazing

#### DIVISION 09 – FINISHES

09 21 16	Gypsum Board Systems
09 30 00	Tile
09 51 13	Acoustical Panel Ceilings
09 65 00	Resilient Flooring
09 65 66	Resilient Athletic Flooring - Sheet-Tiles
09 68 00	Carpeting
09 91 00	Painting

#### DIVISION 10 – SPECIALTIES

<b>10 11 00</b>	<b>Visual Display Surfaces</b>
10 14 10	Interior Signage
10 14 19	Dimensional Letter Signage

10 26 00	Wall Protection
10 28 13	Toilet Accessories
10 31 00	Fireplace Components
10 41 16	Emergency Key Cabinets
10 44 00	Fire Extinguishers and Cabinets
10 55 23	Mailboxes
10 56 23	Wire Shelving

#### DIVISION 11 - EQUIPMENT

11 31 00	Residential Appliances
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#### DIVISION 12 – FURNISHINGS

12 21 23	Horizontal Window Blinds (Cordless)
12 32 00	Manufactured Wood Casework
12 36 40	Stone Countertops
<b>12 56 51</b>	<b>Furniture, Furnishings and Accessories</b>

#### DIVISION 14 - CONVEYING EQUIPMENT

14 24 23	Hydraulic Passenger Elevator MRL
14 91 82	Trash Chute

### **VOLUME 2**

#### DIVISION 21 - FIRE SUPPRESSION

21 05 17	- Sleeves and Sleeve Seals for Fire-Suppression Piping
21 05 18	- Escutcheons for Fire-Suppression Piping
21 05 29	- Hangers and Supports for Fire Suppression Piping and Equipment
21 05 53	- Identification for Fire-Suppression Piping and Equipment
21 13 13	- Wet-Pipe Sprinkler Systems
21 13 16	- Dry-Pipe Sprinkler Systems

#### DIVISION 22 - PLUMBING

22 05 17	- Sleeves and Sleeve Seals for Plumbing Piping
22 05 18	- Escutcheons for Plumbing Piping
22 05 19	- Meters and Gages for Plumbing Piping
22 05 23	- General-Duty Valves for Plumbing Piping
22 05 29	- Hangers and Supports for Plumbing Piping and Equipment
22 05 53	- Identification for Plumbing Piping and Equipment
22 07 19	- Plumbing Piping Insulation
22 11 16	- Domestic Water Piping
22 11 19	- Domestic Water Piping Specialties
22 11 24	- Facility Natural-Gas Piping
22 13 16	- Sanitary Waste and Vent Piping
22 13 19	- Sanitary Waste Piping Specialties

22 14 13 - Facility Storm Drainage Piping  
22 14 23 - Storm Drainage Piping Specialties  
22 14 29 - Sump Pumps  
22 33 00 - Electric, Domestic-Water Heaters  
22 00 00 - Plumbing Fixtures

#### DIVISION 23 - HVAC

23 00 00 - HVAC General Requirements  
23 05 13 - Common Motor Requirements for HVAC Equipment  
23 05 29 - Hangers and Supports for HVAC Piping and Equipment  
23 05 48.13 - Vibration Controls for HVAC  
23 05 53 - Identification for HVAC Piping and Equipment  
23 05 93 - Testing Adjusting and Balancing for HVAC  
23 07 13 - HVAC Duct Insulation  
23 07 19 - HVAC Piping Insulation  
23 08 00 - Commissioning of HVAC  
23 21 13 - Hydronic Piping  
23 23 00 - Refrigerant Piping  
23 31 13 - Metal Ducts  
23 33 00 - Air Duct Accessories  
23 33 46 - Flexible Ducts  
23 34 23 - HVAC Power Ventilators  
23 37 13 - Diffusers, Registers, and Grilles  
23 74 16.11 - Packaged, Small-Capacity, Rooftop Air-Conditioning Units  
23 81 26 - Split-System Air-Conditioners  
23 82 39.19 - Wall and Ceiling Unit Heaters

#### DIVISION 26 - ELECTRICAL

26 00 10 - Electrical General Requirements  
26 00 15 - Submittals  
26 00 20 - Basic Electrical Materials and Methods  
26 05 19 - Low-Voltage Electrical Power Conductors and Cables  
26 05 26 - Grounding and Bonding for Electrical Systems  
26 05 29 - Hangers and Supports for Electrical Systems  
26 05 33 - Raceways and Boxes for Electrical Systems  
26 05 43 - Underground Ducts and Raceways for Electrical Systems  
26 05 53 - Identification for Electrical Systems  
26 05 81 - Manholes, Handholes and Underground Pull Boxes  
26 09 23 - Lighting Control Devices  
26 09 43 - Relay-Based Lighting Controls  
26 24 16 - Panelboards  
26 27 13 - Electricity Metering  
26 27 26 - Wiring Devices  
26 28 13 - Fuses  
26 28 16 - Enclosed Switches and Circuit Breakers  
26 28 17 - Elevator Safety Switches  
26 29 13 - Enclosed Controllers  
26 41 13 - Lightning Protection for Structures

- 26 43 13 - Surge Protection for Low-Voltage Electrical Power Circuits
- 26 51 19 - LED Interior Lighting
- 26 52 13 - Emergency and Exit Lighting
- 26 56 13 - Lighting Poles and Standards
- 26 56 19 - LED Exterior Lighting

DIVISION 27 - COMMUNICATIONS

- 27 05 26 - Grounding and Bonding for Communications Systems
- 27 05 28 - Pathways for Communications Systems
- 27 05 29 - Hangers and Supports for Communications Systems
- 27 05 44 - Sleeves and Sleeve Seals for Communications Pathways and Cabling
- 27 05 53 - Identification for Communications Systems
- 27 11 16 - Communications Racks, Frames, and Enclosures
- 27 15 13 - Communications Copper Horizontal Cabling
- 27 20 10 - Local Area Network Electronics
- 27 51 23 - Sound Reinforcement System

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

- 28 13 00 - Access Control System
- 28 13 53 - Video Intercom System
- 28 15 00 - Access Control Hardware Devices
- 28 31 11 - Digital, Addressable Fire-Alarm System
- 28 31 16 - Rescue Assistance Signal System - Audio-Visual
- 28 53 19 - Emergency Responders Radio System

DIVISION 31 EARTHWORK

- |          |                               |
|----------|-------------------------------|
| 31 00 00 | Earthwork                     |
| 31 21 13 | Radon Mitigation              |
|          | Plan and Design               |
| 31 22 13 | Rough Grading                 |
| 31 23 00 | Excavation and Fill           |
| 31 23 33 | Piped Utilities-Basic Methods |
| 31 25 00 | Erosion and Sediment Control  |

DIVISION 32 EXTERIOR IMPROVEMENTS

- |          |                   |
|----------|-------------------|
| 32 12 00 | Flexible Pavement |
| 32 13 00 | Rigid Pavement    |
| 32 92 00 | Turf and Grass    |
| 32 93 00 | Plants            |

DIVISION 33 UTILITIES

- |          |                    |
|----------|--------------------|
| 33 11 00 | Water Distribution |
| 33 30 00 | Sanitary Sewerage  |
| 33 40 00 | Storm Drainage     |

## **SECTION 01 81 13**

### **SUSTAINABLE DESIGN REQUIREMENTS**

#### **PART 1 - GENERAL**

##### GENERAL CONDITIONS

- A. The General Conditions, Modifications to General Conditions, Supplementary or Special Conditions and any Instructions to Bidders shall apply to all Divisions of work.
- B. The requirements of State, Local or appropriate codes applicable to the work, whichever is the most stringent is a requirement of all Divisions of work.

##### WORK OF THIS SECTION

- A. LEED Certification requirements
- B. The intent of this project is to achieve a **Silver- level** LEED certification under the **LEED BD+C Homes and Multifamily Low-rise** rating system.
- C. Contractor shall coordinate work and requirements with Owner Contracted LEED Homes verification team comprising **LEED Provider and Green Rater**. Pertinent to LEED certifications the role of the verification team is to guide the construction team with certification process; review documentation, verify green requirements are met; and to perform third-party testing.

##### REFERENCES

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
  - 1. ASHRAE 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
  - 2. ASHRAE 62 - Ventilation for Acceptable Indoor Air Quality.
  - 3. ASHRAE 90.1 - Energy Efficient Design of New Buildings except Low-Rise Residential Buildings.
  - 4. ASHRAE 129 - Measuring Air-Change Effectiveness.
- B. ASTM International:
  - 1. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
  - 2. ASTM E903 - Standard Test Method for Solar Absorption, Reflectance, and Transmittance of Materials Using Integrating Spheres.
- C. Bay Area Air Quality Management District: BAAQMD Regulation 8, Rule 51 –
- D. Adhesive and Sealant Products. Carpet and Rug Institute: CRI Green Label Testing Program.
- E. Forest Stewardship Council: FSC Guidelines- Forest Stewardship Council Guidelines.
- F. Green Seal: GS-11 - Product Specific Environmental Requirements.
- G. California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B.
- H. Sheet Metal and Air Conditioning Contractors: SMACNA IAQ - IAQ Guidelines for Occupied Buildings under Construction.

- I. South Coast Air Quality Management District: SCAQMD Rule 1168 - Adhesive and Sealant Applications.
- J. U.S. Environmental Protection Agency:
  - 1. EPA 832-R-92-005 - Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
  - 2. EPA Baseline IAQ - Testing for Indoor Air Quality, Baseline IAQ, and Materials Section 01445
  - 3. EPA 402-K-01-002 – A Step-by-Step Guide on how to Build Radon-Resistant Homes
- K. U.S. Green Building Council:
  - 1. LEED Version 4 - Reference Guide for Homes Design & Construction
- L. ENERGY STAR Qualified Homes
  - 1. Energy Star National Rater Design Review Checklist
  - 2. Energy Star National Rater Field Checklist
  - 3. Energy Star National HVAC Design Report
  - 4. Energy Star National HVAC Commissioning Checklist
  - 5. Energy Star Water Management System Builder Checklist

#### SUBMITTALS

- A. The contractor shall submit the following items directly to the Green Rater.
  - 1. Attendee list of On-site LEED Trades Training meeting moderated by LEED Verification Team (LEED Green Rater and/or Provider-QAD)
  - 2. Energy Star Water Management System Builder Checklist signed and initialed by General Contractor.
- B. Energy Star HVAC System Quality Installation Contractor Checklist signed and initialed by HVAC Contractor credentialed by an EPA-recognized HVAC Quality Installation Training and Oversight Organization (H-QUITO)
  - 1. If tropical wood is used – Provide invoices for FSC certified wood with Chain of Custody Certificate number.
  - 2. Construction Waste Volume or Weight and Diversion Rate (Calculation and Waste Hauling Tickets)
  - 3. Provide documentation of dates and times of preoccupancy flush schedule to Green Rater.
- C. Signed LEED Accountability Form certifying that all products meet or exceed the specified requirements and the requirements of LEED, as noted with "LEED". Submit this information as part of the product submittals.
- D. The contractor shall submit cut-sheets of products intended to comply with Environmentally Preferable Products (EPP). See LEED checklist for list of products intended to meet this requirement. EPP criteria are as follows:
  - 1. Recycled Content Requirement:
    - a. Minimum 25% post-consumer or 50% post-industrial. OR
    - b. The product contains at least 25% reclaimed material, including salvaged, refurbished, or reused materials.
    - c. Bio-based materials. Bio-based products must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country.
    - d. Concrete that consists of at least 30% fly ash or slag used as a cement substitute and 50% recycled content or reclaimed aggregate OR 90% recycled content or reclaimed aggregate.
  - 2. Low Emissions Requirement– See specific requirements for Low-VOC paints, Adhesives and

- Sealants at end of this section.
3. Local Production Requirement – Extracted, manufactured, and fabricated (all processes) within a 100-mile crow-fly distance of site.

#### QUALITY ASSURANCE

1. Perform work in accordance with the **LEED Version 4 - Reference Guide for Homes Design & Construction** for prerequisites and credits pertinent to this project listed in LEED Checklist included at the end of this section.
  - A. Maintain one copy of LEED for Homes Rating System document on site. Download at <https://www.usgbc.org/resources/leed-v4-homes-and-multifamily-midrise-current-version>
  - B. Perform inspections to assure conformance to Energy Star Qualified Homes Checklists throughout construction of the project. A copy of all pertinent Energy Star Inspection Checklists is enclosed at end of this section.
  - C. Monitor closely any requests for substitution for products that are related to LEED prerequisites and credits. Unless reviewed thoroughly substitutions may jeopardize projects' ability to obtain certification.
  - D. Perform storm water management and erosion control Work in accordance with EPA Best Management Practices or local erosion and sedimentation control standards, whichever is more stringent.
  - E. Perform Work to meet or exceed minimum energy efficiency and performance in accordance with Energy Star requirements and local energy code, whichever is more stringent.
  - F. Perform Work without use of CFC based refrigerants in HVAC building systems.
  - G. Perform ventilation Work in accordance with ASHRAE 62.
  - H. Develop and implement construction indoor air quality management plan including the following:
    1. Comply with minimum requirements of SMACNA IAQ.
    2. Protect stored and installed absorptive materials from moisture damage.
      - a. Store materials on elevated platforms under cover, and in dry location.
      - b. When materials are not stored in enclosed location, cover tops and sides of material with secured waterproof sheeting.
    3. Protect HVAC equipment during construction.
      - a. Shut down return side of HVAC system whenever possible during heavy construction or demolition.
      - b. When HVAC system is operated during heavy construction, furnish disposable temporary filters.
    4. Pre-Occupancy Flush: Flush the entire building with fresh air for a total of 48 hours after all construction is complete. Run continuous fans through the duration of the flush. Replace all HVAC filters upon completion.

#### **PART 2 – PRODUCTS**

##### PRODUCT SUBSTITUTION

- A. Monitor closely any requests for substitution for products that are related to LEED prerequisites and credits. Unless reviewed thoroughly substitutions may jeopardize projects' ability to obtain certification.

## **PART 3 - EXECUTION**

LEED PREREQUISITES AND CREDITS (See enclosed LEED Checklist for more information)

### INTEGRATIVE PROCESS

#### **A. IP Credit 1.3 (option 3) – Trades Training**

1. At the onset of construction organize a LEED trades training moderated by LEED Green Rater and/or Provider-QAD.
2. Following trades to attend - GC Project Manager, GC Site Superintendent, Mechanical-Electrical-Plumbing, Insulation, Framing, Drywall, Air-Infiltration Package.
3. Provide a minimum of 2-week notice to LEED Green Rater prior to training date.

### SUSTAINABLE SITES

#### **A. SS Prerequisite 1 - Construction Activity Pollution Prevention**

1. Stockpile and protect disturbed topsoil from erosion (for reuse).
2. Control the path and velocity of runoff with silt fencing or comparable measures.
3. Protect on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures.
4. Provide swales to divert surface water from hillsides.
5. Use tiers, erosion blankets, compost blankets, filter socks, berms, or comparable measures to stabilize soils in any area with a slope of 15% (6.6:1) or more that is disturbed during construction.
6. Prevent air pollution from dust and particulate matter.
7. Construction sites larger than 1 acre must conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency Construction General Permit or local equivalent, whichever are more stringent.

#### **B. SS Prerequisite 2 - No Invasive Plants**

1. Coordinate with Landscape Contractor to ensure no invasive plant species are introduced into landscape.

#### **C. SS Credit 3 – Non-toxic Pest Control**

1. For below-grade walls, use solid concrete foundation walls, masonry walls with a course of solid block bond beam, or concrete-filled block.
2. Design a minimum 6-inch inspection space between the surface of the planned landscape grade and non-masonry siding.
3. Seal all external cracks, joints, penetrations, edges, and entry points with appropriate caulking. Install rodent and corrosion-proof screens (e.g., copper or stainless-steel mesh) on all openings greater than 1/4 inch, except where code prohibits their installation (e.g., dryer vents).
4. Design discharge points for rain gutters, air-conditioning condensation lines, steam vent lines, or any other moisture source such that discharge is at least 24 inches from the foundation.
5. Design landscape features to provide a minimum 18-inch space between the exterior wall and any plantings.
6. Multifamily building projects **must** develop an integrated pest management policy that includes guidance for residents on pesticide use, housekeeping, and prompt reporting of pest problems; incorporate the policy in the Homeowner Education Manual.

## WATER EFFICIENCY

### A. WE Prerequisite 1 – Water Metering

1. Multifamily: Install a water meter for each building.

### B. WE Credit 2 – Indoor Water Use

Provide product data showing flow rates for following fixtures:

1. Average flow rate of lavatory faucets shall be 1.00 gallons per minute or less. Each lavatory faucet or faucet aerator must be WaterSense labeled.
2. Average flow rate of showers shall be 1.50 gallons per minute or less. Each showerhead fixture and fitting must be WaterSense labeled.
3. Each clothes washer must be ENERGY STAR qualified.
4. The water pressure in the house must not exceed 60 pounds per square inch (414 kPa), with no detectable water leaks.

## ENERGY & ATMOSPHERE

### A. EA Prerequisite 1– Minimize Energy Performance (Single-Family and Multifamily Low-rise)

1. Meet the requirements of ENERGY STAR for Homes, version 3.
2. Complete the thermal enclosure system rater checklist, the HVAC system quality installation rater and contractor checklists, and the water management system builder checklist. Certified Passive House projects automatically meet the thermal enclosure system rater checklist requirement. Achieve a HERS index rating at or below the HERS index target or meet the requirements of the ENERGY STAR for Homes version 3.
3. At least one of the following appliances must be ENERGY STAR qualified and installed in each dwelling unit: refrigerator; OR dishwasher; OR clothes washer.
4. All duct runs must be fully ducted (i.e., building cavities may not be used as ducts).
5. Minimum envelope leakage –  
following areas of building envelope and demising walls shall be sealed, caulked, gasketed, or weather-stripped to minimize envelope leakage:
  - a. Joints around windows and doors.
  - b. Joints between walls and foundation; between conditioned spaces and attics, demising walls, crawl spaces or garage.
  - c. Seal joints between sill plate and drywall.
  - d. Seal joints between top plate and drywall.
  - e. All mechanical, plumbing, and electrical penetrations in exterior and demising walls. Mechanical chase shall be sealed at crawl space ceiling.
  - f. Exterior sheathing and house wrap.
  - g. Minimize entry of air from outdoors, attic, garage, and crawl space into exterior wall and interior wall cavities to ensure passing of air infiltration test.
  - h. Batt insulation shall be stapled to face of stud to ensure full contact of insulation with face of drywall. Cut insulation around all mechanical, plumbing, and electrical work.
6. Thermal Bypass Inspection -  
The Green Rater will conduct a visual Thermal Bypass Inspection to inspect proper installation and continuity of thermal insulation and air-tightness of envelope. This inspection must take place after exterior envelope insulation has been installed, but prior to and installation of any drywall. One inspection per floor shall be conducted. If additional inspections are deemed necessary due construction sequencing, Contractor shall notify the Architect and Green Rater immediately. Contractor shall schedule the inspection with no less than a two-week notice to the Green Rater. Contractor shall provide access to each unit and cooperate with conducting of the test. Additional inspections necessary due to incomplete work shall be back-charged to the Contractor. A sample Thermal Bypass Inspection Checklist is enclosed in section 018113.

7. Final Inspections -  
Upon substantial completion and prior to occupancy, the Green Rater will conduct a visual Final Inspection to verify green requirements incorporated in the project. The contractor shall notify the Green Rater at least four (4) weeks prior to the anticipated date for such inspection. Contractor shall provide access to each unit and cooperate with conducting of the test. Additional inspections necessary due to incomplete work shall be back-charged to the Contractor.
8. Third-Party Testing -  
Third-party Testing is to be scheduled and conducted in conjunction with the final inspection. The contractor shall notify the Green Rater at least four (4) weeks prior to the anticipated date for such inspection. Contractor shall provide access to each unit and cooperate with conducting of the test. The following tests shall be conducted by Green Rater:
  - a. Air Infiltration Test (Blower door Test) – Mandatory – Measures air leakage through unit enclosure such as exterior walls, demising walls, ceilings, chases, etc.
  - b. Distribution Loss Test (Duct Blaster Test) – Mandatory – Measures leakage through the mechanical distribution system
  - c. Exhaust Test - Measures exhaust rate for bathroom fans and kitchen fans.
  - d. Flow Test and Balancing – Measure air flow at each supply register and pressure differential between rooms.

**B. EA Prerequisite 2 – Energy Metering**

For Multifamily Buildings

1. Install an electricity meter or submeter for each residential unit and a gas meter for the entire building, or a gas meter or sub-meter for each unit. Single room–occupancy units, transitional and temporary housing, and designated supportive housing buildings do not need an energy meter in each unit but must have a whole-building energy meter.

**C. EA Prerequisite 3 – Education of the Homeowner, Tenant, or Building Manager**

1. General Contractor to provide to Owner or Owner’s Building Management an operations and maintenance manual, binder, or CD that includes all the following items:
  - a. the completed checklist of LEED-related features;
  - b. a copy of each signed accountability form;
  - c. copies of all ENERGY STAR for Home, version 3, checklists;
  - d. product manufacturers’ manuals for all installed equipment, fixtures, and appliances;
  - e. general information on efficient use of energy, water, and natural resources;
  - f. operations and maintenance guidance for any installed equipment, including space heating and cooling, mechanical ventilation, humidity control, radon protection, renewable energy, and irrigation, rainwater harvesting, or graywater systems (following 2009 EPA WaterSense Single-Family New Home Specifications, item 5.0, Homeowner Education);
2. LEED Green Rater to assist with following items for inclusion in manuals:
  - a. guidance on occupants’ activities and choices, including cleaning materials and methods, water-efficient landscaping, integrated pest management, effects of chemical fertilizers and pesticides, irrigation, lighting selection, and appliance selection;
  - b. information on local green power options; and
  - c. information on sharing utility data with USGBC via a USGBC-approved third party.
3. General Contractor to conduct a minimum one-hour walkthrough of the home with Owner and/or building manager. The walkthrough must feature the following:
  - a. identification of all installed equipment;
  - b. instruction in how to use and operate the equipment; and
  - c. information on its maintenance.

#### **D. EA Credit 2 – Efficient Hot Water Distribution System**

1. Option 1 - Path 1 - Maximum Allowable Pipe Length:
  - a. Total linear hot water pipe length not to exceed 21 feet or 3/4" dia.; 32 feet for 5/8" dia.; 42 feet for 1/2" dia.; and 50 feet for 3/8" dia.
  - b. Length requirements do not apply to cold water demand loads for following fixtures – toilets, tubs without showerheads, or stovetop pot-fillers.
  - c. For projects using circulating systems, meet all the following:
    - i. Circulating pump does not operate continuously, is on a timer, or is on a water temperature sensor.
    - ii. Circulating pump is demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.
    - iii. After the pump starts, the controls allow the pump to operate until the water temperature in the return pipe rises not more than 10°F (6 °C) above the initial temperature of the water in the pipe. Controls limit the water temperature to a maximum of 105°F (40 °C). Controls limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.
    - iv. Circulating hot water systems have with an automatic or readily accessible manual switch to turn off the hot water circulating pump when not in use.
2. Option 3 – Pipe insulation
  - a. Install at least R-4 insulation on all domestic hot water piping, including sub slab pipes. Insulation on all piping elbows and tees must adequately insulate changes in direction.
  - b. Run buried piping in a slab or below grade through a protective, waterproof raceway, channel, sleeve, or path whose internal dimensions and changes of direction are large enough that the piping and insulation can be removed and replaced without damaging the piping's dimensional integrity.
  - c. The waterproof sleeve is not required for below-grade piping if the insulation manufacturer stipulates that the pipe insulation will maintain its insulating value in underground applications in damp soil when installed according to the manufacturer's instructions. This exception does not apply to piping that runs through or under building slabs.

#### **MATERIALS & RESOURCES**

##### **A. MR Prerequisite 1 – Certified Tropical Wood**

1. All wood in the building must be non-tropical, reused or reclaimed, or certified by the Forest Stewardship Council, or USGBC-approved equivalent.
2. If tropical wood is used it must be FSC Certified. Provide vendor's chain-of-custody certificate number must be shown on any invoice that includes FSC-certified products.

##### **B. MR Prerequisite 2 – Durability Management**

1. Meet the requirements of the ENERGY STAR for Homes, version 3, water management system builder checklist attached at end of this section.
2. Install all the applicable indoor moisture control measures:
  - a. Area directly above bathtub, spa, or shower (extending to ceiling), exposed wall or area behind fiberglass enclosure if wallboard is installed - Use non-paper-faced backer board or paper-faced product or coating over wallboard that meets standard ASTM D 3273 standard
  - b. Kitchen, bathroom, laundry room, spa area - Use water-resistant flooring; do not install carpet.
  - c. Install water resistant flooring (not carpet) within 3 feet of exterior doors accessible from ground.
  - d. Tank water heater in or over living space - Install drain and drain pan, drain pan and automatic water shut-off or flow restrictor, or floor drain with floor sloped to drain.

- e. Clothes washer (or condensing clothes dryer) in or over living space - Install drain and drain pan, drain pan and automatic water shut-off or flow restrictor, floor drain with floor sloped to drain, or braided washer hose.
- f. Conventional clothes dryer - Exhaust directly to outdoors

**C. MR Credit 1 – Durability Management Verification**

- 1. LEED verification team (Green Rater) to inspect and verify each measure listed in the ENERGY STAR for Homes, version 3, water management system builder checklist.
- 2. Allow Green Rater access to the premise to inspect items in ENERGY STAR for Homes, version 3, water management system builder checklist.

**D. MR Credit 2 – Environmentally Preferable Products**

- 1. Option 1 - Local Production - Use products that were extracted, processed, and manufactured locally within 100 miles of site and for the following components (at least 50% of the component). Contractor to provide documentation proving compliance with Environmentally Preferable Product requirements for the following products:
  - a. Aggregate for concrete and foundation
- 2. Option 2 – Environmentally Preferable Products –Use synthetic gypsum board products that contain at least 95% recycled content and non-synthetic gypsum board products that contain at least 10% post-consumer recycled content. Contractor to provide documentation proving compliance with Environmentally Preferable Product requirements for the following products:
  - a. Drywall, Interior Finish

**E. MR Credit 4 – Material Efficient Framing**

- 1. Implement any of the following advanced framing techniques for at least 90% of each component.
  - a. Use ladder blocking or drywall clips.
  - b. Use two-stud corners or California corners.
  - c. Space floor joists greater than 16 inches o.c. or.
  - d. Space roof rafters greater than 16 inches o.c.

**INDOOR ENVIRONMENTAL QUALITY**

**A. EQ Prerequisite 1 – Ventilation**

Multifamily

- 1. Local Exhaust
  - a. Design and install local exhaust systems in all bathrooms (including half-baths) and the kitchen to meet the requirements of ASHRAE Standard 62.2–2010, Sections 5 and 7 or local equivalent, whichever is more stringent. Provide minimum intermittent local exhaust flow rates of 100 cfm or 5ACH in kitchen, and 50 cfm in bathrooms.
  - b. Exhaust air to the outdoors. Do not route exhaust ducts to terminate in attics or interstitial spaces. Just recirculating range hoods or recirculating over-the-range microwaves do not satisfy the kitchen exhaust requirements.
  - c. Use ENERGY STAR–labeled bathroom exhaust fans in all bathrooms.
  - d. For exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (188 liters per second), provide makeup air at a rate approximately equal to the exhaust air rate. Makeup air systems must have a means of closure and be automatically controlled to start and operate simultaneously with the exhaust system.
- 2. Ventilation
  - a. Fresh air ventilation to dwelling units shall comply with ventilation requirements of ASHRAE 62.2–2010.
  - b. Do not use systems that rely on transfer air from pressurized hallways or corridors, adjacent dwelling units, attics, etc.

- c. Project teams using exhaust-only ventilation systems must comply with flow rate required by ASHRAE 62.2–2010. If bathroom exhaust fan is used for exhaust-only fresh-air ventilation, then refer to HVAC drawings for exhaust fan run-time and controls. Coordinate continuous / intermittent fan run-time and controls with HVAC and Electrical contractor. Provide dual-speed bathroom exhaust fan with continuous speed set to 30 cfm in 1-Bedroom units, 45 cfm in 2-Bedroom units, and 45 cfm in 3-Bedroom units.
  - d. Continuous in-unit ventilation fans must be rated for sound at a maximum of 1.0 sone, per ASHRAE 62.2–2010, Section 7.2.1. Remote mounted fans need not meet these sound requirements.
  - e. Locate air inlets that are part of the ventilation design at least 10 feet (3 meters) from known sources of contamination, such as a stack, vent, exhaust hood, or vehicle exhaust. Place the intake such that entering air is not obstructed by snow, plantings, or other material. Forced air inlets must be covered by screens to exclude rodents and insects (mesh not larger than 1/2 inch or 13 millimeters).
3. For all non-unit spaces, meet the minimum requirements of ASHRAE Standard 62.1–2010 or local equivalent, whichever is more stringent, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata). Mechanically ventilated spaces must be designed using the ventilation rate procedure or the applicable local code, whichever is more stringent. Ventilation fans that penetrate rated assemblies may require radiation and fire dampers to meet local building and fire codes.

#### **B. EQ Prerequisite 2 – Combustion Venting**

- 1. Do not install any unvented combustion appliances (ovens and ranges excluded).
- 2. Install a carbon monoxide (CO) monitor on each floor, hard-wired with a battery backup. In multifamily buildings, install a CO monitor on each floor of each unit.
- 3. For all fireplaces and woodstoves inside the building, provide doors that close or a solid glass enclosure. Interior fireplaces and woodstoves that are not closed-combustion or power-vented must pass BPI or RESNET combustion safety testing protocols to ensure that depressurization of the combustion appliance zone is less than 5 Pa.
- 4. Space- and water-heating equipment that involves combustion must meet one of the following:
  - a. it must be designed and installed with closed combustion (i.e., sealed supply air and exhaust ducting);
  - b. it must be designed and installed with power-vented exhaust; or
  - c. it must be located in a detached utility building or open-air facility.

#### **C. EQ Prerequisite 3 – Garage Pollutant Protection**

- 1. Place all air-handling equipment and ductwork outside the fire-rated envelope of the garage.
- 2. Tightly seal shared surfaces between the garage and conditioned spaces, including all of the following:
  - a. In conditioned spaces above the garage, seal all penetrations and all connecting floor and ceiling joist bays.
  - b. In conditioned spaces next to the garage, weather-strip all doors, install carbon monoxide detectors in rooms that share a door with the garage, seal all penetrations, and seal all cracks at the base of the walls.

#### **D. EQ Prerequisite 4 – Radon-Resistant Construction**

- New Construction
- 1. Provide a Passive or Active Radon Mitigation System per following requirements:
    - a. Install polyethylene sheeting or extruded polystyrene (XPS) insulation beneath concrete slabs, including basement floors. Ensure sheeting is in direct contact with the concrete slab above. Install a capillary break at all crawlspace floors using ≥ 6 mil polyethylene sheeting, lapped 6 to 12 in.
    - b. Under the polyethylene sheeting or extruded polystyrene (XPS) insulation installed to meet ENERGY STAR Water Management System Builder Checklist Item 1.3:

- i. Install a 4 in. layer of 1/2 in. diameter or greater clean aggregate; OR
    - ii. Install a 4 in. uniform layer of sand, overlain with either a layer of geotextile drainage matting throughout or strips of geotextile drainage matting along the perimeter installed according to the manufacturer's instructions.
  - c. A 3 or 4 in. diameter gas-tight vertical vent pipe, clearly labeled to conform with the radon-resistant standard used, e.g., "Radon Reduction System" or "Radon Pipe" or "Radon System." The vent pipe shall be connected to an open T-fitting in the aggregate layer (or connected to geotextile drainage matting according to the manufacturer's instructions) beneath the polyethylene sheeting, extending up through the conditioned spaces and terminating a minimum of 12 in. above the roof opening. For crawlspaces, install at least 5 ft. of horizontal perforated drain tile on either side of the T-fitting, attached to the vertical radon vent pipe beneath the sheeting and running parallel to the long dimension of the house.
  - d. Radon fan installed in the attic (i.e., an active system) OR an electrical receptacle installed in an accessible attic location near the radon vent pipe (i.e., a passive system) to facilitate future fan installation if needed.
2. The requirements for radon protection are automatically satisfied if the building is elevated by at least 2 feet (600 millimeters), with open air space between the building and ground. An enclosed vented crawlspace does not qualify. A garage under a building is an acceptable alternative.
  3. Foundation air sealing with polyurethane caulk or the equivalent at all slab openings, penetrations and control or expansion joints.

**E. EQ Prerequisite 5 – Air Filtering**

1. Install air filters with a minimum efficiency reporting value (MERV) of 8 or higher on all recirculating space conditioning systems, per ASHRAE 62.2–2010. Design ductwork and specify the central blower to account for the pressure drop across the filter. Air filter housings must be airtight to prevent bypass or leakage.
2. Non-ducted systems are exempt from the minimum MERV 8 requirements but must have an internal air filter in the air-handling unit.
3. Install air filters rated MERV 6 or higher for mechanically supplied outdoor air for systems with 10 feet (3 meters) of ductwork or more, per ASHRAE 62.2–2010, Section 6.7.

**F. EQ Prerequisite 6 – Environmental Tobacco Smoke**

Multifamily

1. Provide signage to:
  - a. prohibit smoking in common areas,
  - b. prohibit smoking within 25 feet of building entrances.
  - c. or prohibit smoking on the entire property.

**G. EQ Prerequisite 7 – Compartmentalization**

1. Compartmentalize each residential unit to minimize leakage between units. Minimize uncontrolled pathways for environmental tobacco smoke and other indoor air pollutants between units by sealing penetrations in walls, ceilings, and floors and by sealing vertical chases (including utility chases, garbage chutes, mail drops, and elevator shafts) adjacent to the units.
2. Weather-strip all doors in the residential units leading to common hallways to minimize air leakage into the hallway. Weather-strip all exterior doors and operable windows to minimize leakage from outdoors.
3. Demonstrate acceptable sealing of residential units by a blower door test. Follow the procedure described by RESNET or the ENERGY STAR Multifamily High Rise Program Testing and Verification Protocols, Version 1.0, with an allowable maximum leakage of 0.30 cfm<sub>50</sub> per square foot (0.07 cmm<sub>50</sub> per square meter) of enclosure (i.e., all surfaces enclosing the apartment, including exterior and party walls, floors, and ceiling) for new construction buildings.

# Seasons Grove Scorecard (ID: 100056789)

Project Address **100056789, Seasons Grove, 1050 Lamplighter Drive Grove City, OH**



Note: The information on this tab is READ-ONLY. To edit this information, see the Credit Category tabs.

Total		Certification Level:	Not Certified	Verified	19
	<b>Integrative Process</b>	Preliminary Y	2 of 2	M 0	Verified 0
<b>IPc</b>	<b>Integrative Process</b>		2 of 2	0	
	<b>Location and Transportation</b>	Preliminary Y	7 of 15	M 0	Verified 0
<b>LTP</b>	Floodplain Avoidance		Required		Not Verified
<b>LTC</b>	LEED for Neighborhood Development		0 of 15	0	
<b>LTC</b>	Site Selection		2 of 8	0	
<b>LTC</b>	Compact Development		3 of 3	0	
<b>LTC</b>	Community Resources		2 of 2	0	
<b>LTC</b>	Access to Transit		0 of 2	0	
	<b>Sustainable Sites</b>	Preliminary Y	3 of 7	M 0.5	Verified 0
<b>SSp</b>	Construction Activity Pollution Prevention		Required		Not Verified
<b>SSp</b>	No Invasive Plants		Required		Not Verified
<b>SSc</b>	Heat Island Reduction		0 of 2	0	
<b>SSc</b>	Rainwater Management		1 of 3	0	
<b>SSc</b>	Nontoxic Pest Control		2 of 2	0.5	
	<b>Water Efficiency</b>	Preliminary Y	4 of 12	M 1	Verified 0
<b>WEp</b>	Water Metering		Required		Not Verified
<b>WEC</b>	Total Water Use		0 of 12	0	
<b>WEC</b>	Indoor Water Use		4 of 6	0	
<b>WEC</b>	Outdoor Water Use		0 of 4	1	
	<b>Energy and Atmosphere</b>	Preliminary Y	19.5 of 38	M 1	Verified 19
<b>EAp</b>	Minimum Energy Performance		Required		Not Verified
<b>EAp</b>	Energy Metering		Required		Not Verified
<b>EAp</b>	Education of the Homeowner, Tenant or Building Manager		Required		Not Verified
<b>EAc</b>	Annual Energy Use		19.5 of 29	0	19
<b>EAc</b>	Efficient Hot Water Distribution System		0 of 5	0	
<b>EAc</b>	Advanced Utility Tracking		0 of 2	0	
<b>EAc</b>	Active Solar-Ready Design		0 of 1	0	
<b>EAc</b>	HVAC Start-Up Credentialing		0 of 1	1	



<b>Materials and Resources</b>		Preliminary	Y	4 of 10	M	3	Verified	0
<b>MRp</b>	Certified Tropical Wood			Required				Not Verified
<b>MRp</b>	Durability Management			Required				Not Verified
<b>MRc</b>	Durability Management Verification			1 of 1		0		
<b>MRc</b>	Environmentally Preferable Products			1.5 of 4		1		
<b>MRc</b>	Construction Waste Management			0 of 3		2		
<b>MRc</b>	Material-Efficient Framing			1.5 of 2		0		



<b>Indoor Environmental Quality</b>		Preliminary	Y	9 of 16	M	0.5	Verified	0
<b>EQp</b>	Ventilation			Required				Not Verified
<b>EQp</b>	Combustion Venting			Required				Not Verified
<b>EQp</b>	Garage Pollutant Protection			Required				Not Verified
<b>EQp</b>	Radon-Resistant Construction			Required				Not Verified
<b>EQp</b>	Air Filtering			Required				Not Verified
<b>EQp</b>	Environmental Tobacco Smoke			Required				Not Verified
<b>EQp</b>	Compartmentalization			Required				Not Verified
<b>EQc</b>	Enhanced Ventilation			1 of 3		0		
<b>EQc</b>	Contaminant Control			1 of 2		0		
<b>EQc</b>	Balancing of Heating and Cooling Distribution Systems			2 of 3		0		
<b>EQc</b>	Enhanced Compartmentalization			0 of 1		0		
<b>EQc</b>	Enhanced Combustion Venting			2 of 2		0		
<b>EQc</b>	Enhanced Garage Pollutant Protection			2 of 2		0		
<b>EQc</b>	Low-Emitting Products			1 of 3		0.5		



<b>Innovation</b>		Preliminary	Y	3 of 6	M	1.5	Verified	0
<b>INp</b>	Preliminary Rating			Required				Not Verified
<b>INc</b>	Innovation			3 of 5		0.5		
<b>INc</b>	LEED Accredited Professional			0 of 1		1		



<b>Regional Priority</b>		Preliminary	Y	3 of 4	M	1	Verified	0
<b>RPC</b>	Regional Priority			3 of 4		1		

**Point Floors**

The project earned at least 8 points total in Location and Transportation and Energy and Atmosphere	<input type="text" value="Yes"/>
The project earned at least 3 points in Water Efficiency	<input type="text" value="No"/>
The project earned at least 3 points in Indoor Environmental Quality	<input type="text" value="No"/>

<b>Total</b>		Preliminary	Y	54.5 of 110	M	8.5	Verified	19
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**Certification Thresholds** Certified: 40-49, Silver: 50-59, Gold: 60-79, Platinum: 80-110

# Integrative Process

Preliminary Y 2 Maybe 0 Verified 0

## IP Credit Integrative Process

Up to 2 points

Preliminary Y  M  Verified

Exemplary Performance: Achieve all three options

### Option 1. Integrative Project Team (1 point)

Y  M  V

Team members, in addition to the builder and verification team, include capabilities in at least three of the following skill sets: architecture or residential building design; mechanical or energy engineering; building science or performance testing; green building or sustainable design; and civil engineering, landscape architecture, habitat restoration, or land-use planning.

All team members referenced above were involved in at least three of the following phases of the design and construction process: conceptual or schematic design; LEED planning; preliminary design; energy and envelope systems analysis or design; design development; and construction.

Meetings were conducted with the project team at least monthly to review project status, introduce new team members to project goals, discuss problems, formulate solutions, review responsibilities, and identify next steps.

AND/OR

### Option 2. Design Charrette (1 point)

Y  M  V

A full-day workshop (or two half-day workshops) was conducted with the project team, as defined in Option 1, no later than the design development phase.

Date(s)  
 Duration

AND/OR

### Option 3. Trades Training (1 point)

Y  M  V

At least eight hours of training on the green aspects of the project and how the trades can contribute to achieving each LEED for Homes prerequisite and attempted credit was conducted before construction but after trades have been hired for the project.

Date(s)  
 Duration  
 Trainer

# Location and Transportation

Preliminary Y 7

Maybe 0

Verified 0

## LT Prerequisite Floodplain Avoidance

### Required

Verified

Select one of the following:

The project is not built on land within a flood hazard area.

The project is built on land within a flood hazard area and in accordance with flood provisions.

The project is built on land within a flood hazard area and is a previously developed building and hardscape.

## LT Credit LEED for Neighborhood Development

15 points

Preliminary Y  M  Verified

Name of LEED for Neighborhood Development project

LEED ND project ID number

Rating system and version

LEED ND certification date

## LT Credit Site Selection

Up to 8 points

Preliminary Y  M  Verified

Exemplary Performance: Earn all 9 points

**Option 1. Sensitive Land Protection (3-4 points)** Y  M  V

**Path 1. Previously Developed (4 points)** Y  M  V

Total buildable land area (acre or sq ft)

Previously developed buildable land area (acre or sq ft)

Percentage of lot previously developed (%)

OR

**Path 2. Avoidance of Sensitive Land (3 points)** Y  M  V

All new buildings, hardscapes, roads, or parking areas of the project are located on land that meets the following criteria:

Does not consist of prime farmland, unique farmland, or farmland of statewide or local importance.

Was not public parkland prior to acquisition.

Is not in a flood hazard area shown on a legally adopted flood hazard map or otherwise legally designated by the local jurisdiction or state.

Is not on land specifically identified as habitat for species listed in the U.S. Endangered Species Act; the state's endangered species act; NatureServe GH, G1, or G2 lists; or those listed under local equivalent standards (for projects outside the U.S.) that are not covered by NatureServe data.

Is not on land within 50 ft (15 m) of wetlands or within the setback distance from wetlands prescribed by local, state or national regulations, whichever is more stringent.

Is not on land within 100 ft (30 m) of water bodies, including seas, lakes, rivers, streams and tributaries.

AND/OR

**Option 2. Infill Development (2 points)**

Y  M  V

Percent of land within a 1/2 mile (800 meters) from the project boundary that is previously developed

Alternatively, for projects within city limits of towns with populations less than 20,000

Percent of land adjacent to the project boundary that is previously developed

AND/OR

**Option 3. Open Space (1 point)**

Y  M  V

Select one of the following:

Built within 1/2 mile (800 meters) of open space that is at least 3/4 acres (0.3 hectares)

Create publicly available open space on the project site

AND/OR

**Option 4. Street Network (1 point)**

Y  M  V

Qualifying intersection density (intersections per square mile)

AND/OR

**Option 5. Bicycle Network and Storage (1 point)**

Y  M  V

Bicycle Network

Select one of the following. The project has a functional entry and/or bicycle storage within 200 yd (180 m) of a bicycle network that connects to:

At least 10 uses

A school or employment center

A bus rapid transit stops, rail stations, and/or ferry terminals

Bicycle Storage for Multifamily Buildings

Number of building occupants

Number of residential units

Number of short-term spaces provided

Number of short-term spaces required

Number of long-term spaces provided

Number of long-term spaces required

Bicycle Storage for Single Family Homes

The project is a single family home with garage.

**LT Credit Compact Development**

Up to 3 points

Exemplary Performance for Single and Multifamily Lowrise Only: 35 DU/acre (86.5 DU/hectare)

Preliminary Y  M  Verified

Total project boundary area (acre)

Buildable land area (acre)

Number of dwelling units

DU/acre of buildable land

**LT Credit Community Resources**

Up to 2 points

Exemplary Performance: 16 uses for 1/2 point, 20 uses for 1 point.

Preliminary Y  M  Verified

Number of community resources within a 1/2 mile (800 meters) walking distance

**LT Credit Access to Transit**

Up to 2 points

*Exemplary Performance: For multiple transit types, 720 weekday trips and 432 weekend trips; For commuter rail or ferry, 120 weekday trips.*

Preliminary Y  M  Verified

*For projects with multiple transit types*

Number of weekday trips  
 Number weekend day trips

*For projects with commuter rail or ferry service only*

Number of weekday trips

# Sustainable Sites

Preliminary Y 3

Maybe 0.5

Verified 0

## SS Prerequisite Construction Activity Pollution Prevention

### Required

Verified

Confirm all of the following measures were implemented on the project, as applicable:

- Stockpiled and protected disturbed topsoil from erosion.
- Controlled the path and velocity of runoff with silt fencing or comparable measures.
- Protected on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures.
- Provided swales to divert surface water from hillsides.
- Used tiers, erosion blankets, compost blankets, filter socks, berms, or comparable measures to stabilize soils in any area with a slope of 15% (6.6:1) or more that was disturbed during construction.
- Prevented air pollution from dust and particulate matter.

For construction sites larger than 1 acre

Select one of the following:

- The project team created an implemented an Erosion and Sedimentation Control (ESC) plan that conforms to the requirements of the 2012 U.S. Environmental Protection Agency Construction General Permit (CGP).
- The project team created an implemented an Erosion and Sedimentation Control (ESC) plan that conforms to local standards and codes, which are as or more stringent than the 2012 EPA Construction General Permit (CGP).

## SS Prerequisite No Invasive Plants

### Required

Verified

- No invasive plant species have been introduced into the landscape.

## SS Credit Heat Island Reduction

Up to 2 points

### Option 1. Shading and Option 2. Nonabsorptive Materials (1-2 points)

Preliminary Y  M  Verified

#### Hardscapes

- Area of shaded hardscapes (sq ft)
- Area of unshaded paving materials with an initial SR value of at least 0.33 (sq ft)
- Area of unshaded vegetation in open pavers (sq ft)
- Remaining hardscape area (not earning credit) (sq ft)
- Total hardscape area (driveways, walkways, patios, etc.) (sq ft)

#### Roof

- Area of ENERGY STAR qualified roof (sq ft)  
The ENERGY STAR roofing program had a sunset date effective June 1, 2022. Single family projects can use the LEED v4.1 Single Family pathway for 'High-Reflectance Roof. Use roofing materials that have an aged SRI equal to or greater than the values in Table 1. See the rating system for Table 1.' LEED v4 Multifamily projects can pursue the LEED v4.1 Multifamily credit substitution approach as outlined in the LEED v4.1 Guide.
- Area of vegetated roof (sq ft)
- Remaining roof area (not earning credit) (sq ft)
- Total roof area (sq ft)
- Percentage of area with shading or nonabsorptive material (%)

**SS Credit Rainwater Management**

Up to 3 points

Preliminary Y  M  Verified

Exemplary Performance: For Case 1, manage 100% of all stormwater on-site.

**Case 1. Low Impact Development (1-3 points)**

Y  M  V

*Site Characteristics*

Total lot area (sq ft)

*Roof*

<input type="text"/>	Vegetated roof area (sq ft)
<input type="text"/>	Roof area directed to a qualifying infiltration feature (sq ft)
<input type="text" value="27211.00"/>	Remaining roof area (not earning credit) (sq ft)
<input type="text" value="27,211"/>	Total roof area (sq ft)

*Non-roof Site Area*

*Softscape*

Total landscape softscape area (sq ft)

*Hardscape*

<input type="text"/>	Permeable paving (sq ft)
<input type="text"/>	Qualifying open pavers (sq ft)
<input type="text"/>	Hardscapes directed to qualifying infiltration features (sq ft)
<input type="text" value="55818.00"/>	Remaining hardscape area (not earning credit) (sq ft)
<input type="text" value="55,818"/>	Total hardscape area (driveways, walkways, patios, etc.) (sq ft)

*Qualifying area, as a percentage of total lot area*

Qualifying area, as percentage of total lot area (%)

*Reduction of total impermeable area*

<input type="text" value="83,029"/>	Total impermeable area of the project (sq ft)
<input type="text" value="#N/A"/>	Reference home size (sq ft)
<input type="text" value="0.0%"/>	Impermeable area as a percentage of reference home size

OR

**Case 2. NPDES Projects (2-3 points)**

Y  M  V

Percentile rainfall event

**SS Credit Nontoxic Pest Control**

Up to 2 points

*Exemplary Performance: Projects that achieve 2 points can earn another 1/2 point for each additional strategy, up to a total of 1 point.*

Preliminary Y  M  Verified

Select all of the following that have been included in the project.

- Install a steel mesh barrier termite control system. (1 point)
- Install a physical termite barrier system (e.g., basaltic rock) approved by code. (1 point)
- For below-grade walls, use solid concrete foundation walls, masonry walls with a course of solid block bond beam, or concrete-filled block. (0.5 point)
- Install post-tension slabs. (0.5 point)
- Treat all cellulosic structural material (e.g., wood framing) with a registered pesticide containing borates, following the manufacturer's directions for preconstruction treatment. (0.5 point)
- Use noncellulosic material for all structural elements. (0.5 point)
- Install ports or openings for all plumbing elements that penetrate the slab, to allow access for inspection and treatment of pest infestations. (0.5 point)
- Install a registered termite bait system and provide for ongoing maintenance as required by the manufacturer. (0.5 point)
- Design a minimum 6-inch (150 millimeters) inspection space between the surface of the planned landscape grade and nonmasonry siding. (0.5 point)
- Seal all external cracks, joints, penetrations, edges, and entry points with appropriate caulking. Install rodent- and corrosion-proof screens (e.g., copper or stainless steel mesh) on all openings greater than 1/4 inch (6 millimeters), except where code prohibits their installation. (0.5 point)
- Design discharge points for rain gutters, air-conditioning condensation lines, steam vent lines, or any other moisture source such that discharge is at least 24 inches (600 millimeters) from the foundation. (0.5 point)
- Design landscape features to provide a minimum 18-inch (450 millimeters) space between the exterior wall and any plantings. (0.5 point)

*For multifamily projects*

- Develop an integrated pest management policy. The policy must include guidance for residents on pesticide use, housekeeping and prompt reporting of pest problems and incorporate policy in the Homeowner Education Manual. (Required)

# Water Efficiency

Preliminary Y 4

Maybe 1

Verified 0

## WE Prerequisite Water Metering

Required

Verified

OR

Case 2. Multifamily

V

A water meter or submeter is installed for each unit.

True A water meter or submeter is installed for the whole building.

## WE Credit Total Water Use

Up to 12 points

Exemplary Performance: 70% reduction of indoor and outdoor water consumption

Preliminary Y  M  Verified

0.00% Total reduction of indoor and outdoor water consumption as calculated in the [Water Reduction Calculator](#) (%)

For single family projects

The water pressure does not exceed 60 psi (415 kPa). There are no detectable water leaks. Any installed water softeners are demand initiated.

For multifamily projects

There are no detectable water leaks. Any installed water softeners are demand initiated.

## WE Credit Indoor Water Use

Up to 6 points

Preliminary Y  4 M  0 Verified  0

OR

Case 2. Multifamily and Midrise

Y  4 M  V

True There are no detectable water leaks.

Note: No additional credit is awarded if the fixtures and fittings in non-unit spaces are more efficient than those of in-unit spaces.

Meet any of the following for in-unit spaces and non-unit spaces:

Lavatory Faucet (1-2 points)

True All installed lavatory faucets and/or faucet aerators are WaterSense labeled.

1.00 Average rated flow volume across all lavatory faucets (gpm)

Showerheads (1-2 points)

True All installed showerhead fixtures and fittings are WaterSense labeled.

1.50 Average rated flow volume per shower compartment (gpm)

Toilets (1 point)

All installed toilet fixtures and fittings are WaterSense labeled.

Average rated flush volume across all toilets (gpf)

Clothes Washers (1 point)

All clothes washers are ENERGY STAR qualified or performance equivalent

**WE Credit Outdoor Water Use**

Up to 4 points

**Preliminary** Y  **M**  **Verified**

<input type="text" value="&lt;60"/>	Turf grass area as a percentage of total landscape softscape area (%)
<input type="text"/>	Native or adapted plant area as a percentage of total landscape softscape area (%)

# Energy and Atmosphere

Preliminary Y 19.5

Maybe 1

Verified 19

## EA Prerequisite Minimum Energy Performance

### Required

Verified

#### 1. ENERGY STAR for Homes version 3

ENERGY STAR version 3 checklists are complete

HERS index rating

ENERGY STAR HERS index target

OR

ENERGY STAR Builder Option Package has been followed and all requirements met.

#### 2. ENERGY STAR Qualified Appliances

Select at least one of the following:

ENERGY STAR refrigerator is installed.

ENERGY STAR dishwasher is installed.

ENERGY STAR clothes washer is installed.

#### 3. Duct Runs

All duct runs are fully ducted.

## EA Prerequisite Energy Metering

### Required

Verified

OR

#### Case 2. Multifamily

V

Electric submeters are installed in each residential unit.

A whole-building gas meter or submeter for each residential unit is installed.

## EA Prerequisite Education of Homeowner, Tenant, or Building Manager

### Required

Verified

An operations and maintenance manual, binder, or CD has been/will be provided to all individuals or organizations responsible for the maintenance of the home.

A minimum one-hour walkthrough of the home with the occupants has been conducted.

## EA Credit Annual Energy Use

Up to 29 points

Preliminary Y

M

Verified

Exemplary Performance: For Option 1, 100% reduction; For Option 2, -10 HERS index rating.

Projects may choose to pursue either Option 1 or Option 2 based on the option that produces the most points.

Y

M

V

#### Option 1. LEED Energy Budget (1-29 points)

LEED Energy Budget (MMBtu/year)

Annual energy consumption (MMBtu/year)

Percent reduction below LEED Energy Budget (%)

Total Points

Other major energy users not included in the energy rating (if any):

Heated driveway

Private pool

Spa

Heated garage

Other (describe in detail)

OR  
**Option 2. HERS Index with Home Size Adjuster (0.5-29 points)**      Y       M       V

63	HERS index rating
2.00	Number of bedrooms
1100.00	Conditioned floor area of the house (sq ft)
1,600	ENERGY STAR for Homes, version 3, reference home floor area (sq ft)
7	HSA points
12	Points for achieving HERS index rating
19	<b>Total (HSA points + Points for achieving HERS index rating)</b>

**EA Credit Efficient Hot Water Distribution System**

Up to 5 points      Preliminary Y       M       Verified

**Option 1. Efficient Hot Water Distribution (2 points)**      Y       M       V

*Note: Projects using heat traces that serve a single unit or house are awarded only half credit.*

*For projects using circulating systems (required for both Path 1 AND Path 2 below)*

- Circulating pump does not operate continuously, is on a timer, or is on a water temperature sensor.
- Circulating pump is demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.
- After the pump starts, the controls allow the pump to operate until the water temperature in the return pipe rises not more than 10°F (6 °C) above the initial temperature of the water in the pipe. Controls limit the water temperature to a maximum of 105°F (40 °C). Controls limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.
- Circulating hot water systems have with an automatic or readily accessible manual switch to turn off the hot water circulating pump when not in use.

*For projects using heat-traced piping systems*

- Piping is insulated.

**Path 1. Maximum Allowable Pipe Length (2 points)**      Y       M       V

<input type="text"/>	Pipe or tube length installed (ft)
<input type="text"/>	Nominal pipe size (in)
<input type="text"/>	Maximum pipe or tube length allowed for water heaters, boilers with no circulation loop or heat traced pipe or in multifamily buildings a central circulation loop or heat traced pipe (ft)
<input type="text"/>	Maximum pipe or tube length allowed for circulation loop or heat traced pipe serving a single unit or house (ft)

OR  
**Path 2. Maximum Allowable Pipe Volume (2 points)**      Y       M       V

<input type="text"/>	Volume of hot or tempered water from source to termination (oz)
----------------------	---

OR  
**Option 2. Performance Test (3 points)** Y  M  V

Note: Projects using heat traces that serve a single unit or house are awarded only half credit.

For projects using circulating systems (required for both Case 1 AND Case 2 below)

- Circulating pump does not operate continuously, is on a timer, or is on a water temperature sensor.
- Circulating pump is demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.
- After the pump starts, the controls allow the pump to operate until the water temperature in the return pipe rises not more than 10°F (6 °C) above the initial temperature of the water in the pipe. Controls limit the water temperature to a maximum of 105°F (40 °C). Controls limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.
- Circulating hot water systems have with an automatic or readily accessible manual switch to turn off the hot water circulating pump when not in use.

For projects using heat-traced piping systems

- Piping is insulated.

**Case 1. Hot water source is a water heater or boiler with no circulation loop or heat traced pipe; or in multifamily buildings a central circulation loop or heat traced pipe.** Y  M  V

- Meets WaterSense Labeled New Homes requirements

OR

- Tested volume of water stored in piping (gal)

**Case 2. Hot water source is a circulation loop or heat traced pipe serving a single unit or house** Y  M  V

- Tested volume of water stored in piping (gal)

AND/OR  
**Option 3. Pipe Insulation (2 points)** Y  M  V

- Insulation R-value

**EA Credit Advanced Utility Tracking**

Up to 2 points Preliminary Y  M  Verified   
 Exemplary Performance: Meter separate energy usage information for at least four end uses.

**Case 1. Single Family** Y  M  V

**Option 1. Electric and Water (1 point)** Y  M  V

- Select one of the following:
- A permanent energy-monitoring system that records at intervals of one hour or less has been installed.
  - The house has an automatic in-ground irrigation system and landscaped irrigated area larger than 1,000 sq ft (93 sq m) and has installed a submeter to monitor all irrigation system components.

AND/OR  
**Option 2. Third-Party Utility Reporting (1 point)** Y  M  V

- The homeowner has shared all applicable utility data with USGBC via a USGBC-approved third-party.

**Case 2. Multifamily** Y  M  V

**Option 1. Electric and Water (1 point)** Y  M  V

- Select one of the following:
- A permanent energy-monitoring system that records at intervals of one hour or less has been installed in each unit.
  - The project has an automatic in-ground irrigation system and landscaped irrigated area larger than 1,000 sq ft (93 sq m) and has installed a submeter to monitor all irrigation system components.

AND/OR

**Option 2. Third-Party Utility Reporting (1 point)**

Y  M  V

**Path 1. Whole-Building Master Meter**

Y  M  V

(Select one) The building owner has shared all applicable utility data with USGBC via a USGBC-approved third-party.

OR

**Path 2. Individual Unit Meters**

Y  M  V

(Select one) At least 50% of unit owners or occupants have shared all applicable utility data with USGBC via a USGBC-approved third-party.

**EA Credit Active Solar-Ready Design**

1 point

**Preliminary** Y  M  **Verified**

*Exemplary Performance: Achieve Option 1 and Option 2.*

**Option 1. Photovoltaic-Ready Design (1 point)**

Y  M  V

*Note: Projects that install a photovoltaic (PV) system that meets the requirements of EA Credit Renewable Energy are not eligible for this credit.*

(Select one) The house meets EPA's solar photovoltaic specifications for a renewable energy-ready home.

AND/OR

**Option 2. Solar Direct Hot Water-Ready Design (1 point)**

Y  M  V

*Note: Projects that install a solar direct hot water (DHW) system that meets the requirements of EA Credit Efficient Domestic Hot Water Equipment are not eligible for this credit.*

(Select one) Meets EPA's solar water heating specifications for a renewable energy-ready home.

**EA Credit HVAC Start-Up Credentialing**

1 point

**Preliminary** Y  M  **Verified**

Name of technician

Company of technician

Technician commissioning all heating, cooling, and ventilation systems has the following credential

The south-facing glazing area is at least 50% greater than the sum of the glazing area on the east- and west-facing walls.

# Materials and Resources

Preliminary Y 4

Maybe 3

Verified 0

## MR Prerequisite Certified Tropical Wood

Required

Verified

True All wood in the building is nontropical, reused or reclaimed, or certified by the Forest Stewardship Council, or USGBC-approved equivalent.

## MR Prerequisite Durability Management

Required

Verified

True ENERGY STAR for Homes, version 3, water management system checklist is collected from builder.

Confirm all of the following have been implemented on the project:

True Nonpaper-faced backer board, or a product or coating over wallboard that meets standard ASTM D 3273 standard, was installed on the area above bathtub, spa or shower, and in areas behind fiberglass enclosures where wallboard is installed.

True Water-resistant flooring was installed in the kitchen, bathroom(s), laundry room, spa area(s). No carpet was installed in these areas.

True Water-resistant flooring was installed in entryways within 3 feet of exterior door(s).

True A drain and drain pan, drain pan and automatic water shut-off or flow restrictors, or floor drain with floor sloped to drain was installed for all tank water heaters in or over living space.

True A braided washer hose, drain and drain pan, drain pan and automatic water shut-off or flow restrictors, or floor drain with floor sloped to drain was installed for clothes washer in or over living space.

True Conventional clothes dryers exhaust directly to outdoors.

## MR Credit Durability Management Verification

1 point

Preliminary Y  1 M  Verified

True Each measure in the ENERGY STAR for Homes, version 3, water management system builder checklist was verified by the verification team.

## MR Credit Environmentally Preferable Products

Up to 4 points

Preliminary Y  1.5 M  1 Verified  0

Exemplary Performance: For Option 2, achieve a minimum of 4 points to earn another 2 points for purchasing products that meet the requirements.

### Option 1. Local Production

Preliminary Y  0.5 M  Verified

Select which the following were extracted, processed, and manufactured within 100 miles (160 km) of the project site:

100.00 Percentage of locally produced framing (%) (0.5 point)

Percentage of locally produced aggregate for concrete and foundation (%) (0.5 point)

Percentage of locally produced drywall and interior sheathing (%) (0.5 point)

AND/OR

**Option 2. Environmentally Preferable Products**

Preliminary Y  M  Verified

Select the criteria met by at least 90% of the component:

No Floor Covering (2 points)	
Floor Covering (1 point)	
Insulation (1 point)	Maybe
Sheathing (1 point)	
Framing (1 point)	
Drywall (1 point)	For synthetic, 95% recycled content (pre-, post-, or combination)
Concrete (1 point)	
Roofing (1 point)	
Siding (1 point)	

Select criteria met for at least 3 of the following additional components by at least 90% of the component (1 point):

Doors	
Cabinets	
Counters	
Interior Trim	
Decking/Patio	
Windows	

**MR Credit Construction Waste Management**

Up to 3 points

*Exemplary Performance: For renovation projects, track and divert at least 50% of demolition waste.*

Preliminary Y  M  Verified

<input type="text"/>	LEED Reference Home Baseline Waste (lbs)
<input type="text"/>	Total Construction Waste (including recycled waste) (lbs)
<input type="text"/>	Recycled Waste (lbs)
0.00	Project Construction Waste (lbs)
<input type="text"/>	Percent reduction below baseline (%)

**MR Credit Material-Efficient Framing**

Up to 2 points

*Exemplary Performance: Achieve a minimum of 2 points to earn up to 1/2 point for each additional requirement met.*

Preliminary Y  M  Verified

Select one of the following for at least 90% of each component: (1 point)

- No more than one horizontal 2x top plate on walls by aligning studs with joists and roof rafters was installed.
- Window and door headers were placed in the rim joist.
- Raised (directly beneath the top plate), single-ply headers not more than 2 inches nominal thickness in a 2x4 wall or 4 inches nominal thickness in a 2x6 wall, were installed.
- Structural insulated panels (SIPs) were installed for walls.

Select at least 2 of the following for at least 90% of each component: (0.5 point)

- Headers were sized for actual loads.
- Ladder blocking or drywall clips were used.
- Two-stud corners or California corners were used.

Select all that apply for at least 90% of each component: (0.5 point each)

- Interior wall studs were spaced greater than 16 inches (400 mm) o.c.
- Floor joists were spaced greater than 16 inches (400 mm) o.c.
- Roof rafters were spaced greater than 16 inches (400 mm) o.c.

# Indoor Environmental Quality

Preliminary Y 9

Maybe 0.5

Verified 0

## EQ Prerequisite Ventilation

Required

Verified

OR

### Case 2. Multifamily

V

#### Local Exhaust

Confirm all of the following have been implemented on the project:

True Local exhaust systems meeting the requirements of ASHRAE Standard 62.2–2010, Sections 5 and 7 or local equivalent, whichever is more stringent, were installed in all bathrooms (including half-baths) and the kitchen.

True Local exhaust systems exhaust air directly to the outdoors.

True All bathroom exhaust fans are ENERGY STAR-labeled or an HRV or ERV is used.

True For exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (188 liters per second), makeup air is provided at a rate approximately equal to the exhaust air rate. Makeup air systems have a means of closure and can be automatically controlled to start and operate simultaneously with the exhaust system.

#### Whole Unit Mechanical Ventilation

True The project meets ASHRAE Standard 62.2-2010 Sections 4 and 7 or local equivalent, whichever is more stringent.

#### Non-Unit Spaces

True The project meets the minimum requirements of ASHRAE Standard 62.1-2010 Sections 4 -7 or local equivalent, whichever is more stringent.

The project is located in a nonattainment area for PM2.5. The project has installed MERV 11 or higher filters.

The project is located in a nonattainment area for ozone.

## EQ Prerequisite Combustion Venting

Required

Verified

The project has earned the EPA Indoor airPLUS label

OR

True No unvented combustion appliances were installed (ovens and ranges excluded).

True A carbon monoxide (CO) monitor is installed on each floor, hard-wired with a battery backup.

*For projects with fireplaces or woodstoves installed*

N/A Provide doors that close or a solid glass enclosure.

N/A Closed-combustion, power-vented or passes BPI or RESNET combustion safety protocols

*For projects where space and water heating equipment involving combustion are installed*

Select one of the following:

N/A Equipment is installed with closed combustion (i.e. sealed supply air and exhaust ducting)

N/A Equipment is installed with power-vented exhaust

N/A Equipment is located in a detached utility building or open-air facility

**EQ Prerequisite Garage Pollutant Protection**

**Required**

Verified

The project has earned the EPA Indoor airPLUS label  
OR

True All air-handling equipment and ductwork is placed outside the fire-rated envelope of the garage.  
 True Shared surfaces between the garage and conditioned spaces are tightly sealed.

**Conditioned Spaces Above Garage**

N/A All penetrations and all connecting floor and ceiling joist bays are sealed.

**Conditioned Spaces Next to Garage**

N/A All doors are weather-stripped.

N/A Carbon monoxide detectors are installed in rooms that share a door with the garage.

N/A All penetrations and all cracks at the base of the walls are sealed.

**EQ Prerequisite Radon-Resistant Construction**

**Required**

Verified

*Exemplary Performance: For projects in radon zones 2 and 3, install a qualifying passive radon ventilation system.*

**EPA Indoor airPLUS label**

V

The project has earned the EPA Indoor airPLUS label

OR

**Case 1. New Construction**

V

1 EPA radon zone

*For projects in EPA radon zone 1*

True There is a capillary break per the Indoor airPLUS specifications.  
 True An electrical outlet has been provided near vent piping in the attic to facilitate future fan installation.  
 True A gas-tight vertical vent pipe extending up through the conditioned spaces and terminating above the roof opening has been installed.

OR

The house is elevated by at least 2 feet (600 millimeters) with open air space between building and ground or there is a garage under the building.

OR

**Case 2. Renovation of Existing Building**

V

EPA radon zone

*For renovation projects in EPA radon zone 1 with no slab work being performed*

Radon test results (pCi/L)  
 If results are greater than 4 pCi/L, an active ventilation system has been installed.

**EQ Prerequisite Air Filtering**

**Required**

Verified

- The project has earned the EPA Indoor airPLUS label
- OR
- MERV rating of filters on recirculating space conditioning systems
- MERV rating of filters on mechanically supplied outdoor air systems with 10 ft (3 m) or more of ductwork

**EQ Prerequisite Environmental Tobacco Smoke**

**Required**

Verified

- For multifamily projects*
- Smoking is prohibited in all common areas of the building.
  - Smoking is prohibited outside the project building(s) except in designated smoking areas located at least 25 ft (7.5 m) from all entries, outdoor air intakes, and operable windows.
  - Signage communicating the smoking policy has been installed.

**EQ Prerequisite Compartmentalization**

**Required**

Verified

- For multifamily and attached single-family projects*
- Each residential unit has sealed penetrations through walls, ceilings, and floors and vertical chases adjacent to units.
  - All doors in the residential units leading to common hallways have weather-stripping.
  - All exterior doors and operable windows have weather-stripping.
  - Blower door test results (cfm50)
  - Envelope enclosure area (sq ft)
  - Leakage per area of enclosure (cfm50/sq ft)

**EQ Credit Enhanced Ventilation**

Up to 3 points

Preliminary Y  M  Verified

**Option 1. Enhanced Local Exhaust (1 point)**

Y  M  V

Bathroom exhaust fan control type in every bathroom with a shower, bathtub, or spa

AND/OR

**Option 2. Enhanced Whole-House Ventilation (2 points)**

Y  M  V

A balanced whole-house ventilation system was designed and installed that meets ASHRAE 62.2-2010 sections 4 and 7 in each home or unit.

The system does not exceed ASHRAE 62.2-2010 requirements by more than 10%.

**EQ Credit Contaminant Control**

Up to 2 points

Preliminary Y  M  Verified

Exemplary Performance: Achieve a minimum of 2 1/2 points to earn another 1/2 point.

**Option 1. Walk-off Mats (0.5 point)**

Y  M  V

For all primary entryways, a permanent walk-off mat that is at least 4 feet (1.2 meters) long and allows access for cleaning has been installed.

For multifamily projects

For exterior entryways in common areas, permanent systems that are at least 10 feet (3 meters) long have been installed.

AND/OR

**Option 2. Shoe Removal and Storage (0.5 point)**

Y  M  V

A shoe removal and storage space is near the primary entryway.

No conventional carpet is installed in shoe removal and storage area.

AND/OR

**Option 3. Preoccupancy Flush (0.5 point)**

Y  M  V

The project has earned the EPA Indoor airPLUS label  
OR

At installation, all permanent ducts and vents were sealed to minimize contamination from construction.

After construction ends and before occupancy

Any dust and debris was removed from ducts.

The home was flushed out for 48 hours, with all windows open, a fan run continuously or all HVAC fans and exhaust fans.

AND/OR

**Option 4. Air Testing (1 point)**

Y  M  V

The building was tested for indoor air contaminants and maximum concentrations were not exceeded.

**EQ Credit Balancing of Heating and Cooling Distribution Systems**

Up to 3 points

Preliminary Y  M  Verified

**Case 1. Forced-Air Systems**

Y  M  V

**Option 1. Multiple Zones (1 point)**

Y  M  V

A system with at least two space-conditioning zones with independent thermostatic controls has been installed.  
OR

The project is a single family home less than 800 sq ft (74 sq m) or a multifamily building whose average unit size is less than 1,200 sq ft (110 sq m).

AND/OR

**Option 2. Supply Air-Flow Testing (1 point)**

Y  M  V

The supply air-flow rates are within +/- 20% (or +/- 25 cfm or 11 lps) of calculated values from ACCA Manual J.

AND/OR

**Option 3. Pressure Balancing (1 point)**

Y  M  V

The pressure differential between bedroom and rest of the house is less than 3 Pa.

OR

**Case 2. Radiative Systems**

Y  M  V

**Option 1. Multiple Zones (1 point)**

Y  M  V

A system with at least two zones with independent thermostatic controls has been installed  
Each zone has a separate loop and pump controlled automatically by a thermostat control.

OR

The project is a single family home less than 800 sq ft (74 sq m) or a multifamily building whose average unit size is less than 1,200 sq ft (110 sq m).

AND/OR

**Option 2. Room-by-Room Controls (2 points)**

Y  M  V

Room-by-room thermostatic controls are installed.

**EQ Credit Enhanced Compartmentalization**

1 point

**Preliminary** Y  M  **Verified**

Leakage per area of enclosure (cfm50/sq ft)

**EQ Credit Enhanced Combustion Venting**

Up to 2 points

**Preliminary** Y  M  **Verified**

**Option 1. No Fireplace or Woodstove (2 points)**

Y  M  V

No fireplaces or woodstoves have been installed.

OR

**Option 2. Enhanced Combustion Venting Measures (1 point)**

Y  M  V

The project has earned the EPA Indoor airPLUS label

OR

EPA qualified wood- or pellet-burning fireplaces with either power or direct venting have been installed.  
 A natural gas, propane, or alcohol stove approved by a safety testing facility and has power or direct venting has been installed.  
 A natural gas, propane, or alcohol stove has a permanently fixed glass front or gasketed door and an electronic pilot.

**EQ Credit Enhanced Garage Pollutant Protection**

Up to 2 points

**Preliminary** Y  M  **Verified**

**Case 1. Single Family**

Y  M  V

**Option 1. Exhaust Fan in Garage (1 point)**

Y  M  V

The project has earned the EPA Indoor airPLUS label  
OR

Meet all of the following:

An exhaust fan is installed in the garage and is rated at least 75 cfm (35 lps).

The exhaust fan meets Energy Star cfm/w performance requirements.

The exhaust fan vents directly to the outdoors.

The exhaust fan has an automatic timer control linked to an occupant sensor, a light switch, a garage door opening-closing mechanism, or a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm, or equivalent.

The exhaust fan has an automatic timer set to provide at least three air changes each time the fan is turned on.

OR

**Option 2. No Garage, or Detached Garage, or Carport (2 points)**

Y  M  V

Select one of the following:

No garage has been constructed.

A detached garage has been constructed.

A carport has been constructed.

OR

**Case 2. Multifamily**

Y  M  V

**Option 1. Exhaust Fan in Multicar Garage (1 point)**

Y  M  V

Meet all of the following:

All of the requirements in ASHRAE 62.1-2010 for garage ventilation have been met.

The garage has sufficient exhaust to create negative pressure with respect to adjacent spaces with the doors to the garage closed.

Self-closing doors have been installed. Deck-to-deck partitions or a hard lid ceiling have been installed.

The exhaust fan either runs continuously or is on a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm.

OR

**Option 2. Exhaust Fan in Small Garage (1 point)**

Y  M  V

Meet all of the following:

An exhaust fan that meets ENERGY STAR minimum efficacy levels (cfm/W) has been installed.

Installed direct-exhaust fans are 100 cfm (47 lps) or greater.

Installed ducted exhaust fans are 130 cfm (61 lps) or greater.

The exhaust fan either runs continuously or has an automatic timer control linked to an occupant sensor, a light switch, a garage door opening-closing mechanism, or a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm, or equivalent.

The exhaust fan has an automatic timer set to provide at least three air changes each time the fan is turned on.

OR

**Option 3. No Garage, or Detached Garage (2 points)**

Y  M  V

No garage has been constructed.

A detached garage has been constructed.

**EQ Credit Low-Emitting Products**

Up to 3 points

Preliminary Y  1  M  0.5  Verified

Select all that apply. At least 90% of a component must meet the requirement:

- True Site-applied interior paints and coatings have been tested and meet the requirements of CA Section 01350. (0.5 point)
- True Flooring has been tested and meets the requirements of CA Section 01350. (0.5 point)
- Maybe Insulation has been tested and meets the requirements of CA Section 01350. (0.5 point)
- Site-applied adhesives and sealants have been tested and meet the requirements of CA Section 01350. (0.5 point)
- Composite wood products have been tested and meet the California Air Resources Board requirements for ultra-low-emitting formaldehyde (ULEF) resins or no-added formaldehyde based resins. (1 point)

# Innovation

Preliminary Y 3

Maybe 1.5

Verified 0

## IN Prerequisite Preliminary Rating

Required

Verified

True Preliminary rating and meeting are complete.

## IN Credit Innovation

To achieve all five innovation points, a project team must achieve at least one pilot credit, at least one innovation credit and no more than two exemplary performance  
Up to 5 points

Preliminary Y  M  Verified

### Option 1. Innovation (1 point)

Y  M  V

Describe the intent of the proposed innovation credit.

AND/OR

### Option 2. Pilot (1 point)

Y  M  V

Pilot credit name

AND/OR

### Option 3. Additional Strategies (0.5-3 points)

Y  M  V

Exemplary Performance: 1-2 points

Strategy   
Credit name

## IN Credit LEED Accredited Professional

1 point

Preliminary Y  M  Verified

Name of credential holder

# Regional Priority

Preliminary Y 3      Maybe 1      Verified 0

## RP Credit Regional Priority

Up to 4 points

Preliminary Y       M       Verified

Regional priority credits may be found on [www.usgbc.org/rpc](http://www.usgbc.org/rpc).

Regional Priority Credit Name	Required Threshold
EA HVAC Start-up Credentialing	1 -MAYBE
LT Site Selection	4
SS Heat Island Reduction	2
EA Building Orientation for Passive Solar	1
EA Annual Energy Use	13 - YES
MR Durability Managaement Verification	1 - YES
SS Rainwater Management	2
Total Water Use (threshold: 5) OR Indoor Water Use (threshold: 3)	3 - YES

4. Third-party Testing is to be scheduled and conducted in conjunction with the final inspection. The contractor shall notify the Green Rater at least four (4) weeks prior to the anticipated date for such inspection. Contractor shall provide access to each unit and cooperate with conducting of the test. The following tests shall be conducted by Green Rater:
  - a. Air Infiltration Test (Blower door Test) – Mandatory – Measures air leakage through unit enclosure.

**H. EQ Credit 1.1 (option 1) – Enhanced Ventilation - Enhanced Local Exhaust**

1. Use one of the following strategies in every bathroom with a shower, bathtub, or spa (i.e., half-baths are exempt) to control the use of the local exhaust fan:
  - a. an occupancy sensor;
  - b. an automatic humidistat controller;
  - c. a continuously operating exhaust fan; or
  - d. a delay timer that operates the fan for at least 20 minutes

**I. EQ Credit 2.3 (option 3) – Contaminant Control - Preoccupancy Flush**

1. At installation, seal all permanent ducts and vents to minimize contamination from construction. Remove seals after all phases of construction are completed. After construction ends and before occupancy, flush the home with fresh air, according to the following guidelines:
  - a. Remove any dust and debris from ducts.
  - b. Flush the entire home for 48 hours, keeping all windows and interior doors open; the 48 hours may be nonconsecutive if necessary.
  - c. 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.

**J. EQ Credit 3.1 (option 1) – Balancing of H&C Distribution Systems - Multiple Zones**

1. Single-family houses with less than 800 square feet (74 square meters) of conditioned floor area and multifamily buildings whose average unit size is less than 1,200 square feet (110 square meters) automatically meet the requirements of this credit.

**K. EQ Credit 3.3 (option 3) – Balancing of H&C Distribution Systems - Pressure Balancing**

1. Facilitate for Green Rater or a Third-Party to test each bedroom for pressure difference of more than 3 Pa (0.012-inch w.c.) with respect to the main body of the house when doors are closed, and the air handler is operating on highest speed.

**L. EQ Credit 7 – Low Emitting Products**

1. In the interior of the home, use products that have been tested and found compliant with the California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B, New Single-Family Residence Scenario, for emissions testing guidance. At least 90% of a component must meet the requirements to earn credit.
  - a. For site-applied interior paints and coatings, meet the requirements of CA Section 01350.
  - b. For flooring, meet the requirements of CA Section 01350.

<b>TABLE 1. Acceptable certifications for emissions and content requirements</b>		
<b>CERTIFICATION</b>	<b>TESTING STANDARD REFERENCED IN LEED</b>	<b>APPLICABLE CATEGORIES</b>
SCS Indoor Advantage Gold	CDPH Standard Method v1.1 ANSI/BIFMA M7.1-2011	General Emissions Evaluation (many product categories), Furniture
FloorScore	CDPH Standard Method v1.1	Flooring
Carpet and Rug Institute (CRI) Green Label Plus	CDPH Standard Method v1.1	Carpeting, carpet padding, adhesives
Greenguard Children and Schools	CDPH Standard Method v1.1	General Emissions Evaluation (many product categories including exterior applied products)
Collaborative for High Performance Schools (CHPS)	CDPH Standard Method v1.1	General Emissions Evaluation (many product categories)
CARB ULEF label	N/A	Composite Wood

**ENCLOSURES**

- 1 LEED for Homes Scorecard and Credit Categories
- 2 Energy Star National Rater Design Review Checklist
- 3 Energy Star National Rater Field Checklist
- 4 Energy Star National HVAC Design Report
- 5 Energy Star National HVAC Commissioning Checklist
- 6 Energy Star Water Management System Builder Checklist

**END OF SECTION**



# National Rater Design Review Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

**If pursuing Path A - HVAC Grading, complete this page. <sup>1</sup>**

Home Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Permit Date: \_\_\_\_\_

1. Partnership Status	Must Correct	Rater <sup>2</sup> Verified
1.1 Rater has verified and documented that <b>builder has an ENERGY STAR partnership agreement</b> using <a href="http://energystar.gov/partnerlocator">energystar.gov/partnerlocator</a> . <sup>3</sup>	<input type="checkbox"/>	<input type="checkbox"/>
2. High-Performance Fenestration		
2.1 Specified fenestration meets or exceeds 2009 IECC requirements. <sup>4</sup>	<input type="checkbox"/>	<input type="checkbox"/>
3. High-Performance Insulation		
3.1 Specified ceiling, wall, floor, and slab insulation levels comply with one of the following options:		
3.1.1 Meets or exceeds 2009 IECC levels <sup>5, 6, 7</sup> <b>OR</b> ;	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2 Achieves $\leq 133\%$ of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3, per guidance in Footnote 5d, AND specified home infiltration does not exceed the following: <sup>6, 7</sup> 3 ACH50 in CZs 1, 2      2.5 ACH50 in CZs 3, 4      2 ACH50 in CZs 5, 6, 7      1.5 ACH50 in CZ 8	<input type="checkbox"/>	<input type="checkbox"/>
4a. Review of ANSI / RESNET / ACCA Std. 310 HVAC Design Report with ENERGY STAR Supplement		
4a.1 HVAC design report compliant with ANSI / RESNET / ACCA Std. 310, with the ENERGY STAR supplement, collected for records, with <b>no items left blank</b> .	<input type="checkbox"/>	<input type="checkbox"/>
4a.2 ANSI / RESNET / ACCA Std. 310 Rater Design Review Checklist completed for applicable housing type, with all items marked, "Rater Verified".	<input type="checkbox"/>	<input type="checkbox"/>
4a.3 Cooling <b>sizing % is within the cooling sizing limit</b> selected by the HVAC designer.	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____ Date of Review: _____		
Rater Signature: _____ Rater Company Name: _____		



# National Rater Design Review Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

If pursuing Path B - HVAC Credential, complete this page.

Home Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Permit Date: \_\_\_\_\_

1. Partnership Status	Must Correct	Rater <sup>2</sup> Verified
1.1 Rater has verified and documented that <b>builder has an ENERGY STAR partnership agreement</b> using <a href="http://energystar.gov/partnerlocator">energystar.gov/partnerlocator</a> . <sup>3</sup>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Rater has verified and documented <sup>8</sup> that <b>HVAC contractor holds credential required to</b> complete National HVAC Commissioning Checklist, unless all equipment to be installed in home to be certified is an exempted type, in which case check "N/A". <sup>9</sup> <input type="checkbox"/> N/A HVAC Contractor Company Name: _____	<input type="checkbox"/>	<input type="checkbox"/>
2. High-Performance Fenestration		
2.1 Specified fenestration meets or exceeds 2009 IECC requirements. <sup>4</sup>	<input type="checkbox"/>	<input type="checkbox"/>
3. High-Performance Insulation		
3.1 Specified ceiling, wall, floor, and slab insulation levels comply with one of the following options:		
3.1.1 Meets or exceeds 2009 IECC levels <sup>5,6,7</sup> <b>OR</b> ;	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2 Achieves $\leq 133\%$ of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3, per guidance in Footnote 5d, AND specified home infiltration does not exceed the following: <sup>6,7</sup> 3 ACH50 in CZs 1, 2      2.5 ACH50 in CZs 3, 4      2 ACH50 in CZs 5, 6, 7      1.5 ACH50 in CZ 8	<input type="checkbox"/>	<input type="checkbox"/>
4b. Review of ENERGY STAR National HVAC Design Report <sup>10</sup>		
4b.1 National HVAC Design Report collected for records, with <b>no items left blank</b> .	<input type="checkbox"/>	<input type="checkbox"/>
4b.2 National HVAC Design Report reviewed by Rater for the following parameters (National HVAC Design Report Item # in parenthesis):		
4b.2.1 Cooling season and heating season outdoor design temperatures used in loads (3.3) are within the limits defined for the State and County, or US Territory, where the home will be built, or the designer has provided an allowance from EPA to use alternative values. All limits are published at <a href="http://energystar.gov/hvacdesigntemps">energystar.gov/hvacdesigntemps</a> . Note that revised (i.e., 2019 Edition) limits are required to be used for all HVAC Design Reports generated after 10/01/2020. <sup>11</sup>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.2 Number of occupants used in loads (3.4) is within $\pm 2$ of the home to be certified. <sup>12</sup>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.3 Conditioned floor area used in loads (3.5) is between 100 sq. ft. smaller and 300 sq. ft. larger than the home to be certified. <sup>13</sup>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.4 Window area used in loads (3.6) is between 15 sq. ft. smaller and 60 sq. ft. larger than the home to be certified, or, for homes to be certified with > 500 sq. ft. of window area, between 3% smaller and 12% larger. <sup>14</sup>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.5 Predominant window SHGC used in loads (3.7) is within 0.1 of predominant value in the home to be certified. <sup>15</sup>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.6 Sensible, latent, & total heat gain are documented (3.10 - 3.12) for the orientation of the home to be certified. <sup>16</sup>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.7 The variation in total heat gain across orientations (3.13) is $\leq 6$ kBtuh. <sup>16</sup>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.8 <b>Cooling sizing % (4.13) is within the cooling sizing limit</b> (4.15) selected by the HVAC designer.	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____ Date of Review: _____		
Rater Signature: _____ Rater Company Name: _____		



# National Rater Design Review Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

### Footnotes

1. Path A – HVAC Grading shall not be used until an Effective Date has been defined by RESNET for ANSI / RESNET / ACCA Std. 310. Path A – HVAC Grading shall then use ANSI / RESNET / ACCA Std. 310 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the Effective Date and Transition Period End Date defined by RESNET. RESNET interpretations of Standard 310 shall also be followed.
2. The term ‘Rater’ refers to the person(s) completing the third-party verification required for certification. The person(s) shall: a) be a Certified Rater, Approved Inspector, or an equivalent designation as determined by a Verification Oversight Organization such as RESNET; and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
3. Raters are only required to document the partnership status of a builder once, for the first home that the Rater certifies for them.
4. All windows, doors and skylights shall meet or exceed the component U-factor and SHGC requirements specified in 2009 IECC Table 402.1.1. If no NFRC rating is noted on the window or in product literature (e.g., for site-built fenestration), select the U-factor and SHGC value from Tables 4 and 10, respectively, in 2013 ASHRAE Fundamentals, Chapter 15. Select the highest U-factor and SHGC value among the values listed for the known window characteristics (e.g., frame type, number of panes, glass color, and presence of low-e coating). Note that the U-factor requirement applies to all fenestration while the SHGC only applies to the glazed portion. The following exceptions apply:
  - a. An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements;
  - b. An area-weighted average of fenestration products  $\geq 50\%$  glazed shall be permitted to satisfy the SHGC requirements;
  - c. 15 square feet of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using a) and b), above;
  - d. One side-hinged opaque door assembly up to 24 square feet in area shall be exempt from the U-factor requirements and shall be excluded from area-weighted averages calculated using a) and b), above;
  - e. Fenestration utilized as part of a passive solar design shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using a) and b), above. Exempt windows shall be facing within 45 degrees of true South and directly coupled to thermal storage mass that has a heat capacity  $> 20$  btu / ft<sup>2</sup>x°F and provided in a ratio of at least 3 sq. ft. per sq. ft. of South facing fenestration. Generally, thermal mass materials will be at least 2 in. thick.

In PHIUS+ or PHI certified homes, where triple-glazed window assemblies with thermal breaks / spacers between the panes are used, such windows meet the intent of Item 2.1 and shall be excluded when assessing compliance of a) through e), above.

5. Specified levels shall meet or exceed the component insulation levels in 2009 IECC Table 402.1.1. The following exceptions apply:
  - a. Steel-frame ceilings, walls, and floors shall meet the insulation levels of 2009 IECC Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24 in. on center. This exception shall not apply if the alternative calculations in d) are used;
  - b. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in d) are used;
  - c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof / ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 sq. ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;
  - d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows:

An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies.

A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The performance of all components (i.e., ceilings, walls, floors, slabs, and fenestration) can be traded off using the UA approach. Note that Items 3.1 through 3.3 of the National Rater Field Checklist shall be met regardless of the UA tradeoffs calculated. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use the ASHRAE zone method or a method providing equivalent results, and not a series-parallel path calculation method.
6. Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall. Alternatively, the thermal break is permitted to be created using  $\geq R-3$  rigid insulation on top of an existing slab (e.g., in a home undergoing a gut rehabilitation). In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates). Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).
7. Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the house, slab insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab. Where specific details cannot meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the home’s certification. EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program. A list of currently exempted details is available at: [energystar.gov/slabeledge](http://energystar.gov/slabeledge).
8. Raters’ documentation of the HVAC contractor credential must be updated at least once every 12 months.
9. HVAC contractors must be credentialed by an EPA-recognized HVAC Quality Installation Training and Oversight Organization (H-QUITO) if a split air conditioner, unitary air conditioner, air-source heat pump, or water-source (i.e., geothermal) heat pump up to 65 kBtu/h with a forced-air distribution system (i.e., ducts) or a furnace up to 225 kBtu/h with a forced-air distribution system (i.e., ducts) will be installed in the home to be certified. For all other permutations of equipment (e.g., boilers, mini-split / multi-split systems) and distribution systems, a credential is not required. An explanation of this credentialing process and links to H-QUITOs, which maintain lists of credentialed contractors, can be found at [energystar.gov/newhomeshvac](http://energystar.gov/newhomeshvac).



# National Rater Design Review Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

10. The Rater shall collect one National HVAC Design Report per system design per plan. Regardless of whether the “site-specific design” or “group design” box has been checked in Item 1.6 of the National HVAC Design Report, the system design as documented on the National HVAC Design Report must fall within the tolerances in Item 4b.2 for the home to be certified. The report is only required to be collected once per system design, even if multiple homes are built using this design (e.g., in a production environment where the same plan is built multiple times, only one report is required as long as no aspect of the system design changes between homes). The Rater is only responsible for verifying that the designer has not left any items blank on the National HVAC Design Report and for verifying the discrete objective parameters in Item 4b.2 of this Checklist, not for verifying the accuracy of every input on the National HVAC Design Report.
11. Visit [energystar.gov/hvacdesigntemps](http://energystar.gov/hvacdesigntemps) for the maximum cooling season design temperature and minimum heating season design temperature permitted for ENERGY STAR certified homes and the process for a designer to obtain an allowance from EPA. The same design report is permitted to be used in other counties, as long as the design temperature limits in those other counties meet or exceed the cooling and heating season temperature limits for the county selected. For example, if Fauquier County, VA, is used for the load calculations, with a 1% cooling temperature limit of 93 F, then the same report could be used in Fairfax County (which has a higher limit of 94 F) but not in Arlington County (which has a lower limit of 92 F).
12. To determine the number of occupants among all HVAC systems in the home, calculate the number of bedrooms, as defined below, and add one. The number of occupants used in loads must be within  $\pm 2$  of the home to be certified, unless Item 1.5 of the National HVAC Design Report indicates that the system is a cooling system for temporary occupant loads.

A bedroom is defined by ANSI / RESNET / ICC Standard 301-2014 as a room or space 70 sq. ft. or greater size, with egress window and closet, used or intended to be used for sleeping. A “den”, “library”, or “home office” with a closet, egress window, and 70 sq. ft. or greater size or other similar rooms shall count as a bedroom, but living rooms and foyers shall not.

An egress window, as defined in 2009 IRC section R310, shall refer to any operable window that provides for a means of escape and access for rescue in the event of an emergency. The egress window definition has been summarized for convenience. The egress window shall:

  - have a sill height of not more than 44 inches above the floor; AND
  - have a minimum net clear opening of 5.7 sq. ft.; AND
  - have a minimum net clear opening height of 24 in.; AND
  - have a minimum net clear opening width of 20 in.; AND
  - be operational from the inside of the room without the use of keys, tools or special knowledge.
13. Conditioned Floor Area for the home to be certified shall be calculated in accordance with the definition in ANSI / RESNET / ICC Standard 301-2019.
14. Window area for the home to be certified shall be calculated in accordance with the on-site inspection protocol provided in Normative Appendix B of ANSI / RESNET / ICC Standard 301-2019.
15. “Predominant” is defined as the SHGC value used in the greatest amount of window area in the home.
16. Orientation represents the direction that the front door of the house is facing. The designer is only required to document the loads for the orientation(s) that the house might be built in. For example, if a house plan will only be built one time in a specific orientation (e.g., a site-specific design), then the designer only needs to document the loads for this one orientation.



# National Rater Field Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

Home Address: _____	City: _____	State: _____	Permit Date: _____		
Thermal Enclosure System		Must Correct	Builder Verified <sup>1</sup>	Rater Verified <sup>2</sup>	N/A <sup>3</sup>
<b>1. High-Performance Fenestration &amp; Insulation</b>					
1.1 Fenestration meets or exceeds specification in Item 2.1 of the National Rater Design Review Checklist.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.2 Insulation meets or exceeds specification in Item 3.1 of the National Rater Design Review Checklist. <sup>4</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.3 All insulation achieves Grade I install. per ANSI / RESNET / ICC Std. 301. Alternatives in Footnote 5. <sup>5,6</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
<b>2. Fully-Aligned Air Barriers<sup>7</sup></b> - At each insulated location below, a complete air barrier is provided that is fully aligned as follows:					
<u>Ceilings:</u> At interior or exterior horizontal surface of ceiling insulation in Climate Zones 1-3; at interior horizontal surface of ceiling insulation in Climate Zones 4-8. Also, at exterior vertical surface of ceiling insulation in all climate zones (e.g., using a wind baffle that extends to the full height of the insulation in every bay or a tabbed baffle in each bay with a soffit vent that prevents wind washing in adjacent bays). <sup>8</sup>					
2.1 Dropped ceilings / soffits below unconditioned attics, and all other ceilings.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Walls:</u> At exterior vertical surface of wall insulation in all climate zones; also at interior vertical surface of wall insulation in Climate Zones 4-8. <sup>9</sup>					
2.2 Walls behind showers, tubs, staircases, and fireplaces.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Attic knee walls and skylight shaft walls. <sup>10</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4 Walls adjoining porch roofs or garages.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5 Double-walls and all other exterior walls.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
<u>Floors:</u> At exterior vertical surface of floor insulation in all climate zones and, if over unconditioned space, also at interior horizontal surface including supports to ensure alignment. Alternatives in Footnotes 12 & 13. <sup>11, 12, 13</sup>					
2.6 Floors above garages, floors above unconditioned basements or crawlspaces, and cantilevered floors.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7 All other floors adjoining unconditioned space (e.g., rim / band joists at exterior wall or at porch roof).		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. Reduced Thermal Bridging</b>					
3.1 For insulated ceilings with attic space above (i.e., non-cathedralized), Grade I insulation extends to the inside face of the exterior wall below and is $\geq R-21$ in CZ 1-5; $\geq R-30$ in CZ 6-8. <sup>14</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 For slabs on grade in CZ 4-8, 100% of slab edge insulated to $\geq R-5$ at the depth specified by the 2009 IECC and aligned with the thermal boundary of the walls. <sup>15, 16</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Insulation beneath attic platforms (e.g., HVAC platforms, walkways) $\geq R-21$ in CZ 1-5; $\geq R-30$ in CZ 6-8.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 At above-grade walls separating conditioned from unconditioned space, one of the following options used (rim / band joists exempted): <sup>17</sup>					
3.4.1 Continuous rigid insulation, insulated siding, or combination of the two is: $\geq R-3$ in CZ 1-4; $\geq R-5$ in CZ 5-8 <sup>18, 19, 20</sup> ; <b>OR</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.2 Structural Insulated Panels <b>OR</b> ; Insulated Concrete Forms <b>OR</b> ; Double-wall framing <b>OR</b> ; <sup>18, 21</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3 Advanced framing, including all of the Items below: <sup>22</sup>					
3.4.3a Corners insulated $\geq R-6$ to edge <sup>23</sup> ; <b>AND</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3b Headers above windows & doors insulated $\geq R-3$ for 2x4 framing or equivalent cavity width, and $\geq R-5$ for all other assemblies (e.g., with 2x6 framing) <sup>24</sup> ; <b>AND</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3c Framing limited at all windows & doors to one pair of king studs, plus one pair of jack studs per window opening to support the header and sill; <b>AND</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3d Interior / exterior wall intersections insulated to same R-value as rest of exterior wall; <sup>25</sup> <b>AND</b> ;		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3e Minimum stud spacing of 16 in. o.c. for 2x4 framing in all Climate Zones and, in CZ 6-8, 24 in. o.c. for 2x6 framing. <sup>26</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. Air Sealing</b> (Unless otherwise noted below, "sealed" indicates the use of caulk, foam, or equivalent material)					
4.1 Ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations to unconditioned space sealed, with blocking / flashing as needed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
4.2 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to $\geq R-10$ in CZ 4-8.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3 Above-grade sill plates adjacent to conditioned space sealed to foundation or sub-floor. Gasket also placed beneath above-grade sill plate if resting atop concrete / masonry & adjacent to cond. space. <sup>27,28</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4 Continuous top plate or blocking is at top of walls adjoining unconditioned space, and sealed.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5 Drywall sealed to top plate at all unconditioned attic / wall interfaces using caulk, foam, drywall adhesive (but not other construction adhesives), or equivalent material. Either apply sealant directly between drywall and top plate or to the seam between the two from the attic above.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6 Rough opening around windows & exterior doors sealed. <sup>29</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
4.7 Walls that separate attached garages from occupiable space sealed and, also, an air barrier installed and sealed at floor cavities aligned with these walls.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8 In multifamily buildings, the gap between the common wall (e.g. the drywall shaft wall) and the structural framing between units sealed at all exterior boundaries.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9 Doors adjacent to unconditioned space (e.g., attics, garages, basements) or ambient conditions made substantially air-tight with weatherstripping or equivalent gasket.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.10 Attic access panels, drop-down stairs, & whole-house fans equipped with durable $\geq R-10$ cover that is gasketed (i.e., not caulked). Fan covers either installed on house side or mechanically operated. <sup>30</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# National Rater Field Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

HVAC System <sup>31</sup> (National HVAC Design Report Item # in parenthesis)			Must Correct	Rater Verified <sup>2</sup>	N/A <sup>3</sup>
<b>5. Heating &amp; Cooling Equipment</b> - Complete Path A - HVAC Grading <sup>32</sup> or Path B - HVAC Credential					
Path A	5a.1 Blower fan volumetric airflow is Grade I or II per ANSI / RESNET / ACCA Std. 310.		<input type="checkbox"/>	<input type="checkbox"/>	-
	5a.2 Blower fan watt draw is Grade I or II per ANSI / RESNET / ACCA Std. 310.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5a.3 Refrigerant charge is Grade I per ANSI / RESNET / ACCA Std. 310. See Footnote 33 for exemptions. <sup>33</sup>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Path B	5b.1 HVAC manufacturer & model number on installed equipment matches either of the following (check box): <sup>34</sup> <input type="checkbox"/> National HVAC Design Report (4.3, 4.4, & 4.17) <input type="checkbox"/> Written approval received from designer		<input type="checkbox"/>	<input type="checkbox"/>	-
	5b.2 External static pressure measured by Rater at contractor-provided test locations and documented below: <sup>35</sup> Return-Side External Static Pressure: _____ IWC    Supply-Side External Static Pressure: _____ IWC		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5b.3 Permitted, but not required: National HVAC Commissioning Checklist collected, with no items left blank.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>6. Duct Quality Installation</b> (Applies to Heating, Cooling, Ventilation, Exhaust, & Pressure Balancing Ducts, unless <b>Required for LEED</b> )					
6.1 Ductwork installed without kinks, sharp bends, compressions, or excessive coiled flexible ductwork. <sup>36</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2 Bedrooms pressure-balanced (e.g., using transfer grilles, jump ducts, dedicated return ducts, undercut doors) to achieve a Rater-measured pressure differential $\geq -3$ Pa and $\leq +3$ Pa with respect to the main body of the house when all air handlers are operating. Test configuration and an alternative compliance option in Footnote 37. <sup>37</sup>			<input type="checkbox"/>	<input type="checkbox"/>	-
6.3 All supply and return ducts in unconditioned space, including connections to trunk ducts, are insulated to $\geq$ R-6 <sup>38</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4 Rater-measured total duct leakage meets one of the following two options. Alternative in Footnote 40: <sup>39, 40, 41</sup>					
6.4.1 Rough-in: The greater of $\leq 4$ CFM25 per 100 sq. ft. of CFA or $\leq 40$ CFM25, with air handler & all ducts, building cavities used as ducts, & duct boots installed. In addition, all duct boots sealed to finished surface, Rater-verified at final. <sup>42</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4.2 Final: The greater of $\leq 8$ CFM25 per 100 sq. ft. of CFA or $\leq 80$ CFM25, with the air handler & all ducts, bldg. cavities used as ducts, duct boots, & register grilles atop the finished surface (e.g., drywall, floor) installed. <sup>43</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5 Rater-measured duct leakage to outdoors the greater of $\leq 4$ CFM25 per 100 sq. ft. of CFA or $\leq 40$ CFM25. <sup>39, 44</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>7. Whole-House Mechanical Ventilation System</b>					
7.1 Rater-measured ventilation rate is within either $\pm 15$ CFM or $\pm 15\%$ of design value (2.3). <sup>45</sup>			<input type="checkbox"/>	<input type="checkbox"/>	-
7.2 A readily-accessible ventilation override control installed and also labeled if its function is not obvious (e.g., a label is required for a standalone wall switch, but not for a switch that's on the ventilation equipment). <sup>46</sup>			<input type="checkbox"/>	<input type="checkbox"/>	-
7.3 No outdoor air intakes connected to return side of the HVAC system, unless controls are installed to operate intermittently & automatically based on a timer and to restrict intake when not in use (e.g., motorized damper).			<input type="checkbox"/>	<input type="checkbox"/>	-
7.4 System fan rated $\leq 3$ sones if intermittent and $\leq 1$ sone if continuous, or exempted. <sup>47</sup>			<input type="checkbox"/>	<input type="checkbox"/>	-
7.5 If system utilizes the HVAC fan, then the specified fan type is ECM / ICM (4.7), or the controls will reduce the standalone ventilation run-time by accounting for hours when the HVAC system is heating or cooling.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6 Bathroom fans are ENERGY STAR certified if used as part of the whole-house system. <sup>48</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7 Air inlet location (Complete if ventilation air inlet location was specified (2.12, 2.13); otherwise check "N/A"): <sup>49, 50</sup>			-	-	<input type="checkbox"/>
7.7.1 Inlet pulls ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit.			<input type="checkbox"/>	<input type="checkbox"/>	-
7.7.2 Inlet is $\geq 2$ ft. above grade or roof deck; $\geq 10$ ft. of stretched-string distance from known contamination sources not exiting the roof, and $\geq 3$ ft. distance from dryer exhausts and sources exiting the roof. <sup>51</sup>			<input type="checkbox"/>	<input type="checkbox"/>	-
7.7.3 Inlet is provided with rodent / insect screen with $\leq 0.5$ inch mesh.			<input type="checkbox"/>	<input type="checkbox"/>	-
<b>8. Local Mechanical Exhaust</b> - In each kitchen and bathroom, a system is installed that exhausts directly to the outdoors and meets one of the following Rater-measured airflow and manufacturer-rated sound level standards: <sup>45, 52</sup>					
Location		Continuous Rate	Intermittent Rate <sup>53</sup>		
8.1 Kitchen	Airflow	$\geq 5$ ACH, based on kitchen volume <sup>54, 55</sup>	$\geq 100$ CFM and, if not integrated with range, also $\geq 5$ ACH based on kitchen volume <sup>54, 55, 56</sup>		
	Sound	Recommended: $\leq 1$ sone	Recommended: $\leq 3$ sones		
8.2 Bathroom	Airflow	$\geq 20$ CFM	$\geq 50$ CFM		
	Sound	Required: $\leq 1$ sone	Recommended: $\leq 3$ sones		
<b>9. Filtration</b>					
9.1 MERV 6+ filter(s) installed in each ducted mech. system, located to facilitate occupant access & regular service. <sup>57</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2 Filter access panel includes gasket and fits snugly against exposed edge of filter when closed to prevent bypass. <sup>58</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3 All return air and mechanically supplied outdoor air passes through filter prior to conditioning.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>10. Combustion Appliances</b>					
10.1 Furnaces, boilers, & water heaters are mechanically drafted or direct-vented. Alternatives in Footnote 61. <sup>59, 60, 61</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2 Fireplaces are mechanically drafted or direct-vented. Alternatives in Footnote 62. <sup>59, 60, 62</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3 If unvented combustion appliances other than cooking ranges or ovens are located inside the home's pressure boundary, the Rater has followed Section 802 of RESNET's Standards, encompassing ANSI/ACCA 12 QH-2014, Appendix A, Section A3 (Carbon Monoxide Test), and verified the equipment meets the limits defined within. <sup>59, 63</sup>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____		Rater Pre-Drywall Inspection Date: _____		Rater Initials: _____	
Rater Name: _____		Rater Final Inspection Date: _____		Rater Initials: _____	
Builder Employee: _____		Builder Inspection Date: _____		Builder Initials: _____	



# National Rater Field Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

### Footnotes

1. At the discretion of the Rater, the builder may verify up to eight items in Sections 1-4 of this Checklist. When exercised, the builder's responsibility will be formally acknowledged by the builder signing off on the checklist for the item(s) that they verified. However, if a quality assurance review indicates that Items have not been successfully completed, the Rater will be responsible for facilitating corrective action.
2. The term 'Rater' refers to the person(s) completing the third-party verification required for certification. The person(s) shall: a) be a Certified Rater, Approved Inspector, or an equivalent designation as determined by a Verification Oversight Organization such as RESNET; and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
3. The column titled "N/A," which denotes items that are "not applicable," should be used when the checklist Item is not present in the home or conflicts with local requirements.
4. In addition, the infiltration shall not exceed the limits specified in Item 3.1.2 of the National Rater Design Review Checklist, if this option has been used to comply with Item 3.1.
5. Two alternatives are provided: a) Grade II cavity insulation is permitted to be used for assemblies that contain a layer of continuous, air impermeable insulation  $\geq R-3$  in Climate Zones 1 to 4,  $\geq R-5$  in Climate Zones 5 to 8; b) Grade II batts are permitted to be used in floors if they fill the full width and depth of the floor cavity, even when compression occurs due to excess insulation, as long as the R-value of the batts has been appropriately assessed based on manufacturer guidance and the only defect preventing the insulation from achieving Grade I is the compression caused by the excess insulation.
6. Ensure compliance with this requirement using ANSI / RESNET / ICC Std. 301 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the Effective Date and Transition Period End Date defined by RESNET. RESNET interpretations of Standard 301 shall also be followed.
7. For purposes of this Checklist, an air barrier is defined as any durable solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams and adequate support to resist positive and negative pressures without displacement or damage. EPA recommends, but does not require, rigid air barriers.  
Open-cell or closed-cell foam shall have a finished thickness  $\geq 5.5$  in. or 1.5 in., respectively, to qualify as an air barrier unless the manufacturer indicates otherwise.  
If flexible air barriers such as house wrap are used, they shall be fully sealed at all seams and edges and supported using fasteners with caps or heads  $\geq 1$  in. diameter unless otherwise indicated by the manufacturer. Flexible air barriers shall not be made of kraft paper, paper-based products, or other materials that are easily torn. If polyethylene is used, its thickness shall be  $\geq 6$  mil.
8. All insulated ceiling surfaces, regardless of slope (e.g., cathedral ceilings, tray ceilings, conditioned attic roof decks, flat ceilings, sloped ceilings), must meet the requirements for ceilings.
9. All insulated vertical surfaces are considered walls (e.g., above and below grade exterior walls, knee walls) and must meet the air barrier requirements for walls. The following exceptions apply: air barriers recommended, but not required, in adiabatic walls in multifamily dwellings; and, in Climate Zones 4 through 8, an air barrier at the interior vertical surface of insulation is recommended but not required in basement walls or crawlspace walls. For the purpose of these exceptions, a basement or crawlspace is a space for which  $\geq 40\%$  of the total gross wall area is below-grade.
10. Exterior air barriers are not required for attic knee walls that are  $\leq 24$  in. in height if an interior air barrier is provided and insulation extends in all directions from the top of this interior air barrier into unconditioned space at the following levels: CZ 1-5:  $\geq R-21$ ; CZ 6-8:  $\geq R-30$ .
11. EPA highly recommends, but does not require, an air barrier at the interior vertical surface of floor insulation in Climate Zones 4-8.
12. Examples of supports necessary for permanent contact include staves for batt insulation or netting for blown-in insulation. Alternatively, supports are not required if batts fill the full depth of the floor cavity, even when compression occurs due to excess insulation, as long as the R-value of the batts has been appropriately assessed based on manufacturer guidance and the only defect preventing the insulation from achieving the required installation grade is the compression caused by the excess insulation.
13. Alternatively, an air barrier is permitted to be installed at the exterior horizontal surface of the floor insulation if the insulation is installed in contact with this air barrier, the exterior vertical surfaces of the floor cavity are also insulated, and air barriers are included at the exterior vertical surfaces of this insulation.
14. The minimum designated R-values must be achieved regardless of the trade-offs determined using an equivalent U-factor or UA alternative calculation. Note that if the minimum designated values are used, then higher insulation values may be needed elsewhere to meet Item 1.2. Also, note that these requirements can be met by using any available strategy, such as a raised-heel truss, alternate framing that provides adequate space, and / or high-density insulation.
15. Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall. Alternatively, the thermal break is permitted to be created using  $\geq R-3$  rigid insulation on top of an existing slab (e.g., in a home undergoing a gut rehabilitation). In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates). Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).
16. Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the house, slab insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab. Where specific details cannot meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the home's certification. EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program. A list of currently exempted details is available at: [energystar.gov/slabeledge](http://energystar.gov/slabeledge).
17. Mass walls utilized as the thermal mass component of a passive solar design (e.g., a Trombe wall) are exempt from this Item. To be eligible for this exemption, the passive solar design shall be comprised of the following five components: an aperture or collector, an absorber, thermal mass, a distribution system, and a control system. For more information, see: [energy.gov/sites/prod/files/guide\\_to\\_passive\\_solar\\_home\\_design.pdf](http://energy.gov/sites/prod/files/guide_to_passive_solar_home_design.pdf).



