



Department of Building & Grounds  
Architectural Services Division

City of Baton Rouge  
Parish of East Baton Rouge

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## **ADDENDUM #2**

**May 10, 2024**

### **TO ALL BIDDERS**

#### **PROJECT: CAUW RENOVATION**

#### **CITY PARISH PROJECT NO. 21-ASC-CP-1487**

The following revisions shall be incorporated in and take precedence over any conflicting part of the original contract documents.

- A. Addendum No. 2 from Architect DNA Workshop dated May 10<sup>th</sup>, 2024 Narrative Summary 4 pages
  - 1.) Bid Request For Information (RFI) Responses 2 pages
  - 2.) Revised Construction Documents including responses to RFIs 27 sheets
  - 3.) Revised Specification Manual including responses to RFIs 412 pages
- B. Courtesy reminder of Bid Opening schedule: 2:00pm CDT Thursday, May 16<sup>th</sup>, 2024.

*Total pages in this addendum, including cover page: 446*

**FAILURE TO INDICATE RECEIPT OF THIS ADDENDUM ON BID FORM MAY BE CAUSE FOR THE BID TO BE REJECTED**

Stephen Long, AIA, LEED AP BD+C  
Senior Architect  
Architectural Services Division  
1100 Laurel St Rm 225  
Baton Rouge, LA 70802

# ADDENDUM (02)

5/10/2024  
Capital Area United Way Renovations  
21-ASC-CP-1487

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This Addendum supersedes and supplements all portions of the bidding documents with which it conflicts. Written addenda, including drawings or other graphic documents issued before the execution of the contract modifies or interprets the bidding documents.

## DESCRIPTION:

1. G-100 – Cover Page
  - a. Clarification of alternates
  - b. Alternate 3 detail drawings relocated to G-100.
  - c. Revisions to sheet list
2. G-001 – Reference Photographs – Roof
  - a. Addition of sheet.
3. G-002 – Reference Photographs – Site
  - a. Addition of sheet.
4. L-100 – Landscape Plan
  - a. Revision of planting layout, schedule, and details.
5. AD-000 – Demo - Site Plan
  - a. Revision of General Notes.
  - b. Alternate 3 removed from drawing.
  - c. Clarification on work at rear stair.
  - d. Clarification to landscaping scope.
  - e. Clarification to keynotes.
6. AD-100 – Demo First Floor Plan
  - a. Revision of General Notes.
  - b. Instruction on mural located at Main Lobby, note D5.8.
  - c. Clarification of location of wall-based vents to be replaced, note D1.8.
  - d. Clarification to window and or glazing replacement.
  - e. Clarification to keynote D5.6 noting transom to be removed and replaced at entry doors.
7. AD-101 – Demo – Basement Plan
  - a. Revision of General Notes.
  - b. Removal of Alternate #2 from drawings. Revision to keynote D4.3.
  - c. Clarification to window and or glazing replacement.
  - d. Removal of floor tile replacement at Vestibule.
  - e. Clarification of scope at Employee Lounge.
  - f. Addition of room numbers to Wall Repair Schedule and Room Tags.
8. AD-102 – Demo – First Floor RCP
  - a. Revision of General Notes.
  - b. Sheet numbering changed to “AD-102”.



- c. Clarification of ceiling heights/types.
  - d. Clarification of light types/locations.
  - e. Instruction on existing projector, note D1.9.
  - f. Revision to keynote D1.6.
9. AD-103 – Demo – Basement RCP
  - a. Revision of General Notes.
  - b. Sheet numbering changed to “AD-103”
  - c. Clarification of ceiling heights/types.
  - d. Location of light in Vestibule.
  - e. Additional location of wall-based register/diffuser to be replaced, note D1.8.
  - f. Removal of existing security monitor, note D1.10.
10. AD-200 – Demo – Elevations
  - a. Revision to General Notes.
  - b. Consolidation of all exterior elevations onto one sheet.
  - c. Alternate 3 removed from drawings.
  - d. Clarification of level heights.
  - e. Addition of note D5.11.
  - f. Addition of note D2.10 calling for repair of exterior light fixtures.
  - g. Revision to note D2.13.
  - h. Clarifications to note D2.17.
  - i. Clarifications to window/glazing repairs.
11. A-000 – Site Plan
  - a. Revision to General Notes.
  - b. Alternate 3 removed from drawings.
  - c. Revision to keynotes.
  - d. Proposed lay down area noted.
12. A-100 – First Floor Plan
  - a. Revision to General Notes.
  - b. Clarification of exterior signage location.
  - c. Instruction on mural located at Main Lobby, note C5.15.
  - d. Clarifications to window/glazing repairs.
  - e. Addition of note to re-install existing grab bars at W.C. 20.
13. A-101 – Basement Plan
  - a. Revision to General Notes.
  - b. Revision to Keynotes.
  - c. Removal of floor tile replacement location at Vestibule.
  - d. Additional details at Employee Lounge millwork.
  - e. Revision of counter height and Employee Lounge millwork.
  - f. Revision of sink to be new at Employee Lounge.
  - g. Addition of room numbers to Basement Wall Repair Schedule.
  - h. Relocation of millwork details to sheet A-302.
  - i. Revision to Employee Lounge – Kitchen Elevation.
14. A-103 – First Floor RCP
  - a. Revision of General Notes.
  - b. Revision of light layout to match existing throughout.
  - c. Clarification of lighting/RCP schedule.
  - d. Addition of Ceiling Legend and clarification of ceiling types throughout.



- e. Instruction on mural located at Main Lobby, note C5.15.
  - f. Removal of Sensory System from scope.
15. A-105 – Basement RCP
  - a. Revision of General Notes.
  - b. Revision of light layout to match existing throughout.
  - c. Clarification of lighting/RCP schedule.
  - d. Addition of Ceiling Legend and clarification of ceiling types throughout.
  - e. Location of Alternate 2 control panel noted to be coordinated with architect.
  - f. Removal of Sensory System from scope.
16. A-106 – Roof Plan
  - a. Removed from set.
17. A-200 – Elevations
  - a. Revision of General Notes.
  - b. Consolidation of all exterior elevations onto one sheet.
  - c. Clarification of level heights.
  - d. Detail drawing called out for entry lights.
  - e. Alternate 3 removed from drawings.
  - f. Revision to note C2.11
  - g. Clarifications to window/glazing repairs.
  - h. Revision to keynotes.
  - i. Clarification to note C2.11.
  - j. Removal of Alternate #3 from drawings.
  - k. Note to repair/replace limestone base.
18. A-300 –Details
  - a. Roof details removed from sheet.
  - b. Sheet re-named.
  - c. Addition of Light Fixture Details.
  - d. Addition of Banner Mounting Details
19. A-301 – Details
  - a. Roof details removed from sheet.
  - b. Sheet re-named.
  - c. Addition of Molding Details.
  - d. Addition of Millwork Details.
20. A-400 – Window Schedule & Details
  - a. Revisions to Window Schedule.
  - b. Removal of details from sheet.
21. A-401 – Schedules & Details
  - a. Revision to Door Schedule.
  - b. Revision to Finish Legend and Schedule.
  - c. Addition of Entry Vinyl Decal Signage Detail.
22. A-500 – Reference Roof Plan
  - a. Addition of sheet.
23. WP3.10 – Repair Details
  - a. Addition of sheet.
24. WP3.20 – Repair Details
  - a. Addition of sheet.
25. WP5.10 – KEE Membrane Roof Details



- a. Addition of sheet.
- 26. WP5.20 – PVB Membrane Roof Details
  - a. Addition of sheet.
- 27. WP5.21 – PVB Membrane Roof Details
  - a. Addition of sheet.

**ATTACHMENTS:**

- 1.) **Response to submitted RFI's.**
- 2.) **Revised Sheets.**
- 3.) **Revised Spec set.**

**ISSUED: DNA WORKSHOP**

BY: Allison Keppinger



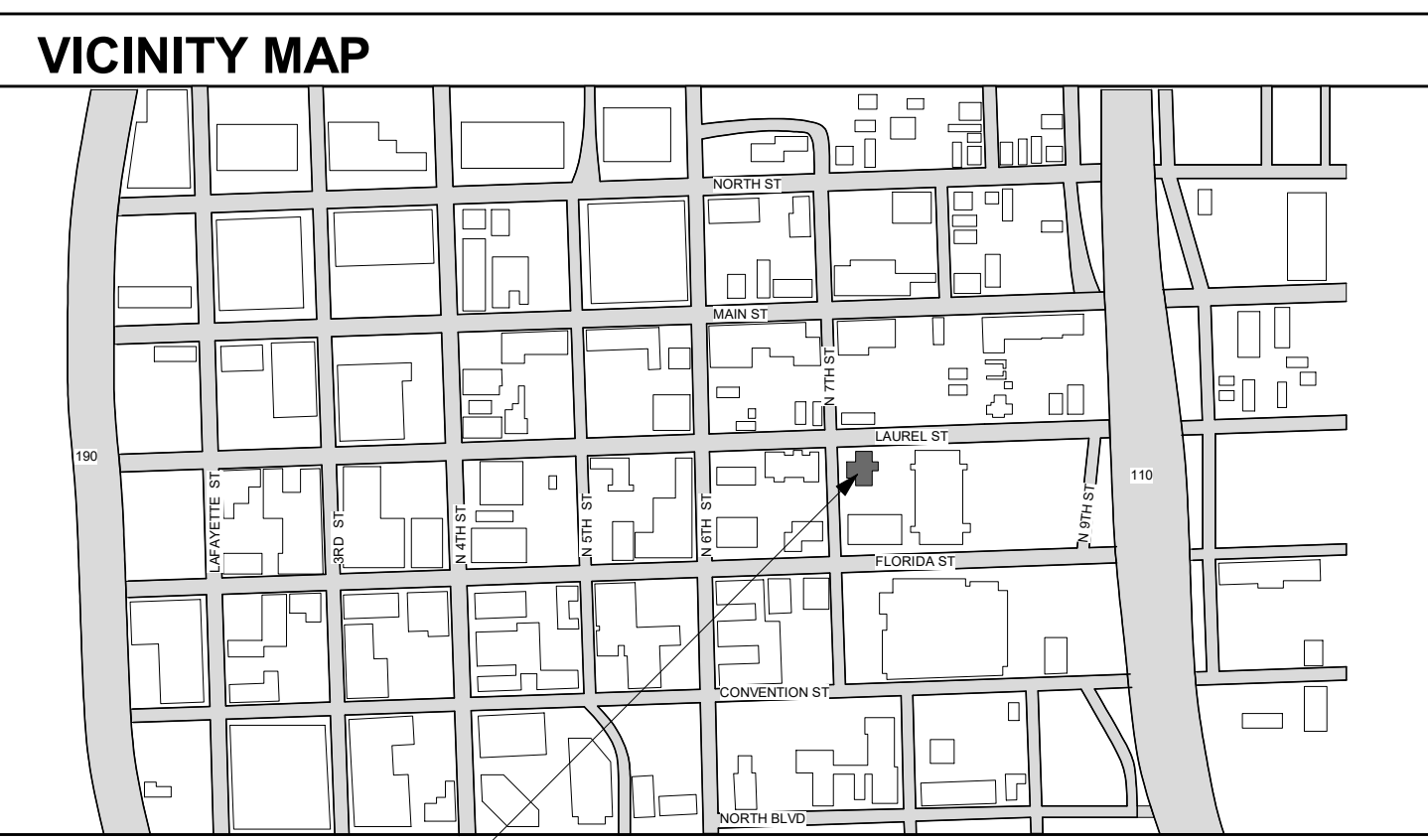
5/10/2024  
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BID RFI RESPONSES

- 1) What color powder coat for the railings and handrails?
  - a. **Silver finished.**
- 2) What color finish for the window screens?
  - a. **The windows are to have a clear finish.**
- 3) See attached regarding one of the metal grates. Is it your intent for the contractor to temporarily cut and cap the cooling tower lines and electrical until the grate is reinstalled. Removing the grate and getting it refinished is going to take more than a few days. Therefore there will be no AC in the building and I don't think that is the best route to take.
  - a. **No. Contractor to make no modifications to the grate that would interrupt building systems. Contractor to coordinate with Architect on final solution.**
- 4) The handrails call for anodization and powder coating for different units. Is this correct that you want each? Also, there are no specifications on powder coating.
  - a. **See revised sheets for clarification on anodization and powder coating.**
  - b. **Powder coat spec. included in ASI No. 2**
- 5) The schedule on sheet AD-101 refers to the kitchen, but there are no rooms that say kitchen on the plans.
  - a. **See revised sheet AD-101.**
- 6) On sheet AD-101 keynote D3.1 is in a shaded room saying no work.
  - a. **See revised sheet AD-101.**
- 7) Sheet AD-101 note D4.3 is referring to the elevator alternate or is this a separate security system for the building.
  - a. **Revision to note D4.3. Elevator repairs and updated security to be priced as Alternate No.2 as noted on Cover Page G-100.**
- 8) There are currently no specifications on the canopy, banners, elevator panel, security systems, tile, and finishes....
  - a. **See additional specifications.**
- 9) 1. Plans reference a clear water repellent application to the exterior masonry. Will a specification be provided for that scope?
  - a. **See revised notes and specifications for all exterior cleaning.**
- 10) Has an amount of stone repair been decided on so each bidder can assume the same scope? Around 30SF?
  - a. **All bidders should have stone repair allowance of 30sf.**

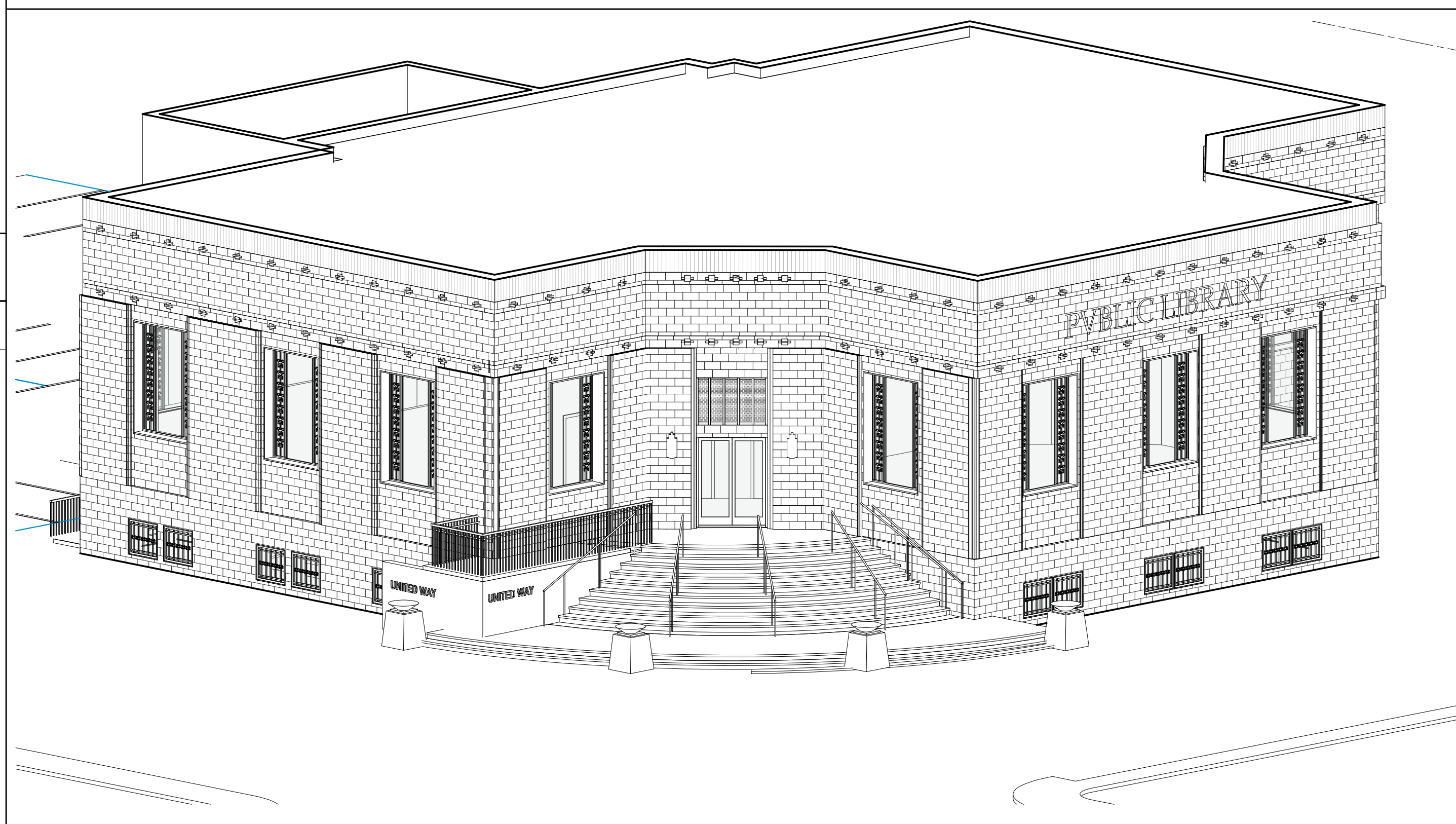


- 11) During the pre-bid conference there was a discussion of some below grade waterproofing along the west wall, south wall, and in the pedestal planters. Is that scope going to be performed? Any details / specs?
  - a. **Yes, see sheet WP3.20 for detail and spec 07115 Below Grade Elastomeric Coatings.**
- 12) During the pre-bid conference the windows were said to get replaced. But in some sections of the plans they are called out to be restored. Please clarify?
  - a. **All windows are to be replaced. See revised drawing notes.**
- 13) Plans call for pressure washing of the hardscape and stucco areas, but specs only allow for low pressure cleaning of the exterior masonry. If a mock up is performed, and it does not damage limestone, will higher pressure cleaning be allowed at the exterior walls? There is no way of assuming how many passes of low pressure cleaning will end up being required.
  - a. **See revised masonry cleaning specifications.**
- 14) 6. Some sections of the plans say to remove the grout at the exterior limestone joints and repoint to match existing. The existing is sealant, but the design intent is still to replace it with mortar. Correct?
  - a. **See Sheet WP3.10 for Limestone Cladding Joint Replacement Detail.**
- 15) 7. Will we have to mix the repointing mortar on site, or will a premixed HDLC approved mortar mix be allowed?
  - a. **See revised Masonry Restoration and Cleaning Specifications.**



# RENOVATION AT CAPITAL AREA UNITED WAY

## 700 LAUREL ST., BATON ROUGE, LA 70802



### GENERAL NOTES

- THESE DRAWINGS ARE THE GRAPHIC AND PICTORIAL PORTION OF THE CONTRACT DOCUMENTS. THESE DRAWINGS CONVEY THE DESIGN INTENT, LOCATION AND DIMENSIONS OF THE WORK.
- THE CONTRACTOR SHALL CAREFULLY STUDY AND COMPARE THESE DRAWINGS WITH OTHER PARTS OF THE CONTRACT DOCUMENTS, WHETHER APPEARING HEREIN OR ISSUED SEPARATELY, AND SHALL AT ONCE REPORT TO DNA ANY ERRORS, INCONSISTENCIES, OR OMISSIONS DISCOVERED.
- ALL PORTIONS OF THE CONTRACT DOCUMENTS, WHETHER APPEARING HEREIN OR ISSUED SEPARATELY ARE INTENDED TO BE COMPLEMENTARY. WHAT IS CALLED FOR BY ANY PORTION THEREOF SHALL BE AS IF CALLED FOR BY ALL PORTIONS OF THE CONTRACT DOCUMENTS. ANY APPARENT OR OBVIOUS INCONSISTENCIES APPEARING WITHIN ANY PORTION OF THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF DNA BY THE CONTRACTOR PRIOR TO PROCEEDING WITH WORK.
- THESE DRAWINGS DO NOT INDICATE OR DESCRIBE ALL WORK REQUIRED FOR FULL PERFORMANCE AND COMPLETION OF THE CONTRACT REQUIREMENTS. ON THE BASIS OF THE GENERAL SCOPE INDICATED OR DESCRIBED HEREIN, THE CONTRACTOR SHALL FURNISH ALL ITEMS REQUIRED FOR PROPER EXECUTION AND COMPLETION OF THE WORK, WHETHER OR NOT SAID ITEMS AND/OR ASSOCIATED WORK ARE SPECIFICALLY IDENTIFIED HEREIN.
- THE CONTRACTOR SHALL VERIFY THAT NO CONFLICTS EXIST IN LOCATIONS OF ALL MECHANICAL, TELEPHONE, ELECTRICAL, LIGHTING, PLUMBING, AND SPRINKLER EQUIPMENT (TO INCLUDE ALL ASSOCIATED PIPING, DUCTWORK, AND/OR CONDUIT) AND THAT ALL REQUIRED CLEARANCES FOR THE INSTALLATION AND MAINTENANCE OF THE ASSOCIATED WIRING AND EQUIPMENT CAN BE PROVIDED.
- WHERE COMPONENTS OR MATERIALS ARE NOTED AS "BUILDING STANDARD", CONTRACTOR SHALL INSTALL ITEMS AS SPECIFIED BY THE PROJECT ARCHITECT AND/OR OWNER'S REPRESENTATIVES.

### SUBMITTAL REQUIREMENTS

**GENERAL**

THE CONTRACTOR SHALL REVIEW, APPROVE, AND STAMP EACH ITEM WHICH IS SUBMITTED BY REVIEWING, APPROVING, STAMPING, AND MAKING SAID SUBMITTALS, THE CONTRACTOR CERTIFIES THAT HE(SHE) HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS, AND FIELD CONSTRUCTION CRITERIA RELATED THERETO (OR THAT HE(SHE) WILL DO SO) AND THAT HE(SHE) HAS CHECKED AND COORDINATED THE INFORMATION CONTAINED WITHIN SUCH SUBMITTALS WITH THE REQUIREMENTS OF THE WORK AND OF THE CONTRACT DOCUMENTS.

THE CONTRACTOR SHALL NOT BE RELIEVED OF RESPONSIBILITY FOR ANY DEVIATION FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BY DNA'S REVIEW OF ANY OF THE FOREMENTIONED SUBMITTALS. FURTHER, THE CONTRACTOR SHALL NOT BE RELIEVED FROM RESPONSIBILITY FOR ERRORS OR OMISSIONS CONTAINED WITHIN ANY SUBMITTAL BY DNA'S REVIEW OF SAID SUBMITTAL.

NOTWITHSTANDING ANY QUANTITIES INDICATED OR SPECIFICALLY STATED ON ANY SPECIFIC SUBMITTAL, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL QUANTITIES OF MATERIALS OR EQUIPMENT REQUIRED TO PROPERLY COMPLETE THE WORK.

SHOP DRAWINGS WHICH ARE REQUIRED TO BE SUBMITTED:

- SHALL BE DRAWN TO A SCALE SUFFICIENT FOR CLARITY AND COORDINATION
- SHALL SHOW NECESSARY WORKING AND ERECTION DIMENSIONS AND NECESSARY DETAILS, SECTIONS, PLANS, AND ELEVATIONS
- SHALL BE PROPERLY CROSS-REFERENCED TO THE APPROPRIATE PAGES OF THESE DRAWINGS TO CLEARLY DELINEATE ARRANGEMENT
- SHALL ILLUSTRATE RELATIONSHIP TO OTHER WORK ASSOCIATED WITH THE PROJECT.

ANY SAMPLE REQUIRED TO BE SUBMITTED FOR REVIEW WILL BE RETURNED WHEN SO REQUESTED BY THE CONTRACTOR. CHARGES FOR SUBMISSION OF SAMPLES AND FOR THEIR RETURN SHALL BE BORNE BY THE CONTRACTOR.

CONTRACTOR SHALL CONSECUTIVELY NUMBER SUBMITTALS. ANY RE-SUBMITTALS SHALL RETAIN THE ORIGINAL IDENTIFICATION NUMBER FOLLOWED BY THE DESIGNATED REVISION NUMBER (I.E. REV. 1, REV. 2, ETC.). CLEAR SPACE SHALL BE PROVIDED ON EACH ITEM SUBMITTED FOR CONTRACTOR'S AND PROJECT ARCHITECT'S STAMPS. WHERE CLEAR SPACE IS NOT AVAILABLE ON SAMPLES, SUBMIT WITH TAGS ATTACHED.

**CONDITIONS AND QUALIFICATIONS**

DNA'S REVIEW AND NON-REJECTION OF A SPECIFIC ITEM SHALL NOT BE CONSTRUED AS ACCEPTANCE OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT.

DNA'S REVIEW OF SUBMITTALS SHALL IN NO WAY IMPLY THAT DNA IS IN ANY WAY RESPONSIBLE FOR THE FABRICATION PROCESS OR TECHNIQUES OF CONSTRUCTION. DNA WILL NOT CHECK, AND ASSUMES NO RESPONSIBILITY FOR, DIMENSIONS OR QUANTITIES ON REVIEWED SUBMITTALS, OR FOR COORDINATION OF ANY TRADES.

THE REVIEW OF SUBMITTALS SHALL NOT ACT TO PERMIT DEPARTURES FROM ADDITIONAL DETAILS OR INSTRUCTION PREVIOUSLY GIVEN.

**SUBSTITUTIONS**

CONTRACTOR SHALL SUBMIT FOR REVIEW ANY ITEM WHICH IS PROPOSED FOR SUBSTITUTION, OR WHICH DIFFERS IN ANY RESPECT FROM MATERIALS, SYSTEMS, AND EQUIPMENT WHICH IS SPECIFIED WITHIN THESE DRAWINGS.

SUBSTITUTIONS WILL ONLY BE CONSIDERED WHICH EITHER:

- PROVIDE A HIGHER LEVEL OF QUALITY
- SAVE THE OWNER MONEY OVER ENTIRE PROJECT (INCLUDING DNA'S REVIEW TIME), OR
- IMPROVE THE PROJECT SCHEDULE.

REQUESTS FOR SUBSTITUTION MUST BE ACCOMPANIED BY THE FOLLOWING:

- COMPLETE TECHNICAL DATA AND PERFORMANCE SPECIFICATIONS
- SAMPLES OF THE ARTICLE PROPOSED FOR SUBSTITUTION (AS APPLICABLE)
- A STATEMENT SIGNED BY THE CONTRACTOR THAT THE PROPOSED SUBSTITUTION IS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
- NOTIFICATION REGARDING THE EFFECT OF THE SUBSTITUTION ON OTHER WORK, ASSEMBLIES, PRODUCTS, OR SEPARATE CONTRACTS. ALSO NOTIFICATION IF ACCEPTANCE OF SUBSTITUTION COULD REQUIRE REVISION OF DRAWINGS OR DETAILS.

REQUESTS FOR SUBSTITUTIONS SHALL INCLUDE FOUR (4) COPIES OF THE ABOVE INFORMATION.

CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXECUTION OF ANY CHANGES IN OTHER PARTS OF HIS(HER) WORK, OR THE WORK OF SUBCONTRACTORS OR OTHER TRADES, WHICH MAY BE CAUSED BY ACCEPTANCE OF THE SUBSTITUTION. SAID CHANGES IN WORK SHALL BE PROVIDED AT NO CHARGE TO THE OWNER.

ORIGINALLY SPECIFIED ITEMS SHALL BE FURNISHED UNLESS A SUBSTITUTION HAS BEEN FORMALLY ACCEPTED.

IT IS UNDERSTOOD THAT DUE TO CITY APPROVALS AND OWNER INSTRUCTIONS, CERTAIN SUBSTITUTIONS CANNOT BE APPROVED. THEREFORE, DNA RESERVES THE RIGHT TO REJECT ANY AND ALL REQUESTS FOR SUBSTITUTION.

WHEN MAKING A SUBSTITUTION CONTRACTOR SHALL BE FINANCIALLY RESPONSIBLE FOR ANY TIME EXPENDED IN ALTERING DRAWINGS TO REFLECT CHANGES IN THE PROJECT AS BY THE INCORPORATION OF THE SUBSTITUTED ARTICLE WITHIN THE WORK.

### DIRECTORY

**OWNER / REPRESENTATIVE:**  
CITY OF BATON ROUGE

**ARCHITECT:**  
DYKE NELSON ARCHITECTURE  
235 SOUTH 14TH STREET, SUITE A  
BATON ROUGE, LA 70802  
T: 225.224.3363  
E: DYKE@DNA-ARCHITECTURE.COM

**CIVIL ENGINEER:**  
STANTEC  
ANDRE RODRIGUE  
1200 BRICKYARD LANE SUITE 400  
BATON ROUGE, LA 70802  
E: ANDRE.RODRIGUE@STANTEC.COM

### GRAPHIC SYMBOLS

	NORTH ARROW		DOOR TAG
	LEVEL & ELEVATION TAG		WINDOW TAG
	KEYNOTE TAG		WALL TAG
	CENTERLINE		ROOM NAME ROOM NUMBER ROOM AREA
	SPOT ELEVATION		OCCUPANCY USE ROOM SF / OCCUPANT LOAD
	REVISION NUMBER		# ON SHEET EXTERIOR ELEVATION TAG SHEET #
	RISE/RUN ROOF SLOPE		# ON SHEET INTERIOR ELEVATION TAG SHEET #
	CALLOUT TAG		

### ABBREVIATIONS

<b>AFF</b>	ABOVE FINISHED FLOOR	<b>FA</b>	FIRE ALARM	<b>N</b>	NORTH
<b>ALUM</b>	ALUMINUM	<b>FE</b>	FIRE EXTINGUISHER	<b>NSF</b>	NET SQUARE FEET
<b>ARCH</b>	ARCHITECTURAL	<b>FIN</b>	FINISH	<b>N/A</b>	NOT APPLICABLE
<b>BLDG</b>	BUILDING	<b>FURR</b>	FURRING	<b>OC</b>	ON CENTER
<b>BOT</b>	BOTTOM	<b>FLR</b>	FLOOR	<b>OD</b>	OUTSIDE DIAMETER
<b>CLR</b>	CLEAR	<b>GSF</b>	GROSS SQUARE FEET	<b>PROP</b>	PROPERTY
<b>CLG</b>	CEILING	<b>GWB</b>	GYP SUM WALL BOARD	<b>PTD</b>	PAINTED
<b>CLO</b>	CLOSET	<b>GYP BD</b>	GYP SUM BOARD	<b>PTC</b>	PRIOR TO CONSTRUCTION
<b>COL</b>	COLUMN	<b>HR</b>	HOUR	<b>RM</b>	ROOM
<b>CONC</b>	CONCRETE	<b>HT</b>	HEIGHT	<b>SPEC</b>	SPECIFICATION
<b>CORR</b>	CORRIDOR	<b>IN</b>	INCH	<b>STD</b>	STANDARD
<b>DIA</b>	DIAMETER	<b>LVP</b>	LAMINATED VINYL PLANK	<b>TYP</b>	TYPICAL
<b>DIM</b>	DIMENSION	<b>MAT</b>	MATERIAL	<b>TBD</b>	TO BE DETERMINED
<b>DN</b>	DOWN	<b>MTL</b>	METAL	<b>VER</b>	VERIFY
<b>DWG</b>	DRAWING	<b>MBM</b>	METAL BUILDING MANUFACTURER		
<b>ELECT</b>	ELECTRICAL				
<b>EQ</b>	EQUAL				
<b>EXT</b>	EXTERIOR				

### PROJECT STATISTICS

PROJECT NAME: **RENOVATION AT CAPITAL AREA UNITED WAY BLDG.**

PROJECT ADDRESS: **700 LAUREL ST., BATON ROUGE, LA 70802**

PROPOSED USE:

<b>BUILDING PLANNING:</b>	<b>B</b>
OCCUPANCY(IBC):	<b>B</b>
OCCUPANCY(NFPA):	<b>B</b>
MIXED OCCUPANCY:	<b>N/A</b>
REQ'D FIRE SEPARATION:	<b>N/A</b>

**MEANS OF EGRESS**

<b>200'-0"</b>	MAX TRAVEL DISTANCE TO EXIT
<b>20'-0"</b>	MAX DEAD END CORRIDOR LENGTH
<b>44"</b>	MIN CORRIDOR WIDTH
<b>30'-0"</b>	MAX COMMON PATH OF TRAVEL
<b>32"</b>	MIN CLEAR OPENING OF EXIT DOORS
<b>2</b>	MIN NUMBER OF EXITS

**FIRE PROTECTION REQUIREMENTS:**

<b>N/A</b>	AUTOMATIC SPRINKLERS
<b>YES</b>	MANUAL EXTINGUISHERS
<b>L</b>	OCCUPANCY HAZARD (LOW, MED, HIGH)
<b>3,000 SF</b>	MAX FLOOR AREA PER EXTINGUISHER
<b>75'-0"</b>	MAX TRAVEL DISTANCE PER EXTINGUISHER

**APPLICABLE CODES:**

BUILDING CODE:	<b>IBC (2021)</b> <b>IECC (2021)</b>
LIFE SAFETY CODE:	<b>NFPA 101 (2015)</b>
ACCESSIBILITY CODE:	<b>ADAAG (2010),</b> <b>ANSI 117.1 (2009)</b>
STRUCTURAL CODE:	<b>N/A</b>
MECHANICAL CODE:	<b>IMC (2021)</b>
ELECTRICAL CODE:	<b>NEC (2020)</b>
PLUMBING CODE:	<b>IPC (2021)</b>
GAS CODE:	<b>IFGC (2021)</b>

**TYPE OF CONSTRUCTION:**

CONSTRUCTION TYPE (IBC):	<b>N/A</b>
CONSTRUCTION TYPE (NFPA):	<b>N/A</b>

### SHEET LIST

SHEET #	SHEET NAME	ISSUE DATE	REV. DATE
0	GENERAL		
G-000	COVER PAGE	02/02/24	05/09/24
G-001	REFERENCE PHOTOGRAPHS-ROOF	05/09/24	
G-002	REFERENCE PHOTOGRAPHS-SITE	05/09/24	
1	CIVIL		
C-100	SITE PLAN	02/06/24	
2	LANDSCAPE		
L-100	LANDSCAPE PLAN	02/02/24	
3	ARCHITECTURE DEMO		
AD-000	DEMO - SITE PLAN	02/02/24	05/09/24
AD-100	DEMO - FIRST FLOOR PLAN	02/02/24	05/09/24
AD-101	DEMO - BASEMENT PLAN	02/02/24	05/09/24
AD-102	DEMO - FIRST FLOOR RCP	02/02/24	05/09/24
AD-103	DEMO - BASEMENT RCP	02/02/24	05/09/24
AD-200	DEMO - ELEVATIONS	02/02/24	05/09/24
4	ARCHITECTURE		
A-000	SITE PLAN	02/02/24	05/09/24

### SHEET LIST

SHEET #	SHEET NAME	ISSUE DATE	REV. DATE
A-100	FIRST FLOOR PLAN	02/02/24	05/09/24
A-101	BASEMENT PLAN	02/02/24	05/09/24
A-102	FIRST FLOOR RCP	02/02/24	05/09/24
A-103	BASEMENT RCP	02/02/24	05/09/24
A-200	ELEVATIONS	02/02/24	05/09/24
A-300	DETAILS	02/02/24	05/09/24
A-301	DETAILS	02/02/24	
A-303	ROOF DETAILS	05/09/24	
A-400	WINDOW SCHEDULE & DETAILS	02/02/24	05/09/24
A-401	SCHEDULE & DETAILS	02/02/24	05/09/24
A-500	REFERENCE ROOF PLAN	05/09/24	
WP	WATER PROOFING		
WP 5.10	Unnamed	05/09/24	
WP 3.10	REPAIR DETAILS	05/09/24	
WP 3.20	REPAIR DETAILS	05/09/24	

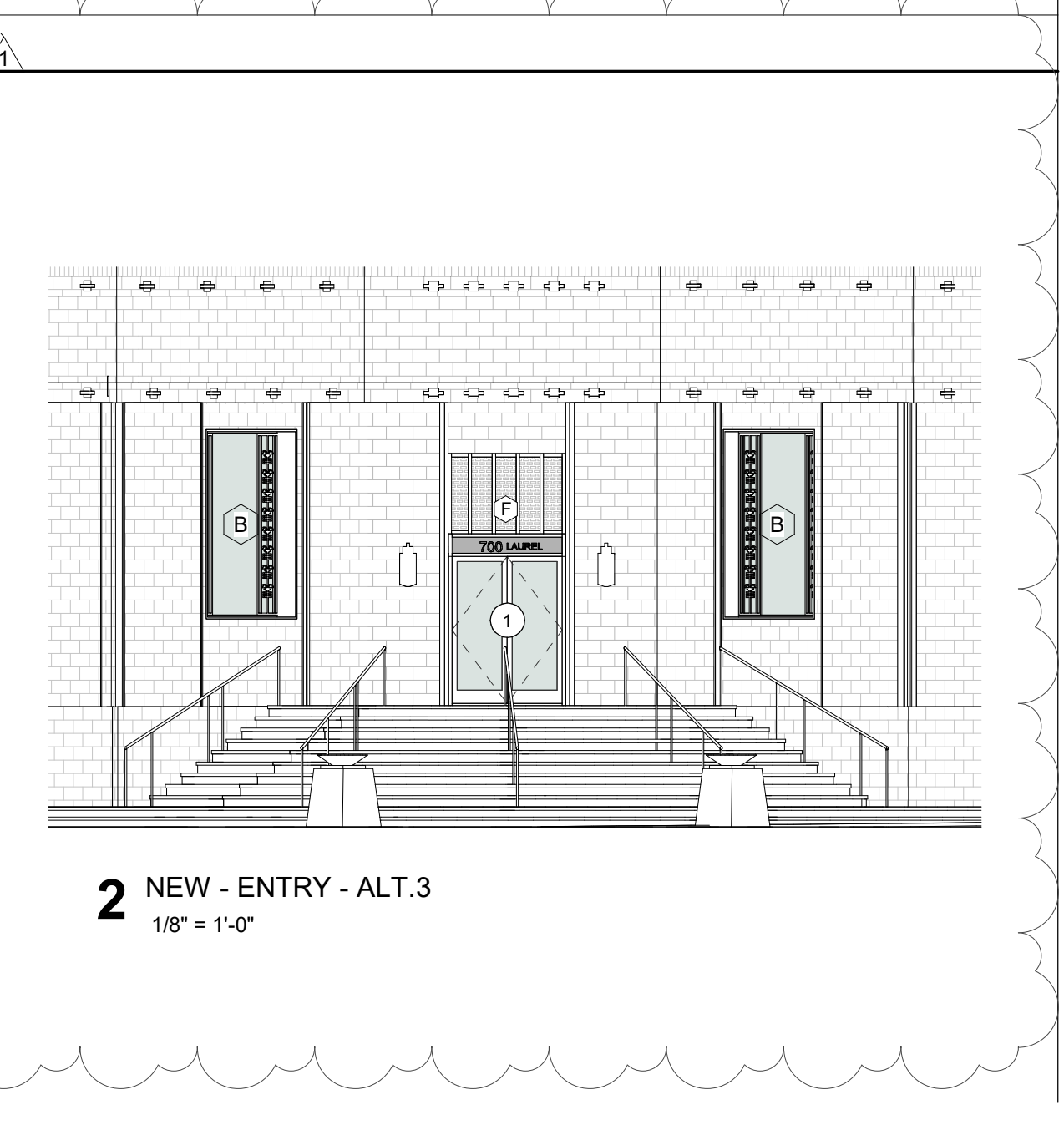
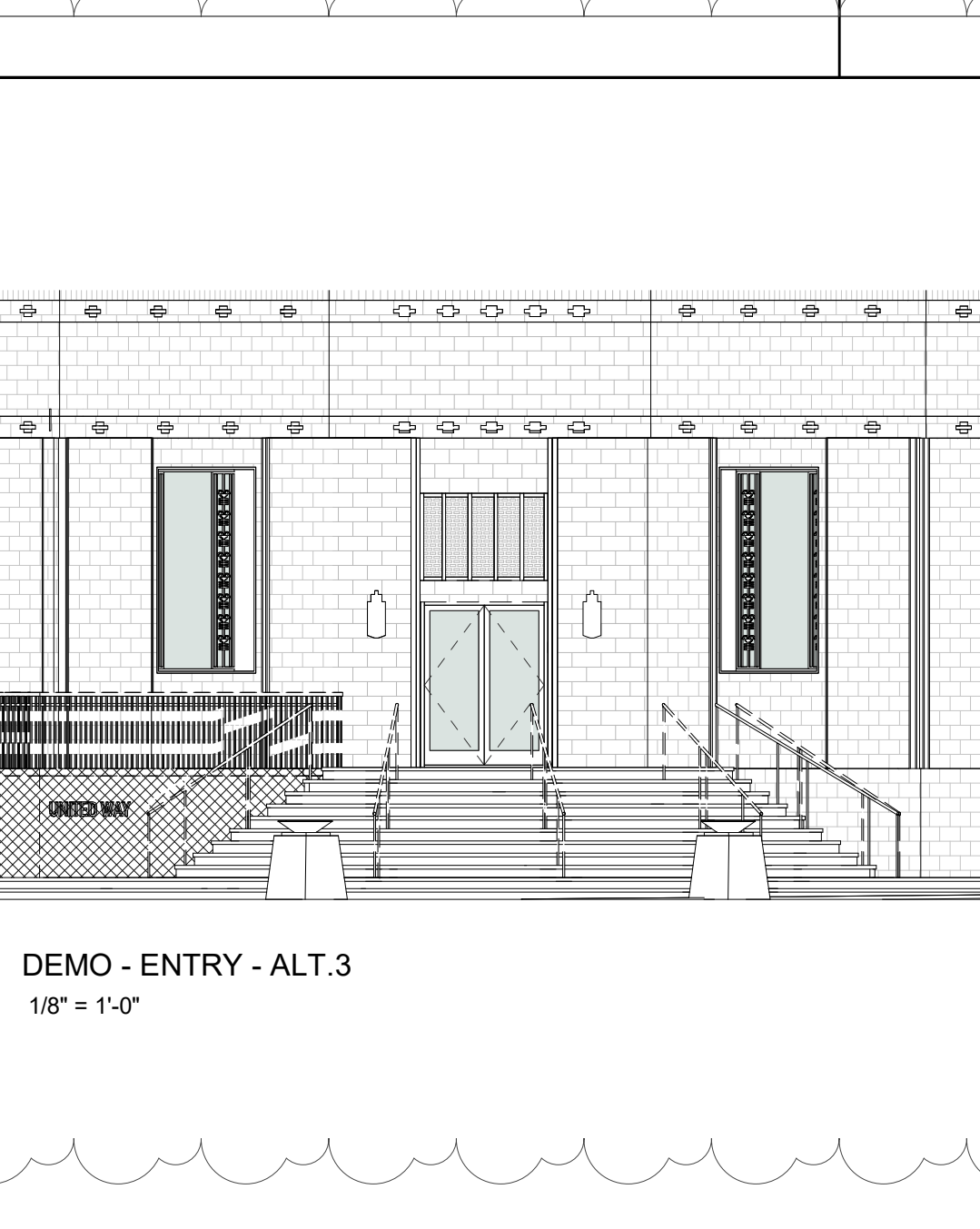
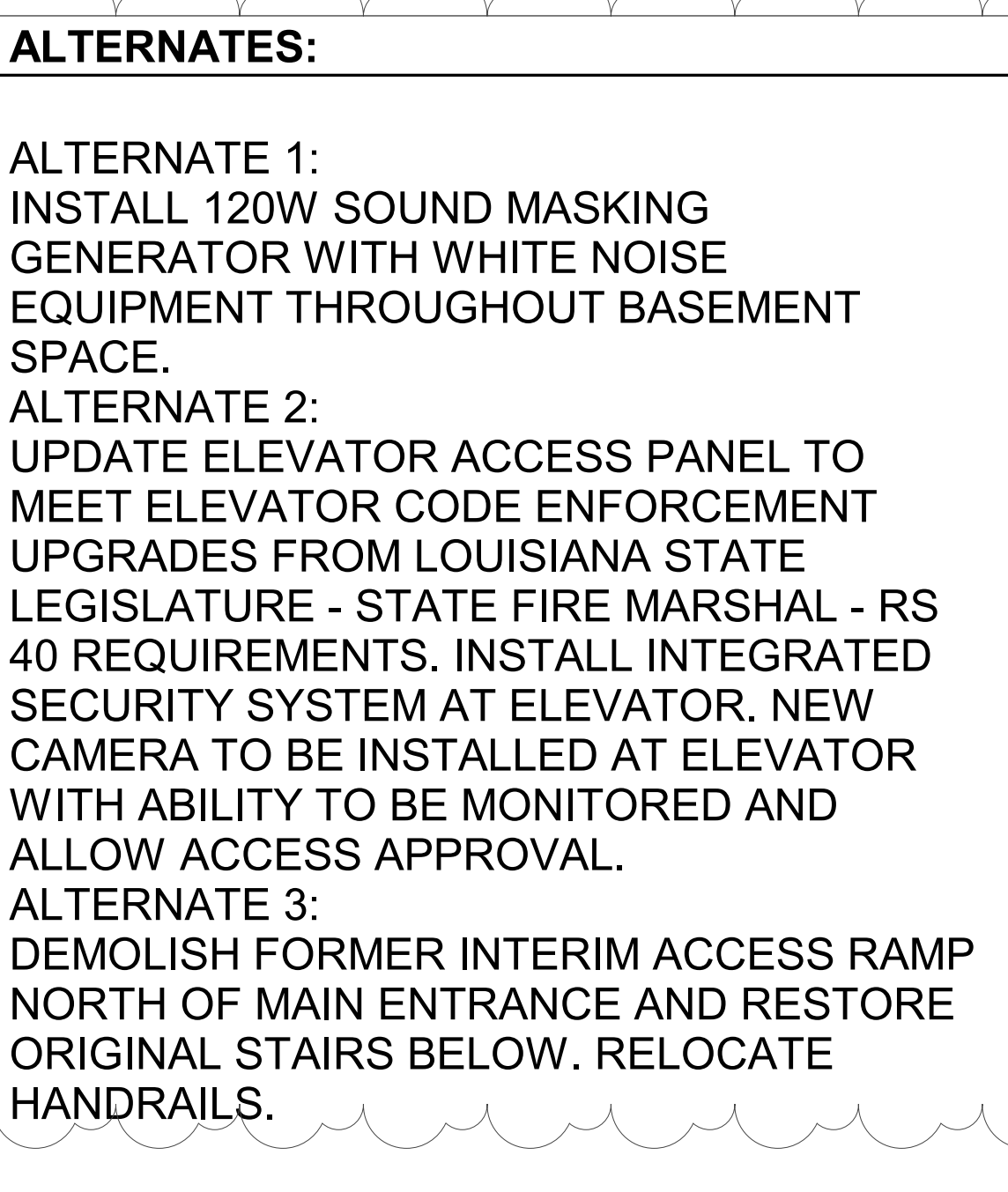
### ALTERNATES:

**ALTERNATE 1:**  
INSTALL 120W SOUND MASKING GENERATOR WITH WHITE NOISE EQUIPMENT THROUGHOUT BASEMENT SPACE.

**ALTERNATE 2:**  
UPDATE ELEVATOR ACCESS PANEL TO MEET ELEVATOR CODE ENFORCEMENT UPGRADES FROM LOUISIANA STATE LEGISLATURE - STATE FIRE MARSHAL - RS 40 REQUIREMENTS. INSTALL INTEGRATED SECURITY SYSTEM AT ELEVATOR. NEW CAMERA TO BE INSTALLED AT ELEVATOR WITH ABILITY TO BE MONITORED AND ALLOW ACCESS APPROVAL.

**ALTERNATE 3:**  
DEMOLISH FORMER INTERIM ACCESS RAMP 1 DEMO - ENTRY - ALT.3  
1/8" = 1'-0"

**2** NEW - ENTRY - ALT.3  
1/8" = 1'-0"



### REVISIONS

NO.	DATE	DESCRIPTION
1	05/09/24	AD 2

**JOB NUMBER:** 00-000  
**ISSUED:** 02/02/24  
**ISSUED FOR:** CONSTRUCTION

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C:\USERS\STEVEN\BOX\PROJECTS\NOA\LA CLIENTS\_CURRENT\700 LAUREL ST. BATON ROUGE - CAUM\DESIGN\WORKSHEET FILES\CAUM\02 REFERENCE PHOTOGRAPHS.DWG PLOTTED: 24\_05\_09



**A3** ANTENNA SUPPORT STAND  
G0.01 SCALE: NONE ARCH REF: NONE



**A2** REFERENCE PHOTOGRAPH  
G0.01 SCALE: NONE ARCH REF: NONE



**A1** REFERENCE PHOTOGRAPH  
G0.01 SCALE: NONE ARCH REF: NONE



**B3** PARAPET COPING TO BE REMOVED  
G0.01 SCALE: NONE ARCH REF: NONE



**B2** ROOF DRAIN AND ROOF VENT  
G0.01 SCALE: NONE ARCH REF: NONE



**B1** ROOF 'B'  
G0.01 SCALE: NONE ARCH REF: NONE



**C3** REFERENCE PHOTOGRAPH  
G0.01 SCALE: NONE ARCH REF: NONE



**C2** REFERENCE PHOTOGRAPH  
G0.01 SCALE: NONE ARCH REF: NONE



**C1** REFERENCE PHOTOGRAPH  
G0.01 SCALE: NONE ARCH REF: NONE



NO.	DATE	REVIEW	ISSUE FOR
1	05.09.24		



**A4** WINDOW IN STONE WALL  
G0.02 SCALE: NONE ARCH REF: NONE



**A3** JOINTS TO REPLACE / CRACKED PANEL  
G0.02 SCALE: NONE ARCH REF: NONE



**A2** JOINTS TO REPLACE / SURFACE SPALLING  
G0.02 SCALE: NONE ARCH REF: NONE



**A1** MOCK-UP LOCATION  
G0.02 SCALE: NONE ARCH REF: NONE



**B4** FAILED JOINTS AT TP OF WALL  
G0.02 SCALE: NONE ARCH REF: NONE



**B3** FAILING EIFS ADJOINING STONE PANEL  
G0.02 SCALE: NONE ARCH REF: NONE



**B2** RAILING / CRACKED PANEL  
G0.02 SCALE: NONE ARCH REF: NONE



**B1** RAILING / CRACKED PANEL  
G0.02 SCALE: NONE ARCH REF: NONE



**C4** DAMAGED EIFS FASCIA BROW  
G0.02 SCALE: NONE ARCH REF: NONE



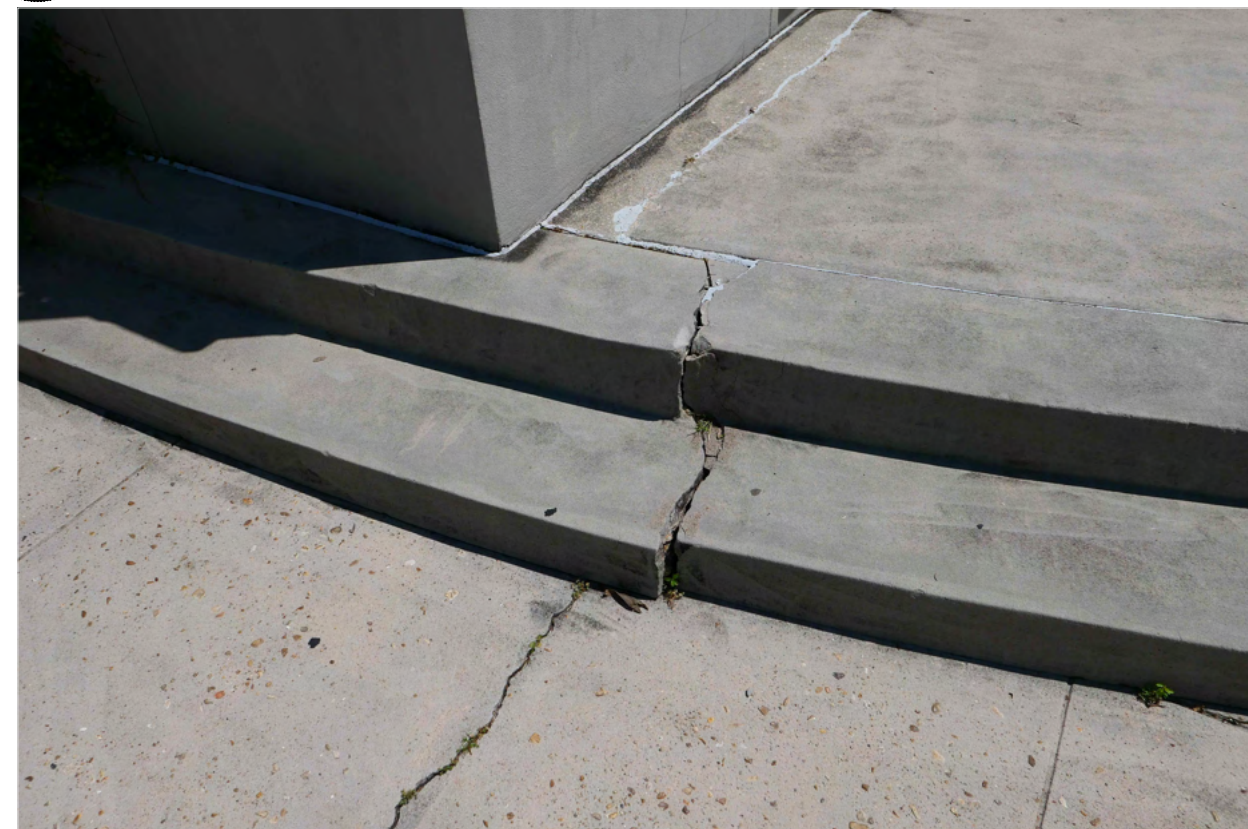
**C3** EIFS BASE OF WALL  
G0.02 SCALE: NONE ARCH REF: NONE



**C2** SILL FLASHING AT WINDOW IN EIFS WALL  
G0.02 SCALE: NONE ARCH REF: NONE



**C1** STONE WALL BASE TO BE REPLACED  
G0.02 SCALE: NONE ARCH REF: NONE



**D4** CRACKED AND SHIFTING OF SIDEWALK / STEPS  
G0.02 SCALE: NONE ARCH REF: NONE



**D3** BUCKLED CONCRETE SLAB AT STEPS  
G0.02 SCALE: NONE ARCH REF: NONE



**D2** CRACKED AND SHIFTING RETAINING WALL AND SLAB  
G0.02 SCALE: NONE ARCH REF: NONE



**D1** SPALLING AT STUCCO COATED CONCRETE WALL  
G0.02 SCALE: NONE ARCH REF: NONE

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**LEGEND**

	UNDERGROUND ELECTRIC
	GAS LINE
	TELEPHONE LINE
	WATER LINE
	REQUIRED SILT FENCE
	REQ'D DRAINAGE PIPE
	DRAINAGE ARROWS
	REQUIRED YARD DRAIN (RE: DET 4)
	REQUIRED CLEANOUT

- SITE PLAN NOTES:**
- THIS EXISTING CONDITIONS MAP HAS BEEN COMPILED FROM REFERENCE DOCUMENTS FOR THE SOLE AND EXCLUSIVE USE AS AN EXISTING CONDITIONS MAP AND DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY AS DEFINED BY LOUISIANA REVISED STATUTES 37.681 ET. SEQ., TITLE 48, PART LXI, CHAPTER 29.
  - THIS PROPERTY IS LOCATED IN FLOOD ZONE X ACCORDING TO FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP FOR EAST BATON ROUGE PARISH, PANEL NUMBER 22033C0235E, REVISED MAY 2, 2008.
  - A SURVEY WAS NOT COMPLETED AS PART OF THIS PROJECT AND ALL LOCATIONS ARE APPROXIMATE; THE NORTH ARROW AS SHOWN HEREON IS REFERENCED TO THE STATE OF LOUISIANA STATE PLANE COORDINATE SYSTEM (LOUISIANA SOUTH ZONE - NAD 83).
  - UTILITY LOCATIONS SHOWN HEREON ARE BASED ON FIELD OBSERVATION AND RECORD MAPS. THESE LOCATIONS ARE APPROXIMATE AND ARE NOT WARRANTED AS EXACT BY STANTEC.
  - THE CONTRACTOR MUST CONTACT ALL UTILITY COMPANIES FORTY-EIGHT HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND HAVE THEIR FACILITIES LOCATED IN THE FIELD PRIOR TO ANY WORK. ANY REQUEST FOR UNDERGROUND UTILITIES SHOULD BE MADE THROUGH LOUISIANA ONE CALL (811) BEFORE DIGGING.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LAYOUT AND CONTROL AS DETAILED IN THE CONSTRUCTION DOCUMENTS FOR THE PROJECT.
  - THE CONTRACTOR SHALL CONFORM TO ALL APPLICABLE CITY/PARISH, STATE AND FEDERAL CODES AND REGULATORY REQUIREMENTS IN REGARD TO ENVIRONMENTAL AND DISPOSAL OF DEBRIS.
  - ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.
  - ALL DIMENSION SHOULD BE VERIFIED ON SITE BEFORE PROCEEDING WITH WORK.

- GRADING NOTES:**
- ALL DRAINAGE PIPES SHALL BE PLASTIC AND PROVIDED IN ACCORDANCE WITH TECHNICAL SPECIFICATION.
  - RIPRAP SHALL BE CLASS 10LB IN ACCORDANCE WITH LADOTD STANDARD SPECIFICATIONS.
  - MAINTAIN FINISH FLOOR ELEVATION AT BUILDING DOORS.
  - ALL ELEVATIONS AT EXISTING FEATURES (BUILDING, PAVEMENT, DRAINAGE STRUCTURE, ETC.) SHALL BE VERIFIED ON JOB.
  - SITE PREPARATION, FILL PLACEMENT AND COMPACTION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH TECHNICAL SPECIFICATION.
  - CONTRACTOR SHALL ALWAYS MAINTAIN DRAINAGE AWAY FROM BUILDING LIMITS. PLACE A MUDMAT OF LEAN CONCRETE IN EXCAVATIONS NEAR BUILDING LIMITS IF EXPOSED LONGER THAN 48 HOURS OR ANTICIPATED WET WEATHER.
  - GRADES SHOWN ARE TO BE FIELD DETERMINED (Tbfd) AND PROVIDED TO ENGINEER FOR REVIEW PRIOR TO ORDERING SITE MATERIAL.

**EXISTING CONDITION NOTE:**  
 THE EXISTING CONDITIONS ARE BASED ON RECORD PLANS PROVIDED BY THE OWNER AND FIELD VISIT. NEITHER A TOPOGRAPHIC SURVEY NOR GEOTECHNICAL INVESTIGATION WAS PROVIDED TO DESIGNER OF RECORD FOR THIS PROJECT. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO ORDERING OR SUBMITTING MATERIALS FOR THE SITE WORK.

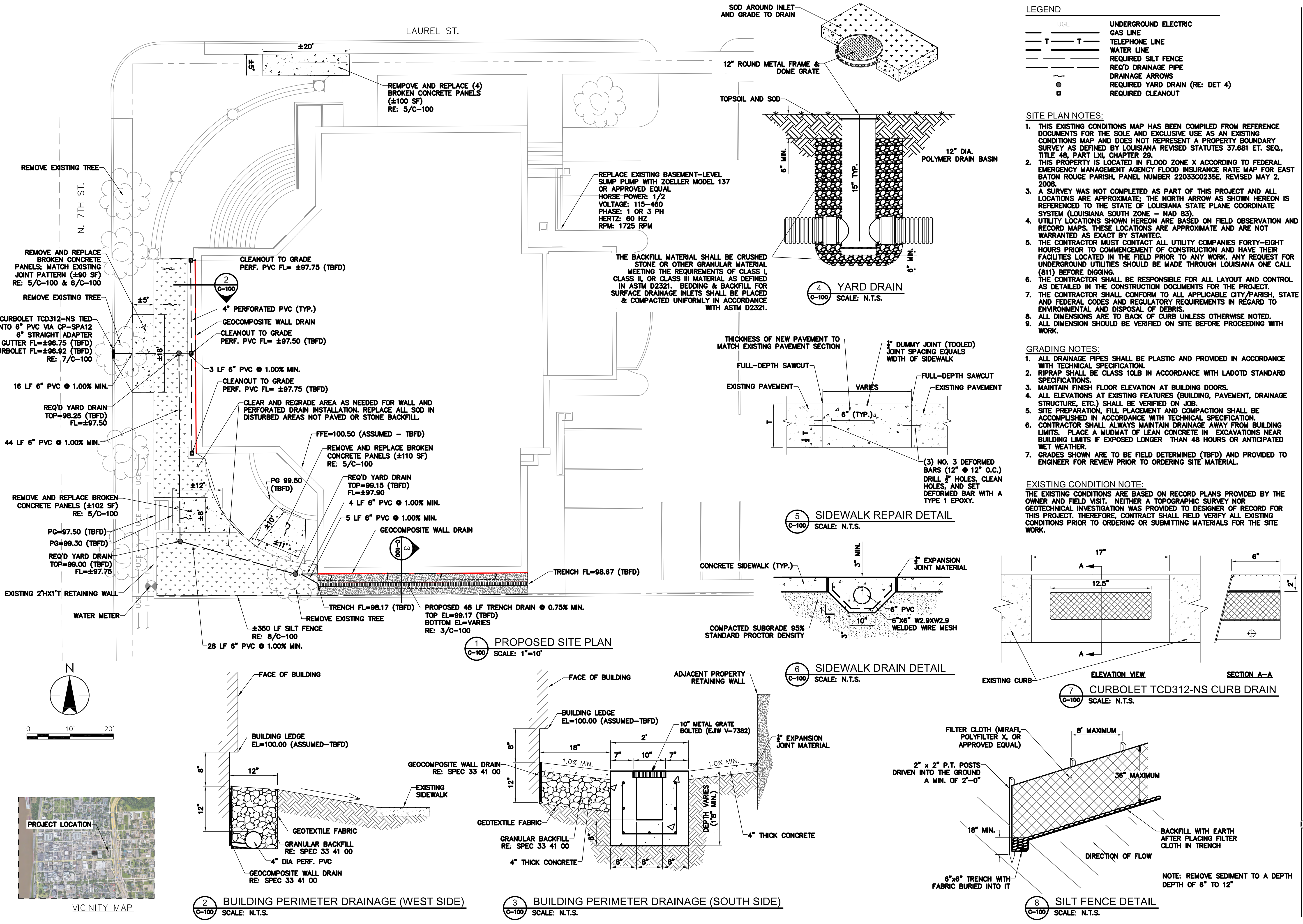
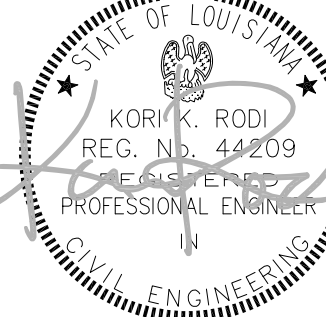
**REVISIONS**

NO.	DATE	DESCRIPTION

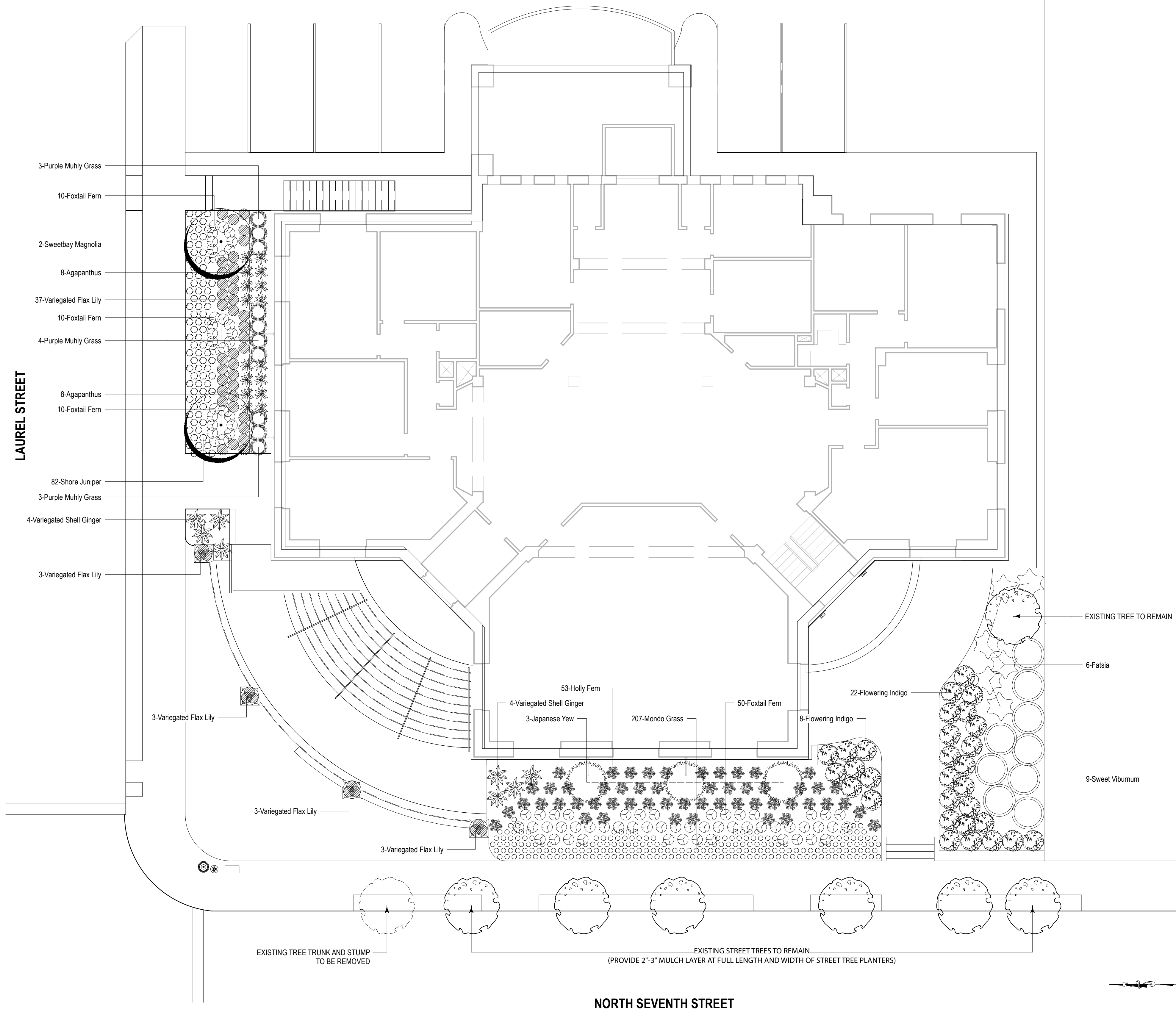
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**Plant List**

Qty	Common Name	Scheduled Size
6	Fatsia	5 gal.
80	Foxtail Fern	3 gal.
53	Holly Fern	3 gal.
16	Agapanthus	3 gal.
10	Purple Muhly Grass	3 gal.
8	Variiegated Shell Ginger	5 gal.
3	Japanese Yew	30 gal.
9	Sweet Viburnum	15 gal.
2	Sweetbay Magnolia	30 gal.
49	Variiegated Flax Lily	3 gal.
30	Flowering Indigo	3 gal.
207	Mondo Grass	4 in.
82	Shore Juniper	1 gal.

**PLANT LIST NOTE:**  
QUANTITIES PROVIDED ON THE PLANT LIST PROVIDED INCLUDE ALL PLANT MATERIAL REQUIRED TO COMPLETE THE PROJECT. IT IS THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR TO VERIFY ALL QUANTITIES.

**UTILITY NOTE:**  
THE CONTRACTOR MUST CONTACT ALL UTILITY COMPANIES FOURTY-EIGHT HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND HAVE THEIR FACILITIES LOCATED IN THE FIELD PRIOR TO ANY WORK. ANY REQUEST FOR UNDERGROUND UTILITIES SHOULD BE MADE THROUGH LOUISIANA ONE CALL (811) BEFORE DIGGING.

**REVISIONS**

NO.	DESCRIPTION	DATE

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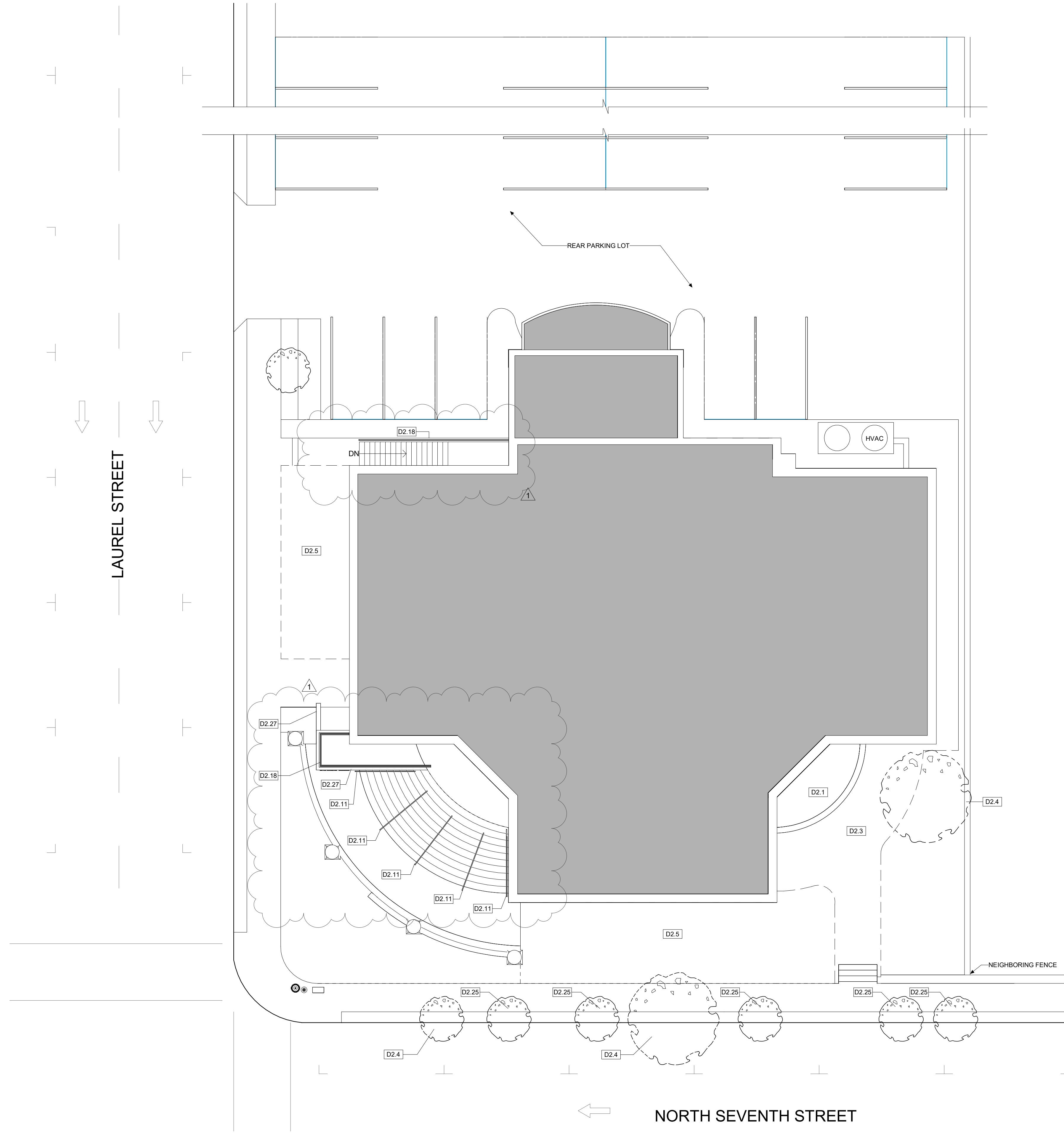
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LANDSCAPE PLAN

**L-100**

PHASE: CD

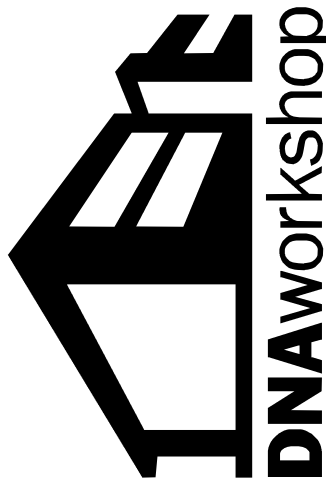


**SITE PLAN GENERAL NOTES:**

1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.
2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, EQUIPMENT LOCATIONS, SIZE AND QUANTITIES. CONTRACTOR TO VERIFY ON JOB ALL EXISTING CONDITIONS PRIOR TO BID.
3. CONTRACTOR TO PROTECT BUILDING CONTENTS.

**KEYNOTE LEGEND**

MARK	DESCRIPTION
D2.1	REMOVE ALL EXISTING SEALANT AT JOINTS IN CONCRETE PAVEMENT AND STAIRS. PREP TO RECEIVE NEW. SEE DETAILS.
D2.3	DEMO AREA OF BUCKLED CONCRETE AND PREP TO RECEIVE NEW. RE: CIVIL
D2.4	REMOVE EXISTING TREE AND REPLACE WITH NEW. NEW TREE TO BE CLEAR OF DRAIN. RE: CIVIL
D2.5	REMOVE EXISTING GROUND COVERING AND INSTALL NEW RE: LANDSCAPE PLAN AND CIVIL
D2.11	REMOVE EXISTING ALUMINUM RAILINGS AT ENTRY STAIRS. CLEAN AND APPLY NEW POWDER COAT FINISH AND REINSTALL. FINISH TO BE PROVIDED BY ARCHITECT
D2.18	EXISTING RAILINGS TO BE REMOVED, POWDER COATED AND RE-INSTALLED.
D2.25	TREE TO BE PRESERVED
D2.27	REMOVE STUCCO AT ALL SIDES OF EXISTING CMU WALL AND PREP TO RECEIVE NEW. SIGNAGE TO BE REMOVED, CLEANED AND RE-INSTALLED. SEE SHEET WP3.10 FOR DETAILS.



**CAPITAL AREA UNITED WAY**  
 700 LAUREL STREET, BATON ROUGE, LA 70802

DYKE NELSON ARCHITECTURE 235 SOUTH 14TH ST. BATON ROUGE, LA 70802 DINA-WORKSHOP.COM (225) 224 3363

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DEMO - SITE PLAN

**AD-000**

**PHASE:** CD

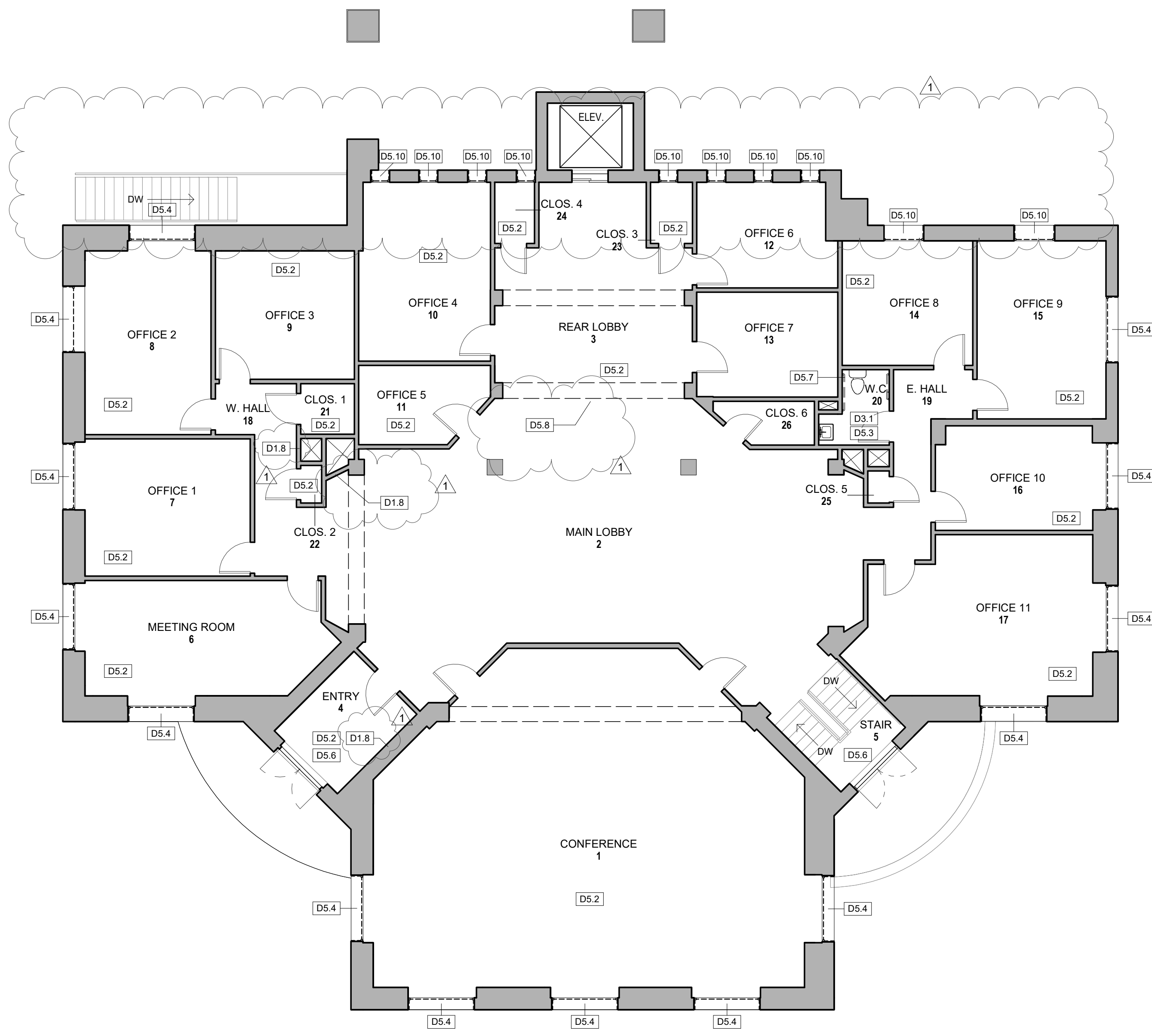
**1 DEMO SITE PLAN**  
 1" = 10'-0"

**FLOOR PLAN GENERAL NOTES:**

1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.
2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, EQUIPMENT LOCATIONS, SIZE AND QUANTITIES. CONTRACTOR TO VERIFY ON JOB ALL EXISTING CONDITIONS PRIOR TO BID.
3. CONTRACTOR TO PROTECT BUILDING CONTENTS.
4. WALL SIGNAGE, PLAQUES, ARTWORK, ETC. TO BE CAREFULLY REMOVED, STORED AND RESET. CONTRACTOR TO CONFIRM LOCATION WITH ARCHITECT PRIOR TO RE-INSTALL.

**KEYNOTE LEGEND**

MARK	DESCRIPTION
D1.8	REMOVE EXISTING WALL BASED REGISTERS AND DIFFUSERS TO BE REPLACED WITH NEW
D3.1	REMOVE EXISTING FLOOR TILE AND BASE TRIM AND PREP TO RECEIVE NEW. RE: FINISH SCHEDULE
D5.2	REMOVE ALL DAMAGED AREA OF WALL FINISH AND TRIM REPLACE WITH NEW TO MATCH EXISTING. PREP ALL WALLS TO RECEIVE NEW PAINT. V.I.F. AND RE: WALL REPAIR SCHEDULE FOR DAMAGED AREAS, TYP.
D5.3	REMOVE EXISTING WALLPAPER AND PREP WALL TO RECEIVE PAINT
D5.4	REMOVE EXISTING WINDOWS AND ALUMINUM GRATES. PREP OPENING TO RECEIVE NEW WINDOW. SURROUNDING MASONRY TO BE PROTECTED THROUGHOUT.
D5.6	REMOVE EXISTING DOOR AND TRANSOM. PREP TO RECEIVE NEW. PROTECT EXISTING OPENING.
D5.7	REMOVE EXISTING GRAB BARS. STORE FOR REUSE.
D5.8	EXISTING MURAL TO BE CAREFULLY REMOVED, STORED AND RE-INSTALLED. WALL BEHIND MURAL TO BE PREPARED TO RECEIVE NEW PAINT RE: FINISH SCHEDULE.
D5.10	REMOVE EXISTING WINDOWS AND PREP TO RECEIVE NEW. PROTECT EXISTING OPENING.



**FIRST FLOOR WALL REPAIR SCHEDULE**

	#	NORTH		SOUTH		EAST		WEST	
		WALL	TRIM	WALL	TRIM	WALL	TRIM	WALL	TRIM
OFFICE 2	8	X	X					X	X
OFFICE 3	9	X							
OFFICE 4	10	X						X	
OFFICE 6	12								
CLOS. 3	23	X							
OFFICE 8	14	X							
OFFICE 9	15	X				X			
OFFICE 10	16					X	X		
OFFICE 11	17			X	X	X	X		
OFFICE 1	7							X	
MEETING ROOM	6			X	X			X	X
OFFICE 5	11								
OFFICE 7	13								
CLOS. 6	26								
W.C.	20								
CLOS. 5	25								
STAIR	5								
FRONT LOBBY	18	X	X						X
REAR LOBBY	3								
CLOS. 1	21								
CLOS. 2	22								
CONFERENCE	1			X	X	X	X	X	X
ENTRY	4		X						
W. HALL	18								
MAIN LOBBY	2				X				

\*\* NOTE:  
 CHART INDICATES WALL LOCATION THAT IS TO RECEIVE REPAIR.  
 CONTRACTOR TO VERIFY IN FIELD AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.

**1 DEMO - FIRST FLOOR PLAN**  
 1/8" = 1'-0"

**REVISIONS**

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DEMO - FIRST FLOOR PLAN

**AD-100**

PHASE: CD



**1 DEMO - BASEMENT PLAN**  
1/8" = 1'-0"

**FLOOR PLAN GENERAL NOTES:**

1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.
2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, EQUIPMENT LOCATIONS, SIZE AND QUANTITIES. CONTRACTOR TO VERIFY ON JOB ALL EXISTING CONDITIONS PRIOR TO BID.
3. CONTRACTOR TO PROTECT BUILDING CONTENTS.
4. WALL SIGNAGE, PLAQUES, ARTWORK, ETC. TO BE CAREFULLY REMOVED, STORED AND RESET. CONTRACTOR TO CONFIRM LOCATION WITH ARCHITECT PRIOR TO RE-INSTALL.

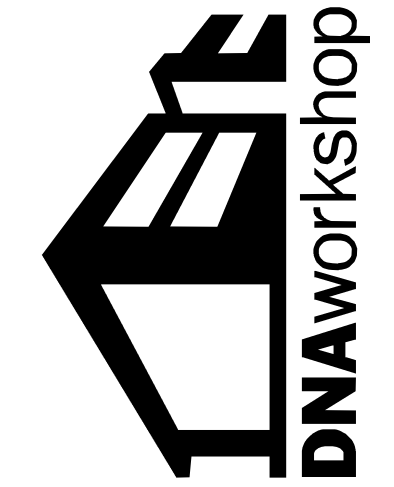
**KEYNOTE LEGEND**

MARK	DESCRIPTION
D3.1	REMOVE EXISTING FLOOR TILE AND BASE TRIM AND PREP TO RECEIVE NEW, RE: FINISH SCHEDULE
D3.2	REMOVE EXISTING BASEBOARD AND PREP TO RECEIVE NEW.
D4.1	DECONSTRUCT AND REMOVE ALL EXISTING CUBICLES AND FURNITURE. PROTECT AND STORE PER OWNER INSTRUCTIONS.
D4.2	REMOVE EXISTING MILLWORK, APPLIANCES AND VENT HOOD.
D4.3	REMOVE EXISTING SECURITY MONITOR AND PATCH WALL.
D5.1	ALL EXISTING LOCKERS AND MILLWORK TO REMAIN
D5.2	REMOVE ALL DAMAGED AREA OF WALL FINISH AND TRIM. OPENING TO RECEIVE NEW WINDOW. SURROUNDING MASONRY TO BE PROTECTED THROUGHOUT.
D5.4	REMOVE EXISTING WINDOWS AND ALUMINUM GRATES. PREP OPENING TO RECEIVE NEW PAINT, V.I.F. AND RE: WALL REPAIR SCHEDULE FOR DAMAGED AREAS, TYP.
D5.9	REMOVE EXISTING DOOR AND PREP TO RECEIVE NEW. PROTECT EXISTING OPENING. RE: DOOR LEGEND AND SCHEDULE
D5.14	REMOVE EXISTING WINDOWS AND METAL GRATES. SEE DETAIL B4/WP3.10. PREP OPENING TO RECEIVE NEW WINDOW. SURROUNDING MASONRY TO BE PROTECTED THROUGHOUT.

**BASEMENT WALL REPAIR SCHEDULE**

NAME	#	NORTH		SOUTH		EAST		WEST		CEILING	FLOOR	NOTES
		WALL	TRIM	WALL	TRIM	WALL	TRIM	WALL	TRIM			
VESTIBULE	8	X				X						
OPEN OFFICE	7					X		X				X
W. R.R.	27					X						
M. R.R.	28					X						
EMPLOYEE LOUNGE	30					X						X
B. HALL	9							X				X

\*\* NOTE:  
CHART INDICATES WALL LOCATION THAT IS TO RECEIVE REPAIR.  
CONTRACTOR TO VERIFY IN FIELD AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.



**CAPITAL AREA UNITED WAY**  
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**REVISIONS**

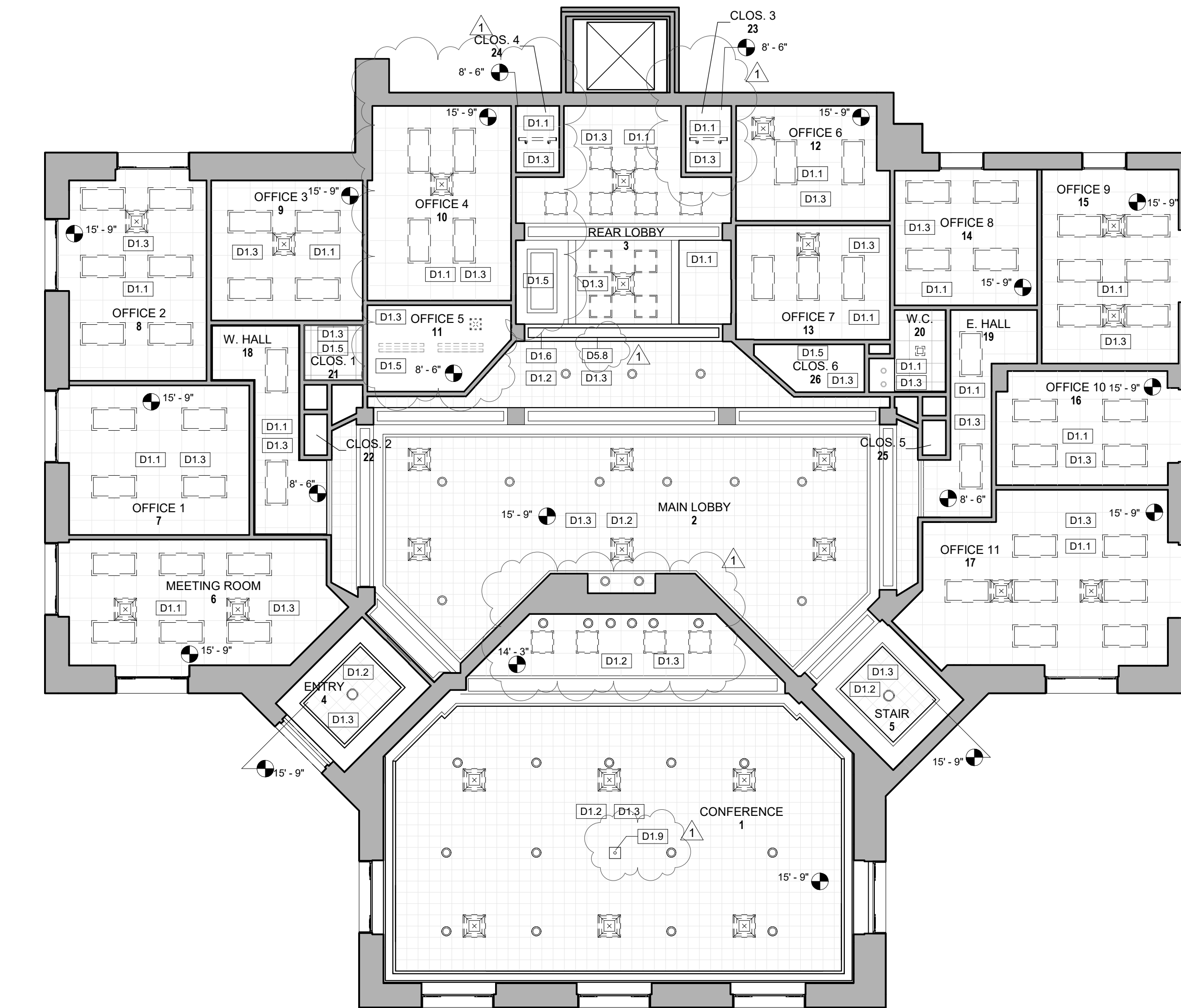
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DEMO - BASEMENT PLAN  
**AD-101**  
PHASE: CD

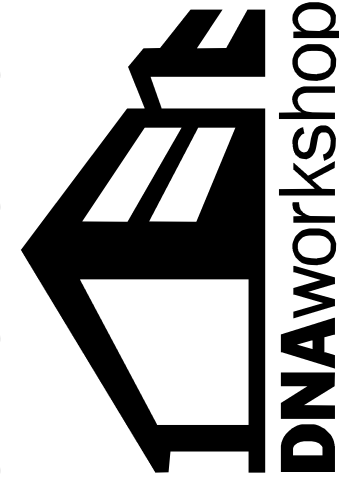


**1** DEMO - FIRST FLOOR RCP  
1/8" = 1'-0"

**RCP GENERAL NOTES:**  
 1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.  
 2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, EQUIPMENT LOCATIONS, SIZE AND QUANTITIES. CONTRACTOR TO VERIFY ON JOB ALL EXISTING CONDITIONS PRIOR TO BID.  
 3. CONTRACTOR TO PROTECT BUILDING CONTENTS.

**KEYNOTE LEGEND**

MARK	DESCRIPTION
D1.1	REMOVE ALL EXISTING GRID SYSTEM. PREP TO RECEIVE NEW. REMOVE ALL EXISTING REGISTERS AND DIFFUSERS TO BE REPLACED WITH NEW.
D1.2	REMOVE EXISTING ACT TILES FROM CEILING SURFACE AND PREP SURFACE TO RECEIVE NEW 2X2 ACT TILES
D1.3	REMOVE ALL EXISTING LIGHT FIXTURES TO BE REPLACED WITH NEW LED FIXTURES.
D1.5	EXISTING CEILING TO REMAIN AND PREP TO RECEIVE PAINT. SEE FINISH SCHEDULE AND LEGEND. REMOVE ALL EXISTING REGISTERS AND DIFFUSERS TO BE REPLACED WITH NEW.
D1.6	DEMO WALL FINISH AND TRIM AT UNDERSIDE OF BEAM PREP TO RECEIVE NEW
D1.9	EXISTING PROJECTOR TO REMAIN. PROTECT DURING CONSTRUCTION
D5.8	EXISTING MURAL TO BE CAREFULLY REMOVED, STORED AND RE-INSTALLED. WALL BEHIND MURAL TO BE PREPARED TO RECEIVE NEW PAINT RE. FINISH SCHEDULE



**CAPITAL AREA UNITED WAY**  
 700 LAUREL STREET, BATON ROUGE, LA 70802

**REVISIONS**

1 05/09/24 AD. 2

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**ISSUED FOR:**  
**CONSTRUCTION**

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DEMO - FIRST FLOOR RCP

**AD-102**

**PHASE:** CD

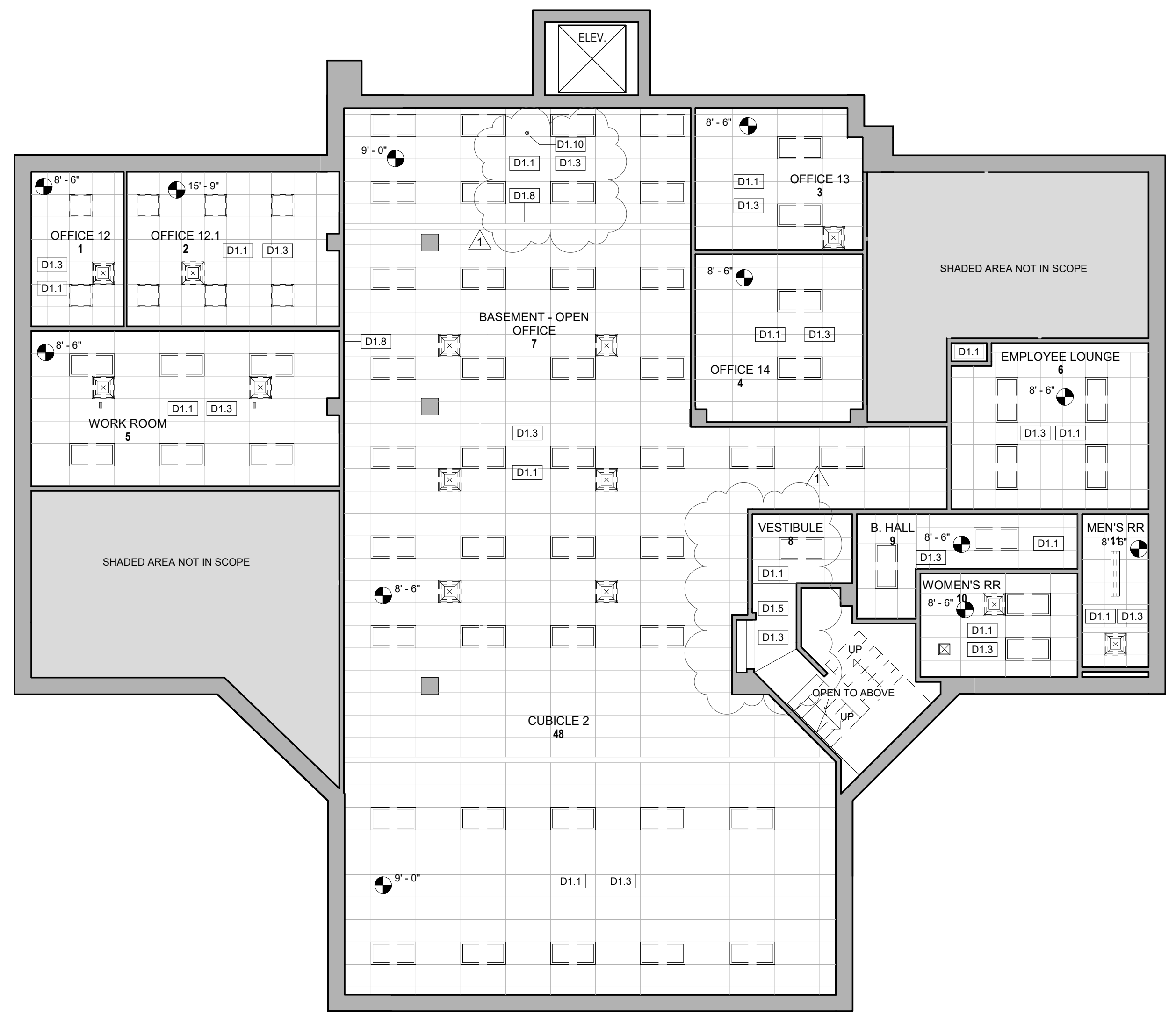


**RCP GENERAL NOTES:**

1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.
2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, EQUIPMENT LOCATIONS, SIZE AND QUANTITIES. CONTRACTOR TO VERIFY ON JOB ALL EXISTING CONDITIONS PRIOR TO BID.
3. CONTRACTOR TO PROTECT BUILDING CONTENTS.

**KEYNOTE LEGEND**

MARK	DESCRIPTION
D1.1	REMOVE ALL EXISTING GRID SYSTEM. PREP TO RECEIVE NEW. REMOVE ALL EXISTING REGISTERS AND DIFFUSERS TO BE REPLACED WITH NEW.
D1.3	REMOVE ALL EXISTING LIGHT FIXTURES TO BE REPLACED WITH NEW LED FIXTURES.
D1.5	EXISTING CEILING TO REMAIN AND PREP TO RECEIVE PAINT. SEE FINISH SCHEDULE AND LEGEND. REMOVE ALL EXISTING REGISTERS AND DIFFUSERS TO BE REPLACED WITH NEW.
D1.8	REMOVE EXISTING WALL BASED REGISTERS AND DIFFUSERS TO BE REPLACED WITH NEW
D1.10	REMOVE EXISTING SECURITY MONITOR.



**1 DEMO - BASEMENT RCP**  
 1/8" = 1'-0"

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**REVISIONS**

NO.	DATE	DESCRIPTION
1	05/09/24	AD. 2

**JOB NUMBER:** 00-000

**ISSUED:** 02/02/24

**ISSUED FOR:**  
**CONSTRUCTION**

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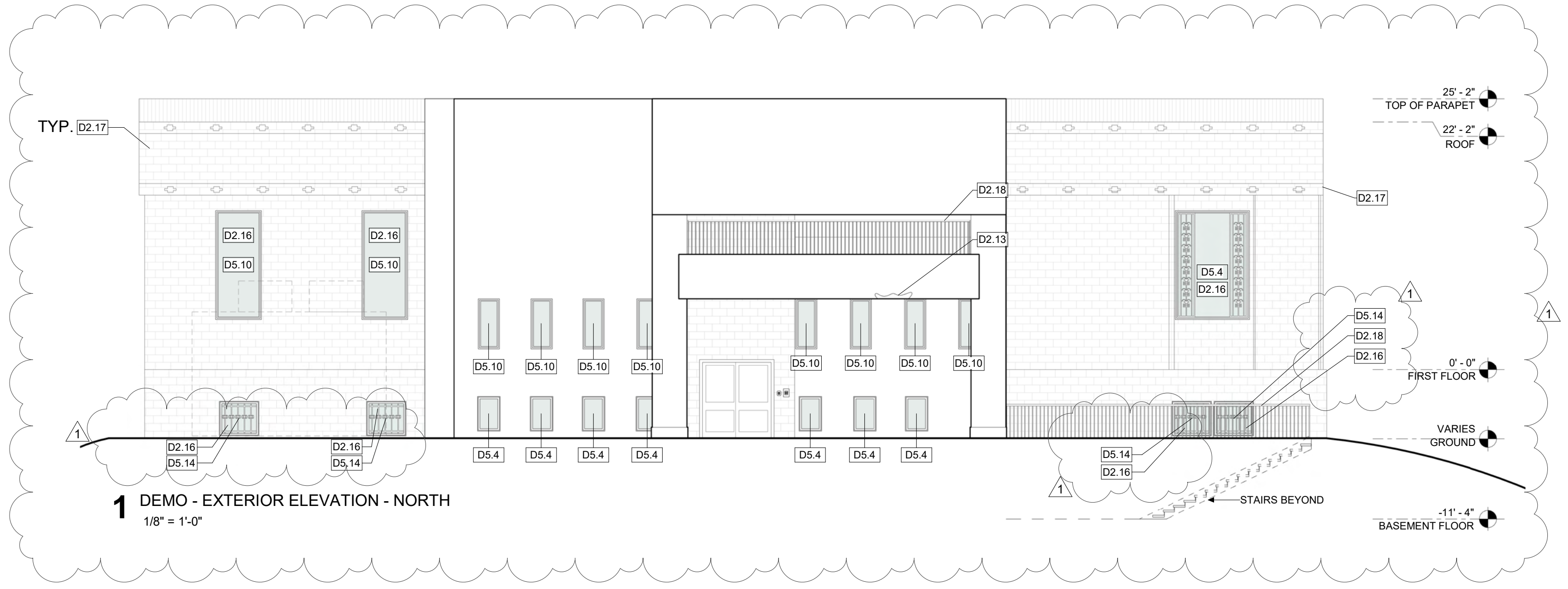
DEMO - BASEMENT RCP

**AD-103**

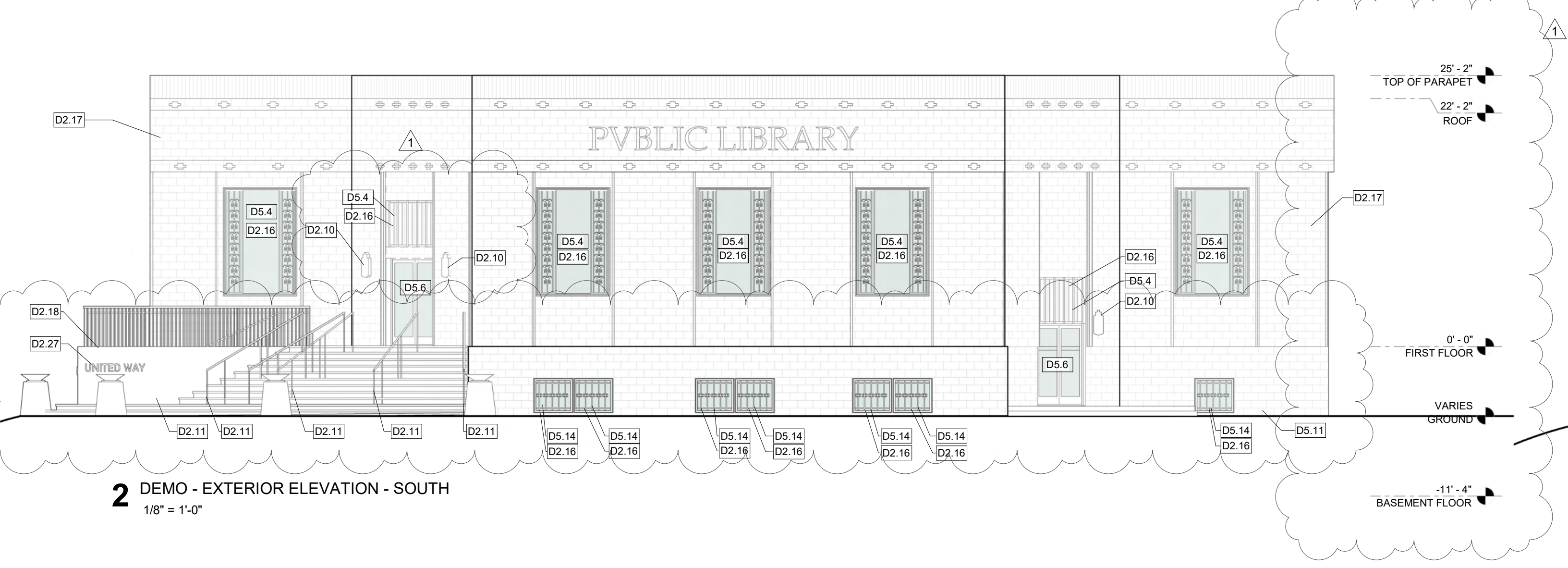
**PHASE:** CD

MARK	DESCRIPTION
D2.10	RESTORE/REPAIR ORNAMENTAL LIGHT FIXTURE
D2.11	REMOVE EXISTING ALUMINUM RAILINGS AT ENTRY STAIRS. CLEAN AND APPLY NEW POWDER COAT FINISH AND REINSTALL. FINISH TO BE PROVIDED BY ARCHITECT
D2.13	REMOVE DAMAGED PORTION OF EFIS AND PREP TO RECEIVE NEW. SEE DETAILS
D2.16	REPAIR/REPAINT ALL EXISTING LENTILS AT WINDOWS. TYP.
D2.17	ALL GROUT/SEALANT AT EXTERIOR LIMESTONE WALLS TO BE REMOVED.
D2.18	EXISTING RAILINGS TO BE REMOVED, POWDER COATED AND RE-INSTALLED.
D2.27	REMOVE STUCCO AT ALL SIDES OF EXISTING CMU WALL AND PREP TO RECEIVE NEW. SIGNAGE TO BE REMOVED, CLEANED AND RE-INSTALLED. SEE SHEET WP3.10 FOR DETAILS.
D5.4	REMOVE EXISTING WINDOWS AND ALUMINUM GRATES. PREP OPENING TO RECEIVE NEW WINDOW. SURROUNDING MASONRY TO BE PROTECTED THROUGHOUT.
D5.6	REMOVE EXISTING DOOR AND TRANSOM. PREP TO RECEIVE NEW. PROTECT EXISTING OPENING.
D5.10	REMOVE EXISTING WINDOWS AND PREP TO RECEIVE NEW. PROTECT EXISTING OPENING.
D5.11	REMOVE ALL DAMAGED AREAS OF LIMESTONE BASE UP TO 10 LF. PREP TO RECEIVE NEW. ALL SALVAGEABLE LIMESTONE TO BE PROTECTED AND REINSTALLED. SEE DETAIL C1/WP3.10.
D5.12	REMOVE EXISTING WINDOW. PREP OPENING TO RECEIVE NEW WINDOW AND REPLACEMENT METAL GRATE TO MATCH EXISTING AT NEIGHBORING WINDOW. SURROUNDING MASONRY TO BE PROTECTED THROUGHOUT.
D5.14	REMOVE EXISTING WINDOWS AND METAL GRATES. SEE DETAIL B/WP3.10. PREP OPENING TO RECEIVE NEW WINDOW. SURROUNDING MASONRY TO BE PROTECTED THROUGHOUT.

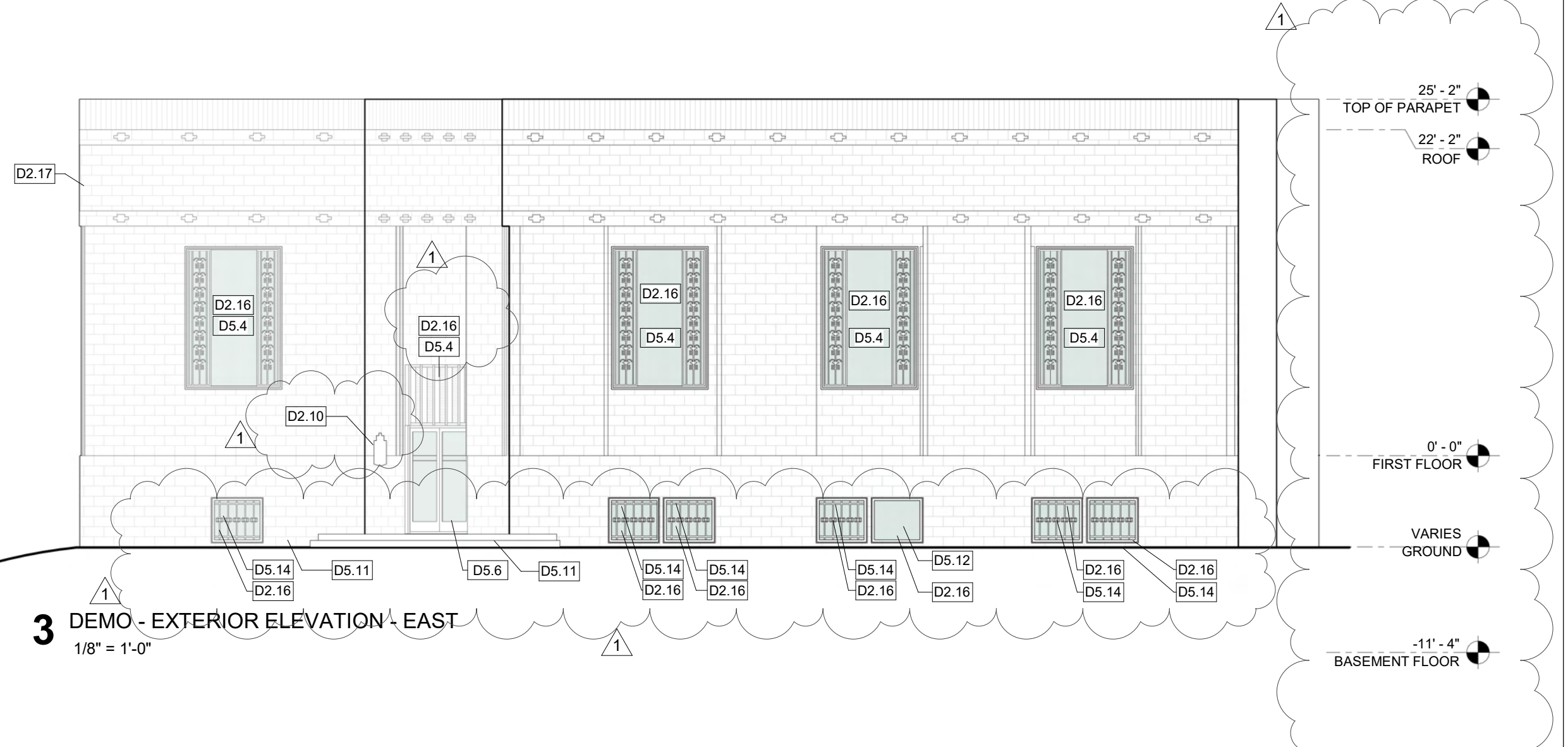
**ELEVATION GENERAL NOTES:**  
 1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.  
 2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS. INCLUDING BUT NOT LIMITED TO DIMENSIONS.



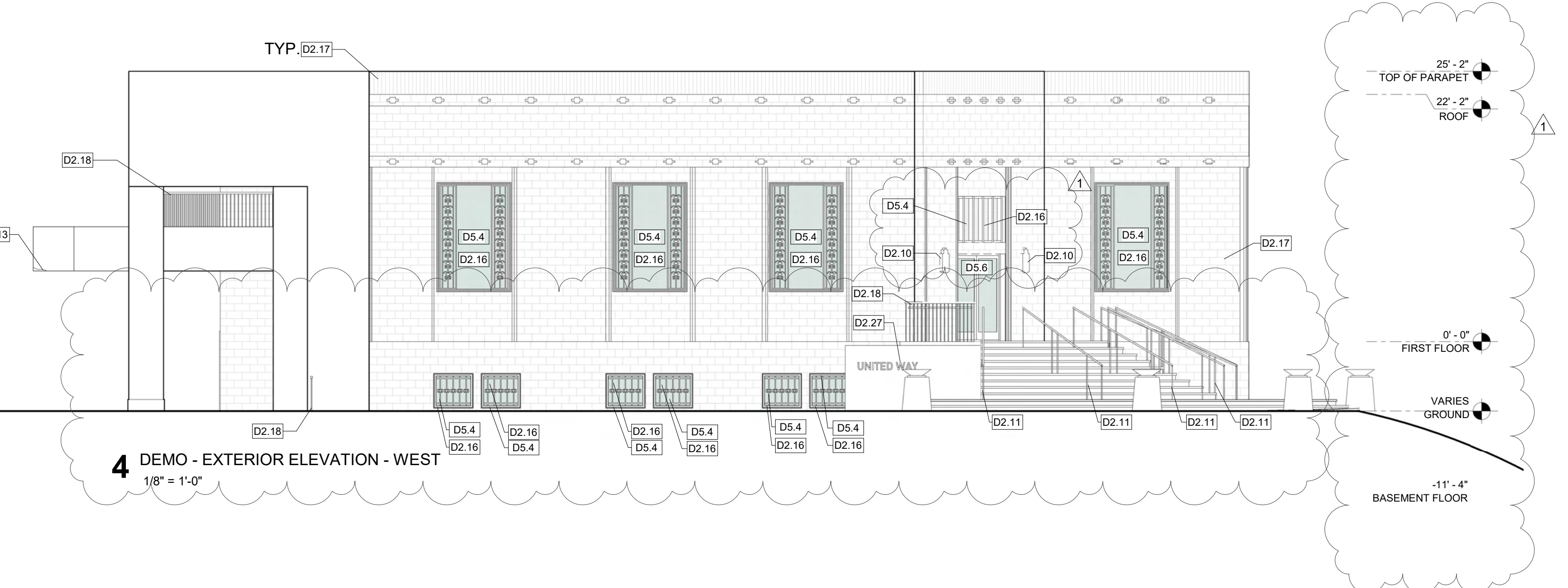
**1 DEMO - EXTERIOR ELEVATION - NORTH**  
 1/8" = 1'-0"



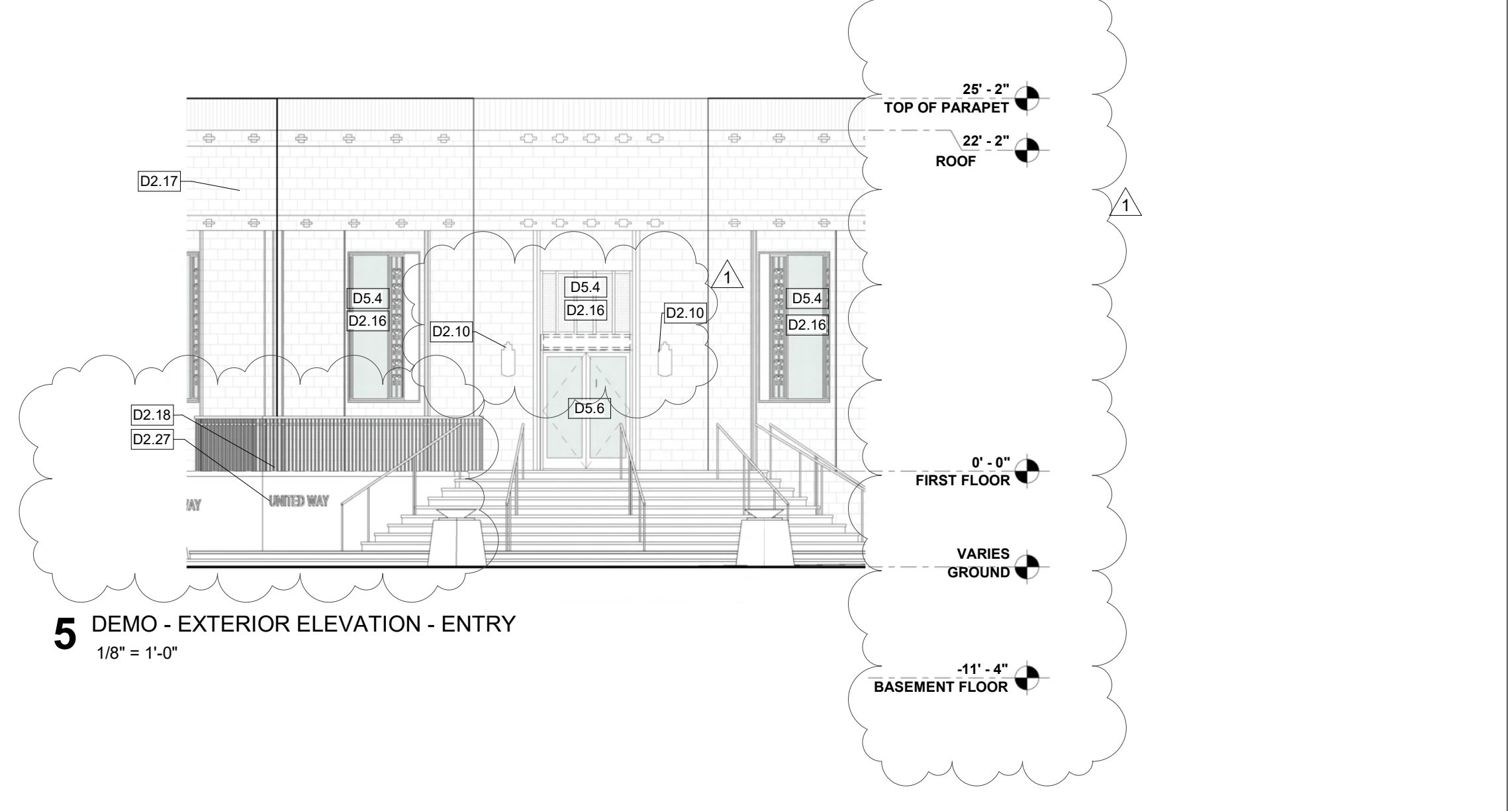
**2 DEMO - EXTERIOR ELEVATION - SOUTH**  
 1/8" = 1'-0"



**3 DEMO - EXTERIOR ELEVATION - EAST**  
 1/8" = 1'-0"



**4 DEMO - EXTERIOR ELEVATION - WEST**  
 1/8" = 1'-0"



**5 DEMO - EXTERIOR ELEVATION - ENTRY**  
 1/8" = 1'-0"

**REVISIONS**

1	05/09/24	AD. 2
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**JOB NUMBER:** 00-000  
**ISSUED:** 02/02/24

**ISSUED FOR:**  
**CONSTRUCTION**

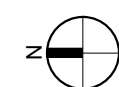
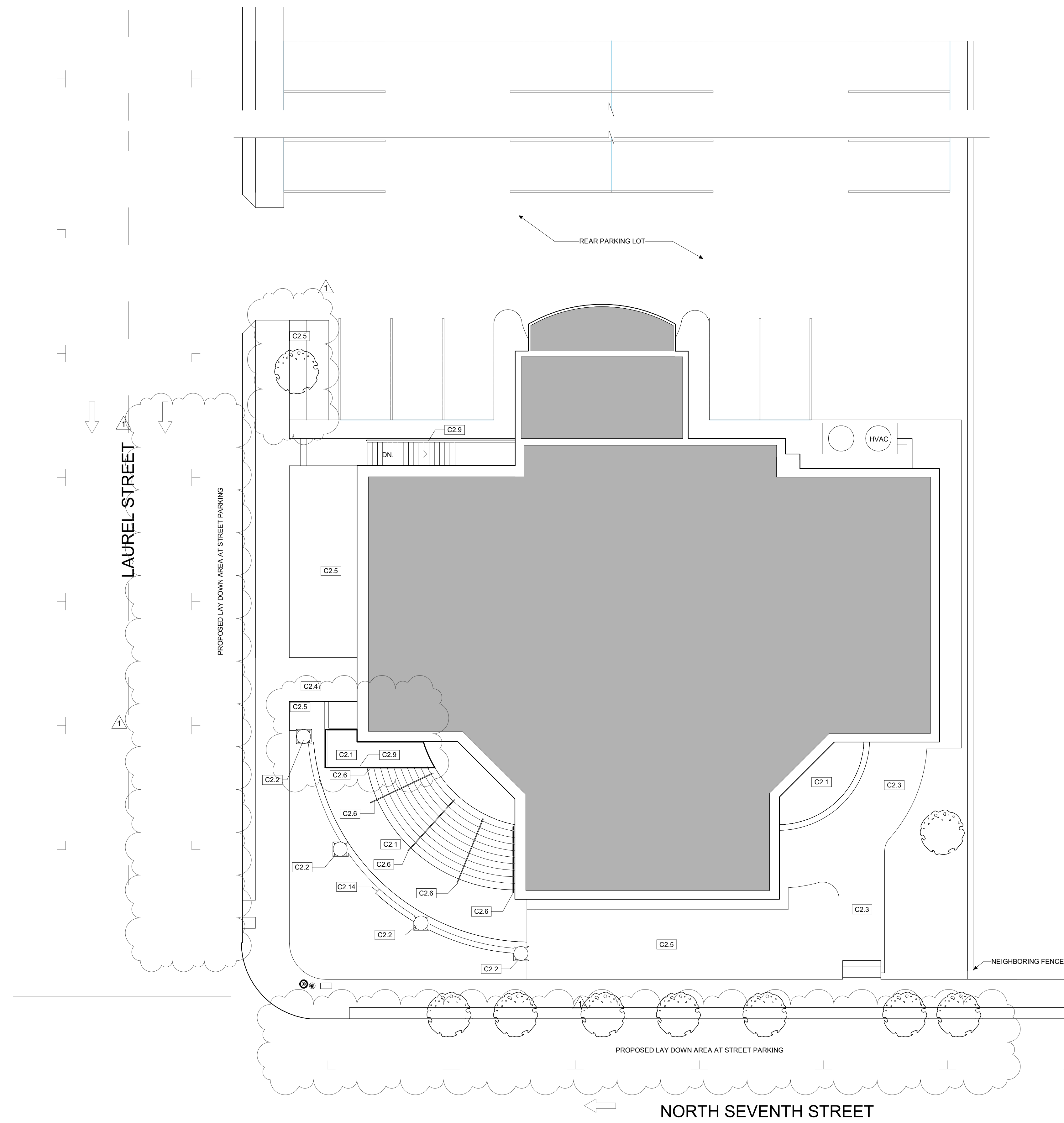
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DEMO - ELEVATIONS

**AD-200**

PHASE: CD



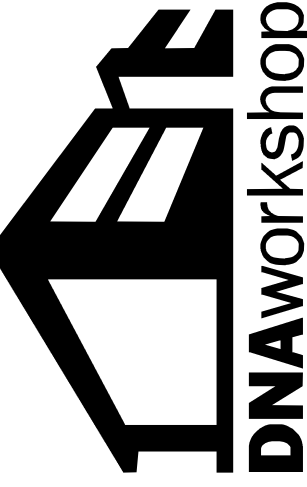
**1** OVERALL SITE PLAN  
3/32" = 1'-0"

**SITE PLAN GENERAL NOTES:**

1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.
2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, EQUIPMENT LOCATIONS, SIZE AND QUANTITIES. CONTRACTOR TO VERIFY ON JOB ALL EXISTING CONDITIONS PRIOR TO BID.
3. CONTRACTOR TO PROTECT BUILDING CONTENTS.

**KEYNOTE LEGEND**

MARK	DESCRIPTION
C2.1	SEAL ALL JOINTS AT CONCRETE PAVEMENT AND STAIRS WITH NEW SEALANT AND CLEAN.
C2.2	CLEAN PLANTER PEDESTALS, PLANTERS AND REPLANT RE: LANDSCAPE PLAN
C2.3	REPLACE AREA OF BUCKLED CONCRETE WITH NEW. RE: CIVIL
C2.4	CLEAN ALL EXTERIOR CONCRETE
C2.5	NEW LANDSCAPING RE: LANDSCAPE PLAN
C2.6	REMOVE EXISTING ALUMINUM RAILINGS AT ENTRY STAIRS. CLEAN AND APPLY NEW POWDER COAT FINISH AND REINSTALL FINISH TO BE PROVIDED BY ARCHITECT
C2.9	EXISTING RAILINGS TO BE REMOVED, CLEANED, POWDER COATED AND RE-INSTALLED.
C2.14	REPAIR/REPLACE EXISTING CONCRETE STEPS. SEAL ALL JOINTS AT CONCRETE PAVERS AND STAIRS AND CLEAN.



**CAPITAL AREA UNITED WAY**  
700 LAUREL STREET, BATON ROUGE, LA 70802

DYKE NELSON ARCHITECTURE 235 SOUTH 14TH ST. BATON ROUGE, LA 70802 DNA-WORKSHOP.COM (225) 224 3363

**REVISIONS**

1 05/09/24 AD. 2

**JOB NUMBER:** 00-000

**ISSUED:** 02/02/24

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SITE PLAN

**A-000**

PHASE: CD

**FLOOR PLAN GENERAL NOTES:**

1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.
2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, EQUIPMENT LOCATIONS, SIZE AND QUANTITIES. CONTRACTOR TO VERIFY ON JOB ALL EXISTING CONDITIONS PRIOR TO BID.
3. CONTRACTOR TO PROTECT BUILDING CONTENTS.
4. WALL SIGNAGE, PLAQUES, ARTWORK, ETC. TO BE CAREFULLY REMOVED, STORED AND RESET. CONTRACTOR TO CONFIRM LOCATION WITH ARCHITECT PRIOR TO RE-INSTALL.

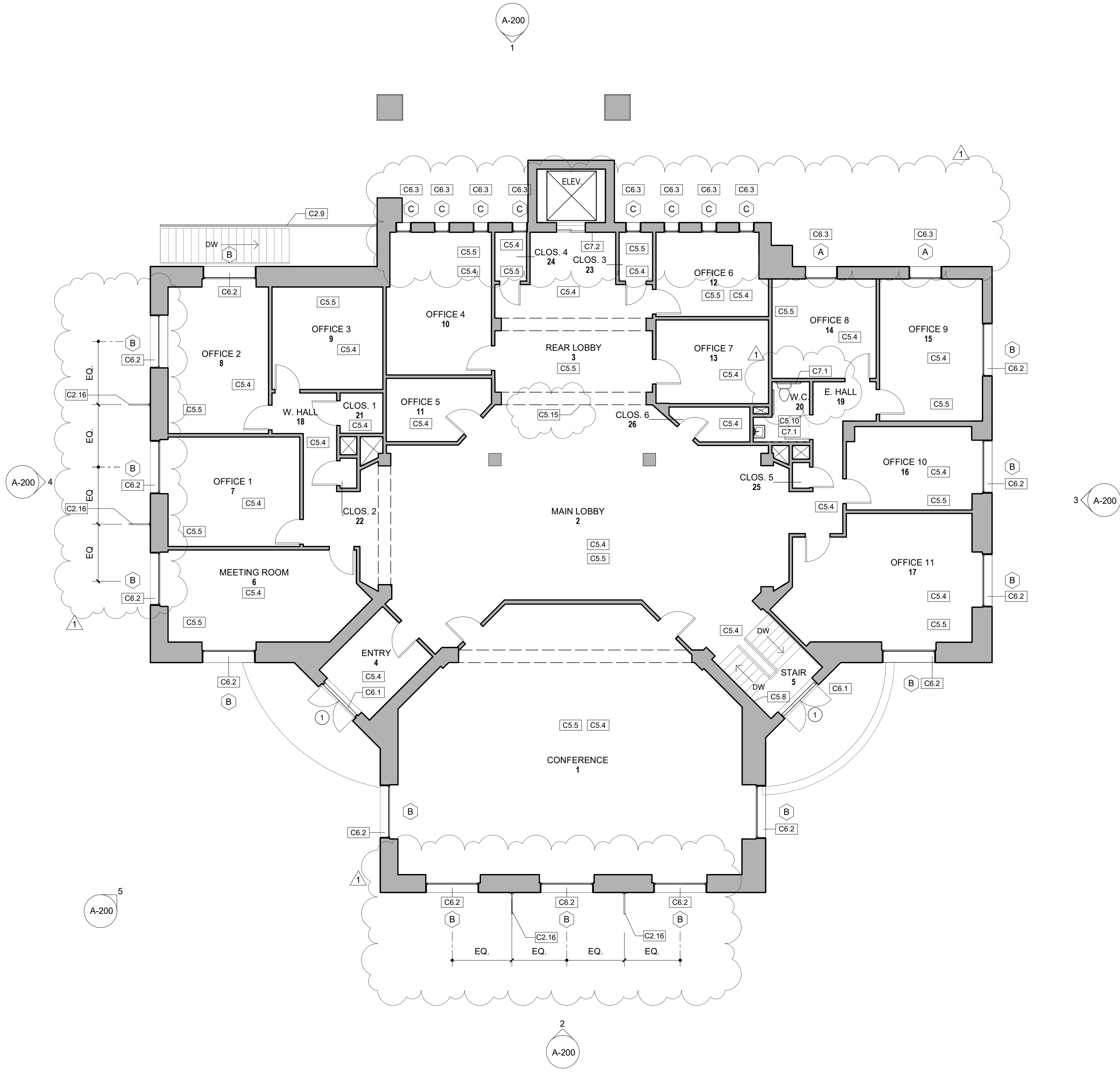
**KEYNOTE LEGEND - NEW CONSTRUCTION**

MARK	DESCRIPTION
C2.9	EXISTING RAILINGS TO BE REMOVED, CLEANED, POWDER COATED AND RE-INSTALLED.
C2.16	CUSTOM WALL MOUNTED HEAVY DUTY OPAQUE VINYL BANNER SECURED WITH RUST RESISTANT ALUMINUM MOUNTING BRACKETS PER MANUF. REC. CONTRACTOR TO VERIFY LOCATION WITH ARCH. IN FIELD. SEE DETAILS.
C5.4	PREP AND PAINT ALL INTERIOR WALLS. RE: FINISH SCHEDULE
C5.5	REMOVE ALL DAMAGED AREA OF WALL FINISH AND TRIM AND REPLACE WITH NEW TO MATCH EXISTING. PREP AND PAINT. RE: WALL REPAIR SCHEDULE AND V.I.F. EXISTING BASEBOARD TO REMAIN.
C5.8	CAP OFF EXPOSED PIPE
C5.10	REMOVE EXISTING WALLPAPER AND BASEBOARD. PREP AND PAINT WALL AND INSTALL NEW 4" PTD WOOD BASEBOARD. VERIFY PROFILE WITH ARCHITECT. RE: FINISH SCHEDULE.
C5.15	MURAL TO BE RE-INSTALLED IN PRIOR LOCATION.
C6.1	INSTALL NEW DOOR AND TRANSOM IN EXISTING OPENING. RE: DOOR LEGEND AND SCHEDULE
C6.2	INSTALL NEW WINDOW IN EXISTING OPENING AND ORIGINAL RE-ANODIZED ALUMINUM SCREENS. SEE DETAILS. INSTALL/REPAIR LENTIL AND PAINT
C6.3	INSTALL NEW WINDOW IN EXISTING OPENING. RE: DOOR SCHEDULE & DETAILS
C7.1	CLEAN ALL EXISTING FIXTURES
C7.2	ALTERNATE 2: UPDATE ELEVATOR ACCESS PANEL TO MEET ELEVATOR CODE ENFORCEMENT UPGRADES FROM LOUISIANA STATE LEGISLATURE - STATE FIRE MARSHAL - RS 40 REQ. INSTALL INTEGRATED SECURITY SYSTEM AT ELEVATOR. NEW CAMERA TO BE INSTALLED AT ELEVATOR. NEW CAMERA TO BE INSTALLED AT ELEVATOR WITH ABILITY TO BE MONITORED AND ALLOW ACCESS APPROVAL.

**FIRST FLOOR WALL REPAIR SCHEDULE**

	#	NORTH		SOUTH		EAST		WEST	
		WALL	TRIM	WALL	TRIM	WALL	TRIM	WALL	TRIM
OFFICE 2	8	X							
OFFICE 3	9	X							
OFFICE 4	10	X						X	
OFFICE 6	12								
OFFICE 8	14	X							
OFFICE 9	15	X				X			
OFFICE 10	16					X	X		
OFFICE 11	17			X	X	X	X		
OFFICE 1	7							X	
MEETING ROOM	6			X	X			X	X
OFFICE 5	11								
OFFICE 7	13								
CLOS. 6	26								
W.C.	20								
CLOS. 5	25								
STAIR	5								
FRONT LOBBY	18	X	X						X
REAR LOBBY	3								
CLOS. 1	21								
CLOS. 2	22								
CONFERENCE	1			X	X	X	X	X	X
ENTRY	4		X						
W. HALL	18								
MAIN LOBBY	2				X				

\*\* NOTE: CHART INDICATES APPROX. WALL LOCATION THAT IS TO RECEIVE REPAIR. CONTRACTOR TO VERIFY IN FIELD AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.



**1 FIRST FLOOR PLAN**  
 1/8" = 1'-0"

**REVISIONS**

NO.	DATE	DESCRIPTION
1	05/09/24	AD. 2

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**ISSUED:** 02/02/24

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FIRST FLOOR PLAN

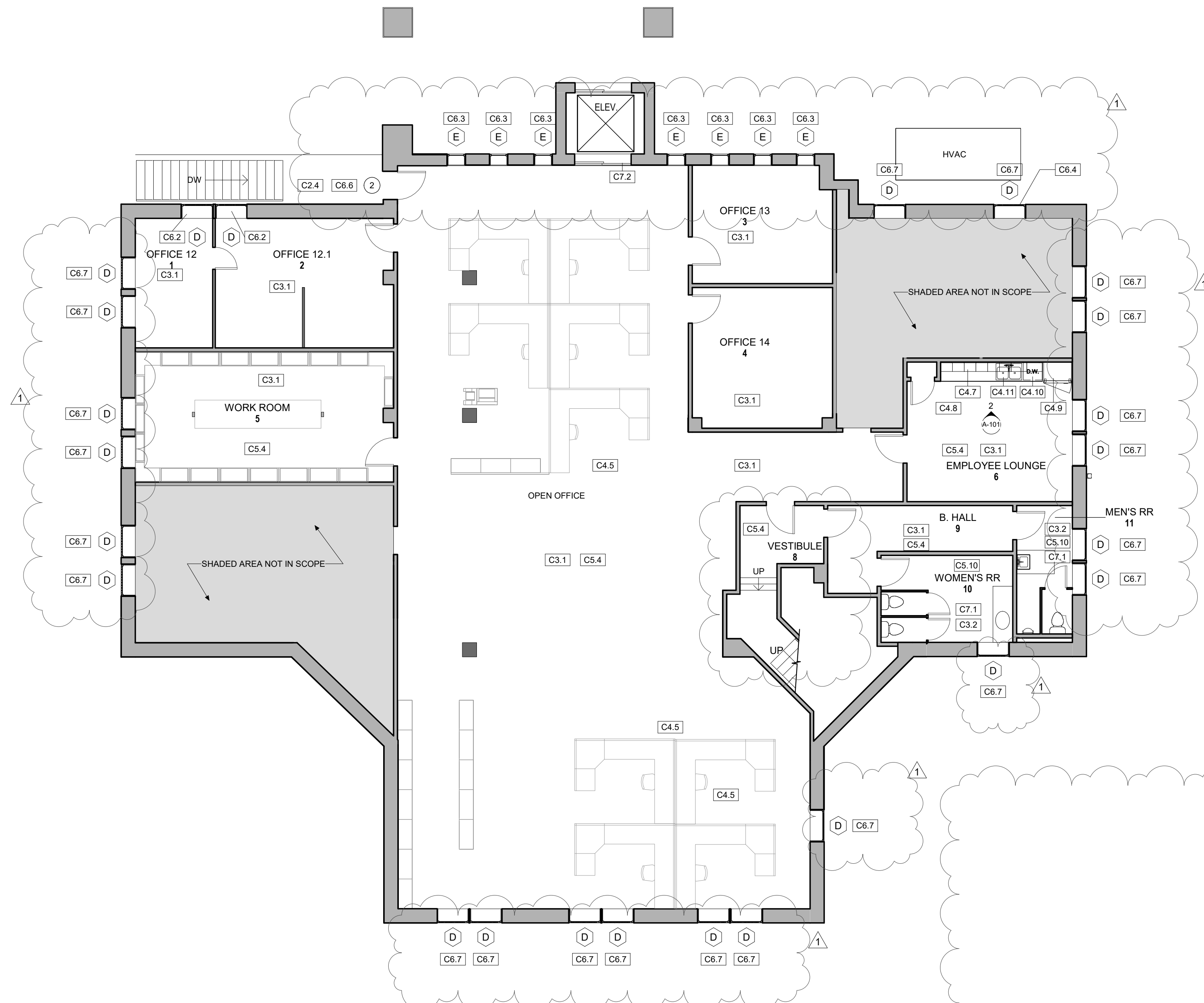
**A-100**

**PHASE:** CD

- FLOOR PLAN GENERAL NOTES:**
1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.
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  3. CONTRACTOR TO PROTECT BUILDING CONTENTS.
  4. WALL SIGNAGE, PLAQUES, ARTWORK, ETC. TO BE CAREFULLY REMOVED, STORED AND RESET. CONTRACTOR TO CONFIRM LOCATION WITH ARCHITECT PRIOR TO RE-INSTALL.

**KEYNOTE LEGEND - NEW CONSTRUCTION**

MARK	DESCRIPTION
C1.3	PROVIDE AND INSTALL STRIP LIGHTING AT UNDERSIDE OF UPPER CABINETS.
C2.4	CLEAN ALL EXTERIOR CONCRETE
C3.1	INSTALL NEW FLOOR AND 4" PTD WOOD BASEBOARD. VERIFY PROFILE WITH ARCHITECT. RE: FINISH SCHEDULE
C3.2	CLEAN EXISTING FLOOR AND WALL TILE
C4.5	EXISTING CUBICLES TO BE CLEANED AND RELOCATED AS SHOWN ON PLAN. VERIFY LAYOUT WITH ARCHITECT PRIOR TO INSTALLATION.
C4.7	NEW LAQUERED FINISH UPPER CABINETS IN HIGH GLOSS - BABY BLUE. ALL FINISHES TO BE APPROVED BY ARCH.
C4.8	NEW LAQUERED FINISH BASE CABINETS IN HIGH GLOSS - YELLOW. ALL FINISHES TO BE APPROVED BY ARCH.
C4.9	PROVIDE AND INSTALL NEW STAINLESS STEEL COUNTER DEPTH REFRIGERATOR.
C4.10	PROVIDE AND INSTALL NEW STAINLESS STEEL DISHWASHER
C4.11	PROVIDE AND INSTALL NEW UNDERMOUNT STAINLESS STEEL DOUBLE SINK.
C4.12	NEW QUARTZ COUNTERTOP QT-1. SEE FINISH LEGEND.
C5.4	PREP AND PAINT ALL INTERIOR WALLS. RE: FINISH SCHEDULE
C5.10	REMOVE EXISTING WALLPAPER AND BASEBOARD. PREP AND PAINT WALL AND INSTALL NEW 4" PTD WOOD BASEBOARD. VERIFY PROFILE WITH ARCHITECT. RE: FINISH SCHEDULE
C5.11	EXISTING DOOR CASING AND FACE (BOTH SIDES) TO BE PREP AND PAINTED IN PT-3. RE: FINISH LEGEND
C5.12	BACKSPLASH TO RECEIVE NEW TILE T-1. RE: FINISH LEGEND
C5.13	NEW 4" PTD WOOD BASEBOARD. VERIFY PROFILE WITH ARCHITECT. RE: FINISH LEGEND AND SCHEDULE
C6.2	INSTALL NEW WINDOW IN EXISTING OPENING AND ORIGINAL RE-ANODIZED ALUMINUM SCREENS. SEE DETAILS. INSTALL/REPAIR LENTIL AND PAINT
C6.3	INSTALL NEW WINDOW IN EXISTING OPENING. RE: DOOR SCHEDULE & DETAILS
C6.4	WINDOW GLAZING TO BE FIT AROUND EXISTING PIPING
C6.6	INSTALL NEW DOOR IN EXISTING OPENING. RE: DOOR LEGEND AND SCHEDULE
C6.7	INSTALL NEW WINDOW IN EXISTING OPENING AND ORIGINAL METAL GRATES. SEE DETAILS INSTALL/REPAIR LENTIL AND PAINT.
C7.1	CLEAN ALL EXISTING FIXTURES
C7.2	ALTERNATE 2: UPDATE ELEVATOR ACCESS PANEL TO MEET ELEVATOR CODE ENFORCEMENT UPGRADES FROM LOUISIANA STATE LEGISLATURE - STATE FIRE MARSHAL - RS 40 REQ. INSTALL INTEGRATED SECURITY SYSTEM AT ELEVATOR. NEW CAMERA TO BE INSTALLED AT ELEVATOR. NEW CAMERA TO BE INSTALLED AT ELEVATOR WITH ABILITY TO BE MONITORED AND ALLOW ACCESS APPROVAL.

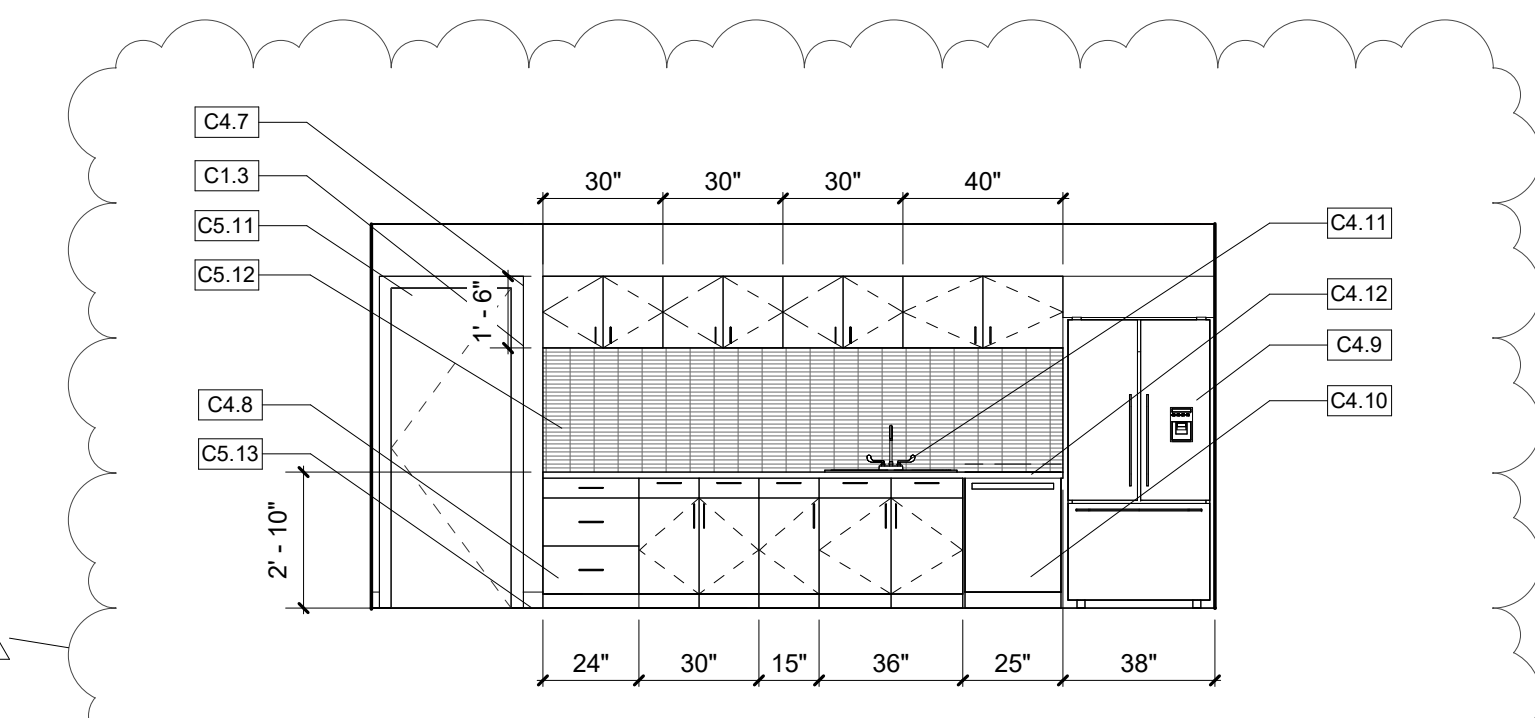


**1 BASEMENT PLAN**  
 1/8" = 1'-0"

**BASEMENT WALL REPAIR SCHEDULE**

NAME	#	NORTH		SOUTH		EAST		WEST		CEILING	FLOOR	NOTES
		WALL	TRIM	WALL	TRIM	WALL	TRIM	WALL	TRIM			
VESTIBULE	8	X				X						
OPEN OFFICE	7							X				X
W. R. R.	27					X						
M. R. R.	28					X						X
EMPLOYEE LOUNGE	30					X						X
B. HALL	9							X				X

\*\* NOTE: CHART INDICATES APPROX. WALL LOCATION THAT IS TO RECEIVE REPAIR. CONTRACTOR TO VERIFY IN FIELD AND REPORT ANY DISCREPANCIES TO THE ARCHITECT.



**2 EMPLOYEE LOUNGE - KITCHEN ELEVATION**  
 1/4" = 1'-0"

**REVISIONS**

1 05/09/24 AD 2

**JOB NUMBER:** 00-000

**ISSUED:** 02/02/24

**ISSUED FOR:**  
**CONSTRUCTION**

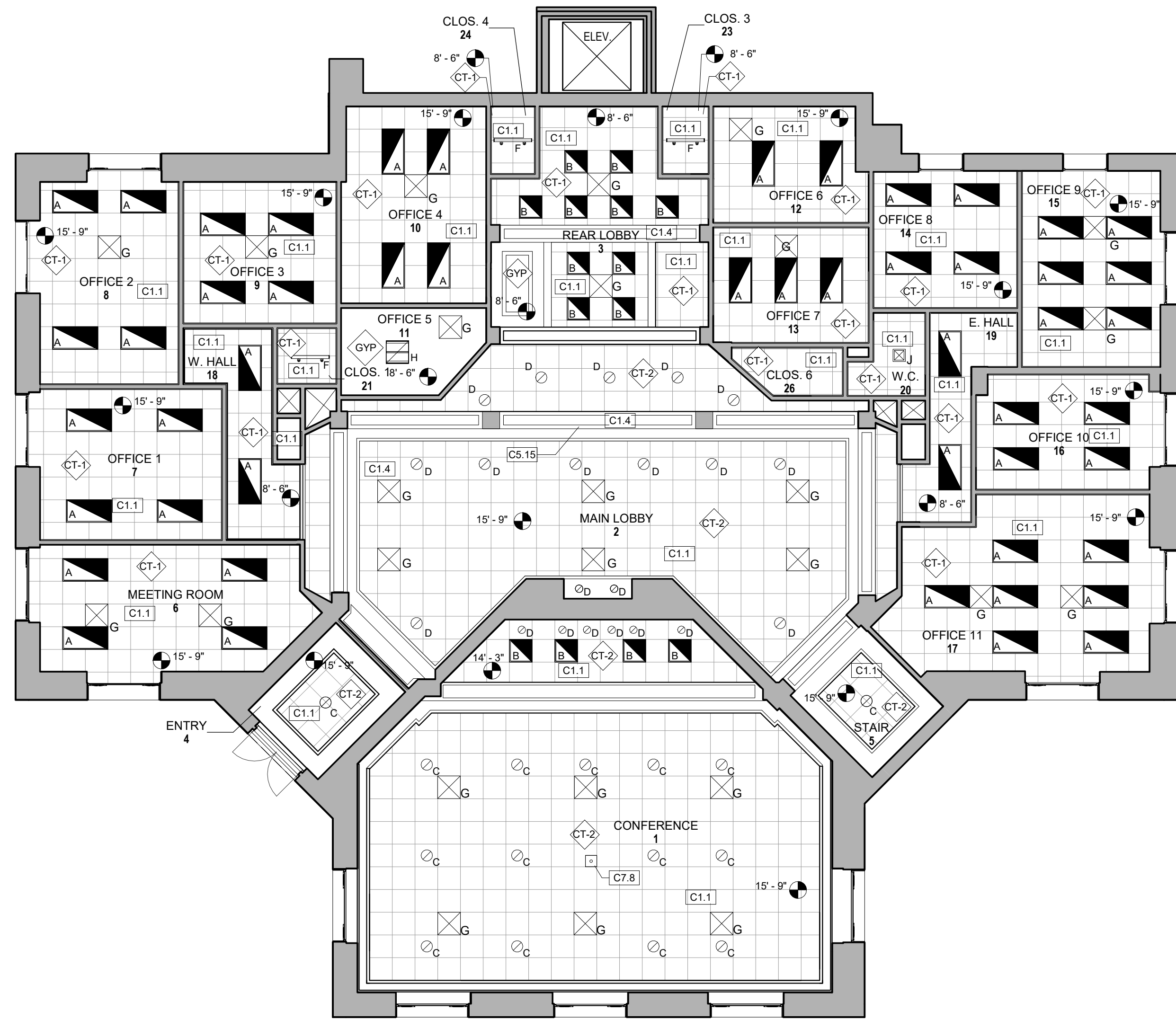
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BASEMENT PLAN

**A-101**

PHASE: CD



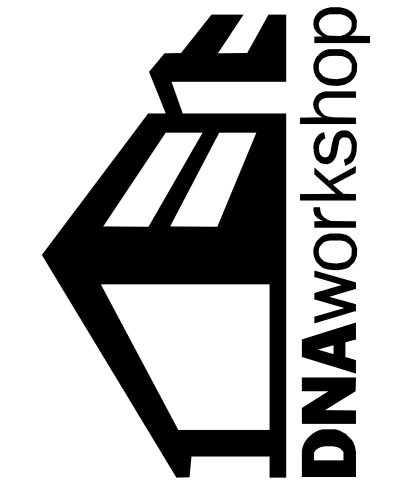
1 FIRST FLOOR RCP  
1/8" = 1'-0"

**RCP GENERAL NOTES:**  
 1) CONTRACTOR TO VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.  
 2) ALL CEILING MOUNTED DIFFUSERS/GRILLS/REGISTERS TO BE REPLACED. CONTRACTOR TO VERIFY COUNT AND LOCATION IN FIELD.  
 3) ALL EXISTING LIGHT FIXTURES TO BE REPLACED WITH NEW LED FIXTURES AT EXISTING LOCATIONS. ELECTRICIAN TO VERIFY LIGHT LOCATIONS AND WIRING CONNECTIONS.

LIGHTING/RCP SCHEDULE	
	2X4 RECESSED TROFFER LED PANEL
	2X2 SURFACE MOUNT LED PANEL
	12" CAN LIGHTING
	8" CAN LIGHTING
	CEILING MOUNTED LINEAR LIGHT, 2400 LUMENS
	2X2 REGISTER/DIFFUSER - REPLACE EXISTING IN KIND
	NEW LED FLUSH MOUNTED LIGHT FIXTURE, 4670 LUMENS.
	BATHROOM QUIET EXHAUST FAN WITH LED LIGHT
	3" 70 VOLT CEILING MOUNT SPEAKER CONNECTED TO SOUND MASKING GENERATOR - ALTERNATE 2 - LOCATION OF CONTROL PANEL TO BE COORDINATED WITH ARCHITECT PRIOR TO INSTALLATION.

KEYNOTE LEGEND - NEW CONSTRUCTION	
MARK	DESCRIPTION
C1.1	NEW CEILING TO BE INSTALLED. V.I.F. SPACING BASED ON HVAC RETURN LOCATIONS. RE-CEILING LEGEND AND FINISH SCHEDULE.
C1.4	REPLACE ALL DAMAGED AREA OF CEILING AND TRIM TO MATCH EXISTING. PRIME AND PAINT.
CS 15	MURAL TO BE RE-INSTALLED IN PRIOR LOCATION.
C7.8	EXISTING PROJECTOR TO REMAIN. PROTECT DURING CONSTRUCTION.

CEILING LEGEND	
	2X2 ACT DROP CEILING SYSTEM RE-SPECS
	2X2 ACT SURFACE MOUNTED TO CEILING RE-SPECS
	2X4 ACT DROP CEILING SYSTEM RE-SPECS
	PAINTED GYPSUM BOARD CEILING



**CAPITAL AREA UNITED WAY**  
 700 LAUREL STREET, BATON ROUGE, LA 70802  
 DYKE NELSON ARCHITECTURE 235 SOUTH 14TH ST. BATON ROUGE, LA 70802 DINA-WORKSHOP.COM [225] 224 3363

REVISIONS		
1	05/09/24	AD. 2

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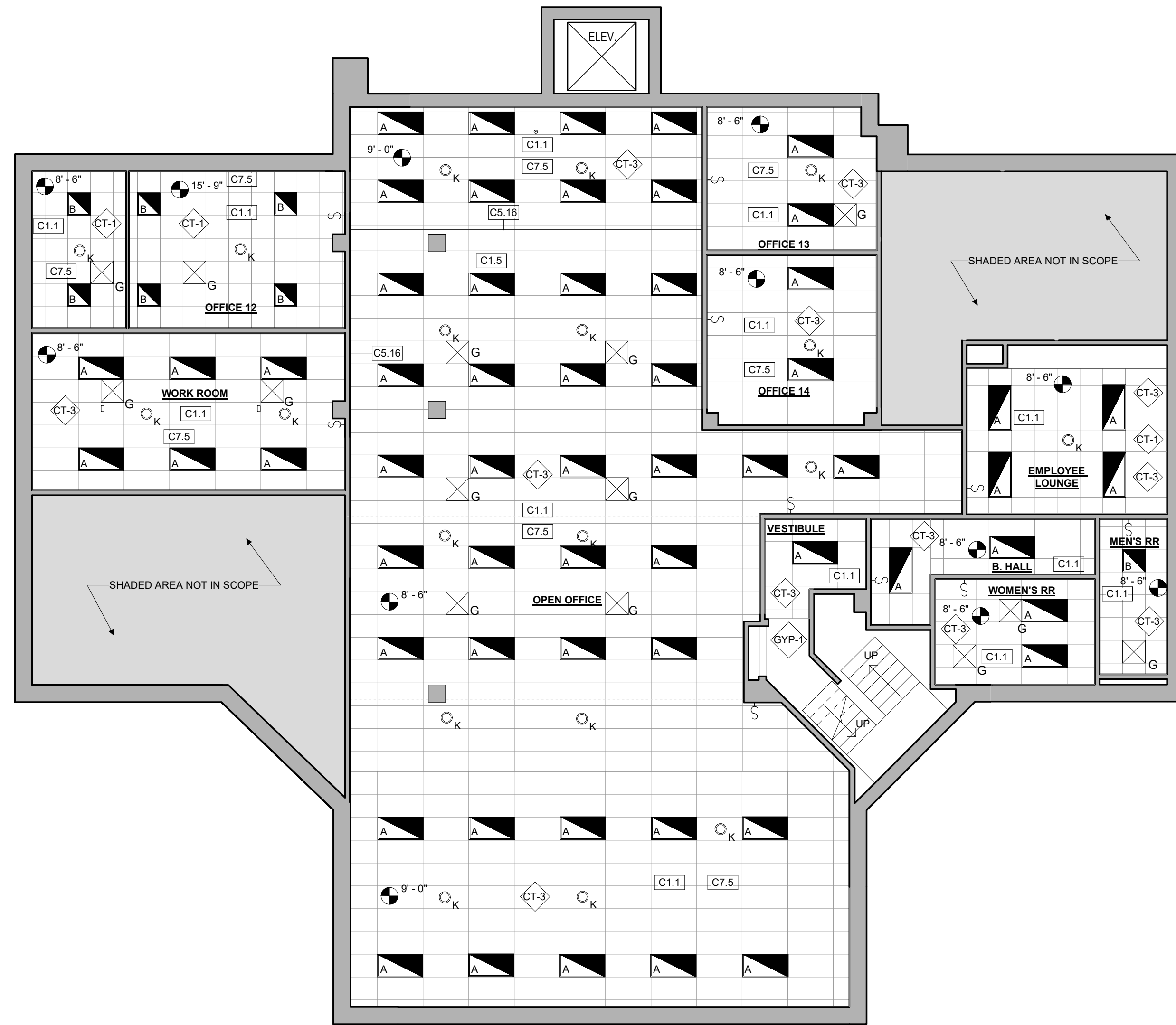


FIRST FLOOR RCP

A-102

PHASE: CD

1 BASEMENT RCP  
1/8" = 1'-0"

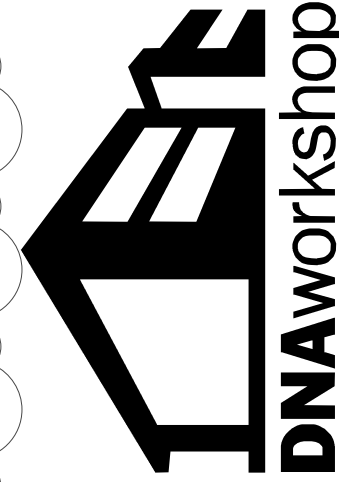


**RCP GENERAL NOTES:**  
 1) CONTRACTOR TO VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.  
 2) ALL CEILING MOUNTED DIFFUSERS/GRILLS/REGISTERS TO BE REPLACED. CONTRACTOR TO VERIFY COUNT AND LOCATION IN FIELD.  
 3) ALL EXISTING LIGHT FIXTURES TO BE REPLACED WITH NEW LED FIXTURES AT EXISTING LOCATIONS. ELECTRICIAN TO VERIFY LIGHT LOCATIONS AND WIRING CONNECTIONS.

LIGHTING/RCP SCHEDULE	
	2X4 RECESSED TROFFER LED PANEL
	2X2 SURFACE MOUNT LED PANEL
	12" CAN LIGHTING
	8" CAN LIGHTING
	CEILING MOUNTED LINEAR LIGHT, 2400 LUMENS
	2X2 REGISTER/DIFFUSER - REPLACE EXISTING IN KIND
	NEW LED FLUSH MOUNTED LIGHT FIXTURE, 4670 LUMENS.
	BATHROOM QUIET EXHAUST FAN WITH LED LIGHT
	3" 70 VOLT CEILING MOUNT SPEAKER CONNECTED TO SOUND MASKING GENERATOR - ALTERNATE 2 - LOCATION OF CONTROL PANEL TO BE COORDINATED WITH ARCHITECT PRIOR TO INSTALLATION.

KEYNOTE LEGEND - NEW CONSTRUCTION	
MARK	DESCRIPTION
C1.1	NEW CEILING TO BE INSTALLED. V.I.F. SPACING BASED ON HVAC RETURN LOCATIONS. RE: CEILING LEGEND AND FINISH SCHEDULE.
C1.5	ALL EXISTING WALL AND SOFFIT MOUNTED DIFFUSERS AND SUPPLY GRILLS TO BE REPLACED WITH NEW
C5.16	REPLACE EXISTING WALL GRILL/DIFFUSER, TYP. CONFIRM FINISH WITH ARCHITECT
C7.5	ALTERNATE 1: INSTALL 120W SOUND MASKING GENERATOR WITH WHITE NOISE EQUIPMENT THROUGHOUT SPACE

CEILING LEGEND	
	2X2 ACT DROP CEILING SYSTEM RE: SPECS
	2X2 ACT SURFACE MOUNTED TO CEILING RE: SPECS
	2X4 ACT DROP CEILING SYSTEM RE: SPECS
	PAINTED GYPSUM BOARD CEILING



**CAPITAL AREA UNITED WAY**  
 700 LAUREL STREET, BATON ROUGE, LA 70802

DYKE NELSON ARCHITECTURE 235 SOUTH 14TH ST. BATON ROUGE, LA 70802 DNA-WORKSHOP.COM (225) 224 3363

**REVISIONS**

NO.	DATE	DESCRIPTION
1	05/09/24	AD. 2

**JOB NUMBER:** 00-000

**ISSUED:** 02/02/24

**ISSUED FOR:**  
CONSTRUCTION

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BASEMENT RCP

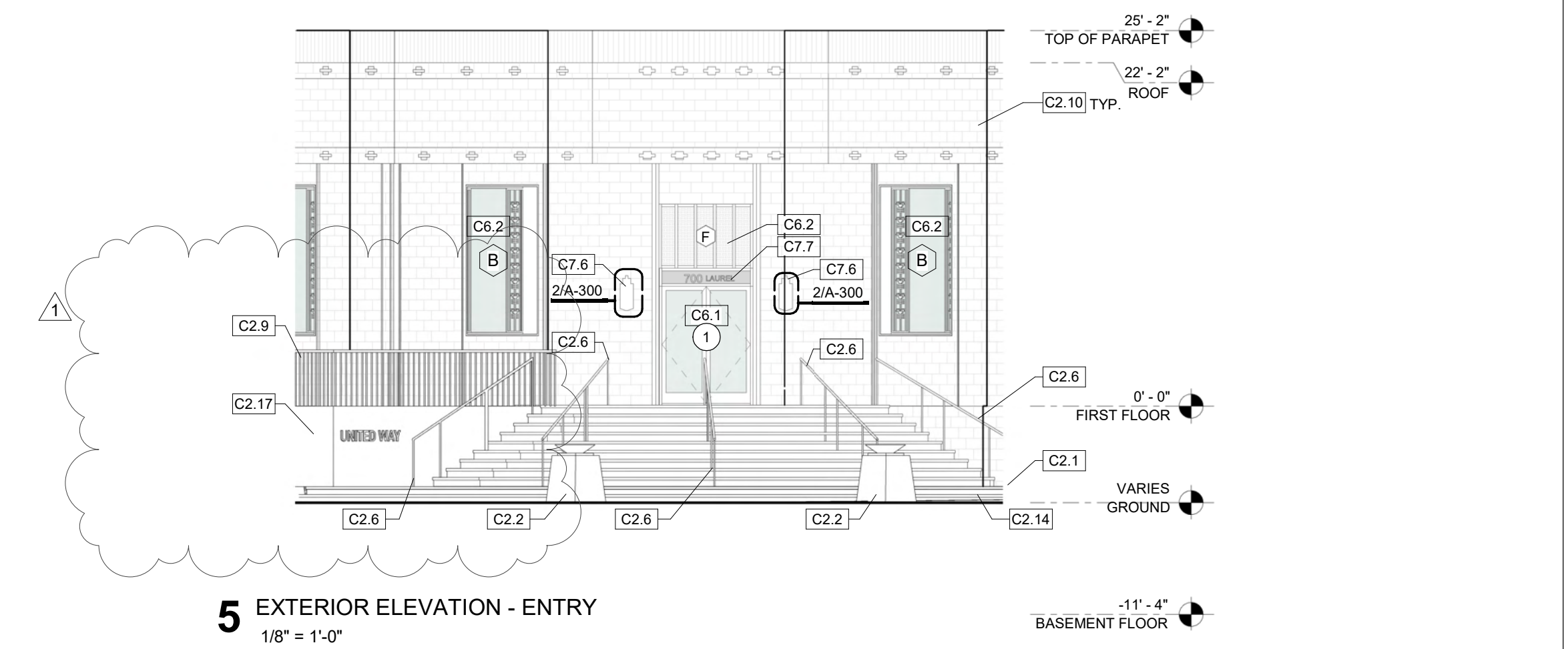
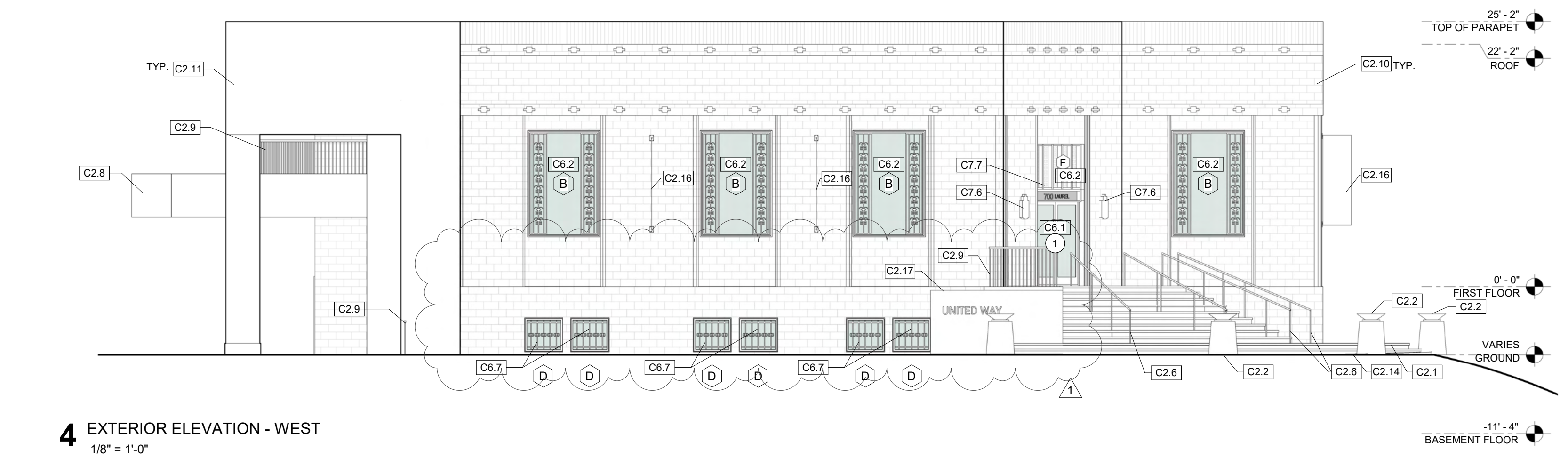
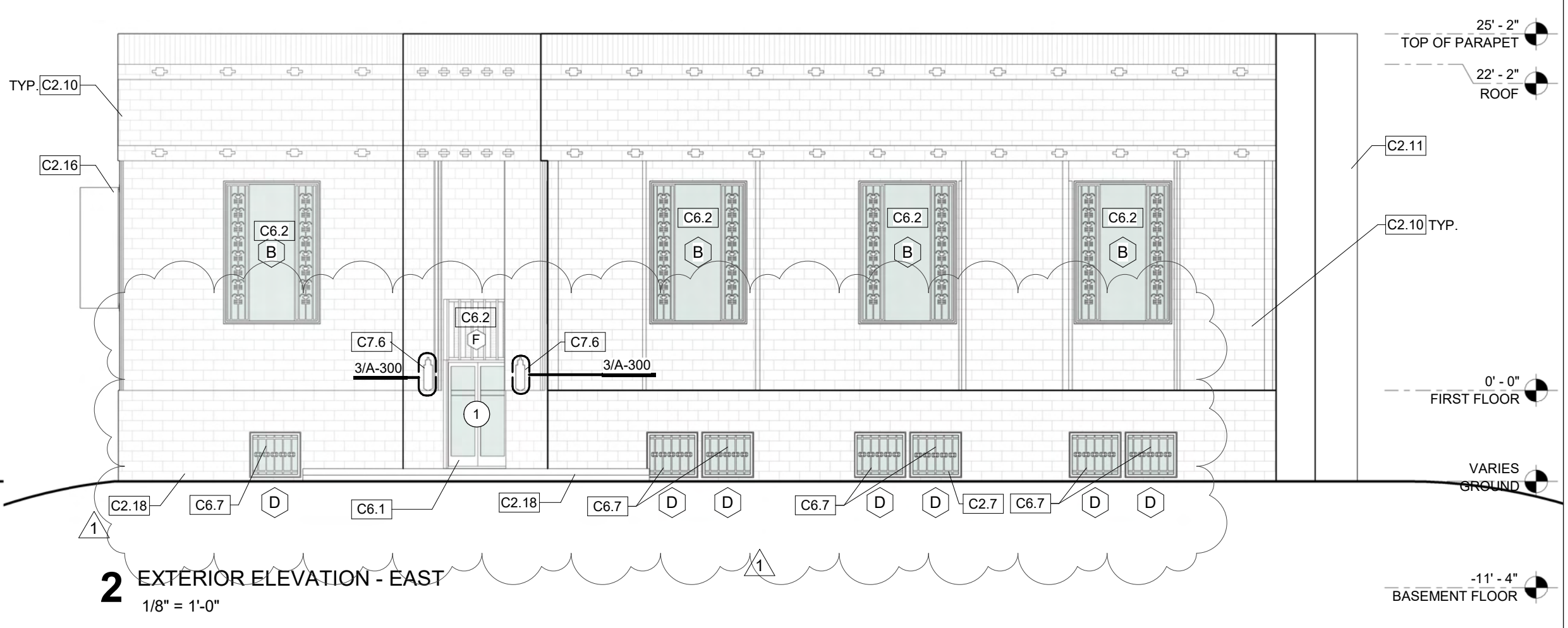
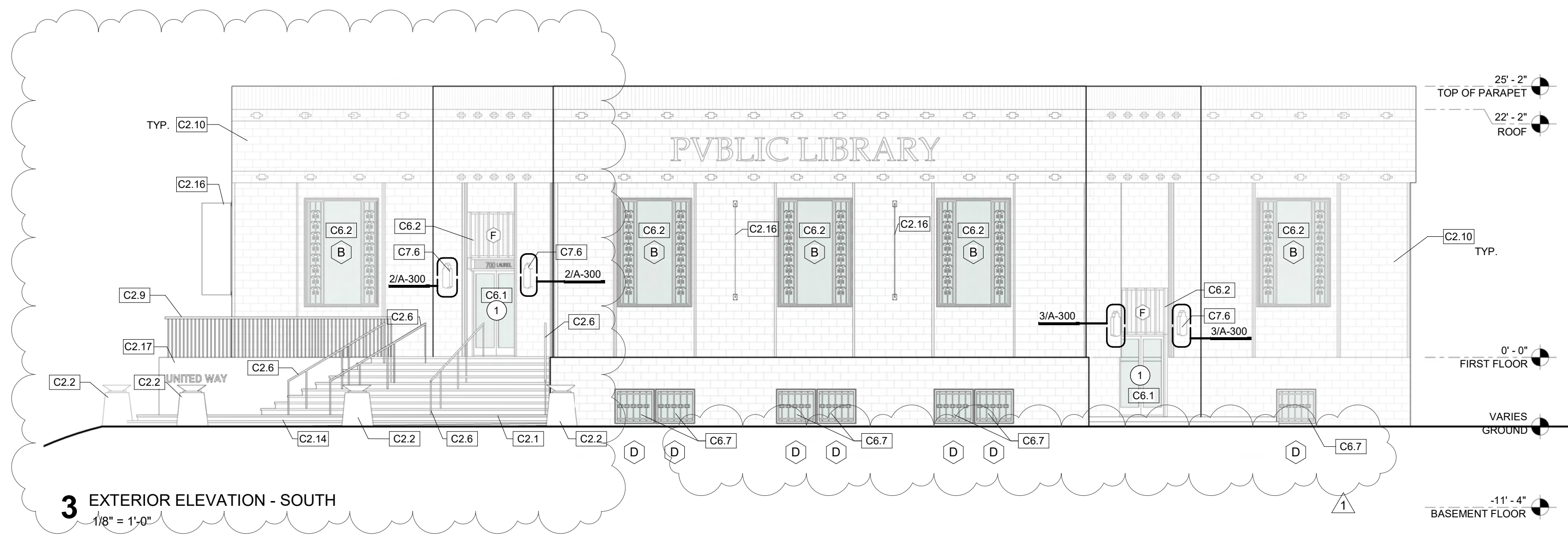
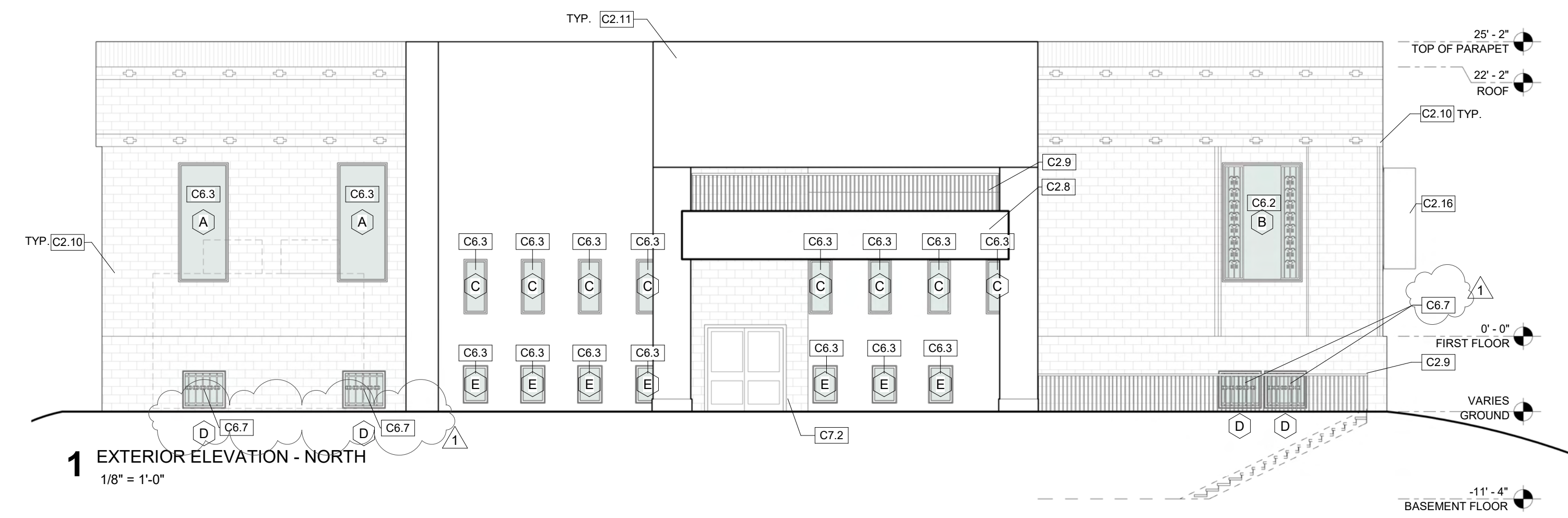
**A-103**

PHASE: CD

KEYNOTE LEGEND - NEW CONSTRUCTION	
MARK	DESCRIPTION
C2.1	SEAL ALL JOINTS AT CONCRETE PAVEMENT AND STAIRS WITH NEW SEALANT AND CLEAN.
C2.2	CLEAN PLANTER PEDESTALS, PLANTERS AND REPLANT RE: LANDSCAPE PLAN
C2.6	REMOVE EXISTING ALUMINUM RAILINGS AT ENTRY STAIRS. CLEAN AND APPLY NEW POWDER COAT FINISH AND REINSTALL. FINISH TO BE PROVIDED BY ARCHITECT
C2.7	INSTALL NEW METAL GRATE TO MATCH NEIGHBORING. SEE DETAILS
C2.8	REPAIR EXISTING AREA OF DAMAGED E.I.F.S. CANOPY. CLEAN AND APPLY NEW POWDER COAT FINISH AND REINSTALL. FINISH TO BE PROVIDED BY ARCHITECT
C2.9	EXISTING RAILINGS TO BE REMOVED, CLEANED, POWDER COATED AND RE-INSTALLED.
C2.10	REPOINT AND CLEAN EXISTING LIMESTONE. SEE DETAILS. ALLOWANCE OF 30 SF FOR LIMESTONE REPLACEMENT AS NEEDED.
C2.11	CLEAN ALL EXISTING E.I.F.S.
C2.14	REPAIR/REPLACE EXISTING CONCRETE STEPS. SEAL ALL JOINTS AT CONCRETE PAVERS AND STAIRS AND CLEAN.

KEYNOTE LEGEND - NEW CONSTRUCTION	
MARK	DESCRIPTION
C2.16	CUSTOM WALL MOUNTED HEAVY DUTY OPAQUE VINYL BANNER SECURED WITH RUST RESISTANT ALUMINUM MOUNTING BRACKETS PER MANUF. REC. CONTRACTOR TO VERIFY LOCATION WITH ARCH. IN FIELD. SEE DETAILS
C2.17	CMU WALL TO RECEIVE NEW STUCCO. SEE DETAILS.
C2.18	REPLACE/REPAIR LIMESTONE BASE. ALLOWANCE OF 10 LF REPLACEMENT. SEE C1/WP3.10
C6.1	INSTALL NEW DOOR AND TRANSOM IN EXISTING OPENING. RE: DOOR LEGEND AND SCHEDULE
C6.2	INSTALL NEW WINDOW IN EXISTING OPENING AND ORIGINAL RE-ANODIZED ALUMINUM SCREENS. SEE DETAILS. INSTALL/REPAIR LENTIL AND PAINT
C6.3	INSTALL NEW WINDOW IN EXISTING OPENING. RE: DOOR SCHEDULE & DETAILS
C6.7	INSTALL NEW WINDOW IN EXISTING OPENING AND ORIGINAL METAL GRATES. SEE DETAILS. INSTALL/REPAIR LENTIL AND PAINT.
C7.2	ALTERNATE 2: UPDATE ELEVATOR ACCESS PANEL TO MEET ELEVATOR CODE ENFORCEMENT UPGRADES FROM LOUISIANA STATE LEGISLATURE - STATE FIRE MARSHAL - RS 40 REQ. INSTALL INTEGRATED SECURITY SYSTEM AT ELEVATOR. NEW CAMERA TO BE INSTALLED AT ELEVATOR. NEW CAMERA TO BE INSTALLED AT ELEVATOR WITH ABILITY TO BE MONITORED AND ALLOW ACCESS APPROVAL.
C7.6	REPAIR, RESTORE, CLEAN AND RELAMP EXISTING LIGHT FIXTURE. SEE DETAILS.
C7.7	NEW VINYL SIGNAGE TO BE INSTALLED ON GLASS TRANSOM. SEE DETAIL.

**ELEVATION GENERAL NOTES:**  
 1. VERIFY ALL EXISTING DIMENSIONS & HEIGHTS IN THE FIELD.  
 2. INFORMATION SHOWN RELATIVE TO EXISTING CONDITIONS DERIVED FROM SITE VISITS. INCLUDING BUT NOT LIMITED TO DIMENSIONS.



**REVISIONS**

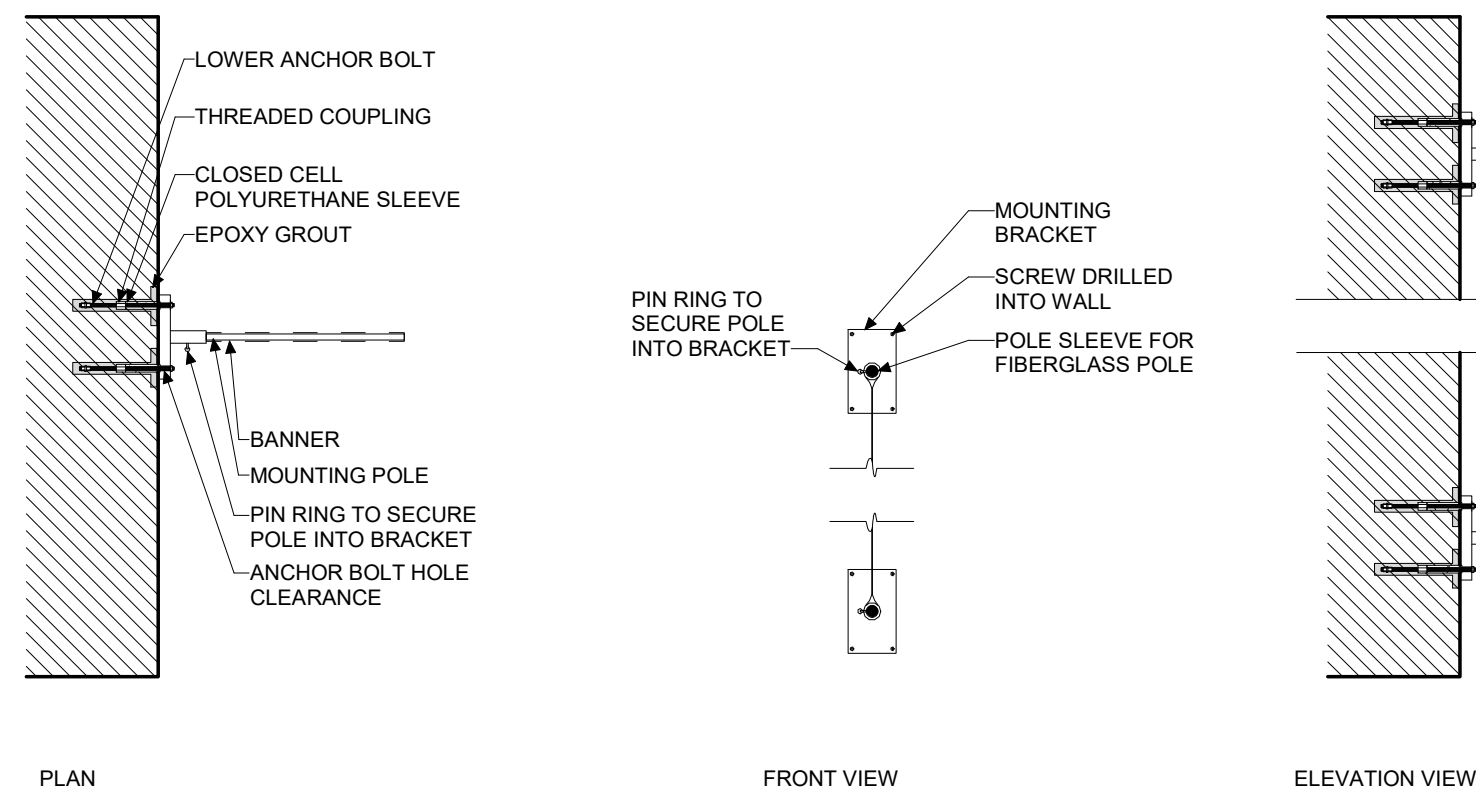
1	05/09/24	AD. 2
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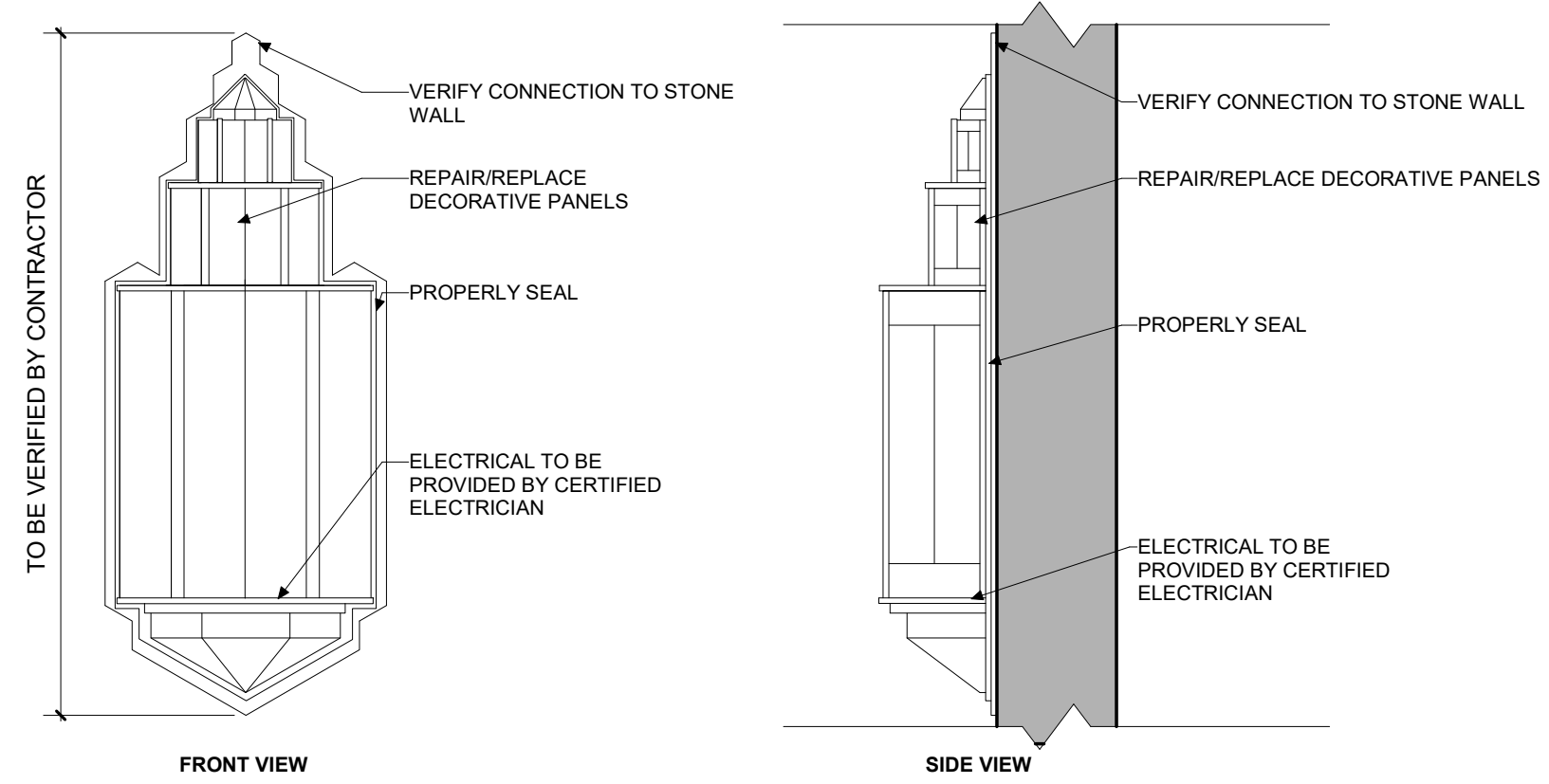
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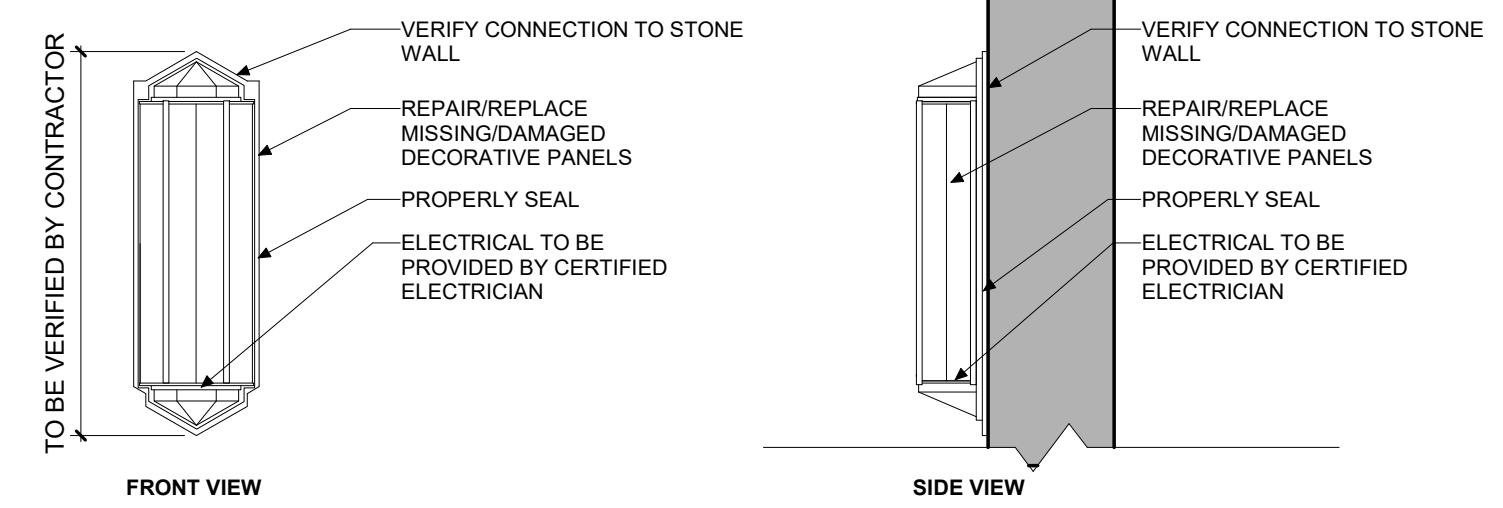


**5 BANNER MOUNTING DETAIL**  
NTS



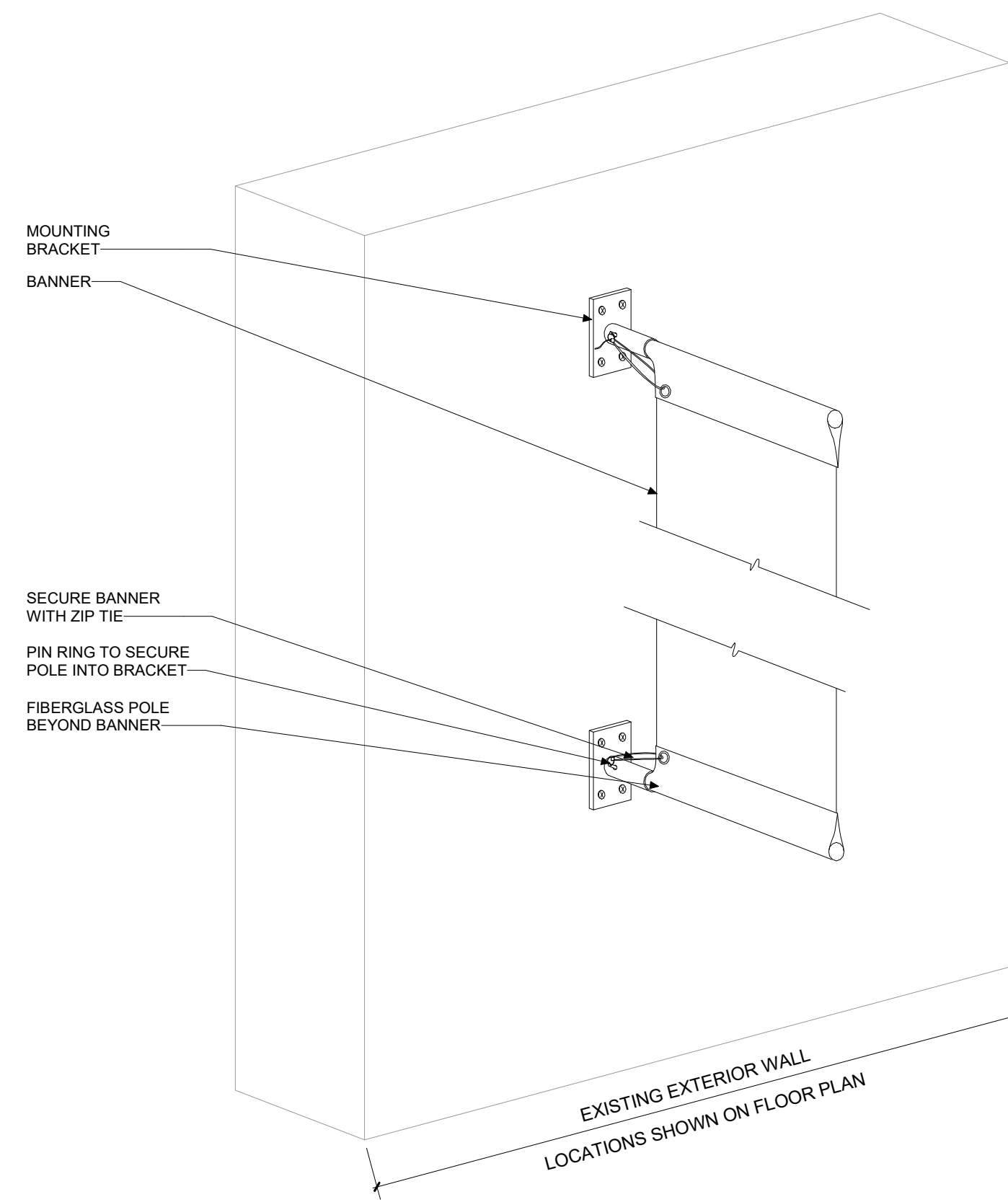
**2 ENTRANCE LIGHT FIXTURE**  
NTS

NOTE: LIGHT TO BE PROTECTED FOR RE-INSTALLATION



**3 SIDE ENTRY LIGHT FIXTURE**  
NTS

NOTE: LIGHT TO BE PROTECTED FOR RE-INSTALLATION



**REVISIONS**

1 05/09/24 AD. 2

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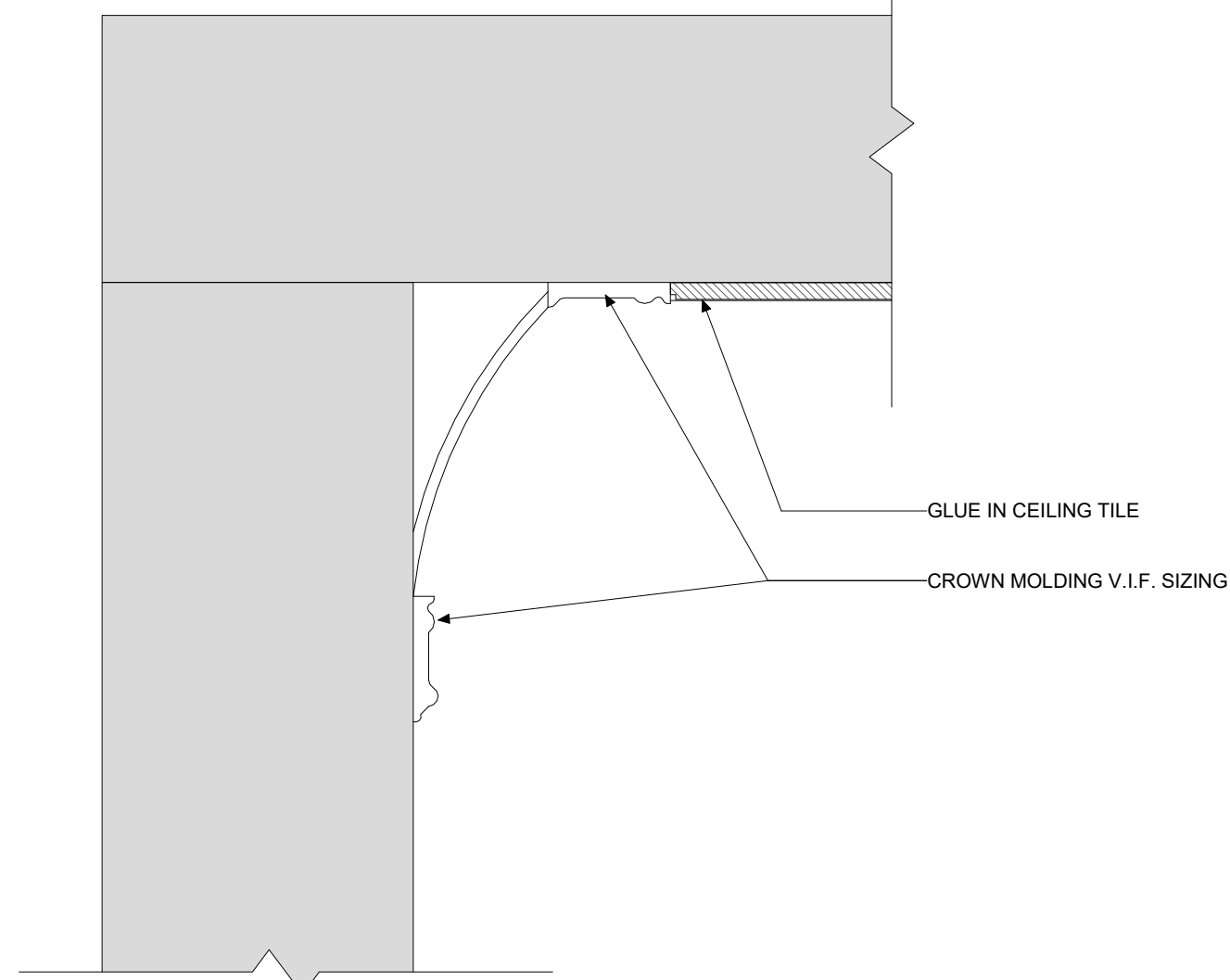


DETAILS

**A-300**

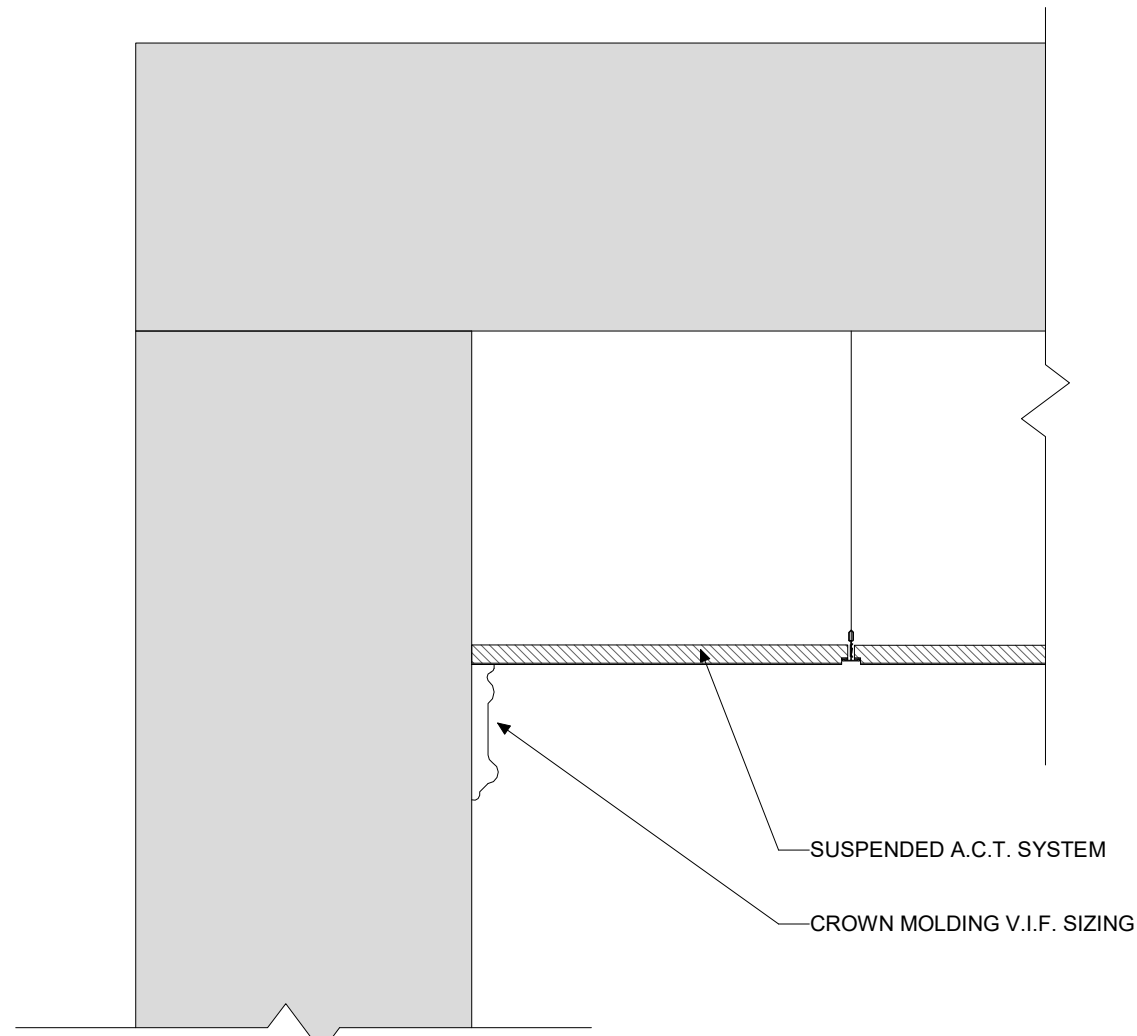
**PHASE:** CD

NOTE: CONTRACTOR TO VERIFY MOLDING PROFILE.

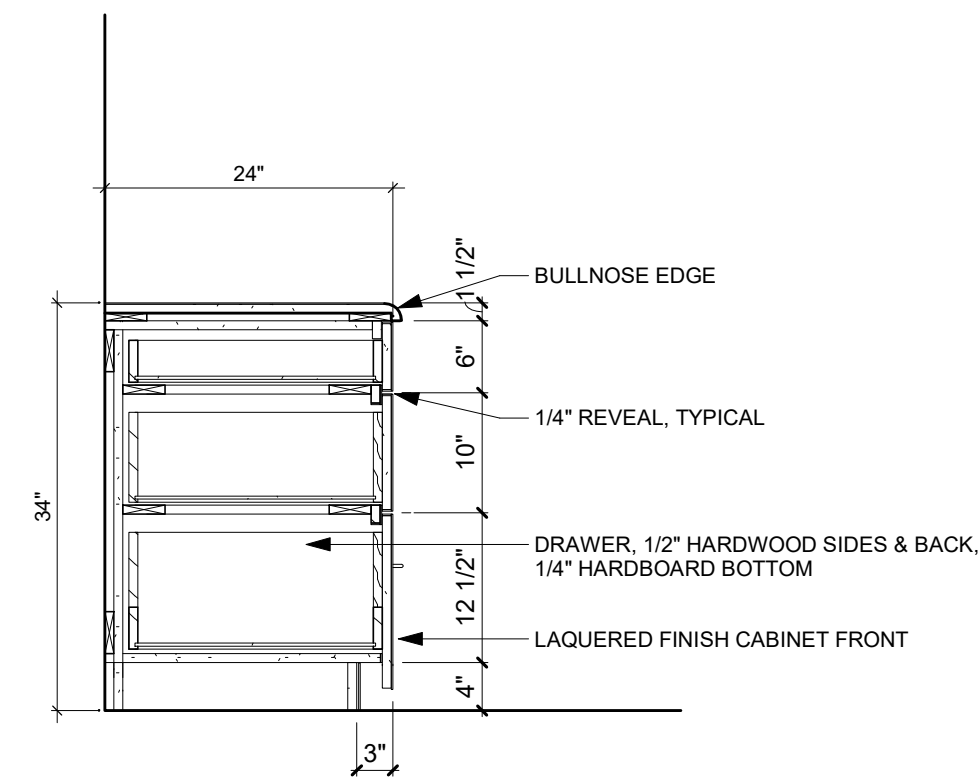


**1** TYP. DECORATIVE MOLDING - CONFERENCE AND FRONT LOBBY  
1 1/2" = 1'-0"

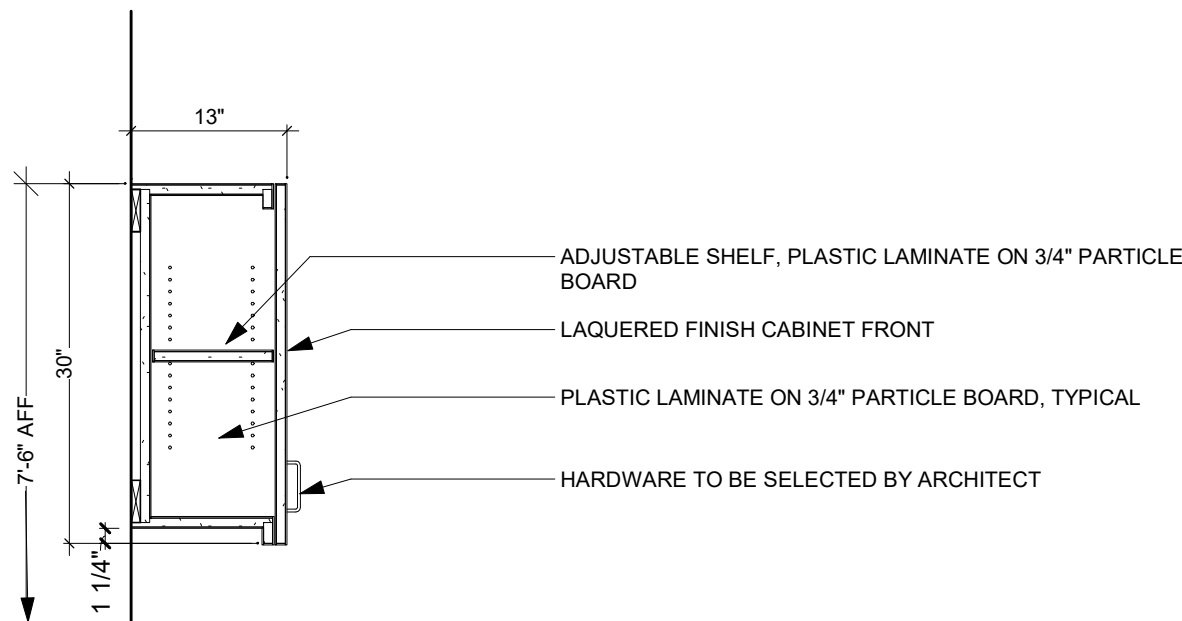
NOTE: CONTRACTOR TO VERIFY MOLDING PROFILE.