# National Rater Field Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

Mass walls that are not part of a passive solar design (e.g., CMU block or log home enclosure) shall either utilize the strategies outlined in Item 3.4 or the pathway in the assembly with the least thermal resistance, as determined using a method consistent with the 2013 ASHRAE Handbook of Fundamentals, shall provide  $\geq 50\%$  of the applicable assembly resistance, defined as the reciprocal of the mass wall equivalent U-factor in the 2009 IECC Table 402.1.3. Documentation identifying the pathway with the least thermal resistance and its resistance value shall be collected by the Rater and any Builder Verified or Rater Verified box under Item 3.4 shall be checked.

18. Up to 10% of the total exterior wall surface area is exempted from the reduced thermal bridging requirements to accommodate intentional designed details (e.g., architectural details such as thermal fins, wing walls, or masonry fireplaces; structural details, such as steel columns). It shall be apparent to the Rater that the exempted areas are intentional designed details or the exempted area shall be documented in a plan provided by the builder, architect, or engineer. The Rater need not evaluate the necessity of the designed detail to certify the home.
19. If used, insulated siding shall be attached directly over a water-resistive barrier and sheathing. In addition, it shall provide the required R-value as demonstrated through either testing in accordance with ASTM C 1363 or by attaining the required R-value at its minimum thickness. Insulated sheathing rated for water protection can be used as a water resistant barrier if all seams are taped and sealed. If non-insulated structural sheathing is used at corners, the advanced framing details listed in Item 3.4.3 shall be met for those wall sections.
20. Steel framing shall meet the reduced thermal bridging requirements by complying with Item 3.4.1 of the Checklist.
21. Double-wall framing is defined as any framing method that ensures a continuous layer of insulation covering the studs to at least the R-value required in Item 3.4.1 of the Checklist, such as offset double-stud walls, aligned double-stud walls with continuous insulation between the adjacent stud faces, or single-stud walls with 2x2 or 2x3 cross-framing. In all cases, insulation shall fill the entire wall cavity from the interior to exterior sheathing except at windows, doors and other penetrations.
22. All advanced framing details shall be met except where the builder, architect, or engineer provides a framing plan that encompasses the details in question, indicating that structural members are required at these locations and including the rationale for these members (e.g., full-depth solid framing is required at wall corners or interior / exterior wall intersections for shear strength, a full-depth solid header is required above a window to transfer load to jacks studs, additional jack studs are required to support transferred loads, additional cripple studs are required to maintain on-center spacing, or stud spacing must be reduced to support multiple stories in a multifamily building). The Rater shall retain a copy of the detail and rationale for their records, but need not evaluate the rationale to certify the home.
23. All exterior corners shall be constructed to allow access for the installation of  $\geq R-6$  insulation that extends to the exterior wall sheathing. Examples of compliance options include standard-density insulation with alternative framing techniques, such as using three studs per corner, or high-density insulation (e.g., spray foam) with standard framing techniques.
24. Compliance options include continuous rigid insulation sheathing, SIP headers, other prefabricated insulated headers, single-member or two-member headers with insulation either in between or on one side, or an equivalent assembly. R-value requirement refers to manufacturer's nominal insulation value.
25. Insulation shall run behind interior / exterior wall intersections using ladder blocking, full length 2x6 or 1x6 furring behind the first partition stud, drywall clips, or other equivalent alternative.
26. In Climate Zones 6 - 8, a minimum stud spacing of 16 in. o.c. is permitted to be used with 2x6 framing if  $\geq R-20.0$  wall cavity insulation is achieved. However, all 2x6 framing with stud spacing of 16 in. o.c. in Climate Zones 6 - 8 shall have  $\geq R-20.0$  wall cavity insulation installed regardless of any framing plan or alternative equivalent total UA calculation.
27. Existing sill plates (e.g., in a home undergoing a gut rehabilitation) on the interior side of structural masonry or monolithic walls are exempt from this Item. In addition, other existing sill plates resting atop concrete or masonry and adjacent to conditioned space are permitted, in lieu of using a gasket, to be sealed with caulk, foam, or equivalent material at both the interior seam between the sill plate and the subfloor and the seam between the top of the sill plate and the sheathing.
28. In Climate Zones 1 through 3, a continuous stucco cladding system adjacent to sill and bottom plates is permitted to be used in lieu of sealing plates to foundation or sub-floor with caulk, foam, or equivalent material.
29. In Climate Zones 1 through 3, a continuous stucco cladding system sealed to windows and doors is permitted to be used in lieu of sealing rough openings with caulk or foam.
30. Examples of durable covers include, but are not limited to, pre-fabricated covers with integral insulation, rigid foam adhered to cover with adhesive, or batt insulation mechanically fastened to the cover (e.g., using bolts, metal wire, or metal strapping).
31. This Checklist is designed to meet the requirements of ASHRAE 62.2-2010 / 2013 / 2016, and ANSI / ACCA's 5 QI-2015 protocol, thereby improving the performance of HVAC equipment in new homes when compared to homes built to minimum code. However, these features alone cannot prevent all ventilation, indoor air quality, and HVAC problems, (e.g., those caused by a lack of maintenance by occupants). Therefore, this Checklist is not a guarantee of proper ventilation, indoor air quality, or HVAC performance.
32. Path A – HVAC Grading shall not be used until an Effective Date has been defined by RESNET for ANSI / RESNET / ACCA Std. 310. Path A – HVAC Grading shall then use ANSI / RESNET / ACCA Std. 310 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the Effective Date and Transition Period End Date defined by RESNET. RESNET interpretations of Standard 310 shall also be followed. For Path A, all unitary HVAC Systems including air conditioners and heat pumps up to 65 kBtuh shall comply with 5a.1 through 5a.3 for the home to be certified.
33. If the non-invasive procedure in ANSI / RESNET / ACCA Std. 310 is not permitted to be used during the final inspection of a home (i.e., due to the equipment type or to outdoor air temperatures that do not meet the requirements of the non-invasive method), then the home is permitted to be certified with a default refrigerant charge designation of Grade III. Note that in these circumstances, the weigh-in method procedure in ANSI / RESNET / ACCA Std. 310 may still be used to pursue a Grade I designation.
34. If installed equipment does not match the National HVAC Design Report, then prior to certification the Rater shall obtain written approval from the designer (e.g., email, updated National HVAC Design Report) confirming that the installed equipment meets the requirements of the National HVAC Design Report. In addition, if "N/A" was selected for Item 1.2 of the National Rater Design Review Checklist, then the Rater shall verify that all installed equipment is an exempted type per Footnote 9 of that Checklist or, if not an exempted type, shall re-review the National Rater Design Review Checklist to ensure compliance with all requirements (e.g., contractor credential, full completion of HVAC Design Report, HVAC design tolerances).



# National Rater Field Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

In cases where the condenser unit is installed after the time of inspection by the Rater, the HVAC manufacturer and model numbers on installed equipment can be documented through the use of photographs provided by the HVAC Contractor after installation is complete.

35. The Rater shall measure and record the external static pressure in the return-side and supply-side of the system using the contractor-provided test locations. However, at this time, the Rater need not assess whether these values are within a specific range to certify the home.
36. Kinks are to be avoided and are caused when ducts are bent across sharp corners such as framing members. Sharp bends are to be avoided and occur when the radius of the turn in the duct is less than one duct diameter. Compression is to be avoided and occurs when flexible ducts in unconditioned space are installed in cavities smaller than the outer duct diameter and ducts in conditioned space are installed in cavities smaller than inner duct diameter. Ducts shall not include coils or loops except to the extent needed for acoustical control.
37. Item 6.2 does not apply to ventilation ducts, exhaust ducts, or non-ducted systems. For an HVAC system with a multi-speed fan, the highest design fan speed shall be used when verifying this requirement. When verifying this requirement, doors separating bedrooms from the main body of the house (e.g., a door between a bedroom and a hallway) shall be closed and doors to rooms that can only be entered from the bedroom (e.g., a closet, a bathroom) shall be open. As an alternative to the  $\pm 3$  Pa limit, a Rater-measured pressure differential  $\geq -5$  Pa and  $\leq +5$  Pa is permitted to be used for bedrooms with a design airflow  $\geq 150$  CFM. The Rater-measured pressure shall be rounded to the nearest whole number to assess compliance.
38. Item 6.3 does not apply to ducts that are a part of local mechanical exhaust and exhaust-only whole-house ventilation systems. EPA recommends, but does not require, that all metal ductwork not encompassed by Section 6 (e.g., exhaust ducts, duct boots, ducts in conditioned space) also be insulated and that insulation be sealed to duct boots to prevent condensation.
39. Items 6.4 and 6.5 only apply to heating, cooling, and balanced ventilation ducts. Duct leakage shall be determined and documented by a Rater using ANSI / RESNET / ICC Std. 380 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the Effective Date and Transition Period End Date defined by RESNET. RESNET interpretations of Standard 380 shall also be followed. Leakage limits shall be assessed on a per-system, rather than per-home, basis. For balanced ventilation ducts that are not connected to space heating or cooling systems, a Rater is permitted to visually verify, in lieu of duct leakage testing, that all seams and connections are sealed with mastic or metal tape and all duct boots are sealed to floor, wall, or ceiling using caulk, foam, or mastic tape.
40. For a duct system with three or more returns, the total Rater-measured duct leakage is permitted to be the greater of  $\leq 6$  CFM25 per 100 sq. ft. of CFA or  $\leq 60$  CFM25 at 'rough-in' or the greater of  $\leq 12$  CFM25 per 100 sq. ft. of CFA or  $\leq 120$  CFM25 at 'final'.
41. Note that compliance with Item 6.4.1 or 6.4.2 in conjunction with Section 4a of the National Rater Design Review Checklist automatically achieves Grade I total duct leakage per ANSI / RESNET / ACCA Std. 310.
42. Cabinets (e.g., kitchen, bath, multimedia) or ducts that connect duct boots to toe-kick registers are not required to be in place during the 'rough-in' test.
43. Registers atop carpets are permitted to be removed and the face of the duct boot temporarily sealed during testing. In such cases, the Rater shall visually verify that the boot has been durably sealed to the subfloor (e.g., using duct mastic or caulk) to prevent leakage during normal operation.
44. Testing of duct leakage to the outdoors can be waived in accordance with the 2nd or 3rd alternative of ANSI / RESNET / ICC Std. 301, Table 4.2.2 (1), footnote (w). Alternatively, testing of duct leakage to outdoors can be waived in accordance with Section 5.5.2 of ANSI / RESNET / ICC Std. 380 if total duct leakage, at rough-in or final, is  $\leq 4$  CFM25 per 100 sq. ft. of conditioned floor area or 40 CFM25, whichever is larger. Guidance to assist partners with these alternatives, including modeling inputs, is available at <http://www.energystar.gov/newhomesguidance>.
45. The whole-house ventilation air flow and local exhaust air flows shall be determined and documented by a Rater using ANSI / RESNET / ICC Std. 380 including all Addenda and Normative Appendices, with new versions and Addenda implemented according to the Effective Date and Transition Period End Date defined by RESNET. RESNET interpretations of Standard 380 shall also be followed.
46. For an attached dwelling unit, excluding units in dwellings (i.e., duplex) and townhomes, the override control is not required to be readily accessible to the occupant. However, in such cases, EPA recommends but does not require that the control be readily accessible to others (e.g., building maintenance staff) in lieu of the occupant.
47. Whole-house mechanical ventilation fans shall be rated for sound at no less than the airflow rate in Item 2.3 of the National HVAC Design Report. Fans exempted from this requirement include HVAC air handler fans, remote-mounted fans, and intermittent fans rated  $\geq 400$  CFM. To be considered for this exemption, a remote-mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways and there shall be  $\geq 4$  ft. ductwork between the fan and intake grill. Per ASHRAE 62.2-2010, habitable spaces are intended for continual human occupancy; such space generally includes areas used for living, sleeping, dining, and cooking but does not generally include bathrooms, toilets, hallways, storage areas, closets, or utility rooms.
48. Bathroom fans with a rated flow rate  $\geq 500$  CFM are exempted from the requirement to be ENERGY STAR certified.
49. Ventilation air inlets that are only visible via rooftop access are exempted from Item 7.7 and the Rater shall mark "n/a". The outlet and inlet of balanced ventilation systems shall meet these spacing requirements unless manufacturer instructions indicate that a smaller distance may be used. However, if this occurs the manufacturer's instructions shall be collected for documentation purposes.
50. Without proper maintenance, ventilation air inlet screens often become filled with debris. Therefore, EPA recommends, but does not require, that these ventilation air inlets be located so as to facilitate access and regular service by the occupant.
51. Known contamination sources include, but are not limited to, stacks, vents, exhausts, and vehicles.
52. Continuous bathroom local mechanical exhaust fans shall be rated for sound at no less than the airflow rate in Item 8.2. Intermittent bathroom and both intermittent and continuous kitchen local mechanical exhaust fans are recommended, but not required, to be rated for sound at no less than the airflow rate in Items 8.1 and 8.2. Per ASHRAE 62.2-2010, an exhaust system is one or more fans that remove air from the building, causing outdoor air to enter by ventilation inlets or normal leakage paths through the building envelope (e.g., bath exhaust fans, range hoods, clothes dryers). Per ASHRAE 62.2-2010, a bathroom is any room containing a bathtub, shower, spa, or similar source of moisture.
53. An intermittent mechanical exhaust system, where provided, shall be designed to operate as needed by the occupant. Control devices shall not impede occupant control in intermittent systems.



# National Rater Field Checklist

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

54. Kitchen volume shall be determined by drawing the smallest possible rectangle on the floor plan that encompasses all cabinets, pantries, islands, peninsulas, ranges / ovens, and the kitchen exhaust fan, and multiplying by the average ceiling height for this area. In addition, the continuous kitchen exhaust rate shall be  $\geq 25$  CFM, per 2009 IRC Table M1507.3, regardless of the rate calculated using the kitchen volume. Cabinet volume shall be included in the kitchen volume.
55. Homes shall meet this Item. Alternatively, the prescriptive duct sizing requirements in Table 5.3 of ASHRAE 62.2-2010 / 2013 / 2016 are permitted to be used for kitchen exhaust fans based upon the rated airflow of the fan at 0.25 IWC. If the rated airflow is unknown,  $\geq 6$  in. smooth duct shall be used, with a rectangular to round duct transition as needed. Guidance to assist partners with these alternatives is available at <http://www.energystar.gov/newhomesguidance>. As an alternative to Item 8.1, homes are permitted to use a continuous kitchen exhaust rate of 25 CFM per 2009 IRC Table M1507.3, if they are either a) PHIUS+ or PHI certified, or b) provide both whole-house ventilation and local mechanical kitchen exhaust using a balanced system, and have a Rater-verified whole-building infiltration rate  $\leq 0.05$  CFM50 per sq. ft. of Enclosure Area, and a Rater-verified dwelling unit compartmentalization rate  $\leq 0.30$  CFM50 per sq. ft. of Enclosure Area if multiple dwelling units are present in the building. 'Enclosure Area' is defined as the area of the surfaces that bound the volume being pressurized / depressurized during the test.
56. All intermittent kitchen exhaust fans must be capable of exhausting at least 100 CFM. In addition, if the fan is not part of a vented range hood or appliance-range hood combination (i.e., if the fan is not integrated with the range), then it must also be capable of exhausting  $\geq 5$  ACH, based on the kitchen volume.
57. Based upon ASHRAE 62.2-2010, ducted mechanical systems are those that supply air to an occupiable space with a total amount of supply ductwork exceeding 10 ft. in length and through a thermal conditioning component, except for evaporative coolers. Systems that do not meet this definition are exempt from this requirement. While filters are recommended for mini-split systems, HRV's and ERV's, these systems, ducted or not, typically do not have MERV-rated filters available for use and are, therefore, also exempted under this version of the requirements. HVAC filters located in the attic shall be considered accessible to the occupant if either 1) drop-down stairs provide access to attic and a permanently installed walkway has been provided between the attic access location and the filter or 2) the filter location enables arm-length access from a portable ladder without the need to step into the attic and the ceiling height where access is provided is  $\leq 12$  ft.
58. Sealing mechanisms comparable to a gasket are also permitted to be used. The filter media box (i.e., the component in the HVAC system that houses the filter) may be either site-fabricated by the installer or pre-fabricated by the manufacturer to meet this requirement. These requirements only apply when the filter is installed in a filter media box located in the HVAC system, not when the filter is installed flush with the return grill.
59. The pressure boundary is the primary enclosure boundary separating indoor and outdoor air. For example, a volume that has more leakage to outside than to conditioned space would be outside the pressure boundary.
60. Per the 2009 International Mechanical Code, a direct-vent appliance is one that is constructed and installed so that all air for combustion is derived from the outdoor atmosphere and all flue gases are discharged to the outside atmosphere; a mechanical draft system is a venting system designed to remove flue or vent gases by mechanical means consisting of an induced draft portion under non-positive static pressure or a forced draft portion under positive static pressure; and a natural draft system is a venting system designed to remove flue or vent gases under nonpositive static vent pressure entirely by natural draft.
61. This item only applies to furnaces, boilers, and water heaters located within the home's pressure boundary. Naturally drafted equipment is allowed within the home's pressure boundary in Climate Zones 1-3 if the Rater has followed Section 802 of RESNET's Standards, encompassing ANSI / ACCA 12 QH-2014, Appendix A, Sections A3 (Carbon Monoxide Test) and A4 (Depressurization Test for the Combustion Appliance Zone), and verified that the equipment meets the limits defined within.
62. This item only applies to fireplaces located within the home's pressure boundary. Naturally drafted fireplaces are allowed within the home's pressure boundary if the Rater has verified that the total net rated exhaust flow of the two largest exhaust fans (excluding summer cooling fans) is  $\leq 15$  CFM per 100 sq. ft. of occupiable space when at full capacity. If the net exhaust flow exceeds the allowable limit, it shall be reduced or compensating outdoor airflow provided. Per ASHRAE 62.2-2010, the term "net rated exhaust flow" is defined as flow through an exhaust fan minus the compensating outdoor airflow through any supply fan that is interlocked to the exhaust fan. Per ASHRAE 62.2-2010, the term "occupiable space" is defined as any enclosed space inside the pressure boundary and intended for human activities, including, but not limited to, all habitable spaces, toilets, closets, halls, storage and utility areas, and laundry areas. See Footnote 47 for the definition of "habitable spaces".
63. The minimum volume of combustion air required for safe operation by the manufacturer and / or code shall be met or exceeded. Also, in accordance with the National Fuel Gas Code, ANSI Z223.1 / NFPA54, unvented room heaters shall not be installed in bathrooms or bedrooms.



# National HVAC Design Report <sup>1</sup>

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

### HVAC Designer Responsibilities:

- Complete one National HVAC Design Report for each system design for a house plan, created for either the specific plan configuration (i.e., elevation, option, orientation, & county) of the home to be certified or **for a plan that is intended to be built with different configurations** (i.e., different elevations, options, and/or orientations). Visit [www.energystar.gov/newhomeshvacdesign](http://www.energystar.gov/newhomeshvacdesign) and see Footnote 2 for more information. <sup>2</sup>
- **Obtain efficiency features** (e.g., window performance, insulation levels, and infiltration rate) **from the builder or Rater.** <sup>3</sup>
- Provide the completed National HVAC Design Report to the builder or credentialed HVAC contractor and to the Rater.

### 1. Design Overview

1.1 Designer name: \_\_\_\_\_ Designer company: \_\_\_\_\_ Date: \_\_\_\_\_

1.2 Select which party you are providing these design services to:  Builder or  Credentialed HVAC contractor

1.3 Name of company you are providing these design services to (if different than Item 1.1): \_\_\_\_\_

1.4 Area that system serves:  Whole-house  Upper-level  Lower-level  Other \_\_\_\_\_

1.5 Is cooling system for a temporary occupant load? <sup>4</sup>  Yes  No

1.6 House plan: \_\_\_\_\_ Check box to indicate whether the system design is site-specific or part of a group: <sup>2</sup>

Site-specific design. Option(s) & elevation(s) modeled: \_\_\_\_\_

Group design. Group #: \_\_\_\_\_ out of \_\_\_\_\_ total groups for this house plan. Configuration modeled: \_\_\_\_\_

### 2. Whole-House Mechanical Ventilation Design <sup>5, 6</sup>

**Designer Verified**

#### Airflow:

2.1 Ventilation airflow design rate & run-time meet the **requirements of ASHRAE 62.2-2010, 2013, or 2016.** <sup>7</sup>

2.2 Ventilation airflow rate **required by 62.2 for a continuous system:** \_\_\_\_\_ CFM -

2.3 Design for this system: Vent. airflow rate: \_\_\_\_\_ CFM Run-time per cycle: \_\_\_\_\_ minutes Cycle time: \_\_\_\_\_ minutes -

#### System Type & Controls:

2.4 Specified system type:  Supply  Exhaust  Balanced -

2.5 Specified control location: \_\_\_\_\_ (e.g., Master bath, utility room) -

2.6 Specified controls allow the system to operate automatically, without occupant intervention.

2.7 Specified controls include a readily-accessible ventilation override and a label has also been specified if its function is not obvious (e.g., a label is required for a standalone wall switch, but not for a switch that's on the ventilation equipment).

2.8 No outdoor air intakes designed to connect to the return side of the HVAC system, unless specified controls operate intermittently and automatically based on a timer and restrict intake when not in use (e.g., motorized damper). <sup>8</sup>

**Sound:** 2.9 The fan of the specified system is rated  $\leq 3$  sones if intermittent and  $\leq 1$  sone if continuous, or exempted. <sup>9</sup>

#### Efficiency:

2.10 If system utilizes the HVAC fan, then the specified fan type in Item 4.7 is ECM / ICM, or the specified controls will reduce the standalone ventilation run-time by accounting for hours when the HVAC system is heating or cooling.

2.11 If bathroom fans are specified as part of the system, then they are **ENERGY STAR certified.** <sup>10</sup>

#### Air Inlet Location: (Complete this section if system has a specified air inlet location; otherwise check "N/A"). <sup>11</sup> N/A

2.12 Inlet pulls ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit.

2.13 Inlet is  $\geq 2$  ft. above grade or roof deck;  $\geq 10$  ft. of stretched-string distance from known contamination sources (e.g., stack, vent, exhaust, vehicles) not exiting the roof, and  $\geq 3$  ft. from known sources exiting the roof.

### 3. Room-by-Room Heating & Cooling Loads

3.1 Room-by-room loads calculated using:  Unabridged ACCA Manual J v8  2013 ASHRAE Fundamentals  Other per AHJ <sup>12</sup> -

3.2 Indoor design temperatures used in loads are 70°F for heating and 75°F for cooling.

3.3 Outdoor design temperatures used in loads: (See Footnote 13 **and [energystar.gov/hvacdesigntemps](http://energystar.gov/hvacdesigntemps)**) <sup>13</sup> -  
County & State, or US Territory, selected: \_\_\_\_\_ Cooling season: \_\_\_\_\_°F Heating season: \_\_\_\_\_°F

3.4 Number of occupants used in loads: <sup>14</sup> \_\_\_\_\_ -

3.5 **Conditioned floor area** used in loads: <sup>15</sup> \_\_\_\_\_ Sq. Ft. -

3.6 **Window area used** in loads: <sup>16</sup> \_\_\_\_\_ Sq. Ft. -

3.7 **Predominant window SHGC** used in loads: <sup>17</sup> \_\_\_\_\_ -

3.8 Infiltration rate used in loads: <sup>18</sup> Summer: \_\_\_\_\_ Winter: \_\_\_\_\_ -

3.9 Mechanical ventilation rate used in loads: \_\_\_\_\_ CFM -

Loads At Design Conditions (kBtuh)		N	NE	E	SE	S	SW	W	NW	-
Cooling	3.10 Sensible heat gain (By orientation <sup>19</sup> ):									-
	3.11 Latent heat gain (Not by orientation):									-
	3.12 Total heat gain (By orientation <sup>19</sup> ):									-
	3.13 Maximum – minimum total heat gain (Item 3.12) across orientations = _____ kBtuh Variation is $\leq 6$ kBtuh. <sup>19, 20</sup>									
Heating	3.14 Total heat loss (Not by orientation):									-



# National HVAC Design Report <sup>1</sup>

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

4. Heating & Cooling Equipment Selection						Designer Verified
4.1 Equipment selected per ACCA Manual S (see Footnote 21 & 22). <sup>21, 22</sup>						<input type="checkbox"/>
<b>Air Conditioner / Heat Pump</b> (Complete if air conditioner or heat pump will be installed; otherwise check "N/A")						<input type="checkbox"/> N/A
4.2 Equipment type: <input type="checkbox"/> Cooling-only air conditioner or <input type="checkbox"/> Cooling & heating heat pump						-
4.3 Condenser manufacturer & model: _____						-
4.4 Evaporator / fan coil manufacturer & model: _____						-
4.5 AHRI reference #: <sup>23</sup> _____						-
4.6 AHRI listed efficiency: _____ / _____ EER / SEER Air-source heat pump: _____ HSPF Ground-source heat pump: _____ COP						-
4.7 Evaporator fan type: <input type="checkbox"/> PSC <input type="checkbox"/> ECM / ICM <input type="checkbox"/> Other: _____						-
4.8 Compressor type: <input type="checkbox"/> Single-speed <input type="checkbox"/> Two-speed <input type="checkbox"/> Variable-speed						-
4.9 Latent capacity at design conditions, from OEM expanded performance data: _____ kBtuh						-
4.10 Sensible capacity at design conditions, from OEM expanded performance data: _____ kBtuh						-
4.11 Total capacity at design conditions, from OEM expanded performance data: _____ kBtuh						-
4.12 Air-source heat pump capacity: At 17°F: _____ kBtuh At 47°F: _____ kBtuh <input type="checkbox"/> N/A						-
4.13 Cooling sizing % = Total capacity (Item 4.11) divided by maximum total heat gain (Item 3.12): _____ %						-
4.14 Complete this Item if Condition B Climate will be used to select sizing limit in Item 4.15. Otherwise, check "N/A". <sup>24</sup> <input type="checkbox"/> N/A						-
4.14.1 Load sensible heat ratio = Max. sensible heat gain (Item 3.10) / Max. total heat gain (Item 3.12) = _____ %						-
4.14.2 HDD / CDD ratio (Visit <a href="http://energystar.gov/hvacdesigntemps">energystar.gov/hvacdesigntemps</a> to determine this value for the design location) = _____						-
4.15 Check box of applicable cooling sizing limit from chart below: <sup>21, 22</sup>						-
Equipment Type (Per Item 4.2) & Climate Condition (Per Item 4.14)		Compressor Type (Per Item 4.8)				
		Single-Speed	Two-Speed	Variable-Speed		
For Cooling-Only Equipment or For Cooling Mode of Heat Pump in Condition A Climate		<input type="checkbox"/> Recommended: 90 – 115% Allowed: 90 – 130%	<input type="checkbox"/> Recommended: 90 – 120% Allowed: 90 – 140%	<input type="checkbox"/> Recommended: 90 – 130% Allowed: 90 – 160%		
For Cooling Mode of Heat Pump in Condition B Climate		<input type="checkbox"/> 90% - 100%, plus 15 kBtuh			<input type="checkbox"/> 90% - 100%, plus 15 kBtuh	
4.16 Cooling sizing % (4.13) is within cooling sizing limit (4.15).						<input type="checkbox"/>
<b>Furnace</b> (Complete if furnace will be installed; otherwise check "N/A").						<input type="checkbox"/> N/A
4.17 Furnace manufacturer & model: _____						-
4.18 Listed efficiency: _____ AFUE						-
4.19 Total capacity: _____ kBtuh						-
4.20 Heating sizing % = Total capacity (Item 4.19) divided by total heat loss (Item 3.14): _____ %						-
4.21 Check box of applicable heating sizing limit from chart below:						-
When Used for Heating Only			When Paired With Cooling			
<input type="checkbox"/> 100 – 140%			<input type="checkbox"/> Recommended: 100 – 140% Allowed: 100 – 400%			
4.22 Heating sizing % (4.20) is within heating sizing limit (4.21).						<input type="checkbox"/>
<b>5. Duct Design</b> (Complete if heating or cooling equipment will be installed with ducts; otherwise check "N/A").						<input type="checkbox"/> N/A
5.1 Duct system designed for the equipment selected in Section 4, per ACCA Manual D.						<input type="checkbox"/>
5.2 Design HVAC fan airflow: <sup>25</sup> Cooling mode _____ CFM Heating mode _____ CFM						-
5.3 Design HVAC fan speed setting (e.g., low, medium, high): <sup>26</sup> Cooling mode _____ Heating mode _____						-
5.4 Design total external static pressure (corresponding to the mode with the higher airflow in Item 5.2): <sup>27</sup> _____ IWC						-
5.5 Room-by-room design airflows documented below (which must sum to the mode with the higher airflow in Item 5.2): <sup>28, 29</sup>						-
Room Name	Design Airflow (CFM)	Room Name	Design Airflow (CFM)	Room Name	Design Airflow (CFM)	
1		12		23		
2		13		24		
3		14		25		
4		15		26		
5		16		27		
6		17		28		
7		18		29		
8		19		30		
9		20		31		
10		21		32		
11		22		Total for all rooms		



# National HVAC Design Report <sup>1</sup>

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

### Footnotes

1. This report is designed to meet ASHRAE 62.2-2010 / 2013 / 2016 and ANSI / ACCA's 5 QI-2015 protocol, thereby improving the performance of HVAC equipment in new homes when compared to homes built to minimum code. However, these features alone cannot prevent all ventilation, indoor air quality, and HVAC problems (e.g., those caused by a lack of maintenance or occupant behavior). Therefore, system designs documented through the use of this report are not a guarantee of proper ventilation, indoor air quality, or HVAC performance.

This report applies to split air conditioners, unitary air conditioners, air-source heat pumps, and water-source (i.e., geothermal) heat pumps up to 65 kBtuh with forced-air distribution systems (i.e., ducts) and to furnaces up to 225 kBtuh with forced-air distribution systems (i.e., ducts). For all other permutations of equipment (e.g., boilers, mini-split / multi-split systems) and distribution systems, Section 1 and 2 are required and Sections 3 through 5 are recommended, but not required.

2. The report shall represent a single system design for a house plan. Check the box for "site-specific design" if the design was created for the specific plan configuration (i.e., elevation, option, orientation, and county) of the home to be certified. Check the box for "group design" if the design was created for a plan that is intended to be built with potentially different configurations (i.e., different elevations, options, and/or orientations). Regardless of the box checked, the system design as documented on this National HVAC Design Report must fall within the following tolerances for the home to be certified:
  - Item 3.3: The outdoor design temperature used in loads are within the limits defined at [energystar.gov/hvacdesigntemps](http://energystar.gov/hvacdesigntemps).
  - Item 3.4: The number of occupants used in loads is within  $\pm 2$  of the home to be certified.
  - Item 3.5: The conditioned floor area used in loads is between 100 sq. ft. smaller and 300 sq. ft. larger than the home to be certified.
  - Item 3.6: The window area used in loads is between 15 sq. ft. smaller and 60 sq. ft. larger than the home to be certified, or, for homes to be certified with >500 sq. ft. of window area, between 3% smaller and 12% larger.
  - Item 3.7: The predominant window SHGC is within 0.1 of the predominant value in the home to be certified.
  - Items 3.10 - 3.12: The sensible, latent, & total heat gain are documented for the orientation of the home to be certified.
  - Item 3.13: The variation in total heat gain across orientations is  $\leq 6$  kBtuh.
  - Item 4.16: The cooling sizing % is within the cooling sizing limit selected.

Provide the National HVAC Design Report to the party you are providing these design services to (i.e., a builder or credentialed HVAC contractor) and to the Rater. The report is only required to be provided once per system design, even if multiple homes are built using this design (e.g., in a production environment where the same plan is built multiple times, only one report is required). As long as a report has been provided that falls within these tolerances for the home to be certified, no additional work is required. However, if no report falls within these tolerances or if any aspect of the system design changes, then an additional report will need to be generated prior to certification.

Visit [energystar.gov/newhomeshvacdesign](http://energystar.gov/newhomeshvacdesign) for a tool to assist with group designs and for more information.

3. The term "Rater" refers to the person(s) completing the third-party verification required for certification. The person(s) shall: a) be a Certified Rater, Approved Inspector, or an equivalent designation as determined by a Verification Oversight Organization such as RESNET; and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
4. Check "Yes" if this system is to handle temporary occupant loads. Such a system may be required to accommodate a significant number of guests on a regular or sporadic basis and shall be handled by a supplemental cooling system (e.g., a small, single-package unit or split-coil unit) or by a system that can shift capacity from zone to zone (e.g., a variable volume system).
5. The system shall have at least one supply or exhaust fan with associated ducts and controls. Local exhaust fans are allowed to be part of a whole-house ventilation system. Designers may provide supplemental documentation as needed to document the system design.
6. In "Warm-Humid" climates as defined by 2009 IECC Figure 301.1 (i.e., CZ 1 and portions of CZ 2 and 3A below the white line), it is recommended, but not required, that equipment be specified with sufficient latent capacity to maintain indoor relative humidity at  $\leq 60\%$ .
7. Airflow design rates and run-times shall be determined using ASHRAE 62.2-2010 or later. Designers are permitted, but not required, to use published addenda and/or the 2013 or 2016 version of the standard to assess compliance.
8. In addition, consult manufacturer requirements to ensure return air temperature requirements are met.
9. Whole-house mechanical ventilation fans shall be rated for sound at no less than the airflow rate in Item 2.3. Fans exempted from this requirement include HVAC air handler fans, remote-mounted fans, and intermittent fans rated  $\geq 400$  CFM. To be considered for this exemption, a remote-mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways and there shall be  $\geq 4$  ft. ductwork between the fan and intake grill. Per ASHRAE 62.2-2010, habitable spaces are intended for continual human occupancy; such space generally includes areas used for living, sleeping, dining, and cooking but does not generally include bathrooms, toilets, hallways, storage areas, closets, or utility rooms.
10. Bathroom fans with a rated flow rate  $\geq 500$  CFM are exempted from the requirement to be ENERGY STAR certified.
11. Without proper maintenance, ventilation air inlet screens often become filled with debris. Therefore, EPA recommends, but does not require, that these ventilation air inlets be located so as to facilitate access and regular service by the occupant.
12. Select "2013 ASHRAE Fundamentals" if using Chapter 17 of the 2013 ASHRAE Handbook of Fundamentals. Select "Other per AHJ" if the Authority Having Jurisdiction where the home will be certified mandates the use of a load calculation methodology other than Unabridged ACCA Manual J v8 or 2013 ASHRAE Fundamentals.
13. Visit [energystar.gov/hvacdesigntemps](http://energystar.gov/hvacdesigntemps) for the maximum cooling season design temperature and minimum heating season design temperature permitted for ENERGY STAR certified homes. For "County & State, or US Territory, selected", select the County and State or US Territory (i.e., Guam, Northern Mariana Islands, Puerto Rico, or US Virgin Islands), where the home is to be certified. The same design report is permitted to be used in other counties, as long as the design temperature limits in those other counties meet or exceed the cooling and heating season temperature limits for the county selected. For example, if Fauquier County, VA, is used for the load calculations, with a 1% cooling temperature limit of 93 F, then the same report could be used in Fairfax County (which has a higher limit of 94 F) but not in Arlington County (which has a lower limit of 92 F). If a jurisdiction-specified design temperature is used that exceeds the limit in the ENERGY STAR Certified Homes Design Temperature Limit Reference Guide, designers must submit a [Design Temperature Exception Request](#).



# National HVAC Design Report <sup>1</sup>

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

14. To determine the number of occupants among all HVAC systems in the home, calculate the number of bedrooms, as defined below, and add one. This number of occupants must be within  $\pm 2$  of the home to be certified, unless Item 1.5 indicates that the system is a cooling system for temporary occupant loads.

A bedroom is defined by ANSI / RESNET / ICC Standard 301-2014 as a room or space 70 sq. ft. or greater size, with egress window and closet, used or intended to be used for sleeping. A “den”, “library”, or “home office” with a closet, egress window, and 70 sq. ft. or greater size or other similar rooms shall count as a bedroom, but living rooms and foyers shall not.

An egress window, as defined in 2009 IRC section R310, shall refer to any operable window that provides for a means of escape and access for rescue in the event of an emergency. The egress window definition has been summarized for convenience. The egress window shall:

  - have a sill height of not more than 44 inches above the floor; AND
  - have a minimum net clear opening of 5.7 sq. ft.; AND
  - have a minimum net clear opening height of 24 in.; AND
  - have a minimum net clear opening width of 20 in.; AND
  - be operational from the inside of the room without the use of keys, tools or special knowledge.
15. The difference between the Conditioned Floor Area (CFA) used in the design and the actual home to be certified must fall within the tolerance specified in Footnote 2, as verified by a Rater. Be advised, the Rater will calculate CFA using the definition in ANSI / RESNET / ICC Standard 301-2019, which defines this value, in part, as the floor area of the Conditioned Space Volume within a building or Dwelling Unit, not including the floor area of attics, crawlspaces, and basements below air sealed and insulated floors. See <https://codes.iccsafe.org/content/chapter/16185/> for the complete definition.
16. The difference between the window area used in the design and the actual home to be certified must fall within the tolerance specified in Footnote 2, as verified by a Rater. Be advised, the Rater will calculate window area using the on-site inspection protocol provided in Normative Appendix B of ANSI / RESNET / ICC Standard 301-2019, which instructs the Rater to measure the width and height of the rough opening for the window and round to the nearest inch, and then to use these measurements to calculate window area, rounding to the nearest tenth of a square foot. See <https://codes.iccsafe.org/content/chapter/16191/> for the complete protocol.
17. “Predominant” is defined as the SHGC value used in the greatest amount of window area in the home.
18. Infiltration rate shall reflect the value used in the confirmed or projected ERI rating for home to be certified. Alternatively, use “Average” or “Semi-loose” values for the cooling season infiltration rate and “Semi-tight” or “Average” values for the heating season infiltration rate, as defined by ACCA Manual J, Eighth Edition, Version Two.
19. Orientation represents the direction that the front door of the house is facing. The designer is only required to document the loads for the orientation(s) that the house might be built in. For example, if a house plan will only be built one time in a specific orientation (e.g., a site-specific design), then the designer only needs to document the loads for this one orientation.
20. Determine the orientation with the largest and smallest Total Heat Gain. Verify that the difference in Total Heat Gain between the orientation with the largest and smallest value is  $\leq 6$  kBtuh. If not, then assign the orientations into one or more groups until the difference is  $\leq 6$  kBtuh and then complete a separate National HVAC Design Report for each group.
21. Equipment shall be selected using the maximum total heat gain in Item 3.12 and the total heat loss in Item 3.14 per ACCA Manual S, Second Edition, except that cooling ranges above ACCA Manual S limits are temporarily allowed, per Item 4.15.
22. As an alternative for low-load spaces, a system match-up including a single-speed compressor with a total capacity  $\leq 20$  kBtuh is permitted to be used in spaces with a total cooling load  $\leq 15$  kBtuh. A system match-up including a two-speed or variable-speed compressor with a total capacity  $\leq 25$  kBtuh is permitted to be used in spaces with a total cooling load  $\leq 18$  kBtuh.
23. If an AHRI Reference # is not available, OEM-provided documentation shall be attached with the rated efficiency of the specific combination of indoor and outdoor components of the air conditioner or heat pump, along with confirmation that the two components are designed to be used together.
24. Per ACCA Manual S, Second Edition, if the load sensible heat ratio is  $\geq 95\%$  and the HDD/CDD ratio is  $\geq 2.0$ , then the Climate is Condition B, otherwise it is Condition A.
25. Design HVAC fan airflow is the design airflow for the blower in CFM, as determined using the manufacturer’s expanded performance data.
26. Design HVAC fan speed setting is the fan speed setting on the control board (e.g., low, medium, high) that corresponds with the Design HVAC fan airflow.
27. Design total external static pressure is the pressure corresponding to the Design HVAC fan airflow, inclusive of external components (e.g., evaporator coil, whole-house humidifier, or  $\geq$  MERV 6 filter).
28. Designers may provide supplemental documentation with room-by-room and total design airflows in lieu of completing Item 5.5. Sample supplemental documentation can be found at <http://www.energystar.gov/newhomeshvacdesign>.
29. Orientation-specific room-by-room design airflows are recommended, but not required, to distribute airflow proportional to load, thereby improving comfort and efficiency.



# National HVAC Commissioning Checklist <sup>1, 2</sup>

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

### HVAC Commissioning Contractor Responsibilities:

- The **commissioning contractor must be credentialed by an HVAC oversight organization** to complete this checklist. One checklist must be completed and signed by the commissioning contractor for each HVAC system that is commissioned.
- The completed checklist for each commissioned system, along with the corresponding National HVAC Design Report, shall be retained by the contractor for a minimum of three years for quality assurance purposes. Furthermore, the contractor shall provide the completed checklist to the builder, the Rater <sup>3</sup> responsible for certifying the home, and the HVAC oversight organization upon request.
- Visit [www.energystar.gov/newhomeshvac](http://www.energystar.gov/newhomeshvac) for information about the credential requirement and this checklist.

### 1. Commissioning Overview

1.1 Contractor name \_\_\_\_\_ Contractor company \_\_\_\_\_ Date \_\_\_\_\_

1.2 Organization that your company is credentialed with:  ACCA  Advanced Energy  NYSERDA

1.3 Builder client name: \_\_\_\_\_

1.4 Home address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

1.5 National HVAC Design Report corresponding to this system has been collected from designer or builder.  Contractor-verified

1.6 Area that system serves, per Item 1.4 of National HVAC Design Report:  Whole-house  Upper-level  Lower-level  Other \_\_\_\_\_

1.7 House plan, per Item 1.6 of National HVAC Design Report: \_\_\_\_\_  Site-specific design  Group design #: \_\_\_\_\_

### 2. Refrigerant Charge - Run system for 15 minutes before testing. If outdoor ambient temperature at the condenser is $\leq 55^{\circ}\text{F}$ or, if known, below the manufacturer-recommended minimum operating temperature for the cooling cycle, then the system shall include a TXV, the outdoor temperature shall be recorded in Item 2.1, and the contractor shall check "N/A" in this Section. <sup>4</sup>

	Contractor Verified	N/A
2.1 Outdoor ambient temperature at condenser: _____ $^{\circ}\text{F}$ DB	-	-
2.2 Return-side air temperature inside duct near evaporator, during cooling mode: _____ $^{\circ}\text{F}$ WB	-	<input type="checkbox"/>
2.3 Liquid line pressure: _____ psig	-	<input type="checkbox"/>
2.4 Liquid line temperature: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>
2.5 Suction line pressure: _____ psig	-	<input type="checkbox"/>
2.6 Suction line temperature: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>

#### For System with Thermal Expansion Valve (TXV):

2.7 Condenser saturation temperature: _____ $^{\circ}\text{F}$ DB (Using Item 2.3)	-	<input type="checkbox"/>
2.8 Subcooling value: _____ $^{\circ}\text{F}$ DB (Item 2.7 - Item 2.4)	-	<input type="checkbox"/>
2.9 OEM subcooling goal: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>
2.10 Subcooling deviation: _____ $^{\circ}\text{F}$ DB (Item 2.8 – Item 2.9)	-	<input type="checkbox"/>

#### For System with Fixed Orifice:

2.11 Evaporator saturation temperature: _____ $^{\circ}\text{F}$ DB (Using Item 2.5)	-	<input type="checkbox"/>
2.12 Superheat value: _____ $^{\circ}\text{F}$ DB (Item 2.6 – Item 2.11)	-	<input type="checkbox"/>
2.13 OEM superheat goal: _____ $^{\circ}\text{F}$ DB (Using superheat tables and Items 2.1 & 2.2)	-	<input type="checkbox"/>
2.14 Superheat deviation: _____ $^{\circ}\text{F}$ DB (Item 2.12 – Item 2.13)	-	<input type="checkbox"/>
2.15 Item 2.10 is $\pm 3^{\circ}\text{F}$ or Item 2.14 is $\pm 5^{\circ}\text{F}$	<input type="checkbox"/>	<input type="checkbox"/>
2.16 An OEM test procedure (e.g., as defined for a ground-source heat pump) has been used in place of the sub-cooling or super-heat process and documentation has been attached that defines this procedure.	<input type="checkbox"/>	<input type="checkbox"/>

### 3. Indoor HVAC Fan Airflow

3.1 The mode with the higher design HVAC fan airflow used, per Item 5.2 of National HVAC Design Report: <input type="checkbox"/> Heating <input type="checkbox"/> Cooling	<input type="checkbox"/>	-
3.2 <b>Static pressure test holes have been created, and test hole locations are well-marked and accessible.</b>	<input type="checkbox"/>	-
Test hole location for <b>return</b> external static pressure: <input type="checkbox"/> Plenum <input type="checkbox"/> Cabinet <input type="checkbox"/> Transition <input type="checkbox"/> Other: _____	-	-
Test hole location for <b>supply</b> external static pressure: <input type="checkbox"/> Plenum <input type="checkbox"/> Cabinet <input type="checkbox"/> Transition <input type="checkbox"/> Other: _____	-	-
3.3 Measured <b>return</b> external static pressure (Enter value only, without negative sign): _____ IWC	-	-
3.4 Measured <b>supply</b> external static pressure (Enter value only, without positive sign): _____ IWC	-	-
3.5 Measured <b>total</b> external static pressure = Value-only from Item 3.3 + Value-only from Item 3.4 = _____ IWC	-	-
3.6 <b>Measured</b> (Item 3.5) - <b>Design</b> (Item 5.4 on National HVAC Design Report) total external static pressure = _____ IWC	-	-
3.7 Measured HVAC fan airflow, using Item 3.5 and fan speed setting: _____ CFM	-	-
3.8 Measured HVAC fan airflow (Item 3.7) is $\pm 15\%$ of design HVAC fan airflow (Item 5.2 on National HVAC Design Report).	-	-

for LEED, may be pursued for points

### 4. Air Balancing of Supply Registers & Return Grilles (Recommended, **but not Required**) <sup>5</sup>

4.1 Balancing report attached with room-by-room design airflows from Item 5.5 on National HVAC Design Report, and contractor-measured airflow using ANSI / ACCA 5 QI-2015 protocol.	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Room-by-room airflows verified by contractor to be within the greater of $\pm 20\%$ or 25 CFM of design airflow.	<input type="checkbox"/>	<input type="checkbox"/>



# National HVAC Commissioning Checklist <sup>1, 2</sup>

## ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 10)

### Footnotes

1. This Checklist is designed to align with the requirements of ANSI / ACCA's 5 QI-2015 protocol, thereby improving the performance of HVAC equipment in new homes when compared to homes built to minimum code. However, these features alone cannot prevent all ventilation, indoor air quality, and HVAC problems (e.g., those caused by a lack of maintenance or occupant behavior). Therefore, this Checklist is not a guarantee of proper ventilation, indoor air quality, or HVAC performance.  
This Checklist applies to split air conditioners, unitary air conditioners, air-source heat pumps, and water-source (i.e., geothermal) heat pumps up to 65 kBtuh with forced-air distribution systems (i.e., ducts) and to furnaces up to 225 kBtuh with forced-air distribution systems (i.e., ducts). All other permutations of equipment (e.g., boilers, mini-split / multi-split systems) and distribution systems are exempt.
2. For a home certified in the State of ID, MT, OR, or WA, the following alternatives and exemptions apply:
  - a. For a home with an air-source heat pump up to 65 kBtuh with a forced-air distribution system (i.e., ducts), the contractor is permitted to complete the 2011 PTCS<sup>®</sup> Commissioned Heat Pump Certificate and Startup Form in lieu of this Checklist.
  - b. For a home with a split air conditioner or unitary air conditioner up to 65 kBtuh with a forced-air distribution system (i.e., ducts), the contractor is permitted to complete the Northwest Central AC Commissioning & Startup Form in lieu of this Checklist.
  - c. For a home in a location with < 600 CDD, the completion of this Checklist is recommended, but not required.
3. The term 'Rater' refers to the person(s) completing the third-party verification required for certification. The person(s) shall: a) be a Certified Rater, Approved Inspector, or an equivalent designation as determined by a Verification Oversight Organization such as RESNET; and, b) have attended and successfully completed an EPA-recognized training class. See [www.energystar.gov/newhomestraining](http://www.energystar.gov/newhomestraining).
4. Either factory-installed or field-installed TXV's may be used. For field-installed TXV's, ensure that sensing bulbs are insulated and tightly clamped to the vapor line with good linear thermal contact at the recommended orientation, usually 4 or 8 o'clock.
5. Air balancing of supply registers and return grilles is highly recommended to improve the performance of the HVAC system and comfort of the occupants, but is not required at this time for certification. When air balancing is completed, balancing dampers or proper duct sizing shall be used instead of looped or coiled ductwork to limit flow to diffusers. When balancing dampers are used, they shall be located at the trunk to limit noise unless the trunk will not be accessible when the balancing process is conducted. In such cases, Opposable Blade Dampers (OBD) or dampers located in the duct boot are permitted to be used.



# ENERGY STAR Certified Homes, Version 3 (Rev. 07) Water Management System Builder Checklist <sup>1,2</sup>

Home Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

1. Water-Managed Site and Foundation	Must Correct	Builder Verified	Rater Verified	N/A
1.1 Patio slabs, porch slabs, walks, and driveways sloped $\geq 0.25$ in. per ft. away from home to edge of surface or 10 ft., whichever is less. <sup>3</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Back-fill has been tamped and final grade sloped $\geq 0.5$ in. per ft. away from home for $\geq 10$ ft. See Footnote for alternatives. <sup>3</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Capillary break beneath all slabs (e.g., slab on grade, basement slab) except crawlspace slabs using either: $\geq 6$ mil polyethylene sheeting, lapped 6-12 in., or $\geq 1$ in. extruded polystyrene insulation with taped joints. <sup>4, 5, 6</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4 Capillary break at all crawlspace floors using $\geq 6$ mil polyethylene sheeting, lapped 6-12 in., & installed using one of the following opt's: <sup>4, 5, 6</sup>				
1.4.1 Placed beneath a concrete slab; OR,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4.2 Lapped up each wall or pier and fastened with furring strips or equivalent; OR,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4.3 Secured in the ground at the perimeter using stakes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5 Exterior surface of below-grade walls of basements & unvented crawlspaces finished as follows: a) For poured concrete, masonry, & insulated concrete forms, finish with damp-proofing coating. <sup>7</sup> b) For wood framed walls, finish with polyethylene and adhesive or other equivalent waterproofing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Class 1 vapor retarder not installed on interior side of air permeable insulation in ext. below-grade walls. <sup>8</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7 Sump pump covers mechanically attached with full gasket seal or equivalent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8 Drain tile installed at the exterior side of footings of basement and crawlspace walls, with the top of the drain tile pipe below the bottom of the concrete slab or crawlspace floor. Drain tile surrounded with $\geq 6$ in. of $\frac{1}{2}$ to $\frac{3}{4}$ in. washed or clean gravel and with gravel layer fully wrapped with fabric cloth. Drain tile level or sloped to discharge to outside grade (daylight) or to a sump pump. <sup>9</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. Water-Managed Wall Assembly</b>				
2.1 Flashing at bottom of exterior walls with weep holes included for masonry veneer and weep screed for stucco cladding systems, or equivalent drainage system. <sup>10</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Fully sealed continuous drainage plane behind exterior cladding that laps over flashing in Item 2.1 and fully sealed at all penetrations. Additional bond-break drainage plane layer provided behind all stucco and non-structural masonry cladding wall assemblies. <sup>10, 11</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Window and door openings fully flashed. <sup>12</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. Water-Managed Roof Assembly</b>				
3.1 Step and kick-out flashing at all roof-wall intersections, extending $\geq 4$ " on wall surface above roof deck and integrated shingle-style with drainage plane above; boot / collar flashing at all roof penetrations. <sup>13</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 For homes that don't have a slab-on-grade foundation and do have expansive or collapsible soils, gutters & downspouts provided that empty to lateral piping that discharges water on sloping final grade $\geq 5$ ft. from foundation, or to underground catchment system not connected to the foundation drain system that discharges water $\geq 10$ ft. from foundation. See Footnote for alternatives & exemptions. <sup>4, 14</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Self-sealing bituminous membrane or equivalent at all valleys & roof deck penetrations. <sup>4</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 In 2009 IECC Climate Zones 5 & higher, self-sealing bituminous membrane or equivalent over sheathing at eaves from the edge of the roof line to $> 2$ ft. up roof deck from the interior plane of the exterior wall. <sup>4</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. Water-Managed Building Materials</b>				
4.1 Wall-to-wall carpet not installed within 2.5 ft. of toilets, tubs, and showers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Cement board or equivalent moisture-resistant backing material installed on all walls behind tub and shower enclosures composed of tile or panel assemblies with caulked joints. Paper-faced backerboard shall not be used. <sup>15</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3 In Warm-Humid climates, Class 1 vapor retarders not installed on the interior side of air permeable insulation in above-grade walls, except at shower and tub walls. <sup>8</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4 Building materials with visible signs of water damage or mold not installed or allowed to remain. <sup>16</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5 Framing members & insulation products having high moisture content not enclosed (e.g., with drywall) <sup>17</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Builder Employee: _____ Builder Signature: _____ Date: _____				
Builder has completed Builder Checklist in its entirety, except for items that are checked in the Rater Verified column (if any) <sup>2</sup> Rater Signature: _____ Date: _____				

## Notes:

- The specifications in this Checklist are designed to help improve moisture control in new homes compared with homes built to minimum code. However, these features alone cannot prevent all moisture problems. For example, leaky pipes or overflowing sinks or baths can lead to moisture issues and negatively impact the performance of this Checklist's specified features.



# ENERGY STAR Certified Homes, Version 3 (Rev. 07)

## Water Management System Builder Checklist<sup>1,2</sup>

2. Upon completion, the builder shall return the Checklist to the Rater for review. Alternatively, at the discretion of the builder and Rater, the Rater may verify any item on this Checklist. When this occurs, the Rater shall check the box of the verified items in the Rater Verified column. The Rater is only responsible for ensuring that the builder has completed the Builder Checklist in its entirety and for verifying the items that are checked in the Rater Verified column (if any). The Rater is not responsible for assessing the accuracy of the field verifications for items in this Checklist that are not checked in the Rater Verified column. Instead, it is the builder's exclusive responsibility to ensure the design and installation comply with the Checklist.
3. Swales or drains designed to carry water from foundation are permitted to be provided as an alternative to the slope requirements for any home, and shall be provided for a home where setbacks limit space to less than 10 ft. Also, tamping of back-fill is not required if either: proper drainage can be achieved using non-settling compact soils, as determined by a certified hydrologist, soil scientist, or engineer; OR, the builder has scheduled a site visit to provide in-fill and final grading after settling has occurred (e.g., after the first rainy season).
4. Not required in Dry (B) climates as shown in 2009 IECC Figure 301.1 and Table 301.1.
5. Not required for raised pier foundations with no walls. To earn the ENERGY STAR, EPA recommends, but does not require, that radon-resistant features be included in homes built in EPA Radon Zones 1, 2 & 3. For more information, see [www.epa.gov/indoorairplus](http://www.epa.gov/indoorairplus).
6. For an existing slab (e.g., in a home undergoing a gut rehabilitation), in lieu of a capillary break beneath the slab, a continuous and sealed Class I or Class II Vapor Retarder (per Footnote 8) is permitted to be installed on top of the entire slab. In such cases, up to 10% of the slab surface is permitted to be exempted from this requirement (e.g., for sill plates). In addition, for existing slabs in occupiable space, the Vapor Retarder shall be, or shall be protected by, a durable floor surface. If Class I Vapor Retarders are installed, they shall not be installed on the interior side of air permeable insulation or materials prone to moisture damage.
7. Interior surface of existing below-grade wall (e.g., in a home undergoing a gut rehab.) listed in Item 1.5a is permitted to be finished by:
  - Installing a continuous and sealed drainage plane, capillary break, Class I Vapor Retarder (per Footnote 8) and air barrier that terminates into a foundation drainage system as specified in Item 1.8; OR
  - If a drain tile is not required as specified in Footnote 9, adhering a capillary break and Class I Vapor Retarder (per Footnote 6) directly to the wall with the edges taped/sealed to make it continuous.

Note that no alternative compliance option is provided for existing below-grade wood-framed walls in Item 1.5b.

8. The 2009 IRC defines Class I vapor retarders as a material or assembly with a rating of  $\leq 0.1$  perm, as defined using the desiccant method with Procedure A of ASTM E 96. The following materials are typically rated at  $\leq 0.1$  perm and therefore shall not be used on the interior side of air permeable insulation in above-grade exterior walls in warm-humid climates or below-grade exterior walls in any climate: rubber membranes, polyethylene film, glass, aluminum foil, sheet metal, foil-faced insulating sheathings, and foil-faced non-insulating sheathings. These materials can be used on the interior side of walls if air permeable insulation is not present (e.g., foil-faced rigid foam board adjacent to a below-grade concrete foundation wall is permitted).

Note that this list is not comprehensive and other materials with a perm rating  $\leq 0.1$  also shall not be used. Also, if manufacturer specifications for a specific product indicate a perm rating above 0.1, then the material may be used, even if it is in this list. Also note that open-cell and closed-cell foam generally have perm ratings above this limit and may be used unless manufacturer specifications indicate a perm rating  $\leq 0.1$ . Several exemptions to these requirements apply:

- Class I vapor retarders, such as ceramic tile, may be used at shower and tub walls;
  - Class I vapor retarders, such as mirrors, may be used if mounted with clips or other spacers that allow air to circulate behind them.
9. Alternatively, either a drain tile that is pre-wrapped with a fabric filter or a Composite Foundation Drainage System (CFDS) that has been evaluated by ICC-ES per AC 243 are permitted to be used to meet this Item. Note that the CFDS must include a soil strip drain or another ICC-ES evaluated perimeter drainage system to be eligible for use. In an existing home (e.g. in a home undergoing a gut rehab.) a drain tile installed only on the interior side of the footings is permitted. Additionally, a drain tile is not required when a certified hydrologist, soil scientist, or engineer has determined that a crawlspace foundation, or an existing basement foundation (e.g., in a home undergoing a gut rehab.), is installed in Group I Soils (i.e. well-drained ground or sand-gravel mixture soils), as defined by 2009 IRC Table R405.1.
  10. These Items not required for existing structural masonry walls (e.g., in a home undergoing a gut rehabilitation). Note this exemption does not extend to existing wall assemblies with masonry veneers.
  11. Any of the following systems may be used: a monolithic weather-resistant barrier (i.e., house wrap) shingled at horizontal joints and sealed or taped at all joints; weather resistant sheathings (e.g., faced rigid insulation) fully taped at all "butt" joints; lapped shingle-style building paper or felts; or other water-resistive barrier recognized by ICC-ES or other accredited agency.
  12. Apply pan flashing over the rough sill framing, inclusive of the corners of the sill framing; side flashing that extends over pan flashing; and top flashing that extends over side flashing or equivalent details for structural masonry walls.
  13. Intersecting wall siding shall terminate 1 in. above the roof or higher, per manufacturer's recommendations. Continuous flashing shall be installed in place of step flashing for metal and rubber membrane roofs.
  14. The assessment of whether the soil is expansive or collapsible shall be completed by a certified hydrologist, soil scientist, or engineer. As an alternative, a roof design is permitted to be used that deposits rainwater to a grade-level rock bed with a waterproof liner and a lateral drain pipe that meets discharge requirements per Item 3.2. As another alternative, a rainwater harvesting system is permitted to be used that drains overflow to meet discharge requirements per Item 3.2.
  15. In addition to cement board, materials that have been evaluated by ICC-ES per AC 115 may also be used to meet this requirement. Monolithic tub and shower enclosures (e.g., fiberglass with no seams) are exempt from this backing material requirement unless required by the manufacturer. Paper-faced backerboard may only be used behind monolithic enclosures or waterproof membranes that have been evaluated by ICC-ES per AC 115, and then only if it meets ASTM mold-resistant standards ASTM D3273 or ASTM D6329.
  16. If mold is present, effort should be made to remove all visible signs of mold (e.g., by damp wipe with water and detergent). If removal methods are not effective, then the material shall be replaced. However, stains that remain after damp wipe are acceptable. Lumber with "sap stain fungi" is exempt from this Item as long as the lumber is structurally intact.
  17. For wet-applied insulation, follow manufacturer's drying recommendations. EPA recommends that lumber moisture content be  $\leq 18\%$ .

## **SECTION 05 50 00**

### **METAL FABRICATIONS**

#### **PART 1 GENERAL**

##### **1.01 WORK INCLUDED**

- A. Provide miscellaneous metals as indicated on the drawings and specified herein. Work includes, but is not limited to:
1. Ladders.
  2. Loose steel lintels.
  3. Steel railings and handrails; work includes design.
  4. Downspout boot castings.
  5. Loose leveling and bearing plates.
  6. Miscellaneous steel framing and supports which are not indicated as part of structural steel work.
  7. Miscellaneous steel members to be embedded in concrete.
  8. Elevator sill angles and elevator intermediate structural supports.
  9. Counter supports.
  10. Supports above ceilings for ceiling hung items.
  11. Aluminum pipe and tube guardrailings systems at Juliet openings

##### **1.02 RELATED SECTIONS**

- A. Sustainable Design Requirements: Section 01 81 13.
- B. Structural Steel: Section 05 12 00.
- C. Painting: Section 09 90 00.
- D. Alternates: Section 01 23 00.

##### **1.03 REFERENCES**

- A. Steel Construction Manual: American Institute of Steel Construction (AISC).
- B. American Welding Society (AWS).
1. AWS D1.1 - Structural Welding Code - Steel.
  2. AWS D1.3 – Structural Welding Code – Sheet Steel.
  3. AWS D1.2 – Structural Welding Code – Aluminum.
  4. AWS D1.6 – Structural Welding Code – Stainless Steel
- C. American Society for Testing and Materials (ASTM).

1. ASTM A36 - Structural Steel.
2. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless.
3. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. ASTM A283 – Low and Intermediate Tensile Strength Carbon Steel Plates.
6. ASTM A307 - Carbon Steel Bolts and Studs Externally and Internally Threaded Fasteners, 60,000 PSI Tensile Strength.
7. ASTM A325 – Structural Bolts, Steel, Heat Strengthened, 120/105 KSI Minimum Tensile Strength.
8. ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
9. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
10. ASTM A510 - General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel.
11. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
12. ASTM A569 - Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality.
13. ASTM A570 - Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.
14. ASTM A611 - Steel Sheet, Carbon, Cold-Rolled, Structural Quality.
15. ASTM A780 - Practice for Repair of Damaged Hot-Dip Galvanized Coatings.

D. American National Standards Institute (ANSI)

1. ANSI A14.3 - Safety Requirements for Fixed Ladders
2. ANSI Z49.1 – Safety in Welding, Cutting and Allied Processes

E. National Association of Architectural Metal Manufacturers, (NAAMM).

F. Society for Protective Coatings (SSPC)

1. SSPC-SP1 - Solvent Cleaning
2. SSPC-SP2 - Hand Tool Cleaning
3. SSPC-SP3 - Power Tool Cleaning
4. SSPC-SP6 - Commercial Blast Cleaning
5. SSPC-SP11 - Power Tool Cleaning to Bare Metal

1.04 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design metal stairs and railings and ladders, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

- 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

#### 1.05 SUBMITTALS

- A. Shop Drawings - General: Submit for all items.
- B. Shop Drawings – Handrails and Guardrails: Indicate in detail construction, gages of metals, jointing, methods of installation, fastening and supports, location and sizes of welds, anchors, hangers and other pertinent information and data.
  - 1. In addition, submit plans and details of stairs and handrails, drawn to scale not less than 1/4 inch per foot.
  - 2. Shop drawings shall contain design, type of steel and load assumption, bearing the seal of a licensed professional engineer registered in the State of Ohio.
- C. Samples: Submit samples of materials or workmanship, if requested by the Architect.
- D. Stair manufacturer's certificate of compliance with the Architectural Products Division of the National Association of Architectural Metal Manufacturer's AMP 510 Metal Stairs Manual materials, construction and installation specification.
- E. Special Environmental Requirements: Submit the following in accordance with Section 01 81 13:

#### 1.06 QUALITY ASSURANCE

- A. Fabricate and install metal items in accordance with applicable standards of AISC and NAAMM. Welding and related procedures in accordance with AWS.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1 - Structural Welding Code - Steel.
  - 2. AWS D1.2 - Structural Welding Code - Aluminum.
- C. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- D. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of miscellaneous metal work.

Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

1.07 PROJECT CONDITIONS

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

1.08 COORDINATION

- A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of miscellaneous metal work. Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

1.09 STORAGE AND HANDLING

- A. Protect from corrosion.
- B. Store materials in a weathertight and dry place until ready for use in the work.
- C. Store packaged materials in their original unbroken package or container.

**PART 2 PRODUCTS**

2.01 MATERIALS

A. Ferrous Metals

1. Steel Shapes, Bars and Plates: ASTM A36.
2. Steel Plates to be Bent or Cold Formed: ASTM A283, Grade C.
3. Steel Pipe: ASTM A53, Type E or S, Grade B, black standard weight.
  - a. Pipe Bollards: Heavy weight, schedule 80.
4. Steel for Gratings: ASTM A569 or A36.
  - a. Wire Cross Bars for Gratings: ASTM A510.
5. Steel Tubing: ASTM A500, Grade A, cold-formed; or ASTM A501, hot-formed.
6. Steel Sheets: Hot-rolled ASTM A570, Class 1, Grade 36; or cold-rolled ASTM A611, Grade C, Type 1.
7. Galvanized Steel Sheets: ASTM A653 Grade 33, G90 coating.

B. Aluminum

1. Structural Shapes, Plates and Bars: ASTM B209, 6061-T5.
2. Non-Structural Plates: ASTM B209, 3003.
3. Extruded Structural Pipe and Tube: ASTM B429, 6063-T5 and ASTM B221, alloy 6061-T6/T62, Fy = 35 ksi.

4. Aluminum Extrusions: ASTM B221, Alloy 6063-T6
- C. Gray Iron Castings: ASTM A48, minimum Class 30B.
- D. End Welded Studs
1. Material: Compatible with material to which it is attached.
  2. Type: Automatically end welded in the shop or field, head or bent top.
  3. Welding Procedures: In strict conformance with manufacturer's recommendations.
  4. Size: Diameter and length as indicated.
- E. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded

## 2.02 FASTENERS

- A. General
1. Provide fasteners of types as required for assembly and installation of fabricated items.
  2. Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941; Class Fe/Zn 5; at exterior walls.
- B. Bolts, Nuts and Washers: Regular hexagon head type, externally and internally threaded fasteners; include necessary nuts and plain hardened washers. Provide the following materials/finishes:
1. Steel: ASTM A307 Grade A bolts; A563 nuts. For members for support of structural members or connection thereto, provide ASTM A325 bolts.
  2. Stainless Steel: ASTM F 593 for bolts and ASTM F 594 for nuts, Alloy Group 1
- C. Expansion Anchors: Stainless steel "DH Bolts" or "Ankr Tite" devices by WEJ-IT or similar by REDHEAD, HILTI or SIMPSON. Length as required to provide minimum 2-1/2" embedment into sound masonry.
- D. Adhesive Type Anchor Bolts – In Hollow CMU: Chemically grouted adhesive anchor systems with nylon or stainless steel screen inserts. Use 1/2 inch diameter anchors, unless otherwise noted.
1. HIT HY-70 Adhesive Anchors, HILTI, INC.
  2. EPCON System, ITW/RAMSET/RED HEAD
  3. Chem-Stud Adhesive Anchors, RAWLPLUG COMPANY, INC.
  4. Simpson Set Epoxy- Tie Adhesive Anchors, SIMPSON STRONG- TIE COMPANY, INC.

- E. Adhesive Type Anchor Bolts - In solid grouted CMU and Concrete: Chemically grouted adhesive anchor systems. Use  $\frac{3}{4}$  inch diameter anchors, unless otherwise noted.
1. HIT HY 200 or RE-500 V "Safe Set System" Adhesive Anchors, HILTI, INC.
  2. EPCON System, ITW/RAMSET/REDHEAD
  3. Chem-Stud Adhesive Anchors, POWERS FASTENERS, INC.
  4. Simpson Set Epoxy-Tie Adhesive Anchors, SIMPSON STRONG-TIE COMPANY, INC.
- F. Miscellaneous Fasteners
1. Lag Bolts: ANSI B18.2.1.
  2. Machine Screws: Cadmium plated steel, ANSI B18.6.3.
  3. Wood Screws: Flat head carbon steel, ANSI B18.6.1.
  4. Plain Washers: Round, carbon steel, ANSI B18.22.1
  5. Toggle Bolts: Tumble-wing or spring wing type, FS FF-B-588, type, class, and style as required.
  6. Lock Washers: Helical spring type carbon steel, ANSI B18.21.1.

## 2.03 FABRICATION

- A. General
1. Workmanship
    - a. Construct all items to ensure ease of installation and minimal field adjustment.
    - b. Use materials of size and thickness shown, or, if not shown, of required size and thickness to produce strength and durability in finished product. Ease exposed edges to a radius of approximately  $\frac{1}{32}$  inch. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
    - c. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces. Grind crotches to  $\frac{1}{8}$ " radius.
    - d. Form exposed connections with hairline joints, flush and smooth.
  2. Field Measuring: Field measure all items required to obtain proper fit.
  3. Exposed mill names and logos not permitted in finished work.
- B. Ladders
1. Fabricate ladders for the locations shown with dimensions, spacings, details and anchorages as indicated. Comply with the requirements of ANSI A14.3 and OSHA, except as otherwise indicated.
    - a. Unless otherwise shown on the drawings, provide  $\frac{1}{2}$  inch x 2- $\frac{1}{2}$  inch continuous structural steel flat bar stringers with eased edges, spaced 18 inches apart.

- b. Provide 1 inch diameter solid structural steel bar rungs, spaced maximum 12 inches on center.
  - 2. Center rungs on stringers, plug weld and grind smooth on outer rail faces.
  - 3. Coat top of each rung with aluminum oxide granules set in epoxy adhesive to provide non-slip surface.
  - 4. Finish: Hot-dip galvanize after fabrication.
- C. Handrail/Guardrail: Fabricate as indicated on the drawings.
  - 1. Material: Steel pipe or shapes as detailed; meeting the requirements specified herein for the specific material.
    - a. Juliet Railings: Aluminum shapes as detailed
      - 1) Basis of Design: SUPERIOR ALUMINUM PRODUCTS Ultra Fencing.**
  - 2. Loadings: Steel guardrails and handrails shall meet the following load requirements:
    - a. Welded construction, fabricated, complete with connectors to structure designed for a concentrated load of 200 pounds applied at any point and in any direction on the handrail and at the top of the guardrail and in compliance with OBC.
    - b. Guardrails: Designed and constructed for a load of 50 pounds per lineal foot applied horizontally at the required guardrail height and a simultaneous load of 100 pounds per lineal foot applied vertically downward at the top of the guardrail.
    - c. Guardrails: Designed and constructed to resist a 200 pound concentrated horizontal load applied on a one foot square area at any point in the system including intermediate rails or other elements serving this purpose.
    - d. Handrails: Designed and constructed for a load of 50 pounds per lineal foot applied in any direction and in compliance with the OBC.
    - e. Loading conditions in paragraphs a, b, c and d shall not be applied simultaneously, but each shall be applied to produce maximum stress in each of the respective components or any of the supporting components.
  - 3. Verify dimensions on site prior to shop fabrication.
  - 4. Railing system shall be assembled in a shop in largest sizes for delivery to site and for installation; to minimize field-splicing and assembly.
    - a. Rails shall be disassembled only as necessary for shipping and handling.
    - b. Rails shall be marked for re-assembly and coordinated installations.
  - 5. Close open ends of railings, not scheduled to be closed with finials, with close fitting steel plates welded in place and ground smooth.
  - 6. Welded Connection: Cope intersections of rails and posts, weld joints and grind smooth. Butt weld end-to-end joints of railings, or use welding connections at fabricator's option.
  - 7. Form simple and compound curves by bending pipes in jigs to produce uniform curves.
    - a. Maintain profile of pipes throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces.

8. Space posts and wall brackets as indicated. If not indicated, 7'-0" maximum center to center.
  9. Brackets, Flanges and Anchors: Provide for railing posts and handrail supports. Provide inserts and sleeves as required for anchorage to concrete or masonry.
  10. Provide wall returns at ends of wall mounted rails.
  11. For Exterior Installations: Provide weepholes or other means for evacuation of water trapped in pipe rails.
  12. Expansion Joints: Provide expansion joints at locations indicated. If not indicated, locate at intervals not to exceed 40 feet.
    - a. Provide slip-joint interval sleeve extending beyond joint on each side; secure sleeve to one side.
    - b. Do not locate expansion joints closer than 6" from post.
  13. Toe Boards: Where indicated, provide toe boards around openings and at edge of open-sided floors and platforms.
    - a. Fabricate to dimensions and details shown.
- D. Miscellaneous Steel Lintels: Provide sizes and shapes as indicated with 8" minimum bearing each jamb, unless otherwise noted. When lintel is fabricated of two or more members to accommodate thickness of wall, weld adjacent members to form a single unit.
1. Unless otherwise indicated, provide one 3-1/2" wide angle leg for each nominal 4" wythe of masonry.
- E. Miscellaneous Embedded Items: Provide steel members of shapes and size required per drawings. Equip members to be anchored into concrete or masonry with welded on anchor straps or weld studs as shown or required. Spacing and location of anchors per drawings, but if not otherwise detailed, provide at ends and at maximum intervals of 12" with minimum two per member.
- F. Miscellaneous Framing and Supports
1. Provide as indicated on drawings.
  2. Fabricate members and assemblies to size, shape and dimensions detailed with provisions to receive adjacent construction supported by such items.
- G. Miscellaneous Loose Steel Items: Provide steel shapes such as channels, angles, plates, protection posts, etc., as indicated on drawings.
- H. Accessories: Provide all clips, bolts, anchors, fasteners, etc., as required for completion of miscellaneous metal work. Type, size and strength as noted or as suitable for conditions and construction involved.
- J. Counter Supports:
1. Surface Mounted: 1/8" steel with 45 degree notch that allows for wall cleat and wire run clearance.
    - a. Load to Deformation: 1500 lbf/pair minimum.

- b. Finish: Powder coated paint.
  - c. Manufacturer: A&M HARDWARE or approved equal
- 2. In-Wall Mounted (Concealed): Fabricate from steel angles and welded in sizes indicated or as required.
  - a. Load to Deformation: 650 lbf/pair minimum.
  - b. Finish: Powder coated paint.
- 3. Accessories: Provide all required fasteners to structure type provided.

## 2.04 FINISHES

- A. Preparation: Grind all exposed cut surfaces as required to remove burrs and sharp edges.
- B. Galvanizing
  - 1. Galvanize all ferrous metal items exposed to weather, embedded in masonry or concrete, and where indicated.
  - 2. Hot-dip galvanize after fabrication in accordance with ASTM A123; provide minimum of 2 oz. of galvanizing (Grade 85) per sq. ft. of subsurface. Prepare and pretreat surfaces as recommended by galvanizer. Do not weld after galvanizing.
  - 3. Galvanizing Repair Paint: Minimum 79% zinc dust by weight in dried film. TNEMEC COMPANY, INC., No. 92 Tneme-Zinc; ZRC Cold Galvanizing Compound by ZRC, Zinc-rich Galvax by ALVIN PRODUCTS.
  - 4. Do not use stainless steel or other non-galvanized fasteners in the assembly of galvanized components.
- C. Shop Painting (Non-galvanized Ferrous Metal)
  - 1. Cleaning: After fabrication, clean all items of loose scale, rust, oil, dirt or other foreign matter.
  - 2. Minimum Surface Preparation: Hand tool cleaning SSPC SP-2 or SP-11. Where required, blast clean in accordance with SP-6.
  - 3. Solvent Cleaning (SSPC Spec. No. SP-1): Perform where necessary.
  - 4. Paint: One shop coat of paint compatible with the finish paint system. Section 09 91 00.
- D. Aluminum Surfaces Railings
  - 1. Shop paint aluminum surfaces with baked-on organic polymer thermosetting powder coating applied over conversion coating.
  - 2. Finish Coating Properties
    - a. Hardness: H or better in accordance with ASTM D3363.
    - b. Crosshatch Adhesion: In accordance with ASTM D3359.
    - c. Salt Spray Resistance: 1,000 hours, tested in accordance with ASTM D117.
    - d. Humidity Resistance: 1,000 hours tested in accordance with ASTM D2247.
    - e. Detergent Immersion: 1,000 hours tested in accordance with ASTM

D2248.

3. Colors: As Indicated.

### **PART 3 EXECUTION**

#### **3.01 PREPARATION**

- A. Coordinate and furnish anchorages, settings drawings, diagrams, templates, instructions and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

#### **3.02 INSTALLATION**

##### **A. General**

1. **Fastening to In-Place Construction:** Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
2. **Cutting, Fitting and Placement:** Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and level. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
3. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
4. **Field Welding:** Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work. Comply with the following requirements:
  - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - b. Obtain fusion without undercut or overlap.
  - c. Remove welding flux immediately.
  - d. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
5. **Protection from Dissimilar Materials:** Coat all aluminum surfaces in contact with steel, concrete or masonry with one coat of heavy bodied bituminous paint. Where aluminum contacts steel surfaces, and only where specifically approved, the painting required on the steel surface may be substituted for the bituminous paint.

B. Handrail

1. Adjust railings prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or specified herein. Plumb posts in each direction. Secure posts in each direction. Secure posts and railing ends to building construction as follows.
2. Anchor posts to concrete as indicated on the drawings.
3. Weld posts to channels as indicated.
4. Secure handrails to wall with wall brackets. Provide brackets with not less than 1-1/2" clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required for design loading. Secure wall brackets and wall return fittings to concrete or masonry with expansion bolts.

3.03 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

**END OF SECTION**

## **SECTION 06 40 00**

### **ARCHITECTURAL WOODWORK**

#### **PART 1 GENERAL**

##### 1.01 WORK INCLUDED

- A. Provide architectural woodwork as indicated and specified. Work includes:
  - 1. Custom casework and shelving units
  - 2. Plastic laminate countertops
  - 3. Mantle assembly
  - 4. **Shelving and accessories.**
    - a. **Adjustable shelving, plastic laminate finish.**

##### 1.02 RELATED SECTIONS

- A. Wood Blocking: Section 06 10 50
- B. Finish Carpentry: Section 06 20 00.
- C. Wood Casework: Section 12 32 00.
- D. Sustainable Design Requirements: Section 01 81 13.

##### 1.03 REFERENCES

- A. Standards: Wherever the following abbreviations are used herein, they shall refer to the corresponding standard:
  - 1. ANSI: American National Standards Institute.
  - 2. AWI: Architectural Woodwork Institute.
  - 3. NEMA: National Electrical Manufacturer's Association.
  - 4. P.S.: U.S. Product Standard.

##### 1.04 SUBMITTALS

- A. Product Data: Submit for all items.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
  - 1. Provide large scale details.
  - 2. Indicate methods of fabrication, edging, location and construction of joints.
  - 3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other

## Sections

- C. AWI Quality Standards: A photo-copy of the applicable portions of the AWI publication "Architectural Woodwork Quality Standards", latest edition, shall be submitted with each set of shop drawings.
  - 1. Each copy must be marked to clearly show all details, specifications and finishes proposed for this work.
- D. Submit samples of all finish materials, including the following:
  - 1. Plastic laminate for texture and color selections. (8" x 10").
  - 2. Cabinet hardware (1 of each type).
  - 3. Solid or quartz surface material.
- E. Manufacturer's product data describing type and quality of the following:
  - 1. Plastic laminate (face grade and liner grade).
  - 2. Cabinet hardware (each type).
- F. Submit certification that fire-retardant treatment materials comply with governing ordinances and meet or exceed ASTM E84 tests. Include certification by treating plant that treatment will not bleed through finish surfaces. Materials shall bear UL label showing Flame Spread 25 or less and smoke developed 40 or less. Mill certification is not acceptable.
- E. Sustainable Design Documentation Submittals: Comply with Section 01 81 13.
  - 1. VOC Limits: Include documentation verifying product Low Emitting Material.
  - 2. Building Product Disclosures and Optimization.

### 1.05 DEFINITIONS

- A. Exposed Portions of Casework: Include surfaces visible when doors and drawers are closed. Bottoms of casework more than 4 feet above floor and tops less than 6 feet 6 inches above floor shall be considered as exposed. Visible members in open cases or behind glass doors also shall be considered as exposed portions.
- B. Semi-Exposed Portions of Casework: Includes those members behind opaque doors, such as shelves, divisions, interior faces of ends, case back, drawer sides, backs and bottoms, and back face of doors. Tops of casework 6 feet 6 inches or more above floor shall be considered semi-exposed.
- C. Concealed Portions of Casework: Include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

### 1.06 QUALITY ASSURANCE

- A. Fabricator qualifications: A firm specializing in the fabrication of millwork with a minimum of 5 years experience and a satisfactory record of performance on projects of comparable size and quality. Shop is in compliance with all AWI's Quality Certification Program requirements.
- B. Installation: Performed only by skilled finish carpenters with a minimum of 3 years experience in installing custom millwork similar to that required for this project.
- C. All solid surface material type work shall be performed by a Manufacturer Certified fabricator.
- D. Provide lumber factory marked with type, grade, mill and grading agency identification on concealed surfaces. Omit marking and submit mill certificates for materials to receive transparent finishes that cannot be marked on a concealed surface.
- E. Quality Grade: Materials and fabrication shall be "custom grade" unless otherwise indicated on the drawings or specified herein as "premium grade", both in accordance with "Quality Standard Illustrated," of the AWI conforming to the following sections:
  - 1. Section 100: Solid wood members.
  - 2. Section 200: Plywood and particleboard.
  - 3. Section 400: Casework and tops.
  - 4. Section 1700: Installation of architectural woodwork.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Protect woodwork materials and items during delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver woodwork materials and items until concrete, masonry, painting, grinding and other similar wet work has been completed and is thoroughly dry, outside door openings are permanently watertight, exterior windows are glazed and, in case of temperature dropping below 60° F., until temporary heating and ventilating systems are in operation.
- C. Store materials in dry, well-ventilated spaces with constant minimum temperature of 60° F., and maximum relative humidity of 55%.
  - 1. Do not store adhesives with materials that have a high capacity to absorb VOC emissions (i.e., materials which are woven, fibrous or porous in nature, such as acoustical ceilings, carpets, textiles, etc.).
  - 2. Do not store adhesives in occupied spaces.

1.08 PROJECT CONDITIONS

- A. Provide and maintain a constant temperature and humidity before, during and after installation as required to maintain optimum moisture content of installed materials.

- B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

#### 1.09 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.

### **PART 2 PRODUCTS**

#### 2.01 MATERIALS

- A. General: Provide materials that comply with Project Sustainable Design Requirements and Low Emitting Material goals.
- B. Lumber
  - 1. Provide lumber surfaced four sides (S4S) and worked to profiles and patterns shown. Nominal sizes are as shown, except where detailed dimensions are indicated.
  - 2. Moisture Content: Provide materials kiln-dried to maximum moisture content of 6% complying with AWI Standards, Section 100-G-3.
  - 3. Softwood Lumber: Comply with PS-20, "American Softwood Lumber Standard," and with applicable rules of grading and inspection agency for species indicated.
    - a. Western Red Cedar, Ponderosa Pine, White Pine: Western Lumber Grading Rules, published by Western Wood Products Association (WWPA), or Standard Grading Rules for West Coast Lumber, No. 16, published by West Coast Lumber Inspection Bureau (WCLIB).
  - 4. Species: Fabricator's option.
- C. Softwood Plywood: Thickness as indicated. Formaldehyde free.
  - 1. Concealed Use: APA-BB-EXPOSURE I, with exterior glue (Plyform).
  - 2. Comply with PS-1, "Construction and Industrial Plywood".

- D. Particle Board (Substrate for Laminate Surfaces): High density industrial grade with a minimum density of 45 pounds per cubic foot and a moisture content between 12% maximum and 8% minimum, meeting or exceeding ANSI A208.1 grade M-2 minimum or ASTM D1037; formaldehyde-free. ASTM E84, Class A.
1. ARAUCO Vesta FR Particleboard
  2. SIERRAPINE Encore FR
  3. PANEL SOURCE INTERNATIONAL Pyroblock Platinum Particleboard
- E. Hardwood Lumber: In accordance with AWI 300, "Custom" Grade, and AWI 100, Grade I, except no checks will be allowable on visible surfaces. Well seasoned and kiln dried. Moisture content at time of fabrication shall not exceed 6%.
1. Species and Cut: As indicated on casework details.
- F. Hardwood Plywood: "Custom" Grade, in accordance with AWI 200, Grade I (one-side or two side as required). MDF fiberboard core typical except veneer core permitted for thickness less than 1/2". Thickness as indicated. Formaldehyde free
- G. Medium Density Fiberboard (MDF): Thickness as specified unless otherwise indicated on Drawings. Moisture content between 12% maximum and 7% minimum . Formaldehyde free. Meets ANSI A208.2 and the following minimum standards:
1. Internal Bond: 90 psi.
  2. Modulus of Rupture: 2,500 psi.
  3. Screw Holding Power: 325 pounds.
  4. Density: Minimum 40 pounds per cubic foot.
  5. Fire Rating: ASTM E84 Class A
    - a. Smoke Developed: 95
    - b. Flame Spread: 15
  6. Manufacturers
    - a. ARAUCO Vesta FR MDF
    - b. ROSEBURG FOREST PRODUCTS Medite FR
    - c. PANEL SOURCE INTERNATIONAL Pyroblock Platinum MDF
- H. Thermoset Decorative Overlay: Particle board or MDF with surface of thermally fused, melamine impregnated decorative paper complying with Laminating Materials Association (LMA) SAT-1 and NEMA LD 3, Grade VGL. Formaldehyde free.
- J. Plastic Laminate: Conform to the requirements of the National Electrical Manufacturer's Association (NEMA) Publication Number LD-3. Colors, patterns and finishes as indicated.
1. General Purpose Grade: 0.05 inches thick.
  2. Backing Sheet Grade: 0.02 inches thick.
  3. Post-Forming Grade: 0.042 inches thick.
  4. Cabinet Liner: 0.02 inches thick.

5. Provide solid color type where indicated on drawings.
6. Fill and seal plastic laminate joints with Seamfil by KAMPEL ENTERPRISES, INC. or equal. Colors to match plastic laminate.
7. Manufacturer and Color: As indicated
8. Other Acceptable Manufacturers: Solid surface manufactured by the following companies are acceptable providing they meet the requirements specified herein and the colors and pattern are an acceptable match as determined by the Architect.
  - a. FORMICA
  - b. PIONITE
  - c. NEVAMAR
  - d. WILSONART.
  - e. LAMINART

K. Hardware Items:

1. Drawer Slides: Self-closing, side mounting type with nylon tire, steel ball-bearing rollers. Manufactured by BLUM, GRASS, AMEROCK, KNAPE & VOGT; ACCURIDE. Load capacity as follows:
  - a. 75 pounds: Drawers up to 3-1/2 inches deep: Similar to ACCURIDE Series 2132.
  - b. 100 pounds: Drawers up to 8 inches deep: Similar to ACCURIDE Series 2832.
  - c. 150 pounds: Drawers over 8 inches deep, all file drawers: Similar to ACCURIDE Series 4034.
2. Drawer and Door locks: 5-pin tumbler, dead bolt. KENSTAN; BEST; COMPLEX NATIONAL; CORBIN. Provide 2 keys per cylinder.
3. Concealed Hinges: European style, self-closing, type as required for construction. HAFELE; GRASS; PRAMETE; BLUM.
4. Drawer and Door Pulls: As indicated.
5. Adjustable Cabinet Shelf Supports – Spoon Type: 5mm; nickel plated.
6. Catches: Magnetic, STANLEY #45 or equal by NATIONAL LOCK or EPCO.
7. Adjustable Cabinet Shelf Supports – Clip Type: KNAPE & VOGT steel nickel plated.
  - a. Standards: KV #255 NP for dado installation.
  - b. Clips: KV #256 NP.
8. **Surface Mount Shelf Supports: KNAPE & VOGT (KV); NEWTECH HARDWARE; SUGATSUNE AMERICA, steel cadmium plated heavy duty double slotted supports.**
  - a. **Standards: Equivalent to KV #85; unless otherwise indicated 48 inches high, maximum 30 inch spacing.**
  - b. **Brackets: Equivalent to KV #185; unless otherwise indicated, 3 per standard, for 12 inch shelf.**

I. Nails

1. Provide steel nails with diamond point for soft woods and blunt point for

- hardwoods.
- 2. Interior Work - Finishing Nails: 6d for 3/4" material; 9d or 10d for 5/4" material; and 12d for 1-1/2" material.
- J. Adhesive: Low-VOC, FS MMM-A-125C, Type II, water- and mold-resistant; complying with required VOC regulations.
- K. Quartz Composition Material: Non porous, scratch and high temperature resistant crushed quartz composition.
  - 1. Thicknesses: As indicated.
  - 2. Flexural properties: ASTM D 790, ASTM C 880
  - 3. Compression strength: ASTM C 170
  - 4. Certified food contact: NSF/ANSI 51 Certified.
  - 5. Surface burning characteristics - ASTM E 84: Class I or A, and as follows:
    - a. Flame spread: <25.
    - b. Smoke developed: <25.
  - 6. Joints: Provide watertight color matched, fused joints as recommended by manufacturer.
  - 7. Edge Treatment: As detailed on drawings. Ease all exposed edges not otherwise detailed.
  - 8. Manufacturer and Color: As indicated
  - 9. Other Acceptable Manufacturers: Solid surface manufactured by the following companies are acceptable providing they meet the requirements specified herein and the patterns and colors are an acceptable match as determined by the Architect.
    - a. DU PONT Corian
    - b. CAMBRIA
    - c. CAESERSTONE
    - D. LG VIATERA

## 2.02 FABRICATION

- A. General: Except as specified hereinafter, fabricate all work in accordance with AWI quality standards as specified. Work not specified with a level of quality shall be not less than "Custom" quality per AWI. All particle board panels to be balanced construction.
- B. Custom Casework
  - 1. Quality Standard: Custom Grade per AWI Section 400.
  - 2. "Flush Overlay" design as shown in AWI Architectural Casework Details.
  - 3. Core Materials
    - a. Partical Board: Typical for plastic laminated finish materials.
    - b. Plywood Core: Typical for wood veneered surfaces.
    - c. Solid Hardwood: Typical for all drawer construction, except drawer faces.
    - d. Hardboard or Luan Plywood: Drawer bottoms.
  - 4. Plastic Laminate Facing

- a. All exposed surfaces: Plastic laminate, general purpose grade. Include on exposed face and edges of all cabinets except where detailed otherwise on the drawings. Apply to all edges of doors and drawer fronts. Doors shall have laminate on both faces. Cabinet elements (tops, counters, face panels, end panels, rails, etc.) that are finished with laminate on the exposed surfaces shall have laminate balancing sheets on the concealed or semi-concealed faces.
    - 1) Back Panels: Standard 1/4" prefinished hardboard. Install in housed joints in surrounding panels.
  - b. A vinyl catalyzed factory finish (AWI Finish System No. 4) shall be applied to all semi-concealed surfaces that do not have a pressure laminate finish or a balancing sheet finish. This includes drawer interior and drawer sides, ends, edges and adjustable semi-concealed shelving.
  - c. At Contractor's option, the use of .025" thick cabinet Liner Grade laminate and .030" thick Backing sheet grade laminate may be used in lieu of AWI Finish System No. 4.
- 5. All casework material in 3/4" thick, excluding facing material thickness, unless otherwise detailed, required for stability, or doors in excess of 48" in any dimension. Drawer sides to be 1/2" thick; front and back 3/4"; bottom 1/4" thick.
  - 6. Adjustable Shelves: Install supports at each end of all shelves and intermediate supports at all shelves over 30".
  - 7. Design
    - a. Configuration of casework is indicated on drawings.
    - b. Detailing and design required to provide rigid, solid and structurally adequate casework is the responsibility of the fabricator; all within parameters of AWI specifications and as approved by the Architect.
    - c. The following conditions require special attention:
      - 1) Casework exceeding 42" in width between supports.
      - 2) Sink and/or equipment cutouts and supports.
      - 3) Countertops exceeding 24" unsupported.
      - 4) Wall and Ceiling Mounted Casework: Provide integral framing in casework of size, strength, and in locations which allow unit to be screw attached to proper substrate and remain rigidly in place.

C. Plastic Laminate Countertops

- 1. Quality Standard: Custom Grade per AWI Section 400.
- 2. Top Core: Construct tops of 3/4" thick particle board core typical; provide exterior grade plywood (Plyform) at counters with sinks (and associated splashes) and other locations where indicated on drawings.
  - a. Where double layers indicated, glue together to form monolithic 1-1/2" thick panel.
- 3. Splashes: Provide with minimum 1/4" scribe typical.
  - a. Integral coved back splash with permanently attached straight side splash coped into backsplash.

- b. Seal: Prior to permanent attachment of straight splashes to top, seal all joints by setting in continuous bead of clear silicone sealant.
- 4. Exposed Edges: Build exposed edges to 1-1/2" thick at overhang by attaching continuous strip of core material to bottom side of top.
- 5. Joints in core, if required, to be fitted with mechanical panel fasteners; spacing not to exceed 12" apart nor more than 3" from outside corners.
- 6. Finishes: Finish tops, splashes and edges with plastic laminate as follows:
  - a. General purpose grade
  - b. Balance underside of tops with backing sheets, 0.020".
  - c. Finish bottom of all overhangs with laminate.
- 7. Custom Edges: Finish as indicated on drawings.
- 8. Edges: Except where cabinet design requires matching laminate edge, provide 3mm PVC on Front & Back Edges, 1mm PVC on Side Edges.

**D. Adjustable Shelving – Plastic Laminate Finish: Fabricate to details indicated; conform to requirements for countertops specified herein.**

***PART 3 EXECUTION***

**3.01 PREPARATION**

- A. Condition architectural woodwork materials, items and products to average prevailing humidity conditions in installation areas before installing.
- B. Install blocking and anchoring devices built into substrates for anchorage of architectural woodwork.
- C. Deliver inserts and anchoring devices to be built into substrates well in advance of time substrates are to be built.
- D. Before installing woodwork, examine shop-fabricated work for completion and back priming.
- E. Ventilation for Adhesives: Comply, at a minimum, with the adhesive manufacturers' recommendations for space ventilation during and after installation. Maintain the following ventilation conditions during the adhesive curing period or for 72 hours after installation (whichever is longer): 1) supply 100% outside air 24 hours a day; 2) supply airflow at a rate of 6 air changes per hour, when outside air temperatures are between 55° F and 85° F and humidity is between 30% and 60%; and 3) supply airflow at a rate of 1.5 air changes per hour, when outside air conditions are not within the range stipulated in the previous item 2.

**3.02 INSTALLATION**

- A. Quality: Comply with AWI Section 1700.
- B. Install woodwork materials and products plumb, level, true and straight with no distortion. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including countertops, window stools and shelves),

and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offsets in revealed adjoining surfaces.

- C. Scribe and cut work to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Install countertops level, true to alignment, accurately fit to wall conditions and securely fastened to base units and other support systems as indicated.
  - 1. Solid Surface Type Countertops: Form joints using tinted adhesive as recommended by top manufacturer.
- E. Casework: Install without distortion so that doors and drawers will fit openings properly and be accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
- F. Anchor woodwork to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk concealed fasteners and blind nailing as required for a complete installation. Use fine finishing nail for exposed nailings, countersunk and filled flush with woodwork.

### 3.03 CLEANING AND PROTECTION

- A. Repair damaged and defective millwork to eliminate functional and visual defects. Where not possible to repair properly, replace millwork as directed by the Architect.
  - 1. Chipped, scratched or patched plastic laminate will not be accepted and must be replaced.
- B. Clean hardware, lubricate and make final adjustments for proper operation.
- C. Protect installed work during remaining construction operations.
- D. Clean woodwork on exposed and semi-exposed surfaces. Touch-up shop applied finishes to restore damaged or soiled areas.
- E. Cover completed casework with 4-mil polyethylene film protective enclosure, applied in a manner that will allow easy removal and without damage to woodwork or adjoining work. Remove cover immediately before the time of final acceptance.

**END OF SECTION**

**SECTION 07 21 00**  
**THERMAL INSULATION**

**PART 1 GENERAL**

1.01 WORK INCLUDED

- A. Perimeter and under slab insulation.
- B. Glass fiber blanket wall and ceiling insulation.
- C. Sound attenuation blankets in stud/gypsum board walls.
- D. Loose fill attic insulation
- E. Spray polyurethane foam insulation.**

1.02 RELATED SECTIONS

- A. Sustainable Design Requirements: Section 01 81 13.
- B. Roof Insulation: Section 07 54 23.
- C. Firestopping (Safing): Section 07 84 00.

1.03 SUBMITTALS

- A. Product Data: Submit for all items.
- B. Sustainable Design Documentation Submittals: Comply with Section 01 81 13.
  - 1. VOC Limits: Include documentation verifying product Low Emitting Material Building Product Disclosures and Optimization.
  - 2. All products to be compliant with CA Section 01350

1.04 QUALITY ASSURANCE

- A. Insulation Thermal Properties: Thermal conductivity k-factors and thermal resistance R-values indicated are values at 75 degrees F., mean temperature.
  - 1. Where insulation is identified by R-value, provide thickness required to achieve indicated R-value. Foam insulation R-values are "aged" thermal values in accordance with LTTR – Long Term Thermal Resistance predicted by ASTM C1289.
- B. Surface-Burning Characteristics: As determined by testing identical products

according to ASTM E84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver insulation materials in manufacturer's original, unopened, and labeled packages.
- B. Store insulation materials at the site inside storage trailers or the building in a dry, ventilated place. Exterior storage not permitted. Comply with manufacturer's recommendations for handling and protection during installation.
- C. Remove fibrous batt insulation that has become wet before or after installation. Replace with new, dry insulation.
- D. Protect plastic insulation from excessive exposure to sunlight. Protect at all times against ignition. Complete installation and covering of plastic insulation materials as rapidly as possible in each area of work.

**PART 2 PRODUCTS**

2.01 RIGID BOARD INSULATION - POLYSTYRENE

- A. Extruded-Polystyrene Board Insulation: ASTM C578, Type IV, 25 psi, 1.6 p/cf.; maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.
  - 1. Insulation in contact with ground to have  $\leq 0.3\%$  water absorption rate per ASTM C272
- B. Thicknesses: Provide the following unless otherwise indicated on the drawings.
  - 1. Perimeter/Under Slab Application: 2 inch.
  - 2. Masonry Cavity Wall Application: 2 inch.
- C. Adhesive: Types as recommended by insulation manufacturer for substrates and substrate coating materials where applicable.
- D. Manufacturer: Subject to compliance with requirements, provide products by DOW CHEMICAL Styrofoam; OWENS CORNING Foamular; KINGSPAN GreenGuard; DIVERSIFOAM PRODUCTS Certifoam

2.02 GLASS-FIBER BLANKET INSULATION

- A. Type: Glass fiber high density blanket designed to friction fit with metal. Manufacturers standard lengths; widths as required to fit framing conditions; Provide facings as follows:
  - 1. Unfaced: Conform to ASTM C665 Type I, with maximum flame-spread

and smoke-developed indexes of 25 and 50, respectively, per ASTM E84; passing ASTM E 136 for combustion characteristics.

2. Kraft Facing: Areas where insulation is not exposed (concealed behind gypsum board). Conform to ASTM C665 Type II, Class C, Category 1.
3. Flame Resistant Foil Facing: Areas where insulation is exposed (not covered by gypsum board or concealed interstitial space between faced insulation and gypsum wall board face). Conform to ASTM C665 Type III, Class A, Category 1; flame-spread index of 25 or less.

B. Thickness: 5 ½”.

1. R Value: R-21

C. Basis of Design: OWENS-CORNING High Density EcoTouch PINK Fiberglas

D. Other Manufacturer: Subject to compliance with requirements, provide equivalent products by JOHNS MANVILLE, FIBERGLASS, CERTAINTEED, GUARDIAN BUILDING PRODUCTS or KNAUF INSULATION.

E. Tape: Type as approved by insulation manufacturer.

#### 2.03 SOUND ATTENUATION BLANKETS

A. Type: Unfaced semi-rigid mineral fiber or glass fiber blankets. Conform to ASTM C665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

B. Thickness: 3 inch, unless otherwise indicated.

C. Manufacturer: Subject to compliance with requirements, provide products by JOHNS MANVILLE; THERMAFIBER, OWENS-CORNING FIBERGLAS, CERTAINTEED, ROXUL or FIBREX.

#### 2.04 LOOSE FILL INSULATION

A. Glass Fiber Loose-Fill Insulation. ASTM C 764 Type 1 for pneumatic application with maximum flame spread of and smoke indexes of 5 per ASTM E 84.

B. Manufacturer: Subject to compliance with requirements, provide products by OWENS-CORNING or CERTAINTEED

C. Thickness: As indicated.

#### 2.05 SPRAY POLYURETHANE FOAM INSULATION

**A. Closed-Cell Type**

- 1. Material: ASTM C1029, Type II minimum, closed cell polyurethane**

- foam insulation containing no CFC's, HCFC's and VOC's.
2. **Physical Properties**
    - a. **Density (ASTM D1622): Minimum 2.0 pcf**
    - b. **Closed cell content (ASTM D6226): >90%**
    - c. **Thermal Conductivity: R-Value = 6.4/inch. R-values are "aged" thermal values in accordance with PIMA Bulletin #101 and RIC/TIMA Bulletin #281-1 conditioning procedures**
    - d. **Water Absorption (ASTM D2842): Maximum 1.0% volume.**
    - e. **Water Vapor Transmission Permeability (perm-inch) (ASTM E96): 2.2.**
    - f. **Fire performance in accordance with ASTM E84 and UL 723 flame spread 25 or less and smoke development 450.**
    - g. **Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.**
  3. **Thickness: As indicated or as required to fill voids where applicable.**
  4. **Thermal Barrier: Where foam insulation is left exposed to building interior, provide approved 15 minute thermal or ignition barrier meeting the requirements of ASTM E 119, UL 1715, UL 1040 or NFPA 286 and IBC Section 2603.4 (minimum 1/2" gypsum board, intumescent coating or similar code complying material).**
    - a. **Bonding Agent: Provide suitable agent to ensure adequate bond between spray foam insulation and thermal barrier.**
  5. **Manufacturers: Subject to compliance with specified requirements, provide products by HENRY, DUPONT - DOW CHEMICAL, JOHNS MANVILLE, BASF, CERTAINTEED, GACO-WESTERN, PREFERRED SOLUTIONS, INC. or ICYNENE.**

**B. Open Cell Type**

1. **Material: Spray-applied polyurethane foam using water as a blowing agent, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.**
  - a. **Minimum density of 0.4 lb/cu. ft., thermal resistivity of 3.4 deg F x h x sq. ft./Btu x in. at 75 deg F.**
2. **Primer: Type as recommended by insulation manufacturer for adjacent and substrate surfaces.**
3. **Manufacturers: Subject to compliance with specified requirements, provide products by DEMILEC, GACO-WESTERN JOHNS MANVILLE or ICYNENE.**

2.05 ACCESSORY MATERIALS

- A. **Supplementary Support: Provide galvanized wire mesh, woven wire ties or flexible metal rods where required for supplementary support of insulation in permanent proper location.**
- B. **Insulation Clips**

1. Description: Perforated metal plates (2" x 2") with metal spindle welded and extending through center. Speed washer (1" x 1") snaps over spindle to secure insulation.
2. Adhesive: Type as recommended by clip manufacturer for adhesion to the various substrates.
3. Spacing: As recommended by manufacturer.
4. Spindle Length: As selected to ensure tight fit without compressing insulation so as to decrease insulation value.
5. Manufacturer: AGM INDUSTRIES, INC. Series T TACTOO Insul-Hangers; ECKEL INDUSTRIES OF CANADA; Stic-Klip Type N Fasteners; GEMCO; Spindle Type.

**PART 3 EXECUTION**

**3.01 PREPARATION**

- A. Examine substrates and installation conditions. Do not proceed with insulation work until unsatisfactory conditions have been corrected.
- B. Verify substrate surfaces are dry and free of irregularities or substances harmful to insulation. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.
- C. Verify mechanical and electrical services within walls have been installed and tested.
- D. Fill miscellaneous voids and spaces in wall framing and at window and door framing with batt insulation loosely stuffed in place.

**3.02 INSTALLATION OF RIGID BOARD INSULATION - PERIMETER INSULATION**

- A. Place at all slab-on-grade conditions at building perimeter.
- B. Adhere to substrate as required to maintain insulation in final location prior to backfilling.
- C. Coordinate placement of insulation with placement of vapor barrier. See Section 07 26 00.

**3.03 INSTALLATION OF BLANKET/BATT INSULATION**

- A. Install blanket type insulation with tight fitting butt joints. Provide supplementary support at vertical and horizontal installations when required to maintain insulation in permanent proper location.
  1. Spot adhere insulation to inside face of exterior sheathing or similar back-up material as required to maintain insulation in it's proper location.

- B. Fit insulation between members.
- C. Locate facing to room side, where applicable.
- D. Install interior wall sound attenuation at interior partitions where indicated on floor plans or wall types.

3.04            **INSTALLATION OF RIGID BOARD INSULATION - CAVITY WALL**

- A. Place insulation horizontally within cavity where indicated. Fit boards tightly together and around penetrations.
- B. Place to ensure tight joints between all insulation panels installed.
- C. Use manufacturer's suggested adhesive and or mechanical fasteners to bond the insulation panel to substrate. Keep perimeter fasteners 3/8" from edges and ends of boards
- D. CMU Backup Cavity: Place insulation panels to clear wall ties, yet maintain a tight joint between the panels.

3.05            **LOOSE FILL INSULATION**

- A. Apply according to ASTM C 1015 and manufacturer's written instruction. Level horizontal application to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.

3.06            **SPRAY FOAM INSULATION**

- A. Prepare surfaces as recommended by insulation manufacturer. Remove substances from metal deck or other metal surfaces that will prohibit insulation/metal bond. Apply primer where required by manufacturer.**
- B. Spray-Applied Insulation: Install Spray-application of polyurethane foam in accordance with ULC S705.2 and the manufacturer's instructions. Install in areas where indicated on the drawings. Fill all voids for a complete solid installation.**
- C. Trim, as needed, any excess thickness that would interfere with the application of cladding/covering system by other trades.**

**END OF SECTION**

## **SECTION 07 22 19.13**

### **NAILABLE WALL INSULATION**

#### **PART 1 GENERAL**

##### 1.01 WORK INCLUDED

- A. Provide nailable insulation at exterior metal stud walls.

##### 1.02 REFERENCES

- A. Reference Standards
  - 1. American Society for Testing and Materials
  - 2. FM: Factory Mutual.
  - 3. U.L.: Underwriters' Laboratories.

##### 1.03 SUBMITTALS

- A. Product Data: Submit for all items in accordance with the requirements of the General Conditions and Section 01 33 23. Include the following:
  - 1. Wall panel fasteners.
  - 2. Installation instructions

##### 1.04 QUALITY ASSURANCE

- A. Insulation Thermal Properties: Thermal conductivity k-factors and thermal resistance R-values indicated are values at 75 degrees F., mean temperature.
  - 1. Thickness / R Value: Long Term Thermal Resistance Values based on ASTM C 1289 and CAN/ULC S770 with a 15-year time weighted average.
- B. Core Physical Properties:
  - 1. Compressive Strength: ASTM D 1621; Grade 2, 20 psi (138 kPa) minimum or Grade 3, 25 psi (172 kPa).
  - 2. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
  - 3. Moisture Vapor Permeance: ASTM E 96, less than 1 perm (57.5ng/(Pa\*s\*m2)).
  - 4. Water Absorption: ASTM C 209, less than 0.1 percent by volume.
  - 5. Service Temperature: Minus 100 degrees to 250 degrees F (Minus 73 degrees C to 122 degrees C).
  - 6. Resistance to Mold: ASTM D 3273 Passed (10).

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver insulation materials in manufacturer's original, unopened, and labeled packages.
- B. Store insulation materials at the site inside storage trailers or the building in a dry, ventilated place. Exterior storage not permitted. Comply with manufacturer's recommendations for handling and protection during installation.
- C. Protect plastic insulation from excessive exposure to sunlight. Protect at all times against ignition. Complete installation and covering of plastic insulation materials as rapidly as possible in each area of work.

**PART 2 PRODUCTS**

2.01 NAILABLE INSULATION

- A. Description: Nailbase rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded on one side to a performance coated glass facer on one side and fire treated plywood on the other.
- B. Foam Board Type: ASTM C 1289, Type V Grade 2.
  - 1. Physical properties (Foam Core):
    - a. Compressive Strength: ASTM D 1621; Grade 2, 20 psi (138 kPa)
    - b. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
    - c. Moisture Vapor Permeance: ASTM E 96, less than 1 perm (57.5ng/(Pa\*s\*m2)).
    - d. Water Absorption: ASTM C 209, less than 0.1 percent by volume.
    - e. Resistance to Mold: ASTM D 3273 Passed (10).
    - f. Flame Spread - ASTM E84: 75.
    - g. Smoke Developed – ASTM E84: 450.
- C. Plywood Thickness: 1/2"
- D. Total Thickness: as indicated
- D. Mechanical Fasteners: Type and size as recommended by manufacturer for wall substrate conditions.
- E. Sealant: As required, sealant shall be specifically designed for use with Nailbase Insulation.

2.04 MANUFACTURERS

- A. Basis of Design: Nailable insulation indicated are based on HUNTER PANELS Xci Ply.

1. Other Manufacturers: DOW Thermax.

**PART 3 EXECUTION**

3.01 PREPARATION

- A. Examine substrate and installation conditions. Do not proceed with insulation work until unsatisfactory conditions have been corrected.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in exterior spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.
- E. Exposed insulation must be protected from open flame and kept dry at all times.
- F. Install air barriers over insulation panels.
- G. Exterior wall insulation is not intended to be left exposed for extended periods of time in excess of 45-60 days without adequate protection. If extended exposure is anticipated all exposed foam surfaces including corners, window and door openings, should be taped with a compatible waterproof tape.
- H. Install exterior cladding as recommended by the cladding manufacturer and as specified.

**END OF SECTION**

## **SECTION 07 27 26**

### **FLUID-APPLIED MEMBRANE AIR BARRIERS**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. This Section includes the following:
  - 1. Fluid applied vapor permeable air barrier.

##### **1.02 RELATED SECTIONS**

- A. Sustainable Design Requirements: Section 01 81 13.
- B. Joint Sealants for joint-sealant materials and installation: Section 07 92 00.

##### **1.03 DEFINITIONS**

- A. ABAA: Air Barrier Association of America.
- B. Air Barrier Assembly: The collection of air barrier materials and auxiliary materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

##### **[1.04 PRECONSTRUCTION TESTING**

- A. Mockup Testing: Air barrier assemblies shall comply with performance requirements indicated, as evidenced by reports based on mockup testing by a qualified testing agency.
  - 1. Contractor will engage a qualified testing agency.
  - 2. Qualitative Testing: Mockups will be tested for evidence of air leakage according to ASTM E1186, smoke pencil with pressurization or depressurization.
  - 3. Quantitative Air Leakage Testing: Testing of the mockup for air leakage will be conducted not to exceed the test pressure differential, positive and negative, indicated in "Performance Requirements" Article for air barrier assembly air leakage when tested according to ASTM E2178.
  - 4. Notify Architect seven days in advance of the dates and times when mockup testing will take place. ]

##### **1.05 REFERENCES**

- A. The following standards are applicable to this section:

1. ASTM E2178: Standard Test Method for Air Permeance of Building Materials.
2. ASTM E283: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
3. ASTM E1677 Specification for Air Retarder (AR) Material or System for Low-Rise Framed Building Walls
4. ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
5. ASTM E96: Water Vapor Transmission of Materials.
6. CGSB 37-GP-56M: Membrane, Modified, Bituminous, Prefabricated, and Reinforced.

#### 1.06 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of air barrier.
- B. Shop Drawings: Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction. Include details of interfaces with other materials that form part of air barrier. Include details of mockups.
- C. Product Certificates: For air barriers, certifying compatibility of air barrier and accessory materials with Project materials that connect to or that come in contact with the barrier; signed by product manufacturer.
- D. Qualification Data: For Applicator.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for air barriers.
- F. Sustainable Design Documentation Submittals: Comply with Section 01 81 13.
  1. VOC Limits: Include documentation verifying product Low Emitting Material Building Product Disclosures and Optimization.

#### 1.07 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Mockups: Before beginning installation of air barrier, [apply air barrier to masonry mock-up constructed under section 04 00 00] [build mockups cold-formed metal framing and sheathing construction indicated and apply air barrier] to

demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.

1. Coordinate construction of mockup to permit inspection by testing agency of air barrier before external insulation and cladding is installed.
2. Include junction with foundation wall intersection.
3. If Architect determines air barrier applications to mockups do not comply with requirements, reapply air barrier until approved.

C. Preinstallation Conference: Conduct conference at Project site.

1. Include installers of other construction connecting to air barrier, including roofing, waterproofing, architectural precast concrete, masonry, sealants, windows, glazed curtain walls, and door frames.
2. Review air barrier requirements including surface preparation, substrate condition and pretreatment, minimum substrate curing period, forecasted weather conditions, special details and sheet flashings, mockups, installation procedures, sequence of installation, testing and inspecting procedures, and protection and repairs.

D. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations and where applicable, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

E. Statement of Application: Submit statement signed by Contractor and installer, stating that work complies with these specifications and that the installation methods complied with the manufacturer's printed specifications and instructions for the conditions of installation and use on this project.

1. Contamination Profile: Manufacturer shall provide the Installer, Contractor and Owner with a tabular profile of chemicals, solutions, oils, compounds or materials which are injurious to the system. This profile shall be established by generic (or trade name) basis, including those materials normally found to exist in the work environment or likely to occur on this work. The system should not be exposed to materials (directly or indirectly) as established by the Contamination Schedule during application or after completion of the work.

#### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier manufacturer.
- B. Remove and replace liquid materials that cannot be applied within their stated shelf life.

- C. Store rolls according to manufacturer's written instructions.
- D. Protect stored materials from direct sunlight.

1.09 PROJECT CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air barrier manufacturer. Protect substrates from environmental conditions that affect performance of air barrier. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.10 WARRANTY

- A. Submit manufacturer's 10 year material warranty.

**PART 2 PRODUCTS**

2.01 FLUID-APPLIED MEMBRANE VAPOR/AIR BARRIER

- A. Fluid-Applied, Vapor Permeable Membrane Air Barrier: Cold-applied, elastomeric membrane.
  - 1. Products: Subject to compliance with requirements, provide either synthetic polymer or modified bituminous from one of the following:
    - a. HENRY COMPANY
    - b. CARLISLE COATINGS & WATERPROOFING
    - c. MEADOWS, W. R., INC.
    - d. STO CORPORATION
    - e. MOMENTIVE – GE
    - f. RUBBER POLYMER CORP.
    - g. MASTER BUILDERS SOLUTIONS
    - h. DOW - DUPONT
    - i. Subject to compliance with the specified performance requirements, products manufactured by others are acceptable upon Architects approval.
  - 2. Physical and Performance Properties
    - a. Air Permeability ASTM E2178: 0.004 cfm / ft<sup>2</sup> @ 1.57 lbs / ft<sup>2</sup> and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/ft<sup>2</sup> for 1 hour and gust wind load pressure of 62.8 lbs/ft<sup>2</sup> for 10 seconds when tested at 1.6 lbs/ft<sup>2</sup> to ASTM E331
    - b. Water vapor permeance: 10 - 14 perms to ASTM E96 Method B
    - c. Wet Film Thickness: Per manufacturer as required to achieve performance and code compliance.
    - d. Surface Burning: ASTM E 84 Class A flame spread and smoke developed.
    - e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
    - f. Adhesion to Substrate: Minimum 20 lbf/sq. in. when tested according to ASTM D 4541

- B. Self-adhering transition membrane: Vapor permeable air barrier membrane consisting of a microporous film laminate, backed with adhesive, which allows water vapor to permeate through while acting as a barrier to air and rain water. Membrane shall have the following physical properties:
1. Air leakage: <0.002 CFM/ft<sup>2</sup> @ 1.6 lbs/ft<sup>2</sup> to ASTM E283
  2. Membrane Thickness: 17 mils
  3. Low temperature flexibility -40 degrees F: Pass to ASTM D3111

## 2.02 AUXILIARY MATERIALS

- A. Primer and block filler: Liquid waterborne or solvent-borne primer recommended for substrate by manufacturer of air barrier material.
- B. Through-Wall Flashing and Transition Membrane (Self-Adhering): SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. Membrane shall have the following physical properties:
1. Membrane Thickness: 0.0394 inches (40 mils)
  2. Film Thickness: 4.0 mils
  3. Flow (ASTM D5147): Pass @ 212 degrees F
  4. Puncture Resistance: 134 lbf to ASTM E154
  5. Tensile Strength (film): 5723 psi ASTM D882
  6. Tear Resistance: 13lbs. MD to ASTM D1004
  7. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M
- C. Joint Reinforcing Strip: Air barrier manufacturer's glass-fiber-mesh tape.
- D. Substrate Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- E. Adhesive and Tape: Air barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- F. Stainless-Steel Sheet: ASTM A240, Type 304, 0.0187 inch thick, and Series 300 stainless-steel fasteners.
- G. Sprayed Polyurethane Foam Sealant: 1- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft density; flame spread index of 25 or less according to ASTM E162; with primer and non-corrosive substrate cleaner recommended by foam sealant manufacturer.
- H. Preformed Silicone-Sealant Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.
- I. Joint Sealant: ASTM C920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 07 92 00.

- J. Other materials as recommended by barrier manufacturer for a complete air and water tight barrier.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
  - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
  - 2. Verify that concrete has cured and aged for minimum time period recommended by air barrier manufacturer.
  - 3. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.
  - 4. Verify that masonry joints are flush and completely filled with mortar.
  - 5. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 SURFACE PREPARATION**

- A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate patching membrane.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

**3.03 JOINT TREATMENT**

- A. Concrete and Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C1193 and air barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D4258 before coating surfaces.

1. Prime substrate and apply a single thickness of preparation coat strip extending a minimum of 3 inches along each side of joints and cracks. Apply a double thickness of air barrier membrane and embed a joint reinforcing strip in preparation coat.
- B. Gypsum Sheathing: Fill joints greater than 1/4 inch with sealant according to ASTM C1193 and with air barrier manufacturer's written instructions. Apply first layer of fluid air barrier membrane at joints. Tape joints with joint reinforcing strip after first layer is dry. Apply a second layer of fluid air barrier membrane over joint reinforcing strip.

### 3.04 TRANSITION STRIP INSTALLATION

- A. Install strips, transition strips, and auxiliary materials according to air barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
  2. Install transition strip so that a minimum of 3 inches of coverage is achieved over both substrates.
- B. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- C. Connect and seal exterior wall air barrier membrane continuously to roofing membrane air barrier, concrete below-grade structures, floor-to floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- E. Apply joint sealants forming part of air barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Wall Openings: Prime concealed perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply manufacturer's recommended transition strip so that a minimum of 3 inches of coverage is achieved over both substrates. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.
1. Transition Strip: Roll firmly to enhance adhesion.

2. Elastomeric Flashing Sheet: Apply adhesive to wall, frame, and flashing sheet. Install flashing sheet and termination bars, fastened at 6 inches o.c. Apply lap sealant over exposed edges and on cavity side of flashing sheet.
  3. Preformed Silicone-Sealant Extrusion: Set in full bed of silicone sealant applied to walls, frame, and membrane.
- G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air barrier membrane with foam sealant.
- H. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- I. Seal top of through-wall flashings [, specified in Section 04 00 00,] to air barrier with an additional 6-inch- wide, strip.
- J. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- K. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

### 3.05 AIR BARRIER MEMBRANE INSTALLATION

- A. Apply air barrier membrane to form a seal with strips and transition strips and to achieve a continuous air barrier according to air barrier manufacturer's written instructions.
- B. Apply air barrier membrane within manufacturer's recommended application temperature ranges.
- C. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- D. Apply a continuous unbroken air barrier to substrates according to the following minimum thickness. Apply membrane in full contact around protrusions such as masonry ties.
1. Membrane Air Barrier: Dry film thickness as required by manufacturers written instructions or greater thickness as required to meet specified performance properties.
- E. Apply strip and transition strip a minimum of 1 inch onto cured air membrane according to air barrier manufacturer's written instructions.

- F. Do not cover air barrier until it has been tested and inspected by testing agency
- G. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.

### 3.06 FIELD QUALITY CONTROL

- A. Inspections: Air barrier materials and installation are subject to inspection for compliance with requirements. Inspections may include the following:
  - 1. Continuity of air barrier system has been achieved throughout the building envelope with no gaps or holes.
  - 2. Continuous structural support of air barrier system has been provided.
  - 3. Masonry and concrete surfaces are smooth, clean and free of cavities, protrusions, and mortar droppings.
  - 4. Site conditions for application temperature and dryness of substrates have been maintained.
  - 5. Maximum exposure time of materials to UV deterioration has not been exceeded.
  - 6. Surfaces have been primed, if applicable.
  - 7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
  - 8. Termination mastic has been applied on cut edges.
  - 9. Strips and transition strips have been firmly adhered to substrate.
  - 10. Compatible materials have been used.
  - 11. Transitions at changes in direction and structural support at gaps have been provided.
  - 12. Connections between assemblies (membrane and sealants) have complied with requirements for cleanliness, preparation and priming of surfaces, structural support, integrity, and continuity of seal.
  - 13. All penetrations have been sealed.
- B. Remove and replace deficient air barrier components and retest as specified above.

### 3.07 CLEANING AND PROTECTION

- A. Protect air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
  - 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace air barrier exposed for more than 60 days or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions..
  - 2. Protect air barrier from contact with incompatible materials and sealants not approved by air barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the

completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

- C. Remove masking materials after installation.

END OF SECTION

## **SECTION 07 41 13**

### **METAL ROOF PANELS**

#### **PART 1 GENERAL**

##### **1.01 WORK INCLUDED**

- A. Provide clipless, one-piece, positive-locking, standing seam system complete, including prefabricated roof sheets, fasteners, flashing, trim, gutters, snow guards and accessories as required for a watertight installation.

##### **1.02 RELATED SECTIONS**

- A. Sustainable Design Requirements: Section 01 81 13.
- B. Sealant: 07 92 00.

##### **1.03 REFERENCES**

- A. Standards
  - 1. American Society for Testing and Materials (ASTM).
    - a. B209: Aluminum Alloys Sheet and Plate.
    - b. A792: Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot-Dip Process, Structural Quality, minimum 50,000 psi yield strength in appropriate gage.
  - 2. National Roofing Contractors Association (NRCA).  
"The NRCA Construction Details".
  - 3. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)  
"Architectural Sheet Metal Manual".
  - 4. American Iron and Steel Institute  
"Light Gage Cold-Formed Steel Design Manual".
  - 5. American Architectural Manufacturers Association (AAMA)
    - a. AAMA 2605; Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing High Performance Organic Coatings on Architectural Extrusions and Panels.

##### **1.04 SUBMITTALS**

- A. Product Data: Submit manufacturer's literature for all items. Data to fully explain product indicating materials, sizes and finishes, and installation procedures.
- B. Sustainable Design Documentation Submittals: Comply with Section 01 81 13.
  - 1. VOC Limits: Include documentation verifying product Low Emitting

## Material Building Product Disclosures and Optimization.

- C. Shop Drawings: Submit for all items. Include the following:
  - 1. Panel profile and gage.
  - 2. Erection layout.
  - 3. Special framing details.
  - 4. Flashing details.
- D. Samples: Submit minimum 9 inch long by full width sample showing finish, pattern, color, gage and profile.
- E. Certification
  - 1. Submit written evidence from manufacturer of roofing system that installer is approved by manufacturer for installation of specified roofing system.
  - 2. Submit copies of production quality control test and written assurance from an officer of manufacturer that materials furnished for the project are the same type and dimension as that produced for tests.
- F. Submit invoices and documentation from manufacturer of the amounts of post-consumer and post-industrial recycled content by weight for products with specified recycled content.

### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications and Responsibilities
  - 1. Minimum 10 years experience in architectural roofing; and roof panel supplied shall have been in use for a minimum 10 years.
  - 2. Review and comment to Architect on shop drawings submitted.
- B. Installer Qualifications: Approved and authorized by roofing manufacturer.
  - 1. Provide supervisory personnel trained by roofing manufacturer in the proper application of product with a minimum related experience of 10 years.
  - 2. All Other Personnel: Minimum 5 years experience in sheet metal roofing with previous experience in comparable size projects.
- C. Wind Uplift: Meet or exceed requirements of U.L. for Class 90 Wind Uplift Resistance.
- D. Water Infiltration Under Static Pressure: Tested with sidelap sealant per ASTM E1646.
  - 1. No leakage through panel joints at 12.0 psf.

- E. Air Infiltration: Tested in accordance with ASTM E1680.
  - 1. 0.006 cfm per linear foot of joint at static test pressure differential of 20.00 psf.
- F. Wind Uplift Classification: The panel system shall be listed as a Class 90 windstorm rated system, as determined by UL 580.
- G. Painted Finishes: Factory painted finish to be performed by an applicator specifically approved by the paint manufacturer. The applicator shall provide written notification of approval by paint manufacturer prior to application of the finish.

1.06 HANDLING AND STORAGE

- A. Exercise care so as not to damage or deform materials.
- B. Stack on platforms or pallets and cover to protect from weather.
- C. Provide anti-stick compound or ply on finished surfaces to protect finish. Compound or ply shall be readily removable type with no adverse effects on finish.

1.07 WARRANTY

- A. Prior to completion of project, submit copies of the following:
  - 1. Panel manufacturer's 20 year warranty against structural defects and corrosion.
  - 2. Installation Contractor's 2 year guaranty on workmanship and watertightness.
  - 3. Provide manufacturer's guarantee of paint finish against failure of paint finish. Failure includes blistering, peeling, cracking, flaking, checking, excessive color change and chalking. Color change shall not exceed 5 N.B.S. units (per ASTM D523) and chalking shall not less than a rating of 8 per ASTM D4214.
    - a. Warranty Period: 20 years.

**PART 2 PRODUCTS**

2.01 MATERIALS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, bearing plates, sealants and accessories required for weathertight installation.
- B. Roofing Sheets: 24 gage, aluminum-zinc alloy-coated steel sheet, 50,000 psi minimum yield, structural grade 50A, coating designation AZ50 per ASTM A792.

- C. Joints: Standing rib, approximately 1" to 1 ½" high, 15" to 18" on center, with continuous groove capillary break. Securely lock ribs over concealed anchor clips with field applied mechanically sealed seam cover strips.
- D. Panel Length: Full length from ridge to eaves (or flashing break to flashing break). No end joints permitted in the field of a span length.
- E. Finish: Fluoropolymer finish containing not less than 70% PVDF (Kynar 500) resins; "Trinar" by AKZO; "Duronar" by PPG; "Fluoropon" by VALSPAR. Total dry film thickness not less than 1.0 mils, or coatings meet or exceed the requirements of AAMA 2605.
  - 1. Color: DMI Metallic Silver.
  - 2. Application: Apply coating systems in strict accordance with manufacturer's printed instructions and recommendations. Refer to Quality Assurance in Part 1.

## 2.02 ACCESSORIES

- A. Flashing, Trim and Accessories: Same material and finish as roofing panel. Gage of various components as designed by roofing manufacturer to meet design conditions encountered. Fabricate to profiles indicated.
  - 1. Flashing and Counterflashing: 0.0276".
  - 2. Gutters and Downspouts: 0.0396".
  - 3. Downspout Straps: 0.0635".
  - 4. Gutter Brackets and Supports: 0.0635".
  - 5. Fascia: 0.0396".
  - 6. Others: 0.0276".
- B. Exposed Flashing Fasteners: #300 stainless steel. For weathertightness, screws shall have separate washers with hot bonded neoprene faces and pop-rivets shall be set in wet sealant. Exposed fasteners shall be a minimum #14 size screw or 3/16" rivet. Locate fasteners so that leakage does not run directly inside the structure.
- D. Closures: Precut foam profile closures cut from a black closed cell foam meeting specification ASTM D1056 grade SCE-41 Black EPT. Field fabricated hip closures shall be gray PVC foam. All hip and ridge closures shall be supported and protected from weathering by a channel matching the roof and flashing.
- E. **Underlayment: Provide under entire metal roof surface.**
  - 1. **Material: Self adhering polyethylene sheet backed rubberized asphalt membrane, 40 mils thick. Provide primer as recommended by membrane manufacturer. Product to withstand high temperature applications, up to 260°F (127°C).**
  - 2. **Manufacturers: Bituthene HT Ice and Water Shield by W.R. GRACE; or equal by POLYKEN TECHNOLOGIES; POLYGUARD PRODUCTS;**

**GAF; or CERTAINTEED.**

- F. Sealant used with the roofing shall be applied between surfaces during assembly with a minimum amount exposed on the completed installation.
  - 1. Concealed sealant shall be a non-curing polyisobutylene tape of sufficient thickness to make full contact with both surfaces.
  - 2. Exposed Sealant: Urethane elastomeric type with excellent weathering and sunlight resistance. See Section 07 92 00.
    - a. Color: Match prefinished exterior metal.
    - b. Apply sealant in accordance with manufacturer's recommendations.
- G. **Snow Guards: Laser-cut machined grade 304 stainless steel., color as selected by Architect. SNO-GEM, SNO-JAX INC. SnowCatcher, or equal. Fasteners and sealant as recommended by snow guard manufacturer.**

2.03 FABRICATION

- A. Shop fabricate to the maximum extent practicable.
  - 1. Brake-form to the indicated arrangement and profile with sharply defined lines and with braked shapes sharp and true. Seams, ridges and other edges and corners are straight and well aligned.
  - 2. Tolerances: Maximum 1/16" in 8' of length (non-accumulative) and maximum 3/8" in 40' or more.
  - 3. Flat Planes: Free of wave, warp, buckle or other deficiencies in appearance.
  - 4. Seams
    - a. Standing Seams: Straight, of uniform height and profile and without wave.
    - b. Cross Seams: Lay out panels so cross seams, when required and permitted, will be made in the direction of flow with higher pans overlapping lower pans. Provide continuous sight line.

2.04 MANUFACTURER AND DESIGN

- A. Basis of Design: DIMENSIONAL METALS (DMI) Nail Strip NS15
- B. The following manufacturers and models are acceptable provided they meet the requirements specified herein and conform to the design intent indicated on the drawings.
  - 1. BERRIDGE MANUFACTURING
  - 2. MBCI
  - 3. AEP- SPAN
  - 4. FIRESTONE
  - 5. ATAS

- C. Design roofing system in accordance with the dimensions and general arrangements indicated on the drawings.

**PART 3 EXECUTION**

**3.01 INSPECTION**

- A. Before installation of panels, verify that the structure is ready to receive work. Check field dimensions and alignment of structural members to assure that the roof panels and flashing are straight and true.
- B. Notify Architect of conditions which may adversely affect the appearance of the installed roof; work on that location will not proceed until resolved by the Architect.

**3.02 INSTALLATION**

- A. Erect in accordance with Drawings and manufacturer's instructions and recommendations under the direct supervision of an experienced sheet metal craftsman trained in application of metal roofing.
- B. General
  - 1. Do not allow installed work of this section to be used as a storage space for other materials.
  - 2. Do not permit unnecessary walking on the finished roof. Require personnel to wear rubber-soled shoes when installing or walking on finished roof.
- C. Erect panels true and to the slopes indicated on the drawings. Final appearance of the roof shall be visually flat, straight and free from defects and dents.
- D. Install all work so as to allow for thermal movement without distortion or elongation of fastener holes.
- E. Installation Tolerance: Shim and align panel units within installed tolerance of 3/8" in 40' on level/plumb/slope and location/line as indicated, and within 1/8" offset of adjoining faces and of alignment of matching profiles.
- F. Install flashing in accordance with the recommended practices of AA, NRCA and SMACNA architectural sheet metal manuals, without fasteners in end laps.
- G. Seal all panel/panel, panel/trim, and accessory/panel joints to provide resistance to air and water penetration.

**3.03 FIELD TESTING**

- A. Conduct 5 random fastener pull tests in areas designated by Architect. Submit test results for comparison to design requirements.

**3.04 DAMAGED PANELS**

- A. Do not install panels that are bent, chipped, or otherwise damaged.
- B. Refinish all abraded surfaces to match original finish, using materials and methods recommended by roofing manufacturer. Materials shall be fully compatible with the original finish system.
- C. Repaired surfaces shall be uniform and free from variations in color and surface texture from that of adjacent, like surfaces.
- D. If repaired sheet is not acceptable to the Architect, remove sheet and replace with a new sheet, at no additional cost to the Owner.

3.05 CLEAN UP

- A. Clean all roofing surfaces of dirt, grime, excess sealant and other surface blemishes.
- B. Remove from the site all excess material, shipping cartons debris and etc., related to the roofing work.

3.06 PROTECTION

- A. Protect installed panels from abuse by other trades.
- B. Installing Contractor shall advise General Contractor of any necessities for protection from the work of other trades.

**END OF SECTION**

## **SECTION 08 19 00**

### **INTERIOR DOORS**

#### **PART 1 GENERAL**

##### 1.01 WORK INCLUDED

- A. Provide interior doors as indicated and specified.
  - 1. Interior Unit: Solid core, MDF painted, **two** panel with pre-hung frames.
  - 2. Unit Entry: Solid fire rated core, MDF painted, two panel.
    - a. Fire rating: 20 minute.
    - b. **Alternate: Stain grade veneer faced.**
  - 3. **Louvered doors: Stile and rail and wood louvered doors with half panel.**

##### 1.02 RELATED SECTIONS

- A. Installation: Section 06 20 00
- B. Hardware: Section 08 71 00.
- C. Hollow Metal Frames: Section 08 11 13.

##### 1.03 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for each type of wood door required.
  - 1. Include details of core and edge construction.
  - 2. Include certification indicating compliance with specification requirements.

##### 1.04 DELIVERY

- A. Deliver doors in manufacturer's original unopened protective packaging or wrapper.
- B. Store, handle and protect doors in accordance with manufacturer's recommendations to prevent damage, wetting, soiling and deterioration.
- C. Comply with AWI Section 1300-S-8 recommendations for care and handling at the site. Store doors inside the building, flat in a dry well-ventilated area.

##### 1.05 LABEL DOOR REQUIREMENTS

- A. Fire Ratings Compliance: Comply with the label requirements of NFPA and

applicable local codes. Fabricate doors and frames in accordance with requirements of NFPA Standard No. 80 and U.L. Standards.

B. Ratings Certifications

1. Provide U.L. labels permanently fastened on each door that is within the size limitations established by NFPA and U.L. for labeling.
2. Provide anchors for U.L. labeled frames required by the authority having jurisdiction.

**PART 2 PRODUCTS**

2.01 INTERIOR DOORS AND FRAMES – INTERIOR UNIT DOORS

A. Material - **Interior Unit** Frames

1. Provide lumber surfaced four sides (S4S) and worked to profiles and patterns required. Nominal sizes are as shown, except where detailed dimensions are indicated.
2. Moisture Content: Provide materials kiln-dried to moisture content complying with AWI Standards, Section 100-G-3.
3. Softwood Lumber: Comply with PS-20, "American Softwood Lumber Standard", and with applicable rules of grading and inspection agency for species indicated.
  - a. Western Red Cedar, Ponderosa Pine, White Pine: Western Lumber Grading Rules, published by Western Wood Products Association (WWPA), or Standard Grading Rules for West Coast Lumber, No. 16, published by West Coast Lumber Inspection Bureau (WCLIB).

B. Material - Medium Density Fiberboard (MDF): Thickness as specified unless otherwise indicated on Drawings. Maximum moisture content of 8%. Formaldehyde free. Meet the following minimum standards:

1. Internal Bond: 90 psi.
2. Modulus of Rupture: 2,500 psi.
3. Screw Holding Power: 325 pounds.
4. Density: Minimum 40 pounds per cubic foot.
5. Fire Rating: ASTM E84 Class A
  - a. Smoke Developed: 95
  - b. Flame Spread: 15

C. Pre-hung Door Assemblies, Solid core. Fabricate doors in accordance with WDMA I.S. 1A.

1. 1-3/4" thick with solid wood edge and sticking. Rails and stiles cores to be finger jointed wood. Interior unit doors to be pre-hung and pre-fit. Prepare for door hardware.
  - a. Interior Unit: Medium density fiberboard faced doors. 1 panel.
  - b. Unit Entry Doors: Medium density fiberboard faced doors. 2 panel.

- 1) Fire Rating: Fire rated core - 20 minutes
  2. Interior Unit Frames: Filled and primed medium or softwood. See Section 06 20 00 for door casing trim. Door frames to be fabricated assemblies with swing doors.
    - a. Unit Entry Doors: Hollow Metal Frames: Section 08 11 13.
  3. Finish
    - a. Interior Unit: Shop primed for field paint. See Section 09 91 00.
    - b. Unit Entry Doors: Shop primed for field paint. See Section 09 91 00.
  4. Style: Shaker sticking/profile.
  5. Finish: Smooth.
  6. Hardware: Scheduled in 08 71 00.
- D. Hinges at Prehung Doors: Unless otherwise indicated, provide the following:
1. Interior Hinges: Steel, with steel pin. Standard weight, five-knuckle.
  2. Screws: Phillips flat-head wood screws; screw heads finished to match surface of hinges.
- E. Basis of Design
1. Interior Unit: MASONITE Le Chateau

**PART 3 EXECUTION**

3.01 INSPECTION

- A. Examine substances, rough openings and installation conditions. Do not proceed with wood door installation until unsatisfactory conditions have been corrected.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 INSTALLATION

- A. Condition doors to average prevailing humidity in installation area before hanging.
- B. Install doors in accordance with manufacturer's installation instructions. Job fit doors and prepare to receive hardware. Bevel 1/8" in 2" at strike edges for clearance in arc of swing.
- C. Hang doors straight, plumb and square securely anchored into position. Adjust doors to provide uniform clearance and to contact stops uniformly. Remove and replace doors and frames which are warped, bowed or otherwise damaged.
- D. Install fire-rated doors in corresponding fire-rated frames in accordance with requirements of NFPA No. 80.

3.03 PROTECTION

- A. Protect installed doors from soiling, staining and damage until final acceptance.
- B. Repair or replace doors damaged beyond acceptable repair as directed by the Architect.

**END OF SECTION**

## **SECTION 08 41 13**

### **ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS**

#### **PART 1 GENERAL**

##### **1.01 WORK INCLUDED**

- A. Work under this section includes the design of the aluminum entrance and window systems and all materials, labor and equipment for the complete installation of the work as shown on the drawings and specified herein. Work includes:
1. Aluminum entrance doors.
  2. Aluminum entrance framing system for entrances, including sidelight and transom frames as indicated.
  5. Glass and glazing of the systems.
  6. Hardware.
  7. Anchors, fasteners, flashings, trim and accessories to complete the work.
  8. Sealants required within entrance and window construction.
  9. All gaskets, sealants and tapes required in final assembly of the work.
  10. Installation of lock cylinders furnished under Section 08 71 10.

##### **1.02 RELATED SECTIONS**

- A. Sustainable Design Requirements: Section 01 81 13.
- B. Joint Sealants: Section 07 92 00.
- C. Glazing: Section 08 81 00.
- D. Hardware: Section 08 71 10.

##### **1.03 QUALITY ASSURANCE**

- A. Provide aluminum doors and framing system manufactured by a single firm specializing in the production of this type of work.
- B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- C. Painted Finishes: Factory painted finish to be performed by an applicator specifically approved by the paint manufacturer. The applicator shall provide written notification of approval by paint manufacturer prior to application of the finish.

##### **1.04 REFERENCES**

- A. American Architectural Manufacturers Association (AAMA): Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing High Performance Organic Coatings on Architectural Extrusions and Panels, AAMA 2605.

1.05 SUBMITTALS

- A. Submit the following:
  - 1. Framing system details.
  - 2. Door details.
  - 3. Window details.
  - 4. Installation instructions.
  - 5. Itemized schedule of door hardware.
  - 6. Finish samples.
- B. Tests: Submit two copies of test reports made or witnessed by an independent testing laboratory showing the results of tests conducted on previously manufactured windows of the type used on this project. The reports shall verify conformance to thermal movement, air and water infiltration and structural properties as described herein.
- C. Building Shop Drawings: Include complete evaluations of all systems; details and methods of anchorage; details of construction finishes; methods of assembly; location and installation of hardware and reinforcement for same; size, shape and thickness of materials; joints and connections; details of joining with other work.
  - 1. Scale: Include typical unit elevation of each system at 1/2" scale and details at full scale where practical.
- D. Product Data: Submit manufacturer's specifications for materials and fabrication of work, and instructions and recommendations for installation and maintenance. Include certified test reports showing compliance with requirements where a test method is indicated.
- E. Samples: Submit samples of each type and color and finish required by this Section, on 12" sections of extrusions or formed shapes and on 6" squares of sheet/plate. Include two or more samples in each set.
  - 1. Architect reserves right to require fabrication samples showing prime members, joinery, anchorage, expansion provisions, glazing and similar details, profiles and intersections.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Pack, deliver, handle, store and protect materials from damage in accordance with AAMA Curtain Wall #10, "Care and Handling of Architectural Aluminum" recommendations.

1. Remove paper type wrappings when unloading.
2. Store materials inside the buildings whenever possible in clean, dry ventilated areas free of dust or corrosive fumes.
3. Stack members vertically or on edge, shim between components to provide water drainage and ventilation. Protect with adequate coverings, placed to provide adequate air circulation.
4. During installation, protect materials from lime mortar, run-off from concrete and copper, weld splatter, acids, roofing materials, solvents and abrasive cleaner.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.07 WARRANTIES

- A. Submit written warranty signed by manufacturer, Contractor, and installer agreeing to repair or replace work which fails in materials or workmanship within three (3) years of the date of project acceptance.
1. Failure of materials or workmanship shall include excessive leakage or air infiltration, excessive deflections and defects in accessories, weather seals and other components of work.
- B. Finish: Provide paint manufacturer's guarantee of paint finish against failure of paint finish. Failure includes blistering, peeling, cracking, flaking, checking, excessive color change and chalking. Color change shall not exceed 5 N.B.S. units (per ASTM D523) and chalking shall not less than a rating of 8 per ASTM D4214.
1. Warranty Period: 20 years.

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. Basis of Design: Drawings and specifications are based on products by KAWNEER CO.
- B. Other Acceptable Manufacturers: Equal products by the following manufacturers are acceptable providing they meet or exceed the requirements specified herein and conform to the design intent indicated on the drawings:
1. CRL – U.S. ALUMINUM
  2. EFCO
  3. OLDCASTLE BUILDING ENVELOPE
  4. TUBELITE DIVISION, INDAL, INC.

5. YKK AMERICA

2.02 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Sheet and Plate: ASTM B 209.
  2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
  3. Extruded Structural Pipe and Tubes: ASTM B 429.
  4. Structural Profiles: ASTM B 308.
- B. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
1. Structural Shapes, Plates, and Bars: ASTM A 36.
  2. Cold-Rolled Sheet and Strip: ASTM A 1008.
  3. Hot-Rolled Sheet and Strip: ASTM A 1011.

2.03 STOREFRONT, WINDOW FRAMING AND ENTRANCE DOOR SYSTEMS

- A. Type: An integrated system of extruded aluminum sections, glazing devices, sealing devices, doors and hardware and operable windows.
- B. Materials: Provide aluminum alloy and temper for each shape as recommended by manufacturer and processor to comply with requirements of performance, fabrication, and application of finish.
1. Thickness: As required to meet design requirements with a minimum of 1/8" for major sections.
- C. Framing: KAWNEER 451T, framing for 1" insulating glass.
1. Type: Thermally broken, outside glazed, fixed type framing as indicated on drawings.
  2. Frame
    - a. Members: Main frame members designated specifically for manufacture of aluminum windows extruded from 6063-T5 aluminum alloy.
    - b. Glazing: Extruded snap-in type bead. Units to accept 1" insulating glass.
    - c. Trim: Provide all trim, sills, flashings and closures to complete installation.
    - d. Size
      - 1) Sightline: Nominal 2".
      - 2) Depth: 4-1/2".

3. Glazing Plane: As indicated
  4. Special Framing Shapes: Provide as detailed or as required to maintain design intent as indicated on building elevations drawings and section drawings. Aluminum extruded shapes and bent aluminum sheet, minimum 0.063", finished after fabrication.
  5. Vestibule Framing: Non-thermally broken; dimensions to match exterior framing. KAWNEER Trifab II 451. Units to accept 1/4" glass.
  6. Interior Framing: Non-thermally broken. KAWNEER Trifab II 451. Units to accept glass thickness indicated.
    - a. Designed to resist a 200 lb/SF concentrated load in any direction where indicated on the drawings.
    - b. Size
      - 1) Sightline: Nominal 2".
      - 2) Sill Sightline: Nominal 4-1/2"
      - 3) Depth: 4-1/2".
  7. Provide extruded solid backed framing shapes where framing abuts solid wall conditions.
- D. Performance Requirements: Exterior window wall system (excluding doors) shall meet or exceed the following performance requirements.
1. Wind loads: Provide storefront system; include anchorage, capable of withstanding wind load design pressures indicated on the drawings.
  2. Thermal Movement: Window framing system shall be designed to provide for expansion and contraction of component materials caused by a surface temperature range of 180° F., without causing buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects.
    - a. Doors: Function properly over the above specified temperature range.
  3. Air Infiltration: Air leakage shall not exceed 0.06 cfm per square foot of fixed wall area when tested in accordance; with ASTM E283 at test pressure not less than 6.24 psf.
  4. Water Infiltration
    - a. Provide drainage to exterior face of framing any water entering at joints.
    - b. No uncontrolled water penetration shall occur when tested in accordance with ASTM E331, at test pressure not less than 8.0 psf.
  5. Structural Properties - Uniform Load: A static air design load of 20 psf shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
  6. Thermal Properties
    - a. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than (Glass to Center) 0.44 (low-e) BTU/hr/ft sq./degree F

- b. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than (Glass to Center) 62 frame and 68 glass (low-e)
- E. Glazed Aluminum Entrance Doors: Standard duty, wide stile, manufacturer's standard, single acting aluminum entrances. Provide thermally broken units without vestibules
  - 1. Stiles: Nominal 4 1/4" to 5" wide.
  - 2. Rails
    - a. Top: 4 1/4" to 5" wide.
    - b. Bottom: 10" high.
  - 3. Intermediate Rail: Provide if indicated.
  - 4. Section Wall Thickness: .125" for major components; 0.05" for glazing moldings.
  - 5. Door Thickness: 1-3/4" in vestibules. Provide thermally broken 2 1/4" units without vestibules.
  - 6. Corners: Stiles through design, joined by concealed bolts and weld.
  - 7. Provide complete with snap-in glazing stops and gaskets.
  - 8. Sizes: As indicated. Provide single or pairs of doors as scheduled.
  - 9. Exterior Entrance Weatherstripping: Stile with dual pile weathering with polymeric fin and bulb polymeric weatherstripping and pile weathering with polymeric fin in door frame system or equal by other approved manufacturer. Locate weatherstripping at jambs, head and meeting stiles (as applicable). Provide bottom rail with EPDM blade gasket sweep. Size sweep to close against door threshold. Sweep housing finish to match door finish.
  - 10. Glazing: 1/4" thick in vestibules, insulated units without vestibules, unless otherwise indicated.

## 2.04 FINISHES

- A. Finish: Fluoropolymer baked enamel finish with Kynar 500 (70%) resins by ELF ATOCHEM OF NORTH AMERICA INC.; "Trinar" by AKZO; "Duramar" by PPG; "Fluropon" by VALSPAR. Total dry film thickness not less than 1.0 mils, or coatings meet or exceed the requirements of AAMA 2605.
  - 1. Color: **Dark Bronze** - As selected by Architect from paint manufacturer's complete specified line.
  - 2. Application: Apply coating systems in strict accordance with manufacturer's printed instructions and recommendations. Refer to Quality Assurance in Part 1.
  - 3. Concealed members may be mill finished, providing they cannot be seen through the glass.

## 2.05 ENTRANCE DOOR HARDWARE

- A. Prepare and reinforce doors and frames for hardware. Factory fit and install hardware in accordance with Section 08 71 10 and manufacturer's requirements.

## 2.06 ACCESSORIES

- A. Fasteners: Aluminum, non-magnetic stainless steel or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum components. Finish exposed fasteners to match aluminum work.
- B. Flashing, Trim and Accessories: Provide as required to complete the work. Finish shall match aluminum entrances and storefront finishes. Work includes:
  - 1. Aluminum closure panels, flashing and trim.
  - 2. Concealed Flashing: Dead-soft stainless steel, 26 gauge minimum, type selected by manufacturer for compatibility.
  - 3. All trim materials shall be finished after fabrication, unfinished exposed edges at holes and trim terminations are not acceptable.
- C. Brackets and Reinforcements: Manufacturer's high strength aluminum units where feasible; otherwise, nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A123.
- D. Bituminous Coatings: Cold applied asphalt mastic complying with SSPC PS 12, compounded for 30 mil thickness per coat.

## 2.07 FABRICATION

- A. Provide manufacturer's standard fabrication and accessories that comply with indicated requirements. Minor dimension differences will be accepted in order to utilize manufacturer's standard products.
- B. Fit and assemble the work at the shop to the greatest extent possible. Disassemble only as required for shipment and erection. Maintain true continuity of line and accurate relation of planes and angles. Provide secure attachment and support at mechanical joints, with hairline fit of contacting members. Conceal fasteners wherever possible.
- C. Reinforce aluminum work as necessary at points of support or anchorage and at mechanical joints and points of attachment to meet performance requirements and for support of the system. Separate dissimilar metals with bituminous paint or preformed separators that will prevent corrosion. Separate metal surfaces at moving joints with plastic inserts or other non-abrasive concealed inserts.
- D. Coordinate work of this section with other work for proper sequence of construction without delays. Verify dimensions of supporting structure and other elements that precede wall system work before fabrication of required components. Provide for erection tolerances for other work where field measurements cannot be obtained.

## **PART 3 EXECUTION**

### 3.01 INSPECTION

- A. Examine substrates supporting structure, and installation conditions. Do not proceed with aluminum entrances erection until unsatisfactory conditions have been corrected.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

### 3.02 INSTALLATION

- A. General
  - 1. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraded and broken members.
  - 2. Remove and replace members that have been damaged during installation or thereafter before time of acceptance.
  - 3. Do not cut or trim component parts during erection, in a manner which would damage finish, decrease strength or result in a visual imperfection or a failure in performance of the work.
- B. Install components in accordance with the manufacturer's installation instructions and recommendations.
- C. Install component parts level, plumb, true to line and with uniform joints and reveals. Secure to structure with non-staining and non-corrosive shims, anchors, fasteners, spacers and fillers.
- D. Assembly and Anchorage: Anchor component parts securely in place, by bolting or other permanent mechanical attachment system, which will comply with performance requirements and permits movements as required.
  - 1. Anchor storefront sill to a continuous interior aluminum anchor.
- E. Apply a bituminous coating or other suitable separator on concealed contact surfaces of dissimilar materials, before assembly or installation to prevent corrosive or electrolytic action.
- F. Set sill members and entrance thresholds in a bed of sealant compound, or with joint fillers or gaskets to provide weathertight requirements.
- G. Install glass and glazing, in accordance with Section 08 81 00 and the manufacturer's requirements.
- H. Install joint sealants specified in Section 07 92 00, in accordance with the manufacturer's requirements.
- I. Coordinate installation of storefront framing with installation of air/vapor barrier transition membrane.

- J. Adjust operating hardware to function properly, without binding, and to provide tight proper fit at contact points and weatherstripping.

3.03 CLEANING AND PROTECTION

- A. Protect glass from breakage immediately upon installation, by attachment of streamers to framing held away from glass. Do not apply markings of any type to surfaces of glass.
- B. Remove protective coating when completion of construction activities no longer require its retention.
- C. Immediately before acceptance of the work, clean the aluminum entrance systems thoroughly, inside and out. Demonstrate proper cleaning methods to Owner's maintenance personnel during final cleaning. Prepare a "Cleaning and Maintenance Manual" listing types of cleaning compounds, cleaning methods, sealants and glazing materials used for cleaning, repair and maintenance of work and turn over to Owner upon acceptance of the work.

**END OF SECTION**

## **SECTION 08 43 14**

### **INTERIOR ALUMINUM STOREFRONT**

#### **PART 1 GENERAL**

##### **1.01 WORK INCLUDED**

- A. Provide aluminum storefront systems as shown and specified. Work includes:
  - 1. Aluminum framing.
  - 2. Glass and glazing of the systems.
  - 3. Anchors, fasteners, flashings, trim and accessories to complete the work.
  - 4. Sealants required within storefront construction.
  - 5. All gaskets, sealants and tapes required in final assembly of the work.

##### **1.02 RELATED SECTIONS**

- A. Joint Sealants: Section 07 92 00.
- B. Aluminum-Framed Entrances and Storefronts: Section 08 41 13.
- C. Glass and Glazing: Section 08 81 00.
- D. Door Hardware: Section 08 71 10.
- E. Sustainable Design Requirements: Section 01 81 13.

##### **1.03 REFERENCES**

- A. Architectural Aluminum Manufacturer's Association (AAMA)
- B. American Society for Testing and Materials (ASTM)
- C. American Architectural Manufacturers Association (AAMA): Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing High Performance Organic Coatings on Architectural Extrusions and Panels, AAMA 2605.

##### **1.04 QUALITY ASSURANCE**

- A. Provide interior aluminum storefront systems manufactured by a single firm specializing in the production of this type of work.

##### **1.05 SUBMITTALS**

- A. Submit the following in accordance with the General Conditions and Section 01 33 23:

1. Framing system details.
  2. Installation instructions.
  3. Finish samples.
- B. Shop Drawings: Include complete evaluations of all systems including doors; details and methods of anchorage; details of construction finishes; methods of assembly; location and installation of hardware and reinforcement for same; size, shape and thickness of materials; joints and connections; details of joining with other work.
- C. Product Data: Submit manufacturer's specifications for materials and fabrication of work, and instructions and recommendations for installation and maintenance. Include certified test reports showing compliance with requirements where a test method is indicated.
- D. Sustainable Design Documentation Submittals: Comply with Section 01 81 13.
1. VOC Limits: Include documentation verifying product Low Emitting Material Building Product Disclosures and Optimization.

#### 1.06 DELIVERY, STORAGE AND HANDLING

- A. Pack, deliver, handle, store and protect materials from damage in accordance with AAMA Curtain Wall #10, "Care and Handling of Architectural Aluminum" recommendations.
1. Remove paper type wrappings when unloading.
  2. Store materials inside the buildings in clean, dry ventilated areas free of dust or corrosive fumes.
  3. Stack members vertically or on edge, shim between components to provide water drainage and ventilation. Protect with adequate coverings, placed to provide adequate air circulation.
  4. During installation, protect materials from lime mortar, run-off from concrete and copper, weld splatter, acids, roofing materials, solvents and abrasive cleaner.

## **PART 2 PRODUCTS**

### 2.01 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Sheet and Plate: ASTM B 209.
  2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221.
  3. Extruded Structural Pipe and Tubes: ASTM B 429.

### 2.02 STOREFRONT SYSTEM

- A. Type: An integrated system of extruded aluminum sections, glazing devices, sealing devices.
- B. Framing:
  - 1. Provide complete with snap-in glazing stops and gaskets for the thicknesses of glass units indicated or specified. Provide rectangular glazing stops; triangular or beveled not permitted.
  - 2. Provide silicone glazed system framing members where indicated.
- C. Provide door frame extrusions as required to fit in storefront framing system or as individual framed opening as scheduled.
- D. Manufacturer: KAWNEER Trifab 450 CG." and "Trifab VG 450", 1-3/4" x 4-1/2" members. Equal products by VISTAWALL; EFCO, YKK AMERICA, RACO INTERIORS or TUBELITE are acceptable provided they comply with requirements stated herein.

2.03 FINISHES

- A. **Finish: Fluoropolymer baked enamel finish with Kynar 500 (70%) resins by ELF ATOCHEM OF NORTH AMERICA INC.; "Trinar" by AKZO; "Duranar" by PPG; "Fluropon" by VALSPAR. Total dry film thickness not less than 1.0 mils, or coatings meet or exceed the requirements of AAMA 2605.**
  - 1. **Color: Dark Bronze - As selected by Architect from paint manufacturer's complete specified line.**
  - 2. **Application: Apply coating systems in strict accordance with manufacturer's printed instructions and recommendations. Refer to Quality Assurance in Part 1.**
  - 3. **Concealed members may be mill finished, providing they cannot be seen through the glass.**

2.04 ACCESSORIES

- A. Fasteners: Aluminum, non-magnetic stainless steel or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum components. Finish exposed fasteners to match aluminum work.
- B. Brackets and Reinforcements: Manufacturer's high strength aluminum units where feasible; otherwise, nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A123.
- C. Bituminous Coatings: Cold applied asphalt mastic complying with SSPC PS 12, compounded for 30 mil thickness per coat.
- D. Clear Protective Coatings: Provide aluminum surfaces covered with strippable surfacing designed specifically for protection of aluminum finish.

## 2.05 FABRICATION

- A. Aluminum Storefronts: Provide manufacturer's standard fabrication and accessories which comply with indicated requirements. Minor dimension differences will be accepted in order to utilize manufacturer's standard products.
- B. Shop fabricate aluminum storefront systems. Fit and assemble the work at the shop to the greatest extent possible. Disassemble only as required for shipment and erection. Maintain true continuity of line and accurate relation of planes and angles. Provide secure attachment and support at mechanical joints, with hairline fit of contacting members. Conceal fasteners wherever possible.
- C. Reinforce aluminum work as necessary at points of support or anchorage and at mechanical joints and points of attachment to meet performance requirements and for support of the system. Separate dissimilar metals with bituminous paint or preformed separators which will prevent corrosion. Separate metal surfaces at moving joints with plastic inserts or other non-abrasive concealed inserts.
- D. Coordinate aluminum storefront systems work with other work for proper sequence of construction without delays. Verify dimensions of supporting structure and other elements which precede wall system work before fabrication of required components. Provide for erection tolerances for other work where field measurements cannot be obtained.

## **PART 3 EXECUTION**

### 3.01 INSPECTION

- A. Examine substrates supporting structure, and installation conditions. Do not proceed with aluminum storefront erection until unsatisfactory conditions have been corrected.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

### 3.02 INSTALLATION

- A. General
  - 1. Do not install component parts which are observed to be defective, including warped, bowed, dented, abraded and broken members. Remove and replace members which have been damaged during installation or thereafter before time of acceptance.
  - 2. Do not cut or trim component parts during erection, in a manner which would damage finish, decrease strength or result in a visual imperfection or a failure in performance of the work.
- B. Install the aluminum storefront systems in accordance with the manufacturer's

installation instructions and recommendations.

- C. Install component parts level, plumb, true to line and with uniform joints and reveals. Secure to structure with non-staining and non-corrosive shims, anchors, fasteners, spacers and fillers.
- D. Assembly and Anchorage: Anchor component parts securely in place, by bolting or other permanent mechanical attachment system, which will comply with performance requirements and permits movements as required.
- E. Apply a bituminous coating or other suitable separator on concealed contact surfaces of dissimilar materials, before assembly or installation to prevent corrosive or electrolytic action.
- F. Install aluminum storefront system glass and glazing, in accordance with Section 08 81 00 and the manufacturer's requirements.
- G. Install joint sealants within the aluminum storefront systems work with elastomeric joint sealants specified in Section 07 92 00, in accordance with the manufacturer's requirements.

### 3.03 CLEANING AND PROTECTION

- A. Protect glass from breakage immediately upon installation, by attachment of streamers to framing held away from glass. Do not apply markings of any type to surfaces of glass.
- B. Remove protective coating when completion of construction activities no longer require its retention.
- C. Immediately before acceptance of the work, clean the aluminum storefront systems thoroughly. Demonstrate proper cleaning methods to Owner's maintenance personnel during final cleaning. Prepare a "Cleaning and Maintenance Manual" listing types of cleaning compounds, cleaning methods, sealants and glazing materials used for cleaning, repair and maintenance of work and turn over to Owner upon acceptance of the work.
- D. Prepare a "Cleaning and Maintenance Manual" listing types of cleaning compounds, cleaning methods, sealants and glazing materials used for cleaning, repair and maintenance of work and turn over to Owner upon acceptance of the work.

**END OF SECTION**

## **SECTION 08 53 13**

### **VINYL WINDOWS AND PATIO DOORS**

#### **PART 1 GENERAL**

##### **1.01 SCOPE**

- A. Provide exterior single hung vinyl windows and sliding patio doors.
  - 1. Glass and glazing of the various window systems.
  - 2. Anchors, **nauling flange**, fasteners, flashings, receptors, trim and accessories to complete the work.

##### **1.02 RELATED SECTIONS**

- A. Sealant: Section 07 92 00.
- B. Alternates: Section 01 23 00.

##### **1.03 QUALITY ASSURANCE**

- A. Standards: Comply with the applicable provisions of American Architectural Manufacturers Association (AAMA) "Voluntary Specifications for Aluminum and Poly (Vinyl Chloride) (PVC) Prime Windows and Glass Doors, AAMA 101".
- B. Reference Standards: Wherever the following abbreviations are shown herein, they shall refer to the corresponding standard:
  - 1. AAMA: American Architectural Manufacturers Association.
  - 2. ASTM: American Society for Testing and Materials.
- C. Manufacturer: Products to be rated in accordance to NFRC
- D. Windows that require additional opening for egress are to be equipped with an ASTM F2090-10 compliant device, such as a Window Opening Control Device, which initially limits the opening of the window to no more than 4" as defined above, and provides a two-step mechanism allowing further operation to full egress.
  - 1. Verify requirement with Architect.
- E. Installer Qualifications: An installer acceptable to window manufacturer for installation of units required for this Project, not less than five (5) years of successful experience with a minimum of 5 projects similar in scope and complexity to this project.
- F. Manufacturer: Windows to be manufactured by a single firm with minimum five

years experience in fabrication of windows with a minimum of 5 projects similar in scope and complexity to this project.

#### 1.04 SUBMITTALS

- A. Submit the following in accordance with the General Conditions and Section 01 33 23.
  - 1. Submit manufacturer's product data and installation instructions. Submit shop drawings for fabrication and installation of windows. Include elevations and detail sections of every typical member.
  - 2. Submit finish samples.

#### 1.05 SAMPLE INSTALLATION

- A. Provide sample installation of windows and doors to determine acceptability of installation methods. Adjustments may be required by the Architect for compliance with the intent of the Contract Documents.
- B. Once the approval process is complete, the approved sample installation, modified as needed, will represent minimum installation quality for the work.
- C. Sample installation can be used in the finished work, when approved as such by the Architect.
- D. Window and door unit used for sample installation to be selected by Architect.

#### 1.06 DELIVERY AND STORAGE OF MATERIALS

- A. Pack, load, ship, unload, store and protect windows in a manner which will avoid abuse, damage and defacement in accordance with AAMA CW-10.
- B. Store all materials delivered to the site in locations designated by the Architect. Spaces will be located where stored materials will not be exposed to wetting or damage, and will permit easy access to and handling of the materials.
  - 1. Stack vertically or on edge so that water cannot accumulate on or within components.
  - 2. Use nonstaining wood or plastic shims between components to provide water drainage and air circulation.
- C. Deliver other materials, except bulk materials, to project site in manufacturer's unopened containers with name, brand type, grade and color fully indicated thereon. Store bulk materials as required to avoid any deleterious effects of weather, soiling or contamination.

#### 1.07 WARRANTY

- A. Warranty for all work in this Section to operate properly and be weathertight for the standard manufacturer's warranty.

- B. Provide Contractor's guarantee for all work under this Section to be free from defects of workmanship for a period on one year.

**PART 2 PRODUCTS**

2.01 SINGLE HUNG WINDOW

- A. Manufacturer: Drawings and specifications are based on Series 3000 windows by LINDSAY.
1. **Other Manufacturers: Windows by other manufacturers is acceptable, however substitutions must be approved by the Owner, through the Architect, during bidding. Approval process includes submission of product data, catalog cuts, design information and, where requested, a full size sample.**
- B. Type: Single hung units complying to AAMA 101 for DH-R40 specifications.
1. Design Pressure (Performance Class): 40 psf.
  2. Structural Test Pressure (Design Pressure x 1.5): 45 psf.
  3. Water Resistance Test Pressure - ASTM E547: 4.5 psf.
- C. Frame and Window
1. Member: Main frame and window members designed specifically for manufacturers of vinyl windows using hollow extrusions of rigid PVC.
  2. Minimum Wall Thickness:
    - a. Main Frame: .062".
    - b. Fixed Meeting Rail: .07".
  3. Main Frame Corners: Welded construction.
  4. Glazing: Extruded snap-in type PVC bead, allowing exterior glazing. Units to accept 7/8 inch thick insulating glass.
  5. Weatherstripping: Provide around entire perimeter of all operating sash.
  6. Screens: Fiberglass fabric, roll formed aluminum frame, finish to match window.
- D. Hardware
1. Sash Balance: Stainless steel constant force springs or similar type as approved by Architect.
  2. Locks: Two cam-type on each operable sash.
  3. Screws, Clips and Other Fasteners: Manufacturer's standard non-corrosive type materials compatible with aluminum.
  4. Limit stops
  5. **ADA units: Must be provided with windows with pull cord acuator and autolocks. WINDOWEASE or equal**
- E. Color:

1. **Base Bid Exterior Driftwood (Tan), Interior White**
2. **Alternate – Exterior Black, Interior White**

F. Muntins:

1. Matching material, located between glass panes within the sealed insulated glass unit.
2. Muntins shall have finish to match color of window frame.
3. ~~Simulated~~ Divided Lite Muntins: **As indicated.**
  - a. Exterior, **between glass and interior applied** continuously adhered to surface of glass with a high performance acrylic adhesive system located between glass panes within the sealed insulated glass unit. **Finish to match interior and exterior unit.**

2.02 SLIDING PATIO DOORS

A. Manufacturer: Drawings and specifications are based on **425 Series patio doors by LINDSAY Windows**. Doors by other manufacturers must be approved by the Owner, through the Architect, during bidding. Approval process includes submission of product data, catalog cuts, design information and, where requested, a full size sample.

B. Frames

1. Member: Fabricated from extruded aluminum 6063-T5. Provide with polyurethane thermal break. Clad head and jamb frame members with .05" rigid vinyl extrusion. Provide weep slots in sill.
2. Minimum Wall Thickness
  - a. Sill: .062".
  - b. Head and Jambs: .05".
3. Sills in Wheelchair Accessible Units: Provide extruded aluminum threshold extension for wheelchair access. Similar to # CM-92033 and CM-92034.

C. Door Panels: Vinyl extrusions; mechanically fasten at corners using welded construction.

D. Weatherstripping: Provide around entire perimeter and meeting stiles; interlock endseals are adjustable.

E. Hardware

1. Roller Assembly: Corrosive resistant adjustable, ball-bearing type.
2. Lock: Clam type latch.
3. Pulls: Manufacturer's standard.

F. Screen: Rolling type fabricated from roll-formed sections; corners mitered and fitted. Finish to match door.

1. Fabric: Fiberglass mesh.
2. Wheels: Adjustable; mounted in top and bottom rails.

- G. Colors: Custom as selected by Architect..
- F. Muntins:
  - 1. Matching material, located between glass panes within the sealed insulated glass unit.
  - 2. Muntins shall have finish to match color of window frame.
  - 3. Simulated Divided Lite Muntins:
    - a. Exterior applied continuously adhered to surface of glass with a high performance acrylic adhesive system located between glass panes within the sealed insulated glass unit.

## 2.03 GLAZING

- A. Factory glaze. Conform with section 08 81 00 for type and performance values.
- B. General: Preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E774 for performance classification indicated as well as with other requirements specified for glass characteristics, air space, sealing system, sealant, spacer material, corner design and desiccant.
- C. Windows - Glass Type: Provide manufacturer's standard insulating glass; Type I, Class 1 for clear glass, Quality q<sup>3</sup>, conforming to ASTM C1036.
- D. Patio Doors: Provide tempered insulating glass; Kind FT, Condition A, Type I, Class 1 for clear glass, conforming to ASTM C1048.

## 2.04 FABRICATION

- A. Manufacture each window and door to fit tightly within existing rough opening. Maximum allowable shim space is 1/2" per side jamb and 3/4" at head. Shim at sill to level low side with high side touching at the sill.
- B. Provide window and door members and components with joints neatly made, free of burrs and tight fitting to provide hairline joints with ends capped, mitered, milled or machined as appropriate and approved and develop full structural value of members and provide permanent water tight joints.
- C. Fasteners: Provide manufacturers perimeter nail flange Conceal fasteners wherever possible.
  - 1. No through fasteners short circuiting thermal barrier permitted.
  - 2. No bolts, screws or other components, metallic fastenings, etc., to impair independent frame movement.
  - 3. All bolts, screws, fastenings, fillers, etc. bridging thermal barrier to be reinforced nylon or suitable low conductivity non-metallic materials.

## **PART 3 EXECUTION**

3.01 INSPECTION

- A. Examine substrates, supporting structure and installation conditions. Do not proceed with window or door erection until unsatisfactory conditions have been corrected.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 INSTALLATION

A. General

- 1. Do not install component parts which are observed to be defective, including warped, bowed, dented, abraded, and broken members. Remove and replace members which have been damaged during installation or thereafter before time of acceptance.
  - 2. Do not cut or trim component parts during erection, in a manner which would damage finish, decrease strength or result in a visual imperfection of a failure in performance of the work.
- B. Install windows and doors in accordance with the manufacturer's instructions and recommendations for the installation of window components.
  - C. Install component parts level, plumb, true to line and with uniform joints and reveals. Secure to structure with non-staining and non-corrosive shims, anchors, fasteners, spacers and fillers. Use erection equipment which will not mar or stain finished surfaces, and will not damage component parts.
  - D. Assembly and Anchorage: Anchor component parts securely in place by bolting or other permanent mechanical attachment system which will comply with performance requirements and permit movements as required.
  - E. Set sill members in a bed of sealant compound or with joint fillers or gaskets to provide weathertight requirements. Do not seal drainage holes (slots).

3.03 CLEANING AND PROTECTION

- A. Protect glass from breakage immediately upon installation, by attachment of streamers to framing held away from glass.
  - 1. Do not apply markings of any type on surfaces of glass.
- B. Immediately before acceptance of the work, clean the window thoroughly, inside and out.

**END OF SECTION**

## **SECTION 08 71 00**

### **DOOR HARDWARE**

#### PART 1 - GENERAL

##### 1.01 SUMMARY

###### A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

###### B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

###### C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
  - a. "Metal Doors and Frames"
  - b. "Flush Wood Doors"
  - c. "Stile and Rail Wood Doors"
  - d. "Interior Aluminum Doors and Frames"
  - e. "Aluminum-Framed Entrances and Storefronts"
  - f. "Stainless Steel Doors and Frames"
  - g. "Special Function Doors"
  - h. "Entrances"
6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

##### 1.02 REFERENCES

###### A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
  - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
  - b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
  - a. Wiring Diagrams: For power, signal, and control wiring and including:
    - 1) Details of interface of electrified door hardware and building safety and security systems.
    - 2) Schematic diagram of systems that interface with electrified door hardware.
    - 3) Point-to-point wiring.
    - 4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.

- a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule:
- a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
  - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
  - c. Indicate complete designations of each item required for each opening, include:
    - 1) Door Index: door number, heading number, and Architect's hardware set number.
    - 2) Quantity, type, style, function, size, and finish of each hardware item.
    - 3) Name and manufacturer of each item.
    - 4) Fastenings and other pertinent information.
    - 5) Location of each hardware set cross-referenced to indications on Drawings.
    - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
    - 7) Mounting locations for hardware.
    - 8) Door and frame sizes and materials.
    - 9) Degree of door swing and handing.
    - 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.
5. Key Schedule:
- a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
  - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
  - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
  - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
  - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
  - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
- C. Informational Submittals:
- 1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
  - 2. Provide Product Data:
    - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
    - b. Include warranties for specified door hardware.
- D. Closeout Submittals:
- 1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:

- a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
- b. Catalog pages for each product.
- c. Final approved hardware schedule edited to reflect conditions as installed.
- d. Final keying schedule
- e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
- f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

- 1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
  - a. Fire door assemblies, in compliance with NFPA 80.
  - b. Required egress door assemblies, in compliance with NFPA 101.

#### 1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

- 1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
- 2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
- 3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
  - a. For door hardware: DHI certified AHC or DHC.
  - b. Can provide installation and technical data to Architect and other related subcontractors.
  - c. Can inspect and verify components are in working order upon completion of installation.
  - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
- 4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

- 1. Fire-Rated Door Openings:
  - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.

- b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
  - 2. Smoke and Draft Control Door Assemblies:
    - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
    - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
  - 3. Electrified Door Hardware
    - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
  - 4. Accessibility Requirements:
    - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.
- C. Pre-Installation Meetings
- 1. Keying Conference
    - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      - 2) Preliminary key system schematic diagram.
      - 3) Requirements for key control system.
      - 4) Requirements for access control.
      - 5) Address for delivery of keys.
  - 2. Pre-installation Conference
    - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - b. Inspect and discuss preparatory work performed by other trades.
    - c. Inspect and discuss electrical roughing-in for electrified door hardware.
    - d. Review sequence of operation for each type of electrified door hardware.
    - e. Review required testing, inspecting, and certifying procedures.
    - f. Review questions or concerns related to proper installation and adjustment of door hardware.
  - 3. Electrified Hardware Coordination Conference:
    - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

#### 1.06 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

#### 1.07 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
  - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
  - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    - a. Mechanical Warranty
      - 1) Locks
        - a) Mortise - 3 years
        - b) Cylindrical - 10 years
      - 2) Exit Devices
        - a) 10 years
      - 3) Closers
        - a) 10 years
      - 4) Automatic Operators
        - a) 2 years
    - b. Electrical Warranty
      - 1) Locks

- a) 1 year
- 2) Exit Devices
  - a) 1 year

#### 1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
  - 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

#### 2.02 MATERIALS

- A. Fabrication
  - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
  - 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
  - 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
  - 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- C. Cable and Connectors:
  - 1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
  - 2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
  - 3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

## 2.03 HINGES

- A. Manufacturers and Products:
  - 1. Scheduled Manufacturer and Product:
    - a. Ives 5BB series
  - 2. Acceptable Manufacturers and Products:
    - a. Hager BB1191/1279 series
    - b. McKinney TB series
- B. Requirements:
  - 1. Provide hinges conforming to ANSI/BHMA A156.1.
  - 2. Provide five knuckle, ball bearing hinges.
  - 3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
    - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
    - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
  - 4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
    - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
    - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
  - 5. 2 inches or thicker doors:
    - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
    - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
  - 6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
  - 7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
  - 8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
    - a. Steel Hinges: Steel pins
    - b. Non-Ferrous Hinges: Stainless steel pins
    - c. Out-Swinging Exterior Doors: Non-removable pins
    - d. Out-Swinging Interior Lockable Doors: Non-removable pins
    - e. Interior Non-lockable Doors: Non-rising pins

9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

## 2.04 SPRING HINGES

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Ives 3SP series
2. Acceptable Manufacturers and Products:
  - a. Hager 1250 series
  - b. McKinney 1502 series

### B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide 3 knuckle, steel based, spring full mortise hinges.
3. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
4. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Do not use spring hinges of door 96 inches and greater in height.

## 2.05 CONTINUOUS HINGES

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Select
  - b. Best

### B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

## 2.06 ELECTRIC POWER TRANSFER

### A. Manufacturers:

1. Scheduled Manufacturer and Product:
  - a. Von Duprin EPT-10
2. Acceptable Manufacturers and Products:
  - a. Securitron CEPT-10
  - b. Security Door Controls PTM

### B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

## 2.07 FLUSH BOLTS

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Rockwood

### B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

## 2.08 COORDINATORS

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Rockwood

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

## 2.09 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Falcon MA series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
2. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
3. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
6. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide a request to exit (RX) switch that is actuated with rotation of inside lever.
7. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
  - a. Lever Design: LAT.

## 2.10 CYLINDRICAL LOCKS – GRADE 2

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Falcon W series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 2, and UL Listed for 3-hour fire doors.
2. Cylinders: Refer to "KEYING" article, herein.

3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
  - a. Lever Design: LAT.

## 2.11 TUBULAR LOCKS – GRADE 2

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage F series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

### B. Requirements:

1. Provide tubular locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 2, Grade 2 and ANSI/BHMA A156.39 Residential Grade AAA, and UL Listed for 3-hour fire doors.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide locks with standard 2-3/8 inches (60 mm) adjustable to 2-3/4 inches (70 mm) backset with 1/2-inch (13 mm) latch throw. Provide 2-3/4 inches (70 mm) backset, unless 2-3/8 inches (60 mm) is required by door or frame detail or noted otherwise.
4. Provide locksets that fit standard 2-1/8 inches (54 mm) diameter bore without use of thru bolts.
5. Door Thickness: Locksets adjustable to fit in 1-3/8 inches (35 mm) or 1-3/4 inches (44 mm) door thickness.
6. Provide standard T-strikes unless extended lip strikes are necessary to protect trim.
7. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
  - a. Lever Design: LAT.

## 2.12 DEADBOLTS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage B500 Series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

### B. Requirements:

1. Provide grade 2 deadbolt series conforming to ANSI/BHMA A156.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide deadbolts with standard 2-3/4 inches (70 mm) backset. Provide 2-3/8 inches (60 mm) where noted or if door or frame detail requires. Provide deadbolt with full 1-inch (25 mm) throw, constructed of steel alloy.
4. Provide manufacturer's standard strike.

## 2.13 EXIT DEVICES

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Falcon 24/25 series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

### B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide flush end caps for exit devices.
7. Provide exit devices with manufacturer's approved strikes.
8. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
9. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
10. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
11. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
12. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
13. Provide electrified options as scheduled.
14. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

## 2.14 POWER SUPPLIES

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage/Von Duprin PS900 Series
2. Acceptable Manufacturers and Products:
  - a. Precision ELR series
  - b. Sargent 3500 series

### B. Requirements:

1. Provide power supplies approved by manufacturer of supplied electrified hardware.

2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
4. Provide power supplies with the following features:
  - a. 12/24 VDC Output, field selectable.
  - b. Class 2 Rated power limited output.
  - c. Universal 120-240 VAC input.
  - d. Low voltage DC, regulated and filtered.
  - e. Polarized connector for distribution boards.
  - f. Fused primary input.
  - g. AC input and DC output monitoring circuit w/LED indicators.
  - h. Cover mounted AC Input indication.
  - i. Tested and certified to meet UL294.
  - j. NEMA 1 enclosure.
  - k. Hinged cover w/lock down screws.
  - l. High voltage protective cover.

#### 2.15 CYLINDERS (Unit Openings)

##### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Instakey
2. Acceptable Manufacturers and Products:
  - a. No Substitute

##### B. Requirements:

1. Provide cylinders/cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset; manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
  - a. Patented Restricted Small Format: cylinder with small format interchangeable cores (SFIC) with restricted, patented keyway.
3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

#### 2.16 CYLINDERS (Common Openings)

##### A. Manufacturers and Products:

1. Scheduled Manufacturer:
  - a. Falcon
2. Acceptable Manufacturers and Products:
  - a. No Substitute

B. Requirements:

1. Provide cylinders/cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset; manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
  - a. Open: cylinder with small format interchangeable core (SFIC) core with open keyway

2.17 KEYING

A. Scheduled System:

1. Existing factory registered system:
  - a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:
  - a. Replaceable Construction Cores.
    - 1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
      - a) 3 construction control keys
      - b) 12 construction change (day) keys.
    - 2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
2. Permanent Keying:
  - a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
    - 1) Master Keying system as directed by the Owner.
  - b. Forward biting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
  - c. Provide keys with the following features:
    - 1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
  - d. Identification:
    - 1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
    - 2) Identification stamping provisions must be approved by the Architect and Owner.
    - 3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
    - 4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
    - 5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
  - e. Quantity: Furnish in the following quantities.
    - 1) Change (Day) Keys: 3 per cylinder/core.
    - 2) Permanent Control Keys: 3.
    - 3) Master Keys: 6.

## 2.18 DOOR CLOSERS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Falcon SC70A series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

### B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with aluminum cylinder.
3. Closer Body: 1-1/2-inch (38 mm) diameter with 5/8-inch (16 mm) diameter heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

## 2.19 DOOR CLOSERS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Falcon SC80A series
2. Acceptable Manufacturers and Products:
  - a. No Substitute

### B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide door closers with fully hydraulic, full rack and pinion action with aluminum cylinder.
3. Closer Body: 1-1/4-inch (32 mm) diameter, with 5/8-inch (16 mm) diameter heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.

8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

## 2.20 ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. LCN 4600 series
2. Acceptable Manufacturers and Products:
  - a. Norton 6000 series
  - b. Precision D4990 series

### B. Requirements:

1. Provide low energy automatic operator units with hydraulic closer complying with ANSI/BHMA A156.19.
2. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door
4. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.
5. Provide drop plates, brackets, and adapters for arms as required for details.
6. Provide actuator switches and receivers for operation as specified.
7. Provide weather-resistant actuators at exterior applications.
8. Provide key switches with LED's, recommended and approved by manufacturer of automatic operator as required for function described in operation description of hardware group below. Cylinders: Refer to "KEYING" article, herein.
9. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
10. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

## 2.21 DOOR TRIM

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Elmes
  - b. Trimco

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

## 2.22 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Trimco

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

## 2.23 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
  - a. Glynn-Johnson
2. Acceptable Manufacturers:
  - a. Rixson
  - b. Sargent

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
2. Provide friction type at doors without closer and positive type at doors with closer.

## 2.24 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Trimco
  - b. Burns

- B. Provide door stops at each door leaf:
  - 1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
  - 2. Where a wall stop cannot be used, provide universal floor stops.
  - 3. Where wall or floor stop cannot be used, provide overhead stop.
  - 4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

## 2.25 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

### A. Manufacturers:

- 1. Scheduled Manufacturer:
  - a. Zero International
- 2. Acceptable Manufacturers:
  - a. National Guard
  - b. Reese

### B. Requirements:

- 1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
- 2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
- 3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
- 4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

## 2.26 SILENCERS

### A. Manufacturers:

- 1. Scheduled Manufacturer:
  - a. Ives
- 2. Acceptable Manufacturers:
  - a. Burns
  - b. Rockwood

### B. Requirements:

- 1. Provide "push-in" type silencers for hollow metal or wood frames.
- 2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
- 3. Omit where gasketing is specified.

## 2.27 BALL CATCHES

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Rockwood

### B. Requirements:

1. Provide ball catches at single doors with strike to fit ANSI frame prep. If dummy levers are used in conjunction with ball catch, mount ball catch at a height as to not interfere with proper mounting and height of dummy lever.
2. Provide ball catches with full lip strike at pair doors. Mount rolling ball in top rail of each leaf per manufacturer's template.

## 2.28 DOOR POSITION SWITCHES

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Schlage
2. Acceptable Manufacturers:
  - a. GE-Interlogix
  - b. Sargent

### B. Requirements:

1. Provide recessed or surface mounted type door position switches as specified.
2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. 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. Custom Steel Doors and Frames: HMMA 831.
  - 3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
  - 4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
  - 1. Furnish permanent cores to Owner for installation.
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
  - 1. Conduit, junction boxes and wire pulls.
  - 2. Connections to and from power supplies to electrified hardware.
  - 3. Connections to fire/smoke alarm system and smoke evacuation system.
  - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
  - 5. Connections to panel interface modules, controllers, and gateways.
  - 6. Testing and labeling wires with Architect's opening number.
- K. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- L. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

- M. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- N. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- O. 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 may impede traffic or present tripping hazard.
- P. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- Q. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- R. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

### 3.03 ADJUSTING

- A. Initial 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.
  - 1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
  - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
  - 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

### 3.04 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

### 3.05 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to 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.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

83805 OPT0313361 Version 6

Hardware Group No. 01

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	710	IVE
1	EA	POWER TRANSFER	EPT10 CON	695	VON
1	EA	ELEC PANIC HARDWARE	RX-MEL-25-R-NL-CON 24 VDC	643E	FAL
1	EA	MORTISE CYLINDER HOUSING	C987	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	OH STOP	100S	643E/7 16	GLY
1	EA	SURFACE CLOSER	SC71A RW/PA	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	RAIN DRIP	142D	D	ZER
1	SET	GASKETING	429D-S	D	ZER
1	EA	DOOR SWEEP	8197D	D	ZER
1	EA	THRESHOLD	65D	D	ZER
1	EA	WIRE HARNESS	CON-XX-P (LENGTH AS REQUIRED)		SCH
2	EA	WIRE HARNESS	BY ACCESS CONTROL PROVIDER		SCH
1	EA	MULTITECH READER	MTB11/MTB15 - BY ACCESS CONTROL PROVIDER (COORDINATE WITH HEAD END & CREDENTIAL TYPE)	BLK	SCE
1	EA	DOOR CONTACT	679 SERIES	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC	LGR	SCE

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

ELECTRICAL OPERATIONAL DESCRIPTION:

DOOR IS NORMALLY CLOSED AND LOCKED. FROM THE SECURE SIDE PRESENTING VALID CREDENTIALS TO THE CREDENTIAL READER WILL MOMENTARILY RETRACT THE LATCH, ALLOWING ENTRY. AFTER ENTRY THE DOOR RETURNS TO THE CLOSED AND LATCHED POSITION. A KEY OVERRIDE ALSO ENABLES ENTRY. FROM THE NON-SECURE SIDE, PRESSING THE PUSH PAD RETRACTS LATCH ALLOWING EGRESS. DURING A POWER OUTAGE, THE DOOR WILL REMAIN LOCKED AND WILL CONTINUE TO ALLOW FREE EGRESS AT ALL TIMES. DOOR POSITION SWITCH MONITORS DOOR FOR OPEN/CLOSED POSITION. REQUEST TO EXIT (RX) FOR REMOTE MONITORING.

Hardware Group No. 02

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	CLASSROOM LOCK	W561BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC81A REG OR PA AS REQ	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
3	EA	SILENCER	SR64/SR65 AS REQ'D	GRY	IVE

Hardware Group No. 03

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	CLASSROOM LOCK	W561BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC81A RW/PA	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS406/407CCV	643E/7 16	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 04

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURF OH STOP	450S	613	GLY
1	EA	SURFACE CLOSER	SC81A REG OR PA AS REQ	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
3	EA	SILENCER	SR64/SR65 AS REQ'D	GRY	IVE

Hardware Group No. 05

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	710	IVE
1	EA	FIRE EXIT HDWE	F-25-R-L-BE-LAT	643E	FAL
1	EA	SURFACE CLOSER	SC71A RW/PA	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	MAGNET	SEM7850 12V/24V/120V	695	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER

TIE TO FIRE ALARM

OPERATION: UPON POWER LOSS OR FIRE ALARM SIGNAL DOORS TO RELEASE FROM MAGNETIC HOLDERS, CLOSE AND LATCH.

Hardware Group No. 06

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	CLASSROOM LOCK	W561BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	OH STOP	410S	613	GLY
1	EA	SURFACE CLOSER	SC81A REG OR PA AS REQ	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
3	EA	SILENCER	SR64/SR65 AS REQ'D	GRY	IVE

Hardware Group No. 07

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	710	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC71A SS	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	RAIN DRIP	142D	D	ZER
1	SET	GASKETING	429D-S	D	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP	8197D	D	ZER
1	EA	THRESHOLD	65D	D	ZER

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

Hardware Group No. 08

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY EPT	710	IVE
2	EA	POWER TRANSFER	EPT10 CON	695	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	695	VON
1	EA	ELEC PANIC HARDWARE	RX-MEL-25-R-EO-CON 24 VDC	643E	FAL
1	EA	ELEC PANIC HARDWARE	RX-MEL-25-R-NL-OP-CON 24 VDC	643E	FAL
1	EA	RIM CYLINDER HOUSING	C953-7CCA	643e	FAL
1	EA	MORTISE CYLINDER HOUSING	C987	643e	FAL
2	EA	SFIC CORE	C607	606	FAL
2	EA	90 DEG OFFSET PULL	8190EZHD 12" O	643E/7 16	IVE
1	EA	OH STOP	100S	643E/7 16	GLY
1	EA	OH STOP	100SE	643E/7 16	GLY
1	EA	SURFACE CLOSER	SC71A RW/PA	695	FAL
1	EA	AUTO OPERATOR	4642 TBWMS 120 VAC	695	LCN
2	EA	ACTUATOR, TOUCH	8310-852T/8310-818T AS REQ'D	630	LCN
1	EA	MOUNTING PLATE	SC70A-18PA AS REQ.	695	FAL
1	EA	BLADE STOP SPACER	SC70A-61 AS REQ	695	FAL
1	SET	WEATHER STRIPPING	BY DOOR/FRAME MANUFACTURER		
1	SET	WEATHER STRIPPING	BY DOOR/FRAME MANUFACTURER		
2	EA	DOOR SWEEP	8197D	D	ZER
1	EA	THRESHOLD	65D	D	ZER
2	EA	WIRE HARNESS	CON-XX-P (LENGTH AS REQUIRED)		SCH
2	EA	WIRE HARNESS	BY ACCESS CONTROL PROVIDER		SCH
1	EA	MULTITECH READER	MTB11/MTB15 - BY ACCESS CONTROL PROVIDER (COORDINATE WITH HEAD END & CREDENTIAL TYPE)	BLK	SCE
2	EA	DOOR CONTACT	679 SERIES	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-4RL 120/240 VAC	LGR	SCE

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

OPERATIONAL DESCRIPTION:

DOOR IS NORMALLY CLOSED AND LOCKED. FROM THE SECURE SIDE, PRESENTING VALID CREDENTIALS TO THE CREDENTIAL READER WILL MOMENTARILY RETRACT THE LATCH AND ACTIVATE THE OUTSIDE ACTUATOR. PUSHING THE ACTUATOR ENGAGES AUTOMATIC OPERATOR, ALLOWING ENTRY. AFTER ENTRY THE DOOR RETURNS TO THE CLOSED AND LATCHED POSITION. A KEY OVERRIDE ALSO ENABLES ENTRY. FROM THE NON-SECURE SIDE, PRESSING THE PUSH PAD RETRACTS LATCH ALLOWING EGRESS. INSIDE ACTUATOR ALWAYS ACTIVE. DURING A POWER OUTAGE, THE DOOR WILL REMAIN LOCKED AND WILL CONTINUE TO ALLOW FREE EGRESS AT ALL TIMES. DOOR POSITION SWITCH MONITORS DOOR FOR OPEN/CLOSED POSITION. REQUEST TO EXIT (RX) FOR REMOTE MONITORING.

Hardware Group No. 09

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	FIRE EXIT HDWE	F-25-R-L-BE-LAT	643E	FAL
1	EA	SURFACE CLOSER	SC71A REG OR PA AS REQ	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 10

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY	710	IVE
2	EA	PUSH/PULL BAR	9103EZHD-12"-NS	643E/7 16	IVE
2	EA	OH STOP	100S	643E/7 16	GLY
1	EA	OH STOP	100SE	643E/7 16	GLY
1	EA	SURFACE CLOSER	SC71A RW/PA	695	FAL
1	EA	AUTO OPERATOR	4642 TBWMS 120 VAC	695	LCN
2	EA	ACTUATOR, TOUCH	8310-852T/8310-818T AS REQ'D	630	LCN
1	EA	MOUNTING PLATE	SC70A-18PA AS REQ.	695	FAL
1	EA	BLADE STOP SPACER	SC70A-61 AS REQ	695	FAL

OPERATIONAL DESCRIPTION:

DOOR IS NORMALLY CLOSED PUSHING ACTUATOR ENGAGES AUTOMATIC OPERATOR, ALLOWING ENTRY. AFTER ENTRY THE DOOR RETURNS TO THE CLOSED POSITION.

Hardware Group No. 11

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	PASSAGE SET	W101S LAT	643e	FAL
1	EA	SURFACE CLOSER	SC81A SS	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 12

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	710	IVE
1	EA	CLASSROOM LOCK	W561BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC81A RW/PA	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE

Hardware Group No. 13

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP [PER 08 71 00]	F643E/ 716	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
3	EA	SILENCER	SR64/SR65 AS REQ'D	GRY	IVE

Hardware Group No. 14

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	710	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC71A SS	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	RAIN DRIP	142D	D	ZER
1	SET	GASKETING	429D-S	D	ZER
1	EA	DOOR SWEEP	8197D	D	ZER
1	EA	THRESHOLD	65D	D	ZER

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

Hardware Group No. 15

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	SPRING HINGE	3SP1 4 X 4	F643E/ 716	IVE
1	EA	HINGE	5BB1 4 X 4	F643E/ 716	IVE
1	EA	PASSAGE SET	F10CF LAT	716	SCH
1	EA	SGL CYL DEADBOLT	B560BDC	643E	SCH
1	EA	SFIC CORE	AS REQUIRED	606	INS
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	DOOR STOP	060 OR 70 AS REQ'D	F643E/ 716	IVE
1	EA	GASKETING	8303D	D	ZER
1	EA	DOOR SWEEP	153A(UNLESS FURNISHED BY PRE-HUNG DOOR MFR)	D	ZER
1	EA	THRESHOLD	625D	D	ZER
1	EA	KNOCKWER W/ VIEWER	02-3125 U700	643E/7 16	IVE
1	EA	VIEWER	U700[PROVIDE @ ACCESSIBLE UNITS ONLY]	B643E/ 716	IVE

Hardware Group No. 16

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	1011 3.5 X 3.5	F716E	IVE
2	EA	BALL CATCH	349	B643E/ 716	IVE
2	EA	SINGLE DUMMY TRIM	F170 LAT	716	SCH
2	EA	DOOR STOP	060 OR 70 AS REQ'D	F643E/ 716	IVE

Hardware Group No. 17

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	1011 3.5 X 3.5	F716E	IVE
1	EA	PRIVACY LOCK	F40 LAT	716	SCH
1	EA	DOOR STOP	060 OR 70 AS REQ'D	F643E/ 716	IVE

Hardware Group No. 18

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY	710	IVE
1	EA	PANIC HARDWARE	CD-25-C-C-718	643E	FAL
1	EA	PANIC HARDWARE	CD-25-C-EO	643E	FAL
1	EA	RIM CYLINDER HOUSING	C953-7CCA	643e	FAL
2	EA	MORTISE CYLINDER HOUSING	C987	643e	FAL
3	EA	SFIC CORE	C607	606	FAL
2	EA	90 DEG OFFSET PULL	8190EZHD 12" O	643E/7 16	IVE
2	EA	OH STOP & HOLDER	100H	643E/7 16	GLY
2	EA	SURFACE CLOSER	SC71A REG OR PA AS REQ	695	FAL
2	EA	BLADE STOP SPACER	SC70A-61 AS REQ	695	FAL
2	EA	KICK PLATE	8400 8" X 1" LDW B-CS	BLK	IVE

Hardware Group No. 19

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	1011 3.5 X 3.5	F716E	IVE
1	EA	PASSAGE SET	F10 LAT	716	SCH
1	EA	DOOR STOP	060 OR 70 AS REQ'D	F643E/ 716	IVE

Hardware Group No. 20

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	CLASSROOM LOCK	W561BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC81A REG OR PA AS REQ	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 21

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC81A REG OR PA AS REQ	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 22

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
3	EA	SILENCER	SR64/SR65 AS REQ'D	GRY	IVE

Hardware Group No. 23

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	ENTRY / OFFICE LOCK	W511BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
3	EA	SILENCER	SR64/SR65 AS REQ'D	GRY	IVE

Hardware Group No. 24

Provide each PD door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	POCKET DOOR	111PD SERIES	628	JOH
1	EA	SLIDING DOOR PULL	990	B643E/ 716	IVE
1	EA	POCKET DOOR BOLT	42	B643E/ 716	IVE

Hardware Group No. 25

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	710	IVE
1	EA	PANIC HARDWARE	CD-25-R-NL-OP-1439	643E	FAL
1	EA	RIM CYLINDER HOUSING	C953-7CCA	643e	FAL
1	EA	MORTISE CYLINDER HOUSING	C987	643e	FAL
2	EA	SFIC CORE	C607	606	FAL
1	EA	90 DEG OFFSET PULL	8190EZHD 12" O	643E/7 16	IVE
1	EA	OH STOP	100S	643E/7 16	GLY
1	EA	SURFACE CLOSER	SC71A RW/PA	695	FAL
1	EA	MOUNTING PLATE	SC70A-18PA AS REQ.	695	FAL
1	EA	BLADE STOP SPACER	SC70A-61 AS REQ	695	FAL
1	EA	DOOR SWEEP	8197D	D	ZER
1	EA	THRESHOLD	65D	D	ZER
1	EA	DOOR CONTACT	679 SERIES	BLK	SCE

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

PERIMETER WEATHER SEALS PROVIDED BY ALUMINUM SECTION.

DOOR POSITION SWITCH MONITORS DOOR FOR OPEN/CLOSED POSITION. REQUEST TO EXIT (RX) FOR REMOTE MONITORING.

Hardware Group No. 26

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP [PER 08 71 00]	F643E/ 716	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC81A RW/PA	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 27

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP [PER 08 71 00]	F643E/ 716	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC81A SS	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 28

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	PRIVACY LOCK	L9040 LATA L583-363 L283-722	643e	SCH
1	EA	SURFACE CLOSER	SC71A REG OR PA AS REQ	695	FAL
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	BLK	IVE
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS406/407CCV	643E/7 16	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 29

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	PASSAGE SET	W101S LAT	643e	FAL
1	EA	WALL STOP	WS406/407CVX	643E/7 16	IVE
3	EA	SILENCER	SR64/SR65 AS REQ'D	GRY	IVE

Hardware Group No. 30

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	710	IVE
1	EA	PANIC HARDWARE	LD-25-R-EO	643E	FAL
1	EA	OH STOP	100S	643E/7 16	GLY
1	EA	SURFACE CLOSER	SC71A RW/PA	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	RAIN DRIP	142D	D	ZER
1	EA	DOOR SWEEP	8197D	D	ZER
1	EA	THRESHOLD	65D	D	ZER
1	EA	DOOR CONTACT	679 SERIES	BLK	SCE

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

DOOR POSITION SWITCH MONITORS DOOR FOR OPEN/CLOSED POSITION.

Hardware Group No. 32

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 [PER 08 71 00]	F643E/ 716	IVE
1	EA	FIRE EXIT HARDWARE	F-25-R-L-NL-LAT	643E	FAL
1	EA	RIM CYLINDER HOUSING	C953-7CCA	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC71A SS	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 33

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	710	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	SURFACE CLOSER	SC71A REG OR PA AS REQ	695	FAL
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	BLK	IVE
1	EA	WALL STOP	WS11	613	IVE
1	EA	RAIN DRIP	142D	D	ZER
1	SET	GASKETING	429D-S	D	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	365D	D	ZER
1	EA	THRESHOLD	655D	D	ZER
1	EA	DOOR CONTACT	679 SERIES	BLK	SCE

S-400 & S-401 - LOCKED ON THE STAIRWELL SIDE PREVENTING ACCESS TO ROOF.

DOOR POSITION SWITCH MONITORS DOOR FOR OPEN/CLOSED POSITION.

Hardware Group No. 34

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	710	IVE
1	EA	POWER TRANSFER	EPT10 CON	695	VON
1	EA	ELEC PANIC HARDWARE	RX-MEL-25-R-NL-OP-1439-CON 24 VDC	643E	FAL
1	EA	RIM CYLINDER HOUSING	C953-7CCA	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	OH STOP	100S	643E/7 16	GLY
1	EA	SURFACE CLOSER	SC71A RW/PA	695	FAL
1	EA	MOUNTING PLATE	SC70A-18PA AS REQ.	695	FAL
1	EA	BLADE STOP SPACER	SC70A-61 AS REQ	695	FAL
1	EA	DOOR SWEEP	8197D	D	ZER
1	EA	THRESHOLD	65D	D	ZER
1	EA	WIRE HARNESS	CON-XX-P (LENGTH AS REQUIRED)		SCH
2	EA	WIRE HARNESS	BY ACCESS CONTROL PROVIDER		SCH
1	EA	MULTITECH READER	MTB11/MTB15 - BY ACCESS CONTROL PROVIDER (COORDINATE WITH HEAD END & CREDENTIAL TYPE)	BLK	SCE
1	EA	DOOR CONTACT	679 SERIES	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC	LGR	SCE

DOORS REQUIRE SPECIAL 3/8 INCH UNDERCUT FOR ADA TYPE THRESHOLD.

PERIMETER WEATHER SEALS PROVIDED BY ALUMINUM SECTION.

ELECTRICAL OPERATIONAL DESCRIPTION:

DOOR IS NORMALLY CLOSED AND LOCKED. FROM THE SECURE SIDE PRESENTING VALID CREDENTIALS TO THE CREDENTIAL READER WILL MOMENTARILY RETRACT THE LATCH, ALLOWING ENTRY. AFTER ENTRY THE DOOR RETURNS TO THE CLOSED AND LATCHED POSITION. A KEY OVERRIDE ALSO ENABLES ENTRY. FROM THE NON-SECURE SIDE, PRESSING THE PUSH PAD RETRACTS LATCH ALLOWING EGRESS. DURING A POWER OUTAGE, THE DOOR WILL REMAIN LOCKED AND WILL CONTINUE TO ALLOW FREE EGRESS AT ALL TIMES. DOOR POSITION SWITCH MONITORS DOOR FOR OPEN/CLOSED POSITION. REQUEST TO EXIT (RX) FOR REMOTE MONITORING.

Hardware Group No. 35

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY	710	IVE
1	EA	AUTO FLUSH BOLT	FB31P/41P AS REQ	613	IVE
1	EA	DUST PROOF STRIKE	DP2	643E/7 16	IVE
1	EA	STOREROOM LOCK	W581BDC LAT	643e	FAL
1	EA	SFIC CORE	C607	606	FAL
1	EA	COORDINATOR	COR X FL (MB AS REQ)	711	IVE
2	EA	SURFACE CLOSER	SC71A SS	695	FAL
2	EA	KICK PLATE	8400 8" X 1" LDW B-CS	BLK	IVE
1	EA	RAIN DRIP	142D	D	ZER
1	SET	GASKETING	429D-S	D	ZER
1	EA	MEETING STILE	383D	D	ZER
2	EA	DOOR SWEEP	8197D	D	ZER
1	EA	THRESHOLD	65D	D	ZER

Hardware Group No. SL-01

Provide each SL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	SLIDING DOOR	ALL HARDWARE BY SLIDING DOOR MFR.		

**END OF SECTION**

## **SECTION 10 11 00**

### **VISUAL DISPLAY SURFACES**

#### **PART 1 GENERAL**

##### **1.01 WORK INCLUDED**

- A. Provide the following items, as specified herein and indicated on the drawings:

1. Tackboards

##### **1.02 RELATED SECTIONS**

- A. Wood Blocking: Section 06 10 00.  
B. Sustainable Design Requirements: Section 01 81 13.

##### **1.03 REFERENCES**

- A. ASTM International

1. ASTM C1036 Specification for Flat Glass  
2. ASTM C1048 Specification for Heat-Treated Flat Glass-Kind HS Coated and Uncoated Glass

- B. ANSI - American National Standards Institute

1. ANSI Z-97.1 Safety Performance Specifications and Methods of Test Used in Buildings

##### **1.04 SUBMITTALS**

- A. Samples: Submit samples of color finishes for all items specified for selection by Architect.

1. Submit 6" length sample of trim required.

- B. Shop Drawings: Submit drawings showing sizes, arrangements, accessories and installation details of all items specified.

- C. Submit manufacturer's product data showing reference numbers, construction details and methods of assembly.

- D. Cleaning Instructions: Provide written instructions for any care, maintenance and cleaning required beyond normal custodial care.

- E. Sustainable Design Documentation Submittals: Comply with Section 01 81 13.
  - 1. VOC Limits: Include documentation verifying product Low Emitting Material Building Product Disclosures and Optimization.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original unopened shipping cartons. Store indoors in clean, dry area in manner to prevent warping or physical damage.
- B. Protect work from dust, dirt and physical damage during and after installation until final acceptance.

**PART 2 PRODUCTS**

2.01 MANUFACTURERS

- A. CLAIRIDGE PRODUCTS AND EQUIPMENT; ADP LEMCO; PLATINUM VISUAL SYSTEMS; GHENT MANUFACTURING,.
  - 1. Material Providers: POLYVISION, DRAPER, KOROSEAL – FORBO.

2.02 TACKBOARD

- A. Description: 1/4" flame retardant cork laminated to 1/4" hardboard with extruded aluminum trim, clear anodized finish.
  - 1. Provide 2 map hooks per 4' of tackboard.
  - 2. Color: As selected by Architect from manufacturer's standard colors.
- B. Sizes: As indicated on drawings.
- C. Provide all required mounting devices for installation without exposed fasteners.

2.03 FABRICATION

- A. Fabricate and factory assemble complete units where possible. Frames shall be straight and square with joints tight and neat.

**PART 3 EXECUTION**

3.01 INSPECTION

- A. Verify building items affecting this section are placed and ready to receive work.
- B. Field measurements shall be taken to verify that boards will fit in their designated locations.
- C. Install wood grounds or wood blocking as required.

3.02           INSTALLATION

A.           Workmanship

1.           Install boards straight and level and securely anchored in place.
2.           Leave surfaces clean and free from defects at time of final acceptance.

B.           Clean-up: Remove all cartons, debris, scraps, etc. and leave spaces clean and have boards ready for use.

**END OF SECTION**

## **SECTION 23 21 13**

### **HYDRONIC PIPING**

#### **PART 1 - GENERAL**

##### 1.1 SUMMARY

- A. Section includes pipe and fittings for hydronic piping.

##### 1.2 SUBMITTALS

- A. Action Submittals:

- 1. Product Data: For each type of the following:

- a. Pipe.
    - b. Fittings.
    - c. Joining materials.

- 2. Delegated-Design Submittal:

- a. Locations of and details for penetrations, including sleeves and sleeve seals for exterior walls, and foundation walls.

- B. Informational Submittals:

- 1. Field quality-control reports.

#### **PART 2 - PRODUCTS**

##### 2.1 PERFORMANCE REQUIREMENTS

- A. Hydronic piping components and installation capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:

- 1. Condensate-Drain Piping: 50 psig and 150 deg F.

##### 2.2 PLASTIC PIPE AND FITTINGS

- A. CPVC Plastic Pipe: ASTM F 441/F 441M, with wall thickness as indicated in "Piping Applications" Article.

- 1. CPVC Plastic Pipe Fittings: Socket-type pipe fittings, ASTM F 438 for Schedule 40 pipe; ASTM F 439 for Schedule 80 pipe.

- B. PVC Plastic Pipe: ASTM D 1785, with wall thickness as indicated in "Piping Applications" Article.
  - 1. PVC Plastic Pipe Fittings: Socket-type pipe fittings, ASTM D 2466 for Schedule 40 pipe; ASTM D 2467 for Schedule 80 pipe.

### 2.3 JOINING MATERIALS

- A. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.
- B. Solvent Cements for CPVC Piping: ASTM F 493. Solvent cement VOC content 490 g/L or less. Adhesive primer VOC content 550 g/L or less.
- C. Solvent Cements for PVC Piping: ASTM D 2564. Primer ASTM F 656. Solvent cement VOC content 510 g/l or less. Adhesive primer VOC content 550 g/L or less.

## **PART 3 - EXECUTION**

### 3.1 PIPING APPLICATIONS

- A. Condensate-Drain Piping: PVC or CPVC plastic pipe and fittings and solvent-welded joints.
  - 1. PVC shall not be used in return air plenums.
  - 2. CPVC must be approved for installation in return air plenum applications.

### 3.2 PIPING INSTALLATIONS

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping a maximum of 2 feet above accessible ceilings or enough to allow sufficient space for ceiling panel removal.
- E. Install piping to permit equipment and valve servicing.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Comply with requirements in other Division 23 Sections for identifying piping.

- I. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in other Division 23 Sections.
- J. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in other Division 23 Sections.
- K. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in other Division 23 Sections.

### 3.3 HANGERS AND SUPPORTS

- A. Comply with requirements in other Division 23 Sections for hanger, support, and anchor devices. Comply with the following requirements for maximum spacing of supports.
- B. Install the following pipe attachments:
  - 1. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.
- C. Plastic Piping Hanger Spacing: Space hangers according to pipe manufacturer's written instructions for service conditions and local codes. Avoid point loading. Space and install hangers with the fewest practical rigid anchor points.

### 3.4 PIPE JOINT CONSTRUCTION

- A. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
  - 2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  - 3. PVC Pressure Piping: Join ASTM D 1785 schedule number, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule number PVC pipe and socket fittings according to ASTM D 2855.
  - 4. PVC Nonpressure Piping: Join according to ASTM D 2855.

**END OF SECTION 23 21 13**

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**SECTION 28 31 11**  
**DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM**

**PART 1 - GENERAL**

1.1 SUMMARY

- A. Section Includes:
1. Fire-alarm control unit.
  2. Manual fire-alarm boxes.
  3. System smoke detectors.
  4. Nonsystem smoke detectors.
  5. Heat detectors.
  6. Notification appliances.
  7. Remote annunciator.
  8. Addressable interface device.
  9. Radio alarm transmitter.

1.2 DEFINITIONS

- A. FACP: Fire Alarm Control Panel.
- B. NICET: National Institute for Certification in Engineering Technologies.
- C. PC: Personal computer.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.
1. Include construction details, material descriptions, dimensions, profiles, and finishes.
  2. Include rated capacities, operating characteristics, and electrical characteristics.
- B. Shop Drawings: For fire-alarm system.
1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
  2. Include plans, elevations, sections, details, and attachments to other work.
  3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
  4. Detail assembly and support requirements.

5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
11. Provide program report showing that air-sampling detector pipe layout balances pneumatically within the airflow range of the air-sampling detector.
12. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
  - a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
  - b. Show field wiring required for HVAC unit shutdown on alarm.
  - c. Locate detectors according to manufacturer's written recommendations.
  - d. Show air-sampling detector pipe routing.
13. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
14. Include floor plans to indicate final outlet locations showing address of each addressable device.