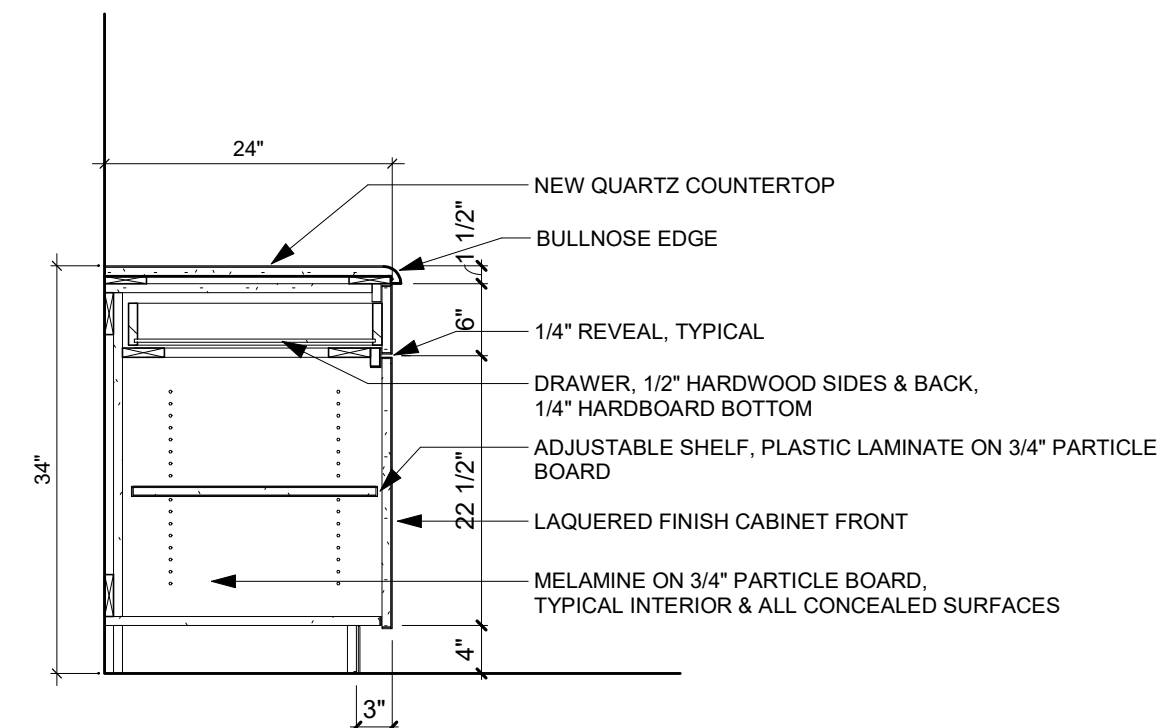
**2** TYP. OFFICE TRIM AND MOLDING (1)  
NTS



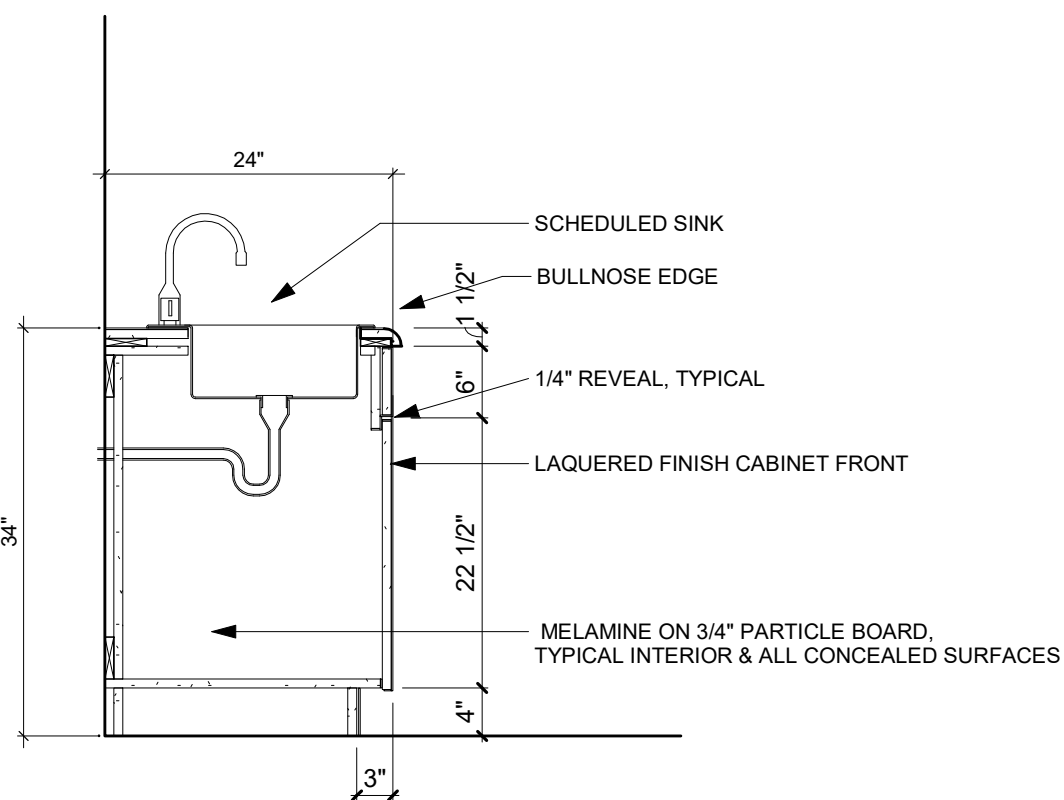
**1** BASE CABINET  
3/4" = 1'-0"



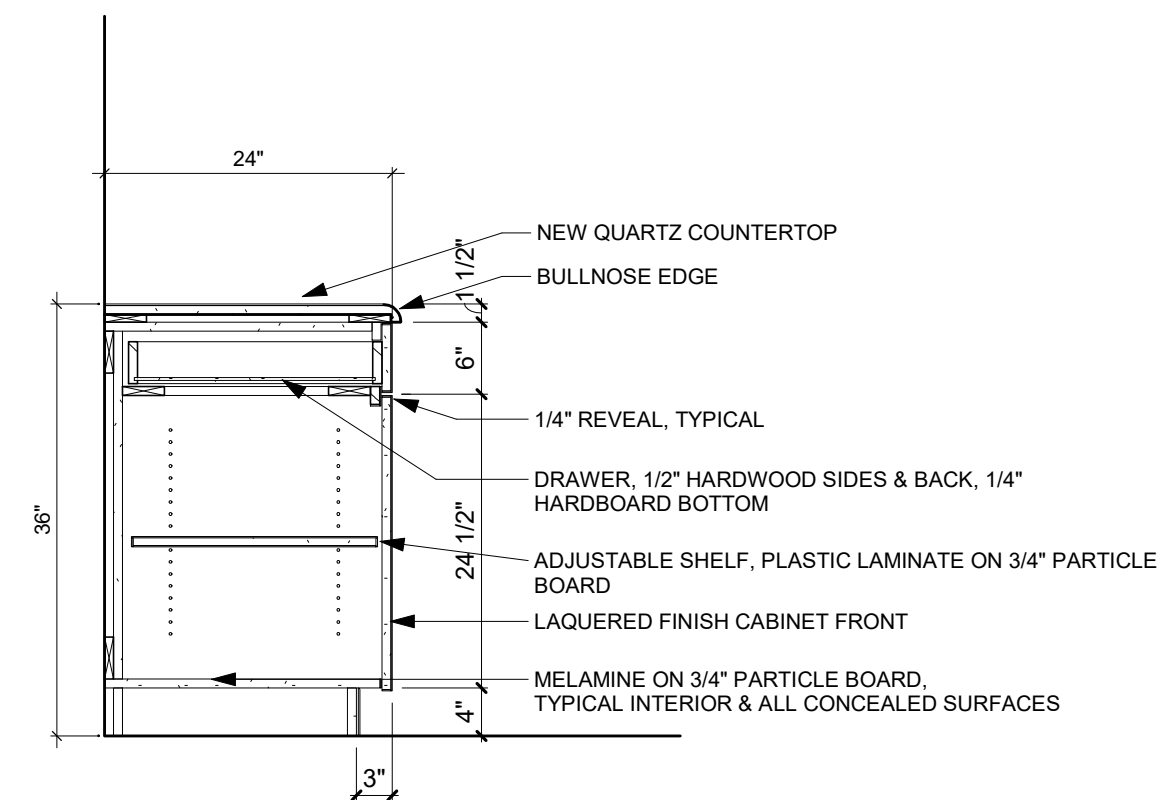
**2** UPPER CABINET  
3/4" = 1'-0"



**3** ACCESSIBLE BASE CABINET  
3/4" = 1'-0"



**4** BASE CABINET - SINK FRONT  
3/4" = 1'-0"



**5** BASE CABINET  
3/4" = 1'-0"

**3** MILLWORK  
3/4" = 1'-0"

REVISIONS

NO.	DESCRIPTION	DATE

JOB NUMBER: 00-000

ISSUED: 02/02/24

ISSUED FOR:  
**CONSTRUCTION**

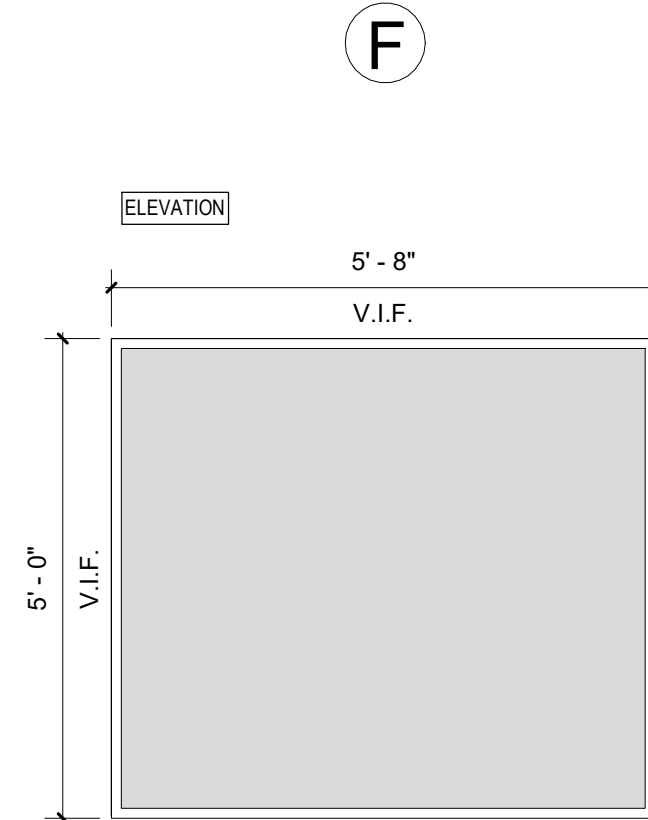
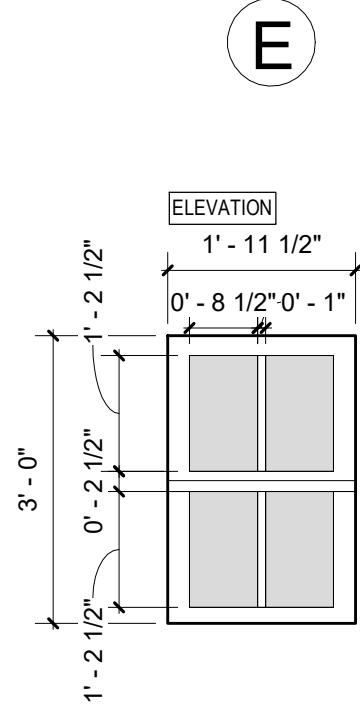
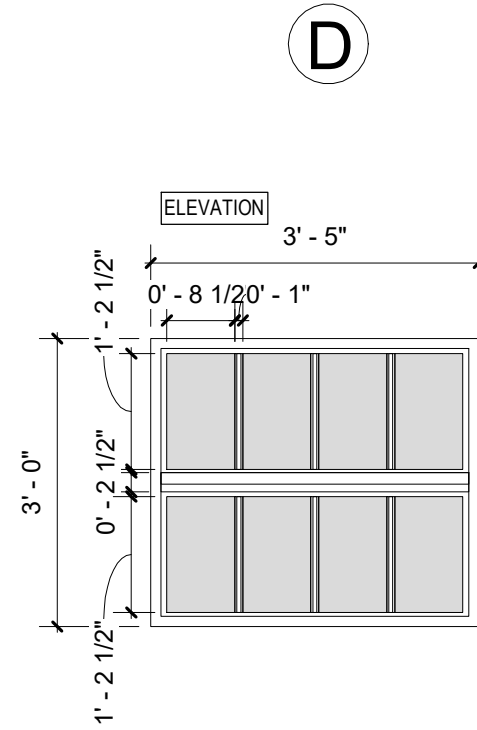
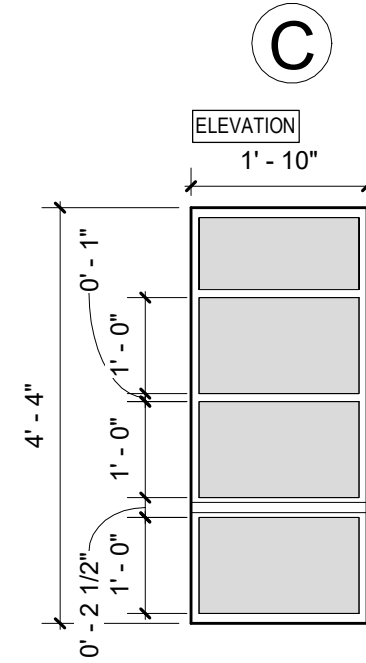
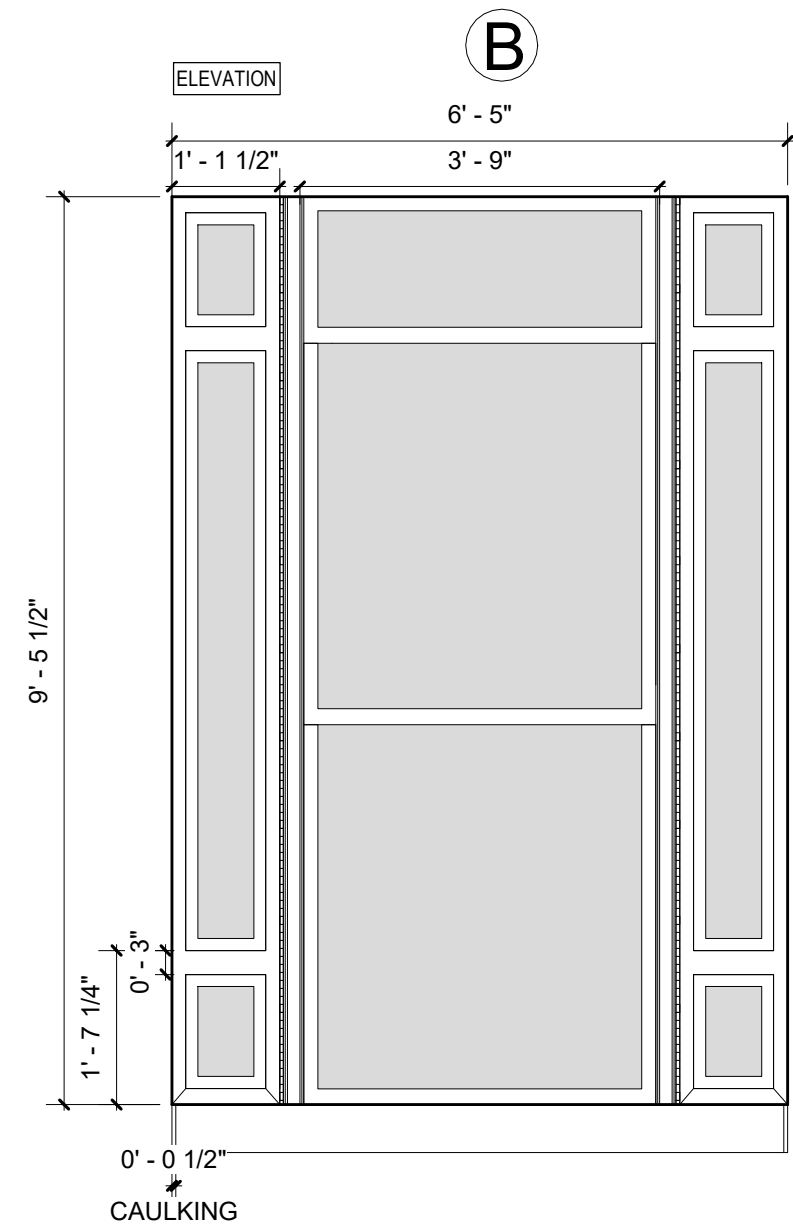
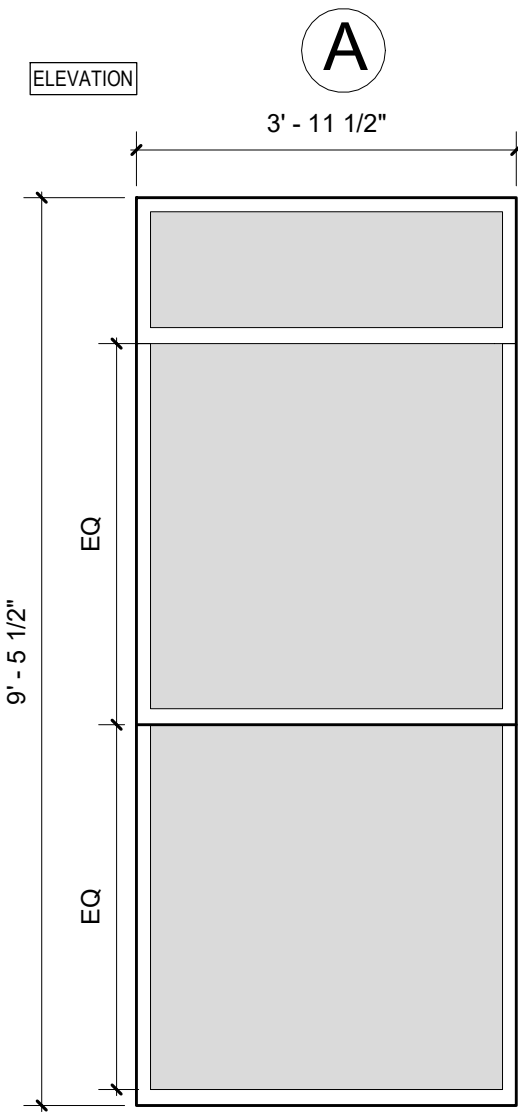
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DETAILS

**A-301**

PHASE: CD



**1 WINDOW SCHEDULES & LEGEND**  
1/2" = 1'-0"

WINDOW SCHEDULE				
TYPE	COUNT	Height	Width	NOTES
A	14	9' - 5 1/2"	3' - 11 1/2"	
B	2	9' - 5 1/2"	6' - 5"	RECEIVE ORIG. RESTORED ALUM SCREEN
C	8	4' - 4"	1' - 10"	
D	24	3' - 0"	3' - 5"	BASEMENT WINDOW RECEIVE ORIG. OR NEW METAL GRATE
E	7	3' - 0"	1' - 11 1/2"	
F	2	5' - 6"	5' - 8"	WINDOW ABOVE ENTRY DOOR - TO RECIEVE ORIG. RESTORED METAL GRATE

- NOTE:**  
 1) VERIFY ALL WINDOW DIMENSIONS.  
 2) WINDOWS TO BE ENERGY EFFICIENT DOUBLE PANE.  
 3) WINDOWS TO BE ENERGY EFFICIENT DOUBLE PANE.  
 4) EXISTING ALUMINUM SCREENS TO BE REMOVED, RE-ANODIZED AND SECURED TO NEW WINDOWS TO LOOK UNTOUCHED.  
 5) EXISTING METAL GRATES TO BE REMOVED AS PER DETAILS. RESTORED AND RE-INSTALLED AS PER DETAILS. NEW GRATE TO BE INSTALLED AT MISSING LOCATION TO MATCH NEIGHBORING WINDOWS.  
 6) NEW WINDOWS TO BE DOUBLE PANE INSULATED, LOW-EMISSION GLASS

**REVISIONS**

1 05/09/24 AD. 2

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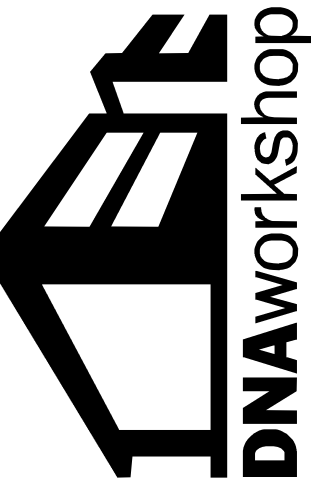
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WINDOW SCHEDULE & DETAILS

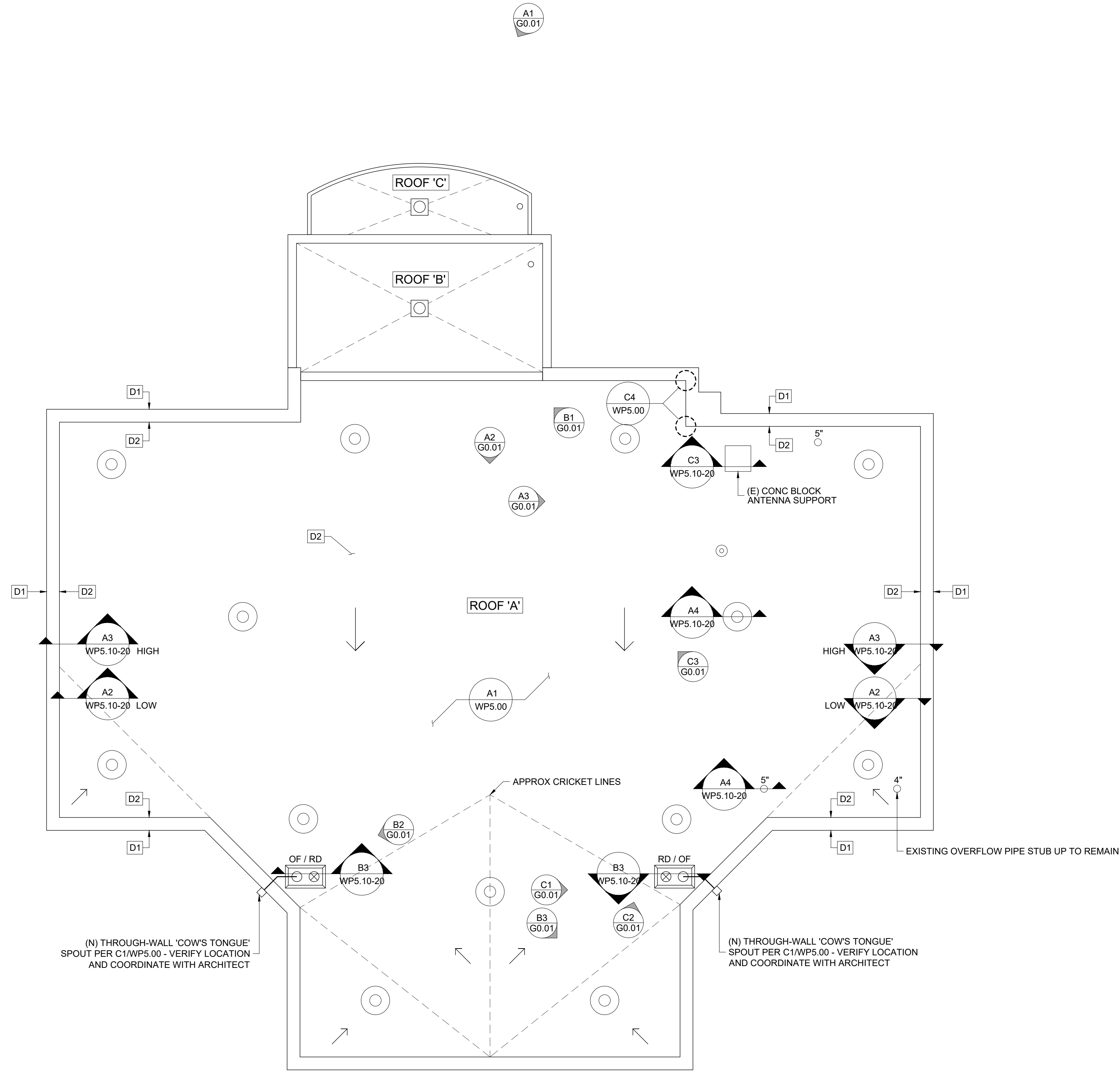
**A-400**

**PHASE:** CD



C:\USERS\STEVEN\BOX\REV\PROJECTS\NO\ANOLA CLIENTS\_CURRENT\700 LAUREL ST. BATON ROUGE - CAUM\DESIGN\WORKSHEET FILES\CAUW\03 A5.00 REF ROOF PLAN.DWG PLOTTED: 24.05.09

LAUREL STREET



1 REFERENCE ROOF PLAN  
 A5.00 SCALE: 1/8" = 1'-0" (+/-) ARCH REF: A-106

**GENERAL NOTES:**

**DEMOLITION:**

- D1. DEMOLISH AND LEGALLY DISPOSE OF EXISTING COPING COVERINGS.
- D2. DEMOLISH AND LEGALLY DISPOSE OF EXISTING MODIFIED BITUMEN MEMBRANE AT PARAPET WALLS.
- D3. DEMOLISH AND LEGALLY DISPOSE OF MARKED WET AREAS OF ROOF INSULATION AND MEMBRANE. ASSUME APPROXIMATELY 1,500 SF OF WET AREA. REPAIR AREAS PER DETAIL A1/WP5.10 OR A2/WP5.20.

**NEW ASSEMBLY INSTALLATION:**

- 1. SEE DETAILS.
- 2. ASSUME 200 LF OF WALKWAY MEMBRANE PER ARCHITECT.

**KEY:**

- (E) VENT
- ROOF DRAIN / OVERFLOW DRAIN SUMP
- 5" (E) PLUMBING VENT
- REFERENCE PHOTOGRAPH

CAPITAL AREA UNITED WAY  
 ROOF RE-COVER /  
 SITE REPAIRS  
 700 LAUREL STREET  
 BATON ROUGE, LOUISIANA 70802

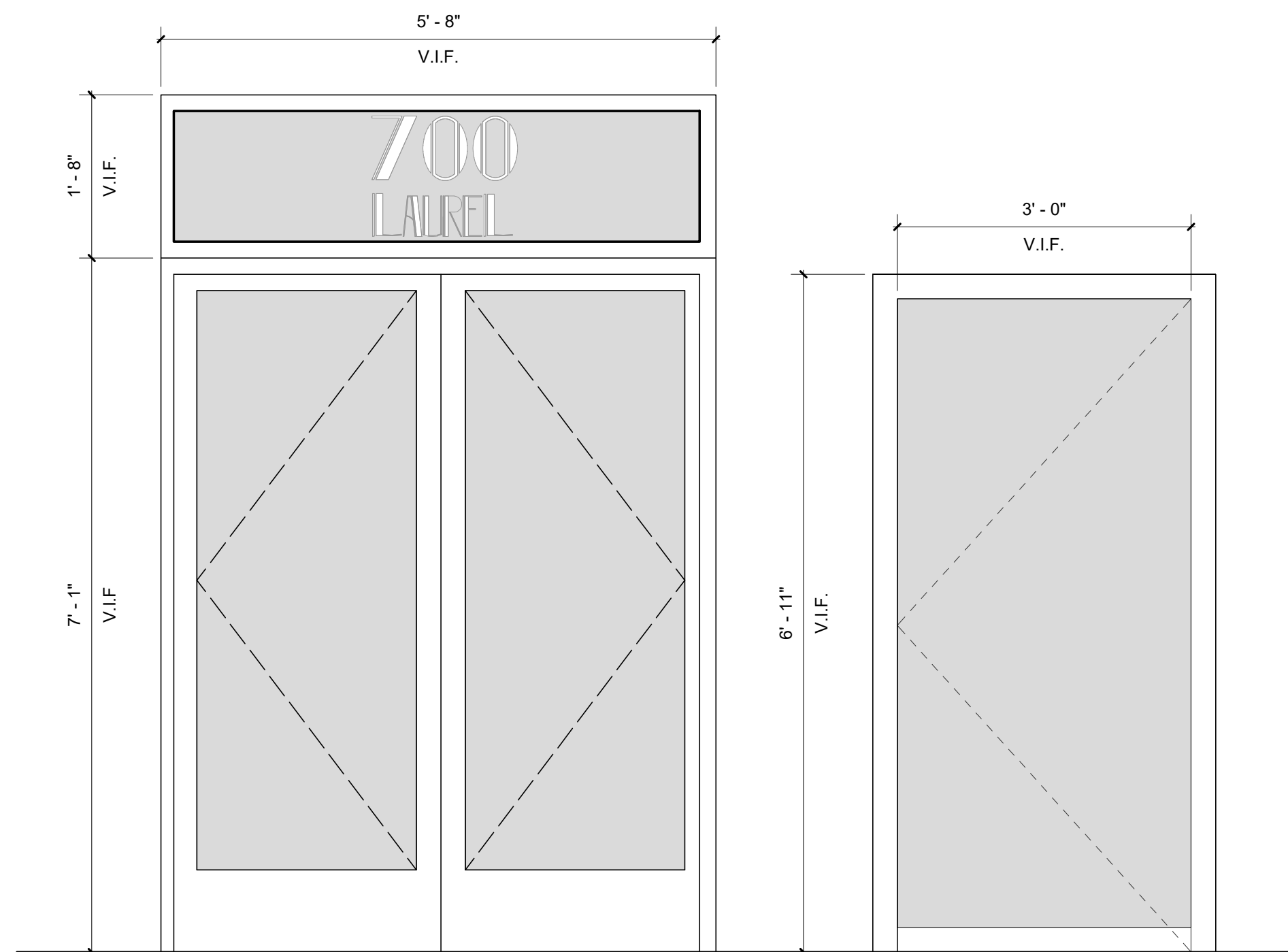
DRAWN: SJH CHECKED: CRM SCALE: AS NOTED  
 CAUW\03 A5.00 REF ROOF PLAN 24.05.09 SIZE: 34 x 22 1" AT FULL SIZE

PROJECT NO:	SC1241779	ISSUE FOR
SHEET NAME:	REFERENCE ROOF PLAN	
SHEET NO:	A5.00	
NO.	DATE	REVIEW
1	05.09.24	

SOCOTEC CONSULTING, INC  
 517 SORAPARU STREET  
 SUITE 101  
 NEW ORLEANS, LA 70130  
 TEL: 504.235.6164  
 WWW.SOCOTEC.COM/locations

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 DESIGN  
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**A**

ALUMINUM STOREFRONT  
DOUBLE DOOR WITH  
TRANSOM

**B**

ALUMINUM STOREFRONT  
DOOR

**DOOR SCHEDULE**

TYPE	COUNT	ELEVATION	HEIGHT	WIDTH	HW SET
1	2	A	6'-8"	6'-0"	1
2	1	B	6'-8"	3'-0"	2

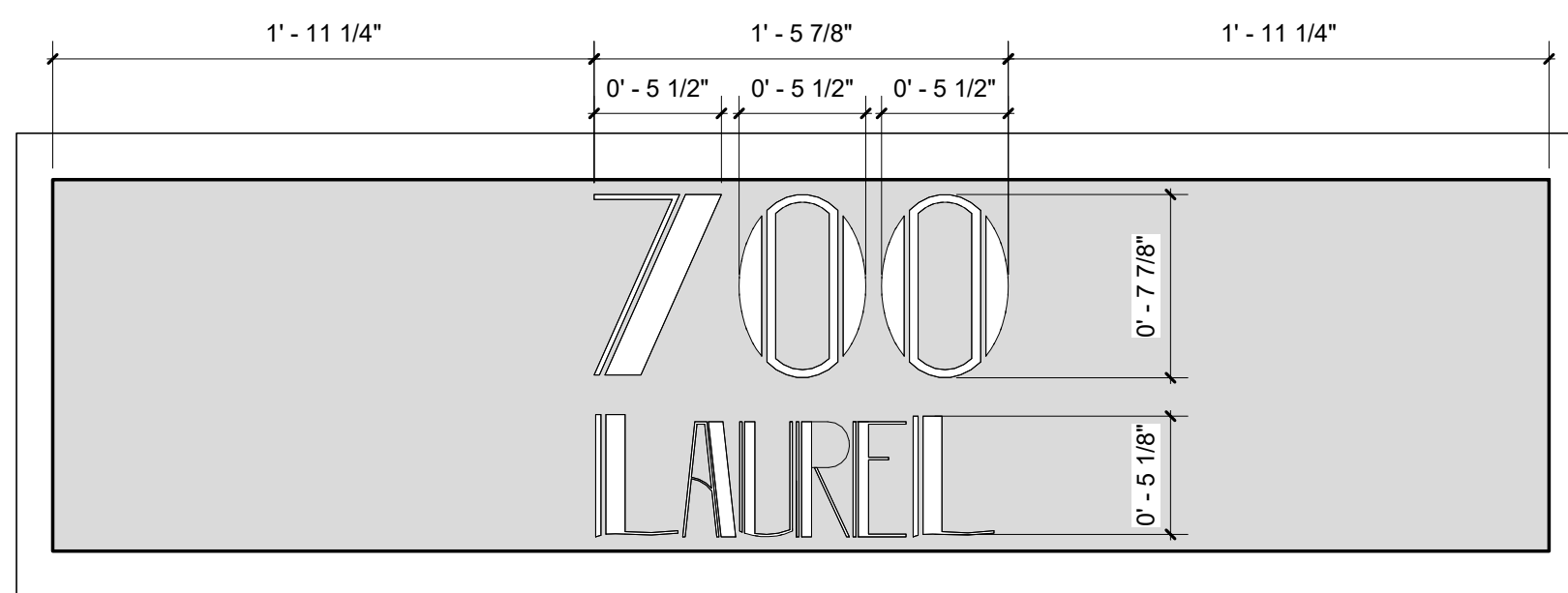
NOTE: GLASS DOOR TO BE REPLACED WITH INSULATED, LOW-EMISSION GLASS DOORS. TRANSOM WINDOWS TO BE REPLACED WITH INSULATED, LOW-EMISSION GLASS.

**HARDWARE: 1**

- HINGES: 4 HEAVY DUTY
- INTERIOR HANDLE: PUSH BAR
- EXTERIOR HANDLE: LEVER STYLE HANDLE
- CLOSER: ADA COMPLIANT ADJUSTABLE SPRING
- GASKET
- THRESHOLD
- WEATHER STRIPPING
- MULLION
- DOOR STOP

**HARDWARE: 2**

- HINGES: 3 HEAVY DUTY
- HANDLE: PUSH BAR
- CLOSER: ADA COMPLIANT ADJUSTABLE SPRING
- CYLINDER
- GASKET
- THRESHOLD
- WEATHER STRIPPING
- DOOR STOP
- MULLION



**2** ENTRY VINYL DECAL SIGNAGE  
1 1/2" = 1'-0"

FINISH LEGEND	
CT-1	2X2 ACT DROP CEILING SYSTEM RE: SPECS.
CT-2	2X2 ACT SURFACE MOUNTED TO CEILING RE: SPECS.
GYP	GYPSUM BOARD CEILING
PT-1	WHITE DOVE BY BENJAMIN MOORE IN SATIN FINISH
PT-2	SILVER LAKE BY BENJAMIN MOORE IN SATIN FINISH
PT-3	INTERIOR PAINT IN SEMI-GLOSS FINISH RE: ARCH
PT-4	INTERIOR PAINT IN SATIN FINISH RE: ARCH
VT-1	LVT - AVA - VRSE - TRBLE VRS013L OR EQUAL
T-1	1X8 CERAMIC TILE - GREY GROUT
VB-1	4" WD BASE FINISH TO BE CHOSEN BY ARCHITECT
CL-1	EXISTING CARPET TO BE CLEANED
QT-1	2" WHITE QUARTZ OR EQUAL

NOTE:  
ALL FINISHES TO BE SUBMITTED FOR APPROVAL BY ARCHITECT. ALL FINISHES SPECIFIED DENOTE THE QUALITY STANDARD, STYLE, TYPE, OR CHARACTER OF PRODUCT SOUGHT, AND DO NOT RESTRICT BIDDERS TO THE SPECIFIC MANUFACTURER. THE EQUIVALENT PRODUCTS MAY BE ACCEPTABLE.

**FINISH SCHEDULE - FIRST FLOOR**

ROOM	WALL FINISH				FLOOR FINISH	CEILING FINISH	BASE FINISH	COMMENTS
	N	E	W	S				
ENTRY	PT-1/PT-4	PT-1/PT-4	PT-1/PT-4	PT-1/PT-4	N/A	PT-1/PT-4	N/A	
STAIR	PT-1	PT-1	PT-1	PT-1	N/A	PT-1/PT-4	N/A	
MAIN LOBBY	PT-1/PT-4	PT-1/PT-4	PT-1/PT-4	PT-1/PT-4	CL-1	CT-2	N/A	
REAR LOBBY	PT-1/PT-4	PT-1/PT-4	PT-1/PT-4	PT-1/PT-4	CL-1	CT-1	N/A	
CONFERENCE	PT-1/PT-4	PT-1/PT-4	PT-1/PT-4	PT-1/PT-4	CL-1	CT-2	N/A	
MEETING ROOM	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 1	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 2	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 3	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 4	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 5	PT-1	PT-1	PT-1	PT-1	CL-1	PT-1/PT-4	N/A	PAINT CEILING
OFFICE 6	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 7	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 8	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 9	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 10	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
OFFICE 11	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
WATER CLOSET	PT-1	PT-1	PT-1	PT-1	VT-1	CT-1	PT-1	
CLOS. 1	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
CLOS. 3	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
CLOS. 4	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
WEST HALL	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	
EAST HALL	PT-1	PT-1	PT-1	PT-1	CL-1	CT-1	N/A	

**FINISH SCHEDULE - BASEMENT**

ROOM	WALL FINISH				FLOOR FINISH	CEILING FINISH	BASE FINISH	COMMENTS
	N	E	W	S				
EMPLOYEE LOUNGE	PT-3/PT-1	PT-1	PT-1	PT-1	VT-1	CT-1	PT-1	
VESTIBULE	PT-1	PT-1	PT-1	PT-1	VT-1	CT-1	N/A	
B. HALL	PT-1	PT-1	PT-1	PT-1	N/A	CT-1	PT-1	
WOMEN'S RR	PT-2	PT-2	PT-2	PT-2	N/A	CT-1	N/A	
MEN'S RR	PT-2	PT-2	PT-2	PT-2	N/A	CT-1	N/A	
OFFICE 12	PT-1	PT-1	PT-1	PT-1	VT-1	CT-1	PT-1	
WORK ROOM	PT-1	PT-1	PT-1	PT-1	VT-1	CT-1	N/A	
OFFICE 13	PT-1	PT-1	PT-1	PT-1	VT-1	CT-1	PT-1	
OFFICE 14	PT-1	PT-1	PT-1	PT-1	VT-1	CT-1	PT-1	

**REVISIONS**

1 05/09/24 AD. 2

**JOB NUMBER:** 00-000

**ISSUED:** 02/02/24

**ISSUED FOR:**  
**CONSTRUCTION**

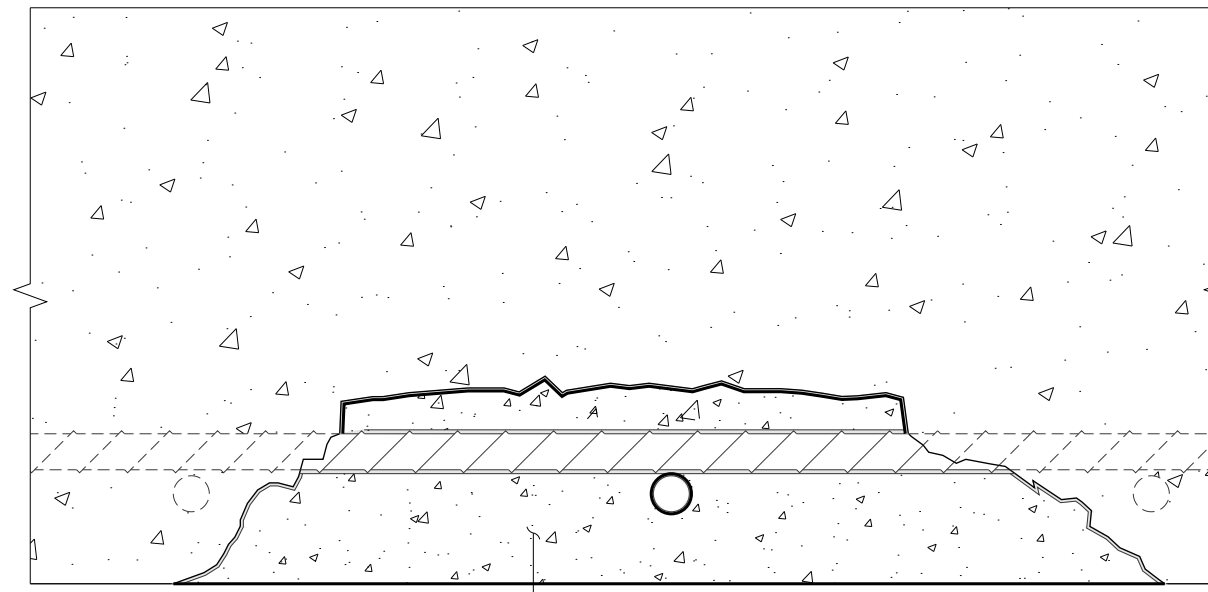
THESE DRAWINGS ARE THE PROPERTY OF DYKE NELSON ARCHITECTURE, LLC AND ARE NOT TO BE REPRODUCED IN WHOLE OR IN PART. THEY ARE ONLY TO BE USED FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN. SCALES STATED HEREON ARE VALID ON THE ORIGINAL DRAWINGS ONLY. CONTRACTOR SHALL CAREFULLY REVIEW ALL DIMENSIONS AND CONDITIONS SHOWN AND REPORT TO THE ARCHITECT ANY ERRORS, INCONSISTENCIES, OR OMISSIONS DISCOVERED THESE PLANS WERE PREPARED IN THIS OFFICE UNDER OUR PERSONAL SUPERVISION AND TO THE BEST OF OUR KNOWLEDGE COMPLY WITH STATE AND LOCAL CODES.



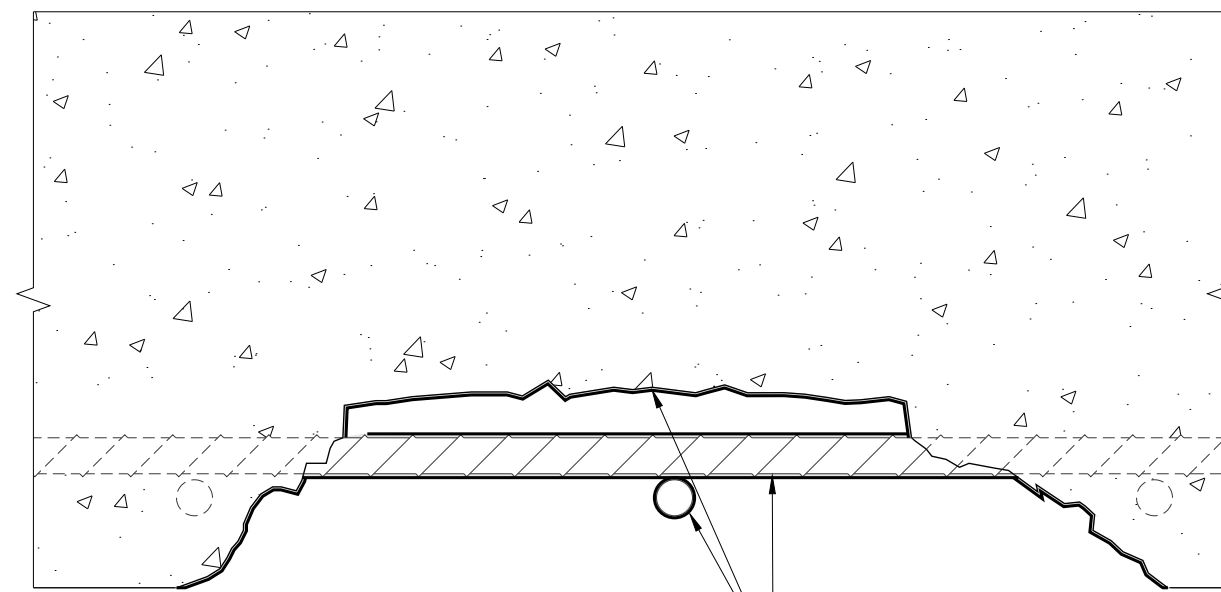
SCHEDULE & DETAILS

**A-401**

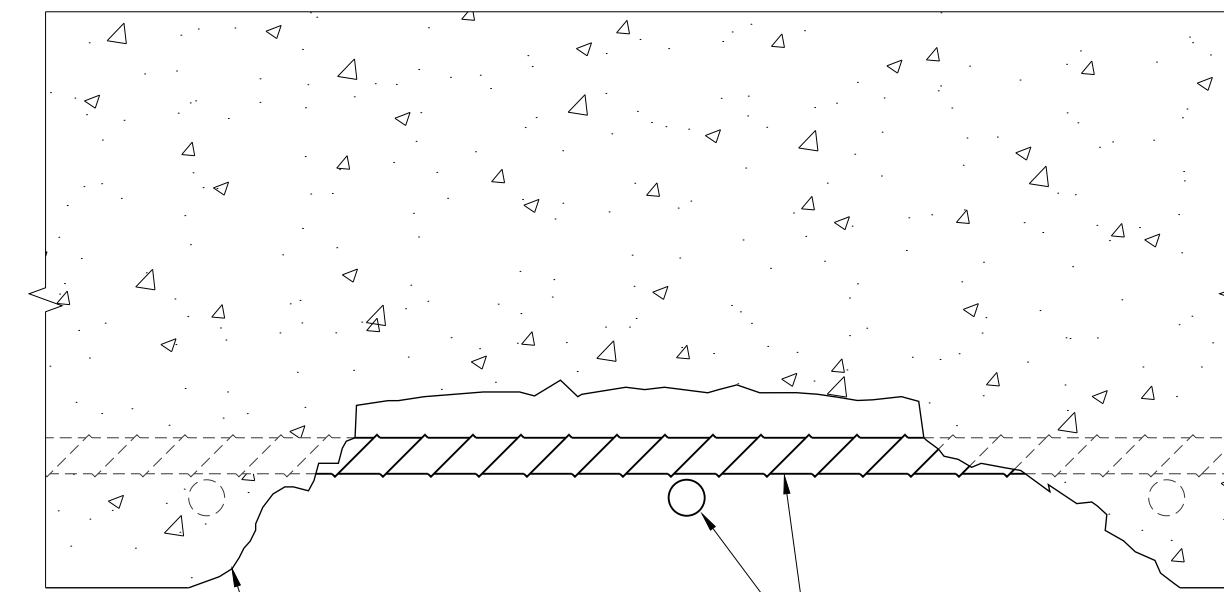
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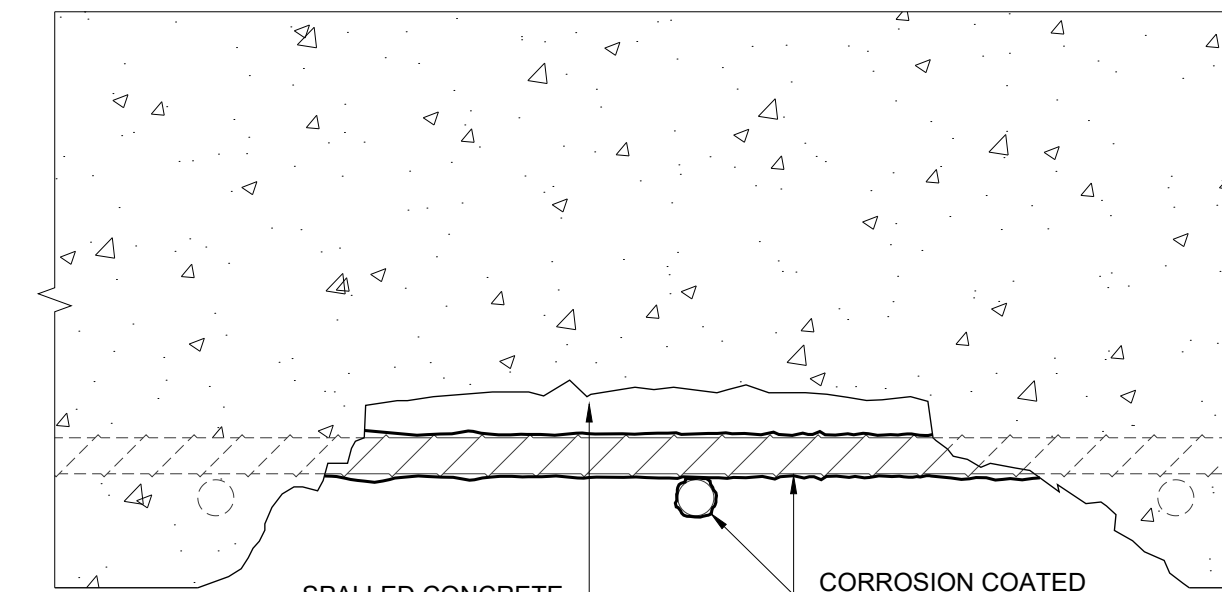
AFTER COMPLETE PRIMING AND CURING, REPAIR SPALLED AREA WITH SIKAQIICK VOH CEMENTITIOUS REPAIR MORTAR



APPLY SIKA ARMATEC 110 EPOCEM BONDING AGENT AND REINFORCEMENT PROTECTION TO ALL EXPOSED CLEAN CONCRETE AND REINFORCING STEEL SURFACES



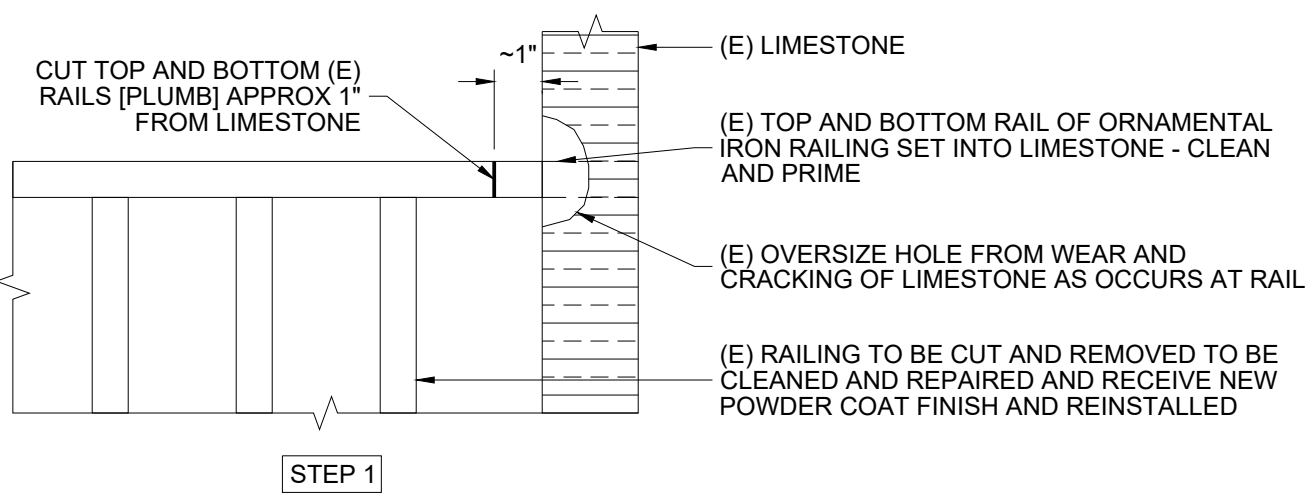
BLAST ALL EXPOSED CONCRETE AND BLOW COMPLETELY CLEAN AND CLEAR OF LOOSE PARTICLES. BLAST ALL EXPOSED REINFORCING STEEL UNTIL ALL CORROSION IS REMOVED COMPLETELY



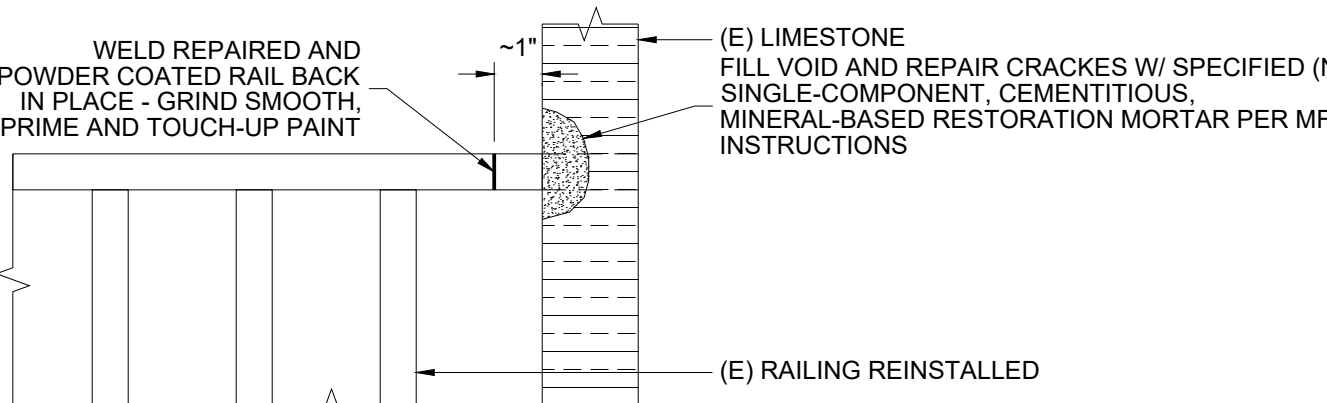
SPALLED CONCRETE CORROSION COATED REINFORCING BARS

[STEP 4] CONCRETE DECK SPALLING REMEDIATION (WHERE OCCURS)

A4 WP3.10 SCALE: N T S ARCH REF: NONE



STEP 1

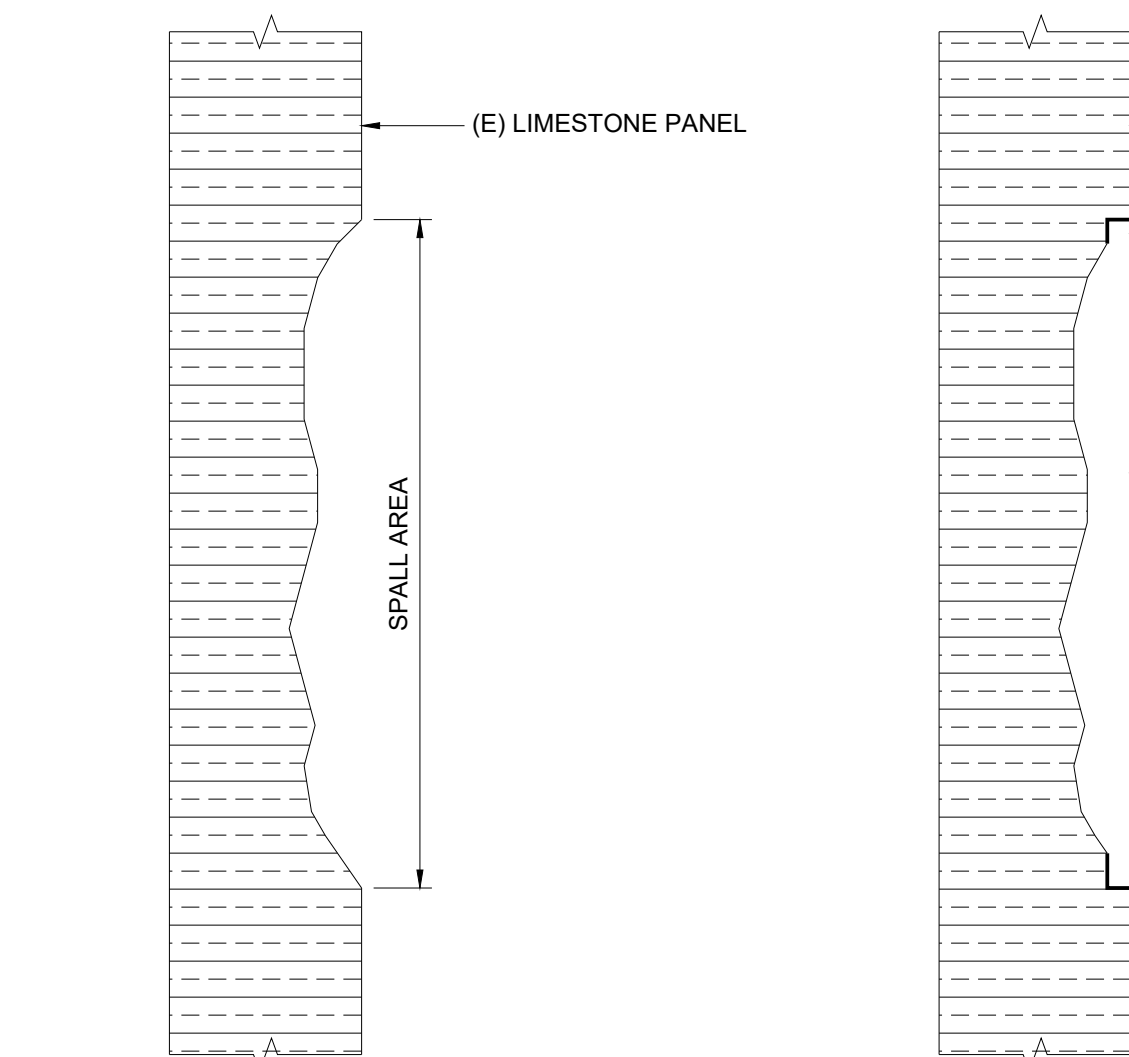


STEP 2

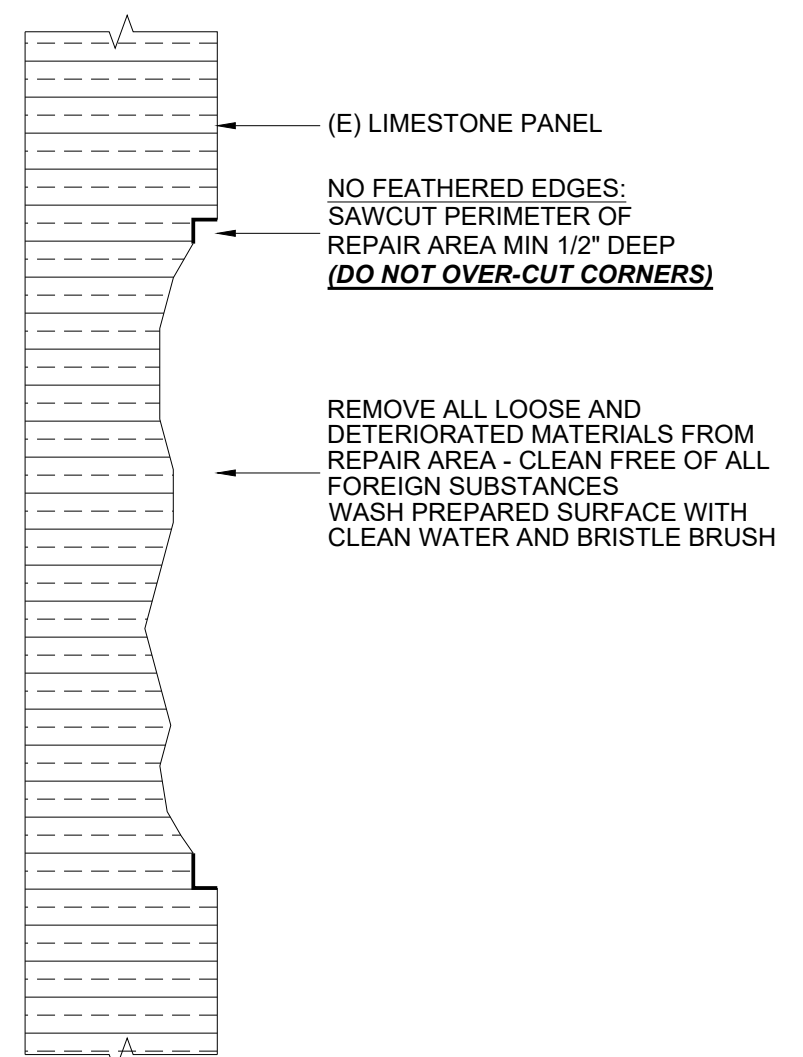
NOTE: MATERIALS SHOWN ARE NOT TO SCALE AND ARE SHOWN FOR REPAIR DIRECTIVE ONLY

B4 ORNAMENTAL WINDOW RAILING REPAIRS [SECTION / ELEVATION VIEW]

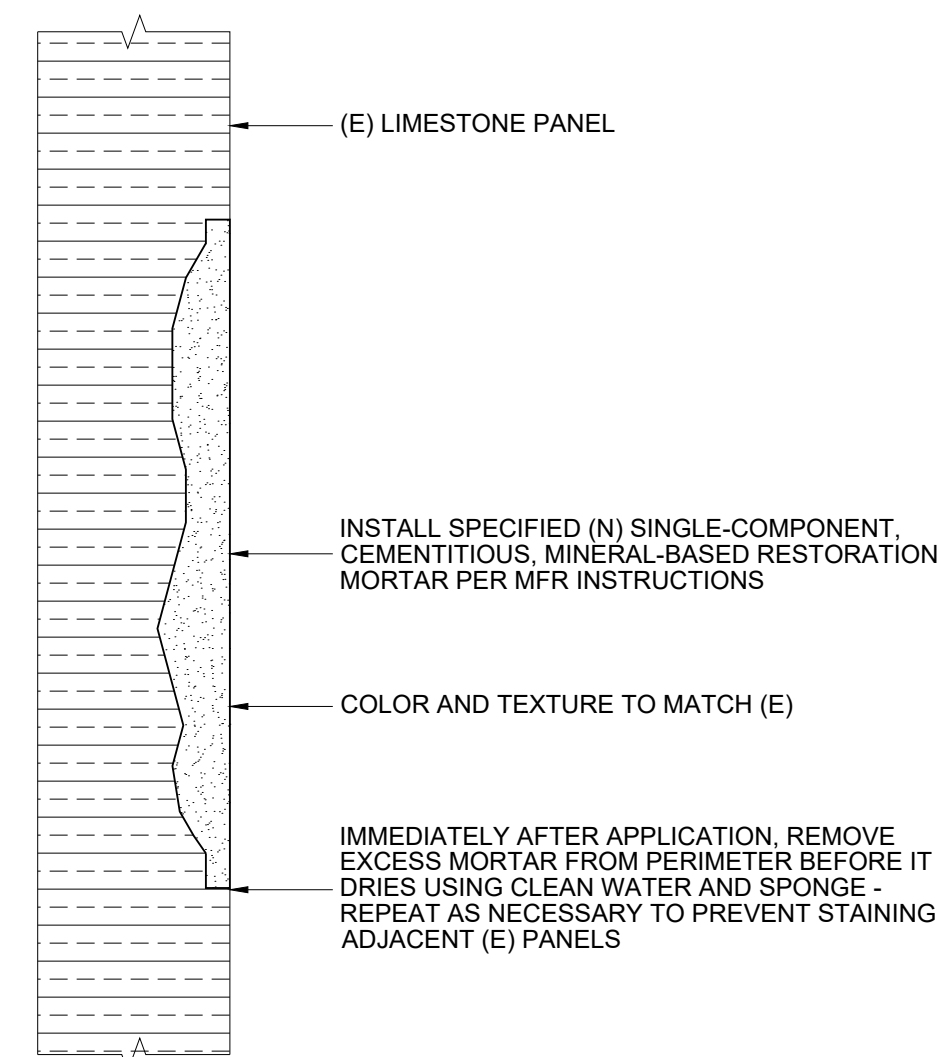
WP3.10 SCALE: N T S ARCH REF: NONE



STEP 1



STEP 2



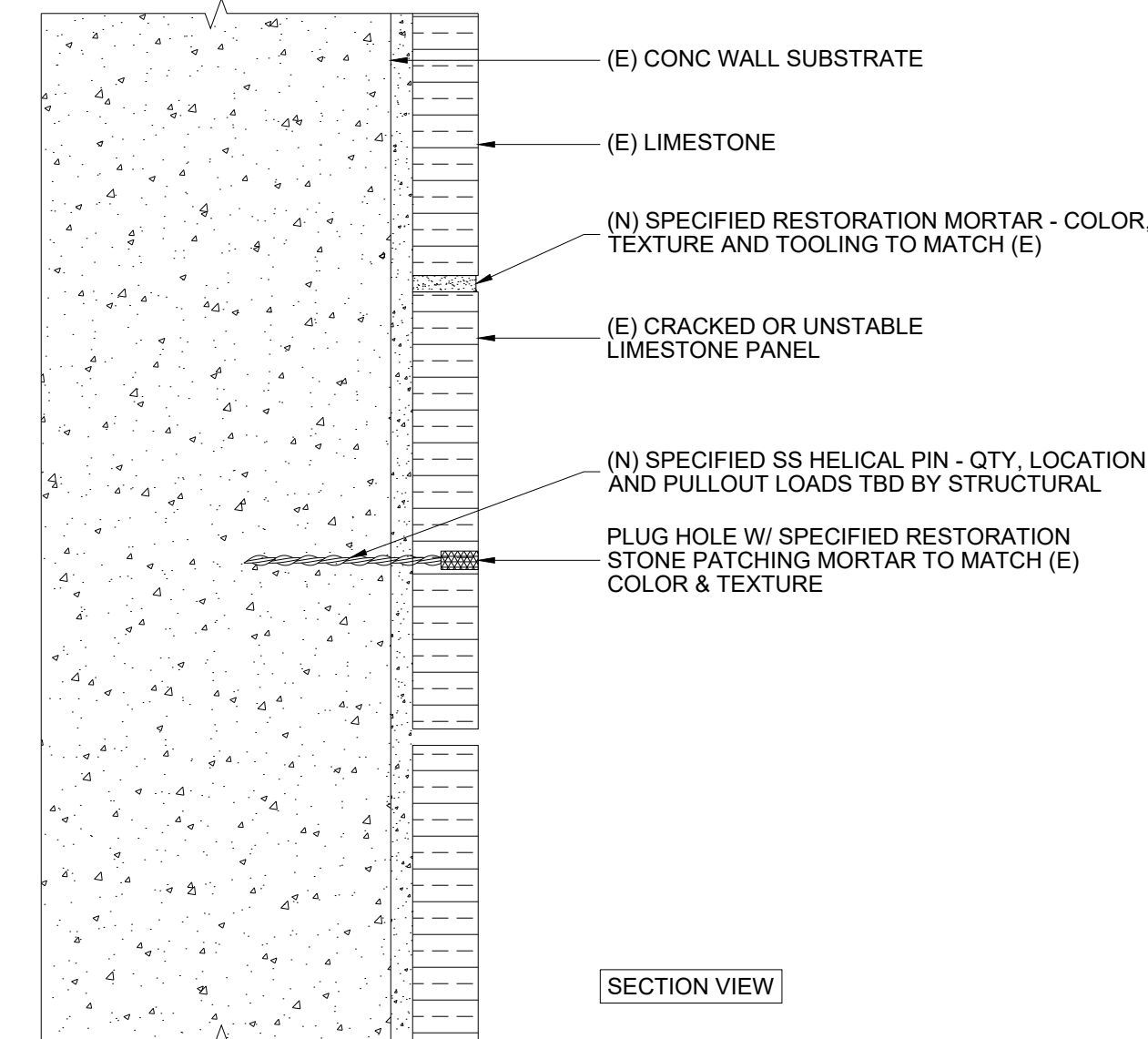
STEP 3

C4 LIMESTONE PANEL SPALL REPAIR DETAIL

WP3.10 SCALE: N T S [EXPLODED] ARCH REF: NONE

[STEP 3] CONCRETE SPALLING REMEDIATION (WHERE OCCURS)

A3 WP3.10 SCALE: N T S ARCH REF: NONE



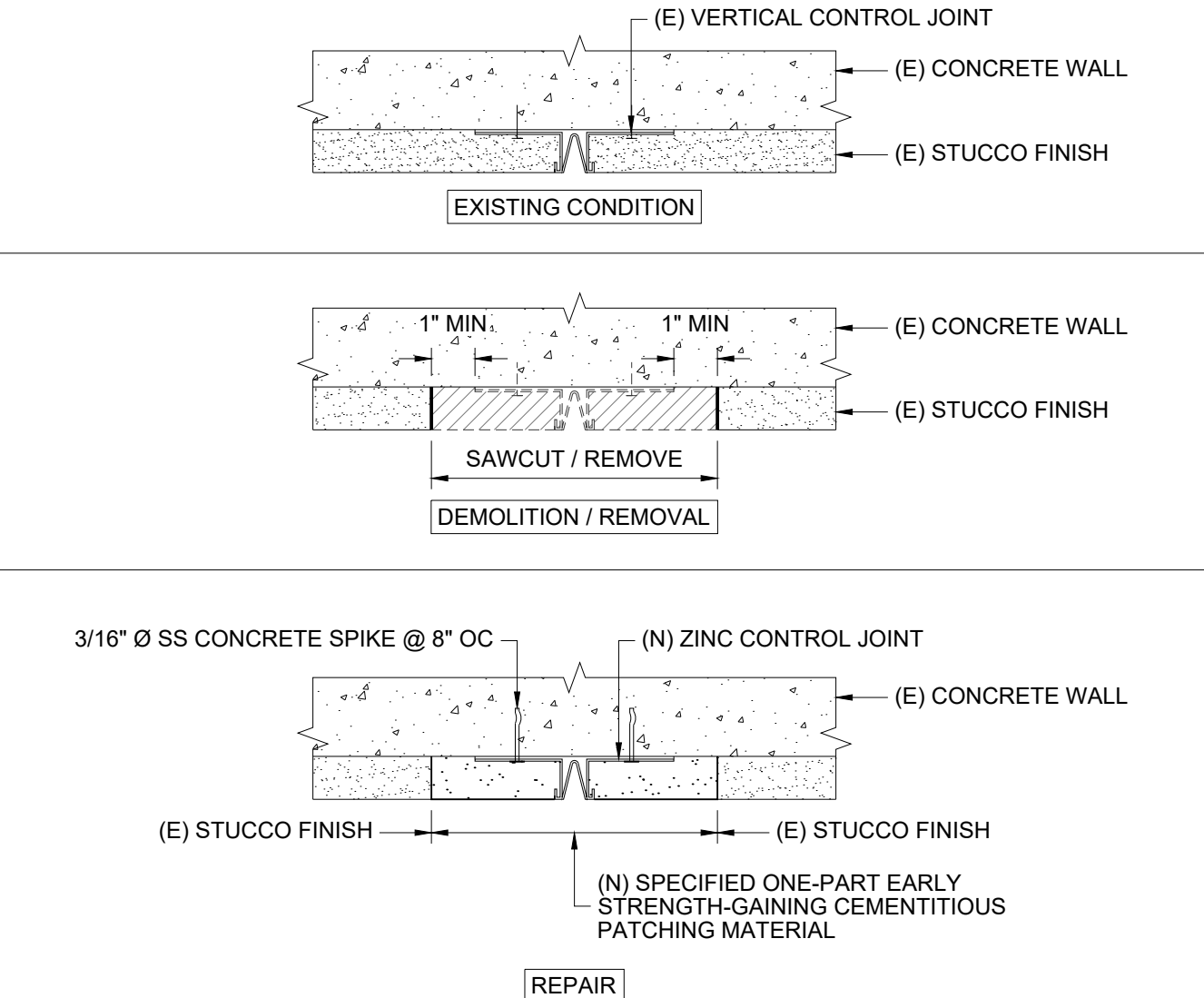
SECTION VIEW

B3 LIMESTONE PANEL STABILIZATION DETAIL [SECTION VIEW]

WP3.10 SCALE: 3"=1'-0" ARCH REF: NONE

[STEP 2] CONCRETE SPALLING REMEDIATION (WHERE OCCURS)

A2 WP3.10 SCALE: N T S ARCH REF: NONE

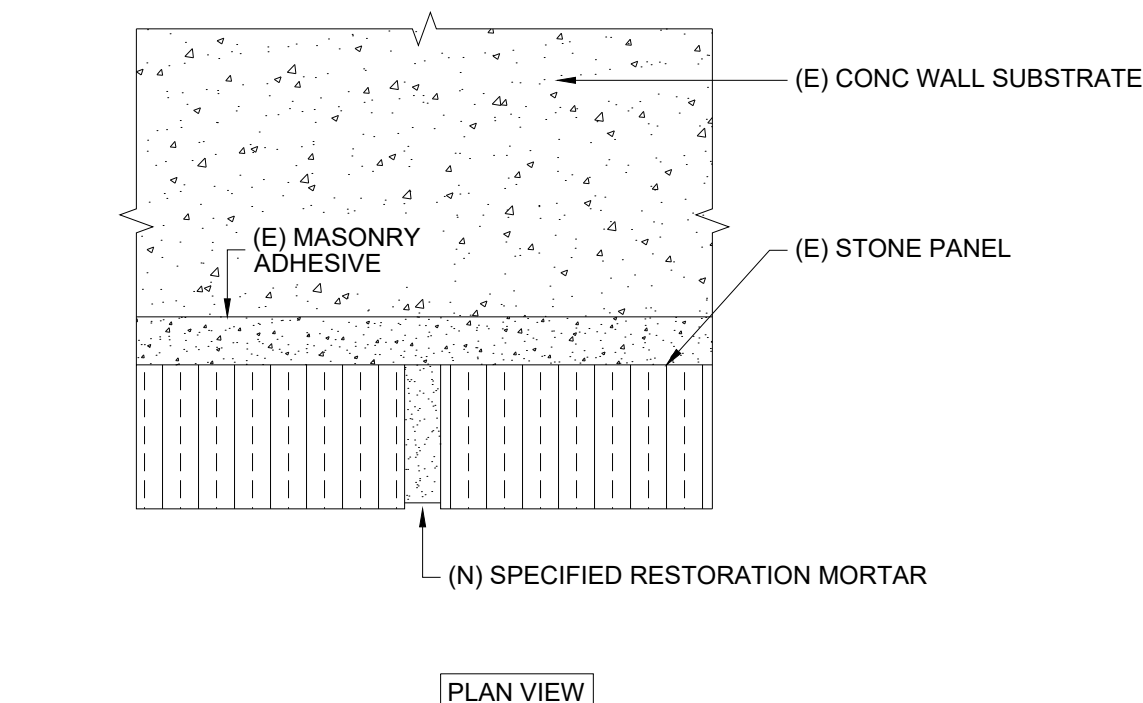


REPAIR

(SIGN WALL) VERT CONTROL JOINT REPLACEMENT DETAIL (PLAN VIEW)

B2 WP3.10 SCALE: N T S ARCH REF: NONE

- NOTES:
- REMOVE (E) DETERIORATED SEALANT AND MORTAR WITH HAND TOOLS, USING CARE TO NOT DAMAGE ADJACENT STONE PANEL(S).
  - CLEAN JOINT OF ALL DEBRIS AND DUST USING COMPRESSED AIR.
  - INSTALL SPECIFIED RESTORATION MORTAR AND TOOL TO MATCH EXISTING.



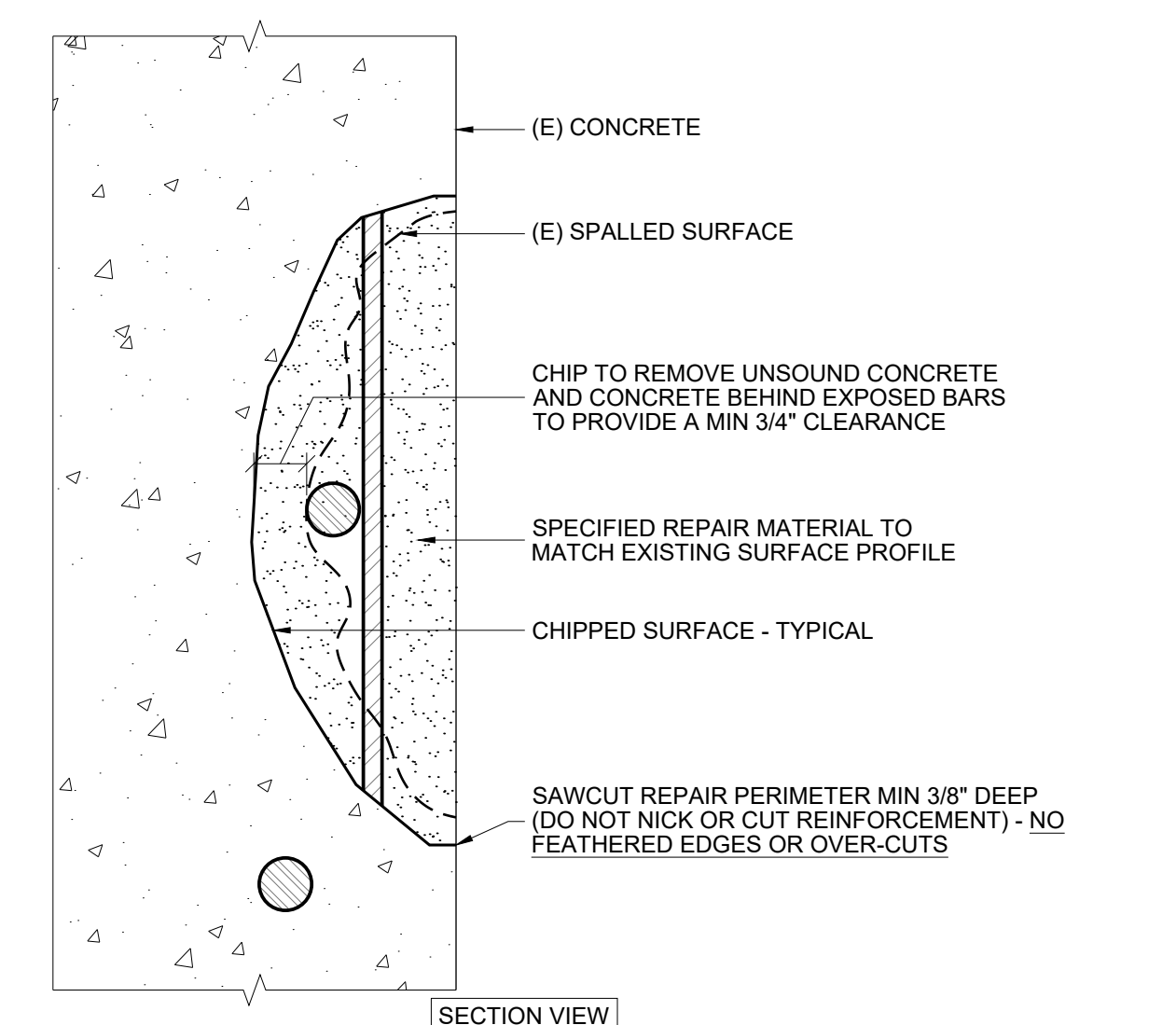
PLAN VIEW

C2 LIMESTONE CLADDING JOINT REPLACEMENT DETAIL

WP3.10 SCALE: N T S ARCH REF: NONE

[STEP 1] CONCRETE SPALLING REMEDIATION (WHERE OCCURS)

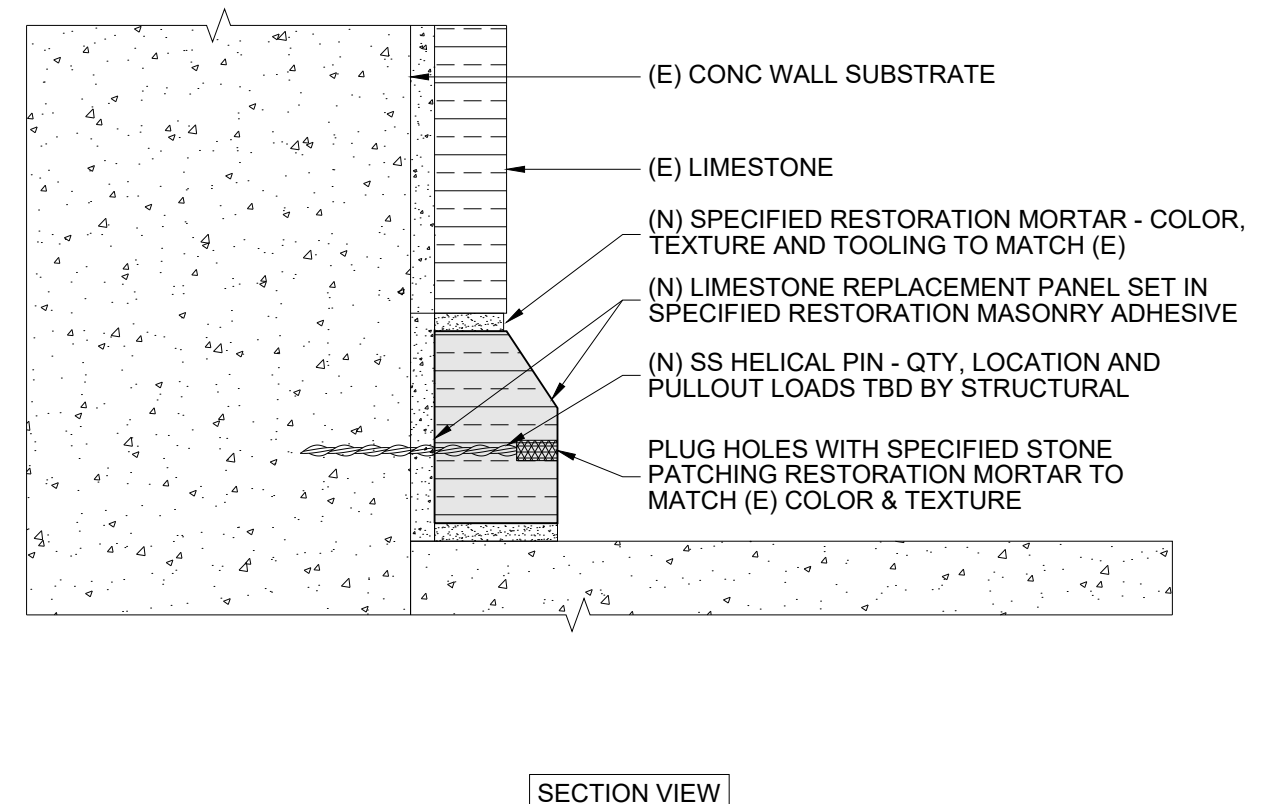
A1 WP3.10 SCALE: N T S ARCH REF: NONE



SECTION VIEW

(SIGN WALL) TYPICAL PARTIAL DEPTH VERTICAL SPALL REPAIR DETAIL

B1 WP3.10 SCALE: N T S ARCH REF: NONE

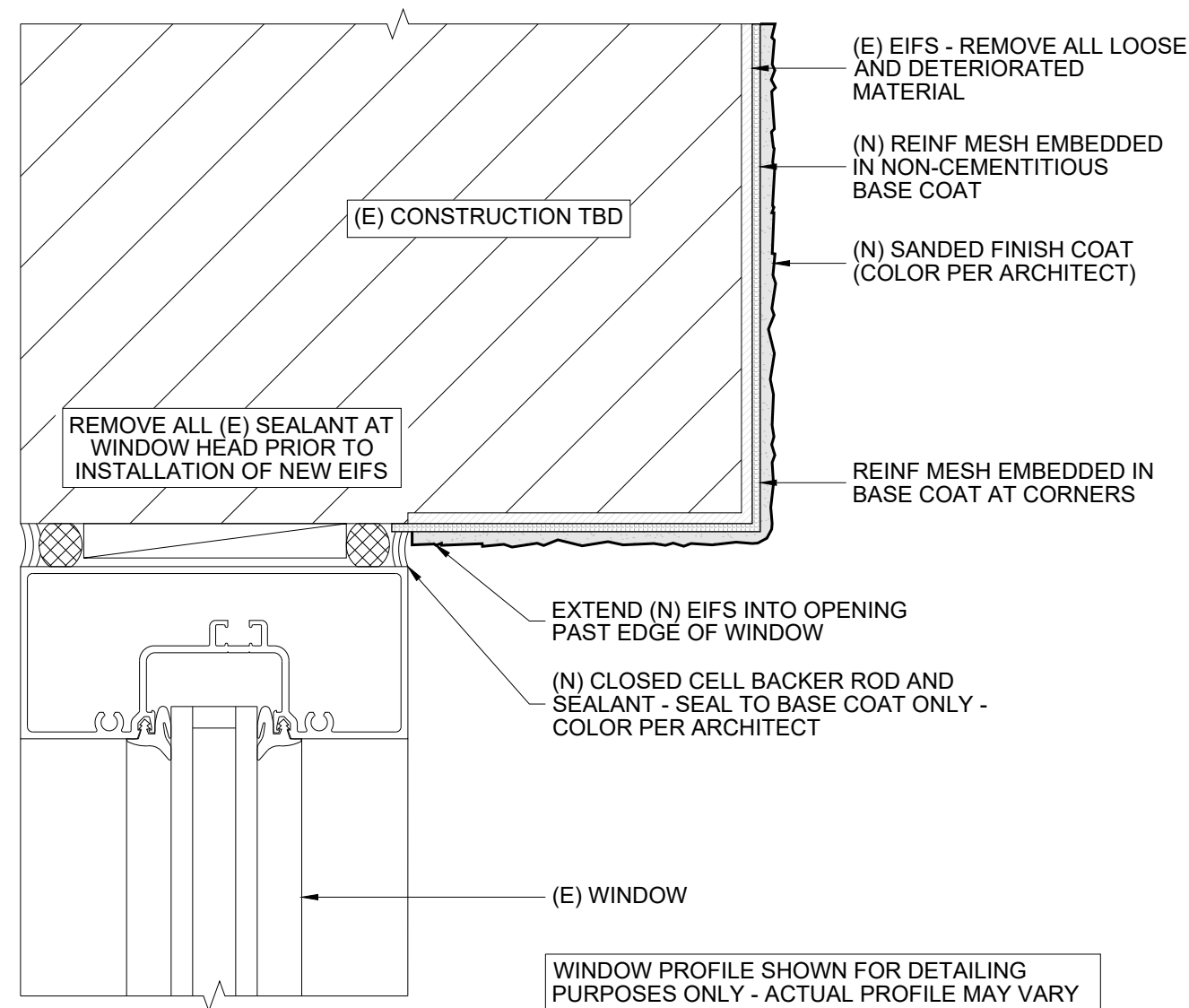


SECTION VIEW

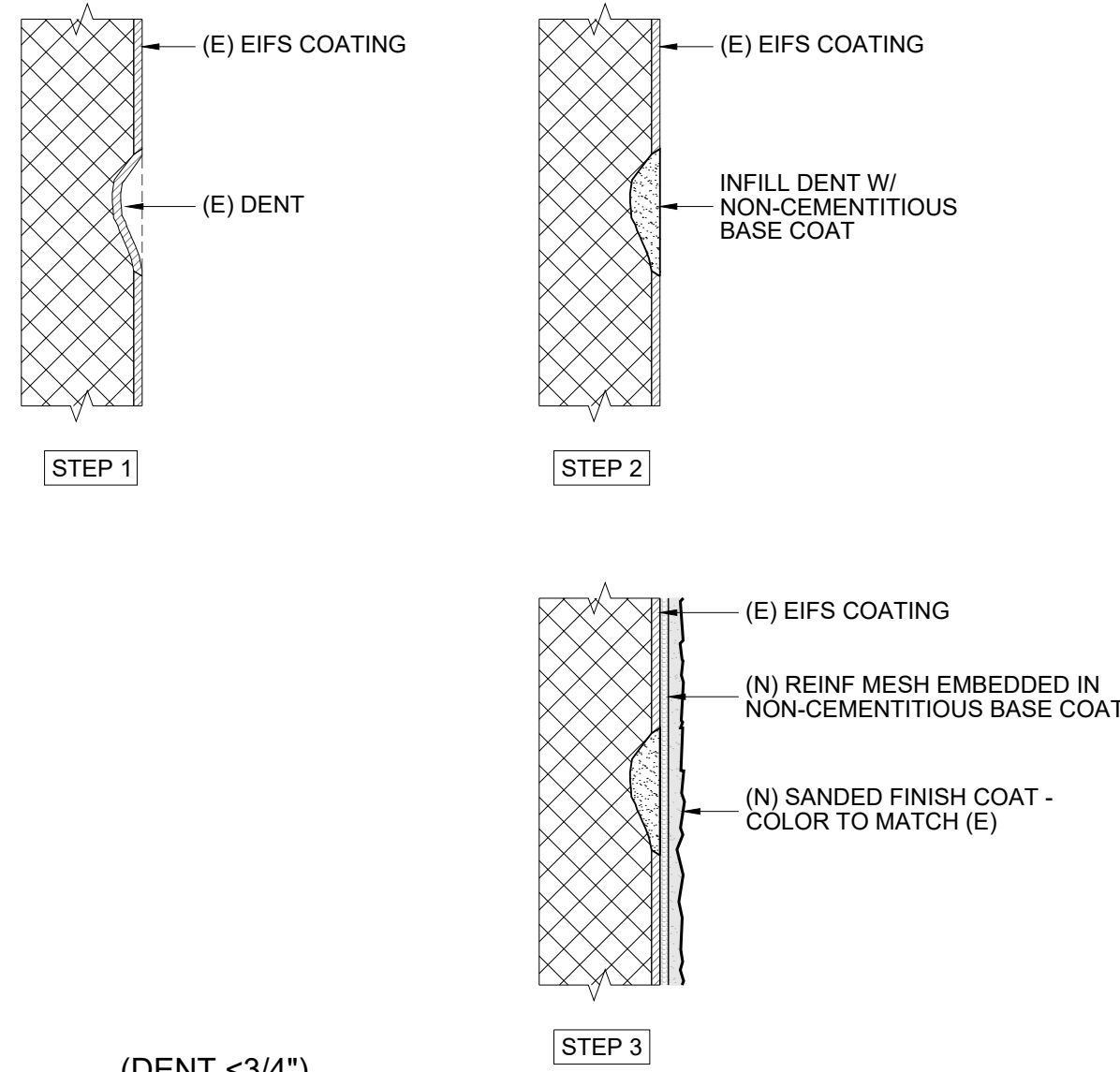
C1 LIMESTONE CLADDING BASE PANEL REPLACEMENT DETAIL

WP3.10 SCALE: N T S ARCH REF: NONE

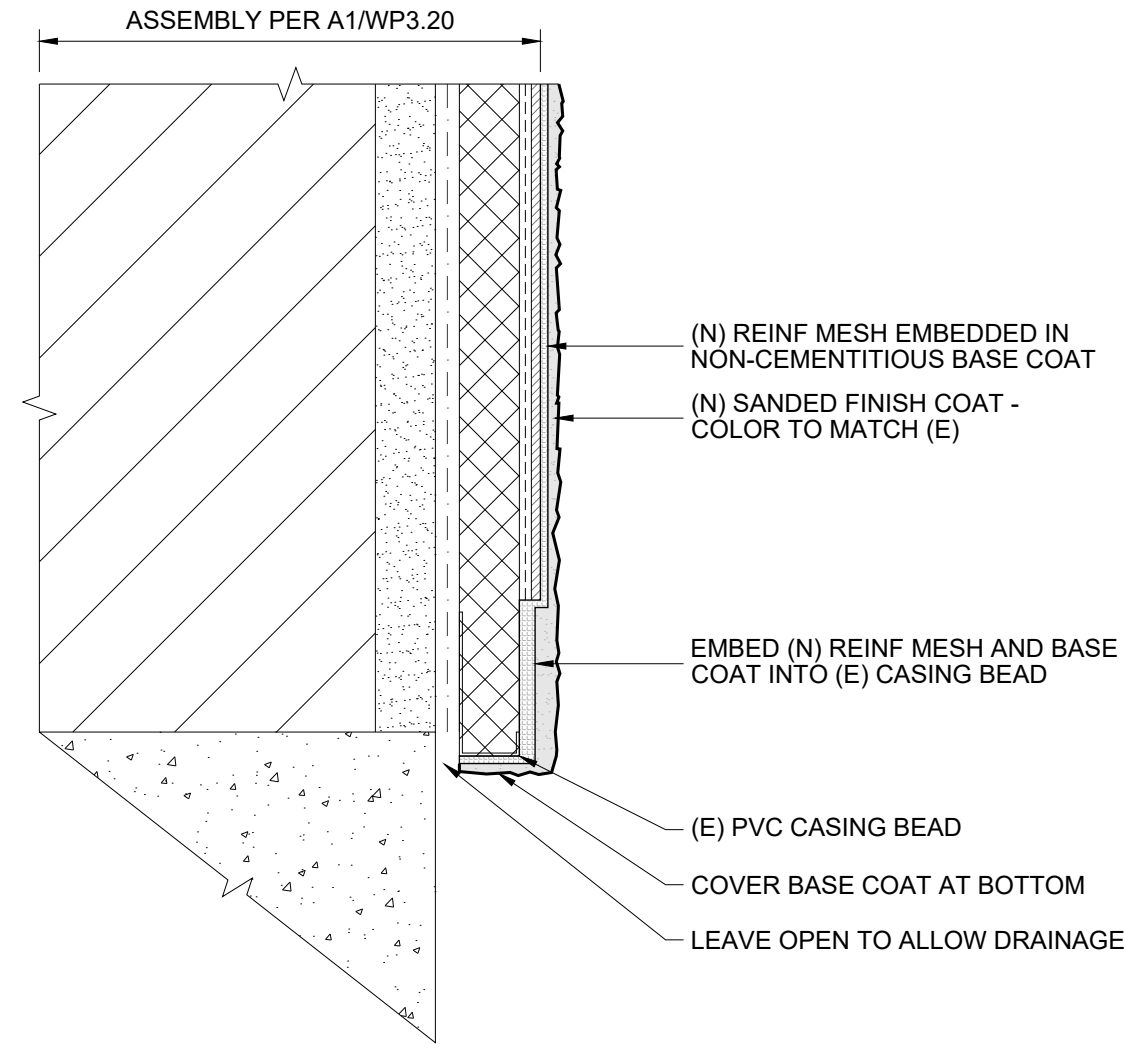
C:\USERS\STEVEN\WORK\PROJECTS\INCL\A CLIENTS\_CURRENT\700 LAUREL ST. BATON ROUGE - CAUMIDES\DWG\PROJECT\04 DETAILS.DWG PLOTTED: 24\_05\_09



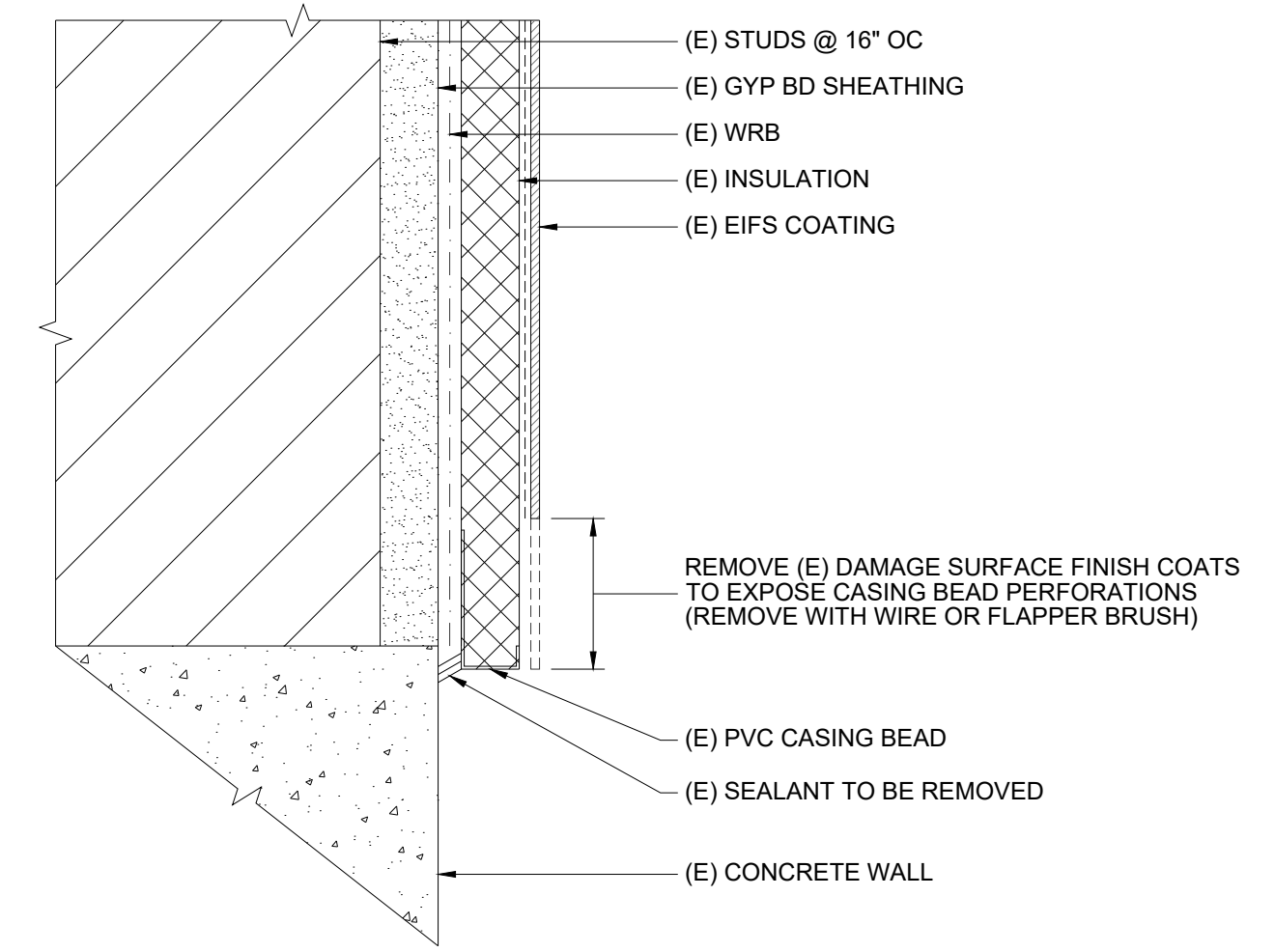
**A4** EIFS REPAIR - WINDOW HEAD [SECTION VIEW]  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE



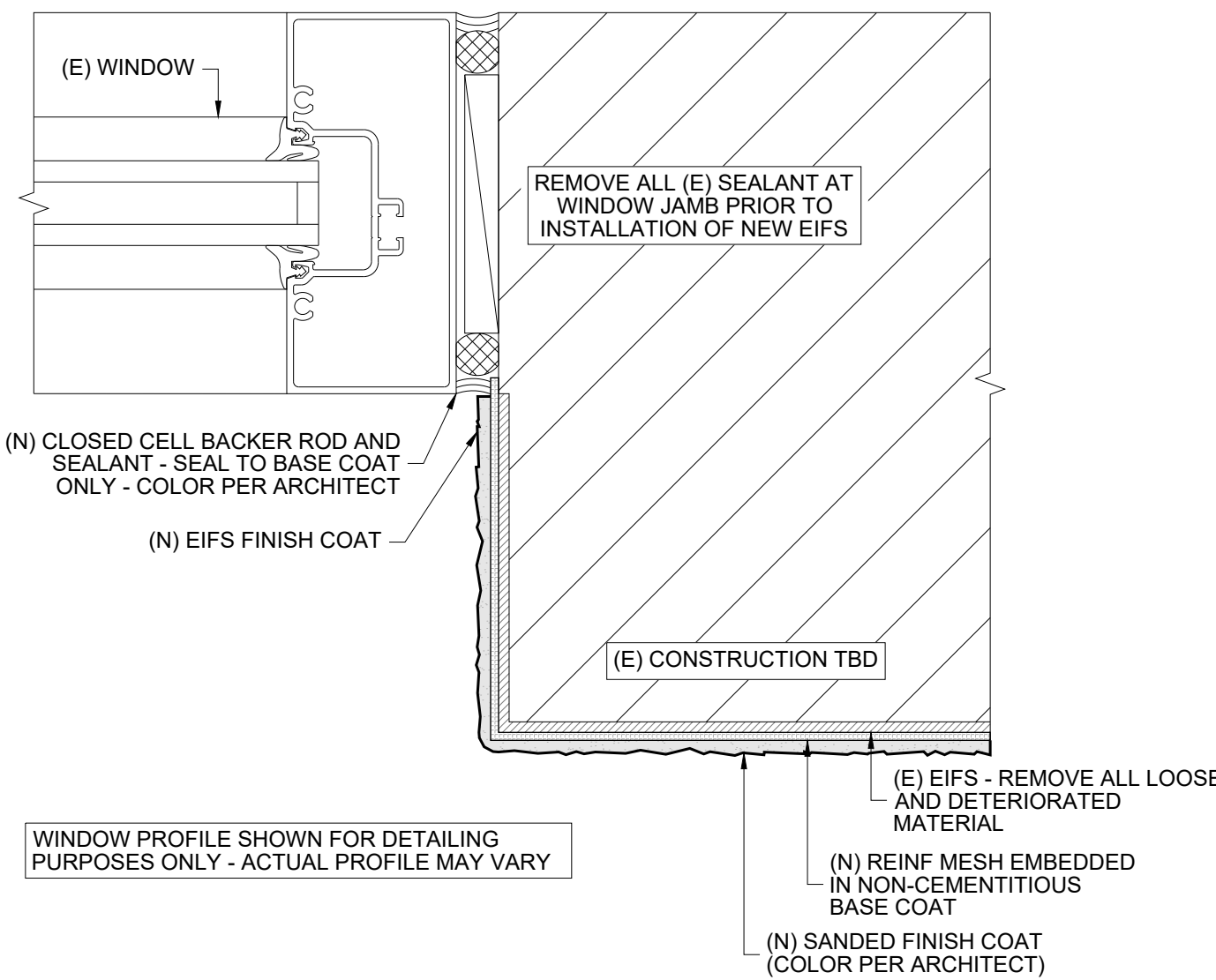
**A3** (DENT <3/4") EIFS WALL DENT REPAIR DETAIL [SECTION VIEW]  
 WP3.20 SCALE: N T S [EXPLODED] ARCH REF: NONE



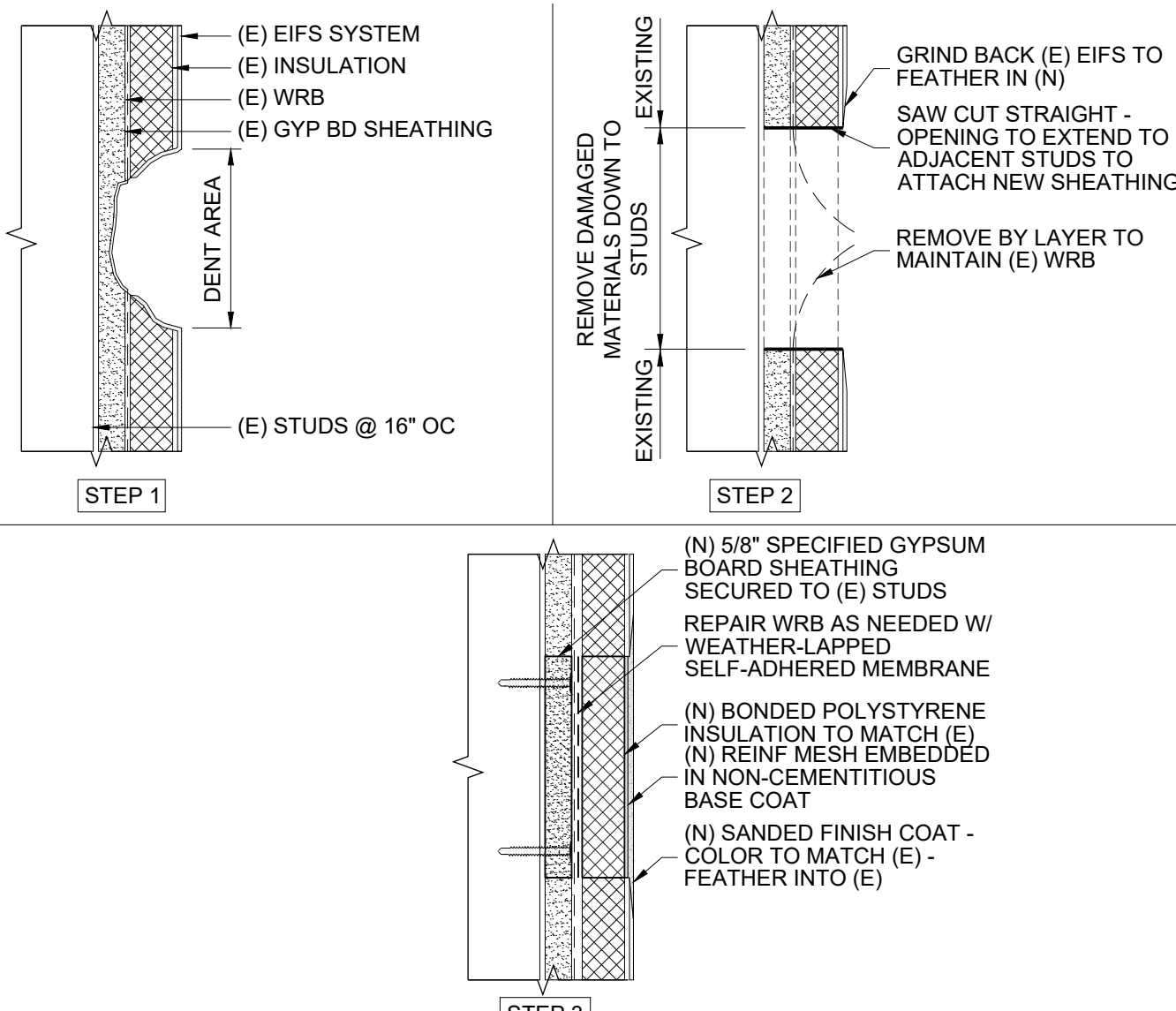
**A2** EIFS WALL BASE REPAIR DETAIL [SECTION VIEW]  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE



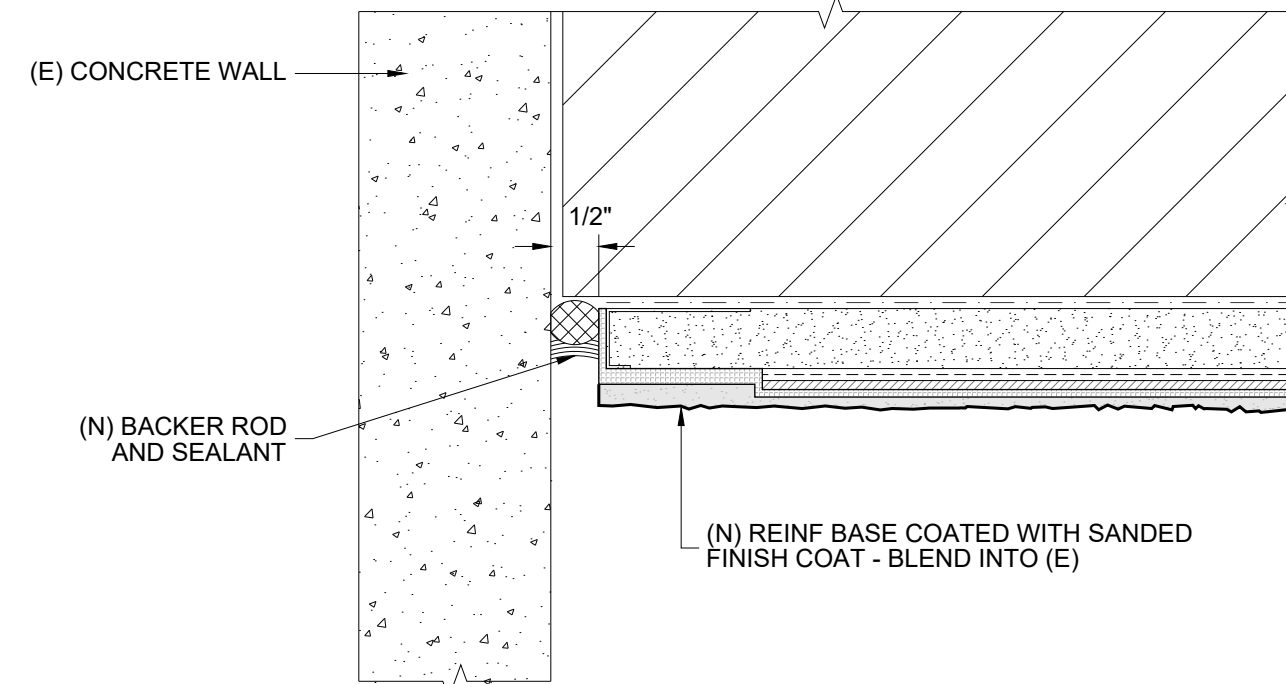
**A1** EIFS WALL BASE EXISTING / DEMOLITION DETAIL [SECTION VIEW]  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE



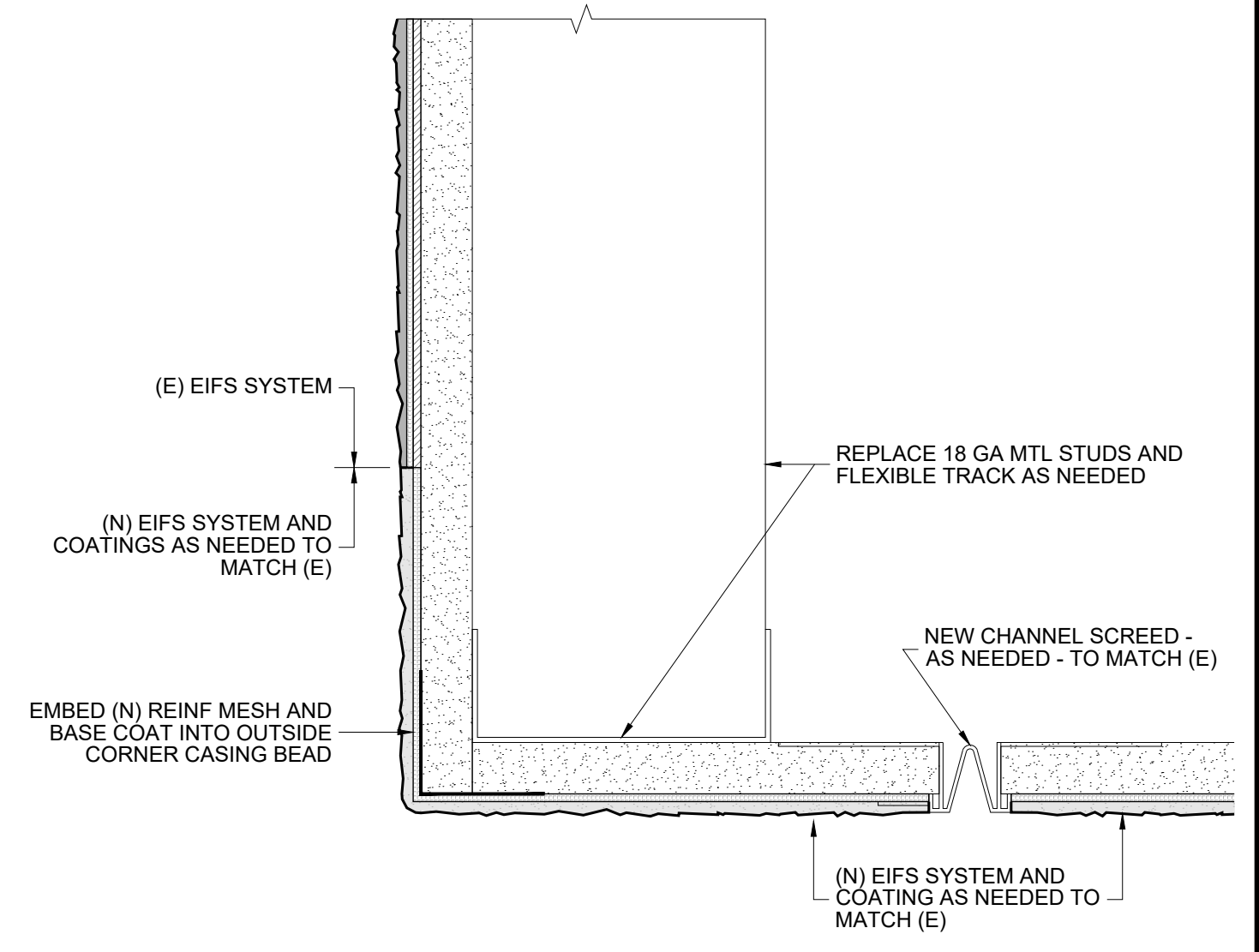
**B4** EIFS REPAIR - WINDOW JAMB [PLAN VIEW]  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE



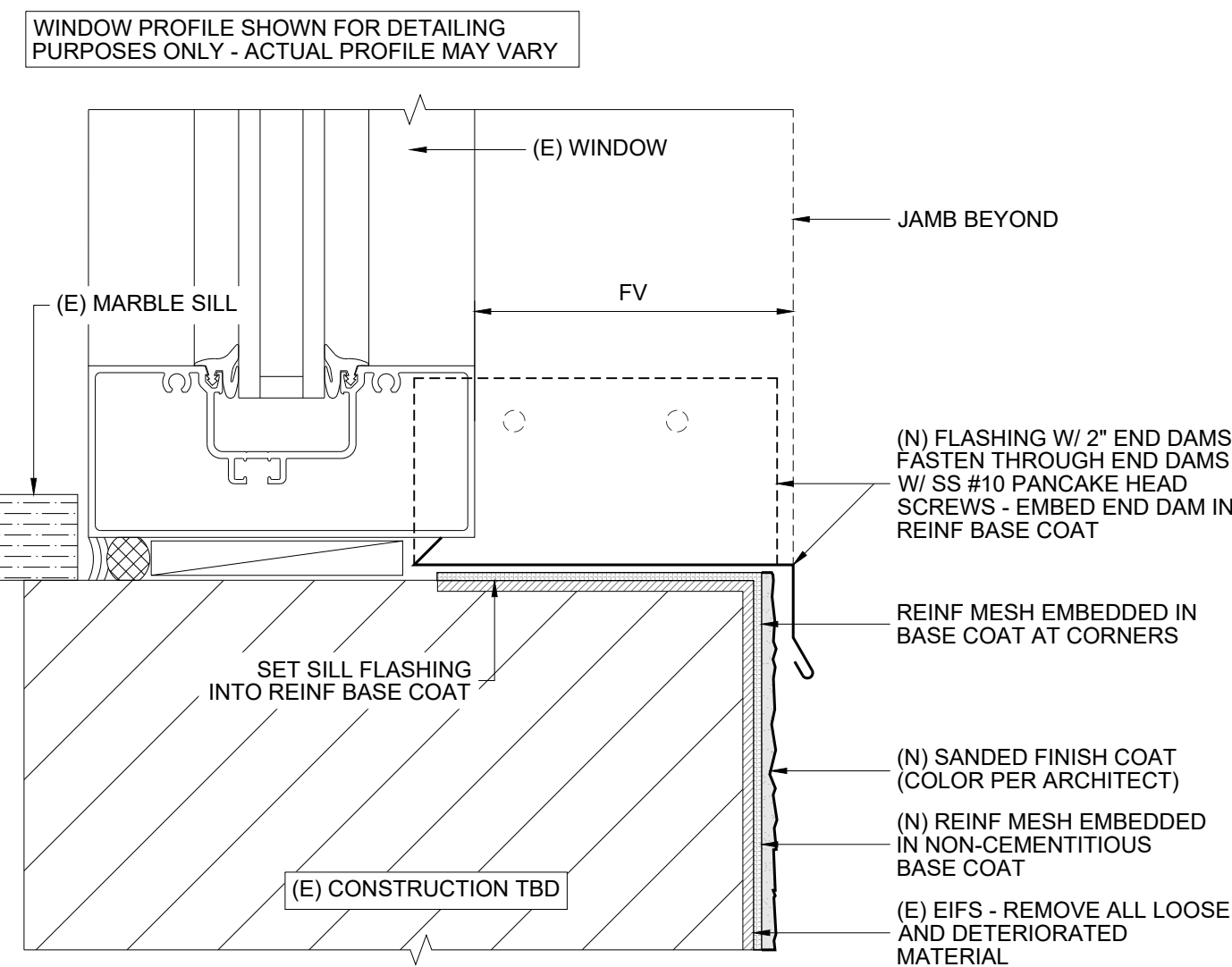
**B3** (DENT >3/4") EIFS WALL DENT REPAIR DETAIL [SECTION VIEW]  
 WP3.20 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE



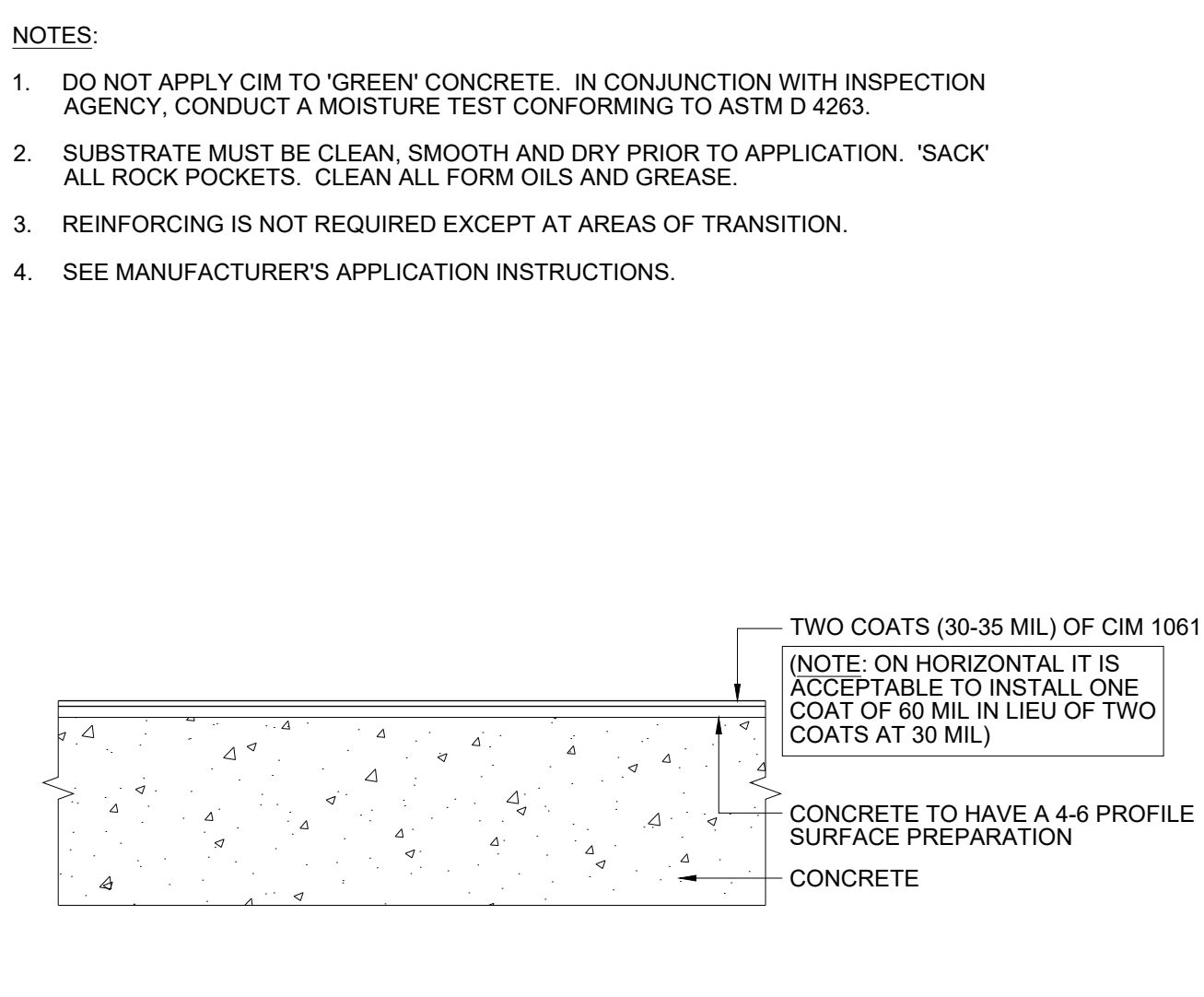
**B2** WALL TRANSITION DETAIL (PLAN VIEW)  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE



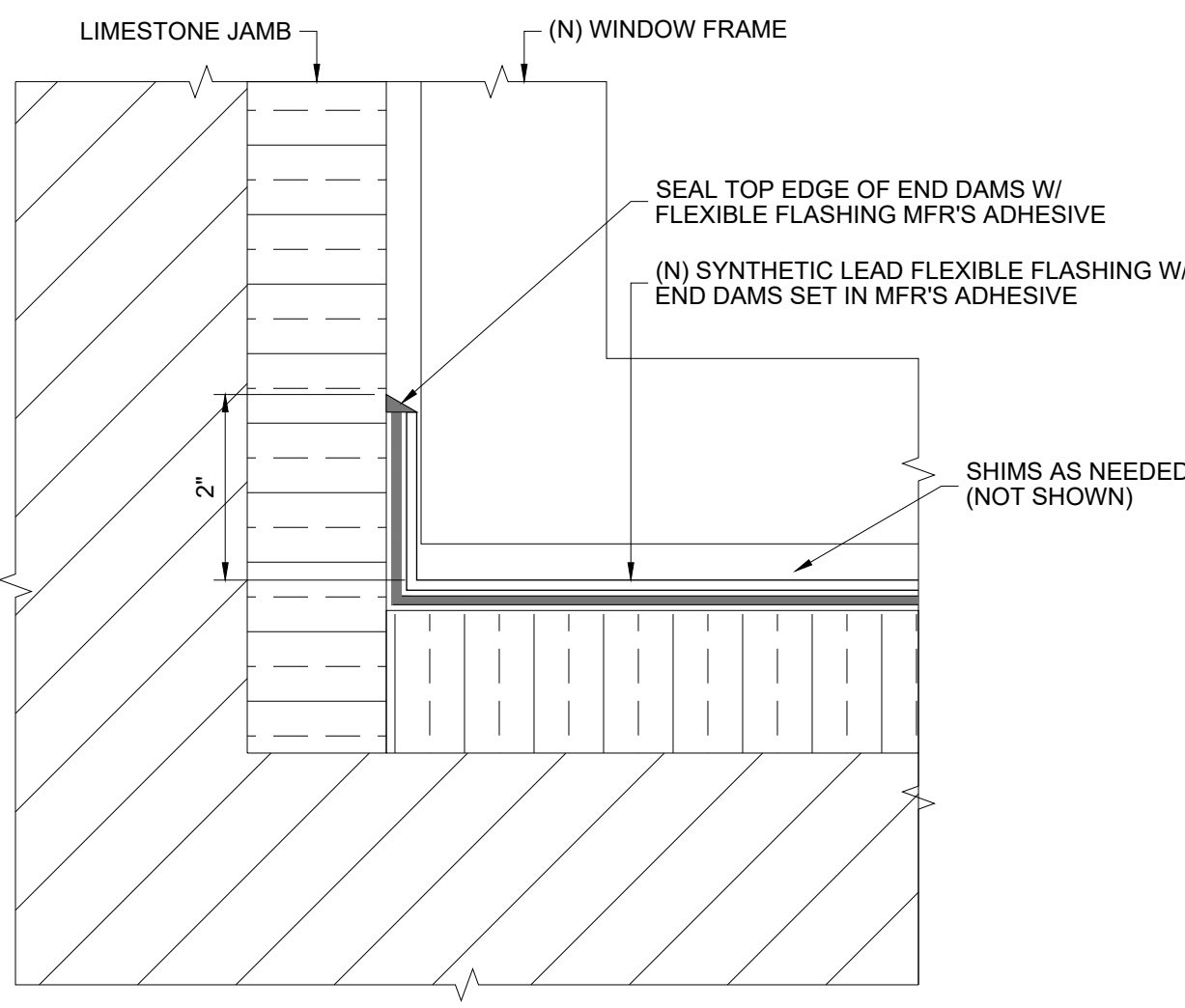
**B1** ENTRY SOFFIT REPAIR (SECTION VIEW)  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE



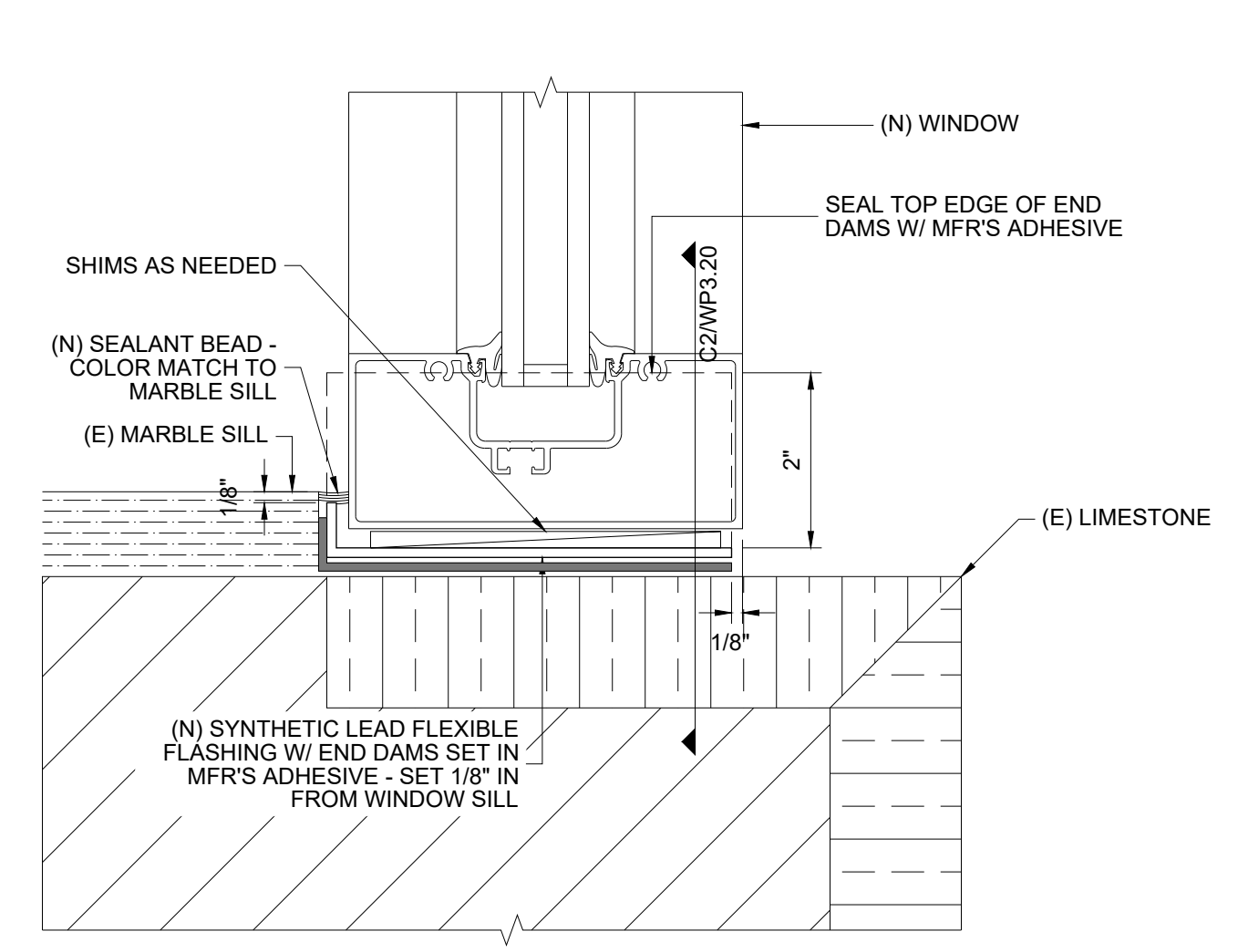
**C4** EIFS REPAIR - WINDOW SILL [SECTION VIEW]  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE



**C3** CIM 1000 TYPICAL INSTALLATION  
 WP3.20 SCALE: N T S [EXPLODED] ARCH REF: NONE

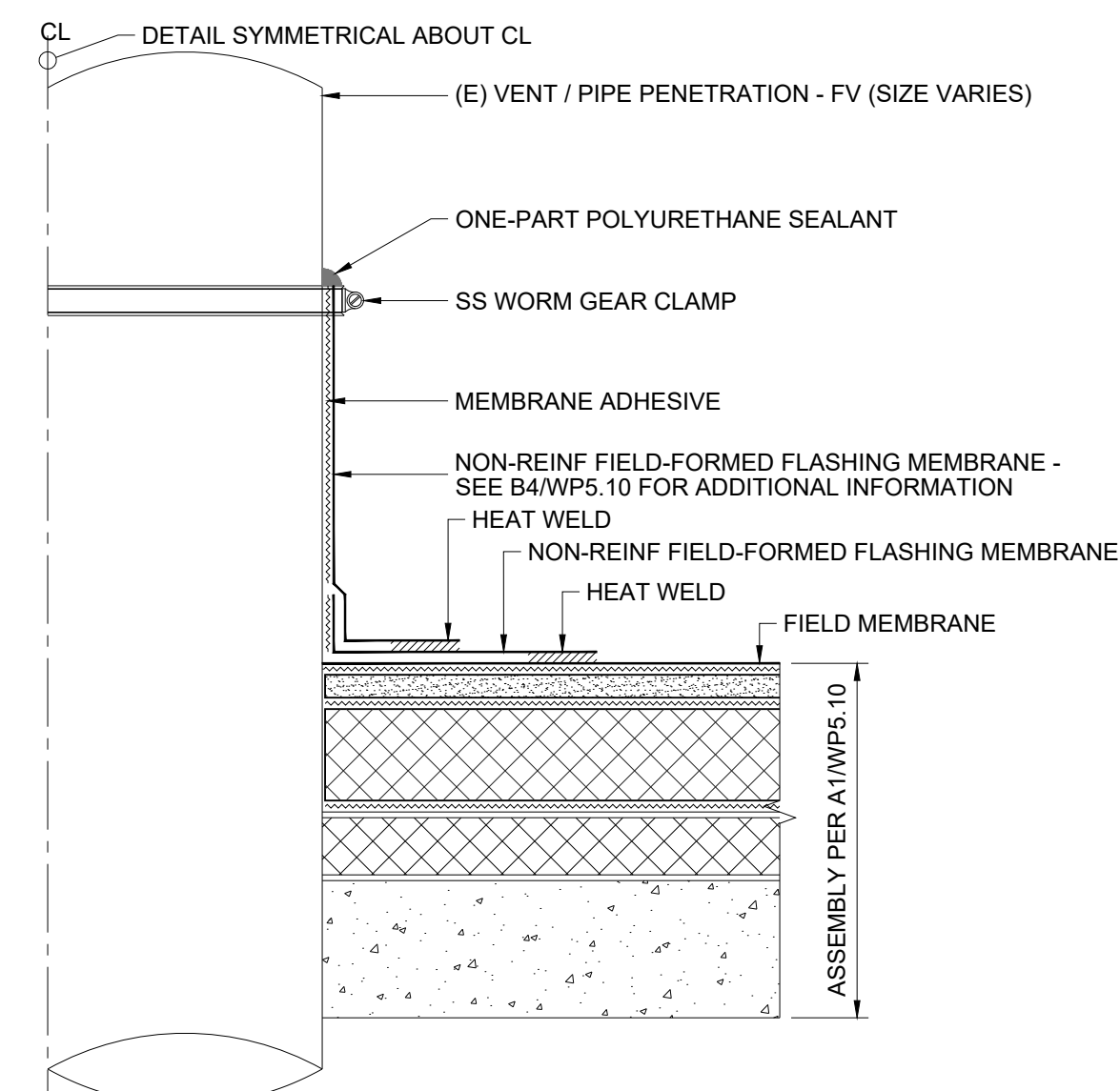


**C2** SILL DETAIL - NEW WINDOW AT LIMESTONE (END DAM)  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE



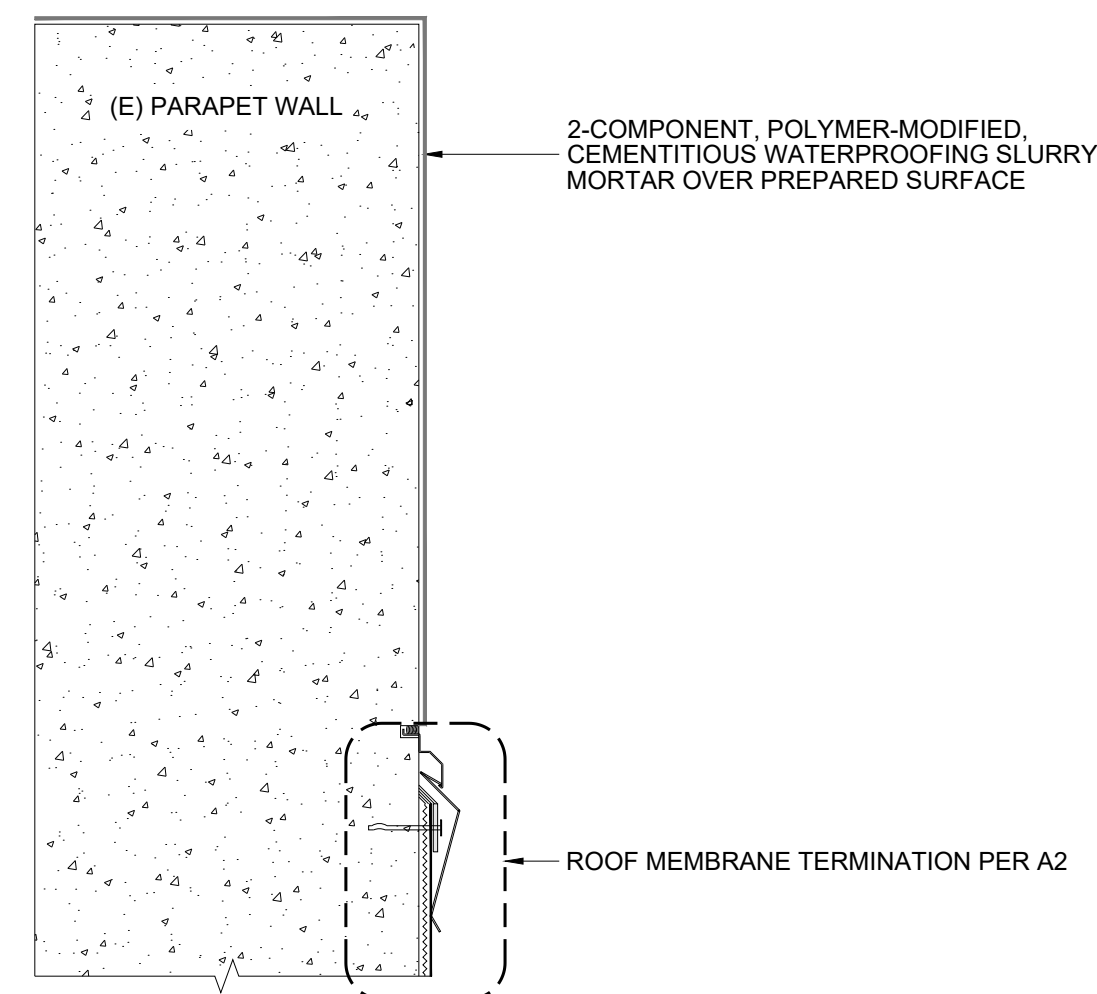
**C1** SILL DETAIL - NEW WINDOW AT LIMESTONE (SILL PAN)  
 WP3.20 SCALE: 6"=1'-0" [EXPLODED] ARCH REF: NONE

C:\USERS\STEVEN\BOWEN\PROJECTS\NO.1401\CLIENTS\_CURRENT\700 LAUREL ST. BATON ROUGE - CAJUN DESIGN\DWG SHEET FILES\CAJUN\04 DETAILS.DWG PLOTTED: 24\_05\_10



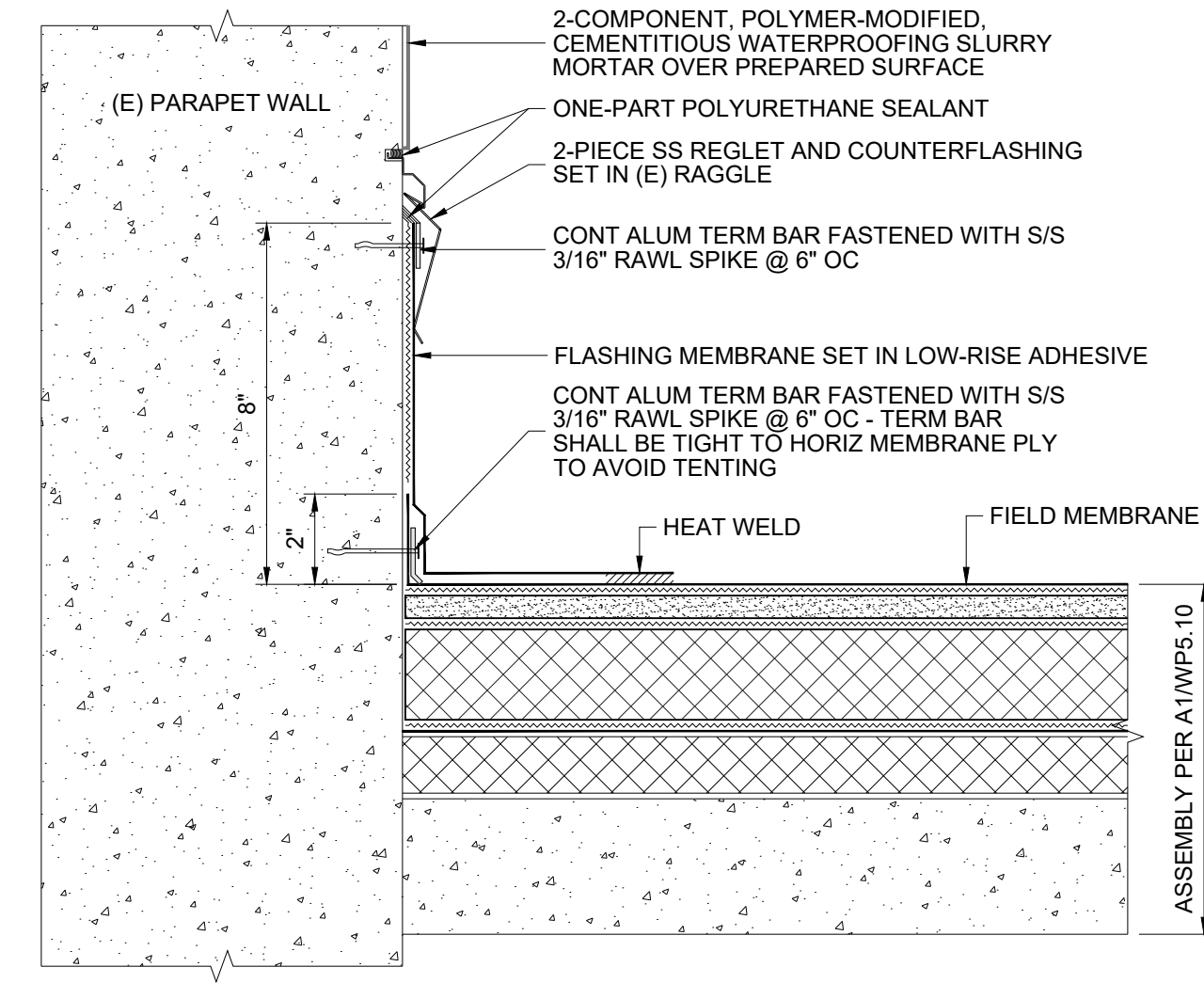
**A4** FIELD FABRICATED PIPE PENETRATION FLASHING

WP5.10 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE



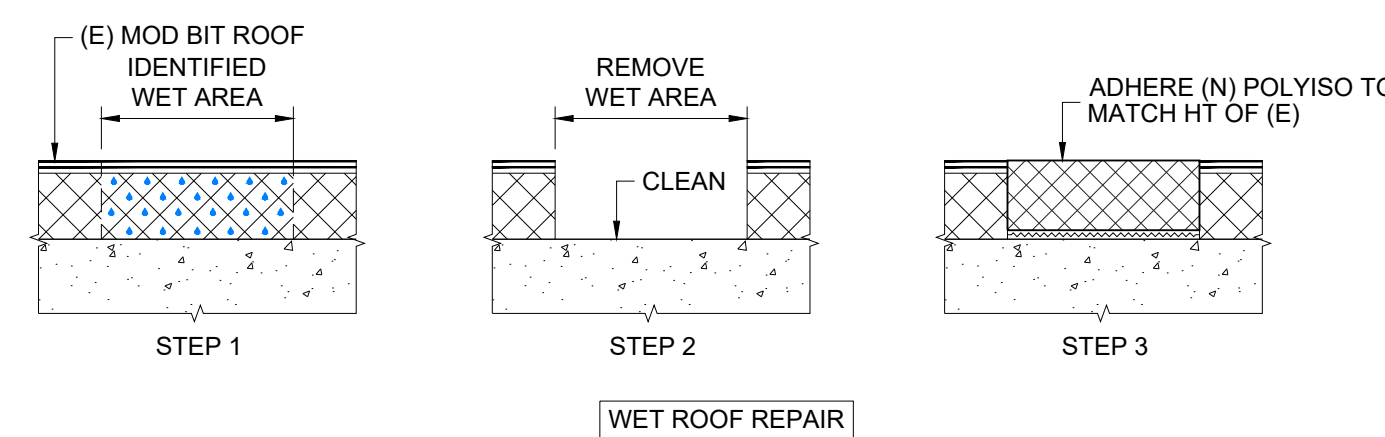
**A3** PARAPET DETAIL

WP5.10 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE



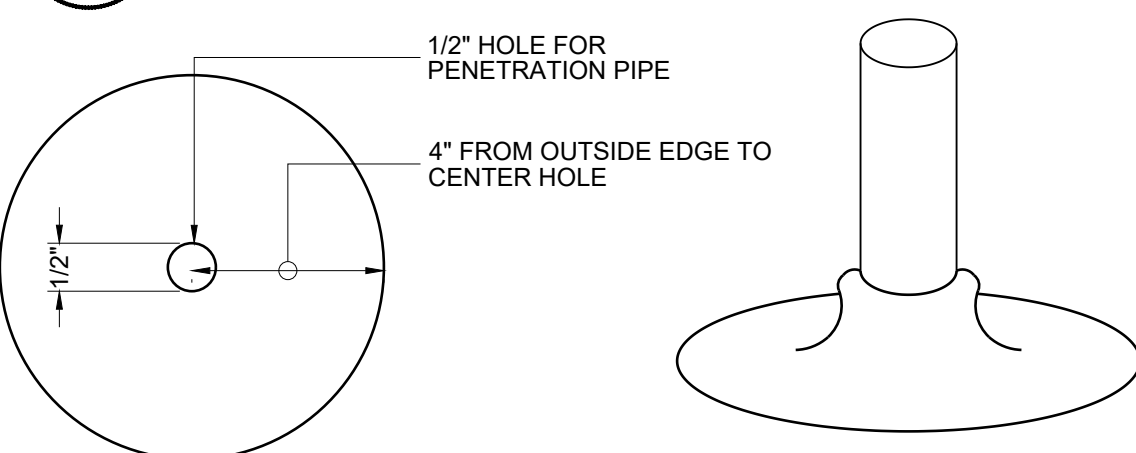
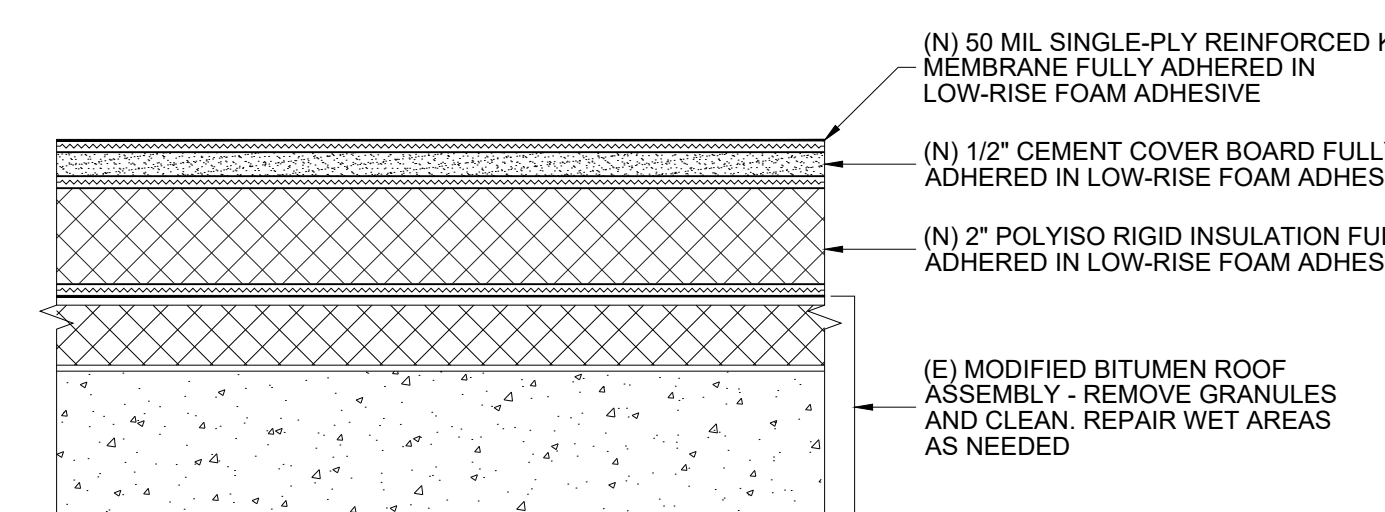
**A2** ROOF TO WALL / TERMINATION DETAIL

WP5.10 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE

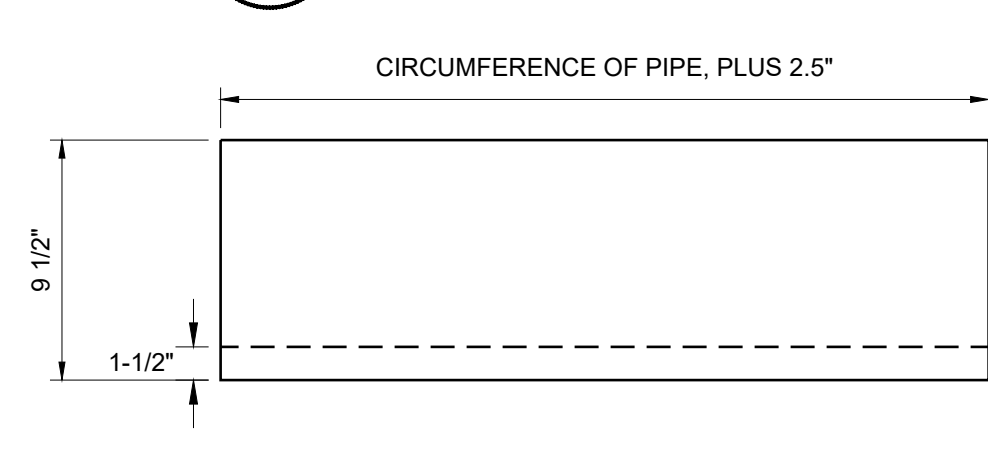


**A1** KEE MEMBRANE ASSEMBLY DETAIL

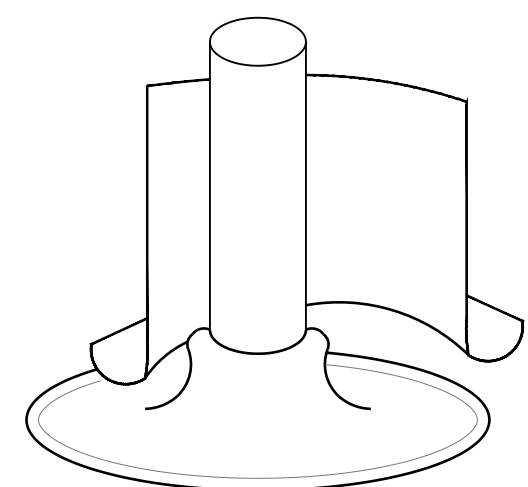
WP5.10 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE



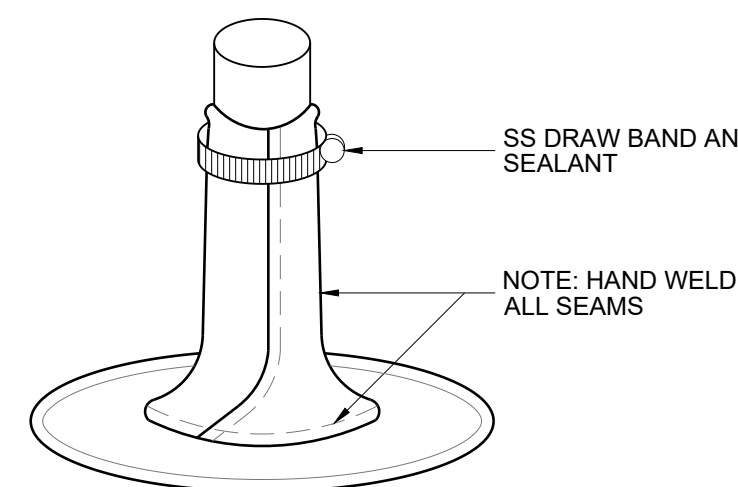
STEP #1  
• CREATE TARGET PIECE USING NON-REINFORCED FIBERTITE MEMBRANE



STEP #2  
• CREATE COLLAR PIECE- 9-1/2" WIDE; LENGTH SHALL BE THE CIRCUMFERENCE OF THE PIPE PLUS 2-1/2"



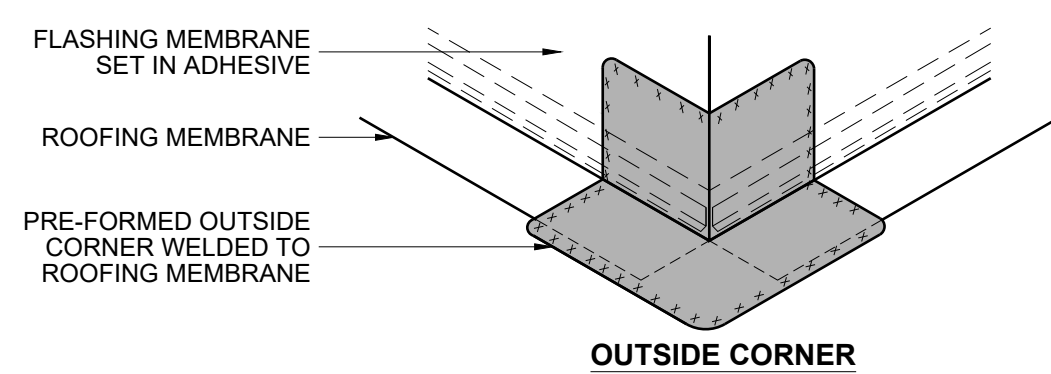
STEP #3  
• FOLD BOTTOM EDGE OF COLLAR UP 1-1/2" AND WRAP AROUND PENETRATION



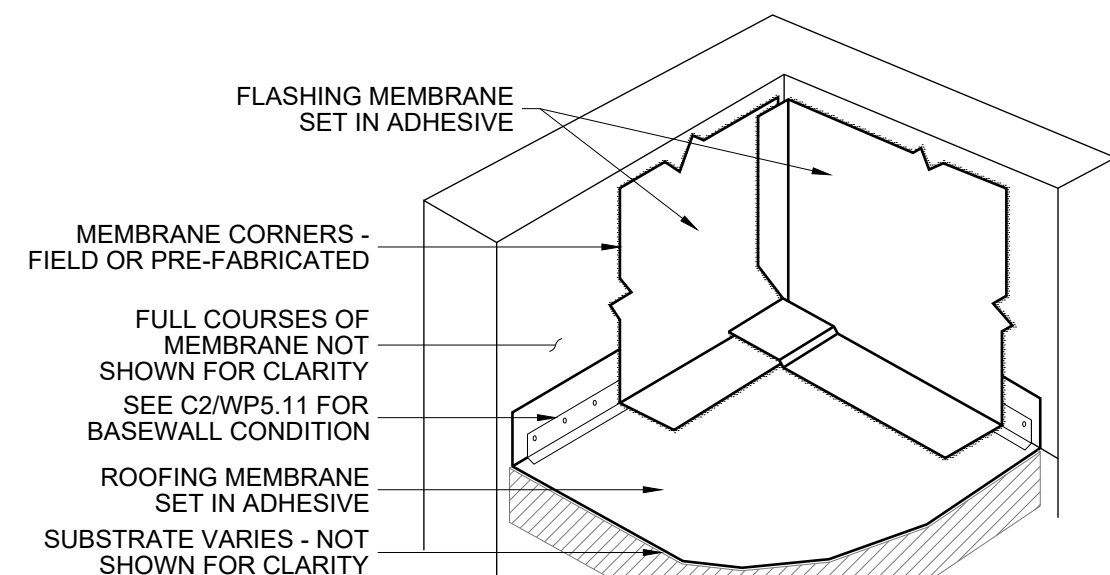
STEP #4  
• TURN DOWN COLLAR AND WELD ALL SEAMS; INSTALL S/S WORM-GEAR CLAMP AND SEALANT

**B4** FIELD WRAP BOOT FLASHING DETAIL

WP5.10 SCALE: N T S ARCH REF: NONE



**OUTSIDE CORNER**



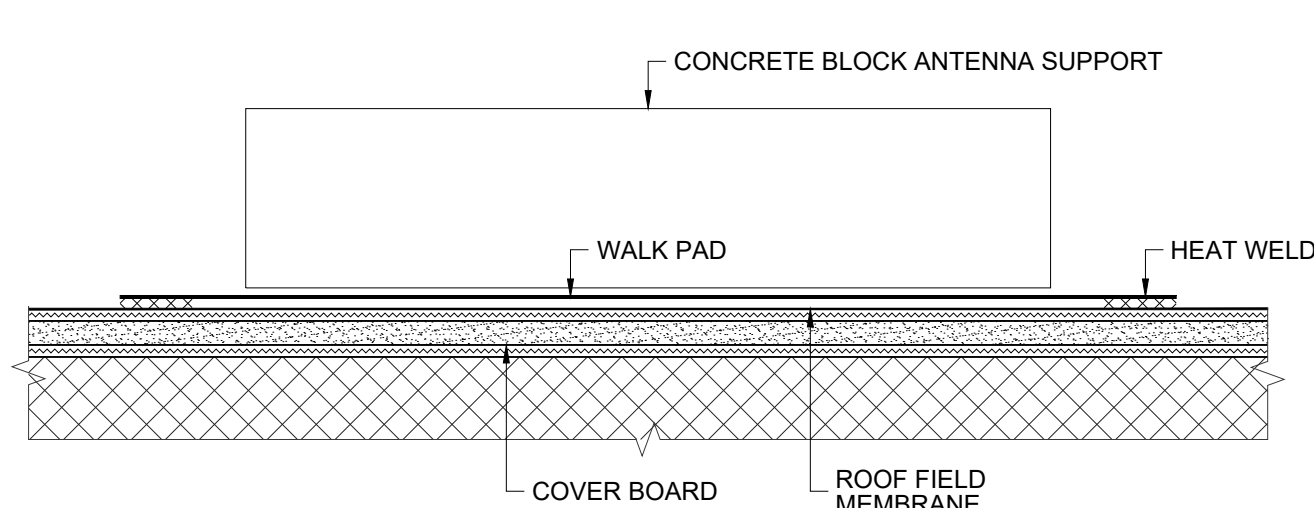
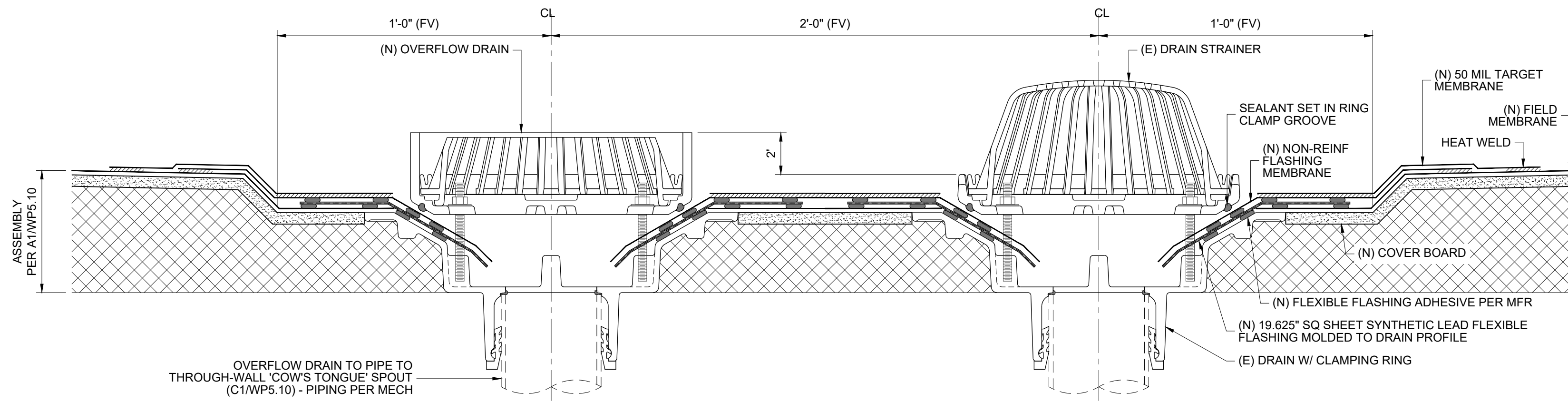
**INSIDE CORNER**

**C4** KEE MEMBRANE CORNER DETAILS

WP5.10 SCALE: N T S [EXPLODED] ARCH REF: NONE

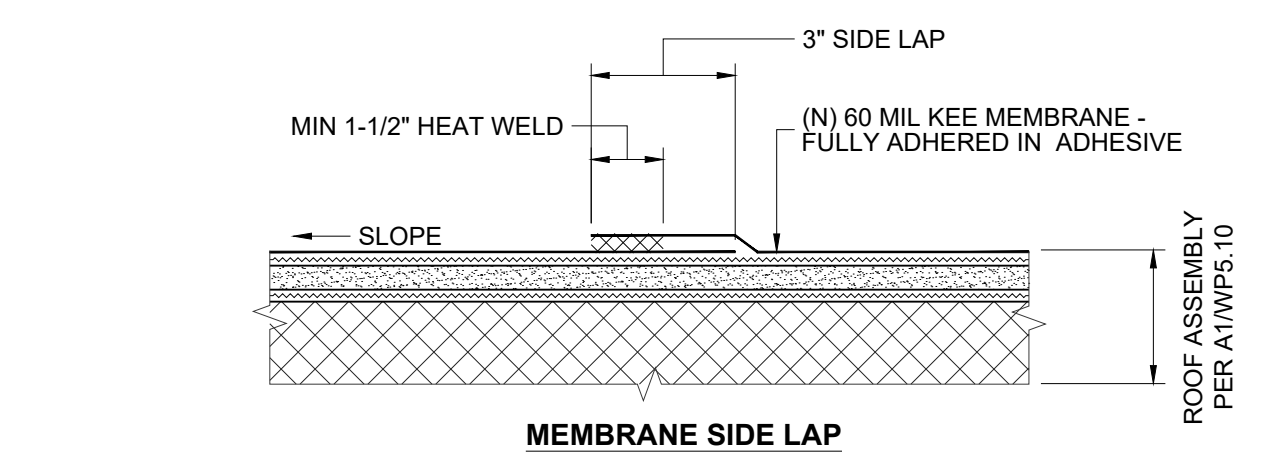
**B3** DRAIN / OVERFLOW DRAIN SUMP DETAIL

WP5.10 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE

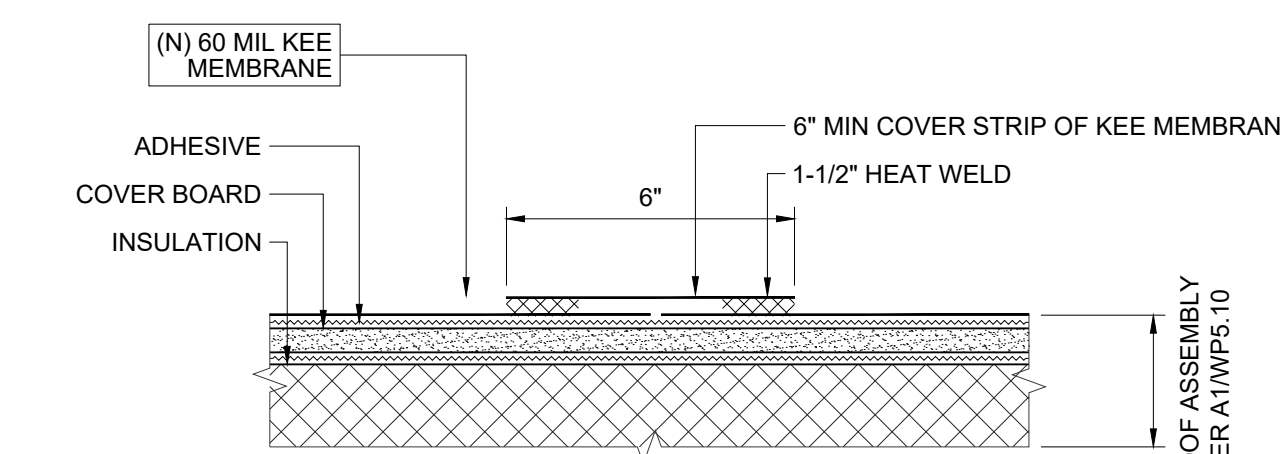


**C3** KEE MEMBRANE WALK / PROTECTION PAD DETAIL

WP5.10 SCALE: N T S [EXPLODED] ARCH REF: NONE



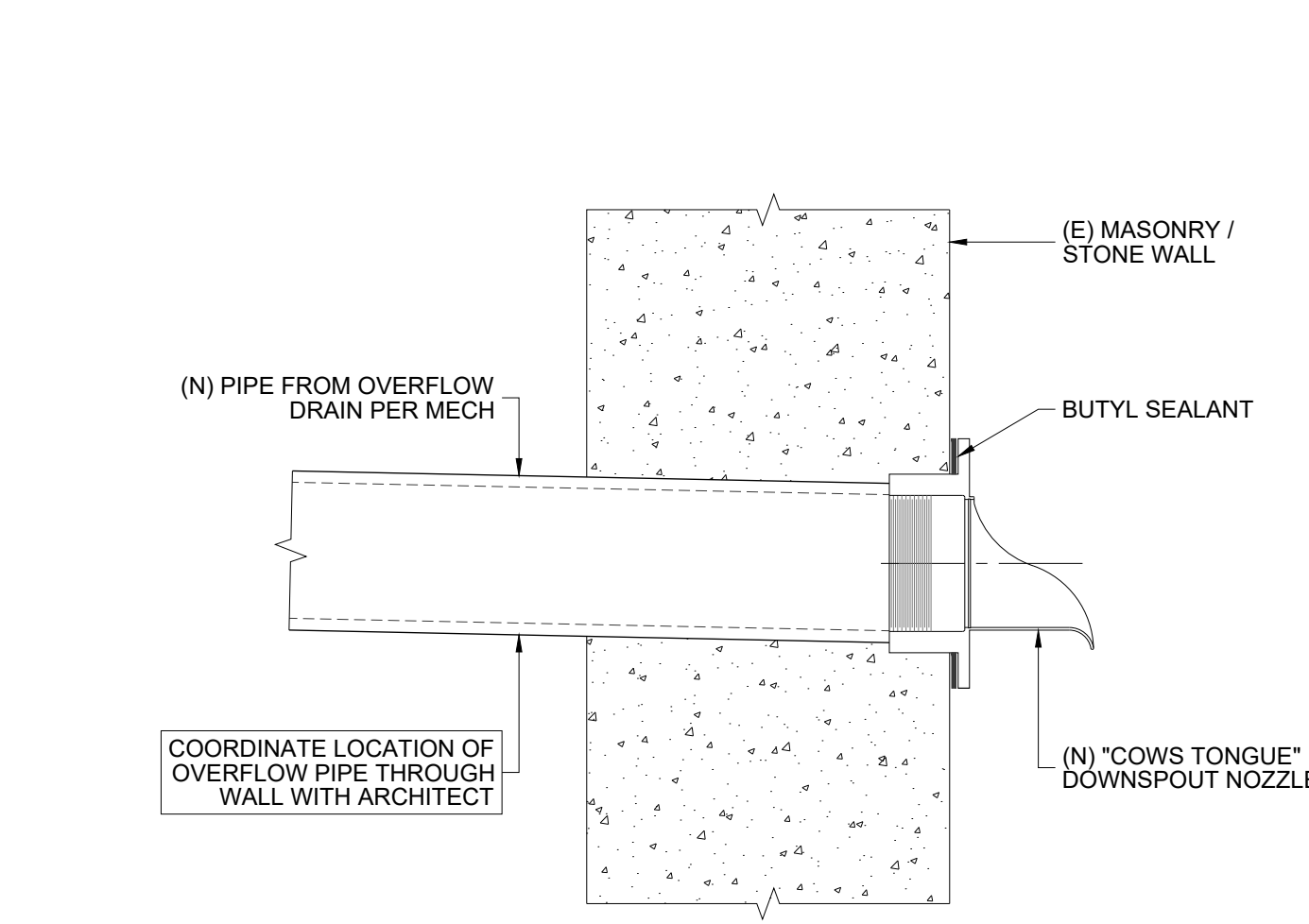
**MEMBRANE SIDE LAP**



**MEMBRANE END LAP**

**C2** KEE MEMBRANE LAP DETAILS

WP5.10 SCALE: N T S [EXPLODED] ARCH REF: NONE



**C1** THROUGH-WALL SPOUT DETAIL

WP5.10 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE

C:\USERS\STEVEN\BBOX\PROJECTS\IN\LAUREL ST. BATON ROUGE - CAUMIDES\DWG\DETAILS\WP5.10\DETAILS.DWG PLOTTED: 24\_05\_09

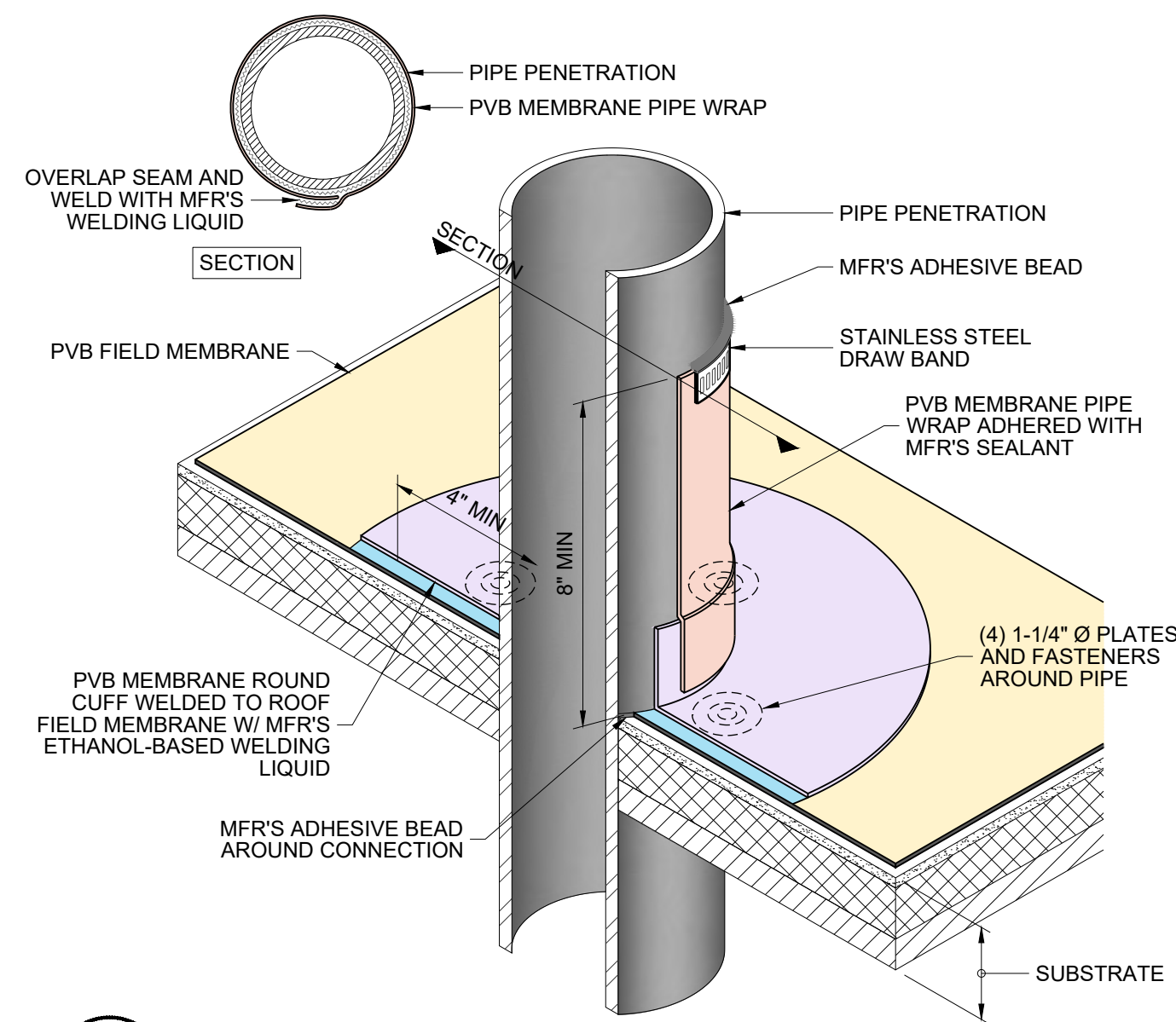
CAPITAL AREA UNITED WAY  
ROOF RE-COVER /  
SITE REPAIRS  
700 LAUREL STREET  
BATON ROUGE, LOUISIANA 70802

PROJECT NO: SC1241779  
SHEET NAME: KEE MEMBRANE ROOF DETAILS  
SHEET NO: WP5.10

DRAWN: SJH CHECKED: CRM SCALE: AS NOTED  
CAUW/04/DETAILS 24\_05\_09 SIZE: 34 x 22 1" AT FULL SIZE

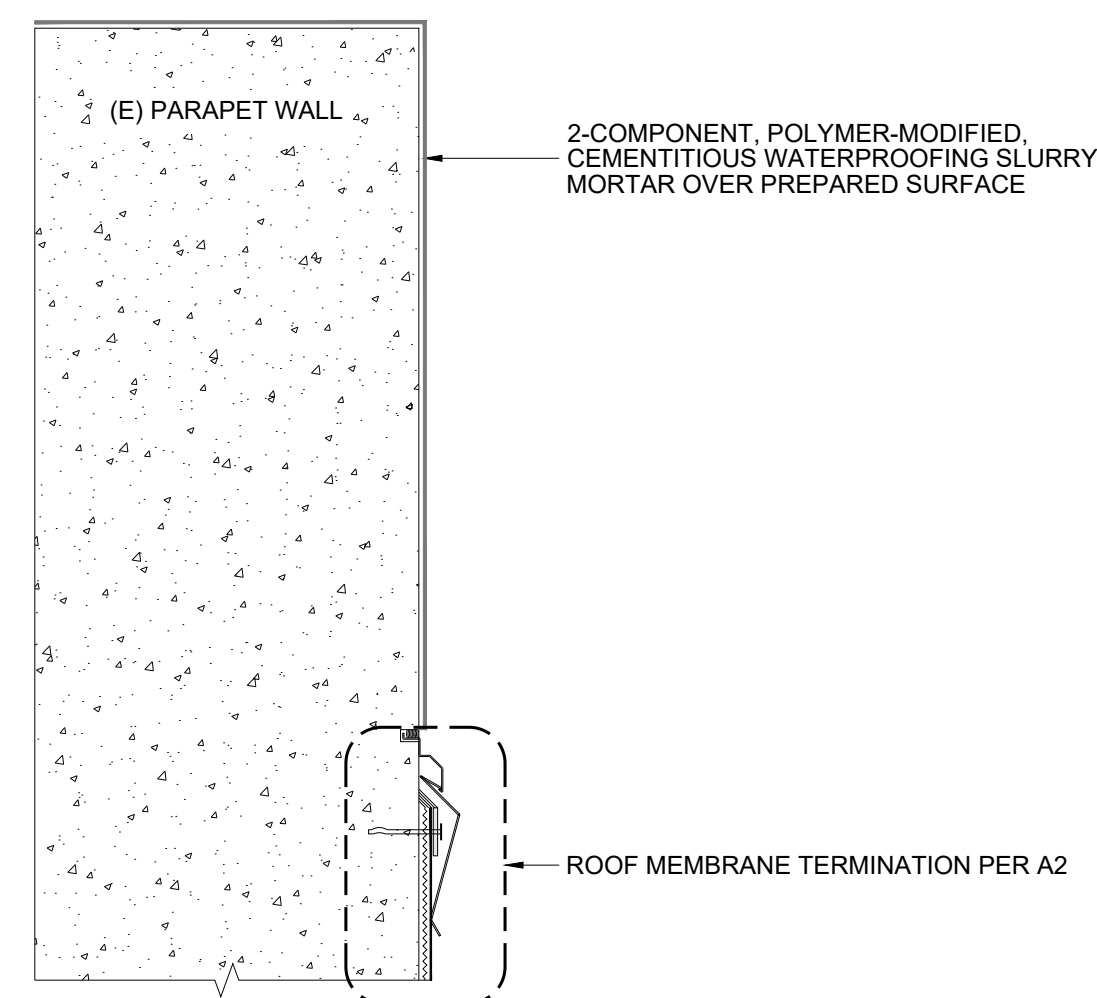
SOCOTEC CONSULTING, INC  
517 SORAPARU STREET  
SUITE 101  
NEW ORLEANS, LA 70130  
TEL: 504-235-6164  
WWW.SOCOTEC.US/en-locations  
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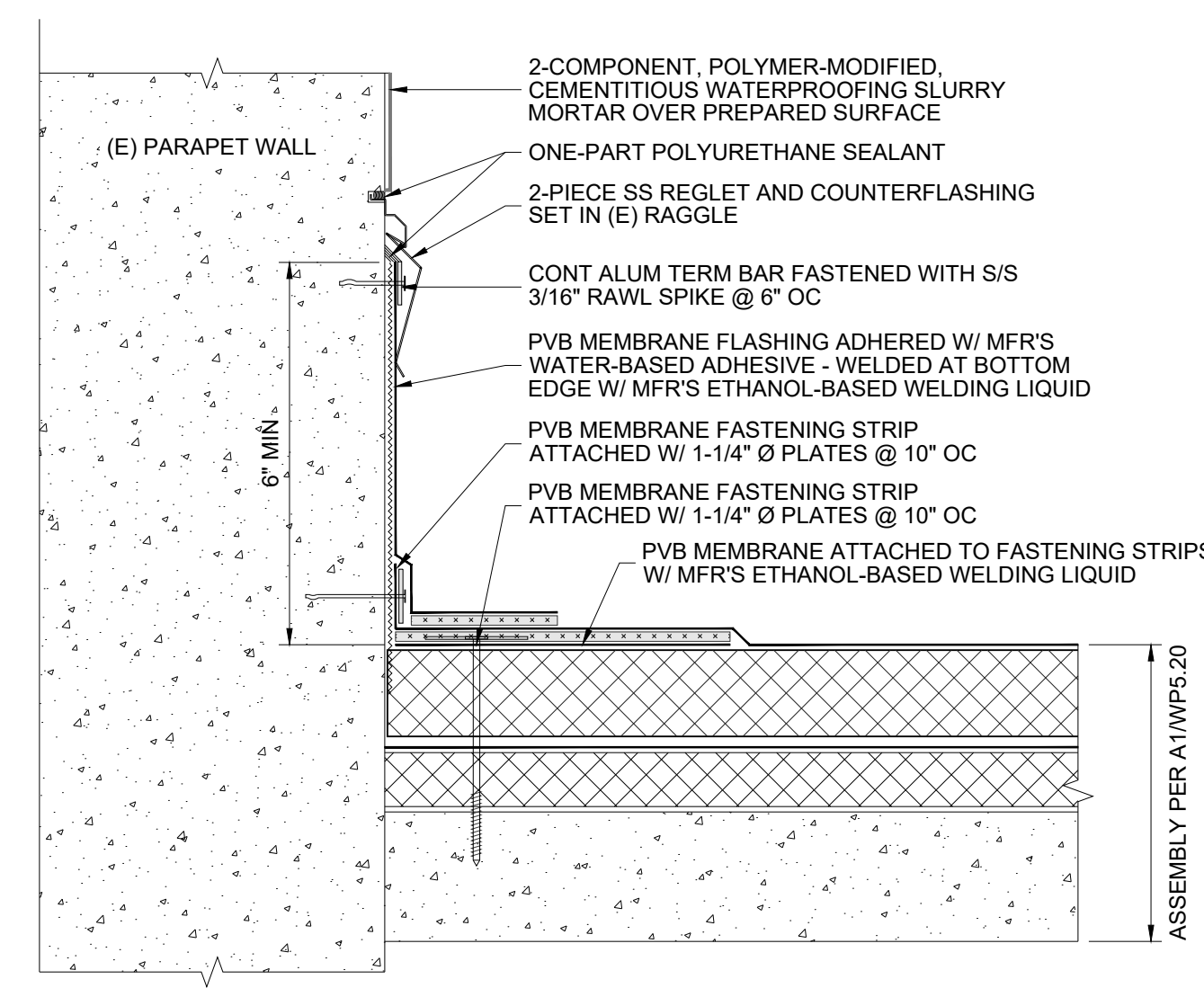
**A4** TYPICAL PIPE PENETRATION FLASHING DETAIL

WP5.20 SCALE: N T S ARCH REF: NONE



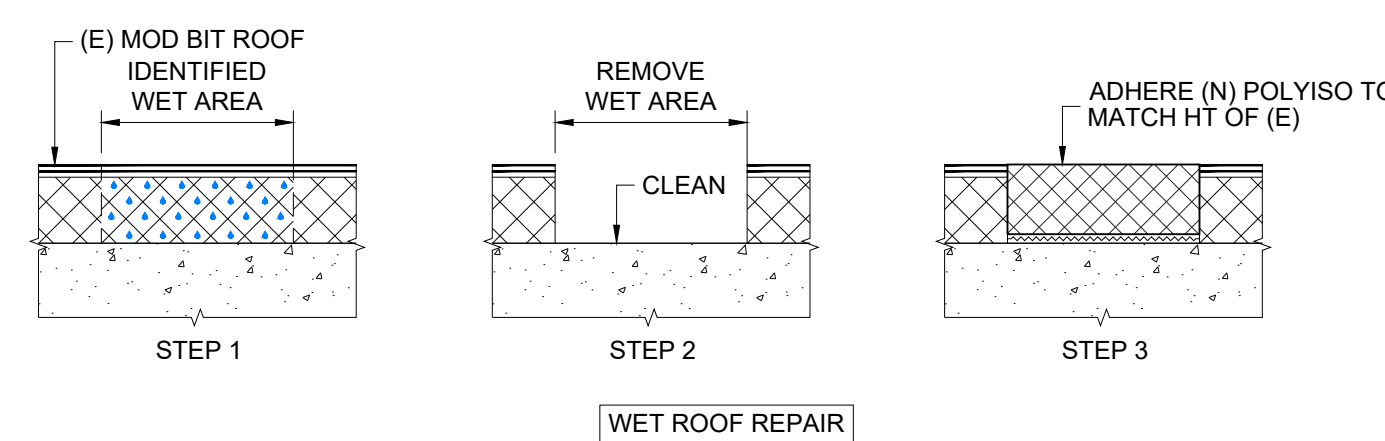
**A3** PARAPET DETAIL

WP5.20 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE



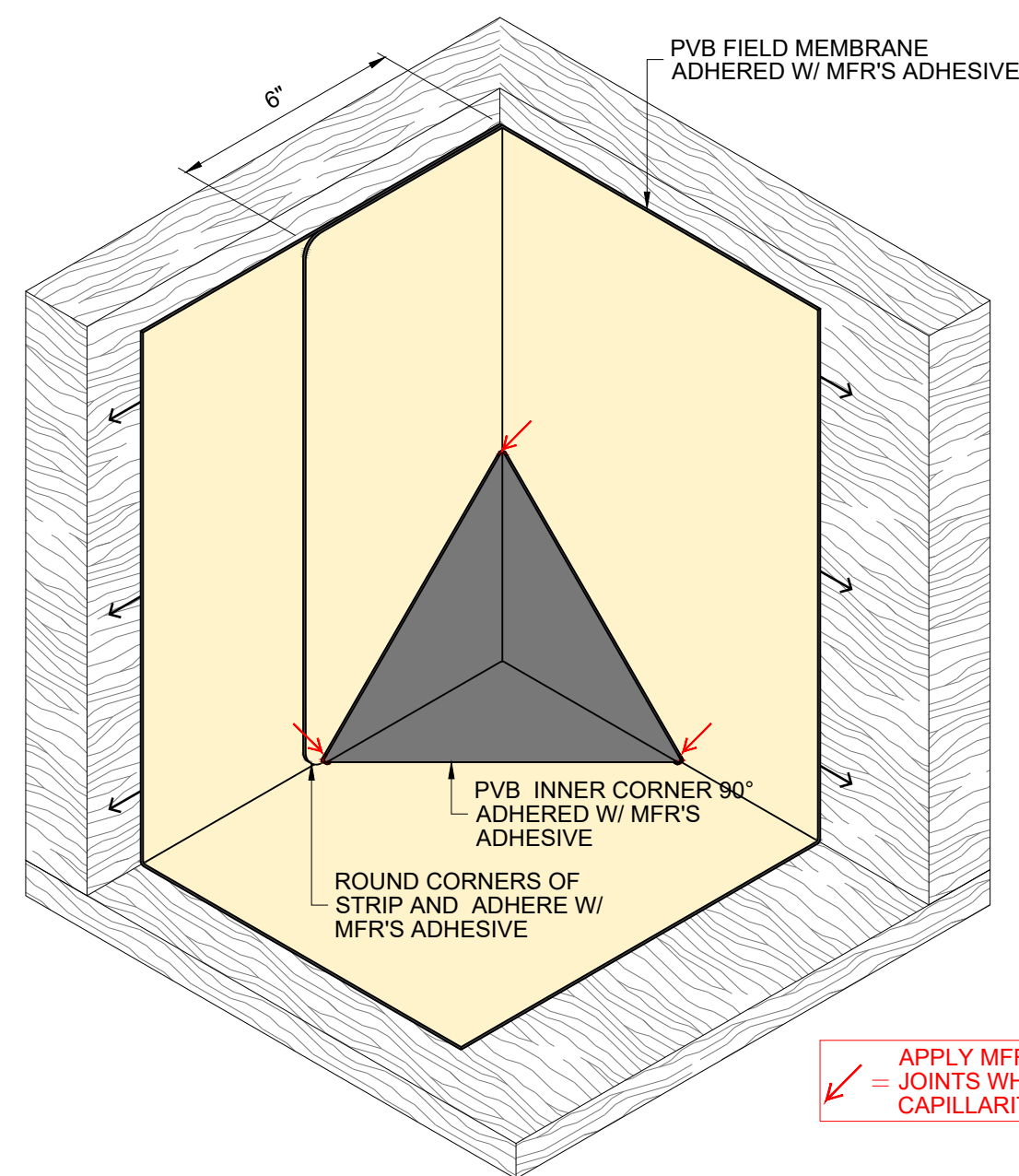
**A2** ROOF TO WALL / TERMINATION DETAIL

WP5.20 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE



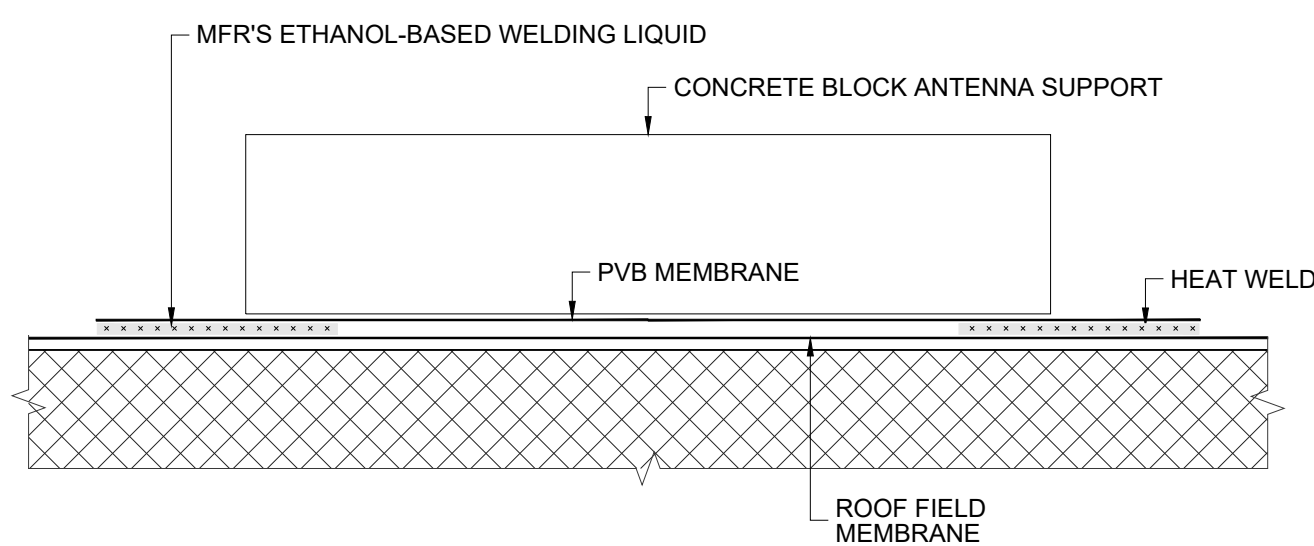
**A1** PVB MEMBRANE ASSEMBLY DETAIL

WP5.20 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE



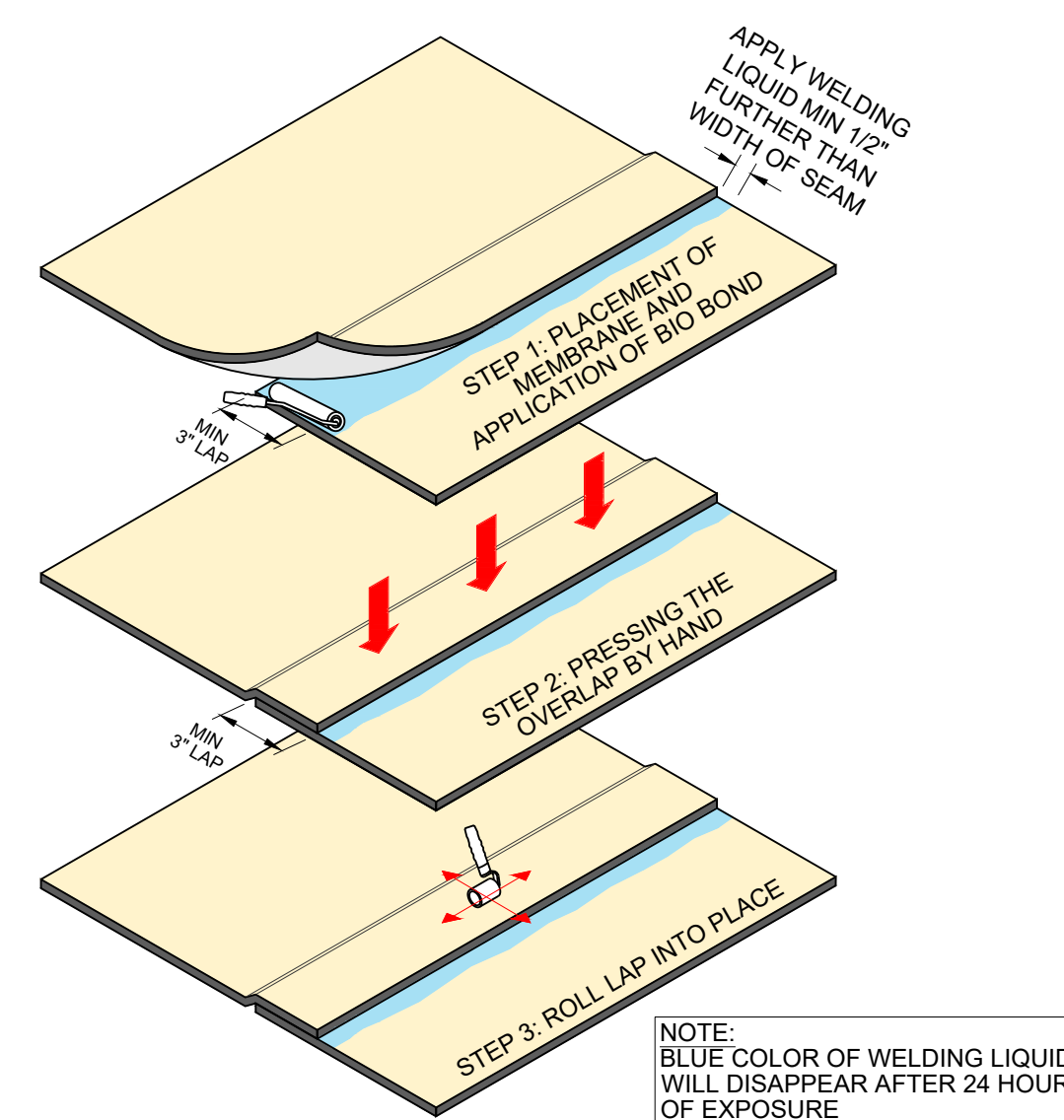
**C4** KEE MEMBRANE CORNER DETAILS

WP5.20 SCALE: N T S [EXPLODED] ARCH REF: NONE



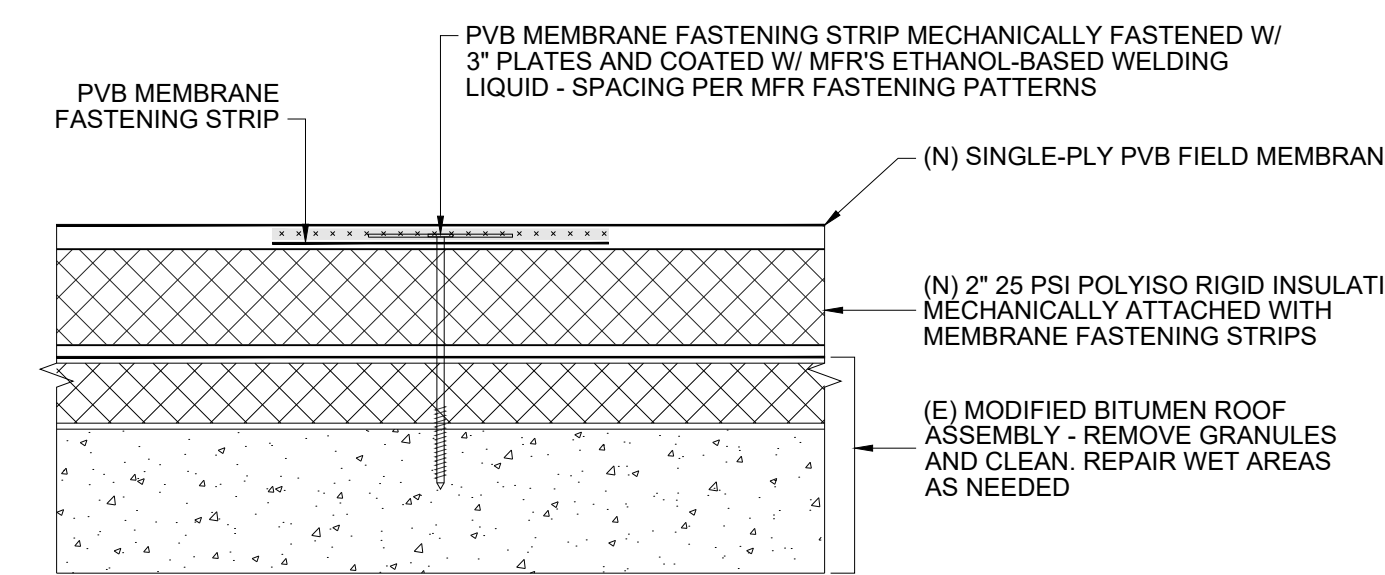
**C3** PVB MEMBRANE WALK / PROTECTION PAD DETAIL

WP5.20 SCALE: N T S [EXPLODED] ARCH REF: NONE



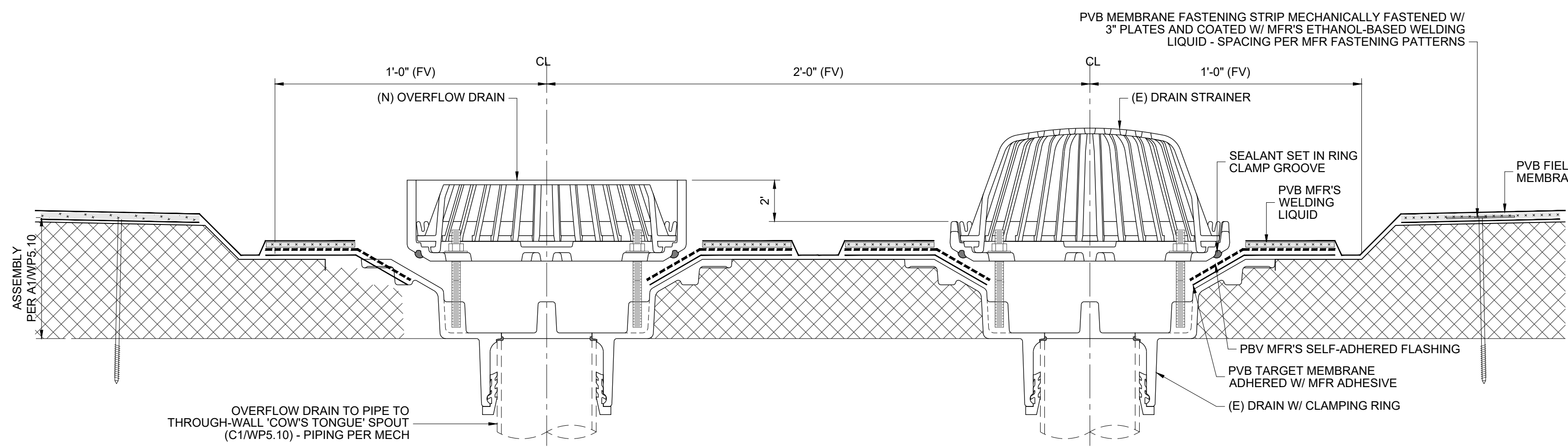
**C2** PVB MEMBRANE LAP DETAILS

WP5.20 SCALE: N T S [EXPLODED] ARCH REF: NONE



**C1** THROUGH-WALL SPOUT DETAIL

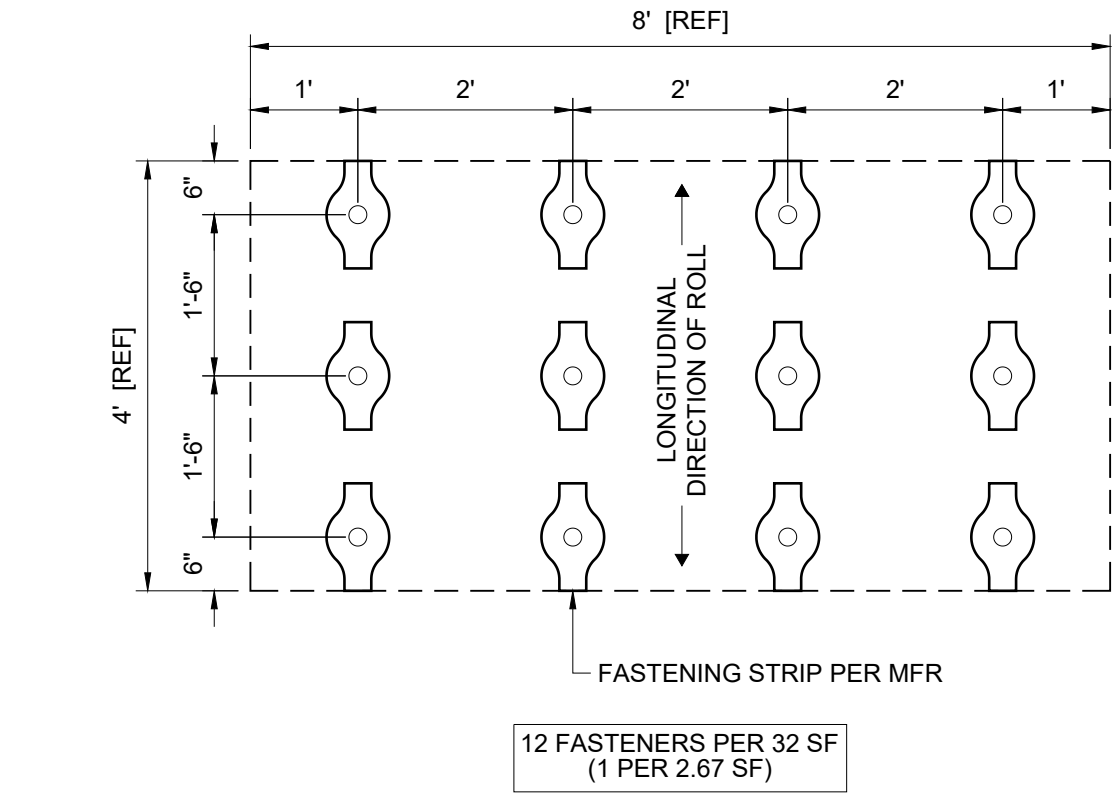
WP5.20 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE



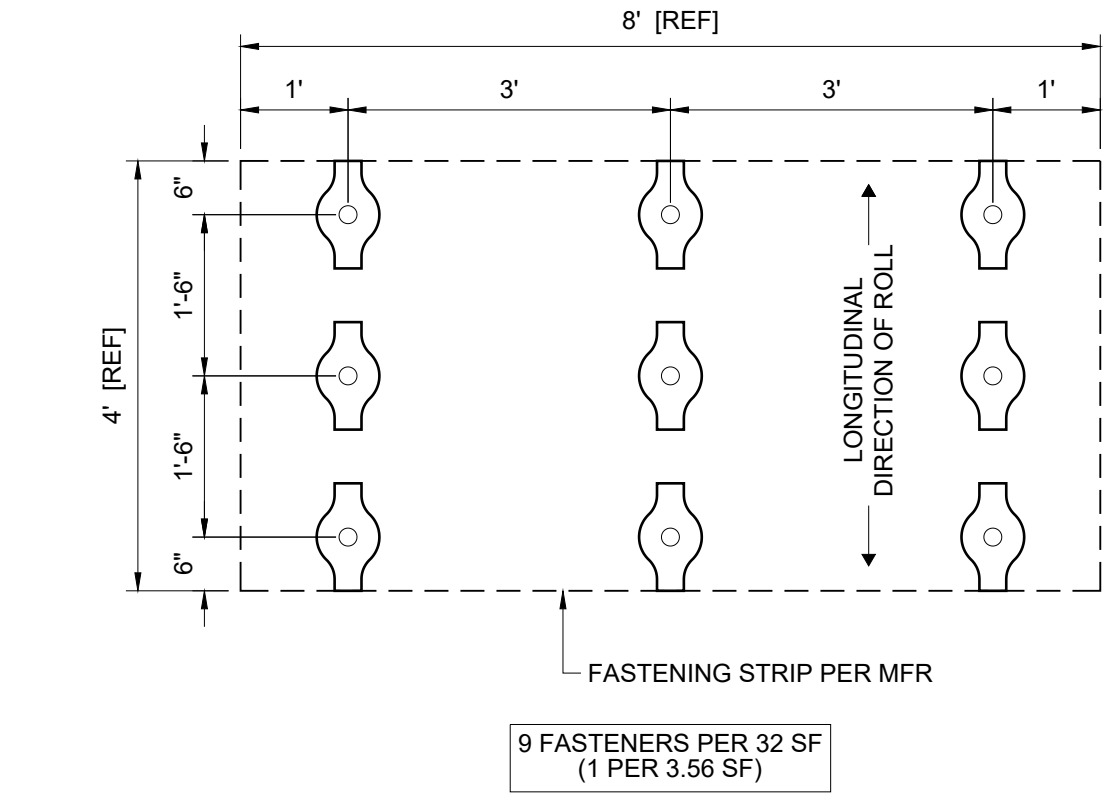
**B3** DRAIN / OVERFLOW DRAIN SUMP DETAIL

WP5.20 SCALE: 3"=1'-0" [EXPLODED] ARCH REF: NONE

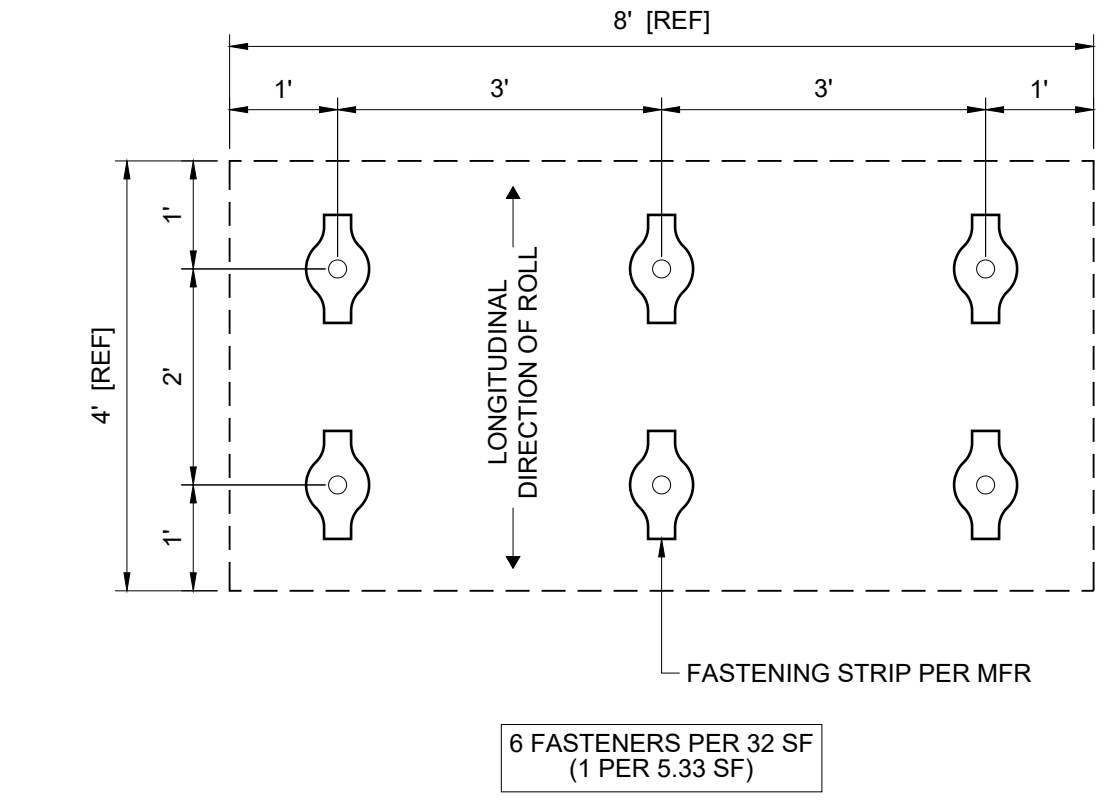
C:\USERS\STEVEN\BBOX\PROJECTS\NO. ANOLA CLIENTS\_CURRENT\700 LAUREL ST. BATON ROUGE - CAUMIDES\DWG\SHEET FILES\CAUMI\04 DETAILS.DWG PLOTTED: 24\_05\_09



**A3**  
 PVB MEMBRANE ATTACHMENT STRIP PATTERN - CORNER  
 WP5.21 SCALE: N T S [EXPLODED] ARCH REF: NONE



**A2**  
 PVB MEMBRANE ATTACHMENT STRIP PATTERN - PERIMETER  
 WP5.21 SCALE: N T S [EXPLODED] ARCH REF: NONE



**A1**  
 PVB MEMBRANE ATTACHMENT STRIP PATTERN - FIELD  
 WP5.21 SCALE: N T S [EXPLODED] ARCH REF: NONE

PROJECT NO: SC1241779  
 SHEET NAME: PVB MEMBRANE ROOF DETAILS  
 SHEET NO: WP5.21

NO.	DATE	ISSUE FOR
1	05.09.24	REVIEW

CAPITAL AREA UNITED WAY  
 ROOF RE-COVER /  
 SITE REPAIRS  
 700 LAUREL STREET  
 BATON ROUGE, LOUISIANA 70802

DRAWN: SJH CHECKED: CRM SCALE: AS NOTED  
 CAUW04 DETAILS 24\_0509 SIZE: 34 x 22 1" AT FULL SIZE

**SOCOTEC**  
 BUILDING SCIENCE RESEARCH  
 DESIGN  
 CONSULTATION

SOCOTEC CONSULTING, INC  
 517 SORAPARU STREET  
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**00 01 01 TABLE OF CONTENTS**

**INTRODUCTORY INFORMATION**

**PAGES**

00 01 01 Table of Contents..... 000101 - 1/2

**01 00 00 – GENERAL REQUIREMENTS**

01 11 00 Summary..... 011100 - 1/3  
01 26 00 Contract Modification Procedures..... 012600 - 1/2  
01 31 00 Project Management and Coordination ..... 013100 - 1/4  
01 32 00 Construction Progress Documentation ..... 013200 - 1/4  
01 33 00 Submittal Procedures..... 013300 - 1/6  
01 40 00 Quality Requirements ..... 014000 - 1/4  
01 42 00 References..... 014200 - 1/12  
01 50 00 Temporary Facilities and Controls ..... 015000 - 1/7  
01 60 00 Product Requirements ..... 016000 - 1/5  
01 70 00 Execution Requirements ..... 017000 - 1/6  
01 77 00 Closeout Procedures ..... 017700 - 1/4  
01 78 39 Project Record Documents ..... 017839 - 1/3  
01 93 13 Operation and Maintenance Data ..... 019313 - 1/5

**02 00 00–SELECTIVE DEMOLITION**

02 41 19 Selective Demolition ..... 024119 – 01/4

**03 00 00– CONCRETE**

03 01 30 Maintenance of Cast-in-Place Concrete ..... 030130 - 1/20  
03 20 00 Concrete Reinforcement ..... 032000 - 1/2  
03 30 00 Cast-In-Place Concrete..... 033000 - 1/36  
03 34 00 Lightweight Concrete ..... 034000 - 1/3  
03 54 13 Gypsum Cement Underlayment..... 035413 - 1/5  
03 63 00 Epoxy Grout ..... 036300 - 1/6

**04 00 00– MASONRY**

04 01 20 Masonry Restoration and Cleaning..... 040120 - 1/16  
04 03 42 Historic Stone Masonry Repair ..... 040342 - 1/10

**05 00 00 - METALS**

05 01 70 Decorative Metal Cleaning..... 050170 - 1/3  
05 01 70.63 Decorative Metal Refinishing..... 050170 - 1/9  
05 50 00 Metal Fabrications ..... 055000 - 1/3  
05 15 13 Shop Applied Metal Finishes Guide Spec..... 051513 – 1/4  
05 52 14 Metal Handrails and Railings ..... 055214 - 1/7

**06 00 00 – WOOD, PLASTICS, AND COMPOSITES**

06 11 00 Wood Framing..... 061100 – 1/7  
06 16 60 Sheathing..... 061660 – 1/3  
06 20 00 Finish Carpentry..... 062000 – 1/2  
06 40 23 Interior Architectural Woodwork..... 064023 - 1/5

**07 00 00 – THERMAL AND MOISTURE PROTECTION**

07 11 00 Air Sealing..... 071100 – 1/5  
07 11 50 Below Grade Elastomeric Waterproofing..... 071150 – 1/10  
07 24 13 Polymer-Based Exterior Insulation and Finish System (EIFS)..... 072413 – 1/7  
07 54 00 Thermoplastic Membrane Roofing..... 075400 – 1/22  
07 54 16 Ethylene Interpolymer (Kee) Roofing..... 075416 – 1/17  
07 62 00 Sheet Metal Flashing and Trim..... 076200 - 1/3  
07 92 00 Joint Sealants..... 079200 - 1/7

**08 00 00 – OPENINGS**

08 01 51 Aluminum Windows..... 080151 - 1/6  
08 12 16 Aluminum Frames..... 081216 - 1/4  
08 13 51 Aluminum Terrace Doors..... 081316 - 1/5  
08 14 16 Molded Panel Interior Doors..... 081416 – 1/4  
08 71 00 Door Hardware..... 087100 - 1/16

**09 00 00 – FINISHES**

09 29 00 Gypsum Board..... 092900 - 1/7  
09 26 13 Gypsum Veneer Plastering..... 092613 - 1/5  
09 30 13 Ceramic Tiling..... 093013 - 1/7  
09 51 10 Acoustic Ceilings..... 095110 – 1/6  
09 51 13 Acoustic Panel Ceilings..... 095113 – 1/5  
09 65 30 Resilient Wall Base & Accessories..... 096530 – 1/5  
09 65 55 Vinyl Plank Flooring..... 096555 - 1/4  
09 91 00 Painting..... 099100 - 1/5

**11 00 00 – EQUIPMENT**

11 31 00 Residential Appliances..... 113100 - 1/3

**12 00 00 – FURNISHINGS**

12 36 61 Quartz Agglomerate Countertops..... 123661 - 1/4

**22 00 00 – Plumbing**

22 42 16 Commercial Sinks..... 224216 - 1/4

**26 00 00 – ELECTRICAL**

26 00 00 Electrical..... 260000 - 1/39  
26 42 16 Interior Lighting..... 264116 - 1/12

**31 00 00 – EARTHWORK**

31 10 00 Site Clearing..... 311000 - 1/3  
31 20 00 Earthwork..... 312000 - 1/9

**32 00 00 – EXTERIOR IMPROVEMENTS**

32 13 14 Concrete Pavement ..... 321314 - 1/3  
32 92 00 Lawns and Grasses ..... 329200 – 1/4

**33 00 00 – EXTERIOR IMPROVEMENTS**

33 41 00 Site Storm Drainage..... 334100 - 1/4

**END OF DOCUMENT**

## **SECTION 00 73 00 - SUPPLEMENTARY CONDITIONS OF THE CONTRACT**

These Supplementary Conditions replace and/or modify the provisions of AIA Document A201-2017 as indicated herein below. Any provision not specifically addressed shall remain as stated in the AIA Document A201-2017 (hereinafter the "General Conditions").

### **Article 1 - General Provisions**

§1.1.8 Initial Decision Maker - Strike this section in its entirety and delete from all Contract Documents any and all references to the "Initial Decision Maker" and replace with the "Architect" as it is the intent of the parties that the Architect will perform all such functions and there will be no Initial Decision Maker.

### **Article 3 - Contractor**

§3.1.2 - Delete in its entirety and substitute with the following:

The Contractor shall perform the Work in accordance with the Contract Documents.

Add new §3.1.4 to read as follows:

Before executing this Agreement and before commencing construction for any phase of the Work, the Contractor has carefully reviewed all Contract Documents, including all exhibits and all Legal Requirements.

Add new §3.1.5 to read as follows:

Without otherwise limiting the Contractor's obligations, duties and agreements set forth in the Contract, the Contractor shall carefully inspect the conditions of the Project site, particularly as it relates to adjacent property and structures located adjacent to or near the Project site and undertake all measures reasonably necessary to protect adjacent or nearby structures and property (and their occupants and invitees) against damage or loss caused by performance of the Work. The Contractor shall conduct its operations in a manner so as not to damage adjacent or nearby structures or property or persons adjacent to or nearby the Project site. Notwithstanding anything else to the contrary contained in the Contract Documents, any damage to or loss of adjacent or nearby structures or property or affected persons arising out of Contractor's performance of the Work shall be the responsibility of the Contractor and shall be remedied by the Contractor at its sole expense without recourse to the Owner, except to the extent of damage attributed to the acts or omissions of the Owner, its agents or anyone else for whom or which Owner is Legally responsible (including Owner's separate contractors).

Add new §3.1.6 to read as follows:

The Contractor shall coordinate its Work with the work of any contractors or vendors contracted directly by the Owner to work at the Project.

§3.2.2 - Delete in its entirety and replace with the following:

Because the Contract Documents are complimentary, the Contractor shall, before starting each portion of the Work, carefully study all conditions upon which any portion of the Work is to be performed in order to ensure that conditions are suitable for the performance of each portion of the Work in strict accordance with the Contract Documents. The Contractor shall, before performance of each portion of the Work, take field measurements of existing conditions related to that portion of the Work, and the Contractor shall take into account all existing conditions including, but not limited to,

conditions at the site affecting the Work, including existing utilities. The Contractor shall report to the Architect, prior to commencing any portion of the Work, any errors, inconsistencies or omissions discovered by or made known to the Contractor.

§3.2.4 - Delete in its entirety and replace with the following:

In order for the Contractor to have any right to assert or claim for any additional time or money associated with or arising from any clarification or instruction issued by the Architect in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall, prior to commencing any work involving additional time or additional money, make a Claim as provided in Article 15. Failure to provide such notice shall serve as a knowing and voluntary waiver of any Claim by the Contractor, and the Contractor shall be liable for and shall pay all costs, damages and attorney's fees incurred by the Owner which could have been avoided had the Contractor provided the prior notification and allowed for a reasonable period of time for the Owner to respond.

§3.3.3 - Delete in its entirety and substitute with the following:

The Contractor shall be responsible for inspection of portions of the Work already performed to determine and ensure that such portions are in proper condition to receive subsequent portions of the Work.

§3.4.1 - Delete the following from the 2<sup>nd</sup> line: "water, heat, utilities, ".

§3.6 Taxes - Delete in its entirety and replace with the following:

The Contractor shall pay all sales, consumer, use and similar taxes associated with the Contractor's performance of the Work.

§3.10 Contractor's Construction Schedules

§3.10.2 - Add to the end:

The Contractor's submittal schedule shall allow for a minimum of 7 calendar days for the Architect to review each submittal.

Add new §3.10.4 to read as follows:

Schedules submitted by the Contractor under §3.10.1 through 3.10.3 are not to be considered, nor interpreted to be, Contract Documents. The Contractor stipulates and agrees that, unless approved, the schedules shall not form the basis of any delay claim as the schedules are submitted solely for information purposes.

§3.11 Documents and Samples at the Site - Add the following sentence:

The Contractor shall also maintain at the site for the Owner the record set of Drawings and Specifications as stamped by governmental officials having jurisdiction over the Work.

§3.12.8 - Add the following:

Any deviation from the requirements of the Contract Documents shall also be noted by the Contractor as deviations in the written correspondence transmitting the shop drawings, product data, samples or similar submittals by the Contractor to the Architect.

§3.12.10 - Modify the last sentence and add the following:

, as supplied by the Architect. This section shall also be applicable to any Subcontractor or supplier engaged by the Contractor for performance of any portion of the Work which requires any design services including, but not limited to, fire protection.

§3.15.2 - Delete in its entirety and replace with the following:

If the Contractor fails to clean up as provided in the Contract Documents within three (3) calendar days after receiving written notice from the Owner or the Architect to do so, the Owner may, at its option, perform such clean up work, and the Contractor shall be liable to pay to the Owner for all such costs, expenses and fees.

§3.18 Indemnification

§3.18.1 - In the first sentence delete the parenthetical phrase “(other than the Work itself)” and replace with the following: “(including the Work itself)”.

#### **Article 4 - Architect**

§4.1 General

§4.1.2 - Add the following:

Unless directed by the owner, the Architect shall not be considered as the Owner’s agent and the Owner shall not be responsible for any reliance by the Contractor upon oral instructions given by the Architect, nor shall the Owner be responsible for any acts, errors or omissions of the Architect which exceed the duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents. Contractor hereby stipulates and agrees that reliance upon any appearance of authority beyond the duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents, is not reasonable.

§4.2 Administration of the Contract

§4.2.1 - Delete and replace with the following:

The Architect will provide administration of the Contract as described in the Contract Documents, not as the agent for the Owner but as an independent professional.

§4.2.3 - Delete the first sentence.

§4.2.10 Delete in its entirety

§4.2.11 - Delete the first sentence and replace with the following:

The Architect will interpret and decide all matters concerning performance failure to perform by either the Contractor or Owner under the Contract Documents either on written request of the Owner or the Contractor, or upon the Architect’s own initiative.

#### **Article 7 - Changes in the Work**

§ 7.1 GENERAL – Delete in its entirety and replace with the following:

§ 7.1.1



Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order signed by the Owner and the Contractor, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2

A Change Order shall be based upon agreement among the Owner, Contractor and Architect. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3

Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order or order for a minor change in the Work.

Add new §7.1.4 to read as follows:

Any Change in the Work shall only be effective if in writing. The Contractor hereby stipulates and agrees that reliance upon any oral instruction which may cause a Change in the Work is unreasonable, and shall not serve as the basis for any claim by the Contractor.

§7.4 Minor Changes in the Work - Add the following:

The issuance of an Architect's supplemental instruction ("ASI") or the Architect's response to any request for information ("RFI") shall not be interpreted as authorization for the Contractor to perform Work which increases the Contract Sum or Contract Time. The Contractor hereby stipulates and agrees that the Architect does not have the authority to instruct the Contractor to perform any Work which increases the Contract Sum or Contract Time without the express written approval of the Owner as may be documented in a Change Order or Construction Change Directive.

**Article 8 - Time**

§8.3 Delays and Extensions of Time

§8.3.1 - Add the following:

Any and all claims by the Contractor arising from or connected with delay shall be submitted in strict accordance with Article 15 of the General Conditions. The Contractor hereby stipulates and agrees that the Contractor's failure to strictly comply with the procedures as set forth in Article 15 of the General Conditions shall serve as a knowing and voluntary forfeiture of any such claim.

Add new §8.3.4 to read as follows:

If adverse weather conditions are the basis for a claim for additional time, the Contractor shall document that weather conditions had an adverse effect on the scheduled construction: Rain days shall be those of occurrence of rain greater than 1/2" of recorded rainfall at nearest National Oceanic and Atmospheric Administration weather station during a work day. Wet days will not be considered. An increase in the contract time due to weather shall not be cause for an increase in the contract sum."

Note: Adverse weather conditions shall not be considered as a basis of claim for additional time involving interior work and may not be claimed for normally scheduled

holidays.

The following are considered reasonably anticipated days of adverse weather on a monthly basis:

January 11 days	May 5 days	September 4 days
February 10 days	June 6 days	October 3 days
March 8 days	July 6 days	November 5 days
April 7 days	August 5 days	December 8 days

**Note: Contract is on a consecutive calendar day basis.**

The Contractor shall submit to the Architect a written request for total adverse weather days with each application for payment. Failure to submit such request with supporting documentation with the Contractor's application for payment shall serve as a knowing and voluntary waiver of any claim for weather related delays for the period of time covered by the application for payment which did not include a request and supporting documentation for weather related delay. The Contractor's request for extension of time due to weather related delay shall be considered only for days over the allowable number of days stated above. The Contractor stipulates and agrees that delays caused by any adverse weather conditions shall not increase the Contract Sum.

**Article 9 – Payments and Completion**

§9.3 Applications for Payment

Add new §9.3.4 to read as follows:

Upon written request by the Architect or Owner, the Contractor shall submit with each Application for Payment, lien waivers or other documentation acceptable to the Owner to evidence that the Contractor has properly applied all previous payments.

§9.5 Decisions to Withhold Certification

§9.5.1 Add the following after number (.7):

or (.8) Failure to provide approved documentation as required under the Contract Documents.

§9.6 Progress Payments

§9.6.7 - Delete in its entirety.

§9.8 Substantial Completion

§9.8.3 - Add the following:

Failure of the Architect to include any item on any list of deficiencies or punch list prepared by the Architect, or failure of the Architect to identify any non-conforming work or Contractor failure to perform, shall not serve to waive any of the Owner's rights and the Contractor shall, notwithstanding any omission by the Architect, remain responsible for

strict compliance with the Contract Documents.

Add new §9.8.6 to read as follows:

The Architect will, based solely upon the Architect's professional judgment, include monetary values for the estimated cost to perform each item on the list of deficiencies or punch list. The estimated cost of such deficiencies shall not exceed the balance of funds for the related item from the Contract Schedule of Values. The Architect's monetary quantification shall be final, binding and not subject to review by a court or arbitrator absent a finding of arbitrary and capricious.

Add new §9.8.7 to read as follows:

After the Contractor, Architect and Owner have signed the Certificate of Substantial Completion, the Contractor shall record with the Recorder of Mortgages in the Parish where the Work is performed, the fully executed Certificate of Substantial Completion together with the final list of deficiencies or punch lists within two (2) business days after final execution of the Certificate of Substantial Completion. The Contractor shall deliver a copy of same to the Owner and Architect bearing the file stamp of the Recorder of Mortgages. The Certificate of Substantial Completion must identify the date of

recordation and the recordation data where the Notice of Contract was originally recorded.