C. General Submittal Requirements:

1. Shop Drawings shall be prepared by persons with the following qualifications:
  - a. Trained and certified by manufacturer in fire-alarm system design.
  - b. NICET-certified, fire-alarm technician; Level II minimum.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
  1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following and deliver copies to authorities having jurisdiction:

- a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
- c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
- d. Riser diagram.
- e. Device addresses.
- f. Record copy of site-specific software.
- g. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
  - 1) Equipment tested.
  - 2) Frequency of testing of installed components.
  - 3) Frequency of inspection of installed components.
  - 4) Requirements and recommendations related to results of maintenance.
  - 5) Manufacturer's user training manuals.
- h. Manufacturer's required maintenance related to system warranty requirements.
- i. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

## 1.6 MAINTENANCE MATERIAL SUBMITTALS

### A. ADDITIONAL INSTALLED DEVICES

- 1. Electrical Contractor shall include in his bid an allowance for the installation of the following:
  - a. Smoke detectors Twenty
  - b. Duct smoke detectors One
  - c. Manual fire alarm box Three
  - d. Audible device Two
  - e. Combination audible/visual device Ten
  - f. Addressable interface device Ten
- 2. The contractor shall include 50'-0" length of conduit and wire for each device, and shall assume that the devices will be installed at the completion of the project as directed by the Architect or Engineer. If not all devices are used, the remaining devices shall be turned over to the Owner. The unused amount of labor, conduit and wire shall be credited to the Owner in a deduct change order.

## 1.7 QUALITY ASSURANCE

- A. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: **FIVE** years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### 2.1 SYSTEM DESCRIPTION

- A. Noncoded, UL-listed addressable system, with multiplexed signal transmission and voice /strobe evacuation.
- B. Automatic sensitivity control of certain smoke detectors.
- C. All components provided shall be listed for use with the selected system.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

### 2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire Alarm Signal:
  - 1. Fire Alarm signal initiation shall be by one or more of the following devices and/or systems:
    - a. Manual stations.
    - b. Heat detectors.
    - c. Smoke detectors.
    - d. Duct smoke detectors.
    - e. Carbon monoxide detectors.
    - f. Automatic sprinkler system water flow.
    - g. Fire standpipe system.
    - h. Dry system pressure flow switch.
    - i. Fire pump running.
  - 2. Fire-alarm signal shall initiate the following actions:
    - a. Continuously operate alarm notification appliances, including voice evacuation notices.
    - b. Identify alarm and specific initiating device at fire-alarm control units and remote annunciators.
    - c. Identify alarm and specific initiating device at connected network control panels and/or off-premises network control panels.
    - d. Transmit an alarm signal to the remote alarm receiving station.
    - e. Unlock electric door locks in designated egress paths.

- f. Recall elevators to primary or alternate recall floors.
- g. Activate emergency lighting control.
- h. Activate emergency shutoffs for gas and fuel supplies.
- i. Record events in the system memory.
- j. Shutdown air handling units.

B. Supervisory Signal:

1. Supervisory signal initiation shall be by one or more of the following devices and actions:
  - a. Valve supervisory switch.
  - b. High- or low-air-pressure switch of a dry-pipe sprinkler system.
  - c. Fire pump running.
  - d. Fire-pump loss of power.
  - e. Fire-pump power phase reversal.
  - f. User disabling of zones or individual devices.
  - g. Loss of communication with any panel on the network.
  - h. Generator running
  - i. Generator abnormal condition (e.g. failure to start, temperature alarms, low fluids, etc.)
2. System Supervisory signal shall initiate the following actions:
  - a. Identify specific device initiating the event at fire-alarm control unit, connected network control panels, off-premises network control panels, and remote annunciators.
  - b. Record the event on system printer.
  - c. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.
  - d. Transmit system status to building management system.
  - e. Display system status on graphic annunciator.

C. System Trouble Signal:

1. System trouble signal initiation shall be by one or more of the following devices and actions:
  - a. Open circuits, shorts, and grounds in designated circuits.
  - b. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
  - c. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
  - d. Loss of primary power at fire-alarm control unit.
  - e. Ground or a single break in internal circuits of fire-alarm control unit.
  - f. Abnormal ac voltage at fire-alarm control unit.
  - g. Break in standby battery circuitry.
  - h. Failure of battery charging.
  - i. Abnormal position of any switch at fire-alarm control unit or annunciator.
  - j. Voice signal amplifier failure.
2. System trouble signal shall initiate the following actions:

- a. Identify specific device initiating the event at fire-alarm control unit, connected network control panels, off-premises network control panels, and remote annunciators.
- b. Transmit system status to building management system.

### 2.3 FIRE-ALARM CONTROL UNIT

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers:

- 1. Fire-Lite Alarms.
- 2. GAMEWELL.
- 3. GE UTC Fire & Security; A United Technologies Company.
- 4. Notifier.
- 5. Potter Fire.**
- 6. Siemens Industry, Inc.; Fire Safety Division.
- 7. Silent Knight.
- 8. SimplexGrinnell LP.
- 9. EST Edwards

- B. General Requirements for Fire-Alarm Control Unit:

- 1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
  - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
  - b. Include a real-time clock for time annotation of events on the event recorder and printer.
  - c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
  - d. The FACP shall be listed for connection to a central-station signaling system service.
  - e. The FACP shall be listed for use with supervisory signals from other essential building systems.
  - f. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 500-event history log.
- 2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
- 3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.

- C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including

annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.
3. Shall indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.

D. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:

1. Contractor shall verify quantity of each circuit type required with his approved equipment vendor prior to bidding. Fire alarm riser drawings that may be shown on the drawings are intended to be schematic in nature and may not depict all circuits where multiple circuits are required.
2. Pathway Class Designations: NFPA 72, Class B.
3. Pathway Survivability: Level 1.
4. Install no more than 100 addressable devices on each signaling-line circuit.
5. Serial Interfaces:
  - a. One dedicated RS 485 port for central-station remote station operation using point ID DACT.
  - b. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
  - c. One USB RS 232 port for PC configuration.
  - d. One RS 232 port for voice evacuation interface.

E. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Sound general alarm if the alarm is verified.
4. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

F. Notification-Appliance Circuit:

1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

G. Elevator Recall:

1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:
    - a. Elevator lobby detectors except the lobby detector on the designated floor.
    - b. Smoke detector in elevator machine room.
  2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
  3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.
    - a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.
- H. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and print out the final adjusted values on system printer.
- I. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.
- J. Voice/Alarm Signaling Service: Central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided.
1. Indicate number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711.
    - a. Allow the application of, and evacuation signal to, indicated number of zones and, at the same time, allow voice paging to the other zones selectively or in any combination.
    - b. Programmable tone and message sequence selection.
    - c. Standard digitally recorded messages for "Evacuation" and "All Clear."
    - d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification-appliance circuits of fire-alarm control unit.
  2. Status Annunciator: Indicate the status of various voice/alarm speaker zones and the status of firefighters' two-way telephone communication zones.
  3. Preamplifiers, amplifiers, and tone generators shall automatically transfer to backup units, on primary equipment failure.

- K. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, shall be powered by 24-V dc source.
  - 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- L. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
  - 1. Batteries: Sealed, valve-regulated, recombinant lead acid.
- M. Surge Suppression: Provide surge suppression devices at each 120V circuit serving fire alarm equipment. Refer to specification section 26 43 13 – Surge Protection for Low Voltage Electrical Power for requirements.
- N. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.
- O. At main fire alarm control panel and lobby remote annunciator panel, provide programmed soft key to initiate fire fighters stairwell door release. Initiation of door release sequence shall signal fire alarm relay modules located at each stairwell electrified door to fail safe. Soft key shall be concealed behind secured panel cover and shall be labeled.

## 2.4 REMOTE FIRE ALARM DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers:
  - 1. Cooper Wheelock.
  - 2. Fire-Lite Alarms.
  - 3. GAMEWELL.
  - 4. GE UTC Fire & Security; A United Technologies Company.
  - 5. Notifier.
  - 6. Siemens Industry, Inc.; Fire Safety Division.
  - 7. Silent Knight.
  - 8. SimplexGrinnell LP.
  - 9. System Sensor.
- B. Manual Fire-Alarm Boxes
  - 1. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

- a. Double-action mechanism requiring two actions to initiate an alarm, breaking-glass or plastic-rod pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
- b. Station Reset: Key- or wrench-operated switch.

### C. Notification Appliances

1. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
  - a. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
2. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch-high letters on the lens.
  - a. Rated Light Output minimum:
    - 1) 15 cd. in corridors and transition spaces, unless otherwise noted.
    - 2) 30 cd. in other spaces, unless otherwise noted.
  - b. Mounting: Wall mounted unless otherwise indicated.
  - c. Flashing shall be in a temporal pattern, synchronized with other units.
  - d. Strobe Leads: Factory connected to screw terminals.
  - e. Mounting Faceplate: Factory finished, RED.
3. Voice/Tone Notification Appliances:
  - a. Comply with UL 1480.
  - b. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
  - c. High-Range Units: Rated 2 to 15 W.
  - d. Low-Range Units: Rated 1 to 2 W.
  - e. Mounting: Flush semirecessed or surface mounted and bidirectional.
  - f. Matching Transformers: Tap range matched to acoustical environment of speaker location.
  - g. Mounting Faceplate: Factory finished, RED.

### D. Addressable Interface Device

1. General:
  - a. Include address-setting means on the module.
  - b. Store an internal identifying code for control panel use to identify the module type.
  - c. Listed for controlling HVAC fan motor controllers.
2. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.

3. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall to circuit-breaker shunt trip for power shutdown .
  - a. Allow the control panel to switch the relay contacts on command.
  - b. Have a minimum of two normally open and two normally closed contacts available for field wiring.
4. Control Module:
  - a. Operate notification devices.
  - b. Operate solenoids for use in sprinkler service.

E. System Smoke Detectors

1. General Requirements for System Smoke Detectors:
  - a. Comply with UL 268; operating at 24-V dc, nominal.
  - b. Detectors shall be two-wire type.
  - c. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
  - d. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
  - e. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
    - 1) Rate-of-rise temperature characteristic of combination smoke- and heat-detection units shall be selectable at fire-alarm control unit for 15 or 20 deg F per minute.
    - 2) Fixed-temperature sensing characteristic of combination smoke- and heat-detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F.
    - 3) Multiple levels of detection sensitivity for each sensor.
    - 4) Sensitivity levels based on time of day.
2. Photoelectric Smoke Detectors:
  - a. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
  - b. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
    - 1) Primary status.
    - 2) Device type.
    - 3) Present average value.
    - 4) Present sensitivity selected.
    - 5) Sensor range (normal, dirty, etc.).
3. Duct Smoke Detectors: Photoelectric type complying with UL 268A.
  - a. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
  - b. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
    - 1) Primary status.

- 2) Device type.
- 3) Present average value.
- 4) Present sensitivity selected.
- 5) Sensor range (normal, dirty, etc.).
- c. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector for smoke detection in HVAC system ducts.
- d. Each sensor shall have multiple levels of detection sensitivity.
- e. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
- f. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

#### F. Carbon Monoxide Detectors

- 1. General: Carbon monoxide detector listed for connection to fire-alarm system.
  - a. Mounting: Adapter plate for outlet box mounting.
  - b. Testable by introducing test carbon monoxide into the sensing cell.
  - c. Detector shall provide alarm contacts and trouble contacts.
  - d. Detector shall send trouble alarm when nearing end-of-life, power supply problems, or internal faults.
  - e. Comply with UL 2075.
  - f. Locate, mount, and wire according to manufacturer's written instructions.
  - g. Provide means for addressable connection to fire-alarm system.
  - h. Test button simulates an alarm condition.

#### G. Multicriteria Detectors

- 1. Mounting: Adapter plate for outlet box mounting Twist-lock base interchangeable with smoke-detector bases.
- 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
- 3. Automatically adjusts its sensitivity by means of drift compensation and smoothing algorithms. The detector shall send trouble alarm if it is incapable of compensating for existing conditions.
- 4. Test button tests all sensors in the detector.
- 5. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
  - a. Primary status.
  - b. Device type.
  - c. Present sensitivity selected.
  - d. Sensor range (normal, dirty, etc.).
- 6. Sensors: The detector shall be comprised of Three sensing elements including a smoke sensor, a carbon monoxide sensor, an infrared sensor.
  - a. Smoke sensor shall be photoelectric type as described in "System Smoke Detectors" Article.
  - b. Carbon monoxide sensor shall be as described in "Carbon Monoxide Detectors" Article.

- c. Each sensor shall be separately listed according to requirements for its detector type.

#### H. Residential Unit Smoke Detectors

1. Provide multi-criteria smoke sensors with sounder bases to meet the following:
  - a. Photoelectric type sensor and carbon monoxide sensor.
  - b. Sounder Base, 520Hz: Provide minimum audible alarm of 85 dBA at 10 feet; minimum of 75 dBA "at the pillow".
  - c. Activation of room smoke sensor to immediately and automatically sound an alarm within the room of incident.
2. System smoke sensor normal and emergency power is provided by the Fire Alarm Control Panel (FACP).
3. In units or other mixed Sleeping / Living Units, provide smoke sensors in each separate sleeping / living rooms (or in areas providing access to the corridor doorway). Multiple sensor sounder bases located within the same suite or unit shall sound at the same time.

#### I. Residential Unit Smoke Alarms (Handicap Accessible and Hearing Impaired): Same as above with the following additions.

- a. Visible Alarm Device: Xenon Strobe. Activation of detector to cause both alarm horn and visible alarm device (xenon strobe) to flash.

#### J. Heat Detectors

1. General Requirements for Heat Detectors: Comply with UL 521.
  - a. Temperature sensors shall test for and communicate the sensitivity range of the device.
2. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F or a rate of rise that exceeds 15 deg F per minute unless otherwise indicated.
  - a. Mounting: Adapter plate for outlet box mounting Twist-lock base interchangeable with smoke-detector bases.
  - b. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

#### K. Remote Annunciator

1. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
  - a. Mounting: Flush cabinet, NEMA 250, Type 1.
2. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to

acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

## 2.5 RADIO ALARM TRANSMITTER

- A. Transmitter shall comply with NFPA 1221 and 47 CFR 90.
- B. Description: Manufacturer's standard commercial product; factory assembled, wired, and tested; ready for installation and operation.
  - 1. Packaging: A single, modular, NEMA 250, Type 1 metal enclosure with a tamper-resistant flush tumbler lock.
  - 2. Signal Transmission Mode and Frequency: VHF or UHF 2-W power output, coordinated with operating characteristics of the established remote alarm receiving station designated by Owner.
  - 3. Normal Power Input: 120-V ac.
  - 4. Secondary Power: Integral-sealed, rechargeable, 12-V battery and charger. Comply with NFPA 72 requirements for battery capacity; submit calculations.
  - 5. Antenna: Omnidirectional, coaxial half-wave, dipole type with driving point impedance matched to transmitter and antenna cable output impedance. Wind-load strength of antenna and mounting hardware and supports shall withstand 100 mph with a gust factor of 1.3 without failure.
  - 6. Antenna Cable: Coaxial cable with impedance matched to the transmitter output impedance.
  - 7. Antenna-Cable Connectors: Weatherproof.
  - 8. Alarm Interface Devices: Circuit boards, modules, and other auxiliary devices, integral to the transmitter, matching fire-alarm and other system outputs to message-generating inputs of the transmitter that produce required message transmissions.
- C. Functional Performance: Unit shall receive alarm, supervisory, or trouble signal from fire-alarm control unit or from its own internal sensors or controls and shall automatically transmit signal along with a unique code that identifies the transmitting station to the remote alarm receiving station. Transmitted messages shall correspond to standard designations for fire-reporting system to which the signal is being transmitted and shall include separately designated messages in response to the following events or conditions:
  - 1. Transmitter Low-Battery Condition: Sent when battery voltage is below 85 percent of rated value.
  - 2. System Test Message: Initiated manually by a test switch within the transmitter cabinet, or automatically at an optionally preselected time, once every 24 hours, with transmission time controlled by a programmed timing device integral to transmitter controls.
  - 3. Transmitter Trouble Message: Actuated by failure, in excess of one-minute duration, of the transmitter normal power source, derangement of the wiring of the transmitter, or any alarm input interface circuit or device connected to it.
  - 4. Local Fire-Alarm-System Trouble Message: Initiated by events or conditions that cause a trouble signal to be indicated on the building system.

5. Local Fire-Alarm-System Alarm Message: Actuated when the building system goes into an alarm state. Identifies device that initiated the alarm.
6. Local Fire-Alarm-System, Supervisory-Alarm Message: Actuated when the building alarm system indicates a supervisory alarm .

## 2.6 FIRE ALARM CABLE

- A. Furnish only wire recommended by the fire alarm system manufacturer. Coordinate closely with equipment vendor for quantity, type, and size of fire alarm cables required.
- B. SLC Circuit Cable for Addressable Initiation Devices: Power-limited (FPLP) solid or stranded (7 strand minimum) copper, 75 Degrees C insulation, #18 AWG twisted, shielded or unshielded, color-coded vinyl insulation, PVC jacket.
- C. NAC Circuit Cable for Notification Devices: Power-limited (FPLP), solid or stranded (7 strand minimum) copper, 75 Degrees C insulation, #14 AWG twisted, shielded or unshielded, color-coded vinyl insulation, PVC jacket.
- D. All wiring shall be color coded and labeled at each end. Splicing by way of wire nuts is prohibited.
- E. All fire alarm wiring shall be plenum rated where located in air plenum.

## **PART 3 - EXECUTION**

### 3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
  1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
  1. Devices placed in service before all other trades have completed cleanup shall be replaced.

2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
- B. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor.
- C. Manual Fire-Alarm Boxes:
1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
  2. The operable part of manual fire-alarm box shall be between 42 inches and 48 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- D. Smoke- or Heat-Detector Spacing:
1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
  2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
- E. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall be supported at both ends.
1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.
- G. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.
- H. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- I. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.
- J. Device Location-Indicating Lights: Locate in public space near the device they monitor.

- K. Antenna for Radio Alarm Transmitter: Mount to building structure where indicated. Use mounting arrangement and substrate connection that resists **100-mph** wind load with a gust factor of 1.3 without damage.

### 3.3 PATHWAYS

- A. Fire alarm cable above ceilings and in non-accessible locations may be routed exposed, where supported by j-hooks or other approved method.
  - 1. Exposed fire alarm cable located less than 96 inches above the floor shall be installed in raceway.
- B. Exposed fire alarm raceways shall be painted red enamel.

### 3.4 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.
  - 1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
  - 1. Magnetically held-open doors.
  - 2. Electronically locked doors and access gates.
  - 3. Alarm-initiating connection to elevator recall system and components.
  - 4. Alarm-initiating connection to activate emergency lighting control.
  - 5. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
  - 6. Supervisory connections at valve supervisory switches.
  - 7. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
  - 8. Supervisory connections at fire-pump power failure including a dead-phase or phase-reversal condition.
  - 9. Supervisory connections at fire-pump engine control panel.
  - 10. Supervisory connections at generator.

### 3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Install framed instructions in a location visible from fire-alarm control unit.

### 3.6 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

### 3.7 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by Engineer and authorities having jurisdiction.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Perform the following tests and inspections :
  - 1. Visual Inspection: Conduct visual inspection prior to testing.
    - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
    - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
  - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
  - 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
  - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
  - 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.

- G. Prepare test and inspection reports.
- H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

### 3.8 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include TWELVE months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
  - 1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  - 2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  - 3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

### 3.9 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for TWO years.

### 3.10 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

**END OF SECTION 28 31 11**

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**LEGEND - FLOOR PLAN**

- 1 HOUR FIRE RATING - INCLUDING BUT NOT LIMITED TO EXTERIOR WALLS, UNIT DEMISING WALLS, STAIR & ELEVATOR WALLS, SHAFT WALLS.
- 1 HOUR FIRE RATING - CORRIDOR WALLS
- 2 HOUR FIRE RATING
- INTERIOR PARTITION
- SENSORY (HEARING / VISUALLY IMPAIRED) UNIT** - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
- ANSI TYPE A UNIT** - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. UNITS TO ALSO INCLUDE SENSORY (HEARING / VISUALLY IMPAIRED) UNIT FEATURES. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
- DIRECTION OF INSTALLATION OF LVT FLOORING. SEE FINISH SCHEDULE FOR ADDITIONAL INFO.
- DOOR TYPE
- REQUIRED 30"x48" CLEAR FLOOR SPACE - 48" SHALL BE CENTERED AT APPLIANCES AND SINKS
- UNOBSTRUCTED CLEARANCE FOR PATH OF ACCESSIBLE MEANS OF EGRESS, MIN. 30" REQUIRED

**CODED NOTE LEGEND**

- (1) METAL ROOFING SYSTEM
- (2) MEMBRANE ROOFING SYSTEM
- (3) PROJECTION OF FLOOR ABOVE (DASHED)
- (4) WOOD HANDRAIL ONE SIDE OF CORRIDORS @36"-38" MAX. A.F.F. SEE PLAN FOR EXTENT AND LOCATION. SEE DETAIL 10A820.
- (5) WOOD CHAIR RAIL ONE SIDE OF CORRIDORS @36"-38" MAX. A.F.F. SEE PLAN FOR EXTENT AND LOCATION. SEE DETAIL 10A820.
- (6) MECHANICAL ROOF SCREEN AND SUPPORT.
- (7) MECHANICAL ROOF-TOP UNITS. SEE MECHANICAL DRAWINGS & SPECIFICATIONS.
- (8) FIRE EXTINGUISHER IN SEMI-RECESSED CABINET. PROVIDE RATED CABINETS AT RATED WALL LOCATIONS.
- (9) TOP OF LAUNDRY ROOM COUNTER TO BE AT 34 INCHES MAXIMUM AFF. PROVIDE AND INSTALL PLAM COUNTER WITH COUNTERTOP OF METAL SUPPORTS. PROVIDE INTERMEDIATE SUPPORTS AS REQUIRED.
- (10) MAXIMUM OCCUPANCY SIGNAGE PLATE IN COMMUNITY RM, WELNESS RM, FLEX SPACE (TYPE C), REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A81020.
- (11) ACCESSIBLE UNISEX RESTROOM SIGNAGE PLATE (TYPE A). REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A931.
- (12) FIRE EXIT IDENTIFIER ELEVATOR SIGNAGE PLATE (TYPE D), REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A931. REFER DETAILS ON SHEET A820.
- (13) SMOKE FREE AND WEAPONS FREE VINYL DECAL APPLIED ON GLASS STOREFRONT IN THE VESTIBULE (TYPE F), REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A931.
- (14) ELECTRICAL CONTROL PANEL ROOM IDENTIFIER SIGNAGE PLATE ON THE DOOR OF THE E-100 (TYPE E).
- (15) STAIR EXIT IDENTIFIER SIGNAGE PLATE (TYPE B). REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A931.
- (16) 3' ACROBYN CORNER GUARD. SEE SPECIFICATIONS.
- (17) SET DUMPSTER ENCLOSURE WALL 4' OFF OF THE BUILDING - RETURN BRICK TO THE INSIDE.
- (18) SLOPE ENTIRE TRASH ROOM SLAB TO FLOOR DRAIN.

**FLOOR PLAN GENERAL NOTES**

- A. EXTERIOR WALL DIMENSIONS ARE TO EXTERIOR FACE OF EXTERIOR SHEATHING OR EXTERIOR FACE OF BRICK. ALL OTHER DIMENSIONS ARE TO FINISH FACE OF WALL (UNLESS NOTED OTHERWISE).
- B. SEE STRUCTURAL DRAWINGS FOR LOCATIONS OF ALL STEEL REINFORCING IN WALL & FLOOR CONSTRUCTION.
- C. SEE ENLARGED PLANS AND FINISH SCHEDULE FOR ADDITIONAL INFORMATION OF LOCATIONS AND TYPES OF FINISH MATERIALS.
- D. ALL UNITS ARE TYPICAL (ANSI TYPE B). UNLESS ENLARGED UNIT FLOOR PLANS FOR UNIT TYPE AND ADDITIONAL INFORMATION.
- E. SEE ELEVATIONS & STRUCTURAL DRAWINGS FOR LOCATIONS OF EXPANSION & CONTROL JOINTS. CONTRACTOR SHALL PROVIDE ADDITIONAL INTERIOR CONTROL JOINTS AS REQUIRED TO COMPLY WITH MAXIMUM SPACING REQUIREMENTS IN SPECIFICATIONS AND NATIONAL MASONRY INSTITUTE, MECHANICAL & ELECTRICAL EQUIPMENT SHALL BE ON HOUSEKEEPING PADS. PADS ARE TO BE PROVIDED BY THE TRADE SUPPLYING THE EQUIPMENT. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION. WORK TO BE COORDINATED THROUGH THE GENERAL TRADES CONTRACTOR. PADS 4" MIN. 4" THICK W/ W.F. UNLESS NOTED OTHERWISE.
- F. FURNITURE IS INCLUDED IN CONTRACT. SEE FINE DRAWINGS FOR ADDITIONAL INFO. PROVIDE RESIDENTIAL APPLIANCES IN RESIDENTIAL UNITS AND PUBLIC AREAS UNLESS NOTED OTHERWISE. ALL APPLIANCES TO BE PROVIDED AND INSTALLED BY GC.
- G. ALL INTERIOR GYPSUM BOARD PARTITIONS TO INCLUDE THE USE OF 5/8" GYPSUM BOARD. WHERE NEW SHOWERS & SURROUNDS, ALL SINKS, WATER HEATERS AND CLOTHES WASHERS ARE BEING PROVIDED AND INSTALLED. GYPSUM BOARD (SUBSTRATE IS TO BE MOISTURE-RESISTANT SUBSTRATE (NON-PAPER FACED), WITHIN 4 FEET OF ANY WATER SOURCES WHERE DRYWALL CAN BE SPLASHED.
- H. FOR 1-PIECE SHOWER UNIT, IT IS NOT REQUIRED TO INSTALL DRYWALL OR TYVEK BEHIND UNIT EXCEPT AT FIRE RATED WALL ASSEMBLIES. INSTALL GYPSUM BOARD AS REQUIRED.
- I. ALL DOORS LOCATED FOR PUBLIC ACCESS, ALL RESIDENTIAL ENTRANCES AND ALL USABLE DOORS IN ANSI TYPE A UNITS SHALL BE INSTALLED TO MAINTAIN THE DOOR CLEARANCE (32" MINIMUM) REQUIREMENTS OUTLINED ON THE TYPICAL PROJECT DETAILS SHEETS ON A81020.
- J. ACCESSIBLE ROUTE WIDTH SHALL BE 36" MINIMUM, CONTINUOUS AND UNOBSTRUCTED. CONNECTING ACCESSIBLE ELEMENTS AND SPACES: THRESHOLDS, IF PROVIDED AT PUBLIC DOORWAYS AND IN ANSI TYPE A UNITS, MUST BE 1/2 INCH HIGH MAXIMUM. CHANGES IN LEVEL OF 1/4 INCH HIGH MAXIMUM ARE PERMITTED TO BE VERTICAL. CHANGES IN LEVEL BETWEEN 1/4 INCH HIGH MINIMUM AND 1/2 INCH HIGH MAXIMUM MUST BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2.
- K. COORDINATE TRUSS LAYOUT AND DESIGN WITH MECHANICAL, ELECTRICAL AND PLUMBING LAYOUT PRIOR TO FABRICATION. TRUSS SHOP DRAWINGS SHALL INDICATE PLUMBING LINES AND HVAC DUCTS. PROVIDE COORDINATION DRAWING TO ARCHITECT. FRAMING CONTRACTOR SHALL COORDINATE TRUSS FRAMING OFFSETS AS REQUIRED TO ACCOMMODATE SANITARY LINES AND OTHER MEP EQUIPMENT / FIXTURES.
- L. INSTALL ACOUSTIC BATT INSULATION AT PARTITIONS WITH PLUMBING STACKS, DEMISING WALLS AND FLOORING ASSEMBLIES.
- M. WATER SUPPLY AND DRAIN PIPES UNDER LAVATORIES AND SINKS MUST BE INSULATED TO PROTECT AGAINST CONTACT, INCLUDING COLD WATER SUPPLIES. PROVIDE SPRAY FOAM INSULATION AT DEMISING AND EXTERIOR WALLS AT LOCATIONS AROUND PLUMBING INSTALLATIONS. PROVIDE A VALANCE AT AREAS WITH EXPOSED SINK DRAINING. SEE TYPICAL PROJECT DETAILS SHEETS ON A81020 FOR REQUIREMENTS.
- N. HORIZONTAL OFFSETS IN PLUMBING DRAIN PIPES. PROVIDE ACOUSTIC PIPE INSULATION. REFER TO PLUMBING DRAWINGS.
- O. GYPSUM UNDERLAYMENT SHALL BE PROVIDED AT ALL FLOOR / CEILING ASSEMBLIES EXCEPT STAIR TREADS. ALL GYPSUM UNDERLAYMENT SHALL RECEIVE A FINISH MATERIAL. GYPSUM UNDERLAYMENT SHALL NOT BE VISIBLE TO VIEW. FLOORING MATERIAL IS NOT REQUIRED UNDERNEATH BASE CABINETS BUT REQUIRED UNDER REMOVABLE BASE CABINETS.
- P. ACOUSTICAL MAT SHALL BE PROVIDED ON ALL WOOD FLOOR / CEILING ASSEMBLIES.
- Q. WHERE STANDARD SHOWERS ARE LOCATED, PROVIDE AND INSTALL WOOD BLOCKING IN WALLS AROUND SHOWER FOR FUTURE INSTALLATION OF GRAB BARS. WHERE ROLL-IN SHOWERS ARE LOCATED, PROVIDE AND INSTALL WOOD BLOCKING AND GRAB BARS IN WALLS AROUND SHOWER. SEE TYPICAL PROJECT DETAILS ON SHEET A81020 AND MEP DRAWINGS FOR ADDITIONAL INFORMATION.
- R. PROVIDE BLOCKING FOR CURVED SHOWER RODS, LOCATED DIRECTLY ABOVE THE TOP OF THE SHOWER ENCLOSURE.
- S. PROVIDE WOOD BLOCKING NOT SHOWN OR SHOWN AS REQUIRED TO MOUNT MILLWORK, MEP DEVICES AND ALL FIXTURES.
- T. ALL MEP OPERABLE CONTROLS, FIXTURES, OUTLETS AND TOILET ACCESSORIES SHALL NOT BE MOUNTED LOWER THAN 18 INCHES AFF AND HIGHER THAN 48 INCHES. SEE TYPICAL PROJECT DETAILS FOR ADDITIONAL MOUNTING REQUIREMENTS.
- U. REFER TO MOUNTING HEIGHTS SCHEDULE ON SHEET A81020 FOR MOUNTING HEIGHTS.
- V. FOR KITCHEN ELECTRIC OUTLET RECEPTACLES, THE MAXIMUM ALLOWABLE HEIGHT TO THE CENTERLINE OF AN OUTLET IS 48 INCHES AFF WHEN REACHING OVER AN OBSTRUCTION 36 INCHES HIGH MAXIMUM AND 25-12 INCHES DEEP MAXIMUM. OUTLETS MUST BE A MINIMUM OF 36 INCHES FROM AN INSIDE CORNER OR 12 INCHES FROM END WALL. DM 5.3.5.8
- W. THERMOSTATS, SWITCHES, ELECTRIC OUTLETS, ELECTRICAL PANELBOARDS AND OTHER OPERABLE PARTS MUST BE LOCATED WITHIN AN ACCESSIBLE REACH RANGE FROM 15 INCHES TO 48 INCHES AFF FOR AN UNOBSTRUCTED REACH. DM 5.3.5.5. ANSI 1003.9, 1004.9, 309.3, 309.3.
- X. KITCHEN SINKS AT COMMUNITY ROOM KITCHEN SHALL INCLUDE REAR DRAINAGE SINKS TO ACCOMMODATE DISPOSALS. SINK BOWL SHALL NOT BE DEEPER THAN 6 1/2 INCHES.
- AA. WHERE REQUIRED, INSTALL ANY MEP DEVICES / FIXTURES SO THE INTEGRITY OF RATED WALL IS MAINTAINED. CONTINUE TYPE X GYPSUM BOARD ASSEMBLY BEHIND MEP DEVICE / FIXTURE.
- BB. EXTEND FINISH FLOOR MATERIAL UNDER COMMUNITY ROOM KITCHEN APPLIANCES. UNITS IN ALL PUBLIC BATHS AND UNDERNEATH REMOVABLE UNIVERSAL BASE CABINETS. ALL CABINETS SURFACES VISIBLE INCLUDING AREAS EXPOSED AFTER REMOVING REMOVABLE BASE CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK. EXPOSED SIDES OF CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK.
- CC. SIDES OF BANCHE OR OPEN WORK AREAS BELOW BASE CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK. EXPOSED SIDES OF WALL AND BASE CABINETS SHALL HAVE FINISH PANELS ON ALL EXPOSED TO VIEW.
- DD. ALL PLUMBING FIXTURES IN PUBLIC AREAS TO BE WATERSENSE-RATED.
- EE. ALL APPLIANCES IN PUBLIC AREAS TO BE ENERGY STAR-RATED.
- FF. PROVIDE AND INSTALL WINDOW COVERINGS AND HEAVY DUTY WINDOW SCREENS AT ALL RESIDENTIAL UNIT WINDOWS. PROVIDE AND INSTALL WINDOW COVERINGS AT COMMUNITY ROOMS CR-100 AND CR-101.
- GG. COMMUNITY ROOM KITCHENS AND ALL OTHER PUBLIC AREAS (WHERE PROVIDED) TO RECEIVE QUARTZ COUNTERTOPS.
- HH. IN PUBLIC AREAS, ALL COUNTERTOPS TO BE SET AT 34 INCHES MAXIMUM HEIGHT TO THE TOP OF KITCHEN OR BATH / TOILET SINK RIM.
- II. AT PUBLIC AREAS WITH TOP-SET BACKSPLASH, 1 INCH THICK SQUARE EDGE RECEPTACLES TO BE LOCATED HORIZONTALLY ON FACE OF BACKSPLASH. BACKSPLASH TO BE 8 INCHES HIGH AT THESE LOCATIONS.
- JJ. CAULK ALL EXTERIOR PENETRATIONS. REFER TO SPEC SECTION 07 82 00 JOINT SEALANTS FOR DETAILS.
- KK. ANY PENETRATIONS AT FIRE RATED WALLS ARE TO BE FIRESTOPPED.
- LL. PROVIDE AND INSTALL PASSIVE RADON REMEDIATION SYSTEM AS NOTED. REFER TO TYPICAL PROJECT DETAILS, PLUMBING PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- MM. PROVIDE AND INSTALL CORNER GUARDS AT ALL WALL CORNER LOCATIONS IN CORRIDORS AND PUBLIC AREAS.
- NN. PROVIDE AND INSTALL CHAIR RAILS ON ONE SIDE AND HAND RAILS ON THE OTHER SIDE AT ALL CORRIDORS.
- OO. SEE SHEET A720 FOR WINDOW ELEVATIONS AND DETAILS.



**1 PLAN** OVERALL FIRST FLOOR PLAN  
 1/16" = 1'-0"

#	DATE	CHANGE DESCRIPTION
1	12/27/2023	ADDENDUM NO 2

**COBBLESTONE MANOR**  
 1500 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**  
 COLUMBUS METROPOLITAN HOUSING AUTHORITY  
COLUMBUS, OHIO 43260-0001

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

DRAWING TITLE:  
**LEVEL 01 - FLOOR PLAN - OVERALL**

06/08/2023  
 DRAWN BY: xxx CHECKED BY: xxx  
 #22172.01  
**A101**  
 JAY W BOONE, LIC. #10740  
 EXP. DATE: 12/31/2023  
 PERMIT & BID SET

EXTERIOR WALL TYPE LEGEND	
EX-01	BRICK ON WD STUD
EX-02	STONE VENEER ON WD STUD
EX-03	CLAPBOARD SIDING ON WD STUD
EX-04	BRICK ON CMU
EX-05	STONE VENEER ON CMU

LEGEND - FLOOR PLAN	
	1 HOUR FIRE RATING - INCLUDING BUT NOT LIMITED TO EXTERIOR WALLS, UNIT DEMISING WALLS, STAIR & ELEVATOR WALLS, SHAFT WALLS.
	1 HOUR FIRE RATING - CORRIDOR WALLS
	2 HOUR FIRE RATING
	INTERIOR PARTITION
	<b>SENSORY (HEARING / VISUALLY IMPAIRED) UNIT</b> - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
	<b>ANSI TYPE A UNIT</b> - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. UNITS TO ALSO INCLUDE SENSORY (HEARING / VISUALLY IMPAIRED) UNIT FEATURES. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
	DIRECTION OF INSTALLATION OF LVT FLOORING. SEE FINISH SCHEDULE FOR ADDITIONAL INFO.
	DOOR TYPE
	REQUIRED 30"x48" CLEAR FLOOR SPACE - 48" SHALL BE CENTERED AT APPLIANCES AND SINKS
	UNOBSTRUCTED CLEARANCE FOR PATH OF ACCESSIBLE MEANS OF EGRESS, MIN. 30" REQUIRED

CODED NOTE LEGEND	
1	METAL ROOFING SYSTEM
2	MEMBRANE ROOFING SYSTEM
3	PROJECTION OF FLOOR ABOVE (DASHED)
4	WOOD HANDRAIL ONE SIDE OF CORRIDORS @36"-38" MAX. A.F.F. SEE PLAN FOR EXTENT AND LOCATION. SEE DETAIL 10A820.
5	WOOD CHAIR RAIL ONE SIDE OF CORRIDORS @36"-38" MAX. A.F.F. SEE PLAN FOR EXTENT AND LOCATION. SEE DETAIL 10A820.
6	MECHANICAL ROOF SCREEN AND SUPPORT.
7	MECHANICAL ROOF-TOP UNITS. SEE MECHANICAL DRAWINGS & SPECIFICATIONS.
8	FIRE EXTINGUISHER IN SEMI-RECESSED CABINET. PROVIDE RATED CABINETS AT RATED WALL LOCATIONS.
9	TOP OF LAUNDRY ROOM COUNTER TO BE AT 34 INCHES MAXIMUM AFF. PROVIDE AND INSTALL PLAM COUNTER WITH COUNTERTOP METAL SUPPORTS. PROVIDE INTERMEDIATE SUPPORTS AS REQUIRED.
10	MAXIMUM OCCUPANCY SIGNAGE PLATE IN COMMUNITY RM, WELNESS RM, FLEX SPACE (TYPE C), REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A811.
11	ACCESSIBLE UNISEX RESTROOM SIGNAGE PLATE (TYPE A). REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A811.
12	FIRE EXIT IDENTIFIER ELEVATOR SIGNAGE PLATE (TYPE D), REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A811.
13	SMOKE FREE AND WEAPONS FREE VINYL DECAL APPLIED ON GLASS STOREFRONT IN THE VESTIBULE (TYPE F), REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A811.
14	ELECTRICAL CONTROL PANEL ROOM IDENTIFIER SIGNAGE PLATE ON THE DOOR OF THE E-100 (TYPE E).
15	STAIR EXIT IDENTIFIER SIGNAGE PLATE (TYPE B). REFER SIGNAGE LEGEND AND SCHEDULE ON SHEET A811.
16	3' ACROBYN CORNER GUARD. SEE SPECIFICATIONS.
17	SET DUMPSTER ENCLOSURE WALL 4' OFF OF THE BUILDING - RETURN BRICK TO THE INSIDE.
18	SLOPE ENTIRE TRASH ROOM SLAB TO FLOOR DRAIN.

FLOOR PLAN GENERAL NOTES	
A.	EXTERIOR WALL DIMENSIONS ARE TO EXTERIOR FACE OF EXTERIOR SHEATHING OR EXTERIOR FACE OF BRICK. ALL OTHER DIMENSIONS ARE TO FINISH FACE OF WALL (UNLESS NOTED OTHERWISE).
B.	SEE STRUCTURAL DRAWINGS FOR LOCATIONS OF ALL STEEL REINFORCING IN WALL & FLOOR CONSTRUCTION.
C.	SEE ENLARGED PLANS AND FINISH SCHEDULE FOR ADDITIONAL INFORMATION OF LOCATIONS AND TYPES OF FINISH MATERIALS.
D.	ALL UNITS ARE TYPICAL (ANSI TYPE B). UNLESS OTHERWISE NOTED, UNITS FOR UNIT TYPE AND ADDITIONAL INFORMATION.
E.	SEE ELEVATIONS & STRUCTURAL DRAWINGS FOR LOCATIONS OF EXPANSION & CONTROL JOINTS. CONTRACTOR SHALL PROVIDE ADDITIONAL INTERIOR CONTROL JOINTS AS REQUIRED TO COMPLY WITH MAXIMUM SPACING REQUIREMENTS IN SPECIFICATIONS AND NATIONAL MASONRY INSTITUTE, MECHANICAL & ELECTRICAL EQUIPMENT SHALL BE ON HOUSEKEEPING PADS. PADS ARE TO BE PROVIDED BY THE TRADE SUPPLYING THE EQUIPMENT. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION. WORK TO BE COORDINATED THROUGH THE GENERAL TRADES CONTRACTOR. PADS 4" MIN. 4" THICK W/ W.W.F. UNLESS NOTED OTHERWISE. PROVIDE AND INSTALL PASSIVE RADON REMEDIATION SYSTEM AS NOTED. REFER TO TYPICAL PROJECT DETAILS, PLUMBING PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
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G.	FURNITURE IS INCLUDED IN CONTRACT. SEE FINE DRAWINGS FOR ADDITIONAL INFO. PROVIDE AND INSTALL CORNER GUARDS AT ALL WALL CORNER LOCATIONS IN CORRIDORS AND PUBLIC AREAS. UNLESS NOTED OTHERWISE, ALL APPLIANCES TO BE PROVIDED AND INSTALLED BY GC.
H.	ALL INTERIOR GYPSUM BOARD PARTITIONS TO INCLUDE THE USE OF 5/8" GYPSUM BOARD. WHERE NEW SHOWERS & SURROUNDS, ALL SINKS, WATER HEATERS AND CLOTHES WASHERS ARE BEING PROVIDED AND INSTALLED, GYPSUM BOARD / SUBSTRATE IS TO BE MOISTURE-RESISTANT SUBSTRATE (NON-PAPER FACED), WITHIN 4 FEET OF ANY WATER SOURCES WHERE DRYWALL CAN BE SPLASHED.
I.	FOR 3' PREC. SHOWER UNIT, IT IS NOT REQUIRED TO INSTALL DRYWALL OR TYVEK BEHIND UNIT EXCEPT AT FIRE RATED WALL ASSEMBLIES. INSTALL GYPSUM BOARD AS REQUIRED.
J.	ALL DOORS LOCATED FOR PUBLIC ACCESS, ALL RESIDENTIAL ENTRANCES AND ALL USABLE DOORS IN ANSI TYPE A UNITS SHALL BE INSTALLED TO MAINTAIN THE DOOR CLEARANCE (32" MINIMUM) REQUIREMENTS OUTLINED ON THE TYPICAL PROJECT DETAILS SHEETS ON A810820.
K.	ACCESSIBLE ROUTE WIDTH SHALL BE 36" MINIMUM, CONTINUOUS AND UNOBSTRUCTED. CONNECTING ACCESSIBLE ELEMENTS AND SPACES: THRESHOLDS, IF PROVIDED AT PUBLIC DOORWAYS AND IN ANSI TYPE A UNITS, MUST BE 1/2" HIGH MAXIMUM. CHANGES IN LEVEL OF 1/4" INCH MAXIMUM ARE PERMITTED TO BE VERTICAL. CHANGES IN LEVEL BETWEEN 1/4" INCH HIGH MINIMUM AND 1/2" INCH HIGH MAXIMUM MUST BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2.
L.	THRESHOLDS, IF PROVIDED AT PUBLIC DOORWAYS AND IN ANSI TYPE A UNITS, MUST BE 1/2" HIGH MAXIMUM. CHANGES IN LEVEL OF 1/4" INCH MAXIMUM ARE PERMITTED TO BE VERTICAL. CHANGES IN LEVEL BETWEEN 1/4" INCH HIGH MINIMUM AND 1/2" INCH HIGH MAXIMUM MUST BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2.
M.	COORDINATE TRUSS LAYOUT AND DESIGN WITH MECHANICAL, ELECTRICAL AND PLUMBING LAYOUT PRIOR TO FABRICATION. TRUSS SPOTS DRAWINGS SHALL INDICATE PLUMBING LINES AND HVAC DUCTS. PROVIDE COORDINATION DRAWING TO ARCHITECT. FRAMING CONTRACTOR SHALL COORDINATE TRUSS FRAMING OFFSETS AS REQUIRED TO ACCOMMODATE SANITARY LINES AND OTHER MEP EQUIPMENT / FIXTURES.
N.	INSTALL ACOUSTIC BATT INSULATION AT PARTITIONS WITH PLUMBING STAKES, DEMISING WALLS AND FLOORING REQUIREMENTS.
O.	WATER SUPPLY AND DRAIN PIPES UNDER LAVATORIES AND SINKS MUST BE INSULATED TO PROTECT AGAINST CONTACT, INCLUDING COLD WATER SUPPLIES. PROVIDE SPRAY FOAM INSULATION AT DEMISING AND EXTERIOR WALLS AT LOCATIONS AROUND PLUMBING INSTALLATIONS. PROVIDE A VALANCE AT AREAS WITH EXPOSED SINK DRAIN. SEE TYPICAL PROJECT DETAILS SHEETS A810820 FOR REQUIREMENTS.
P.	HORIZONTAL OFFSETS IN PLUMBING DRAIN PIPES. PROVIDE ACOUSTIC PIPE INSULATION. REFER TO PLUMBING DRAWINGS.
Q.	GYPSUM UNDERLAYMENT SHALL BE PROVIDED AT ALL FLOOR / CEILING ASSEMBLIES EXCEPT STAIR TREADS. ALL GYPSUM UNDERLAYMENT SHALL RECEIVE A FLOORING MATERIAL. GYPSUM UNDERLAYMENT SHALL NOT BE VISIBLE TO VIEW. FLOORING MATERIAL IS NOT REQUIRED UNDERNEATH BASE CABINETS BUT REQUIRED UNDER REMOVABLE BASE CABINETS.
R.	ACOUSTICAL MAT: SHALL BE PROVIDED ON ALL WOOD FLOOR / CEILING ASSEMBLIES.
S.	WHERE STANDARD SHOWERS ARE LOCATED, PROVIDE AND INSTALL WOOD BLOCKING IN WALLS AROUND SHOWER FOR FUTURE INSTALLATION OF GRAB BARS. WHERE ROLL-IN SHOWERS ARE LOCATED, PROVIDE AND INSTALL WOOD BLOCKING AND GRAB BARS IN WALLS AROUND SHOWER. SEE TYPICAL PROJECT DETAILS ON SHEET A810820 AND MEP DRAWINGS FOR ADDITIONAL INFORMATION.
T.	PROVIDE BLOCKING FOR CURVED SHOWER RODS, LOCATED DIRECTLY ABOVE THE TOP OF THE SHOWER ENCLOSURE.
U.	PROVIDE WOOD BLOCKING NOT SHOWN OR SHOWN AS REQUIRED TO MOUNT MILLWORK, MEP DEVICES AND ALL FIXTURES.
V.	ALL MEP OPERABLE CONTROLS, FIXTURES, OUTLETS AND TOILET ACCESSORIES SHALL NOT BE MOUNTED LOWER THAN 18 INCHES AFF AND HIGHER THAN 48 INCHES. SEE TYPICAL PROJECT DETAILS FOR ADDITIONAL MOUNTING REQUIREMENTS.
W.	REFER TO MOUNTING HEIGHTS SCHEDULE ON SHEET A810820 FOR MOUNTING HEIGHTS.
X.	FOR KITCHEN ELECTRIC OUTLET RECEPTACLES, THE MAXIMUM ALLOWABLE HEIGHT TO THE CENTERLINE OF AN OUTLET IS 40 INCHES AFF WHEN REACHING OVER AN OBSTRUCTION 36 INCHES HIGH MAXIMUM AND 25-12 INCHES DEEP MAXIMUM. OUTLETS MUST BE A MINIMUM OF 36 INCHES FROM AN INSIDE CORNER OR 12 INCHES FROM END WALL. DM 5.3.5.8
Y.	THERMOSTATS, SWITCHES, ELECTRIC OUTLETS, ELECTRICAL PANELBOARDS AND OTHER OPERABLE PARTS MUST BE LOCATED WITHIN AN ACCESSIBLE REACH RANGE FROM 15 INCHES TO 48 INCHES AFF FOR AN UNOBSTRUCTED REACH. DM 5.3.5.5, ANSI 1003.9, 1004.9, 309.3, 309.3
Z.	KITCHEN SINKS AT COMMUNITY ROOM KITCHEN SHALL INCLUDE REAR DRAINAGE SINKS TO ACCOMMODATE DISPOSALS. SINK BOWL SHALL NOT BE DEEPER THAN 6 1/2 INCHES.
AA.	WHERE REQUIRED, INSTALL ANY MEP DEVICES / FIXTURES SO THE INTEGRITY OF RATED WALL IS MAINTAINED. CONTINUE TYPE X GYPSUM BOARD ASSEMBLY BEHIND MEP DEVICE / FIXTURE.
BB.	EXTEND FINISH FLOOR MATERIAL UNDER COMMUNITY ROOM KITCHEN APPLIANCES. UNITS IN ALL PUBLIC BATHS AND UNDERNEATH REMOVABLE UNIVERSAL BASE CABINETS. ALL CABINET SURFACES VISIBLE INCLUDING AREAS EXPOSED AFTER REMOVING REMOVABLE BASE CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK. EXPOSED SIDES OF CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK.
CC.	SIDES OF BANCOS OR OPEN WORK AREAS BELOW BASE CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK. EXPOSED SIDES OF WALL AND BASE CABINETS SHALL HAVE FINISH PANELS ON ALL EXPOSED TO VIEW.
DD.	ALL PLUMBING FIXTURES IN PUBLIC AREAS TO BE WATERSENSE-RATED.
EE.	ALL APPLIANCES IN PUBLIC AREAS TO BE ENERGY STAR-RATED.
FF.	PROVIDE AND INSTALL WINDOW COVERINGS AND HEAVY DUTY WINDOW SCREENS AT ALL RESIDENTIAL UNIT WINDOWS. PROVIDE AND INSTALL WINDOW COVERINGS AT COMMUNITY ROOMS CR-100 AND CR-101.
GG.	COMMUNITY ROOM KITCHENS AND ALL OTHER PUBLIC AREAS (WHERE PROVIDED) TO RECEIVE QUARTZ COUNTERTOPS.
HH.	IN PUBLIC AREAS, ALL COUNTERTOPS TO BE SET AT 34 INCHES MAXIMUM HEIGHT TO THE TOP OF KITCHEN OR BATH / TOILET SINK RIM.
II.	AT PUBLIC AREAS WITH TOP-SET BACKSPLASH, 1" INCH THICK SQUARE EDGE RECEPTACLES TO BE LOCATED HORIZONTALLY ON FACE OF BACKSPLASH. BACKSPLASH TO BE 8 INCHES HIGH AT THESE LOCATIONS.
JJ.	CAULK ALL EXTERIOR PENETRATIONS. REFER TO SPEC SECTION 07 82 00 JOINT SEALANTS FOR DETAILS.
KK.	ALL PENETRATIONS AT FIRE RATED WALLS ARE TO BE PRESTOPPED.
LL.	PROVIDE AND INSTALL PASSIVE RADON REMEDIATION SYSTEM AS NOTED. REFER TO TYPICAL PROJECT DETAILS, PLUMBING PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
MM.	PROVIDE AND INSTALL CORNER GUARDS AT ALL WALL CORNER LOCATIONS IN CORRIDORS AND PUBLIC AREAS.
NN.	PROVIDE AND INSTALL CHAIR RAILS ON ONE SIDE AND HAND RAILS ON THE OTHER SIDE AT ALL CORRIDORS.
OO.	SEE SHEET A720 FOR WINDOW ELEVATIONS AND DETAILS.



**1 PLAN** LEVEL 01 - FLOOR PLAN - AREA 'B'  
 1/8" = 1'-0"



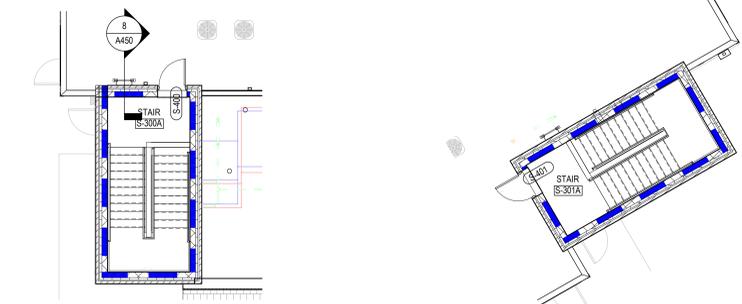
#	DATE	CHANGE DESCRIPTION
1	10/16/23	Grove City Comments
2	12/27/2023	ADDENDUM NO 2

**COBBLESTONE MANOR**  
 1050 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

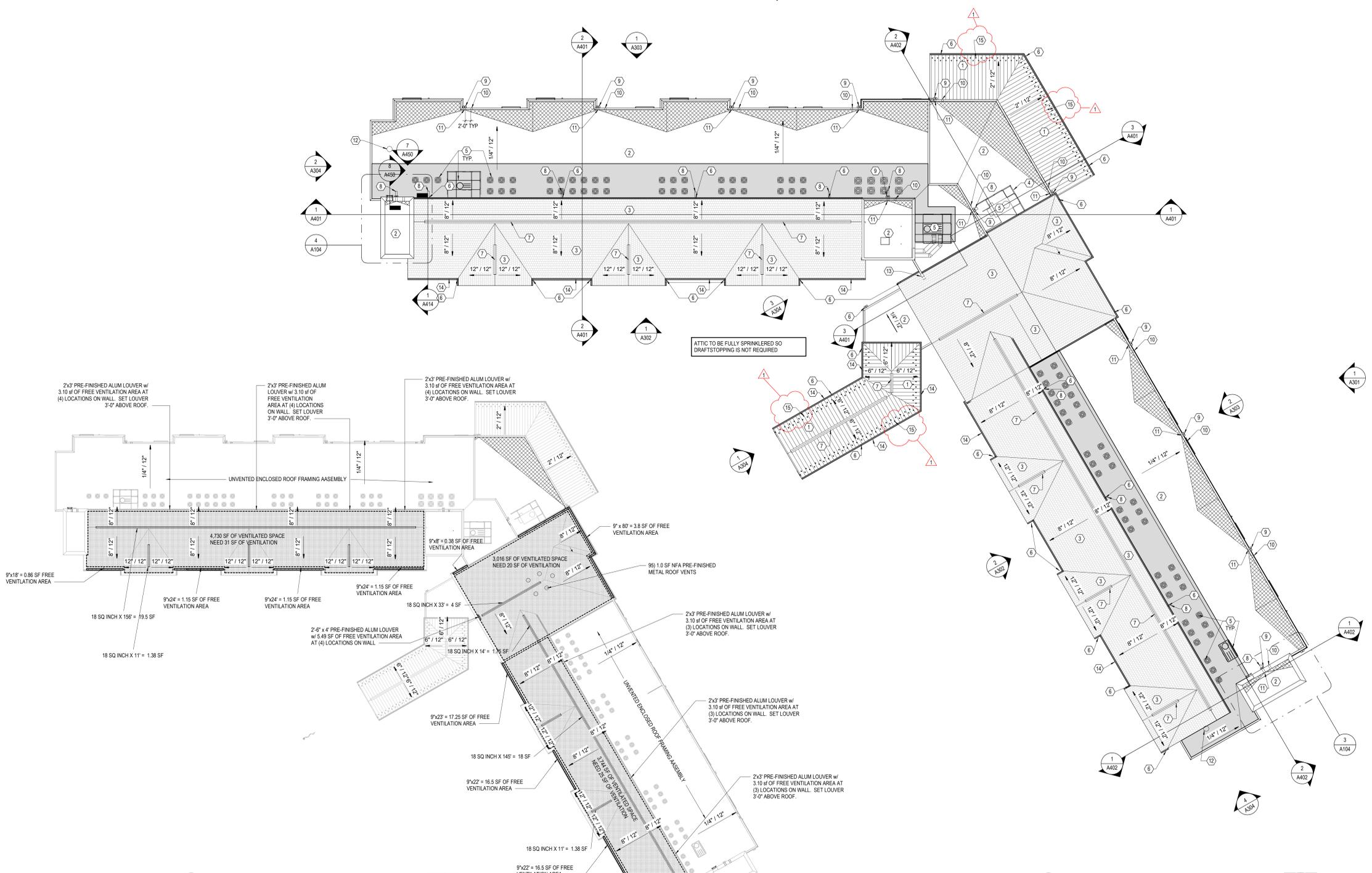
MOODY-NOLAN  
 DRAWING TITLE:  
**LEVEL 01 - FLOOR PLAN - AREA 'B'**

06/08/2023  
 DRAWN BY: xxx CHECKED BY: xxx  
 #22172.01  
**A101B**  
 PERMIT & BID SET  
 JAY W. BOONE, LIC. #10740  
 EXP. DATE: 12/31/2023



**4 PLAN** STAIR TOWER WEST @ ROOF  
 1/8" = 1'-0"

**3 PLAN** STAIR TOWER EAST @ ROOF  
 1/8" = 1'-0"



**2 PLAN** OVERALL ROOF PLAN - VENTILATION  
 3/64" = 1'-0"

**1 PLAN** OVERALL ROOF PLAN  
 1/16" = 1'-0"

- ROOF PLAN GENERAL NOTES**
- SEE STRUCTURAL DRAWINGS FOR TOP OF BEARING (T.O.B.) AT ALL PROPOSED ROOF.
  - REFER TO MECHANICAL AND ARCHITECTURAL DRAWINGS FOR PIPE PENETRATION DETAIL AT ROOF.
  - REFER TO PLUMBING, HVAC AND ELECTRICAL DRAWINGS FOR INFORMATION REGARDING ROOF MOUNTED EQUIPMENT AND ALL REQUIRED ROOF PENETRATIONS.
  - INSTALL ROOF SADDLE OR CRICKET AT LOCATIONS ON ROOF WHERE EQUIPMENT ROOF PENETRATIONS BLOCKS DOWN FLOW OF WATER TO DRAINS.
  - GRAPHIC REPRESENTATION OF TAPERED INSULATION IS SIMPLIFIED AND SHALL SERVE FOR REFERENCE ONLY. IT IS CONTRACTOR RESPONSIBILITY TO PROVIDE POSITIVE DRAINAGE TO ROOF OR DECK DRAINS AT SLOPE 1/4" PER FOOT MINIMUM ON THE ENTIRE ROOF.
  - ROOFING ASSEMBLY SHALL CONTAIN MINIMUM R-30 CONTINUOUS INSULATION ABOVE DECK.
  - DRAFTSTOPPING SHALL DIVIDE THE ATTIC SPACE INTO AREAS NOT EXCEEDING 3,000 SF OR ABOVE EVERY TWO UNITS, WHICHEVER IS SMALLER. DRAFTSTOPPING MATERIAL SHALL BE NOT LESS THAN 1/2" GYPSUM BOARD OR 3/8" OSB SHEATHING.
  - ALL MECHANICAL EQUIPMENT SHALL BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ROOF EDGES TO AVOID GUARDRAILS AS REQUIRED BY CODE.
  - SEE A400 SERIES SHEETS FOR TYPICAL ROOF DETAILS.
  - REFER TO TYPICAL PROJECT DETAILS FOR ADDITIONAL RADON MITIGATION SYSTEM INFORMATION.

- CODED NOTE LEGEND**
- METAL ROOFING SYSTEM. SEE ROOF DETAILS & SPECIFICATIONS.
  - MEMBRANE ROOFING SYSTEM. SEE ROOF DETAILS & SPECIFICATIONS.
  - ASPHALT SHINGLE ROOFING SYSTEM. SEE ROOF DETAILS & SPECIFICATIONS.
  - MECHANICAL ROOF SCREEN AND SUPPORT.
  - MECHANICAL ROOF-TOP UNITS. SEE MECHANICAL DRAWINGS & SPECIFICATIONS.
  - PRE-FINISHED METAL 3" x 4" DOWNSPOUTS. PROVIDE SPLASH PANS AT ALL UPPER ROOF LOCATIONS WHERE DISCHARGING ONTO ROOF.
  - ROOF RIDGE VENT.
  - SPLASH PAN
  - PRE-FINISHED METAL LEADER BOX W/ 4" x 4" DOWNSPOUT. SEE DETAIL 11A450
  - OVERFLOW SCUPPER, TYP. AT PRIMARY SCUPPER. SEE DETAIL 5A440
  - THROUGH WALL SCUPPER
  - TRASH CHUTE ROOF VENT PENETRATION - SEE A802 FOR DETAILS
  - METAL FLASHING ON TOP OF THE PARAPET WALL, INSTALLED UNDER ROOF SHINGLES TO DIVERT RAIN WATER
  - 5" x 4" PRE-FINISHED METAL GUTTER - TYP
  - PRE-FINISHED METAL SNOW GUARDS TO BE INSTALLED ON EAVES OF METAL ROOFING - (2) ROWS IN A STAGGERED PATTERN - TYP

**ROOF VENTILATION**

ROOF VENTILATION: THE NET FREE CROSS-VENTILATION AREA SHALL NOT BE LESS THAN 1/150 OF THE AREA OF THE SPACE VENTILATED.

- ROOF PLAN LEGEND**
- PROVIDE & INSTALL WALKWAY PADS IN SHADED AREA FOR ACCESS TO ROOFTOP UNITS.
  - TAPERED ROOF INSULATION MINIMUM SLOPE 1/4" / 12"

#	DATE	CHANGE DESCRIPTION
1	12/27/2023	ADDENDUM NO 2

**COBBLESTONE MANOR**  
 1550 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

DRAWING TITLE:  
**ROOF PLAN - OVERALL**

DATE: 06/08/2023  
 DRAWN BY: Author  
 CHECKED BY: Checker  
 #22172.01  
**A104**  
 PERMIT & BID SET



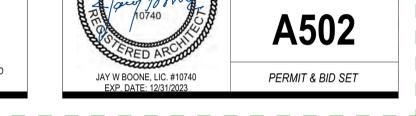
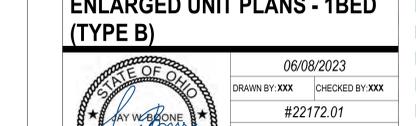
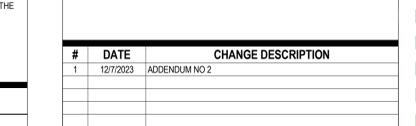
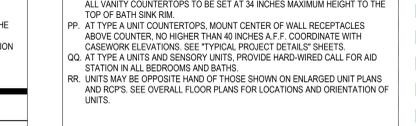
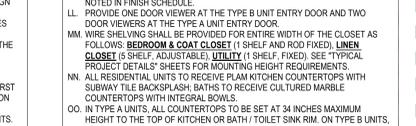
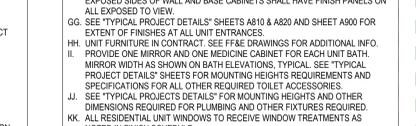
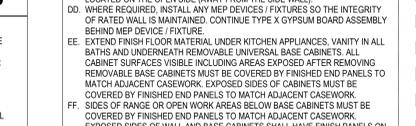
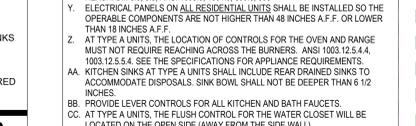
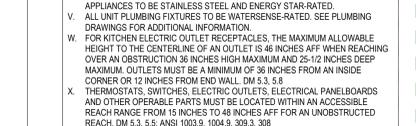
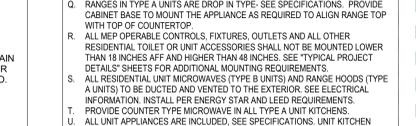
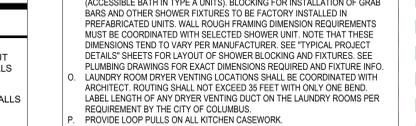
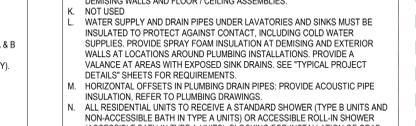
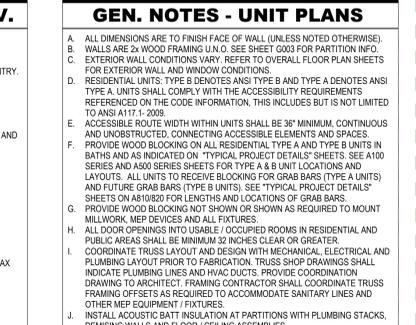
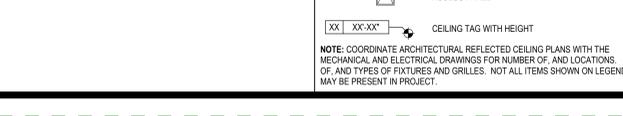
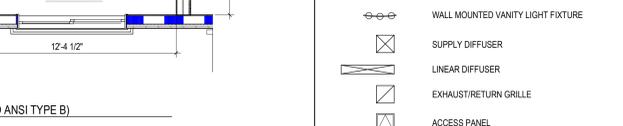
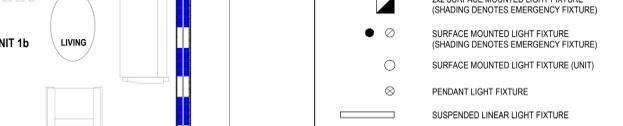
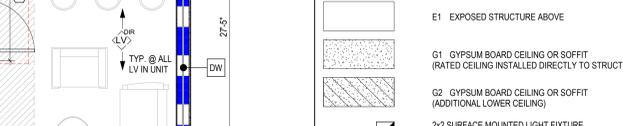
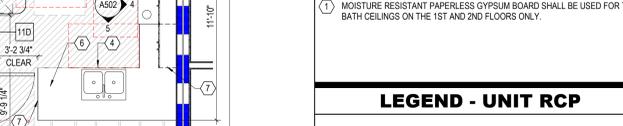
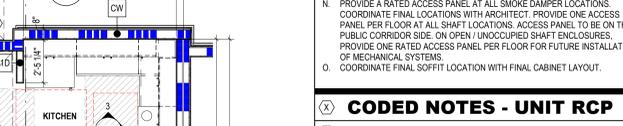
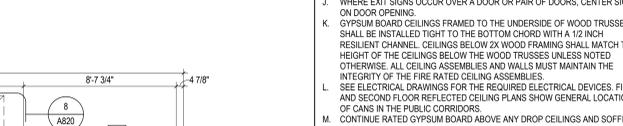
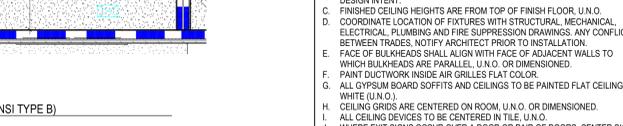
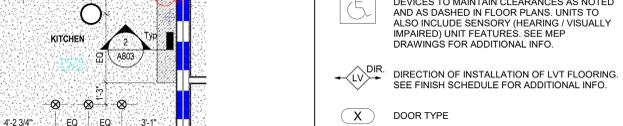
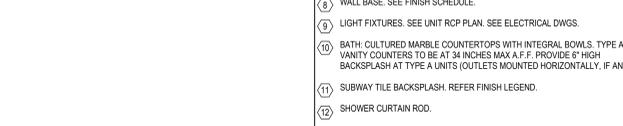
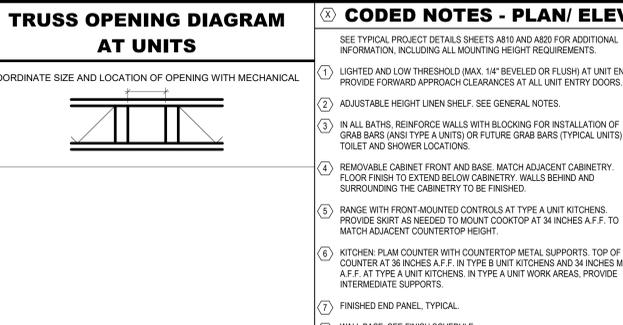
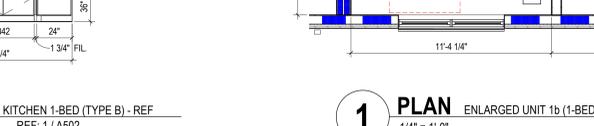
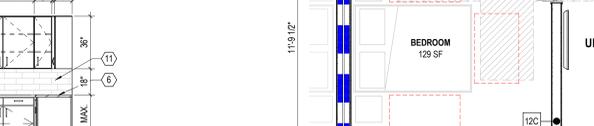
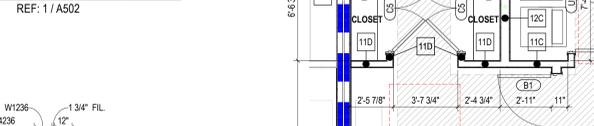
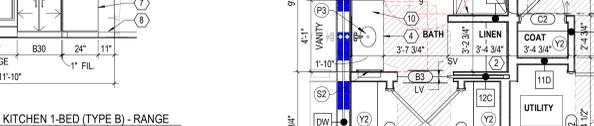
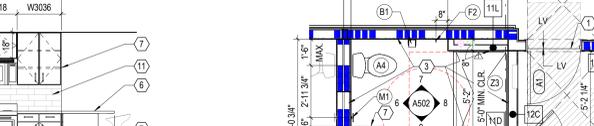
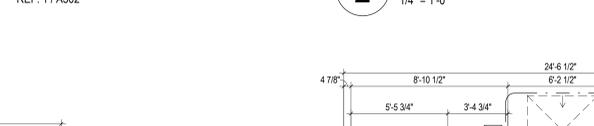
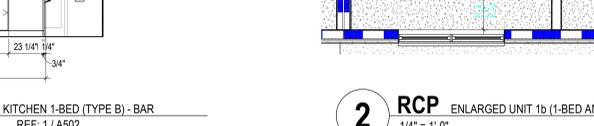
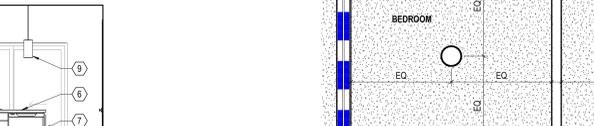
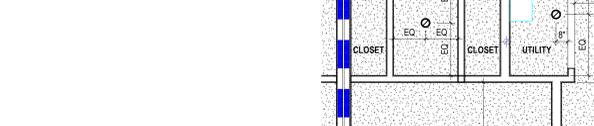
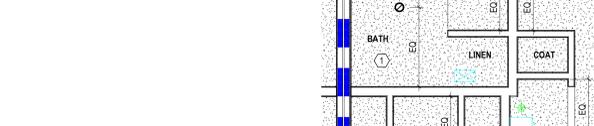
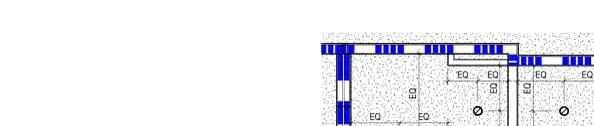
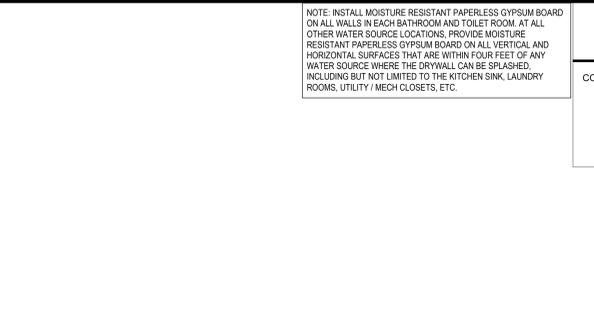
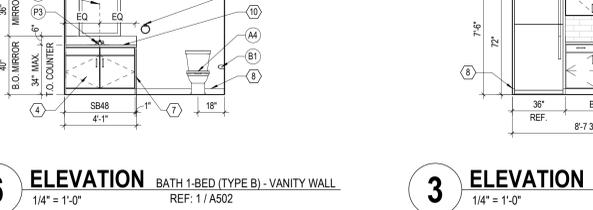
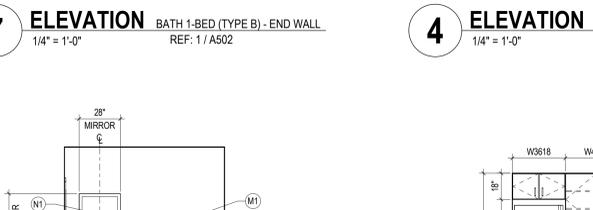
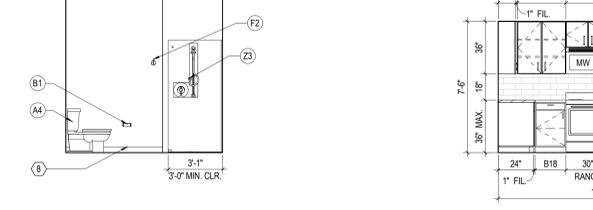
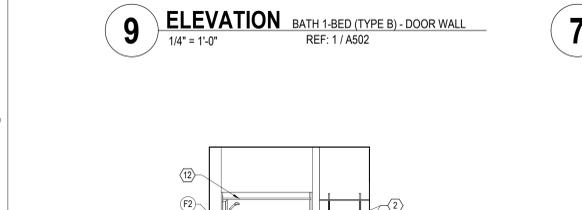
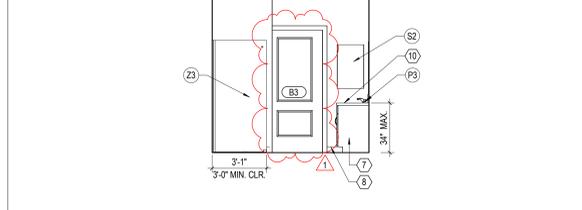
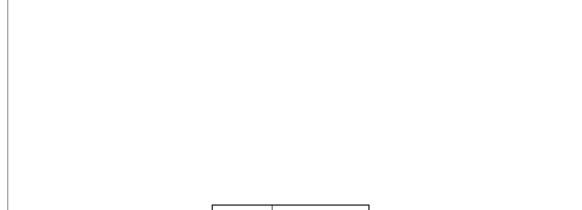
DOOR SCHEDULE UNITS												
DOOR NUMBER	DOOR TYPE	DOOR		FRAME		FIRE RATING	HOW SET	DETAILS - SHEET A710, A711 AND A712			REMARKS	
		WIDTH	HEIGHT	MATERIAL	ELEV			MATERIAL	ELEV	HEAD		JAMB
A1	ENTRY	3'-0"	7'-0"	ID	AP	HM	1	20 MINUTES	15	14/A712	13/A712	REFER DETAILS A820 AND A9A20
B1	BEDROOM	3'-0"	7'-0"	ID	AP	WD	1		17	14/A712	17/A712	
B1R	BEDROOM	3'-0"	7'-0"	ID	AP	WD	1		17	14/A712	13/A712	DOOR IN RATED WALL
B2	BATHROOM	3'-0"	7'-0"	ID	AP	WD	1		17	8/A712	7/A712	
B3	BATHROOM	3'-2"	7'-0"	ID	AP	WD	1		24	18/A712	17/A712	POCKET DOOR
C1	CLOSET	2'-4"	7'-0"	ID	AP	WD	1		19	8/A712	7/A712	
C2	CLOSET	2'-4"	7'-0"	ID	AP	WD	1		19	8/A712	7/A712	
C3	CLOSET	3'-0"	7'-0"	ID	AP	WD	1		19	8/A712	7/A712	
C5	CLOSET	5'-0"	7'-0"	ID	AAP	WD	3		16	8/A712	7/A712	
O6	CLOSET	6'-0"	7'-0"	ID	AAP	WD	3		16	8/A712	7/A712	
L1	LAUNDRY	6'-0"	7'-0"	ID	AAP	WD	3		16	8/A712	7/A712	
L1R	LAUNDRY	6'-0"	7'-0"	ID	AAP	WD	3		16	14/A712	13/A712	DOOR IN RATED WALL
U1	UTILITY	3'-0"	8'-0"	ID	H	WD	1		19	8/A712	7/A712	
U2	UTILITY	6'-0"	8'-0"	ID	HH	WD	3		16	8/A712	7/A712	
U2R	UTILITY	6'-0"	8'-0"	ID	HH	WD	3		16	14/A712	13/A712	DOOR IN RATED WALL

- PROVIDE A ROBE HOOK ON THE DOOR OF BATH ROOMS. HOOK TO FACE SIDE OF TOILET AREA.
- ALL DOOR WIDTHS IN OCCUPIED ROOMS OF BUILDING TO BE 32" MIN CLEAR.
- PROVIDE LEVER STYLE DOOR HARDWARE ON ALL INTERIOR DOORS.
- ALL DOORS PROVIDING ACCESS TO RESIDENTIAL SPACES TO BE PAINTED.
- HM = HOLLOW METAL; WD = WOOD; ID = INTERIOR DOOR (WOOD, SOLID CORE)

TYPICAL RESIDENTIAL UNIT FINISH SCHEDULE						
ROOM NAME	FLOOR		WALLS		GENERAL REMARKS	KEYED REMARKS
	FINISH	COLOR	FINISH	COLOR		
COAT	LV	1	PT	1	APPLIES TO COAT CLOSET	1
KITCHEN	LV	1	PT/CW	1/1	CW@ BACKSPLASH	3.4
LIVING	LV	1	PT	1		
BEDROOM	LV	1	PT	1		
BATH/ACC. BATH	SV	1	PT	1		5
LINEN	SV	1	PT	1		
CLOSET	LV	1	PT	1	APPLIES TO BEDROOM CLOSETS	2
LAUNDRY	LV	1	PT	1		
UTILITY	LV/SV	1	PT	1		2.6

- GENERAL NOTES:
- REFER TO "FINISH LEGEND" A900 FOR MATERIAL AND COLOR INFORMATION.
  - ALL UNIT INTERIOR DOORS AND DOOR FRAMES TO BE PAINTED PT2 IN SEMI-GLOSS.
  - ALL WALL BASE WITHIN RESIDENTIAL UNITS TO BE WB1 AND TO BE PAINTED PT2 - EXCEPT UNIT BATHROOM TO BE RB1. WINDOW AND DOOR OPENINGS TO RECEIVE WOOD CASINGS. WINDOWS TO RECEIVE CULTURED MARBLE SILL.
  - KITCHEN BACKSPLASH TO BE CULTURED MARBLE.
  - CEILING TO BE PAINTED PT6.
  - CONTINUE FLOOR FINISH INTO KNEE SPACE OF REMOVABLE CABINETS, PAINT BACK WALL, INSTALL WALL BASE.
  - ALL EXTERIOR WINDOWS TO RECEIVE MINI-BLINDS WITH HIDDEN CORDS AS SPECIFIED IN THE PROJECT MANUAL.
  - KITCHEN CABINETS TO BE CABINETWORKS GROUP/ADVANTA NEWBURY PROFILE - EXTREME CONSTRUCTION IN STORM FINISH.

- KEYED REMARKS:
- COAT ROD AND SHELF SPAN FULL WIDTH OF CLOSET.
  - WIRE SHELVING: TYPE A OR B TO SPAN FULL WIDTH OF CLOSET.
  - UNIT KITCHEN COUNTERTOP TO BE PLAM. SEE FINISH LEGEND A900 FOR COLOR.
  - TYPE A KITCHEN TO HAVE A 6" HIGH X 3/4" THICK SQUARE EDGE BACKSPLASH LENGTH OF BASE CABINERY. RECEPTACLES TO BE MOUNTED HORIZONTALLY IN THE BACKSPLASH.
  - BATH VANITY COUNTERTOP TO BE CULTURED MARBLE.
  - FLOOR FINISH TO MATCH FLOOR FINISH IN ADJACENT ROOM.



**COBBLESTONE MANOR**  
1500 LAMPLIGHTER DRIVE  
GROVE CITY, OH 43123  
FOR  
**CMHA**

300 SPRUCE STREET  
SUITE 300  
COLUMBUS, OHIO 43215  
PHONE: (614) 461-4664  
FAX: (614) 280-8881

MOODY-NOLAN  
**ENLARGED UNIT PLANS - 1BED (TYPE B)**

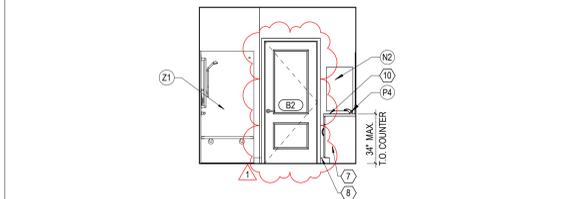
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DRAWN BY: XXXX  
CHECKED BY: XXXX  
#22172.01  
**A502**  
PERMIT & BID SET

JAY W BOONE, LIC. #10740  
REGISTERED ARCHITECT  
EXP. DATE: 12/31/2023

DOOR SCHEDULE UNITS												
DOOR NUMBER	DOOR TYPE	DOOR		FRAME		FIRE RATING	HOW SET	DETAILS - SHEET A710, A711 AND A712			REMARKS	
		WIDTH	HEIGHT	MATERIAL	ELEV			MATERIAL	ELEV	HEAD		JAMB
A1	ENTRY	3'-0"	7'-0"	ID	AP	HM	1	20 MINUTES	15	14/A712	13/A712	REFER DETAILS A820 AND A9A20
B1	BEDROOM	3'-0"	7'-0"	ID	AP	WD	1		17	14/A712	17/A712	DOOR IN RATED WALL
B1R	BEDROOM	3'-0"	7'-0"	ID	AP	WD	1		17	14/A712	13/A712	DOOR IN RATED WALL
B2	BATHROOM	3'-0"	7'-0"	ID	AP	WD	1		17	14/A712	17/A712	
B3	BATHROOM	3'-2"	7'-0"	ID	AP	WD	1		24	18/A712	17/A712	POCKET DOOR
C1	CLOSET	2'-4"	7'-0"	ID	AP	WD	1		19	14/A712	17/A712	
C2	CLOSET	2'-4"	7'-0"	ID	AP	WD	1		19	14/A712	17/A712	
C3	CLOSET	3'-0"	7'-0"	ID	AP	WD	1		19	14/A712	17/A712	
C5	CLOSET	5'-0"	7'-0"	ID	AAP	WD	3		16	14/A712	17/A712	
O6	CLOSET	6'-0"	7'-0"	ID	AAP	WD	3		16	14/A712	17/A712	
L1	LAUNDRY	6'-0"	7'-0"	ID	AAP	WD	3		16	14/A712	17/A712	DOOR IN RATED WALL
L1R	LAUNDRY	6'-0"	7'-0"	ID	AAP	WD	3		16	14/A712	13/A712	DOOR IN RATED WALL
U1	UTILITY	3'-0"	8'-0"	ID	H	WD	1		19	14/A712	17/A712	
U2	UTILITY	6'-0"	8'-0"	ID	HH	WD	3		16	14/A712	17/A712	
U2R	UTILITY	6'-0"	8'-0"	ID	HH	WD	3		16	14/A712	13/A712	

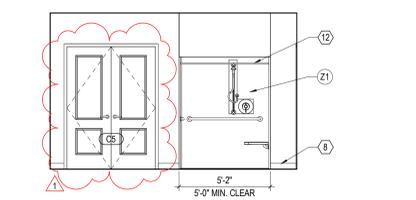
TYPICAL RESIDENTIAL UNIT FINISH SCHEDULE					
ROOM NAME	FLOOR FINISH	WALLS		GENERAL REMARKS	KEYED REMARKS
		COLOR	FINISH		
COAT	LV	1	PT	APPLIES TO COAT CLOSET	3
KITCHEN	LV	1	PT / CW	CW@ BACKSPLASH	3, 4
LIVING	LV	1	PT		1
BEDROOM	LV	1	PT		1
BATH ACC. BATH	SV	1	PT		5
LINEIN	SV	1	PT		1
CLOSET	LV	1	PT	APPLIES TO BEDROOM CLOSETS	2
LAUNDRY	LV	1	PT		1
UTILITY	LV or SV	1	PT		2, 6

- GENERAL NOTES:**
- REFER TO "FINISH LEGEND" A900 FOR MATERIAL AND COLOR INFORMATION.
  - ALL UNIT INTERIOR DOORS AND DOOR FRAMES TO BE PAINTED PT2 IN SEMI-GLOSS.
  - ALL WALL BASE WITHIN RESIDENTIAL UNITS TO BE WB1 AND TO BE PAINTED PT2 - EXCEPT UNIT BATHROOM TO BE WB1. WINDOW AND DOOR OPENINGS TO RECEIVE WOOD CASINGS. WINDOWS TO RECEIVE CULTURED MARBLE SILL.
  - KITCHEN BACKSPLASH TO BE CULTURED MARBLE.
  - CEILING TO BE PAINTED PT2.
  - CONTINUE FLOOR FINISH INTO KNEE SPACE OF REMOVABLE CABINETS. PAINT BACK WALL. INSTALL WALL BASE. PROJECT FINISH CHANNEL CEILING PRIOR TO INSTALLATION.
  - ALL EXTERIOR WINDOWS TO RECEIVE MINI-BLINDS WITH HIDDEN CORDS AS SPECIFIED IN THE PROJECT MANUAL.
  - KITCHEN CABINETS TO BE CABINETWORKS GROUP / ADVANTAGE NEWBURY PROFILE - EXTREME CONSTRUCTION IN STORM FINISH.
- KEYED REMARKS:**
- COAT ROD AND SHELF SPAN FULL WIDTH OF CLOSET.
  - WIRE SHELVING: TYPE A OR B TO SPAN FULL WIDTH OF CLOSET.
  - UNIT KITCHEN COUNTERTOP TO BE PLAM. SEE FINISH LEGEND A 900 FOR COLOR.
  - TYPE A KITCHEN TO HAVE A 6" HIGH X 3/4" THICK SQUARE EDGE BACKSPLASH LENGTH OF BASE CABINERY. RECEPTACLES TO BE MOUNTED HORIZONTALLY IN THE BACKSPLASH.
  - BATH VANITY COUNTERTOP TO BE CULTURED MARBLE.
  - FLOOR FINISH TO MATCH FLOOR FINISH IN ADJACENT ROOM.

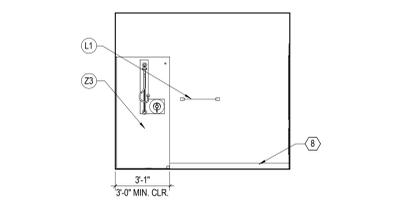


**12 ELEVATION** ACC. BATH 2-BED (TYPE A) - DOOR WALL  
1/4" = 1'-0" REF: 1 / A503

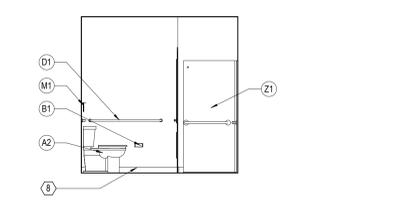
**8 ELEVATION** BATH 2-BED (TYPE A) - DOOR WALL  
1/4" = 1'-0" REF: 1 / A503



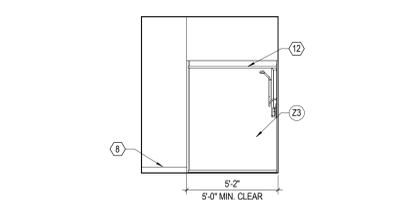
**11 ELEVATION** ACC. BATH 2-BED (TYPE A) - SHOWER WALL  
1/4" = 1'-0" REF: 1 / A503



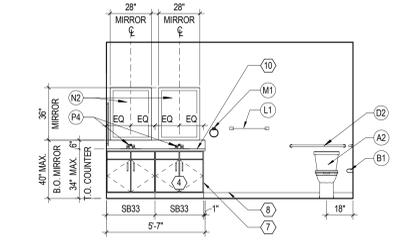
**7 ELEVATION** BATH 2-BED (TYPE A) - SIDE WALL  
1/4" = 1'-0" REF: 1 / A503



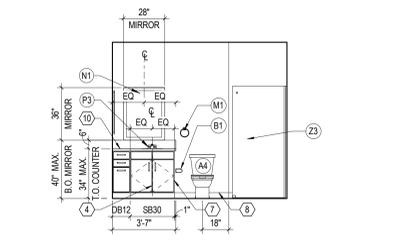
**10 ELEVATION** ACC. BATH 2-BED (TYPE A) - END WALL  
1/4" = 1'-0" REF: 1 / A503



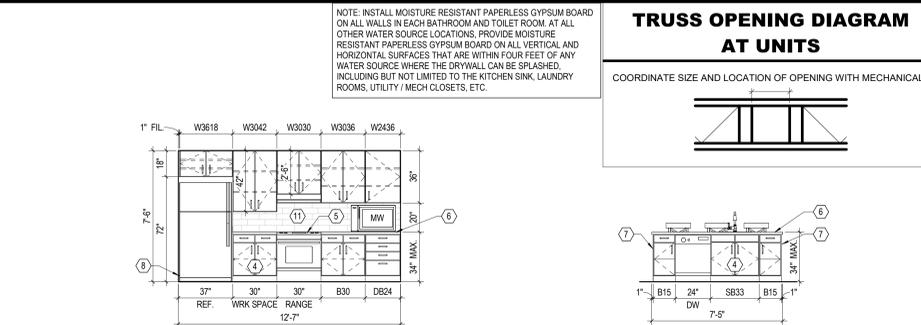
**6 ELEVATION** BATH 2-BED (TYPE A) - SHOWER WALL  
1/4" = 1'-0" REF: 1 / A503



**9 ELEVATION** ACC. BATH 2-BED (TYPE A) - VANITY WALL  
1/4" = 1'-0" REF: 1 / A503

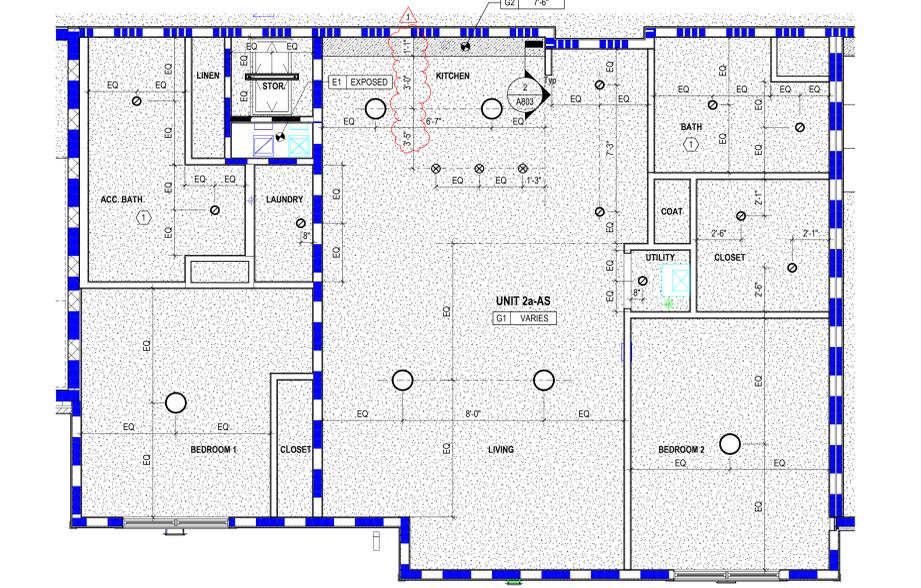


**5 ELEVATION** BATH 2-BED (TYPE A) - VANITY WALL  
1/4" = 1'-0" REF: 1 / A503

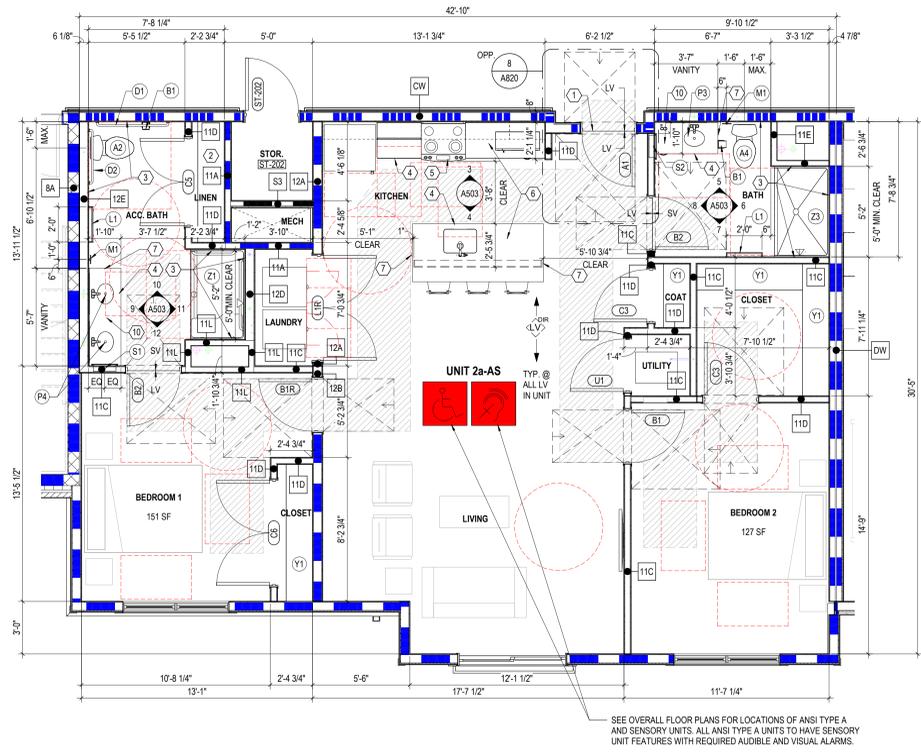


**3 ELEVATION** KITCHEN 2-BED (TYPE A)  
1/4" = 1'-0" REF: 1 / A503

**4 ELEVATION** KITCHEN 2-BED (TYPE A) - ISLAND  
1/4" = 1'-0" REF: 1 / A503



**2 RCP** ENLARGED UNIT 2a-AS (2-BED ANSI TYPE A)  
1/4" = 1'-0"



**1 PLAN** ENLARGED UNIT 2a-AS (2-BED ANSI TYPE A)  
1/4" = 1'-0"

- CODED NOTES - ABLO / ELEV.**
- SEE TYPICAL PROJECT DETAILS SHEETS A810 AND A820 FOR ADDITIONAL INFORMATION, INCLUDING ALL MOUNTING HEIGHT REQUIREMENTS.
  - LIGHTED AND LOW THRESHOLD (MAX. 1/4" BEVELED OR FLUSH) AT UNIT ENTRY. PROVIDE FORWARD APPROACH CLEARANCES AT ALL UNIT ENTRY DOORS.
  - ADJUSTABLE HEIGHT LINEN SHELF. SEE GENERAL NOTES.
  - REMOVABLE CABINET FRONT AND BASE. MATCH ADJACENT CABINERY. FLOOR FINISH TO EXTEND BELOW CABINERY. WALLS BEHIND AND SURROUNDING THE CABINERY TO BE FINISHED.
  - RANGE WITH FRONT MOUNTED CONTROLS AT TYPE A UNIT KITCHENS. PROVIDE SHORT AS NEEDED TO MOUNT COOKTOP AT 34 INCHES A.F.F. TO MATCH ADJACENT COUNTERTOP HEIGHT. OCCUPIED RESIDENTIAL AND PUBLIC AREAS SHALL BE MINIMUM 32 INCHES CLEAR OR GREATER.
  - KITCHEN: PLAM. COUNTERTOP WITH COUNTERTOP METAL SUPPORTS. TOP OF COUNTERTOP SHALL BE MINIMUM 34 INCHES A.F.F. IN TYPE B UNIT KITCHENS AND 34 INCHES MAX. A.F.F. AT TYPE A UNIT KITCHENS. IN TYPE A UNIT WORK AREAS, PROVIDE INTERMEDIATE SUPPORTS.
  - FINISHED END PANEL TYPICAL.
  - WALL BASE. SEE FINISH SCHEDULE.
  - LIGHT FIXTURES. SEE UNIT RCP PLAN. SEE ELECTRICAL DWGS.
  - BATH: CULTURED MARBLE COUNTERTOPS WITH INTEGRAL BOWLS. TYPE A & B VANITY COUNTERTOPS TO BE AT 34 INCHES MAX. A.F.F. PROVIDE 9" HIGH BACKSPLASH AT TYPE A UNITS (OUTLETS MOUNTED HORIZONTALLY, IF ANY).
  - SUBWAY TILE BACKSPLASH. REFER FINISH LEGEND.
  - SHOWER CURTAIN ROD.

- LEGEND - UNIT PLAN**
- 1 HOUR FIRE RATING - INCLUDING BUT NOT LIMITED TO UNIT DEMISING WALLS
  - 1 HOUR FIRE RATING - CORRIDOR WALLS
  - INTERIOR PARTITION
  - SENSORY (HEARING / VISUALLY IMPAIRED) UNIT - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
  - ANSI TYPE A UNIT - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. UNITS TO ALSO INCLUDE SENSORY (HEARING / VISUALLY IMPAIRED) UNIT FEATURES. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
  - DIRECTION OF INSTALLATION OF LVT FLOORING. SEE FINISH SCHEDULE FOR ADDITIONAL INFO.
  - DOOR TYPE
  - REQUIRED 30"x48" CLEAR FLOOR SPACE - 48" SHALL BE CENTERED AT APPLIANCES AND SINKS
  - UNOBSTRUCTED CLEARANCE FOR PATH OF ACCESSIBLE MEANS OF EGRESS. MIN. 36" REQUIRED

- GENERAL NOTES - UNIT RCP**
- PAINT DESIGNATED FOR EXPOSED OVERHEAD STRUCTURE IS TO INCLUDE ALL EXPOSED COMPONENTS INCLUDING BUT NOT EXCLUSIVE TO DECKING, STRUCTURAL MEMBERS, MECHANICAL AND ELECTRICAL DELIVERY SYSTEMS, FIRE PROTECTION SYSTEMS (EXCLUDING SPRINKLER HEADS), AND ALL OTHER MISCELLANEOUS BUILDING SYSTEMS LOCATED OVERHEAD. EACH OF THE AFORESAID CATEGORIES IS TO INCLUDE ANY AND ALL ASSOCIATED SUPPORTS, FASTENERS, HANGERS, STRUTS, BRACES, BRACKETS, ETC.
  - LIGHT FIXTURES SHOWN TO INDICATE PROPOSED FIXTURES AND GENERAL DESIGN INTENT.
  - FINISHED CEILING HEIGHTS ARE FROM TOP OF FINISH FLOOR. U.N.O.
  - COORDINATE LOCATION OF FIXTURES WITH STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION DRAWINGS. ANY CONFLICT BETWEEN TRADES, NOTIFY ARCHITECT PRIOR TO INSTALLATION.
  - FACE OF BULKHEADS SHALL ALIGN WITH FACE OF ADJACENT WALLS TO WHICH BULKHEADS ARE PARALLEL, U.N.O. OR DIMENSIONED.
  - PAINT DUCTWORK INSIDE AIR GRIDS BE FLAT COLOR.
  - ALL GYPSUM BOARD SOFFITS AND CEILINGS TO BE PAINTED FLAT CEILING WHITE (U.N.O.).
  - CEILING GRIDS ARE CENTERED ON ROOM. U.N.O. OR DIMENSIONED.
  - ALL CEILING DEVICES TO BE CENTERED IN TLE, U.N.O.
  - WHERE EXT SIGN OCCUR OVER A DOOR OR PAIR OF DOORS, CENTER SIGN ON DOOR OPENING.
  - GYPSUM BOARD CEILINGS FRAMED TO THE UNDERSIDE OF WOOD TRUSSES SHALL BE INSTALLED TIGHT TO THE BOTTOM CHORD WITH A 1/2 INCH RESILIENT CHANNEL. CEILING OVER 2x4 WOOD FRAMING SHALL MATCH THE HEIGHT OF THE CEILING BEHIND THE WOOD TRUSSES UNLESS NOTED OTHERWISE. ALL CEILING ASSEMBLIES AND WALLS MUST MAINTAIN THE INTEGRITY OF THE FIRE RATED CEILING ASSEMBLIES.
  - SEE ELECTRICAL DRAWINGS FOR THE REQUIRED ELECTRICAL DEVICES, FIRST AND SECOND FLOOR REFLECTED CEILING PLANS SHOW GENERAL LOCATION OF CANS IN THE PUBLIC CORRIDORS.
  - CONTINUE RATED GYPSUM BOARD ABOVE ANY DROP CEILING AND SOFFITS. PROVIDE A RATED ACCESS PANEL AT ALL SMOKE DAMPER LOCATIONS. COORDINATE FINAL LOCATIONS WITH ARCHITECT. PROVIDE THE ACCESS PANEL PER FLOOR OR ALL SHAFT LOCATIONS. ACCESS PANEL TO BE ON THE PUBLIC CORRIDOR SIDE ON OPEN / UNOCCUPIED SHAFT ENCLOSURES. PROVIDE ONE RATED ACCESS PANEL PER FLOOR FOR FUTURE INSTALLATION OF MECHANICAL SYSTEMS.
  - COORDINATE FINAL SOFFIT LOCATION WITH FINAL CABINET LAYOUT.

- CODED NOTES - UNIT RCP**
- MOISTURE RESISTANT PAPERLESS GYPSUM BOARD SHALL BE USED FOR THE BATH CEILING ON THE 1ST AND 2ND FLOORS ONLY.
- LEGEND - UNIT RCP**
- E1 EXPOSED STRUCTURE ABOVE
  - G1 GYPSUM BOARD CEILING OR SOFFIT (RATED CEILING INSTALLED DIRECTLY TO STRUCTURE)
  - G2 GYPSUM BOARD CEILING OR SOFFIT (ADDITIONAL LOWER CEILING)
  - 2x2 SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
  - SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
  - SURFACE MOUNTED LIGHT FIXTURE (UNIT)
  - PENDANT LIGHT FIXTURE
  - SUSPENDED LINEAR LIGHT FIXTURE
  - WALL MOUNTED VANITY LIGHT FIXTURE
  - SUPPLY DIFFUSER
  - LINEAR DIFFUSER
  - EXHAUST/RETURN GRILLE
  - ACCESS PANEL
  - CEILING TAG WITH HEIGHT
- NOTE:** COORDINATE ARCHITECTURAL REFLECTED CEILING PLANS WITH THE MECHANICAL AND ELECTRICAL DRAWINGS FOR NUMBER OF, AND LOCATIONS OF, AND TYPES OF FIXTURES AND GRILLES. NOT ALL ITEMS SHOWN ON LEGEND MAY BE PRESENT IN PROJECT.