#### §9.9 Partial Occupancy or Use

§9.9.1 - Delete in its entirety and replace with the following:

The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by the Architect, provided such occupancy or use is authorized by public authorities having jurisdiction over the Work, and the Contractor has been provided ten (10) days prior written notice to enable the Contractor to fully document conditions prior to occupancy or use of the completed or partially completed portion of the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete. Any partial occupancy or use of the Work by the Owner shall not relieve the Contractor of any obligation under the Contract Documents except an obligation to provide property casualty insurance for the specific portion of the Work upon the occupancy or use of that portion of the Work by the Owner. The stage of the progress of the Work for any portion to be occupied or used by the Owner shall be determined by decision of the Architect whose decision shall be final, binding and not subject to review by a court or arbitrator absent a finding of arbitrary and capricious.

#### §9.10 Final Completion and Final Payment

§9.10.2 - Add the following:

In addition to the above, neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect a certificate issued by the Recorder of Mortgages for the parish where the Work has been performed attesting that no liens have been recorded in connection with the Work.

§9.10.4 - Add the following:

The failure of the Architect to identify any failure to perform by the Contractor in

accordance with the Contract Documents, shall not serve as a waiver of any Owner rights nor relieve the Contractor of any responsibility to perform the Work in strict accordance with the Contract Documents, despite the Architect's signature on a Final Application or Certification for Payment, or on any recommendation of final acceptance.

§9.10.5 - Delete in its entirety and substitute the following:

Acceptance of Final Payment by the Contractor, a subcontractor or material supplier shall constitute a knowing and voluntary forfeiture of any and all claims by that payee except those claims which are specifically identified in writing by that payee on the Final Application for Payment document.

#### **Article 10 – Hazardous Materials**

§ 10.3.3 Add the following sentence.

The Contractor shall not be held responsible for bodily or property damage due to mold.

§ 10.3.7 – Add the following new section.

The Owner shall be responsible for providing sufficient evidence (such as a Phase 1) determining if any hazardous materials or conditions exist on site. The Contractor shall not be responsible for determining the existence of hazardous materials or conditions on site.

#### **Article 11 – Insurance and Bonds**

Add new §11.1.5 to read as follows:

The Contractor hereby agrees, on its behalf and on behalf of its insurance carriers, to waive any rights of Subrogation for any loss sustained arising from the Work in favor of the Owner as per Section 11.3.7. The Contractor agrees to carry the insurance required in the Contract Documents, which shall be written for not less than the following minimum limits or as required by law, whichever is greater.

- |    |  |   |
|----|--|---|
| .1 | COMMERCIAL GENERAL LIABILITY INSURANCE   |   |
|    | Bodily Injury  | \$500,000 Any One Person or Organization;<br>\$1,000,000 Any One Occurrence |
|    | Property Damage  | \$1,000,000 per occurrence; \$1,000,000 Aggregate                           |
|    | Products Completed Operations  | \$ 1,000,000 To be maintained for one (1) year after final payment.         |
| .2 | WORKMEN'S COMPENSATION   | - statutory minimum   |
| .3 | EMPLOYERS LIABILITY INSURANCE  | \$1,000,000 per accident.   |
| .4 | COMPREHENSIVE AUTOMOBILE LIABILITY   |   |
|    | Bodily Injury & Property   | \$ 500,000 each person  |
|    | Damage Liability   | \$1,000,000 each accident   |
| .5 | Insurance provided under this Contract by the Contractor shall be primary and not contributory to any other insurance provided to the Owner. |   |

## §11.2 Property Insurance

§11.2.2 - Delete in its entirety.

Add new §11.6 to read as follows:

The Owner shall be named as "additional insured" on all of the Contractor's liability policies as respects liability arising out of the Work; products and completed operations of the Contractor, as well as premises owned, occupied or used by the Contractor. The additional insured coverage shall contain no special limitations on the scope of protection afforded to any additional insured. It is understood that the business auto policy under "Who is an Insured" automatically provides liability coverage in favor of the Owner. Any failure of Contractor to comply with any reporting provision of any policy shall not affect coverage provided to an additional insured. The insurance to be provided by Contractor shall not include any provision, exclusion or endorsement precluding coverage for claims between insureds and/or additional insureds.

§11.4 Loss of Use Insurance - Delete in its entirety

§11.3.2 - Delete in its entirety

§11.3.1 Waivers of Subrogation - In the first sentence, delete the phrase "required by the agreement or other property insurance"

§11.5.1 - Delete in its entirety

§11.5.2 - Delete in its entirety

## **Article 12 – Uncovering and Correction of Work**

§12.2.2.3 - Delete in its entirety and replace with the following:

The one-year period for correction of Work shall be extended for any portion of the Work, excluding manufacturer warranties, corrected or performed by the Contractor for an additional one year from the date that the corrective Work was completed in accordance with the Contract Documents as determined by the Architect.

## **Article 13 - Miscellaneous Provisions**

Add new §13.8 - ADAAG Certificate, to read as follows:

Along with and at the same time that Contractor records the Certificate of Substantial Completion, the Contractor shall record in the Mortgage Records for the Parish where the Work is performed, a fully executed ADAAG Certificate in the form as attached hereto as Exhibit 'A.'

## **Article 15 – Claims and Disputes**

§15.1.7 Claims for Consequential Damages - Delete this section in its entirety.

§15.2 Initial Decision Maker - Delete in their entirety the following sections:

§15.2.1; §15.2.2; §15.2.3; §15.2.4; §15.2.5; §15.2.6; and §15.2.6.1.

§15.3 Mediation

§15.3.1 - Delete in its entirety and replace with the following:

Claims, disputes, or other matters in controversy arising out of, or related to the Contract Documents or the Work, except those previously waived, shall be subject to mediation as a condition precedent to binding dispute resolution.

§15.4 Arbitration - Strike this Article in its entirety and strike any and all references to arbitration wherever they may appear anywhere in the Contract Documents as that parties stipulate and agree that all claims, disputes or any matter in controversy among the parties of any nature or kind arising from or in any way whatsoever connected with the Contract Documents or the Work, the binding dispute procedure shall be litigation in a court in the Parish where the Work is performed, or to be performed. The parties agree that exclusive venue shall be in a court in the Parish where the Work is performed or to be performed.

**END OF SECTION 00 7300 – SUPPLEMENTARY CONDITIONS OF THE CONTRACT**

## SECTION 01 11 00 - SUMMARY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes:

1. Project information / Work covered by Contract Documents.
2. Phased construction.
3. Owner-furnished, contractor installed products.
4. Access to site.
5. Work restrictions.
6. Specification and drawing conventions.

- B. Related Section:

1. Division 1 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

#### 1.3 PROJECT INFORMATION / WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification:

1. Project Location: Capital Area United Way  
700 Laurel  
Baton Rouge, LA

Owner: Sate of Louisiana

- B. Architect Identification: The Contract Documents, dated May 30, 2023, were prepared for Grosvenor Square Apartments by:

Dyke Nelson Architecture, LLC  
235 S. 14<sup>th</sup> Street  
Baton Rouge, Louisiana 70802.

- C. The Work consists of:

Grosvenor Square Apartments are 184 new apartment units located in five three/four story apartment buildings. The building contains 10 ADA units and one community room/maintenance building.

D. Type of Contract:

Project will be constructed under a single prime contract.

1.4 PHASED CONSTRUCTION

1.5 ACCESS TO SITE

- A. General: Contractor will have access to entire site for the entire duration of the project.
- B. Use of site: Keep driveways, loading areas, lots, sidewalks, and public ways adjacent to the project site clear unless an agreement has been executed with property owners, government agencies, etc.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.

1.7 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.8 OWNER-FURNISHED, CONTRACTOR INSTALLED PRODUCTS

- A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products and making building services connections.
- B. Owner-Furnished Products:
  - 1. None at this time.



PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100

## SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
  - 1. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

#### 1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

#### 1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

#### 1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

#### 1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01250

## SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General Project coordination procedures.
  - 2. Coordination Drawings.
  - 3. Project meetings.

#### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
  - 4. Coordinate Owners Separate Contractors.
  - 5. Coordinate the work of Mechanical and Electrical Subcontractors.
- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's Construction Schedule.
  - 2. Preparation of the Schedule of Values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Pre-installation conferences.
  - 7. Project closeout activities.

## 1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings as limited space availability necessitates maximum utilization of space for efficient installation of different components and coordination and is required for installation of products and materials fabricated by separate entities.
1. Indicate relationship of components shown on separate Shop Drawings.
  2. Indicate required installation sequences.
  3. See Division 15 Sections for specific Coordination Drawing requirements for mechanical installations.
  4. See Division 16 Sections for specific Coordination Drawing requirements for electrical installations.
  5. Provide list of components to be shown in the coordination drawings for approval to the architect prior to the creation of said drawings.

## 1.5 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: At the Architect's discretion: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 4 days of the meeting.
- B. Pre-construction Conference: Schedule a pre-construction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing.
    - d. Designation of responsible personnel.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for processing Applications for Payment.
    - g. Distribution of the Contract Documents.
    - h. Submittal procedures.
    - i. Preparation of Record Documents.
    - j. Use of the premises.
    - k. Responsibility for temporary facilities and controls.
    - l. Parking availability.
    - m. Office, work, and storage areas.
    - n. Equipment deliveries and priorities.
    - o. First aid.
    - p. Security.
    - q. Progress cleaning.
    - r. Working hours.
    - s. Coordination drawings

- C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates 48 hours in advance.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related Change Orders.
    - d. Purchases.
    - e. Deliveries.
    - f. Submittals.
    - g. Review of mockups.
    - h. Possible conflicts.
    - i. Compatibility problems.
    - j. Time schedules.
    - k. Weather limitations.
    - l. Manufacturer's written recommendations.
    - m. Warranty requirements.
    - n. Compatibility of materials.
    - o. Acceptability of substrates.
    - p. Temporary facilities and controls.
    - q. Space and access limitations.
    - r. Regulations of authorities having jurisdiction.
    - s. Inspecting requirements.
    - t. Required performance results.
    - u. Protection of construction and personnel.
  3. Record significant conference discussions, agreements, and disagreements.
  4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at monthly intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.

- 2) Sequence of operations.
  - 3) Status of submittals.
  - 4) Deliveries.
  - 5) Off-site fabrication.
  - 6) Access.
  - 7) Site utilization.
  - 8) Temporary facilities and controls.
  - 9) Work hours.
  - 10) Hazards and risks.
  - 11) Progress cleaning.
  - 12) Quality and work standards.
  - 13) Change Orders.
  - 14) Documentation of information for payment requests.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310

## SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Contractor's Construction Schedule.
  - 2. Submittals Schedule.
- B. See Division 1 Section "Payment Procedures" for submitting the Schedule of Values.

#### 1.3 DEFINITIONS

- A. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- B. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
- C. Fagnnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- D. Major Area: A story of construction, a separate building, or a similar significant construction element.

#### 1.4 SUBMITTALS

- A. Submittals Schedule: Submit one copy of schedule. Arrange the following information in a tabular format:
  - 1. Scheduled date for first submittal.
  - 2. Specification Section number and title.
  - 3. Submittal category (action or informational).
  - 4. Name of subcontractor.
  - 5. Description of the Work covered.
  - 6. Scheduled date for Architect's final release or approval.
- B. Contractor's Construction Schedule: Submit one printed copy of initial schedule, large enough to show entire schedule for entire construction period, including critical path and updated weekly.



## 1.5 COORDINATION

- A. Coordinate preparation and processing of schedules with performance of construction activities.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from parties involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

## PART 2 - PRODUCTS

### 2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
  - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
  - 2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

### 2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within 14 days of date established for commencement of the Work. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a CPM network analysis diagram.
  - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for commencement of the Work.
  - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  - 3. Use "one workday" as the unit of time.

- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following:
    - a. Preparation and processing of submittals.
    - b. Purchase of materials.
    - c. Delivery.
    - d. Fabrication.
    - e. Installation.
  2. Processing: Process data to produce output data or a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
  3. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
    - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
  2. Description of activity.
  3. Principal events of activity.
  4. Immediate preceding and succeeding activities.
  5. Early and late start dates.
  6. Early and late finish dates.
  7. Activity duration in workdays.
  8. Total float or slack time.
  9. Average size of workforce.
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations in workdays.
  5. Changes in the critical path.
  6. Changes in total float or slack time.
  7. Changes in the Contract Time.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
  2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01320

## SECTION 01 33 00 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. See Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
- C. See Division 1 Section "Quality Requirements" for submitting test and inspection reports and Delegated-Design Submittals and for erecting mockups.
- D. See Division 1 Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.

#### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

#### 1.4 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.

1. Initial Review: Allow 7 days after receipt by Architect for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  2. If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Allow 7 days for processing each re-submittal.
  4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- D. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  3. Include the following information on label for processing and recording action taken:
    - a. Project name and Architect's Project Number.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name and address of Contractor.
    - e. Name and address of subcontractor.
    - f. Name and address of supplier.
    - g. Name of manufacturer.
    - h. Unique identifier, including revision number.
    - i. Section Number and title of appropriate Specification Section.
    - j. Drawing number and detail references, as appropriate.
    - k. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
1. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
  2. Submittals may be transmitted electronically.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

## PART 2 - PRODUCTS

### 2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
  - 1. Number of Copies: Submit four copies of each submittal, unless otherwise indicated. Architect will return three, or two copies, if Architect's consulting Engineer must review items. Mark up and retain one returned copy as a Project Record Document.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
  - 2. Mark each copy of each submittal to show which products and options are applicable.
  - 3. Include the following information, as applicable:
    - a. Manufacturer's written recommendations.
    - b. Manufacturer's product specifications.
    - c. Manufacturer's installation instructions.
    - d. Manufacturer's catalog cuts.
    - e. Wiring diagrams showing factory-installed wiring.
    - f. Printed performance curves.
    - g. Operational range diagrams.
    - h. Compliance with recognized trade association standards.
    - i. Compliance with recognized agency standards.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data except as approved by the Architect.
  - 1. Preparation: Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    - f. Shopwork manufacturing instructions.
    - g. Templates and patterns.
    - h. Schedules.
    - i. Notation of coordination requirements.
    - j. Notation of dimensions established by field measurement.
  - 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
  - 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches. Submit Digital-Bond copies for large sheets.
- D. Coordination Drawings: Comply with requirements in Division 1 Section "Project Management and Coordination."
- E. Samples: Prepare physical units of materials or products, including the following:
  - 1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups.
  - 2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components.
    - a. Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
  4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side.
  5. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
  6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- F. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location.
  - G. Delegated-Design Submittal: Comply with requirements in Division 1 Section "Quality Requirements."
  - H. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
  - I. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."
  - J. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."
  - K. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A.

## 2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
  1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
  2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
  3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."
- B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- M. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."
- N. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- O. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
- P. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections.
- Q. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.



- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

### 3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
  - 1. NO EXCEPTIONS TAKEN. No further review of Submittal required.
  - 2. MAKE CORRECTIONS AS NOTED: Incorporate corrections in work; resubmittal is not required. If contractor cannot comply with corrections as noted, revise to respond to exceptions and resubmit.
  - 3. REVISE AND RESUBMIT: Revise as noted and resubmit for further review.
  - 4. RESUBMIT PROPERLY: Submittal not reviewed because it does not contain Contractor's signature indicating its review and approval, and/or is not in proper condition for review. Resubmit.
  - 5. NOT REVIEWED: Submittal is not required by Contract Documents.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 01330

## SECTION 01 40 00 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.

#### 1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged.

#### 1.4 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

#### 1.5 SUBMITTALS

- A. Qualification Data: For agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the agency by a recognized authority.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

- C. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
  2. Project title and number.
  3. Dates and locations of samples and tests or inspections.
  4. Names of individuals making tests and inspections.
  5. Description of the Work and test and inspection method.
  6. Identification of product and Specification Section.
  7. Complete test or inspection data.
  8. Test and inspection results and an interpretation of test results.
  9. Ambient conditions at time of sample taking and inspecting.
  10. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  11. Name and signature of laboratory inspector.
  12. Recommendations on re-inspecting.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

## 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product, that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities that are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
  2. Notify Architect seven days in advance of dates and times when mockups will be constructed.

3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

## 1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified agency to perform these services.
- B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
  1. Where services are indicated as Contractor's responsibility, engage a qualified agency to perform these quality-control services.
    - a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- D. Associated Services: Cooperate with agencies performing required inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  6. Security and protection for samples and for testing and inspecting equipment at Project site.
- E. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- F. Building Envelope: It is the intent of the Construction Documents that the Project be constructed free of water infiltration, excessive air infiltration, excessive moisture or vapor build-up in building materials and that continuous thermal barriers against excessive heat loss or gain are maintained. The proper use of certain materials such as bituminous damp proofing, flexible and rigid flashing and building insulation are essential to ensure this performance. It is the responsibility of the Contractor to review

the Documents carefully and advise the Architect of any concerns or recommendations in regard to potential problem areas. It is also the responsibility of the Contractor, during construction, to coordinate the work to ensure that the integrity of the continuous waterproofing and thermal envelope be maintained.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 REPAIR AND PROTECTION

- A. General: On completion of inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

## SECTION 01 42 00 - REFERENCES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to and govern the execution of the work of all Sections of the Project Manual.

#### 1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": The term "approved," when used to convey Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.
- D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
- E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": The term "install" describes operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer": An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
- J. The term "experienced," when used with an entity, means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
  - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.

- K. "Project site" is the space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

### 1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
  - 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.
- E. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) <a href="http://www.aluminum.org">www.aluminum.org</a>	(202) 862-5100
AAADM	American Association of Automatic Door Manufacturers <a href="http://www.taol.com/aaadm">www.taol.com/aaadm</a>	(216) 241-7333
AABC	Associated Air Balance Council <a href="http://www.aabchq.com">www.aabchq.com</a>	(202) 737-0202
AAMA	American Architectural Manufacturers Association <a href="http://www.aamanet.org">www.aamanet.org</a>	(847) 303-5664
AAN	American Association of Nurserymen (See ANLA)	
AASHTO	American Association of State Highway and Transportation Officials <a href="http://www.aashto.org">www.aashto.org</a>	(202) 624-5800

AATCC	American Association of Textile Chemists and Colorists (The) <a href="http://www.aatcc.org">www.aatcc.org</a>	(919) 549-8141
ABMA	American Bearing Manufacturers Association <a href="http://www.abma-dc.org">www.abma-dc.org</a>	(202) 429-5155
ACI	American Concrete Institute/ACI International <a href="http://www.aci-int.org">www.aci-int.org</a>	(248) 848-3700
ACPA	American Concrete Pipe Association <a href="http://www.concrete-pipe.org">www.concrete-pipe.org</a>	(972) 506-7216
ADC	Air Diffusion Council	(312) 201-0101
AEIC	Association of Edison Illuminating Companies, Inc. (The) <a href="http://www.aeic.org">www.aeic.org</a>	(205) 257-2530
AFPA	American Forest & Paper Association (See AF&PA)	
AF&PA	American Forest & Paper Association <a href="http://www.afandpa.org">www.afandpa.org</a>	(800) 878-8878 (202) 463-2700
AGA	American Gas Association <a href="http://www.aga.org">www.aga.org</a>	(202) 824-7000
AHA	American Hardboard Association <a href="http://www.ahardbd.org">www.ahardbd.org</a>	(847) 934-8800
AHAM	Association of Home Appliance Manufacturers <a href="http://www.aham.org">www.aham.org</a>	(202) 872-5955
AI	Asphalt Institute <a href="http://www.asphaltinstitute.org">www.asphaltinstitute.org</a>	(606) 288-4960
AIA	American Institute of Architects (The) <a href="http://www.aiaonline.org">www.aiaonline.org</a>	(202) 626-7300
AISC	American Institute of Steel Construction, Inc. <a href="http://www.aisc.org">www.aisc.org</a>	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute <a href="http://www.steel.org">www.steel.org</a>	(202) 452-7100
AITC	American Institute of Timber Construction	(303) 792-9559
ALA	American Laminators Association (See LMA)	
ALCA	Associated Landscape Contractors of America <a href="http://www.alca.org">www.alca.org</a>	(800) 395-2522 (703) 736-9666
ALSC	American Lumber Standard Committee	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. <a href="http://www.amca.org">www.amca.org</a>	(847) 394-0150



ANLA	American Nursery & Landscape Association (Formerly: AAN - American Association of Nurserymen) <a href="http://www.anla.org">www.anla.org</a>	(202) 789-2900
ANSI	American National Standards Institute <a href="http://www.ansi.org">www.ansi.org</a>	(212) 642-4900
AOSA	Association of Official Seed Analysts <a href="http://www.zianet.com/AOSA">www.zianet.com/AOSA</a>	(402) 476-3852
APA	APA-The Engineered Wood Association <a href="http://www.apawood.org">www.apawood.org</a>	(253) 565-6600
APA	Architectural Precast Association <a href="http://www.archprecast.org">www.archprecast.org</a>	(941) 454-6989
API	American Petroleum Institute <a href="http://www.api.org">www.api.org</a>	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute <a href="http://www.ari.org">www.ari.org</a>	(703) 524-8800
ASCA	Architectural Spray Coaters Association <a href="http://www.ascassoc.com">www.ascassoc.com</a>	(856) 848-6120
ASCE	American Society of Civil Engineers <a href="http://www.asce.org">www.asce.org</a>	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers <a href="http://www.ashrae.org">www.ashrae.org</a>	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) <a href="http://www.asme.org">www.asme.org</a>	(800) 843-2763
ASSE	American Society of Sanitary Engineering <a href="http://www.asse-plumbing.org">www.asse-plumbing.org</a>	(440) 835-3040
ASTM	American Society for Testing and Materials <a href="http://www.astm.org">www.astm.org</a>	(610) 832-9585
AWCI	AWCI International (Association of the Wall and Ceiling Industries International)  <a href="http://www.awci.org">www.awci.org</a>	(703) 534-8300
AWCMA	American Window Covering Manufacturers Association (See WCMA)	
AWI	Architectural Woodwork Institute <a href="http://www.awinet.org">www.awinet.org</a>	(800) 449-8811 (703) 733-0600
AWPA	American Wood-Preservers' Association <a href="http://www.awpa.com">www.awpa.com</a>	(817) 326-6300

AWS	American Welding Society <a href="http://www.aws.org">www.aws.org</a>	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association <a href="http://www.awwa.org">www.awwa.org</a>	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association <a href="http://www.buildershardware.com">www.buildershardware.com</a>	(212) 661-4261
BIA	Brick Industry Association (The) <a href="http://www.bia.org">www.bia.org</a>	(703) 620-0010
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International) <a href="http://www.bifma.com">www.bifma.com</a>	(616) 285-3963
CCC	Carpet Cushion Council <a href="http://www.carpetcushion.org">www.carpetcushion.org</a>	(203) 637-1312
CCFSS	Center for Cold-Formed Steel Structures <a href="http://www.umn.edu/~ccfss">www.umn.edu/~ccfss</a>	(573) 341-4471
CDA	Copper Development Association Inc. <a href="http://www.copper.org">www.copper.org</a>	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association (The) <a href="http://www.canelect.ca">www.canelect.ca</a>	(613) 230-9263
CFFA	Chemical Fabrics & Film Association, Inc. <a href="http://www.taol.com/cffa">www.taol.com/cffa</a>	(216) 241-7333
CGA	Compressed Gas Association <a href="http://www.cganet.com">www.cganet.com</a>	(703) 412-0900
CGSB	Canadian General Standards Board <a href="http://www.pwgsc.gc.ca/cgsb">www.pwgsc.gc.ca/cgsb</a>	(819) 956-0425
CIMA	Cellulose Insulation Manufacturers Association <a href="http://www.cellulose.org">www.cellulose.org</a>	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association <a href="http://www.cisca.org">www.cisca.org</a>	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute <a href="http://www.cispi.org">www.cispi.org</a>	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute <a href="http://www.chainlinkinfo.com">www.chainlinkinfo.com</a> (under construction)	(301) 596-2584
CPA	Composite Panel Association (Formerly: National Particleboard Association) <a href="http://www.pbmdf.com">www.pbmdf.com</a>	(301) 670-0604
CPPA	Corrugated Polyethylene Pipe Association Division of Plastics Pipe Institute <a href="http://www.cppa-info.org">www.cppa-info.org</a>	(800) 510-2772 (419) 241-2221

CRI	Carpet and Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	CSA International (Formerly: IAS - International Approval Services) Division of Canadian Standards Association www.iasapprovals.org	(216) 524-4990
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 462-8961
CTI	Cooling Tower Institute www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA/TIA	Electronic Industries Alliance/Telecommunications Industry Association www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eifsfacts.com	(800) 294-3462 (770) 968-7945
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
FCI	Fluid Controls Institute www.fluidcontrolsinstitute.org	(216) 241-7333
FGMA	Flat Glass Marketing Association (See GANA)	
FM	Factory Mutual System (See FMG)	
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	(401) 275-3000
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America (Formerly: FGMA - Flat Glass Marketing Association) www.glasswebsite.com/gana	(785) 271-0208
GRI	Geosynthetic Research Institute www.drexel.edu/gri	(610) 522-8440
GTA	Glass Tempering Division of Glass Association of North America	

(See GANA)

HI	Hydraulic Institute	(888) 786-7744 (973) 267-9700
HI	Hydronics Institute Division of Gas Appliance Manufacturers Association <a href="http://www.gamanet.org">www.gamanet.org</a>	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association Division of National Association of Architectural Metal Manufacturers (See NAAMM)	
HPVA	Hardwood Plywood & Veneer Association <a href="http://www.hpva.org">www.hpva.org</a>	(703) 435-2900
HPW	H. P. White Laboratory, Inc.	(410) 838-6550
IAS	International Approval Services (See CSA International)	
ICEA	Insulated Cable Engineers Association, Inc. <a href="http://www.icea.net">www.icea.net</a>	(508) 394-4424
ICRI	International Concrete Repair Institute <a href="http://www.icri.org">www.icri.org</a>	(703) 450-0116
IEC	International Electrotechnical Commission <a href="http://www.iec.ch">www.iec.ch</a>	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) <a href="http://www.ieee.org">www.ieee.org</a>	(212) 419-7900
IESNA	Illuminating Engineering Society of North America (The) <a href="http://www.iesna.org">www.iesna.org</a>	(212) 248-5000
IGCC	Insulating Glass Certification Council <a href="http://www.igcc.org">www.igcc.org</a>	(315) 938-7444
ILI	Indiana Limestone Institute of America, Inc. <a href="http://www.iliai.com">www.iliai.com</a>	(812) 275-4426
IRI	HSB Industrial Risk Insurers <a href="http://www.industrialrisk.com">www.industrialrisk.com</a>	(800) 520-7300 (860) 520-7300
ITS	Intertek Testing Services <a href="http://www.itsglobal.com">www.itsglobal.com</a>	(800) 345-3851 (607) 753-6711
IWS	Insect Screening Weavers Association (Now defunct)	
KCMA	Kitchen Cabinet Manufacturers Association <a href="http://www.kcma.org">www.kcma.org</a>	(703) 264-1690
LGSI	Light Gage Structural Institute <a href="http://www.loseke.com">www.loseke.com</a>	(972) 625-4560

LMA	Laminating Materials Association (Formerly: ALA - American Laminators Association) www.lma.org	(201) 664-2700
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864 (847) 577-7200
LSGA	Laminated Safety Glass Association (See GANA)	
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Maple Flooring Manufacturers Association www.maplefloor.org	(847) 480-9138
MFMA	Metal Framing Manufacturers Association	(312) 644-6610
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America www.marble-institute.com	(614) 228-6194
ML/SFA	Metal Lath/Steel Framing Association (See SSMA)	
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry, Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NAAMM	North American Association of Mirror Manufacturers (See GANA)	
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(281) 228-6200
NAIMA	North American Insulation Manufacturers Association (The)  www.naima.org	(703) 684-0084
NAMI	National Accreditation and Management Institute, Inc.	(304) 258-5100
NAPM	National Association of Photographic Manufacturers (See PIMA)	
NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute	(414) 248-9094

	www.ncpi.org	
NCTA	National Cable Television Association www.ncta.com	(202) 775-3669
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.electricnet.com/neta	(303) 697-8441
NFPA	National Fire Protection Association www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-6372
NGA	National Glass Association www.glass.org	(703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	National Oak Flooring Manufacturers Association www.nofma.org	(901) 526-5016
NPA	National Particleboard Association (See CPA)	
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(301) 587-1400
NSA	National Stone Association www.aggregates.org	(800) 342-1415 (202) 342-1100
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NTMA	National Terrazzo & Mosaic Association (The) www.ntma.com	(800) 323-9736 (703) 779-1022
NWWDA	National Wood Window and Door Association	

(See WDMA)

PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting and Decorating Contractors of America www.pdca.com	(800) 332-7322 (703) 359-0826
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (508) 230-3516
PGI	PVC Geomembrane Institute/Technology Program University of Illinois-Urbana Champaign //pgi-tp.ce.uiuc.edu	(217) 333-3929
PIMA	Photographic & Imaging Manufacturers Association (Formerly: NAPM - National Association of Photographic Manufacturers) www.pima.net	(914) 698-7603
RCSC	Research Council on Structural Connections c/o AISC www.boltcouncil.org	
RFCI	Resilient Floor Covering Institute	(Contact by mail only)
RIS	Redwood Inspection Service Division of the California Redwood Association www.calredwood.org	(888) 225-7339 (415) 382-0662
RMA	Rubber Manufacturers Association www.rma.org	(800) 220-7620 (202) 682-4800
SAE	SAE International www.sae.org	(724) 776-4841 (724) 776-4960 (publications)
SDI	Steel Deck Institute www.sdi.org	(847) 462-1930
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabfurn.com	(843) 689-6878
SGCC	Safety Glazing Certification Council <a href="http://www.sgcc.org">www.sgcc.org</a>	(315) 938-7444
SIGMA	Sealed Insulating Glass Manufacturers Association www.sigmaonline.org/sigma	(312) 644-6610
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association	(561) 533-0991

SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SPI	The Society of the Plastics Industry, Inc. www.plasticsindustry.org	(202) 974-5200
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611
SPI/SPFD	The Society of the Plastics Industry, Inc. Spray Polyurethane Foam Division (See SPI)	
SPRI	SPRI (Single Ply Roofing Institute) www.spri.org	(781) 444-0242
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSMA	Steel Stud Manufacturers Association (Formerly: ML/SFA - Metal Lath/Steel Framing Association) www.ssma.com	(312) 456-5590
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(800) 837-8303 (412) 281-2331
STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWI	Steel Window Institute www.steelwindows.com	(216) 241-7333
SWRI	Sealant, Waterproofing & Restoration Institute www.swrionline.org	(816) 472-7974
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TPI	Truss Plate Institute	(608) 833-5900
TPI	Turfgrass Producers International www.turfgrassod.org	(800) 405-8873 (847) 705-9898
UFAC	Upholstered Furniture Action Council <a href="http://www.ufac.org">www.ufac.org</a>	(336) 885-5065
UL	Underwriters Laboratories Inc. www.ul.com	(800) 704-4050 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association //members.aol.com/unibell	(972) 243-3902
USG	United States Gypsum Company A Subsidiary of USG Corporation www.usg.com	(800) 874-4968 (312) 606-4000



USITT	United States Institute for Theatre Technology, Inc. www.culturenet.ca/usitt	(800) 938-7488 (315) 463-6463
USP	U.S. Pharmacopeia www.usp.org	(800) 822-8772 (301) 881-0666
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association (Formerly: AWCMA - American Window Covering Manufacturers Association) www.windowcoverings.org	(212) 661-4261
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
WIC	Woodwork Institute of California www.wicnet.org	(916) 372-9943
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

#### 1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weather-tight; exterior walls are insulated and weather-tight; and all openings are closed with permanent construction or substantial temporary closures.

#### 1.4 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, and inspecting agencies and personnel of authorities having jurisdiction.
- B. Water Service: Obtain and pay for all permits and periodic charges to provide water service to the temporary and construction facilities.
- C. Electric Power Service: Obtain and pay for all permits and periodic charges to provide electric power to the temporary and construction facilities.

#### 1.5 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
  - 1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

## 1.6 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.
  - 1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
  - 1. Keep temporary services and facilities clean and neat.
  - 2. Relocate temporary services and facilities by progress of the Work.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.
- B. Walkways: Comply with Division 2 Section "Cement Concrete Pavement."
- C. Lumber and Plywood: Comply with requirements in Division 6 Section "Miscellaneous Carpentry."
- D. Water: Potable.

### 2.2 EQUIPMENT

- A. Field Offices: Prefabricated, mobile units, or job-built construction with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.
- B. Job Signage: 4' x 8' exterior grade plywood, double sided, in layout and lettering/logo(s)/etc. as indicated by Architect, including, but not limited to, Owner and/or Occupant name, address, etc., Architects and Consultants name, address, etc., and General Contractor name, address, etc.
- C. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
  - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- D. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- E. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water, drinking-water units, including paper cup supply.

1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F.
- F. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.
- G. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- H. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify facilities. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
  1. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
  2. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
  1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
  2. Connect temporary sewers to municipal system as directed by sewer department officials.
  3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
  4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.

- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use. Sterilize temporary water piping before use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
  - 1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
  - 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.
  - 3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
  - 4. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
    - a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.
  - 1. Maintain a minimum temperature of 50 deg F in permanently enclosed portions of building for normal construction activities, and 65 deg F for finishing activities and areas where finished Work has been installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- G. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.
  - 1. Install electric power service underground, unless overhead service must be used.
  - 2. Install power distribution wiring overhead and rise vertically where least exposed to damage.
- H. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
  - 1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. Provide one 100-W incandescent lamp per 500 sq. ft., uniformly distributed, for general lighting, or equivalent illumination.
  - 3. Provide one 100-W incandescent lamp every 50 feet in traffic areas.

4. Provide one 100-W incandescent lamp per story in stairways and ladder runs, located to illuminate each landing and flight.
  5. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.
- J. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities. Install separate telephone line for each field office and first-aid station.
1. Provide additional telephone lines for the following:
    - a. In field office with more than two occupants, install a telephone for each additional occupant or pair of occupants.
    - b. Provide a dedicated telephone line for each facsimile machine and computer with modem in each field office.
  2. At each telephone, post a list of important telephone numbers, including police and fire departments ambulance service Contractor's home office Architect's office Engineers' offices Owner's office and principal subcontractors' field and home offices.
  3. Provide voice-mail service on superintendent's telephone.
  4. Provide a portable cellular telephone for superintendent's use in making and receiving telephone calls when away from field office.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
  2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
  3. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Job Signage:
1. Locate and orient job signage as coordinated with Architect.
  2. Furnish\install job signage complete with associated support members and hardware; paint support members to coordinate with job signage.
  3. No other signage may be posted or attached, and/or adjacent, to job signage to ensure non-clutter of information.
- C. Dewatering Facilities and Drains: Comply with requirements in applicable Division 2 Sections for temporary drainage and dewatering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain Project site, excavations, and construction free of water.
- D. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.
1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
  2. Prepare temporary signs to provide directional information to construction personnel and visitors.

- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
  - 1. Provide separate containers, clearly labeled, for each type of waste material to be deposited.
  - 2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.
- F. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.
- G. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and sub-grade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.
- C. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- D. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  - 2. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
  - 3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
  - 4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.
- F. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
  - 1. Construct dustproof, floor-to-ceiling partitions of not less than nominal 4-inch studs, 2 layers of 3-mil polyethylene sheets, inside and outside temporary enclosure. Cover floor with 2 layers of

3-mil polyethylene sheets, extending sheets 18 inches up the side walls. Overlap and tape full length of joints. Cover floor with 3/4-inch fire-retardant plywood.

- a. Construct a vestibule and airlock at each entrance to temporary enclosure with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.
2. Protect air-handling equipment.
- G. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
    - a. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
  2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
  4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
  5. Provide hoses for fire protection of sufficient length to reach construction areas. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
  1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
  2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
  2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION 01 50 00



## **SECTION 01 60 00 - PRODUCT REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes the following administrative and procedural requirements: Selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and product substitutions.
- B. Related Sections include the following:
  - 1. Division 1 Section "References" for applicable industry standards for products specified.
  - 2. Division 1 Section "Closeout Procedures" for submitting warranties for contract closeout.
  - 3. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

#### **1.2 DEFINITIONS**

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating products of other named manufacturers.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

### 1.3 SUBMITTALS

- A. Substitution Requests: Submit one copy of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use CSI Form 13.1A or a form provided by Owner or the form provided at end of Section.
  2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified material or product cannot be provided.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - g. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    - h. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
    - i. Cost information, including a proposal of change, if any, in the Contract Sum.
    - j. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
    - k. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
  3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 7 days of receipt of request, or 3 days of receipt of additional information or documentation, whichever is later.
    - a. Form of Acceptance: Change Order.
    - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

#### **1.4 QUALITY ASSURANCE**

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

#### **1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
  - 5. Store products to allow for inspection and measurement of quantity or counting of units.
  - 6. Store materials in a manner that will not endanger Project structure.
  - 7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
  - 8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
  - 9. Protect stored products from damage.

#### **1.6 PRODUCT WARRANTIES**

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
  - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  - 2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

## **PART 2 - PRODUCTS**

### **2.1 PRODUCT OPTIONS**

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," Architect will make selection.
  5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
  6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
- B. Product Selection Procedures: Procedures for product selection include the following:
1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
  2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
  3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
  4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
  5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements.
  6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements.
  7. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specific product or system indicated.
  8. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Products" are included and also introduce or refer to a list of manufacturers' names, provide the specified product. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.
    - a. Substitutions may be considered, unless otherwise indicated as "No Substitutions".

## **2.2 PRODUCT SUBSTITUTIONS**

- A. Timing: Unless otherwise prohibited in “Instructions To Bidders” and “Supplementary Instructions To Bidders”, if applicable, Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Architect.
- B. Other Requirements: Refer to “Instructions To Bidders” and “Supplementary Instructions To Bidders”, if applicable to the Project.
- C. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  - 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
  - 2. Requested substitution does not require extensive revisions to the Contract Documents.
  - 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - 4. Substitution request is fully documented and properly submitted.
  - 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
  - 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - 7. Requested substitution is compatible with other portions of the Work.
  - 8. Requested substitution has been coordinated with other portions of the Work.
  - 9. Requested substitution provides specified warranty.
- D. Approvals: On public projects, approved substitutions will be published in Addenda under the heading of “Prior Approvals”, and subsequently reviewed in the construction “submittal period” for compliance with the Contract Documents. On private projects, there is no requirement for approval prior to submitting proposals. The Architect will consider substitutions at the time of construction “submittal period”. If the substitution does not meet the requirements of the Contract Documents, the Contractor must be prepared to provide a product that does.

## **PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01 60 00**

## SECTION 01 70 00 - EXECUTION REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. General installation of products.
4. Coordination of Owner-installed products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

- B. Related Sections include the following:

1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 1 Section "Submittal Procedures" for submitting surveys.
3. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

#### 1.3 SUBMITTALS

- A. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.
- B. Certified Surveys: Submit two copies signed by professional engineer.

#### 1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

### PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
  - 1. Before construction, verify the location and points of connection of utility services.
- B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a professional engineer to lay out the Work using accepted surveying practices.
  - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 3. Inform installers of lines and levels to which they must comply.
  - 4. Check the location, level and plumb, of every major element as the Work progresses.
  - 5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
  - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

### 3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
  - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
  - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.



### 3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
  - 4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
- G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
  - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
  - 2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

### 3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F
  3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

### 3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

## SECTION 01 77 00 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures.
  - 2. Project Record Documents.
  - 3. Operation and maintenance manuals.
  - 4. Warranties.
  - 5. Instruction of Owner's personnel.
  - 6. Final cleaning.
- B. See Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
- C. See Division 1 Section "Project Record Documents" for requirements for As Built Drawings and Specifications.
- D. See Division 1 Section "Operation and Maintenance Data" for submitting OP&M manuals and other requirements.
- E. See Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
- F. See Divisions 2 through 33 Sections for specific closeout and special cleaning requirements for products of those Sections.

#### 1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
  - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
10. Advise Owner of changeover in heat and other utilities.
11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
12. Complete final cleaning requirements, including touchup painting.
13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, which must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

#### 1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### 1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

## 1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - f. Sweep concrete floors broom-clean in unoccupied spaces.
    - g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

- h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
  - i. Remove labels that are not permanent.
  - j. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
  - k. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - l. Replace parts subject to unusual operating conditions.
  - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
  - p. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

#### PART 4 - REQUIRED DOCUMENTS

PART 5 - A. Provide Record Documents and As-Built Plans in electronic format.

END OF SECTION 01770

## **SECTION 01 78 39 - PROJECT RECORD DOCUMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. See Divisions 2 through 33 Sections for specific requirements for Project Record Documents of products in those Sections.

#### **1.3 SUBMITTALS**

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set of marked-up Record Prints. HUD requires electronic copies.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. HUD requires electronic copies.
- C. Record Product Data: Submit one copy of each Product Data submittal.

### **PART 2 - PRODUCTS**

#### **2.1 RECORD DRAWINGS**

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
  - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare marked-up Record Prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.



- b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
  1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Design/Builder.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
  1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  4. Note related Change Orders, Record Drawings, and Product Data where applicable.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  3. Note related Change Orders, Record Drawings, and Product Data where applicable.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records for Owner's availability and record keeping in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for Owner's continued use and reference for the following:
1. Addenda
  2. Change orders and other modifications to the contract
  3. Owner's field orders or written instructions.
  4. Final shop drawings, product data, and samples.
  5. Construction photographs.
  6. Punch list.
  7. Warranties and guarantees.
  8. Written operation or maintenance instructions.
  9. Operations training meetings.
  10. Operations, maintenance, and parts list manuals.
  11. Artist's renderings (if applicable).
  12. Keys and key schedules.
  13. Fire sprinkler testing records.
  14. Building Permit authority inspection reports: mechanical, electrical, fire marshal, etc.
  15. Occupancy permit.
  16. Test reports: concrete, soils, etc.
  17. Engineer's concrete slab on-site pour and finish reports.
  18. Affidavits and waivers of lien accompanied by a list of the subcontractors and major material men.
  19. Design/Builder and subcontractor list (work performed, company name, address, telephone number, and contact for each.

## PART 3 - EXECUTION

### 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Owner's reference during normal working hours.

**END OF SECTION 017839**

## **SECTION 01 93 13 - OPERATION AND MAINTENANCE DATA**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Emergency manuals.
  - 2. Operation manuals for systems, subsystems, and equipment.
  - 3. Maintenance manuals for the care and maintenance of products, materials, and finishes systems and equipment.
- B. See Divisions 2 through 16 Sections for specific operation and maintenance manual requirements for products in those Sections.

#### **1.3 SUBMITTALS**

- A. Manual: Submit 1 copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.
  - 1. Correct or modify each manual to comply with Architect's comments. Submit 3 copies of each corrected manual within 15 days of receipt of Architect's comments.

### **PART 2 - PRODUCTS**

#### **2.1 MANUALS, GENERAL**

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Name and address of Owner.
  - 4. Date of submittal.
  - 5. Name, address, and telephone number of Contractor.
  - 6. Name and address of Architect.
  - 7. Cross-reference to related systems in other operation and maintenance manuals.

- C. Table of Contents: List each product included in manual, identified by product name, indexed to content of volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
  - 1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
  - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
  - 4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## 2.2 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for type of emergency, emergency instructions, and emergency procedures.
- B. Type of Emergency: Where applicable, include instructions and procedures for each system, subsystem, piece of equipment, and component for fire flood gas leak water leak power failure water outage equipment failure and chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include instructions on stopping, shutdown instructions for each type of emergency, operating instructions for conditions outside normal operating limits, and required sequences for electric or electronic systems.

## 2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.

- B. Descriptions: Include the following:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Equipment identification with serial number of each component.
  - 4. Equipment function.
  - 5. Operating characteristics.
  - 6. Limiting conditions.
  - 7. Performance curves.
  - 8. Engineering data.
  - 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include startup, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
- D. Systems and Equipment Controls: Describe sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

#### 2.4 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations for inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

#### 2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in the manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment.
- D. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions, and demonstration and training videotape if available, that detail essential maintenance procedures.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

## PART 3 - EXECUTION

### 3.1 MANUAL PREPARATION

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
- F. Comply with Division 1 Section "Closeout Procedures" for the schedule for submitting operation and maintenance documentation.

END OF SECTION 01782

## SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Demolition and removal of selected portions of building or structure.
  - 2. Demolition and removal of selected site elements.

#### 1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

#### 1.3 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.

#### 1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.
- D. Predemolition Conference: Conduct conference at Project site.

#### 1.5 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.



- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
- D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

## 1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Arrange to shut off indicated utilities with utility companies.
  - 2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

### 3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

### 3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
  1. Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
  2. Demolition and Recycling – Contractor shall endeavor to recycle materials whenever possible. Salvage rights of any deconstructed materials are retained by Owner, though upon review, salvage rights may be granted to Contractor. Such materials to be evaluated might be copper wiring or cladding, various stainless steel materials like sinks, equipment or other

units that may have some value in surplus resale, but not considered of any use to for the Agency.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

### 3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

## SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.

#### 1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, and other pozzolans, ground granulated blast-furnace slag, and silica fume.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- C. ACI Publications: Comply with the following, unless more stringent provisions are indicated:
  - 1. ACI 301, "Specification for Structural Concrete."

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle steel reinforcement to prevent bending and damage.
  - 1. Avoid damaging steel reinforcement when placed on site.

### PART 2 - PRODUCTS

#### 2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
  - 1. Plywood, metal, or other approved panel materials.

- B. Form Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely effect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

## 2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Deformed –Steel Welded Wire Fabric: ASTM A 497, flat sheet.

## 2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
- B. Normal Weight Aggregate: ASTM C 33, uniformly graded, and as follows:
  - 1. Nominal Maximum Aggregate Size: Size: 1/2 inch.
- C. Water: Potable and complying with ASTM C 94.

## 2.4 CURING MATERIALS – NOT PERMITTED

## 2.5 CONCRETE MIXING

- A. Ready Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information.

# PART 3 - EXECUTION

## 3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.
- B. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
- C. Chamfer exterior corners and edges of permanently exposed concrete.

## 3.2 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

### 3.3 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Before placing concrete, water may be added at Project site, subject to limitations of ACI 301.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

### 3.4 FINISHING- FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.

### 3.5 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 305R.

### 3.6 JOINT FILLING

- A. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

### 3.7 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.
- B. Perform structural repairs of concrete, subject to Engineer/Engineer's approval, using epoxy adhesive and patching mortar.
- C. Repair materials and installation not specified above may be used, subject to Engineer/Engineer's approval.

### 3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control shall include pile caps, slabs, grade beams, pit walls, pavement, curbs and any other miscellaneous items not specified but integral to the work. Tests shall include compression tests, slump tests
- B. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

**END OF SECTION 03300**

SECTION 036300 - EPOXY GROUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Epoxy Grouting.
- B. Related Requirements:
  - 1. Section 036100 "Cementitious Grouting," for cementitious grouting.
  - 2. Section 042000 "Unit Masonry" requirements for grouting unit masonry.
  - 3. Section 042200 "Concrete Unit Masonry" requirements for grouting concrete unit masonry.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include material descriptions for each grout type.

1.4 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Material Certificates: For each type of grout indicating products are compatible and suitable for the specified application.
- B. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Holder of current ISO 9001 certificates as primary manufacturer of specified products.
- B. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.



- B. Store cementitious materials off the ground, under cover, and in a dry location.
- C. Store aggregates covered and in a dry location; maintain grading and other required characteristics and prevent contamination.
- D. Store grout materials at room temperature hours prior to use; 70 deg F is optimal.

## 1.7 FIELD CONDITIONS

- A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide listed grout products of The Euclid Chemical Co. or comparable product by one of the following:
  - 1. BASF Corporation, Construction Systems.
  - 2. Five Star Products, Inc.
  - 3. Quikrete
- B. Source Limitations: Obtain grout products from a single manufacturer through a single source.

### 2.2 EPOXY GROUTING

- A. Basis of Design Product: The Euclid Chemical Co.; E3-Deep Pour Grout with DL Technology™.
  - 1. Grout: High strength epoxy grout for deep pour applications.
  - 2. Compressive Strength: ASTM C 579, 2 inches cubes at 70 deg F, 50 percent RH):
    - a. Standard Unit:
      - 1) 28 days: 15,500 psi.
    - b. High Flow Mix:
      - 1) 28 days: 15,100 psi.
  - 3. Creep, ASTM C 1181 at 400 psi at 140 deg F:
    - a. Standard Unit: 28 days: 0.0023 in./in..
    - b. High Flow Mix: 28 days: 0.0027 in./in..
  - 4. Flexural Strength, ASTM C 580:
    - a. Standard Unit:
      - 1) 28 days: 4300 psi.
    - b. High Flow Mix:
      - 1) 28 days: 4250 psi.
  - 5. Tensile Strength, ASTM C 307:

- a. Standard Unit:
    - 1) 28 days: **2100 psi.**
  - b. High Flow Mix:
    - 1) 28 days: **2100 psi.**
  6. Bond to Concrete: Exceeds tensile and shear strength of base concrete.
  7. Chemical Resistance: Excellent resistance to most industrial chemicals.
  8. Maximum Thickness per Lift:
    - a. Standard Unit: Up to **18 inches.**
    - b. High Flow Mix: Up to **9 inches.**
  9. Early Age Height Change, ASTM C 827/C 827M at **90 deg F**:
    - a. Standard Unit: +0.66 percent.
    - b. High Flow Mix: +0.10 percent.
  10. Effective Bearing Area, ASTM C 1339:
    - a. Standard Unit: Greater than 95 percent.
    - b. High Flow Mix: Greater than 95 percent.
  11. Peak Exotherm, **3 x 6 inch** Cylinder (adiabatic):
    - a. Standard Unit: **99.6 deg F.**
    - b. High Flow Mix: **110 deg F.**
- B. Basis of Design Product: The Euclid Chemical Co.; E3-Flowable Grout with DL Technology™, Standard Unit (5-bag) Mix.
1. Grout: Gray, high-flow epoxy grout.
  2. Compressive Strength, ASTM C 579, **2 inches** cubes at **70 deg F**:
    - a. 28 days: **12,500 psi.**
    - b. Post Cured: **14,500 psi.**
  3. Creep, ASTM C 1181 at **400 psi** at **73 deg F**: **0.0031 in./in.** .
  4. Linear Shrinkage, ASTM C 531, 28 days: 0.02 percent.
  5. Flexural Strength, ASTM C 580:
  6. Tensile Strength, ASTM C 307, 28 days: **1900 psi.**
  7. Peak Exotherm, ASTM D 2471: **84 deg F** at 140 minutes.
  8. Effective Bearing Area, ASTM C 1339: Greater than 95 percent.
  9. Bond to Concrete, ASTM C 882/C 882M, 28 days: **3500 psi.**
  10. Chemical Resistance: Excellent resistance to most industrial chemicals.
- C. Basis of Design Product: The Euclid Chemical Co.; E3-Flowable Grout with DL Technology™, High Flow (4-bag) Mix.
1. Grout: Gray, high-flow epoxy grout.
  2. Compressive Strength, ASTM C 579, **2 inches** cubes at **70 deg F**:
    - a. 28 days: **12,500 psi.**
    - b. Post Cured: **13,500 psi.**
  3. Creep, ASTM C 1181 at **400 psi** at **73 deg F**: **0.0033 in./in.**..
  4. Linear Shrinkage, ASTM C 531; Specification: 28 days: 0.02 percent.
  5. Flexural Strength, ASTM C 580:
    - a. 28 days: **3900 psi.**
    - b. Post Cured: **4000 psi.**
  6. Tensile Strength, ASTM C 307: 28 days: **1900 psi.**
  7. Peak Exotherm, ASTM D 2471: **96 deg F** at 162 minutes.
  8. Effective Bearing Area, ASTM C 1339: Greater than 95 percent.
  9. Bond to Concrete, ASTM C 882/C 882M: 28 days: **1500 psi.**

10. Chemical Resistance: Excellent resistance to most industrial chemicals.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
  2. Verify that substrates are free of substances that impair grout bond.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Preparing Concrete Substrates for Grouting: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with grout.
  1. New concrete to be a minimum of 28 days old.
  2. Mechanically abrade surfaces in accordance with manufacturers recommendations using a scabblers, bushhammer, shotblast, or other suitable equipment to give a minimum surface profile of CSP 5-7 in accordance with ICRI Guideline 310.2, exposing the coarse aggregate of the concrete.
  3. Completely remove residue using a vacuum cleaner.
  4. Verify concrete is completely dry.
  5. For existing concrete, prepare concrete surfaces in accordance with manufacturer's written instructions.
- B. Preparing Steel Substrates for Grouting: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 10/NACE No. 2, "Near-White Metal Blast Cleaning." Apply grout immediately to prevent re-oxidizing.
- C. Clean and prepare substrates of substances for bonding grout.
  1. Concrete to be clean and rough.
- D. Anchor Bolt Holes and Blockouts:
  1. Clean holes and blockouts of dust, dirt and debris and allow to dry.
  2. If sides of holes and blockouts are smooth, roughen with a stiff bristle wire brush or with a rotary brush hammer.
- E. Form Preparation:
  1. Assemble forms liquid tight and braced.

2. Set forms a minimum **1 inch** higher than bottom of baseplate.

### 3.3 INSTALLATION OF EPOXY GROUT

- A. General: Comply with requirements in Drawings, approved shop drawings, and manufacturer's written instructions.
- B. Mixing: Mix multiple components of epoxy grout thoroughly in proper order and with equipment recommended by manufacturer and place immediately.
- C. Placement: Place grout in accordance with manufacturer's written instructions.
  1. Pour into anchor bolt holes and blockouts through a funnel or directly if space permits.
  2. When grouting plates, pour grout into the headbox and allow to flow under the plate.
  3. Pre-placed straps under the plate aid in working the grout across.
  4. Place grout at a minimum **1 inch** thick per lift and maximum **18 inches** thick per lift when placed in a large mass.
- D. Finish: Finish grout in accordance with manufacturer's written instructions.
  1. If a smooth finish is desired, the surface of the grout may be brushed and troweled with a light application of manufacturer's recommended solvent.
- E. Cleanup: Tools and mixer may be cleaned with manufacturer's recommended solvent.

### 3.4 CLEANING

- A. Clean tools and mixer with water.

END OF SECTION 036300

## **SECTION 040120 - MASONRY RESTORATION AND CLEANING**

### **PART 1 - GENERAL**

#### **1.1 GENERAL REQUIREMENTS**

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.
- B. Work shall comply with local building codes and governing agencies having jurisdiction. Where governing codes are in conflict with these specifications, comply with the more stringent requirements.

#### **1.2 SUMMARY**

- A. Work of this Section includes all labor, materials, equipment, and services necessary to perform operations in conjunction with the exterior wall restoration work covered by this Contract, complete, in accordance with the Drawings, Specifications, General and Supplementary Conditions, and codes of governing agencies having jurisdiction, including but not limited to the following:

- 1. Tuckpointing all like stone mortar joints.
- 2. Repairing of stone surfaces
- 3. Cleaning all surfaces.
- 4. Application of cementitious waterproofing to limestone surfaces

- B. RELATED SECTIONS

- 1. Sealants - Section 07 92 00

#### **1.3 REFERENCES**

- A. All work shall comply with the codes and standards referenced below, unless a more stringent requirement is given in the specification. In the event of conflict, the most stringent requirements shall govern. The most recent codes and standards shall apply, unless otherwise noted:

- 1. Latest standards and recommendations of ASTM, ACI, and Local Building Code.
- 2. Indiana Limestone Institute of America, Inc. Handbook

3. National Park Service Cultural Resources Preservation Briefs 2, "Repointing Mortar Joints in Historic Masonry Buildings," revised edition October 1998.
4. The Society for Protective Coatings (SSPC)
5. U.S. General Services Administration "General Cleaning of Exterior Limestone", August 2017.
6. U.S. General Services Administration "Repointing Masonry Using Lime Mortar", January 2018.
7. German Mortar WTA Guidelines and Test Standards.

#### **1.4 PRE-INSTALLATION MEETINGS**

- A. Prior to the start of Work, meet at the Project site to review methods and sequence of Work, special details and conditions, standard of workmanship, and other pertinent topics related to the Work.

#### **1.5 SUBMITTALS**

- A. Product Data: Submit manufacturers' technical data for each product required, including instructions for preparation and application.
- B. Material Safety Data Sheets: Submit manufacturers' safety data sheets for each product required.
- C. Samples:
  1. Before purchasing stone, submit samples of the following:
    - a. Furnish representative samples for limestone, include no less than three six by six inch by four inch samples for each type of stone, exhibiting extremes of the full range of color and other visual characteristics expected in completed Work.
    - b. The samples shall be finished to match that of existing stone on the building.
  2. Each type of chemical cleaning material data.
  3. Each type of stone masonry patching compound in form of briquettes, at least three inches long by 1-1/2 inches wide. Document each sample with manufacturer and stock number or other information necessary to order

additional material.

- F. Certificates: Prior to delivery, submit certificates attesting compliance with the applicable specifications for grades, types or classes included in these specifications.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: All patch repairs must be performed by a mechanic who obtained a Training Workshop Certificate from the Cathedral Stone, or similar. Contractor shall maintain proof of this credential for each installer at the site at all times. The mechanic must have a record of successful stone patching for at least five years.
- B. Source of Materials: Obtain materials from a single manufacturer for each different product.
- C. Field Mock-ups:
1. Repointing: Prepare sample area of approximately four feet high by four feet wide for each type of repointing required to demonstrate methods and quality of workmanship expected in pointing mortar joints. The intent of the new pointing work is to match cleaned existing mortar. Newly pointed areas shall be consistent with existing adjacent mortar joints for color and texture.
  2. Contractor shall mock-up a section of cleaning and repointing approximately 150 sq. ft in area at the area adjacent to the electrical supply in the parking lot area for review and approval by the architect.
  3. Contractor shall mock-up section of limestone repair to demonstrate methods and quality of workmanship expected in filling cracks and holes in limestone for review and approval by the architect.
  4. Mockups shall be completed at the site in an area scheduled to be determined. Erect samples in area selected by the architect, and in the presence of the architect's representative before installation of materials.
  5. When required, provide additional and separate samples for each condition to be determined when requested by architect.
  6. Do not start work until the architect has accepted each different sample.
  7. Use samples as standard of comparison for all work built of same material and configuration.

8. Do not destroy or move samples until all work is completed and accepted by the architect. Upon acceptance, the samples may become part of the completed work.
  
- D. Quality Assurance Manager: Installer shall develop a Quality Assurance program managed by an on-site quality assurance manager, who shall be designated at the pre-construction conference. The quality assurance program shall include daily forms for completion by field personnel documenting the application of the assembly. The quality assurance manager shall coordinate site documentation with the third-party inspectors and the building envelope consultant. Documents shall be posted daily for a quality audit by the building envelope consultant and commissioning agent.

## 1.7 PROJECT CONDITIONS

- A. Environmental Conditions:
  1. Cold Weather Requirements: Do not work in temperatures below 40°F, when the substrate is colder than 40°F, or when temperature is expected to fall below 40°F for 48 hours after installation of repair mortars. Building an enclosure and heating areas to maintain this temperature may only be done with the written approval of the material Manufacturer. Remove work exposed to lower temperatures as directed by the architect.
  2. Hot Weather Requirements: Protect repair mortar from direct sunlight and wind using protection measures submitted and approved when the ambient air temperature exceeds 70° F. Do not use or prepare mortar when ambient air temperature is above 85° F at the location of the work.
  3. Patching: Patch stone only when air and surface temperatures are between and 40 and 85 deg F and are predicted to remain above 40 deg F for at least 7 days after completion of work. On days when air temperature is predicted to go above 85 deg F, schedule patching work to coincide with time that surface being patched will be in shade or during cooler morning hours.
  
- B. General: Examine facade elements, substrates, support, and condition under which the Work is to be performed and notify the architect in writing of conditions detrimental to the proper completion of the Work. Do not proceed with work until unsatisfactory conditions are corrected.
  
- C. Unanticipated Conditions: Where conditions are uncovered that are not anticipated by the Drawings and Specifications, notify the architect immediately before repairs are initiated.



- D. Contractor is not to perform repairs at areas of discrepancies until receipt of appropriate repair for the location in writing from the architect. Proceeding with repairs at these locations without description from the architect is entirely at the risk and cost of the contractor.
- E. Precautions: Apply epoxies only to dry surfaces meeting the manufacturer's recommendations for surface preparation and working temperatures. Apply epoxies to surfaces free of moisture, dirt, organic materials, efflorescent salts, and other contaminants.
- F. Protection of work:
1. Provide protection and cover for work area during rain. No work will be allowed to proceed if protective coverings are not provided.
  2. Cover area being worked on with strong waterproof membrane at the end of each day or shutdown.
  3. Cover open and partially completed areas when work is not in progress.
  4. Extend protective covering a minimum of 24 inches beyond work area in all directions.
  5. Staining: Prevent grout or mortar from staining the face of masonry to be left exposed or adjacent surfaces of existing construction. Remove immediately grout and mortar that come in contact with such surfaces. Protect all sills, ledges, metal accessories and projections from mortar droppings.
- G. Protection Of Fresh Mortar Repairs:
1. Mist new mortar repairs with water for a duration of at least 3 minutes at the end of the day of initial installation.
    - a) During hot weather (greater than 70 degrees Fahrenheit) thoroughly dampen the repair area with water mist a minimum of two or three times per day for the first 3 days following installation.
    - b) Care should be exercised on stone surfaces to avoid water run-off from the face of the stone oversaturating the mortar joints.
  2. Protect newly repaired areas from direct sun and winds for the first (3) days after installation.
    - a) During hot weather (greater than 70 degrees Fahrenheit) protect freshly repaired areas with burlap or plastic sheeting for the first 24 hours after installation.
    - b) If plastic sheeting is used, it should never come into direct contact with the mortar during initial curing and until fully set. It can be hung 3-4" clear of the work.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.
- B. Protect masonry restoration materials during storage and construction from wetting by rain, snow, or ground water, and from staining or intermixture with earth or other types of materials.
- C. Protect grout, mortar, and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

## 1.9 SEQUENCING

- A. Perform masonry restoration work in the following sequence:
  - 1. Remove damaged base limestone trim at base of wall where damaged. Measure for dimensions of base limestone for replacement.
  - 2. Clean stone.
  - 3. Rake-out existing mortar, sealant and backer rod from all joints indicated to be repointed.
  - 4. Repoint existing mortar joints of masonry indicated to be restored.
  - 5. Install new base limestone trim.
  - 6. Replace all sealants at windows and penetrations. (See section 079200)

## 1.10 DESIGN RESPONSIBILITY

- A. Contract Documents define design intent and performance requirements. Elevations and details show approximate dimensions only. Contractor is responsible for field measurements and verification of existing conditions, certificates, permits, filing, and related documentation.

Quantities for masonry repairs have been estimated only. Contractor to submit unit prices for each type of repair. Repair type and unit prices shall be determined prior to commencement of work.

- B. Architect will perform survey of the exterior wall to identify type, location, and scope

of masonry repairs to establish the criteria of masonry repairs to be installed as required. Contractor will provide time, men and access for survey as required.

## 1.11 WARRANTY

- A. Provide written warranty agreeing to repair or replace, at no cost to owner, defective materials, and workmanship for two (2) years from the Date of Substantial Completion. Defective materials and workmanship shall include, but are not limited to:
1. Discoloration of existing substrates.
  2. Defective repairs: Areas that become loose, crack, or otherwise fail to perform as required.
  3. Deterioration of adjacent surfaces including glass, gaskets, sealants aluminum substrates, etc.
  4. Water and/or Air Leakage as a result of such deterioration.
  5. Efflorescence at areas of repair.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Obtain materials from a single source for each type of material required (stone, sand, cement, etc.) to ensure match of quality, color, pattern and texture.
- B. Compatibility: Select materials of proven compatibility with other materials with which they will be in contact with, under conditions of installation and service, as demonstrated by testing and field experience. Where requested, submit manufacturer certification that materials are compatible.

### 2.2 CLEANING MATERIALS AND EQUIPMENT:

- A. For Limestone:
1. ProsoCo Sure Klean Limestone Restorer
- B. For spot problem stains and heavy stains, where required:
1. Product: Subject to compliance with requirements, provide "Sure Leak Limestone Restorer", "766 Limestone and Masonry Prowash", ProSoCo, Inc.

- C. Water for Cleaning: Clean, potable, free of oils, acids, alkalis, salts, and organic matter.
  - 1. Warm Water: Heat water to temperature of 140 deg.F-180 deg.F (60 deg.C-82 deg.C).
- D. Brushes: Tampico brush.
- E. Spray Equipment: Provide equipment for controlled spray application of water and chemical cleaners, if any, at rates indicated for pressure, measured at spray tip, and for volume. Spray application shall be at pressures not exceeding 50 psi.
  - 1. For spray application of chemical cleaners provide low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray-tip (<50 psi).
  - 2. For spray application of water provide fan-shaped spray-tip which disperses water at angle of not less than 15 degrees.

### 2.3 MASONRY MATERIALS:

Materials shall be the following or approved alternates as determined by the Architect.

- A. Mortar Materials:
  - 1. Jahn M70 Limestone Repair Mortar, Cathedral Stone Products, Inc.
    - a. Mix mortars in strict compliance with manufacturer's installation instructions.
      - 1) The mixing ratio is approximately 5 to 5 ½ parts powder to 1 part water by volume, depending on temperature and humidity. More water may be required as ambient temperature rises. The mixing may be done by hand, stirring until the mortar is thoroughly mixed. The mortar should be the consistency of damp sand. M70 may also be mixed using a slow speed drill (400 -600 rpm) equipped with a Jiffiler-type mixing paddle. For best results, add the powder to the water slowly. The working time will vary, depending upon wind, temperature, and humidity.
    - b. Mortar shall meet or exceed German WTA Guidelines and Test Standards.
    - c. Compressive strength dry 2600 to 3200 PSI, Water absorption 16%.
    - d. Watch size, texture and gradation as closely as possible.
    - e. Colored pigment shall match current elements as closely as possible. Standard colors S2LS or S3LS are most likely color matches. No custom colors needed.

- f. Provide mock-up for architect and sub-consultant review.

B. Stone Adhesive:

1. LATAPOXY 310 Stone Adhesive; Laticrete; A two component, high strength epoxy adhesive, formulated for spot bonding method of tile and stone installations on vertical surfaces. Maintains non-sag consistency at high temperatures up to 95°F (35°C).
  - a. Store resins at room temperature (>70°F [>21°C]) for 24 hours before using.
  - b. Mix in strict compliance with manufacturer's installation instructions.
    - 1) Combine equal volumes of LATAPOXY 310 Stone Adhesive Part A and Part B (1:1 mix ratio by volume). Mix until uniform in color; no swirls. Small quantities can be mixed with a putty knife or margin trowel. Larger quantities can be mixed with an electric drill mixer (low speed).
    - 2) Provide mock-up for architect and sub-consultant review.
  - c. Compressive strength (ANSI A118.3-5.6) 8300–8450 psi.

C. Point Mortar Mixes:

1. BioLine Pointing Mortar; preformulated, pre-blended lime based pointing mortar.
  - a. Mix mortars in strict compliance with manufacturer's installation instructions.
    - 1) BioLime Pointing Mortar is a pre-blended product and requires only mixing with water on the jobsite. BioLime Pointing Mortar requires 6 quarts of water per 45 Lb bag. (Use manufacturer's measuring bucket). Mix the product with a heavy duty mortar mixing drill equipped with proper mixing paddle. BioLime recommends the use of a 2-speed drill with low torque capacity, such as a Milwaukee 1/2" Hole-Hawg® Drill 300/1200 RPM and the BioLime 4.5" helical mixing paddle.
      - a) Fill the plaster manufacturer's measuring bucket with clean water to the referenced product margin line.
      - b) In a clean six-gallon plastic bucket, pour half of the measured water.
      - c) While stirring the water at low RPM, add plaster from the bag at a rate to prevent clumping of the material. Continue adding water from the measuring bucket and dry plaster until bag is empty.

- d) Once the dry powder is wetted, mix for additional 3 minutes maximum. Allow to rest five minutes to fully hydrate and then stir to relax the batch. Over-mixing plaster will cause loss of strength. Keep bucket covered to extend working time to about one hour.
  - e) Make sure to avoid mixing times exceeding three minutes as a significant drop in strength can occur.
- b. Mortar shall meet or exceed German WTA Guidelines and Test Standards.
  - c. Compressive strength 28 days 411 PSI. Water vapor transmission (ASTM D1653) 112 perm. Density (ASTM D1475) 1.63 glcc.
  - d. Watch size, texture and gradation as closely as possible.
  - e. Colored pigment shall be natural and synthetic iron oxides and chromium oxides blended specifically for use in mortar mixes. Colors shall be exclusively from mortar mix supplier.
  - f. Measurement and Mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials at low speed with a 4.5-inch helical mixing paddle.
  - g. Colored Mortar: Produce mortar of color required by use of selected ingredients. Do not adjust proportions without Architect's approval.

#### **2.4 CEMENTITIOUS WATERPROOFING:**

- a. SikaTop Seal 107 Two-component, polymer-modified, cementitious waterproofing, and protective slurry mortar for concrete. Flexible application to tolerate fine cracks and suitable for exterior applications.

#### **2.5 LIMESTONE:**

- A. Replacement and new limestone must match original limestone in size, type, color, appearance, and composition. Samples shall be submitted to architect for review and approval. Samples shall be in full element sizes.

## **PART 3. EXECUTION**

### **3.1 GENERAL REQUIREMENTS**

- A. Inspection: Contractor shall inspect areas prior to work commencement and report conditions, which may be detrimental to work, specified to be performed. Do not proceed until directed by Owner.

### **3.2 MASONRY CLEANING**

A. PREPARATION

1. General: Comply with recommendations of manufacturers of chemical cleaners for protecting building surfaces against damage from exposure to their products.
2. Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site, mask windows, window frames and window decorations.
3. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings and other surfaces, which could be injured by such contact.
4. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
5. Dispose of run-off from cleaning operations by legal means and in manner which prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
6. Erect temporary protection covers over pedestrian walkways and at points of entrance and exit for persons and vehicles, which must remain in operation during course of masonry restoration work. All protective coverings shall be reviewed with building occupants prior to any installation. Building access shall not be limited without 48 hours' notice.
7. Protect glass and unpainted metal trim from contact with chemical cleaners by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape. Apply masking agent to comply with manufacturer's recommendations. Do not apply liquid masking agent to painted or porous surfaces.
8. If lead point is encountered removal shall be in compliance with all Local, State and Federal environmental regulations.

B. Chemical Cleaner Application Methods:

1. General: Apply chemical cleaners to stone surfaces to comply with chemical manufacturer's recommendations using brush and spray application methods, at Contractor's option, unless otherwise indicated. Do not allow chemicals to remain on surface for periods longer than that indicated or recommended by manufacturer.

### **3.3 REPOINTING PREPARATION**

#### **A. Preparing the Joints:**

1. Clean area of loose dirt and debris using a stiff bristle brush and remove all extraneous fastenings and devices.
2. Install necessary protection of adjacent building materials, property and persons from joint cleaning work and dirt.
3. Control dust and dirt from raking work; dampen area being worked; and use curtains to limit spread of dust from joint raking and cutting operations.

#### **B. Joint Raking:**

1. Cut and rake old mortar from existing joints by hand using a hammer and chisel to depths equal to 2-1/2 times their widths but not less than 3/4" nor less than that required to expose sound, unweathered mortar. While raking out joints, remove all metal fittings such as nails, brackets, all backer rods, and clips on both horizontal and vertical surfaces. NOTE: POWER CHISELS AND POWER SAWS SHOULD NOT BE USED.
2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose stone for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris. Aggitate surface with brush before final flush.
3. Do not spall edges of masonry units or widen joints. Repair any stone edges, which become damaged with Cathedral Stone Limestone Repair Mortar to match existing color. Provide a color sample at cleaned stone for architect approval.
4. Cut out old mortar by hand with chisel and mallet, unless otherwise indicated. CAUTION: AVOID OVERCUTTING ENDS OF VERTICAL JOINTS, WIDENING JOINTS OR CUTTING INTO BEDDING FACES OF MASONRY UNITS.
5. Power operated rotary hand saws and grinders will be permitted but only on specific written approval of Architect based on submission by Contractor of a satisfactory quality control program and demonstrated ability of operators to use tools without damage to stone. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.



### 3.4 REPOINTING EXISTING MASONRY

Installation to be performed according to approved Mock-Up and Project Documents.

#### A. Joint Pointing:

1. Ensure surface is free of construction dust and debris or loose particulate.
2. Prewet masonry surfaces relative to their absorbency. Highly absorbent surfaces require more hydration. Once water has evaporated from surface, with substrate holding and retaining moisture, application may begin. NOTE: THERE SHOULD BE NO FREE WATER PRESENT WHICH MAY CAUSE VOIDS IN THE MORTAR.
3. Apply mortar with even distribution to a maximum 3/4-inch layer thickness. Trowel surface smooth and in plane, or as desired. NOTE: THE POINTING TOOL SHOULD BE ABOUT 1/16" NARROWER THAN THE JOINT BEING FILLED TO ACHIEVE GOOD COMPACTION. IN SOME CASES, THE JOINTS WILL BE SO THIN THAT A STANDARD POINTING TOOL WILL NEED TO BE GROUND DOWN TO FIT THE JOINT.
4. CURING:
  - a. CURE CYCLE: A cure cycle begins when the entire surface is dry, then hydrated. This technique ensures the "active" pozzolans in the mortar bond together as a whole, hardening in the process.
  - b. For every 1/8" (3mm) of thickness, moisture-cure for 2 (two) cycles by flooding entire surface with cool, clean water at 0 PSI (no pressure).
  - c. PROCEDURE:
    - 1) Begin the first cure cycle using "appearance-based determination" for each mortar layer.
    - 2) As applied mortar dries, the appearance changes from dark to light. When dark, it is visibly damp. As water evaporates from the layer, it becomes lighter in contrast to the damp areas. In mid-transition between damp and dry, the surface appears mottled. Once mottling disappears and the entire surface area is dry, the moisture-curing cycles can begin by hydrating the surface.
    - 3) Weather conditions and mortar layer thickness affect how quickly the mortar transitions from damp to dry. In dry weather, moisture-curing cycles might begin the day of application while in humid weather the cycles might start the following day. Appearance-based determination ensures proper sequencing of the moisture-curing coats for each

applied layer of mortar.

- 4) Once moisture-curing begins, flood all surfaces including terminations at soffits, inside and outside corners, and window/door returns with clean water. This constitutes one moisture-curing cycle. Moisture-curing cycles continue based on layer thickness.
- 5) Owner shall have the right to perform periodic tests to verify depth of repointing. Contractor shall repair with like materials area where mortar has been removed to ascertain depth of repointing.

### 3.5 REPAIR EXISTING LIMESTONE

Installation to be performed according to approved Mock-Up and Project Documents.

#### A. Broken Water Table Stone

Installation to be performed according to approved Mock-Up and Project Documents.

1. Drill down to bare stone. Clean and grind back of stone at areas to receive adhesive using a mechanical wheel grinder with a diamond wheel/blade.
2. Apply dabs of LATAPOXY 310 Stone Adhesive evenly distributed on back of the stone or tile: five dabs minimum, one in each corner and one in center. Cover at least 10% of the area of each piece. Finished dab thickness must be a minimum of 1/8 inch, maximum of one inch. Units shall not exceed two inches. Facial dimensions not to exceed 720 inches and no greater than 36 inches along any edge or dimension.
3. Final drilling to be through the substrate before the anchor is installed.
4. Anchors are to be installed where the stone is not fully bonded. 14 anchors as an allowance over and above those for the water table.

#### B. Fill Existing Cracks/Holes in Limestone:

1. Moisten the substrate using clean water. Jahn Mortar should be applied to a glistening wet surface on vertical applications and a well-dampened surface (with no pooling water) on horizontal applications. If the surface is allowed to dry out before applying M70, this step must be repeated.
2. The Jahn mortar should be mixed with water to the consistency of wet putty. Apply the "Peanut Butter" coat to the glistening wet substrate approximately 1/8 inch thick. To achieve proper bond, the coat must not dry out prior to application of Jahn Mortar (5:1) mix.

3. Build the material out beyond the surface of the original stone. After achieving initial set, scrape away excess mortar until the desired profile is reached. Due to the effects of heat, humidity, and wind on the final color, the waiting period for scraping should be determined on the job.
4. When repairing horizontal surfaces using this product, apply material flush to the surface and finish to a tight steel troweled finish, float, or broom to achieve a textured effect.
5. Curing:
  - a. Periodically mist M70 repairs using clean water for at least a 72-hour period. The timing for initial water misting will vary with ambient conditions. Hot, dry conditions may require misting within 30 to 60 minutes. Cooler, damp conditions may require waiting several hours before beginning the curing process. Mist several times a day. Should access to the repairs be impossible over a period of time, plastic may be used to cover them temporarily. The application of plastic, however, does not remove the need for normal curing techniques. No curing is necessary when masonry surface temperature is 85°F or lower. When working on surface temperatures above 85°F, follow the Traditional Cure procedures outlined above.

### **3.6 CEMENTITIOUS WATERPROOFING**

- a. SikaTop® Seal 107 can be applied by trowel, notched trowel, stiff bristle, or spray equipment. Work the material well into the prepared substrate, filling all pores and voids. For brush consistency: Apply the first coat of cementitious waterproofing with horizontal brush strokes and leave to harden (4 to 8 hours). Apply the second coat with vertical brush strokes.

For trowel consistency: Apply the first coat with a notched trowel and leave to harden (4 to 8 hours). Apply the second coat with a flat trowel.

### **3.7 ADJUSTING/CLEANING**

#### **A. Cleaning Up:**

1. Use masking and drop cloths to prevent mortar stains on adjacent work and ledges.
2. Keep work areas clean and free from mortar drips, spills, and residue of waste mortars or wash-off.
3. Clean off excess mortar as work proceeds using masonry brushes before mortar sets.

4. Wash completed repointing work when finished mortar joints are set with clean water and masonry brushes, scrubbing only as required to clean mortar stains off masonry without scouring the units and joint faces.
5. Do not use acid or detergent cleaning agent to aid mortar removal and clean-up without written approval from RHPO.

B. Curing:

1. Schedule work only when moderate weather is forecast.
2. Protect completed work from adverse weather, heavy rainfall, freezing, and drying by direct sunlight and winds until cured.
3. Sprinkle or mist repointed work as required to achieve cure in mortar joints for a minimum of 72 hours after completion.
4. Lime Mortar: Cures by drying and crystallization, not by hydration; and can be washed out of joints if not protected before it cures.

C. Final Cleaning:

1. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter using stiff nylon or bristle brushes and clean water spray applied at low pressure. NOTE: USE OF METAL SCRAPERS OR BRUSHES IS NOT PERMITTED. USE OF ACID OR ALKALI CLEANING AGENTS IS NOT PERMITTED.

D. Some efflorescence, called new construction "bloom," occasionally appears on the surface within the first few months following a repointing project. These deposits normally are harmless and are removed by the natural washing of the rain. If not removed by natural weathering, they can be removed with dry brushing with a bristle brush. The use of chemical cleaners to remove this type of efflorescence normally is not necessary. AVOID USING ACIDS, PARTICULARLY MURIATIC ACID after placement of mortar.

E. Testing and Inspection to be approved by architect and sub-consultant review.

**END OF SECTION**

SECTION 050170.51 - DECORATIVE METAL CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes decorative metal cleaning as follows:
  - 1. Cleaning metal.
  - 2. Removing corrosion.
- B. Related Requirements:
  - 1. Section 013516 "Alteration Project Procedures" for general remodeling, renovation, repair, and maintenance requirements.

1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."
  - 1. Unit prices apply to authorized work covered by estimated quantities.
  - 2. Unit prices apply to authorized additions to and deletions from the Work as authorized by Change Orders.

1.4 DEFINITIONS

- A. Low-Pressure Spray: 100 to 400 psi ; 4 to 6 gpm .
- B. Medium-Pressure Spray: 400 to 800 psi ; 4 to 6 gpm .
- C. High-Pressure Spray: 800 to 1200 psi ; 4 to 6 gpm .

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site .

## 1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include recommendations for product application and use.
  - 2. Include test data substantiating that products comply with requirements.

## 1.7 INFORMATIONAL SUBMITTALS

## 1.8 QUALITY ASSURANCE

- A. Decorative Metal Cleaning Specialist Qualifications: A qualified decorative metal cleaning specialist. Cleaning specialist shall be experienced in using mechanical and chemical methods on the types of metal surfaces indicated.
  - 1. Single Specialist: Subject to compliance with requirements, engage the same specialist firm to perform the work of Section 050170.61 "Decorative Metal Repair" Section 050170.63 "Decorative Metal Refinishing" and the work of this Section.

## 1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with decorative metal cleaning only when existing and forecasted weather conditions are within the environmental limits set by each manufacturer's written instructions and specified requirements.

## PART 2 - PRODUCTS

## 2.1 CLEANING MATERIALS

- A. Water: Potable.
- B. Hot Water: Water heated to a temperature of 140 to 160 deg F.
- C. Detergent Solution, Job Mixed: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate (TSPP), 1/2 cup of laundry detergent, and 20 quarts of hot water for every 5 gal. of solution required.
- D. Nonacidic Liquid Chemical Cleaner: Manufacturer's standard mildly alkaline liquid cleaner, formulated for removing organic soiling from ordinary building materials, including polished stone, brick, copper, brass, bronze, aluminum, stainless steel, plastics, wood, and glass.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. American Building Restoration Products, Inc.
    - b. Dumond Chemicals, Inc.

E. Abrasive Materials:

1. Abrasives for Ferrous Metal Cleaning: Aluminum oxide paper, emery paper, fine steel wool, steel scrapers, and steel-wire brushes of various sizes.

2.2 MISCELLANEOUS MATERIALS

A. Masking Tape: Nonstaining, nonabsorbent material; compatible with chemical solutions being used and substrate surfaces; and that will easily come off entirely, including adhesive.

B. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:

1. Previous effectiveness in performing the work involved.
2. Little possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could do the following:
  - a. Remove, alter, or in any way harm the present or future condition of existing surfaces, including surrounding surfaces not in the Contract.
  - b. Leave an unintended residue on surfaces.

PART 3 - EXECUTION

3.1 DECORATIVE METAL CLEANING SPECIALIST

A. Decorative Metal Cleaning Specialist Firms: Subject to compliance with requirements, :

1. .

3.2 PROTECTION

A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical solutions being used unless products being used will not damage adjacent surfaces. Use protective materials that are waterproof and UV resistant. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Do not apply chemical solutions during winds of sufficient force to spread them to unprotected surfaces.
3. Neutralize alkaline and acid wastes before disposal.

4. Dispose of runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

### 3.3 DECORATIVE METAL CLEANING, GENERAL

- A. Execution of the Work: In cleaning items, disturb them as minimally as possible and as follows:
  1. Remove deteriorated coatings and corrosion.
  2. Sequence work to minimize time before protective coatings are reapplied.
  3. Clean items in place unless otherwise indicated.
- B. Mechanical Coating Removal: Use gentle methods, such as scraping and wire brushing, that will not abrade metal substrate.
- C. Repaint: Where indicated, prepare painted decorative metal by cleaning surface, removing less than firmly adhered existing paint, sanding edges smooth, and priming for painting as specified.

### 3.4 CLEANING

- A. General: Use those methods indicated for each type of decorative metal and its location.
  1. Brushes: If using wire brushes, use brushes of same base metal composition as metal being treated. Use brushes that are resistant to chemicals being used.
  2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that spray methods do not damage surfaces.
    - a. Equip units with pressure gages.
    - b. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with nozzle having a cone-shaped spray.
    - c. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.
    - d. For high-pressure water-spray application, use fan-shaped spray that disperses water at an angle of at least 40 degrees.
    - e. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.
  3. Uniformity: Perform each cleaning method in a manner that results in uniform coverage of all surfaces, including corners, contours, and interstices, and that produces an even effect without streaks or damaging surfaces.
  4. Protection: After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.
- B. Detergent Cleaning:
  1. Wet surface with hot water applied by low-pressure spray.
  2. Scrub surface with detergent solution and natural-fiber or plastic-bristle brush until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil



from joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet.

3. Rinse with hot water applied by low -pressure spray to remove detergent solution and soil.
4. Repeat cleaning procedure where needed to produce cleaning effect established by mockup.

C. Nonacidic Liquid Chemical Cleaning: Apply chemical cleaner to surfaces according to chemical-cleaner manufacturer's written instructions.

1. Wet surface with hot water applied by low-pressure spray.
2. Apply cleaner to surface in two applications by brush or low-pressure spray.
3. Let cleaner remain on surface for period recommended in writing by chemical-cleaner manufacturer .
4. Ferrous Metals: Do not rinse ferrous metals with water; neutralize chemical cleaner on ferrous metals as recommended in writing by manufacturer. Dry immediately with clean soft cloths. Follow direction of grain in metal.
5. Repeat cleaning procedure where needed to produce cleaning effect established by mockup. Do not repeat more than once.

END OF SECTION 050170.51

## SECTION 050170.63 - DECORATIVE METAL REFINISHING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes refinishing bare decorative metal surfaces as follows:
  - 1. Refinishing metal in place.
  - 2. Removing metal for shop refinishing; reinstalling refinished metal.
  - 3. Integral metal finishes.
  - 4. Clear protective coatings.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include recommendations for product application and use.
  - 2. Include test data substantiating that products comply with requirements.
- B. Shop Drawings:
  - 1. Include plans, elevations, and sections showing locations and extent of refinishing work.
  - 2. Include field-verified dimensions.
- C. Samples for Initial Selection: For the following:
  - 1. A range of each type of exposed finish prepared on metal of the same alloy matching existing metal.
- D. Samples for Verification: For the following products in manufacturer's standard sizes unless otherwise indicated, finished as required for use in the Work:
  - 1. Each type of exposed finish prepared on metal of the same alloy matching existing metal; 6 inches (150 mm) long in least dimension.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For decorative metal refinishing specialist.

- B. Warranty: Sample of special warranty.

## 1.5 QUALITY ASSURANCE

- A. Decorative Metal Refinishing Specialist Qualifications: A qualified decorative metal refinishing specialist.
  - 1. Single Specialist: Subject to compliance with requirements, engage the same specialist firm to perform the work of [Section 050170.51 "Decorative Metal Cleaning"] [Section 050170.61 "Decorative Metal Repair"] and the work of this Section.
- B. Mockups: Prepare mockups of decorative metal refinishing processes[ on existing surfaces] to demonstrate aesthetic effects and to set quality standards for materials and execution. Prepare mockups so they are inconspicuous.
  - 1. Waxing Bronze: Wax a cleaned area [approximately 2 sq. ft. (0.2 sq. m)] [as indicated on Drawings] <Insert dimension> of [each type of] bronze [sculpture] [paneling] [and] [hardware] <Insert item description>.
  - 2. Refinishing Decorative Metal: Refinish [one] <Insert number> decorative <Insert item description> for each type of metal indicated to be refinished.
  - 3. Repairing Decorative Metal Finish: Repair finish of [one] <Insert number> decorative <Insert item description> for each type of metal finish indicated to be repaired.
  - 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Pack, deliver, and store decorative metal items in suitable packs, heavy-duty cartons, or wooden crates; surround with sufficient packing material to ensure that products are not deformed, cracked, or otherwise damaged.
- B. Store decorative metal inside a well-ventilated area, away from uncured concrete and masonry and protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity.
- C. Protect strippable protective covering on decorative metal from exposure to sunlight and high humidity, except to the extent necessary for the period of decorative metal installation.

## 1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with decorative metal refinishing only when existing and forecasted weather conditions are within the environmental limits set by each manufacturer's written instructions and specified requirements.

## PART 2 - PRODUCTS

### 2.1 PREPARATORY CLEANING MATERIALS

- A. Water: Potable.
- B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).
- C. Detergent Solution, Job Mixed: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium pyrophosphate (TSP), 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.
- D. Nonacidic Liquid Chemical Cleaner: Manufacturer's standard mildly alkaline liquid cleaner, formulated for removing organic soiling from ordinary building materials, including polished stone, brick, copper, brass, bronze, aluminum, stainless steel, plastics, wood, and glass.
- E. Abrasive Materials:
  - 1. Abrasive Pads for Copper-Alloy Cleaning: Extra-fine bronze wool or plastic abrasive pads.
  - 2. Blasting Abrasive: [Pulverized walnut shells] [Powdered aluminum silicate] <Insert material>.
  - 3. Abrasives for Ferrous Metal Cleaning: Aluminum oxide paper, emery paper, fine steel wool, steel scrapers, and steel-wire brushes of various sizes.

### 2.2 PROTECTIVE COATING MATERIALS

- A. Wax Coating: Inert, high-melting-point wax or wax blend, consisting primarily of [carnauba] [or] [microcrystalline petroleum] wax[ and no solvents].
- B. Organic Coating: Clear, waterborne, air-drying, acrylic lacquer called "Incralac"; specially developed for coating copper-alloy products; consisting of a solution of methyl methacrylate copolymer with benzotriazole UV inhibitor.
- C. Copper-Alloy Corrosion Inhibitor: Solution of [1] [to] [3] <Insert number> percent benzotriazole in water.

## 2.3 MISCELLANEOUS MATERIALS

- A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, glazed masonry, and polished stone surfaces from damaging effects of acidic and alkaline cleaners.
- B. Masking Tape: Nonstaining, nonabsorbent material; compatible with chemical solutions being used and substrate surfaces, and that will easily come off entirely, including adhesive.
- C. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
  - 1. Previous effectiveness in performing the work involved.
  - 2. Little possibility of damaging exposed surfaces.
  - 3. Consistency of each application.
  - 4. Uniformity of the resulting overall appearance.
  - 5. Do not use products or tools that could do the following:
    - a. Remove, alter, or in any way harm the present or future condition of existing surfaces, including surrounding surfaces not in the Contract.
    - b. Leave an unintended residue on surfaces.

## 2.4 FINISHES, GENERAL

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.5 COPPER-ALLOY FINISHES

- A. General: Finish designations for copper alloys comply with the system defined in NAAMM's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)."
- B. Buffed Finish: [M21 (Mechanical Finish: buffed, smooth specular)] [M22 (Mechanical Finish: buffed, specular)] <Insert description>.
- C. Buffed Finish, Lacquered: [M22 (Mechanical Finish: buffed, specular; specified clear organic coating)] <Insert description>.
- D. Satin Hand-Rubbed Finish: [M32-M34 (Mechanical Finish: directionally textured, medium satin and hand rubbed)] <Insert description>.
- E. Satin Hand-Rubbed Finish, Lacquered: [M32-M34-06x (Mechanical Finish: directionally textured, medium satin and hand rubbed; specified clear organic coating)] <Insert description>.

- F. Satin Finish with Statuary Conversion Coating: [M32-C55 (directionally textured, medium satin; sulfide conversion coating)] <Insert description>.
  - 1. Color: [Match design reference sample] [Match existing] [Match Architect's sample] <Insert color>.
- G. Brushed Finish with Patina Conversion Coating: M35-C12-C52 (directionally textured, rotary brushed and buff polished, nonetched cleaned; ammonium sulfate conversion coating).
  - 1. Texture and Color: [Match design reference sample] [Match existing] [Match Architect's sample] <Insert description>.
- H. Bright-Relieved Statuary Conversion Coating, Lacquered: M12-C55-M2x-06x (matte finish as cast; sulfide conversion coating; buffed to brighten high spots; specified clear organic coating):
  - 1. Color and Buffing: [Match design reference sample] [Match existing] [Match Architect's sample] <Insert description>.

## 2.6 FERROUS METAL FINISHES

- A. Patina Finish: <Insert description>.

## 2.7 STAINLESS STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines from new replacement stainless steel, or blend into finish.
- B. Restored Finish: Grind and polish surfaces to produce uniform, directionally textured, polished finish to match [existing finish] [Architect's sample], free of cross scratches.
  - 1. Run grain to match existing metal.
  - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- C. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
  - 1. Run grain of directional finishes with long dimension of each piece.
  - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
  - 3. Directional Satin Finish: ASTM A480/A480M, No. 4.
  - 4. Dull Satin Finish: ASTM A480/A480M, No. 6.
  - 5. Reflective, Directional Polish: ASTM A480/A480M, No. 7.
  - 6. Mirrorlike Reflective, Nondirectional Polish: ASTM A480/A480M, No. 8.

## **PART 3 - EXECUTION**

### **3.1 DECORATIVE METAL REFINISHING SPECIALIST**

- A. Decorative Metal Refinishing Specialist Firms: Subject to compliance with requirements, [provide decorative metal refinishing by one of the following] [firms that may provide decorative metal refinishing include, but are not limited to, the following]:
1. <Insert, in separate subparagraphs, names of decorative metal refinishing specialist firms>.

### **3.2 PROTECTION**

- A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
1. Cover adjacent surfaces with materials that are proved to resist chemical solutions being used unless products being used will not damage adjacent surfaces. Use protective materials that are waterproof and UV resistant. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
  2. Do not apply chemical solutions during winds of enough force to spread them to unprotected surfaces.
  3. Neutralize alkaline and acid wastes before disposal.
  4. Dispose of runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

### **3.3 DECORATIVE METAL REFINISHING, GENERAL**

- A. Refinishing Appearance Standard: Refinished surfaces are to have a uniform appearance as viewed from [20 feet (6 m)] [50 feet (15 m)] <Insert distance> away by Architect.
- B. Execution of the Work: In refinishing items, disturb remaining existing work as minimally as possible and as follows:
1. Remove dirt and corrosion.
  2. Sequence work to minimize time before protective coatings are reapplied.
  3. Refinish items in place where possible and according to required appearance.
- C. Refinish Decorative Metal Item: Remove existing metal finishes on item unless otherwise indicated[, including integral polished and patinated finishes,] and reapply them.

- D. Repair Finish of Decorative Metal Item: Restore areas of deteriorated or missing finish on item and blend restored finish with existing, adjacent finish[, including integral polished and patinated finishes].

### 3.4 PREPARATORY CLEANING

- A. General: Use those methods indicated for each type of decorative metal and its location.
1. Brushes: If using wire brushes, use brushes of same base metal composition as metal being treated. Use brushes that are resistant to chemicals being used.
  2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that spray methods do not damage surfaces.
    - a. Equip units with pressure gages.
    - b. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with nozzle having a cone-shaped spray.
    - c. For water-spray application, use fan-shaped spray that disperses water at an angle of 25 to 50 degrees.
    - d. For high-pressure water-spray application, use fan-shaped spray that disperses water at an angle of at least 40 degrees.
    - e. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated.
  3. Uniformity: Perform each cleaning method in a manner that results in uniform coverage of all surfaces, including corners, contours, and interstices, and that produces an even effect without streaks or damaging surfaces.
  4. Protection: After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.
- B. Water Cleaning: Clean with [cold] [hot] water applied by [low] [medium] [high]-pressure spray. Supplement with [natural-fiber] [or] [plastic]-bristle brush. Use small brushes to remove soil from joints and crevices.
- C. Detergent Cleaning:
1. Wet surface with [cold] [hot] water applied by low-pressure spray.
  2. Scrub surface with detergent solution and [natural-fiber] [or] [plastic]-bristle brush until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet.
  3. Rinse with [cold] [hot] water applied by [low] [medium] [high]-pressure spray to remove detergent solution and soil.
- D. Nonacidic Liquid Chemical Cleaning: Apply chemical cleaner to surfaces according to chemical-cleaner manufacturer's written instructions.



1. Wet surface with [cold] [hot] water applied by low-pressure spray.
  2. Apply cleaner to surface[ in two applications] by brush[ or low-pressure spray].
  3. Let cleaner remain on surface for period [recommended in writing by chemical-cleaner manufacturer] [established by mockup] [of two to three minutes] <Insert requirement>.
  4. Nonferrous Metals: Rinse with [cold] [hot] water applied by [low] [medium] [high]-pressure spray to remove chemicals and soil.
  5. Ferrous Metals: Do not rinse ferrous metals with water; neutralize chemical cleaner on ferrous metals as recommended in writing by manufacturer. Dry immediately with clean soft cloths. Follow direction of grain in metal.
- E. Cleaning with Abrasive Pads: Clean surfaces to remove dirt[, leaving uniform patina intact,] by light rubbing with abrasive pads and water. [Rinse with cold water to remove residue. Apply rinse by low-pressure spray] [Do not rinse ferrous metals with water; wipe with damp cloths to remove residue] <Insert requirement>.
- F. Cleaning by Abrasive Blasting: Clean surfaces to remove dirt[, leaving uniform patina intact,] by dry blasting with specified blasting abrasive at pressure and distance from surface indicated below. [Rinse with cold water, low-pressure spray to remove residue.] [Do not rinse ferrous metals with water; wipe with damp cloths to remove residue] <Insert requirement>.
1. Pressure and Distance from Surface: Maximum pressure of [60 psi (415 kPa)] [100 psi (690 kPa)] [200 psi (1375 kPa)] <Insert value> with specified blasting abrasive propelled from a distance of [6 to 12 inches (152 to 305 mm)] [12 to 18 inches (305 to 457 mm)] <Insert dimension> from the surface.
  2. Pressure and Distance from Surface: As established by mockup.

### 3.5 PROTECTIVE COATING

- A. Protective Hot-Wax Coating:[ Pretreat cleaned copper-alloy surfaces with copper-alloy corrosion inhibitor, wipe off excess with ethanol-saturated rag, and allow surface to dry. If fresh corrosion appears, repeat process.] Apply wax coating to produce uniform appearance without runs or other surface imperfections.
1. Clean and dry surface being waxed.
  2. Preheat surface to about 212 deg F (100 deg C); hot enough to melt the wax and remove water vapor and other gases within metal surface, but not hot enough to boil the wax or ignite solvents if any.
  3. Apply uniform wax coating to surface, ensuring that wax coverage is complete, including recesses.[ Apply second wax coating following the same process.]
  4. Inspect surface and repair holidays by reheating and applying more wax.
  5. Buff waxed surface to a slight shine with a lint-free cloth after wax has cooled to a hazy appearance.
- B. Protective Organic Coating:[ Pretreat cleaned copper-alloy surfaces with copper-alloy corrosion inhibitor, wipe off excess with ethanol-saturated rag, and allow surface to dry. If fresh corrosion appears, repeat process.] Apply organic coating to produce uniform appearance without runs or other surface imperfections.

1. Clean and dry surface being coated.
2. Apply two uniform coats by air-spray method according to manufacturer's written instructions, with interim drying between coats.
3. Apply coating to a total dry film thickness of 1 mil (0.025 mm).
4. Protect coated surface from contamination until fully cured.

### 3.6 REMOVAL, REPAIR, AND REINSTALLATION

- A. General: Perform removal, repair, and reinstallation work as required in Section 024119 "Selective Demolition" and Section 050170.61 "Decorative Metal Repair."

### 3.7 DECORATIVE METAL REFINISHING SCHEDULE

- A. Treatment of Decorative Handrail [DMR-#] <Insert drawing designation>: Tarnished bronze railing with bronze handrail.
1. General: Perform work [in the shop] [or] [in the field].
  2. Cleaning: [Water cleaning] [Detergent cleaning] [Chemical cleaning] [Abrasive blasting] <Insert description>.
  3. Bronze Finish: [Satin finish with statuary conversion coating on railing; satin hand-rubbed finish, lacquered, on handrail] <Insert requirement>.
- B. Treatment for Bronze Statue Finish [DMS-#] <Insert drawing designation>: Clean, repair patina finish, and coat statue.
1. General: Perform work [in the shop] [or] [in the field].
  2. Cleaning: [Water cleaning] [Detergent cleaning] [Chemical cleaning] [Abrasive blasting] <Insert description>.
  3. Finish Repair: Selectively patinate the [nose] [foot] [and] [previous metal repairs] <Insert description> to match the rest of the statue.
  4. Protective Coating: Protective [hot-wax] [organic] coating.

**END OF SECTION 050170.63**

## SECTION 05 0513

### SHOP-APPLIED COATINGS FOR METAL

#### GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
1. Shop-applied [PVDF] [SMP][anodize] finishes for aluminum [railings] [architectural metalwork] [roof panels] [wall panels] [doors] [frames] [entrances] [storefronts] [windows] [curtain walls] [translucent panel systems] [louvers] [skylights] [sun screens] [and] [\_\_\_\_\_].
- B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
  2. Section [05 5000- Metal Fabrications] [05 7000 - Decorative Metal] [05 5800 - Formed Metal Fabrications] [\_\_\_\_ - \_\_\_\_\_]: Architectural metalwork to receive shop-applied finishes.
  3. Section [05 5100 - Metal Stairs] [05 5200 - Metal Railings] [\_\_\_\_ - \_\_\_\_\_]: Metal railings to receive shop-applied finishes.
  4. Section [08 9100 - Louvers] [\_\_\_\_ - \_\_\_\_\_]: Aluminum louvers to receive shop-applied finishes.

##### 1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
1. 611 - Voluntary Specification for Anodized Architectural Aluminum.
  2. 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Architectural Extrusions and Panels.
  3. 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Architectural Extrusions and Panels.
- B. ASTM International (ASTM)www.astm.org:
1. B449 - Standard Specification for Chromates on Aluminum.
  2. D1730 - Standard Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting.
  3. D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
  4. D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

##### 1.3 SUBMITTALS

- A. Submittals for Review:
1. Product Data: Manufacturer's descriptive data and test results for specified finishes.
  2. Samples: [2 x 3-1/2] [\_\_\_\_ x \_\_\_\_] inch coating samples [showing available colors] [in specified color] on aluminum backing.
- B. Quality Control Submittals:

1. Certificates of Compliance: Manufacturer's certification that finishes applied on Project components comply with referenced AAMA standards.
- C. Closeout Submittals:
1. Maintenance Data: Provide information regarding touch-up, cleaning, and maintenance of finishes.

#### 1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Certified by AAMA and listed on AAMA Verified Components List.
- B. Verify accuracy of components, quantities, and sizes prior to application of finishes.
- C. Applicator - PVDF-Based Finishes:
1. Use regenerative thermal oxidizer to destroy VOC's.
  2. Utilize chrome-based five-stage pretreatment system applied in accordance with AAMA and ASTM standards.
  3. Possess in-house blending capabilities, allowing for only specific amount of paint needed for each project.
  4. Utilize automated rotary atomization spray bell application providing uniform coverage with manual spray reinforcement for coverage in areas unreachable by automation.
  5. Employ skilled professional field service division to repair warranty or application issues arising at Project site.
  6. Utilize documented quality control protocol in accordance with AAMA test procedures.
    - a. Color uniformity: 8.1.1.
    - b. Performance: 8.1.2.
    - c. Specular gloss: 8.2.
    - d. Dry film hardness: 8.3.
    - e. Dry adhesion: 8.4.1.1.
    - f. Wet adhesion: 8.4.1.2.
    - g. Boiling water adhesion: 8.4.1.3.
    - h. Direct impact: 8.5.
    - i. Abrasion resistance: 8.6.
    - j. Muriatic acid resistance: 8.7.1.
    - k. Mortar resistance: 8.7.2.
    - l. Nitric acid resistance: 8.7.3.
    - m. Detergent resistance: 8.7.4.
    - n. 24-hour window cleaner resistance: 8.7.5.
    - o. Online Quality Assurance Inspection:
      - 1) Proper paint coverage: 5.0.
      - 2) Visual/appearance: 5.2.
      - 3) Dry-film thickness: 5.3.
      - 4) Color ΔE per ASTM D2244, Section 3.
      - 5) Gloss: +/- 5 units of manufacturers specification.
- D. Applicator - Anodize Finishes:
1. Offer both caustic (traditional) and eco-friendly (acid) etching technologies.
  2. Utilize fully automated, computer-controlled process lines for consistency throughout Project.
  3. Utilize documented quality control protocol in accordance with AAMA 611 test procedures :
    - a. Color uniformity: 8.3.
    - b. Gloss uniformity: 8.4.
    - c. Oxide coating thickness: 9.1.
    - d. Oxide coating weight/density: 9.2.
    - e. Seal test: 9.8.
    - f. Online quality assurance inspection:
      - 1) Random sample check for color uniformity: Maximum difference of 5ΔE.
      - 2) Random coating thickness testing: Minimum oxide coating of 18 microns (0.7 mil) for Class I clear and color anodize coatings and 10 microns (0.4 mils) for Class II clear anodize.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Apply manufacturer's standard protective coverings to finished surfaces.
- B. Deliver, store, and handle finished components in manner to prevent damage to finishes.
- C. Furnish touch-up paint along with each material shipment.

## 1.6 WARRANTIES

- A. Furnish manufacturer's [10] [20] year warranty providing coverage that coatings:
  - 1. Will not chip, crack or peel (lose adhesion) but this does not include minute fracturing which may occur in proper fabrication of building parts.
  - 2. Will not chalk in excess of ASTM D4214 Number 8 rating, determined by procedure outlines in ASTM D4214.
  - 3. Will not change color more than five Delta-E Hunter units (square root of the sum of square Delta L, Delta a, and Delta b) as determined by ASTM D2244, Method 6.3. Fading or color changes may not be uniform if surfaces are not equally exposed to sun and elements. Mica and metallic coatings are exempt due to inability to accurately measure color; mica and metallic flakes reflect and scatter light in random patterns.
- B. Furnish applicator's 10 year warranty providing coverage against failure of PVDF-based coating over improper pretreatment where coating was not applied in accordance with ASTM D1730, Type B, Method 5 or ASTM B449, Section 5.
- C. Furnish manufacturer's 5 year warranty providing coverage that coatings:
  - 1. Will not chip, crack or peel (lose adhesion) but this does not include minute fracturing which may occur in proper fabrication of building parts.
  - 2. Will not chalk in excess of ASTM D4214 Number 8 rating, determined by procedure outlines in ASTM D4214.
  - 3. Will not change color more than five Delta-E Hunter units (square root of the sum of square Delta L, Delta a, and Delta b) as determined by ASTM D2244, Method 6.3. Fading or color changes may not be uniform if surfaces are not equally exposed to sun and elements. Mica and metallic coatings are exempt due to inability to accurately measure color; mica and metallic flakes reflect and scatter light in random patterns.
- D. Furnish applicator's 5 year warranty providing coverage against failure of PVDF-based coating over improper pretreatment where coating was not applied in accordance with ASTM D1730, Type B, Method 5 or ASTM B449, Section 5.
- E. Furnish applicator's [5] [10] year warranty providing coverage that coatings:
  - 1. Will resist cracking, crazing, flaking, and blistering if forming and welding are completed prior to finishing; post-forming or welding voids warranty.
  - 2. Will not chalk in excess of ASTM D4214 Number 8 rating, determined by procedure outlined in ASTM D-4214.
  - 3. Will not change color more than five Delta-E Hunter units (square root of the sum of square Delta L, Delta a, and Delta b) as determined by ASTM D2244, Method 6.3. Fading or color changes may not be uniform if surfaces are not equally exposed to sun and elements.

## PART 2 PRODUCTS

### 2.1 APPLICATORS

- A. Acceptable Applicator: Linetec. ([www.linetec.com](http://www.linetec.com))
- B. Substitutions: [Under provisions of Division 01.] [Not permitted.]

### 2.2 SHOP-APPLIED FINISHES

A. PVDF-Based Coating: AAMA 2605, fluoropolymer finish containing minimum 70 percent PVDF resins, [two] [three] [four] coat system, [custom] [ ] color [to be selected from manufacturer's full color range].

\*\*\*\* OR \*\*\*\*

B. PVDF-Based Coating or Silicone Modified Polyester: AAMA 2604, [two] [three] [four] coat system, [custom] [ ] color [to be selected from manufacturer's full color range].

\*\*\*\* OR \*\*\*\*

C. Anodize Finish: AAMA 611, Architectural Class I anodized to 0.0007 inch minimum thickness, [clear.] [champagne] [light bronze] [medium bronze] [dark bronze] [extra dark bronze] [black] [copper] [Bourdeaux] [ ] color.

\*\*\*\* OR \*\*\*\*

D. Anodized Finish: AAMA 611, Architectural Class II anodized to 0.0004 inch minimum thickness, clear.

### **PART 3 EXECUTION**

#### **3.1 ADJUSTING**

A. Touch up minor scratches and abrasions in finishes in accordance with finish manufacturer's instructions; replace components having damage that cannot be successfully touched up.

#### **3.2 CLEANING**

A. Clean finished surfaces after installation in accordance with finish manufacturer's instructions.

#### **3.3 SCHEDULE**

COMPONENT	FINISH TYPE	COLOR
Entrance Doors	70 percent PVDF	Standard white
Curtain Wall	Class I anodized	Dark bronze
Interior Door Frames	Baked enamel	Custom color to be selected

END OF SECTION

## SECTION 05 5000 - METAL FABRICATIONS

### PART 1 - GENERAL

#### 1.1 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for metal fabrications.
  - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
  - 2. Provide templates for anchors and bolts specified for installation under other Sections.

### PART 2 - PRODUCTS

#### 2.1 METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 240/A 240M or ASTM A 666, Type 304.
- C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- D. Rolled Steel Floor Plate: ASTM A 786/A 786M.
- E. Steel Tubing: ASTM A 500.
- F. Steel Pipe: ASTM A 53, standard weight (Schedule 40), black finish.
- G. Slotted Channel Framing: Cold-formed steel channels, 1-5/8 by 1-5/8 inches by 0.0677 inch thick, complying with MFMA-4.
- H. Cast Iron: ASTM A 48/A 48M or ASTM A 47/A 47M.
- I. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
- J. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
- K. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

#### 2.2 GROUT

- A. Nonshrink, Nonmetallic Grout: ASTM C 1107; recommended by manufacturer for exterior applications.

#### 2.3 FABRICATION

- A. General: Shear and punch metals cleanly and accurately. Remove burrs and ease exposed edges. Form bent-metal corners to smallest radius possible without impairing work.

- B. Welding: Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. At exposed connections, finish welds and surfaces smooth with contour of welded surface matching those adjacent.
- C. On units indicated to be cast into concrete or built into masonry, provide welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c.
- D. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.
- E. Fabricate steel pipe columns with 1/2-inch steel base plates and 1/4-inch steel top plates welded to pipe with continuous fillet weld same size as pipe wall thickness. Drill top plates for connection bolts and base plates for 5/8-inch anchor bolts.
- F. Fabricate loose lintels from steel angles and shapes. Size to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches.
- G. Fabricate structural-steel door frames from structural shapes and bars fully welded together, with 5/8-by-1-1/2-inch steel channel stops. Plug-weld built-up members and continuously weld exposed joints.
- H. Fabricate window security bars to designs indicated from steel bars and shapes of sizes and profiles indicated. Form steel bars by bending, forging, coping, mitering, and welding with full-length, full-penetration welds. Provide wall brackets, fittings, and anchors to secure units.
- I. Fabricate ladders for locations shown, complying with ANSI A14.3, welded steel construction.
  - 1. For elevator pit ladders, comply with ASME A17.1.
- J. Alternating Tread Devices: Fabricate alternating tread devices to comply with the IBC. Fabricate of open-type construction with channel or plate stringers and pipe and tube railings unless otherwise indicated. Fabricate from steel and assemble by welding or with stainless-steel fasteners. Provide brackets and fittings for installation.
- K. Fabricate pipe bollards from Schedule 40 steel pipe. Cap bollards with 1/4-inch- minimum steel plate.
- L. Fabricate pipe guards from 3/8-inch- thick by 12-inch- wide steel plate, bent to fit flat against the wall or column at ends and to fit around pipe with 2-inch clearance between pipe and pipe guard. Drill each end for two 3/4-inch anchor bolts.
- M. Fabricate nosings from cast iron with an integral abrasive finish.
  - 1. Apply bituminous paint to concealed surfaces of units set into concrete.
- N. Fabricate nosings and treads from extruded aluminum with abrasive filler consisting of aluminum-oxide or silicon-carbide grits, or a combination of both, in an epoxy-resin binder.
  - 1. Ribbed-type units.
  - 2. Apply clear lacquer to concealed surfaces of units set into concrete.



## 2.4 STEEL AND IRON FINISHES

- A. Hot-dip galvanize steel fabrications at exterior locations.
- B. Prepare uncoated ferrous metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning," and paint with a fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack.
- B. Fit exposed connections accurately together to form hairline joints.
- C. Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.
- D. Install pipe guards at exposed vertical pipes in parking garage where not protected by curbs or other barriers. Install by bolting to wall or column with drilled-in expansion anchors.
- E. Anchor bollards in concrete and fill solidly with concrete, mounding top surface.

### 3.2 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.
  - 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 05 5000

## SECTION 05 5214 - METAL HANDRAILS AND RAILINGS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Steel pipe handrails and railings at stairways.
  - 2. Aluminum Railing at Balconies.

#### 1.2 SYSTEM DESCRIPTION

- A. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Handrails:
    - a. Uniform load of 50 lbf/ ft. applied in any direction.
    - b. Concentrated load of 200 lbf applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
  - 2. Top Rails of Guards:
    - a. Uniform load of 50 lbf/ ft applied in any direction.
    - b. Concentrated load of 200 lbf applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
  - 3. Infill of Guards:
    - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
    - b. Infill load and other loads need not be assumed to act concurrently.
- B. Thermal Movements: Exterior handrails and railings shall allow for thermal movements resulting from changes in ambient and surface temperatures. Thermal movement shall prevent buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and night time-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- C. Design Requirements: Comply with ASTM E985 and applicable building codes.

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's literature for the following:
  - 1. Grout
  - 2. Anchoring cement
  - 3. Paint/Primer products.
- B. Shop Drawings: Show fabrication and installation of handrails and railings. Include plans, Elevations, sections, component details, and attachments to other Work.
  - 1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.
  - 2. Include structural analysis data indicating compliance with structural load requirements.
  - 3. Refer to drawings for locations.
- C. Product Test Reports: Submit reports from a qualified testing agency indicating handrails and railings comply with ASTM E 985, based on comprehensive testing of current products.
- D. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

- E. Welding certificates.
- F. Qualification Data: For professional engineer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of handrail and railing through one source from a single manufacturer.
- B. Welding: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1, "Structural Welding Code--Steel."

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in fabricator's original protective wrapping. Protect finished surfaces with removable wrapping or coating which will not bond to handrail or railing when exposed to sunlight.
- B. Store handrails and railings in a dry, well-ventilated, weathertight place.

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

#### 1.7 SCHEDULING

- A. Schedule installation so handrails and railings are mounted only on completed walls. Temporary supports shall satisfy structural performance requirements.

### PART 2 - PRODUCTS

#### 2.1 METALS

- A. General: Provide metal with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, blemishes and other imperfections where exposed to view on finished units.
- B. Steel and Iron:
  - 1. Steel Pipe: ASTM A 53
    - a. Type F, or Type S, Grade A, standard weight (Schedule 40), unless another grade and weight are required by structural loads.
  - 2. Steel Plates, Shapes, and Bars: ASTM A 36.
  - 3. Refer to Architectural Details for Decorative Railing manufacturers and styles.
- C. Brackets, Flanges, and Anchors: Same type of material and finish as supported rails, unless otherwise indicated.

#### 2.2 ACCESSORIES

- A. Fasteners:
  - 1. General: Exposed fasteners shall match appearance of handrails and railings.

2. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
  3. Fasteners for Anchoring Handrails and Railings to Other Construction: Fasteners of type, grade, and class suitable for anchoring handrails and railings to other types of construction indicated and capable of withstanding design loads.
    - a. Steel handrails, railings, and fittings: Plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.
  4. Fasteners for Interconnecting Handrail and Railing Components: Provide concealed fasteners fabricated from same metal as handrail and railings, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
  5. Cast-in-Place and Post-Installed Anchors: Fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- B. Shop Primer for Ferrous Metal: 2-part epoxy primer, compatible with finish paint systems indicated.
1. Products: Subject to compliance with requirements, provide one of following:
    - a. Carboline Carboguard 60.
    - b. PPG Amerlock 2/400.
    - c. Sherwin Williams Macropoxy 646 Fast Cure Epoxy B58W610.
    - d. Tnemec Series 66.
- C. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.
- D. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Steel Sleeves: Preset steel sleeves, a minimum of 6 inches long with inside dimensions a minimum of 1/2 inch greater than outside dimensions of post, and steel plate forming bottom closure.
- F. Wall Bracket (Pipe Handrails): Julius Blum #382 with appropriate fastener and anchor plate.

### 2.3 FABRICATION

- A. General: Fabricate handrails and railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Assemble handrails and railings in the 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. Use connections that maintain structural value of joined pieces.
- C. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

- D. Welded Connections: Fabricate handrails and railings for connecting members by welding. Cope components at perpendicular and skew connections to provide close fit, or use fittings designed for this purpose.
  - 1. Continuously weld connections to obtain fusion without undercut or overlap.
  - 2. Remove flux immediately.
  - 3. Exposed Connections: Finish exposed welded surfaces so welding matches contours of adjoining surfaces and is smooth and blended with no visual roughness.
- E. Use concealed mechanical fasteners and fittings whenever possible. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- F. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect handrail and railing members to other work, unless otherwise indicated.
- G. Provide inserts and other anchorage devices for connecting handrails and railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by handrails and railings. Coordinate anchorage devices with supporting structure.
- H. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.
- I. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation.
- J. Cut, reinforce, drill, and tap components, to receive finish hardware, screws, and similar items as indicated.
- K. Exterior Locations:
  - 1. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members that are exposed to exterior or subject to moisture from condensation or other sources.
  - 2. Fabricate joints exposed to weather in a watertight manner.
- L. Close exposed ends of handrail and railing members with prefabricated end fittings.
- M. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns, unless clearance between end of railing and wall is 1/4 inch or less.
- N. Fillers: Provide fillers made from steel plate where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

## 2.4 FINISHES

- A. General:
  - 1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Steel Finish:
  - 1. Primed:
    - a. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting. Shop prime steel surfaces, except the following:

- 1) Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
  - 2) Surfaces to be field welded.
- b. Surface Preparation: Remove loose rust, loose mill scale, and spatter, slag, or flux deposits before shop coat of paint is applied. Remove oil, grease and similar contaminants in accordance with SSPC SP-1. Clean surfaces as required by primer manufacture and in accordance with SSPC SP-6.
- c. Priming:
- 1) Immediately after surface preparation, apply primer in accordance with manufacturer's instructions and to provide a uniform dry film thickness required by manufacturer. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
  - 2) Stripe paint corners, crevices, bolts, welds, and sharp edges.
  - 3) Apply additional coat of shop paint to surfaces that after assembly or erection will be inaccessible. Change color of additional coat to distinguish it from first, matching color of field topcoat for exposed and semi-exposed inaccessible surfaces.
  - 4) Paint erection marks on painted surfaces. Touch up surfaces where welding, grinding of welds, joints, etc., are done in the field.
  - 5) Paint shall be thoroughly dry before members are handled.
- C. For nongalvanized steel handrails and railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.
- D. Finish:
1. Handrails:
    - a. Shop primed for field painting.
      - 1) Locations: Refer to Drawings.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verification of Conditions: Examine subsurfaces to receive Work and report detrimental conditions in writing to Architect. Commencement of Work will be construed as acceptance of subsurfaces.
- B. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

### 3.2 INSTALLATION

- A. General:
1. Fit exposed connections together to form tight, hairline joints.
  2. Perform cutting, drilling, and fitting required to install handrails and railings. Set handrails and railings accurately in location, alignment, and elevation; measured from established lines and levels and free from rack.
  3. Do not weld, cut, or abrade surfaces of handrail and railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials. Coat

- concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.
- C. Adjust handrails and railings before anchoring to ensure alignment at abutting joints. Space posts at interval indicated, but not less than that required by structural loads.
  - D. Fastening to In-Place Construction: Use anchorage devices and fasteners to secure handrails and railings and properly transfer loads to in-place construction.
  - E. Apply sealant to holes prior to installing fasteners.

### 3.3 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of handrails and railings.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components.
  - 1. Continuously weld connections to obtain fusion without undercut or overlap.
  - 2. Remove flux immediately.
  - 3. Exposed Connections: Finish exposed welded surfaces so welding matches contours of adjoining surfaces and is smooth and blended with no visual roughness.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

### 3.4 ANCHORING POSTS

- A. Install posts in concrete using one of the following methods as approved by Architect:
  - 1. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with the following anchoring material, mixed and placed to comply with anchoring material manufacturer's written instructions:
  - 2. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than outside diameter of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Cover anchorage joint with flange of same metal as post after placing anchoring material.
- C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
  - 1. Steel pipe railings: Weld flanges to post and bolt to metal supporting surfaces.
- D. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

### 3.5 ANCHORING RAILING ENDS

- A. Anchor railing ends into concrete and masonry with round flanges connected to railing ends and anchored into wall construction with postinstalled anchors and bolts.

- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces.
- C. Weld flanges to railing ends.

### 3.6 ATTACHING HANDRAILS TO WALLS

- A. Attach handrails to wall with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.
- B. Securely anchor brackets as indicated or, if not indicated, at spacing required to support structural loads.

### 3.7 TOLERANCES

- A. Install posts and vertical members plumb within 1/8 inch of vertical. Install longitudinal members parallel with each other and to floor surfaces or slope of stairs to within 1/8 inch per 10 running feet.

### 3.8 CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

### 3.9 PROTECTION

- A. Protect finishes of handrails and railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at the time of Substantial Completion.
- B. Correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 5214



## SECTION 061100 – WOOD FRAMING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Shear wall panels.
  - 4. Wood blocking, and nailers.
- B. Related Requirements:
  - 1. Division 02 Section "Termite Control" for site application of borate treatment to wood framing.
  - 2. Division 06 Section "Sheathing."

#### 1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
  - 1. SPIB: The Southern Pine Inspection Bureau.

#### 1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.
- B. All lumbers shall be straight and plumb at installation.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

## PART 2 - PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  - 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  - 1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- D. All lumbers shall be straight and plumb at installation up to Length/500 or 3/8" whichever governs. Contractor shall take all precautions in handling, shipping, and storage to ensure the straightness and plumbness of lumber at installation; non-straight and non-plumb lumber shall be rejected and shall be at contractor's cost.
- E. All structural wood walls or walls shown in structural drawings are designed to be conventionally constructed in field or so called 'stick framed'; they are not designed to be constructed in panels and assembled in field, or so called 'panelized construction'. Should the selected contractor decide to construct the walls in panels, approval shall be obtained from the Engineer of Record. Contractor shall submit signed and sealed proposed connection details along with signed and sealed calculations at each panel-to-panel connection, panel-to-top plate connection, etc. Connections shall satisfy all gravity and lateral load path. Connection calculations shall be based on capacities of the shear wall sheathing specified in shear wall schedules. Additional floor straps shall be provided at each panel end as required per calculations.

### 2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Inorganic boron (SBX) not permitted for sill plates.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat all rough carpentry exposed to weather and as indicated in drawings.
  - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - 2. Wood sills, sleepers, blocking, stripping, and similar concealed members in contact with masonry or concrete.
  - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
  - 4. Wood floor plates that are installed over concrete slabs-on-grade.

### 2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
  - 1. Use treatment that does not promote corrosion of metal fasteners.
  - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
  - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
  - 4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841 For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.90 for modulus of elasticity and 0.90 for extreme fiber in bending for Project's climatological zone.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
  - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by testing agency.
- E. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- F. Application: Treat items indicated in the structural or architectural drawings generally as follows:
  - 1. Concealed blocking.
  - 2. Framing for load bearing interior walls where required.

3. Framing for load bearing exterior walls.
4. Framing for non-load-bearing partitions.
5. Framing for non-load-bearing exterior walls.
6. Roof construction.
7. Plywood backing panels.

## 2.4 DIMENSION LUMBER FRAMING

- A. Load-Bearing Partitions: No. 2 grade.
  1. Application: Exterior walls and interior load-bearing partitions.
  2. Species – See structural drawings.

## 2.5 ENGINEERED WOOD PRODUCTS

- A. Engineered Wood Products, General: Products shall comply with manufacturer's published design values.
- B. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.
- C. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
  1. Extreme Fiber Stress in Bending, Edgewise: See structural drawings.
  2. Modulus of Elasticity, Edgewise: See structural drawings.

## 2.6 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  1. Blocking.
  2. Nailers.
  3. Cants.
- B. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

## 2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153
- B. Nails, Brads, and Staples: ASTM F 1667.

- C. Wood Screws: ASME B18.6.1.
- D. Lag Bolts: ASME B18.2.1.

## 2.8 METAL FRAMING ANCHORS

- A. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated on drawings. If not indicated, provide connector of appropriate type to meet the framing condition and assume fastener is fully nailed to achieve maximum capacity in gravity and uplift. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  - 1. Use for wood-preserved-treated lumber and where indicated.
- D. See structural drawings for hold down, strap ties, and connectors requirements.

## 2.9 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- D. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

- C. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.
- F. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- I. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### **3.2 WALL AND PARTITION FRAMING INSTALLATION**

- A. General: Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions and for load-bearing partitions where framing members bearing on partition are located directly over studs. Fasten plates to supporting construction unless otherwise indicated.
- B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
  - 1. For load-bearing walls, provide double-jamb studs for all openings. Unless noted otherwise in structural drawings, provide (3)2x12 headers at all openings.

### **3.3 PROTECTION**

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

**END OF SECTION 061100**

## SECTION 061600 – SHEATHING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Wall sheathing.
  - 2. Roof sheathing.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
  - 4. For building wrap, include data on air-/moisture-infiltration protection based on testing according to referenced standards.

#### 1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory."

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

### PART 2 - PRODUCTS

#### 2.1 WOOD PANEL PRODUCTS, GENERAL

- A. Plywood: DOC PS 1, EXPOSURE 1, 48/24 span rated.
- B. Oriented Strand Board: DOC PS 2 EXPOSURE 1.



- C. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- D. Factory mark panels to indicate compliance with applicable standard.
- E. All sheathing shall be APA rated to match spans indicated in structural drawings.

## 2.2 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWPA C9.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat all plywood, unless otherwise indicated.

## 2.3 WALL SHEATHING

- 1. Wall Sheathing: See structural drawings.

## 2.4 ROOF SHEATHING

- 1. Roof Sheathing: See structural drawings.

## 2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
  - 1. For roof sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
  - 1. For wall and roof sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

## 2.6 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.
  - 1. Use adhesives that have NO VOC content.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION, GENERAL**

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
  - 1. NES NER-272 for power-driven fasteners.
  - 2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
  - 3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's "Uniform Building Code."
  - 4. Table 2305.2, "Fastening Schedule," in BOCA's "BOCA National Building Code."
  - 5. Table 2306.1, "Fastening Schedule," in SBCCI's "Standard Building Code."
  - 6. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's "International Residential Code for One- and Two-Family Dwellings."
  - 7. Table 602.3(1), "Fastener Schedule for Structural Members," and Table 602.3(2), "Alternate Attachments," in ICC's "International One- and Two-Family Dwelling Code."
- D. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

### **3.2 WOOD STRUCTURAL PANEL INSTALLATION**

- A. General: Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
  - 1. Wall and Roof Sheathing:
    - a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
    - b. Screw to cold-formed metal framing.
    - c. Space panels 1/8 inch apart at edges and ends.

**END OF SECTION 061660**

## SECTION 062000 - FINISH CARPENTRY

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Interior wainscot and trim.

### 1.2 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Cementitious Composite Material.
  - a. Tongue and Groove Bead Board in Sheets.
    - 1. 1/2" thickness (pair of 1/4" thickness sheets).
    - 2. Widths per mfr. availabilities.
    - 3. Finished flush and prepared for paint.
  - b. Moldings and Trim.
    - 1. Match existing profiles and thicknesses.
    - 2. As indicated on Drawings.

### 2.2 MANUFACTURERS

- A. James Hardie.
- B. National Gypsum.
- C. USG.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

### 3.2 INSTALLATION, GENERAL

- A. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
  2. Countersink fasteners, fill surface flush, and sand unless otherwise indicated.
  3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
  4. Install stairs with no more than 3/16-inch variation between adjacent treads and risers and with no more than 3/8-inch variation between largest and smallest treads and risers within each flight.

### 3.3 STANDING AND RUNNING TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

END OF SECTION 062023

## SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Wood cabinets.
  - 2. Quartz countertops
- B. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips unless concealed within other construction before woodwork installation.

#### 1.2 SUBMITTALS

- A. Product Data: For cabinet hardware, countertops and accessories.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- C. Samples:
  - 1. Lumber and panel products for transparent finish, for each species and cut, finished on one side and one edge.
  - 2. Lumber and panel products with shop-applied opaque finish, for each finish system and color, with exposed surface finished.
  - 3. Plastic-laminates, for each type, color, pattern, and surface finish.
  - 4. Thermoset decorative panels, for each type, color, pattern, and surface finish.
  - 5. Solid-surfacing materials.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of woodwork.
- B. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards."

#### 1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

### PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Wood Species for Opaque Finish: Any closed-grain hardwood.
- B. Wood Products:
  - 1. Hardboard: AHA A135.4.
  - 2. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
  - 3. Particleboard: ANSI A208.1, Grade M-2
  - 4. Softwood Plywood: DOC PS 1, Medium Density Overlay.
  - 5. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.
- C. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

## 2.2 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."
- B. Butt Hinges: 2-3/4-inch , 5-knuckle steel hinges made from 0.095-inch-thick metal, and as follows:
  - 1. Semiconcealed Hinges for Flush Doors: BHMA A156.9, B01361.
- C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening.
- D. Back-Mounted Pulls: BHMA A156.9, B02011.
- E. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter, 2-1/2 inches deep.
- F. Catches: Magnetic catches, BHMA A156.9, B03141.
- G. Drawer Slides: BHMA A156.9, B05091.
  - 1. Standard Duty (Grade 1, Grade 2, and Grade 3): Side mounted and extending under bottom edge of drawer. with polymer rollers.
  - 2. Box Drawer Slides: Grade 1for drawers not more than 6 inches high and 24 inches wide.
  - 3. File Drawer Slides: Grade 1HD-100 for drawers more than 6 inches high or 24 inches wide.
- H. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
  - 1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.

## 2.3 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

## 2.4 FABRICATION

- A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.

- 1. Interior Woodwork Grade: Custom.
- 2. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.
- 3. Install glass to comply with applicable requirements in Division 08 Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

- B. Wood Cabinets for Opaque Finish:

- 1. AWI Type of Cabinet Construction: Flush inset with face frame.
- 2. WI Construction Style: Style B, Face Frame.
- 3. WI Construction Type: Type I, multiple self-supporting units rigidly joined together.
- 4. WI Door and Drawer Front Style: Flush.
- 5. Reveal Dimension: 1/2 inch.
- 6. Species for Exposed Lumber Surfaces: Any closed-grain hardwood.
- 7. Panel Product for Exposed Surfaces: Medium-density fiberboard.
- 8. Semiexposed Surfaces Other Than Drawer Bodies: Match materials indicated for exposed surfaces.
- 9. Drawer Sides and Backs: Solid-hardwood lumber.
- 10. Drawer Bottoms: Hardwood plywood.
- 11. Provide dust panels of 1/4-inch plywood or tempered hardboard above compartments and drawers, unless located directly under tops.

- C. Plastic-Laminate Countertops:
  - 1. High-Pressure Decorative Laminate Grade: HGP.
  - 2. Colors, Patterns, and Finishes: High gloss lacquered finish. Color to be approved.
  - 3. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of solid color finishes.
  - 4. Edge Treatment: Same as laminate cladding on horizontal surfaces.
  - 5. Core Material at Sinks: Medium-density fiberboard made with exterior glue or exteriorgrade plywood.

## 2.5 SHOP FINISHING

- A. Finish architectural woodwork at fabrication shop. Defer only final touchup, cleaning, and polishing until after installation.

- B. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling. C. Opaque Finish:
  - 1. Grade: Custom.
  - 2. AWI Finish System: Catalyzed vinyl.
  - 3. Color: Match sample.
  - 4. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.
- B. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- C. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96 inches. Shim as required with concealed shims.
- D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails [or finishing screws] for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible.[ Scarf running joints and stagger in adjacent and related members.] Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.
- G. Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips. Do not use face fastening, unless covered by trim.
- H. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
  - 1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with [No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips] [No. 10 wafer-head sheet metal screws through



metal backing or metal framing behind wall finish] [toggle bolts through metal backing or metal framing behind wall finish].

- I. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

END OF SECTION 064023

## SECTION 07 1100 – AIR SEALING

### PART 1 - GENERAL

#### 1.1 RELATED SECTIONS

- A. General
  - 1. Rough Carpentry
  - 2. Thermal Insulation
  - 3. Sealants
  - 4. Use of Blower Door Testing
  - 5. Plumbing and Drainage
  - 6. HVAC and Electrical

#### 1.2 DEFINITIONS

- A. Air barrier: Building elements which prevent the migration of air between zones
- B. Zone: An air space, within which air movement is permissible or desirable, but which is intentionally separated from other spaces.
- C. Outer air seal: Exterior air barrier, including shell and air sealing measures, intended to prevent infiltration of outside air into framing cavities and spaces within the thermal boundary.
- D. Inner air seal: Interior air barrier, including interior building finish and air sealing measures, intended to prevent transfer of air between building interior and framing cavities.
- E. Intermediate air seal: Measures performed to subfloor, framing voids, shaft ways, chase ways, and penetrations to isolate, or impede air flow between zones as required.
- F. Top floor ceiling air barrier: Continuous air barrier, terminating at exterior sheathing or masonry, intended to prevent the transfer of air between roof cavity and all zones below, including building interior and framing cavities.
- G. Unconditioned space: Space enclosed by building shell but outside thermal boundary.
- H. Conditioned space: All space within thermal boundary.
- I. Sealing measure: Sealant, rigid or spray-applied blocking, or a combination of blocking and sealant as appropriate.

### PART 2 - PRODUCTS

#### 2.1 RIGID BLOCKING

- A. Lumber, plywood

- B. Radiator reflector board: foil-faced foam
- C. Foam insulating board: polyisocyanurate, extruded polystyrene
- D. FSK-faced rigid glass fiber

## 2.2 SPRAY-APPLIED BLOCKING

- A. Expanding foam
- B. Damp-spray cellulose
  - 1. Sealants
  - 2. Gaskets, Silicone, EPDM, or neoprene bulb
  - 3. Fire-resistive materials-
    - a. Sealant: RTV silicone firestop caulk
    - b. Sheet metal: 0.032-inch pre-finished aluminum
    - c. Concrete board: nominal ½ inch thick Durock, Eternaboard, Utilicrete

## PART 3 - EXECUTION

### 3.1 FIRESTOPS

- A. Provisions of this section do not supersede firestopping or smoke barrier requirements of this or any other applicable code.
- B. Blower door test – Sealing measures shall be judged adequate when structure passes all portions of blower door test. Note that there are minimum and maximum allowable airflows.
- C. Zones requiring separation by air sealing (note that firestop requirements may apply to air-sealing materials)
  - 1. Finished interior and ductwork
  - 2. Framing voids and chase ways.
  - 3. Attic or roof cavity and the outdoors to which it is vented.
  - 4. Framing cavities in projecting construction (bays).

### 3.2 OUTER AIR SEAL

- A. Roof cavities and attics:
  - 1. Unconditioned – For cavities outside thermal boundary, do not seal to outside unless otherwise required.
  - 2. Conditioned – For cavities enclosed within thermal boundary (i.e. unvented with roof deck and exterior walls insulated), seal to outside
- B. Exterior walls (not covered in A above):
  - 1. Masonry and sheathing – Seal all cracks, gaps and unintentional openings.

2. Fenestration – Frames and sills shall be sealed to rough openings.

### 3.3 INTERMEDIATE AIR SEAL (FRAMING)

- A. Top floor ceilings: Seal cavities of perimeter stud walls and partitions at ceiling level. Note: failure to provide firestop or top plate at ceiling level may increase cost of air sealing.
- B. Dropped ceiling between apartments: Seal cavities of perimeter stud walls and partitions at ceiling level.
- C. Bathtub at exterior wall: Seal exterior wall cavity from space under tub.
- D. Subflooring: Above basement and crawlspaces: seal subfloor to exterior sheathing or masonry
- E. Chaseways: Seal all openings into attics, roof cavities, basements and crawlspaces.
- F. Framing penetrations:
  1. Piping subject to movement – All seals around soil stack, stack vent, and domestic water piping shall employ resilient materials. Rigid foam shall not be used.
  2. Hot pipes and ducts – Seals around all hot water, hydronic, or steam piping, and un-insulated warm-air ducts shall employ resilient materials rated for the service temperature.
- G. Electrical devices: Seal cable knockouts from back of box unless box is provided with device and cover designed to prevent infiltration.
- H. Abandoned flues, conduits and chases: Remove or seal to prevent air movement between zones.

### 3.4 INNER AIR SEAL

- A. Sealed drywall to framing:
  1. Top-floor ceiling – Seal interior finish to wall framing at ceiling level to prevent air transfer between vented roof cavity and wall cavities below.
  2. Ceiling method: Caulk edges of ceiling finish to all top plates, runners, and firestops prior to installing wall finish. For ceilings finished prior to framing walls, caulk to exterior masonry.
  3. Wall method: Install approved drywall gasket, caulk, or panel adhesive to top plates, runners, and firestops before installing interior finish.
- B. Openings for mechanicals: In top-floor ceilings and all exterior walls, caulk penetrations of interior finish for electrical devices, pipes, register boots, etc.
- C. Prioritizing inner air sealing measures: Where necessary to comply with whole house infiltration (blower door) test limits, caulk trim to interior finish in the following order of priority:
  1. All bathrooms
  2. Exterior walls on top floor.

### 3.5 COMPARTMENTALIZATION OF INDIVIDUAL DWELLING UNITS

- A. Walls
  1. Seal exterior wall corners with joint sealant and or foam.

2. Seal vertical walls at all penetrations with joint sealant and or foam.
  3. Seal window frame with low expanding foam.
  4. Weatherstrip doors to common spaces with joint sealant and or foam.
  5. Seal between drywall and framed common walls using expanded foam and fire rated blocking caulk.
  6. Seal bottom plates on exterior walls with a foam gasket and or caulk or foam.
- B. Floors
1. Provide complete seal at joists supporting conditioned space with joint sealant and or foam.
- C. Ceilings
1. Install continuous top and bottom plates, and sheathing to create a six sided air barrier on all attic knee walls and seal with foam and or caulk
  2. Install blocking at exposed edges of insulation at joists and rafters.
  3. Truss framing: install blocking at the top and bottom of each framing bay.
  4. Seal dropped ceiling soffit at the top and sides bordering exterior ceiling and wall assemblies with foam and or blocking and caulk
  5. Recessed lighting: Install insulation contact, airtight rated and seal to drywall with gasket and or caulk.
- D. Bathtub and shower enclosures:
1. Use mold resistant material, paperless material behind shower enclosures and extend the mold resistant materials the full length and width of the wall on which the shower enclosure abuts. Seal at all joints.

### 3.6 CONTINUITY OF EXTERNAL AIR BARRIER

- A. Building Envelope
1. Air barrier must be continuous around building, including all components that act together as the exterior air barrier. Foam or caulk all exterior sheathing joints and intersections.
  2. Install weatherstripping hard fastened to the door and frame at entranceways.
  3. Seal the roof curb at ductwork penetrations.

### 3.7 PEST MANAGEMENT MEASURES

- A. For openings in the building envelope less than ¼” including pipe and electrical penetrations, completely seal to avoid pest entry.
- B. Install rodent and corrosion proof screens for openings greater than ¼ inch.

### 3.8 INSPECTIONS AND TESTING

- A. Residential units have been designed to have airtight air barriers between units, inspect air barrier at the following locations and repair as required.
1. Between tenant separation walls.
  2. Between tenant separation floor ceiling assemblies

3. Around pipes, conduits ducts and fixtures penetrating air barrier
4. At exterior walls or surfaces adjoining unconditioned spaces.

END OF SECTION 07 1100

## **SECTION 07115 – BELOW GRADE ELASTOMERIC WATERPROOFING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes surface preparation and application of elastomeric coating systems on the following substrates:
  - 1. Exterior Below Grade Substrates:
    - a. Pre-Cast concrete walls.
    - b. Cast-in-place concrete footings.

#### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated, including recommendations for method of application, primer, number of coatings, coverage or thickness, reinforcing fabric and drainage/protection mat.
- B. Samples for Verification: For each type of coating system indicated.
  - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
  - 2. Step coats on Samples to show each coat required for system including color coats and architectural aggregate.
  - 3. Label each coat of each Sample.
  - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated. Cross-reference products to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules.
- D. Material Certificates for each product, signed by manufacturer indicating compatibility with substrate materials.

#### **1.4 QUALITY ASSURANCE**

- A. Qualifications:

1. Applicator: Use Applicator experienced in the application of the specified high performance coating for a minimum of 2 years on projects of similar size and complexity. Provide list of completed projects including project name and location, name of coating manufacturer and approximate quantity of coating applied.
  2. Source Limitations: Obtain primary waterproofing materials and primers through one source from a single manufacturer. Provide secondary materials as recommended by manufacturer of primary materials.
  3. Applicator's Supervisor: Employ a supervisor during all phases of the work that has been successfully completed Manufacturer's contractor training program.
  4. Applicator's Personnel: Employ persons trained for the application of high performance coating.
- B. Regulatory Requirements: Comply with environmental regulations.
- C. Pre-Application Meeting:
1. Convene a pre-application meeting one week before the start of application.
  2. Require attendance of parties directly affecting work of this section, including the Contractor, Engineer, Applicator, and Manufacturer's representative. Require attendance of installers whose work interfaces with below grade waterproofing.
  3. Review environmental requirements , materials, protection of adjacent work, surface preparation, application, curing, field quality control, cleaning, and coordination with other work.
  4. Examine substrate for compliance with manufacturers requirements including smoothness and moisture content.

## **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver in Manufacturer's original, unopened containers complete with labeling.
- B. Store materials in accordance with manufacturer's published instructions.
1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.
  3. Store in a well ventilated area away from open flames, sparks and hot surfaces.
  4. Store on elevated platforms protected from weather.
  5. Keep applicable MSDS nearby.



## 1.6 PROJECT CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Do not apply when rain is imminent or when surface may become wet within 4 hours of application.

## 1.7 PRODUCTS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Elastomeric Asphalt Extended Urethane Industrial Coating:
    - a. CIM Industries, Inc. – CIM 1000
    - b. Approved Equal or there shall be no substitutions
  - 2. Drainage Mat:
    - a. Carlisle Company – CCW MiraDRAIN 9000
  - 3. Reinforcing Fabric:
    - a. CIM – Scrim
    - b. Henry Company – Tietex T272
  - 4. Decorative Top Coat and Aggregate:
    - a. 3M Company – Aliphatic Urethane – Scotchclad
    - b. 3M Company – ColorQuartz Aggregate (color per architect)
- C. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
  - 2. Products: Subject to compliance with requirements, provide one of the products specified.
  - 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  - 4. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

## 1.8 ELASTOMERIC COATINGS, GENERAL

### A. Material Compatibility:

1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. Provide products of same manufacturer for each coat in a coating system.

### B. High-performance coating: CIM 1000: Two-component, high solids, elastomeric asphalt extended urethane industrial coating. Designed for spray, squeegee, or roller application.

1. Elastomeric Waterproofing, ASTM C 836 and C 957: Exceeds all criteria.
2. Solids by Volume: 88 percent.
  1. Volatile Organic Compounds (VOC): 0.76 pounds per gallon (92g/L).
  2. Mullen Burst Strength, ASTM D 751, 50 mils: 150 per square inch.
  3. Tear Strength, ASTM D 624, Die C: 150 pounds per inch.
  4. Tensile Strength, ASTM D 412, 100-mil sheet: 900 lbs per square inch.
  5. Extension to Break, ASTM D 412: 400 percent.

### C. Recovery from 100 Percent Extension:

1. After 5 Minutes: 98 percent.
2. After 24 Hours: 100 percent.

### D. Coating Performance, Crack Bridging:

E. 10 Cycles at -15 degrees F (-26 degrees C): Greater than 1/8 inch.

F. After Heat Aging: Greater than 1/4 inch.

G. Coating Performance, Weathering, ASTM D 822: 5000 hours – no cracking.

H. Softening Point, ASTM D 36: Greater than 325 degrees F (160 degrees C).

I. Deflection Temperature, ASTM D 648: Below -60 degrees F (-50 degrees C).

J. Service Temperature: -60 degrees F to 220 degrees F (-50 degrees C to 105 degrees C).

K. Hardness, ASTM D 2240, Shore A, 77 degrees F (25 degrees C): 60.

- L. Permeability to Water Vapor, ASTM E 96, Method E, 100 degrees F (38 degrees C), 100-mil sheet: 0.03 perms.
- M. Abrasion Resistance, Weight Loss, ASTM D 4060: 1.2 mg.
- N. Adhesion to Concrete, Dry, Elcometer: 350 per square inch.
- O. Color: Black.
- P. Primer: CIM 61 BG Epoxy Primer. Two-component, high solids, epoxy primer. Use as a prime coat on dry, porous substrates such as concrete.
- Q. Solids by Volume: 80 percent mixed.
- R. Volatile Organic Compounds (VOC): 1.41 pounds per gallon (170 g/L).
- S. Bonding Agent: CIM Bonding Agent. Organo-silane compound dispersed in isopropyl alcohol. Ensures a continuous and uniform bond between surfaces. Do not use where solvent cleaners are prohibited.
- T. Solids by Volume: Less than 1 percent.
- U. Volatile Organic Compounds (VOC): 6.4 pounds per gallon (743 g/L).
- V. Patching Material: CIM 1000 Trowel Grade. Tough, liquid applied, chemical and corrosion resistant urethane elastomer, chemically thickened to allow trowel applications with minimum sag. Use as a crack filler and for application to vertical surfaces and cold joints.
  - 1. Elastomeric Waterproofing, ASTM C 836 and C 957: Exceeds all criteria.
  - 2. Solids by Volume: 89 percent.
  - 3. Volatile Organic Compounds (VOC): 0.74 pounds per gallon (88 g/l).
  - 4. Mullen Burst Strength, ASTM D 751, 50 mils in CIM Scrim: 150 per square inch.
  - 5. Tear Strength, ASTM D 624, Die C: 150 pounds per inch.
  - 6. Tensile Strength, ASTM D 412, 100-mil sheet: 800 per square inch.
  - 7. Extension to Break, ASTM D 412: 300 percent.
  - 8. Coating Weight, 60 mils wet film thickness: 31 pounds per 100 square feet.
  - 9. Recovery from 100 Percent Extension:
    - 10. After 5 Minutes: 98 percent.
    - 11. After 24 Hours: 100 percent.

12. Coating Performance, Crack Bridging:
  13. 10 Cycles at -15 degrees F (-26 degrees C): Greater than 1/8 inch.
  14. After Heat Aging: Greater than 1/4 inch.
  15. Coating Performance, Weathering, ASTM D 832: Pass 5000 hours – no cracking.
  16. Softening Point, ASTM D 36: Greater than 325 degrees F (160 degrees C).
  17. Deflection Temperature, ASTM D 648: Below -60 degrees F (-50 degrees C).
  18. Service Temperature: -60 degrees F to 220 degrees F (-50 degrees C to 105 degrees C).
  19. Hardness, ASTM D 2240, Shore A, 77 degrees F (25 degrees C): 60.
  20. Permeability to Water Vapor, ASTM E 96, Method E, 100 degrees F (38 degrees C), 100-mil sheet: 0.03 perms.
  21. Abrasion Resistance, Weight Loss, ASTM D 4060: 1.2 mg.
  22. Adhesion to Concrete, Dry, Elcometer: 350 per square inch.
  23. Color: Black.
- W. Reinforcing Fabric and Joint Cover Sheet: CIM Scrim. Stitch bonded polyester. Compatible with coating materials.
1. Weight: 3 ounces per square yard (100 g/m<sup>2</sup>).
  2. Tensile Strength, ASTM D 1682: 57.1 pounds (30 kg).
  3. Elongation, ASTM D 1682: 61.65 percent.
  4. Mullen Burst Strength, ASTM D 3786: 176.8 psi (1,215 kPa).
  5. Trapezoid Tear Strength, ASTM D 1117: 16.1 pounds (7.2 kg).

## **PART 2 - EXECUTION**

### **2.1 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - a. Concrete: 12 percent.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Begin coating application only after installer has satisfied himself that all unsatisfactory conditions have been corrected and surfaces are dry.
4. Coating application indicates acceptance of surfaces and conditions.

## **2.2 PREPARATION**

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
  1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.
- C. Clean substrates of substances that could impair bond of coatings, including dirt, oil, grease, and incompatible paints and encapsulants.
  1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- E. Prepare surfaces in accordance with Manufacturer's instructions.
- F. Provide clean, dry, and structurally sound concrete surfaces.
- G. New Concrete:
  1. New concrete must have a minimum compressive strength of 3,000 psi, be dry, and be free of release agents or curing compounds prior to the application of the high-performance coating.
  2. Remove any cement past and expose the tops of the underlying aggregate consistent with ICRI CSP 4-6 surface profile.

H. Abrasive Blasting:

1. Prepare concrete surfaces to receive high-performance coating by abrasive blasting.
2. Remove dirt, soil, grease, oil, paint, coatings, form release agents, curing compounds, laitance, loose material, unsound concrete, and other foreign materials that would inhibit performance of high-performance coating in accordance with ASTM D 4258 and by abrasive blasting.
3. Obtain a firm, sound concrete surface in which bug holes are fully opened or repaired.
4. Remove sharp concrete edges and projections.
5. Perform abrasive blasting in accordance with ASTM D 4259.
6. Receive approval by Engineer of blasting media.
7. Maintain air supply for abrasive blasting free of oil and water in accordance with ASTM D 4285.

I. Repair concrete surface to be free of holes. Fully open bug holes before repair. Repair defects in the concrete surface, such as bug holes, air pockets, and honeycomb by filling and smoothing off with patching material, epoxy patching compound, or grout. Abrasive blast repaired surfaces.

J. Concrete surface shall have cement paste removed to expose aggregate tops and shall have a profile of ICRI CSP 4 to 6 in accordance with ICRI 03732. ICRI-CSP 4-6 surface profile exposing aggregate. The substrate must be clean and dry in accordance with Manufacture's instructions.

K. Repair cracks in concrete surface with materials suitable for type and width of crack, compatible with substrate and high-performance coating, and approved by the Engineer.

L. Do not apply primer or high-performance coating to concrete surface unless two or more of the following moisture tests confirm appropriate moisture levels for properly prepared substrates:

Plastic Sheet Method (ASTM D 4263)	Pass/Fail
Relative Humidity Test	<75% RH @ 70°F
Calcium Chloride Test	<5lb/1,00 sqft/24hr
Radio Frequency Test	<5% Moisture

### 3.3 APPLICATION

A. Comply with Manufacturer's written recommendations unless more stringent requirements are indicated by project conditions to ensure a satisfactory performance of waterproofing. Apply primer to concrete surface a minimum of 5 mils dry thickness. A uniform coating free of holidays or pinholes is necessary to minimize outgassing effects curing the application of the high-performance coating to porous surfaces such as concrete. Surfaces may require additional coats to obtain a pinhole free finish.

- B. Allow primer to cure in accordance with Manufacturer's instructions before topcoating with the high-performance coating.
- C. Apply high-performance coating in accordance with Manufacturer's instructions.
- D. Keep material containers tightly closed until ready for use.
- E. Keep equipment, air supplies, and application surfaces absolutely dry.
- F. Mix and apply when high-performance coating is above 55 degrees F (15 degrees C).
- G. Do not use adulterants, thinners, or cutback solutions.
- H. Blend and mix 2-component materials in accordance with Manufacturer's instructions. Do not hand mix components.
- I. Maintain air supply for material spray application free of oil and water in accordance with ASTM D 4285.
- K. Apply high-performance coating directly to a clean and dry surface or to reinforcing fabric.
- L. Apply 6 to 12 inch wide strip of joint cover sheet over cracks over 1/8 inch wide, non-working joints, and edges. Center joint cover sheet over all joints and adhere by first applying a tack coat of the high-performance coating.
- M. Apply sufficient high-performance coating to achieve 60 mils wet film thickness for wastewater immersion service.
- N. Prepare for joint lines should rain or other conditions require work stoppage or extended delay. Install joint lines clean and straight. Install overlap 6 inches minimum to ensure an impervious joint. Severely abrade with wire brush or sandpaper and apply bonding agent to all areas to be recoated when more than 4 hours curing time has taken place.
- O. Recoating:
  - 1. Recoat the high-performance coating system within 4 hours to obtain maximum interlayer adhesion to build specified thickness.
  - 2. Immersion Service: Complete recoating within 4 hours, except at joint lines.
  - 3. Non-Immersion Service: Severely abrade with wire brush or surface grinder, apply bonding agent, and recoat, if high-performance coating has cured more than 4 hours.
- P. Decorative Top Coat:
  - a. Test Aliphatic Urethane for adhesion and 'bleed-through', use only in conditions listed as appropriate by manufacturer.
  - b. Apply 10-15 mils of Aliphatic Urethane after elastomeric coating has cured for four hours.
  - c. Evenly broadcast decorative aggregate over top coat to uniform thickness.

### **3.5 CURING**

- A. Cure high-performance coating in accordance with Manufacturer's instructions.
- B. Do not allow uncured high-performance coating to come into contact with wastewater.
- C. Curing Time:
  - 1. Allow sufficient time for solvents to evaporate from the cured high-performance coating before placing into service.
  - 2. Allow minimum solvent release time of 24 to 48 hours at 60 degrees F (15 degrees C) for a 60-mil coating. Other temperatures or thicknesses shall require different solvent release times.
- D. Receive approval of cured coating by Engineer.

### **3.6 FIELD QUALITY CONTROL**

- A. Provide inspection services by an independent inspection firm throughout all phases of surface preparation, application, and curing of coating.

### **3.7 CLEANING AND PROTECTION**

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.
- E. After coatings have cured and prior to backfill install drainage mat. Install drainage mat on the exterior face of the concrete that is below grade. Starting at the bottom of cast-in-place concrete footing install drainage mat filter-fabric side out, extend mat to finish grade. Cut back rigid portion of mat 2 inches, leaving fabric. Fold leading edge of fabric over top of corrugated plastic and secure to concrete with mechanical fasteners taking care not to cause the concrete to spawl or crack. Backfill against drainage mat to hold remainder in place. Option – tie in base of drainage mat to footing drain per Civil drawings.

END OF SECTION 09960



SECTION 072413 - POLYMER-BASED EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Polymer-based exterior insulation and finish system (EIFS).
  - 1. EIFS-clad barrier-wall assemblies that are field applied over substrate.
- B. Related Requirements:
  - 1. Section 072419 "Water-Drainage Exterior Insulation and Finish System (EIFS)" for EIFS-clad drainage-wall assemblies.
  - 2. Section 072600 "Vapor Retarders" for wall sheet vapor retarders.
  - 3. Section 072713 "Modified Bituminous Sheet Air Barriers" for self-adhering sheet air barriers composed of bituminous materials applied over sheathing behind mechanically fastened EIFS.
  - 4. Section 072715 "Nonbituminous Self-Adhering Sheet Air Barriers" for self-adhering sheet air barriers composed of nonbituminous polymers applied over sheathing behind mechanically fastened EIFS.
  - 5. Section 072726 "Fluid-Applied Membrane Air Barriers" for fluid-applied, synthetic polymer air barriers applied over sheathing behind EIFS-clad wall assemblies.
- C. .

1.2 DEFINITIONS

- A. Definitions in ASTM E2110 apply to Work of this Section.
- B. EIFS: Exterior insulation and finish system(s).
- C. IBC: International Building Code.
- D. Polymer-Based Exterior Insulation and Finish System: Class PB EIFS, as defined in ASTM E2568.

1.3 ACTION SUBMITTALS

- A. Product Data: For each EIFS component, trim, and accessory.
- B. [<Click to insert sustainable design text for material ingredient screening and optimization action plan.>](#)

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For .
- B. Product Certificates: For cementitious materials and aggregates and for insulation, from manufacturer.
- C. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

1.6 QUALITY ASSURANCE

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.
- B. Store materials inside and under cover; keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.
  - 1. Stack insulation board flat and off the ground.
  - 2. Protect plastic insulation against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
  - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.8 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air, humidity, and substrate temperatures permit EIFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.
  - 1. Proceed with installation of adhesives or coatings only when ambient temperatures have remained, or are forecast to remain, above 40 deg F for a minimum of 24 hours before, during, and after application. Do not apply EIFS adhesives or coatings during rainfall.

1.9 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of EIFS that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:

- a. Bond integrity and weathertightness.
- b. Deterioration of EIFS finishes and other EIFS materials beyond normal weathering.
2. Warranty coverage includes the following EIFS components:
  - a. EIFS finish, including base coats, finish coats, and reinforcing mesh.
  - b. Insulation installed as part of EIFS , including buildouts.
  - c. Insulation adhesive.
  - d. EIFS accessories, including trim components and flashing.
3. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 POLYMER-BASED EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

- A. [<Click here to find, evaluate, and insert list of manufacturers and products.>](#)
- B. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as tested and compatible with EIFS components.

### 2.2 PERFORMANCE REQUIREMENTS

- A. EIFS Performance: Comply with ASTM E2568 and with the following:
  1. Weathertightness: Resistant to water penetration from exterior.
  2. .
  3. Structural Performance of Assembly and Components:
    - a. Wind Loads:
      - 1) Uniform pressure of .35 lb/sf , acting inward or outward.
      - 2) Uniform pressure as indicated on Drawings.
  4. Impact Performance: ASTM E2568, Standard impact resistance.
  5. Abrasion Resistance of Finish Coat: Sample consisting of **1-inch-** thick EIFS mounted on **1/2-inch-** thick gypsum board; cured for a minimum of 28 days and shows no cracking, checking, or loss of film integrity after exposure to **528 quarts** of sand when tested in accordance with ASTM D968, Method A.
  6. Mildew Resistance of Finish Coat: Sample applied to **2-by-2-inch** clean glass substrate; cured for 28 days and shows no growth when tested in accordance with ASTM D3273 and evaluated in accordance with ASTM D3274.
- B. Performance of Prefabricated Panels: EIFS to be designed as follows and withstand the structural performance indicated for Class PB EIFS and thermal movement limits indicated below without failure due to defective manufacture, fabrication, installation, or other defects in construction.

### 2.3 EIFS MATERIALS

- A. Base Coat: EIFS manufacturer's standard mixture complying with the following:
  - 1. Factory-blended dry formulation of portland cement, dry polymer admixture, and inert fillers to which only water is added at Project site.
- B. Finish Coat: EIFS manufacturer's product complying with the following:
  - 1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, and fillers used with stone particles for embedding in finish coat to produce an applied-aggregate finish.
    - a. Aggregate: Marble chips of size and color as indicated by manufacturer's designations .
  - 2. Colors: As selected by Architect from manufacturer's full range.
  - 3. Textures: As selected by Architect from manufacturer's full range.
- C. Sealer: Manufacturer's waterproof, clear acrylic-based sealer for protecting finish coat.
- D. Water: Potable.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 1. Begin coating application only after surfaces are dry.
  - 2. Application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
- B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind EIFS and deterioration of substrates.
- C. Prepare and clean substrates to comply with EIFS manufacturer's written instructions to obtain optimum bond between substrate and adhesive for insulation.

1. Concrete Substrates: Provide clean, dry, neutral-pH substrate for insulation installation. Verify suitability of substrate by performing bond and moisture tests recommended by EIFS manufacturer.

### 3.3 INSTALLATION OF EIFS, GENERAL

- A. Comply with ASTM C1397, ASTM E2511, and EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate.

### 3.4 APPLICATION OF SUBSTRATE PROTECTION

- A. Flexible-Membrane Flashing: Apply and lap to shed water; seal at openings, penetrations, and terminations. Prime substrates with flashing primer if required and install flashing.

### 3.5 INSTALLATION OF INSULATION

- A. Board Insulation: Adhesively attach insulation to substrate in compliance with ASTM C1397 and the following:
  1. Sheathing: Apply adhesive to insulation by notched-trowel method in a manner that results in coating the entire surface of sheathing with adhesive once insulation is adhered to substrate. Apply adhesive to a thickness of not less than **1/4 inch** for factory mixed and not less than **3/8 inch** for field mixed, measured from surface of insulation before placement.
  2. Concrete or Masonry: Apply adhesive by ribbon-and-dab method.
  3. Press and slide insulation into place. Apply pressure over entire surface of insulation to accomplish uniform contact, high initial grab, and overall level surface.
  4. Allow adhered insulation to remain undisturbed for not less than 24 hours, before installing mechanical fasteners, beginning rasping and sanding insulation or before applying base coat and reinforcing mesh.
  5. Apply insulation over dry substrates in courses, with long edges of boards oriented horizontally.
  6. Begin first course of insulation from a level base line and work upward.
  7. Begin first course of insulation from screed/track and work upward. Work from perimeter casing beads toward interior of panels if possible.
  8. Stagger vertical joints of insulation boards in successive courses to produce running bond pattern. Locate joints, so no piece of insulation is less than **12 inches** wide or **6 inches** high. Offset joints not less than **6 inches** from corners of window and door openings and not less than **4 inches** from aesthetic reveals.
    - a. Adhesive Attachment: Offset joints of insulation not less than **6 inches** from horizontal and **4 inches** from vertical joints in sheathing.
    - b. Mechanical Attachment: Offset joints of insulation from horizontal joints in sheathing.
  9. Interlock ends at internal and external corners.
  10. Abut insulation tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between boards. If gaps greater

- than **1/16 inch** occur, fill with insulation cut to fit gaps exactly; insert insulation without using adhesive or other material.
11. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes complying with details indicated.
  12. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than **1/16 inch** from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than **1/16 inch**. Prevent airborne dispersal and immediately collect insulation raspings or sandings.
  13. Cut aesthetic reveals in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that comply with profiles and locations indicated. Do not reduce insulation thickness at aesthetic reveals to less than **3/4 inch**.
  14. Install foam buildouts and attach to structural substrate by adhesive .
  15. Interrupt insulation for expansion joints where indicated.
  16. Form joints for sealant application by leaving gaps between adjoining insulation edges and between insulation edges and dissimilar adjoining surfaces. Make gaps wide enough to produce joint widths indicated after encapsulating joint substrates with base coat and reinforcing mesh.
  17. Form joints for sealant application with back-to-back casing beads for joints within EIFS and with perimeter casing beads at dissimilar adjoining surfaces. Make gaps between casing beads and between perimeter casing beads and adjoining surfaces of width indicated.
  18. Before installing insulation and before applying field-applied reinforcing mesh, fully wrap board edges. Cover edges of board and extend encapsulating mesh not less than **2-1/2 inches** over front and back face unless otherwise indicated on Drawings.
  19. Treat exposed edges of insulation as follows:
    - a. Except for edges forming substrates of sealant joints, encapsulate with base coat, reinforcing mesh, and finish coat.
    - b. Encapsulate edges forming substrates of sealant joints within EIFS or between EIFS and other work with base coat and reinforcing mesh.
    - c. At edges trimmed by accessories, extend base coat, reinforcing mesh, and finish coat over face leg of accessories.
  20. Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and EIFS lamina.
- B. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, and as follows:
1. At expansion joints in substrates behind EIFS.
  2. Where EIFS adjoin dissimilar substrates, materials, and construction, including other EIFS.
  3. At floor lines in multilevel wood-framed construction.
  4. Where wall height or building shape changes.
  5. Where EIFS manufacturer requires joints in long continuous elevations.
  6. Where panels abut one another.

3.6 APPLICATION OF BASE COAT

- A. Base Coat: Apply full coverage to exposed insulation and foam buildouts with not less than **1/16-inch** dry-coat thickness.
- B. Reinforcing Mesh: Embed reinforcing mesh in wet base coat to produce wrinkle-free installation with mesh continuous at corners, overlapped not less than **2-1/2 inches** or otherwise treated at joints to comply with ASTM C1397. Do not lap reinforcing mesh within **8 inches** of corners. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are invisible.

3.7 APPLICATION OF FINISH COAT

- A. Finish Coat: Apply full-thickness coverage over dry base coat, maintaining a wet edge at all times for uniform appearance, to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.
  - 1. Embed aggregate in finish coat to produce a uniform applied-aggregate finish of color and texture matching approved sample.
- B. Sealer Coat: Apply over dry finish coat, in number of coats and thickness required by EIFS manufacturer.

3.8 CLEANING AND PROTECTION

- A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive EIFS coatings.

END OF SECTION 072413

## SECTION 075400 - THERMOPLASTIC MEMBRANE ROOFING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Mechanically Fastened, Thermoplastic Membrane Roofing System. (concrete roof deck)
  - 2. Rigid Roof Insulation. (concrete roof deck)
  - 3. Tapered concrete crickets
- B. Unit Prices: Refer to Division 1 Section "Unit Prices" for description of Work in this Section affected by unit prices.

#### 1.3 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems".
- C. Factored Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems."



#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure. providing the maintenance, designated in the Roof Warranty Rider has been performed on an annual basis.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience. The roofing manufacturer shall provide a letter confirming compatibility of all roofing components supplied and coming in contact with the roof assembly.
- C. Service Life: The specified roof assembly must demonstrate through historical performance a proven service life track record of not less than 20 years. The roofing manufacturer shall provide documentation of performance of the roof assembly in service for a period of not less than twenty years within a similar geographic climate.
- D. The Installer: The Installer shall provide sufficient evident to document a familiarity with the specified system.
- E. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.
  - 1. Corner Uplift Pressure: 90 psf
  - 2. Perimeter Uplift Pressure: 67.5 psf
  - 3. Field-of-Roof Uplift Pressure: 45 psf

#### 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work. Provide a fastener, including withdrawal resistance data list including cut sheets for all fasteners proposed in the installation. Provide complete Shop Drawings for the following:
  - 1. Base flashings.
  - 2. Tapered cricket system indicating all slopes and degree of fall from high points to drain sumps.
  - 3. Crickets, saddles, and tapered edge strips, including slopes and methods of attachment.

4. Butterfly and Insulation fastening patterns.
  5. Membrane attachment patterns
  6. A roof assembly build-up indicating all components within the system.
- C. Samples for Verification: For the following products:
1. 12-by-12-inch square of sheet roofing of color specified, including T-shaped side and end lap seam.
  2. 12-by-12-inch square of roof insulation.
  3. 12-by-12-inch square of walkway pads or rolls.
  4. 12-inch length of metal termination bars.
  5. Four butterfly attachment sections.
  6. Six butterfly stress plates and insulation fasteners of each type, length, and finish.
  7. Six roof perimeter attachment fasteners; each type, length, and finish.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, by manufacturer to install the specified roofing system.
- E. Copy of Specification and Manufacturer's Specification. These submittals shall serve as evidence that the contractor has read and understands the project requirements.
- F. Manufacturer Certificates: Signed by a company officer or the Technical Manager of the roofing manufacturer, certifying that the roofing system complies with requirements specified in "Performance Requirements" Article of this section. The letter shall be submitted with all relevant support documents enumerated in the "Performance Requirements" Article.
1. Submit evidence of meeting performance requirements.
- G. Qualification Data: For Installer and manufacturer.
- H. Product Test Reports: Provide Test Reports confirming testing of the assembly by an ICC Certified Laboratory confirming performance to the specified field uplift pressures.
- I. Research/Evaluation Reports: Submit any relevant ICC ES Evaluation and or reports for physical property data for components of roofing system.
- J. Maintenance Data: The roofing system manufacturer shall provide a comprehensive maintenance and care manual for inclusion in the project O&M Manual. The maintenance and care documents shall be delivered as a part of the initial submittal as a part of the system consideration.
- K. Warranties: Special warranties specified in this Section.

- L. Inspection Report: Copy of roofing system manufacturer's inspection report of interim and completed roofing installation. A written inspection report shall be provided within seven days of site visits.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.
- B. Manufacturer Qualifications: A qualified manufacturer that has fire testing from an approved laboratory for membrane roofing system identical to that used for this Project. Documented evidence of the specified service life expectation.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented. in the laboratory certification documents issued by NIST, ICC, The South Florida Building Code, or other Code regulated laboratory code certification body.
- D. Source Limitations: Obtain components from suppliers and/or manufacturers approved by roofing membrane manufacturer.
- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
  - 2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.
- F. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Comply with requirements for preinstallation conferences in Division 1 Section "Project Management and Coordination." The Conference shall be organized by the General Contractor who shall provide not less than seven days written notice prior to the conference. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
  - 1. Meet with Owner, Architect, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.

2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
  7. Review governing regulations and requirements for insurance and certificates if applicable.
  8. Review temporary protection requirements for roofing system during and after installation.
  9. Review roof observation and repair procedures after roofing installation.
- G. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." The Conference shall be organized by the General Contractor who shall provide not less than seven days written notice prior to the conference. Review methods and procedures related to roofing system including, but not limited to, the following:
1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
  2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
  7. Review governing regulations and requirements for insurance and certificates if applicable.
  8. Review temporary protection requirements for roofing system during and after installation.
  9. Review roof observation and repair procedures after roofing installation.

### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components. All materials delivered shall have SDS sheets on file with building facilities management.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight. Coordinate with the General Contractor for storage of flammable and weather sensitive materials. Store all materials raised off the ground on pallets or dunnage.
  - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life. Do not incorporate into the work any materials that have expired shelf-life dates.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck. Coordinate loading and storage areas with the General Contractor or Facilities Management. The structural engineer of record shall be consulted regarding storage on the roof deck if there is any question regarding temporary load capacity.
- E. All packaging and debris that can be reasonably recycled shall be separated for disposal into a local recycling system. All wood, paper, cardboard, and recyclable plastics shall be separated for separate handling and disposal.

### 1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements. Cessation of work as a result of weather shall be communicated to the General Contractor and the roof site testing and observation agency within an hour of cessation during the working day, or within a hour of typical morning commencement of work.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer's warranty without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
1. Special warranty shall include roofing membrane, base flashings, and walkway products.
  2. Warranty Period: Twenty (20) years from date of Substantial Completion from the roof system manufacturer and Two (2) years from the installer.
- B. Special Project Warranty: Submit roofing Installer's warranty, similar to warranty form at end of this Section, signed by Manufacturer and Installer, covering Work of this Section, including all components of membrane roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards (if specified), substrate boards (if specified), vapor retarders (if specified), roof pavers (if specified), and walkway products, for the following warranty period-specified above: The signed sample warranty shall confirm acceptance of the terms and the commitment to issue the warranty at the point of substantial completion.
1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A.
1. Products Subject to compliance with requirements, provide one of the products specified.
  2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  3. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

### 2.2 PVB ROOFING MEMBRANE (Polyvinyl Butyral)

- A. PVB Sheet: 60 mil non reinforced PVB membrane formulated from recycled materials into a homogeneous roof membrane; mechanically attached to the

roof deck with manufacturer's 90 mil butterflies, bonded to the roof cover with adhesion promoting liquid. .

1. Product: Provide Leadax Roov Membrane by Leadax Americas Inc – 700 S. Rosemary Ave Suite 204 West Palm Beach, FL 33401.
2. Approved Alternate
3. Thickness: nominal 60 mils
4. Exposed Face Color: Off White

### 2.3 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  1. Components other than those manufactured and/or supplied by manufacturer shall be submitted for review, prior to ordering. Any product(s) not specifically authorized in writing for the project by Manufacturer, shall be considered unacceptable and their performance excluded from the warranty.
- B. Sheet Flashing: Manufacturer's standard thermoplastic PVB sheet flashing, of same color as sheet membrane.
  1. Product: nominal 60 mil Leadax Roov PVB membrane
  2. Approved Alternate
- C. Butterflies for attachment: nominal 90 mil non-reinforced PVB formed in pattern to secure membrane to resist uplift pressures.
- D. Bonding Liquid: Manufacturer's standard ethanol based liquid surface treatment to promote adhesion of two PVB surfaces to create an inseparable bond of the two membrane layers.

#### 1. General

- a. Bonding Liquid Supplier shall certify, in writing, that the specified bonding promotor liquid meets identifiable code requirements, is compatible with the insulation and is approved for its intended use.
- b. Bonding Liquid shall be listed and approved by the ICC Testing Agency that tested the assembly for uplift resistance in conjunction with the specified insulation and specific substrate.

- c. Adhesive manufacturer shall provide written specifications regarding the safe handling, storage, and surface preparation for a quality application of the product.
  - d. Liquid Bonding agent manufacturer shall provide applicable warranty to Leadax for the performance of the adhesion promoting product.
  - f. All Bonding Adhesion promoters shall be pre-approved by Manufacturer.
- E. Metal Termination Bars: Manufacturer's standard predrilled (oval holes) aluminum bars, approximately 1 by 1/8 inch thick; with 6061-T notes drilled 6" o.c.
1. Trufast #75 Termination Bar
  2. Approval Equal
- F. Fasteners: Factory-coated steel fasteners and 3" diameter Leadax attachment metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
1. Products:
    - a. SFS #15 diameter coated threaded fasteners
    - b. TruFast #15 diameter coated threaded fasteners
    - c. OMG # 15 diameter coated threaded fasteners  
To secure Membrane to concrete decks. A #15-13, butress thread-  
ed, #3 Phillips or T-25 Torx head fastener constructed of case hard-  
ened carbon steel with a reduced diameter drill point and corrosion  
resistant coating.
    - d. 3" Diameter 18 ga. Round Leadax Attachment Stress Plates  
designed to anchor butterflies through the insulation layer to the un-  
derlying substrate fabricated from AZ-50 galvalume steel with a 0.260  
inch diameter hole in its center. The plate has a raised reinforcement  
area to resist bending.
- G. Miscellaneous Accessories: Provide pourable sealers, preformed corners and membrane sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories as manufactured by Leadax, or approved equal.
1. Leadax Original Drain Flashings
  2. Leadax Water based Adhesive
  3. Leadax Pre molded flashings
  4. Leadax LRS Strips



5. Leadax Perimeter stress plates
6. Leadax High Tack adhesive
7. Leadax BioBond Adhesion Promoter
8. All pressure treated dimensional lumber shall be CCA treated to a minimum treatment of 0.25 pcf; comply with AWPA Use category UC3A.
9. All fasteners to secure treated lumber shall be 304 series stainless steel or coated with a proprietary coating tested for application into CCA pressure treated lumber.
10. Pressure treated lumber shall be Kiln dried to a moisture content of 20% moisture by weight. Lumber shall be straight and true. All checked or deformed lumber shall be discarded.

## 2.4 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Grade III, 25 psi all coated glass facer insulation.
  1. Available Manufacturers:
    - a. Atlas Roofing Corp.; two-inch thick AC Foam III; 25 psi with coated glass facers. Boards shall be 4' x 8' panels secured to the roof deck with #15 fasteners and Leadax stress plates; six fasteners per board in the field (Zone 1) of the roof; nine fasteners in the perimeter (zone 2) and twelve fasteners in corners (zone 3).
    - b. Approved equal Retain paragraph and subparagraphs below for composite polyisocyanurate board insulation faced with insulation board on one side and felt or glass-fiber mat facer on the other. Revise to include other facer types not yet recognized in ASTM C 1289 if applicable.

## 2.5 WALKWAYS

- A. Flexible Walkways: Cross Grip TPO Walking Pads

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with manufacturer's representative present, for compliance with the following requirements and other conditions affecting performance of roofing system:
  - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
  - 2. Review placement of overflow drains for code compliance with new insulation layer.
  - 3. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by ASTM F-2170.
  - 5. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions and established industry practices. Remove sharp projections. Examine attachment of deck components to insure full and complete attachment.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.3 SUBSTRATE BOARD PREPARATION (CONCRETE DECK)

- A. The roofing contractor shall be responsible for verifying that the deck condition is suitable for the specified installation of the mechanically attached Thermoplastic Roofing System.
- B. Examine surfaces for inadequate anchorage, low areas that will not drain properly, foreign material, wet insulation, unevenness, or any other defect which would prevent the proper execution and quality application of the mechanically attached Thermoplastic Roofing System, as specified.
- C. Prepared substrate shall be smooth, dry, free of debris and/or any other irregularities which would interfere with the proper installation of the mechanically attached Thermoplastic Roofing System.
- D. Do not proceed with any part of the application until all defects and preparation work have been corrected and complete.

### 3.4 WOOD NAILERS

- A. Install treated lumber at the same heights as insulation layer  $\pm$  1/4 in. Continuous treated wood nailers shall be installed at all perimeters; around roof projections and penetrations as shown in Manufacturer's approved details and approved shop drawings (see section 061000).
- B. Where wood nailers are installed directly to the substrate, the substrate shall be carefully examined to confirm that the entire area provides a suitable fastening surface. All defects shall be repaired by the appropriate trade prior to installation.
- C. Nailers shall be a minimum of 3½ in. wide, installed and anchored in such a manner to resist a force of 250 lbs. per linear foot of in any direction.
- D. Alternate attachment at perimeters shall be approved providing manufacturer approved details are submitted and approved. Attached to perimeter wall with a 1/8" x 1" 6061-T aluminum termination bar shall be acceptable where attachment is spaced six inches o.c. and withdrawal resistance of each fastener shall be not less than 400 lbf. Withdrawal resistance testing shall be required to demonstrate performance.

### 3.5 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.
- C. Board joints shall be staggered a minimum of six inches.
- D. Additional fasteners and stress plates shall be installed to create a flat, planar surface.
- E. Install tapered crickets at areas of roofing to conform to slopes indicated in project documents.
- F. Taper roof insulation to drain sumps using tapered edge strips. Taper 18 in. from the drain bowl in all directions. Mechanically fasten all tapered sections using minimum two fasteners per board.
- G. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- H. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation and secure with low rise foam.
  - 1. Cut and fit insulation within 1/4 inch of wood nailers, projections, and penetrations.
- I. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using #15 mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type securing both insulation and membrane butterflies.
  - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof. Increase fasteners at perimeter to nine fasteners per 4' x 8' board and twelve fasteners per 4' x 8' board in corner areas.

### 3.6 MECHANICALLY FASTENED ROOFING MEMBRANE INSTALLATION (CONCRETE ROOF DECK)

- A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of NRCA "Quality Control Guidelines for the Application of Thermoplastic Single Ply Roof Systems. The

roofing contractor shall maintain on site a copy of the written installation instructions published by the manufacturer at the time of installation. This document shall be a component of the roofing submittal and shall form a part of the specification by reference. Where the installation recommendations provide options, the method of installation shall be modified within the submittal package and clouded in red. The modified installation recommendations shall be reviewed and accepted prior to installation of any components of the roof membrane assembly."

1. Install roofing system consisting of flexible sheet PVB membrane in compliance with the published installation recommendations published by the roofing manufacturer and in compliance with the ICC testing of the roof assembly. Any conflicts in the referenced documents shall be resolved in the pre-roofing conference. Any deviation from the published listing shall be approved by in writing prior to application. Installation of accessory components shall be in compliance with published manufacturer's installation recommendations and shall be in general compliance with "The NRCA Roofing and Waterproofing Manual", current edition.
- B. Start installation of roofing membrane in the presence of roofing system manufacturer's technical representative who shall provide a written report to confirm the roof assembly is being applied in accordance with published installation recommendations and is eligible for the specified warranty.
- C. Cooperate with testing, observation and inspecting agencies engaged or required to perform services for installing roofing system.
- D. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.
  2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
  3. Remove and discard temporary seals before beginning work on adjoining roofing.
  4. Any installed work subjected to water within the roof assembly shall be removed at no cost to the owner and disposed of off site. The cost of replacement of damaged work shall be the sole responsibility of the contractor.

- E. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing. Membrane shall be unrolled for minimum of 30 minutes before bonding to butterflies and adjoining membrane.
- F. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps a minimum of 36".
- G. Mechanically or adhesively fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing in compliance with project drawings and approved shop drawings.
- H. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- I. Seams: Clean seam areas, overlap roofing membrane, and apply Bio bond adhesion promotor with brush, roller, or spray in accordance with manufacturer's written instructions to ensure a watertight seam and butterfly connection installation .
  - 1. Test lap edges and end laps with probe to verify seam continuity after thirty minutes.
  - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
  - 3. Repair tears, voids, and lapped seams in roofing membrane that does not meet requirements.
- J. Install Leadax Original in a continuous layer of High Tack Adhesive in compliance with project drawings. At drains to create a firm and watertight compression seal.
- K. Select one of two methods of mechanical fastening described in two paragraphs below. Classification of attachment methods follows SPRI guidelines. First paragraph conceals fasteners within seams of roofing membranes. Second paragraph fastens roofing membrane independent of seam locations and requires a cover strip to conceal fasteners. Revise to describe the seldom used "under membrane attachment" method or another method if applicable.
- L. Through-Membrane Attachment: Secure roofing membrane using Leadax termination fastening plates or termination bars, and mechanically fasten roofing membrane to roof deck or perimeter walls. Cover battens and fasteners with a continuous cover strip.
- M. Membrane

1. Rolls of Thermoplastic Roofing shall be positioned and installed straight and snug but not taut. Stretching of the membrane places undue stress on the mechanical fasteners and the membrane layer.
2. Adjoining rolls shall overlap four (4) inches, properly shingled with the flow of water where possible.
3. Membrane Attachment: Membrane shall be attached within the field, perimeter and corner of particular roof sections utilizing fastener spacing to meet specific design pressures, determined in compliance with procedures outlined within the current code requirements and incompliance with project drawings.
2. All stress plates must be centered on the butterflies with the center of the stress plates directly over the pre-punched hole.
3. Fasteners shall be fully seated securing the stress plate tight to the insulation substrate.
4. Butterflies shall be positioned over the insulation panel in strict compliance with the project drawings. Attachment density shall increase at perimeters and corners in compliance with project document.

#### 5. Perimeters

- a. The perimeter area of the roof shall be defined as the outer parallel boundary of the roof section or edge. Projects having variable roof levels shall treat the outer boundary of each level as a perimeter. Internal expansion joints, firewalls, or adjoining building walls greater than 4ft. are not considered perimeter areas.
- b. The width of the perimeter area shall be calculated to be either ten percent of the width of the roof section or forty percent of the building or section height above ground, whichever is less to a minimum of 4 ft.

#### N. Inspection

1. The job foreman and/or supervisor shall initiate daily inspections of all completed work which shall include but is not limited to the probing of all field welding with a dull pointed instrument to assure the quality of the application and ensure that any equipment or operator deficiencies are immediately resolved.
2. Ensure that all aspects of the installation (sheet layout, attachment, bonding, flashing details, etc.) are in strict conformance with the most current Manufacturer's Roofing Systems Specifications and Details.
3. Excessive patching of field seams because of inexperienced or poor workmanship will not be accepted at time of FINAL INSPECTION FOR WARRANTY ACCEPTANCE.

4. Any deviation from pre-approved specifications and/or details requires written authorization from the Manufacturer prior to application to avoid any warranty disqualification.

### 3.7 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply water based bonding adhesive to substrate and underside of sheet flashing at required rate and allow too partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.
- F. Clean all vents, pipes, conduits, tubes, walls, and stacks to bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard all lead, pipe and drain flashing. Flash all penetrations according to approved details.
- G. Remove all loose and / or deteriorated cant strips and flashing.
- H. Flash all curbs, parapets, and interior walls in strict accordance with approved Manufacturer's details.
- I. All flashing shall be fully adhered to properly prepared, approved substrate(s) with Leadax water based adhesive in sufficient quantity to insure total adhesion.
- J. The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond the wood nailer to a maximum width of six inches.
- K. Vertical flashing shall be terminated no less than eight inches. above the plane of the deck with approved termination bar and counterflashing or metal cap flashing.
- L. Vertical wall flashing termination shall not exceed 30 inches without supplemental mechanical attachment of the flashing between the deck and the



termination point of the flashing when using Leadax water base as the adhesive.

- M. Complete all inside and outside corner flashing details with Manufacturer's pre-formed corners or an approved field fabrication detail.
- N. Probe all seams with a dull, pointed probe to ensure a homogeneous bond has been formed.
- O. Install penetration accessories in strict accordance with approved details. Ensure penetration accessories have not impeded in any way the flow of water to the drains.

### 3.8 FLASHINGS

#### F. Roof Drains

- 1. Flash all roof drains in accordance with Manufacturer's roof drain details using Leadax Original drain collars.
- 2. Replace all *worn or broken* parts that may cut the membrane or prevent a watertight seal. This includes the clamping ring and strainer basket.
- 3. Replace all drain bolts or clamps used to hold the drain compression ring to the drain bowl.

#### G. Walk pads: Crossgrip by Plastex TPO Walkpads

- 1. Walk pads shall have four way drainage, UV resistant and certified slip resistance.
- 2. Slip resistance shall meet ASTM E 303; 78-83
- 3. Stable winds greater than 100 mph
- 4. Dimensions: 3' wide, 33' length
- 5. Rolls shall be joined with snap track sections at all joints

#### Pitch Pans

- 1. Efforts shall be made to eliminate the need for pitch pans.
- 2. In the event of no alternative, install Chem-Link Chem-Curb prefabricated penetration flashings. Fabricate and bond prefabricated sections to the membrane surface with M-1 adhesive.
- 3. Pitch Pans shall be filled with Chem-Link single component filler to the top of the prefabricated elements.

4. Pitch Pans and the sealant will require periodic maintenance by the building owner's maintenance personnel.

### 3.9 SEALANTS

- A. Apply specified sealant(s) to all surface mounted reglets and were called for. Sealant(s) are to shed water, following manufacturer's instructions and installation guides.
- B. Use primer when recommended by the manufacturer.
- C. Sealants will require periodic maintenance by the building owner's maintenance personnel.

### 3.10 TEMPORARY SEALS

- A. At the end of each working day or at the sign of rain, install temporary, 100% watertight seal(s) where the completed new roofing adjoins the uncovered deck or existing roof surface.
- B. The authorized roofing contractor shall create and maintain the temporary seal in such a manner to prevent water from traveling beneath the new roof system.
- C. If water is allowed to enter beneath the newly completed roofing, the affected area(s) shall be removed and replaced at no additional expense to the building owner.

### 3.11 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports *and daily Field Reports*.
- B. Test Cuts: Test specimens will be removed at the direction of the testing agency by the roofing contractor to evaluate any problems or observed deviations during quality-assurance observations of roofing membrane as follows:
  1. Materials shall be tested to confirm compliance with the published physical properties for newly applied components.
  2. If deemed appropriate by the site observer, wind uplift testing shall be carried out in compliance with **ASTM E-907** to confirm conformance with the specification.

3. Cuts shall be patched to match existing and shall be inspected prior to issuance of the manufacturer's warranty.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect and to owner's roof observation and testing agency.
  1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- D. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- F. Upon completion of the project, the authorized roofing contractor shall complete and submit the Leadax Project Completion Notice to Leadax Technical Customer Services.
- G. Upon receipt of the notice of completion, a Leadax Technical Customer Service Representative will schedule an inspection with a representative of the authorized roofing contractor to thoroughly review the installation and verify compliance with Leadax America specifications.
- H. Any corrections or modifications necessary for compliance with the specifications and acceptance for warranty (*punch list*) will be noted on the Final Inspection for Warranty Form.
- I. Upon completion of all punch list items and final acceptance of the installation, a warranty will be issued in accordance with the Leadax America, pre-approved project specifications and Warranty Request Form.

### 3.12 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane

roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

### 3.13 SAMPLE ROOFING INSTALLER'S WARRANTY

- A. WHEREAS herein the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
  - 1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
    - a. lightning.
    - b. sustained wind speed exceeding 90 mph as measured by the nearest weather station.
    - c. fire.
    - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition.
    - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work.
    - f. vapor condensation on bottom of roofing; and
    - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
  - 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

END OF SECTION 07540

## SECTION 075416 – ETHYLENE INTERPOLYMER (KEE) ROOFING

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes the following:
  - 1. Fully Adhered KEE roofing system [over and existing insulated roof assembly](#);
  - 2. Adhered Cover Board;
  - 3. Fully adhered and mechanically attached polyisocyanurate insulation;
  - 4. Related Flashings and Trim; and
  - 5. Walkways.
- B. Related Sections include the following
  - 1. Section 076200 - Sheet Metal Flashing and Trim;
  - 2. Section 079200 - Joint Sealants; and
  - 3. Section 07 72 00 - Roof Accessories.

#### 1.03 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

#### 1.04 REFERENCE STANDARDS

- A. ANSI/SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems ([Perimeter Flashings](#)).
- B. ANSI/SPRI FX-1 - American National Standard - Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.
- C. ASCE/[SEI 7-2240](#) - Minimum Design Loads for Buildings and Other Structures, IBC 2021;~~45~~.
- D. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board, 2018a.
- E. ASTM D6754/D6754M - Standard Specification for Ketone Ethylene Ester (KEE) Based Sheet Roofing, 2023~~45~~.
- F. ASTM D7877- Standard Guide for Electronic Methods for Detecting and Locating Leaks in Waterproof Membranes, 2014.

- G. ASTM E1980 – Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces, 2011.
- H. NRCA ML104 – The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association, Current Edition.
- I. SMACNA (ASMM) – Architectural Sheet Metal Manual, Current Edition.
- J. UL (RMSD) – Roofing Materials and Systems Directory; Underwriters Laboratories, Inc., Current Edition.

#### 1.05 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane, base flashings and related components that remain watertight; do not permit the passage of water; and resist specified uplift pressures; thermally induced movement; and exposure to weather without failure, providing required maintenance has been performed on an annual basis.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience. The roof manufacturer shall provide a letter confirming compatibility of all roofing components supplied and coming in contact with the roof assembly.
- C. Service Life: The specified roof assembly must demonstrate through historical performance a proven service life track record of not less than 20 years within the environment of the project. The roof manufacturer shall provide documentation of performance of the roof assembly in service for a period of not less than twenty years within a similar geographic climate.
- D. The Installer: The Installer shall provide sufficient evidence to document a familiarity with the specified system and evidence of prior successful installations. The installer shall provide a list a project names, contact individuals and telephone numbers, along with written references.
- E. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to all current FM Global Loss Prevention Data Sheets (LPDS 1-29) and current local Building Codes. The testing laboratory shall be FMG or an independent third-party testing laboratory certified by ICC or NIST to perform wind uplift testing in compliance with FMG Standard 4470. The roof assembly shall be tested to specified design pressures with a 2:1 margin of safety.
- F. Corner Uplift Resistance Pressure: See Roof Plan.
- G. Perimeter Uplift Resistance Pressure: See Roof Plan.
- H. Field-of-Roof Uplift Resistance Pressure: See Roof Plan.
- I. [Wind Uplift Performance FMG Listing](#): Provide roofing membrane, base flashings, and component materials that [have been tested at an ICC certified testing laboratory over non-combustible decks that has demonstrated uplift resistance performance of not less than -105 psf when the insulation is mechanically attached to a concrete deck, comply with requirements in Test Standard FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or](#)

~~noncombustible construction, as applicable. Identify materials with FMG markings. FMG Listing:~~

1. ~~Uplift Fire/Windstorm Classification: -105 psf Class 1A-90, or greater.~~
  2. ~~Hail Resistance: MH (Testing over the specified coverboard)-~~
- J. Roof Drainage: Slope minimum ¼ inch in 12 inches (Two percent) to prevent ponding 48 hours after precipitation.
- K. Fire Classification:
1. Class A roof assembly tested in accordance with ASTM E108 or UL 790.
  2. ~~Roof assembly with foam insulation: Passes FM 4450 or UL 1256.~~

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## 1.06 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system, include plans, elevations, sections, details, and attachments to other Work. Provide a fastener list including cut sheets for all fasteners proposed in the installation. Provide complete Shop Drawings for the following:
1. Base flashings and all membrane terminations.
  2. Tapered cricket and saddle system indicating all slopes and degree of fall from high points to collector boxes.
  3. Crickets, saddles, and tapered edge strips, including slopes and methods of attachment.
  4. Flashing of all water collection components including drains, scuppers, overflows, etc.
  5. Flashing of all roof penetrations.
  6. A roof assembly build-up detail indicating all components within the system from the top side of the concrete deck or metal profile deck.
- C. Samples for Verification: For the following products:
1. 12-by-12-inch square of KEE sheet roofing, of color specified, including T-shaped side and end lap seam.
  2. 12-by-12-inch square of Cover Board.
  3. 12-by-12-inch square of roof insulation.
  4. 12-by-12-inch square of walkway pads.
  5. 12-inch length of ~~6061-T aluminum~~ ~~non-ferrous metal~~ termination bar.
  6. Six fasteners of each type, length, and finish.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved by manufacturer to install the specified roofing system and has installed not less than five similar systems within the same geographic location within the past three years. Certificate for the roofing manufacturer shall include addresses, contact individuals and telephone numbers to confirm references.
- E. Manufacturer Certificates: Signed by a Company Officer or Technical Manager of the roof manufacturer certifying that the roofing system complies with requirements

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specified in "Performance Requirements" Article of this section. The letter shall be submitted with all relevant support documents enumerated in the "Performance Requirements" Article.

1. Submit evidence of meeting specified performance requirements.

- F. Qualification Data: For Installer and manufacturer.
- G. Product Test Reports: Provide Test Reports to confirm performance under the specified wind and fire resistance ratings for acceptance of the submitted roof assembly.
- H. Research/Evaluation Reports: Submit any relevant ICC ES Evaluation reports for components of roofing system, where applicable.
- I. Maintenance Data: The roofing system manufacturer shall provide a comprehensive Maintenance Manual for inclusion in the project O&M Manual. The maintenance documents shall be delivered as a part of the initial submittal as a part of the system consideration.
- J. Warranties: Special warranties specified in this Section from both the manufacturer and the installer.
- K. Observation Report: Copy of roof system manufacturer's site observation report of interim and completed roofing installation. A written report shall be provided within three business days of the site visit. Roof system manufacturer shall visit the site at the commencement of the project; one interim site visit and a final close out site visit at the completion of the roof assembly. The purpose of the site visits is to confirm the system installed is in compliance with warranty requirements.
- L. Product Data: Provide properties of all products in Product Data Sheets.
- M. Material Certificates: For each product, signed by manufacturers.
- N. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

#### 1.07 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Comply with Owner requirements for pre-installation conferences. The Conference shall be organized by the General Contractor who shall provide not less than seven days written notice prior to the conference. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
  - 1. Meet with Owner, Consultant, testing and inspecting agency representative, roofing installer, roofing system manufacturer's technical representative, liquid applied deck waterproofing installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.

2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
  7. Review governing regulations and requirements for insurance and certificates if applicable.
  8. Review temporary protection requirements for roofing system during and after installation.
  9. Review roof observation and repair procedures after roofing installation.
  10. Review Quality and Observe Quality Control Program provided by installer. Installer must identify a Quality Assurance Manager for the project. Quality Assurance and Quality Control program shall incorporate pre-installation inspections, daily confirmation of installations in compliance with project documents and post installation reports.
  11. Review submittal for walkway design and placement.
- B. Pre-installation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." The Conference shall be organized by the General Contractor who shall provide not less than seven days written notice prior to the conference. Review methods and procedures related to roofing system including, but not limited to, the following:
1. Meet with [Owner, Consultant, Owner, A/E, Waterproofing Consultant](#), testing and inspecting a ~~agency representative~~, roofing Installer, roofing system manufacturer's representative, liquid applied deck waterproofing installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
  2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Examine [existing roof assembly and](#) deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  5. Review structural loading limitations of roof deck during and after roofing.
  6. Review moisture conditions within the roof deck and review moisture limitations for the roof assembly.

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7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs (if any), and condition of other construction that will affect roofing system.
8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review appointment of installers and Quality Manager and Quality Plan to support the installation.
11. Review testing criteria for finished roofing.
12. Review procedure for protection of the roof assembly after completion of the roofing work.

#### **1.08 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified roof installation firm that is approved by the roof system manufacturer to install manufacturer's product. The installer shall be approved and eligible to receive specified manufacturer's warranty.
- B. Manufacturer Qualifications: A qualified manufacturer that has submitted performance data provided by a certified third part testing laboratory indicating the submitted roof assembly meets all performance criteria and shall submit evidence of the specified service life expectation.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented in the laboratory certification documents issued by NIST, ICC, The South Florida Building Code or other Code regulated laboratory Code certification body. Testing agency shall be certified by NIST, ICC or ISO to carry out ASTM testing protocols detailed in this specification. Testing agency shall have experience in Electronic Leak Detect ('ELD') testing of the completed roof membrane.
- D. Source Limitations: Obtain components for membrane roofing system approved by roofing membrane manufacturer or by suppliers that have been approved in writing by the roof membrane manufacturer.
- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having permit jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
  1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated over a non-combustible deck.
  2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.
- F. Inspection Reports: Submit copies of roof system manufacturer's field observation reports issued for warranty following the approved format within five days of each site visit. The purpose of the site visits is to determine conformance with the manufacturer's warranty requirements only.

ETHYLENE INTERPOLYMER (KEE) ROOFING

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- G. Roofing installer shall develop a Quality Assurance program managed by an on-site contractor appointed quality assurance manager, who shall be designated at the pre-construction conference. The quality assurance program shall include daily forms for completion by field personnel documenting the application of the roofing assembly. The forms shall include a review of stored materials, substrate conditions, quality of asphalt heating and transport, quality of installation of all roof assembly components, protection of finished work and environmental conditions. The quality assurance manager shall coordinate site documentation with the third-party inspectors and the Roof Consultant. Documents shall be posted daily to the Job Log for a quality audit by the contract administrators.

#### 1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight. Coordinate with the General Contractor for storage of flammable and weather sensitive materials. Store all materials raised off the ground on pallets or dunnage.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life. Do not incorporate into the work any materials that have expired ~~shelf life~~ shelf-life dates.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation. Insulation shall be kept dry and under protection that is breathable. All wet or damaged insulation shall be removed from site immediately and shall be disposed of in a legal manner.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck. Coordinate loading and storage areas with the General Contractor. The structural engineer shall be consulted regarding temporary storage on the roof deck and anticipated additional dead load.
- E. All packaging and debris that can be reasonably recycled shall be separated for disposal into a local recycling system. All wood, paper, cardboard, and recyclable plastics shall be separated for separate handling and disposal.

#### 1.10 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements. Cessation of work as a result of weather shall be communicated to the General Contractor and the roof site testing and observation agency within an hour of cessation during the working day, or within an hour of typical morning commencement of work. Temperatures shall be monitored throughout the installation period to ensure work does not continue during deteriorating conditions.

- B. Have necessary waterproof canvas or plastic sheeting readily available in case of emergency. The Contractor will be held liable for any damage to building interior due to Contractor's negligence.
- C. Protect open roofs and flashings to prevent the entrance of moisture or rain water into the existing structure until new materials have been applied and roof is in a watertight condition.
- D. Roofing materials shall not be applied when water in any form (i.e., rain, dew, etc.) is present on the deck.

#### 1.11 WARRANTY

- A. Special Warranty: Manufacturer's warranty shall be issued without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes repeated roof leaks.
  - 1. Manufacturer's warranty without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Warranty Period: Twenty years from date of Substantial Completion from the manufacturer and Five years from the installer.
  - 2. Standard manufacturers' warranties begin on completion of roofing system.
  - 3. Warranty Period: Twenty years from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty on warranty form at end of this Section, signed by Manufacturer and Installer, covering Work of this Section, including all components of roofing system such as roofing membrane and base flashing for the following warranty period specified below: The signed sample warranty provided as a part of the roofing submittal shall confirm acceptance of the terms and the commitment by both the roof system manufacturer and the roof installer to issue the warranties at the point of substantial completion.
  - 1. Warranty Period: Twenty years from date of Substantial Completion. (Manufacturer)
  - 2. Warranty Period: Five years from date of Substantial Completion. (Installer)

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work are listed below.
- B. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified:
  - 1. Fully Adhered KEE roofing system:
    - a. Seaman Corporation: FiberTite Roofing System.
    - b. Approved Equal.

- C. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
  2. Products: Subject to compliance with requirements, provide one of the products specified.
  3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  4. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

## 2.02 KEE THERMOPALSTIC ROOF MEMBRANE

- A. KEE Sheet: ASTM D 6754-~~2302~~, Type II, Grade 1, fiber reinforced, as follows:
1. Roof membrane shall be FiberTite 50 mil XT, an ethylene interpolymer (EIP) alloy, reinforced with knitted polyester fabric, as manufactured by Seaman Corporation.
  2. Product: Subject to compliance with requirements, provide "FiberTite Membrane" by Seaman Corporation; [www.fibertite.com](http://www.fibertite.com).
  3. Thickness: Nominal 50 mil.
  4. Exposed Face Color: Energy Grey.
- B. Approved Equal.

## 2.03 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
1. Components other than those manufactured and / or supplied by manufacturer shall be submitted for review, prior to ordering. Any product(s) not specifically authorized in writing for the project by Manufacturer, shall be considered unacceptable and their performance excluded from the warranty.
- B. Sheet Flashing: Manufacturer's thermoplastic KEE sheet flashing, of same color as sheet membrane.
1. Product: 50 mil XT- Seaman Corporation.
  2. Approved Equal.
- C. Bonding Adhesive: Adhesives, supplied by Seaman Corporation, have been specially formulated for FiberTite Roofing Systems.
1. FTR-CR-20 Adhesive: An environmentally friendly, adhesive for adhering FiberTite FB membranes to a cover board.
  2. FTR-190e Bonding Adhesive: A solvent based, contact type, (two sided) bonding adhesive, designed for bonding FiberTite membrane to clean and dry, pre-approved horizontal or vertical substrates. Use for flashing installation only.

3. Approved alternate adhesive supplied by the membrane manufacturer and meets the specified wind uplift rating.
4. General:
  - a. Membrane manufacturer shall certify, in writing, that the specified adhesive meets identifiable code requirements, is compatible with the insulation and is approved for its intended use.
  - b. Adhesive shall be listed and approved [in the ICC Test Report by Factory Mutual Research](#) in conjunction with the specified insulation and specific substrate.
  - c. Membrane manufacturer shall provide written specifications regarding the safe handling, storage, and surface preparation for a quality application of the product.
  - d. All adhesives shall be pre-approved by Manufacturer.
- B. Insulation and Cover Board Adhesive: dual-component, reaction cured, polyurethane adhesive; dispensed from a portable disposable pre-pressurized container; FTR 601 insulation adhesive or approved equal.
  - C. Metal Termination Bars: Membrane flashing(s) restraint / termination seals, nominal 1/8 inch x ~~one~~ inch x Ten feet, 6061-T6 extruded aluminum bar with pre-punched slots, Six inches o.c., or as detailed in the project drawings
  - D. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories.
1. FTR 101 Sealant- A one-component gun-grade polyurethane sealant to seal flashing termination.
2. FTR-SL1 Sealant - A one component pourable, self-leveling, polyurethane sealant to fill "pitch pans".
3. Fiber Clad Metal - To fabricate metal flashing, 4' x 10' sheets of 24 gage hot dipped, G-90 steel, laminated with a 0.020 mil polymeric coating.
4. FTR-Pre-Molded Flashing(s) Injection molded vent stack and inside/outside corner flashing using FiberTite EIP compound
5. ~~Wood~~ Nailers – See Rough Carpentry Section.
6. Millennium Lockin' Pocket Interlocking flashing system and filler for all roof penetrations that cannot be flashed with a FTR Pre-Molded Flashing, as detailed in the project documents; or approved equal.

## 2.04 WALKWAYS

- A. Flexible Walkways:
  1. Product: FiberTite Tuff-Trac ~~protection~~ mat reinforced with a polyester woven fabric formulated with a KEE formulation and embossed with a low profile diamond pattern.
  2. Walkpads shall be spaced for drainage and welded to the underlying membrane.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
1. Verify that roof openings and penetrations are in place, set and braced.
  2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation in compliance with the Project Documents.
  3. Verify that existing curb heights allow for membrane to be terminated a minimum of eight inches above the roofing membrane surface as shown in project documents.
  4. Verify the surface plane flatness with the contract documents.
  5. Verify moisture levels in the concrete deck are in compliance with the insulation and membrane manufacturer's installation recommendations.
  6. Proceed with installation only after unsatisfactory conditions have been corrected.
  7. Notify the General Contractor of any non-compliant conditions in writing prior to commencement of roofing.

### 3.02 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions and established industry practices. Remove sharp projections. Examine attachment of deck components to insure full and complete attachment.
- B. Prevent materials from entering and clogging conductor heads or ~~drain pipes~~drain pipes, and from spilling or migrating onto surfaces of other construction.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.03 COVERBOARD INSTALLATION

- A. Adhered Coverboard: Apply beads of insulation adhesive in accordance with manufacturer's installation guidelines to comply with the specified uplift criteria. Installing additional adhesive at roof perimeter, roof penetrations and drains to comply with design pressures. Adhere cover board in adhesive within five minutes after adhesive application. Walk on or weight cover boards to help spread adhesive for maximum contact and minimize voids between cover boards. Repeat regularly or wait until cover boards are firmly attached.
- B. Offset joints a minimum of six inch.
- C. Leave gaps as required by manufacturer, but not greater than 1/8 inch.
- D. If infill sections are added no pieces shall be less than twelve-inch squares.



- E. All boards shall be in place to create a flat surface.

### 3.04 INSTALLATION OF FIBERTITE

#### A. Quality Control

1. It is the responsibility of the roofing contractor to initiate and document an on-site Quality Control program to govern all aspects of the installation of the new adhered FiberTite 50 mil XT Roofing system. Evidence of the program should be submitted for review with the roofing submittal and should be reviewed at the pre-construction conference.
2. The job foreman and / or supervisor will be responsible for the daily execution and documentation of the QC program which will include, but is not limited to, the supervision and inspection during substrate preparation, installation of insulation and/or base sheet, and the application of adhesive(s), fasteners and probing of all heat welding incorporated within the FiberTite 560 mil XT system.
3. If any inconsistencies in the overall quality of the installation including, but not limited to, the adhesion of the FiberTite 560 mil XT membrane, or in the quality of the welds are found, all work shall cease until corrective actions are taken to insure the continuity of all workmanship.

#### B. General

1. All work shall be coordinated to ensure that the sequencing of the installation will allow for a 100 percent watertight installation at the end of each workday.
2. FiberTite 560 mil XT Roofing Systems will utilize conventional roll goods 72 inches wide by 100 feet in length.
3. Outside ambient air temperature must be above 40°F and rising to ensure proper bonding.
4. Drying time of the adhesive(s) will be affected by ambient temperatures and must be taken into consideration when determining daily production schedules.

#### C. Membrane Attachment

1. Position the FiberTite Membrane and fold the sheet to allow a workable exposure of the underside of the sheet.
2. Apply a 100 percent continuous spatter pattern of bonding adhesive to the exposed bottom side of the membrane.
3. The amount of membrane and substrate that can be coated with adhesive will be determined by application method, ambient temperature, humidity and available manpower.
4. Adhesive shall be applied by spraying in a consistent pattern in compliance with the ~~manufacturers~~manufacturer's installation instructions.
5. Roller applied solvent based adhesive for flashings shall utilize a solvent resistant 3/8 inch nap roller, spreading the adhesive to ensure a smooth, even 100 percent coverage of the substrate and membrane
6. Solvent adhesive coverage should average 100 square feet per gallon of applied adhesive with a 50 square feet per gallon net coverage (± 10 percent) for the membrane and substrate combined.

7. Allow the solvent based adhesive to dry or cure to a point of being tacky, but not stringy to the touch on both surfaces. Do not allow adhesive to completely dry out on either surface.
8. When sufficiently cured, carefully maneuver the glued portion of the membrane onto the glued substrate surface, avoiding any wrinkles or air pockets.
9. Broom the adhered portion of the membrane to ensure full contact and complete the bonding process by firmly pressing the bonded membrane into place with a weighted, foam-covered, lawn roller.
10. Repeat the process for the remaining unbonded portion of the membrane, lapping subsequent, adjacent rolls of membrane a minimum of three inches, ensuring proper shingling of the membrane to shed water along the laps.
11. No adhesive shall be applied to the lap seam areas of the membrane. Contaminated areas will inhibit proper welding of the seams requiring a membrane patch or strip.
12. Do not use bad or marginal adhesives. Contact [FiberTite Div. of Seaman Corp.FTCS](#) if the quality of the adhesive is suspect.

D. Hot Air Welding

1. General

- a. All field seams exceeding Ten feet in length shall be welded with an approved automatic welder.
- b. All field seams must be clean and dry prior to initiating any field welding.
- c. Remove foreign materials from the seams (dirt, oils, etc.) with Acetone, MEK, or approved alternative. Use CLEAN cotton cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.
- d. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.

2. Hand Welding

- a. The lap or seam area of the membrane should be intermittently tack welded to hold the membrane in place.
- b. The back "interior" edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
- c. The nozzle of the hand held hot air welder shall be inserted into the lap at a 45-degree angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be used to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1½ inch wide nozzle, to create a homogeneous weld, a minimum of 1½ inch in width.
- d. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1 ½ inch weld.

3. Automatic Machine Welding

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- a. The automatic welder intended for use on the project shall be reviewed and approved by the manufacturer's technical representative prior to use. A sample weld with the on-site unit shall be provided to the third-party inspector for review.
  - b. Follow all manufacturers' instructions for the safe operation of the automatic welder.
  - c. Follow local Code requirements for electric supply, grounding and surge protection.
  - d. A dedicated, portable generator shall be used to insure a consistent electrical supply, without fluctuations that can interfere with weld consistency.
  - e. Properly welded seams shall utilize a 1½ inch wide nozzle, to create a homogeneous weld, a minimum of 1½ inch in width.
- E. Inspection
1. The job foreman and/or superintendent shall initiate daily inspections of all completed work, which shall include, but are not limited to the probing of all field welding with a dull pointed instrument.
  2. Ensure that all aspects of the installation (sheet layout, attachment, welding, flashing details, etc.) are in strict conformance with the most current FiberTite-~~FB~~ Roofing System Specifications and Details.
  3. Excessive patching of field seams will not be accepted. A definition of excessive shall be defined in the preconstruction conference.

### 3.05 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roof system manufacturer's written instructions and in compliance with the Project Documents.
- B. Apply 190-~~eE~~ solvent-based bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings in compliance with the Contract Documents.

### 3.06 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in existing locations identified prior to removal of existing roof and in compliance with the project documents. Prior to roofing demolition, document existing walkway conditions and submit walkway layout plan for owner approval. Loose lay walkway products to substrate according to manufacturer's installation requirements in locations identified on owner approved walkway plan.

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**3.07 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports and daily Field Reports.
- B. Test Cuts: Test specimens will be removed at the direction of the testing agency by the roofing contractor to evaluate any problems or observed deviations during quality-assurance observations of roofing membrane as follows:
  - 1. Materials shall be tested to confirm compliance with the published physical properties for newly applied components.
  - 2. If deemed appropriate by the site observer, wind uplift testing shall be carried out in compliance with ASTM E-907 to confirm conformance with the specification.
  - 3. Cuts shall be patched to match existing and shall be inspected prior to issuance of the manufacturer's warranty.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Building Envelope Consultant and to the Owner's roof observation and testing agency.
- D. Electronic Leak Detection (ELD) Testing: The roofing installer shall engage the services of a testing agency to carry out ELD testing of the completed roof membrane immediately after completion of the installation of the roofing membrane and related flashings. The ELD testing shall identify all breaches in the roofing membrane and the roofing installer shall repair the breaches prior to final acceptance of the roof assembly.
  - 1. Notify Building Envelope Consultant or Owner 48 hours in advance of date and time of inspection and testing.
- E. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

**3.08 PROTECTING AND CLEANING**

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Building Envelope Consultant and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

**3.09 SAMPLE ROOFING INSTALLER'S WARRANTY**

- A. WHEREAS herein the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

ETHYLENE INTERPOLYMER (KEE) ROOFING

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- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
    - a. lightning;
    - b. sustained wind speed exceeding 90 mph as measured by the nearest weather station;
    - c. fire;
    - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    - f. vapor condensation on bottom of roofing; and
    - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
  2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
  4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
  5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally

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May 3, 2024  
Issue for Bid

Capital Arena United Way  
Baton Rouge, LA

specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

**END OF SECTION 075416**

ETHYLENE INTERPOLYMER (KEE) ROOFING

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## **SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

A. Section Includes:

1. Manufactured Products:
  - a. Manufactured through-wall flashing and counterflashing.
  - b. Manufactured reglets and counterflashing.
  - c. Roof drainage.
2. Formed Products:
  - a. Formed low-slope roof sheet metal fabrications.
  - b. Formed wall sheet metal fabrications.
  - c. Formed equipment support flashing.
  - d. Formed overhead-piping safety pans.