- GEN. NOTES - UNIT PLANS**
- ALL DIMENSIONS ARE TO FINISH FACE OF WALL UNLESS NOTED OTHERWISE.
  - WALLS ARE 2x4 WOOD FRAMING U.N.O. SEE SHEET G030 FOR PARTITION INFO.
  - EXTERIOR WALL CONDITIONS VARY. REFER TO OVERALL FLOOR PLAN SHEETS FOR EXTERIOR WALL AND WINDOW CONDITIONS.
  - RESIDENTIAL UNITS: TYPE B DENOTES ANSI TYPE B AND TYPE A DENOTES ANSI TYPE A. UNITS SHALL COMPLY WITH THE ACCESSIBILITY REQUIREMENTS.
  - ACCESSIBLE ROUTE WIDTH WITHIN UNITS SHALL BE 36" MINIMUM. CONTINUOUS AND UNOBSTRUCTED, CONNECTING ACCESSIBLE ELEMENTS AND SPACES.
  - PROVIDE WOOD BLOCKING ON ALL RESIDENTIAL TYPE A AND TYPE B UNITS IN BATHS AND AS INDICATED ON "TYPICAL PROJECT DETAILS" SHEETS. SEE A100 SERIES AND A500 SERIES SHEETS FOR TYPE A & B UNIT LOCATIONS AND LAYOUTS. ALL UNITS TO RECEIVE BLOCKING FOR GRAB BARS (TYPE A UNITS) AND FUTURE GRAB BARS (TYPE B UNITS). SEE "TYPICAL PROJECT DETAILS" SHEETS ON ARRIVAL FOR LENGTHS AND LOCATIONS OF GRAB BARS.
  - PROVIDE WOOD BLOCKING NOT SHOWN OR SHOWN AS REQUIRED TO MOUNT MILLWORK, MEP DEVICES AND ALL FIXTURES.
  - ALL DOOR OPENINGS WITH LEASABLE / OCCUPIED RESIDENTIAL AND PUBLIC AREAS SHALL BE MINIMUM 32 INCHES CLEAR OR GREATER.
  - COORDINATE TRUSS LAYOUT AND DESIGN WITH MECHANICAL, ELECTRICAL AND PLUMBING LAYOUT PRIOR TO FABRICATION. TRUSS SHOP DRAWINGS SHALL INDICATE PLUMBING LINES AND HVAC DUCTS. PROVIDE COORDINATION DRAWING TO ARCHITECT. FRAMING CONTRACTOR SHALL COORDINATE TRUSS FRAMING OFFSETS AS REQUIRED TO ACCOMMODATE SANITARY FIXTURES AND OTHER MEP EQUIPMENT / FIXTURES.
  - INSTALL ACOUSTIC BATT INSULATION AT PARTITIONS WITH PLUMBING STACKS, DEMISING WALLS AND FLOOR / CEILING ASSEMBLIES.
  - NOT USED
  - WATER SUPPLY AND DRAIN PIPES UNDER LAVATORIES AND SINKS MUST BE INSULATED TO PROTECT AGAINST CONTACT, INCLUDING COLD WATER SUPPLIES. PROVIDE SPRAY FOAM INSULATION AT DEMISING AND EXTERIOR WALLS AT LOCATIONS AROUND PLUMBING INSTALLATIONS. PROVIDE 1/2" VALANCE AT AREAS WITH EXPOSED SINK DRAINS. SEE "TYPICAL PROJECT DETAILS" SHEETS FOR REQUIREMENTS.
  - HORIZONTAL OFFSETS IN PLUMBING DRAIN PIPES: PROVIDE ACOUSTIC PIPE INSULATION. REFER TO PLUMBING DRAWINGS.
  - ALL RESIDENTIAL UNITS TO RECEIVE A STANDARD SHOWER (TYPE B UNITS AND NON-ACCESSIBLE BATH IN TYPE A UNITS). BLOCKING FOR INSTALLATION OF GRAB BARS AND OTHER SHOWER FIXTURES TO BE FACTORY INSTALLED IN PREFABRICATED UNITS. WALL ROUGH FRAMING DIMENSION REQUIREMENTS MUST BE COORDINATED WITH SELECTED SHOWER UNIT. NOTE THAT THESE DIMENSIONS TEND TO VARY PER MANUFACTURER. SEE "TYPICAL PROJECT DETAILS" SHEETS FOR LAYOUT OF SHOWER BLOCKING AND FIXTURES. SEE PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
  - LAUNDRY ROOM DRYER VENTING LOCATIONS SHALL BE COORDINATED WITH ARCHITECT. ROUTING SHALL NOT EXCEED 35 FEET WITH ONLY ONE BEND. LABEL LENGTH OF ANY DRYER VENTING DUCT ON THE LAUNDRY ROOM PER REQUIREMENT BY THE CITY OF COLUMBUS.
  - PROVIDE LOOP UPS ON ALL KITCHEN CASEWORK.
  - ALL MECH OPERABLE CONTROLS, FIXTURES, OUTLETS AND ALL OTHER RESIDENTIAL TOILET OR UNIT ACCESSORIES SHALL NOT BE MOUNTED LOWER THAN 18 INCHES AFF AND HIGHER THAN 48 INCHES. SEE "TYPICAL PROJECT DETAILS" SHEETS FOR ADDITIONAL REQUIREMENTS.
  - ALL RESIDENTIAL UNIT MICROWAVES (TYPE B UNITS) AND RANGE HOODS (TYPE A UNITS) TO BE DUCTED AND VENTED TO THE EXTERIOR. SEE ELECTRICAL INFORMATION. INSTALL PER ENERGY STAR RATED AND ENERGY EFFICIENT. PROVIDE COUNTER TYPE MICROWAVE IN ALL TYPE A UNIT KITCHENS.
  - ALL UNIT APPLIANCES ARE INCLUDED. SEE SPECIFICATIONS. UNIT KITCHEN APPLIANCES TO BE STAINLESS STEEL AND ENERGY STAR RATED.
  - ALL UNIT PLUMBING FIXTURES TO BE WATERSENSE-RATED. SEE PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
  - FOR KITCHEN ELECTRIC OUTLET RECEPTACLES, THE MAXIMUM ALLOWABLE HEIGHT TO THE CENTERLINE OF AN OUTLET IS 46 INCHES AFF WHEN REACHING OVER AN OBSTRUCTION 36 INCHES HIGH MAXIMUM AND 25-1/2 INCHES DEEP MAXIMUM. OUTLETS MUST BE A MINIMUM OF 38 INCHES FROM AN INSIDE CORNER OR 12 INCHES FROM END WALL. DM 5.3.5.8
  - THERMOSTATS, SWITCHES, ELECTRIC OUTLETS, ELECTRICAL PANELBOARDS AND OTHER OPERABLE PARTS MUST BE LOCATED WITHIN AN ACCESSIBLE REACH RANGE FROM 15 INCHES TO 48 INCHES AFF FOR AN UNOBSTRUCTED REACH. DM 5.3.5.5, ANSI 1003.9, 1004.9, 309.3, 308
  - ELECTRICAL PANELS ON ALL RESIDENTIAL UNITS SHALL BE INSTALLED SO THE OPERABLE COMPONENTS ARE NOT HIGHER THAN 48 INCHES A.F.F. OR LOWER THAN 18 INCHES A.F.F.
  - AT TYPE A UNITS, THE LOCATION OF CONTROLS FOR THE OVEN AND RANGE MUST NOT REQUIRE REACHING ACROSS THE BURNERS. ANSI 1003.12.5.4.4, 1003.12.5.4.4. SEE THE SPECIFICATIONS FOR APPLIANCE REQUIREMENTS.
  - KITCHEN SINKS AT TYPE A UNITS SHALL INCLUDE REAR DRAINED SINKS TO ACCOMMODATE DISPOSALS. SINK BOWL SHALL NOT BE DEEPER THAN 6 1/2 INCHES.
  - PROVIDE LEVER CONTROLS FOR ALL KITCHEN AND BATH FAUCETS.
  - AT TYPE A UNITS, THE FLUSH CONTROL FOR THE WATER CLOSET SHALL BE LOCATED ON THE OPEN SIDE (AWAY FROM THE SIDE WALL).
  - WHERE REQUIRED, INSTALL ANY MEP DEVICES / FIXTURES SO THE INTEGRITY OF RATED WALL IS MAINTAINED. CONTINUE TYPE X GYPSUM BOARD ASSEMBLY BEHIND MEP DEVICE / FIXTURE.
  - EXTEND FINISH FLOOR MATERIAL UNDER KITCHEN APPLIANCES, VANITY IN ALL BATHS AND UNDERNEATH REMOVABLE UNIVERSAL BASE CABINETS. ALL CABINET SURFACES VISIBLE INCLUDING AREAS EXPOSED AFTER REMOVING REMOVABLE BASE CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK. EXPOSED SIDES OF CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK. EXPOSED SIDES OF WALL AND BASE CABINETS SHALL HAVE FINISH PANELS ON ALL EXPOSED TO VIEW.
  - SEE "TYPICAL PROJECT DETAILS" SHEETS A810 & A820 AND SHEET A900 FOR EXTENT OF FINISHES AT ALL UNIT ENTRANCES.
  - UNIT FURNITURE IN COMMON AREAS. SEE FINE DRAWINGS FOR ADDITIONAL INFO.
  - PROVIDE ONE MIRROR AND ONE MEDICINE CABINET FOR EACH UNIT BATH. MIRROR WIDTH AS SHOWN ON BATH ELEVATIONS. TYPE "SEE TYPICAL PROJECT DETAILS" SHEETS FOR MOUNTING HEIGHT REQUIREMENTS.
  - ALL RESIDENTIAL UNITS TO RECEIVE FINISHED END PANELS WITH SUBWAY TILE BACKSPLASH. BATHS TO RECEIVE CULTURED MARBLE COUNTERTOPS WITH INTEGRAL BOWLS.
  - IN TYPE A UNITS, ALL COUNTERTOPS TO BE SET AT 34 INCHES MAXIMUM HEIGHT TO THE TOP OF KITCHEN OR BATH / TOILET SINK RIM. ON TYPE B UNITS, ALL VANITY COUNTERTOPS TO BE SET AT 34 INCHES MAXIMUM HEIGHT TO THE TOP OF BATH SINK RIM.
  - AT TYPE A UNITS, MOUNT CENTER OF WALL RECEPTACLES ABOVE COUNTER, NO HIGHER THAN 40 INCHES A.F.F. COORDINATE WITH CASEWORK ELEVATIONS. SEE "TYPICAL PROJECT DETAILS" SHEETS.
  - AT TYPE A UNITS AND SENSORY UNITS, PROVIDE HARD-WIRED CALL FOR AID STATION IN ALL BEDROOMS AND BATHS.
  - UNITS MAY BE OPPOSITE HAND OF THOSE SHOWN ON ENLARGED UNIT PLANS AND RCP'S. SEE OVERALL FLOOR PLANS FOR LOCATIONS AND ORIENTATION OF UNITS.

- LEGEND - UNIT RCP**
- E1 EXPOSED STRUCTURE ABOVE
  - G1 GYPSUM BOARD CEILING OR SOFFIT (RATED CEILING INSTALLED DIRECTLY TO STRUCTURE)
  - G2 GYPSUM BOARD CEILING OR SOFFIT (ADDITIONAL LOWER CEILING)
  - 2x2 SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
  - SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
  - SURFACE MOUNTED LIGHT FIXTURE (UNIT)
  - PENDANT LIGHT FIXTURE
  - SUSPENDED LINEAR LIGHT FIXTURE
  - WALL MOUNTED VANITY LIGHT FIXTURE
  - SUPPLY DIFFUSER
  - LINEAR DIFFUSER
  - EXHAUST/RETURN GRILLE
  - ACCESS PANEL
  - CEILING TAG WITH HEIGHT
- NOTE:** COORDINATE ARCHITECTURAL REFLECTED CEILING PLANS WITH THE MECHANICAL AND ELECTRICAL DRAWINGS FOR NUMBER OF, AND LOCATIONS OF, AND TYPES OF FIXTURES AND GRILLES. NOT ALL ITEMS SHOWN ON LEGEND MAY BE PRESENT IN PROJECT.

- GENERAL NOTES - UNIT RCP**
- PAINT DESIGNATED FOR EXPOSED OVERHEAD STRUCTURE IS TO INCLUDE ALL EXPOSED COMPONENTS INCLUDING BUT NOT EXCLUSIVE TO DECKING, STRUCTURAL MEMBERS, MECHANICAL AND ELECTRICAL DELIVERY SYSTEMS, FIRE PROTECTION SYSTEMS (EXCLUDING SPRINKLER HEADS), AND ALL OTHER MISCELLANEOUS BUILDING SYSTEMS LOCATED OVERHEAD. EACH OF THE AFORESAID CATEGORIES IS TO INCLUDE ANY AND ALL ASSOCIATED SUPPORTS, FASTENERS, HANGERS, STRUTS, BRACES, BRACKETS, ETC.
  - LIGHT FIXTURES SHOWN TO INDICATE PROPOSED FIXTURES AND GENERAL DESIGN INTENT.
  - FINISHED CEILING HEIGHTS ARE FROM TOP OF FINISH FLOOR. U.N.O.
  - COORDINATE LOCATION OF FIXTURES WITH STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION DRAWINGS. ANY CONFLICT BETWEEN TRADES, NOTIFY ARCHITECT PRIOR TO INSTALLATION.
  - FACE OF BULKHEADS SHALL ALIGN WITH FACE OF ADJACENT WALLS TO WHICH BULKHEADS ARE PARALLEL, U.N.O. OR DIMENSIONED.
  - PAINT DUCTWORK INSIDE AIR GRIDS BE FLAT COLOR.
  - ALL GYPSUM BOARD SOFFITS AND CEILINGS TO BE PAINTED FLAT CEILING WHITE (U.N.O.).
  - CEILING GRIDS ARE CENTERED ON ROOM. U.N.O. OR DIMENSIONED.
  - ALL CEILING DEVICES TO BE CENTERED IN TLE, U.N.O.
  - WHERE EXT SIGN OCCUR OVER A DOOR OR PAIR OF DOORS, CENTER SIGN ON DOOR OPENING.
  - GYPSUM BOARD CEILINGS FRAMED TO THE UNDERSIDE OF WOOD TRUSSES SHALL BE INSTALLED TIGHT TO THE BOTTOM CHORD WITH A 1/2 INCH RESILIENT CHANNEL. CEILING OVER 2x4 WOOD FRAMING SHALL MATCH THE HEIGHT OF THE CEILING BEHIND THE WOOD TRUSSES UNLESS NOTED OTHERWISE. ALL CEILING ASSEMBLIES AND WALLS MUST MAINTAIN THE INTEGRITY OF THE FIRE RATED CEILING ASSEMBLIES.
  - SEE ELECTRICAL DRAWINGS FOR THE REQUIRED ELECTRICAL DEVICES, FIRST AND SECOND FLOOR REFLECTED CEILING PLANS SHOW GENERAL LOCATION OF CANS IN THE PUBLIC CORRIDORS.
  - CONTINUE RATED GYPSUM BOARD ABOVE ANY DROP CEILING AND SOFFITS. PROVIDE A RATED ACCESS PANEL AT ALL SMOKE DAMPER LOCATIONS. COORDINATE FINAL LOCATIONS WITH ARCHITECT. PROVIDE THE ACCESS PANEL PER FLOOR OR ALL SHAFT LOCATIONS. ACCESS PANEL TO BE ON THE PUBLIC CORRIDOR SIDE ON OPEN / UNOCCUPIED SHAFT ENCLOSURES. PROVIDE ONE RATED ACCESS PANEL PER FLOOR FOR FUTURE INSTALLATION OF MECHANICAL SYSTEMS.
  - COORDINATE FINAL SOFFIT LOCATION WITH FINAL CABINET LAYOUT.

**CODED NOTES - UNIT RCP**

- MOISTURE RESISTANT PAPERLESS GYPSUM BOARD SHALL BE USED FOR THE BATH CEILING ON THE 1ST AND 2ND FLOORS ONLY.

**LEGEND - UNIT RCP**

- E1 EXPOSED STRUCTURE ABOVE
- G1 GYPSUM BOARD CEILING OR SOFFIT (RATED CEILING INSTALLED DIRECTLY TO STRUCTURE)
- G2 GYPSUM BOARD CEILING OR SOFFIT (ADDITIONAL LOWER CEILING)
- 2x2 SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
- SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
- SURFACE MOUNTED LIGHT FIXTURE (UNIT)
- PENDANT LIGHT FIXTURE
- SUSPENDED LINEAR LIGHT FIXTURE
- WALL MOUNTED VANITY LIGHT FIXTURE
- SUPPLY DIFFUSER
- LINEAR DIFFUSER
- EXHAUST/RETURN GRILLE
- ACCESS PANEL
- CEILING TAG WITH HEIGHT

**NOTE:** COORDINATE ARCHITECTURAL REFLECTED CEILING PLANS WITH THE MECHANICAL AND ELECTRICAL DRAWINGS FOR NUMBER OF, AND LOCATIONS OF, AND TYPES OF FIXTURES AND GRILLES. NOT ALL ITEMS SHOWN ON LEGEND MAY BE PRESENT IN PROJECT.

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**MOODY-NOLAN**

DRAWING TITLE:  
**ENLARGED UNIT PLANS - 2BED (TYPE A)**

DATE: 06/08/2023  
DRAWN BY: Author  
CHECKED BY: Checker  
#22172.01  
**A503**  
PERMIT & BID SET

DOOR SCHEDULE UNITS												
DOOR NUMBER	DOOR TYPE	DOOR		FRAME		FIRE RATING	HOW SET	DETAILS - SHEET A710, A711 AND A712			REMARKS	
		WIDTH	HEIGHT	MATERIAL	ELEV			MATERIAL	ELEV	HEAD		JAMB
A1	ENTRY	3'-0"	7'-0"	ID	AP	HM	1	20 MINUTES	15	14/A712	13/A712	REFER DETAILS B4820 AND B4820
B1	BEDROOM	3'-0"	7'-0"	ID	AP	WD	1		17	14/A712	17/A712	
B1R	BEDROOM	3'-0"	7'-0"	ID	AP	WD	1		17	14/A712	13/A712	DOOR IN RATED WALL
B2	BATHROOM	3'-0"	7'-0"	ID	AP	WD	1		17	8/A712	7/A712	
B3	BATHROOM	3'-2"	7'-0"	ID	AP	WD	1		24	18/A712	17/A712	POCKET DOOR
C1	CLOSET	2'-4"	7'-0"	ID	AP	WD	1		19	8/A712	7/A712	
C2	CLOSET	2'-4"	7'-0"	ID	AP	WD	1		19	8/A712	7/A712	
C3	CLOSET	3'-0"	7'-0"	ID	AP	WD	1		19	8/A712	7/A712	
C5	CLOSET	5'-0"	7'-0"	ID	AAP	WD	3		16	8/A712	7/A712	
O6	CLOSET	6'-0"	7'-0"	ID	AAP	WD	3		16	8/A712	7/A712	
L1	LAUNDRY	6'-0"	7'-0"	ID	AAP	WD	3		16	8/A712	7/A712	
L1R	LAUNDRY	6'-0"	7'-0"	ID	AAP	WD	3		16	14/A712	13/A712	DOOR IN RATED WALL
U1	UTILITY	3'-0"	8'-0"	ID	H	WD	1		19	8/A712	7/A712	
U2	UTILITY	6'-0"	8'-0"	ID	HH	WD	3		16	8/A712	7/A712	
UZ	UTILITY	6'-0"	8'-0"	ID	HH	WD	3		16	14/A712	13/A712	DOOR IN RATED WALL

TYPICAL RESIDENTIAL UNIT FINISH SCHEDULE					
ROOM NAME	FLOOR FINISH	WALLS		GENERAL REMARKS	KEYED REMARKS
		COLOR	FINISH		
COAT	LV	1	PT	APPLIES TO COAT CLOSET	1
KITCHEN	LV	1	PT / CW	CW@ BACKSPLASH	3.4
LIVING	LV	1	PT		
BEDROOM	LV	1	PT		
BATH ACC. BATH	SV	1	PT		5
LINEIN	SV	1	PT		
CLOSET	LV	1	PT	APPLIES TO BEDROOM CLOSETS	2
LAUNDRY	LV	1	PT		
UTILITY	LV or SV	1	PT		2.6

- GENERAL NOTES:**
- REFER TO "FINISH LEGEND" A900 FOR MATERIAL AND COLOR INFORMATION.
  - ALL UNIT INTERIOR DOORS AND DOOR FRAMES TO BE PAINTED PT2 IN SEMI-GLOSS.
  - ALL WALL BASE WITHIN RESIDENTIAL UNITS TO BE WB1 AND TO BE PAINTED PT2 - EXCEPT UNIT BATHROOM TO BE WB2.
  - KITCHEN BACKSPLASH TO BE EQ.
  - CEILING TO BE PAINTED PT6.
  - CONTINUE FLOOR FINISH INTO KNEE SPACE OF REMOVABLE CABINETS, PAINT BACK WALL, INSTALL WALL BASE.
  - ALL EXTERIOR WINDOWS TO RECEIVE MINI-BLINDS WITH HIDDEN CORDS AS SPECIFIED IN THE PROJECT MANUAL.
  - KITCHEN CABINETS TO BE CABINETWORKS GROUP ADVANTA NEWBURY PROFILE - EXTREME CONSTRUCTION IN STORM FINISH.

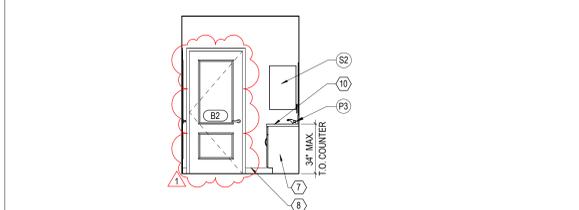
- KEYED REMARKS:**
- COAT ROD AND SHELF SPAN FULL WIDTH OF CLOSET.
  - WIRE SHELVING: TYPE A OR B TO SPAN FULL WIDTH OF CLOSET.
  - UNIT KITCHEN COUNTERTOP TO BE PLAM. SEE FINISH LEGEND A500 FOR COLOR.
  - TYPE A KITCHEN TO HAVE A 6" HIGH X 3/4" THICK SQUARE EDGE BACKSPLASH LENGTH OF BASE CABINERY. RECEPTACLES TO BE MOUNTED HORIZONTALLY IN THE BACKSPLASH.
  - BATH VANITY COUNTERTOP TO BE CULTURED MARBLE.
  - FLOOR FINISH TO MATCH FLOOR FINISH IN ADJACENT ROOM.



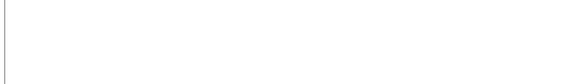
**4 ELEVATION** KITCHEN 2BED (TYPE B) REF: 1 / A504



**3 ELEVATION** KITCHEN 2BED (TYPE B) - ISLAND REF: 1 / A504



**2 RCP** ENLARGED UNIT 2b (2-BED ANSI TYPE B) REF: 1 / A504



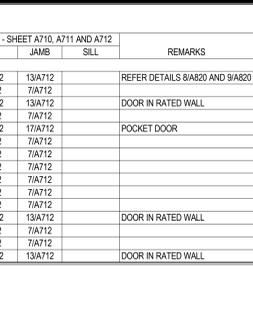
**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504



**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504



**1 PLAN** ENLARGED UNIT 2b (2-BED ANSI TYPE B) REF: 1 / A504



**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504



**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504



**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



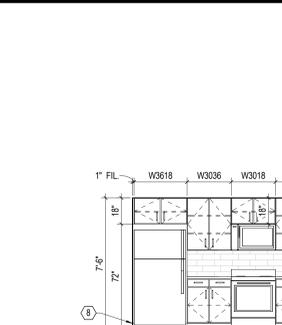
**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504



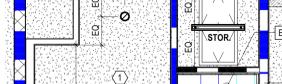
**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504



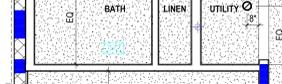
**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504



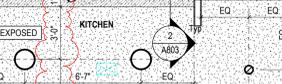
**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504



**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



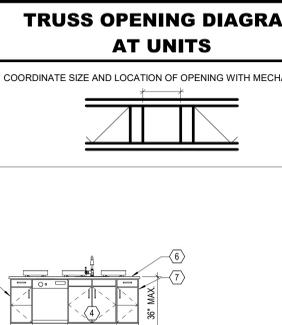
**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



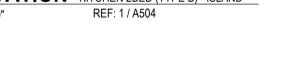
**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504



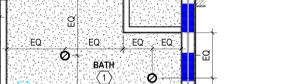
**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504



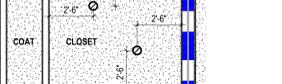
**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



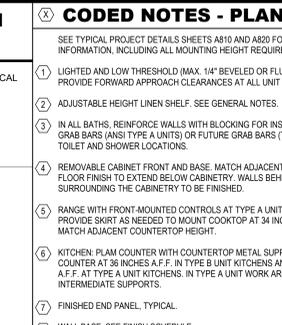
**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504



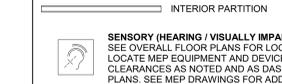
**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504



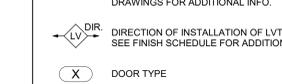
**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



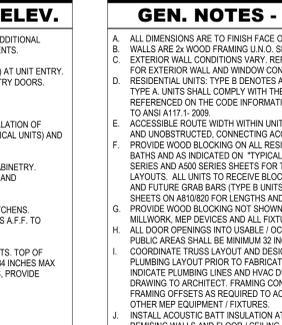
**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



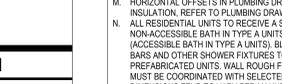
**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504



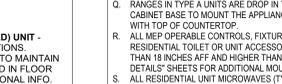
**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504



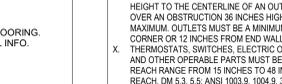
**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



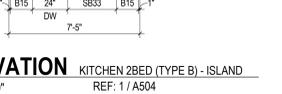
**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504

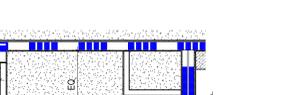


**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504

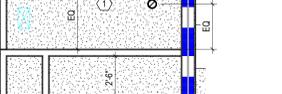


**TRUSS OPENING DIAGRAM AT UNITS**

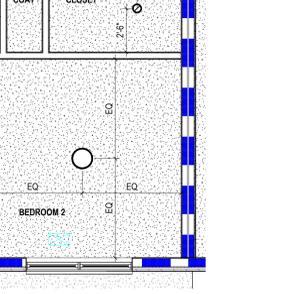
COORDINATE SIZE AND LOCATION OF OPENING WITH MECHANICAL.



**4 ELEVATION** KITCHEN 2BED (TYPE B) REF: 1 / A504



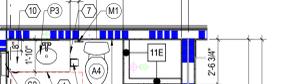
**3 ELEVATION** KITCHEN 2BED (TYPE B) - ISLAND REF: 1 / A504



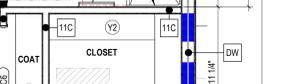
**2 RCP** ENLARGED UNIT 2b (2-BED ANSI TYPE B) REF: 1 / A504



**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



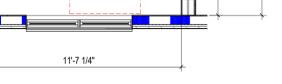
**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504



**7 ELEVATION** BATH 2-BED (TYPE B) - SIDE WALL REF: 1 / A504



**5 ELEVATION** BATH 2-BED (TYPE B) - VANITY WALL REF: 1 / A504



**8 ELEVATION** BATH 2-BED (TYPE B) - DOOR WALL REF: 1 / A504



**6 ELEVATION** BATH 2-BED (TYPE B) - SHOWER WALL REF: 1 / A504

- CODED NOTES - PLAN/ ELEV.**
- LIGHTED AND LOW THRESHOLD (MAX. 1/4" BEVELED OR FLUSH) AT UNIT ENTRY. PROVIDE FORWARD APPROACH CLEARANCES AT ALL UNIT ENTRY DOORS.
  - ADJUSTABLE HEIGHT LINES SHLF. SEE GENERAL NOTES.
  - IN ALL BATHS, REINFORCE WALLS WITH BLOCKING FOR INSTALLATION OF GRAB BARS (ANSI TYPE A UNITS) OR FUTURE GRAB BARS (TYPICAL UNITS) AND TOILET AND SHOWER LOCATIONS.
  - REMOVABLE CABINET FRONT AND BASE. MATCH ADJACENT CABINERY. FLOOR FINISH TO EXTEND BELOW CABINERY, WALLS BEHIND AND SURROUNDING THE CABINERY TO BE FINISHED.
  - RANGE WITH FRONT MOUNTED CONTROLS AT TYPE A UNIT KITCHENS. PROVIDE SKIRT AS NEEDED TO MOUNT COOKTOP AT 34 INCHES A.F.F. TO MATCH ADJACENT COUNTERTOP HEIGHT.
  - KITCHEN PLAM COUNTER WITH COUNTERTOP METAL SUPPORTS. TOP OF COUNTER AT 36 INCHES A.F.F. IN TYPE B UNIT KITCHENS AND 34 INCHES MAX. A.F.F. AT TYPE A UNIT KITCHENS. IN TYPE A UNIT WORK AREAS, PROVIDE INTERMEDIATE SUPPORTS.
  - FINISHED END PANEL TYPICAL.
  - WALL BASE. SEE FINISH SCHEDULE.
  - LIGHT FIXTURES. SEE UNIT RCP PLAN. SEE ELECTRICAL DWGS.
  - BATH CULTURED MARBLE COUNTERTOPS WITH INTEGRAL BOWLS. TYPE A & B VANITY COUNTERTOPS TO BE AT 34 INCHES MAX. A.F.F. PROVIDE 6" HIGH BACKSPASH AT TYPE A UNITS (OUTLETS MOUNTED HORIZONTALLY, IF ANY).
  - SUBWAY TILE BACKSPLASH. REFER FINISH LEGEND.
  - SHOWER CURTAIN ROD.

- LEGEND - UNIT PLAN**
- 1 HOUR FIRE RATING - INCLUDING BUT NOT LIMITED TO UNIT DEMISING WALLS
  - 1 HOUR FIRE RATING - CORRIDOR WALLS
  - INTERIOR PARTITION
  - SENSORY (HEARING / VISUALLY IMPAIRED) UNIT** - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
  - ANSI TYPE A UNIT** - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. UNITS TO ALSO INCLUDE SENSORY (HEARING / VISUALLY IMPAIRED) UNIT FEATURES. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
  - DIR** - DIRECTION OF INSTALLATION OF LVT FLOORING. SEE FINISH SCHEDULE FOR ADDITIONAL INFO.
  - X** - DOOR TYPE
  - REQUIRED 30"x48" CLEAR FLOOR SPACE - 48" SHALL BE CENTERED AT APPLIANCES AND SINKS
  - UNOBSTRUCTED CLEARANCE FOR PATH OF ACCESSIBLE MEANS OF EGRESS, MIN. 36" REQUIRED

- GENERAL NOTES - UNIT RCP**
- PAINT DESIGNATED FOR EXPOSED OVERHEAD STRUCTURE IS TO INCLUDE ALL EXPOSED COMPONENTS INCLUDING (BUT NOT EXCLUSIVE TO) DECKING, STRUCTURAL MEMBERS, MECHANICAL AND ELECTRICAL DELIVERY SYSTEMS, FIRE PROTECTION SYSTEMS (EXCLUDING SPRINKLER HEADS), AND ALL OTHER MISCELLANEOUS BUILDING SYSTEMS LOCATED OVERHEAD. EACH OF THE AFORESAID CATEGORIES IS TO INCLUDE ANY AND ALL ASSOCIATED SUPPORTS, FASTENERS, HANGERS, STRUTS, BRACES, BRACKETETS, ETC.
  - LIGHT FIXTURES SHOWN TO INDICATE PROPOSED FIXTURES AND GENERAL DESIGN INTENT.
  - FINISHED CEILING HEIGHTS ARE FROM TOP OF FINISH FLOOR, U.N.O.
  - COORDINATE LOCATION OF FIXTURES WITH STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION DRAWINGS. ANY CONFLICT BETWEEN TRADES, NOTIFY ARCHITECT PRIOR TO INSTALLATION.
  - FACE OF BULKHEADS SHALL ALIGN WITH FACE OF ADJACENT WALLS TO WHICH BULKHEADS ARE PARALLEL, U.N.O. OR DIMENSIONED.
  - PAINT DUCTWORK INSIDE AIR SPACES TO MATCH CO. OR.
  - ALL GYPSUM BOARD SOFFITS AND CEILINGS TO BE PAINTED PALT CEILING WHITE (U.N.O.).
  - CEILING GRIDS ARE CENTERED ON ROOM, U.N.O. OR DIMENSIONED.
  - ALL CEILING DEVICES TO BE CENTERED IN TILE, U.N.O.
  - WHERE EXT. SIGNS OCCUR OVER A DOOR OR PAIR OF DOORS, CENTER SIGN ON DOOR OPENING.
  - GYPSUM BOARD CEILINGS FRAMED TO THE UNDERSIDE OF WOOD TRUSSES SHALL BE INSTALLED TIGHT TO THE BOTTOM CHORD WITH A 1/2 INCH RESILIENT CHANNEL. CEILING BELOW 2X WOOD FRAMING SHALL MATCH THE HEIGHT OF THE CEILING BELOW THE WOOD TRUSSES UNLESS NOTED OTHERWISE. ALL CEILING ASSEMBLIES AND WALLS MUST MAINTAIN THE INTEGRITY OF THE FIRE RATED CEILING ASSEMBLIES.
  - CONTINUE RATED GYPSUM BOARD ABOVE ANY DROP CEILING AND SOFFITS. PROVIDE A RATED ACCESS PANEL AT ALL SMOKE DAMPER LOCATIONS. COORDINATE FINAL LOCATIONS WITH ARCHITECT. PROVIDE THE ACCESS PANEL PER FLOOR AT ALL SHAFT LOCATIONS. ACCESS PANEL TO BE ON THE PUBLIC CORRIDOR SIDE ON OPEN / UNOCCUPIED SHAFT ENCLOSURES. PROVIDE ONE RATED ACCESS PANEL PER FLOOR FOR FUTURE INSTALLATION OF MECHANICAL SYSTEMS.
  - COORDINATE FINAL SOFFIT LOCATION WITH FINAL CABINET LAYOUT.

- CODED NOTES - UNIT RCP**
- MOISTURE RESISTANT PAPERLESS GYPSUM BOARD SHALL BE USED FOR THE BATH CEILINGS ON THE 1ST AND 2ND FLOORS ONLY.
- LEGEND - UNIT RCP**
- E1 EXPOSED STRUCTURE ABOVE
  - G1 GYPSUM BOARD CEILING OR SOFFIT (RATED CEILING INSTALLED DIRECTLY TO STRUCTURE)
  - G2 GYPSUM BOARD CEILING OR SOFFIT (ADDITIONAL LOWER CEILING)
  - 2x2 SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
  - SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
  - SURFACE MOUNTED LIGHT FIXTURE (UNIT)
  - PENDANT LIGHT FIXTURE
  - SUSPENDED LINEAR LIGHT FIXTURE
  - WALL MOUNTED VANITY LIGHT FIXTURE
  - SUPPLY DIFFUSER
  - LINEAR DIFFUSER
  - EXHAUST/RETURN GRILLE
  - ACCESS PANEL
  - CEILING TAG WITH HEIGHT

**NOTE:** COORDINATE ARCHITECTURAL REFLECTED CEILING PLANS WITH THE MECHANICAL AND ELECTRICAL DRAWINGS FOR NUMBER OF, AND LOCATIONS OF, AND TYPES OF FIXTURES AND GRILLES. NOT ALL ITEMS SHOWN ON LEGEND MAY BE PRESENT IN PROJECT.

- GEN. NOTES - UNIT PLANS**
- ALL DIMENSIONS ARE TO FINISH FACE OF WALL UNLESS NOTED OTHERWISE.
  - WALLS ARE 2X WOOD FRAMING U.N.O. SEE SHEET G003 FOR PARTITION INFO.
  - EXTERIOR WALL CONDITIONS VARY. REFER TO OVERALL FLOOR PLAN SHEETS FOR EXTERIOR WALL AND WINDOW CONDITIONS.
  - RESIDENTIAL UNITS: TYPE B DENOTES ANSI TYPE B AND TYPE A DENOTES ANSI TYPE A. UNITS SHALL COMPLY WITH THE ACCESSIBILITY REQUIREMENTS REFERENCED ON THE CODE INFORMATION. THIS INCLUDES BUT IS NOT LIMITED TO ANSI A117.1 - 2009.
  - ACCESSIBLE ROUTE WIDTH WITHIN UNITS SHALL BE 36" MINIMUM, CONTINUOUS AND UNOBSTRUCTED, CONNECTING ACCESSIBLE ELEMENTS AND SPACES.
  - PROVIDE WOOD BLOCKING ON ALL RESIDENTIAL TYPE A AND TYPE B UNITS IN BATHS AND AS INDICATED ON "TYPICAL PROJECT DETAILS" SHEETS. SEE A100 SERIES AND A500 SERIES SHEETS FOR TYPE A AND TYPE B UNIT LOCATIONS AND LAYOUTS. ALL UNITS TO RECEIVE BLOCKING FOR GRAB BARS (TYPE A UNITS) AND FUTURE GRAB BARS (TYPE B UNITS). SEE "TYPICAL PROJECT DETAILS" SHEETS ON ARRIVES FOR LENGTHS AND LOCATIONS OF GRAB BARS.
  - PROVIDE WOOD BLOCKING NOT SHOWN OR SHOWN AS REQUIRED TO MOUNT MILLWORK, MEP DEVICES AND ALL FIXTURES.
  - ALL DOOR OPENINGS WITH (E) OR (F) OCCUPIED ROOMS IN RESIDENTIAL AND PUBLIC AREAS SHALL BE MINIMUM 32 INCHES CLEAR OR GREATER.
  - COORDINATE TRUSS LAYOUT AND DESIGN WITH MECHANICAL, ELECTRICAL AND PLUMBING LAYOUT PRIOR TO FABRICATION. TRUSS SHOP DRAWINGS SHALL INDICATE PLUMBING LINES AND HVAC DUCTS. PROVIDE COORDINATION DRAWING TO ARCHITECT. FRAMING CONTRACTOR SHALL COORDINATE TRUSS FRAMING OFFSETS AS REQUIRED TO ACCOMMODATE SANITARY LINES AND OTHER MEP EQUIPMENT / FIXTURES.
  - INSTALL ACOUSTIC BATT INSULATION AT PARTITIONS WITH PLUMBING STACKS, DEMISING WALLS AND FLOOR / CEILING ASSEMBLIES.
  - NOT USED
  - WATER SUPPLY AND DRAIN PIPES UNDER LAVATORIES AND SINKS MUST BE INSULATED TO PROTECT AGAINST CONTACT, INCLUDING COLD WATER SUPPLIES. PROVIDE SPRAY FOAM INSULATION AT DEMISING AND EXTERIOR WALLS AT LOCATIONS AROUND PLUMBING INSTALLATIONS. PROVIDE 6" VALANCE AT AREAS WITH EXPOSED SINK. SEE "TYPICAL PROJECT DETAILS" SHEETS FOR REQUIREMENTS.
  - HORIZONTAL OFFSETS IN PLUMBING DRAIN PIPES: PROVIDE ACOUSTIC PIPE INSULATION REFER TO PLUMBING DRAWINGS FOR DETAILS.
  - ALL RESIDENTIAL UNITS TO RECEIVE A STANDARD SHOWER (TYPE B UNITS AND NON-ACCESSIBLE BATH IN TYPE A UNITS) OR ACCESSIBLE ROLL-IN SHOWER (ACCESSIBLE BATH IN TYPE A UNITS). BLOCKING FOR INSTALLATION OF GRAB BARS AND OTHER SHOWER FIXTURES TO BE FACTORY INSTALLED IN PREFABRICATED UNITS. WALL ROUGH FRAMING DIMENSION REQUIREMENTS MUST BE COORDINATED WITH SELECTED SHOWER UNIT. NOTE THAT THESE DIMENSIONS TEND TO VARY PER MANUFACTURER. SEE "TYPICAL PROJECT DETAILS" SHEETS FOR LAYOUT OF SHOWER BLOCKING AND FIXTURES. SEE PLUMBING DRAWINGS FOR EXACT DIMENSIONS REQUIRED AND FIXTURE INFO.
  - LAUNDRY ROOM DRYER VENTING LOCATIONS SHALL BE COORDINATED WITH ARCHITECT. ROUTING SHALL NOT EXCEED 35 FEET WITH ONLY ONE BEND. LABEL LENGTH OF ANY EXTERIOR VENTING ON THE LAUNDRY ROOM PER REQUIRE

DOOR SCHEDULE UNITS table with columns: DOOR NUMBER, DOOR TYPE, WIDTH, HEIGHT, MATERIAL, ELEV, FRAME, MATERIAL, ELEV, FIRE RATING, HOW SET, DETAILS, SHEET A710, A711 AND A712, HEAD, JAMB, SILL, REMARKS.

- PROVIDE A ROBE HOOK ON THE DOOR OF BATH ROOMS. HOOK TO FACE SIDE OF TOILET AREA.
• ALL DOOR WIDTHS IN OCCUPIED ROOMS OF BUILDING TO BE 32" MIN CLEAR.
• PROVIDE LEVER STYLE DOOR HARDWARE ON ALL INTERIOR DOORS.
• ALL DOORS PROVIDING ACCESS TO RESIDENTIAL SPACES TO BE PAINTED.
• HM = HOLLOW METAL; WD = WOOD; ID = INTERIOR DOOR (WOOD, SOLID CORE)

TYPICAL RESIDENTIAL UNIT FINISH SCHEDULE table with columns: ROOM NAME, FLOOR FINISH, COLOR, WALLS FINISH, COLOR, GENERAL REMARKS, KEYED REMARKS.

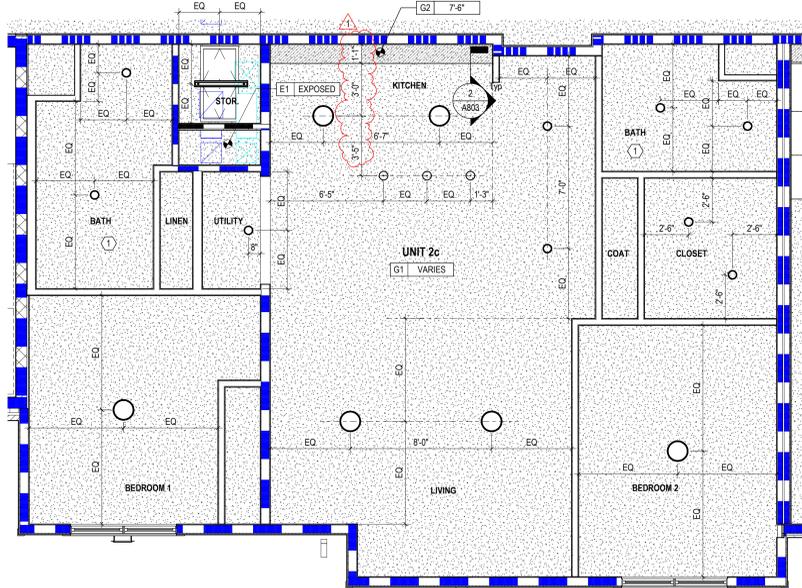
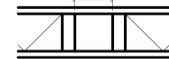
- GENERAL NOTES:
A. REFER TO "FINISH LEGEND" A900 FOR MATERIAL AND COLOR INFORMATION.
B. ALL UNIT INTERIOR DOORS AND DOOR FRAMES TO BE PAINTED PT2 IN SEMI-GLOSS.
C. ALL WALL BASE WITHIN RESIDENTIAL UNITS TO BE WB1 AND TO BE PAINTED PT2 - EXCEPT UNIT BATHROOM TO BE RB1. WINDOW AND DOOR OPENINGS TO RECEIVE WOOD CASINGS. WINDOWS TO RECEIVE CULTURED MARBLE SILLS.
D. KITCHEN BACKSPLASH TO BE CW1.
E. CEILING TO BE PAINTED PT6.
F. CONTINUE FLOOR FINISH INTO KNEE SPACE OF REMOVABLE CABINETS, PAINT BACK WALL, INSTALL WALL BASE.
G. ALL EXTERIOR WINDOWS TO RECEIVE MINI-BLINDS WITH HIDDEN CORDS AS SPECIFIED IN THE PROJECT MANUAL.
H. KITCHEN CABINETS TO BE CABINETWORKS GROUP/ADVANTA NEWBURY PROFILE - EXTREME CONSTRUCTION IN STORM FINISH.

- KEYED REMARKS:
1. COAT ROD AND SHELF SPAN FULL WIDTH OF CLOSET.
2. WIRE SHELVING: TYPE A OR B TO SPAN FULL WIDTH OF CLOSET.
3. UNIT KITCHEN COUNTER TOP TO BE PLAM. SEE FINISH LEGEND A 900 FOR COLOR.
4. TYPE A KITCHEN TO HAVE A 6" HIGH X 3/4" THICK SQUARE EDGE BACKSPLASH LENGTH OF BASE CABINERY. RECEPTACLES TO BE MOUNTED HORIZONTALLY IN THE BACKSPLASH.
5. BATH VANITY COUNTERTOP TO BE CULTURED MARBLE.
6. FLOOR FINISH TO MATCH FLOOR FINISH IN ADJACENT ROOM.

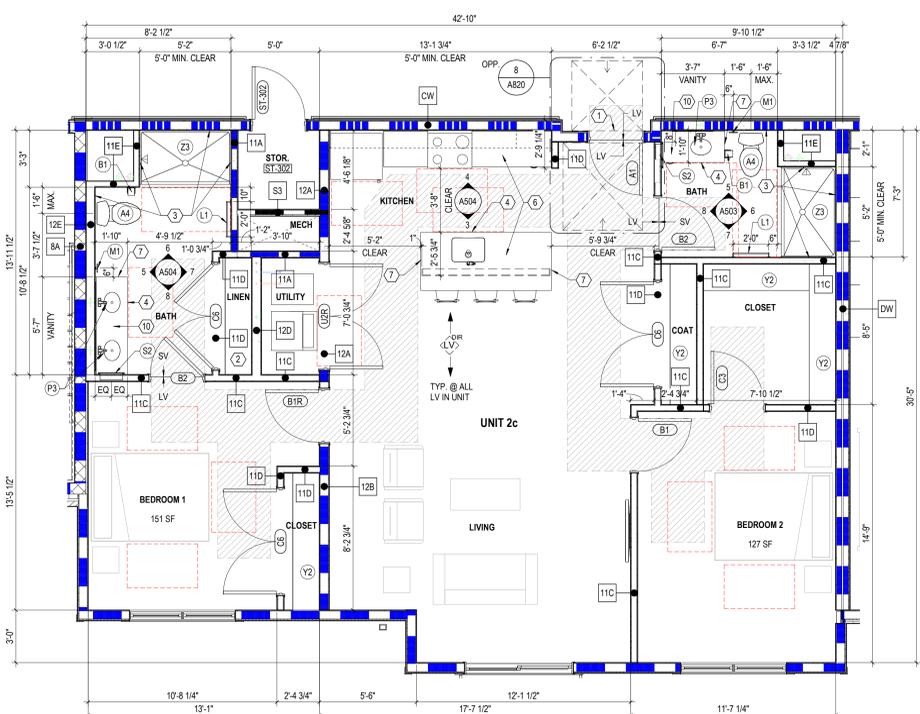
NOTE: INSTALL MOISTURE RESISTANT PAPERLESS GYPSUM BOARD ON ALL WALLS IN EACH BATHROOM AND TOILET ROOM AT ALL OTHER WATER SOURCE LOCATIONS. PROVIDE MOISTURE RESISTANT PAPERLESS GYPSUM BOARD ON ALL VERTICAL AND HORIZONTAL SURFACES THAT ARE WITHIN FOUR FEET OF ANY WATER SOURCE WHERE THE DRYWALL CAN BE SPLASHED. INCLUDING BUT NOT LIMITED TO THE KITCHEN SINK, LAUNDRY ROOMS, UTILITY / MESH CLOSETS, ETC.

TRUSS OPENING DIAGRAM AT UNITS

COORDINATE SIZE AND LOCATION OF OPENING WITH MECHANICAL



2 RCP ENLARGED UNIT 2c (2-BED ANSI TYPE B) 1/4" = 1'-0"



1 PLAN ENLARGED UNIT 2c (2-BED ANSI TYPE B) 1/4" = 1'-0"

CODED NOTES - PLIN / ELEV.

- (1) SEE TYPICAL PROJECT DETAILS SHEETS A810 AND A820 FOR ADDITIONAL INFORMATION, INCLUDING ALL MOUNTING HEIGHT REQUIREMENTS.
(2) LIGHTED AND LOW THRESHOLD (MAX. 1/4" BEVELED OR FLUSH) AT UNIT ENTRY. PROVIDE FORWARD APPROACH CLEARANCES AT ALL UNIT ENTRY DOORS.
(3) ADJUSTABLE HEIGHT LINEN SHELF. SEE GENERAL NOTES.
(4) REMOVABLE CABINET FRONT AND BASE. MATCH ADJACENT CABINERY. FLOOR FINISH TO EXTEND BELOW CABINERY. WALLS BEHIND AND SURROUNDING THE CABINERY TO BE FINISHED.
(5) RANGE WITH FRONT MOUNTED CONTROLS AT TYPE A UNIT KITCHENS. PROVIDE SKIRT AS NEEDED TO MOUNT COOKTOP AT 34 INCHES A.F.F. TO MATCH ADJACENT COUNTERTOP HEIGHT.
(6) KITCHEN: PLAM COUNTER WITH COUNTERTOP METAL SUPPORTS. TOP OF COUNTERTOP AT 36 INCHES A.F.F. IN TYPE B UNIT KITCHENS AND 34 INCHES MAX A.F.F. AT TYPE A UNIT KITCHENS. IN TYPE A UNIT WORK AREAS, PROVIDE INTERMEDIATE SUPPORTS.
(7) FINISHED END PANEL, TYPICAL.
(8) WALL BASE. SEE FINISH SCHEDULE.
(9) LIGHT FIXTURES. SEE UNIT RCP PLAN. SEE ELECTRICAL DWGS.
(10) BATH: CULTURED MARBLE COUNTERTOPS WITH INTEGRAL BOWLS. TYPE A & B VANITY COUNTERS TO BE AT 34 INCHES MAX A.F.F. PROVIDE HIGH BACKSPASH AT TYPE A UNITS (OUTLETS MOUNTED HORIZONTALLY, IF ANY).
(11) SUBWAY TILE BACKSPASH. REFER FINISH LEGEND.
(12) SHOWER CURTAIN ROD.

LEGEND - UNIT PLAN

- 1 HOUR FIRE RATING - INCLUDING BUT NOT LIMITED TO UNIT DEMISING WALLS
1 HOUR FIRE RATING - CORRIDOR WALLS
INTERIOR PARTITION
SENSORY (HEARING / VISUALLY IMPAIRED) UNIT - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLAN. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
ANSI TYPE A UNIT - SEE OVERALL FLOOR PLANS FOR LOCATIONS. LOCATE MEP EQUIPMENT AND DEVICES TO MAINTAIN CLEARANCES AS NOTED AND AS DASHED IN FLOOR PLANS. UNITS TO ALSO INCLUDE SENSORY (HEARING / VISUALLY IMPAIRED) UNIT FEATURES. SEE MEP DRAWINGS FOR ADDITIONAL INFO.
DIRECTION OF INSTALLATION OF LVT FLOORING. SEE FINISH SCHEDULE FOR ADDITIONAL INFO.
DOOR TYPE
REQUIRED 30"x48" CLEAR FLOOR SPACE - 48" SHALL BE CENTERED AT APPLIANCES AND SINKS
UNOBSTRUCTED CLEARANCE FOR PATH OF ACCESSIBLE MEANS OF EGRESS, MIN. 36" REQUIRED

GENERAL NOTES - UNIT RCP

- A. PAINT DESIGNATED FOR EXPOSED OVERHEAD STRUCTURE IS TO INCLUDE ALL EXPOSED COMPONENTS INCLUDING (BUT NOT EXCLUSIVE TO) DECKING, STRUCTURAL MEMBERS, MECHANICAL AND ELECTRICAL DELIVERY SYSTEMS, FIRE PROTECTION SYSTEMS (EXCLUDING SPRINKLER HEADS), AND ALL OTHER MISCELLANEOUS BUILDING SYSTEMS LOCATED OVERHEAD. EACH OF THE AFORESAID CATEGORIES IS TO INCLUDE ANY AND ALL ASSOCIATED SUPPORTS, FASTENERS, HANGERS, STRUTS, BRACES, BRACKETETS, ETC.
B. LIGHT FIXTURES SHOWN TO INDICATE PROPOSED FIXTURES AND GENERAL DESIGN INTENT.
C. FINISHED CEILING HEIGHTS ARE FROM TOP OF FINISH FLOOR, U.I. O.
D. COORDINATE LOCATION OF FIXTURES WITH STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION DRAWINGS. ANY CONFLICT BETWEEN TRADES, NOTIFY ARCHITECT PRIOR TO INSTALLATION.
E. FACE OF BULKHEADS SHALL ALIGN WITH FACE OF ADJACENT WALLS TO WHICH BULKHEADS ARE PARALLEL, U.I. O. OR DIMENSIONED.
F. PAINT DUCTWORK, HESB AIR SLEEVES, ETC. TO MATCH CO. CO.
G. ALL GYPSUM BOARD SOFFITS AND CEILINGS TO BE PAINTED PALT CEILING WHITE (U.I. O.).
H. CEILING GRIDS ARE CENTERED ON ROOM, U.I. O. OR DIMENSIONED.
I. ALL CEILING DEVICES TO BE CENTERED IN TILE, U.I. O.
J. WHERE EXT SIGNS OCCUR OVER A DOOR OR PAIR OF DOORS, CENTER SIGN ON DOOR OPENING.
K. GYPSUM BOARD CEILING FRAMED TO THE UNDERSIDE OF WOOD TRUSSES SHALL BE INSTALLED TIGHT TO THE BOTTOM CHORD WITH A 1/2 INCH RESILIENT CHANNEL. CEILING BELOW 2X WOOD FRAMING SHALL MATCH THE HEIGHT OF THE CEILING BELOW THE WOOD TRUSSES UNLESS NOTED OTHERWISE. ALL CEILING ASSEMBLIES AND WALLS MUST MAINTAIN THE INTEGRITY OF THE FIRE RATED CEILING ASSEMBLIES.
L. SEE ELECTRICAL DRAWINGS FOR THE REQUIRED ELECTRICAL DEVICES, FIRST AND SECOND FLOOR REFLECTED CEILING PLANS SHOW GENERAL LOCATION OF CANS IN THE PUBLIC CORRIDORS.
M. CONTINUE RATED GYPSUM BOARD ABOVE ANY DROP CEILING AND SOFFITS. PROVIDE A RATED ACCESS PANEL AT ALL SMOKE DAMPER LOCATIONS. COORDINATE FINAL LOCATIONS WITH ARCHITECT. PROVIDE ONE ACCESS PANEL PER FLOOR AT ALL SHAFT LOCATIONS. ACCESS PANEL TO BE ON THE PUBLIC CORRIDOR SIDE, ON OPEN / UNOCCUPIED SHAF ENCLLOSURES. PROVIDE ONE RATED ACCESS PANEL PER FLOOR FOR FUTURE INSTALLATION OF MECHANICAL SYSTEMS.
O. COORDINATE FINAL SOFFIT LOCATION WITH FINAL CABINET LAYOUT.

CODED NOTES - UNIT RCP

- (1) MOISTURE RESISTANT PAPERLESS GYPSUM BOARD SHALL BE USED FOR THE BATH CEILING ON THE 1ST AND 2ND FLOORS ONLY.

LEGEND - UNIT RCP

- E1 EXPOSED STRUCTURE ABOVE
G1 GYPSUM BOARD CEILING OR SOFFIT (RATED CEILING INSTALLED DIRECTLY TO STRUCTURE)
G2 GYPSUM BOARD CEILING OR SOFFIT (SHADING DENOTES EMERGENCY FIXTURE)
2x2 SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
SURFACE MOUNTED LIGHT FIXTURE (SHADING DENOTES EMERGENCY FIXTURE)
SURFACE MOUNTED LIGHT FIXTURE (UNIT)
PENDANT LIGHT FIXTURE
SUSPENDED LINEAR LIGHT FIXTURE
WALL MOUNTED VANITY LIGHT FIXTURE
SUPPLY DIFFUSER
LINEAR DIFFUSER
EXHAUST/RETURN GRILLE
ACCESS PANEL
CEILING TAG WITH HEIGHT

NOTE: COORDINATE ARCHITECTURAL REFLECTED CEILING PLANS WITH THE MECHANICAL AND ELECTRICAL DRAWINGS FOR NUMBER OF, AND LOCATIONS OF, AND TYPES OF FIXTURES AND GRILLES. NOT ALL ITEMS SHOWN ON LEGEND MAY BE PRESENT IN PROJECT.

GEN. NOTES - UNIT PLANS

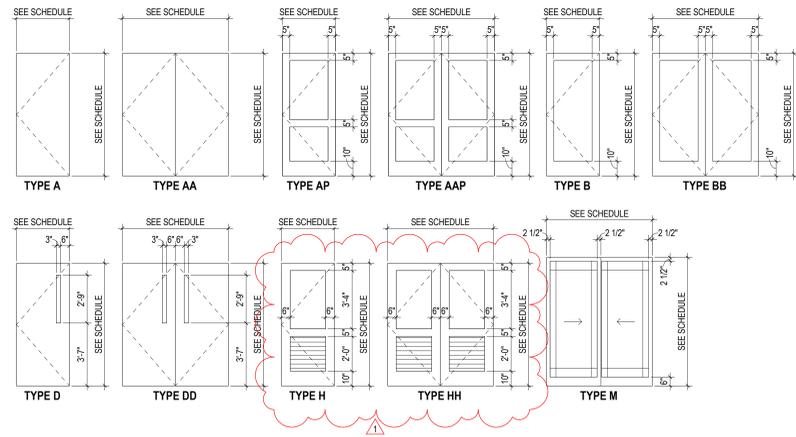
- A. ALL DIMENSIONS ARE TO FINISH FACE OF WALL UNLESS NOTED OTHERWISE.
B. WALLS ARE 2X WOOD FRAMING U.I. O. SEE SHEET G00 FOR PARTITION INFO.
C. EXTERIOR WALL CONDITIONS VARY. REFER TO OVERALL FLOOR PLAN SHEETS FOR EXTERIOR WALL AND WINDOW CONDITIONS.
D. RESIDENTIAL UNITS: TYPE B DENOTES ANSI TYPE B AND TYPE A DENOTES ANSI TYPE A. UNITS SHALL COMPLY WITH THE ACCESSIBILITY REQUIREMENTS REFERENCED ON THE CODE INFORMATION. THIS INCLUDES BUT IS NOT LIMITED TO ANSI A117.1 - 2009.
E. ACCESSIBLE ROUTE WIDTH WITHIN UNITS SHALL BE 36" MINIMUM, CONTINUOUS AND UNOBSTRUCTED, CONNECTING ACCESSIBLE ELEMENTS AND SPACES.
F. PROVIDE WOOD BLOCKING ON ALL RESIDENTIAL TYPE A AND TYPE B UNITS IN BATHS AND AS INDICATED ON "TYPICAL PROJECT DETAILS" SHEETS. SEE A100 SELECTION AND ASOR SHEETS S5 FOR TYPE A & B UNIT LOCATIONS AND LAYOUTS. ALL UNITS TO RECEIVE BLOCKING FOR GRAB BARS (TYPE A UNITS) SHEETS ON ARCHIBO FOR LENGTHS AND LOCATIONS OF GRAB BARS.
G. PROVIDE WOOD BLOCKING NOT SHOWN OR SHOWN AS REQUIRED TO MOUNT MILLWORK, MEP DEVICES AND ALL FIXTURES.
H. ALL DOOR OPENINGS INTO OCCUPIED RESIDENTIAL AND PUBLIC AREAS SHALL BE MINIMUM 32 INCHES CLEAR OR GREATER.
I. COORDINATE TRUSS LAYOUT AND DESIGN WITH MECHANICAL, ELECTRICAL AND PLUMBING LAYOUT PRIOR TO FABRICATION. TRUSS SHOP DRAWINGS SHALL INDICATE PLUMBING LINES AND HVAC DUCTS. PROVIDE COORDINATION DRAWING TO ARCHITECT. FRAMING CONTRACTOR SHALL COORDINATE TRUSS FRAMING OFFSETS AS REQUIRED TO ACCOMMODATE SANITARY LINES AND OTHER MEP EQUIPMENT / FIXTURES.
J. INSTALL ACOUSTIC BATT INSULATION AT PARTITIONS WITH PLUMBING STACKS, DEMISING WALLS AND FLOOR / CEILING ASSEMBLIES.
K. NOT USED
L. WATER SUPPLY AND DRAIN PIPES UNDER LAVATORIES AND SINKS MUST BE INSULATED TO PROTECT AGAINST CONTACT, INCLUDING COLD WATER SUPPLIES. PROVIDE SPRAY FOAM INSULATION AT DEMISING AND EXTERIOR WALLS AT LOCATIONS AROUND PLUMBING INSTALLATIONS. PROVIDE A VALANCE AT AREAS WITH EXPOSED SINKS. SEE TYPICAL PROJECT DETAILS' SHEETS FOR REQUIREMENTS.
M. HORIZONTAL OFFSETS IN PLUMBING DRAIN PIPES: PROVIDE ACOUSTIC PIPE INSULATION REFER TO ARCHITECT DRAWINGS.
N. ALL RESIDENTIAL UNITS TO RECEIVE A STANDARD SHOWER (TYPE B UNITS AND NON-ACCESSIBLE BATH IN TYPE A UNITS) OR ACCESSIBLE ROLL-IN SHOWER (ACCESSIBLE BATH IN TYPE A UNITS). PROVIDE SHOWER STALL WITH GRAB BARS AND OTHER SHOWER FIXTURES TO BE FACTORY INSTALLED IN PREFABRICATED UNITS. WALL ROUGH FRAMING DIMENSION REQUIREMENTS MUST BE COORDINATED WITH THE MANUFACTURER. SEE TYPICAL PROJECT DETAILS' SHEETS FOR LAYOUT OF SHOWER BLOCKING AND FIXTURES. SEE PLUMBING DRAWINGS FOR EXACT DIMENSIONS REQUIRED AND FEATURE INFO.
O. LAUNDRY ROOM DRYER VENTING LOCATIONS SHALL BE COORDINATED WITH ARCHITECT. ROUTING SHALL NOT EXCEED 35 FEET WITH ONLY ONE BEND. LABEL LENGTH OF ANY DRYER VENTING DUCT ON THE LAUNDRY ROOM PER REQUIREMENT BY THE CITY OF COLUMBUS.
P. PROVIDE PULL UPS ON ALL KITCHEN CASEWORK.
Q. RANGES IN TYPE A UNITS ARE TO BE INSTALLED AS SPECIFICATIONS. PROVIDE CABINET BASE TO MOUNT THE APPLIANCE AS REQUIRED TO ALIGN RANGE TOP WITH TOP OF COUNTERTOP.
R. ALL MEP OPERABLE CONTROLS, FIXTURES, OUTLETS AND ALL OTHER RESIDENTIAL TOILET OR UNIT ACCESSORIES SHALL NOT BE MOUNTED LOWER THAN 18 INCHES AFF AND HIGHER THAN 48 INCHES. SEE TYPICAL PROJECT DETAILS' SHEETS FOR ADDITIONAL REQUIREMENTS.
S. ALL RESIDENTIAL UNIT MICROWAVES (TYPE B UNITS) AND RANGE HOODS (TYPE A UNITS) TO BE DUCTED AND VENTED TO THE EXTERIOR. SEE ELECTRICAL INFORMATION. INSTALL PER ENERGY STAR AND LEED REQUIREMENTS.
T. PROVIDE COUNTER TYPE MICROWAVE IN ALL TYPE A UNIT KITCHENS.
U. ALL UNIT APPLIANCES ARE INCLUDED. SEE SPECIFICATIONS. UNIT KITCHEN APPLIANCES TO BE STAINLESS STEEL AND ENERGY STAR RATED.
V. ALL UNIT PLUMBING FIXTURES TO BE WATERSENSE-RATE. SEE PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
W. FOR KITCHEN ELECTRIC OUTLET RECEPTACLES, THE MAXIMUM ALLOWABLE HEIGHT TO THE CENTERLINE OF AN OUTLET IS 46 INCHES AFF WHEN REACHING OVER AN OBSTRUCTION 36 INCHES HIGH MAXIMUM AND 25-1/2 INCHES DEEP MAXIMUM. OUTLETS MUST BE A MINIMUM OF 36 INCHES FROM AN INSIDE CORNER OR 12 INCHES FROM END WALL, DM 5.3.5.8
X. THERMOSTATS, SWITCHES, ELECTRIC OUTLETS, ELECTRICAL PANELBOARDS AND OTHER OPERABLE DEVICES SHALL BE LOCATED WITHIN AN ACCESSIBLE REACH RANGE FROM 15 INCHES TO 48 INCHES AFF FOR AN UNOBSTRUCTED REACH. DM 5.3.5.5; ANSI 1003.9; 1004.9; 308.3; 308
Y. ELECTRICAL PANELS ON ALL RESIDENTIAL UNITS SHALL BE INSTALLED SO THE OPERABLE COMPONENTS ARE NOT HIGHER THAN 48 INCHES A.F.F. OR LOWER THAN 18 INCHES A.F.F.
Z. AT TYPE A UNITS, THE LOCATION OF CONTROLS FOR THE OVEN AND RANGE MUST NOT REQUIRE REACHING ACROSS THE BURNERS. ANSI 1003.12.5.4.4; 1003.12.5.4.4. SEE THE SPECIFICATIONS FOR APPLIANCE REQUIREMENTS.
AA. KITCHEN SINKS AT TYPE A UNITS SHALL INCLUDE REAR DRAINED SINKS TO ACCOMMODATE DISPOSALS. SINK BOWL SHALL NOT BE DEEPER THAN 6 1/2 INCHES.
BB. PROVIDE LEVER CONTROLS FOR ALL KITCHEN AND BATH FAUCETS.
CC. AT TYPE A UNITS, THE FLUSH CONTROL FOR THE WATER CLOSET WILL BE LOCATED ON THE OPEN SIDE (AWAY FROM THE SIDE WALL).
DD. WHERE REQUIRED, INSTALL ANY MEP DEVICES / FIXTURES SO THE INTEGRITY OF RATED WALL IS MAINTAINED. CONTINUE TYPE X GYPSUM BOARD ASSEMBLY BEHIND MEP DEVICE / FIXTURE.
EE. EXTEND FINISH FLOOR MATERIAL UNDER KITCHEN APPLIANCES, VANITY IN ALL BATHS AND UNDERNEATH REMOVABLE UNIVERSAL BASE CABINETS. ALL CABINET SURFACES VISIBLE INCLUDING AREAS EXPOSED AFTER REMOVING REMOVABLE BASE CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK. EXPOSED SIDES OF CABINETS MUST BE COVERED BY FINISHED END PANELS TO MATCH ADJACENT CASEWORK. EXPOSED SIDES OF WALL AND BASE CABINETS SHALL HAVE FINISH PANELS ON ALL EXPOSED TO VIEW.
GG. SEE TYPICAL PROJECT DETAILS' SHEETS A810 & A820 AND SHEET A900 FOR EXTENT OF FINISHES AT ALL UNIT ENTRANCES.
HH. UNIT FURNITURE IN CONTRAST. SEE FINE DRAWINGS FOR ADDITIONAL INFO.
II. PROVIDE ONE MIRROR AND ONE MEDICINE CABINET FOR EACH UNIT BATH. MIRROR WIDTH AS SHOWN ON BATH ELEVATIONS. TYPICAL. SEE TYPICAL PROJECT DETAILS' SHEETS FOR MOUNTING HEIGHTS REQUIREMENTS AND SPECIFICATIONS FOR ALL OTHER REQUIRED TOILET ACCESSORIES.
JJ. SEE TYPICAL PROJECT DETAILS' FOR MOUNTING HEIGHTS AND OTHER DIMENSIONS REQUIRED FOR PLUMBING AND OTHER FIXTURES REQUIRED.
KK. ALL RESIDENTIAL UNIT WINDOWS TO RECEIVE WINDOW TREATMENTS AS NOTED IN FINISH SCHEDULE.
LL. PROVIDE ONE DOOR VIEWER AT THE TYPE B UNIT ENTRY DOOR AND TWO DOOR VIEWERS AT THE TYPE A UNIT ENTRY DOOR.
MM. WIRE SHELVING SHALL BE PROVIDED FOR ENTIRE WIDTH OF THE CLOSET AS FOLLOWS: BEDROOM & COAT CLOSET (1 SHELF, FIXED) AND ROBE WARD. LINEN CLOSET (6 SHELF, ADJUSTABLE) UTILITY (1 SHELF, FIXED). SEE TYPICAL PROJECT DETAILS' SHEETS FOR MOUNTING HEIGHT REQUIREMENTS.
NN. ALL RESIDENTIAL UNITS TO RECEIVE PLAM KITCHEN COUNTERTOPS WITH SUBWAY TILE BACKSPLASH. BATHS TO RECEIVE CULTURED MARBLE COUNTERTOPS WITH INTEGRAL BOWLS.
OO. IN TYPE A UNITS, ALL COUNTERTOPS TO BE SET AT 34 INCHES MAXIMUM HEIGHT TO THE TOP OF KITCHEN OR BATH / TOILET SINK RIM. ON TYPE B UNITS, ALL VANITY COUNTERTOPS TO BE SET AT 34 INCHES MAXIMUM HEIGHT TO THE TOP OF BATH SINK RIM.
PP. AT TYPE A UNIT COUNTERTOPS, MOUNT CENTER OF WALL RECEPTACLES ABOVE COUNTER, NO HIGHER THAN 40 INCHES A.F.F. COORDINATE WITH CASEWORK ELEVATIONS. SEE TYPICAL PROJECT DETAILS' SHEETS.
QQ. AT TYPE A UNITS AND SENSORY UNITS, PROVIDE HARD-WIRED CALL FOR AID STATION IN ALL BEDROOMS AND BATHS.
RR. UNITS MAY BE OPPOSITE HAND OF THOSE SHOWN ON ENLARGED UNIT PLANS AND RCP'S. SEE OVERALL FLOOR PLANS FOR LOCATIONS AND ORIENTATION OF UNITS.

Table with columns: #, DATE, CHANGE DESCRIPTION. Row 1: 1, 12/7/2023, ADDENDUM NO 2

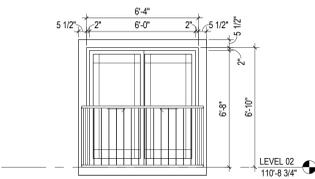
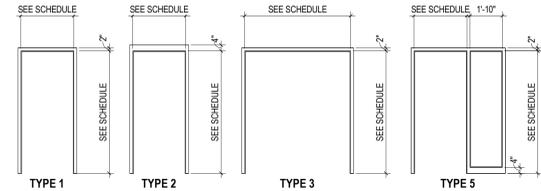
COBBLESTONE MANOR
1500 LAMPLIGHTER DRIVE
GROVE CITY, OH 43123
FOR CMHA
300 SPRUCE STREET
SUITE 300
COLUMBUS, OHIO 43215
PHONE: (614) 461-4664
FAX: (614) 280-8881

MOODY-NOLAN ARCHITECTS
ENLARGED UNIT PLANS - 2BED (TYPE B)
06/08/2023
DRAWN BY: Author CHECKED BY: Checker
#22172.01
A505
PERMIT & BID SET
JAY W BOONE, LIC. #10740
EXP. DATE: 12/31/2023

**DOOR PANEL TYPE LEGEND**



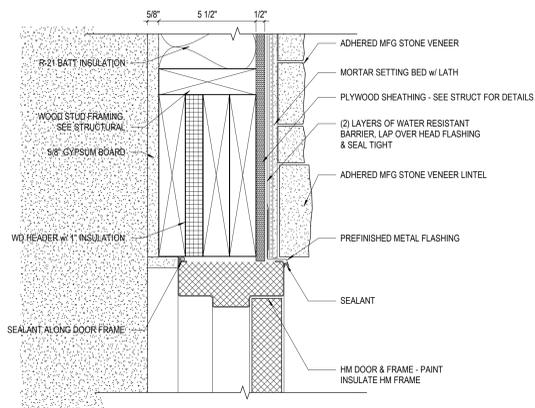
**DOOR FRAME TYPE LEGEND**



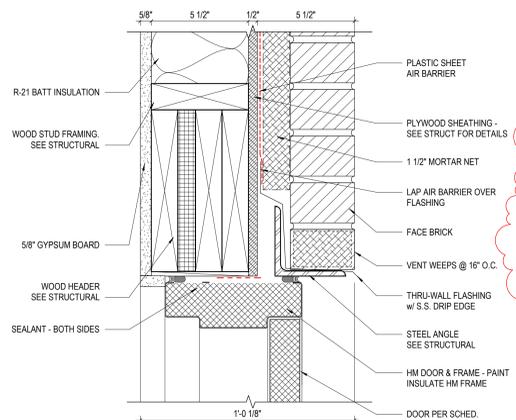
**1 ELEVATION SLIDING DOOR**  
1/4" = 1'-0" REF: 1 / A1.2

**DOOR SCHEDULE**

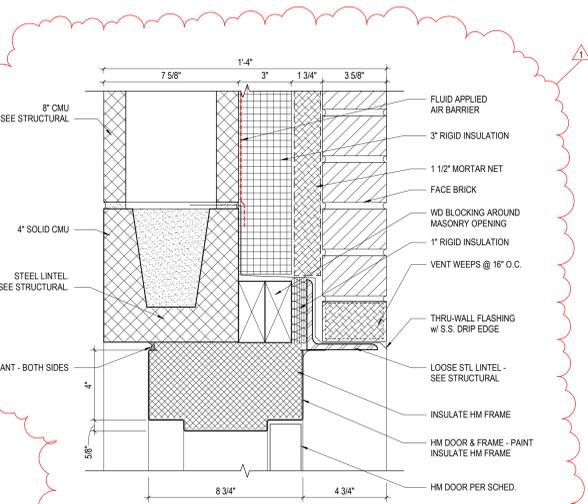
NUMBER	ROOM NAME	DOOR	WIDTH	HEIGHT	FRAME		FIRE RATING	HOW SET	DETAILS - SHEET A710, A711 AND A712			REMARKS	
					MATERIAL	ELEV			HEAD	JAMB	SILL		
LEVEL 01													
A-100	ADMIN.	3'-0"	7'-0"	WD	A	HM	5	02	14A712	13A712	24A712		
A-101	CONF.	3'-0"	7'-0"	WD	A	HM	5	29	2A712	1A712	24A712		
A-102	ADMIN.	3'-0"	7'-0"	WD	A	HM	5	13	2A712	1A712	24A712		
A-103	MSR	3'-0"	7'-0"	WD	A	HM	5	23	2A712	1A712	24A712		
C-101A	CORRIDOR	4'-0"	7'-0"	WD	D	HM	1	20 MINUTES	05	10A712	9A712	24A712	
C-101B	CORRIDOR	3'-0"	7'-0"	HM	D	HM	1	01	3A711	2A711	9A710		
C-102A	CORRIDOR	4'-0"	7'-0"	WD	D	HM	1	20 MINUTES	05	10A712	9A712	24A712	
C-102B	CORRIDOR	3'-0"	7'-0"	HM	D	HM	1	01	3A711	2A711	9A710		
CO-100A	COMP.	3'-0"	7'-0"	WD	A	AL	16A702	12	--	--	--	SEE STOREFRONT ELEVATIONS FOR DETAILS ON A702	
CR-100A	COMMUNITY ROOM	6'-0"	7'-0"	WD/GL	BB	AL	15A702	18	--	--	--	SEE STOREFRONT ELEVATIONS FOR DETAILS ON A702	
CR-100B	COMMUNITY ROOM	3'-0"	7'-0"	AL/GL	B	AL	9A702	25	--	--	--	SEE STOREFRONT ELEVATIONS FOR DETAILS ON A702	
CR-100C	COMMUNITY ROOM	3'-0"	7'-0"	AL/GL	B	AL	9A702	25	--	--	--	SEE STOREFRONT ELEVATIONS FOR DETAILS ON A702	
CR-100D	COMMUNITY ROOM	3'-0"	7'-0"	AL/GL	B	AL	9A702	25	--	--	--	SEE STOREFRONT ELEVATIONS FOR DETAILS ON A702	
E-100	ELEC.	3'-0"	7'-0"	WD	A	HM	1	90 MINUTES	23	23A712	21A712	24A712	
EL-100	ELEV.	3'-0"	7'-0"	WD	A	HM	2	60 MINUTES	11	20A712	19A712	26A712	
EL-101	ELEV.	3'-0"	7'-0"	WD	A	HM	2	90 MINUTES	26	4A712	3A712	26A712	
FS-100	FLEX SPACE	3'-0"	7'-0"	WD	D	HM	1	03	2A712	1A712	24A712		
M-101	PARCEL	3'-0"	7'-0"	WD	A	HM	1	04	2A712	1A712	24A712		
ME-100A	MECHWATER	3'-0"	7'-0"	HM	A	HM	1	21	2A712	1A712	26A712		
ME-100B	MECHWATER	3'-0"	7'-0"	WD	A	HM	1	14	10A711	9A711	9A710		
ME-101	MECH	3'-0"	7'-0"	HM	A	HM	1	13	2A712	1A712	26A712		
S-100A	STAIR	3'-0"	7'-0"	WD	D	HM	2	60 MINUTES	09	4A712	3A712	24A712	
S-100B	STAIR	3'-0"	7'-0"	HM	D	HM	2	30	6A711	5A711	9A710		
S-101A	STAIR	3'-0"	7'-0"	WD	D	HM	2	60 MINUTES	09	4A712	3A712	24A712	
S-101B	STAIR	3'-0"	7'-0"	HM	D	HM	2	30	6A711	5A711	9A710		
ST-100	STORAGE	3'-0"	7'-0"	HM	A	HM	1	22	2A712	1A712	24A712		
ST-101	STORAGE	3'-0"	7'-0"	HM	A	HM	1	22	2A712	1A712	24A712		
ST-102	STOR.	3'-0"	7'-0"	HM	A	HM	1	20 MINUTES	27	10A712	9A712	24A712	
ST-103	STOR.	3'-0"	7'-0"	WD	A	HM	1	20 MINUTES	27	10A712	9A712	24A712	
T-100	RR	3'-0"	7'-0"	WD	A	HM	1	28	2A712	1A712	24A712		
T-101	RR	3'-0"	7'-0"	WD	A	HM	1	28	2A712	1A712	24A712		
TR-100A	TRASH	3'-0"	7'-0"	WD	A	HM	1	20 MINUTES	21	10A712	9A712	24A712	
TR-100B	TRASH	6'-0"	7'-0"	HM	AA	HM	3	06	3A711	2A711	9A710		
TR-101A	TRASH	3'-0"	7'-0"	WD	A	HM	1	20 MINUTES	21	10A712	9A712	24A712	
TR-101C	TRASH	6'-0"	7'-0"	HM	AA	HM	3	31	3A711	2A711	9A710		
U-102	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	1A710		
U-103	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-104	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	1A710		
U-105	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-106	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
U-107	UNIT 1b-AS	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-108	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	1A710		
U-109	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-110	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
U-111	UNIT 2b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-112	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	1A710		
U-114	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
U-118	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-119	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
U-120	UNIT 1b-AS	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-121	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
U-122	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-123	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
U-124	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-125	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
U-126	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-127	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
U-128	UNIT 2b-S	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	1A710		
U-129	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	1A710		
V-100A	VEST.	6'-0"	7'-0"	AL/GL	BB	AL	19A702	10	--	--	--	SEE STOREFRONT ELEVATIONS FOR DETAILS ON A702	
V-100B	VEST.	6'-0"	7'-0"	AL/GL	BB	AL	12A702	08	--	--	--	SEE STOREFRONT ELEVATIONS FOR DETAILS ON A702	
W-100	WELLNESS	3'-0"	7'-0"	WD/GL	B	AL	20A702	12	--	--	--	SEE STOREFRONT ELEVATIONS FOR DETAILS ON A702	
LEVEL 02													
E-200	ELEC	3'-0"	7'-0"	WD	A	HM	1	21	10A712	9A712	24A712		
J-200	JAN	3'-0"	7'-0"	WD	A	HM	1	20 MINUTES	21	10A712	9A712	24A712	
LR-200	LAUNDRY RM	3'-0"	7'-0"	WD	A	HM	1	60 MINUTES	03	10A712	9A712	24A712	
ME-200	MECH	3'-0"	7'-0"	WD	A	HM	1	13	2A712	1A712	24A712		
S-200	STAIR	3'-0"	7'-0"	WD	A	HM	2	45 MINUTES	07	4A712	3A712	24A712	
S-201	STAIR	3'-0"	7'-0"	WD	A	HM	2	45 MINUTES	07	4A712	3A712	24A712	
ST-201	STOR.	3'-0"	7'-0"	WD	A	HM	1	21	2A712	1A712	24A712		
ST-202	STOR.	3'-0"	7'-0"	WD	A	HM	1	20 MINUTES	27	10A712	9A712	24A712	
ST-203	STOR.	3'-0"	7'-0"	WD	A	HM	1	20 MINUTES	27	10A712	9A712	24A712	
ST-204	TRASH	3'-0"	7'-0"	WD	A	HM	1	21	2A712	1A712	24A712		
TR-200	TRASH	3'-0"	7'-0"	WD	A	HM	1	20 MINUTES	20	10A712	9A712	24A712	
TR-201	TRASH	3'-0"	7'-0"	WD	A	HM	1	20 MINUTES	20	10A712	9A712	24A712	
U-200	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	2A710		
U-201	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	2A710		
U-202	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	10A710		
U-203	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	10A710		
U-204	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	10A710		
U-205	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	2A710		
U-206	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	6A710		
U-207	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	10A710		
U-208	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	10A710		
U-209	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	4A710	3A710	2A710		
U-210	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	6A710		
U-211	UNIT 2b-AS	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	10A710		
U-212	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	10A710		
U-214	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	6A710		
U-216	LIBRARY	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	2A710		
U-217	UNIT 1b-AS	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	10A710		
U-218	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	2A710		
U-219	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	8A710	7A710	6A710		
U-220	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF	SL-01	12A710	11A710	2A710		
U-221	UNIT 1b	6'-0"	6'-8"	FG/GL	M	FG	MNF						



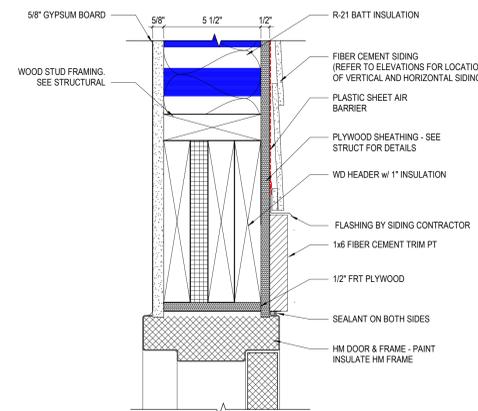
**10** DETAIL HM DOOR HEAD - STONE VENEER  
3" = 1'-0"



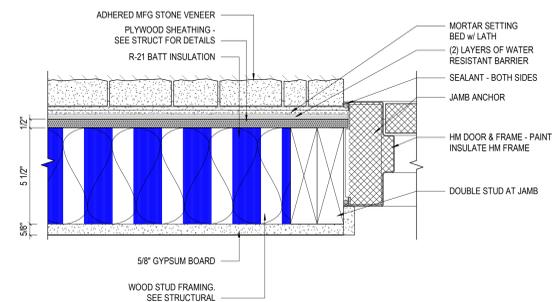
**8** DETAIL EXT. HM DOOR HEAD AT BRICK  
3" = 1'-0"



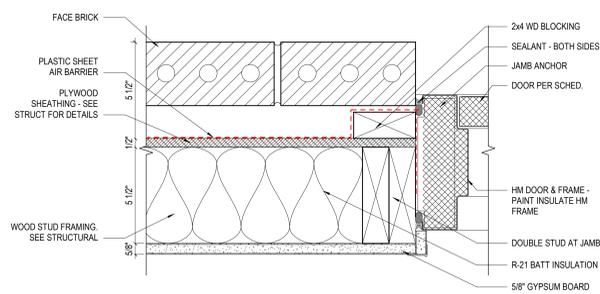
**6** DETAIL EXT. DOOR HEAD AT BRICK  
3" = 1'-0"



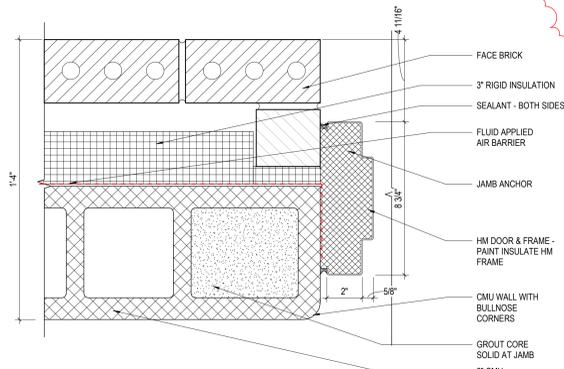
**3** DETAIL ACCESS DOOR HEAD  
3" = 1'-0" REF: 6 / A412



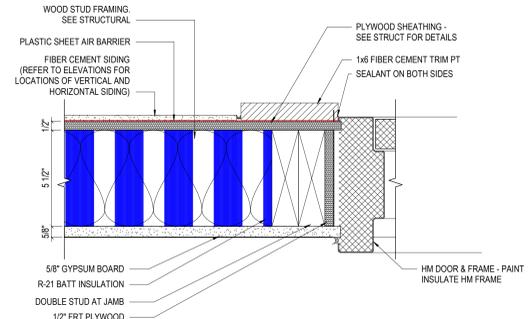
**9** DETAIL HM DOOR JAMB - STONE VENEER  
3" = 1'-0" REF: 1 / A101A



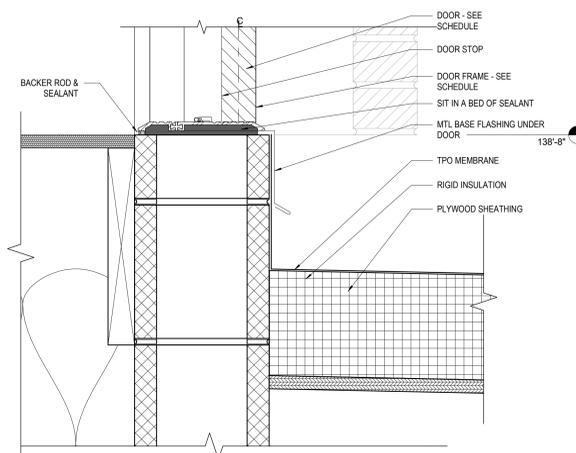
**7** DETAIL EXT. HM DOOR JAMB AT BRICK  
3" = 1'-0"



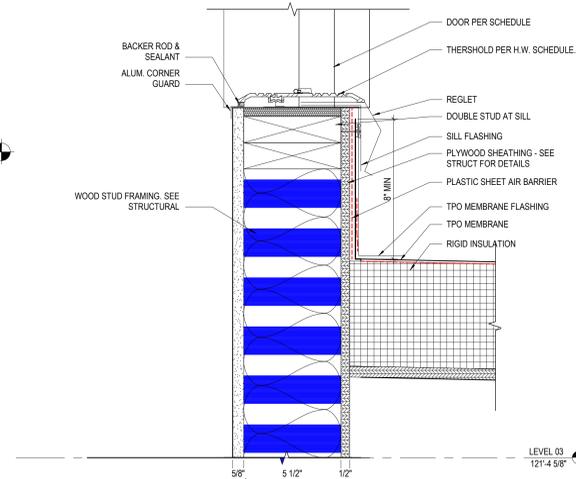
**5** DETAIL EXT. HM DOOR JAMB AT BRICK  
3" = 1'-0"



**2** DETAIL ACCESS DOOR JAMB - 3RD FLOOR  
3" = 1'-0" REF: 1 / A103A



**4** DETAIL HM DOOR @ ROOF  
3" = 1'-0"



**1** DETAIL ACCESS DOOR SILL - 3RD FLOOR  
3" = 1'-0" REF: 6 / A412

#	DATE	CHANGE DESCRIPTION
1	12/7/2023	ADDENDUM NO 2

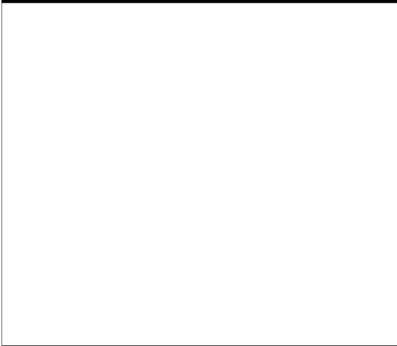
**COBBLESTONE MANOR**  
 COLUMBUS METROPOLITAN HOUSING AUTHORITY  
 1550 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR CMHA

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

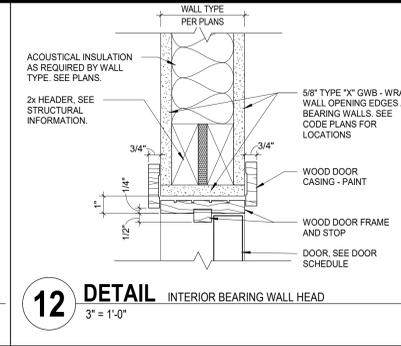
**DOOR DETAILS - EXTERIOR**

DRAWING TITLE: **DOOR DETAILS - EXTERIOR**

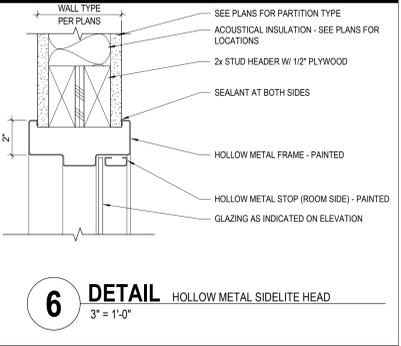
DATE: 06/08/2023  
 DRAWN BY: Author  
 CHECKED BY: Checker  
 #22172.01  
**A711**  
 PERMIT & BID SET



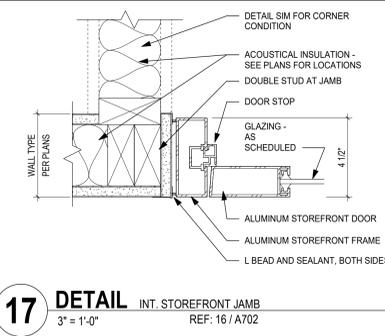
**18 DETAIL** INT. STOREFRONT HEAD  
3" = 1'-0"



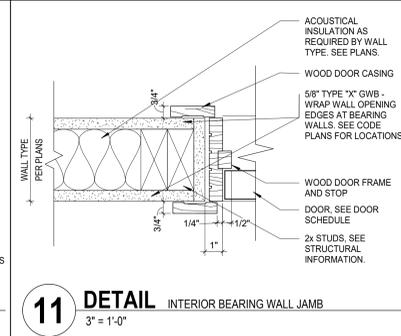
**12 DETAIL** INTERIOR BEARING WALL HEAD  
3" = 1'-0"



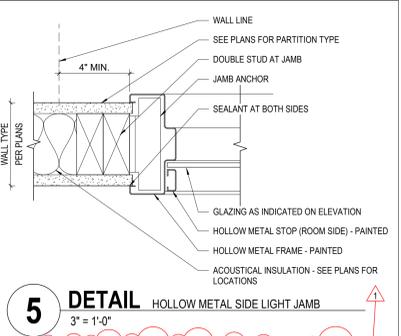
**6 DETAIL** HOLLOW METAL SIDELITE HEAD  
3" = 1'-0"



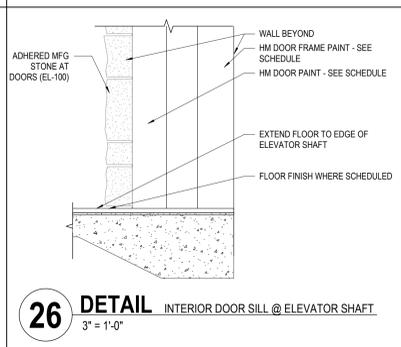
**17 DETAIL** INT. STOREFRONT JAMB  
3" = 1'-0"  
REF: 16 / A702



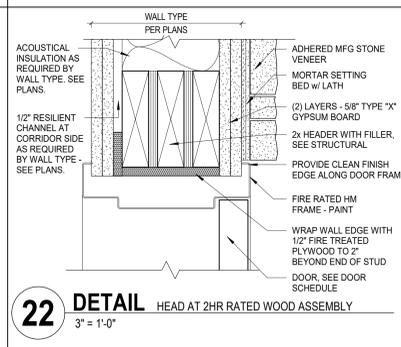
**11 DETAIL** INTERIOR BEARING WALL JAMB  
3" = 1'-0"



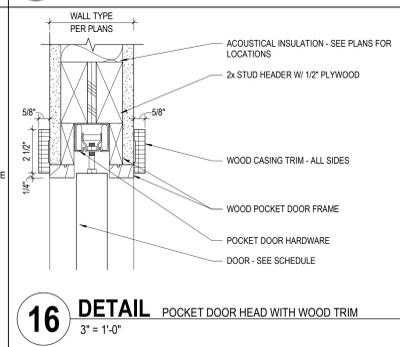
**5 DETAIL** HOLLOW METAL SIDE LIGHT JAMB  
3" = 1'-0"



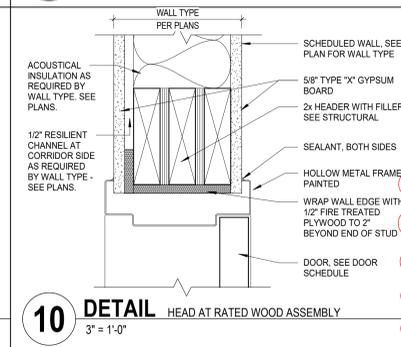
**26 DETAIL** INTERIOR DOOR SILL @ ELEVATOR SHAFT  
3" = 1'-0"



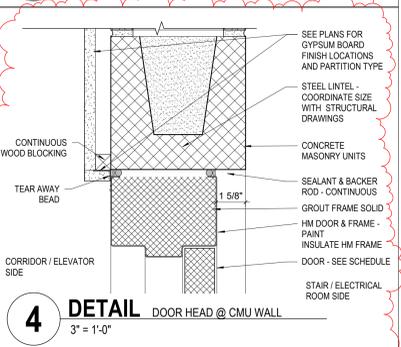
**22 DETAIL** HEAD AT 2HR RATED WOOD ASSEMBLY  
3" = 1'-0"



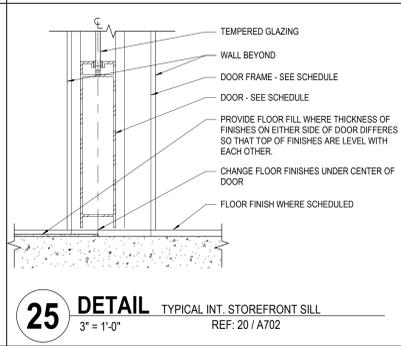
**16 DETAIL** POCKET DOOR HEAD WITH WOOD TRIM  
3" = 1'-0"



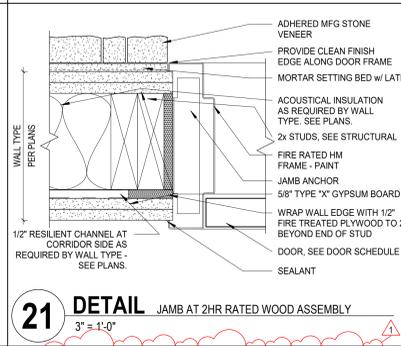
**10 DETAIL** HEAD AT RATED WOOD ASSEMBLY  
3" = 1'-0"



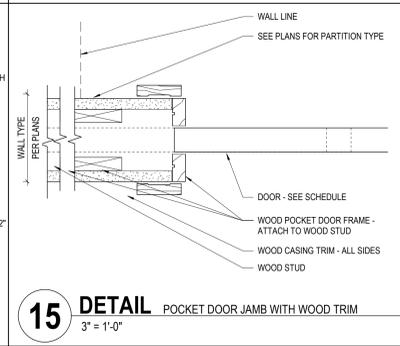
**4 DETAIL** DOOR HEAD @ CMU WALL  
3" = 1'-0"



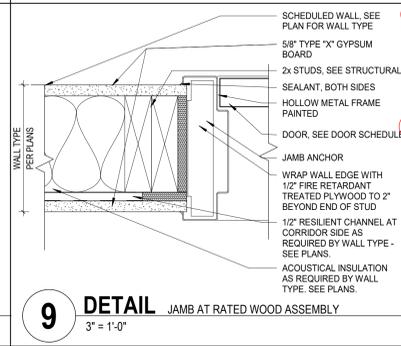
**25 DETAIL** TYPICAL INT. STOREFRONT SILL  
3" = 1'-0"  
REF: 20 / A702



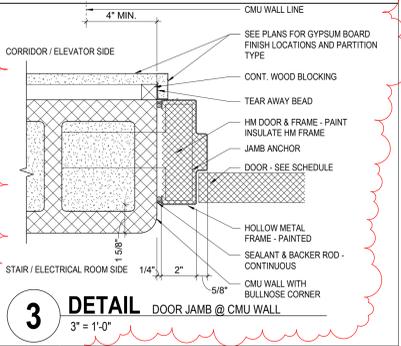
**21 DETAIL** JAMB AT 2HR RATED WOOD ASSEMBLY  
3" = 1'-0"



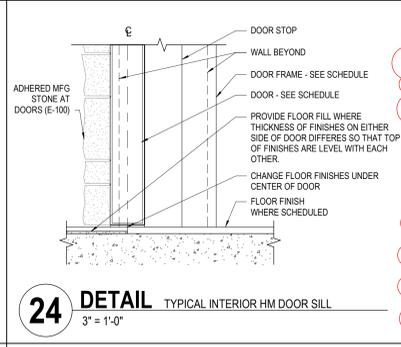
**15 DETAIL** POCKET DOOR JAMB WITH WOOD TRIM  
3" = 1'-0"



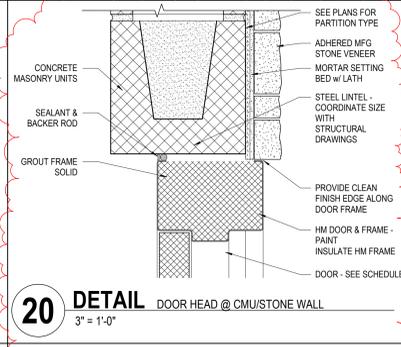
**9 DETAIL** JAMB AT RATED WOOD ASSEMBLY  
3" = 1'-0"



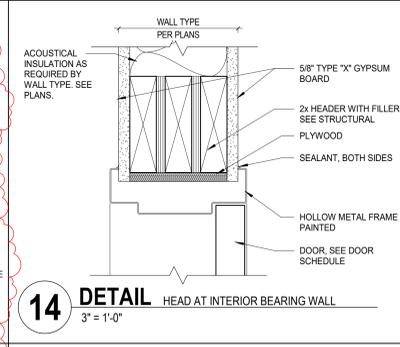
**3 DETAIL** DOOR JAMB @ CMU WALL  
3" = 1'-0"



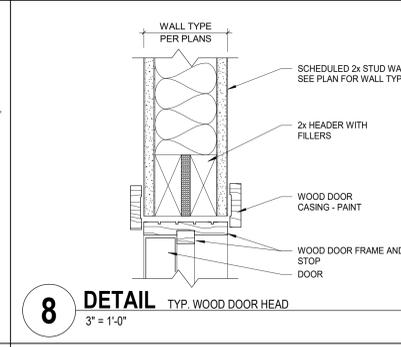
**24 DETAIL** TYPICAL INTERIOR HM DOOR SILL  
3" = 1'-0"



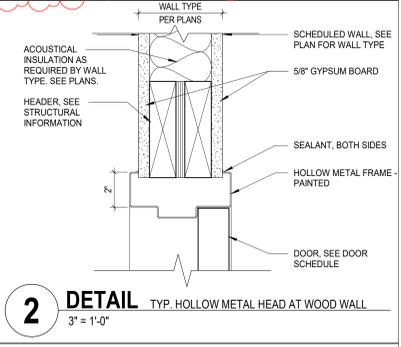
**20 DETAIL** DOOR HEAD @ CMU/STONE WALL  
3" = 1'-0"



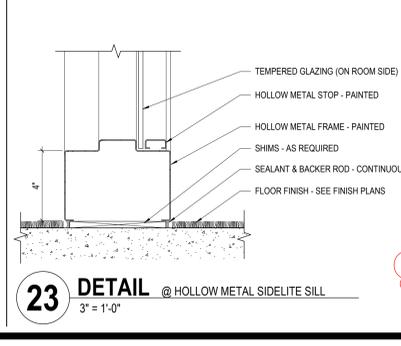
**14 DETAIL** HEAD AT INTERIOR BEARING WALL  
3" = 1'-0"



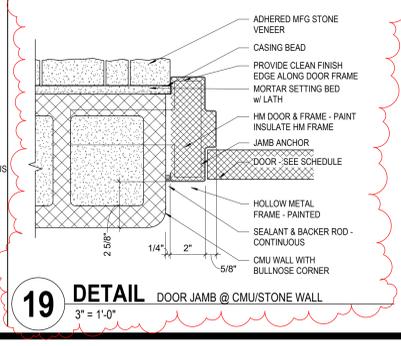
**8 DETAIL** TYP. WOOD DOOR HEAD  
3" = 1'-0"



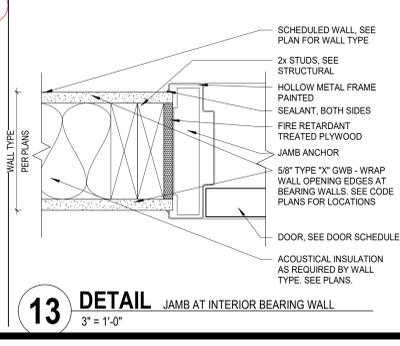
**2 DETAIL** TYP. HOLLOW METAL HEAD AT WOOD WALL  
3" = 1'-0"



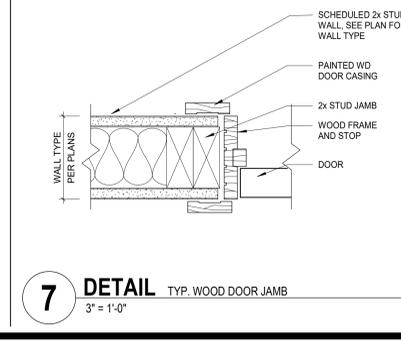
**23 DETAIL** @ HOLLOW METAL SIDELITE SILL  
3" = 1'-0"



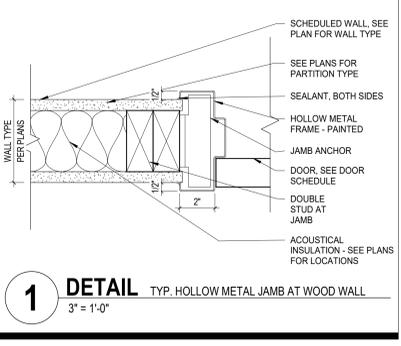
**19 DETAIL** DOOR JAMB @ CMU/STONE WALL  
3" = 1'-0"



**13 DETAIL** JAMB AT INTERIOR BEARING WALL  
3" = 1'-0"



**7 DETAIL** TYP. WOOD DOOR JAMB  
3" = 1'-0"



**1 DETAIL** TYP. HOLLOW METAL JAMB AT WOOD WALL  
3" = 1'-0"

#	DATE	CHANGE DESCRIPTION
1	12/27/2023	ADDENDUM NO 2

**COBBLESTONE MANOR**  
 1550 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**  
 COLUMBUS METROPOLITAN HOUSING AUTHORITY  
 COMMUNITY ORIENTED COLLEBORATION

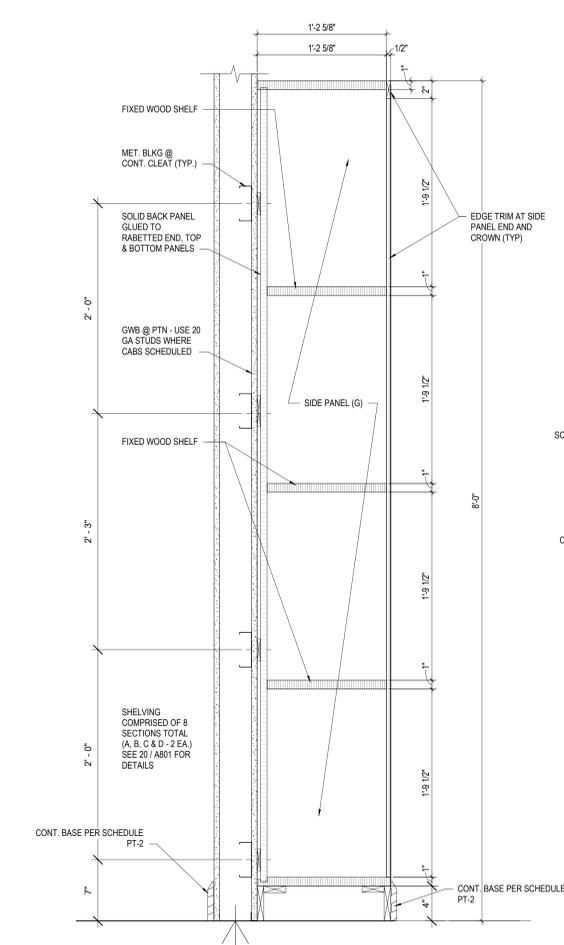
**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

**DOOR DETAILS - INTERIOR**

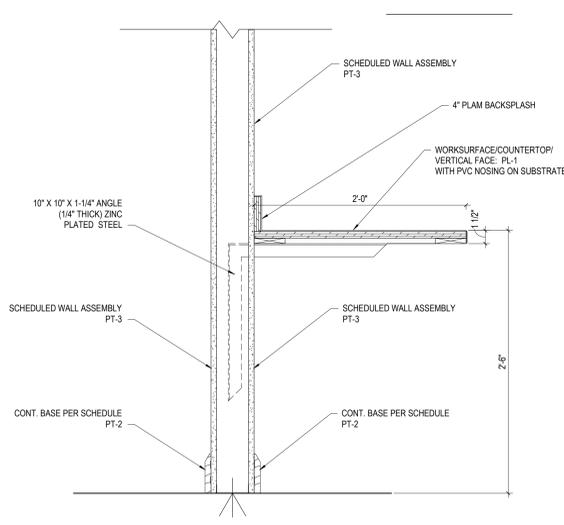
DRAWING TITLE: **DOOR DETAILS - INTERIOR**

DATE: 06/08/2023  
 DRAWN BY: Author  
 CHECKED BY: Checker  
 #22172.01  
**A712**  
 PERMIT & BID SET

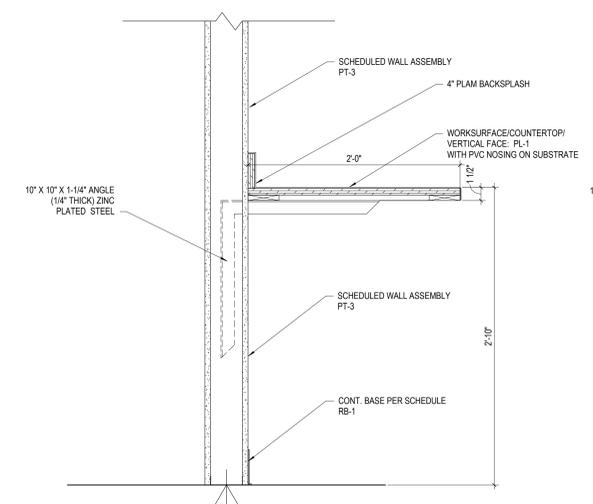
JAY W BOONE, LIC. #10740  
 EXP. DATE: 12/31/2022



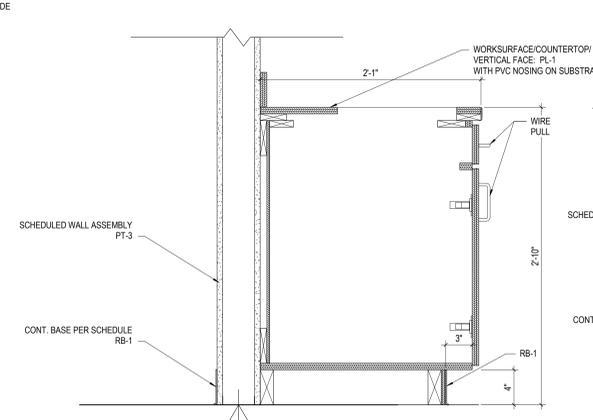
**14 LIBRARY SHELVING**  
 1 1/2" = 1'-0"



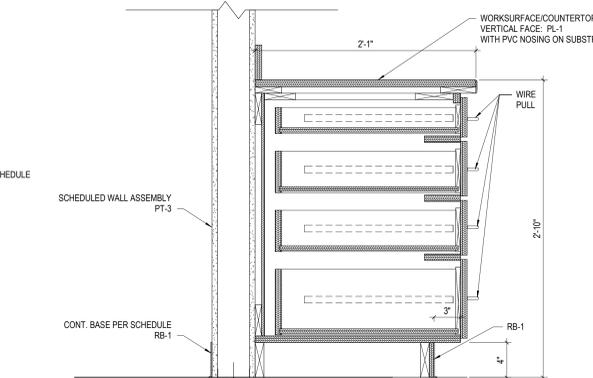
**13 DETAIL COMPUTER ROOM - COUNTER**  
 1 1/2" = 1'-0" REF: 2 / A801



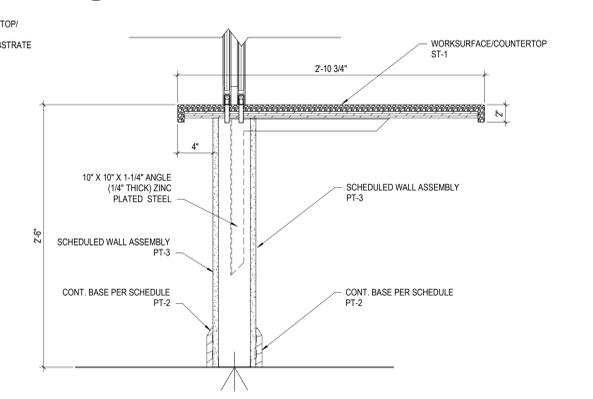
**12 DETAIL LAUNDRY ROOM - COUNTER**  
 1 1/2" = 1'-0" REF: 1 / A102B



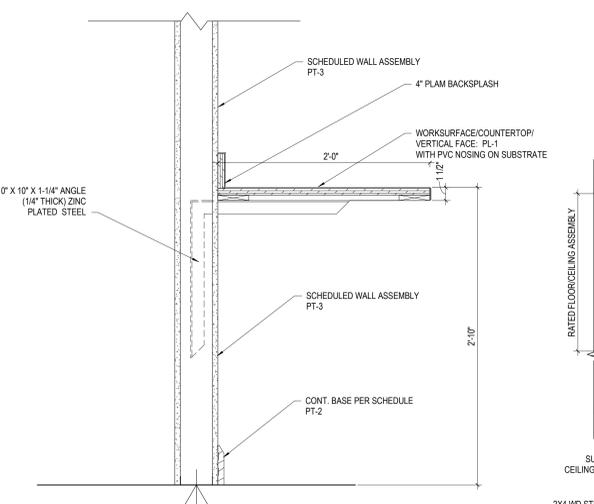
**11 DETAIL FLEX SPACE - SINK CABINET**  
 1 1/2" = 1'-0" REF: 10 / A801



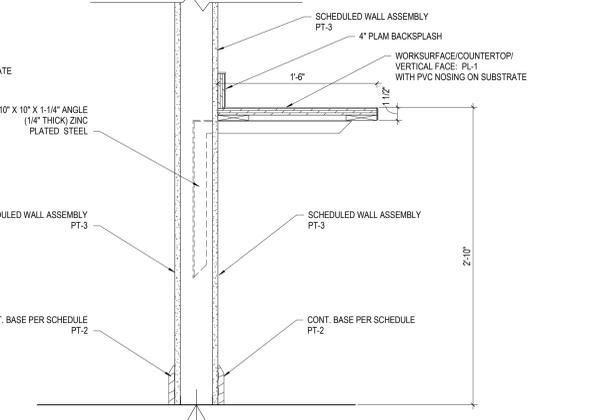
**10 DETAIL FLEX SPACE - DRAWER CABINET**  
 1 1/2" = 1'-0" REF: 10 / A801



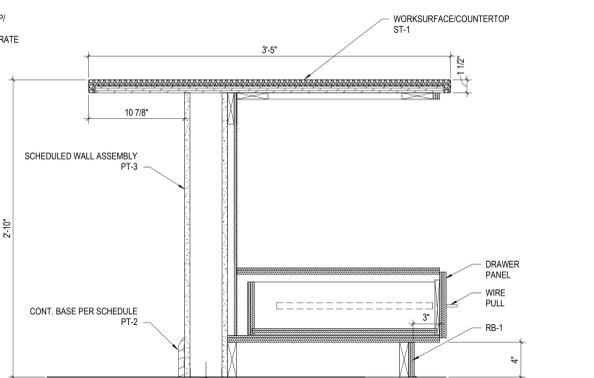
**9 DETAIL ADMIN - WINDOW COUNTER**  
 1 1/2" = 1'-0" REF: 17 / A801



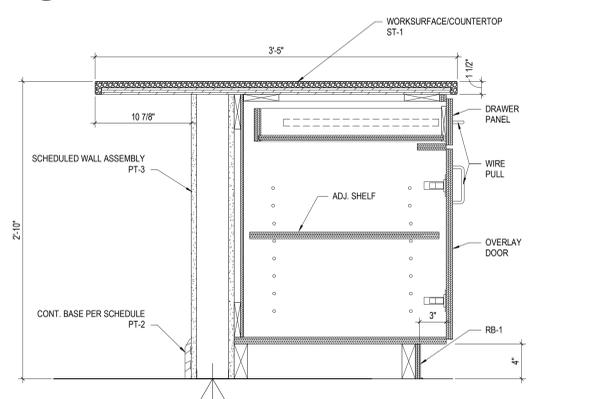
**8 DETAIL PARCEL ROOM - COUNTER**  
 1 1/2" = 1'-0" REF: 18 / A801



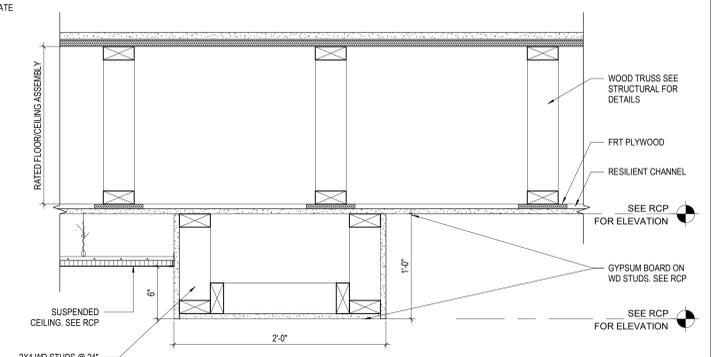
**7 DETAIL MAIL - COUNTER**  
 1 1/2" = 1'-0" REF: 4 / A801



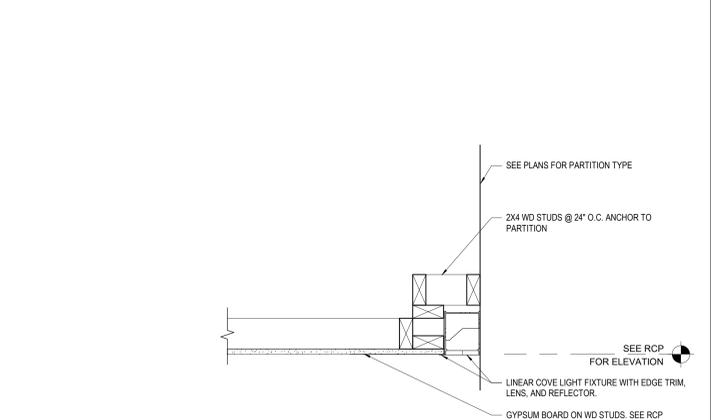
**6 DETAIL COMMUNITY ROOM ISLAND - EAST - Section 2**  
 1 1/2" = 1'-0" REF: 12 / A801



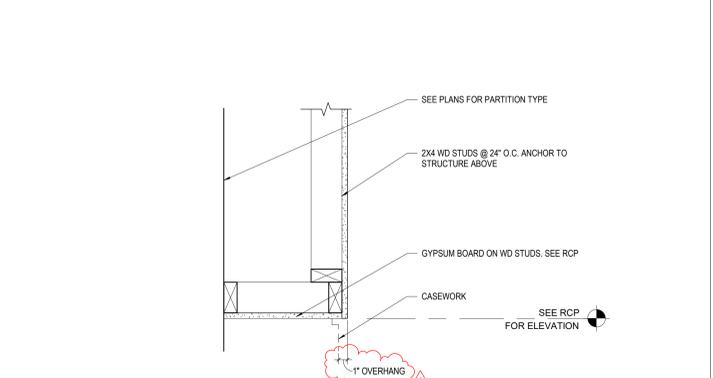
**5 DETAIL COMMUNITY ROOM ISLAND - EAST - Section 1**  
 1 1/2" = 1'-0" REF: 12 / A801



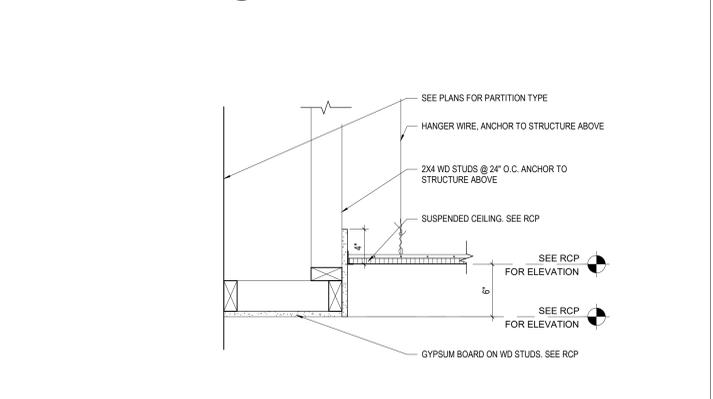
**4 DETAIL SOFFIT - GYP BD TO GYP BD**  
 1 1/2" = 1'-0" REF: 1 / A201A



**3 DETAIL GBS WALL-WASH @ ELEVATION WALL**  
 1 1/2" = 1'-0" REF: 1 / A201A



**2 DETAIL SOFFIT @ CASEWORK**  
 1 1/2" = 1'-0" REF: 1 / A201A



**1 DETAIL SOFFIT - GYP BD TO ACT**  
 1 1/2" = 1'-0" REF: 1 / A201A

#	DATE	CHANGE DESCRIPTION
1	12/27/2023	ADDENDUM NO 2

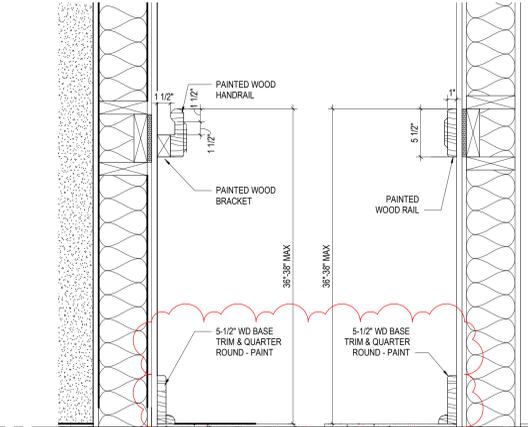
**COBBLESTONE MANOR**  
 COLUMBUS METROPOLITAN HOUSING AUTHORITY  
 150 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

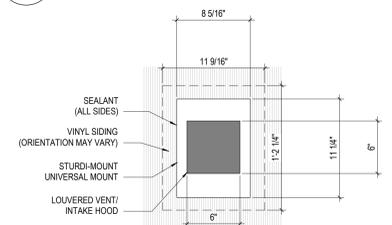
DRAWING TITLE:  
**INTERIOR DETAILS**

STATE OF OHIO REGISTERED ARCHITECT  
 JAY W. BOONE, LIC. #10740  
 EXP. DATE: 12/31/2023

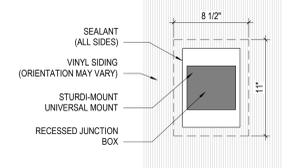
06/08/2023  
 DRAWN BY: Author CHECKED BY: Checker  
 #22172.01  
**A803**  
 PERMIT & BID SET



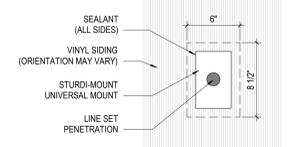
**10 DETAIL** HAND RAIL / CHAIR RAIL DETAIL  
1 1/2" = 1'-0" REF: 1 / A506



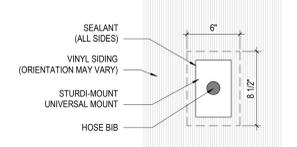
TRIM AT EXHAUST VENT/INTAKE



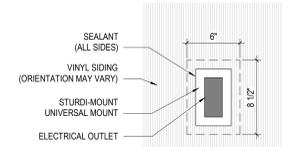
TRIM AT LIGHT FIXTURES



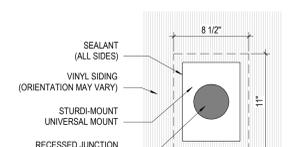
TRIM AT LINE SET PENETRATION



TRIM AT HOSE BIB

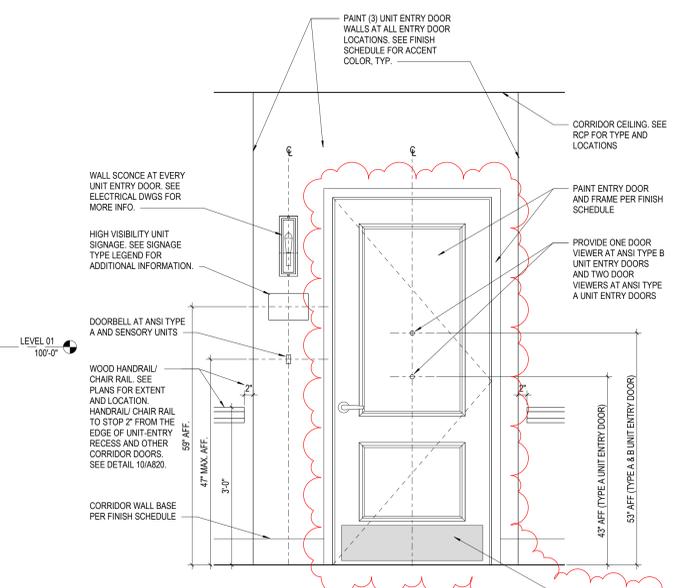


TRIM AT ELECTRICAL OUTLET

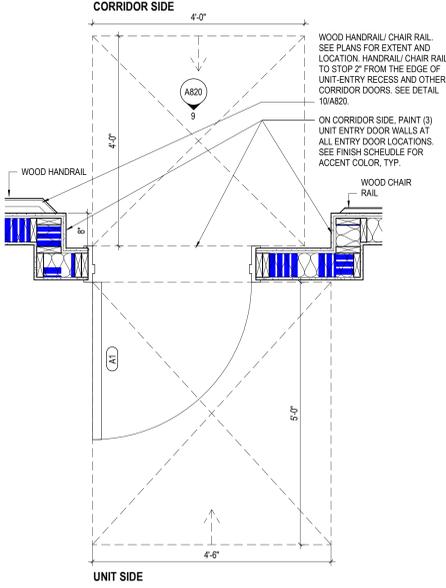


TRIM AT LIGHT FIXTURES

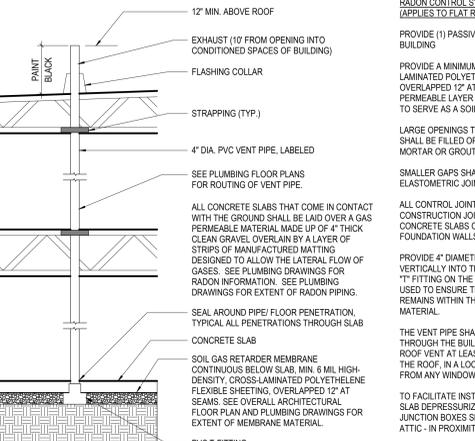
**100 DETAIL** DETAIL\_EXTERIOR WALL FIXTURE / PENETRATION TRIM DETAILS  
1 1/2" = 1'-0"



**9 DETAIL** TYPICAL UNITY ENTRY  
3/4" = 1'-0" REF: 8 / A820



**8 DETAIL** TYPICAL UNITY ENTRY  
3/4" = 1'-0" REF: 1 / A501



**7 DETAIL** PASSIVE RADON SYSTEM - FLAT ROOF BUILDING  
1/2" = 1'-0"

**RADON CONTROL SYSTEM GENERAL NOTES (APPLIES TO FLAT ROOF SYSTEMS)**

PROVIDE (1) PASSIVE RADON CONTROL SYSTEM IN BUILDING

PROVIDE A MINIMUM 6-MIL, HIGH-DENSITY, CROSS-LAMINATED POLYETHYLENE FLEXIBLE SHEETING OVERLAPPED 12" AT SEAMS, ON TOP OF THE GAS PERMEABLE LAYER PRIOR TO POURING THE SLAB TO SERVE AS A SOIL-GAS RETARDER.