B. Related Sections:

1. Section 07 54 00 Thermoplastic Roofing
2. Section 04 03 42 Stone Restoration and Cleaning
3. Section 07 92 00 Joint Sealants.

#### **1.2 PERFORMANCE REQUIREMENTS**

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
1. Temperature Change (Range): 60 deg F (15.56 deg C), ambient; 180 deg F (100 deg C), material surfaces.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
1. Identification of material, thickness, weight, and finish for each item and location in Project.
  2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
  3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  4. Details of termination points and assemblies, including fixed points.
  5. Details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
  6. Details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter flashings as applicable.
  7. Details of special conditions.
  8. Details of connections to adjoining work.
  9. Detail formed flashing and trim at a scale of not less than 3 inches per 12 inches (1:5).
  10. Verification of job dimensions shall be the sole responsibility of the installer.
- C. Samples for Initial Selection: Submit eight (8) samples for each type of sheet metal flashing, trim, and accessory indicated with factory-applied color finishes involving color selection.
- D. Samples for Verification: Submit eight (8) samples for each type of exposed finish required, prepared on Samples of size indicated below:
1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
  2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
  3. Accessories and Miscellaneous Materials: Full-size Sample.
  4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified fabricator.
- B. Warranty: Sample of special warranty.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.



## 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA "Architectural Sheet Metal Manual", current addition, unless more stringent requirements are specified or shown on Drawings.
- C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
  - 1. Build mockup of typical roof eave, including fascia and fascia trim, approximately 10 feet (3.0 m) long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
  - 2. Build mockups of the following:
    - a. Cap flashing, (minimum of 20 linear feet).
    - b. Bulkhead flashing, (minimum 20 linear feet).
    - c. Door saddle flashing, (minimum 20 linear feet).
    - d. Window Sill Flashing (Flexible)
    - e. Roof Counterflashing
  - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- D. Pre-installation Conference:
  - 1. Conduct conference at Project site.
  - 2. Meet with Installing Contractor, Architect, and sub contractors whose work interfaces with or affects roof specialties including installers of roofing materials and accessories.
  - 3. Review requirements for sheet metal work, including:
    - a. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - b. Site use, access, staging, and setup location limitations.
    - c. Approved mockup procedures.
    - d. Forecast weather conditions.
    - e. Surface preparation and substrate condition and pretreatment.
    - f. Installation procedures.
    - g. Special details.
    - h. Testing and inspection requirements.
    - i. Site protection measures.
    - j. Governing regulations if applicable.

4. Contractor's site foreman, waterproofing manufacturer's technical representative, waterproofing installer, sheet metal fabricator, sheet metal installer, Installing Contractor's Representative, and Architect/Engineer shall attend.
- E. Product Identification: No exposed logos, stickers, or manufacturer's names are permitted on products, with the exclusion of code-mandated language.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

## 1.8 WARRANTY

- A. Contractor's Warranty:
  1. Written warranty, signed by Contractor, including:
    - a. Replace sheet metal work that does not comply with requirements; that has corroded surface, coating that fails cohesively or adhesively, or other surface defects or imperfections; or that deteriorates in manner not clearly specified by material supplier's data as inherent quality of material for application indicated.
    - b. Remove and replace sealant that has failed cohesively or adhesively; or that deteriorates in manner not clearly specified by sealant manufacturer's data as inherent quality of material for application indicated.
    - c. Repair or replacement, to satisfaction of Installing Contractor, of other work or items which may have been displaced or damaged as consequence of defective work.
    - d. Warranty does not include deterioration or damage from changes in sheet metal environment from that reasonable anticipated at Substantial Completion, or physical damage from adjacent activities.
  2. Warranty Period: three years after date of Substantial Completion.
- B. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.

- b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
  - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 SHEET METALS**

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.
  1. Surface: Smooth, flat.
  2. Exposed Coil-Coated Finishes:
    - a. Metallic Fluoropolymer: AAMA 620. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  3. Color: Match exterior wall.
  4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).
- C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed.
  1. Finish: 4 (polished directional satin).
  2. Surface: Smooth, flat.
- D. Lead Sheet: ASTM B 749, Type L51121, copper-bearing lead sheet, 0.062 inch minimum thickness, 4 lbs. per sq. ft.
- E. Flexible Pan Flashing: Leadax Original PVB lead substitute bonded into place with Leadax High Tack Adhesive.

### **2.2 UNDERLAYMENT MATERIALS**

- A. Polyethylene Sheet: 6 mil (0.15 mm) thick polyethylene sheet complying with ASTM D 4397.
- B. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

- C. Self-Adhering, High-Temperature Sheet: Thickness 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
  - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C).
  - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C).
  - 3. Products: Subject to compliance with requirements, provide one of the following:
    - a. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT.
    - b. Grace Construction Products, a unit of W. R. Grace & Co.; Ultra.
    - c. Henry Company; Blueskin PE200 HT.
- D. Slip Sheet: Rosin building paper, 3 lb/100 sq. ft. (0.16 kg/sq.m) minimum, rosin sized.
- E. Expansion Joints: Uncured EPDM sheets conforming to ASTM D 4637, Type I, non-reinforced; 60 mils nominal thickness.

### 2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
  - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
  - 3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- C. Solder:
  - 1. For Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.
- I. Termination Bar: Type 304 stainless steel or 6061-T extruded aluminum, as noted in the project drawings, 1/8 inch minimum thickness, 1 inch wide with prepunched 9/32" oval holes spaced 6 inches o.c. for termination of flashing or underlayments at sheet metal.

## 2.4 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Cheney Flashing Company.
    - b. Fry Reglet Corporation.
    - c. Hickman, W. P. Company.
    - d. Keystone Flashing Company, Inc.
  - 2. Material: Stainless steel, 0.34 inch thick.
  - 3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
  - 4. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
  - 5. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
  - 6. Accessories:
    - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
    - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
  - 7. Finish: Mill.

## 2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  2. Obtain field measurements for accurate fit before shop fabrication.
  3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
  4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
  5. Provide preformed inside and outside corner sections of matching material, finish and profile for all sheet metal work. Corners and transitions must be welded or soldered.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8 inch (3 mm) offset of adjoining faces and of alignment of matching profiles.
- C. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
- D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- E. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.
- G. Do not use graphite pencils to mark metal surfaces.

## 2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof and Roof to Wall Transition, Roof to Roof Edge Flashing (Gravel Stop) Transition, Roof to Roof Edge Flashing (Gravel Stop), and Fascia Cap Transition Expansion-Joint Cover: Fabricate from the following materials:
1. Aluminum: 0.050 inch (1.27 mm) thick.
  2. Stainless Steel: 0.025 inch (0.64 mm) thick.

- B. Base Flashing: Fabricate from the following materials:
  - 1. Aluminum: 0.040 inch (1.02 mm) thick.
  - 2. Stainless Steel: 0.025 inch (0.64 mm) thick.
- C. Counterflashing: Fabricate from the following materials:
  - 1. Aluminum: 0.040 inch thick.
  - 2. Stainless Steel: 0.025 inch (0.64 mm) thick.
- D. Flashing Receivers: Fabricate from the following materials:
  - 1. Aluminum: 0.040 inch thick.
  - 2. Stainless Steel: 0.025 inch (0.64 mm) thick.
- E. Roof-Penetration Flashing: Fabricate from the following materials:
  - 1. Stainless Steel: 0.025 inch (0.64 mm) thick.
- F. Roof-Drain Flashing: Fabricate from the following materials (if required by roof system manufacturer):
  - 1. Lead: 4 lb/sq. ft.

## 2.7 WALL SHEET METAL FABRICATIONS

- A. In-Wall Flashing: Fabricate continuous flashings in minimum 96 inch (2400 mm) long, but not exceeding 12 foot (3.6 m) long, sections, at in-wall reglets, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches (150 mm) beyond each side of wall openings. Form with two inch (50 mm) high, end dams where flashing is discontinuous. Fabricate from the following materials:
  - 1. Stainless Steel: 0.025 inch (0.64 mm) thick.
- B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings. Form head and sill flashing with 2 inch (50 mm) high, end dams. Fabricate from the following materials:
  - 1. Aluminum: 16 gauge (0.05 inch) thick.
  - 2. Stainless Steel: 0.025 inch (0.64 mm) thick.
- C. Wall Expansion-Joint Cover: Fabricate from the following materials:
  - 1. Aluminum: 0.050 inch thick.
  - 2. Stainless Steel: 0.34 inch thick.

## 2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.025 inch (0.64 mm) thick.
- B. Overhead-Piping Safety Pans: Fabricate from the following materials:
  1. Stainless Steel: 0.34 inch thick.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.
  1. Verify compliance with requirements for installation tolerances of substrates.
  2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 UNDERLAYMENT INSTALLATION**

- A. General: Install underlayment as indicated on Drawings.
- B. Felt Underlayment: Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).
- C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply proprietary primer, if required, by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.
- D. EPDM Underlayment at Building Expansion Joints: Install EPDM underlayment sheet with adhesive for anchorage to minimize the use of mechanical fasteners under expansion joints. Apply in shingle fashion to shed water, with lapped and taped joints of not less than 2 inches.

### **3.3 INSTALLATION, GENERAL**

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners,



solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  3. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
  4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
  5. Install sealant tape where indicated.
  6. Torch cutting of sheet metal flashing and trim is not permitted.
  7. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
1. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
  2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
- E. Seal joints as shown and as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
  2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

- F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder aluminum sheet.
  2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
  3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
- G. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength. Rivets shall be closed end.

### **3.4 ROOF DRAINAGE SYSTEM INSTALLATION**

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

### **3.5 ROOF FLASHING INSTALLATION**

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant per Drawings and approved shop drawings from all related trades.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75 mm) centers.
1. Coordinate with roof system manufacturer's requirements to ensure continuity of warranty. Install per FM 1-29 recommendations and wind load requirements.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with sealant. Secure in a waterproof manner as shown on approved shop drawings.

- E. Roof-Penetration Flashing: Per roof system specifications and details.
- F. Wind Clips: Install wind clips on all counterflashing, spaced 24 inches o.c. Meet wind uplift requirements.

### **3.6 WALL FLASHING INSTALLATION**

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Reglets: Installation of reglets in compliance with project documents.
- C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings.

### **3.7 ERECTION TOLERANCES**

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8 inch (3 mm) offset of adjoining faces and of alignment of matching profiles.

### **3.8 CLEANING AND PROTECTION**

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.
- F. Protect sheet metal flashings and trim from damage and wear during remainder of construction period.

**END OF SECTION 07 62 00**

## SECTION 07 92 00 – JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes sealants for the following applications:
1. Exterior joints in the following vertical surfaces and non-traffic horizontal surfaces:
    - a. Control and expansion joints in cast-in-place concrete.
    - b. Joints between architectural precast concrete units.
    - c. Control and expansion joints in unit masonry.
    - d. Joints between different materials listed above.
    - e. Perimeter joints between materials listed above and frames of doors and windows and louvers.
    - f. Other joints as indicated.
- B. Related Sections:
1. [Section 04 01 20 Masonry Restoration and Cleaning](#)
  2. [Section 07 54 00 Thermoplastic Membrane Roofing](#)
  4. [Section 07 54 00 KEE Membrane Roofing](#)
  3. ~~[SBS Modified Bitumen Membrane Roofing](#)~~
  2. [Section 07 62 00 Sheet Metal Flashing and Trim](#).

#### 1.2 ACTION SUBMITTALS

- A. Product Data: Submit product data for each joint-sealant product indicated and the following:
1. Written certification from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use(s) indicated as verified through manufacturer's in-house testing laboratory.
    - a. Test results for all job specific concealed and exposed (custom colored) sealants confirming compatibility and adhesion are mandatory for all materials in contact with exterior glazing, curtain wall components, metal panels, architectural precast concrete, and exterior stone cladding, prior to mockup and testing.
    - b. Complete instructions for handling, storage, mixing, priming, installation, curing and protection of each type of sealant.
  2. Laboratory and field test results confirming joint preparation (cleaning/priming), chemical compatibility, and proper adhesion for specified joint sealant for each of the joint profiles and substrate materials included in the design of this project.

- B. Samples: Submit eight (8) samples of each type and color of exposed joint sealant required. Provide fully cured joint sealant samples in 3/4 inch (19 mm) wide joints 12 inches (300 mm) long formed between two strips of material to be sealed as they will appear on the Project.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Warranties: Submit specified warranties.

### 1.4 QUALITY ASSURANCE

A. Installer Qualifications: Exposed sealant work including, but not limited to, sealants used for air and weather

A-B. seals which are external to curtain wall systems at their perimeter, metal panel to panel joints at their perimeter, architectural precast to precast joints, exterior stone cladding joints), shall be performed by one firm specializing in the installation of sealants who has successfully produced work comparable to this project, in not less than three projects of similar scope to the satisfaction of the Architect, and whose work has resulted in construction with a record of successful in-service performance for a period of 10 years. Concealed sealant work (sealants which are internal to curtain wall systems, metal panels, necessary for air and moisture penetration resistance under applied loads) shall be the responsibility of the subcontractor responsible for the final design, installation, and performance of the respective system.

B-C. Source Limitations: Obtain each type of joint sealant, and each type of structural silicone adhesive, from a single manufacturer.

C-D. Preconstruction Compatibility and Adhesion Testing (All Exterior Wall Sealants Only): Submit to joint sealant manufacturers, prior to full size building mockup(s) and sample installation(s), samples of materials that will contact or affect, by direct or indirect chemical or mechanical means, exterior wall joint sealants for compatibility and adhesion testing below.

1. General: Test results confirming compatibility and adhesion are mandatory for all concealed and exposed sealant materials in contact with exterior glazing, exterior precast, exterior stone cladding, other sealants, flashings, metal framing, and shims, prior to the construction of full-sized mockup and testing and the construction of full sized sample installation(s).
  - a. Schedule sufficient time for testing and analysis of results to prevent delay in the progress of the work.
    - 1) It is anticipated that a minimum of 3 months will be required to complete preconstruction sealant compatibility and adhesion testing.
  - b. Investigate materials that fail compatibility and adhesion testing and obtain sealant manufacturer's written recommendations for corrective measures, which may include the use of primers, cleaners, cleaning measures, curing

time, temperature limitations (surface and air), humidity conditions, moisture content of substrate, etc.

c. Definitions:

- 1) **Compatibility:** The capability of the sealant materials and substrates to be placed in direct contact with each other and maintain their required physical, chemical and visual qualities with the absence of softening, staining, oil exudation, discoloration or other detrimental, deleterious or degradative effects caused by chemical interactions.
- 2) **Adhesion:** The mechanical or chemical ability of the sealant materials and substrates to adhere or bond together at their interface.

d. **Specimen Sizes and Shapes:** As required by the manufacturer's testing laboratory for the tests listed, unless otherwise specified.

2. Tests Required:

a. Adhesion in Peel Testing:

1) Test Methods:

- a) Comply with ASTM C 794 'Adhesion and Peel of Elastomeric Joint Sealants,' modified to include project specific substrates and to report cohesive or adhesive failure mode. Samples of each exterior precast, exterior stone cladding, other sealants, flashings, metal framing in contact with the concealed and exposed sealant materials are required to be tested.
- b) Comply with ASTM C 1135 'Determining Tensile Adhesion Properties of Structural Sealants,' modified to include project specific substrates and the following. Sealant manufacturer's modified interpretations of ASTM C 1135 will not be permitted. Samples of each exterior structural glazing and metal framing in contact with the structural sealant materials are required to be tested. In addition to the testing being performed under the standard environmental conditioning required of ASTM C 1135; the Contractor shall prepare, and test, additional specimens for each project specific environmental condition under which the sealant will be applied and cured.

2) All specimens shall be tested for primed and unprimed performance.

3) Report:

- a) Date(s) of testing.
- b) Project identification.
- c) Test method (as identified herein).
- d) Specimen substrate(s) tested.
- e) Sealant(s) tested.

- f) Substrate preparation (cleaning materials, methods and primers used).
  - g) Test results for each specimen tested (type of failure - adhesive or cohesive - force measured at failure in pounds per lineal inch).
  - h) Recommendations. Where testing shows equal or better performance without a primer, a primer will not be required.
  - i) Additional remarks, if any (i.e., color change of substrate or sealant, voids in the body of the sealant when examined in cross section, blistering, bubbling, sealant softening, or evidence of improperly mixed or cured sealant).
- b. Compatibility Testing: This test method describes an accelerated laboratory procedure to determine if the proposed sealant materials and substrates are compatible.
- 1) Test Methods:
    - a) Comply with ASTM C 1248 'Staining of Porous Substances by Joint Sealants,' modified to include project specific substrates. Samples of each exterior precast, exterior stone cladding and other sealants, in contact with the concealed and exposed sealant materials are required to be tested.
    - b) Comply with ASTM C 1087 'Determining Compatibility of Liquid Applied Sealants with Accessories Used in Structural Glazing Systems,' modified to include project specific substrates. Sealant manufacturer's modified interpretations of ASTM C 1087 will not be permitted. Samples of each exterior dry glazing gasket (if any), spacers, shims and setting blocks proposed for use in contact with the structural sealant materials are required to be tested.
  - 2) All specimens for ASTM C 1248 testing shall be tested for primed and unprimed performance.
  - 3) Report:
    - a) Date(s) of testing.
    - b) Project identification.
    - c) Test method (as identified herein).
    - d) Substrate preparation (cleaning materials, methods and primers used).
    - e) Name of sealant, type of sealant, rated movement capability and identifying batch number.

- f) Substrates used.
  - g) Testing Equipment: Manufacturer of apparatus, type of lamps.
  - h) Statement describing curing conditions if other than at standard conditions.
  - i) Description of, and reasons for, any variations from the test procedure.
  - j) Description of test effects observed, such as change in finished surface appearance, discoloration into the substrate, adhesion failure, or other characteristics, average measurement of stain width and depth.
  - k) Recommendations. Where testing shows equal or better performance without a primer, a primer will not be required.
  - l) Additional remarks, if any (i.e., color change of substrate or sealant, voids in the body of the sealant when examined in cross section, blistering, bubbling, sealant softening, or evidence of improperly mixed or cured sealant).
- c. Preconstruction Field-Adhesion Testing: Before installing exposed exterior elastomeric sealants, field test their adhesion to joint substrates as follows:
- 1) Locate test joints where indicated or, if not indicated, as directed by [aArchitect](#).
  - 2) Conduct field tests for each type of exposed exterior elastomeric sealant and joint substrate indicated.
  - 3) The [aArchitect](#) and manufacturer's technical representative shall be present when joints are tested.
  - 4) Test Method: Test exterior elastomeric joint sealants by hand-pull method described below:
    - a) Install joint sealants in 60 inch (1500 mm) long joints using same materials and methods for joint preparation and joint-sealant installation in accordance with manufacturer's final laboratory testing recommendations. Allow sealants to cure.
    - b) Make knife cuts from one side of joint to the other, followed by two cuts approximately 3 inch (75 mm) long at sides of joint and meeting crosscut at one end. Place a mark 1 inch (25 mm) from cross-cut end of 3 inch (75 mm) piece.
    - c) Use fingers to grasp 3 inch (75 mm) piece of sealant between cross-cut end and 1 inch (25 mm) mark; pull firmly down at a 90-degree angle to the joint and hold sealant in this position for



ten seconds; following the ten second time duration pull sealant at a 180 degree angle parallel to the joint and hold the sealant in this position for ten seconds. Pull sealant away from joint to the distance recommended by sealant manufacturer for testing adhesion.

d) Repair joint as recommended by the sealant manufacturer.

- 5) Sealants evidencing adhesive failure with one or both substrates during testing, and/or a level of elongation prior to failure that is not in compliance with the performance characteristics specified herein or otherwise published by the sealant manufacturer will be subject to rejection by the Architect. Discontinue use of joint sealants, cleaning agents, primers, and application methods associated with failures documented during testing and immediately notify manufacturer and Architect for further review.

3. Report: Provide written summary of each compatibility and adhesion test.

~~D.E.~~ Mockups and Sample Installations: Provide mockups and sample installations of sealants at locations indicated or required by the Architect. Mockups and sample installations shall represent the primary types of materials, substrate surfaces, joint size, exposure, and other conditions to be encountered in the work. Preparation, priming, application, and curing, shall comply with manufacturer's recommendations and actual proposed methods. Schedule the applications, with allowance for sufficient curing time, so that samples may be examined and necessary adjustments made at least 1 week prior to date scheduled for commencing installation of the work.

1. The mockups and sample installations shall be visually examined for staining, dirt pickup, shrinkage, color, general workmanship and appearance. Cut and pull the sealant from each sample joint to examine for internal bubbles or voids, adhesion, and general compatibility with substrate.

2. Mockups and sample installations are required in conjunction with [all masonry and stone repairs; window installations and roof related work](#) the following:

~~2-3.~~

- ~~a. Section 03 30 00 "Cast-In-Place Concrete."~~
- ~~b. Section 03 45 00 "Precast Architectural Concrete."~~
- ~~c. Section 04 42 00 "Unit Masonry."~~
- ~~d. Section 07 19 00 "Water Repellants."~~
- ~~e. Section 08 41 13 "Aluminum Framed Entrances and Storefront."~~

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~~E.F.~~ Pre-installation Conference: As soon as possible after award of exterior joint sealant work, but no later than 2 weeks before the installation of the joint sealants, meet with ~~i~~nstalling ~~c~~ompany, ~~a~~rchitect, installers of the substrate construction, and other work adjoining joint sealants and representatives of any other entities directly concerned with joint sealant performance. Conduct conference at Project site to comply with the following:

1. Review foreseeable methods and procedures related to sealing substrates, including but not limited to, the following:

- a. Discuss substrates to be sealed, discuss as fabricated and installed condition of substrate, sealant application, flashing details, and other preparatory work.
  - b. Review joint sealant requirements: drawings, specifications, and other contract documents.
  - c. Review required submittals, both complete and incomplete.
  - d. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.
  - e. Review schedule and intended sequence of work.
  - f. Review changes arising from the pre-construction mockup and performance testing program, if any.
  - g. Review the purpose and method of integration of field quality assurance programs developed by Contractor and suppliers/subcontractors responsible for the Work.
  - h. Review purpose and method of integration of field quality assurance program administered by the Contractor's Exterior Wall Testing and Inspection Agency with similarly aligned programs developed by the Contractor and suppliers/ subcontractors responsible for the Work.
2. Record discussion and furnish copy of recorded discussions to each attendee.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
  1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
  2. When joint substrates are wet.
- B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

## 1.7 WARRANTY

- A. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealant work which has failed to provide a weathertight system within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.
- B. Special Manufacturer's Warranties: Written warranties (weather seal and stain resistance), signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that fail to provide airtight and watertight joints, or fail in adhesion, cohesion, abrasion-resistance, stain-resistance, weather resistance, or general durability or appear to deteriorate in any other manner not clearly specified in the manufacturer's data as an inherent quality of the material within specified warranty period.
1. Defective materials and workmanship shall include, but are not limited to:
    - a. Deterioration, aging, or weather of the work.
    - b. Water leakage and or air leakage.
    - c. Sealant loss of adhesion, loss of cohesion, cracking or discoloration.
    - d. Staining or discoloration of sealant or adjacent surfaces.
    - e. Sealant failure due to building or joint movements up to the limits prescribed by the manufacturer.
    - f. Cracks or bubbles in sealant surfaces.
  2. Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as stated by sealant manufacturer's published data, and as substantiated by the manufacturer for each application through testing.
- B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Architectural Sealants: Not more than 250 g/L.
  2. Non-membrane Roof Sealants: 300 g/L.
  3. Single-Ply Roof Membrane Sealants: 450 g/L.
  4. Sealant Primers for Nonporous Substrates: Not more than 250 g/L.
  5. Sealant Primers for Porous Substrates: Not more than 775 g/L.
  - ~~5-6.~~ Adhesion Promoter: Not more than 750 g/L

- C. Colors: For fully concealed joints, provide manufacturer's standard color of sealant which has the best overall performance characteristics for the application shown.
- D. Manufacturer's Representative: Do not use elastomeric sealant produced by a manufacturer who will not agree to send a qualified technical representative to the project site when requested, for the purpose of rendering advice concerning the proper installation of manufacturer's materials.

## 2.2 ELASTOMERIC JOINT SEALANTS

### A. Silicone Sealants for Vertical Applications (Non-Sag):

#### 1. Typical Exterior Wall Joints:

##### a. Properties:

- 1) Standards: Comply with ASTM C 920, Type M or S, Grade NS, Class 25 or 50; use NT, M, A and O.
- 2) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates. The minimum peel adhesion value after 7-day immersion shall not be less than 13 pli (2.27 kN/m) when tested in strict accordance with ASTM C 794 Adhesion in Peel.
- 3) Cure System and Oil Content: Neutral-cure, low or medium modulus system specifically manufactured with controlled oil content to eliminate oil migration into sealed substrates and residue rundown over and onto adjacent substrates.

##### b. Products and Manufacturers: One of the following:

- 1) 756 SMS; Dow Corning.
- 2) 790; Dow Corning
- ~~4~~3) 795; Dow Corning
- ~~2~~4) Spectrem 3 or Spectrem 4-TS (Use Spectrem 1 for metal-to-metal joints); Tremco, a RPM Co.
- 5) Silpruf NB SCS 9000 (use Silpruf SCS 2000 for metal-to-metal joints); GE Advanced Materials – Silicones.
- 6) Sika Sikaflex 1a: One part polyurethane sealant
- 7) Sika Sikaflex 15 LM: On part polyurethane, low modulus sealant
- ~~3~~8) Approved Equal

##### c. Color: Per architect Refer to Drawings.

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- B. Tremco Incorporated; Spectrem 1 Basic or Spectrem 3, Two-Part Polyurethane Sealant for Paving Applications:
1. For Paving Applications with Slopes not Exceeding 5% (Self Leveling): ASTM C 920, Type M, Grade P, Class 25; use T and I; with high durometer hardness and abrasion resistance, and rated for water immersion; one of the following:
    - a. Pecora Corporation; Urexpan NR-200.
    - b. BASF; Sonneborn Systems, Sonolastic SL 2™.
    - c. Tremco, an RPM Co.; THC 900.
  2. For Paving Applications with Slopes Exceeding 5%: ASTM C 920, Type M, Grade P "Slope Grade", Class 25; uses T and I; with high durometer hardness and abrasion resistance, and rated for water immersion; one of the following:
    - a. Pecora Corporation; Dynatred.
    - b. BASF; Sonneborn Systems, Sonolastic SL 2™.
    - c. Tremco, an RPM Co.; THC-901.

### 2.3 PREFORMED JOINT SEALANTS

- A. Preformed Silicone Joint Sealants: Manufacturer's standard sealant consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Dow Corning Corporation; 123 Silicone Seal.
    - b. GE Advanced Materials - Silicones; UltraSpan US1100.
    - c. Pecora Corporation; Sil-Span.
    - d. Tremco; Spectrem Ez Seal.
- B. Preformed Foam Joint Sealant: Manufacturer's standard preformed, pre-compressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu. ft. (160 kg/cu. m) and impregnated with a nondrying, water-repellent agent. Factory produce in pre-compressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Dayton Superior Specialty Chemicals; Polytite Standard.
    - b. EMSEAL Joint Systems, Ltd.; Emseal 25V.
    - c. Polytite Manufacturing Corporation; Polytite B.
    - d. Polytite Manufacturing Corporation; Polytite Standard.
    - e. Sandell Manufacturing Co., Inc.; Polyseal.
    - f. Willseal USA, LLC; Willseal 600.

## 2.4 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: One of the following preformed, compressible, resilient, non-staining, non-waxing, non-extruding backings of flexible plastic foam complying with ASTM C 1330, and of type indicated below. Select shape and density of cylindrical sealant backings in consultation with the manufacturer for proper performance in specific condition of use in each case.
  - 1. Type C: Closed-cell polyethylene foam material with a surface skin, which is nonabsorbent to liquid water and gas, non-outgassing in unruptured state; one of the following:
    - a. HBR Closed Cell Backer Rod; Nomaco, Inc.
    - b. Sonneborn Closed-Cell Backer-Rod; BASF.
  - 2. Type B: Bi-cellular reticulated, polymeric foam material with a surface skin, non-out gassing, with a density of between 1.5-3.0 pcf (24-48 kg/cubic meter) per ASTM D 1622 and minimum tensile strength of greater than 29-38 psi (200-267 kPa) per ASTM D 1623, and with water absorption less than 0.058 oz./cubic inch (0.10 gm/cc) per ASTM C 1016; one of the following:
    - a. SOFROD; Nomaco, Inc.
    - b. Sonneborn Sonolastic Soft Backer-Rod; BASF.
- C. Bond-Breaker Tape: Polyethylene, TFE fluorocarbon, or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
- D. Weep and Vent Tubes: Clear plastic (PVC) tubing, minimum 1/4 inch (6.35 mm) inside diameter, and of length as required to extend between exterior face of sealant and open cavity behind.
  - 1. At window and curtain wall systems, where required by system designer, provide gutter termination of tube with preformed nipples suitable for sealing to gutter.
- E. Cork Joint Filler: Resilient and non-extruding, ASTM D 1752, Type II.
- F. Expansion Joint Sealant: Flexible, lightweight, non-staining, polyethylene close-cell expansion joint filler that is chemical-resistant, ultraviolet stable, non-absorbent, low-density foam.
  - 1. Provide W.R. Meadows Sealtight; DECK-O-FOAM at door and window openings of precast panels, and where indicated on the Drawings.

## 2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended, as verified through compatibility and adhesion testing, by joint sealant manufacturer for the substrates indicated to be sealed.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and which will not stain nor mar the finish of surfaces adjacent to joints to which it is applied.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:
  - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), existing joint sealants, existing backer rods, existing waterproofing materials, existing water repellent treatments, oil, grease, water, surface dirt, and frost.
  - 2. Clean concrete, masonry, unglazed surfaces of tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean metal, glass, porcelain enamel, glazed surfaces of tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

- B. Joint Priming (Elastomeric Sealants Only): Prime joint substrates with primers selected through the preconstruction compatibility and adhesion testing. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant and primer smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
  - 1. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
    - a. Do not leave gaps between ends of sealant backings. Trim for tight fit around obstructions or elements penetrating the joint.
    - b. Do not stretch, twist, puncture, or tear sealant backings.
    - c. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry sealant backings.
  - 2. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.
  - 3. Install weeps and vents into joints at the same time sealants are being installed. Unless otherwise shown on the drawings, or directed by the Architect, locate weeps and vents spaced as recommended by the sealant manufacturer and the window and curtain wall fabricator and erector. Do not install weeps and vents at outside building corners. Do not install vents at horizontal joints immediately below shelf angles, sills, and through wall flashings.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes, and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
  - 1. Apply sealants in the depth shown or, if none is shown, apply in accordance with the manufacturer's recommendations and the following general proportions and limitations:



- a. Apply elastomeric sealants in sidewalk, pavement, and similar horizontal joints to a depth equal to 75% of the joint width, but not less than 3/8 inch (10 mm) and not more than 3/4 inch (19 mm).
  - b. Apply elastomeric sealants, in joints not subject to traffic or other abrasion, to a depth equal to 50% of the joint width, but not less than 1/4 inch (6 mm) and not more than 1/2 inch (13 mm).
  - c. Apply non-elastomeric sealants to a depth approximately equal to the joint width.
  - d. Fill horizontal traffic bearing joints slightly recessed to avoid direct contact with wheel, and pedestrian traffic. Fill horizontal traffic bearing joints with slope grade polyurethane sealants to a depth approximately equal to the joint width.
2. Pour self leveling sealants to a depth approximately equal to the joint width.
- E. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform, beads to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces. Tool exposed surfaces of sealants to the profile shown, or if none is shown, tool slightly concave.
1. Use masking tape to protect adjacent surfaces of recessed tooled joints.
  2. Provide a slight wash on horizontal joints where horizontal and vertical surfaces meet.
  3. Against rough surfaces or in joints of uneven widths avoid the appearance of excess sealant or compound by locating the compound or sealant well back into joint wherever possible.

### 3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field-test exterior wall joint-sealant adhesion to joint substrates as follows:
1. Perform 10 tests for the first 1000 feet (300 m) of joint length for each type of exposed exterior wall sealant and joint substrate.
  2. Perform one test for each 1000 feet (300 m) of joint length thereafter or one test per each floor per elevation.
- B. Field adhesion testing of sealants shall take place in the presence of a qualified technical representative of the sealant manufacturer.
1. Test Method: Test joint sealants by hand-pull method described below:
    - a. Make knife cuts from one side of joint to the other, followed by two cuts approximately 3 inches (75 mm) long at sides of joint and meeting cross cut at one end. Place a mark 1 inch (25 mm) from cross-cut end of 3 inch (75 mm) piece.
    - b. Use fingers to grasp 3 inch (75 mm) piece of sealant between cross-cut end and 1 inch (25 mm) mark; pull firmly at a 90-degree angle to the joint in the direction of side cuts and hold the sealant in this position for 10 seconds; following the 10 second time duration pull sealant at a 180

- degree angle parallel to the joint and hold the sealant in this position for 10 seconds. Pull sealant away from joint to the distance recommended by sealant manufacturer for testing adhesion.
- c. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.
- 2. The sealant manufacturer's qualified technical representative shall record test results, and observations of joint and sealant conditions, in a field adhesion test log.
  - 3. Repair joint sealants pulled from test area as recommended by sealant manufacturer.
  - 4. The sealant manufacturer shall provide written documentation of changes in product and/or application method required to address sealant failure, observe and document retesting as required by the Architect, and provide a written statement of compliance with applicable warranties.
- C. Sealants not evidencing adhesive failure from testing will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

### **3.5 CLEANING**

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### **3.6 PROTECTION**

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

**END OF SECTION 07 92 00**

*Model 2000 Single Hung AW-PG70 1524 x 2515 (60" x 99")*

**PART 1 - GENERAL**

**1.01 GENERAL PROVISIONS:**

- A. The Conditions of the Contract and all Sections of Division 1 are hereby made a part of this Section.
- B. Coordinate work with that of all construction contractors affecting or affected by work of this Contract. Cooperate with such contractors to assure the steady progress of the Work.
- C. Pre-Bid Qualifications: All bids must be based on pre-qualified products; to qualify, the bidder must furnish one complete window unit and additional information as shown below ten (10) days prior to bid date.
  - 1. This sample must be identical to the model of the window the bid is based on, with the finish being the only exception.
  - 2. The prospective bidder shall also include in his pre-bid qualification package, copies of the independent laboratory tests which certify that the proposed product meets or exceeds an AW PG70 1524 x 2515 (60" x 99") classification as specified herein and shall show continuing compliance by furnishing a Notice of Product Certification from an Administrator of a Certification Program. Test reports from an independent laboratory showing that the insulated glass, if any, has been tested to the CBA Level, will also be required.

**1.02 RELATED WORK:**

- A. Provide labor, materials and equipment necessary to complete the work of the window portion of the contract, and without limiting the generality thereof shall include:
  - 1. Removal of existing sash, parting beads, stops and other accessories as required by the proposed replacement system.
  - 2. Removal of other existing construction work as required for the proper installation and operation of the new window system.
  - 3. Removal from site and disposal of all materials, debris packaging, banding and all other materials and equipment.
  - 4. Provide new factory-glazed, thermally broken, aluminum windows, types as specified herein, together with necessary mullions, panning, trim, extenders, operating hardware, all installation hardware and all other accessories as may be required.
  - 5. Treated wood blocking, shims, fillers and nailers as required for a secure installation.
  - 6. Field observations and measurements of existing openings and conditions.
  - 7. Bidders shall survey conditions of existing sills and jambs prior to bidding. Contractor shall be responsible for the replacement of portions of same that are deteriorated.
  - 8. Provide and chink fiberglass insulation between window frames and adjacent construction.
  - 9. Proper sealing of all panning or compensation channel joints within each window assembly, per AAMA 800.
  - 10. Sealing of entire exterior perimeter of window units after installation, per AAMA 800.
  - 11. Furnishing of any extra materials as specified herein.

**1.03 TESTING AND PERFORMANCE REQUIREMENTS:**

- A. Standards: Except as otherwise indicated, requirements for all aluminum windows, terminology and standards of performance, and fabrication workmanship are those specified and recommended in

*Model 2000 Single Hung AW-PG70 1524 x 2515 (60" x 99")*

AAMA/NWWDA 101 I.S.2-A440-08 and applicable general recommendations published by AAMA and the AA.

- B. Performance and Testing: Except as otherwise indicated, comply with air infiltration tests, water resistance tests and applicable load tests specified in AAMA/NWWDA 101 I.S.2-A440-08 for type, rating and classification of the window units required herein.
- C. Testing: Where manufacturer's standard window units comply with requirements and have been tested, in full size required, and in accordance with specified test's procedures, provide independent certification of such testing.
  - 1. Test reports shall be of current AAMA requirements.
  - 2. Sample submitted for tests shall be of manufacturer's standard construction and at least 1524 x 2515 (60" x 99"). The sequence of tests shall be optional between manufacturer and testing laboratory except that in all cases, the air infiltration test shall be performed before the water resistance test.
- D. Specific Requirements: Windows shall conform to specified standards or those specified herein, whichever are the more stringent:
  - 1. Air Infiltration Test: With the sash in a closed and locked position, the window shall be subjected to an air infiltration test in accordance with ASTM E 283. Air infiltration shall not exceed 1.5 L/s/m<sup>2</sup> when tested at 300 Pa (6.27 psf).
  - 2. Water Resistance Test: The glazed unit shall be mounted in a vertical position, continuously supported around perimeter and with sash in the fully closed and locked position. The window unit shall be subjected to a water resistance test of 580 Pa (12.1 psf) in accordance with ASTM E 547 both with and without insect screen.
    - a) AW specimens shall be tested for water penetration resistance at 15% of DP in accordance with both ASTM E 547 ( four cycles ) and ASTM E 331 ( 15 minutes ) at 580 Pa (12.1 psf).
  - 3. Uniform Load Deflection Test: For AW class products, the unit shall be subjected to a uniform load at the design pressure specified, given in pounds per square foot (psf) and applied both positive & negative to the surface of the unit. No member shall deflect more than 1/175 of its span. Test shall be conducted pursuant with ASTM E 330.
  - 4. Uniform Structural Load Test: A minimum exterior and interior uniform load of 105.2 pounds per square foot shall be applied to the entire surface of the test unit. At the conclusion of tests, there shall be no glass breakage, permanent damage of fasteners, hardware, or any other damage causing the window to be inoperable.
  - 5. Thermal performance: The window shall be tested in accordance with NFRC standards and tests of thermal performance and shall yield a condensation resistance factor of no less than a CR of 39.
  - 6. Coefficient of Heat Transfer, or "U-Value" Test: Thermal Transmittance (U-Value) shall be tested to be 0.60.
  - 7. Operating Force: The sash shall have been adjusted to operate, in either direction, with a force not exceeding 200 N ( 45 lb/f ), after the sash is in motion.
  - 8. Product shall meet Forced Entry Resistance per ASTM F 588 for Type A, Grade 40.

**1.04 QUALITY ASSURANCE:**

- A. Provide test reports from an independent laboratory certifying that the performance for air infiltration, water resistance, uniform structural load, and condensation resistance, has been met or exceeds the criterion as set forth herein.

**1.05 REFERENCES:**

***Model 2000 Single Hung AW-PG70 1524 x 2515 (60" x 99")***

- A. American Architectural Manufacturers Association (AAMA), American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), Aluminum Association (AA), National Wood Window & Door Association (NWWDA).

**1.06 SUBMITTAL REQUIREMENTS:**

- A. General: Provide submittals pursuant with the following:
  - 1. Product Data: Submit manufacturer's specifications, any recommendations and standard Product details for aluminum window units, including independent laboratory certified test report as necessary to show compliance with requirements.
  - 2. Shop Drawings: Submit shop drawings, including typical unit elevations and showing full scale details of Product's head, jamb and sill being supplied and typical installation detail. Show anchor locations and other components not included in manufacturer's standard literature. Call out type of glazing, screening, and window finish that will be supplied.
  - 3. Samples: Submit samples as follows:
    - a) Three samples of each required finish, on a 3 inch long section of flat aluminum stock.
    - b) Additional samples as requested by Architect, to show fabrication techniques, workmanship, type of component parts and the type, design or finish of hardware proposed.

**1.07 PRODUCT DELIVERY, STORAGE AND HANDLING:**

- A. Store and handle windows, hardware and all related items in strict compliance with the manufacturer's instructions.
- B. Protect and insure windows and all accessory and related materials adequately against damage from the elements, construction activities and other hazards before, during and after installation.

**1.08 PROJECT WARRANTIES:**

- A. Manufacturer's Warranties: Submit written warranties from window manufacturer for the following:
  - 1. Windows: Windows furnished shall be certified as fully warranted against any defects in material or workmanship, under normal use and service, for a period of one year from date of fabrication.
  - 2. Finish: The pigmented as specified in section 2.05 and fully warranted against chipping, peeling, cracking and blistering for a period of one year.
  - 3. Glass: Any insulated glass shall be warranted from visual obstruction, due to internal moisture, for a period of one year.

**PART 2 – PRODUCTS**

**2.01 GENERAL:**

- A. Manufacturer: Subject to compliance with Contract Documents and specifications, provide one of the following or of equal quality:
  - 1. Model 2000 Single Hung, AW PG70 1524 x 2515 (60" x 99") as manufactured by SEAL CRAFT
    - a) or;
    - b) or;
- B. Thermal Break Construction: Fabricate aluminum window units with an integral low-conductance polyurethane thermal barrier, located mid-frame between exterior and interior of the window, and in a manner, which eliminates direct metal-to-metal contact.

*Model 2000 Single Hung AW-PG70 1524 x 2515 (60" x 99")*

- C. Window Construction: Provide manufacturer's standard construction, which has been in use on similar window units for a period of not less than ten years, and has been tested to demonstrate resistance to thermal conductance and condensation and has been tested to show adequate strength for this purpose.

**2.02 FABRICATION:**

- A. Aluminum Extrusions: All extruded sections shall be of 6063-T6 aluminum alloy and temper recommended by window manufacturer for strength, corrosion resistance, and application of required finish. Shall meet 22,000 psi ultimate tensile strength, yield of 16,000 psi.
- B. Fasteners: Aluminum, stainless steel, or other materials warranted by fastener manufacturer to be non-corrosive and compatible with aluminum window members, and related components of window units.
  - 1. Do not use exposed fasteners, except where unavoidable.
  - 2. Provide stainless steel Phillips flathead machine screws for any exposed fasteners, where required, or tamperproof fasteners.
  - 3. Locate all fasteners so as not to bridge the thermal break.
- C. Anchors, clips and window accessories, depending on strength and corrosion-inhibiting requirements, fabricate such items of aluminum, stainless steel or hot-dip zinc coated steel or iron, complying with ASTM A 123-89a or ASTM B 633-85.
- D. Glazing with cured rubber tape, expanded cellular glazing tape or units may be wet glazed with a high-quality bedding compound. Both fixed and operable sash shall be glazed using aluminum glazing beads, finished to match frame.
- E. Provide weather-stripping using silicone coated woven pile with polypropylene fin center complying with AAMA 702-92.
- F. Sealant: Unless otherwise indicated for sealants required within fabricated window units, provide elastomeric type as recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Provide product complying with AAMA 800.

**2.03 WINDOW CONFIGURATION:**

- A. General: The following defines operating arrangements for types of sash required in window units and specifies the minimum provisions for each type. Project Drawings will show which sash operate, by arrow.
- B. AW PG70 1524 x 2515 (60" x 99") Single Hung aluminum windows, with one balanced and vertically sliding sash, requiring Class V spiral balance mechanisms complying with AAMA 902-94 and as required and appropriate to hold the sash in a stationary position when opened to any distance. Balances shall be accessible and replaceable.
  - 1. Provide lower sash which, are non-tilting, but which may be removed and serviced from the interior of the building.

**2.04 FABRICATION AND ACCESSORIES:**

- A. General: Provide manufacturer's standard fabrication and accessories that comply with specifications indicated. Include complete system for assembly of components and anchorage of window units prepared completely pre-glazed from factory.

*Model 2000 Single Hung AW-PG70 1524 x 2515 (60" x 99")*

- B. Window Members including any muntin bars shall be of aluminum. Secondary members such as friction shoes, weather-stripping, sash guides, etc. shall also be of aluminum or a compatible material.
  - 1. Mainframe and sash members shall have aluminum thickness as allowed by AAMA/NWWDA 101 I.S.2-A440-08. The standard wall thickness tolerance as defined by the Aluminum Association shall apply.
  - 2. The master frame shall be no less than 82.6mm (3 ¼ inches) in depth. The sash shall have hollow extruded sections.
- C. Thermal Break: The thermal barrier shall provide a continuous uninterrupted thermal break around the entire perimeter of the frame and all sash, and shall not be bridged by conductors.
- D. Hardware having component parts, which are exposed, shall be of aluminum, stainless steel or other non-corrosive materials and compatible with aluminum. Cadmium or zinc-plated steel, if used, must be in accordance with ASTM Specification A-164 or A-165.
  - 1. Primary sash locks shall be an extruded 4-inch (101.6mm) snap action sill lock, no plastic will be permitted, no lock at meeting rail shall be allowed.
- E. Frame and sash shall be assembled in a secure and workmanlike manner to perform as specified herein. All joints of mainframe and sash shall be of butt type, coped and neatly joined by means of cadmium plated or stainless-steel screws anchored in an integral screw port. All joinery of mainframe and sash shall be sealed with joint sealant per AAMA 803.3-92.
- F. Structural Members: When mullions occur, whether they are joined by integral mullions, or independent mullions, or by a combination of frame members, the resulting members must be capable of withstanding the specified design pressures herein and to a maximum deflection of L/175 of its span. When integral or independent mullions are used to join windows, evidence of compliance may be by mathematical calculations.
- G. Balances: Class V Spiral balances of appropriate size and capacity to hold operable sash stationary in any open position shall be used. Sash balances shall be easily accessible and replaceable in the field.
- H. Sash: Shall be joined at the corners with screws in integral screw ports, factory assembled and glazed.
  - 1. The lower sash must be easily removed from the frame for either cleaning or repair. Reglazing shall be easily accomplished from the interior without the aid of unique tools.
- I. Glazing:
  - 1. All glass / glazing shall be glazed at the factory as follows:
    - a) All units shall be glazed to withstand a 3360 Pa ( 70.18 psf ) Design Pressure.
    - b) Exterior lite to be minimum of DSB clear or of sufficient strength to meet loading and applicable Codes.
    - c) Interior lite to be minimum of DSB clear or of sufficient strength to meet loading and applicable Codes.
  - 2. The sash shall be bead glazed, with reusable aluminum bead. No tilting sash will be accepted for sash weighing more than 25 pounds.
- J. Screens: If drawings indicate screens, supply insect screens for operable sections of windows in accordance with manufacturer's standard product. Provide aluminum screen cloth.
- K. Accessories: If indicated on drawings, panning shall be of a receiver type, extruded and finished to match, and;
  - 1. Panning extrusions shall be site assembled, secured at the corners with cadmium plated steel screws in integral screw boss with the joints back sealed per AAMA 800. Exposed fasteners are not acceptable on the exterior of pan or receptor system.

*Model 2000 Single Hung AW-PG70 1524 x 2515 (60" x 99")*

2. Interior trims: Shall be as depicted on drawings and provided in extruded profiles only. No break shapes are permissible without prior approval.
3. Exterior mullion covers, when they occur, shall be of extruded profiles, finished to match window system. No break form shapes are permissible without prior approval.
4. Sub-Frame Systems, if indicated on drawings, shall be a two-piece snap-lock receptor system and shall serve to anchor windows in place. The receptor shall be extruded aluminum, finished to match window and utilize a polyurethane thermal break. The receptor system shall be a prefabricated and assembled system including head and jamb receptors and subsill as is indicated on the drawings.

**2.05 ALUMINUM FINISHES:**

- A. Provide organic coating of type and color indicated or selected by Architect. Comply with AAMA 2603. Application of finish must be by window manufacturer for all components to ensure match.
  1. Manufacturer's standard electrostatically applied baked enamel coating of manufacturer's standard color(s) as selected by the Architect and applied over manufacturer's standard substrate preparation including cleaning, degreasing, and appropriate pre-treatments.

**PART 3 – EXECUTION**

**3.01 - PREPARATION**

- A. Prepare openings and chink with insulation, if necessary, to avoid excessive air infiltration from wall cavity; and to be in tolerance, plumb, level, and block as necessary to provide for secure anchoring in accordance with industry standards and the approved shop drawings.

**3.02 - INSTALLATION**

- A. Install windows in accordance ASTM E 2112 together with manufacturer's standard installation instructions, per approved shop drawings and using skilled craftspeople that have demonstrated a successful history of installing commercial window systems for at least five years. If units are to be installed in EIFS veneer, it shall be the General Contractor's responsibility to ensure that openings are properly back-wrapped, prepared per EIMA guidelines and current procedures prior to window installation.
- B. Provide required treated blocking to support and securely fasten windows plumb, square, and level without twist or bow. For single hung units, care must be taken to ensure that jambs are not twisted, bowed inward or outward. Block jambs to ensure that they remain in tolerance, plumb and that sash operate correctly.
- C. Apply sealant per AAMA 800-92, 808.3-92, and pursuant with sealant manufacturer's recommendations, at all exterior joinery. Wipe off any excess sealant and tool all sealant leaving exposed surface clean and smooth.

**3.03 - ADJUSTING AND CLEANING**

- A. Installing contractor shall clean all aluminum surfaces promptly after installation, following either AAMA 609-93 and/or 610.1-79 standards. Comply with AAMA CW-10-12. Report any shipping damages, in writing, to window manufacturer and General Contractor with 72 hours of receipt.
- B. Installing contractor shall make all final adjustments to sash, balances and/or other hardware, to ensure proper operation and weather-ability, and shall touch up any minor blemishes.



*Model 2000 Single Hung AW-PG70 1524 x 2515 (60" x 99")*

- C. Installing contractor shall clean glass, after installation, to remove any labels, excess glazing compound or other sealant and any other foreign substances. Initiate protection and precautions as required ensuring that windows are not misused or abused by other Trades until inspection and/or acceptance by Architect.

**END OF SECTION**

*Model 2200 CW PG 40 FW*

**PART 1 - GENERAL**

**1.01 GENERAL PROVISIONS:**

- A. Coordinate work with that of all construction contractors affecting or affected by work of this Contract. Cooperate with such contractors to assure the steady progress of the Work.
- B. Pre-Bid Qualifications: All bids must be based on pre-qualified products; to qualify, the bidder must furnish one complete window unit and additional information as shown below ten (10) days prior to bid date.
  - 1. This sample must be identical to the model of the window the bid is based on, with the finish being the only exception.
  - 2. The prospective bidder shall also include in his pre-bid qualification package, copies of the independent laboratory tests which certify that the proposed product meets or exceeds an CW PG-40 FW classification as specified herein and shall show continuing compliance by furnishing a Notice of Product Certification from an Administrator of a Certification Program. Test reports from an independent laboratory showing that the insulated glass, if any, has been tested to the CBA Level, will also be required.

**1.02 RELATED WORK:**

- A. Provide labor, materials and equipment necessary to complete the work of the window portion of the contract, and without limiting the generality thereof shall include:
  - 1. Removal of existing sash, parting beads, stops and other accessories as required by the proposed replacement system.
  - 2. Removal of other existing construction work as required for the proper installation and operation of the new window system.
  - 3. Removal from site and disposal of all materials, debris packaging, banding and all other materials and equipment.
  - 4. Provide new factory-glazed, thermally broken, aluminum windows, types as specified herein, together with necessary mullions, panning, trim, extenders, operating hardware, all installation hardware and all other accessories as may be required.
  - 5. Treated wood blocking, shims, fillers and nailers as required for a secure installation.
  - 6. Field observations and securing measurements of existing openings and conditions.
  - 7. Bidders shall survey conditions of existing sills and jambs prior to bidding. Contractor shall be responsible for the replacement of portions of same that are deteriorated.
  - 8. Provide and chink fiberglass insulation between window frames and adjacent construction.
  - 9. Proper sealing of all panning or compensation channel joints within each window assembly, per AAMA 800-05, and chink fiberglass insulation between window frames & accessories.
  - 10. Sealing of entire exterior perimeter of window units after installation, per ASTM E 2112.
  - 11. Furnishing of any extra materials as specified herein.

**1.03 TESTING AND PERFORMANCE REQUIREMENTS:**

- A. Standards: Except as otherwise indicated, requirements for all aluminum windows, terminology and standards of performance, and fabrication workmanship are those specified and recommended in AAMA/WDMA/CSA 101/I.S.2/A440 and applicable general recommendations published by AAMA and the AA.

*Model 2200 CW PG 40 FW*

- B. Performance and Testing: Except as otherwise indicated, comply with air infiltration tests, water resistance tests and applicable load tests specified in AAMA/WDMA/CSA 101/I.S.2/A440 for type, rating and classification of the window units required herein.
- C. Testing: Where manufacturer's standard window units comply with requirements and have been tested, in full size required, and in accordance with specified test's procedures, provide independent certification of such testing.
  - 1. Test reports shall be no more than four years old.
  - 2. Sample submitted for tests shall be of manufacturer's standard construction and 60 inches wide by 99 inches high. The sequence of tests shall be optional between manufacturer and testing laboratory except that in all cases, the air infiltration test shall be performed before the water resistance test.
- D. Specific Requirements: Windows shall conform to specified standards or those specified herein, whichever are the more stringent:
  - 1. Air Infiltration Test: The window shall be subjected to an air infiltration test in accordance with ASTM E 283. Air infiltration shall not exceed 0.01 ft<sup>3</sup>/min/ft<sup>2</sup> when tested at 6.24 psf.
  - 2. Water Resistance Test: The glazed unit shall be mounted in a vertical position, continuously supported around perimeter. The window unit shall be subjected to a water resistance test in accordance with ASTM E 331 & E 547 and as outlined below.
    - a) Using a static pressure of 6.0 pounds per square foot, a water flow rate equal to five gallons of water per hour, per square foot of window area, should be cycled for five minutes of water on, then one minute off, for a total of four cycles. No water shall pass the interior plane of the window frame and there shall be no uncontrolled leakage.
    - b) On windows rated in the AW Class, in addition to the cycling test above, any AW unit shall also be subjected to a water resistance test in accordance with ASTM E 331 & E 547. When a static pressure of 7.5 pounds per square foot has been stabilized, five gallons of water per hour, per square foot of window area shall be applied to the exterior face of the unit for a period of 15 minutes. No water shall pass the interior plane of the window frame and there shall be no uncontrolled leakage as defined in the test procedure.
  - 3. Uniform Structural Load Test: A minimum uniform structural test pressure 60 pounds per sq. ft., shall be applied to the test unit. First, the exterior pressure (positive) then the interior (negative) pressure. Each maximum pressure shall be stabilized and held for 10 seconds. Testing shall be conducted pursuant to ASTM E 330 and the unit shall be evaluated after each load.

**1.04 QUALITY ASSURANCE:**

- A. Provide test reports from an independent laboratory certifying that the performance for air infiltration, water resistance, uniform structural load, and condensation resistance, has been met or exceeds the criterion as set forth herein.

**1.05 REFERENCES:**

- A. American Architectural Manufacturers Association (AAMA), American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), Aluminum Association (AA), National Wood Window & Door Association (NWWDA).

***Model 2200 CW PG 40 FW***

**1.06 SUBMITTAL REQUIREMENTS:**

- A. General: Provide submittals pursuant with the following:
  - 1. Product Data: Submit manufacturer's specifications, any recommendations and standard Product details for aluminum window units, including independent laboratory certified test report as necessary to show compliance with requirements.
  - 2. Shop Drawings: Submit shop drawings, including typical unit elevations and showing half scale details of Product's head, jamb and sill being supplied and typical installation detail. Show anchor locations and other components not included in manufacturer's standard literature. Call out type of glass/glazing, screening, and window finish that will be supplied.
  - 3. Samples: Submit samples as follows:
    - a) Three samples of each required finish, on a 3 inch long section of an extruded shape or flat aluminum stock.
    - b) Additional samples as may be requested by Architect, to show fabrication techniques, workmanship, type of component parts and the type, design or finish of hardware proposed.

**1.07 PRODUCT DELIVERY, STORAGE AND HANDLING:**

- A. Store and handle windows, hardware and all related items in strict compliance with the manufacturer's instructions.
- B. Protect and insure windows and all accessory and related materials adequately against damage from the elements, construction activities and other hazards before, during and after installation.

**1.08 PROJECT WARRANTIES:**

- A. Manufacturer's Warranties: Submit written warranties from window manufacturer for the following:
  - 1. Windows: Windows furnished shall be certified as fully warranted against any defects in material or workmanship, under normal use and service, for a period of one year from date of fabrication.
  - 2. Finish: The pigmented organic finishes on windows and component parts shall comply fully with requirements of AAMA 2603, for pigmented organic coating and fully warranted against chipping, peeling, cracking and blistering for a period of one year.
  - 3. Glass: Any insulated glass shall be warranted from visual obstruction, due to internal moisture, for a period of one year.

**PART 2 – PRODUCTS**

**2.01 GENERAL:**

- A. Manufacturer: Subject to compliance with Contract Documents and specifications, provide one of the following:
  - 1. Model 2250 H Fixed Light as manufactured by SEAL CRAFT
- B. Thermal Break Construction: Fabricate aluminum window units with an integral low-conductance polyurethane thermal barrier, located mid-frame between exterior and interior of the window, and in a manner, which eliminates direct metal-to-metal contact.
- C. Window Construction: Provide manufacturer's standard construction, which has been in use on similar window units for a period of not less than ten years, and has been tested to demonstrate resistance to thermal conductance and condensation and has been tested to show adequate strength for this purpose.

*Model 2200 CW PG 40 FW*

**2.02 FABRICATION:**

- A. Aluminum Extrusions: All extruded sections shall be of 6063-T5 aluminum alloy and temper recommended by window manufacturer for strength, corrosion resistance, and application of required finish. Shall meet 22,000 psi ultimate tensile strength, yield of 16,000 psi.
- B. Fasteners: Aluminum, stainless steel, or other materials warranted by fastener manufacturer to be non-corrosive and compatible with aluminum window members, and related components of window units.
  - 1. Do not use exposed fasteners, except where unavoidable.
  - 2. Provide stainless steel Phillips flathead machine screws for any exposed fasteners, where required, or tamperproof fasteners.
  - 3. Locate all fasteners so as not to bridge the thermal break.
- C. Anchors, clips and window accessories, depending on strength and corrosion-inhibiting requirements, fabricate such items of aluminum, stainless steel or hot-dip zinc coated steel or iron, complying with ASTM A 123-89a or ASTM B 633-85.
- D. Glazing with cured rubber tape, expanded cellular glazing tape or units may be wet glazed with a high-quality silicone. Sash shall be glazed using aluminum glazing beads, finished to match frame.
- E. Sealant: Unless otherwise indicated for sealant required within fabricated window units, provide elastomeric type as recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Provide product complying with AAMA 803.3-92 and/or 808.3-92.

**2.04 FABRICATION AND ACCESSORIES:**

- A. General: Provide manufacturer's standard fabrication and accessories that comply with specifications indicated. Include complete system for assembly of components and anchorage of window units prepared completely pre-glazed from factory.
- B. Window Members, including any muntin bars, shall be of aluminum.
  - 1. Mainframe and any sash members shall have aluminum thickness as allowed by AAMA/WDMA/CSA 101/I.S.2/A440. The standard wall thickness tolerance as defined by the Aluminum Association shall apply.
  - 2. The products main or master frame shall be no less than 3 1/4 inches ( 83.5mm ) in depth.
- C. Thermal Break: The thermal barrier shall provide a continuous uninterrupted thermal break around the entire perimeter of the frame and shall not be bridged by conductors.
- D. Fasteners or hardware as component parts, which are exposed, shall be of aluminum, cadmium plated or other non-corrosive materials and compatible with aluminum. Cadmium or zinc-plated steel, if used, must be in accordance with ASTM Specification A-164 or A-165.
- E. Window shall be assembled in a secure and workmanlike manner to perform as specified herein. All joints of mainframe shall be of butt type, coped and neatly joined by means of screws anchored in an integral boss. All joinery of mainframe shall be sealed with joint sealant per AAMA 800-05.
- F. Structural Members: When mullions occur, whether they are joined by integral mullions, or independent mullions, or by a combination of frame members, the resulting members must be capable of withstanding the specified design pressures herein and to a maximum deflection of L/175 of its span. When integral or independent mullions are used to join windows, evidence of compliance may be by mathematical calculations.

*Model 2200 CW PG 40 FW*

G. Glazing:

1. All glazing and insulated panels shall be glazed at the factory as follows:
  - a) All insulated glass units shall be constructed to a minimum thickness of 5/8 inch with two lights of DSB, or as size, loading and/or local codes may require.
  - b) All insulated glass units shall be tested, certified and carry the respective CBA level certification.
  - c) Test reports supporting CBA certification shall be submitted upon request.
2. The fixed light shall have aluminum glazing beads finished to match.

H. Accessories: If indicated on drawings, panning shall be of a receiver type, extruded and finished to match, and;

1. Panning extrusions shall be site assembled, secured at the corners with stainless steel screws in integral screw boss with the joints back sealed per AAMA 803.3-92. Exposed fasteners are not acceptable on the exterior of pan system.
2. Interior trims: Shall be as depicted on drawings but sized by installer and provided in extruded profiles only. No break form shapes are permissible without written prior approval.
3. Exterior mullion covers, when they occur, shall be of extruded profiles, finished to match window system. No break form shapes are permissible without written prior approval.
4. Receptor Systems, if indicated on drawings, shall be a two-piece snap together receptor system and shall serve to anchor windows in place. The receptor shall be extruded and finished to match window with polyurethane thermal break. The receptor system shall be at head and jamb or head only, as is indicated on the drawings. Installer shall chink fiberglass insulation between receptor and window's frame. An optional extruded aluminum sub-sill may be called for on the drawings and must offer thermal break design.

**2.05 ALUMINUM FINISHES:**

- A. Provide organic coating of type and color indicated or selected by Architect. Comply with AAMA 2603. Application of finish must be by window manufacturer for all components to ensure match.
1. Manufacturer's standard powder coating of manufacturer's standard color(s) as selected by the Architect and applied over manufacturer's standard substrate preparation including cleaning, degreasing, and appropriate pre-treatments.

**PART 3 – EXECUTION**

**3.01 - PREPARATION**

- A. Prepare openings and chink with insulation, if necessary, to avoid excessive air infiltration from wall cavity; and to be in tolerance, plumb, level, and block as necessary to provide for secure anchoring in accordance with industry standards and the approved shop drawings.

**3.02 - INSTALLATION**

- A. Install windows in accordance ASTM E 2112, per approved shop drawings and using skilled craftspeople that have demonstrated a successful history of installing commercial window systems for at least five years. If units are to be installed in EIFS veneer, it shall be the General Contractor's responsibility to ensure that openings are properly back-wrapped, prepared per EIMA guidelines and current procedures prior to window installation.

*Model 2200 CW PG 40 FW*

- B. Provide required blocking and support, securely fasten and set windows plumb, square, and level without twist or bow.
- C. Apply sealant per AAMA 800-05 and pursuant with sealant manufacturer's recommendations, at all exterior joinery. Wipe off any excess sealant and tool all sealant leaving exposed surface clean and smooth.

**3.03 - ADJUSTING AND CLEANING**

- A. Installing contractor shall clean all aluminum surfaces promptly after installation, following either AAMA 609 and/or 610-02 standards. Comply with AAMA CW-10-04. Report any shipping damages to window manufacturer with 72 hours of receipt.
- B. Installing contractor shall make all final adjustments to insure proper operation and weather-ability and shall touch up any minor blemishes.

**END OF SECTION**

SECTION 081216 - ALUMINUM FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior aluminum doors, door frames, and glazing frames.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1.3 ACTION SUBMITTALS

A. Product Data:

1. Interior aluminum doors, door frames, and glazing frames.

B. Shop Drawings: For aluminum frames:

1. Include elevations, sections, and installation details for each wall-opening condition.
2. Include details for each frame type, including dimensioned profiles and metal thicknesses.
3. Include locations of reinforcements and preparations for hardware.
4. Include details of anchorages, joints, field splices, connections, and accessories.
5. Include details of moldings, removable stops, and glazing.

C. Samples for Initial Selection: For each type of exposed finish.

1. Include Samples of seals, gaskets, and accessories involving color selection.

1.4 CLOSEOUT SUBMITTALS

1.5 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

1. Build mockup of each type of aluminum frame and door in typical wall area as shown on Drawings.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.



3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 ALUMINUM FRAMES

- A. Source Limitations: Obtain aluminum frames and frame-manufacturer's doors from single source from single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

### 2.3 INTERIOR ALUMINUM DOORS, DOOR FRAMES, AND GLAZING FRAMES

- A. Aluminum Framing: **ASTM B221**, with alloy and temper required to suit structural and finish requirements, and not less than **0.062 inch** thick.
- B. Door Frames: Extruded aluminum, reinforced for hinges, strikes, and closers.
- C. Doors:
  1. As specified in 081316.13 Aluminum Terrace Doors .
- D. Door Finish: Match frame and trim finish Clear-anodized aluminum .
  1. Color: As selected by Architect from manufacturer's full range .
- E. Frame and Trim Finish: Clear-anodized aluminum .
  1. Color: .

### 2.4 FABRICATION

- A. Provide concealed corner reinforcements and alignment clips for accurately fitted hairline joints at butted and mitered connections.
- B. Factory prepare aluminum frames to receive templated mortised hardware; include cutouts, reinforcements, mortising, drilling, and tapping, according to the Door Hardware Schedule and templates furnished as specified in Section 087100 "Door Hardware."
  1. Locate hardware cutouts and reinforcements as required by fire-rated label for assembly.
- C. Fabricate frames for glazing with removable stops to allow glazing replacement without dismantling frame.
  1. Locate removable stops on the inside of spaces accessed by keyed doors.

- D. Fabricate components to allow secure installation without exposed fasteners.

## 2.5 GENERAL FINISH REQUIREMENTS

- A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.6 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify that wall thickness does not exceed standard tolerances allowed by throat size of indicated aluminum frame.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install aluminum frames plumb, rigid, properly aligned, and securely fastened in place; according to manufacturer's written instructions.
  - 1. At fire-protection-rated openings, install fire-rated frames according to NFPA 80 and NFPA 105.
- B. Install frame components in the longest possible lengths with no piece less than **48 inches**; components **72 inches** or shorter must be one piece.
  - 1. Use concealed installation clips to produce tightly fitted and aligned splices and connections.
  - 2. Secure clips to extruded main-frame components and not to snap-in or trim members.
  - 3. Do not leave screws or other fasteners exposed to view when installation is complete.
- C. Glass: Install glass according to Section 088000 "Glazing" and aluminum-frame manufacturer's written instructions.
- D. Doors: Install doors aligned with frames and fitted with required hardware.
- E. Door Hardware: Install according to Section 087100 "Door Hardware" and aluminum-frame manufacturer's written instructions.

3.3 ADJUSTING

- A. Inspect installation, correct misalignments, and tighten loose connections.
- B. Doors: Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly, and lubricate as recommended by manufacturer.
- C. Clean exposed frame surfaces promptly after installation, using cleaning methods recommended in writing by frame manufacturer and according to AAMA 609 and AAMA 610.
- D. Touch Up: Repair marred frame surfaces to blend inconspicuously with adjacent unrepaired surface so touchup is not visible from a distance of 48 inches as viewed by Architect. Remove and replace frames with damaged finish that cannot be satisfactorily repaired.

END OF SECTION 081216

SECTION 081316.13 - ALUMINUM TERRACE DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum terrace doors.

B. Related Requirements:

1. Section 084113 "Aluminum-Framed Entrances and Storefronts" for coordinating finish among aluminum fenestration units on the building exterior.
2. Section 085113 "Aluminum Windows" for related aluminum-framed transom and sidelite windows and mullions and for coordinating finishes among aluminum fenestration units on the building exterior.
3. Section 087100 "Door Hardware" for hardware not specified in this Section.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Aluminum terrace doors.

B. Shop Drawings: For aluminum terrace doors.

1. Include plans, elevations, sections, and details; hardware; attachments to other work, and between doors, if any; and operational clearances.

C. Samples for Initial Selection: For each type of aluminum terrace door.

1. Include Samples of hardware and accessories involving color selection.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer .

1.4 CLOSEOUT SUBMITTALS

1.5 QUALITY ASSURANCE

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum terrace doors that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
    - a. Failure to meet performance requirements.
    - b. Structural failures including excessive deflection.
    - c. Excessive water infiltration or air leakage.
    - d. Faulty operation of movable panels and hardware.
    - e. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    - f. Failure of insulating glass and laminated glass.
    - g. .
  2. Warranty Period:
    - a. Aluminum Terrace Door: Three years from date of Substantial Completion.
    - b. Insulating-Glass Units: 20 years from date of Substantial Completion.
    - c. Laminated Glass: Five years from date of Substantial Completion.
    - d. Aluminum Finish: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
1. Product Certification: AMMA certified with label attached to each door.
- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
1. Minimum Performance Class: Class CW .
  2. Minimum Performance Grade: Grade 40 .
- C. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum total fenestration product SHGC of 0.27 .

## 2.2 ALUMINUM TERRACE DOORS

- A. Frames and Door Panels: Fabricated from aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.
  - 1. Thermally Improved Construction: Fabricate frames and door panels with an integral, concealed, low-conductance thermal barrier located between exterior and interior surfaces in a manner that eliminates direct metal-to-metal contact.
- B. Threshold: Provide extruded-aluminum threshold of thickness, dimensions, and profile indicated; designed to comply with performance requirements indicated and to drain to the exterior; with manufacturer's standard finish.
  - 1. Low-Profile Threshold: ADA-ABA compliant.

## 2.3 ACCESSORIES

## 2.4 FABRICATION

- A. Fabricate aluminum terrace doors in sizes indicated. Include a complete system for assembling components and anchoring doors.
- B. Fabricate aluminum terrace doors that are reglazable without dismantling panel framing.
- C. Weather Stripping: Provide full-perimeter weather stripping for each door panel.
- D. Weep Holes: Provide weep holes and internal drainage passages to conduct infiltrating water to exterior.
- E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.
- F. Factory-Glazed Fabrication: Glaze aluminum terrace doors in the factory. Comply with requirements in Section 088000 "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440.

## 2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are

acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.6 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of Work.
- B. Verify rough opening dimensions, levelness of threshold substrate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weathertight aluminum terrace door installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing doors, hardware, accessories, and other components.
- B. Windborne Debris Resistance: Anchor aluminum terrace doors that have been tested for windborne debris resistance to structure using anchoring method, fastener type, and fastening frequency identical to that used in windborne debris resistance testing.
- C. Install aluminum terrace doors level, plumb, square, true to line; without distortion, warp, or rack of frames and panels and without impeding thermal movement; anchored securely in place to structural support; and in proper relation to wall flashing, vapor retarders, air barriers, water/weather barriers, and other adjacent construction.
- D. Set sill members in bed of sealant to provide weathertight construction.
- E. Install aluminum terrace doors and components to drain condensation, water-penetrating joints, and moisture migrating within doors to the exterior.
- F. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Lubricate hardware and moving parts.
- B. Adjust operating panels to provide a tight fit at contact points and weather stripping for smooth operation, without binding, and a weathertight closure. Adjust hardware for proper alignment, smooth operation, and proper latching without unnecessary force or excessive clearance.
- C. Clean exposed surfaces immediately after installing aluminum terrace doors. Avoid damaging protective coatings and finishes. Remove nonpermanent labels, excess sealants, glazing materials, dirt, and other substances.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Protect aluminum terrace door surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances contact aluminum terrace door surfaces, remove contaminants immediately according to manufacturer's written instructions.
- F. Refinish or replace aluminum terrace doors with damaged finishes.
- G. Replace damaged components.

END OF SECTION 081316.13



## **SECTION 08 1416 – MOLDED PANEL INTERIOR DOORS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

##### **A. Section Includes:**

1. Solid-core doors with hardboard or MDF faces.
2. Hollow-core doors with hardboard or MDF faces.
3. Shop priming wood doors.
4. Factory fitting wood doors to frames and factory machining for hardware.

#### **1.2 ACTION SUBMITTALS**

##### **A. Product Data:** For each type of door

##### **B. Shop Drawings:** Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Fire-protection ratings for fire-rated doors.

#### **1.3 INFORMATIONAL SUBMITTALS**

##### **A. Quality Standard Compliance Certificates:** AWI Quality Certification Program certificates.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Masonite
- B. Mohawk
- C. Jeld-Wen

#### **2.2 WOOD DOORS, GENERAL**

##### **A. Quality Standard:** In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."

##### **B. WDMA I.S.1-A Performance Grade:**

1. Standard Duty.

- C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
  - 1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
  - 2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
  - 3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
- D. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- E. Particleboard-Core Doors:
  - 1. Particleboard: ANSI A208.1, Grade LD-1 or Grade LD-2, made with binder containing no urea-formaldehyde.
  - 2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
  - 3. Provide doors with glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.
- F. Mineral-Core Doors:
  - 1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
  - 2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
  - 3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
- G. Hollow-Core Doors:
  - 1. Construction: Standard hollow core.

## 2.3 DOORS FOR OPAQUE FINISH

- A. Interior Solid-Core Doors:
  - 1. Faces: Hardboard or MDF.
  - 2. Core: Particleboard.
- B. Interior Hollow-Core Doors:
  - 1. Faces: Hardboard or MDF.
- C. Door Design: Two Panel
- D. Surface Finish: Textured

## 2.4 LIGHT FRAMES AND LOUVERS

- A. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch-thick, cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated.
- B. Metal Louvers:
  - 1. Metal and Finish: Hot-dip galvanized steel, 0.040 inch thick, factory primed for paint finish.

## 2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
  - 1. Comply with NFPA 80 requirements for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied.
- C. Openings: Factory cut and trim openings through doors.
  - 1. Light Openings: Trim openings with moldings of material and profile indicated.
  - 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 08 8000 "Glazing."
  - 3. Louvers: Factory install louvers in prepared openings.

## 2.6 SHOP PRIMING

- A. Doors for Opaque Finish: Shop prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 09 9100 "Painting."

## 2.7 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
  - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Hardware: For installation, see Section 08 7100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire-rated doors according to NFPA 80.
  2. Install smoke- and draft-control doors according to NFPA 105.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
    - a. Comply with NFPA 80 for fire-rated doors.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

**END OF SECTION 08 1416**

## **SECTION 08 71 00 – DOOR HARDWARE**

### **PART 1 - GENERAL**

#### **1.1 GENERAL REQUIREMENTS**

- A. Any door shown on the drawings and not specifically referenced in the hardware sets shall be provided with identical hardware as specified on other similar openings and shall be included in the finish hardware suppliers bid.
- B. All doors that are fire rated shall be provided with fire rated hardware to comply with the local code requirements whether specified that way or not as a part of the hardware supplier's base bid.
- C. Hardware supplier shall notify the Architect in writing of any discrepancies no less than five (5) working days prior to the bid date that could result in hardware being supplied that is non-functional, that will not meet local codes, or any door that is not covered in this specification.
- D. Aluminum storefront hardware shall be provided under this specification section and shall be included in the finish hardware supplier's base bid.
- E. Power supplies for electrified hardware shall be provided under this specification section and shall be included in the finish hardware supplier's base bid.

#### **1.2 RELATED DOCUMENTS**

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

#### **1.3 SUMMARY**

- A. This Section includes the following:
  - 1. Commercial door hardware for the following:
    - a. Swinging Doors
    - b. Other doors to the extent indicated.
  - 2. Cylinders for doors specified in other Sections.
  - 3. Electrified hardware.
- B. Related Sections include the following:
  - 1. Division 8 Section "Hollow Metal Doors and Frames" for astragals furnished as part of fire-rated labeled assemblies.
  - 2. Division 8 Section "Flush Wood Doors" for astragals as part of fire-rated labeled assemblies.

#### **1.4 SUBMITTALS**

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
    - a. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
    - h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
      - 1) Sequence of Operation: Include description of component functions including, but not limited to, the following situations: normal secured/unsecured state of door; authorized access; authorized egress; unauthorized access; unauthorized egress; fire alarm and loss of power conditions.
  4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

- D. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
1. Approved hardware schedule, catalog cuts and keying schedule.
  2. Furnish keying bitting list in paper and electronic format by registered mail directly to facility manager owner.
  3. Hardware installation and adjustment instructions.
  4. Manufacturer's written warranty information.
  5. Wiring diagrams, elevation drawings and operational descriptions for all electronic openings.

## 1.5 QUALITY ASSURANCE

- A. Please be advised that Hardware Supplier and Hardware Installer must obtain a license with the Louisiana Office of State Fire Marshall in accordance to RS 40:1464 and RS 40:1664.
- B. Installer Qualifications: An experienced Installer who has completed standard builder's hardware installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying. Supplier recognized by manufacturers to be a direct factory- authorized distributor of the specified hardware products.
1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- D. Source Limitations: Obtain each type and variety of aluminum, steel and wood door hardware from the same single source manufacturer and supplier, unless otherwise indicated.
- E. Regulatory Requirements: Comply with provisions of the following:
1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
    - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
    - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
      - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
      - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
    - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
  2. NFPA 101: Comply with the following for means of egress doors:
    - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
    - b. Thresholds: Not more than 1/2 inch high.
  3. International Building Code (2006).
- F. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having

jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.

1. Test Pressure: Positive pressure labeling.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. One complete shipment of door hardware as detailed in approved Door Hardware Schedule Shop Drawings to be inventoried on site and upon receipt of material is secure in lock-up room furnished with shelving for door hardware. Do not store electronic access control hardware, software or accessories at Project site without prior authorization and climate controlled facility, failure to do so will void electronic warranties.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver permanent keys, cylinders, cores, access control credentials, electronic key software with loaded bitting and key records per cylinder, and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference". Hardware Supplier must be a regional supplier to address owner questions and concerns relating to keying issues that arise as project close-out.

#### 1.7 COORDINATION

- A. Templates: Door Hardware Supplier to furnish and distribute to the parties involved for templating for doors, frames, and other work specified to be factory prepared for installing standard, electrified and access control door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Access Control and Electrical Connections: Door Hardware supplier with door and frame supplier to coordinate the layout and installation of scheduled electrified door hardware with required connections to source power junction boxes, power supplies and security products.
- C. Keying Conference: Door Hardware Supplier to conduct keying conference to comply with requirements in Division 1 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document prior to any material being ordered:
  1. Function of building, purpose of each area and degree of security required.
  2. Plans for existing and future key system expansion.
  3. Review all lock and exit device functions when reviewing keying requirements.
  4. Requirements for key control system.
  5. Installation of permanent keys and cylinder cores.
  6. Address the requirements for delivery of keys.
  7. Address keying and cylinder stamping (identification) with owner or owner representative.
  8. Establish method of submitting electronic format of keying systems and diagram and to be produced and furnished by Hardware Supplier.
- D. Pre-Installation Conference: Hardware Supplier to conduct conference at Project site attended by representatives of Door Hardware Manufacturers, Hardware Installers, Owner Representative and General Contractor to review proper hardware installation methods and the procedures for receiving and handling hardware. On site training should not be less than four hours of on-site training by qualified Hardware Supplier and Manufactures. At completion of



installation and final walk through, furnish written certification that hardware items were applied according to conference recommendations and to finish hardware specifications.

## 1.8 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of standard, electrified hardware and access control hardware that fails in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
  - 1. Structural failures including excessive deflection, cracking, or breakage.
  - 2. Faulty operation of the hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period: Two year from date of Substantial Completion, unless otherwise indicated.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. General: Furnish door hardware for each door to comply with requirements in this Section and the Door Hardware Schedule at the end of Part 3.
  - 1. Door Hardware Sets: Furnish quantity, item, size, finish, or color indicated for named products listed in Hardware Sets.
  - 2. Sequence of Operation: Furnish electrified and access control hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
  - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

## 2.2 HINGES AND PIVOTS

- A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following:
1. Hinges:
    - a. Stanley
    - b. Hager
- B. Standards: BHMA Certified products complying with the following:
1. Butts and Hinges: BHMA A156.1.
  2. Pivots: BHMA A156.4.
  3. Template Hinge Dimensions: BHMA A156.7.
- C. Quantity: Furnish the following, unless otherwise indicated:
1. Two Hinges: For doors with heights up to 60 inches.
  2. Three Hinges: For doors with heights 61 to 90 inches.
  3. Four Hinges: For doors with heights 91 to 120 inches.
  4. For doors with heights more than 120 inches, furnish 4 hinges, plus 1 hinge for every 30 inches (of door height greater than 120 inches).
- D. Hinge Size: Furnish the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
- | Maximum Door Size (inches) | Hinge Height (inches) | Metal Thickness (inches) |              |
|----------------------------|-----------------------|--------------------------|--------------|
|                            |                       | Standard Weight          | Heavy Weight |
| 36-in by 86-in by 1-3/4    | 4-1/2                 | 0.134                    | 0.180        |
| < 36-in by 120-in by 1-3/4 | 5                     | 0.146                    | 0.190        |
- E. Hinge Weight and Base Material: Unless otherwise indicated, furnish the following:
1. Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges.
  2. Interior Doors: Heavy weight, ball bearing hinges unless Hardware Sets indicate standard weight.
    - a. Standard weight hinges can be used at Mechanical, Electrical, IDF, Data, and Offices with out closers openings, regardless of specified hinge weight in hardware sets.
- F. Hinge Height Clarifications: Where uneven door leafs occur, the widest door leaf in the pair determines the height and weight of the hinges on the inactive and active door leafs; to ensure equal size hinges on opening.
- G. Hinge Weight Clarification: If heavy weight hinges are specified in hardware sets for interior aluminum frames then standard weight hinges can be used. If aluminum frame opening has a door over 42 inches or greater then an additional hinge in lieu of heavy weight or 5 inch hinges.
- H. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:

1. Non-removable Pins: Furnish set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
  - a. Out-swinging exterior doors.
  - b. Out-swinging access controlled doors.
2. Electric Hinges: Furnish electric transfer hinges with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Furnish sufficient number of concealed wires to accommodate electric function of specified hardware. Wire nut connections are not acceptable.
  - I. Accessible Electrical Transfer Continuous Hinges: Furnish electric transfer continuous hinges with a 12" removable hinge modification accessible without de-mounting door from the frame and standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Furnish sufficient number of concealed wires to accommodate electric function of specified hardware. Wire nut connections are not acceptable.
  - J. Furnish mortar guard enclosure on frames at each electrical hinge location specified.

### 2.3 DOOR BOLTS

- A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following: Surface Bolts: Flush Bolts and Coordinators:
  - a. McKinney Products (MC).
  - b. Hager (HA).
  - c. Rockwood Manufacturing (RO).
  - d. Trimco Manufacturing (TR).
  - e. Ives (IV).
- B. Standards: Comply with the following:
  1. Automatic and Self-Latching Flush Bolts: BHMA A156.3.
  2. Manual Flush Bolts: BHMA A156.16.
- C. Flush Bolts: BHMA Certified Grade 1.
- D. Furnish bolts with top rod of sufficient length to allow bolt location approximately six feet from the floor regardless if detailed as such in hardware sets. Furnish dust proof strikes for bottom bolts. Surface bolts to be 8" in length, unless otherwise noted and U.L. listed for labeled fire doors.
- E. Furnish Self-Latching flush bolts as follows:
  1. Access control inactive door leaf.
  2. Uneven inactive door leaf.
- F. Bolt Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
  1. Mortise Flush Bolts: Minimum **3/4-inch** throw.

## 2.4 LOCKS AND LATCHES

- A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following:
  - 1. Mechanical Mortise Locks and Latches:
    - a. Sargent Manufacturing (SA) - 8200 Series – No substitution
  - 2. Auxiliary Cylindrical Deadbolts:
    - a. Sargent Manufacturing (SA) - 480 Series – No substitution
- B. Standards: Comply with the following:
  - 1. Mortise Locks and Latches: BHMA A156.13.
  - 2. Auxiliary Locks: BHMA A156.5.
- C. Mortise Locks: BHMA Certified Grade 1, Series 1000.
- D. Auxiliary Locks: BHMA Certified Grade 1.
- E. Lock Trim: Match the following design style:
  - 1. Levers:
    - a. Sargent Manufacturing (SA) – LNMW
- F. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
  - 1. Mortise Locks: BHMA A156.13.
- G. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
  - 1. Mortise Locks: Minimum **3/4-inch** latchbolt throw, with stainless steel bolt.
  - 2. Deadbolts: Minimum **1-inch** bolt throw.
- H. Backset: **2-3/4 inches** unless otherwise indicated.

## 2.5 CYLINDERS AND KEYING

- A. Key all locks to a new master key system as directed by the owner during the keying conference.
- B. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following:
  - 1. Cylinders:
    - a. Sargent Manufacturing (SA)
- C. Standards: Comply with the following:
  - 1. Cylinders: BHMA A156.5.
  - 2. Key Control System: BHMA A156.5.

- D. Cylinder Grade: BHMA Certified Grade 1.
- E. Construction Keying: Comply with the following:
  - 1. Construction Master keying: Furnish temporary construction master keyed cylinders for adequate security during the construction period. Furnish construction master keys in quantity by project Contractor.
- F. Keying System: Unless otherwise indicated, furnish for a keying system complying with the following requirements:
  - 1. New Grand Master Key System: Cylinders are factory keyed operated by a change key, master key, and a grand master key. Conduct keying meeting with End User to define and document keying system instructions and requirements prior to ordering any material on project.
- G. Keys: Furnish nickel-silver keys complying with the following:
  - 1. Stamping: Permanently inscribe each key with a visual key control number and as directed by Owner.
  - 2. Quantity: Furnish the following:
    - a. Cylinder Change Keys (Per Key Set): Three.
    - b. Master Keys (Per Level): Five.
    - c. Grand Master Keys: Two.
- H. Key Registration List: Furnish keying transcript list to Owner's representative for lock cylinders.

## 2.6 STRIKES

- A. Standards: Comply with the following:
  - 1. Strikes for Bored Locks and Latches: BHMA A156.2.
  - 2. Strikes for Auxiliary Deadlocks: BHMA A156.5.
  - 3. Dustproof Strikes: BHMA A156.16.
- B. Strikes: Furnish manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
  - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  - 3. Aluminum-Frame Strike Box: Furnish manufacturer's special strike box fabricated for aluminum framing.

## 2.7 EXIT DEVICES

- A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following:
  - 1. Exit Devices:
    - a. Sargent Manufacturing (SA) - 80 Series No substitution

2. Electrified Options: As indicated in hardware sets, furnish electrified exit device options including: electric latch retraction, electric dogging, outside door trim control, exit alarm, delayed egress, latchbolt monitoring, lock/unlock status monitoring, touchbar monitoring and request-to-exit signaling. Unless otherwise indicated, furnish electrified exit devices standard as fail secure on lever or trim side, always free egress on push side or fail safe.

B. Standard: BHMA A156.3.

C. Exit Devices: BHMA Certified Grade 1.

D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

E. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.

F. Outside Trim: Match design for locksets and latchsets, unless otherwise indicated.

G. Through Bolt Installation: For exit devices and trim for fire rated wood doors. Where through bolts are used, coordinate the color of bolt on opposite of device with BHMA finish color similar to the color of door finish surface.

## 2.8 ACCESSORIES FOR PAIRS OF DOORS

A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following:

1. Keyed Removable Mullions:
  - a. Sargent Manufacturing (SA).

B. Standards: Comply with the following:

1. Coordinators: BHMA A156.3.
2. Removable Mullions: BHMA A156.3.

## 2.9 CLOSERS

A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one the following:

1. Surface-Mounted Closers (Heavy Duty): BHMA Certified Grade 1 (to be used at exterior, cross corridor and high frequency use openings):
  - a. Sargent Manufacturing (SA) – 351:
    - 1) Approved Arms: O, P10, PS, PSH, CPS, CPSH

B. Standards: Comply with the following:

1. Closers: BHMA A156.4.

- C. Closer Options: As indicated in hardware sets, furnish door closer options including: delayed action, hold open arms, extra duty cast or forged parallel arms, positive stop/hold open arms, compression stop/hold open arms, special mounting brackets, spacers and drop plates. Through bolt type mounting is required as indicated in the door hardware sets. Where through bolts are used, coordinate the color of bolt on opposite of device with BHMA finish color similar to the color of door finish surface. Bent steel or threaded rod arms are not acceptable unless clearly specified in the Hardware Sets.
1. Furnish Delayed Action (DA) feature in closers at Laboratories, Shipping and Receiving doors and where cart traffic is active.
  2. Furnish shock absorbing arm such as Spring or Rubber Cushion at exterior outswing openings.

## 2.10 OPERATING and PROTECTIVE TRIM UNITS

- A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following:
1. Metal Protective Trim Units:
    - a. McKinney Products (MC).
    - b. Hager (HA)
    - c. Ives (IV).
    - d. Rockwood Manufacturing (RO).
    - e. Trimco Manufacturing (TR).
- B. Standard: Comply with BHMA A156.6.
- C. Materials: Fabricate protection plates from the following:
1. Brass/Bronze and Stainless Steel: .050 inches thick, beveled four sides (B4E) with countersunk screw holes.
- D. Push-Pull Design: 1" Round with 10" Centers. Furnish 90 degree offset pulls at exterior openings.
- E. Fasteners: Furnish manufacturer's designated fastener type as indicated in door hardware sets.
- F. Furnish protection plates sized **2 inches** less than door width (LDW) on push side and 1 inch less door width on pull side by height specified in door hardware sets.
- G. Coordinate stainless steel hinges, door edges, kickplates and armor plates with less than .09375 inches between meeting edges, regardless of specified sizes in hardware sets.

## 2.11 STOPS AND HOLDERS

- A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following:
1. Stops and Holders:

- a. McKinney Products (MC).
  - b. Hager(HA)
  - c. Ives (IV).
  - d. Rockwood Manufacturing (RO).
  - e. Trimco Manufacturing (TR).
- B. Standards: Comply with the following:
- 1. Stops and Bumpers: BHMA A156.16.
  - 2. Combination Overhead Holders and Stops: BHMA A156.8.
  - 3. Door Silencers: BHMA A156.16.
- C. Stops and Bumpers: BHMA Certified Grade 1.
- D. Combination Overhead Stops and Holders: Certified BHMA Grade 1.
- 1. Glynn-Johnson (GJ) – 100 Concealed and 90 Surface Series
  - 2. Rixson Hardware (RX) – 1 Concealed and 9 Surface Series.
  - 3. Sargent Hardware (SA) – 600 Concealed and 500 Surface Series.
- E. Provide Overhead Concealed stops at public spaces such as conference, corridors, and office spaces where wall or floor stops are not applicable condition.
- F. Provide Overhead Surface stops at non-public spaces such as mechanical, electrical, storage spaces.
- G. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.
- 1. Where floor or wall stops are not appropriate, furnish overhead stops.
- H. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter **1/2 inch** fabricated for drilled-in application to frame. Furnish (3) per single door and (2) per paired door frame if applied gasketing is not specified in Hardware Sets.

## 2.12 DOOR THRESHOLDS, WEATHERSTRIPPING AND GASKETING

- A. Manufacturers: Subject to compliance with requirements, furnish products by, but not limited to, one of the following:
- 1. Door Thresholds, Weatherstripping and Gasket Seals:
    - a. McKinney Weatherstripping Products (MW).
    - b. Hager (HA)
    - c. NGP Manufacturing (NG)
    - d. Pemko Manufacturing (PE).
- B. Standard: Comply with BHMA A156.22.
- C. General: Furnish continuous weatherstrip seal on exterior doors and smoke, light, or sound gasketing on interior doors where specified. Furnish non-corrosive fasteners for exterior applications.



1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. Install header seal before mounting door closer arms.
  2. Meeting Stile Astragals: Fasten to meeting stiles, forming seal when doors are closed.
  3. Door Sweep: Apply to bottom of door, forming seal with threshold when door is closed.
- D. Furnish thresholds to meet ADA compliance height, coordinate threshold height with floor pivots, finish floor thickness and door undercut. Extended spindles on pivots may be required due to construction detail and final installation; coordination requirements by door and hardware supplier are required prior to ordering material.
- E. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
1. Furnish smoke labeled perimeter gasketing at all smoke labeled openings.
- F. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
1. Intumescent Seals and Gasketing: Furnish concealed, Category A type gasketing systems on assemblies where an intumescent seal is required to meet IBC and UL-10C positive pressure labeling.

## 2.13 FABRICATION

- A. Fasteners: Furnish door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Furnish screws according to manufacturers recognized installation standards for application intended.
1. Furnish manufactures templated and approved stainless steel screws and fasteners for stainless steel hardware specified in the hardware sets.
- B. Mounting Accessories: Furnish drop plates, filler brackets, extended length screws, through bolts, and accessories for complete mounting with door, frame, light kits, applied molding and special applications as part of the base bid with complete installation per manufactures recommendations.

## 2.14 FINISHES

- A. Standard: Comply with BHMA A156.18.
- B. Furnish quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable and temporary protective covering before shipping to jobsite.
- D. BHMA Designations: Comply with base material and finish requirements indicated by the following:
1. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.

2. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
3. BHMA 630: Satin stainless steel, over stainless-steel base metal.
4. BHMA 652: Satin chromium plated over nickel, over steel base metal.
5. BHMA 689: Aluminum painted, over any base metal.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical source power to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

### 3.2 PREPARATION

- A. Steel Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.
- C. Electrified Openings: Furnish steel doors and frames and wood doors prepared to receive electrified hardware connections specified in Door Hardware Sets without additional modification.

### 3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
  3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- C. Furnish and coordinate concealed wood blocking for wall mount stops as detailed in Door Hardware Schedule.

- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

### 3.4 FIELD QUALITY CONTROL

- A. The Contractor shall comply with AIA A201 1997 section 3.3.1 which reads as follows: "The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the contract Documents give other specific instructions concerning these matters."
- B. Field Inspection: Supplier and Door Hardware Manufacturer will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.
  - 1. Access Control System Consultant will inspect integrated electronic and access control hardware and state in report whether installed work complies with or deviates from requirements, including whether electronic and access control hardware is properly installed and performing according to system operational descriptions.
    - a. Inspection: Verify that units and controls are properly installed, connected, and labeled and that interconnecting wires and terminals are identified.
    - b. Pre-testing: Program and adjust the system and pretest all components, wiring, and functions to verify they conform to specified requirements. Replace malfunctioning or damaged items with new items.
    - c. Acceptance Test Schedule: Schedule tests after pre-testing has been successfully completed and system has been in normal functional operation for at least 2 weeks.
    - d. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

### 3.5 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. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
- B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
  - 1. Examine and readjust each item of door hardware to ensure function of doors, door hardware, and electrified door hardware.
  - 2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
  - 3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper finish. Furnish final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

**END OF SECTION 08710**

## SECTION 092613 - GYPSUM VENEER PLASTERING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Gypsum veneer plaster.
2. Panel products.

## B. Related Requirements:

1. Section 092216 "Non-Structural Metal Framing" for non-load-bearing steel framing.

## 1.2 ACTION SUBMITTALS

## A. Product Data:

1. Gypsum veneer plaster.
2. Panel products.

## 1.3 MOCKUPS

## A. Provide a full-thickness finish mockup for each type and finish of gypsum veneer plaster and substrate to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select representative surfaces and conditions for application of each type of gypsum veneer plaster and substrate.
2. Provide mockups of partitions in sizes of at least **10 sq. ft.**
3. Apply gypsum veneer plaster, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.4 DELIVERY, STORAGE, AND HANDLING

## A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.

## B. Store materials inside under cover, and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

## C. Stack panels flat on leveled supports off floor or slab to prevent sagging.

## 1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C843 requirements or gypsum veneer plaster manufacturer's written recommendations, whichever are more stringent.
- B. Room Temperatures: Maintain not less than 55 deg F or more than 80 deg F for seven days before application of gypsum veneer plaster, continuously during application, and after application until veneer plaster is dry.
- C. Avoid conditions that result in gypsum veneer plaster drying too rapidly.
  - 1. Distribute heat evenly; prevent concentrated or uneven heat on veneer plaster.
  - 2. Maintain relative humidity levels, for prevailing ambient temperature, that produce normal drying conditions.
  - 3. Ventilate building spaces in a manner that prevents drafts of air from contacting surfaces during veneer plaster application until it is dry.
- D. Do not install panels that are wet, moisture damaged, mold damaged, or faded from overexposure to sunlight.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

## 2.2 GYPSUM VENEER PLASTER

- A. Two-Component Gypsum Veneer Plaster: ASTM C587, with separate formulations; one for base-coat application and one for finish-coat application over substrates.

## 2.3 JOINT-REINFORCING MATERIALS

- A. General: Comply with joint strength requirements in ASTM C587 and with gypsum veneer plaster manufacturer's written recommendations for each application indicated.

## 2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced product standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

1. Use screws complying with ASTM C954 for fastening panels to steel members from **0.033 to 0.112 inch** thick.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

#### 3.3 APPLICATION OF GYPSUM VENEER PLASTER

- A. Gypsum Veneer Plaster Mixing: Mechanically mix gypsum veneer plaster materials to comply with ASTM C843 and with gypsum veneer plaster manufacturer's written recommendations.
- B. Gypsum Veneer Plaster Application: Comply with ASTM C843 and with veneer plaster manufacturer's written recommendations.
  1. Two-Component Gypsum Veneer Plaster:
    - a. Base Coat: Hand trowel or machine apply base coat over substrate to a uniform thickness of **1/16 to 3/32 inch**. Fill voids and imperfections.
    - b. Finish Coat: Trowel apply finish-coat plaster over base-coat plaster to a uniform thickness of **1/16 to 3/32 inch**.
  2. Where gypsum veneer plaster abuts metal, including doorframes, windows and other units, groove finish coat to eliminate spalling.
  3. Do not apply veneer plaster to gypsum base if paper facing has degraded from exposure to sunlight. Before applying veneer plaster, use remedial methods to restore bonding capability to degraded paper facing according to manufacturer's written recommendations and as approved by Architect.
- C. Radiant-Heat, Two-Component Gypsum Veneer Plaster Ceilings: Comply with ASTM C843 and with radiant-heat veneer plaster manufacturer's written recommendations.
  1. Base Coat: Apply plaster base coat to sufficiently cover electric heating cables. Trowel plaster parallel in direction of cables to a uniform thickness of **3/16 inch**. Completely cover cables.
  2. Finish Coat: After base coat has developed sufficient bond, apply finish coat. Trowel plaster to a uniform thickness of **1/16 to 3/32 inch**.

- D. Concealed Surfaces: Do not omit gypsum veneer plaster behind cabinets, furniture, furnishings, and similar removable items. Omit veneer plaster in the following areas where it will be concealed from view in the completed Work unless otherwise indicated or required to maintain fire-resistance and STC ratings:
  - 1. Above suspended ceilings.
  - 2. Behind wood paneling.
  - 3. .
  
- E. Gypsum Veneer Plaster Finish: Match texture of existing plaster walls on site .

### 3.4 PROTECTION

- A. Protect installed gypsum veneer plaster from damage from weather, condensation, construction, and other causes during remainder of the construction period.
  
- B. Remove and replace gypsum veneer plaster and gypsum base panels that are wet, moisture damaged, or mold damaged.
  - 1. Indications that gypsum base panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that gypsum base panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092613



## SECTION 09 30 13 - CERAMIC TILING

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Ceramic mosaic tile.
2. Porcelain tile.
3. Stone thresholds.
4. Tile backing panels.
5. Waterproof membrane.
6. Crack isolation membrane.
7. Metal edge strips.

#### 1.2 ACTION SUBMITTALS

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

##### B. Samples:

1. Each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide samples of each color blend.
2. Stone thresholds.

#### 1.3 INFORMATIONAL SUBMITTALS

#### 1.4 MAINTENANCE MATERIAL SUBMITTALS

##### A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

## 1.5 QUALITY ASSURANCE

## PART 2 - PRODUCTS

### 2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

### 2.2 TILE PRODUCTS

- A. Ceramic Tile Type CT- 1: Glazed porcelain tile.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. American Marazzi Tile, Inc.
    - b. American Olean; a division of Dal-Tile Corporation.
    - c. Daltile.
  - 2. Certification: Tile certified by the Porcelain Tile Certification Agency.
  - 3. Thickness: 3/8 inch.
  - 4. Face: Plain with square or cushion edges .
  - 5. Dynamic Coefficient of Friction: Not less than 0.42.
  - 6. Tile Color, Glaze, and Pattern: As selected by Architect from manufacturer's full range .
  - 7. Grout Color: As selected by Architect from manufacturer's full range .
  - 8. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
    - a. Base Cap: Surface bullnose, module size same as adjoining flat tile .
    - b. Wainscot Cap: Surface bullnose, module size same as adjoining flat tile .
    - c. External Corners: Surface bullnose, module size same as adjoining flat tile .
    - d. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from 1/2 to 1/4 inch across nominal 4-inch dimension.
- B. Accessories: Provide vitreous china accessories of type and size indicated, suitable for installing by same method as used for adjoining wall tile.
  - 1. Color and Finish: As selected by Architect from manufacturer's full range.

## 2.3 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
  - 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.
- B. Marble Thresholds: ASTM C503/C503M, with a minimum abrasion resistance of 10 according to ASTM C1353 or ASTM C241/C241M and with honed finish.
  - 1. Description: Uniform, fine- to medium-grained white stone with gray veining.

## 2.4 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch nominal thickness.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Schluter Systems L.P.
    - b. Schönox; HPS North America, Inc.
- C. Latex-Portland Cement Waterproof Mortar: Flexible, waterproof mortar consisting of cement-based mix and latex additive.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ARDEX Americas.
    - b. H.B. Fuller Construction Products Inc. / TEC.
    - c. MAPEI Corporation.

## 2.5 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product , selected from the following, that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. PVC Sheet: PVC heat-fused on both sides to facings of nonwoven polyester; 0.040-inch nominal thickness.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Schluter Systems L.P.
    - b. Compotite Corporation.
- C. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch nominal thickness.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Schluter Systems L.P.

## 2.6 GROUT MATERIALS

- A. Sand-Portland Cement Grout: ANSI A108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.
- B. Standard Cement Grout: ANSI A118.6.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Bonsal American, an Oldcastle company.
    - b. LATICRETE SUPERCAP, LLC.
    - c. MAPEI Corporation.
- C. High-Performance Tile Grout: ANSI A118.7.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Bonsal American, an Oldcastle company.
    - b. LATICRETE SUPERCAP, LLC.
    - c. MAPEI Corporation.
  2. Polymer Type: Dry, redispersible form, prepackaged with other dry ingredients.
  3. Polymer Type: Liquid-latex form for addition to prepackaged dry-grout mix.
- D. Water-Cleanable Epoxy Grout: ANSI A118.3 , with a VOC content of 65 g/L or less.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Bonsal American, an Oldcastle company.
    - b. LATICRETE SUPERCAP, LLC.
    - c. MAPEI Corporation.
- E. Grout for Pregrouted Tile Sheets: Same product used in factory to pregrout tile sheets.

## 2.7 MISCELLANEOUS MATERIALS

- A. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Bonsal American, an Oldcastle company.
    - b. Custom Building Products.
    - c. Summitville Tiles, Inc.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
  - 2. Verify that concrete substrates for tile floors installed with adhesives bonded mortar bed or thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

### 3.3 INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108

series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
  - a. Exterior tile floors.
  - b. Tile floors in wet areas.
  - c. Tile swimming pool decks.
  - d. Tile floors in laundries.
  - e. Tile floors consisting of tiles 8 by 8 inches or larger.
  - f. Tile floors consisting of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.
- F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
- G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
  1. Ceramic Mosaic Tile: 1/8 inch.
  2. Porcelain Tile: 1/4 inch .
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, as required. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
  1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
- J. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
  1. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in mortar (thinset).

2. Do not extend waterproof membrane or crack isolation membrane under thresholds set in improved modified dry-set mortar. Fill joints between such thresholds and adjoining tile set on waterproof membrane or crack isolation membrane with elastomeric sealant.
- K. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.
- L. Floor Sealer: Apply floor sealer to grout joints according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- M. Install tile backing panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.
- N. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
- O. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

END OF SECTION 093013

## **SECTION 09 5110 – ACOUSTIC CEILINGS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes acoustical panels and exposed suspension systems for ceilings.
- B. Related Sections include the following:
  - 1. Division 15 Sections "Mechanical" for ceiling air devices.
  - 2. Division 16 sections "Electrical" for ceiling mounted devices.

#### **1.3 DEFINITIONS**

- A. AC: Articulation Class.
- B. CAC: Ceiling Attenuation Class.
- C. LR: Light Reflectance coefficient.
- D. NRC: Noise Reduction Coefficient.

#### **1.4 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For components with factory-applied color finishes.
- C. Maintenance Data: For finishes to include in maintenance manuals.
- D. Sustainable Design Submittals:
  - 1. Regional Materials: State distance from point of manufacture (fabrication) to Project site.
  - 2. Recycled Materials: State percentage of recycled content and whether content is post-consumer or pre-consumer

#### **1.5 QUALITY ASSURANCE**

- A. Source Limitations:
  - 1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.



2. Suspension System: Obtain each type through one source from a single manufacturer.

B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

#### 1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

#### 1.8 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

#### 1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: Full-size panels equal to 2.0 percent of quantity installed.

### PART 2 - PRODUCTS

#### 2.1 ACOUSTICAL PANELS, GENERAL

A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test

specimen is 15-3/4 inches away from test surface per ASTM E 795.