LARGE OPENINGS THROUGH CONCRETE SLABS SHALL BE FILLED OR CLOSED WITH NON-SHRINK MORTAR OR GROUT.

SMALLER GAPS SHALL BE MADE AIR TIGHT WITH AN ELASTOMETRIC JOINT SEAL.

PROVIDE 4" DIAMETER PVC RISER PIPE EMBEDDED VERTICALLY INTO THE SUB-SLAB AGGREGATE. A "T" FITTING ON THE BOTTOM OF THE PIPE SHALL BE USED TO ENSURE THAT THE PIPE OPENING REMAINS WITHIN THE SUB-SLAB PERMEABLE MATERIAL.

THE VENT PIPE SHALL BE EXTENDED VERTICALLY THROUGH THE BUILDING AND TERMINATE WITH A ROOF VENT AT LEAST 12" ABOVE THE SURFACE OF THE ROOF. IN A LOCATION AT LEAST 10' FEET AWAY FROM ANY WINDOW OR OTHER OPENING.

TO FACILITATE INSTALLATION OF AN ACTIVE SUB-SLAB DEPRESSURIZATION SYSTEM, ELECTRICAL JUNCTION BOXES SHALL BE INSTALLED IN THE ATTIC - IN PROXIMITY OF EACH VENT PIPE.

SEAL ALL PERIMETER OPENINGS THROUGH SLAB WITH URETHANE CAULK TO SEAL CONCRETE.

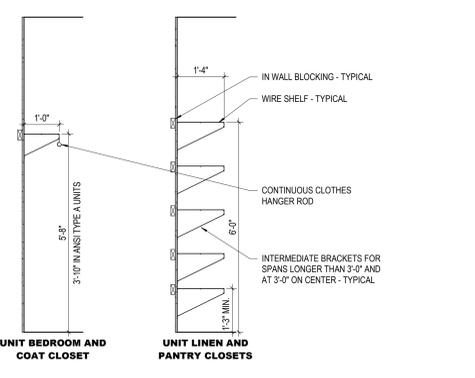
FILL ALL VOIDS UNDER TUBS/SHOWERS WITH CONCRETE OR EXPANDING FOAM.

INSTALL 4" FIRE COLLARS IF REQUIRED BY FIRE CODE.

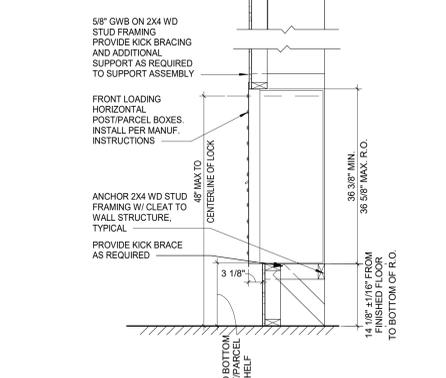
USE FIRE CAULK AROUND RADON VENT PIPES IN ALL UNITS.

FOR FLAT ROOFS INSTALL ROOF CURBS 16 1/2"X16 1/2" WITH CURB CAPS. INSTALL ELECTRIC ROUGH IN BESIDE ROOF CURB FOR FUTURE RADON FAN.

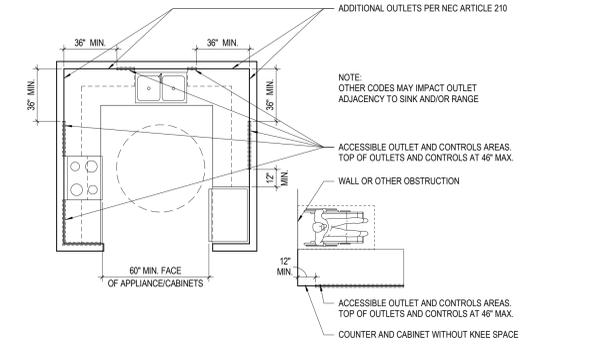
IF ACTIVE SYSTEM IS NECESSARY, INSTALL A RADON FAN, RADON AWAY MODEL R265. RADON FAN, NOT IN CONTRACT.



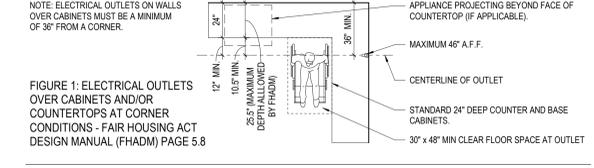
**6 DETAIL** SHELVING  
1/2" = 1'-0"



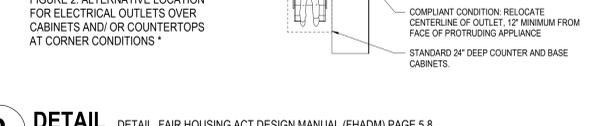
**5 DETAIL** MAILBOXES  
3/4" = 1'-0"



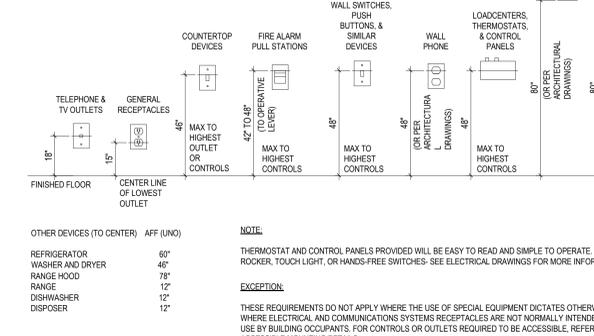
**4 DETAIL** DEVICE MOUNTING AT COUNTERTOPS  
1/4" = 1'-0"



**3 DETAIL** DETAIL FAIR HOUSING ACT DESIGN MANUAL (FHADM) PAGE 5.8  
1/4" = 1'-0"



**2 DETAIL** DEVICE MOUNTING HEIGHTS  
3/8" = 1'-0"



**1 DETAIL** DEVICE MOUNTING AT ACCESSIBLE ROUTES  
3/8" = 1'-0"

#	DATE	CHANGE DESCRIPTION
1	12/27/2023	ADDENDUM NO 2

**COBBLESTONE MANOR**  
1500 LAMPLIGHTER DRIVE  
GROVE CITY, OH 43123  
FOR  
**CMHA**

300 SPRUCE STREET  
SUITE 300  
COLUMBUS, OHIO 43215  
PHONE: (614) 461-4664  
FAX: (614) 280-8881

**TYPICAL PROJECT DETAILS**

06/08/2023  
DRAWN BY: XXXX CHECKED BY: XXXX  
#20172.01  
**A820**  
PERMIT & BID SET  
JAY W BOONE, LIC. #10740  
EXP. DATE: 12/31/2023

FINISH LEGEND						
FINISH TYPE	TAG	MANUFACTURER	STYLE	COLOR/FINISH	SIZE	COMMENTS
BASE						
RESILIENT BASE	RB1	TARKETT	TRADITIONAL COVE BASE W/ TOE KICK - 4"	50 WHITE	4"	UNIT BATHROOM
RESILIENT BASE	RB2	TARKETT	TRADITIONAL COVE BASE W/ TOE KICK - 4"	63 BURNT UMBER	4"	AUXILIARY SPACES
WOOD BASE	WB1	SEE SPECIFICATIONS	EASED EDGE	PAINTED PT2	3-1/2"	UNIT BASE
WOOD BASE	WB2	SEE SPECIFICATIONS	EASED EDGE	PAINTED PT2	5-1/2"	AMENITY BASE - SEE ROOM FINISH SCHEDULE
CEILING						
ACOUSTICAL CEILING TILE	A1	ARMSTRONG	ULTIMA	WHITE	24" x 24"	-
ACOUSTICAL CEILING TILE	A2	ARMSTRONG	LEDGES 8013	WHITE (WH)	24" x 24"	LIBRARY CEILING
FLOORS						
CR-100 COVERED PORCH						
CR-100 COMMUNITY ROOM						
CR-101 LIBRARY						
E-100 ELEC						
EL-101 ELEV						
FS-100 FLEX SPACE						
L-100 LOBBY						
M-100 MAIL						
M-101 PARCEL						
ME-100 MECH/WATER						
ME-101 MECH						
S-100 STAIR						
S-101 STAIR						
ST-100 STORAGE						
ST-101 STORAGE						
ST-102 STOR.						
ST-103 STOR.						
T-100 TR						
T-101 RR						
TR-100 TRASH						
TR-101 TRASH						
V-100 VEST.						
W-100 WELLNESS						
C-201 CORRIDOR						
C-202 CORRIDOR						
E-200 ELEC						
EL-200 ELEV						
EL-201 ELEV						
J-200 JAN						
L-200 LOBBY						
LR-200 LAUNDRY RM						
ME-200 MECH						
S-200 STAIR						
S-201 STAIR						
ST-201 STOR.						
ST-202 STOR.						
ST-203 STOR.						
ST-204 STOR.						
TR-200 TRASH						
TR-201 TRASH						
C-301 CORRIDOR						
C-302 CORRIDOR						
E-300 ELEC						
EL-300 ELEV						
EL-301 ELEV						
J-300 JAN						
L-300 LOBBY						
S-300 STAIR						
S-301 STAIR						
ST-301 STOR.						
ST-302 STOR.						
ST-303 STOR.						
ST-304 STOR.						
TR-300 TRASH						
TR-301 TRASH						
FINISH TYPE						
PAINT	PT1	SHERWIN WILLIAMS	SATIN / EG-SHEL	SW 7631 CITYLOFT	-	UNIT WALLS
PAINT	PT2	SHERWIN WILLIAMS	SEMI-GLOSS	SW 7005 PURE WHITE	-	UNIT TRIM, UNIT INTERIOR DOORS, AMENITY TRIM
PAINT	PT3	SHERWIN WILLIAMS	SATIN / EG-SHEL	SW 7005 PURE WHITE	-	AMENITY WALLS
PAINT	PT4	SHERWIN WILLIAMS	SATIN / EG-SHEL	SW 7047 PORPOISE	-	UNIT DOOR SURROUND @ CORRIDOR, 2ND AND 3RD FLOOR ELEVATOR WALL @ ELEVATOR LOBBY, METAL IN STAIRWELLS
PAINT	PT5	SHERWIN WILLIAMS	SEMI-GLOSS	SW 7044 AMAZING GRAY	-	CORRIDOR HANDRAIL AND CHAIR RAIL
PAINT	PT6	SHERWIN WILLIAMS	SATIN / EG-SHEL	SW 7007 CEILING BRIGHT WHITE	-	CEILING
SPECIALTY WALL	SW1	CREATIVE MINES	GRAFT TRAIL EDGE	GREY PEARL	AS NOTED	@ FIREPLACE AND 1ST FLOOR ELEVATOR WALL

ROOM FINISH SCHEDULE																	
ROOM NUMBER	SPACE	ROOM NAME	FLOOR		BASE		DOOR/FRAME FINISH		WALLS						REMARKS		
			MAT	COL	MAT	COL	DOOR FRAME	NORTH		SOUTH		EAST		WEST			
			PAINT	PAINT	MAT	COL	MAT	COL	MAT	COL	MAT	COL	MAT	COL			
A-100	ADMIN.		LV	2	WB2	PT2			PT	3	PT	3	PT	3	PT	3	
A-101	CONF.		LV	2	WB2	PT2			PT	3	PT	3	PT	3	PT	3	
A-102	MAINT.		LV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
A-103	MSR		LV	2	WB2	PT2			PT	3	PT	3	PT	3	PT	3	
C-100	CORRIDOR		LV	2	WB2	PT2			PT / CW	3/2	PT / SW	3/1	PT / SW	3/1	PT	3	CW2 @ EWC COVE. SW1 (STONE) @ ELEVATOR WALL
C-101	CORRIDOR		LV	2	WB2	PT2			PT	3.4	PT	3.4	PT	3	PT	3	PT4 @ UNIT DOOR ALCOVE - SEE 9 / A820
C-102	CORRIDOR		LV	2	WB2	PT2			PT	3	PT	3	PT	3.4	PT	3.4	PT4 @ UNIT DOOR ALCOVE - SEE 9 / A820
CG-100	COMP.		LV	2	WB2	PT2			PT	3	PT	3	PT	3	PT	3	
CP-100	COVERED PORCH																
CR-100	COMMUNITY ROOM		LV	1	WB2	PT2			PT / SW	3/1	PT / SW	3/1	PT / SW	3/1	PT / CW	3/1	SW1 (STONE) @ FIREPLACE / CW1 @ KITCHEN BACKSPLASH
CR-101	LIBRARY		LV / CR'	1/1	WB2	PT2			PT	3	PT	3	PT	3	PT	3	'SEE A-901 FOR CR1 LOCATION (CR TILE AREA RUG)
E-100	ELEC		SC		RB	2			PT / FR	3/1	PT	3	PT / FR	3/1	PT	3	FR ON N & E WALL @ SINK TO 8" A.F.F. SEE 12 / A801 (SIM.)
EL-101	ELEV		LV	2													
FS-100	FLEX SPACE		LV	2	WB2	PT2			PT	3	PT	3	PT / CW	3/1	PT	3	CW1 @ KITCHENETTE BACKSPLASH
L-100	LOBBY		WO	1	WB2	PT2			PT	3	PT	3	PT	3	PT / SW	3/1	SW1 (STONE) @ FIREPLACE
M-100	MAIL		WO	1	WB2	PT2			PT	3	PT	3	PT	3	PT	3	
M-101	PARCEL		LV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
ME-100	MECH/WATER		SC		RB	2			PT	3	PT	3	PT	3	PT	3	
ME-101	MECH		SC		RB	2			PT	3	PT	3	PT	3	PT	3	
S-100	STAIR		RT / LV	1/2	RB	2			PT	3	PT	3	PT	3	PT	3	RT ON TREADS, LV ON LANDINGS
S-101	STAIR		RT / LV	1/2	RB	2			PT	3	PT	3	PT	3	PT	3	RT ON TREADS, LV ON LANDINGS
ST-100	STORAGE		LV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
ST-101	STORAGE		LV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
ST-102	STOR.		LV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
ST-103	STOR.		LV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
T-100	TR		LV	2	RB	2			CW / PT	2/3	CW / PT	2/3	CW / PT	2/3	CW / PT	2/3	SEE 1, 6, 11, 15, 20 & 21 A-801
T-101	RR		LV	2	RB	2			CW / PT	2/3	CW / PT	2/3	CW / PT	2/3	CW / PT	2/3	SEE 1, 6, 11, 15, 20 & 21 A-801
TR-100	TRASH		SC		RB	2			FR	1	FR	1	FR	1	FR	1	
TR-101	TRASH		SC		RB	2			FR	1	FR	1	FR	1	FR	1	
V-100	VEST.		WO	1	WB2	PT2			PT	3	PT	3	PT	3	PT	3	
W-100	WELLNESS		SF	1	WB2	PT2			PT	3	PT	3	PT	3	PT	3	
C-201	CORRIDOR		LV	2	WB2	PT2			PT	3.4	PT	3.4	PT	3	PT	3	PT4 @ UNIT DOOR ALCOVE - SEE 9 / A820
C-202	CORRIDOR		LV	2	WB2	PT2			PT	3	PT	3	PT	3.4	PT	3.4	PT4 @ UNIT DOOR ALCOVE - SEE 9 / A820
E-200	ELEC		SV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
EL-200	ELEV		LV	2													
EL-201	ELEV		LV	2													
J-200	JAN		SV	2	RB	2			PT	3	PT	3	PT	3	PT	3	FR ON S & E WALL @ SINK TO 8" A.F.F. SEE 14 / A801 (SIM.)
L-200	LOBBY		LV	1	WB2	PT2			PT	3	PT	3	PT	3	PT	4	PT4 @ ELEVATOR WALL - SEE A802 FOR EXTENTS
LR-200	LAUNDRY RM		SV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
ME-200	MECH		SV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
S-200	STAIR		RT / LV	1/2	RB	2			PT	3	PT	3	PT	3	PT	3	RT ON TREADS, LV ON LANDINGS
S-201	STAIR		RT / LV	1/2	RB	2			PT	3	PT	3	PT	3	PT	3	RT ON TREADS, LV ON LANDINGS
ST-201	STOR.		SV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
ST-202	STOR.		LV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
ST-203	STOR.		LV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
ST-204	STOR.		SV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
TR-200	TRASH		SV	2	RB	2			FR	1	FR	1	FR	1	FR	1	
TR-201	TRASH		SV	2	RB	2			FR	1	FR	1	FR	1	FR	1	
C-301	CORRIDOR		LV	2	WB2	PT2			PT	3.4	PT	3.4	PT	3	PT	3	PT4 @ UNIT DOOR ALCOVE - SEE 9 / A820
C-302	CORRIDOR		LV	2	WB2	PT2			PT	3	PT	3	PT	3.4	PT	3.4	PT4 @ UNIT DOOR ALCOVE - SEE 9 / A820
E-300	ELEC		SV	2	RB	2			PT	3	PT	3	PT	3	PT	3	
EL-300	ELEV		LV	2													
EL-301	ELEV		LV	2													
J-300	JAN		SV	2	RB	2			PT	3	PT / FR	3/1	PT / FR	3/1	PT	3	FR ON S & E WALL @ SINK TO 8" A.F.F. SEE 14 / A801 (SIM.)
L-300	LOBBY		LV	1	WB2	PT2			PT	3	PT	3	PT	3	PT	4	PT4 @ ELEVATOR WALL - SEE A802 FOR EXTENTS
S-300	STAIR		RT / LV	1/2	RB	2			PT	3	PT	3	PT	3	PT	3	RT ON TREADS, LV ON LANDINGS
S-301	STAIR		RT / LV	1/2	RB	2											



**1 PLAN** LEVEL 01 - FLOOR FINISH PLAN OVERALL  
 3/32" = 1'-0"

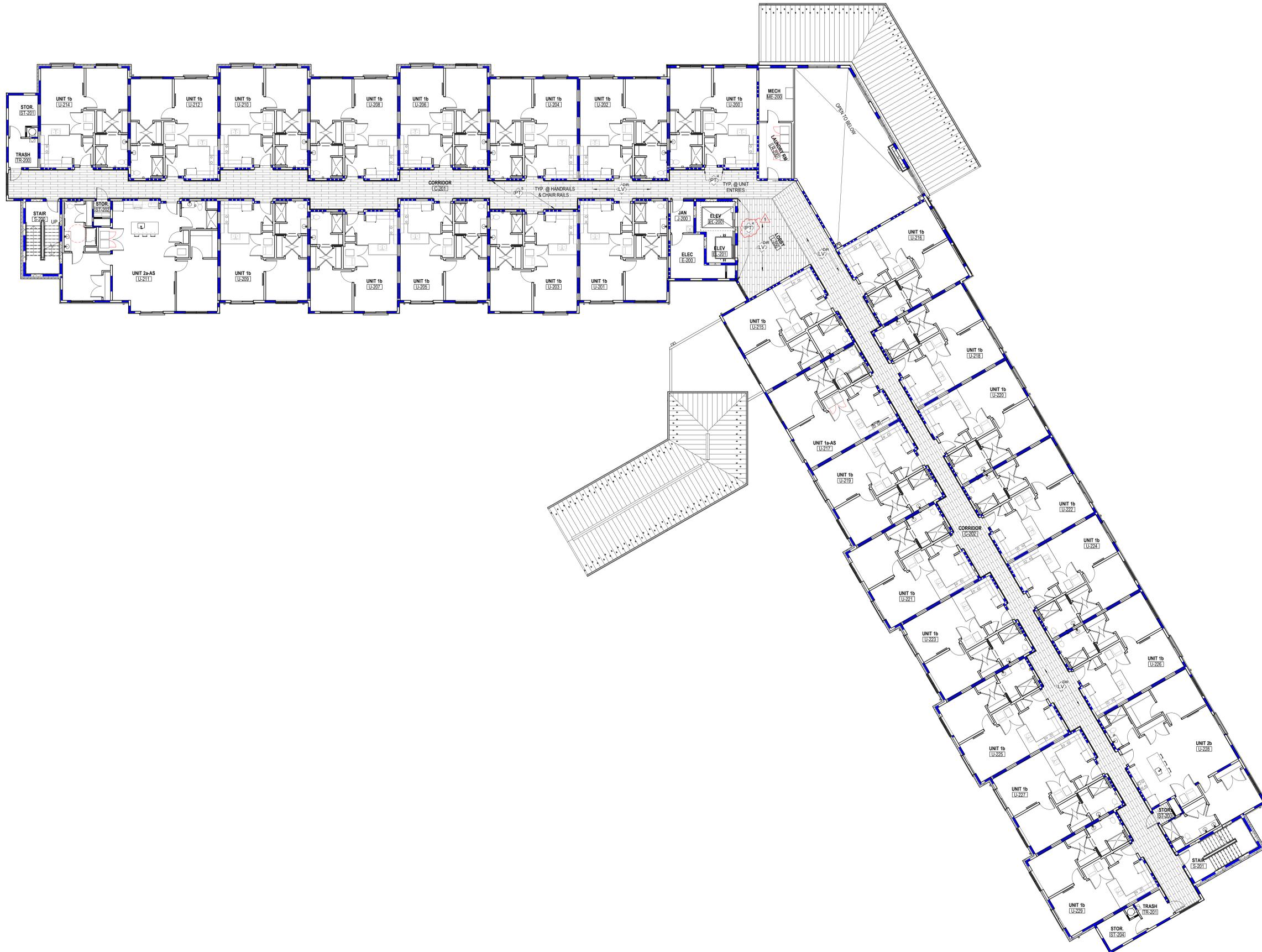
#	DATE	CHANGE DESCRIPTION
1	12/27/2023	ADDENDUM NO 2

**COBBLESTONE MANOR**  
 100 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

DRAWING TITLE:  
**LEVEL 01 - FLOOR FINISH PLAN OVERALL**

	06/08/2023
	DRAWN BY: Author CHECKED BY: Checker
	#22172.01
<b>A901</b>	
PERMIT & BID SET	



**1 PLAN** LEVEL 02 FLOOR FINISH PLAN OVERALL - TYP. @ LEVEL 03  
 3/32" = 1'-0"

#	DATE	CHANGE DESCRIPTION
1	12/7/2023	ADDENDUM NO 2

**COBBLESTONE MANOR**  
 150 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

**LEVEL 02 - FLOOR FINISH PLAN**  
**OVERALL - TYP. @ LEVEL 03**

DRAWING TITLE: **LEVEL 02 - FLOOR FINISH PLAN OVERALL - TYP. @ LEVEL 03**

DATE: 06/08/2023

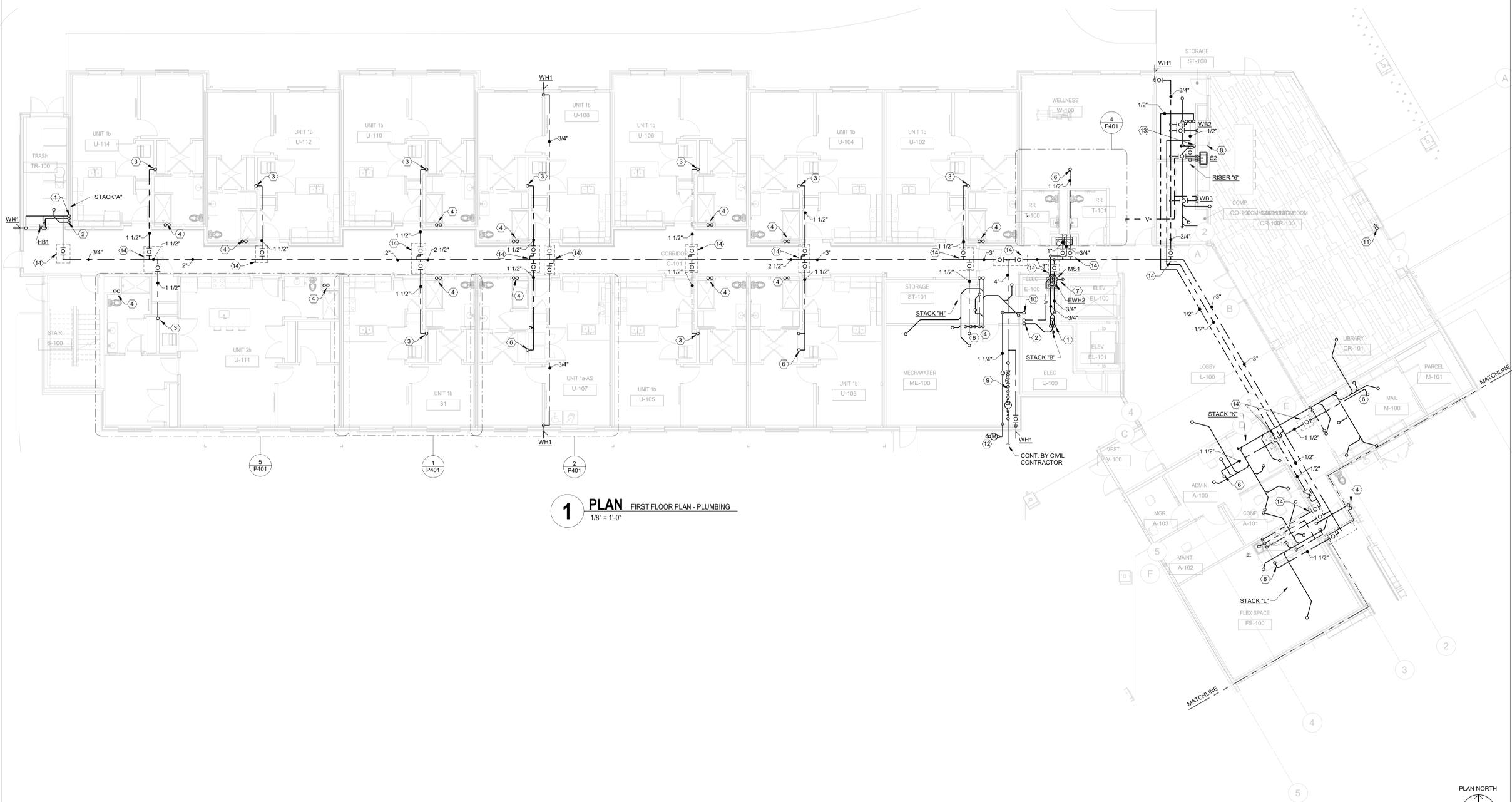
DRAWN BY: Author CHECKED BY: Checker

#22172.01

**A902**

PERMIT & BID SET

JAY W. BOONE, LIC. #10740  
 EXP. DATE: 12/31/2023



**1 PLAN** FIRST FLOOR PLAN - PLUMBING  
 1/8" = 1'-0"

**GENERAL NOTES**

- A. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR FLENUMS LESS APPROPRIATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.

**KEYNOTES**

- 1. 3/4" CW AND 3/4" HW TO FLOOR ABOVE.
- 2. 3" SAN AND 3" V FROM FLOOR ABOVE. 3" SAN TO BELOW SLAB WITH CLEANOUT AT BASE.
- 3. 1" CW TO BELOW. 1-1/2" CW TO FLOOR ABOVE.
- 4. 4" SAN AND 3" V FROM FLOOR ABOVE. 4" SAN TO BELOW SLAB WITH CLEANOUT AT BASE.
- 5. NOT USED.
- 6. 1-1/2" CW TO FLOOR ABOVE.
- 7. 2" PUMP DICHARGE FROM ELEVATOR SUMP PUMP. TURN DOWN TO MOP SINK.
- 8. EXTEND 1/2" HW FROM SINK SUPPLY TO DISHWASHER. EXTEND DRAIN FROM DISHWASHER TO CONNECTION ON GARBAGE DISPOSAL. MAKE FINAL CONNECTIONS.
- 9. WATER SERVICE ENTRANCE. SEE DETAIL ON SHEET P501.
- 10. 1-1/4" G TO FLOOR ABOVE.
- 11. 3/4" G FROM FLOOR ABOVE. PROVIDE SHUT-OFF VALVE AND DIRT LEG. MAKE FINAL CONNECTION TO GAS FIREPLACE.
- 12. GAS METER ASSEMBLY.
- 13. 3" SAN TO BELOW SLAB WITH CLEANOUT AT BASE.
- 14. LOCATE VALVES ABOVE ACCESS PANEL IN CORRIDOR.

#	DATE	CHANGE DESCRIPTION

**COBBLESTONE MANOR**  
 100 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
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 FAX: (614) 280-8881

**FIRST FLOOR PLAN - AREA A - PLUMBING**

DRAWING TITLE: **FIRST FLOOR PLAN - AREA A - PLUMBING**

DATE: 06/08/2023

DRAWN BY: Author CHECKED BY: Checker

5/8/2023

JACK X

#22172.01

**P101A**

PERMIT & BID SET

**AEMC** ADVANCED ENGINEERING CONSULTANTS  
 Mechanical | Electrical | Plumbing | Fire Protection | Utilities  
 1405 Dublin Road Columbus, Ohio 43215 Tel: (614) 466-4778 Fax: (614) 466-4082





**1** PLAN FIRST FLOOR PLAN - PLUMBING  
 1/8" = 1'-0"

**GENERAL NOTES**

A. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR FLENUMS LESS APPROPRIATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.

**KEYNOTES**

1. 3/4" CW TO FLOOR ABOVE.
2. 3" SAN AND 3" V FROM FLOOR ABOVE. 3" SAN TO BELOW SLAB WITH CLEANOUT AT BASE.
3. 1" CW TO BELOW. 1-1/2" CW TO FLOOR ABOVE.
4. 4" SAN AND 3" V FROM FLOOR ABOVE. 4" SAN TO BELOW SLAB WITH CLEANOUT AT BASE.
5. NOT USED.
6. 1-1/2" CW TO FLOOR ABOVE.
7. LOCATE VALVES ABOVE ACCESS PANEL IN CORRIDOR.

#	DATE	CHANGE DESCRIPTION

**COBBLESTONE MANOR**  
 150 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 COLUMBUS METROPOLITAN HOUSING AUTHORITY  
 FOR  
**CMHA**

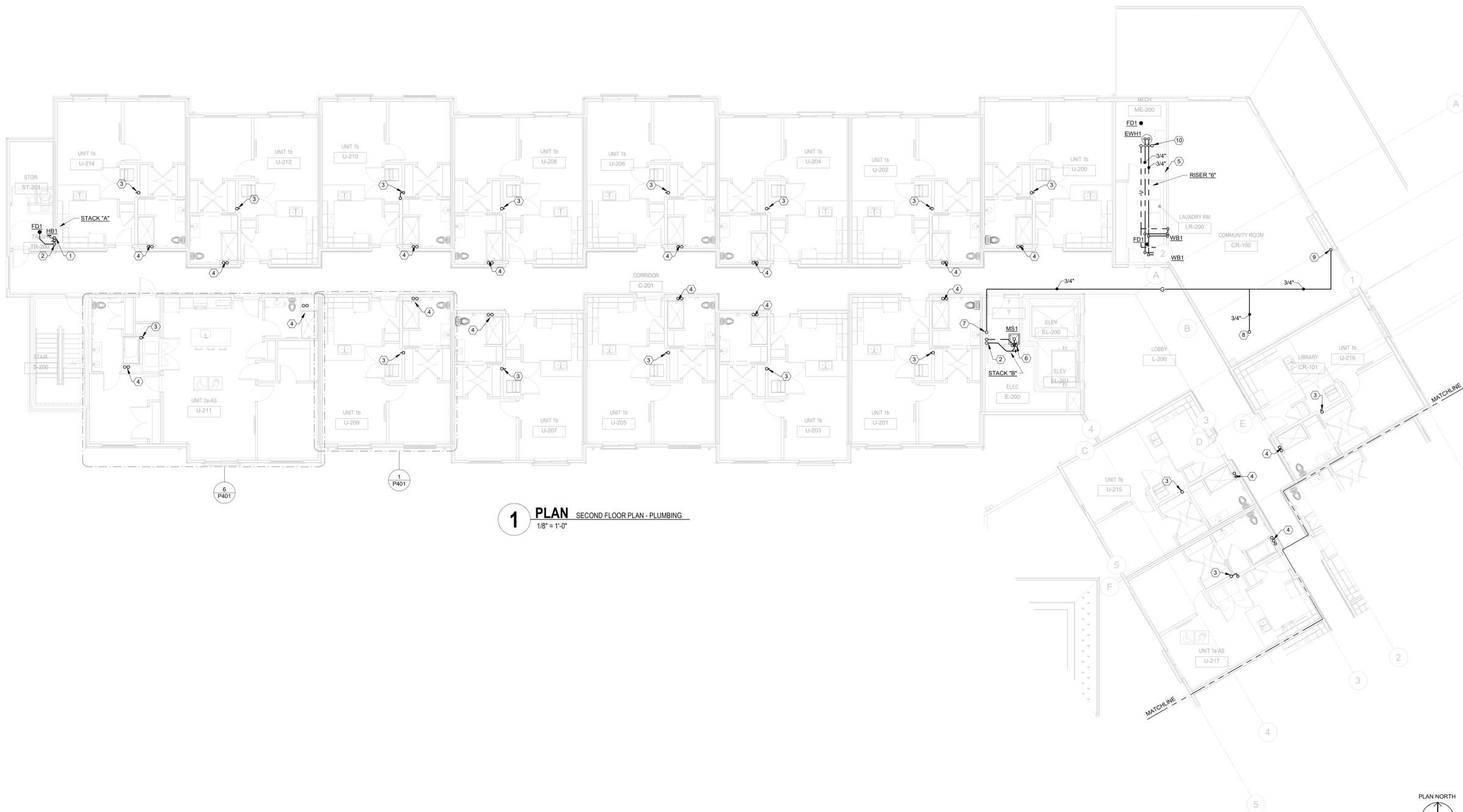
**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

**DRAWING TITLE:  
 FIRST FLOOR PLAN - AREA B -  
 PLUMBING**

	06/08/2023
	DRAWN BY: Author CHECKED BY: Checker
	#22172.01
	<b>P101B</b>
PERMIT & BID SET	

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**1 PLAN** SECOND FLOOR PLAN - PLUMBING  
 1/8" = 1'-0"

**GENERAL NOTES**

- A. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR FLENUMS LESS APPROPRIATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.

**KEYNOTES**

- 1. 3/4" CW FLOOR BELOW. 3/4" CW TO FLOOR ABOVE.
- 2. 3" SAN AND 3" V FROM TO FLOOR BELOW FROM FLOOR ABOVE.
- 3. 1-1/2" CW FROM FLOOR BELOW. 1" CW TO FLOOR ABOVE.
- 4. 4" SAN AND 3" V FROM TO FLOOR BELOW FROM FLOOR ABOVE.
- 5. NOT USED.
- 6. 3/4" CW FROM FLOOR BELOW TO FLOOR ABOVE. 1/2" HW FROM FLOOR ABOVE.
- 7. 1-1/4" G FROM FLOOR BELOW TO FLOOR ABOVE.
- 8. 3/4" G TO ROOF.
- 9. 3/4" G TO FLOOR BELOW.
- 10. 3/4" CW AND 1/2" HWR FROM FLOOR BELOW. 1/2" HW TO FLOOR BELOW.

#	DATE	CHANGE DESCRIPTION

**COBBLESTONE MANOR**  
 150 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

DRAWING TITLE:  
**SECOND FLOOR PLAN - AREA A - PLUMBING**

	06/08/2023
	DRAWN BY: Author    CHECKED BY: Checker
	#22172.01
<b>P102A</b>	
PERMIT & BID SET	

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 Columbus, Ohio 43215    Fax: (614) 466-4082



**1 PLAN** SECOND FLOOR PLAN - PLUMBING  
 1/8" = 1'-0"

**GENERAL NOTES**

A. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR FLENUMS LESS APPROPRIATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.

**KEYNOTES**

1. 3/4" CW FLOOR BELOW, 3/4" CW TO FLOOR ABOVE.
2. 3" SAN AND 3" V FROM TO FLOOR BELOW FROM FLOOR ABOVE.
3. 1-1/2" CW FROM FLOOR BELOW, 1" CW TO FLOOR ABOVE.
4. 4" SAN AND 3" V FROM TO FLOOR BELOW FROM FLOOR ABOVE.
5. NOT USED.

#	DATE	CHANGE DESCRIPTION

**COBBLESTONE MANOR**  
 150 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 COLUMBUS METROPOLITAN HOUSING AUTHORITY  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

**SECOND FLOOR PLAN - AREA B - PLUMBING**

DATE: 06/08/2023	DRAWN BY: Author	CHECKED BY: Checker
DATE: 5/8/2023	#22172.01	
<b>P102B</b>		
PERMIT & BID SET		

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 Columbus, Ohio 43215  
 Tel: (614) 466-4778  
 Fax: (614) 466-4082





**1 PLAN** THIRD FLOOR PLAN - PLUMBING  
 1/8" = 1'-0"

**GENERAL NOTES**

A. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPRIATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.

**KEYNOTES**

1. 3/4" CW FROM FLOOR BELOW.
2. 3" SAN AND 3" V TO FLOOR BELOW.
3. 1" CW FROM FLOOR BELOW.
4. 4" SAN AND 3" V TO FLOOR BELOW
5. 3/4" BACKFLOW PREVENTER FOR TRASH CHUTE SANITIZER.
6. 3/4" HW TO FLOOR BELOW, 3/4" CW FROM FLOOR BELOW.
7. 3/4" G FROM FLOOR BELOW, PROVIDE SHUT-OFF VALVE AND DIRT LEG. MAKE FINAL CONNECTION TO RTU.
8. 3/4" G TO ROOF.
9. 1-1/4" G FROM FLOOR BELOW.

#	DATE	CHANGE DESCRIPTION

**COBBLESTONE MANOR**  
 150 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

**THIRD FLOOR PLAN - AREA A - PLUMBING**

DRAWING TITLE: **THIRD FLOOR PLAN - AREA A - PLUMBING**

DATE: 06/08/2023

DRAWN BY: Author CHECKED BY: Checker

PROJECT: #22172.01

**P103A**

PERMIT & BID SET

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**1 PLAN** THIRD FLOOR PLAN - PLUMBING  
 1/8" = 1'-0"

**GENERAL NOTES**

A. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR FLENUMS LESS APPROPRIATE PROTECTION IS PROVIDED TO PROVIDED 25/50 SMOKE/FLAME RATING.

**KEYNOTES**

1. 3/4" CW FROM FLOOR BELOW.
2. 3" SAN AND 3" V TO FLOOR BELOW.
3. 1" CW FROM FLOOR BELOW.
4. 4" SAN AND 3" V TO FLOOR BELOW.
5. 3/4" BACKFLOW PREVENTER FOR TRASH CHUTE SANITIZER.
6. 3/4" G TO ROOF.

#	DATE	CHANGE DESCRIPTION

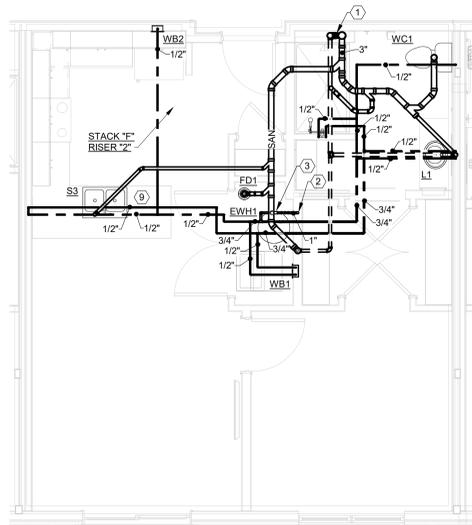
**COBBLESTONE MANOR**  
 150 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 COLUMBUS METROPOLITAN HOUSING AUTHORITY  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
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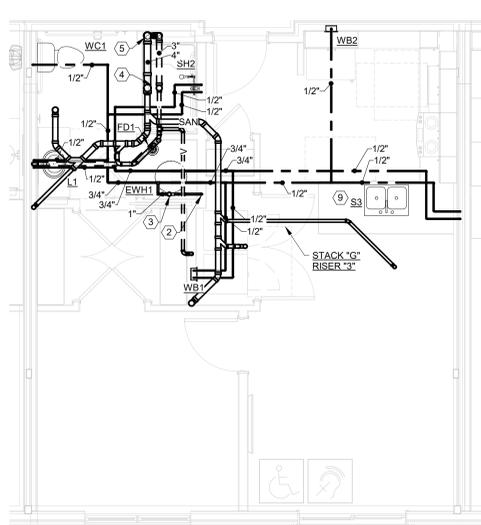
DRAWING TITLE:  
**THIRD FLOOR PLAN - AREA B - PLUMBING**

	06/08/2023
	DRAWN BY: Author    CHECKED BY: Checker
	#22172.01
	<b>P103B</b>
PERMIT & BID SET	

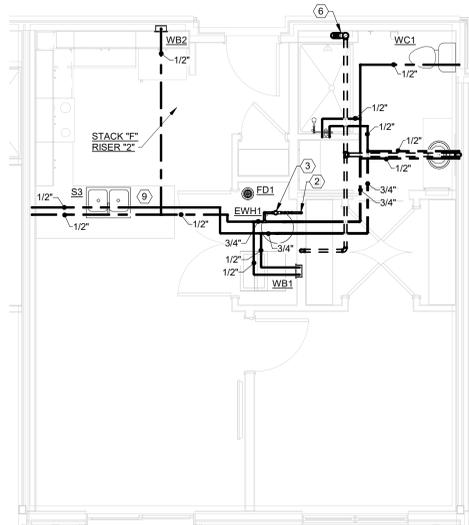
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 Columbus, Ohio 43215    Fax: (614) 466-4082



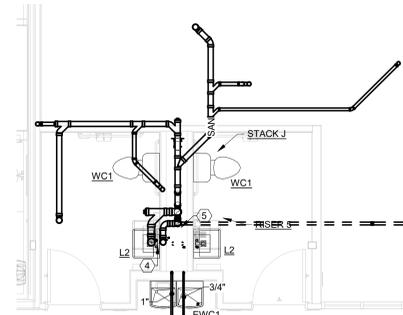
**1 PLAN** ENLARGED TYPICAL FLOOR PLAN - UNIT 1B - PLUMBING  
1/4" = 1'-0"



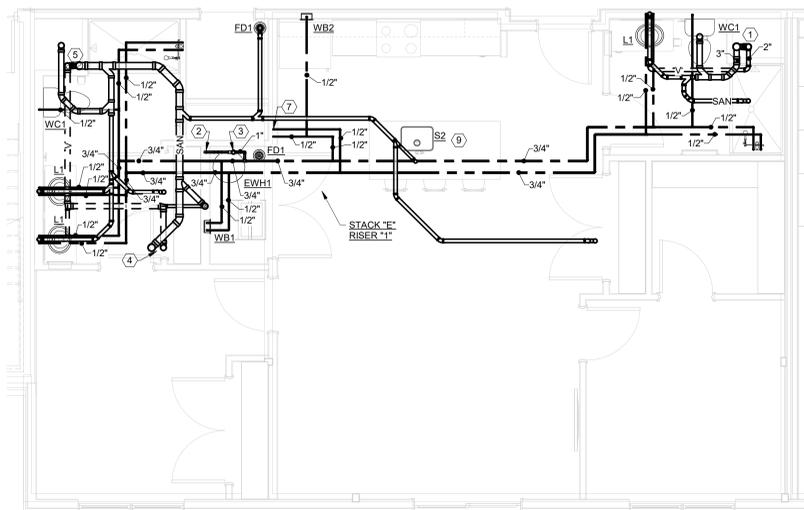
**2 PLAN** ENLARGED TYPICAL FLOOR PLAN - UNIT 1A-AS - PLUMBING  
1/4" = 1'-0"



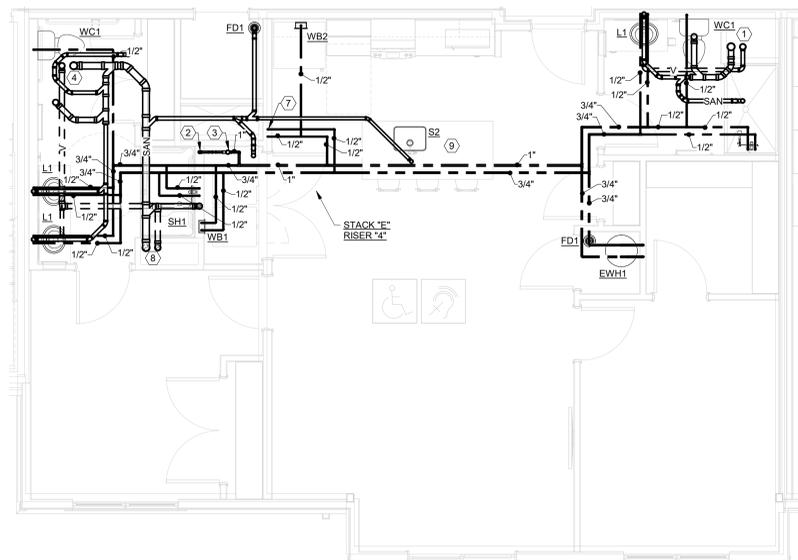
**3 PLAN** ENLARGED THIRD FLOOR PLAN - UNIT 1B - PLUMBING  
1/4" = 1'-0"



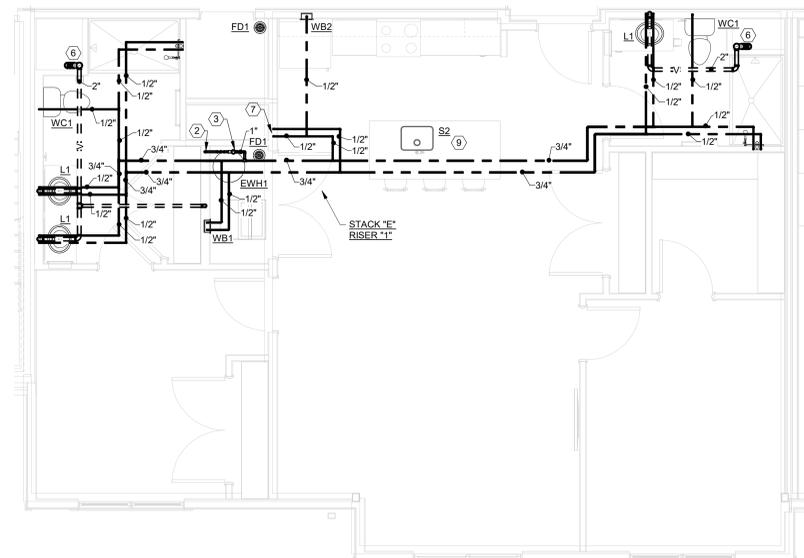
**4 PLAN** ENLARGED FIRST FLOOR PLAN - PLUMBING  
1/4" = 1'-0"



**5 PLAN** ENLARGED TYPICAL FLOOR PLAN - UNIT 2B - PLUMBING  
1/4" = 1'-0"



**6 PLAN** ENLARGED SECOND FLOOR PLAN - UNIT 2B-AS - PLUMBING  
1/4" = 1'-0"



**7 PLAN** ENLARGED THIRD FLOOR PLAN - UNIT 2B - PLUMBING  
1/4" = 1'-0"

**GENERAL NOTES**

- A. NO PVC PIPING IS TO BE ROUTE THROUGH RETURN AIR PLENUMS LESS APPROPRIATE PROTECTION IS PROVIDED TO PROVIDED 2550 SMOKE/FLAME RATING.

**KEYNOTES**

- 1. 4" SAN AND 3" V FROM ABOVE TO BELOW.
- 2. DOMESTIC WATER RISER.
- 3. UNIT DOMESTIC WATER METER.
- 4. 4" SAN AND 3" V FROM FLOOR ABOVE.
- 5. 4" SAN TO BELOW SLAB WITH CLEANOUT AT BASE.
- 6. 4" SAN AND 3" V TO FLOOR BELOW. 3" V TO 3" VTR.
- 7. 1/2" CW AND 1/2" HW TO BELOW.
- 8. 4" SAN AND 3" V TO FLOOR BELOW.
- 9. EXTEND 1/2" HW FROM SINK SUPPLY TO DISHWASHER. EXTEND DRAIN LINE FROM DISHWASHER TO CONNECTION ON GARBAGE DISPOSAL. MAKE FINAL CONNECTIONS.

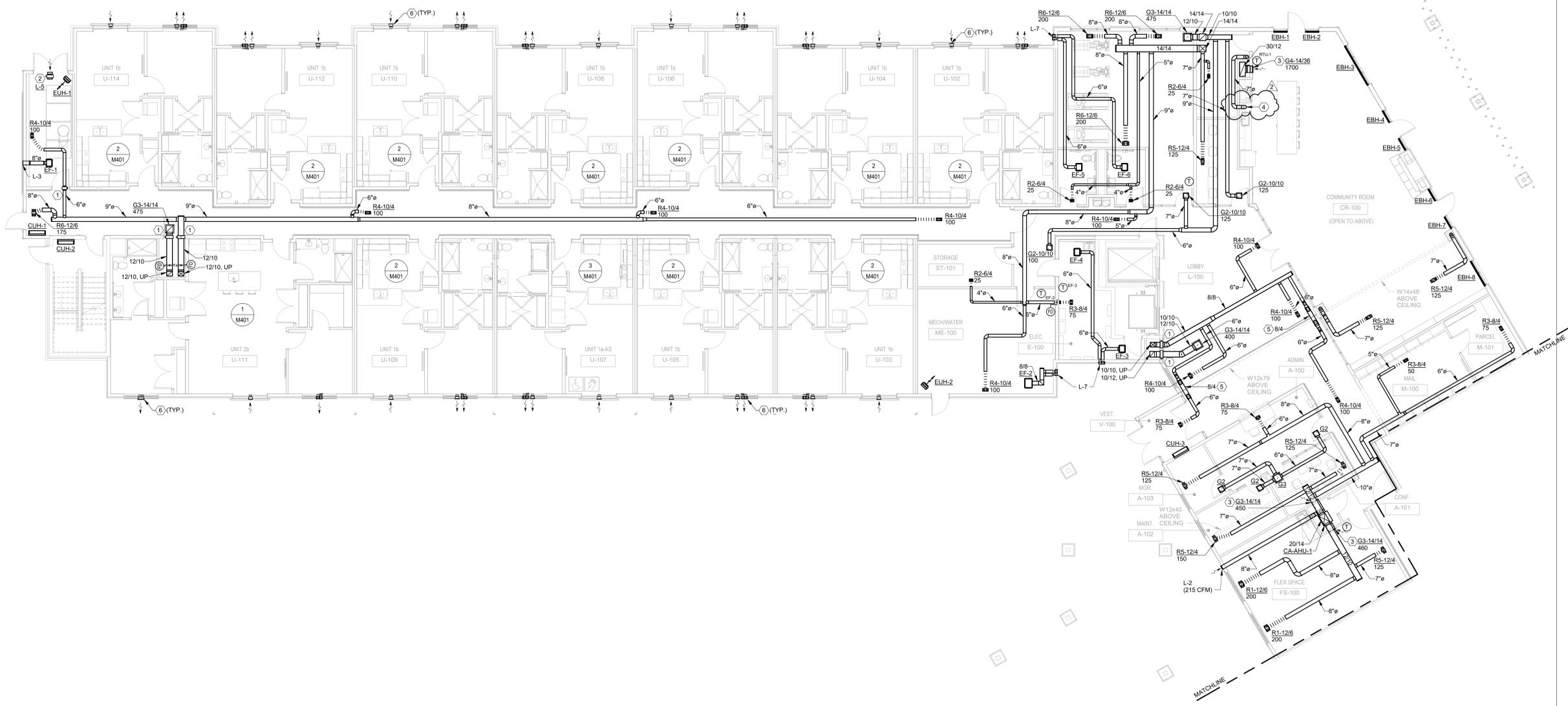
#	DATE	CHANGE DESCRIPTION

**COBBLESTONE MANOR**  
150 LAMPLIGHTER DRIVE  
GROVE CITY, OH 43123  
FOR  
**CMHA**

**MOODY-NOLAN**  
300 SPRUCE STREET  
SUITE 300  
COLUMBUS, OHIO 43215  
PHONE: (614) 461-4664  
FAX: (614) 280-8881

DRAWING TITLE:  
**ENLARGED PLANS - PLUMBING**

	06/08/2023
	DRAWN BY: EL      CHECKED BY: EL
	#22172.01
	<b>P401</b>
PERMIT & BID SET	



- ### GENERAL NOTES
- PER THE OHIO MECHANICAL CODE, OUTSIDE AIR INTAKES MUST BE AT LEAST 10'-0" FROM CONTAMINATED EXHAUST SOURCES SUCH AS BATHROOM EXHAUST OR DRYER EXHAUST.
  - PER THE OHIO MECHANICAL CODE, CONTAMINATED EXHAUST OUTLET SOURCES SUCH AS BATHROOM EXHAUST OR DRYER EXHAUST OPENINGS MUST BE AT LEAST 3'-0" FROM ANY OPERABLE WINDOW OR DOOR OPENING.
  - ALL EXHAUST DUCTWORK WITH CONNECTIONS TO THE OUTSIDE SHALL BE INSULATED A MINIMUM OF 10'-0" LINEAR FEET FROM THE EXTERIOR WALL CONNECTION.
  - ALL OUTSIDE AIR INTAKE DUCTWORK SHALL BE INSULATED FROM AIR HANDLING UNIT TO THE EXTERIOR.
  - ALL SUPPLY AIR DUCTWORK, INCLUDING FLEX DUCT, SHALL BE INSULATED FROM AIR HANDLING UNIT TO AIR DEVICE.
  - PROVIDE CEILING RADIATION DAMPERS FOR ALL AIR DEVICES ON THIS FLOOR UNLESS NOTED OTHERWISE.
  - GENERAL TRADES CONTRACTOR SHALL PROVIDE A CEILING ACCESS PANEL WHERE DUCT ACCESS DOORS ARE ABOVE DRYWALL CEILINGS. COORDINATE LOCATION OF THESE ACCESS POINTS.
  - MECHANICAL CONTRACTOR TO ROUTE INSULATED REFRIGERANT PIPING FROM AIR HANDLING UNIT TO OUTDOOR UNITS ON ROOF. VERIFY EXACT ROUTING IN FIELD. REFRIGERANT VERTICAL DRIPS SHALL BE LOCATED IN STACKED APARTMENT TYPES WHERE APPLICABLE. OTHERWISE, VERTICAL DROPS CAN BE LOCATED IN STUD WALLS AND THEN ROUTED HORIZONTALLY. SIZE REFRIGERANT PIPES PER MANUFACTURERS RECOMMENDATIONS BASED ON FIELD INSTALLED LENGTH.
  - GENERAL TRADES CONTRACTOR SHALL PROVIDE A CEILING ACCESS PANEL WHERE DUCT ACCESS DOORS FOR LIFE SAFETY DAMPERS ARE LOCATED ABOVE DRYWALL CEILINGS. COORDINATE LOCATION OF ACCESS POINTS.
  - PROVIDE CONDENSATE DRAIN LINE WITH P-TRAP FOR ALL AHU UNITS. FULL SIZE UNIT OUTLET. ROUTE TO FLOOR DRAIN. SEE PLUMBING DRAWINGS FOR LOCATIONS.

- ### KEYNOTES
- PROVIDE COMBINATION FIRE/SMOKE DAMPER AT CORRIDOR WALL PENETRATION. COORDINATE SMOKE DETECTOR LOCATION AND 120V/1P POWER WITH EC.
  - INTAKE LOUVER WITH MOTORIZED DAMPER, INTERLOCK WITH EF-1.
  - B.E. = 0'-6" AFF.
  - 7'0" EXHAUST DUCT FROM RANGE HOOD.
  - 8"x4" SA DUCT UNDER BEAM, ROUTE IN SOFFIT. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN. TURN DOWN 6'0" SA DUCT DOWN ON EACH SIDE OF BEAM. PROVIDE GFD AT PENETRATION OF THE FLOOR/CEILING ASSEMBLY.
  - VENT INTAKE TO MATCH EXTERIOR COLOR. REFER TO ARCHITECTURAL PLANS TO DETERMINE COLOR OF EXTERIOR IN EACH LOCATION.

**1 PLAN** FIRST FLOOR PLAN - MECHANICAL - AREA A  
 1/8" = 1'-0"



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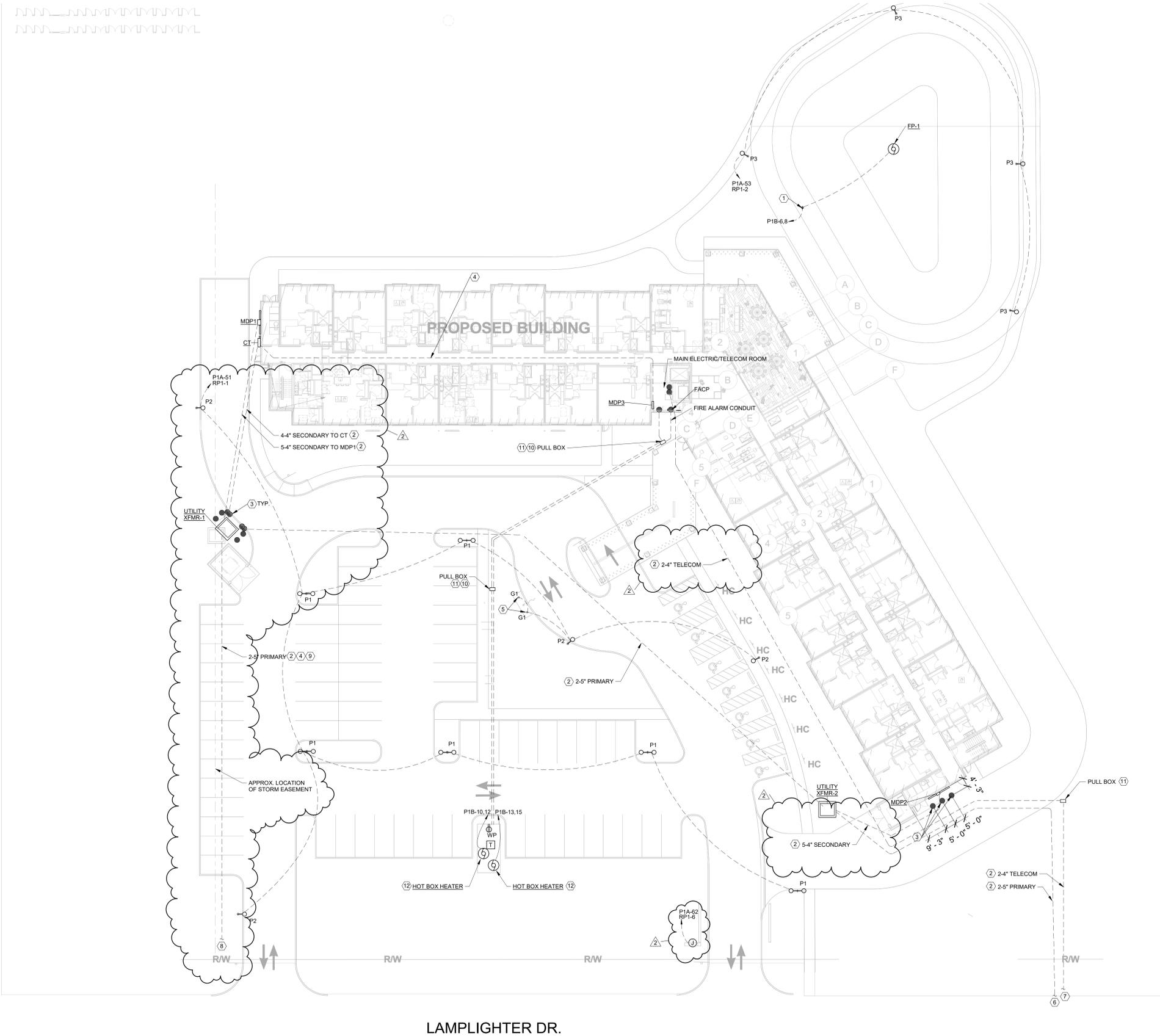
#	DATE	CHANGE DESCRIPTION
2	12/06/23	Addendum 2

**COBBLESTONE MANOR**  
 100 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

DRAWING TITLE:  
**FIRST FLOOR PLAN - MECHANICAL - AREA A**

06/08/2023  
 DRAWN BY: Author CHECKED BY: Checker  
**#22172.01**  
**M101A**  
 PERMIT & BID SET



LAMPLIGHTER DR.

**GENERAL NOTES**

- A. UNDERGROUND CONDUIT ROUTING SHOWN IS SCHEMATIC, COORDINATE EXACT ROUTING WITH CIVIL PLANS.
- B. CONTRACTOR SHALL COORDINATE ALL SITE WORK WITH OTHER TRADES AND EXISTING UNDERGROUND UTILITIES (SEE CIVIL PLANS).
- C. ALL EXTERIOR CONDUITS ARISING ABOVE GRADE, ENTERING PULL BOXES, MANHOLES, HANDHOLES, BUILDINGS, AND/OR EQUIPMENT SHALL BE RIGID GALVANIZED STEEL TYPE FROM THE LAST 6 FEET OF TRANSITION FROM BELOW GRADE.
- D. UNLESS NOTED OTHERWISE, ALL EXTERIOR CONDUITS SHALL BE MINIMUM 1.25"
- E. ALL EXTERIOR LUMINAIRES SHALL HAVE IN-LINE FUSING IN POLE, ACCESSIBLE FROM GRADE.
- F. MINIMUM SITE LIGHTING WIRE SIZE SHALL BE #8 AWG (CU).

**KEYNOTES**

- 1. PROVIDE PEDESTAL MOUNTED NEMA 4X DISCONNECT FOR FOUNTAIN PUMP. REFER TO FOUNTAIN PUMP DISCONNECT DETAIL #E501 FOR MORE INFORMATION.
- 2. ENCASED DUCT BANK, REFER TO DETAIL 1E501.
- 3. PROTECTIVE BOLLARDS, REFER TO DETAIL 1E501.
- 4. COORDINATE UG ROUTING WITH PLUMBING SANITARY IN SAME AREA.
- 5. IN GROUND FLAG LIGHT LOCATED WITHIN CONCRETE SLAB, COORDINATE MOUNTING AND AIMING WITH MANUFACTURER PRIOR TO ROUGH-IN.
- 6. EXTEND PRIMARY DUCT BANK TO UTILITY PAD MOUNTED SPLICE BOX LOCATED EAST OF CUL-DE-SAC AT EAST END OF LAMPLIGHTER DR.
- 7. EXTEND TELECOM DUCT BANK TO UTILITY GROUND MOUNTED PULL BOX LOCATED EAST OF CUL-DE-SAC AT EAST END OF LAMPLIGHTER DR.
- 8. EXTEND PRIMARY DUCT BANK TO RW FOR FUTURE CONNECTION TO UTILITY INFRASTRUCTURE.
- 9. KEEP PRIMARY DUCT BANK CLEAR OF EASEMENT NEAR WEST PROPERTY LINE.
- 10. PROVIDE DEDICATED 1.25" FIRE ALARM CONDUIT TO HOT BOX. CONDUIT SHALL PASS THROUGH POWER PULL BOX. WITHIN POWER PULL BOX PROVIDE GASKETED JUNCTION BOX FOR FIRE ALARM WIRING, TO MAINTAIN SEPARATION OF LINE VOLTAGE AND FIRE ALARM (LOW VOLTAGE) WIRE TYPES. JUNCTION BOX SHALL SERVE AS A PULL POINT, DO NOT SPLICE FIRE ALARM WIRING WITHIN PULL BOX OR JUNCTION BOX. POWER WIRING TO HEATERS MAY BE SPLICED WITHIN PULL BOX USING APPROPRIATE WATER PROOF SPLICE KITS. PROVIDE DEDICATED 1.25" CONDUIT FOR POWER WIRING.
- 11. GROUND MOUNTED PULL BOX, REFER TO DETAIL 12E501. COVER SHALL INDICATE USE - TELECOM OR POWER.
- 12. HEATER SHALL BE CIRCUITED WITH 3-#8 & 1-#10 GRD. UTILIZE ONE LINE CONDUCTOR AND NEUTRAL TO SERVE LOCAL SERVICE RECEPTACLE.
- 13. PROVIDE CONDUIT STUB UP AND POWER FOR MONUMENT SIGN. COORDINATE EXACT LOCATION WITH LANDSCAPE CONTRACTOR.

#	DATE	CHANGE DESCRIPTION
2	12/08/23	Addendum 2

**COBBLESTONE MANOR**  
 100 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

DRAWING TITLE:  
**SITE PLAN - ELECTRICAL**

	06/08/2023
	DRAWN BY: RK    CHECKED BY: KM
	#22172.01
<b>E002</b>	
PERMIT & BID SET	

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 1405 Dublin Road    Tel: (614) 466-4778  
 Columbus, Ohio 43215    Fax: (614) 466-4082

**1 SITE PLAN - ELECTRICAL**  
 1" = 20'-0"



# 1 FIRST FLOOR PLAN - POWER - AREA A

1/8" = 1'-0"



## GENERAL NOTES

- A. COORDINATE MOUNTING HEIGHT AND FINAL LOCATIONS OF RECEPTACLES, DEVICES AND EQUIPMENT WITH ARCHITECTURAL DETAILS AND ELEVATIONS PRIOR TO ROUGH-IN.
- B. COORDINATE ALL DEVICE LOCATIONS WITH FRAMING MEMBERS PRIOR TO ROUGH-IN.
- C. COORDINATE WALL THICKNESS WITH GENERAL TRADES CONTRACTOR. PROVIDE ADAPTER RING APPROPRIATE FOR WALL THICKNESS AND/OR CABINET BACK PANEL.
- D. ALL 120-VOLT, 15 OR 20 AMP RECEPTACLE SHALL BE TAMPER-RESISTANT TYPE.
- E. ALL 120-VOLT, SINGLE PHASE, 15 & 20 AMP BRANCH CIRCUITS SUPPLYING OUTLET IN CORRIDORS, LAUNDRY AREAS AND SIMILAR ROOMS SHALL BE AFCI PROTECTED AT THE CIRCUIT BREAKER.
- F. ALL CONDUIT RUNS AND WIRING DEVICES AND ASSOCIATED ELECTRICAL WORK WHICH PENETRATES THRU FIRE RATED WALLS OR FIRE RATED ASSEMBLIES SHALL BE COMPLETELY FIRE SEALED AT EACH PENETRATION. PROVIDE FIRE RATED PUTTY PADS ON ALL JUNCTION BOXES LOCATED IN FIRE RATED WALLS.
- G. ROUGH-IN FOR TELEVISION AND COMMUNICATIONS OUTLETS SHALL BE A 4" SQUARE BACK BOX WITH SINGLE GANG REDUCER AND A 1" CONDUIT TO TURN OUT ABOVE ACCESSIBLE CEILING. PROVIDE PROTECTIVE BUSHINGS.
- H. NO SHARED NEUTRALS - EACH CIRCUIT THAT REQUIRES A NEUTRAL CONDUCTOR SHALL HAVE A SEPARATE, DEDICATED NEUTRAL CONDUCTOR.

## KEYNOTES

- 1. PROVIDE POWER CONNECTION TO DOOR HARDWARE POWER SUPPLY (120V, 1PH). INSTALL ABOVE DOOR ON SECURE SIDE. REFER TO DETAIL FOR ADDITIONAL INFORMATION.
- 2. PROVIDE 120V, 20 AMP CIRCUIT FOR HANDICAP PUSHBUTTON. COORDINATE EXACT REQUIREMENTS WITH ARCHITECT, OWNER'S VENDOR, AND APPROVED SHOP DRAWINGS. MAKE FINAL CONNECTIONS TO HANDICAP DOOR PUSH BUTTONS.
- 3. RECEPTACLE MOUNTED FLUSH IN CASEWORK 4" BELOW COUNTER.
- 4. PROVIDE DUPLEX RECEPTACLE FOR DISHWASHER. RECEPTACLE SHALL BE SURFACE MOUNTED WITHIN BASE CABINET IMMEDIATELY ADJACENT TO DISHWASHER.
- 5. PROVIDE A 120 VOLT, 20 AMP DUPLEX RECEPTACLE FOR AN UNDERCOUNTER MICROWAVE. CIRCUIT TO GF BREAKER AND LABEL 'GFCI PROTECTED' ON RECEPTACLE.
- 6. PROVIDE A DEDICATED 15 AMP, 120V CIRCUIT FOR WITH GFCI PROTECTION FOR ELEVATOR CAR LIGHTING AND ALARM CONTROLS. COORDINATE WITH ELEVATOR MANUFACTURER'S REQUIREMENTS PRIOR TO ROUGH-IN.
- 7. PROVIDE FINAL CONNECTIONS FROM THE ELEVATOR SAFETY SWITCH TO ELEVATOR MACHINE PER THE ELEVATOR MANUFACTURER'S REQUIREMENTS. REFER TO THE SINGLE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
- 8. RADON MITIGATION PIPING.
- 9. PROVIDE 120V POWER CONNECTION TO INTERCOM SYSTEM.
- 10. PROVIDE 120V POWER CONNECTION TO TRASH CHUTE CONTROL PANEL.
- 11. PROVIDE 120V POWER CONNECTION FOR COMMERCIAL COFFEE MACHINE.
- 12. TELECOM BACKBOARD, GROUND BAR, AND DEMARC LOCATION.
- 13. FIRE ALARM DEVICES SERVING FIRE WATER SERVICE ENTRANCE AND FLOOR CONTROL VALVE. COORDINATE INSTALLATION WITH FIRE PROTECTION CONTRACTOR AND FIRE PROTECTION DETAILS SHEET 501.
- 14. PROVIDE DUPLEX RECEPTACLE FOR GARBAGE DISPOSAL. RECEPTACLE SHALL BE SURFACE MOUNTED WITHIN BASE CABINET WHERE DISPOSAL IS INSTALLED. PROVIDE CORD WITH PLUG AS REQUIRED. CONTROL WITH TOGGLE SWITCH ABOVE COUNTER GANGED WITH RECEPTACLE.
- 15. EXHAUST FAN TO BE POWERED AND SWITCHED WITH ROOM LIGHTS.
- 16. RECEPTACLE FOR TV, MOUNT AT 60" AFF. CONFIRM LOCATION AND MOUNTING HEIGHT WITH ARCHITECT PRIOR TO ROUGH-IN.
- 17. SYSTEM GROUND BAR. REFER TO DETAIL SE501 FOR CONNECTION TO GROUNDING ELECTRODES.
- 18. PROVIDE 2 GANG RECESSED FLOORBOX. FLOOR BOX SHALL INCLUDE TWO 20 AMP, 120 VOLT DUPLEX RECEPTACLES. PROVIDE ROUND FLUSH SURFACE COVER WITH 180 DEGREE OPENING AND CABLE EGRESS DOORS. COORDINATE COVER FINISH WITH ARCHITECT AND OWNER DURING SHOP DRAWING SUBMITTAL PROCESS. PROVIDE ALL INTERNAL COMPONENTS, DEVICE PLATES, AND APPURTENANCES REQUIRED FOR A COMPLETE INSTALLATION. PROVIDE 1" CONDUIT TO ADJACENT FLOOR BOXES SHOWN ON THE SAME CIRCUIT AND TO STUB UP IN NEAREST FULL HEIGHT STUD WALL. COORDINATE UNDERSLAB CONDUIT AND STUB UP LOCATIONS IN FIELD PRIOR TO CONCRETE POUR.
- 19. FIRST RECEPTACLE ON CIRCUIT SHALL BE GF TYPE WIRED TO PROTECT DOWNSTREAM RECEPTACLES.
- 20. PROVIDE 120V POWER CONNECTION TO COMBINATION FIRE/SMOKE DAMPER.
- 21. PROVIDE 120V POWER CONNECTION TO GAS FIREPLACE PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 22. PROVIDE POWER CONNECTION TO CONTROLS, FIRE ALARM MODULE, AND FIRE ALARM CONNECTION AT DRYPIPE STANDPIPE AIR COMPRESSOR CABINET.

#	DATE	CHANGE DESCRIPTION
2	12/08/23	Addendum 2

**COBBLESTONE MANOR**  
100 LAMPLIGHTER DRIVE  
GROVE CITY, OH 43123  
FOR  
**CMHA**

**MOODY-NOLAN**  
300 SPRUCE STREET  
SUITE 300  
COLUMBUS, OHIO 43215  
PHONE: (614) 461-4664  
FAX: (614) 280-8881

## DRAWING TITLE: LEVEL 01 - FLOOR PLAN - POWER - AREA A

06/08/2023	DRAWN BY: RK	CHECKED BY: KM
#21272.01		
<b>E201A</b>		
PERMIT & BID SET		



**AEC** ADVANCED ENGINEERING CONSULTANTS  
Mechanical | Electrical | Plumbing | Fire Protection | Utilities  
1405 Dublin Road Columbus, Ohio 43215  
Tel: (614) 466-4778 Fax: (614) 466-4082





**1** FIRST FLOOR PLAN - POWER - AREA B  
 1/8" = 1'-0"

**GENERAL NOTES**

- A. COORDINATE MOUNTING HEIGHT AND FINAL LOCATIONS OF RECEPTACLES, DEVICES AND EQUIPMENT WITH ARCHITECTURAL DETAILS AND ELEVATIONS PRIOR TO ROUGH-IN.
- B. COORDINATE ALL DEVICE LOCATIONS WITH FRAMING MEMBERS PRIOR TO ROUGH-IN.
- C. COORDINATE WALL THICKNESS WITH GENERAL TRADES CONTRACTOR. PROVIDE ADAPTER RING APPROPRIATE FOR WALL THICKNESS AND/OR CABINET BACK PANEL.
- D. ALL 120-VOLT, 15 OR 20 AMP RECEPTACLE SHALL BE TAMPER-RESISTANT TYPE.
- E. ALL 120-VOLT, SINGLE PHASE, 15 & 20 AMP BRANCH CIRCUITS SUPPLYING OUTLET IN CORRIDORS, LAUNDRY AREAS AND SIMILAR ROOMS SHALL BE AFCI PROTECTED AT THE CIRCUIT BREAKER.
- F. ALL CONDUIT RUNS AND WIRING DEVICES AND ASSOCIATED ELECTRICAL WORK WHICH PENETRATES THRU FIRE RATED WALLS OR FIRE RATED ASSEMBLIES SHALL BE COMPLETELY FIRE SEALED AT EACH PENETRATION. PROVIDE FIRE RATED PUTTY PADS ON ALL JUNCTION BOXES LOCATED IN FIRE RATED WALLS.
- G. ROUGH-IN FOR TELEVISION AND COMMUNICATIONS OUTLETS SHALL BE A 4" SQUARE BACK BOX WITH SINGLE GANG REDUCER AND A 1" CONDUIT TO TURN OUT ABOVE ACCESSIBLE CEILING. PROVIDE PROTECTIVE BUSHINGS.
- H. NO SHARED NEUTRALS - EACH CIRCUIT THAT REQUIRES A NEUTRAL CONDUCTOR SHALL HAVE A SEPARATE, DEDICATED NEUTRAL CONDUCTOR.

**KEYNOTES**

- 1. PROVIDE 120V POWER CONNECTION TO TRASH CHUTE CONTROL PANEL.
- 2. RADON MITIGATION PIPING
- 3. PROVIDE 120V POWER CONNECTION TO COMBINATION SMOKE/FIRE DAMPERS
- 4. PROVIDE POWER CONNECTION TO DOOR HARDWARE POWER SUPPLY (120V, 1PH). INSTALL ABOVE DOOR ON SECURE SIDE. REFER TO DETAIL FOR ADDITIONAL INFORMATION.

#	DATE	CHANGE DESCRIPTION
2	12/08/23	Addendum 2

**COBBLESTONE MANOR**  
 100 LAMPLIGHTER DRIVE  
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 FOR  
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**DRAWING TITLE:**  
 LEVEL 01 - FLOOR PLAN -  
 POWER - AREA B

06/08/2023  
 DRAWN BY: RK CHECKED BY: KM  
 #212172.01  
**E201B**  
 PERMIT & BID SET

**AEC** ADVANCED ENGINEERING CONSULTANTS  
 Mechanical | Electrical | Plumbing | Fire Protection | Utilities  
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 Columbus, Ohio 43215  
 Tel: (614) 466-4778  
 Fax: (614) 466-4082



LUMINAIRE SCHEDULE

TYPE	DIMENSIONS	MOUNTING	CONSTRUCTION AND FINISH	DESCRIPTION AND OPTIONS	LAMPS	DRIVER(S)	VOLTAGE/OAD	APPROVED MANUFACTURER(S)
U1	7" DIA X 5/8" DEEP	SURFACE GRID OR DRYWALL INSTALLS ON FIRE RATED JUNCTION BOX	POLYCARBONATE LENS, CAST ALUMINUM HOUSING, STANDARD FINISH BY ARCHITECT	SURFACE DOWN LIGHT WET LISTED	INTEGRAL LED 3000K 1200LU	INTEGRAL PHASE DIMMING	120V 10W	HALO SMD6R-12-927-WH LIGHTOLIER JUNO RP LIGHTING
U2	14" DIA 3.5" DEEP	SURFACE INSTALLS ON FIRE RATED JUNCTION BOX	BRUSHED ALUMINUM EXTERIOR, WHITE ACRYLIC DIFFUSER	FLUSH MOUNT SCONCE	INTEGRAL LED 4000K 1500LU	INTEGRAL PHASE DIMMING	120V 24W	LITHONIA FMLACL14 RP LIGHTING BROWNLEE
U3	24" X 36" DEEP	WALL		LIGHTED MIRROR	INTEGRAL LED 3000K 2000 LUMENS	INTEGRAL 0-10V DIMMING	120V 20W	ALVISTA WAL2436LED ELK
U4	5.5" DIA X 10"	PENDANT INSTALLS ON FIRE RATED JUNCTION BOX	STEEL HOUSING, SATIN NICKEL FINISH WHITE GLASS SHADE	PENDANT GLASS SHADE	(1) E-26 S60 (NOT INCLUDED)	N/A	120V 60W	GOBE ELECTRIC FARMHOUSE SEEDED GLASS CYLINDER MINI PENDANT 60391
U5	1" X 1" X LENGTH AS SHOWN	SURFACE CHANNEL	EXTRUDED ALUMINUM CHANNEL	UNDER CABINET LIGHT FIELD CUTTABLE	INTEGRAL LED	REMOTE 12V	2W/FT	GM LIGHTING LTR-P SERIES/LED-CHL MODA LIGHT
U6	7" DIA X 5/8" DEEP	SURFACE GRID OR DRYWALL INSTALLS ON FIRE RATED JUNCTION BOX	POLYCARBONATE LENS, CAST ALUMINUM HOUSING, STANDARD FINISH BY ARCHITECT	SURFACE DOWN LIGHT CLOSET RATED, WET LISTED	INTEGRAL LED 3000K 1000LU	INTEGRAL PHASE DIMMING	120V 10W	CONTECH LIGHTING ASMR5

NOTE: STANDARD FINISH SELECTED BY ARCHITECT

LUMINAIRE SCHEDULE

TYPE	DIMENSIONS	MOUNTING	CONSTRUCTION AND FINISH	DESCRIPTION AND OPTIONS	LAMPS	DRIVER(S)	VOLTAGE/OAD	APPROVED MANUFACTURER(S)
C1	7" DIA X 5/8" DEEP	SURFACE INSTALLED ONTO FIRE RATED J-BOX WHERE APPLICABLE	ALUMINUM HOUSING FINISH BY ARCHITECT	SURFACE DOWN LIGHT WET LISTED	INTEGRAL LED 3000K 1200 LUMENS	INTEGRAL PHASE DIMMING	120V 14.2W	HALO SMD6R-12-927-WH LIGHTOLIER JUNO RP LIGHTING
C2	1" X 1" X LENGTH AS SHOWN	SURFACE CHANNEL	EXTRUDED ALUMINUM CHANNEL	UNDER CABINET LIGHT FIELD CUTTABLE	INTEGRAL LED	REMOTE	120V 2W/FT	GM LIGHTING LTR-P SERIES/LED-CHL MODA LIGHT
C3	2" X 2" DEEP	SURFACE INSTALLED ONTO FIRE RATED J-BOX	ALUMINUM HOUSING FINISH BY ARCHITECT	EDGE LIT FLAT PANEL DAMP LISTED, SURFACE KIT	INTEGRAL LED 3000K 4300 LUMENS	INTEGRAL 0-10V DIMMING	120V 38W	METALUX 22FP4235C-FPXSURF22 COLUMBIA DAYBRITE
C4	2" X 4" DEEP	SURFACE INSTALLED ONTO FIRE RATED J-BOX	ALUMINUM HOUSING FINISH BY ARCHITECT	EDGE LIT FLAT PANEL DAMP LISTED, SURFACE KIT	INTEGRAL LED 3000K 4300 LUMENS	INTEGRAL 0-10V DIMMING	120V 38W	METALUX 24FP4235C-FPXSURF24 COLUMBIA DAYBRITE
C5-8	8" X 8" DEEP	SURFACE CHAIN	COLD ROLLED STEEL HOUSING, PAINTED AFTER FABRICATION, BAKED WHITE ENAMEL	INDUSTRIAL STRIP FROSTED DIFFUSE LENS, DAMP LISTED	INTEGRAL LED 3000K 8200 LUMENS	INTEGRAL 0-10V DIMMING	120V 75W	METALUX 8WSL-LD2-60-SRS-UNV-L840-CD-1-U DAYBRITE COLUMBIA
EM	10.25" X 4.25" X 3.6" DEEP	UNIVERSAL	THERMOPLASTIC HOUSING, IMPACT RESISTANT	DUAL HEAD EMERGENCY LIGHT NICAD BATTERY, 90 MINUTE MINIMUM CAPACITY, SELF DIAGNOSTICS	INTEGRAL LED	N/A	120V 3W	SURELITES APEL COMPASS CHLORIDE
G1	11" SQUARE 6" DEEP	IN GRADE (CONCRETE)	ALUMINUM HOUSING	IN GRADE FLAG LIGHT 16 DEGREE BEAM, ADJUSTABLE LED MODULE, ANTI SLIP LENS.	INTEGRAL LED 4000K 3200 LU	INTEGRAL 0-10V DIMMING	120V 27W	LIGMAN UKI-6081-30W-N-W40-120/277-A61612
P1	19" X 33" 4" DEEP	20' DECORATIVE POLE POST TOP ARM MOUNT	DIE CAST ALUMINUM HOUSING	DUAL HEAD DECORATIVE AREA LIGHT WET LISTED, TYPE 5 DISTRIBUTION, 10KA SURGE PROTECTOR	INTEGRAL LED 4000K 9100 LUMENS (PER HEAD)	INTEGRAL 0-10V DIMMING	120V 152W	ANP LIGHTING LA113-1-RF-P078LD4D-T5-40K-SP/PA12 1-1-2-NA HADCO LUMENCON
P2	19" X 33" 4" DEEP	20' DECORATIVE POLE POST TOP ARM MOUNTED	DIE CAST ALUMINUM HOUSING	DECORATIVE AREA LIGHT WET LISTED, TYPE 3 DISTRIBUTION, 10KA SURGE PROTECTOR	INTEGRAL LED 4000K 9100 LUMENS	INTEGRAL 0-10V DIMMING	120V 80W	ANP LIGHTING LA113-1-RF-P078LD4D-T3-40K-SP/PA31 1-1-1 HADCO LUMENCON
P3	19" X 33"	12' DECORATIVE POLE POST TOP MOUNT	DIE CAST ALUMINUM HOUSING	DECORATIVE AREA LIGHT WET LISTED, TYPE 5 DISTRIBUTION	INTEGRAL LED 4000K 5100 LUMENS	INTEGRAL 0-10V DIMMING	120V 46W	ANP LIGHTING LA113-1-RF-P046LD4D-T5-40K-SP/PA31 1-1-1 HADCO LUMENCON
R1	6" DIA X 6" DEEP	RECESSED GYP/GRID	STEEL HOUSING	RECESSED DOWN LIGHT SPECULAR CLEAR REFLECTOR	INTEGRAL LED 3000K 2500 LUMENS	INTEGRAL 0-10V DIMMING	120V 33W	PORTFOLIO LD6C-25-90-30-D010/M-1-LI PRESCOLITE LIGHTOLIER
R2	4" X 5" LENGTH AS SHOWN	RECESSED	EXTRUDED ALUMINUM HOUSING	PERIMETER LINEAR RECESSED FLUSH LENS	INTEGRAL LED 4000K 375LU/FT	INTEGRAL 0-10V DIMMING	120/277V 4W/FT	FOCALPOINT FSM4PR-FXH-FL0-375LF-40K-1C-UNV-L D1-x-X
R3	4" X 2"	RECESSED	EXTRUDED ALUMINUM HOUSING	LINEAR PICTURE LIGHTER	INTEGRAL LED 4000K	INTEGRAL	120/277V	TBD
S1-2	3" X 4" 4" DEEP	SUSPENDED CHAIN	COLD ROLLED STEEL HOUSING, PAINTED AFTER FABRICATION, BAKED WHITE ENAMEL	INDUSTRIAL STRIP FROSTED DIFFUSE LENS, DAMP LISTED	INTEGRAL LED 3000K 4200 LUMENS	INTEGRAL 0-10V DIMMING	120V 35W	METALUX 4SNLED-LD5-41SL-LW-UNV-L830-CD-1 DAYBRITE COLUMBIA
S1-4	3" X 4" 4" DEEP	SUSPENDED CHAIN	COLD ROLLED STEEL HOUSING, PAINTED AFTER FABRICATION, BAKED WHITE ENAMEL	INDUSTRIAL STRIP FROSTED DIFFUSE LENS, DAMP LISTED	INTEGRAL LED 3000K 4200 LUMENS	INTEGRAL 0-10V DIMMING	120V 35W	METALUX 4SNLED-LD5-41SL-LW-UNV-L830-CD-1 DAYBRITE COLUMBIA
S1-8	3" X 8" 4" DEEP	SUSPENDED CHAIN	COLD ROLLED STEEL HOUSING, PAINTED AFTER FABRICATION, BAKED WHITE ENAMEL	INDUSTRIAL STRIP FROSTED DIFFUSE LENS, DAMP LISTED	INTEGRAL LED 3000K 8200 LUMENS	INTEGRAL 0-10V DIMMING	120V 75W	METALUX 8TSLNLED-LD5-83SL-LW-UNV-L830-CD-1 DAYBRITE COLUMBIA
S2	34" X 44" 34" DEEP	STEEL	STEEL HOUSING	DECORATIVE CHANDELIER 8 LAMP	(8) E11	N/A	120V 40W	HUDSON VALLEY LIGHTING BRYANT PENDANT
S3	4" SQUARE 12" HIGH	YOKE MOUNTED	DIE CAST ALUMINUM HOUSING	SQUARE CYLINDER ADJUSTABLE YOKE, WET LISTED TYPE 5 DISTRIBUTION, REMOTE COLD WEATHER BATTERY	INTEGRAL LED 4000K 1500 LUMENS	INTEGRAL 0-10V DIMMING	120V 15W	PORTFOLIO LESQRYM4B-15-D010-X PRESCOLITE LIGHTOLIER
W1	6" X 4" 4" DEEP	SURFACE/WALL	COLD ROLLED STEEL HOUSING, PAINTED AFTER FABRICATION, BAKED WHITE ENAMEL	STAIR LIGHT INTEGRAL OCCUPANCY SENSOR, ACRYLIC DIFFUSER, DAMP LISTED, DIM TO 40% WHEN UNOCCUPIED, 90 MINUTE NICAD BATTERY BACKUP	INTEGRAL LED 3000K 3800 LUMENS	INTEGRAL BI-LEVEL DIM WITH SENSOR	120V 38W	DAYBRITE SF4C38A40USZTEMLD METALUX COLUMBIA
W2	DEEP	SURFACE	FIBERGLASS HOUSING	INDUSTRIAL VAPORTIGHT WET LISTED, STAINLESS HARDWARE, PRISMATIC LENS, INTEGRAL 90 MINUTE BATTERY BACKUP	INTEGRAL LED 3500K 4000 LUMENS	INTEGRAL 0-10V DIMMING	120V 30W	METALUX 4VT2-LD5-4-DR-UNV-EL10W-L835-CD1- WL-SSL DAYBRITE COLUMBIA
W3	24" X 36" DEEP	WALL		LIGHTED MIRROR	INTEGRAL LED 3000K 2000 LUMENS	INTEGRAL 0-10V DIMMING	120V 20W	ALVISTA WAL2436LED ELK
W4	8" X 8" 4" DEEP	SURFACE/WALL	DIE CAST ALUMINUM HOUSING	EXTERIOR WALL PACK WET LISTED, INTEGRAL COLD WEATHER BATTERY PACK	INTEGRAL LED 4000K 3500 LUMENS	INTEGRAL 0-10V DIMMING	120V 28W	LUMARK AXCS3A-XX-CBP
W5	4" X 9" 8" DEEP	SURFACE/WALL	DIE CAST ALUMINUM HOUSING	SQUARE CYLINDER DIRECT/INDIRECT WET LISTED, 20 DEGREE UP, 36 DEGREE DOWN	INTEGRAL LED 4000K 3000 LUMENS	INTEGRAL 0-10V DIMMING	120V 28W	LIGMAN UJE-30361-2X14W-N-W-W40-X
W6	18" X 5" 4" DEEP	WALL	STEEL HOUSING	UNIT NUMBER SCONCE	(1) T8 LED 2700K 180 LUMENS	N/A	120V 2.5W	NUMERA LIGHTING NL1105.01
X1	12" X 8" 2" DEEP	UNIVERSAL SURFACE CEILING/WALL	THERMOPLASTIC HOUSING, IMPACT RESISTANT	SINGLE FACE EXIT RED LETTERS, CHEVRONS AS SHOWN, INTEGRAL 90 MINUTE BATTERY	INTEGRAL LED	N/A	120V 1W	LITHONIA LQM-S-W-3-R-120/277-EL-N CHLORIDE SURELITES
X2	12" X 8" 2" DEEP	UNIVERSAL SURFACE CEILING/WALL	THERMOPLASTIC HOUSING, IMPACT RESISTANT	DUAL FACE EXIT RED LETTERS, UNIVERSAL CHEVRONS AS INDICATED ON DRAWINGS MIRROR BACK, INTEGRAL 90 MINUTE BATTERY	INTEGRAL LED	N/A	120V 1W	LITHONIA LQMSW3R120/277ELN CHLORIDE SURELITES

NOTE: STANDARD FINISH SELECTED BY ARCHITECT

LIGHTING CONTROL ZONE SCHEDULE RP1

ZONE	BRANCH CIRCUIT	DESCRIPTION	CONTROL		
			ON	OFF	FUNCTIONS/PRESETS
1	PIA-51	SITE LIGHTING	TC/PC	TC/PC	-
2	PIA-53	SITE LIGHTING	TC/PC	TC/PC	-
3	PIA-43	BUILDING MTD LIGHTING	TC/PC	TC/PC	-
4	PIA-47	BUILDING MTD LIGHTING	TC/PC	TC/PC	-
5	INV-2	EXTERIOR CANOPY/EGRESS **	TC/PC	TC/PC	-
6	PIA-62	MONUMENT SIGN	TC/PC	TC/PC	-
7	-	SPARE	-	-	-
8	-	SPARE	-	-	-

DIN GREENGATE LWS-1200  
\*\*PROVIDE ILL-SEA BARRIER

CONTROL LEGEND:  
LS: ON/OFF SWITCH  
DM: ON/OFF/DIMMER SWITCH  
TC: TIME CLOCK  
TM: TIMER SWITCH  
MS: MASTER SWITCH  
PC: PHOTOCELL  
OS: OCCUPANCY SENSOR  
\* DIM TO 10% BETWEEN 11PM - 6AM  
\* IN THE EVENT OF FIRE ALARM ACTIVATION, THIS ZONE WILL DEFAULT TO 100% ON VIA WIRELESS LIGHTING RELAY

#	DATE	CHANGE DESCRIPTION
2	12/06/23	Addendum 2

**COBBLESTONE MANOR**  
150 LAMPLIGHTER DRIVE  
GROVE CITY, OH 43123  
FOR  
**CMHA**

300 SPRUCE STREET  
SUITE 300  
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DRAWING TITLE:  
**LIGHTING SCHEDULES -  
ELECTRICAL**

06/08/2023  
DRAWN BY: RK CHECKED BY: KM  
#22172.01  
**E601**  
PERMIT & BID SET

**AEC** ADVANCED  
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1405 Dublin Road  
Columbus, Ohio 43215  
Tel: (614) 466-4778  
Fax: (614) 466-4062

Switchboard: MDP1

Location: UTILITY XFMR-1
Supply From: WALL MTD
Mounting: NEMA 3R
Enclosure: NEMA 3R
Volts: 120/208 Wye
Phases: 3
Wires: 4
A.I.C. Rating: 65 KAIC
Mains Type: M.C.B.
Mains Rating: 1600 A
MCB Rating: 1600 A

Table with 7 columns: CKT, Circuit Description, # of Poles, Frame Size, Trip Rating, Load, Remarks. Lists 40 circuits from UNIT 1B-U-114 to UNIT 1B-U-300.

Conn. Load: 1496.8 kVA
Demand Load: 420.0 kVA
Demand Current: 1166 A

Switchboard: MDP2

Location: UTILITY XFMR-2
Supply From: WALL MTD
Mounting: NEMA 3R
Enclosure: NEMA 3R
Volts: 120/208 Wye
Phases: 3
Wires: 4
A.I.C. Rating: 65 KAIC
Mains Type: M.C.B.
Mains Rating: 1600 A
MCB Rating: 1600 A

Table with 7 columns: CKT, Circuit Description, # of Poles, Frame Size, Trip Rating, Load, Remarks. Lists 45 circuits from UNIT 1B-U-118 to UNIT 1B-U-45.

Conn. Load: 1578.8 kVA
Demand Load: 442.1 kVA
Demand Current: 1227 A

Switchboard: MDP3

Location: ELEC E-100
Supply From: UTILITY XFMR-1
Mounting: WALL MTD
Enclosure: TYPE 1
Volts: 120/208 Wye
Phases: 3
Wires: 4
A.I.C. Rating: 42 KAIC
Mains Type: M.C.B.
Mains Rating: 1200 A
MCB Rating: 1200 A

Table with 7 columns: CKT, Circuit Description, # of Poles, Frame Size, Trip Rating, Load, Remarks. Lists 20 circuits from SPD to UNIT 1B-U-227.

Total Conn. Load: 286.1 kVA
Total Amps: 794 A

Conn. Load: 286.1 kVA
Demand Load: 277.3 kVA
Demand Current: 770 A

Panel: P1A

Location: ELEC E-100
Supply From: MDP3
Mounting: Surface
Enclosure: Type 1
Volts: 120/208 Wye
Phases: 3
Wires: 4
A.I.C. Rating: 22 KAIC
Mains Type: M.L.O.
Mains Rating: 225 A

Table with 10 columns: CKT, Circuit Description, Pole s, A, B, C, Pole s, Trip, Circuit Description, CKT. Lists 83 circuits from EUH-1 to SPARE.

Conn. Load: 15.0 kVA
Demand Load: 17.6 kVA
Demand Current: 9.3 A

Total: 132 A
154 A
78 A

Conn. Load: 42.0 kVA
Demand Load: 42.8 kVA
Demand Current: 119 A

Panel: P1B

Location: ELEC E-100
Supply From: MDP3
Mounting: Surface
Enclosure: Type 1
Volts: 120/208 Wye
Phases: 3
Wires: 4
A.I.C. Rating: 22 KAIC
Mains Type: M.L.O.
Mains Rating: 225 A

Table with 10 columns: CKT, Circuit Description, Pole s, A, B, C, Pole s, Trip, Circuit Description, CKT. Lists 53 circuits from ELLIPTICAL to SPARE.

Conn. Load: 47.1 kVA
Demand Load: 41.0 kVA
Demand Current: 114 A

Panel: P2A

Location: ELEC E-200
Supply From: MDP3
Mounting: Surface
Enclosure: Type 1
Volts: 120/208 Wye
Phases: 3
Wires: 4
A.I.C. Rating: 22 KAIC
Mains Type: M.L.O.
Mains Rating: 225 A

Table with 10 columns: CKT, Circuit Description, Pole s, A, B, C, Pole s, Trip, Circuit Description, CKT. Lists 53 circuits from EF-8 to SPARE.

Conn. Load: 35.1 kVA
Demand Load: 34.5 kVA
Demand Current: 96 A

Panel: P3A

Location: JAN 163
Supply From: MDP3
Mounting: Surface
Enclosure: Type 1
Volts: 120/208 Wye
Phases: 3
Wires: 4
A.I.C. Rating: 22 KAIC
Mains Type: M.L.O.
Mains Rating: 225 A

Table with 10 columns: CKT, Circuit Description, Pole s, A, B, C, Pole s, Trip, Circuit Description, CKT. Lists 53 circuits from RTU-1 to SPARE.

Conn. Load: 53.9 kVA
Demand Load: 56.5 kVA
Demand Current: 157 A

Inverter: INV1

Location: ELEC E-100
Supply From: P1A
Mounting: SURFACE
Enclosure: NEMA 1
Volts: 120 Single
Phases: 1
Wires: 2
A.I.C. Rating:
Mains Type:
Mains Rating:

Table with 7 columns: CKT, Circuit Description, # of Poles, Frame Size, Trip Rating, Load, Remarks. Lists 8 circuits from LTG CORRIDOR A to SPARE.

Total Conn. Load: 0.9 kVA
Total Amps: 8 A

Conn. Load: 0.9 kVA
Demand Load:
Demand Current: 8 A

Inverter: INV2

Location: ELEC E-200
Supply From: P2A
Mounting: SURFACE
Enclosure:
Volts: 120 Single
Phases: 1
Wires: 2
A.I.C. Rating:
Mains Type:
Mains Rating:

Table with 7 columns: CKT, Circuit Description, # of Poles, Frame Size, Trip Rating, Load, Remarks. Lists 8 circuits from LTG CORR A to SPARE.

Total Conn. Load: 0.5 kVA
Total Amps: 4 A

Conn. Load: 0.5 kVA
Demand Load:
Demand Current: 4 A

Inverter: INV3

Location: JAN 163
Supply From: P3A
Mounting: SURFACE
Enclosure: NEMA 1
Volts: 120 Single
Phases: 1
Wires: 2
A.I.C. Rating:
Mains Type:
Mains Rating:

Table with 7 columns: CKT, Circuit Description, # of Poles, Frame Size, Trip Rating, Load, Remarks. Lists 8 circuits from LTG CORR A to SPARE.

Total Conn. Load: 0.5 kVA
Total Amps: 4 A

Conn. Load: 0.5 kVA
Demand Load:
Demand Current: 4 A

Table with 3 columns: #, DATE, CHANGE DESCRIPTION. Shows change 2 on 12/08/23.

COBBLESTONE MANOR
1500 LAMPLIGHTER DRIVE
GROVE CITY, OH 43123
FOR CMHA

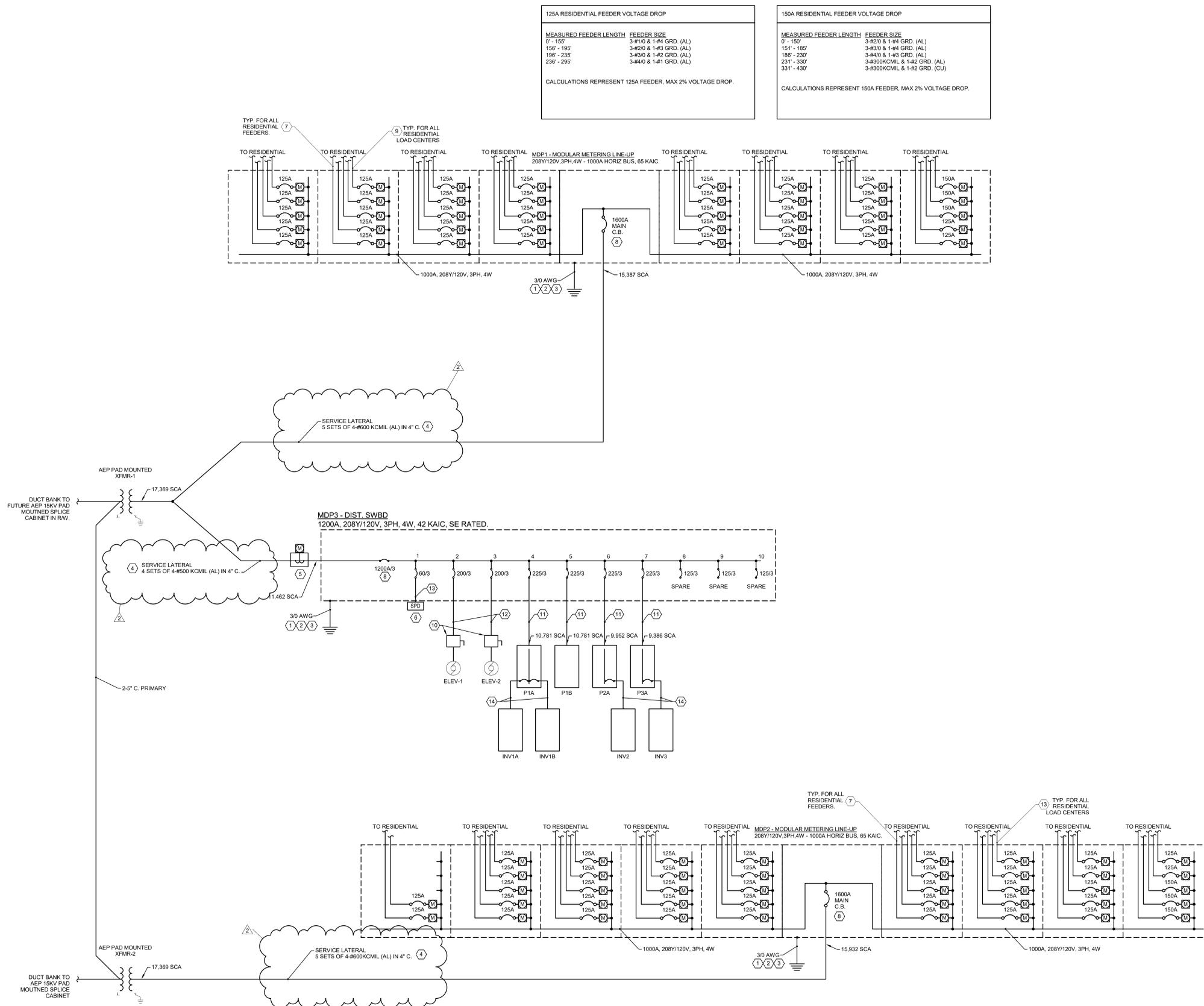
300 SPRUCE STREET
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PANEL SCHEDULES - ELECTRICAL

06/08/2023
DRAWN BY: Author CHECKED BY: Checker
#22172.01
E603
PERMIT & BID SET

AEC ADVANCED ENGINEERING CONSULTANTS
Columbus, Ohio 43215





125A RESIDENTIAL FEEDER VOLTAGE DROP	
MEASURED FEEDER LENGTH	FEEDER SIZE
0' - 155'	3-#10 & 1-#4 GRD. (AL)
155' - 195'	3-#10 & 1-#3 GRD. (AL)
195' - 235'	3-#10 & 1-#2 GRD. (AL)
235' - 295'	3-#10 & 1-#1 GRD. (AL)
CALCULATIONS REPRESENT 125A FEEDER, MAX 2% VOLTAGE DROP.	

150A RESIDENTIAL FEEDER VOLTAGE DROP	
MEASURED FEEDER LENGTH	FEEDER SIZE
0' - 150'	3-#10 & 1-#4 GRD. (AL)
151' - 195'	3-#10 & 1-#4 GRD. (AL)
196' - 230'	3-#10 & 1-#3 GRD. (AL)
231' - 330'	3-#10KCMIL & 1-#2 GRD. (AL)
331' - 430'	3-#10KCMIL & 1-#2 GRD. (CU)
CALCULATIONS REPRESENT 150A FEEDER, MAX 2% VOLTAGE DROP.	

**1 SINGLE-LINE DIAGRAM - ELECTRICAL**  
 INTS

**GENERAL NOTES**

- NONE
- BOND NEUTRAL TO GROUND AT SERVICE ENTRANCE EQUIPMENT. PROVIDE GROUNDING ELECTRODE CONDUCTOR TO UL LISTED INTERSYSTEM GROUND BAR. REFER TO DETAIL 5E501.
- PROVIDE BONDING JUMPERS FROM GROUND BAR TO EACH GROUNDING ELECTRODE IN ACCORDANCE WITH NEC ARTICLE 250. REFER TO DETAIL 5E501. PROVIDE GROUNDING BAR PER DETAIL 11E501.
- PROVIDE 10" X 3/4" DIA. UL LISTED GROUND ROD(S) AS REQUIRED. REFER TO DETAIL 4E501.
- CONTRACTOR SHALL PROVIDE SECONDARY CONDUITS/CONDUCTORS AND MAKE SECONDARY TERMINATIONS.
- CT CABINET SHALL COMPLY WITH AEP REQUIREMENTS, COORDINATE WITH LOCAL UTILITY.
- SPD SHALL BE MOUNTED EXTERNALLY, WALL MOUNTED, KEEP CONDUCTOR LENGTH TO A MINIMUM.
- TYPICAL RESIDENTIAL PANELBOARD FEEDERS SHALL BE SIZED USING THE VOLTAGE DROP TABLE. LENGTH OF CABLE SHALL BE MEASURED AFTER THE PROPOSED PATHWAY HAS BEEN DETERMINED.
- PROVIDE LSI ELECTRONIC TRIP CIRCUIT BREAKER WITH ARMS DEVICE TO ADJUST BREAKER SETTINGS TO REDUCE ARC FLASH INCIDENT ENERGY.
- RESIDENTIAL UNIT LOAD CENTERS SHALL BE SERIES RATED FOR 10KAIC. CONTRACTOR'S EQUIPMENT SUPPLIER SHALL PROVIDE EVIDENCE OF PROVEN SERIES RATING BETWEEN MDP1 BREAKER AND LOAD CENTER MAIN CIRCUIT BREAKER TO ACHIEVE THE SERIES RATING.
- PROVIDE BUSSMAN ELEVATOR POWER MODULE, OR EQUAL. REFER TO SPEC SECTION 26 28 17. FUSE SIZE SHALL BE BY MANUFACTURERS RECOMMENDATION.
- FEEDER: 4-#250 KCMIL (AL) & 1-#2 GRD. IN 3" C.
- FEEDER: 3-#410 (AL) & 1-#4 GRD. IN 2.5" C.
- FEEDER: 4-#6 (CU) & 1-#10 GRD. IN 1.25" C.
- FEEDER: 2-#12 (CU) & 1-#12 GRD. IN 0.75" C.

**KEYNOTES**

#	DATE	CHANGE DESCRIPTION
2	12/08/23	Addendum 2

**COBBLESTONE MANOR**  
 150 LAMPLIGHTER DRIVE  
 GROVE CITY, OH 43123  
 FOR  
**CMHA**  
 COLUMBUS METROPOLITAN HOUSING AUTHORITY  
COLUMBUS, OHIO

**MOODY-NOLAN**  
 300 SPRUCE STREET  
 SUITE 300  
 COLUMBUS, OHIO 43215  
 PHONE: (614) 461-4664  
 FAX: (614) 280-8881

**DRAWING TITLE**  
**SINGLE-LINE DIAGRAM - ELECTRICAL**

06/08/2023  
 DRAWN BY: RK CHECKED BY: KM  
 5/8/2023  
 #22172.01  
**E701**  
 PERMIT & BID SET

**AEC** ADVANCED ENGINEERING CONSULTANTS  
 Mechanical | Electrical | Plumbing | Fire Protection | Utilities  
 1405 Dublin Road Columbus, Ohio 43215 Tel: (614) 466-4778 Fax: (614) 466-4082





**1** FIRST FLOOR PLAN - TELECOMMUNICATIONS - AREA A  
1/8" = 1'-0"

**GENERAL NOTES**

- 1.

**KEYNOTES**

1. PROVIDE DATA OUTLET FOR INTERCOM DOOR STATION.
2. PROVIDE TMGB.
3. CONFIRM EXACT TELEVISION LOCATION WITH ARCHITECT PRIOR TO ROUGH IN.

#	DATE	CHANGE DESCRIPTION
2	12/08/23	Addendum 2

**COBBLESTONE MANOR**  
150 LAMPLIGHTER DRIVE  
GROVE CITY, OH 43123  
FOR  
**CMHA**

**MOODY-NOLAN**  
300 SPRUCE STREET  
SUITE 300  
COLUMBUS, OHIO 43215  
PHONE: (614) 461-4664  
FAX: (614) 280-8881

**DRAWING TITLE**  
LEVEL 01 - FLOOR PLAN -  
SYSTEMS - AREA A

06/08/2023	CHECKED BY: KM
DRAWN BY: RK	#22172.01
<b>T101A</b>	
PERMIT & BID SET	



**AEC** **ADVANCED ENGINEERING CONSULTANTS**  
Mechanical | Electrical | Plumbing | Fire Protection | Utilities  
1405 Dublin Road  
Columbus, Ohio 43215  
Tel: (614) 466-4773  
Fax: (614) 466-4082





**1** FIRST FLOOR PLAN - TELECOMMUNICATIONS - AREA B  
1/8" = 1'-0"

**GENERAL NOTES**

1. .

**KEYNOTES**

1. .

#	DATE	CHANGE DESCRIPTION
2	12/08/23	Addendum 2

**COBBLESTONE MANOR**  
150 LAMPLIGHTER DRIVE  
GROVE CITY, OH 43123  
FOR  
**CMHA**

**MOODY-NOLAN**  
300 SPRUCE STREET  
SUITE 300  
COLUMBUS, OHIO 43215  
PHONE: (614) 461-4664  
FAX: (614) 280-8881

DRAWING TITLE:  
**LEVEL 01 - FLOOR PLAN -  
SYSTEMS - AREA B**

	06/08/2023
	DRAWN BY: RK    CHECKED BY: KM
	#22172.01
<b>T101B</b>	
PERMIT & BID SET	

**AEC** **ADVANCED ENGINEERING CONSULTANTS**  
Mechanical | Electrical | Plumbing | Fire Protection | Utilities  
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Columbus, Ohio 43215    Fax: (614) 466-4082





Geotechnical Exploration Report

CMHA Lamplighter Drive  
1185 Lamplighter Drive  
Columbus, Ohio 43123

Prepared for

Moody Nolan  
300 Spruce Street, Suite 300  
Columbus, Ohio 43215

Prepared by

Professional Service Industries, Inc.  
4960 Vulcan Avenue  
Columbus, Ohio 43228

November 12, 2020

PSI Project No. 01021806

Daniel E Karch, E.I.  
Project Manager

Paul S. Hundley, P.E.  
Geotechnical Dept.  
Manager/Principal Consultant

## TABLE OF CONTENTS

<b>1</b>	<b>PROJECT INFORMATION.....</b>	<b>1</b>
1.1	PROJECT AUTHORIZATION.....	1
1.2	PROJECT DESCRIPTION.....	1
1.3	PURPOSE AND SCOPE OF SERVICES.....	2
<b>2</b>	<b>SITE AND SUBSURFACE CONDITIONS.....</b>	<b>3</b>
2.1	SITE LOCATION AND DESCRIPTION.....	3
2.2	SITE GEOLOGY.....	3
2.3	SUBSURFACE CONDITIONS.....	3
2.4	WATER LEVEL MEASUREMENTS.....	5
2.5	LABORATORY TEST RESULTS.....	5
<b>3</b>	<b>GEOTECHNICAL EVALUATION.....</b>	<b>6</b>
3.1	GEOTECHNICAL DISCUSSION.....	6
<b>4</b>	<b>GEOTECHNICAL RECOMMENDATIONS.....</b>	<b>7</b>
4.1	SITE PREPARATION.....	7
4.2	FOUNDATION RECOMMENDATIONS.....	9
4.3	EARTHQUAKE AND SEISMIC DESIGN CONSIDERATION.....	10
4.4	FLOOR SLAB RECOMMENDATIONS.....	11
4.5	UTILITIES TRENCHING.....	12
4.6	PAVEMENT DESIGN RECOMMENDATIONS.....	12
4.7	PAVEMENT DRAINAGE AND MAINTENANCE.....	14
4.8	SILTATION CONTROL.....	14
<b>5</b>	<b>CONSTRUCTION CONSIDERATIONS.....</b>	<b>15</b>
5.1	MOISTURE SENSITIVE SOILS/WEATHER RELATED CONCERNS.....	15
5.2	DRAINAGE AND GROUNDWATER CONSIDERATIONS.....	15
5.3	EXCAVATIONS.....	15
<b>6</b>	<b>GEOTECHNICAL RISK.....</b>	<b>17</b>
<b>7</b>	<b>REPORT LIMITATIONS.....</b>	<b>18</b>

<b>APPENDIX</b>	-	Site Location Map
		Boring Location Plan
		Profile
		Boring Logs
		Laboratory Test Results
		USGS Seismic Design Maps
		General Notes
		Unified Soil Classification Chart (USCS)





## 1 PROJECT INFORMATION

### 1.1 PROJECT AUTHORIZATION

The following table summarizes, in chronological order, the Project Authorization History for the services performed and represented in this report by Professional Service Industries, Inc. (PSI).

DOCUMENT AND REFERENCE	DATE	REQUESTED/PROVIDED BY
Request for Proposal	09/28/2020	Mr. Jay Boone of Moody Nolan
PSI Proposal No.: 0102-322899	09/29/2020	Daniel Karch & Paul Hundley of PSI, Inc.
Project Authorization	10/13/2020	Mr. Jay Boone of Moody Nolan

### 1.2 PROJECT DESCRIPTION

According to the provided information and documents, the project involves the construction of a new single-story, slab-on-grade, 24,000 SF building, parking lot pavements, and a stormwater management area at 1185 Lamplighter Drive in Columbus, Franklin County, Ohio.

The following table lists the structural loads and site features that are estimated for the design basis for the conclusions of this report:

STURCTURAL LOAD/PROPERTY	REQUIREMENT/REPORT BASIS	
	R*	B*
<b>BUILDINGS</b>		
Maximum Column Loads	Less than 80 kips	<input type="checkbox"/> R* <input checked="" type="checkbox"/> B*
Maximum Wall Loads	Less than 2 kips	<input type="checkbox"/> R* <input checked="" type="checkbox"/> B*
Finish Floor Elevations and type	Not available currently.	<input type="checkbox"/> R* <input checked="" type="checkbox"/> B*
Maximum Floor Loads and size	100 psf	<input type="checkbox"/> R* <input checked="" type="checkbox"/> B*
Settlement Tolerances	1-inch total; ½ inch differential	<input type="checkbox"/> R* <input checked="" type="checkbox"/> B*
<b>GRADING</b>		
Planned grade variations at site, feet	± 2 ft	<input type="checkbox"/> R* <input checked="" type="checkbox"/> B*
Utility Depths	N/A	<input type="checkbox"/> R* <input type="checkbox"/> B*

\*"R" = Requirement indicates specific design information was supplied.

"B" = Report Basis indicates specific design information was not supplied; therefore, this report is based on this parameter.

The geotechnical recommendations presented in this report are based on the available project information for the proposed CMHA Lamplighter Drive project located at 1185 Lamplighter Drive in Columbus, Franklin County, Ohio, and the subsurface materials described in this report. If any of the information noted above is incorrect, please inform PSI in writing so that we may amend the recommendations presented in this report, if necessary. PSI will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.



### 1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to explore the subsurface conditions at the site to prepare recommendations for foundations for the proposed construction. PSI's contracted scope of services included drilling seven (7) soil test borings at the site to depths ranging from 10 to 20 feet below the ground surface, select laboratory testing, and preparation of this geotechnical report. This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and presents recommendations regarding the following:

- A general assessment of area geology based on our local knowledge and study of available geological literature;
- Site preparation as needed for support of foundations, slabs, and pavements;
- Foundation system evaluations and the assessment of the feasibility of utilizing shallow or intermediate foundations;
- General location, description of materials encountered in the borings which may interfere with construction progress or structure performance, including existing fills, cobbles/boulders, or organic soils;
- Design parameters required for the foundation system, including allowable bearing pressure, minimum foundation width, and foundation bearing levels;
- Identification of water levels encountered at the time of drilling;
- If odors, soil staining, or other visually evident indications of possible contamination are found while drilling, the client will be notified, and the conditions will be reported on the boring logs;
- Identify the swell potential of surface soil based on the laboratory tests, and provide recommendations, if any, for potentially swelling soils;
- Recommendation of modulus of subgrade reaction, and analysis of the swell potential of surface soil based on index tests;
- Recommendations for fill including the selection of materials for use and procedures for placement;
- This report incorporating the design parameters and recommendations, with attachments including a boring location drawing, and boring logs.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on, below, or around this site. Any statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

PSI's scope also did not provide any service to investigate or detect the presence of moisture, mold or other biological contaminants in or around any structure, or any service that was designed or intended to prevent or lower the risk of the occurrence or the amplification of the same. The Client should be aware that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. The Client should also be aware that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or reoccurrence of mold amplification.



## 2 SITE AND SUBSURFACE CONDITIONS

### 2.1 SITE LOCATION AND DESCRIPTION

The site for the proposed new building is located at 1185 Lamplighter Drive in Columbus, Franklin County, Ohio. The site latitude and longitude are 39.874° N and 83.035° W, respectively.

Currently, the site consists of an open grass field. The site is bordered by a wooded area to the north, Lamplighter Drive to the south, a tree line to the east, and either residential or commercial buildings to the west. A topographical map was not provided to PSI at the time of this report. Therefore, based on visual observation, the site appears to have approximately 3 feet of relief across the proposed building area and 10 feet of relief across entire site.

### 2.2 SITE GEOLOGY

Based on the geologic map published by the Ohio Geological Survey, the site lies in the Columbus Lowland. Geology consists of loamy, high-lime (west) to medium-lime (east) Wisconsinan-age till and extensive outwash in Scioto Valley over deep Devonian- to Mississippian-age carbonate rocks, shales, and siltstones.

Information obtained from the Ohio Department of Natural Resources (ODNR) website also indicated that no known abandoned mine was recorded in the vicinity of the site area. "Known and Probable Karst in Ohio" map published by ODNR indicates that no known Karst (sink hole) is recorded in the vicinity of the project site.

### 2.3 SUBSURFACE CONDITIONS

The site subsurface conditions were explored with seven (7) soil test boring within the proposed development area on October 21, 2020. The test borings were advanced in the vicinity of the proposed building and parking lot and were terminated at depths ranging from approximately 10 to 20 feet. The surface elevations at the boring should be surveyed prior to construction activities.

The borings were advanced utilizing 3 ¼ inch inside diameter, hollow stem auger drilling methods. Soil samples were routinely obtained during the drilling process. Select soil samples were later tested in the laboratory to obtain soil material properties for the foundation recommendations. Drilling, sampling, and laboratory testing was accomplished in general accordance with ASTM procedures. The laboratory test results are included in each boring log. A description of the classification system and the results of the laboratory tests are included in the Appendix.

**TOPSOIL:** Topsoil was encountered at the surface of the test boring locations ranging in thickness between approximately eight (8) and eleven (11) inches. The topsoil thicknesses should be expected to vary across the site. ***Topsoil thicknesses are included in this report for informational purposes only and should not be used for bidding or estimating purposes.***

**COHESIVE SOILS:** Underlying the surface materials at the boring locations, cohesive soils consisting of **Lean Clay (CL)** with varying degrees of sand and gravel were encountered to termination depths. The Standard Penetration Test values ("N"-values) for the cohesive soils ranged from twelve (12) to fifty-one (51) blows per foot indicating "stiff" to "very hard" consistencies. Two (2) Atterberg limit tests were performed on selected samples of cohesive soils and indicated liquid limits of thirty-three (33) and forty-nine (49) percent and plasticity indices of seventeen



(17) and thirty-two (32), respectively. Moisture contents of the cohesive soils ranged from seven (7) to twenty-five (25) percent.

**GRANULAR SOILS:** Underlying the cohesive soils at boring locations B-1, B-3, and B-4, granular soils consisting of **Silty Sand with Gravel (SM)** were encountered to depths ranging from 7 to 17 feet below existing surface grades. The Standard Penetration Test values (“N”-values) for the granular soils ranged from sixteen (16) to twenty-five (25) blows per foot indicating “medium dense” consistencies. The moisture contents of the granular soils ranged from fourteen (14) to sixteen (16) percent.

The following table briefly summarizes the range of results from the field and laboratory testing programs. Please refer to the attached boring logs and laboratory data sheets for more specific information:

**SUMMARY OF SPT N VALUES, MOISTURE CONTENT & GROUND WATER LEVELS**

Top of Soil Sampling Depth (ft)	SPT N Values								Top of Soil Sampling Depth (ft)	Moisture Content							
	B-1	B-2	B-3	B-4	B-5	B-6	B-7	Average		B-1	B-2	B-3	B-4	B-5	B-6	B-7	Average
1.0	14	13	14	23	22	14	12	16	1.0	17	25	23	11	20	15	17	18
3.5	12	22	23	35	22	14	16	21	3.5	20	14	14	7	11	13	11	13
6.0	14	22	25	16	14	14	32	20	6.0	12	12	15	16	12	15	11	13
8.5	13	20	29	14	30	25	42	25	8.5	22	10	8	11	9	9	8	11
13.5	20	48	36	45	33			36	13.5	14	8	9	8	11			10
18.5	49	29	51	49	42			44	18.5	8	10	9	11	11			10
<b>Groundwater Level Reading and Borehole Caving Depth (ft)</b>																	
<b>Water Level Encountered While Drilling</b>										10.3	-	-	-	-	7.3	-	
<b>Water Level Reading Encountered Upon Completion</b>										13.7	-	-	-	-	-	-	
<b>Caving Depth after Casing Withdrawal</b>										10.1	15.5	14.0	13.3	14.3	6.7	6.5	

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in the Appendix should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, penetration resistances, and locations of the samples and laboratory test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on these boring logs. The samples that were not altered by laboratory testing will be retained for 60 days from the date of this report and then will be discarded.



## 2.4 WATER LEVEL MEASUREMENTS

Groundwater was encountered during activities at boring locations B-1 and B-6 at depths of 10.3 and 7.3 feet, respectively. Upon completion of drilling activities in the test boring B-1, groundwater was measured at a depth of 13.7 feet. Borehole casing depth of between 6.5 and 15.5 feet were observed.

The groundwater level at the site, as well as perched water levels and volumes, will fluctuate based on variations in rainfall, snowmelt, evaporation, surface run-off and other related hydrogeologic factors. The water level measurements presented in this report are the levels that were measured at the time of PSI's field activities. Please refer to the table above for water level measurements in the boring.

## 2.5 LABORATORY TEST RESULTS

Laboratory testing was performed on representative split-spoon samples obtained during drilling. The laboratory tests included natural moisture content, percent fines, and Atterberg Limits. The laboratory test results are summarized in the following table:

**Summary of Laboratory Index Test Results**

Sample Location	Sample Depth (ft)	Moisture Content (%)	Percent Fines (%)	Atterberg Limits			USCS Soil Classification
				LL	PL	PI	
B-1	3.5-5.0	20	70.2	33	16	17	CL
B-7	1.0-2.5	17	78.6	49	17	32	CL



### 3 GEOTECHNICAL EVALUATION

#### 3.1 GEOTECHNICAL DISCUSSION

According to our investigation findings, the following key items are highlighted for the project design and construction:

- Natural soils encountered generally consisted of “stiff” to “hard” clays and “medium dense” sands below a depth of three (3) feet to the termination depths. Groundwater was encountered during activities at boring locations B-1 and B-6 at depths of 10.3 and 7.3 feet, respectively. Upon completion of drilling activities in the test boring B-1, groundwater was measured at a depth of 13.7 feet. Borehole caving depth of between 6.5 and 15.5 feet were observed. Bedrock was not encountered in the test borings.
- The natural soils within the footprint of the proposed building area and properly compacted and documented fill should be capable of supporting the proposed foundations according to our test boring findings. Spread footings for columns and continuous footings for bearing walls, bearing on natural soils or documented engineered fill, can be designed for allowable soil bearing pressures of 4,000 psf and 3,000 psf, respectively. A geotechnical engineer should inspect footing excavations to ensure consistency with the recommended bearing pressure.



## 4 GEOTECHNICAL RECOMMENDATIONS

The following geotechnical related recommendations have been developed based on the subsurface conditions encountered and PSI's understanding of the proposed development. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to our recommendations will be required.

### 4.1 SITE PREPARATION

PSI recommends that topsoil, vegetation, roots, soft, organic, frozen, or unsuitable soils in the construction area be stripped from the site and either wasted or stockpiled for later use in non-structural areas. A representative of the geotechnical engineer should determine and document the depth of removal at the time of construction.

In this region, these otherwise competent clay type soils can undergo a significant loss of stability when construction activities are performed during wetter portions of the year. PSI anticipates that the soils in the project area can become easily disturbed if subjected to conventional rubber tire or narrow track-type equipment. Soils that become disturbed would need to be excavated and replaced; however, this remedial excavation may expose progressively wetter soils with depth, thus compounding the problem condition. Thus, a normal approach to subgrade preparation may not be possible. Appropriate wide-track equipment selection should aid in minimizing potential disturbance.

After stripping to the proposed subgrade level, the subgrade in development areas should be scarified and compacted to at least 98% of the materials' standard proctor maximum dry density, in general accordance with ASTM procedures, to a depth of at least twelve inches below the surface and then proof-rolled with a loaded tandem axle dump truck or similar heavy rubber tired vehicle (typically with an axial load greater than nine tons or meeting specifications outlined in ODOT Item 204 for roadway subgrade compaction and proof-rolling). The subgrade should be compacted or stabilized before proof rolling. Soils that are observed to rut or deflect excessively (typically greater than one inch) under the moving load should be undercut and replaced with properly compacted low plasticity fill material. The proof-rolling and undercutting activities should be witnessed by a representative of the geotechnical engineer and should be performed during a period of dry weather. Care should be taken during construction activities not to allow excessive drying or wetting of exposed soils. If aeration, dry and compaction cannot meet this requirement, chemical stabilization will be required.

After subgrade preparation and observation have been completed, fill placement required to establish grade may begin. Low-plasticity structural fill materials placed beneath the lightly loaded structural features or slabs should be free of organic or other deleterious materials and have a maximum particle size of less than three (3) inches. Low-plasticity soils for this site are defined as having a liquid limit less than forty-five (45) and plasticity index less than twenty (20). The in-situ soils can be reused as engineered fill as long they are **free of organic material** and meet the requirements outlined in this report. A representative of PSI should be on-site to observe, test, and document the placement of the fill. If the fill is too dry, water should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Close moisture content control will be required to achieve the recommended degree of compaction. Modification of the soils using admixtures such as lime, fly ash, kiln dust or cement may be necessary if wet or cool season earthwork is necessary and can be used to lower the plasticity of fat clays to an acceptable level.

Fill should be placed in maximum loose lifts of eight (8) inches and compacted to at least 98% of the materials' standard Proctor maximum dry density, and within a range of the optimum moisture content as designated in



the table below, as determined in general accordance with ASTM procedures. Each lift of compacted-engineered fill should be tested and documented by a representative of the geotechnical engineer prior to placement of subsequent lifts. The edges of compacted fill should extend a minimum of five (5) feet beyond the building footprint, or a distance equal to the depth of fill beneath the footings, whichever is greater. The measurement should be taken from the outside edge of the footing to the toe of the excavation prior to sloping.

Compaction in utility trenches, shallow foundation excavations, and other areas where large compaction equipment cannot be used will require placement of the engineered fill in relatively thin lifts to achieve the required compaction levels using hand equipment. It may be more cost effective to backfill the trenches with flowable fill.

Granular engineered fill should be placed as backfill in the areas where large compaction equipment cannot be used, (i.e., utility trenches, shallow foundation excavations, etc.). PSI recommends the use of material meeting the requirements of ODOT Item 203 Granular Material, for use as granular engineered fill. Engineered fill should be placed in accordance with the recommendations stated in this section of the report. It may be more cost effective to backfill the trenches with flowable fill.

The fill placed should be tested and documented by a geotechnical technician and directed by a Geotechnical Engineer to evaluate the placement of fill material. It should be noted that the Geotechnical Engineer of record can only certify the testing that is performed, and the work observed by that engineer or by staff in direct report to that engineer. The fill should be evaluated in accordance with the following Table:

<b>MATERIAL TESTED</b>	<b>PROCTOR TYPE</b>	<b>MINIMUM % DRY DENSITY</b>	<b>PLACEMENT MOISTURE CONTENT RANGE</b>	<b>FREQUENCY OF TESTING<sup>2</sup></b>
Structural Lean Clay Fill (Cohesive)	Standard	98%	-2 to +3 %	1 per 5,000 ft <sup>2</sup> of fill placed / lift
Structural Fill (Granular)	Standard	98%	-2 to +2 %	1 per 5,000 ft <sup>2</sup> of fill placed / lift
Random Fill (non load bearing)	Standard	90%	-3 to +3 %	1 per 6,000 ft <sup>2</sup> of fill placed / lift
Utility Trench Backfill	Standard	95%	-1 to +3 %	1 per 150 lineal foot / lift

<sup>1</sup>Relative Density as determined in general accordance with ASTM D4253 and D4254. <sup>2</sup> Minimum 2 per lift.

Tested fill materials that do not achieve either the required dry density or moisture content range shall be recorded, the location noted, and reported to the Contractor and Owner. A re-test of that area should be performed after the Contractor performs remedial measures.



## 4.2 FOUNDATION RECOMMENDATIONS

It is PSI's opinion that the planned construction for the proposed building can be supported on conventional spread-type footing foundations bearing on either competent naturally deposited soils or properly compacted and documented engineered fill. If it is desired for the planned foundations to bear on properly compacted and documented fill, the geotechnical engineer should be allowed to review the material so as to ensure its consistency with the recommended bearing pressures. Spread footings for columns and continuous footings for bearing walls, bearing on natural soils or documented engineered fill, can be designed for allowable soil bearing pressures of **4,000 psf and 3,000 psf**, respectively, based on dead load plus design live load.

PSI recommends a minimum dimension of thirty (30) inches for square footings and eighteen (18) inches for continuous footings to minimize the possibility of a local bearing capacity failure.

Exterior footings and footings in unheated areas should be located at a depth of thirty (30) inches or deeper below the final exterior grade to provide adequate frost protection. If the building is to be constructed during the winter months or if footings will likely be subjected to freezing temperatures after foundation construction, then the footings should be protected from freezing. PSI recommends that interior footings be a minimum depth of eighteen (18) inches below the finished floor elevation.

The foundation excavations should be observed and documented by a representative of PSI prior to steel or concrete placement to assess that the foundation materials are consistent with the materials discussed in this report, and therefore are capable of supporting the design loads. Soft or loose soil zones encountered at the bottom of the footing excavations should be removed to the level of suitable soils, and replaced with adequately compacted dense graded aggregate. Granular fill placed below the foundations where unsuitable materials are removed should extend  $\frac{1}{2}$  feet outside the foundation limits for every one foot in thickness between the intended bearing surface and the underlying, suitable natural soils. Cavities formed as a result of excavation of soft or loose soil zones should be backfilled with lean concrete or dense graded compacted crushed stone.

After opening, footing excavations should be observed, and concrete placed as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, the foundation concrete should be placed during the same day the excavation is made. If it is required that footing excavations be left open for more than 1 day, they should be protected to reduce evaporation or entry of moisture.

Based on the known subsurface conditions and site geology, laboratory testing and past experience, PSI anticipates that properly designed and constructed footings supported on the recommended materials should experience total and differential settlement between adjacent columns of less than one (1) inch and  $\frac{3}{4}$  inch, respectively.



### 4.3 EARTHQUAKE AND SEISMIC DESIGN CONSIDERATION

Please note that the project site is located within a municipality that employs the Ohio Building Code (OBC), 2017 edition. As part of this code, the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site.

Part of the IBC code procedure to evaluate seismic forces requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristics of the subsurface profile within the upper 100 feet of the ground surface.

To define the Seismic Site Class for this project, and to the degree PSI discussed with the project design team, PSI has interpreted the results of our soil test borings drilled within the project site and estimated appropriate soil properties below the base of the borings to a depth of 100 feet, as permitted by Section 1613.5.2 of the code. The estimated soil properties were based upon data available in published geologic reports as well as our experience with subsurface conditions in the general site area.

Based on the depth to rock and the estimated shear strength of the soil at the boring locations and the removal of all unsuitable materials and replacement with compacted and tested structural fill, **Site Class “D”** is recommended based on shear strength. The USGS-NEHRP probabilistic ground motion values near latitude 39.874° N and longitude 83.035° W are as follows:

PERIOD (seconds)	2% PROBABILITY OF EVENT IN 50 YEARS (g%)	SITE COEFFICIENTS	MAX. SPECTRAL ACCELERATION PARAMETERS	DESIGN SPECTRAL ACCELERATION PARAMETERS	
0.2 ( $S_s$ )	11.8	$F_a = 1.6$	$S_{ms} = 0.189$	$S_{DS} = 0.126$	$T_0 = 0.154$
1.0 ( $S_1$ )	6.1	$F_v = 2.4$	$S_{m1} = 0.145$	$S_{D1} = 0.097$	$T_s = 0.770$

The Site Coefficients,  $F_a$  and  $F_v$  were interpolated from IBC 2015 Tables 1613.3.3(1) and 1613.3.3(2) as a function of the site classifications and the mapped spectral response acceleration at the short ( $S_s$ ) and 1 second ( $S_1$ ) periods.

According to Section 1803.5.11 and 1803.5.12 of OBC 2017, sites supporting structures in design category “C” and below must be evaluated for slope instabilities, liquefaction and surface rupture due to faulting or lateral spreading. A detailed study of these effects was beyond PSI’s scope of services. However, the following table presents a qualitative assessment of these issues considering the site class, the subsurface soil properties, the groundwater elevation, and probabilistic ground motions:

HAZARD	RELATIVE RISK	COMMENTS
Liquefaction	Low	The soil within the upper 50 feet of the subsurface profile is a relatively dense and/or cohesive soil
Slope Stability	Low	The site is gently sloping and does will incorporate cuts or fill slopes of up to 10 feet
Surface Rupture	Low	The site is not underlain by a mapped Holocene-aged fault



#### 4.4 FLOOR SLAB RECOMMENDATIONS

Floor slabs can be grade supported on naturally occurring soils or properly compacted structural fill. Preparation of floor slab subgrades should be in accordance with recommendations outlined in the *Site Preparation* section of this report. Compaction and proof-rolling, as discussed earlier in this report, should be accomplished to identify soft or unstable soils that should be removed from the floor slab area prior to fill placement and/or floor slab construction and replaced with properly compacted structural fill.

PSI recommends that a minimum four (4) inch thick compactable and trimmable granular material mat be placed beneath the floor slab to enhance drainage to the trench drain system. The soil surface shall be graded to drain away from the building without low spots that can trap water prior to placing the granular drainage layer. Polyethylene sheeting should be placed to act as a vapor retarder where the floor will be in contact with moisture sensitive equipment or products such as tile, wood, carpet, etc., as directed by the design engineer. The decision to locate the vapor retarder in direct contact with the slab or beneath the layer of granular fill should be made by the design engineer after considering the moisture sensitivity of subsequent floor finishes, anticipated project conditions, and the potential effects of slab curling and cracking. The floor slabs should have an adequate number of joints to reduce cracking resulting from differential movement and shrinkage.

For subgrade prepared as recommended and properly compacted fill, a modulus of subgrade reaction,  $k$  value, of 130 pounds per cubic inch (pci) based on a 1' by 1' plate load test, may be used in the grade slab design. However, depending on how the slab load is applied, the value will have to be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesive and cohesionless soil:

$$\text{Modulus of Subgrade Reaction, } k_s = \left( \frac{k}{B} \right) \text{ for cohesive soil and}$$
$$k_s = k \left( \frac{B+1}{2B} \right)^2 \text{ for cohesionless soil}$$

where:  $k_s$  = coefficient of vertical subgrade reaction for loaded area,  
 $k$  = coefficient of vertical subgrade reaction for 1 square foot area, and  
 $B$  = effective width of area loaded, in feet

The precautions listed below should be followed for construction of slab-on-grade pads. These details will not reduce the amount of movement, but are intended to reduce potential damage should some settlement of the supporting subgrade take place. Some increase in moisture content is inevitable as a result of development and associated landscaping. However, extreme moisture content increases can be largely controlled by proper and responsible site drainage, building maintenance and irrigation practices.

Cracking of slab-on-grade concrete is normal and should be expected. Cracking can occur not only as a result of heaving or compression of the supporting soil and/or bedrock material, but also as a result of concrete curing stresses. The occurrence of concrete shrinkage crack, and problems associated with concrete curing may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement, finishing, and curing, and by the placement of crack control joints at frequent intervals, particularly where re-entrant slab corners occur. The American Concrete Institute (ACI) recommends a maximum panel size (in feet) equal to approximately three times the thickness of the slab (in inches) in both directions. For example, joints are recommended at a maximum spacing of twelve (12) feet based on having a 4-inch slab. PSI also recommends that the slab be independent of the foundation walls. Using fiber reinforcement in the concrete can also control shrinkage cracking.



Areas supporting slabs should be properly moisture conditioned and compacted. Backfill in all interior and exterior water and sewer line trenches should be carefully compacted to reduce the shear stress in the concrete extending over these areas.

Exterior slabs should be isolated from the building. These slabs should be reinforced to function as independent units. Movement of these slabs should not be transmitted to the building foundation or superstructure.

#### **4.5 UTILITIES TRENCHING**

Excavation for utility trenches shall be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. It should be noted that utility trench excavations have the potential to degrade the properties of the adjacent fill materials. Utility trench walls that can move laterally can lead to reduced bearing capacity and increased settlement of adjacent structural elements and overlying slabs.

Backfill for utility trenches is as important as the original subgrade preparation or structural fill placed to support either a foundation or slab. Therefore, it is imperative that the backfill for utility trenches be placed to meet the project specifications for the structural fill of this project. PSI recommends that granular material, flowable fill or lean mix concrete be utilized for utility trench backfill. If on-site soils are placed as trench backfill, the backfill for the utility trenches should be placed in four to six inch loose lifts and compacted to a minimum of 98% of the maximum dry density achieved by the standard Proctor test. The backfill soil should be moisture conditioned to be within 2% of the optimum moisture content as determined by the standard Proctor test. Up to four inches of bedding material placed directly under the pipes or conduits placed in the utility trench can be compacted to the 98% compaction criteria with respect to the standard Proctor. Compaction testing should be performed for every 200 cubic yards of backfill place or each lift within 200 linear feet of trench, whichever is less. Backfill of utility trenches should not be performed with water standing in the trench. If granular material is used for the backfill of the utility trench, the granular material should have a gradation that will filter protect the backfill material from the adjacent soils. If this gradation is not available, a geosynthetic non-woven filter fabric should be used to reduce the potential for the migration of fines into the backfill material. Granular backfill material shall be compacted to meet the above compaction criteria. The clean granular backfill material should be compacted to achieve a relative density greater than 75% or as specified by the geotechnical engineer for the specific material used.

#### **4.6 PAVEMENT DESIGN RECOMMENDATIONS**

PSI's scope of services did not include extensive sampling and CBR testing of existing subgrade or potential sources of imported fill for the specific purpose of detailed pavement analysis. Instead, this report is based on pavement-related design parameters that are considered to be typical for the area soils types.

Pavement design will include proper preparation of subgrade sectors, careful design of the pavement area drainage systems and utilization of an aggregate base course with asphalt concrete or concrete surface course. Preparation of pavement subgrades should be in accordance with recommendations outlined in the *Site Preparation* section of this report. Please note that compaction of the upper twelve (12) inches of the subgrade to 98% of the Maximum Dry Density obtained in accordance with ASTM D-698 is recommended in the parking lot pavement area to increase the subgrade strength. Granular engineered fill is recommended in these areas if fill is planned. Careful attention will be required in fine-grading the subgrade surfaces in order to eliminate undulations and depressions that would tend to collect water.



The edges of compacted fill should extend a minimum two (2) feet beyond the edges of the pavement, or a distance equal to the depth of fill beneath the pavement, whichever is greater. The measurement should be taken from the outside edge of the pavement to the toe of the excavation prior to sloping. If preparation is conducted during cool, wet seasons, or if compaction efforts cannot achieve sufficient strength, either chemical stabilization or geogrid and aggregate materials may be required to stabilize the subgrade.

PSI recommends that the exposed surface be proof-rolled and any soft areas removed. Compaction of fill soil intended to support pavement should meet or exceed 98% of the maximum dry density as determined by ASTM D698 (Standard Proctor). The moisture content at the time of compaction should be within 3% of the optimum value. Any removed soil should be replaced by compacted structural fill to arrive at the desired grade.

**Flexible Pavement**

The following pavement design values should be considered the minimum recommended thickness. Based on the assumed traffic information of automobile and light truck traffic, an estimated CBR value of 3, a Terminal Serviceability Index of 2 and a growth rate of 0%, the recommended pavement thickness values are shown in Tables 1 and 2. These design thicknesses assume that a properly prepared subgrade has been achieved.

A layer of filter geofabric (meeting the industrial standard or the Ohio Department of Transportation (ODOT) Construction and Material Specifications of Item 712.09 Type D may be used as reference) is recommended be placed between subgrade soils and aggregate base for this project.

**Table 1: Flexible Pavement Sections**

Layer	Light-Duty*	Standard-Duty
Surface Course	1.5 inches	1.5 inches
Intermediate Course	2.0 inches	4.0 inches
Aggregate Base Course ODOT Item 304	6.0 inches	6.0 inches

\*Parking stalls only.

Allowances for proper drainage and proper material selection of base materials are most important for performance of asphaltic pavements. Ruts and birdbaths in asphalt pavement allow for quick deterioration of the pavement primarily due to saturation of the underlying base and subgrade.

**Rigid Pavement**

The use of concrete for paving has become more prevalent in recent years due to the long-term maintenance cost benefits of concrete compared to asphaltic pavements. Should concrete pavement be utilized, the concrete should be properly reinforced and jointed, and should have a 28-day flexural strength of no less than 600 psi and should be air entrained. Expansion joints should be sealed with a polyurethane sealant so that moisture infiltration into the subgrade soils and resultant concrete deterioration at the joints is reduced.

**Table 2: Rigid Pavement Sections**

Rigid (Concrete) Pavement	Light-Duty*	Standard-Duty
Plain PCC Concrete	4.5 inches	5.0 inches
Aggregate Base Course ODOT Item 304h	4.0 inches	6.0 inches

\*Parking stalls only.



Pavement for any dumpster pad areas or areas subject to consistent heavy loads should be constructed of a minimum of 8 inches of Portland cement concrete with load transfer devices installed where construction joints are required. A thickened edge equal to 20 percent of the pavement thickness and a minimum of 2 inches is recommended on the outside of slabs subjected to wheel loads. This thickened edge usually takes the form of an integral curb, tied shoulders, or thickened pavement tapered in the outer 4 feet of the pavement. Jointing for crack control should have a maximum spacing of 2 times the slab thickness (inches) in feet or for a 5 inch thickness the joints spacing should be a maximum 10 feet. Fill material should be compacted behind the curb or the edge of the outside slabs should be thickened.

Design for drainage is of the utmost importance to minimize detrimental effects that may shorten the service life of the pavements. The pavement should be crowned or sloped to promote effective surface drainage and reduce the risk of water ponding. We recommend a minimum slope of 1.5 percent. In addition, the subgrade should be similarly sloped to promote effective subgrade drainage. We recommend “stub” or “finger” drains be provided around catch-basins and in other low areas of the proposed pavements to limit the accumulation of water on the frost susceptible subgrade soils. Subsurface edge drains should be provided at curbs. Where no curbs are proposed, ditches should be provided, and the pavement base course should be daylighted through the ditch sideslope to facilitate drainage of the base course.

All materials used, and field operations required in connection with the contemplated pavement structures should follow recommendations and procedural details as per the Ohio Department of Transportation, Asphalt Institute, and/or American Concrete Institute.

#### **4.7 PAVEMENT DRAINAGE AND MAINTENANCE**

PSI recommends pavements to be sloped to provide rapid surface drainage. Water allowed to pond on or adjacent to the pavement could saturate the subgrade and cause premature deterioration of the pavements, and removal and replacement may be required. **It must be emphasized that if water is allowed to pond beneath the pavement, then freeze-thaw cycles will cause subsequent heaving of the pavement section (and ultimately failure).** Consideration should be given to the use of interceptor drains to collect and remove water collecting in the granular base. The interceptor drains could be incorporated with the storm drains of other utilities located in the pavement areas.

Periodic maintenance of the pavement should be anticipated. This should include sealing of cracks and joints and by maintaining proper surface drainage to avoid ponding of water on or near the pavement areas. Underdrains, sub-drains and underslab drains presented in this report will not prevent moisture vapor that can cause mold growth.

#### **4.8 SILTATION CONTROL**

The Clean Water Act, implemented in 1990 includes a federal permit program called the National Pollutant Discharge Elimination System (NPDES). This program requires that projects sites more than one (1) acre or are part of a development which exceeds one (1) acre be covered under a permit. This typically includes the development of a storm water pollution prevention plan (SWPPP) as well as period inspections (typically once a week plus after significant rainfall). PSI is available to assist with these services.



## **5 CONSTRUCTION CONSIDERATIONS**

PSI should be retained to provide observation and testing of construction activities involved in the foundation, earthwork, and related activities of this project. PSI cannot accept responsibility for conditions that deviate from those described in this report, nor for the performance of the foundation system if not engaged to also provide construction observation and testing for this project.

### **5.1 MOISTURE SENSITIVE SOILS/WEATHER RELATED CONCERNS**

The upper fine-grained soils encountered at this site will be sensitive to disturbances caused by construction traffic and to changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

### **5.2 DRAINAGE AND GROUNDWATER CONSIDERATIONS**

PSI recommends that the Contractor determine the actual groundwater levels at the site at the time of the construction activities to assess the impact groundwater may have on construction. Water should not be allowed to collect in the foundation excavation or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the foundation. The grades should be sloped away from the foundation and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill area of the foundation.

It is possible that seasonal variations will cause fluctuations or a water table to be present in the upper soils. Additionally, perched water may be encountered in discontinuous zones within the overburden or near the contact with bedrock. Water should be removed from excavations by pumping. Should excessive and uncontrolled amounts of seepage occur, the Geotechnical engineer should be consulted.

### **5.3 EXCAVATIONS**

In Federal Register, Volume 54, Number 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better enhance the safety of workers entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavations, be constructed in accordance with the new OSHA guidelines. It is PSI's understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.



PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations. A trench safety plan was beyond the scope of our services for this project.



## 6 GEOTECHNICAL RISK

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason is the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding section constitutes PSI's professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.



## 7 REPORT LIMITATIONS

The recommendations submitted are based on the available subsurface information obtained by PSI and design details furnished by Moody Nolan. If there are revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation recommendations are required. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

After the plans and specifications are more complete, the geotechnical engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Moody Nolan for the specific application to the proposed CMHA Lamplighter Drive project located at 1185 Lamplighter Drive in Columbus, Franklin County, Ohio.



## **APPENDIX**

Site Location Map  
Boring Location Plan  
Profile  
Boring Logs  
Laboratory Test Results  
USGS Seismic Design Maps  
General Notes  
Unified Soil Classification Chart (USCS)



Note: Base map provided by client; altered for PSI use.



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### Site Vicinity Plan

**CMHA Lamplighter Drive**  
 Columbus, Franklin County, Ohio  
 PSI Project No.: 01021806



Note: Base map provided by client; altered for PSI use.



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## Boring Location Plan

**CMHA Lamplighter Drive**  
 Columbus, Franklin County, Ohio  
 PSI Project No.: 01021806

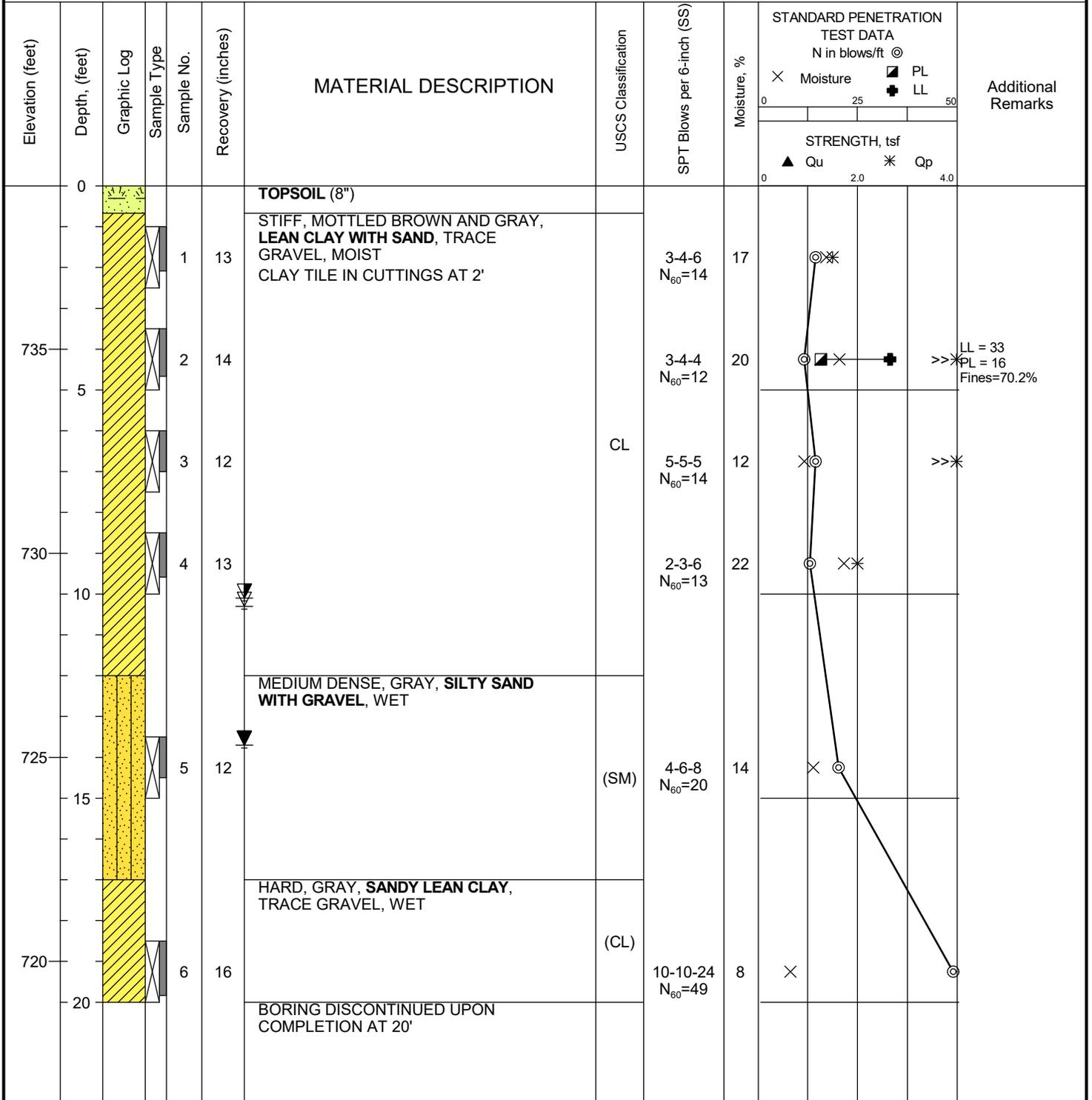
**DATE STARTED:** 10/21/20      **DRILL COMPANY:** PSI, Inc.  
**DATE COMPLETED:** 10/21/20      **DRILLER:** J.E.      **LOGGED BY:** C.W.  
**COMPLETION DEPTH:** 20.0 ft      **DRILL RIG:** CME 45 C ATV 2007  
**BENCHMARK:** N/A      **DRILLING METHOD:** Hollow Stem Auger  
**ELEVATION:** 739 ft      **SAMPLING METHOD:** 2-in SS  
**LATITUDE:** 39.8737°      **HAMMER TYPE:** Automatic  
**LONGITUDE:** -83.0341°      **EFFICIENCY:** 87%  
**STATION:** N/A      **OFFSET:** N/A      **REVIEWED BY:** D.K.

# BORING B-1

<b>Water</b>	▽ While Drilling	10.3 feet
	▼ Upon Completion	13.7 feet
	▽ Caved	10.1 feet

**BORING LOCATION:**

**REMARKS:** N<sub>60</sub> denotes the normalization to 60% efficiency as described in ASTM D4633. Soil symbol in "( )" = Visual Classification



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**PROJECT NO.:** 01021806  
**PROJECT:** CMHA Lamplighter Drive  
**LOCATION:** Grove City  
 Ohio

**DATE STARTED:** 10/21/20      **DRILL COMPANY:** PSI, Inc.  
**DATE COMPLETED:** 10/21/20      **DRILLER:** J.E.      **LOGGED BY:** C.W.  
**COMPLETION DEPTH:** 20.0 ft      **DRILL RIG:** CME 45 C ATV 2007  
**BENCHMARK:** N/A      **DRILLING METHOD:** Hollow Stem Auger  
**ELEVATION:** 741 ft      **SAMPLING METHOD:** 2-in SS  
**LATITUDE:** 39.8731°      **HAMMER TYPE:** Automatic  
**LONGITUDE:** -83.0342°      **EFFICIENCY:** 87%  
**STATION:** N/A      **OFFSET:** N/A      **REVIEWED BY:** D.K.

# BORING B-2

**Water**  
 ∇ While Drilling      feet  
 ▼ Upon Completion      feet  
 ▽ Caved      15.5 feet

**BORING LOCATION:**

**REMARKS:**  $N_{60}$  denotes the normalization to 60% efficiency as described in ASTM D4633. Soil symbol in "( )" = Visual Classification

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		TOPSOIL (11")									
740		STIFF TO HARD, BROWN, SANDY LEAN CLAY, TRACE GRAVEL, MOIST		1	14			3-4-5 $N_{60}=13$	25		>>*
5				2	12			5-6-9 $N_{60}=22$	14		*
735		GRAY BEGINNING AT 7'		3	17			5-7-8 $N_{60}=22$	12		>>*
10				4	17			5-6-8 $N_{60}=20$	10		>>*
730							(CL)				
15				5	16			10-15-18 $N_{60}=48$	8		>>*
725											
20				6	15			7-9-11 $N_{60}=29$	10		>>*
		BORING DISCONTINUED UPON COMPLETION AT 20'									



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**PROJECT NO.:** 01021806  
**PROJECT:** CMHA Lamplighter Drive  
**LOCATION:** Grove City  
 Ohio

**DATE STARTED:** 10/21/20      **DRILL COMPANY:** PSI, Inc.  
**DATE COMPLETED:** 10/21/20      **DRILLER:** J.E.      **LOGGED BY:** C.W.  
**COMPLETION DEPTH:** 20.0 ft      **DRILL RIG:** CME 45 C ATV 2007  
**BENCHMARK:** N/A      **DRILLING METHOD:** Hollow Stem Auger  
**ELEVATION:** 740 ft      **SAMPLING METHOD:** 2-in SS  
**LATITUDE:** 39.8734°      **HAMMER TYPE:** Automatic  
**LONGITUDE:** -83.0343°      **EFFICIENCY:** 87%  
**STATION:** N/A      **OFFSET:** N/A      **REVIEWED BY:** D.K.

# BORING B-3

**Water**  
 ∇ While Drilling      feet  
 ▼ Upon Completion      feet  
 ▽ Caved      14 feet

**BORING LOCATION:**

**REMARKS:**  $N_{60}$  denotes the normalization to 60% efficiency as described in ASTM D4633. Soil symbol in "( )" = Visual Classification

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0	0					<b>TOPSOIL (10")</b>					
				1	12	STIFF TO VERY STIFF, MOTTLED BROWN AND GRAY, <b>SANDY LEAN CLAY</b> , TRACE GRAVEL, MOIST	(CL)	4-5-5 $N_{60}=14$	23	⊗	>>*
				2	13			1-7-9 $N_{60}=23$	14	⊗	>>*
735	5			3	15	MEDIUM DENSE, GRAY, <b>SILTY SAND WITH GRAVEL</b> , MOIST	(SM)	8-8-9 $N_{60}=25$	15	⊗	>>*
				4	12	VERY STIFF TO VERY HARD, GRAY, <b>SANDY LEAN CLAY</b> , TRACE GRAVEL, MOIST SAND LENSE AT 8.0'		5-6-14 $N_{60}=29$	8	⊗	>>*
730	10			5	17		(CL)	9-11-14 $N_{60}=36$	9	⊗	>>*
725	15			6	15			11-16-19 $N_{60}=51$	9	⊗	>>*
720	20					BORING DISCONTINUED UPON COMPLETION AT 20'					



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**PROJECT NO.:** 01021806  
**PROJECT:** CMHA Lamplighter Drive  
**LOCATION:** Grove City  
 Ohio

**DATE STARTED:** 10/21/20      **DRILL COMPANY:** PSI, Inc.  
**DATE COMPLETED:** 10/21/20      **DRILLER:** J.E.      **LOGGED BY:** C.W.  
**COMPLETION DEPTH:** 20.0 ft      **DRILL RIG:** CME 45 C ATV 2007  
**BENCHMARK:** N/A      **DRILLING METHOD:** Hollow Stem Auger  
**ELEVATION:** 742 ft      **SAMPLING METHOD:** 2-in SS  
**LATITUDE:** 39.8735°      **HAMMER TYPE:** Automatic  
**LONGITUDE:** -83.0346°      **EFFICIENCY:** 87%  
**STATION:** N/A      **OFFSET:** N/A      **REVIEWED BY:** D.K.

# BORING B-4

**Water**  
 ∇ While Drilling      feet  
 ▼ Upon Completion      feet  
 ▽ Caved      13.3 feet

**BORING LOCATION:**

**REMARKS:**  $N_{60}$  denotes the normalization to 60% efficiency as described in ASTM D4633. Soil symbol in "( )" = Visual Classification

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks	
0		TOPSOIL (10")										
740	4			1	13	VERY STIFF TO HARD, BROWN, SANDY LEAN CLAY, TRACE GRAVEL, MOIST	(CL)	4-6-10 $N_{60}=23$	11	×	⊙	>>*
5	11			2	11			11-16-8 $N_{60}=35$	7	×	⊙	>>*
735	5			3	10	MEDIUM DENSE, BROWN, SILTY SAND WITH GRAVEL, MOIST	(SM)	2-5-6 $N_{60}=16$	16		⊗	
10	17			4	17	STIFF TO HARD, GRAY, SANDY LEAN CLAY, TRACE GRAVEL, MOIST		5-4-6 $N_{60}=14$	11	×	⊙	>>*
730	15			5	16		(CL)	9-12-19 $N_{60}=45$	8	×	⊙	>>*
725	20			6	17			8-15-19 $N_{60}=49$	11	×	⊙	>>*
						BORING DISCONTINUED UPON COMPLETION AT 20'						



Professional Service Industries, Inc.  
 4960 Vulcan Ave, Suite C  
 Columbus, OH 43228  
 Telephone: (614) 876-8000

**PROJECT NO.:** 01021806  
**PROJECT:** CMHA Lamplighter Drive  
**LOCATION:** Grove City  
 Ohio

**DATE STARTED:** 10/21/20      **DRILL COMPANY:** PSI, Inc.  
**DATE COMPLETED:** 10/21/20      **DRILLER:** J.E.      **LOGGED BY:** C.W.  
**COMPLETION DEPTH:** 20.0 ft      **DRILL RIG:** CME 45 C ATV 2007  
**BENCHMARK:** N/A      **DRILLING METHOD:** Hollow Stem Auger  
**ELEVATION:** 742 ft      **SAMPLING METHOD:** 2-in SS  
**LATITUDE:** 39.8736°      **HAMMER TYPE:** Automatic  
**LONGITUDE:** -83.0349°      **EFFICIENCY:** 87%  
**STATION:** N/A      **OFFSET:** N/A      **REVIEWED BY:** D.K.

# BORING B-5

**Water**  
 ∇ While Drilling      feet  
 ▼ Upon Completion      feet  
 ▽ Caved      14.3 feet

**BORING LOCATION:**

**REMARKS:**  $N_{60}$  denotes the normalization to 60% efficiency as described in ASTM D4633. Soil symbol in "( )" = Visual Classification

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks	
0	0	TOPSOIL (10")										
740	4		1	11	11	STIFF TO HARD, BROWN, SANDY LEAN CLAY, TRACE GRAVEL, MOIST		4-6-9 $N_{60}=22$	20	⊗	>>*	
5	2		14	14	5-7-8 $N_{60}=22$		11	×	⊗	>>*		
735	3		14	14	4-4-6 $N_{60}=14$		12	⊗	⊗	>>*		
10	4		16	16	10-10-11 $N_{60}=30$	(CL)	9	×	⊗	>>*		
730	5		15	15	9-11-12 $N_{60}=33$		11	×	⊗	>>*		
725	6		18	18	10-13-16 $N_{60}=42$		11	×	⊗	>>*		
20	20	BORING DISCONTINUED UPON COMPLETION AT 20'										



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**PROJECT NO.:** 01021806  
**PROJECT:** CMHA Lamplighter Drive  
**LOCATION:** Grove City  
 Ohio

**DATE STARTED:** 10/21/20      **DRILL COMPANY:** PSI, Inc.  
**DATE COMPLETED:** 10/21/20      **DRILLER:** J.E.      **LOGGED BY:** C.W.  
**COMPLETION DEPTH:** 10.0 ft      **DRILL RIG:** CME 45 C ATV 2007  
**BENCHMARK:** N/A      **DRILLING METHOD:** Hollow Stem Auger  
**ELEVATION:** 742 ft      **SAMPLING METHOD:** 2-in SS  
**LATITUDE:** 39.8732°      **HAMMER TYPE:** Automatic  
**LONGITUDE:** -83.0348°      **EFFICIENCY:** 87%  
**STATION:** N/A      **OFFSET:** N/A      **REVIEWED BY:** D.K.

# BORING B-6

<b>Water</b>	▽ While Drilling	7.3 feet
	▼ Upon Completion	feet
	▽ Caved	6.7 feet

**BORING LOCATION:**

**REMARKS:**  $N_{60}$  denotes the normalization to 60% efficiency as described in ASTM D4633. Soil symbol in "( )" = Visual Classification

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0						<b>TOPSOIL (10")</b>					
740				1	11	STIFF TO VERY STIFF, MOTTLED BROWN AND GRAY, <b>SANDY LEAN CLAY</b> , TRACE GRAVEL, MOIST		2-4-6 $N_{60}=14$	15		>>*
5				2	16		(CL)	4-5-5 $N_{60}=14$	13		*
735				3	16			3-5-5 $N_{60}=14$	15		*
				4	15	GRAY AT 8'		5-8-9 $N_{60}=25$	9	X	>>*
10						BORING DISCONTINUED UPON COMPLETION AT 10'					



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 Columbus, OH 43228  
 Telephone: (614) 876-8000

**PROJECT NO.:** 01021806  
**PROJECT:** CMHA Lamplighter Drive  
**LOCATION:** Grove City  
 Ohio

**DATE STARTED:** 10/21/20      **DRILL COMPANY:** PSI, Inc.  
**DATE COMPLETED:** 10/21/20      **DRILLER:** J.E.      **LOGGED BY:** C.W.  
**COMPLETION DEPTH:** 10.0 ft      **DRILL RIG:** CME 45 C ATV 2007  
**BENCHMARK:** N/A      **DRILLING METHOD:** Hollow Stem Auger  
**ELEVATION:** 741 ft      **SAMPLING METHOD:** 2-in SS  
**LATITUDE:** 39.873°      **HAMMER TYPE:** Automatic  
**LONGITUDE:** -83.0347°      **EFFICIENCY:** 87%  
**STATION:** N/A      **OFFSET:** N/A      **REVIEWED BY:** D.K.

# BORING B-7

**Water**  
 ∇ While Drilling      feet  
 ▼ Upon Completion      feet  
 ▽ Caved      6.5 feet

**BORING LOCATION:**

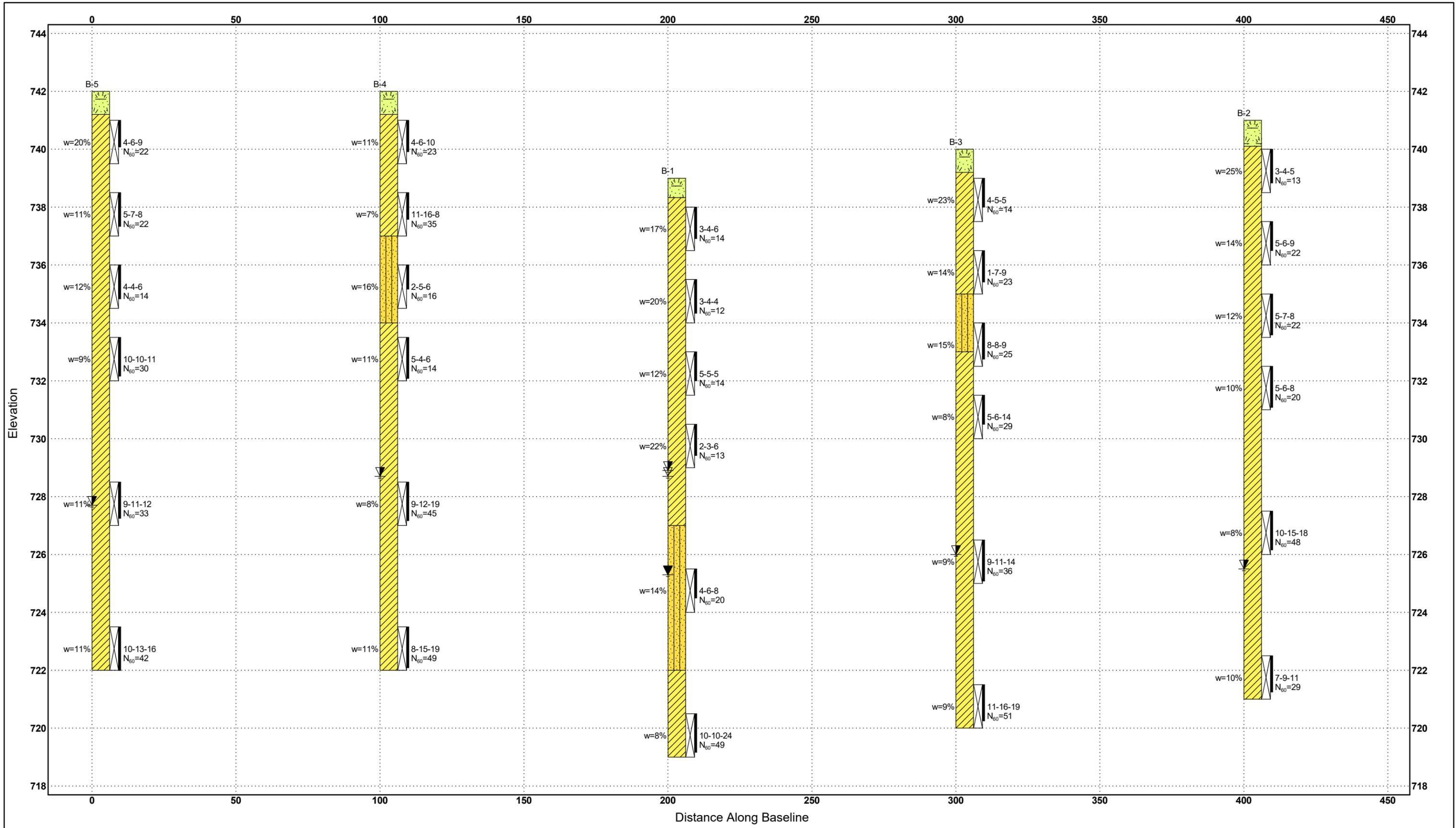
**REMARKS:**  $N_{60}$  denotes the normalization to 60% efficiency as described in ASTM D4633. Soil symbol in "( )" = Visual Classification

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STRENGTH, tsf	Additional Remarks
0		TOPSOIL (10")									
740		STIFF TO HARD, MOTTLED BROWN AND GRAY, LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST		1	13		CL	1-3-5 $N_{60}=12$	17		LL = 49 PL = 17 Fines=78.6%
5				2	16		CL	3-5-6 $N_{60}=16$	11		>>*
735		GRAY AT 7'		3	14		CL	5-8-14 $N_{60}=32$	11		>>*
10				4	16		CL	9-13-16 $N_{60}=42$	8		>>*
		BORING DISCONTINUED UPON COMPLETION AT 10'									



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**PROJECT NO.:** 01021806  
**PROJECT:** CMHA Lamplighter Drive  
**LOCATION:** Grove City  
 Ohio



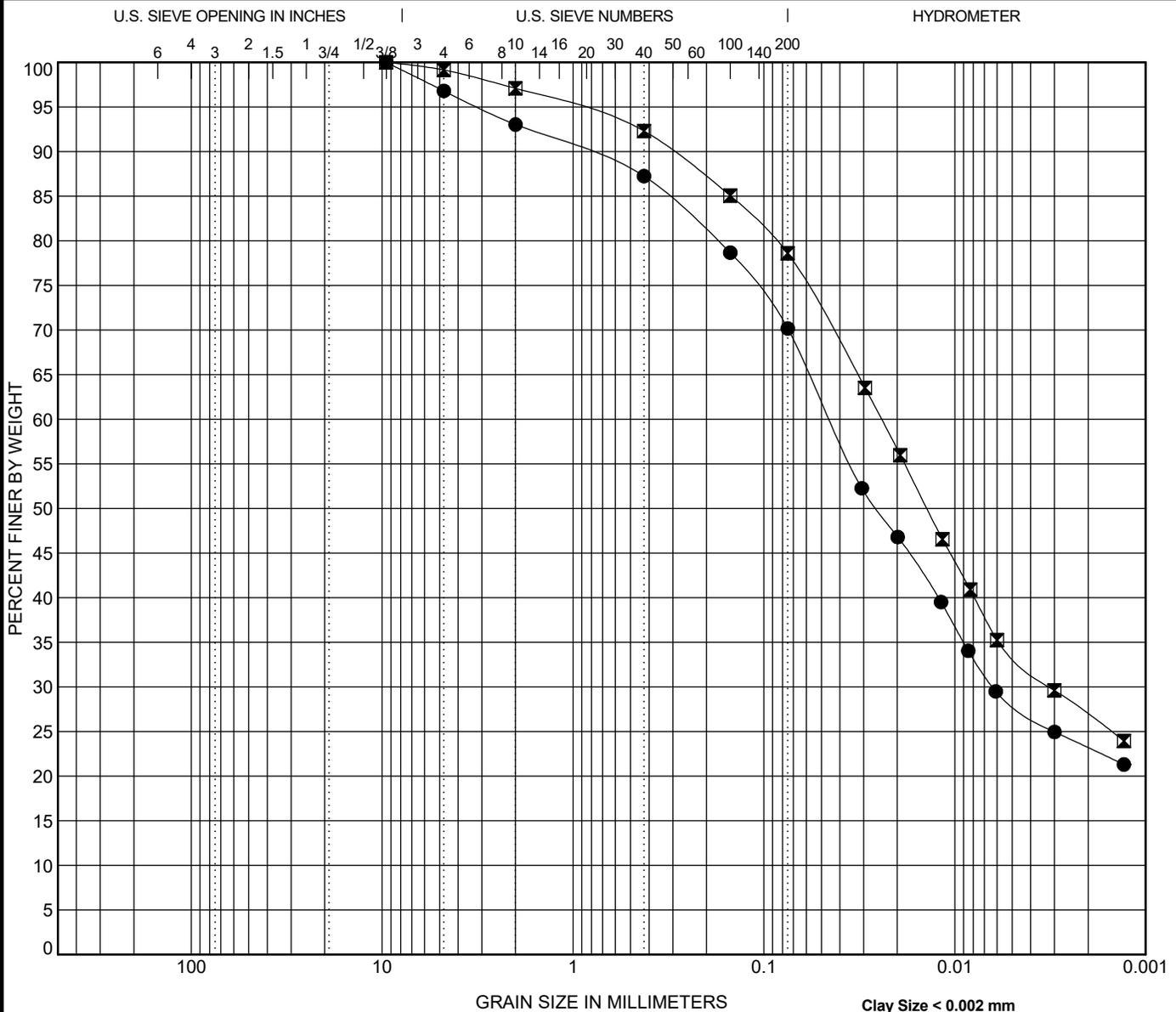
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# Profile

CMHA Lamplighter Drive  
 PSI Project Number: 01021806

Grove City  
 Ohio





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● B-1 4.3	Lean Clay with Sand (CL)	33	16	17		
☒ B-7 1.8	Lean Clay with Sand (CL)	49	17	32		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-1 4.3	9.525	0.045	0.006		3.2	26.6	47.0	23.2
☒ B-7 1.8	9.525	0.024	0.003		0.9	20.5	51.7	26.9



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**GRAIN SIZE DISTRIBUTION**

Project: CMHA Lamplighter Drive  
 PSI Job No.: 01021806  
 Location: Grove City  
 Ohio



# CMHA Lamplighter Drive

Latitude, Longitude: 39.873, -83.035



Map data ©2020

<b>Date</b>	11/11/2020, 1:33:03 PM
<b>Design Code Reference Document</b>	ASCE7-16
<b>Risk Category</b>	II
<b>Site Class</b>	D - Default (See Section 11.4.3)

Type	Value	Description
$S_S$	0.118	$MCE_R$ ground motion. (for 0.2 second period)
$S_1$	0.061	$MCE_R$ ground motion. (for 1.0s period)
$S_{MS}$	0.189	Site-modified spectral acceleration value
$S_{M1}$	0.145	Site-modified spectral acceleration value
$S_{DS}$	0.126	Numeric seismic design value at 0.2 second SA
$S_{D1}$	0.097	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
$F_a$	1.6	Site amplification factor at 0.2 second
$F_v$	2.4	Site amplification factor at 1.0 second
PGA	0.059	$MCE_G$ peak ground acceleration
$F_{PGA}$	1.6	Site amplification factor at PGA
$PGA_M$	0.094	Site modified peak ground acceleration
$T_L$	12	Long-period transition period in seconds
$SsRT$	0.118	Probabilistic risk-targeted ground motion. (0.2 second)
$SsUH$	0.126	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
$SsD$	1.5	Factored deterministic acceleration value. (0.2 second)
$S1RT$	0.061	Probabilistic risk-targeted ground motion. (1.0 second)
$S1UH$	0.067	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
$S1D$	0.6	Factored deterministic acceleration value. (1.0 second)
$PGAd$	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
$C_{RS}$	0.938	Mapped value of the risk coefficient at short periods
$C_{R1}$	0.903	Mapped value of the risk coefficient at a period of 1 s

## GENERAL NOTES

### SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

### DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.	SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
HSA: Hollow Stem Auger - typically 3 1/4" or 4 1/4" I.D. openings, except where noted.	ST: Shelby Tube - 3" O.D., except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry	BS: Bulk Sample
R.C.: Diamond Bit Core Sampler	PM: Pressuremeter
H.A.: Hand Auger	CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings
P.A.: Power Auger - Handheld motorized auger	

### SOIL PROPERTY SYMBOLS

- N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
- N<sub>60</sub>: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
- Q<sub>u</sub>: Unconfined compressive strength, TSF
- Q<sub>p</sub>: Pocket penetrometer value, unconfined compressive strength, TSF
- w%: Moisture/water content, %
- LL: Liquid Limit, %
- PL: Plastic Limit, %
- PI: Plasticity Index = (LL-PL), %
- DD: Dry unit weight, pcf
- ▼, ▼, ▼: Apparent groundwater level at time noted

### RELATIVE DENSITY OF COARSE-GRAINED SOILS

<u>Relative Density</u>	<u>N - Blows/foot</u>
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

### ANGULARITY OF COARSE-GRAINED PARTICLES

<u>Description</u>	<u>Criteria</u>
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

### GRAIN-SIZE TERMINOLOGY

<u>Component</u>	<u>Size Range</u>
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (3/4 in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to 3/4 in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.0075mm to 0.075 mm
Clay:	<0.0075 mm (< 3/64 in.)

### PARTICLE SHAPE

<u>Description</u>	<u>Criteria</u>
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

### RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

## GENERAL NOTES

(Continued)

### CONSISTENCY OF FINE-GRAINED SOILS

<u>Q<sub>u</sub> - TSF</u>	<u>N - Blows/foot</u>	<u>Consistency</u>
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

### MOISTURE CONDITION DESCRIPTION

<u>Description</u>	<u>Criteria</u>
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

### RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

### STRUCTURE DESCRIPTION

<u>Description</u>	<u>Criteria</u>	<u>Description</u>	<u>Criteria</u>
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick	Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick	Lensed:	Inclusion of small pockets of different soils
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing	Layer:	Inclusion greater than 3 inches thick (75 mm)
Slickensided:	Fracture planes appear polished or glossy, sometimes striated	Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
		Parting:	Inclusion less than 1/8-inch (3 mm) thick

### SCALE OF RELATIVE ROCK HARDNESS

<u>Q<sub>u</sub> - TSF</u>	<u>Consistency</u>
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

### ROCK BEDDING THICKNESSES

<u>Description</u>	<u>Criteria</u>
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

### ROCK VOIDS

<u>Voids</u>	<u>Void Diameter</u>
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

### GRAIN-SIZED TERMINOLOGY

<u>(Typically Sedimentary Rock)</u>	
<u>Component</u>	<u>Size Range</u>
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

### ROCK QUALITY DESCRIPTION

<u>Rock Mass Description</u>	<u>RQD Value</u>
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

### DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

# SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS  MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS  (LITTLE OR NO FINES)		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				<b>GC</b>	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS  MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS  (LITTLE OR NO FINES)		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
				<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES
				<b>SC</b>	CLAYEY SANDS, SAND - CLAY MIXTURES
	FINE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS  LIQUID LIMIT LESS THAN 50		<b>ML</b>	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
SILTS AND CLAYS  LIQUID LIMIT GREATER THAN 50			<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
			<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY	
			<b>OH</b>	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
		HIGHLY ORGANIC SOILS		<b>PT</b>	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

## DISCLAIMER

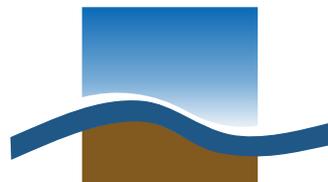
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**Phase I Environmental Site Assessment  
Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio**

Prepared for:

**Korda & Columbus Metropolitan Housing Authority**

**November 4, 2020**



**S P E N C E**  
Environmental  
Consulting, Inc.

**Phase I Environmental Site Assessment  
Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio**

Prepared for:

**Korda & Columbus Metropolitan Housing Authority**

Client: Mr. Christopher Fleming, PE, LEED AP  
Korda  
1650 Watermark Drive  
Columbus, Ohio 43215

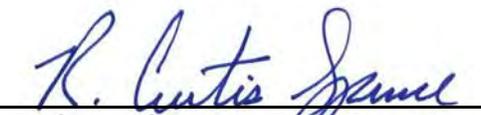
Project No.: Korda-01(20)

Distribution: Mr. Christopher Fleming (Electronic Copy)  
SEC File (Electronic Copy)

Date: November 4, 2020

Prepared by:

  
\_\_\_\_\_  
John W. Mills, Staff Engineer

  
\_\_\_\_\_  
R. Curtis Spence, P.E., President

**Spence Environmental Consulting, Inc.**  
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614.837.4750

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>i</b>
<b>1.0 INTRODUCTION .....</b>	<b>1</b>
1.1 PURPOSE.....	1
1.2 SCOPE OF WORK.....	2
1.3 TERMS AND CONDITIONS .....	2
1.4 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT .....	2
<b>2.0 SITE DESCRIPTION .....</b>	<b>2</b>
2.1 SITE LOCATION.....	2
2.2 SITE AND VICINITY DESCRIPTION.....	3
2.3 CURRENT USE OF SUBJECT SITE .....	3
2.4 DESCRIPTIONS OF ON-SITE STRUCTURES, ROADS, & OTHER IMPROVEMENTS ...	3
2.5 CURRENT USES OF ADJACENT PROPERTIES .....	3
<b>3.0 USER PROVIDED INFORMATION .....</b>	<b>3</b>
<b>4.0 RECORDS REVIEW.....</b>	<b>4</b>
4.1 STANDARD ENVIRONMENTAL RECORD SOURCES .....	4
4.2 AGENCY FILE REVIEW .....	4
4.3 PHYSICAL SETTING SOURCES.....	5
4.3.1 <i>USGS Topographic Map Review</i> .....	5
4.3.2 <i>County Groundwater Resources Map</i> .....	5
4.3.3 <i>County Soil Survey Review</i> .....	5
4.4 HISTORICAL USE AND OWNERSHIP INFORMATION .....	5
4.4.1 <i>Property Ownership Information</i> .....	5
4.4.2 <i>Historical Aerial Photographs</i> .....	5
4.4.3 <i>Historical City Directory Information</i> .....	6
4.4.4 <i>Historical Topographic Maps</i> .....	6
4.4.5 <i>Historical Fire Insurance Maps</i> .....	6
4.4.6 <i>Previous Environmental Report Review</i> .....	6
<b>5.0 INFORMATION FROM SITE RECONNAISSANCE .....</b>	<b>7</b>
5.1 PRESENCE OF HAZARDOUS SUBSTANCES .....	7
5.2 STORAGE TANKS .....	7
5.3 ODORS .....	7
5.4 POOLS OF LIQUID .....	7
5.5 PITS, PONDS, AND LAGOONS .....	7
5.6 DRUMS .....	7
5.7 INDICATIONS OF PCBs .....	7
5.8 STAINS OR CORROSION.....	7
5.9 DRAINS AND SUMPS.....	8
5.10 INDICATIONS OF SOLID WASTE DISPOSAL.....	8
5.11 WASTEWATER, WELLS, SEPTIC SYSTEMS .....	8
5.12 INDICATIONS OF VAPOR MIGRATION.....	8

5.13	ADDITIONAL NON-SCOPE ITEMS PER OHFA HOME/HDAP REQUIREMENTS	8
5.13.1	<i>Asbestos-Containing Materials</i>	8
5.13.2	<i>Lead-Based Paint</i>	8
5.13.3	<i>Histoplasmosis</i>	9
5.13.4	<i>Wetlands</i>	9
5.13.5	<i>Floodplains</i>	9
5.13.6	<i>Underground/Aboveground Storage Tanks &amp; Hazardous Facilities</i>	9
5.13.7	<i>Electromagnetic Fields</i>	9
5.13.8	<i>Buried Petroleum Pipelines and Oil &amp; Gas Wells</i>	9
5.13.9	<i>Drinking Water Wells</i>	10
5.13.10	<i>Site Soil Disturbance</i>	10
5.13.11	<i>Site Waterways</i>	10
5.13.12	<i>Radon Hazards</i>	10
<b>6.0</b>	<b>INTERVIEWS AND ADDITIONAL RECORDS SOURCES</b>	<b>10</b>
6.1	INTERVIEW WITH SITE OWNER	10
6.2	INTERVIEWS WITH LOCAL GOVERNMENT OFFICIALS	10
6.2.1	<i>Local Fire Officials</i>	10
6.2.2	<i>Local Health Officials</i>	11
<b>7.0</b>	<b>FINDINGS</b>	<b>11</b>
<b>8.0</b>	<b>OPINIONS</b>	<b>11</b>
<b>9.0</b>	<b>CONCLUSIONS</b>	<b>11</b>
<b>10.0</b>	<b>DEVIATIONS AND LIMITATIONS</b>	<b>12</b>
<b>11.0</b>	<b>ADDITIONAL NON-SCOPE CONSIDERATIONS</b>	<b>12</b>
11.1	ENVIRONMENTAL LIEN INFORMATION	12
<b>12.0</b>	<b>ENVIRONMENTAL PROFESSIONAL</b>	<b>12</b>

## APPENDICES

### APPENDIX A – FIGURES

FIGURE 1 – USGS TOPOGRAPHIC MAP

FIGURE 2 – SITE PLAN

### APPENDIX B – SITE PHOTOGRAPHS

### APPENDIX C – ENVIRONMENTAL QUESTIONNAIRE BY REPORT USER

### APPENDIX D – ENVIRONMENTAL DATABASE REPORT

### APPENDIX E – HISTORICAL AERIAL PHOTOGRAPHS

### APPENDIX F – HISTORICAL CITY DIRECTORY INFORMATION

### APPENDIX G – HISTORICAL SANBORN™ FIRE INSURANCE MAPS

### APPENDIX H – ADDITIONAL NON-SCOPE SUPPORTING DOCUMENTATION

### APPENDIX I – ENVIRONMENTAL QUESTIONNAIRE COMPLETED BY PROPERTY OWNER

### APPENDIX J – LOCAL GOVERNMENT AGENCY CORRESPONDENCE

## Executive Summary

Included herein is a Phase I Environmental Site Assessment (Phase I ESA) of the vacant commercial land located at 1185 Lamplighter Drive in Grove City, Ohio (the subject site). The subject site measures approximately 4.139 acres in area without structures, situated on an irregularly shaped lot. The majority of the property consists of grassy areas with wooded areas along the eastern and northern portions of the property, a creek along the northern edge of the site, drainage swale on the northern portion of the property, and a concrete sidewalk and Lamplighter Drive along the southern edge of the subject site. The subject site lies in an area dominated by residential and commercial land use. Adjacent properties include undeveloped land to the north and to the east, and senior living apartment facilities to the west and to the south across Lamplighter Drive.

On the date of the site reconnaissance, the subject site consisted of undeveloped land. Review of Franklin County property ownership records indicates that prior to the Elizabeth Morbitzer Trust taking possession of the subject site in 2019, the site had been owned by holdings companies and private individuals since 2005 with no prior ownership information available. Information obtained from the current owner and local government officials and review of historical records reveals that the subject site has consisted of undeveloped land and used only for crop farming dating to at least the early 1900s. SEC did not identify obvious visible evidence or records of current or past underground storage tanks, hazardous spills, dumping, or other potentially hazardous environmental conditions occurring at the subject site.

Based on the information obtained during the performance of this Phase I ESA, the environmental risk associated with the subject site appears to be low.

**This assessment has revealed no evidence of current Recognized Environmental Conditions (RECs) or Controlled Recognized Environmental Conditions (CRECs) in connection with the subject site.** SEC has concluded that the risk of contamination at the subject site is minimal to the extent that further assessment or corrective actions are not recommended.

## 1.0 Introduction

### 1.1 Purpose

This report presents the findings and recommendations of a Phase I Environmental Site Assessment (Phase I ESA) conducted by Spence Environmental Consulting, Inc. (SEC), of the vacant commercial land located at 1185 Lamplighter Drive in Grove City, Ohio (the subject site). This Phase I ESA was performed to advise Korda and Community Metropolitan Housing Authority of Recognized Environmental Conditions identified at the site.

A Recognized Environmental Condition (REC) means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not Recognized Environmental Conditions.

A Controlled Recognized Environmental Condition (CREC) means a REC at the subject site resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). A CREC is a Recognized Environmental Condition.

A Historical Recognized Environmental Condition (HREC) means a past release of any hazardous substances or petroleum products that has occurred in connection with the property that would constitute a REC at the time this Phase I ESA is conducted, but which has been addressed to the satisfaction of the applicable regulatory authority or meets unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).

A Business Environmental Risk (BER) means a risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice. Consideration of business environmental risk issues may involve addressing one

or more non-scope considerations, examples of which are included in SEC proposal number Korda-01(20).

## **1.2 Scope of Work**

This Phase I ESA included: an on-site reconnaissance; general site characterization; the review of federal and state environmental databases, past ownership records, historic aerial photographs; interviews with individuals familiar with the site history; and the preparation of this summary report. The above tasks were performed under the supervision of R. Curtis Spence, P.E., a qualified environmental professional with Spence Environmental Consulting, Inc. The above scope of work was performed in general accordance with on ASTM E 1527-13: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. This Phase I ESA does not include the evaluation of additional issues (non-scope considerations) that may be considered in conjunction with commercial real estate.

## **1.3 Terms and Conditions**

The performance of services by SEC were governed by SEC's General Terms and Conditions for Phase I Environmental Site Assessments, a copy of which was included and incorporated as part of the SEC proposal number Korda-01(20). This Phase I Environmental Site Assessment including the contents of this report was performed for the exclusive use of Korda and Community Metropolitan Housing Authority.

## **1.4 Limitations and Exceptions of Assessment**

SEC performed the Phase I ESA in accordance with the generally accepted practices of environmental consultants performing similar assessments under similar circumstances. No other warranty, expressed or implied, is given by SEC. Furthermore, information contained in this report was provided to SEC by others and SEC is not responsible for the accuracy or completeness of information provided by others.

## **2.0 Site Description**

### **2.1 Site Location**

The subject site is located at 1185 Lamplighter Drive, Grove City, Ohio, Jackson Township, in Franklin County. The subject site is situated on the north side of Lamplighter Drive, approximately 2,000 feet east of Buckeye Parkway. The subject site consists of one parcel of land identified as Franklin County Auditor's parcel number 040-012669-00 (4.139 acres). The site location is indicated on

Figure 1, USGS Topographic Map and Figure 2, Site Plan included in Appendix A of this report.

## **2.2 Site and Vicinity Description**

A site reconnaissance was conducted by John W. Mills with SEC on October 15, 2020, to observe and document subject site conditions. Site photographs are included in Appendix B of this report. The subject site measures approximately 4.139 acres in area without structures, situated on an irregularly shaped lot. The majority of the property consists of grassy areas with wooded areas along the eastern and northern portions of the property, a creek along the northern edge of the site, a drainage swale on the northern portion of the property, and a concrete sidewalk and Lamplighter Drive along the southern edge of the subject site. The subject site lies in an area dominated by residential and commercial land use.

## **2.3 Current Use of Subject Site**

On the date of the site reconnaissance, the subject site consisted of undeveloped land.

## **2.4 Descriptions of On-site Structures, Roads, & Other Improvements**

On the date of the site reconnaissance, the subject site did not contain structures. A creek is located on the northern edge of the site, a drainage swale is located on the northern portion of the property, and a concrete sidewalk and Lamplighter Drive are located along the southern edge of the subject site.

## **2.5 Current Uses of Adjacent Properties**

Adjacent properties include undeveloped land to the north and to the east, and senior living apartment facilities to the west and to the south across Lamplighter Drive.

## **3.0 User Provided Information**

Mr. Mike Wagner, Vice President with Community Metropolitan Housing Authority, the User of this Phase I ESA, completed the ESA User Questionnaire as presented in Appendix C of this report. Mr. Wagner indicated that he is not aware of environmental cleanup liens or property use restrictions against the site parcels, and that he believes the sale price for the subject site property reflects the fair market value. Mr. Wagner indicated that he has no specialized knowledge regarding the subject site.

## 4.0 Records Review

### 4.1 Standard Environmental Record Sources

The environmental database review included the review of ten federal and ten state environmental databases, the report for which is included in Appendix D of this report. The subject site is not listed on the reviewed databases, nor are any adjacent properties listed. The properties listed within distances prescribed by the current ASTM Phase I standard are summarized in the following table.

#### *Environmental Database Summary*

<b>Database (prescribed radius in miles)</b>	<b>Listed Sites</b>
NPL Sites (1 mi.)	0
CERCLIS/SEMS & NFRAP/SEMSARCH (½ mi.)	0
RCRA CORRACTS (1 mi.)	0
RCRA TSD (½ mi.)	0
RCRA Generators (subject site & adjacent)	0
ERNS Reports (subject site)	0
State Spill Sites (¼ mi.)	0
Landfill/Solid Waste (½ mi.)	0
Ohio DERR (½ mi.)	0
Ohio Brownfields (½ mi.)	0
LUST sites (½ mi.)	1
Registered UST sites (subject site & adjacent)	0

#### LUST Listings:

The database review reveals one listing for leaking underground storage tanks (LUSTs) identified by the Ohio Bureau of Underground Storage Tank Regulations (BUSTR) within 0.5 miles of the subject site. This site is listed as requiring no further action (NFA) by BUSTR. The potential for this nearby listed facility to have impacted the subject site appears to be low, due to the nature of this listing and the location relative to the subject site.

### 4.2 Agency File Review

SEC determined that no direct review of regulatory agency files is warranted as part of this Phase I ESA, as neither the subject site nor any adjacent properties are listed in the Standard Environmental Record Sources detailed in Section 4.1 of this report.

### **4.3 Physical Setting Sources**

#### **4.3.1 USGS Topographic Map Review**

The 1988 Revision of the *Commercial Point, Ohio* United States Geological Survey (USGS) 7.5-minute quadrangle map indicates the site elevation ranges from approximately 735 to 740 feet AMSL. Surface grades in the site vicinity generally slope to the east, toward an unnamed tributary of the Scioto River, which runs along the north edge of the subject site.

#### **4.3.2 County Groundwater Resources Map**

The *Ground-Water Resources of Franklin County, Ohio*, 1993 Revision, published by the Ohio Department of Natural Resources (ODNR) - Division of Water indicates that the principal groundwater source in the site area is limestone-dolomite bedrock, with typical groundwater yields of as much as 250 gallons per minute.

#### **4.3.3 County Soil Survey Review**

According to the *Soil Survey of Franklin County, Ohio*, soils in the vicinity of the subject site are indicated to be primarily moderately well to somewhat poorly drained silt loam and silty clay loam soils of 2 to 12 percent slope. (*Crosby (CrB)*, *Celina (CeB)*, *Miamian (MIC2)* soil type).

### **4.4 Historical Use and Ownership Information**

Review of Franklin County property ownership records indicates that prior to the Elizabeth Morbitzer Trust taking possession of the subject site in 2019, the site had been owned by holdings companies and private individuals since 2005 with no prior ownership information available. Information obtained from the current owner and local government officials and review of historical records reveals that the subject site has consisted of undeveloped land and used only for crop farming dating to at least the early 1900s.

#### **4.4.1 Property Ownership Information**

Franklin County property ownership records available online indicate that the site parcel has been owned by holding companies and private individuals dating to 2004 with no prior ownership information available.

#### **4.4.2 Historical Aerial Photographs**

SEC reviewed aerial photographs of the site vicinity dated 1938, 1953, 1963, 1973, 1979, 1985, 1994, 2004, 2010, and 2019 obtained from GeoSearch, Inc.

Copies of the reviewed aerial photographs are included in Appendix E of this report.

The subject site is shown as undeveloped and containing farm fields and undeveloped land in the 1938 through 2019 aerial photographs. Structures consistent with the current senior living apartment complexes adjacent to the subject site to the south and west appear beginning in the 2013 and 2017 aerial photographs.

#### **4.4.3 Historical City Directory Information**

SEC reviewed historical city directories for the site vicinity obtained from GeoSearch, Inc., dated from 2005 through 2019 at approximately five-year intervals. A summary of city directory information available for the subject site and nearby properties is included in Appendix F of this report. The first listings for the vicinity of the subject site appear in the 2005 directory, and the subject site is not listed in the historical city directories. Adjacent listings of note have included apartments and senior assisted living facility listings.

#### **4.4.4 Historical Topographic Maps**

The 1923 *West Columbus, Ohio* 15 Minute Quadrangle USGS Topographic map indicates that the subject site was undeveloped and without structures at that time.

#### **4.4.5 Historical Fire Insurance Maps**

SEC requested historical Sanborn™ fire insurance maps for the site vicinity from GeoSearch, Inc., who responded with a no coverage letter indicating no Sanborn™ maps were available for the site. Generally, the absence of Sanborn™ maps for a given area suggests that the area was not significantly developed prior to the 1960s. A copy of GeoSearch, Inc.'s no coverage letter is included in Appendix G of this report.

#### **4.4.6 Previous Environmental Report Review**

During the course of this Phase I ESA, SEC was not made aware of prior Environmental Site Assessments or other similar environmental reports prepared for the subject site.

## **5.0 Information from Site Reconnaissance**

### **5.1 Presence of Hazardous Substances**

No hazardous substances were noted at the subject site on the date of the site reconnaissance other than potential hazardous substances present in commercial building materials, household chemicals, and related equipment.

### **5.2 Storage Tanks**

SEC did not identify obvious visible evidence or records of aboveground or underground storage tanks (ASTs or USTs) currently or historically used at or adjacent to the subject site.

### **5.3 Odors**

No apparent unusual odors were noted on the subject site during the site visit.

### **5.4 Pools of Liquid**

No apparent pools of liquid were observed on the subject site during the site visit.

### **5.5 Pits, Ponds, and Lagoons**

SEC observed the presence of a drainage swale on the northern portion of the subject site, and two storm water ponds adjacent to the north of the subject site.

### **5.6 Drums**

SEC identified no apparent surficial indications of drums on the subject site during the site visit.

### **5.7 Indications of PCBs**

No apparent potential PCB-containing equipment was observed at the subject site during the site visit.

### **5.8 Stains or Corrosion**

No apparent staining or corrosion was observed during the site visit.

## **5.9 Drains and Sumps**

SEC observed the presence of storm sewer catch basins which appear to be connect to a municipal storm sewer utility located adjacent to the south of the site along Lamplighter Drive.

## **5.10 Indications of Solid Waste Disposal**

SEC did not identify obvious visible evidence or records of current or historical on-site solid waste disposal at the subject site.

## **5.11 Wastewater, Wells, Septic Systems**

No apparent wells, septic systems, cesspools, or other sources of wastewater were observed during the site visit.

## **5.12 Indications of Vapor Migration**

In the performance of this Phase I ESA, SEC has considered the potential for migration of hazardous substances or petroleum products in vapor form in the subsurface of the subject site, per the requirements of ASTM E 1527-13. In consideration of potential environmental hazards posed by vapor migration, SEC has taken into account relevant factors, including the nature and location of the potential source of hazardous vapors, subsurface conditions and features between the potential source and the subject site, and the condition and current use of the subject site. SEC did not identify evidence indicating the likelihood of migration of hazardous substances or petroleum products in vapor form in the subsurface of the subject site. SEC did not conduct a formal ASTM E 2600-10 Vapor Encroachment Screening of the subject site as part of this Phase I ESA.

## **5.13 Additional Non-Scope Items per OHFA HOME/HDAP Requirements**

### **5.13.1 Asbestos-Containing Materials**

On the date of the site reconnaissance, the subject site did not contain structures. No obvious signs of friable asbestos materials were observed on the date of the site reconnaissance.

### **5.13.2 Lead-Based Paint**

On the date of the site reconnaissance, the subject site did not contain structures. No obvious signs of lead hazards were observed on the date of the site reconnaissance.

### **5.13.3 Histoplasmosis.**

On the date of the site reconnaissance, the subject site did not contain structures.

### **5.13.4 Wetlands**

The subject site is undeveloped and contains a drainage swale on the northern portion of the property, and the site appeared to be well-drained. SEC obtained a USFWS Wetlands Map from the US Fish and Wildlife Service website, included in Appendix H of this report, which does not appear to identify wetland conditions at the site, while two freshwater ponds are located adjacent to the north of the subject site across an apparent creek. The USFWS Wetlands website states the following disclaimer: "The map displays at this site show wetland type and extent using a biological definition of wetlands. There is no attempt to define the limits of proprietary jurisdiction of any Federal, state, or local government, or to establish the geographical scope of the regulatory programs of government agencies." SEC did not conduct a wetland survey as part of this Phase I ESA.

### **5.13.5 Floodplains**

The subject site does not lie within a FEMA-designated 100-year floodplain, per the Floodplain FIRMette for the site vicinity included in Appendix H of this report.

### **5.13.6 Underground/Aboveground Storage Tanks & Hazardous Facilities**

SEC did not identify obvious visible evidence or records of aboveground or underground storage tanks (ASTs or USTs) currently or historically used at or adjacent to the subject site.

### **5.13.7 Electromagnetic Fields**

SEC did not observe obvious visible evidence of high-voltage overhead electric transmission lines in the site vicinity on the date of the site reconnaissance.

### **5.13.8 Buried Petroleum Pipelines and Oil & Gas Wells**

SEC reviewed a US Pipeline Map System map and Ohio Department of Natural Resources records for the site vicinity which do not indicate buried petroleum transportation pipelines located within 220 yards of the subject site or oil and gas wells at the subject site. Likewise, SEC did not observe markings within 220 yards of the subject site signifying the presence of such buried pipelines on the date of the site reconnaissance. Copies of the reviewed maps are included in Appendix H of this report.

### **5.13.9 Drinking Water Wells**

SEC consulted Ohio Department of Natural Resources records for the site vicinity, which do not indicate water wells recorded at the subject site. A copy of the reviewed ODNR records is included in Appendix H of this report.

### **5.13.10 Site Soil Disturbance**

SEC did not observe obvious visible indications of extensive surface soil filling or stained surface soils at the subject site on the date of the site reconnaissance. SEC observed the presence of a drainage swale on the northern portion of the subject site.

### **5.13.11 Site Waterways**

SEC did not observe obvious visible indications of surface waterways at the subject site on the date of the site reconnaissance. SEC observed the presence of a drainage swale on the northern portion of the subject site.

### **5.13.12 Radon Hazards**

SEC consulted the Ohio Radon Map prepared by the United States EPA to determine the potential radon risk designation for the site vicinity. As indicated on the Ohio Radon Map (included in Appendix H of this report), Franklin County, in which the subject site is located, carries a designation of "Zone 1 - Highest Potential (greater than 4 pCi/L of radon)".

## **6.0 Interviews and Additional Records Sources**

### **6.1 *Interview with Site Owner***

Ms. Elizabeth Morbitzer, Trustee with the Elizabeth Morbitzer Trust, the current owner of the subject site, completed a Property Owner Phase I ESA Questionnaire for the subject site. The questionnaire is included in Appendix I of this report. Ms. Morbitzer indicated that she has no knowledge of any hazardous spills or other environmental conditions occurring at the subject site.

### **6.2 *Interviews with Local Government Officials***

#### **6.2.1 Local Fire Officials**

SEC requested information from the Jackson Township Fire Department regarding records of underground storage tanks, hazardous spills, fires, or other matters of an environmental nature at the subject site. Ms. Jenny Thomas with

the Jackson Township Fire Department responded with an email on October 28, 2020, which indicated that their department has no records of aboveground storage tanks, hazardous materials storage, or responses to the subject site. The Jackson Township Fire Department correspondence is included in Appendix J of this report.

### **6.2.2 Local Health Officials**

SEC requested information from the Franklin County Health Department regarding records of hazardous spills or other matters relating to environmental health at the subject site. As of the date of this report's publication, the Franklin County Health Department has not responded to SEC's request for information regarding the subject site.

## **7.0 Findings**

On the date of the site reconnaissance, the subject site consisted of undeveloped land. Review of Franklin County property ownership records indicates that prior to the current owner taking possession of the subject site in 2019, the site had been owned by holdings companies and private individuals since 2005 with no prior ownership information available. Information obtained from the current owner and local government officials and review of historical records reveals that the subject site has consisted of undeveloped land and used only for crop farming dating to at least the early 1900s. SEC did not identify obvious visible evidence or records of current or past underground storage tanks, hazardous spills, dumping, or other potentially hazardous environmental conditions occurring at the subject site.

## **8.0 Opinions**

Based on the information obtained during the performance of this Phase I ESA, the environmental risk associated with the subject site appears to be low.

## **9.0 Conclusions**

SEC has performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM Practice E 1527-13 of the vacant commercial property at 1185 Lamplighter Drive, Grove City, Ohio (the subject site). Any exceptions to, or deletions from, this practice are described in

Section 10.0 of this report. **This assessment has revealed no evidence of current Recognized Environmental Conditions (RECs) or Controlled Recognized Environmental Conditions (CRECs) in connection with the subject site.** SEC has concluded that the risk of contamination at the subject site is minimal to the extent that further assessment or corrective actions are not recommended.

## **10.0 Deviations and Limitations**

SEC performed this Phase I ESA in general accordance with ASTM 1527-13. SEC did not perform the inspection of portions of the subject site that were not accessible and/or were not designed for human occupancy including the building roofs, building crawl spaces, sewer manways, etc. SEC did not encounter significant operational limitations or data gaps in the course of this Phase I ESA.

## **11.0 Additional Non-Scope Considerations**

### ***11.1 Environmental Lien Information***

To meet the requirements of ASTM E 1527-13 and “all appropriate inquiries”, a search for the existence of environmental liens or activity and use limitations that are filed or recorded against the property must be conducted by or on the behalf of the User. These documents can be commonly found within recorded land title records. The user did not provide SEC with recorded land title records for the subject site nor did the User authorize SEC to perform a recorded land title records review as a part of this assessment. This could result in a determination that “all appropriate inquiries” was not completed. However, the User indicated they are not aware of any environmental liens or activity and use limitations recorded against the property.

## **12.0 Environmental Professional**

R. Curtis Spence, P.E., is a registered professional engineer in Ohio and has over 25 years of relevant, full-time environmental consulting experience. John W. Mills has over 7 years of relevant, full-time environmental consulting experience. R. Curtis Spence, P.E. and John W. Mills meet the definition of environmental professionals as defined in Section X2 of ASTM E1527-13, and Section 312.10 of 40 CFR 312. The Environmental Professional declares:

“I declare that, to best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312.” and,

“I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in Section 312.10 of 40 CFR 312.”

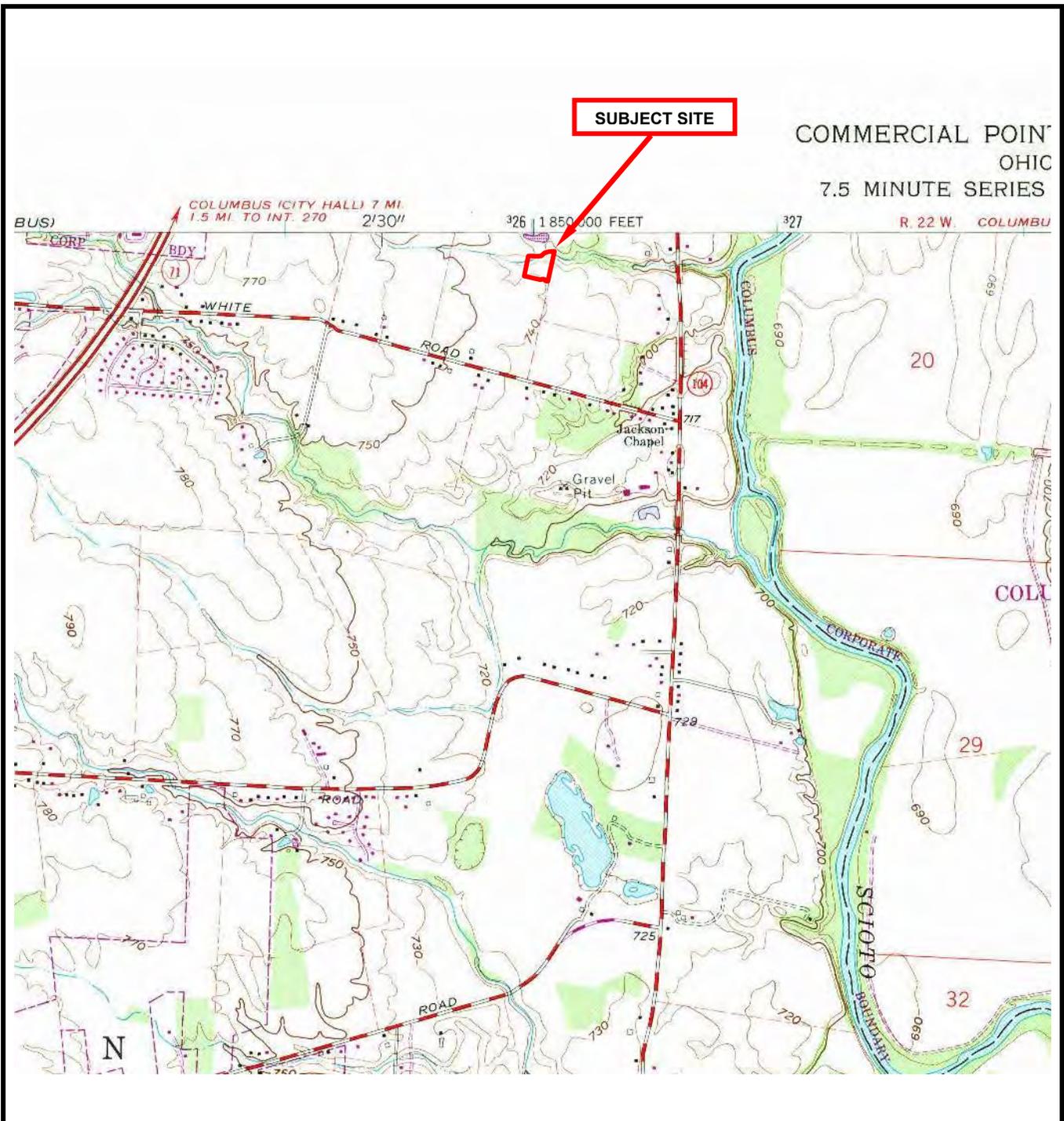
The Environmental Professional’s signature is included on the signature page at the front of the Phase I ESA report for the subject property.

## **Appendix A**

### **Figures**

**Figure 1 – USGS Topographic Map**

**Figure 2 – Site Plan**



Commercial Point, Ohio 7.5 minute series USGS Quadrangle, 1988 Revision



SCALE: 1" = ± 2,000'

**FIGURE 1 – USGS Topographic Map**  
 Vacant Commercial Land  
 1185 Lamplighter Drive  
 Grove City, Ohio





2019 Orthophoto Courtesy of Franklin County Local Government Agencies



SCALE: 1" = ± 150'

**FIGURE 2 – Site Map**  
Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio



**Appendix B**  
**Site Photographs**



View along southern edge of subject site,  
facing west.



View along eastern edge of subject site,  
facing north.



View along eastern edge of subject site,  
facing south.



View along northern edge of subject site,  
facing west.



View along northern edge of subject site,  
facing east.



View along western edge of subject site,  
facing south.



View along western edge of subject site, facing north.



View along southern edge of subject site, facing east.



View across subject site, facing northeast.



View of drainage swale on northern portion of subject site, facing north.



View of adjacent senior living apartment complex south of subject site across Lamplighter Drive, facing south.



View of adjacent undeveloped land east of subject site, facing east.



View of adjacent undeveloped property north of subject site, facing north.



View of adjacent senior living apartment complex west of subject site, facing northwest.

## **Appendix C**

### **Environmental Questionnaire Completed by Report User**



Property Address: 1185 Lamplighter Drive, Grove City, Ohio

User\*:

Name (Printed): MIKE WAGNER

Signature: 

**5. Commonly known or reasonably ascertainable information about the property (40 CFR 312.30).**

Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example, as user,

(a.) Do you know the past uses of the property?

(b.) Do you know the specific chemicals that are present or once were present at the property?

(c.) Do you know of spills or other chemical releases that have taken place at the property?

(d.) Do you know of any environmental cleanups that have taken place at the property?

NO

**6. The degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).**

As the user of this ESA, based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of contamination at the property?

NO

Please attach additional information as needed.

Please return completed questionnaire to Spence Environmental Consulting, Inc. by email, or by fax at 614.837.4755.

**Appendix D**  
**Environmental Database Report**

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## **Radius Report**

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[GeoLens by GeoSearch](#)

*Target Property:*  
**Vacant Commercial Land**  
**1185 Lamplighter Dr**  
**Grove City, Franklin County, Ohio 43123**

*Prepared For:*  
**Spence Environmental Consulting Inc**

**Order #: 155352**  
**Job #: 377434**  
**Project #: Korda-01(20)**  
**Date: 10/09/2020**

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## Table of Contents

---

<i>Target Property Summary</i> . . . . .	1
<i>Database Summary</i> . . . . .	2
<i>Database Radius Summary</i> . . . . .	6
<i>Radius Map</i> . . . . .	10
<i>Ortho Map</i> . . . . .	12
<i>Topographic Map</i> . . . . .	13
<i>Located Sites Summary</i> . . . . .	14
<i>Site Summary By Database</i> . . . . .	15
<i>Elevation Summary</i> . . . . .	16
<i>Unlocated Sites Summary</i> . . . . .	20
<i>Environmental Records Definitions</i> . . . . .	21
<i>Unlocatable Report</i> . . . . .	See Attachment
<i>Zip Report</i> . . . . .	See Attachment

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## Disclaimer

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*This report was designed by GeoSearch to meet or exceed the records search requirements of the All Appropriate Inquiries Rule (40 CFR § 312.26) and the current version of the ASTM International E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process or, if applicable, the custom requirements requested by the entity that ordered this report. The records and databases of records used to compile this report were collected from various federal, state and local governmental entities. It is the goal of GeoSearch to meet or exceed the 40 CFR § 312.26 and E1527 requirements for updating records by using the best available technology. GeoSearch contacts the appropriate governmental entities on a recurring basis. Depending on the frequency with which a record source or database of records is updated by the governmental entity, the data used to prepare this report may be updated monthly, quarterly, semi-annually, or annually.*

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## Target Property Summary

### **Target Property Information**

Vacant Commercial Land  
1185 Lamplighter Dr  
Grove City, Ohio 43123

#### **Coordinates**

Area centroid (-83.034400, 39.8734182)  
740 feet above sea level

#### **USGS Quadrangle**

Commercial Point, OH

### **Geographic Coverage Information**

**County/Parish:** Franklin (OH)

**ZipCode(s):**

Grove City OH: 43123

Lockbourne OH: 43137

Columbus OH: 43207, 43223

## Database Summary

### FEDERAL LISTING

#### Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	<a href="#">ERNSOH</a>	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	<a href="#">EC</a>	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	<a href="#">LUCIS</a>	0	0	TP/AP
RCRA SITES WITH CONTROLS	<a href="#">RCRASC</a>	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	<a href="#">RCRAGR05</a>	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	<a href="#">RCRANGR05</a>	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	<a href="#">BF</a>	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	<a href="#">DNPL</a>	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	<a href="#">NLRRCRAT</a>	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	<a href="#">RCRAT</a>	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	<a href="#">SEMS</a>	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	<a href="#">SEMSARCH</a>	0	0	0.5000
NATIONAL PRIORITIES LIST	<a href="#">NPL</a>	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	<a href="#">NLRRCRAC</a>	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	<a href="#">PNPL</a>	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	<a href="#">RCRAC</a>	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	<a href="#">RCRASUBC</a>	0	0	1.0000
<b>SUB-TOTAL</b>		0	0	

#### Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	<a href="#">AIRSAFS</a>	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	<a href="#">BRS</a>	0	0	TP/AP
CERCLIS LIENS	<a href="#">SFLIENS</a>	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	<a href="#">CDL</a>	0	0	TP/AP
EPA DOCKET DATA	<a href="#">DOCKETS</a>	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	<a href="#">ECHOR05</a>	0	0	TP/AP
FACILITY REGISTRY SYSTEM	<a href="#">FRSOH</a>	0	0	TP/AP

## Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	<a href="#">HMIRSR05</a>	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	<a href="#">HWCD</a>	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	<a href="#">ICIS</a>	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	<a href="#">ICISNPDES</a>	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	<a href="#">MLTS</a>	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	<a href="#">NPDESR05</a>	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	<a href="#">PADS</a>	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	<a href="#">PCSR05</a>	0	0	TP/AP
SEMS LIEN ON PROPERTY	<a href="#">SEMCLIENS</a>	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	<a href="#">SSEHRIPFAS</a>	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	<a href="#">SSTS</a>	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	<a href="#">TSCA</a>	0	0	TP/AP
TOXICS RELEASE INVENTORY	<a href="#">TRI</a>	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	<a href="#">ALTFUELS</a>	0	0	0.2500
FEMA OWNED STORAGE TANKS	<a href="#">FEMAUST</a>	0	0	0.2500
HISTORICAL GAS STATIONS	<a href="#">HISTPST</a>	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	<a href="#">ICISCLEANERS</a>	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	<a href="#">MSHA</a>	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	<a href="#">MRDS</a>	0	0	0.2500
OPEN DUMP INVENTORY	<a href="#">ODI</a>	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	<a href="#">SMCRA</a>	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	<a href="#">USUMTRCA</a>	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	<a href="#">DOD</a>	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	<a href="#">NMS</a>	0	0	1.0000
FORMERLY USED DEFENSE SITES	<a href="#">FUDS</a>	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	<a href="#">FUSRAP</a>	0	0	1.0000
RECORD OF DECISION SYSTEM	<a href="#">RODS</a>	0	0	1.0000
<b>SUB-TOTAL</b>		0	0	

## Database Summary

### STATE (OH) LISTING

#### Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
ENGINEERING CONTROLS REGISTRY	<a href="#">DERREC</a>	0	0	TP/AP
INSTITUTIONAL CONTROLS	<a href="#">DERRIC</a>	0	0	TP/AP
SITES WITH CONTROLS	<a href="#">SC</a>	0	0	TP/AP
UNDERGROUND STORAGE TANK FACILITIES	<a href="#">UST</a>	0	0	0.2500
ABANDONED DUMPS AND LANDFILLS	<a href="#">OLDSWLF</a>	0	0	0.5000
BROWNFIELD INVENTORY DATABASE	<a href="#">BF</a>	0	0	0.5000
HISTORIC WASTE SITES	<a href="#">HWS</a>	0	0	0.5000
LEAKING UNDERGROUND STORAGE TANK FACILITIES	<a href="#">LUST</a>	1	0	0.5000
NON-REGULATED AND REGULATED FACILITIES WITH RELEASES	<a href="#">NRLST</a>	1	0	0.5000
OHIO DIVISION OF ENVIRONMENTAL RESPONSE AND REVITALIZATION DATABASE	<a href="#">DERR</a>	0	0	0.5000
SOLID WASTE FACILITIES	<a href="#">SWF</a>	0	0	0.5000
VOLUNTARY ACTION PROGRAM SITES	<a href="#">VAPS</a>	0	0	0.5000
<b>SUB-TOTAL</b>		<b>2</b>	<b>0</b>	

#### Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CESSATION OF REGULATED OPERATIONS FACILITIES	<a href="#">CRO</a>	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMITS	<a href="#">NPDES</a>	1	0	TP/AP
PERMIT BY RULE AIR FACILITIES	<a href="#">AIRS</a>	0	0	TP/AP
SPILLS LISTING	<a href="#">SPILLS</a>	0	0	TP/AP
UNDERGROUND INJECTION CONTROL WELLS	<a href="#">UIC</a>	0	0	TP/AP
URBAN SETTING DESIGNATIONS	<a href="#">DERRUSD</a>	0	0	TP/AP
DRY CLEANING FACILITIES	<a href="#">CLEANERS</a>	0	0	0.2500
SLUDGE DUMP SITES	<a href="#">SLUDGEDUMPS</a>	0	0	0.5000
COAL GAS GENERATOR SITES	<a href="#">TOWNGAS</a>	0	0	1.0000
<b>SUB-TOTAL</b>		<b>1</b>	<b>0</b>	

## Database Summary

### **TRIBAL LISTING**

#### **Standard Environmental Records**

<b>Database</b>	<b>Acronym</b>	<b>Locatable</b>	<b>Unlocatable</b>	<b>Search Radius (miles)</b>
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	<a href="#">USTR05</a>	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	<a href="#">LUSTR05</a>	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	<a href="#">ODINDIAN</a>	0	0	0.5000

SUB-TOTAL		0	0	
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#### **Additional Environmental Records**

<b>Database</b>	<b>Acronym</b>	<b>Locatable</b>	<b>Unlocatable</b>	<b>Search Radius (miles)</b>
INDIAN RESERVATIONS	<a href="#">INDIANRES</a>	0	0	1.0000

SUB-TOTAL		0	0	
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TOTAL		3	0	
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## Database Radius Summary

### FEDERAL LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
<b>EC</b>	<b>0.0200</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
ECHOR05	0.0200	0	NS	NS	NS	NS	NS	0
<b>ERNSOH</b>	<b>0.0200</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
FRSOH	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR05	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
<b>LUCIS</b>	<b>0.0200</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDES05	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR05	0.0200	0	NS	NS	NS	NS	NS	0
<b>RCRASC</b>	<b>0.0200</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
<b>RCRAGR05</b>	<b>0.1250</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>RCRANGR05</b>	<b>0.1250</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
<b>BF</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>DNPL</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>NLRRCRAT</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>

## Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
<b>RCRAT</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>SEMS</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>SEMSARCH</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
<b>NLRRCRAC</b>	<b>1.0000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>0</b>
NMS	1.0000	0	0	0	0	0	NS	0
<b>NPL</b>	<b>1.0000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>0</b>
<b>PNPL</b>	<b>1.0000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>0</b>
<b>RCRAC</b>	<b>1.0000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>0</b>
<b>RCRASUBC</b>	<b>1.0000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>0</b>
RODS	1.0000	0	0	0	0	0	NS	0
<b>SUB-TOTAL</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Database Radius Summary

### STATE (OH) LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRS	0.0200	0	NS	NS	NS	NS	NS	0
CRO	0.0200	0	NS	NS	NS	NS	NS	0
<b>DERREC</b>	<b>0.0200</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>DERRIC</b>	<b>0.0200</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
DERRUSD	0.0200	0	NS	NS	NS	NS	NS	0
NPDES	0.0200	1	NS	NS	NS	NS	NS	1
<b>SC</b>	<b>0.0200</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
UIC	0.0200	0	NS	NS	NS	NS	NS	0
CLEANERS	0.2500	0	0	0	NS	NS	NS	0
<b>UST</b>	<b>0.2500</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>BF</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>DERR</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>HWS</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>LUST</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>NS</b>	<b>NS</b>	<b>1</b>
<b>NRLST</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>NS</b>	<b>NS</b>	<b>1</b>
<b>OLDSWLF</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
SLUDGEDUMPS	0.5000	0	0	0	0	NS	NS	0
<b>SWF</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>VAPS</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
TOWNGAS	1.0000	0	0	0	0	0	NS	0
<b>SUB-TOTAL</b>		<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>

## Database Radius Summary

### **TRIBAL LISTING**

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
<b>USTR05</b>	<b>0.2500</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>LUSTR05</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>ODINDIAN</b>	<b>0.5000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>NS</b>	<b>0</b>
<b>INDIANRES</b>	<b>1.0000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>NS</b>	<b>0</b>

<b>SUB-TOTAL</b>		<b>0</b>						
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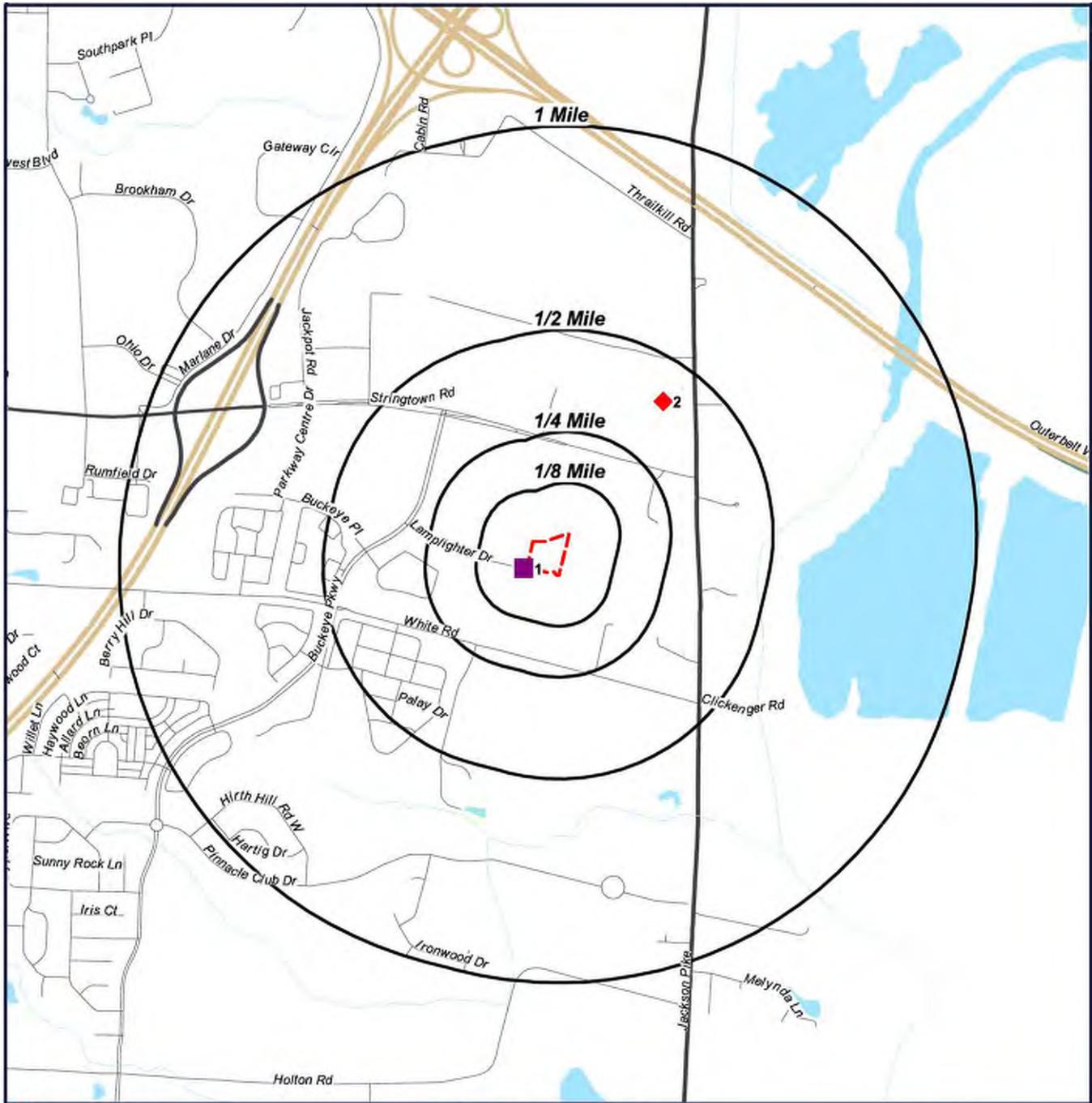
<b>TOTAL</b>		<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>
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**NOTES:**

**NS = NOT SEARCHED**

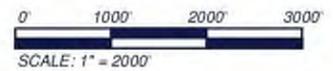
**TP/AP = TARGET PROPERTY/ADJACENT PROPERTY**

# Radius Map 1

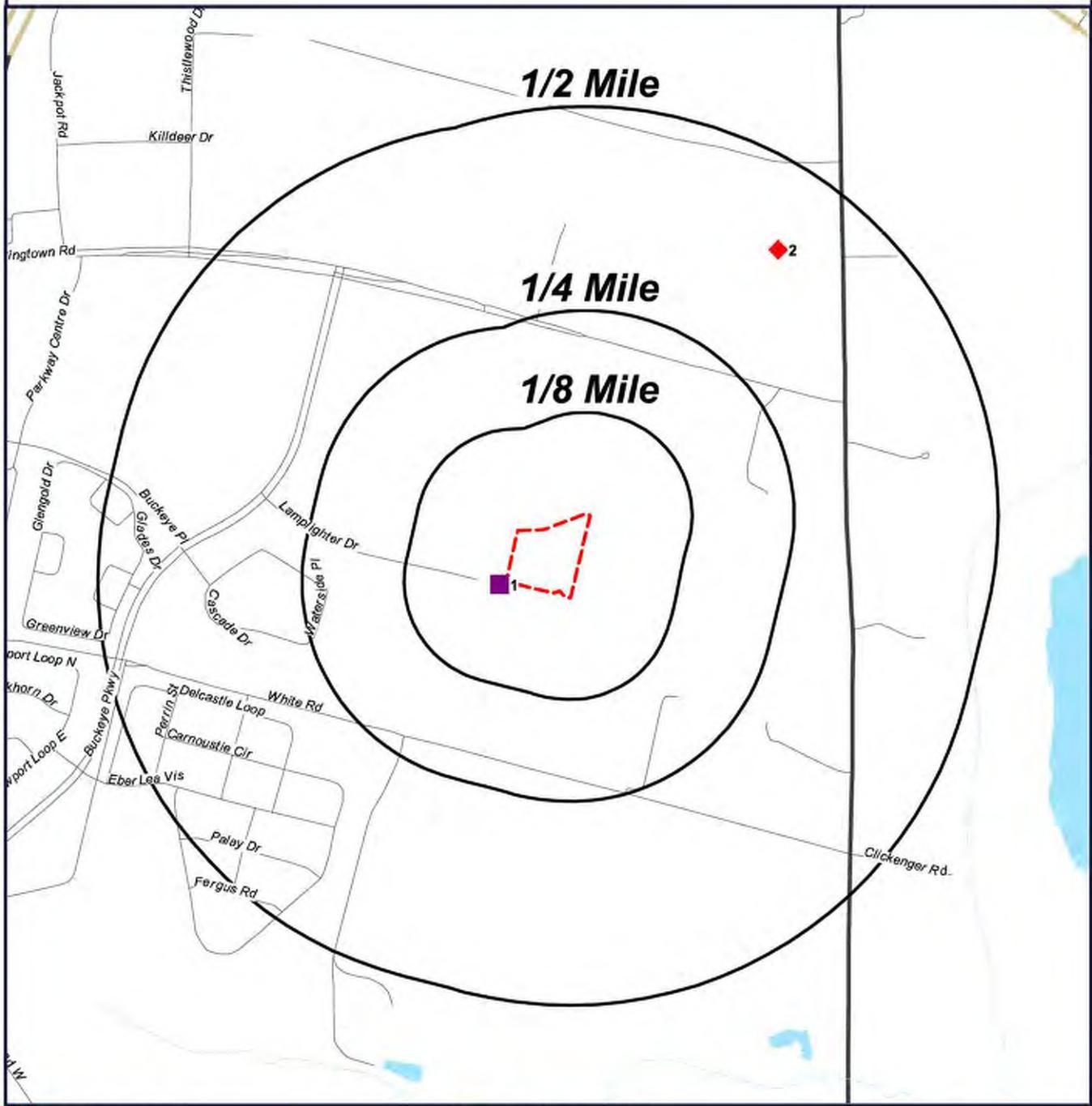


-  Target Property (TP)
-  NPDES
-  NRLST

**Vacant Commercial  
Land**  
**1185 Lamplighter Dr**  
**Grove City, Ohio**  
**43123**

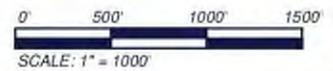


# Radius Map 2



- Target Property (TP)
- NPDES
- NRLST

Vacant Commercial  
Land  
1185 Lamplighter Dr  
Grove City, Ohio  
43123



# Ortho Map

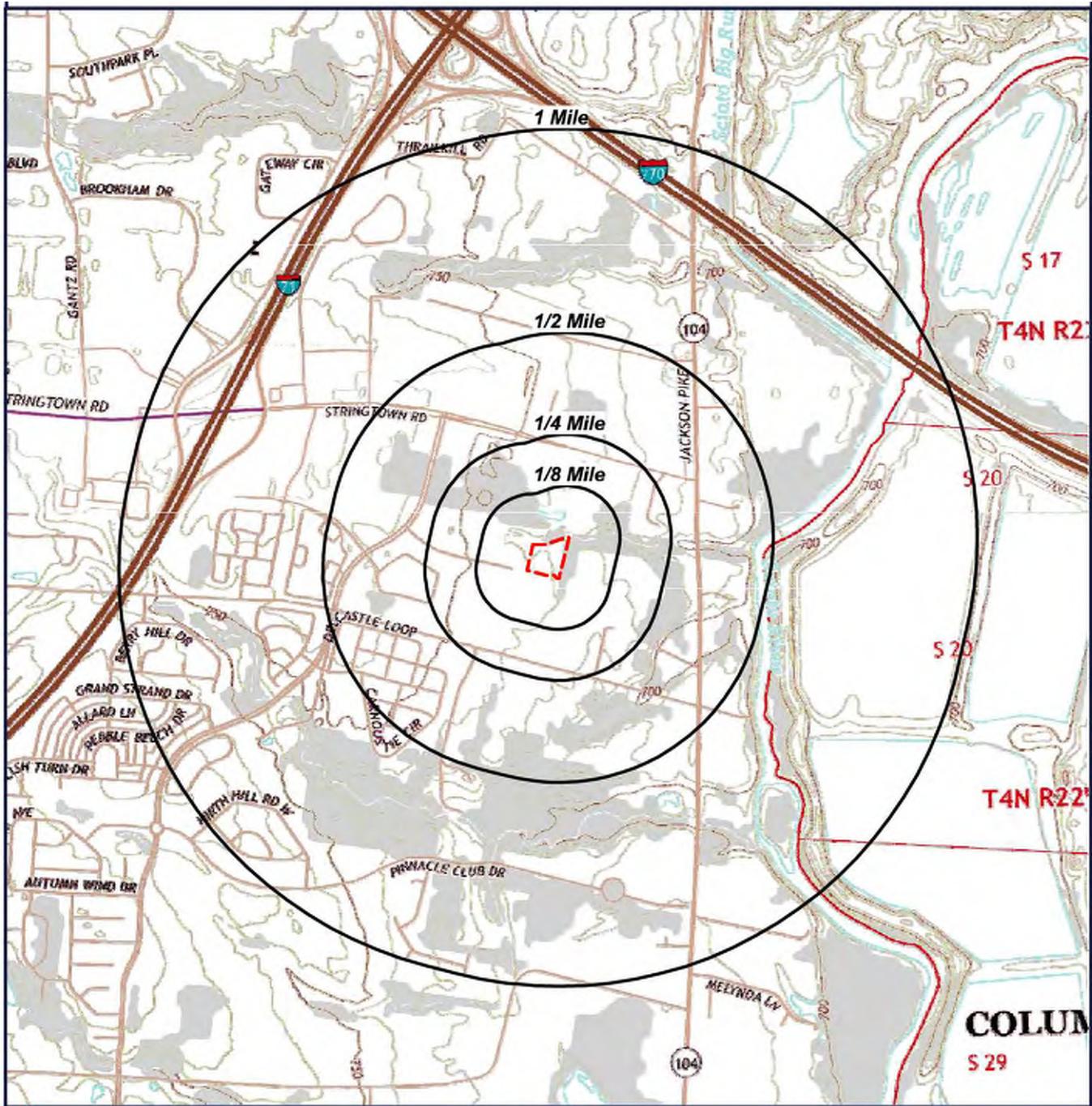


-  Target Property (TP)
-  NPDES
-  NRLST

**Quadrangle(s):**  
**Commercial**  
**Point**  
**Vacant Commercial**  
**Land**  
**1185 Lamplighter Dr**  
**Grove City, Ohio**  
**43123**



# Topographic Map



 Target Property (TP)

Quadrangle(s):  
Commercial  
Point  
Source: USGS,  
10/17/2013  
Vacant Commercial  
Land  
1185 Lamplighter Dr  
Grove City, Ohio



0 1000 2000 3000  
SCALE: 1" = 2000'

## Located Sites Summary

NOTE: Standard environmental records are displayed in **bold**.

Map ID#	Database Name	Site ID#	Relative Elevation	Distance From Site	Site Name	Address	PAGE #
<a href="#">1</a>	NPDES	4GC03488AG	Higher (742 ft.)	0.008 mi. WSW (42 ft.)	CREATIVE HOUSING XIII	END OF LAMPLIGHTER DR, GROVE CITY, OH 43123	<a href="#">17</a>
<a href="#">2</a>	<b>LUST</b>	<b>25001558LUST</b>	<b>Lower (729 ft.)</b>	<b>0.399 mi. NE (2107 ft.)</b>	<b>OHIO AUTO AUCTION</b>	<b>3905 JACKSON PIKE, GROVE CITY, OH 43123</b>	<a href="#">18</a>
<a href="#">2</a>	<b>NRLST</b>	<b>25001558</b>	<b>Lower (729 ft.)</b>	<b>0.399 mi. NE (2107 ft.)</b>	<b>OHIO AUTO AUCTION</b>	<b>3905 JACKSON PIKE, GROVE CITY, OH 43123</b>	<a href="#">19</a>

## Site Summary By Database

NOTE: Standard environmental records are displayed in **bold**.

Map ID#	Database Name	Site ID#	Relative Elevation	Distance From Site	Site Name	Address
<a href="#">2</a>	<b>LUST</b>	<b>25001558LUST</b>	<b>Lower (729 ft.)</b>	<b>0.399 mi. NE (2107 ft.)</b>	<b>OHIO AUTO AUCTION</b>	<b>3905 JACKSON PIKE, GROVE CITY, OH 43123</b>
<a href="#">1</a>	NPDES	4GC03488AG	Higher (742 ft.)	0.008 mi. WSW (42 ft.)	CREATIVE HOUSING XIII	END OF LAMPLIGHTER DR, GROVE CITY, OH 43123
<a href="#">2</a>	<b>NRLST</b>	<b>25001558</b>	<b>Lower (729 ft.)</b>	<b>0.399 mi. NE (2107 ft.)</b>	<b>OHIO AUTO AUCTION</b>	<b>3905 JACKSON PIKE, GROVE CITY, OH 43123</b>

# Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

**Target Property Elevation: 740 ft.**

NOTE: Standard environmental records are displayed in **bold**.

## EQUAL/HIGHER ELEVATION

Map ID#	Database Name	Elevation	Site Name	Address	Page #
<a href="#">1</a>	NPDES	742 ft.	CREATIVE HOUSING XIII	END OF LAMPLIGHTER DR, GROVE CITY, OH 43123	<a href="#">17</a>

## LOWER ELEVATION

Map ID#	Database Name	Elevation	Site Name	Address	Page #
<a href="#">2</a>	LUST	729 ft.	OHIO AUTO AUCTION	3905 JACKSON PIKE, GROVE CITY, OH 43123	<a href="#">18</a>
<a href="#">2</a>	NRLST	729 ft.	OHIO AUTO AUCTION	3905 JACKSON PIKE, GROVE CITY, OH 43123	<a href="#">19</a>

# National Pollutant Discharge Elimination System Permits (NPDES)

[MAP ID# 1](#)

Distance from Property: 0.008 mi. (42 ft.) WSW  
Elevation: 742 ft. (Higher than TP)

## **SITE INFORMATION**

PERMIT NUMBER: 4GC03488\*AG  
NAME: CREATIVE HOUSING XIII  
ADDRESS: END OF LAMPLIGHTER DR  
COUNTY: FRANKLIN  
APPLICATION NAME: CREATIVE HOUSING INC  
APPLICATION ADDRESS: 2233 CITYGATE DR COLUMBUS, OH 43219  
ISSUE DATE: 03/16/11  
TYPE: CONSTRUCTION

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[Back to Report Summary](#)

## Leaking Underground Storage Tank Facilities (LUST)

**MAP ID# 2**

Distance from Property: 0.399 mi. (2,107 ft.) NE  
Elevation: 729 ft. (Lower than TP)

### **SITE INFORMATION**

GEOSEARCH ID: 25001558LUST  
NAME: OHIO AUTO AUCTION  
ADDRESS: 3905 JACKSON PIKE  
GROVE CITY, OH 43123  
COUNTY: FRANKLIN

### **SITE DETAILS**

RELEASE ID: 25001558-N00001  
LEAKING TANK FUND ELIGIBILITY STATUS:  
**1 A SUSPECTED RELEASE/A RELEASE IS CONFIRMED FROM REGULATED UST**  
FR STATUS: NFA: NO FURTHER ACTION  
RELEASE DATE: 10/14/1988  
REVIEW DATE: 6/20/2000  
FACILITY STATUS: INACTIVE  
CLASS DESCRIPTION: A VIABLE RP HAS BEEN IDENTIFIED

RELEASE ID: 25001558-N00002  
LEAKING TANK FUND ELIGIBILITY STATUS:  
**6 CLOSURE OF REGULATED UST**  
FR STATUS: NFA: NO FURTHER ACTION  
RELEASE DATE: 8/15/1994  
REVIEW DATE: 9/25/2013  
FACILITY STATUS: INACTIVE  
CLASS DESCRIPTION: A VIABLE RP HAS BEEN IDENTIFIED

RELEASE ID: 25001558-N00002 (25)  
LEAKING TANK FUND ELIGIBILITY STATUS:  
**6 CLOSURE OF REGULATED UST**  
FR STATUS: NFA: NO FURTHER ACTION  
RELEASE DATE: 8/15/1994  
REVIEW DATE: 9/25/2013  
FACILITY STATUS: INACTIVE  
CLASS DESCRIPTION: A VIABLE RP HAS BEEN IDENTIFIED

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[Back to Report Summary](#)

## Non-Regulated and Regulated Facilities with Releases (NRLST)

**MAP ID# 2**

Distance from Property: 0.399 mi. (2,107 ft.) NE  
Elevation: 729 ft. (Lower than TP)

### **SITE INFORMATION**

GEOSEARCH ID: 25001558  
NAME: OHIO AUTO AUCTION  
ADDRESS: 3905 JACKSON PIKE  
GROVE CITY OH 43123  
COUNTY: FRANKLIN

### **SITE DETAILS**

RELEASE #: 25001558 - N00001  
INCIDENT #: 25835900.0  
LAST REVIEW DATE: 6/20/2000  
RELEASE DATE: 10/14/1988  
LAST UPDATE: CHARLES ZEPP  
LAST UPDATE DATE: 4/30/2013  
STATUS: NFA: NO FURTHER ACTION  
LAST STATUS UPDATED: NOT REPORTED  
SUBSTATUS: NOT REPORTED  
PRIORITY: 2  
CLASS: A VIABLE RP HAS BEEN IDENTIFIED  
RULES: NOT REPORTED  
COORDINATOR: NOT REPORTED  
LTF: 1 SUS/CON FROM REGULATED UST  
RATING: NOT REPORTED

RELEASE #: 25001558 - N00002  
INCIDENT #: 25835901.0  
LAST REVIEW DATE: 9/25/2013  
RELEASE DATE: 8/15/1994  
LAST UPDATE: SCOTT SIGLER  
LAST UPDATE DATE: 9/14/2016  
STATUS: NFA: NO FURTHER ACTION  
LAST STATUS UPDATED: 9/25/2013  
SUBSTATUS: APPROVED  
PRIORITY: 2  
CLASS: A VIABLE RP HAS BEEN IDENTIFIED  
RULES: 1992  
COORDINATOR: CHARLES ZEPP  
LTF: 6 CLOSURE OF REGULATED UST  
RATING: NOT REPORTED

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[Back to Report Summary](#)

## **Unlocated Sites Summary**

*This list contains sites that could not be mapped due to limited or incomplete address information.*

*No Records Found*

## ***Environmental Records Definitions - FEDERAL***

**AIRSAFS** Aerometric Information Retrieval System / Air Facility Subsystem

VERSION DATE: 10/20/14

The United States Environmental Protection Agency (EPA) modified the Aerometric Information Retrieval System (AIRS) to a database that exclusively tracks the compliance of stationary sources of air pollution with EPA regulations: the Air Facility Subsystem (AFS). Since this change in 2001, the management of the AIRS/AFS database was assigned to EPA's Office of Enforcement and Compliance Assurance. Enforcement and Compliance History Online (ECHO) Clean Air Act data from AFS are frozen and reflect data as of October 17, 2014, the EPA retired this system for Clean Air Act stationary sources.

**ALTFUELS** Alternative Fueling Stations

VERSION DATE: 04/30/20

Nationwide list of alternative fueling stations made available by the U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Bio-diesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE).

**BF** Brownfields Management System

VERSION DATE: 07/08/20

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. The United States Environmental Protection Agency maintains this database to track activities in the various brown field grant programs including grantee assessment, site cleanup and site redevelopment. This database included tribal brownfield sites.

**BRS** Biennial Reporting System

VERSION DATE: 12/31/15

The United States Environmental Protection Agency (EPA), in cooperation with the States, biennially collects information regarding the generation, management, and final disposition of hazardous wastes regulated under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. The Biennial Report captures detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage and disposal facilities. Currently, the EPA states that data collected between 1991 and 1997 was originally a part of the defunct Biennial Reporting System and is now incorporated into the RCRAInfo data system.

**CDL** Clandestine Drug Laboratory Locations

VERSION DATE: 06/17/20

## ***Environmental Records Definitions - FEDERAL***

The U.S. Department of Justice ("the Department") provides this information as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments. The Department does not establish, implement, enforce, or certify compliance with clean-up or remediation standards for contaminated sites; the public should contact a state or local health department or environmental protection agency for that information.

**DNPL** Delisted National Priorities List

VERSION DATE: 09/21/20

This database includes sites from the United States Environmental Protection Agency's Final National Priorities List (NPL) where remedies have proven to be satisfactory or sites where the original analyses were inaccurate, and the site is no longer appropriate for inclusion on the NPL, and final publication in the Federal Register has occurred.

**DOCKETS** EPA Docket Data

VERSION DATE: 12/22/05

The United States Environmental Protection Agency Docket data lists Civil Case Defendants, filing dates as far back as 1971, laws broken including section, violations that occurred, pollutants involved, penalties assessed and superfund awards by facility and location. Please refer to ICIS database as source of current data.

**DOD** Department of Defense Sites

VERSION DATE: 12/01/14

This information originates from the National Atlas of the United States Federal Lands data, which includes lands owned or administered by the Federal government. Army DOD, Army Corps of Engineers DOD, Air Force DOD, Navy DOD and Marine DOD areas of 640 acres or more are included.

**EC** Federal Engineering Institutional Control Sites

VERSION DATE: 08/26/20

This database includes site locations where Engineering and/or Institutional Controls have been identified as part of a selected remedy for the site as defined by United States Environmental Protection Agency official remedy decision documents. The data displays remedy component information for Superfund decision documents issued in fiscal years 1982-2017, and it includes final and deleted NPL sites as well as sites with a Superfund Alternative Approach (SAA) agreement in place. The only sites included that are not on the NPL, proposed for NPL, or removed from proposed NPL, are those with an SAA Agreement in place. A site listing does not indicate that the institutional and engineering controls are currently in place nor will be in place once the remedy is complete; it only indicates that the decision to include either of them in the remedy is documented as of the completed date of the document. Institutional controls are actions, such as legal controls, that help minimize the

## ***Environmental Records Definitions - FEDERAL***

potential for human exposure to contamination by ensuring appropriate land or resource use. Engineering controls include caps, barriers, or other device engineering to prevent access, exposure, or continued migration of contamination.

**ECHOR05** Enforcement and Compliance History Information

VERSION DATE: 05/30/20

The U.S. Environmental Protection Agency's Enforcement and Compliance History Online (ECHO) database, provides compliance and enforcement information for facilities nationwide. This database includes facilities regulated as Clean Air Act stationary sources, Clean Water Act direct dischargers, Resource Conservation and Recovery Act hazardous waste handlers, Safe Drinking Water Act public water systems along with other data, such as Toxics Release Inventory releases.

**ERNSOH** Emergency Response Notification System

VERSION DATE: 04/05/20

This National Response Center database contains data on reported releases of oil, chemical, radiological, biological, and/or etiological discharges into the environment anywhere in the United States and its territories. The data comes from spill reports made to the U.S. Environmental Protection Agency, U.S. Coast Guard, the National Response Center and/or the U.S. Department of Transportation.

**FEMAUST** FEMA Owned Storage Tanks

VERSION DATE: 12/01/16

This is a listing of FEMA owned underground and aboveground storage tank sites. For security reasons, address information is not released to the public according to the U.S. Department of Homeland Security.

**FRSOH** Facility Registry System

VERSION DATE: 04/05/20

The United States Environmental Protection Agency's Office of Environmental Information (OEI) developed the Facility Registry System (FRS) as the centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The Facility Registry System replaced the Facility Index System or FINDS database.

**FUDS** Formerly Used Defense Sites

VERSION DATE: 12/31/18

The Formerly Used Defense Sites (FUDS) inventory includes properties previously owned by or leased to the United States and under Secretary of Defense Jurisdiction, as well as Munitions Response Areas (MRAs). The remediation of these properties is the responsibility of the Department of Defense. This data is provided by the U.S. Army Corps of Engineers (USACE), the boundaries/polygon data are based on preliminary findings and not

## ***Environmental Records Definitions - FEDERAL***

all properties currently have polygon data available. **DISCLAIMER:** This data represents the results of data collection/processing for a specific USACE activity and is in no way to be considered comprehensive or to be used in any legal or official capacity as presented on this site. While the USACE has made a reasonable effort to insure the accuracy of the maps and associated data, it should be explicitly noted that USACE makes no warranty, representation or guaranty, either expressed or implied, as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. For additional information on Formerly Used Defense Sites please contact the USACE Public Affairs Office at (202) 528-4285.

**FUSRAP** Formerly Utilized Sites Remedial Action Program

VERSION DATE: 03/04/17

The U.S. Department of Energy (DOE) established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations. The DOE Office of Legacy Management (LM) established long-term surveillance and maintenance (LTS&M) requirements for remediated FUSRAP sites. DOE evaluates the final site conditions of a remediated site on the basis of risk for different future uses. DOE then confirms that LTS&M requirements will maintain protectiveness.

**HISTPST** Historical Gas Stations

VERSION DATE: NR

This historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930.

**HMIRSR05** Hazardous Materials Incident Reporting System

VERSION DATE: 05/20/20

The HMIRS database contains unintentional hazardous materials release information reported to the U.S. Department of Transportation located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

**HWCD** Hazardous Waste Compliance Docket Facilities

VERSION DATE: 04/29/20

This list of the Federal Agency Hazardous Waste Compliance Docket Facilities is maintained by the United States Environmental Protection Agency (EPA). According to the EPA, Section 120(c) of CERCLA requires EPA to establish a listing, known as the Federal Facility Hazardous Waste Compliance Docket (Docket), of Federal facilities which are managing or have managed hazardous waste; or have had a release of hazardous waste. Thus, the Docket identifies all Federal facilities that must be evaluated to determine whether they pose a risk to human health and the environment and it makes this information available to the public. In order for the Docket to remain current and accurate it requires periodic updating.

## ***Environmental Records Definitions - FEDERAL***

**ICIS** Integrated Compliance Information System (formerly DOCKETS)

VERSION DATE: 09/19/20

ICIS is a case activity tracking and management system for civil, judicial, and administrative federal Environmental Protection Agency enforcement cases. ICIS contains information on federal administrative and federal judicial cases under the following environmental statutes: the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know Act - Section 313, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Safe Drinking Water Act, and the Marine Protection, Research, and Sanctuaries Act.

**ICISCLEANERS** Integrated Compliance Information System Drycleaners

VERSION DATE: 09/19/20

This is a listing of drycleaner facilities from the Integrated Compliance Information System (ICIS). The U.S. Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments. The following Primary SIC Codes are included in this data: 7211, 7212, 7213, 7215, 7216, 7217, 7218, and/or 7219; the following Primary NAICS Codes are included in this data: 812320, 812331, and/or 812332.

**ICISNPDES** Integrated Compliance Information System National Pollutant Discharge Elimination System

VERSION DATE: 04/26/20

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. This database is provided by the U.S. Environmental Protection Agency.

**LUCIS** Land Use Control Information System

VERSION DATE: 09/01/06

The LUCIS database is maintained by the U.S. Department of the Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

**MLTS** Material Licensing Tracking System

VERSION DATE: 06/29/17

MLTS is a list of approximately 8,100 sites which have or use radioactive materials subject to the United States Nuclear Regulatory Commission (NRC) licensing requirements. Disclaimer: Due to agency regulations and policies, this database contains applicant/licensee location information which may or may not be related to the physical location per MLTS site.

## **Environmental Records Definitions - FEDERAL**

**MRDS** Mineral Resource Data System

VERSION DATE: 03/15/16

MRDS (Mineral Resource Data System) is a collection of reports describing metallic and nonmetallic mineral resources throughout the world. Included are deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. This database contains the records previously provided in the Mineral Resource Data System (MRDS) of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS. The USGS has ceased systematic updates of the MRDS database with their focus more recently on deposits of critical minerals while providing a well-documented baseline of historical mine locations from USGS topographic maps. A few updates last occurred 2015 and early 2016 for select mine site area/s.

**MSHA** Mine Safety and Health Administration Master Index File

VERSION DATE: 08/07/20

The Mine dataset lists all Coal and Metal/Non-Metal mines under MSHA's jurisdiction since 1/1/1970. It includes such information as the current status of each mine (Active, Abandoned, NonProducing, etc.), the current owner and operating company, commodity codes and physical attributes of the mine. Mine ID is the unique key for this data. This information is provided by the United States Department of Labor - Mine Safety and Health Administration (MSHA).

**NLRRCRAC** No Longer Regulated RCRA Corrective Action Facilities

VERSION DATE: 09/14/20

This database includes RCRA Corrective Action facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements.

**NLRRCRAT** No Longer Regulated RCRA Non-CORRACTS TSD Facilities

VERSION DATE: 09/14/20

This database includes RCRA Non-Corrective Action TSD facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. This listing includes facilities that formerly treated, stored or disposed of hazardous waste.

**NMS** Former Military Nike Missile Sites

VERSION DATE: 12/01/84

This information was taken from report DRXTH-AS-IA-83A016 (Historical Overview of the Nike Missile System, 12/1984) which was performed by Environmental Science and Engineering, Inc. for the U.S. Army Toxic and Hazardous Materials Agency Assessment Division. The Nike system was deployed between 1954 and the mid-1970's. Among the substances used or stored on Nike sites were liquid missile fuel (JP-4); starter fluids (UDKH, aniline, and furfuryl alcohol); oxidizer (IRFNA); hydrocarbons (motor oil, hydraulic fluid, diesel fuel, gasoline,

## **Environmental Records Definitions - FEDERAL**

heating oil); solvents (carbon tetrachloride, trichloroethylene, trichloroethane, stoddard solvent); and battery electrolyte. The quantities of material a disposed of and procedures for disposal are not documented in published reports. Virtually all information concerning the potential for contamination at Nike sites is confined to personnel who were assigned to Nike sites. During deactivation most hardware was shipped to depot-level supply points. There were reportedly instances where excess materials were disposed of on or near the site itself at closure. There was reportedly no routine site decontamination.

**NPDES05** National Pollutant Discharge Elimination System

VERSION DATE: 04/01/07

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The NPDES database was collected from the U.S. Environmental Protection Agency (EPA) from December 2002 through April 2007. Refer to the ICIS and/or ICIS-NPDES database as source of current data. This database includes permitted facilities located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

**NPL** National Priorities List

VERSION DATE: 09/21/20

This database includes United States Environmental Protection Agency (EPA) National Priorities List sites that fall under the EPA's Superfund program, established to fund the cleanup of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action.

**ODI** Open Dump Inventory

VERSION DATE: 06/01/85

The open dump inventory was published by the United States Environmental Protection Agency. An "open dump" is defined as a facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944) and which is not a facility for disposal of hazardous waste. This inventory has not been updated since June 1985.

**PADS** PCB Activity Database System

VERSION DATE: 10/09/19

PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of Polychlorinated Biphenyls (PCB) who are required to notify the U.S. Environmental Protection Agency of such activities.

**PCSR05** Permit Compliance System

VERSION DATE: 08/01/12

The historic Permit Compliance System tracked enforcement status and permit compliance of facilities controlled

## ***Environmental Records Definitions - FEDERAL***

by the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act. This database includes permitted facilities located in EPA Region 5 states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. This system has since been modernized by United States Environmental Protection Agency and is now integrated into the Integrated Compliance Information System (ICIS). Please refer to the ICIS database as the current source for this data.

**PNPL** Proposed National Priorities List

VERSION DATE: 09/21/20

This database contains sites proposed to be included on the National Priorities List (NPL) in the Federal Register. The United States Environmental Protection Agency investigates these sites to determine if they may present long-term threats to public health or the environment.

**RCRAC** Resource Conservation & Recovery Act - Corrective Action Facilities

VERSION DATE: 09/14/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities with corrective action activity.

**RCRAGR05** Resource Conservation & Recovery Act - Generator

VERSION DATE: 09/14/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities currently generating hazardous waste. EPA Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

**RCRANGR05** Resource Conservation & Recovery Act - Non-Generator

VERSION DATE: 09/14/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities classified as non-generators. Non-Generators do not presently generate hazardous waste. EPA

## ***Environmental Records Definitions - FEDERAL***

Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

**RCRASC** RCRA Sites with Controls

VERSION DATE: 08/04/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities with institutional controls in place.

**RCRASUBC** Resource Conservation & Recovery Act - Subject to Corrective Action Facilities

VERSION DATE: 09/14/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities subject to corrective actions.

**RCRAT** Resource Conservation & Recovery Act - Non-CORRACTS Treatment, Storage & Disposal Facilities

VERSION DATE: 09/14/20

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities recognized as hazardous waste treatment, storage, and disposal sites (TSD).

**RODS** Record of Decision System

VERSION DATE: 09/21/20

These decision documents maintained by the United States Environmental Protection Agency describe the chosen remedy for NPL (Superfund) site remediation. They also include site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, and scope and role of response action.

**SEMS** Superfund Enterprise Management System

VERSION DATE: 09/21/20

## ***Environmental Records Definitions - FEDERAL***

The U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation (OSRTI), has implemented The Superfund Enterprise Management System (SEMS), formerly known as CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) to track and report on clean-up and enforcement activities taking place at Superfund sites. SEMS represents a joint development and ongoing collaboration between Superfund's Remedial, Removal, Federal Facilities, Enforcement and Emergency Response programs.

**SEMSARCH** Superfund Enterprise Management System Archived Site Inventory

VERSION DATE: 09/21/20

The U.S. Environmental Protection Agency's (EPA) Superfund Enterprise Management System Archived Site Inventory (List 8R Archived) replaced the CERCLIS NFRAP reporting system in 2015. This listing reflects sites at which the EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program.

**SEMSLIENS** SEMS Lien on Property

VERSION DATE: 06/22/20

The U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation (OSRTI), has implemented The Superfund Enterprise Management System (SEMS), formerly known as CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) to track and report on clean-up and enforcement activities taking place at Superfund sites. SEMS represents a joint development and ongoing collaboration between Superfund's Remedial, Removal, Federal Facilities, Enforcement and Emergency Response programs. This is a listing of SEMS sites with a lien on the property.

**SFLIENS** CERCLIS Liens

VERSION DATE: 06/08/12

A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which United States Environmental Protection Agency has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties. This database contains those CERCLIS sites where the Lien on Property action is complete. Please refer to the SEMSLIENS database as source of current data.

**SMCRA** Surface Mining Control and Reclamation Act Sites

VERSION DATE: 06/24/20

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those

## ***Environmental Records Definitions - FEDERAL***

problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

### **SSEHRIPFAS**

SSEHRI PFAS Contamination Sites

VERSION DATE: 12/12/19

This PFAS Contamination Site Tracker database is compiled by the Social Science Environmental Health Research Institute (SSEHRI) at Northeastern University. According to the SSEHRI, the database records qualitative and quantitative data from each known site of PFAS contamination, including timeline of discovery, sources, levels, health impacts, community response, and government response. The goal of this database is to compile information and support public understanding of the rapidly unfolding issue of PFAS contamination. All data presented was extracted from government websites, news articles, or publicly available documents, and this is cited in the tracker. Disclaimer: The source conveys this database undergoes regular updates as new information becomes available, some sites may be missing and/or contain information that is incorrect or outdated, as well as their information represents all contamination sites SSEHRI is aware of, not all possible contamination sites. This data is not intended to be used for legal purposes. Limited location details are available with this data. Please access the following source link for the most current information:  
<https://pfasproject.com/pfas-contamination-site-tracker/>

### **SSTS**

Section Seven Tracking System

VERSION DATE: 08/04/20

The United States Environmental Protection Agency tracks information on pesticide establishments through the Section Seven Tracking System (SSTS). SSTS records the registration of new establishments and records pesticide production at each establishment. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires that production of pesticides or devices be conducted in a registered pesticide-producing or device-producing establishment. "Production" includes formulation, packaging, repackaging, and relabeling. For this database, the Product Information is only available for establishments up through 2014 or prior years, product details are no longer released by the EPA within the current SSTS non-Confidential Business Information data.

### **TRI**

Toxics Release Inventory

VERSION DATE: 12/31/18

The Toxics Release Inventory, provided by the United States Environmental Protection Agency, includes data on toxic chemical releases and waste management activities from certain industries as well as federal and tribal facilities. This inventory contains information about the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on the quantities of toxic chemicals sent to other facilities for further waste management.

### **TSCA**

Toxic Substance Control Act Inventory

VERSION DATE: 12/31/16

The Toxic Substances Control Act (TSCA) was enacted in 1976 to ensure that chemicals manufactured,

## ***Environmental Records Definitions - FEDERAL***

imported, processed, or distributed in commerce, or used or disposed of in the United States do not pose any unreasonable risks to human health or the environment. TSCA section 8(b) provides the United States Environmental Protection Agency (EPA) authority to "compile, keep current, and publish a list of each chemical substance that is manufactured or processed in the United States." This TSCA Chemical Substance Inventory contains non-confidential information on the production amount of toxic chemicals from each manufacturer and importer site. The EPA has collected Chemical Data Reporting (CDR) data since in 1986 (as Inventory Update Reporting). Collections occur approximately every four years and reporting requirements changed from collection to collection.

### **USUMTRCA**

Uranium Mill Tailings Radiation Control Act Sites

VERSION DATE: 03/04/17

The Legacy Management Office of the Department of Energy (DOE) manages radioactive and chemical waste, environmental contamination, and hazardous material at over 100 sites across the U.S. The L.M. Office manages this database of sites registered under the Uranium Mill Tailings Control Act (UMTRCA).

## ***Environmental Records Definitions - STATE (OH)***

**AIRS** Permit by Rule Air Facilities

VERSION DATE: 07/30/20

A permit-by-rule is a specific permit provision in the Ohio Administrative Code that applies to certain types of low-emitting air pollution sources. This list of Permit by Rule facilities is provided by the Ohio Environmental Protection Agency.

**BF** Brownfield Inventory Database

VERSION DATE: 12/31/19

The Ohio Environmental Protection Agency maintains this inventory of brownfield properties. Most of the properties contained in the inventory have received funding through either the Clean Ohio Assistance Fund or Clean Ohio Revitalization Fund. There are also some properties listed that have received funding through U.S. EPA's Brownfield Grants. In addition, cities, counties, townships, villages and private property owners are encouraged to list their brownfield properties on this Inventory.

**CLEANERS** Dry Cleaning Facilities

VERSION DATE: 09/02/20

List of Facilities which have obtained permits to install or operate dry cleaning operations as regulated by the Ohio Environmental Protection Agency (Ohio EPA).

**CRO** Cessation of Regulated Operations Facilities

VERSION DATE: 08/14/20

The Ohio EPA created the Cessation of Regulated Operations (CRO) program. Going into effect July 1, 1996, it's aim is to prevent threats to human health and the environment that are created when business owners and operators irresponsibly abandon businesses where chemicals were produced, used, stored or handled. ORC Chapter 3752 applies to owners or operators of facilities required to file a chemical inventory report under the Emergency Planning and Community Right-to-Know Act (EPCRA). Facilities exempted from CRO include underground storage tanks regulated by the State Fire Marshal's Bureau of Underground Storage Tank Regulations (BUSTR), oil/gas production operations, and public utilities. Facilities are first inspected at 30 days after closure, then 90 days, then finally inspected. Final Inspection Date is roughly equivalent to date a Facility finishes the CRO process.

**DERR** Ohio Division of Environmental Response and Revitalization Database

VERSION DATE: 09/22/20

The DERR database contains basic site information only. Site information maintained in the database includes the name and address of the site; its latitude and longitude; whether the property is, to Ohio EPA's knowledge, being cleaned up in accordance with the Voluntary Action Program (VAP) or is receiving technical assistance through the VAP; and whether Clean Ohio Fund money has been issued to remediate the site.

## ***Environmental Records Definitions - STATE (OH)***

**DERREC** Engineering Controls Registry

VERSION DATE: 08/27/20

The Division of Environmental Response and Revitalization (DERR) database is an index of sites for which our district offices maintain files. The Engineering Controls database is a database that tracks properties with engineering controls.

**DERRIC** Institutional Controls

VERSION DATE: 09/22/20

This list contains sites with institutional controls in place tracked within the Division of Emergency & Remedial Response (DERR) database. This data is provided by the Ohio Environmental Protection Agency.

**DERRUSD** Urban Setting Designations

VERSION DATE: 04/16/20

This list of Urban Setting Designations (USD) tracked within the Division of Emergency & Remedial Response database is provided by the Ohio Environmental Protection Agency (Ohio EPA). According to the Ohio EPA, for some areas in Ohio with urban land use, ground water is not relied upon as a potable water supply since alternative community water systems supply residents with safe drinking water; therefore, potentially contaminated ground water poses no potable use risk to the community. USD areas utilize voluntary actions to protect humans and ecological receptors from any exposures including exposures to ground water not related to drinking, showering, bathing, or cooking.

**HWS** Historic Waste Sites

VERSION DATE: NR

This database contains locations of sites that were historically used for solid waste disposal around the State of Ohio based on file archives at the Ohio Environmental Protection Agency. The sites were derived from files that were archived under the solid waste regulatory program; however, there may have been more than one type of waste at some sites. There may additional files related to some of these sites that fall under other regulatory programs, such as hazardous waste, surface water or "brownfields" programs. The sites are primarily solid waste disposal sites, including municipal solid waste, industrial solid waste, residual solid waste, and construction and demolition debris.

**LUST** Leaking Underground Storage Tank Facilities

VERSION DATE: 08/16/20

The Bureau of Underground Storage Tank Regulations (BUSTR), a bureau of the State of Ohio Fire Marshal's office of the Ohio Department of Commerce, maintains this database of facilities with active releases from regulated tanks. On March 30, 1987, the State Fire Marshal created BUSTR to develop the underground storage tank program and to administer the federal Leaking Underground Storage Tank Trust Fund. BUSTR is financed

## ***Environmental Records Definitions - STATE (OH)***

through federal grants in combination with annual registration fees and permit fees. BUSTR's mission is to effectively regulate the safe operation of underground storage tanks and to ensure appropriate investigation and cleanup of releases from underground storage tanks for the purpose of protecting human health and the environment for the citizens of Ohio.

**NPDES** National Pollutant Discharge Elimination System Permits

VERSION DATE: 08/10/20

This database contains facilities with National Pollutant Discharge Elimination System (NPDES) Storm Water General Permits Coverage authorization to discharge to surface waters of Ohio, including Construction Storm Water, Industrial Storm Water, and Small MS4 General Permits. Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The data is provided by the Ohio Environmental Protection Agency's Division of Surface Water.

**NRLST** Non-Regulated and Regulated Facilities with Releases

VERSION DATE: 09/08/20

This listing of non-regulated and regulated facilities with release incidents is provided by the Bureau of Underground Storage Tank Regulation (BUSTR), a bureau of the State of Ohio Fire Marshal's office of the Ohio Department of Commerce. BUSTR regulates and supervises the investigation and cleanup of suspected releases from tank facilities to protect human health and preserve the environment. Although some of these facilities are not regulated by the Bureau, based on various reasons such as tank type, capacity, contents and/or prior to regulation by the state, when a release incident is reported to the Bureau a record of this facility is entered into their system.

**OLDSWLF** Abandoned Dumps and Landfills

VERSION DATE: NR

According to the Ohio Environmental Protection Agency, this database contains about 1200 old abandoned dumps or landfills. This database was developed from Ohio EPA staff notebooks and other information dating from the mid-1970's, including old Division of Solid and Hazardous Waste Management and Division of Environmental Response and Revitalization files, the Eckhardt Report and the 1976 Groundwater Pollution Inventory-Summary of Land Disposal.

**SC** Sites with Controls

VERSION DATE: 03/31/17

As stated by the Ohio Environmental Protection Agency, Ohio's Voluntary Action Program (VAP) was established to allow the private sector to clean up brownfields – previously developed sites with potential contamination from industrial or commercial activity that were not being redeveloped due to fear of litigation. The VAP sets standards for contaminated site assessment and remediation and reviews the activities conducted by certified professionals based on those standards to issue covenants not to sue (CNSs). The Ohio EPA has compiled site profiles that

## **Environmental Records Definitions - STATE (OH)**

have been demonstrated to meet the appropriate standards for the proposed land uses from 2008 to 2012. This site listing includes those VAP sites with issued CNSs, as well as other hazardous waste sites with environmental covenants/use restrictions in place. "Environmental covenant" means a servitude arising under an environmental response project that imposes activity and use limitations and that meets the requirements established in §5301.82 of the Revised Code.

### **SLUDGEDUMPS**                      Sludge Dump Sites

VERSION DATE: NR

According to the Ohio Environmental Protection Agency, this database of about 2800 sites represents "pits, ponds and lagoons" where various types of sludge were dumped over many years. The object of this data collection was to determine if harm was done to drinking water supplies below each dump site. The data were collected during the 1970s and published by U.S. EPA in 1980.

### **SPILLS**                              Spills Listing

VERSION DATE: 07/30/20

This database of hazardous material spills is provided by the Emergency Response Program of the Ohio Environmental Protection Agency.

### **SWF**                                  Solid Waste Facilities

VERSION DATE: 01/09/20

Municipal Solid Waste Landfills, Construction and Demolition Debris Landfills, and Municipal Solid Waste Transfer Facilities, Industrial and Residual Waste and Licensed Scrap Tire Facilities are included in this Ohio Environmental Protection Agency licensed solid waste facility list.

### **TOWNGAS**                          Coal Gas Generator Sites

VERSION DATE: NR

According to the Ohio Environmental Protection Agency, this archived database includes 82 coal gas generator sites in Ohio. These plants produced gas for street lights in the communities in which they were located. The production of one million cubic feet of gas also produced about 800 gallons of liquid coal tar, which is a carcinogen. TOWNGAS was developed from a database from Radian Corporation along with information from the Ohio Historical Society and various public libraries.

### **UIC**                                  Underground Injection Control Wells

VERSION DATE: 10/07/19

The Ohio Environmental Protection Agency provides this listing of Class I and Class V Underground Injection Control Wells.

## **Environmental Records Definitions - STATE (OH)**

**UST**                      Underground Storage Tank Facilities

VERSION DATE: 08/16/20

The Bureau of Underground Storage Tank Regulations (BUSTR), a bureau of the State of Ohio Fire Marshal's office of the Ohio Department of Commerce, maintains this database of active and inactive registered facilities. On March 30, 1987, the State Fire Marshal created BUSTR to develop the underground storage tank program and to administer the federal Leaking Underground Storage Tank Trust Fund. BUSTR is financed through a combination a federal grants in combination with annual registration fees and permit fees. BUSTR's mission is to effectively regulate the safe operation of underground storage tanks and to ensure appropriate investigation and cleanup of releases from underground storage tanks for the purpose of protecting human health and the environment for the citizens of Ohio.

**VAPS**                      Voluntary Action Program Sites

VERSION DATE: 09/22/20

The Ohio Environmental Protection Agency's Division of Environmental Response and Revitalization maintains this list of current Voluntary Action Program projects. This program was created to give individuals a way to investigate possible environmental contamination, clean it up if necessary and receive a promise from the State of Ohio that no more cleanup is needed. For those projects where a covenant not to sue has been issued, this is the endpoint of the voluntary action process. This list also includes Class C release designation sites as of February 2012. Class C sites, pursuant to HB 153, are eligible for the VAP as long as the release has been determined by the BUSTR to be a release of petroleum occurring or identified from a UST system subject to the Bureau of Underground Storage Tank Regulations (BUSTR) laws, where the responsible person for the release is specifically determined by BUSTR to not be a viable person capable of undertaking or completing the required corrective actions.

## ***Environmental Records Definitions - TRIBAL***

### **INDIANRES**

Indian Reservations

VERSION DATE: 09/27/17

This database is extracted from select geographic and cartographic information from the U.S. Census Bureau. The Bureau of Indian Affairs (BIA) within the U.S. Department of the Interior (DOI) provides the list of federally recognized tribes. The American Indian/Alaska Native/Native Hawaiian (AIANNH) Areas includes the following legal entities: federally recognized American Indian reservations and off-reservation trust land areas, state-recognized American Indian reservations, and Hawaiian home lands (HHLs). The boundaries for federally recognized American Indian reservations and off-reservation trust lands are as of January 2017. The boundaries for state-recognized American Indian reservations and for state designated tribal statistical areas were delineated by state governor-appointed liaisons for the 2010 Census through the State American Indian Reservation Program and Tribal Statistical Areas Program respectively.

### **LUSTR05**

Leaking Underground Storage Tanks On Tribal Lands

VERSION DATE: 04/14/20

This database, provided by the United States Environmental Protection Agency (EPA), contains leaking underground storage tanks on Tribal lands located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

### **ODINDIAN**

Open Dump Inventory on Tribal Lands

VERSION DATE: 11/08/06

This Indian Health Service database contains information about facilities and sites on tribal lands where solid waste is disposed of, which are not sanitary landfills or hazardous waste disposal facilities, and which meet the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944).

### **USTR05**

Underground Storage Tanks On Tribal Lands

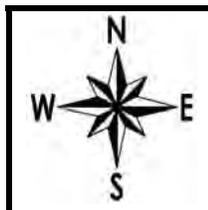
VERSION DATE: 04/14/20

This database, provided by the United States Environmental Protection Agency (EPA), contains underground storage tanks on Tribal lands located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

**Appendix E**  
**Historical Aerial Photographs**

# 2019 AERIAL PHOTOGRAPH

Source: GeoSearch

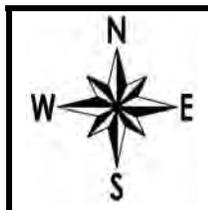


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



# 2010 AERIAL PHOTOGRAPH

Source: GeoSearch

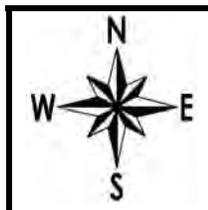


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



# 2004 AERIAL PHOTOGRAPH

Source: GeoSearch

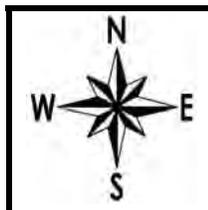


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



# 1994 AERIAL PHOTOGRAPH

Source: GeoSearch

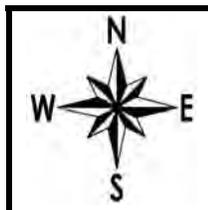


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



# 1985 AERIAL PHOTOGRAPH

Source: GeoSearch

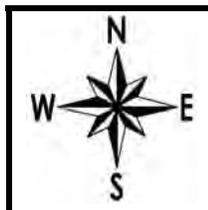


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



# 1979 AERIAL PHOTOGRAPH

Source: GeoSearch

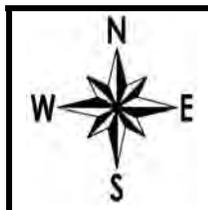


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



# 1973 AERIAL PHOTOGRAPH

Source: GeoSearch

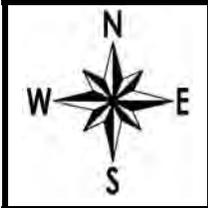


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



**1963 AERIAL PHOTOGRAPH**

Source: GeoSearch

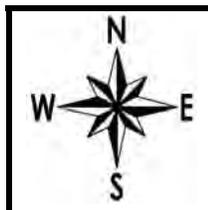
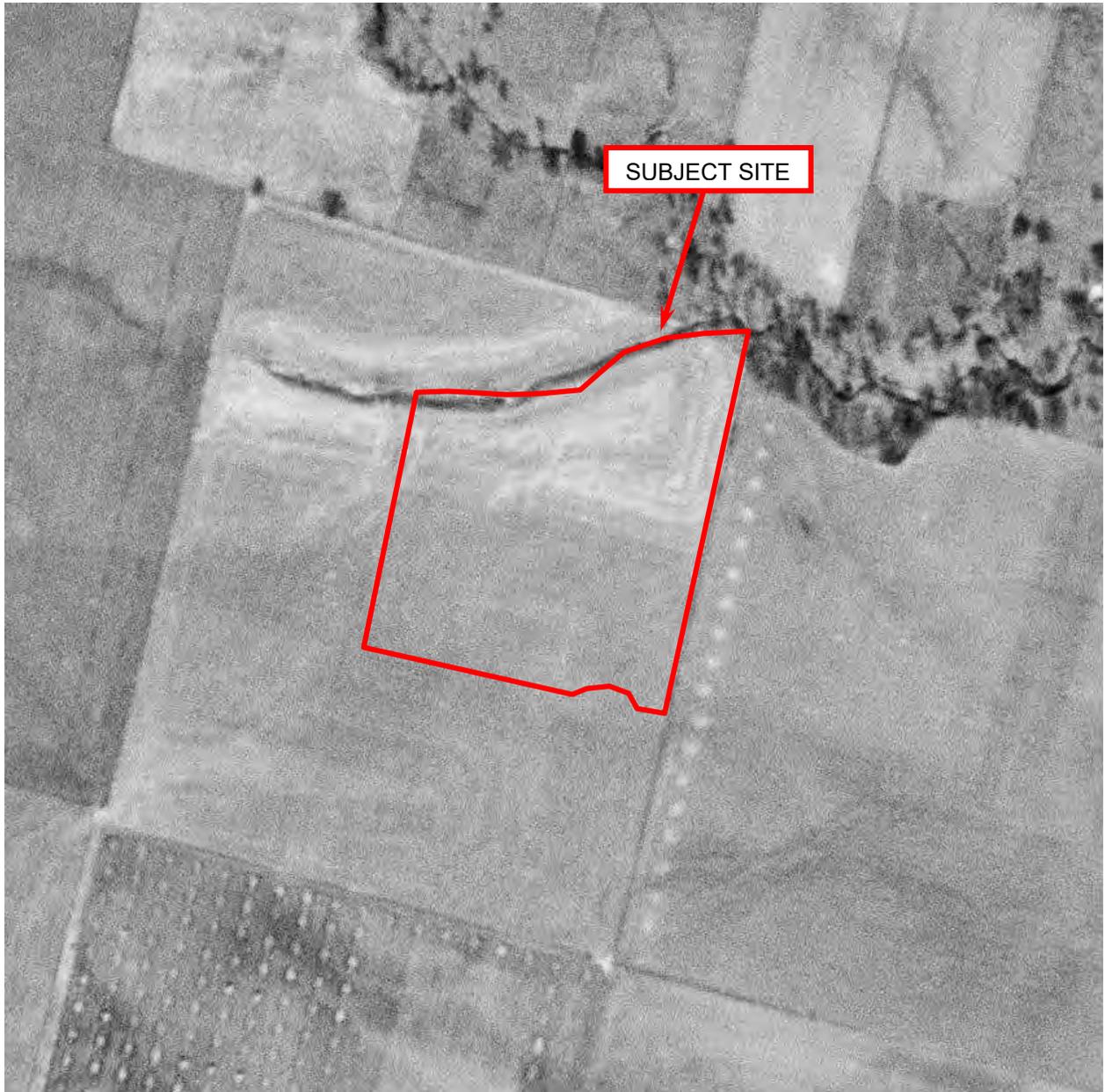


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



# 1953 AERIAL PHOTOGRAPH

Source: GeoSearch

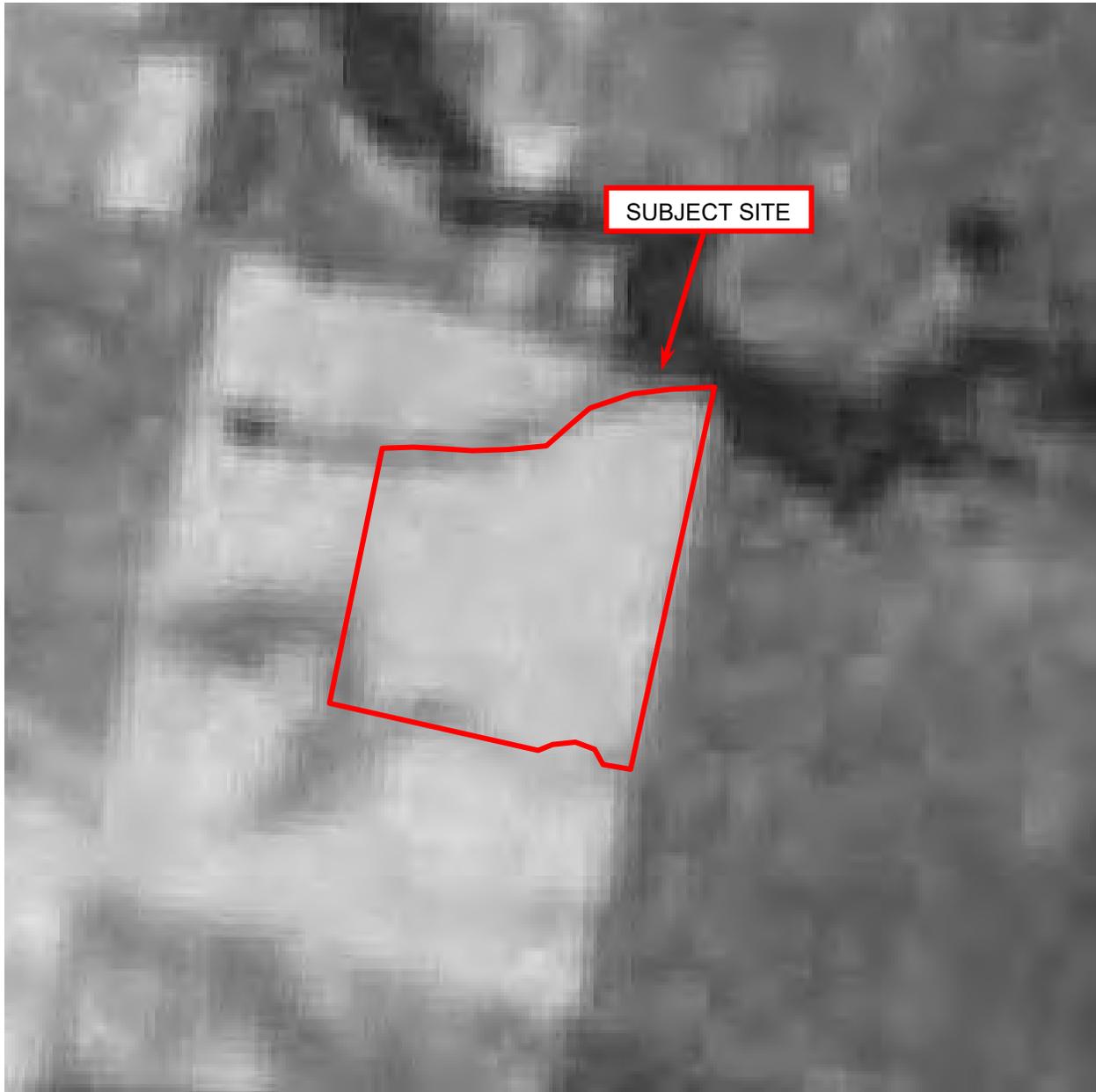


Vacant Commercial Land  
1185 Lamplighter Drive  
Grove City, Ohio  
**1" = ± 200'**



# 1938 AERIAL PHOTOGRAPH

Source: GeoSearch



	<p>Vacant Commercial Land 1185 Lamplighter Drive Grove City, Ohio <b>1" = ± 200'</b></p>	 <p>SPENCE Environmental Consulting, Inc.</p>
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**Appendix F**  
**Historical City Directory Information**

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## ***City Directory Target Property Address***

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***Target Property:***

1185 Lamplighter Dr,  
Grove City, OH 43123

***Prepared For:***

Spence Environmental Consulting Inc

Order #: 155352

Project #: Korda-01(20)

***Date: 10/14/2020***

## City Directory Target Property Address

1185 Lamplighter Dr, Grove City, OH 43123

### 1 LAMPLIGHTER DR

2019	STREET BEGINS	INFOUSA	GREAT LAKES
2014	STREET BEGINS	INFOUSA	GREAT LAKES
2010	STREET BEGINS	INFOUSA	GREAT LAKES
2005	STREET NOT LISTED	INFOUSA	GREAT LAKES

### 1111 LAMPLIGHTER DR

2019	AUSTIN BETHANYANNE	INFOUSA	GREAT LAKES
2019	JONES JOYCE	INFOUSA	GREAT LAKES

### 1113 LAMPLIGHTER DR

2019	HILL DOROTHY	INFOUSA	GREAT LAKES
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### 1115 LAMPLIGHTER DR

2019	APPIAH JANICE	INFOUSA	GREAT LAKES
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### 1117 LAMPLIGHTER DR

2019	HONEYCUTT ALDINE	INFOUSA	GREAT LAKES
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### 1119 LAMPLIGHTER DR

2019	FLOVIN JACK	INFOUSA	GREAT LAKES
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### 1121 LAMPLIGHTER DR

2019	MIDDLETON JAMES	INFOUSA	GREAT LAKES
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### 1123 LAMPLIGHTER DR

2019	REEVES DOROTHY	INFOUSA	GREAT LAKES
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### 1127 LAMPLIGHTER DR

2019	SMITH DANIEL	INFOUSA	GREAT LAKES
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### 1131 LAMPLIGHTER DR

2019	BRANCH LINDA	INFOUSA	GREAT LAKES
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### 1133 LAMPLIGHTER DR

2019	JEAN POWERS	INFOUSA	GREAT LAKES
2019	POWERS JEAN	INFOUSA	GREAT LAKES

### 1135 LAMPLIGHTER DR

2019	WITCHER EVELYN	INFOUSA	GREAT LAKES
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### 1137 LAMPLIGHTER DR

2019	COLLINS DEBRA	INFOUSA	GREAT LAKES
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**City Directory Target Property Address**

**1185 Lamplighter Dr, Grove City, OH 43123**

1139 LAMPLIGHTER DR

2019 PAXTON JEWELL INFOUSA GREAT LAKES

1141 LAMPLIGHTER DR

2019 WHEELER SUSAN INFOUSA GREAT LAKES

1147 LAMPLIGHTER DR

2019 PAYNE PAMELA INFOUSA GREAT LAKES

1149 LAMPLIGHTER DR

2019 WELLS JACQUE INFOUSA GREAT LAKES

2014 WELLS JACQUE A INFOUSA GREAT LAKES

1151 LAMPLIGHTER DR

2019 IMPERATORE LINDA INFOUSA GREAT LAKES

2014 SELLAN LISA D INFOUSA GREAT LAKES

1153 LAMPLIGHTER DR

2019 HOPSON SANDRA INFOUSA GREAT LAKES

1155 LAMPLIGHTER DR

2019 MORBITZER ROBERT INFOUSA GREAT LAKES

2014 MORBITZER ROBERT J INFOUSA GREAT LAKES

1157 LAMPLIGHTER DR

2019 YELLE TERRI INFOUSA GREAT LAKES

1159 LAMPLIGHTER DR

2019 TATE PATRICIA INFOUSA GREAT LAKES

2019 TURK PATRICIA INFOUSA GREAT LAKES

2014 TATE PATRICIA A INFOUSA GREAT LAKES

1161 LAMPLIGHTER DR

2019 KENNARD BERTHA INFOUSA GREAT LAKES

1167 LAMPLIGHTER DR

2019 OWENS ESTHER INFOUSA GREAT LAKES

1169 LAMPLIGHTER DR

2019 ALTMANN KRISTY INFOUSA GREAT LAKES

2019 WADE MARILYN INFOUSA GREAT LAKES

## City Directory Target Property Address

1185 Lamplighter Dr, Grove City, OH 43123

### 1171 LAMPLIGHTER DR

2019	GOLDEN IVAN	INFOUSA	GREAT LAKES
2014	GOLDEN IVAN N	INFOUSA	GREAT LAKES

### 1173 LAMPLIGHTER DR

2019	REED DONNA	INFOUSA	GREAT LAKES
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### 1177 LAMPLIGHTER DR

2019	SCHOENSTRA PAMELA	INFOUSA	GREAT LAKES
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### 1179 LAMPLIGHTER DR

2019	MORRIS SAUNDRA	INFOUSA	GREAT LAKES
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### 1185 LAMPLIGHTER DR

2019	HOUSING LAMPLIGHTER SENIOR LLC	INFOUSA	GREAT LAKES
2014	HOUSING LAMPLIGHTER SENIOR LLC	INFOUSA	GREAT LAKES
2014	LAMPLIGHTER SENIOR HOUSING	INFOUSA	GREAT LAKES
2014	LAMPLIGHTER SENIOR VILLAGE	INFOUSA	GREAT LAKES

### 1191 LAMPLIGHTER DR

2019	ANGELETTI BONNIE	INFOUSA	GREAT LAKES
2014	ANGELETTI BONNIE L	INFOUSA	GREAT LAKES

### 1193 LAMPLIGHTER DR

2019	MCKINLEY SHIRLEY	INFOUSA	GREAT LAKES
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### 1195 LAMPLIGHTER DR

2019	SWORD CHRISTINA	INFOUSA	GREAT LAKES
2014	DANGELO ANNA M	INFOUSA	GREAT LAKES

### 1197 LAMPLIGHTER DR

2019	HARDIMAN PEGGY	INFOUSA	GREAT LAKES
2014	CLARK SANDRA	INFOUSA	GREAT LAKES

### 1199 LAMPLIGHTER DR

2019	CORKWELL DA	INFOUSA	GREAT LAKES
2019	GROVE CITY NOON LIONS CMNTY	INFOUSA	GREAT LAKES
2014	CORKWELL DENISE A	INFOUSA	GREAT LAKES

### 1200 LAMPLIGHTER DR

2019	LUSIGNOLO RICHARD JR	INFOUSA	GREAT LAKES
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**City Directory Target Property Address**

**1185 Lamplighter Dr, Grove City, OH 43123**

2014	LUSIGNOLO RICHIE	INFOUSA	GREAT LAKES
<u>1201 LAMPLIGHTER DR</u>			
2019	TOM SYLVIA	INFOUSA	GREAT LAKES
2014	TOM SYLVIA S	INFOUSA	GREAT LAKES
<u>1203 LAMPLIGHTER DR</u>			
2019	CASSIS NANCY	INFOUSA	GREAT LAKES
<u>1205 LAMPLIGHTER DR</u>			
2019	JAMES DORIS	INFOUSA	GREAT LAKES
2014	JAMES DORIS M	INFOUSA	GREAT LAKES
<u>1208 LAMPLIGHTER DR</u>			
2019	SMITHERMAN JEFF	INFOUSA	GREAT LAKES
<u>1209 LAMPLIGHTER DR</u>			
2019	HARMON NANCY	INFOUSA	GREAT LAKES
<u>1211 LAMPLIGHTER DR</u>			
2019	CHRISTY DOROTHY	INFOUSA	GREAT LAKES
<u>1212 LAMPLIGHTER DR</u>			
2019	HUMMEL ROBERT	INFOUSA	GREAT LAKES
2014	HUMMEL ROBERT L	INFOUSA	GREAT LAKES
<u>1213 LAMPLIGHTER DR</u>			
2014	COLLINS MARTHA J	INFOUSA	GREAT LAKES
<u>1215 LAMPLIGHTER DR</u>			
2019	PARKS PHYLLIS	INFOUSA	GREAT LAKES
<u>1217 LAMPLIGHTER DR</u>			
2019	MAZOTAS THEODORE	INFOUSA	GREAT LAKES
2014	MAZOTAS TED P	INFOUSA	GREAT LAKES
<u>1218 LAMPLIGHTER DR</u>			
2019	SMALLEY RANDY	INFOUSA	GREAT LAKES
2014	WOODRUFF DAVID T	INFOUSA	GREAT LAKES
<u>1219 LAMPLIGHTER DR</u>			
2019	KOKER WELDON	INFOUSA	GREAT LAKES

## City Directory Target Property Address

1185 Lamplighter Dr, Grove City, OH 43123

### 1221 LAMPLIGHTER DR

2019	ADAMS ANNA	INFOUSA	GREAT LAKES
2014	SPEZIALETTI MADELYN	INFOUSA	GREAT LAKES

### 1222 LAMPLIGHTER DR

2019	GOVE JUDITH	INFOUSA	GREAT LAKES
2014	GOVE JUDITH L	INFOUSA	GREAT LAKES

### 1223 LAMPLIGHTER DR

2019	WRIGHT SHIRLEY	INFOUSA	GREAT LAKES
------	----------------	---------	-------------

### 1226 LAMPLIGHTER DR

2019	BOGGS CYNTHIA	INFOUSA	GREAT LAKES
------	---------------	---------	-------------

### 1227 LAMPLIGHTER DR

2019	MASTERSON JOHN	INFOUSA	GREAT LAKES
------	----------------	---------	-------------

### 1229 LAMPLIGHTER DR

2019	SARGENT VIRGINIA	INFOUSA	GREAT LAKES
2014	BANKS VIRGINIA	INFOUSA	GREAT LAKES

### 1230 LAMPLIGHTER DR

2019	WILLIAMS ARTHUR	INFOUSA	GREAT LAKES
2014	WILLIAMS ARTHUR L	INFOUSA	GREAT LAKES

### 1239 LAMPLIGHTER DR

2019	PRIMROSE SCHOOL	INFOUSA	GREAT LAKES
2014	PRIMROSE SCHOOL	INFOUSA	GREAT LAKES
2014	PRIMROSE SCHOOL AT PINNACLE	INFOUSA	GREAT LAKES
2010	PRIMROSE SCHOOL AT PINNACLE	INFOUSA	GREAT LAKES

### 1305 LAMPLIGHTER DR

2019	X [END OF LISTING]	INFOUSA	GREAT LAKES
2019	BROOKDALE PINNACLE	INFOUSA	GREAT LAKES
2014	EMERITUS	INFOUSA	GREAT LAKES
2014	EMERITUS PINNACLE	INFOUSA	GREAT LAKES
2014	EVERETT JAMES T	INFOUSA	GREAT LAKES
2014	FLOWERS DOREEN A	INFOUSA	GREAT LAKES
2014	X [END OF LISTINGS]	INFOUSA	GREAT LAKES
2010	APARTMENTS	INFOUSA	GREAT LAKES

**City Directory Target Property Address**

**1185 Lamplighter Dr, Grove City, OH 43123**

2010	SUMMERVILLE AT PINNACLE	INFOUSA	GREAT LAKES
2010	X [END OF LISTINGS]	INFOUSA	GREAT LAKES

**Comment:**

## **Appendix G**

### **Historical Sanborn™ Fire Insurance Maps**

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## ***Fire Insurance Map Abstract***

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*Target Property:*

***Vacant Commercial Land  
1185 Lamplighter Dr  
Grove City, Franklin County, Ohio 43123***

*Prepared For:*

***Spence Environmental Consulting Inc***

***Order #: 155352***

***Job #: 377437***

***Project #: Korda-01(20)***

***Date: 10/12/2020***

## ***Fire Insurance Map Research Results***

**Date:** 10/12/2020  
**GS Job Number:** 155352  
**Company Name:** Spence Environmental Consulting Inc  
**Project Number:** Korda-01(20)  
**Site Information:** Vacant Commercial Land  
1185 Lamplighter Dr  
Grove City, Ohio 43123

### **Research Results:** No Coverage Available

The collections of fire insurance maps listed below were reviewed according to the site information supplied by client. Based on the information provided, no coverage is available.

Library of Congress  
University Publications of America  
Other Libraries (universities, state, local, etc.).

Disclaimer - The information in this report was obtained from a variety of public sources. GeoSearch cannot insure or makes no warranty or representation as to the accuracy, reliability, quality, errors occurring from data conversion or the customers interpretation of this report. Therefore, this report may not contain sufficient information for other purposes or parties. GeoSearch and its partners, employees, officers and independent contractors cannot be held liable for actual, incidental, consequential, special or exemplary damages suffered by a customer resulting directly or indirectly from any information provided by GeoSearch.

## **Appendix H**

### **Additional Non-Scope Supporting Documents**



October 27, 2020

### Wetlands

- |                                |                                   |          |
|--------------------------------|-----------------------------------|----------|
| Estuarine and Marine Deepwater | Freshwater Emergent Wetland       | Lake     |
| Estuarine and Marine Wetland   | Freshwater Forested/Shrub Wetland | Other    |
|                                | Freshwater Pond                   | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

# National Flood Hazard Layer FIRMMette



83°2'23"W 39°52'38"N



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

<b>SPECIAL FLOOD HAZARD AREAS</b>		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
<b>OTHER AREAS OF FLOOD HAZARD</b>		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
<b>OTHER AREAS</b>		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
		Area of Undetermined Flood Hazard <i>Zone D</i>
<b>GENERAL STRUCTURES</b>		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
<b>OTHER FEATURES</b>		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation 17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
<b>MAP PANELS</b>		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **10/27/2020 at 2:32 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

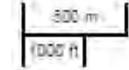
0 250 500 1,000 1,500 2,000 Feet 1:6,000

83°1'45"W 39°52'10"N

# NATIONAL PIPELINE MAPPING SYSTEM

## Legend

-  Gas Transmission Pipelines
-  Hazardous Liquid Pipelines



Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

**This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.**

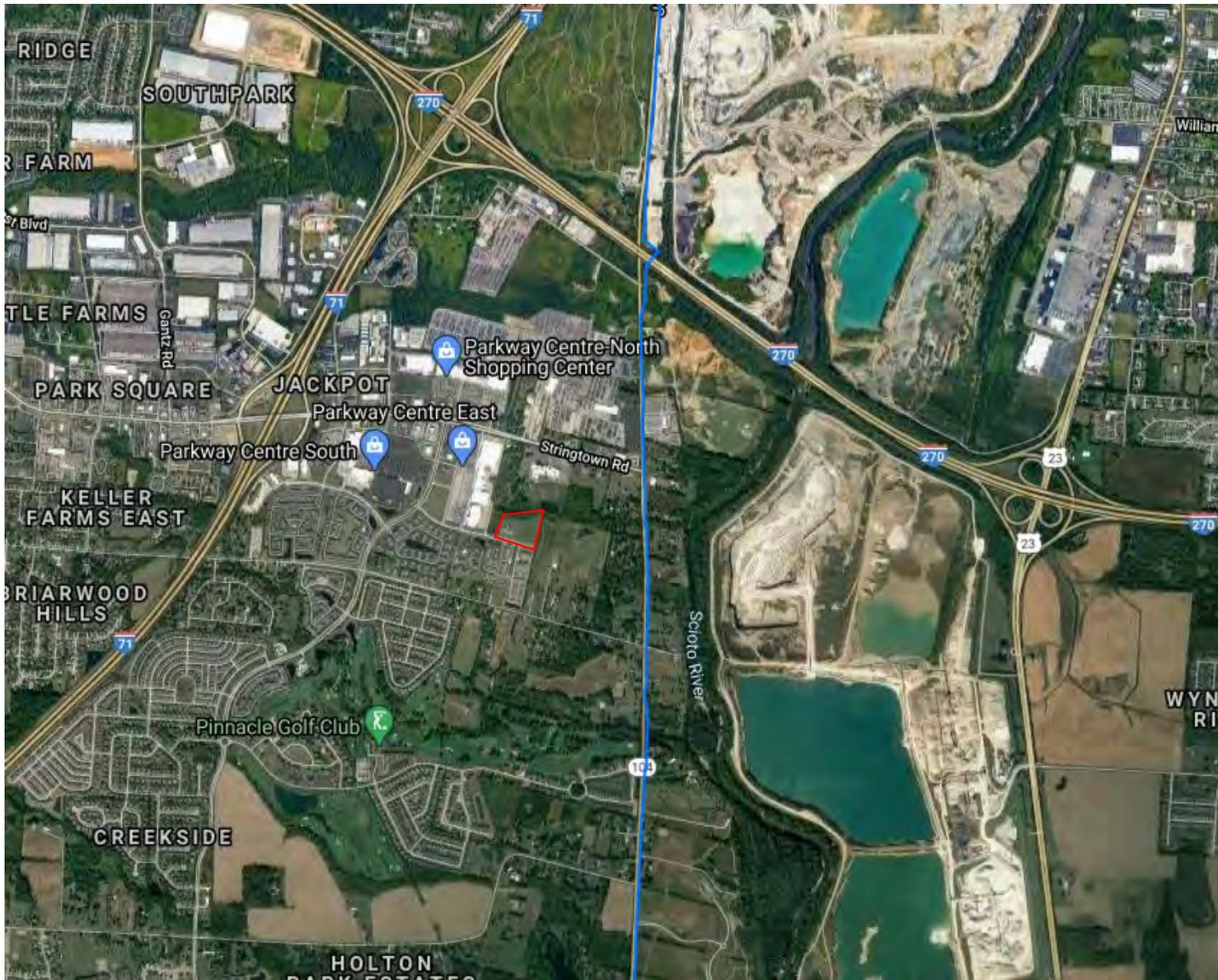
Questions regarding this map or its contents can be directed to [npms@dot.gov](mailto:npms@dot.gov).

Projection: Geographic

Datum: NAD83

Map produced by the Public Viewer application at [www.npms.phmsa.dot.gov](http://www.npms.phmsa.dot.gov)

Date Printed: Oct 27, 2020

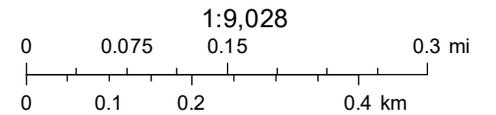


# Ohio Oil & Gas Wells



October 27, 2020

-  Counties
-  Statewide Parcels
-  Current Township
-  Land Subdivision



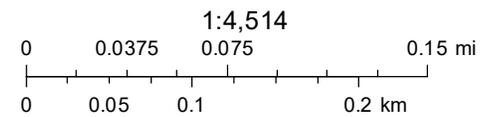
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

# Ohio Water Wells



October 27, 2020

- Water Wells
- Statewide Parcels
- Counties
- Current Township
- Land Subdivision



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



## **Appendix I**

### **Environmental Questionnaire Completed by Property Owner**

## SEC Phase I ESA Questionnaire

Site Description/Address:

Vacant Commercial Property

1185 Lamplighter Drive

Grove City, Ohio

Relationship to Site: (Owner / Occupant)

Please circle the appropriate responses

This questionnaire was completed by:

Company: \_\_\_\_\_

Name (Printed): Elizabeth Morbitzer

Signature: *Elizabeth Morbitzer*

Title: Trustee

Date: 10-3-20

Question	Response
1. Is the property used for industrial use?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
2. Are any adjoining properties used for industrial use?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
3. To the best of your knowledge, has the property been used for industrial use in the past?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
4. To the best of your knowledge, have any adjoining properties been used for industrial use in the past?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
5. Is the property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
6. Are any adjoining properties used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
7. To the best of your knowledge has the property been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
8. To the best of your knowledge have any adjoining properties been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
9. Are there currently any discarded automotive or industrial batteries or pesticides, paints, or other chemicals in individual containers of greater than 5 gal. in size or 50 gal. in aggregate stored on or used at the property or at the facility?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown
10. To the best of your knowledge have there been previously any discarded automotive or industrial batteries or pesticides, paints, or other chemicals in individual containers of greater than 5 gal. in size or 50 gal. in aggregate stored on or used at the property or at the facility?	Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown

Comments Regarding "Yes" Answers: \_\_\_\_\_

## SEC Phase I ESA Questionnaire

Site: 1185 Lamplighter Drive, Grove City, Ohio

Owner Signature: *[Signature]*

Questions (Continued)	Response	
11. Are there currently any industrial drums (typically 55 gal) or sacks of chemicals located on the property or at the facility?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
12. To the best of your knowledge have there been previously any industrial drums (typically 55 gal) or sacks of chemicals located on the property or at the facility?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
13. Has fill dirt been brought onto the property that originated from a contaminated site or that is of an unknown origin?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
14. Are there currently any underground septic tanks, septic wells, leach fields, pits, ponds or lagoons located on the property?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
15. To the best of your knowledge have there been previously any underground septic tanks, septic wells, leach fields, pits, ponds or lagoons located on the property?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
16. Is there currently any stained soil on the property?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
17. To the best of your knowledge, has there been previously any stained soil on the property?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
18. Are there any registered or unregistered storage tanks located on the property?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
19. To the best of your knowledge have there been previously any registered or unregistered storage tanks located on the property?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
20. Are there currently any vent pipes, fill pipes or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
21. To the best of your knowledge have there been previously any vent pipes, fill pipes or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
22. Are there currently any flooring, drains, or walls located within the facility that are stained by substances other than water emitting foul odors?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
23. To the best of your knowledge have there been previously any flooring, drains, or walls located within the facility that are stained by substances other than water emitting foul odors?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
24. If the property is served by a private well or non-public water system have contaminants been identified in the well or system that exceed guidelines applicable to the water system or has the well been designated as contaminated by any government environmental/health agency?	Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown

Comments Regarding "Yes" Answers: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## SEC Phase I ESA Questionnaire

Site: 1185 Lamplighter Drive, Grove City, Ohio

Owner Signature: \_\_\_\_\_

Questions (Continued)	Response		
25. Does the owner or occupant of the property have any knowledge of environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the property or any facility located on the property?	Yes	<input checked="" type="radio"/> No	Unknown
26. Has the owner or occupant of the property been informed of the past or current existence of hazardous substances or petroleum products, environmental violations, or environmental liens with respect to the property or any facility located on the property?	Yes	<input checked="" type="radio"/> No	Unknown
27. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on or contamination of the property or recommended further assessment of the property?	Yes	<input checked="" type="radio"/> No	Unknown
28. Does the owner or occupant of the property know of any past, threatened or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	Yes	<input checked="" type="radio"/> No	Unknown
29. Does the property discharge waste water on or adjacent to the property other than storm water or into a municipal sanitary sewer system?	Yes	<input checked="" type="radio"/> No	Unknown
30. To the best of your knowledge, have any hazardous substances, petroleum products, unidentified waste materials, tires, automotive batteries or any other waste materials been dumped above grade, buried and/or burned on the property?	Yes	<input checked="" type="radio"/> No	Unknown
31. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs, or are there any underground hydraulic systems at the property?	Yes	<input checked="" type="radio"/> No	Unknown
32. Does the owner or occupant of the property have any knowledge of any activity and use limitations (AULs), such as engineering controls, land use restrictions, or institutional controls in place at the site and/or have been filed or recorded in a registry under federal, tribal, state, or local law?	Yes	<input checked="" type="radio"/> No	Unknown
33. To the best of your knowledge, have any prior Phase I ESA, Phase II ESA, or other similar environmental reports been prepared for the subject site?	Yes	<input checked="" type="radio"/> No	Unknown

Comments Regarding "Yes" Answers: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Please return completed questionnaire to Spence Environmental Consulting, Inc.  
by email, or by fax at 614.837.4755.**

## **Appendix J**

### **Local Government Correspondence**

## John Mills

---

**From:** Thomas, Jenny <ThomasJ@jacksonwp.org>  
**Sent:** Wednesday, October 28, 2020 3:06 PM  
**To:** john.mills@spenceenv.com  
**Cc:** Little, Randy  
**Subject:** FW: Records Request - 1185 Lamplighter Drive  
**Attachments:** Franklin County Auditor.pdf; GIS MAp.pdf

This location is the Lamplighter Senior Village Clubhouse and we have no record of AST or hazardous materials storage or responses to this address.

Thanks,



**Jenny Thomas**  
**Jackson Township Fire Department**  
Office: (614) 875-5588  
Mobile: (614) 598-8855

---

**From:** Little, Randy <[LittleR@jacksonwp.org](mailto:LittleR@jacksonwp.org)>  
**Sent:** Wednesday, October 28, 2020 14:27  
**To:** Thomas, Jenny <[ThomasJ@jacksonwp.org](mailto:ThomasJ@jacksonwp.org)>  
**Subject:** FW: Records Request - 1185 Lamplighter Drive

Did we fill this yet?

Thank you,

Randy Little  
Fire Chief  
Jackson Township Fire Department  
3650 Hoover Rd.  
Grove City, OH 43123  
[Littler@jacksonwp.org](mailto:Littler@jacksonwp.org)

---

**From:** John Mills <[john.mills@spenceenv.com](mailto:john.mills@spenceenv.com)>  
**Sent:** Tuesday, October 27, 2020 3:22 PM  
**To:** Little, Randy <[LittleR@jacksonwp.org](mailto:LittleR@jacksonwp.org)>  
**Subject:** Records Request - 1185 Lamplighter Drive

Good afternoon Chief Little,

As part of this firm's research into the environmental history of the property located at 1185 Lamplighter Drive, Grove City, OH, I would like to request records from your division pertaining to hazardous material activity, past or present aboveground or underground storage tanks, emergency hazardous materials responses, or any other relevant environmental information pertaining to the use of the property. We have info from BUSTR regarding USTs in the area but I figured it was worth checking with you as well. The property is an undeveloped parcel and I've included the

auditors card and parcel map for the site. Please don't hesitate to contact me with any questions. Thanks in advance for any assistance you can offer with this, have a good day sir.

John Mills

**Spence Environmental Consulting, Inc.**

70 West Columbus Street

Pickerington, Ohio 43147

Office: (614) 837-4750

Fax: (614) 837-4755

Mobile: (614) 813-1332



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