- B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
  - 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.
- C. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

## 2.2 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

- A. Product **ACP-1**: Available Products: Subject to compliance with requirements, Products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Armstrong Optima #3150 Humiguard
  - 2. Approved Equal
- B. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
  - 1. Type and Form: Type III, mineral base with painted finish; Form 1, nodular.
  - 2. Pattern: Non-directional, as indicated by manufacturer's designation.
- C. Color: White.
- D. Edge/Joint Detail: Beveled Tegular.
- E. Thickness: 3/4 inch.
- F. Modular Size: 24 by 48 inches.

## 2.3 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
- C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
  - 1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488 or

ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.

- D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
  - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
  - 2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.
- E. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- F. Impact Clips: Where indicated, provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

## 2.4 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. 1. Armstrong 9/16" Suprafine XL white
  - 2. Approved Equal

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

### 3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post-installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  8. Do not attach hangers to steel deck tabs.
  9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
  11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
  3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. Arrange directionally patterned acoustical panels as follows:
    - a. As indicated on reflected ceiling plans.
  2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
  3. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
  4. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with

bottom face of runners.

5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

#### 3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**END OF SECTION 09 5110**

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Acoustical panels.

B. Related Requirements:

1. Section 095123 "Acoustical Tile Ceilings" for ceilings consisting of mineral-base acoustical tiles used with fully concealed suspension systems, stapling, or adhesive bonding.
2. Section 095133 "Acoustical Metal Pan Ceilings" for ceilings consisting of metal-pan units with exposed and concealed suspension systems.

- C. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Acoustical panels.

- B. Samples for Initial Selection: For components with factory-applied finishes.

1.3 INFORMATIONAL SUBMITTALS

1.4 CLOSEOUT SUBMITTALS

1.5 QUALITY ASSURANCE

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

## 1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
  - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

### 2.2 ACOUSTICAL PANELS

- A. Acoustical Panel Standard: Provide manufacturer's standard panels in accordance with ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- B. Classification: Provide fire-resistance-rated panels as follows:
  - 1. Type and Form, Type III: Mineral base with painted finish; .
  - 2. Pattern: D (fissured) .
- C. Color: As selected from manufacturer's full range .
- D. Light Reflectance (LR): Not less than 0.80 .
- E. Ceiling Attenuation Class (CAC): Not less than 35 .
- F. Noise Reduction Coefficient (NRC): Not less than 0.75 .
- G. Edge/Joint Detail: Square .
- H. Thickness:
  - 1. 7/8" .
  - 2. 7/8 inch .
- I. Modular Size: 24 by 24 inches .
- J. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing

no mold, mildew, or bacterial growth when tested in accordance with ASTM D3273, ASTM D3274, or ASTM G21 and evaluated in accordance with ASTM D3274 or ASTM G21.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

#### 3.3 INSTALLATION OF ACOUSTICAL PANEL CEILINGS

- A. Install acoustical panel ceilings in accordance with ASTM C636/C636M and manufacturer's written instructions.
  - 1. Fire-Rated Assembly: Install fire-rated ceiling systems in accordance with tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye



- screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  8. Do not attach hangers to steel deck tabs.
  9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  10. Space hangers not more than **48 inches** o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than **8 inches** from ends of each member.
  11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  2. Screw attach moldings to substrate at intervals not more than **16 inches** o.c. and not more than **3 inches** from ends. Miter corners accurately and connect securely.
  3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
1. Arrange directionally patterned acoustical panels as follows:
    - a. As indicated on reflected ceiling plans.
    - b. Install panels with pattern running in one direction parallel to long axis of space.
    - c. Install panels in a basket-weave pattern.
  2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
  3. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

4. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
6. Install clips in areas indicated; space in accordance with panel manufacturer's written instructions unless otherwise indicated.
7. Protect lighting fixtures and air ducts in accordance with requirements indicated for fire-resistance-rated assembly.

### 3.4 ERECTION TOLERANCES

- A. Suspended Ceilings: Install main and cross runners level to a tolerance of **1/8 inch in 12 feet** , non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of **1/8 inch in 12 feet** , non-cumulative.

### 3.5 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

## SECTION 09 6500 - RESILIENT FLOOR TILE

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. Extra Materials: Deliver to General Contractor one box for every 50 boxes or fraction thereof, of each type and color of resilient floor tile installed.

#### 1.2 SUBMITTALS

- A. Product Data: Provide detailed data on each product to be used including but not limited to the following information as applicable:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
  - 4. Maintenance recommendations.
- B. Verification Samples: For each finish product specified, two sets of each type, colors and finish of resilient flooring and accessory required, indicating color and pattern of actual product, including variations, as proof of application compliance.
- C. Closeout Submittals: Submit three copies of the following:
  - 1. Maintenance and operation data includes – methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finish and performance.
  - 2. Documentation of warranty specified herein.
- D. Flame Spread Certification: Submit manufacturer's certification that resilient flooring furnished for areas indicated to comply with required flame spread rating has been tested and meets or exceeds indicated or required standard.

### PART 2 - PRODUCTS

#### 2.1 VINYL COMPOSITION FLOOR TILE

- 1. Available Products: Patcraft
  - a. Uptown, Urban Rustics
    - 1) Dwelling Units: Homegrain 1491V, Library 00770, 8 MIL
- B. ASTM F 1700 Class 3, Type B.
- C. Fire-Test Response: Critical radiant flux classification of Class I, not less than 0.45 W/sq. cm per ASTM E 648.
- D. Wearing Surface: Smooth.
- E. Thickness: 2.0 mm

- F. Size: 6 inches by 24 inches.

## 2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement- or blended hydraulic cement-based formulation provided or approved by flooring manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
- C. Floor Polish: Protective liquid floor polish products as recommended by manufacturer.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Prepare concrete substrates according to ASTM F 710. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
- B. Lay out tiles so tile widths at opposite edges of room are equal and are at least one-half of a tile.
- C. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged. Lay tiles in basket-weave pattern with grain direction alternating in adjacent tiles.
- D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from floor tile surfaces before applying liquid floor polish.
  - 1. Apply two coat(s).

END OF SECTION 09 6500

## **SECTION 09 6530 - RESILIENT WALL BASE & ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Wall base.
  - 2. Molding accessories.
- B. Related Sections include the following:
  - 1. Division 3 Section "Cast-In-Place Concrete" for sealed concrete floors.
  - 2. Division 9 Section "Gypsum Board".
  - 3. Division 9 Section "Resilient Floor Tile".
  - 4. Division 9 Section "Carpet".

#### **1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Sustainable Design Submittals:
  - 1. Regional Materials: State distance from point of manufacture (fabrication) to Project site.
  - 2. Recycled Materials: State percentage of recycled content and whether content is post-consumer or pre-consumer.
  - 3. Material Data Sheets showing Low or No-VOC compliance.

#### **1.3 DELIVERY, STORAGE, AND HANDLING**

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

#### **1.4 PROJECT CONDITIONS**

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.

- B. After post-installation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

### 2.2 COLORS AND PATTERNS

- A. Colors and Patterns: As selected by Architect from manufacturer's full range.

### 2.3 RESILIENT WALL BASE RB-1

- A. Wall Base: ASTM F 1861.
  - 1. Roppe Corporation.
- B. Type (Material Requirement): TS (rubber, vulcanized thermoset).
- C. Group (Manufacturing Method): I (solid).
- D. Style: Cove (with top-set toe).
- E. Minimum Thickness: 0.125 inch (3.2 mm).
- F. Height: 4 inches (102 mm).
- G. Lengths: Coils in manufacturer's standard length but not less than 120 feet.
- H. Outside Corners: Pre-molded.
- I. Inside Corners: Job formed.
- J. Surface: Smooth.
- K. Color: P-174 Smoke

### 2.4 RESILIENT MOULDING ACCESSORIES

- A. Rubber Accessory Moldings: Provide rubber accessory moldings complying with the following:
- B. Products: Rubber adaptors, reducers, terminating or transition strips at changes in flooring materials or changes in color of flooring materials. Conditions may include, but not necessarily limited to, cap for cove

carpet, cap for cove resilient sheet floor covering, carpet bar for tackless installations, carpet edge for glue-down applications, nosing for carpet, nosing for resilient floor covering, reducer strip for resilient floor covering, joiner for tile and carpet and other transitions indicated on the Drawings.

- C. Manufacturers:
  - 1. Roppe Corporation.
- D. Minimum Width of Anchorage Flange: 1-1/2 inches.
- E. Size and Shape: Appropriate for the specific floor transition indicated on the Drawings.
- F. Color: As selected by Architect from manufacturer's full range of colors produced for rubber accessory molding complying with requirements indicated.
- G. Material: Rubber.

## 2.5 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturers for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
- B. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- C. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.

- D. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
  - 1. Do not install resilient products until they are the same temperature as the space where they are to be installed.
- E. Clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 RESILIENT WALL BASE INSTALLATION

- A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- C. Use a full bed of adhesive to substrate throughout length of each piece of wall base with continuous contact with horizontal and vertical substrates.
- D. Do not stretch wall base during installation.
- E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.
- F. Pre-molded Corners: Install pre-molded corners before installing straight pieces.
- G. Job-Formed Corners:
  - 1. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

### 3.4 RESILIENT ACCESSORY INSTALLATION

- A. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed. Locate strips under doors at the "soffit" or stop of door frame so only one material is viewed from one side of the room or area.



### 3.5 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing resilient product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Damp-wash surfaces to remove marks and soil.
    - a. Do not wash surfaces until after time period recommended by manufacturer.
- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

**END OF SECTION 09 6530 – RESILIENT WALL BASE & ACCESSORIES**

## **SECTION 09 6830 - TILE CARPETING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes modular, [fusion-bonded] [tufted] <Insert carpet tile construction> carpet tile.

#### **1.2 SUBMITTALS**

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show the following:
  - 1. Carpet tile type, color, and dye lot.
  - 2. Pattern of installation.
  - 3. Edge, transition, and other accessory strips.
  - 4. Transition details to other flooring materials.
- C. Samples: For each color and texture required.
  - 1. Carpet Tile: Full-size Sample.
  - 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch- long Samples.
- D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- E. Maintenance data.

#### **1.3 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
- B. Mockups: Before installing carpet tile, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with CRI 104, Section 5, "Storage and Handling."

## 1.5 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
- B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

## 1.6 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

## 1.7 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd..

## PART 2 - PRODUCTS

2.1 CARPET TILE: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified. Final patterns, colors, and patterns will be selected after bidding.

2.2 CARPET:

#### CPT-01

- A. Manufacturer: J & J Flooring
- B. Pattern: Against the Grain Demi-Plank -1840
- C. Color: Rye - 2820
- D. Construction: Textile Composite
- E. Backing Construction: Polyester Felt Cushion
- F. Yarn Content: Polyester – Applied Pattern
- G. Flammability: Class 1
- H. Smoke Density: Less than 450
- I. Static Propensity: Under 3 KV
- J. Indoor Air Quality: CRI Green Label Plus: GLP2690
- K. Size: 12" x 48"

#### CPT-02

- A. Manufacturer: J & J Flooring
- B. Pattern: Z Factor - 1844
- C. Color: Value - 2865
- D. Construction: Textile Composite
- E. Backing Construction: Polyester Felt Cushion
- F. Yarn Content: Polyester – Applied Pattern
- G. Flammability: Class 1
- H. Smoke Density: Less than 450
- I. Static Propensity: Under 3 KV
- J. Indoor Air Quality: CRI Green Label Plus: GLP2690
- K. Size: 18" x 36"

### 2.3 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
  - 1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.

- B. Installation Method: [As recommended in writing by carpet tile manufacturer] [Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive] [Partial glue down; install periodic tiles with releasable, pressure-sensitive adhesive] [Free lay; install carpet tiles without adhesive].
- C. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- D. Install pattern parallel to walls and borders.

**END OF SECTION 09 6830 – TILE CARPETING**

## **SECTION 09 91 00 - PAINTING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawing and general provisions of the Contract, including Addenda, Supplementary Instructions and Change Orders, apply to this section.

#### **1.2 SUMMARY**

- A. The work includes painting and finishing of interior and exterior exposed items not noted as pre-finished and surfaces throughout the project, except as otherwise indicated.
  - 1. Surface preparation, priming and coats of paint specified are in additions to shop-priming and surface treatment specified under other sections of the work.
  - 2. Interior and exterior, miscellaneous metals
  - 3. Striping of parking lot.
  - 4. Architectural Woodwork
  - 5. Interior concrete masonry partitions.
  - 6. Steel and wood doors and frames.
  - 7. Metal railings.
  - 8. Color-coding of painted piping.
  - 9. Interior gypsum board walls and ceiling.
  - 10. Exposed structural steel, steel joists, metal decking.
  - 11. Exposed plumbing piping, HVAC ductwork, and electrical conduit is not required or intended to be painted.
- B. Shop Priming:
  - 1. Unless otherwise specified, shop priming of ferrous metal items is included under the various sections for structural steel, miscellaneous metal, hollow metal work, and similar items.

#### **1.3 SUBMITTALS**

- A. Samples, Painting:
  - 1. Submit samples for Architect's review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor. Provide a listing of the material and application for each coat of each finish samples.
  - 2. On Painted Gypsum Board: Provide two 12" x 12" samples of each color and material, with texture to simulate actual conditions. Resubmit samples as requested by Architect until acceptable sheen, color and texture is achieved.
  - 3. On Actual Wood Surfaces: Provide two 4" x 8" samples of natural painted and stained wood finish. Label and identify each as to location and application.
  - 4. On Concrete Masonry: Provide two 4" square samples of masonry for each type of finish and color, defining filler, prime and finish coat.
  - 5. Prior to final painting provide 2' X 2' brush-out on wall to receive finish to be reviewed in the final project lighting.

#### **1.4 DELIVERY AND STORAGE**

- A. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's names and label.

## **1.5 JOB CONDITIONS**

- A. Apply water-base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50°F and 90°F unless otherwise permitted by the paint manufacturer's printed instructions.

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Devoe
  - 2. PPG
  - 3. Benjamin Moore
  - 4. Sherwin Williams

### **2.2 PAINTING MATERIALS**

- A. Primers, Sealers, Fillers, and special coatings shall be of the highest quality manufactured by approved coating manufacturers:

### **2.3 PAINTING SYSTEMS**

- A. New Painted Gypsum Board:
  - 1. Color: To be chosen by architect from manufacturer's full product range
  - 2. Color ( Accent): To be chosen by architect from manufacturer's full product range
- B. New Painted Interior Wood Trim:
  - 1. Color: To be chosen by architect from manufacturer's full product range

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Applicator must examine the areas and conditions under which painting work is to be applied and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Applicator.
- B. Starting of painting work will be construed as the Applicator's acceptance of the surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.
- D. General: Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
  - 1) Remove all hardware, hardware accessories, machined surfaces, plates lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations.

Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.

- 2) Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program the cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly-painted surfaces.

### **3.2 CEMENTITIOUS MATERIALS**

- A. Prepare cementitious surfaces of concrete, concrete block, cement plaster and cement-asbestos board to be painted by removing all efflorescence, chalk, dust, dirt, grease, oils, and by roughening to remove glaze.

### **3.3 WOOD**

- A. Clean wood surfaces to be painted of all dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of the priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
- B. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, paneling, etc.
- C. When transparent finish is used spar varnish for backpriming.
- D. Backprime paneling on interior partitions only where masonry, plaster, or other wet wall construction occurs on backside.
- E. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

### **3.4 FERROUS METALS**

- A. Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
- B. Touch-up shop-applied prime coats wherever damaged or bare. Clean and touch-up with the same type shop primer.

### **3.5 MATERIALS PREPARATION**

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir during the application of the materials. Do not stir surface film into the material. Remove the film and if necessary, strain the material before using.



- D. Apply paint in accordance with the manufacturer's directions. Use applicators and techniques best suited for the substrate and type of material being applied.
- E. Apply additional coats when undercoats, stains or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- F. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
- G. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
- H. Finish doors on tops, bottoms and side edges the same as the exterior faces, unless otherwise indicated.
- I. Sand lightly between each succeeding enamel or varnish coat.
- J. Omit the first coat (primer) on metal surfaces, which have been shop-primed and touch-up painted, unless otherwise indicated.
- K. Scheduling Painting:
  - 1) Apply the first coat materials to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 2) Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not defer or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lighting or loss of adhesion of the undercoat.
- L. Minimum Coating Thickness:
  - 1) Apply each material at not less than the manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.
- M. Prime Coats: Apply a prime coat of material which is required to be painted or finished, and which has not been prime coated by others.
  - 1) Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- N. Pigmented (Opaque) Finishes:
  - 1) Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfection will not be acceptable.

- O. Completed Work:
  - 1) Match approval samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

### **3.6 CLEAN-UP & PROTECTION**

- A. Clean-Up:
  - 1) During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.
  - 2) Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- B. Protection:
  - 1) Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.
  - 2) Provide "Wet Paint" signs to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
  - 3) At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

**END OF SECTION 099100**

## **SECTION 09 2500 - GYPSUM BOARD**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Interior gypsum board.
  - 2. Tile backing panels.
- B. Related Sections include the following:
  - 1. Division 5 Section "Cold-Formed Metal Framing" for exterior framing supporting gypsum board.
  - 2. Division 7 Section "Building Insulation" for insulation installed in assemblies that incorporate gypsum board.
  - 3. Division 9 Section "Non-Load-Bearing Steel Framing" for non-structural framing and suspension systems that support gypsum board.
  - 4. Division 9 Section "Gypsum Veneer Plaster" for applications indicated on the Drawings.
  - 5. Division 9 Section "Ceramic Tile" for tile applied to backing panels.
  - 6. Division 9 painting Sections for primers applied to gypsum board surfaces.

#### **1.3 SUBMITTALS**

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

#### **1.4 QUALITY ASSURANCE**

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

#### **1.5 STORAGE AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

#### **1.6 PROJECT CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

### 2.1 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### 2.2 INTERIOR GYPSUM BOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. National Gypsum Company.
    - b. USG Corporation.
- B. Type X:
  - 1. Thickness: 5/8 inch, unless indicated.
    - a. Two (2) layers 1/4" at curved surfaces.
  - 2. Long Edges: Tapered.

### 2.3 TILE BACKING PANELS

- A. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M or ASTM C 1396/C 1396M.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Gypsum Co.
    - b. BPB America Inc.

- c. G-P Gypsum.
  - d. Lafarge North America Inc.
  - e. National Gypsum Company.
  - f. PABCO Gypsum.
  - g. Temple.
  - h. USG Corporation.
3. Core: 5/8 inch (15.9 mm), Type X.

## 2.4 TRIM ACCESSORIES

### A. Interior Trim: ASTM C 1047.

- 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
- 2. Shapes:
  - a. Cornerbead.
  - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
  - c. Curved-Edge Cornerbead: With notched or flexible flanges.

### B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Fry Reglet Corp.
  - b. Gordon, Inc.
  - c. Pittcon Industries.
- 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
- 3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

## 2.5 JOINT TREATMENT MATERIALS

### A. General: Comply with ASTM C 475/C 475M.

### B. Joint Tape:

- 1. Interior Gypsum Wallboard: Paper.

### C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

- 1. Pre-filling: At open joints and damaged surface areas, use setting-type taping compound.
- 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
  - a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

## 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- D. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants."

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.),

except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  2. Fit gypsum panels around ducts, pipes, and conduits.
  3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
1. Type X: As indicated on Drawings.
  2. Moisture- and Mold-Resistant Type: As indicated on Drawings.
- B. Single-Layer Application:
1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
  2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
  3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
  4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

D. Curved Surfaces:

1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch- long straight sections at ends of curves and tangent to them.
2. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c.

### 3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners.
  2. LC-Bead: Use at exposed panel edges.
  3. Curved-Edge Cornerbead: Use at curved openings.

### 3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Fill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
1. Level 3: At panel surfaces that will be exposed to view, unless otherwise indicated.
    - a. Primer and its application to surfaces are specified in other Division 9 Sections.

### 3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.



- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF SECTION 09 2500 – GYPSUM BOARD**

## SECTION 11 31 00 - RESIDENTIAL APPLIANCES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Cooking equipment including ranges.
  - 2. Ventilation range hoods
  - 3. Refrigerator/freezers.
  - 4. Dishwashers.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. LEED Submittal:
  - 1. Product Data for Credit EA 1.4: For appliances, documentation indicating that products are ENERGY STAR rated.
- C. Maintenance data.

#### 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Gas-Burning Appliances: Comply with ANSI Z21 Series standards.
- D. Residential Appliances: Comply with NAECA standards.
- E. Energy Ratings: Provide appliances that qualify for the EPA/DOE ENERGY STAR product labeling program.

#### 1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer of each appliance specified agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
  - 1. Electric Range: Five-year limited warranty for surface-burner elements.
  - 2. Microwave Oven: Five-year limited warranty for defects in the magnetron tube.

3. Refrigerator/Freezer: Five-year limited warranty for in-home service on the sealed refrigeration system.
4. Dishwasher: 10-year warranty for in-home service against deterioration of tub and door liner.
5. Clothes Washer: 10-year limited warranty for the inner wash basket and outer tub, and five-year limited warranty for the balance suspension system and drive transmission.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
  2. Products: Subject to compliance with requirements, provide one of the products specified.
  3. Basis-of-Design Product: The design for each residential appliance is based on the product named. Subject to compliance with requirements, provide either the named product or a product by one of the other manufacturers specified.

### 2.2 COOKING APPLIANCES

- A. Range RG: Electric, Free Standing
1. Basis-of-Design Product: Provide General Electric – Model Number – JBS15MBB (Black) or a product by, but not limited to, the following:
    - a. GE
    - b. Frigidaire
    - c. Jenn-Air
    - d. Kenmore
    - e. KitchenAid
    - f. LG
    - g. Maytag
- B. Exhaust Hood:
1. Basis-of-Design Product: Provide General Electric or a product by, but not limited to, the following:
    - a. GE
    - b. Frigidaire
    - c. Jenn-Air
    - d. LG
    - e. Kenmore
    - f. KitchenAid

### 2.3 REFRIGERATION APPLIANCES

- A. Refrigerator/Freezer:

1. Basis-of-Design Product: GE refrigerator/freezer Model Number GTH18XCTBB (black) or a product by, but not limited to, the following:
  - a. GE
  - b. Frigidaire
  - c. Jenn-Air
  - d. LG
  - e. Kenmore
  - f. KitchenAid
  - g. Whirlpool Corporation
2. Front Panel: Manufacturer's standard, Reversible panels with choice of colors for door front and lower access panel. Counter depth.

## 2.4 CLEANING APPLIANCES

### A. Dishwasher:

Basis-of-Design Product: GE dishwasher – Model Number – GSD4000RBB (Black) or a product by, but not limited to, the following:

- a. GE
- b. Frigidaire
- c. Jenn-Air
- d. LG
- e. Kenmore
- f. KitchenAid
- g. Whirlpool Corporation

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- B. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- C. Utilities: Refer to Divisions 15 and 16 for plumbing and electrical requirements.

END OF SECTION 11451

SECTION 123661.19 - QUARTZ AGGLOMERATE COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Quartz agglomerate countertops.
2. Quartz agglomerate backsplashes.

B. Related Requirements:

1. Section 224100 "Residential Plumbing Fixtures" for sinks and plumbing fittings.

1.2 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

1. Show locations and details of joints.
2. Show direction of directional pattern, if any.

C. Samples for Initial Selection: For each type of material exposed to view.

1.3 INFORMATIONAL SUBMITTALS

1.4 CLOSEOUT SUBMITTALS

1.5 QUALITY ASSURANCE

1.6 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.7 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

## PART 2 - PRODUCTS

## 2.1 QUARTZ AGGLOMERATE COUNTERTOP MATERIALS

- A. Quartz Agglomerate: Solid sheets consisting of quartz aggregates bound together with a matrix of polymers, resins, and pigment and complying with ISFA 3-01.
  - 1. Colors and Patterns: As selected by Architect from manufacturer's full range.
- B. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

## 2.2 FABRICATION

- A. Fabricate countertops according to quartz agglomerate manufacturer's written instructions and the AWI/AWMAC/WI's "Architectural Woodwork Standards."
  - 1. Grade: Economy.
- B. Configuration:
  - 1. Front: Straight, slightly eased at top .
  - 2. Backsplash: Straight, slightly eased at corner .
- C. Countertops: **3/4-inch**- thick, quartz agglomerate with front edge built up with same material.
- D. Backsplashes: **1/2-inch**- thick, quartz agglomerate.
- E. Fabricate tops with shop-applied edges and backsplashes unless otherwise indicated. Comply with quartz agglomerate manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
  - 1. Fabricate with loose backsplashes for field assembly.
- F. Joints:
  - 1. Fabricate countertops without joints.
- G. Cutouts and Holes:
  - 1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
    - a. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting **3/16 inch** into fixture opening.
  - 2. Counter-Mounted Cooktops: Prepare countertops in shop for field cutting openings for cooktops. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

## 2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by quartz agglomerate manufacturer.
- B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates to receive quartz agglomerate countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

- A. Install countertops level to a tolerance of **1/8 inch in 8 feet, 1/4 inch** maximum. Do not exceed **1/64-inch** difference between planes of adjacent units.
- B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- C. Secure countertops to subtops with adhesive according to quartz agglomerate manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with quartz agglomerate manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
  - 1. Install metal splines in kerfs in countertop edges at joints. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
  - 2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- F. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Pre-drill holes for screws as recommended by manufacturer.

- G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
  - 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- H. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.19



SECTION 224216.16 - COMMERCIAL SINKS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Kitchen/utility sinks.

B. Related Requirements:

1. Section 114000 "Foodservice Equipment" for NSF-compliant foodservice and handwash sinks.
2. Section 224100 "Residential Plumbing Fixtures" for residential sinks.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for sinks.
2. Include rated capacities, operating characteristics and furnished specialties and accessories.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted sinks.

1.4 CLOSEOUT SUBMITTALS

PART 2 - PRODUCTS

2.1 KITCHEN/UTILITY SINKS

A. Kitchen/Utility Sinks - Stainless Steel, Counter Mounted: .

1. Source Limitations: Obtain sinks from single source from single manufacturer.
2. Fixture:
  - a. Standard: ASME A112.19.3/CSA B45.4.
  - b. Type: Stainless steel, self-rimming, sound-deadened unit .
  - c. Number of Compartments: Two .
  - d. Overall Dimensions: See Drawings. .
  - e. Material: 18 gauge, Type 304 stainless steel.

- f. Each Compartment:
  - 1) Dimensions: See Drawings. .
  - 2) Drains: Grid with **NPS 1-1/2** tailpiece and twist drain .
  - 3) Drain Location: Near back of compartment .
  - 4) Depth: Wheelchair accessible.
3. Faucet(s): Manually Operated Sink Faucets .
  - a. Number Required: One .
  - b. Mounting: On ledge.
4. Supply Fittings:
  - a. Standard: ASME A112.18.1/CSA B125.1.
  - b. Supplies: Chrome-plated brass compression stop with inlet connection matching water-supply piping type and size.
    - 1) Operation: Wheel handle .
    - 2) Risers: **NPS 1/2**, ASME A112.18.6/CSA B125.6, braided or corrugated stainless steel flexible hose.
5. Waste Fittings:
  - a. Standard: ASME A112.18.2/CSA B125.2.
  - b. Trap(s):
    - 1) Size: **NPS 2**.
    - 2) Material:
      - a) Chrome-plated, two-piece, cast-brass trap and swivel elbow with 17-gauge brass tube to wall ; and chrome-plated brass or steel wall flange.
  - c. Continuous Waste:
    - 1) Size: **NPS 2**.
    - 2) Material: Chrome-plated, 17-gauge brass tube.
6. Mounting: On counter with sealant.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine roughing-in for water-supply piping and sanitary drainage and vent piping systems to verify actual locations of piping connections before sink installation.
- B. Examine walls, floors, and counters for suitable conditions where sinks will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install sinks level and plumb in accordance with rough-in drawings.
- B. Install supports, affixed to building substrate, for wall-hung sinks.
- C. Install wall-mounted sinks at accessible mounting height in accordance with ICC A117.1.
- D. Set floor-mounted sinks in leveling bed of cement grout.

- E. Install water-supply piping with stop on each supply to each sink faucet.
  - 1. Exception: Use ball or gate valves if supply stops are not specified with sink. Comply with valve requirements specified in Section 220523.12 "Ball Valves for Plumbing Piping" and Section 220523.15 "Gate Valves for Plumbing Piping."
  - 2. Install stops in locations where they can be easily reached for operation.
- F. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Section 220500 "Common Work Results for Plumbing."
- G. Seal joints between sinks and counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 079200 "Joint Sealants."
- H. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

### 3.3 PIPING CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

### 3.4 ELECTRICAL CONNECTIONS

- A. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Install electrical devices furnished by manufacturer, but not factory mounted in accordance with NFPA 70 and NECA 1.
- D. Install nameplate for each electrical connection, indicating electrical equipment designation and circuit number feeding connection.
  - 1. Nameplate shall be laminated acrylic or melamine plastic signs, as specified in Section 260553 "Identification for Electrical Systems."
  - 2. Nameplate shall be laminated acrylic or melamine plastic signs with a black background and engraved white letters at least **1/2 inch** high.

3.5 ADJUSTING

- A. Operate and adjust sinks and controls. Replace damaged and malfunctioning sinks, fittings, and controls.
- B. Install new batteries in battery-powered, electronic-sensor mechanisms.

3.6 CLEANING AND PROTECTION

- A. After completing installation of sinks, inspect and repair damaged finishes.
- B. Clean sinks, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed sinks and fittings.
- D. Do not allow use of sinks for temporary facilities unless approved in writing by Owner.

END OF SECTION 224216.16

## **DIVISION 26 00 00 - ELECTRICAL**

### **1.1 BASIC ELECTRICAL REQUIREMENTS**

- A. The specifications for the project electrical work are included in Divisions 26 00 00, 27 00 00, and 28 00 00. The separation of the project electrical specifications into such divisions is for the sole purpose of convenience. The specifications of any of these divisions shall hold for all such divisions the same as if they were stated in each division.
- B. The word "shall", where used, is to characterize mandatory requirements, and the word "should", where used, is to characterize advisories. The word "may" is used in the permissive sense.
- C. Unless noted otherwise, the word "provide" shall be interpreted to mean "furnish, install, and connect as required to be complete and ready for the intended use" when referencing connectible items, equipment, and/or materials which are associated with the electrical work; shall be interpreted to mean "furnish and install as required to be complete and ready for the intended use" when referencing unconnectible items, equipment, and/or materials which are associated with the electrical work; and shall be interpreted to mean "furnish as required to be complete and ready for the intended use" when referencing electrical work which is neither installable nor connectible.
- D. Consult the General Conditions and the supplementary conditions, and all other sections of the project drawings and specifications, in detail for instructions pertaining to this work.
- E. Give written notice to the architect of all materials and/or apparatuses which are believed to be inadequate or unsuitable, and/or believed to be in violation of codes, laws, ordinances, and/or rules, and of all required items of work which are omitted. In the absence of such written notice, provide all such materials and apparatuses, and be responsible for the approved satisfactory functioning of the entire electrical system, without additional compensation.
- F. The locations of the various existing utilities and electrical work which are involved with the scope of this work, where and as indicated on the drawings and/or referenced herein, are offered only as a general guide, with no guarantee as to accuracy. Examine the site and verify the locations of all existing utilities and electrical work, and the relationship of such utilities and electrical work to the project work, and base the contract proposal on all conditions which will be encountered during the progress of the work. Verify all parameters and requirements in advance.
- G. Cooperate fully with all other trades, where and as required, so as not adversely to impact the project construction schedule or the work of such other trades. Verify all parameters and requirements in advance.
- H. Unless explicitly indicated otherwise, provide all materials, devices, equipment, equipment supports, controls, appurtenances, etc. which are referenced in these specifications, shown on the drawings, and/or required to make complete and satisfactory installations, in working order.
- I. Before submitting the project proposal, ask the architect for a decision concerning all places where drawings, specifications, standards, and/or codes conflict, or are not clearly understood. In the absence of obtaining such decisions, abide by the decisions of the architect if the necessity for such decisions arises after the signing of the project construction contract.

- J. Visit the project site, determine the existing conditions, and allow for such conditions in the project proposal.
- K. Coordinate the locations of the electrical work with the work of all other trades.
- L. The general arrangement of the work is indicated on the drawings. Due to the small scale of the drawings, not all required offsets, fittings, conduit bodies, boxes, etc. are indicated. Provide offsets, fittings, conduit bodies, boxes, etc. where and as needed, in accordance with codes and accepted practices.
- M. Verify measurements for accuracy before ordering any materials or doing any work.
- N. Provide all flashing which is required for the electrical work. Flashing shall meet the architect's approval; verify in advance.
- O. Establish and record the locations and grades of all underground conduit. In the event unforeseen obstructions occur in the work, obtain written consent from the architect before undertaking any deviations from the drawings.
- P. Provide all labor, material, equipment, and services which are required to provide the complete electrical system where and as shown on the accompanying drawings and specified herein, unless explicitly expressed otherwise.
- Q. Provide and maintain a complete grounding system.
- R. Connect all electrical equipment, including that which is furnished by others.
- S. Disconnect and remove all existing electrical equipment which is not intended to remain and be reused.
- T. Disconnect, relocate, and reconnect existing electrical equipment, where and as required.
- U. Refeed, with homeruns where necessary, all existing electrical equipment which is intended to remain and be reused, but becomes de-energized by the removal of other existing electrical equipment on the respective circuit(s).
- V. Connect all electrical equipment in strict accordance with the instructions of the respective manufacturers; verify in advance.
- W. Perform all electrical work in strict accordance with local and state ordinances governing this class of work, and with the National Electrical Code.
- X. The specifications are intended to describe complete and workable systems of various sorts. Report all discrepancies and/or omissions preventing such utility prior to making the contract proposal.
- Y. Due to the equipment which will be installed for this project by other trades, coordination is required. Reference the architectural and mechanical drawings and specifications for layouts and descriptions of equipment which shall be connected.
- Z. Note carefully that the electrical drawings are intended to indicate, only diagrammatically, the extent, the general character, and the respective locations of the work which is included. Provide all work which is obviously intended, but for which minor details are not shown, so as to be complete where and as required to perform the functions that are intended. Follow the architectural and/or structural drawings and specifications for building details and fit the work of the electrical drawings and specifications thereto.

- AA. Furnished materials shall be new and listed by UNDERWRITERS' LABORATORIES as conforming to their standards for the respective applications. All work shall be installed in a well-executed manner and shall present a neat appearance when completed.
- BB. Base the project proposal on the equipment and materials which are specified herein and/or on the drawings. Reference to a specific manufacturer or trade name is not intended to indicate a preference for a specific manufacturer but to indicate a standard of quality. Substitute equipment which meets the architect's approval as being "equivalent" for the respective application, may be provided.
- CC. Provide proper grounding of the construction power system, and provide proper lighting if, where, and as required during construction. Provide adequate construction power and lighting where and as required by all trades.
- DD. Keep the work as installed in repair and perfect working order for one (1) year from the date of notice of final acceptance. Such guarantee shall be based on defective materials, installation, and connection. Provide, free of additional cost to the owner, all materials and labor which are required to comply with such guarantee. In all cases where equipment has a factory warranty exceeding one (1) year, such full warranty shall apply.
- EE. Obtain and pay for all required permits, pay all required legal fees and charges, and comply with all state and municipal building and safety laws, ordinances, and regulations relating to building and public health and safety, and with the National Electrical Code.
- FF. Notify the architect well in advance of permanently concealing any of the project work.
- GG. Coordinate fully with Entergy, the local power company, and give Entergy all required information.
- HH. For the purpose of coordination with Entergy, contact Entergy directly; call 1-800-ENTERGY.
- II. As soon as this contract is let, make arrangements with the local inspection department to have an inspector make periodic inspections of the electrical work as the project progresses. The work shall be inspected before being permanently concealed. Furnish final inspection certificates from the local inspection department to the architect. Include in the contract proposal all costs to comply with the above requirements.
- JJ. Follow, as minimum project standards, the established standards of the following organizations, and the individual standards which are named, the same as if they were fully written herein, except where otherwise explicitly specified (in all places in the project construction/bid documents where standards and codes are referenced, the reference is to the respective latest editions of such standards and codes; provide higher grades of materials and workmanship which are specified herein or indicated on the drawings):
  - 1. The Institute of Electrical and Electronic Engineers (IEEE);
  - 2. The National Fire Protection Association "National Electrical Code" (NFPA No. 70) and "Life Safety Code" (NFPA No. 101);
  - 3. The National Electrical Manufacturers Association (NEMA);
  - 4. The Edison Electric Institute (EEI);
  - 5. The Insulated Power Cable Engineers Association (IPCEA);
  - 6. The American National Standards Institute (ANSI);
  - 7. The American Society for Testing Materials (ASTM);
  - 8. The National Electrical Safety Code (Handbook H30);

9. The Safety Rules for the Installation and Maintenance of Electrical Supply and Communications Lines (Handbook 81) of the National Bureau of Standards, Washington, D.C.;
  10. All National Fire Protection Association related standards; and
  11. The applicable Entergy rules and regulations.
- KK. Submit to the architect for review an electronic copy of detailed drawings showing construction details and dimensions, and in the case of lighting fixtures photometric data, of all items, equipment, and/or materials which are being provided, before they are ordered. Drawings for motor starters and safety switches which do not designate the respective motors and/or equipment, will not be reviewed and will be considered informal.
- LL. With the first set of such detailed drawings (i.e., the project electrical-equipment shop drawings) which are submitted for review, submit for review a scaled drawing of each project interior-and-exterior, electrical-equipment space illustrating the exact proposed equipment layout using the dimensions of the actual equipment which is being provided, and obtain the approval for such layouts from the architect before ordering the project equipment. In laying out such spaces, strictly conform to the requirements of all applicable codes and governing authorities, particularly to the requirements for working space, clearances, guarding, and warning signs of Article 110 of the National Electrical Code. It shall be this contractor's responsibility to produce and submit such accurate, scaled drawings to the architect in a timely manner, i.e., with the project electrical-equipment shop drawings. If this contractor does not submit such accurate, scaled drawings in a timely manner, i.e., with the project electrical-equipment shop drawings, this contractor shall accept all responsibility for all lack of adequate physical space and clearances, and shall bear the cost for all remedies, no matter how extensive and/or costly.
- MM. Deliver to the architect an electronic copy, and three (3) hard copies, of maintenance manuals, which shall include printed instructions relating to the operation, proper maintenance, and repair, and parts lists indicating the various parts by name, number, and diagram, for each piece of equipment that is being provided. Neatly bind such documentation in hard-covered binders and deliver it to the architect before the acceptance of the project.
- NN. Request and obtain from the architect one (1) set of the project electrical drawings and keep such set of drawings on the project site. Show on such drawings all changes in the project work which are caused by any factors whatsoever. At the end of the project, submit such corrected set of drawings to the architect prior to receiving the final project payment.
- OO. Advise the general contractor, both before the contract proposal is made and during construction, which electrical items, equipment, and materials shall be painted in strict accordance with the architectural painting specifications.
- PP. Remove all debris and clean all electrical work prior to project completion.
- QQ. As part of the electrical portion (i.e., Division 26 00 00) of the project, prepare project drawings, in an electronic format and in a version which are approved by the architect (verify in advance), which depict all portions of the above-ceiling project construction (including architectural, structural, mechanical, electrical, etc.) in complete coordination (without any conflicts), as proposed to be constructed, and submit such electronic version of such drawings to the architect for acceptance and approval in advance of the commencement of any project construction.



**1.2 MOTOR STARTERS, VARIABLE-FREQUENCY DRIVES (VFD'S), EQUIPMENT CONTACTORS, AND PUSHBUTTONS**

- A. Install and connect starters and/or VFD's (as applicable) for all motors, and contactors for all equipment, except for motors and equipment having integral, factory-mounted starters, VFD's, and/or contactors (as applicable). In such case, connect the starters, VFD's, and/or contactors.
- B. Furnish starters and/or VFD's (where and as applicable) for all motors, and contactors for all equipment, except for motor starters, VFD's, and/or equipment contactors (where and as applicable) which are expressly specified as being furnished by others.
- C. For all motor starters, VFD's, and/or equipment contactors (where and as applicable) which are required to be furnished, obtain from the mechanical contractor, the control contractor, and/or any other entity that is furnishing the respective motors and/or equipment, the exact electrical characteristics of, and the exact electrical requirements for, such motors and/or equipment, and provide starters, VFD's, and/or contactors (where and as applicable) therefor which are completely compatible with the respective motors and/or equipment, and which are approved for the respective applications. Furnish starters, VFD's, and/or contactors (where and as applicable) having respectively, among other characteristics, the proper NEMA sizes; the proper NEMA-enclosure types; the proper voltage-and-current ratings; the proper numbers of poles; the proper coil arrangements and coil-voltage ratings; the proper numbers and types of auxiliary contacts; the proper control devices for the control schemes that are designed and intended; the proper pilot devices; and the properly-sized overload devices.
- D. Install and connect pushbuttons and pushbutton stations where and as shown on the drawings, and where and as required (verify in advance).
- E. Furnish all required pushbuttons and pushbutton stations, except for pushbuttons and pushbutton stations which are expressly specified as being furnished by others. Pushbuttons and pushbutton stations shall be completely compatible with the respective devices which they control, and shall be approved for the respective applications. Pushbuttons and pushbutton stations shall have the numbers of contacts of the proper ratings and configurations, and shall have the proper enclosures, as required for the respective applications.

**1.3 MOTOR WIRING**

- A. Provide electrical connections to all motors, pushbutton stations, starters, contactors, and starting switches.
- B. Provide conduit connections to motors using flexible (liquidtight where installed outdoors and/or where exposed to moisture) metallic conduit which is not less than 12" long nor more than 36" long.
- C. Provide a safety switch adjacent to, and within sight from, each motor, unless the respective branch-circuit protective device is within fifty (50) feet of, and within sight from, a particular motor and the respective motor starter contains correctly-sized and correctly-rated overload devices protecting all phase conductors. Each such safety switch shall be fused, unless the respective motor starter has correctly-sized and correctly-rated overload devices protecting all phase conductors; in such case the respective safety switch may be the "non-fusible" type.

- D. Provide all wiring to and for all motors, including the feeders to the line side of all starters and contactors, and from the load side of all starters and contactors to the respective motors.
- E. Do not test equipment motors for rotation except in the presence, and under the direction, of qualified representatives of the respective equipment suppliers and/or installers.

#### 1.4 CIRCUITING AND GROUPING OF CIRCUITS

- A. The electrical cables for two (2) or three (3) 15-amp and/or 20-amp, single-pole circuits which emanate from a common three-phase, four-wire panelboard may be grouped into common raceways, boxes, etc.
- B. Except for the electrical cables for 15-amp, single-pole circuits and for 20-amp, single-pole circuits, group, as a maximum, into common raceways, boxes, etc. the electrical cables for individual circuits as indicated on the drawings.
- C. Unless approved in writing and in advance by the architect, do not install the electrical cables for additional circuits (power, lighting, control, or otherwise) into the above-mentioned, common raceways, boxes, etc.
- D. Where, for any reason, the inclusion of additional electrical cables into such common raceways, boxes, etc. is unavoidable, submit in writing to the architect for review a request indicating exactly which raceways, boxes, electrical cables, circuits, etc. would be involved, and the exact proposed sizes and ratings of all items which would be involved.
- E. Except where the number of electrical cables is indicated on the drawings (e.g., for feeders), determine and provide the number of electrical cables which is required for each individual circuit according to all applicable codes and governing authorities, according to the instructions of the manufacturers of the respective electrical equipment that is being fed, and according to good practice.
- F. Provide a separate-and-distinct neutral conductor for each project circuit which requires a neutral conductor, whether such circuit is a "single-pole" circuit or a "multi-wire" circuit. As a clarification, do not provide any "common neutrals" for this project (a "common neutral" conductor is defined as a neutral conductor which is associated with more than one [1] circuit).
- G. Provide an insulated equipment-grounding conductor in each raceway, box, wireway, etc., whether so indicated on the drawings and/or elsewhere in these specifications or not. Such equipment-grounding conductors shall be sized respectively in accordance with Section 250-122 of the National Electrical Code.

#### 1.5 BALANCING THE SYSTEM

- A. Balance the electrical loads to +/- 10% across the incoming phase conductors at each project panelboard, and submit to the architect a tabulation of such balancing.

#### 1.6 TORQUING

- A. Torque all project lugs in strict accordance with the respective manufacturers' instructions, with all UNDERWRITERS' LABORATORIES' standards, and with the National Electrical Code, once at connection, and again just prior to project completion.

**1.7 TESTING**

- A. After the electrical work is complete and at the time that the architect directs, conduct an operating test of each electrical item, equipment, and material for approval. Provide all instruments and personnel which are required for such tests.

**1.8 EXCAVATING**

- A. Provide all required excavations and backfilling for the proper execution of the work, and remove all dirt and debris. Tamp (utilizing a mechanical compactor where and as practicable) the backfill in 9" layers and water the finished fill. At the completion of the project, fill all low spots.

**1.9 CUTTING AND PATCHING**

- A. Cut, patch, and paint where required. Obtain the approval of the architect for the cutting of any structural beams or joists. Patching and painting shall be done by the various crafts whose work is respectively involved.

**1.10 SAFETY PRECAUTIONS**

- A. Provide proper guards for the prevention of accidents. Provide and maintain all other construction which is required to secure safety of life and property, including maintaining sufficient lights where and as required to secure such protection.

**1.11 SUPERVISION**

- A. Constantly supervise the project work from beginning to completion. Furnish all information and personnel which are required to assist the architect in inspecting the work.

**1.12 SLEEVES, THIMBLES, INSERTS, CLAMPS, HANGERS, AND OPENINGS**

- A. Provide all sleeves, thimbles, and openings through floors and/or walls which are required for the passage of raceways.
- B. Sleeves and thimbles shall be constructed of Schedule 40 galvanized-steel pipe which is rigidly supported and suitably packed. After the installation of the raceways and/or cables through such sleeves, thimbles, and/or openings, thoroughly and completely seal such sleeves, thimbles, and/or openings so as to be watertight and firestopped. Seal all unused sleeves, thimbles, and/or openings so as to be watertight and firestopped.
- C. Provide inserts, clamps, and hangers where and as required to support all electrical items, equipment, and/or materials. Fasten hangers and clamps to joists and/or beams and not directly to slabs, roof decks, duct work, piping, or conduit.
- D. Provide all required roof penetrations in strict accordance with architectural details and instructions from the architect. Verify all parameters and requirements in advance, and provide accordingly.

**1.13 SPECIAL NOTE--CONTRACTOR'S ATTENTION**

- A. The horsepower of motors and the load ratings of equipment which are indicated on the drawings or in the specifications are the estimated horsepower and load-rating requirements of equipment which is being furnished under other project divisions. Provide raceways, electrical cables, circuit breakers, safety switches, and fuses (also

contactors, motor starters, VFD's, etc., where and as applicable) of the respective sizes, ratings, and capacities which are required to suit the horsepowers of the motors and the load ratings of the equipment that are actually being furnished under such various project divisions. However, in no case provide raceways, electrical cables, and safety switches (also contactors, motor starters, VFD's, etc., where and as applicable) having smaller capacities or sizes than those which are respectively indicated on the drawings or in the specifications. Coordinate the requirements of the various divisions of the project drawings and specifications, and provide suitable equipment and electrical facilities therefor, in order that the above requirements will be met, without additional cost to the owner. Note carefully all other divisions of the project drawings and specifications which describe electrical work which shall be provided in order to fully understand the total extent of the required electrical work.

#### 1.14 TEMPORARY ELECTRICAL SERVICE

- A. Provide temporary electrical service for construction power, in strict accordance with the National Electrical Code and all local codes, and disconnect and remove same before the completion of the project.
- B. Electrical energy for temporary construction power may be obtained from the existing electrical system at the facility. Make all required, advanced arrangements with the owner. Obtain advanced and written approval from the owner for each required power shutdown, and for its maximum possible duration.

#### 1.15 SAFETY SWITCHES

- A. Safety switches shall be heavy-duty, fusible (except as specified otherwise herein above), quick-make, quick-break, with cover interlock and, where installed outdoors, shall be U.L.-listed as raintight. The handle for each safety switch shall be lockable in the "open" position and in the "closed" position with up to three (3) padlocks. Fusible safety switches shall include rejection clips which will accept current-limiting fuses and reject all others.
- B. Safety switches shall be manufactured by SQUARE "D", ABB/GENERAL ELECTRIC, SIEMENS, or EATON, or shall be approved equivalent.

#### 1.16 FUSES

- A. Each fuse shall be Class "RK1", shall have a minimum U.L.-listed interrupting rating of 200,000 amps, shall provide fast-acting protection against short-circuit currents but time-delayed protection against motor overloads, and shall have a barrel which are yellow in color.
- B. Unless indicated otherwise, the continuous-current rating of each fuse which is provided for a distribution circuit shall be in accordance with the National Electrical Code current-carrying capacity of the conductors of the respective circuit.
- C. Unless indicated otherwise, the continuous-current rating of each fuse which is provided for a motor circuit shall be in accordance with the nameplate of the respective equipment. The exact fuse which is provided for each application involving a motor circuit shall be as determined by the manufacturer of the motor that is being protected, and by the manufacturer of the fuse that is being provided, so that no possibility for a single-phasing condition will exist.

- D. Install each fuse so that its continuous-current rating is readily visible without the need to be removed. As a clarification, on each project punch list, a monetary value will be assigned to each fuse which is not so installed.
- E. Deliver to the owner three (3) spare fuses of each different type and size fuse which is being furnished for the project, and obtain a signed receipt from the owner.

#### 1.17 PROJECT CONDUCTOR AND LUG/TERMINATION TEMPERATURE RATINGS

- A. Ensure that all project conductors and all project lugs/terminations are compatible, as per NEC 110-14(C) and 110-40, as applicable.

#### 1.18 IDENTIFICATION AND DIRECTORIES

- A. Provide at and for each project panelboard, unit motor starter, safety switch, pushbutton station, and motor starter switch a laminated plastic nameplate which is engraved with the appropriate device designation. Provide at and for each project distribution panelboard, whether new or remaining existing, an engraved laminated plastic nameplate which respectively identifies each feeder/branch circuit.
- B. Provide at and for each panelboard, other than distribution panelboards, whether new or remaining existing, a typewritten directory which accurately identifies all respective branch circuits.

#### 1.19 ELEVATOR

- A. Whether indicated on the drawings or not, provide for the new elevator the required, fused, elevator control switch, which is sized and rated as necessary for the equipment and as required to coordinate with the upstream, feeder, protective device (verify all parameters and requirements in advance, and provide accordingly), and which is located in the same room as, and near, the elevator-control equipment, and provide the elevator, main-line-power feeder to such elevator control switch. Extend the main-line-power feeder from the elevator control switch to the elevator-control equipment and make the required connections, etc.
- B. Such fused elevator control switch (disconnecting means) which is provided for elevator-controller, main-line power shall be equipped with a set of auxiliary contacts (which will disconnect all additional power sources from the respective load when the disconnecting means is in the "open" position) wired to terminal blocks; with a micro switch mounted on the main switch which is field-wired in parallel with the alarm contact on the voltage-monitoring relay; with a shunt-trip device and mechanism; with a fire-safety-interface control relay having the proper coil voltage which is required for the respective application (verify in advance and provide accordingly); with shunt-trip-control-circuit monitoring and annunciation; with the proper (for the exact application) fire-alarm-voltage-monitoring relay; with a "key-to-test" switch for performing functional tests of the operation of the shunt-trip device and mechanism; with a pilot light which signals that the switch is "on"; with a neutral lug; and with the associated, properly-sized raceway and electrical cables (verify all parameters and requirements with the elevator supplier in advance, and provide accordingly) that are routed to the elevator controller [as per ANSI/NFPA70 1996, Section 620/91(c)]. Such set of auxiliary contacts shall be positively open when the main disconnecting means is open. Such set of auxiliary contacts shall cause the Emergency Return Unit (ERU) power source of the elevator equipment to be disconnected from its load when such disconnecting means is in the "open" position. The size and rating of such contacts shall be as required to suit the elevator-power characteristics (verify all parameters and requirements with the elevator supplier in advance, and provide accordingly). Such fused elevator control switch shall be an all-in-one solution for

meeting the various codes which are associated with elevator shutdown and monitoring, shall be lockable in the "open" position and externally operable, and shall have a short-circuit-current rating of 200,000 RMS amps. The fusible elevator control switch shall be in strict accordance with NFPA 70, NFPA 72, ANSI/ASME A17.1, NFPA 13, UL 98, and UL 50. The fusible elevator control switch shall be EATON Type "ES", LITTLEFUSE LPS Series, or approved equivalent by SQUARE "D", ABB/GENERAL ELECTRIC, or SIEMENS.

- C. Whether indicated on the drawings or not, provide near the elevator-control equipment a 20-amp, 125-volt, ground-fault-interrupter-type, duplex receptacle which is fed from a separate, dedicated circuit, and provide in the elevator pit a 20-amp, 125-volt, ground-fault-interrupter-type, duplex receptacle which is fed from a separate, dedicated circuit.
- D. Whether indicated on the drawings or not, provide for the elevator equipment the properly-sized and properly-rated, shunt-trip-type, feeder (branch) circuit breaker (that is equipped with the set of N.C. dry contacts which is required by the elevator equipment supplier; verify all requirements and parameters in advance and provide accordingly) that is required to feed the elevator controller and to furnish the required, short-circuit and ground-fault protection.
- E. Whether indicated on the drawings or not, provide for the elevator the required, fused, safety switch which is sized and rated as necessary for the equipment (verify all parameters and requirements in advance, and provide accordingly) and which is located in the same room as, and near, the elevator-control equipment, and provide the elevator, lighting-and-signal-power feeder to such safety switch. Extend such lighting-and-signal-power feeder from such safety switch to the elevator-control equipment and make the required connections, etc.
- F. Whether indicated on the project drawings or not, provide for the elevator equipment the properly-sized and properly-rated, circuit breaker (verify all requirements and parameters in advance and provide accordingly) which is required to feed incoming, lighting-and-signal power to the elevator controller.
- G. Provide all required rough-ins in strict accordance with the equipment manufacturer's drawings, requirements, and recommendations (verify all parameters and requirements with the elevator supplier in advance, and provide accordingly).
- H. As a clarification, the project elevator-design requirements are based on a certain manufacturer's elevators being provided. To the extent that alternate (substitute) elevator equipment is provided for the project, provide all electrical work and construction, and all electrical engineering and design services, which are required therefor, at no additional cost to the owner or to the architect. Verify all parameters and requirements in advance, and provide accordingly.

#### 1.20 RACEWAYS AND ELECTRICAL CABLES

- A. Electrical cables shall be installed in raceways which are concealed to the full extent which is practicable (verify in advance).
- B. Raceways which are installed below grade and beneath the building floor slab shall be Schedule 40 PVC conduit with long-radius, rigid, galvanized-steel, conduit elbows.
- C. Raceways which are installed below grade, but not beneath the building floor slab, shall be Schedule 40 PVC conduit with long-radius, rigid, galvanized-steel, conduit elbows. Such raceways shall be 3'-0" minimum below finished grade. Provide the proper warning

- tape, at 1'-0" below finished grade, immediately above, and running parallel with, each underground raceway, for the entire length of such raceway.
- D. Raceways which are completely concealed within walls or above ceilings shall be electrical metallic tubing (EMT), or metal-clad cable may be provided, except in locations where any governing authority or the National Electrical Code does not permit their use. In such locations, rigid metallic conduit shall be provided.
  - E. In locations where metal-clad cable is provided, only as allowed herein above, such metal-clad cable shall be neatly installed, shall be adequately supported, and shall be routed so as to be parallel or perpendicular (as respectively applicable) to building and structural lines, and all excess lengths of metal-clad cable shall be removed. The "coiling" and retention of excess lengths of metal-clad cable, even where totally concealed, is unacceptable and shall not be done.
  - F. Exposed raceways in unfinished interior areas shall be EMT, unless prohibited by any governing authority or the National Electrical Code, or unless subject to mechanical abuse. In such cases, rigid metallic conduit shall be provided.
  - G. Exposed raceways in finished interior areas shall be WIREMOLD, WALKERDUCT, or PORTER surface-type, metallic raceways. Notify the architect before installing any exposed raceways in finished interior areas so that possible alternate routings using concealed raceways might be found. As a clarification, the architect and the owner will not entertain the provision of exposed raceways in finished areas unless such provision is justified (as determined by the architect) as a result of unusual existing conditions. Be advised of the owner's strong desire for no exposed raceways to be provided in finished areas.
  - H. Above-grade, exterior raceways shall be rigid metallic conduit.
  - I. Install exposed raceways so as to be parallel or perpendicular to building or structural lines.
  - J. EMT and metallic conduit shall be aluminum or galvanized steel, except that metallic conduit which is installed in concrete or below grade shall not be aluminum.
  - K. EMT connectors and couplings shall be the "compression-type". "Set-screw-type" connectors and couplings are unacceptable and shall not be provided.
  - L. Support raceways by pipe straps, conduit clamps, hangers, or other approved fastening devices. Do not provide tie wires for such application.
  - M. Provide an approved expansion fitting wherever a raceway crosses an expansion joint.
  - N. Keep raceways at least 12" from parallel runs, and at least 6" from perpendicular runs, of hot-water pipes.
  - O. In runs of flexible metallic conduit, where 90-degree bends of less than 6" radius are unavoidable, use 90-degree fittings or connectors, as required. Do not install flexible metallic conduit for 90-degree bends of less than 6" radius.
  - P. Raceways serving roof-mounted equipment shall penetrate the roof inside of the respective equipment curbs, to the full extent which is practicable (verify in advance); otherwise the penetrations shall be within 18" of the respective equipment. External penetrations shall be sheathed through the roof allowing conduits to have free

- movement. Each conduit shall have a weathercone. The sleeve shall be sealed with a watertight compound.
- Q. Provide pull boxes where and as required. Each pull box shall be of code-gauge steel or aluminum, and shall have a removable access panel in its side, top, or bottom, as required.
- R. Do not install horizontal runs of raceways in slabs, unless special permission for each such run is obtained from the architect in advance.
- S. Where vertical raceway runs interrupt more than 12" of structural concrete in any direction, reinforce the concrete in accordance with typical reinforcing details.
- T. Provide an insulated equipment-grounding conductor in each raceway system, wireway, etc., whether so indicated on the drawings and/or elsewhere in these specifications or not. Such grounding conductors shall be sized respectively in accordance with Section 250-122 of the National Electrical Code (verify in advance and provide accordingly).
- U. Conductors shall be of soft-drawn copper having the ampacity of at least ninety-eight percent (98%) of that of pure copper.
- V. Unless noted otherwise, the minimum conductor size shall be No. 12 AWG. 15-amp and 20-amp, circuit runs of from 75 feet to 199 feet in length to the ends of the respective loads shall have conductors which are sized no smaller than No. 10 AWG; and 15-amp and 20-amp, circuit runs that are longer than 199 feet in length to the ends of the respective loads shall have conductors which are sized no smaller than No. 8 AWG. The conductor size shall be the same throughout each circuit.
- W. Unless noted otherwise, size all conductors in accordance with the ratings of the respective protective devices and in accordance with the requirements of Article 240-OVERCURRENT PROTECTION of the National Electrical Code.
- X. Provide variable-frequency-drive (VFD) electrical cables from each project VFD to the respective motor. Provide termination kits which are designed, manufactured, installed, and connected specifically for the exact, helical, copper-tape shields that are provided (verify in advance). Each VFD cable:
1. Shall consist of three (3) conductors;
  2. Shall be rated 90 degrees C., wet or dry;
  3. Shall have stranded conductors which are insulated with heat-and moisture-resistant, cross-linked polyethylene
  4. Shall have phase-identified conductors;
  5. Shall have such insulated conductors cables together with suitable fillers and with three (3) symmetrical, bare-copper, equipment-grounding conductors;
  6. Shall have a 5-mil thick, helical, copper-tape shield and an overall, flame-and-sunlight-resistant, black, PVC jacket;
  7. Shall be code-approved and UL-listed specifically for VFD application; and
  8. Shall be in strict accordance with UL 1227, IEEE 383, IEEE 1202, ICEA T-29-520, and ICEA S-95-658/NEMA WC-70.
- Y. Unless noted otherwise, electrical cables shall be the single-conductor type.
- Z. Unless noted otherwise, electrical cables shall be Type "THHN/THWN" (75-degree C. rating).



- AA. Conductors which are sized No. 8 AWG or larger shall be stranded; conductors which are sized smaller than No. 8 AWG shall be solid, except that conductors which are provided purely for control work may be stranded.
- BB. Wiring which is installed in spaces that are being used, or will be used, as air plenums or for environmental air shall be in accordance with Section 300-22 of the National Electrical Code.
- CC. Color code electrical cables in strict accordance with the National Electrical Code. Unless required otherwise by any applicable code or governing authority, the insulation on electrical cables shall be color coded as follows:
  - 1. Phase A - black
  - 2. Phase B - red
  - 3. Phase C - blue
  - 4. Neutral - white
  - 5. Equipment ground - green
- DD. On each phase-conductor cable and on each neutral-conductor cable (not on equipment-grounding-conductor cables) in each outlet and junction box, provide a permanent cable marker which indicates from which panelboard, and from which pole number in such panelboard, it is fed.
- EE. Remove and store, or abandon, as directed, existing electrical work which is not intended to remain and be reused. Do not reinstall removed, existing, electrical work unless so indicated on the drawings or specified herein, or unless such reinstatement is in accordance with the obvious intent of the drawings and/or the specifications. Provide blank covers for abandoned boxes.
- FF. Extend, alter, and reconnect existing raceways where and as shown, directed, and/or intended, or where impossible or impractical to do so, provide new, replacing raceways. Provide new homeruns where and as required to refeed remaining-existing equipment, devices, etc. (verify in advance and provide accordingly).

#### 1.21 OUTLET BOXES

- A. Provide all outlet boxes which are required for electrical devices and connections, whether so indicated on the drawings or not. Each outlet box shall be U.L. listed, and shall be suitable and approved for the exact applications for which it is provided.
- B. As per NFPA101:8.3.5.6.3, electrical outlet boxes which are located on opposite sides of any fire-rated wall shall be separated by not less than 24" horizontally, and the required openings shall not exceed a total of 100 square inches per 100 square feet of wall area.
- C. Each outlet box for a lighting fixture or for another type of ceiling outlet shall be galvanized steel. Each such outlet box which is provided for a lighting fixture shall have a 3/8" fixture stud protruding through, and fastened to, the back of the box.
- D. Each floor-mounted, outlet box (if any; verify) shall be cast iron or PVC; shall be fully adjustable before and after the respective floor installation; shall be the flush type; shall be watertight; shall be appropriate for the depth of the respective floor; shall have a carpet flange, if required; and shall have the appropriate screw-type cover. The cover for each such outlet box shall be brass or aluminum, as respectively selected by the architect (verify in advance and provide accordingly). Where practicable, each such outlet box which is provided in a location that requires both (a) power connection(s) and communication wiring shall be the combination type with (a) divider(s) where and as necessary to separate the "electrical-power" section(s) from the "communication"

section(s). "Pedestal-type" and "tombstone-type" floor outlet boxes are unacceptable and shall not be provided.

- E. Surface-mounted outlet boxes which are provided for weatherproof switches and receptacles shall be corrosion-resistant; cast iron or cast aluminum; and Type "FS" or "FD", as required for the respective application; verify in advance and provide accordingly.
- F. Covers for switches and receptacles in damp or wet locations shall be metallic, and shall be U.L. listed and code approved as being weatherproof. Weatherproof covers which are provided for receptacles in wet locations shall be weatherproof while the respective receptacles are in use.
- G. Each outlet box which is provided for exposed work in an unfinished interior area shall be corrosion-resistant; cast iron or cast aluminum; Type "FS" or "FD", as required for the respective application (verify in advance and provide accordingly); and of the proper number of gangs, with surface-wiring-type cover plates. "Flush-type" boxes (e.g., sheet metal boxes with knockouts, etc.) for such application are unacceptable, as are plaster rings with standard receptacle or switch plates.
- H. Each outlet box which is provided for exposed work in a finished interior area shall be the surface-type and metallic, of the proper number of gangs, with a surface-wiring-type cover plate. "Flush-type" boxes (e.g., sheet metal boxes with knockouts, etc.) for such application are unacceptable, as are plaster rings with standard receptacle or switch plates. Notify the architect before installing any surface-mounted outlet/junction boxes in finished interior areas so that possible alternate installations utilizing recessed outlet/junction boxes might be found. As a clarification, the architect and the owner will not entertain the provision of exposed outlet/junction boxes in finished interior areas unless such provision is justified (as determined in advance by the architect and the owner) as a result of unusual existing conditions, etc. Be advised of the owner's strong desire for no surface-mounted outlet/junction boxes to be provided in finished interior areas.

## 1.22 SWITCHES

- A. Switches shall be U.L. listed and approved for the respective applications for which they are provided and shall have minimum ratings which are equal to the ratings of the respective loads that they control.
- B. Switches shall have a minimum continuous-current rating of 20 amps.
- C. Each switch shall be industrial-specification grade with a nylon or urea housing and a steel mounting strap; switches which are equipped with plastic or nylon mounting straps are unacceptable and shall not be provided. Switches may be back wired and/or side wired (this contractor's option), but each back-wired switch shall utilize pressure connections which require the side screws to be tightened; wires that are held with "clip-type" mechanisms are unacceptable and shall not be provided. This contractor shall tighten the screws on all unused switch terminations so as to reduce the possibility of protruding screws faulting (shorting) to the respective outlet boxes.
- D. Switches which control motor circuits shall be motor-rated, shall have "on" pilot lights, and shall have minimum ratings that are equal to the ratings of the respective loads which they control.
- E. Install switches in suitable metallic boxes and, where they are installed adjacent to doors, locate them on the strike side of the respective doors, whether so indicated on the

drawings or not. Install each switch, except for three-way and four-way switches, so that its "up" position closes, and its "down" position opens, the respective circuit.

- F. The colors of switches shall be as respectively selected by the architect.
- G. Switches which are installed adjacent to lighting dimmers shall match the appearance of such adjacent lighting dimmers (as approved in advance by the architect).

### 1.23 OCCUPANCY-SENSING CONTROLS

- A. Each occupancy-sensing control:
  - 1. Shall be approved for the respective exact application for which it is provided. Verify, in advance, all parameters and requirements which are associated with each occupancy-sensing-control application and provide the respectively-appropriate, occupancy-sensing controls (and associated relays, etc.) accordingly;
  - 2. Shall be the "line-voltage" type, complete with an integral line-voltage relay, having the voltage rating which is compatible with the voltage rating (i.e., 120 volts) of the respective circuit to which it is connected and having a continuous-current rating which is equal to, or greater than, the continuous-current rating of the respective branch-circuit protective device; or be the "low-voltage" type, complete with one (1) or more (as applicable) remote line-voltage relay(s), each having the number of poles which is required for the exact application, having the voltage rating which is compatible with the voltage rating (i.e., 120 volts) of the respective circuit(s) to which it is connected, and having a continuous-current rating which is equal to, or greater than, the continuous-current rating(s) of the respective branch-circuit protective device(s), as respectively required for the exact application; verify all parameters and requirements in advance and provide accordingly. For example, where a particular occupancy-sensing control is indicated on the drawings to control both (a) lighting circuit(s) and (an) exhaust-fan circuit(s), such occupancy-sensing control shall be equipped with one (1) or more (as required for the application) line-voltage relay(s), each having the proper number of poles, the proper voltage rating, and the proper continuous-current rating which are respectively-required for the application (verify all parameters and requirements in advance and provide accordingly);
  - 3. Shall render maximum immunity to false triggering;
  - 4. Shall be equipped with dual technology, i.e., infrared and ultrasonic technologies; each such technology shall have a separate-and-distinct, field-adjustable sensitivity and shall have the capability of being completely de-activated;
  - 5. Shall be equipped with dual LED motion indicators;
  - 6. Shall be equipped with a "field of view" (e.g., 90 degrees, 120 degrees, 180 degree, 270 degrees, 360 degrees, etc.) which is appropriate for the respective exact application for which it is provided; verify all parameters and requirements in advance and provide accordingly;
  - 7. Shall have an occupancy-detection range which is appropriate for the respective application for which it is provided; verify all parameters and requirements in advance and provide accordingly;
  - 8. Shall be equipped for, and sensitive to, small ("hand-movement") motions;
  - 9. Shall have an easily-field-adjustable, "automatic-OFF", time delay of from 30 seconds to 20 minutes (minimum range). Factory-pre-set such time delay for the maximum (i.e., 20 minutes);
  - 10. Shall be equipped with a self-adjusting feature which will maintain optimum performance by automatically and immediately self adjusting its sensitivity and time delay as required to optimize performance and as required to minimize the need for "follow-up" adjustments;

11. Shall be provided with all required junction/outlet boxes and cover plates, and with all required mounting, installation, and connection hardware; and
  12. Shall be manufactured by AUCITY, LEVITON, LUTRON, HUBBELL, G.E., ENERLITES, or WATT-STOPPER, or shall be approved equivalent.
- B. The quantities and locations which are respectively indicated on the drawings for the occupancy-sensing controls are the approximately-required quantities and locations, and are presented only as a general guide, with no guarantee as to accuracy. Employ and pay (if payment is necessary) a factory-trained representative of the manufacturer of the actual occupancy-sensing controls which are being provided (whether such controls are the ones specified or are substitute controls) to determine the proper quantity of, and the best respective locations for, the project occupancy-sensing controls, based on best operation and based on the owner's desired control operation; then provide the proper, respectively-required quantities of occupancy-sensing controls and locate them accordingly. Also, field adjust and field calibrate all possible settings of each installed occupancy-sensing control, as many times as necessary (without limit) until the termination of the project one-year warranty period, as required to render proper operation, as determined by the owner, based on the owner's desired control operation; verify all parameters and requirements in advance and provide accordingly.

#### 1.24 Receptacles

- A. Rigidly fasten receptacles to their respective outlet boxes so that they do not depend on their respective cover plates for support.
- B. Install each vertically-mounted receptacle so that its "equipment-ground hole" is oriented downward (i.e., its blades are oriented upward) and install each horizontally-mounted receptacle so that its "equipment-ground hole" is oriented to the left (i.e., its blades are oriented to the right).
- C. Receptacles which are connected to 20-amp circuits shall be rated 20 amps.
- D. Each receptacle shall be industrial-specification grade with a nylon housing and a steel mounting strap; receptacles which are equipped with plastic or nylon mounting straps are unacceptable and shall not be provided. Receptacles may be back wired and/or side wired (this contractor's option), but each back-wired receptacle shall utilize pressure connections which require the side screws to be tightened; wires held with "clip-type" mechanisms are unacceptable and shall not be provided. This contractor shall tighten the screws on all unused receptacle terminations so as to reduce the possibility of protruding screws faulting (shorting) to the respective outlet boxes. Provide receptacles with integral ground-fault protection for outdoor receptacles, for receptacles which are installed in wet locations, and for all other receptacles which are required by code to be the "ground-fault" type.
- E. Receptacles shall be in strict accordance with the requirements of all applicable articles, sections, and figures of the National Electrical Code Handbook, and in strict accordance with the applicable, ANSI/NEMA, receptacle-configuration standards.
- F. The colors of receptacles shall be as respectively selected by the architect.

#### 1.25 INTERIOR WIRING-DEVICE COVER PLATES

- A. Unless otherwise noted, interior, wiring-device, cover plates shall be flexible nylon or polycarbonate (and expressly not phenolic plastic), and shall be provided in proper gangs as required for the respective outlets.

- B. The colors of interior, wiring-device cover plates shall be as respectively selected by the architect.

#### 1.26 OUTLETS

- A. Provide outlets where and as shown on the drawings, and where and as required, and provide wiring for the controls which are respectively indicated and required. Accurately locate outlets. Unless specified herein or indicated on the drawings otherwise, locate outlets as follows (each dimension which is given is from finished floor to the centerline of the respective outlet, unless noted otherwise):
  1. Wall-mounted, all-communication outlets (ACO's), switch outlets, dimmer outlets, and receptacle outlets which are located above counter tops: 6" above the respective counter-top back splashes;
  2. Wall-mounted ACO's, switch outlets, dimmer outlets, and receptacle outlets which are located above work tables: 6" above the respective working surfaces;
  3. ACO's for wall telephones: 4'-0";
  4. All other wall-mounted, switch outlets and dimmer outlets: 4'-0";
  5. All other wall-mounted, ACO's and receptacle outlets: 1'-6"; and
  6. Pushbutton, fire-alarm-pull-station, access-control-card-reader, and keypad outlets: 4'-0".
- B. The face of each recessed outlet box shall not be more than 1/8" from the respective finished face. Install each recessed outlet box at such a height so as to require the cutting of only one (1) course of brick, block, or tile. Have a mechanic at the project site at such times as necessary to locate outlet boxes in order to comply with such requirement.

#### 1.27 SEALING AND FIRESTOPPING

- A. Seal with an approved sealing compound all raceways which are required to be sealed.
- B. Provide firestopping in strict accordance with details which are furnished by an approved testing agency (U.L.) for all penetrations of vertical and horizontal fire-rated assemblies, as per Section 713 of the IBC. Request and obtain all such details in advance.
- C. Inspections for through-penetrations, membrane penetration firestops, fire-resistant joint systems and perimeter fire-barrier systems shall be in strict accordance with Section 1705.16 of the IBC. Employ and pay an approved inspection agency to inspect penetration firestop systems which are tested and listed in accordance with Sections 714.3.1.2 and 714.4.1.2 of the IBC, in accordance with ASTM E 2174, and to document all such compliance. Employ and pay an approved inspection agency to inspect fire-resistant joint systems which are tested and listed in accordance with Sections 715.3 and 715.4 of the IBC, in accordance with ASTM E 2393, and to document all such compliance. Submit compliance documentation, as well as the certification of such inspection agency's approval status, to the architect.
- D. As per NFPA101:8.3.5, penetrations through rated construction shall be sealed by approved firestop systems or devices which are tested in accordance with ASTM E-814 or ANSI/UL 1479, or by assemblies or firestopping materials that are capable of preventing the passage of flames and hot gasses when tested and rated in accordance with NFPA 251 (such requirement shall apply to electrical outlets, light switches, etc.). Detailed, instructive, cut sheets of the fire-penetration-sealing system which is being provided shall be furnished to the inspector at the time of the inspection. Random selective sampling shall be furnished by the contractor for observation by the inspector, upon the inspector's command.

1.28 CONNECTION OF COMPUTER (DATA) EQUIPMENT

- A. Connect all computer (data) equipment.
- B. The connection for power shall be in the form of a grounded receptacle. Provide matching plugs on equipment cords if, where, and as required.
- C. Each piece of equipment shall be fed from a circuit which includes an equipment-grounding cable.
- D. For each piece of equipment, provide an all-communication outlet (ACO), consisting of a single-gang outlet box (which is recessed to the full extent that is practicable) and a blank cover plate, and provide an empty raceway, which is similar to a 1" conduit, with pull wire, from each ACO to an accessible location above the ceiling of the respective building-floor level that has a contiguous, above-ceiling path to the telecommunication backboard, unless shown on the drawings otherwise. For more information, specifications, and requirements which are relative hereto, reference DIVISION 27 00 00 - COMMUNICATIONS.

1.29 DIMMERS

- A. Provide lighting dimmers where and as shown on the drawings, and where and as required, for the respective light control which is indicated.
- B. Dimmer installations shall include the appropriate outlet boxes and cover plates.
- C. Dimmers which are installed in gangs shall be installed, in strict accordance with instructions from the dimmer manufacturer, so that derating of the dimmers is not required.
- D. The colors of the handles of the dimmers, and the respective cover plates (faceplates), shall be as respectively selected by the architect; verify in advance and provide accordingly.
- E. LED dimmers shall be completely compatible with the corresponding dimming LED drivers in and for the respective lighting fixtures. Whether specifically stipulated in the lighting-fixture descriptions (or catalogue numbers) or not, provide the proper dimming LED drivers (of the proper manufacture) so that such compatibility is realized.
- F. Each LED dimmer which is provided for 0-10V dimming application:
  - 1. Shall be UL-listed for the exact application for which it is provided;
  - 2. Shall be equipped with a large paddle switch with a captive, linear-slide control, and shall be compatible with a standard, designer-opening, wall plate;
  - 3. Shall be completely compatible with all third-party, LED, lighting fixtures (verify in advance);
  - 4. Shall be able to be connected for single-pole, 3-way, or 4-way application (as selected in the field, at the project site), and shall be connected for single-pole, 3-wire, or 4-way operation as required for the application for which it is provided, in strict accordance with the appropriate wiring diagrams which are furnished by the dimmer manufacturer directly to this contractor (request and obtain all required wiring diagrams in advance);
  - 5. Shall have a rated operating voltage of 120VAC;
  - 6. Shall be equipped with power-failure memory;
  - 7. Shall be able to be furnished with accompanying Claro switches and coordinating wall plates;

8. Shall be equipped with field-adjustable, high-end and low-end, trim settings, for optimal performance;
  9. Shall be rated as required to control up to fifteen (15) LED drivers; and
  10. Shall be LUTRON Model Number DVSTV-XX or Model Number DVSTV-453PH-WH, or shall be LUTRON Model Number DVTV-XX with the required LUTRON Model Number PP-DV power pack (so as to render it applicable for 120VAC driver-switching operation), as required for the exact application for which it is provided, and for the amount of electrical load that is respectively being controlled (verify in advance and provide accordingly), or shall approved equivalent by ACUITY, ETC, or WATT-STOPPER.
- G. Switches which are installed adjacent to lighting dimmers shall match the appearance of such adjacent lighting dimmers (as approved in advance by the architect).
- 1.30 SYSTEM OF WIRING
- A. The existing system of wiring is, and shall remain, 120/208 volts, three phase, four wire, wye connected.
- 1.31 SERVICE ENTRANCE
- A. The existing service entrance, which shall remain and continue to be used, is from overhead.
- 1.32 NEW CIRCUIT BREAKERS WHICH ARE INSTALLED INTO EXISTING PANELBOARDS
- A. Each such circuit breaker:
1. Shall be of the same manufacture as the respective panelboard;
  2. Shall have the same voltage rating as the respective panelboard;
  3. Shall have the continuous-current rating and the number of poles which are respectively shown on the drawings;
  4. Shall have a minimum interrupting rating which is equal to the bus-bracing rating of the respective panelboard;
  5. Shall be the quick-make, quick-break, thermal-magnetic, molded-case type;
  6. Shall be furnished with all required mounting and connecting hardware; and
  7. Shall be installed and connected in strict accordance with instructions from the manufacturer of both the circuit breaker and the respective panelboard.
- 1.33 PANELBOARDS
- A. Provide panelboards where and as shown on the drawings, and where and as required. The top of each panelboard cabinet shall be at 6'-6" above finished floor.
- B. Each panelboard shall have the current rating, the voltage rating, the phase and wire ratings, the number and type of branch circuit breakers and branch-circuit-breaker spaces, and a main circuit breaker or main lugs, as respectively shown on the drawings, and as required for the respective application. Verify all parameters and requirements in advance, and provide accordingly.
- C. Whether so indicated on the drawings and/or specified herein, or not, the number of panelboard sections for each panelboard shall be as required to accommodate the number of circuit breakers of the respective ratings and the number of branch-circuit-breaker-pole spaces/provisions which are indicated in the respective panelboard schedule and which are required for the respective applications, and as required for such panelboard physically to fit in the respectively-designated location while accommodating all code-required clearances, etc.; verify all parameters and requirements in advance,

and provide accordingly. In order to accomplish such, and to the extent which is practicable, provide panelboard sections which accommodate more than the classical forty-two (42) branch-circuit-breaker poles (and pole spaces/provisions), where and as required.

- D. "Load-center" type panelboards are unacceptable and shall not be provided.
- E. Panelboards shall have all-copper or all-aluminum (this contractor's option) buses.
- F. Branch circuit breakers shall be bolt-on, quick-make, quick-break, over-center toggle devices with trip indication, and with common-trip for multi-pole breakers. Trip indication for each circuit breaker shall be clearly shown by the circuit-breaker handle taking a position between the "OFF" position and the "ON" position. No tandem-type circuit breakers shall be provided.
- G. Whether so indicated on the drawings and/or specified elsewhere herein, or not, all circuit breakers which are provided for circuits that are involved with air-conditioning equipment shall be UL-listed and code-approved as being the "listed HACR type".
- H. Branch circuit breakers feeding unswitched lighting loads shall be U.L.-listed as being "switching-duty" rated.
- I. Panelboards shall have distributed phase bussing throughout. Any two (2) adjacent, 1-pole, branch circuit breakers shall be replaceable by a 2-pole, branch circuit breaker and any three (3) adjacent, 1-pole, branch circuit breakers shall be replaceable by a 3-pole, branch circuit breaker.
- J. All branch-circuit-breaker spaces shall contain complete provisions (including, but not limited to, bussing, mounting apparatuses, access holes, access hole covers, etc.) which are required for accommodating future branch circuit breakers.
- K. The minimum bus-bracing rating and the minimum circuit-breaker-interrupting rating for each panelboard shall be the value of the available short-circuit current which is indicated in the respective panelboard schedule. In order to achieve such ratings, "U.L. series-connected ratings" may be utilized if, and only if, all documentation which is required to prove such ratings is a part of, and submitted with, the respective panelboard review submittals (shop drawings). The review submittals (shop drawings) for all panelboards shall be submitted simultaneously.
- L. Number branch-circuit-breaker poles from top to bottom beginning at the top of the left-hand column, with odd numbers occurring on the left and even numbers occurring on the right, as required to conform to the circuit numbers which are respectively shown on the drawings. In multiple-section panelboards, number the branch-circuit-breaker poles consecutively. Do not repeat numbers in the same panelboard. Each successive odd-numbered pole and each successive even-numbered pole shall be connected to an alternate incoming line, i.e., the poles shall be connected alternately to Incoming Line 1, Incoming Line 2, Incoming Line 3, Incoming Line 1, Incoming Line 2, Incoming Line 3, etc.
- M. Each panelboard, for which such feature is available, shall be equipped with door-in-door trim as required to allow hinged access to its interior panelboard wiring without removing the panelboard-door assembly (i.e., one [1] lockable door over the interior and one [1] which exposes the gutter).



- N. Unless indicated otherwise, panelboards which are installed indoors shall have NEMA 1 enclosures and panelboards which are installed outdoors shall have NEMA 3R enclosures.
- O. Provide lock-on and lock-off devices for branch circuit breakers where and as indicated, and where and as required.
- P. At each panelboard, provide a "bushing-type" raceway connector at and for each raceway which contains electrical cables that are sized No. 6 AWG or larger.
- Q. Panelboards shall be manufactured by SQUARE "D", SIEMENS, ABB/GENERAL ELECTRIC, or EATON, or shall be approved equivalent.

#### 1.34 SURGE PROTECTIVE DEVICES

- A. Provide surge protective devices (each of which is referenced herein below and on the drawings as "SPD") where and as indicated on the drawings, where and as specified herein, and where and as required for the project.
- B. Each SPD shall be complete in every respect, shall be modified and/or augmented as required for the exact application for which it is provided, and shall contain all appurtenances that are required for proper operation.
- C. Each SPD shall be listed and labeled in strict accordance with UL 1449-3rd Edition, and shall comply with all other UL standards, and with all applicable ANSI/IEEE standards and testing procedures.
- D. Each SPD shall be manufactured by a company that is normally engaged in the design, development, and manufacture of such equipment, and by the manufacturer of the respective panelboard into which it is provided.
- E. The SPD manufacturer shall provide unlimited free replacement of all inoperable SPD units during the warranty period.
- F. Each SPD shall be guaranteed by this project contractor and by the SPD manufacturer to be free of defects in materials and workmanship for a period of not less than ten (10) years from the date of the notice of acceptance of the project by the owner. Any SPD which shows evidence of failure, malfunction, or incorrect operation during such 10-year warranty period shall be replaced as a complete unit, not just modules, subassemblies, or components, by the manufacturer, at no cost to the owner.
- G. Each SPD shall have the phase rating (i.e., three-phase), the voltage rating (i.e., 120/208 volts), and the type of connection (i.e., wye) which are required to be completely compatible with the system to which it is connected (verify all parameters and requirements in advance, and provide accordingly).
- H. Each SPD shall be of a "parallel" design utilizing fast-acting, transient energy protection which will divert and dissipate the surge energy.
- I. Each SPD shall be self-restoring and fully automatic with a total response time not exceeding 1 nanosecond for any individual component.
- J. The maximum continuous-operating-voltage (MCOV) rating and threshold-voltage rating of all suppression components in each SPD unit shall be selected in accordance with ANCI C84.1, and shall provide ample "headroom" for C84.1 Voltage Range B, maximum

utilization and service voltage per Table 1, as required to provide continuous operation without AC voltage sine-wave interaction.

- K. Each SPD shall use only solid-state clamping components to limit the surge voltage. SPD devices and SPD components which "crowbar" short circuit the AC power system (e.g., spark gaps, gas tubes, or SCR's) are unacceptable and shall not be provided.
- L. Each SPD shall have phase-to-phase, phase-to-ground, phase-to-neutral, and neutral-to-ground, independent, distinct, and dedicated, protective circuitry. Reduced-mode devices are unacceptable and shall not be provided.
- M. Each SPD shall have LED status monitors as required to indicate, at a minimum, the continuous, positive, operational status of each protected phase.
- N. Each SPD shall be labeled as a secondary surge arrester and shall meet all requirements of the National Electrical Code, NFPA 70: Article 285.
- O. Each SPD shall be provided with, and shall be factory installed and connected within, the cabinet (enclosure) of the respective panelboard which it is designed and specified to protect.
- P. Each SPD shall be equipped with EMI/RFI filtration (54dB attenuation from 20kHz. to 100MHz., minimum performance), incorporating true, sine-wave tracking ("normal" and "common" mode).
- Q. Each SPD shall have a minimum peak surge current rating of 160kA per phase.

**1.35 LIGHTING FIXTURES, DRIVERS, LAMPS, ETC.**

- A. Individually support each lighting fixture. Provide two (2) hangers for each suspended-type lighting fixture.
- B. Recessed lighting fixtures shall be compatible with the respective ceiling-suspension systems. Ascertain the type and manufacture of each project ceiling prior to purchasing the respective project lighting fixtures, and utilize all such information while deciding exactly which lighting fixtures to order.
- C. Firmly support each ceiling-mounted lighting fixture from the respective ceiling structure by using supports which are designed for the specific purpose; verify all parameters and requirements in advance, and provide accordingly. Such supports shall be attached to the main ceiling-system runners or ceiling joists, as applicable. Such supports shall have a test rating of at least thrice the weight of the respective lighting fixtures.
- D. Provide #9 galvanized steel wires at diagonal corners of each recessed, square or rectangular, lighting fixture, and provide one (1) #9 galvanized steel wire at each recessed, round, lighting fixture, in order to support such lighting fixtures. Firmly attach such wires to the structural system of the building.
- E. Securely bolt lighting-fixture hangers to the structural system of the building. Toggle bolts are unacceptable and shall not be provided for this purpose.
- F. Seal light leaks between the lighting-fixture trim and the ceiling at each recessed lighting fixture.
- G. Pendant-mounted lighting fixtures shall be equipped with ball-aligner or swivel-type hangers.

- H. Lighting-fixture drivers shall be U.L.-listed; high-power factor; certified by CBM, if such certification is available.
- I. Provide dimming LED drivers in and for all project LED lighting fixtures which are indicated on the drawings, and/or are required and intended, to be controlled by lighting dimmers, whether dimming LED drivers are specified in the respective lighting-fixture descriptions in the lighting-fixture schedule on the drawings, or not. Provide LED lamps and dimming LED drivers which are completely compatible with one another, as determined by their manufacturers, by UNDERWRITERS' LABORATORIES, and by good practice; verify all parameters and requirements in advance, and provide accordingly.
- J. Provide LED lamps for all lighting fixtures.
- K. LED lamps for interior lighting fixtures shall produce illumination having a minimum color-rendering index (CRI) of 82 and having the apparent correlated color temperature which is respectively indicated on the drawings.
- L. LED lamps for exterior lighting fixtures shall produce illumination having a minimum color-rendering index (CRI) of 75 and having the apparent correlated color temperature which is respectively indicated on the drawings.
- M. Provide lighting fixtures which have the respectively-proper input-voltage characteristics, based on the actual circuits from which they are fed, whether so indicated on the drawings and/or in the schedules or not (verify all parameters and requirements in advance, and provide accordingly).
- N. The lighting-fixture catalogue numbers which are indicated on the drawings do not necessarily contain the designations for all respectively-required options. Provide all necessary options, the requirements for which are made obvious by the respective lighting-fixture applications (verify all parameters and requirements in advance, and provide accordingly).
- O. Recessed lighting fixtures shall be equipped with thermal, safety-cutout devices, whether so designated in the respective catalogue numbers or not (verify in advance).
- P. Connect to each lighting fixture which is installed in an accessible ceiling with flexible, galvanized-steel conduit or metal-clad cable which is routed from the respective branch-circuit outlet box to such lighting fixture (6'-0" maximum length) in such of a way that will not interfere with the removal of any lay-in ceiling panels, any lighting fixtures, etc. Each such branch-circuit outlet box shall be fed from the respective source (e.g., branch-circuit panelboard, next "upstream" junction or outlet box, etc.) with E.M.T., rigid metallic conduit, or metal-clad cable (as applicable), and shall serve no more than four (4) lighting fixtures. Do not loop from lighting-fixture-to-lighting-fixture with flexible conduit or metal-clad cable.
- Q. Install exit lights so that their faces are visible from the respectively-required directions and so that their arrows (chevrons) point in the respective directions of egress, whether so shown on the drawings or not. Exit lights shall be the "red-LED" type.
- R. Each exit light shall be equipped with integral, rechargeable batteries.

#### 1.36 CENTRAL LIGHTING CONTROL SYSTEM

- A. Submittals of any kind (e.g., shop drawings, prior-approval requests, etc.) which are involved with the "Central Lighting Control System", as specified herein below and/or on

the drawings, shall include adequate verbiage and/or other information, as required to indicate that all specified characteristics, features, options, etc. will be provided. In addition, the verbiage and/or other information which verifies each specified characteristic, feature, option, etc. shall be highlighted and shall be labeled with a number that corresponds to the respective paragraph number which is contained in these specifications, or in the respective addendum or change order, for such specified characteristic, feature, option, etc. Submittals which are received without all such required verbiage and/or other information, and/or without all such highlighting and labeling, will not be reviewed and will be considered informal.

- B. Provide the central lighting control system (which is herein below referenced as "the system") that is indicated on the drawings, specified herein, intended, and required.
- C. The system shall include all equipment, devices, materials, hardware, software, interconnections, certifications, commissioning, etc. which are generally and specifically required for such a system, for "single-source responsibility".
- D. Provide (completely under this division of the project), and be completely responsible for, the entire system as indicated on the drawings, as specified herein, as required, and as intended.
- E. The system shall be complete in every respect. Provide all equipment, materials, labor, supervision, inspections, testing, calibrations, certifications, etc. which are required for a complete and functioning system, as per the owner's needs, whether so indicated on the drawings and/or specified herein or not.
- F. The system shall be installed and connected in strict accordance with installation and connection instructions, including interconnecting diagrams, from the system manufacturer. Request and obtain all required installation-and-connection instructions directly from such manufacturer in advance of the commencement of the system installation.
- G. Provide all necessary system rough-ins, including outlet boxes, junction boxes, pull boxes, raceways, electrical power cable, signal cables, monitoring cables, control cables, etc. where and as required.
- H. Provide all equipment, devices, materials, hardware, software, interconnections, system programming, certifications, calibrations, and adjustments, and all other appurtenances, which are required for the system to render all operations and functions that are indicated, specified, required, intended, and desired, including all such system operations and functions that are required, intended, and desired by the owner. Program the system so that all such system operations and functions are indeed rendered by the system, to the complete satisfaction of the owner. The respective locations which are indicated on the drawings for the various system equipment and components are approximate, and are shown only as a general guide. Locate all such equipment and components in the respective proper locations which are required for best system operation, even if not so indicated on the drawings or not so specified herein.
- I. After the installation and connection of the system is complete, test, adjust, calibrate, and certify the system (all components) as required for first-class operation, and as required for the system to operate and function in strict accordance with the requirements, intentions, and desires of the owner.
- J. The specifications for the system require that all designated and/or desired, lighting-control functions be established and continually maintained, on a 24-hour-per-day, 7-day-per-week basis (except during the times when the system is intentionally disabled), and

that all lighting branch circuits which are designated (on the drawings, herein, or elsewhere) to be controlled by the system be able to be controlled (based on easily field-reprogrammable software; and via the respectively-assigned, system, branch-circuit, control relays) by any and/or all of the system input-signal devices; provide all work which is required to accomplish this, including all required input-signal devices, control relays, software, factory programming, field reprogramming, raceways, electrical power cables, electrical signal cables, etc.

- K. The system shall be in strict accordance with the requirements of all applicable codes and governing authorities; verify all requirements in advance and provide the complete system accordingly.
- L. Each system enclosure shall be equipped with lightning/surge protection against strikes/surges on both power wiring and remote signaling wiring.
- M. The entire system (i.e., all components) shall have a minimum short-circuit-current rating of 25,000 amperes RMS.
- N. System interconnecting wiring shall be installed in raceways which are dedicated for such wiring (i.e., so as to be separate from all other wiring).
- O. Provide all materials, equipment, devices, mounting and supporting apparatuses, and connecting hardware, and all appurtenances, etc., which are required for a complete and functioning system, whether so indicated on the drawings and/or specified herein or not.
- P. After all system equipment, components, devices, materials, raceways, interconnecting wiring, etc. are installed and connected, completely program the system so as to accomplish the exact lighting-control schemes which are desired by the owner. In advance of such programming, meet directly with the owner (in the presence of the architect and the project electrical engineer), as many times as necessary (as determined by the owner), so as to present to the owner all lighting-control possibilities, to assist the owner in making the proper lighting-control decisions, and to obtain the owner's final decisions relative thereto; then utilize such obtained information in completely programming and re-programming the system, as many times as necessary without limit, until the termination of the project one-year warranty period. Be advised that it is mandatory that the initial such meeting be scheduled with the owner, the architect, and the electrical engineer so that the electrical engineer's preliminary-determined, control schemes can be presented as the starting point from which all final programming and control decisions will emanate. Be advised further that, if the initial such meeting is indeed scheduled without the owner, the architect, and the electrical engineer being present, this contractor will be required to start the process over again.
- Q. Provide to the owner, to the owner's complete satisfaction, system orientation and training by authorized factory representatives, at the times and on the dates which are stipulated by the architect and the owner, without limit, until the termination of the project one-year warranty period.
- R. Generally (but possibly not without exception; verify in advance), the basic purpose for the provision of the system is for certain interior-lighting branch circuits (as identified on the drawings) to be controlled (i.e., energized and de-energized) for manual operation and/or automatic "time-of-day" operation via the system, integral, timing function, and for such time-of-day "off" and/or "on" operations to be able to be overridden by activation of the respectively-designated, system, low-voltage, "override switches" (such time-of-day "off" operations shall be able to be overridden for easily-field-reprogrammable time durations of up to four [4] hours; factory set all such durations at the respectively-desired durations which are desired by the owner; verify in advance); for certain exterior-lighting

branch circuits (as identified on the drawings) to be controlled (i.e., energized and de-energized) for "dusk-to-dawn" operation by activation of the system, exterior photocell; and for certain exterior-lighting branch circuits (as identified on the drawings) to be controlled (i.e., energized and de-energized) for "on-at-dusk/off-at-the-preset-time" operation by activation of the system exterior photocell and the system, integral, timing function. Reference the CENTRAL LIGHTING CONTROL SYSTEM CONTROL SCHEDULES on the drawings for more information.

- S. The system equipment, components, devices, etc. shall include, but not be limited to (all equipment and devices shall be completely compatible with each other, and shall render all system operations, features, and characteristics which are indicated, specified, required, and intended; verify all parameters and requirements in advance, and provide accordingly):
1. All system software, factory programming, and field reprogramming which is required for complete system operation, including all system functions that are specified, required, and intended (verify all parameters and requirements in advance and provide accordingly);
  2. BACnet IP and Ethernet native communication network protocols, as required for complete networking with the owner's local area (data) network and the owner's wide area (data) network (via internet), and as required to allow the project energy-management system to have full control of the central lighting control system. Verify all parameters and requirements in advance, and provide accordingly;
  3. ETC "Echo", or approved equivalent by WATT-STOPPER, AUCITY, or LEVITON (as required for the application; verify all parameters and requirements in advance, including the respectively-proper voltage ratings, etc., and provide accordingly), lighting control relay cabinets ("Lighting Control Panels"; provide the types and numbers of lighting control relay cabinets that are required), each of which is:
    - a. Rated for a 120-volt, 1-phase, control-power input;
    - b. Equipped with integral, internal, timing functions (based from an integrated astronomical time clock); an integral keypad; a 2-line, 16-character, LCD screen; a USB port; and lifetime power-failure memory;
    - c. Equipped with the appropriate command module (including a power supply and a main processor unit), as required for proper operation and functionality;
    - d. Equipped with the appropriate panel interior, as required for proper operation and functionality; and
    - e. Equipped with the required quantity (verify in advance) of 20-amp-rated, 1-pole, branch-circuit, control relays;
  4. Photocells (the types which are respectively required for proper operation, and which are respectively rated for exterior application where and as required; the quantity that is indicated on the drawings and the quantity that is required); and
  5. Two-button, digital, low-voltage "override" switches (the types which are respectively required for proper operation; the quantity that is indicated on the drawings and the quantity that is required).

#### 1.37 EQUIPMENT CONNECTIONS

- A. Connect all project equipment, regardless of who actually furnishes such equipment.
- B. Provide junction-box connections and/or receptacles of the proper configurations, ratings, and sizes where and as required to accept the respective plugs on the equipment, and provide matching plugs on equipment cords where and as required.

- C. Information which is presented on the electrical drawings for connection of equipment is based on information which was furnished during the design phases of the project from certain manufacturers, from certain suppliers, and/or from the owner. The possibility exists that the actual requirements for the electrical connections for some or all of such equipment differ from the requirements which are respectively depicted on the project electrical drawings. Provide the facilities which are required for the equipment that will actually be installed. Make allowances in the project proposal as required to accommodate changes in the requirements of the equipment due to changes in the equipment which is actually furnished by such manufacturers, and/or due to changes in the equipment suppliers and/or manufacturers. Bring all conflicts to the immediate attention of the architect for resolution well in advance of the commencement of any work which is associated with equipment connections.
- D. Well in advance of preparing the project electrical-equipment shop drawings and well in advance of ordering any project electrical equipment, and as part of the requirements and work of this project division:
1. Employ, coordinate directly with, and pay (if such payment is required) the respective suppliers/vendors of all project electrified equipment and/or the respective project subcontractors who are providing all project electrified equipment, as respectively applicable:
    - a. To review all respective equipment electrical characteristics and requirements which are indicated and/or given on any of the project drawings and/or in any of the project specifications; and
    - b. To determine whether or not each bit of the information that is relevant to such indicated equipment electrical characteristics and requirements is accurate for the exact respective equipment which is being furnished for the project;
  2. Have such suppliers/vendors and/or subcontractors, as respectively applicable:
    - a. Verify, in no uncertain terms, with proper documentation, which bits of the information that is relevant to such indicated equipment electrical characteristics and requirements are indeed so accurate; and
    - b. Furnish the respective, properly-corrected, equipment electrical characteristics and requirements for all indicated equipment electrical characteristics and requirements which are not so accurate;
  3. Submit all such verifying and/or correcting documentation to the architect, in a timely manner, in the same formats in which the respective equipment electrical characteristics and requirements were originally indicated and/or given. For example,:
    - a. For all equipment electrical characteristics and requirements which were originally indicated and/or given in the form of equipment schedules, submit the respective, properly-corrected, equipment electrical characteristics and requirements in the form of corrected, similar, equipment schedules;
    - b. For all equipment electrical characteristics and requirements which were originally indicated and/or given in the form of equipment notes, submit the respective, properly-corrected, equipment electrical characteristics and requirements in the form of corrected, similar, equipment notes;
    - c. For all equipment electrical characteristics and requirements which were originally indicated and/or given in the form of specification verbiage, submit the respective, properly-corrected, equipment electrical characteristics and requirements in the form of corrected, similar, specification verbiage; etc.
- E. Rough-in in accordance with drawings and/or other information which is supplied by the respective equipment suppliers and/or manufacturers (request and obtain, well in

advance and directly from the respective equipment suppliers and/or manufacturers, all relevant information).

**1.38 ELECTRICAL COORDINATION WITH THE PROJECT, BUILDING AND AUTOMATIC, TEMPERATURE CONTROLS (PRIOR TO MAKING THE PROJECT PROPOSAL)**

- A. Given the nature of the evolving technology in the field of building and automatic temperature controls, as well as the differences between and among the equipment and systems of the various manufacturers, it is possible that temperature-control devices with various voltage characteristics and requirements (e.g., 120 volts, single-phase, 60Hz.; 24 volts AC or DC; etc.) have been specified in the HVAC divisions of the project (verify in advance).
- B. It is the responsibility of the project general contractor, the project mechanical subcontractor, the project electrical subcontractor, and the project temperature-controls subcontractor to coordinate, prior to making the project proposal, as required to ensure that all electrical provisions and accommodations for all project temperature-control devices and work (i.e., materials; equipment; raceways; circuit breakers; electrical power, signal, and control wiring; devices; terminations; connections; installation; labor; etc.) which are required to render a complete and working, temperature-controls system are included in the project proposal and work.
- C. If the project general contractor and such applicable project subcontractors fail to accomplish such coordination prior to making the project proposal, and/or if they fail to include all such electrical provisions and accommodations in the project proposal pricing, then the cost to provide such electrical provisions and accommodations shall be borne solely by the project general contractor and such applicable subcontractors.
- D. No additional cost will be paid by the owner to the project general contractor or to the applicable subcontractors for failure to accomplish such coordination prior to making the project proposal. Reference the applicable HVAC divisions of the project specifications, in advance, for the building and automatic, temperature-controls sequences of operation, EMS point lists, product data, etc.

**1.39 GROUNDING AND BONDING**

- A. Electrical work for system grounding and bonding of circuits and equipment shall conform fully to NFPA 70: National Electrical Code, particularly Article 250, including the other articles which are referenced in 250.4 for particular case applications.
- B. Each raceway system shall enclose a separate, insulated (with green-colored insulation), equipment-grounding conductor. Provide such ground-fault/transient-current return conductor regardless of whether or not the raceway system itself provides an adequate equipment-grounding return path.
- C. System-grounding and equipment-grounding conductors shall be sized in strict accordance with Sections 250-66 and 250-122, respectively, of the National Electrical Code. Adjust the respective sizes which are indicated on the drawings as required to accommodate changes (such as design-manufacture differences, design changes, etc.), voltage drop, etc.
- D. Grounding conductors which are sized No. 8AWG or larger shall be stranded.
- E. Grounding-conductor connections shall be braze, irreversible-crimp, or thermal-weld connected to structural steel and to ground rods.



- F. Grounding-conductor connections to equipment-ground busses, fences, pipes, and wiring devices shall be mechanically bolted, clamped, or screwed, with the proper tightening torque, as required by the respective manufacturer, or by Article 110-14 of the National Electrical Code if the manufacturer's(s') recommendations are unavailable.
- G. Grounding-electrode conductors shall be installed in non-ferrous raceways to the full extent which is practicable.
- H. Grounding systems shall be tested for electrode-to-ground resistance utilizing instruments. Grounding-system electrode-to-ground-resistance magnitudes which exceed the respective, code-allowed, maximum values are unacceptable and shall be remedied.
- I. Grounding-electrode systems shall consist of 3/4" diameter x 10'-0" long (minimum), copper-clad steel rods; facility structural steel; the metallic cold-water-pipe system; the metallic natural-gas-pipe system; and concrete-encased electrodes.
- J. Building structural-steel columns shall be grounded in accordance with IEEE Green Book and industry standards.

END OF DIVISION 26 00 00

## DIVISION 27 00 00 - COMMUNICATIONS

### 1.1 BASIC ELECTRICAL REQUIREMENTS

- A. The specifications for the project electrical work are included in Divisions 26 00 00, 27 00 00, and 28 00 00. The separation of the project electrical specifications into such divisions is for the sole purpose of convenience. The specifications of any of these divisions shall hold for all such divisions the same as if they were stated in each division.
- B. The word "shall", where used, is to characterize mandatory requirements, and the word "should", where used, is to characterize advisories. The word "may" is used in the permissive sense.
- C. Unless noted otherwise, the word "provide" shall be interpreted to mean "furnish, install, and connect as required to be complete and ready for the intended use" when referencing connectible items, equipment, and/or materials which are associated with the electrical work; shall be interpreted to mean "furnish and install as required to be complete and ready for the intended use" when referencing unconnectible items, equipment, and/or materials which are associated with the electrical work; and shall be interpreted to mean "furnish as required to be complete and ready for the intended use" when referencing electrical work which is neither installable nor connectible.

### 1.2 TELECOMMUNICATION BACKBOARD, OUTLETS, RACEWAYS, ETC.

- A. Provide a new, 3/4" thick, fireproofed-plywood, telecommunication backboard where and as shown on the drawings. Unless shown otherwise, such backboard shall be 4'-0" wide x 8'-0" high. Unless noted otherwise, provide on such backboard plugmold, with 120V, 15A, 3W grounding, single receptacles 6" on-center, for the full width of the backboard, and connect such plugmold receptacles to a separate, dedicated, 20-amp, 120-volt, branch circuit. Provide at and for such backboard a 1/4" thick x 2" high, copper, telecommunication equipment-ground bar for the full width of such backboard; insulate such equipment-ground bar from such backboard and from the wall, and label such equipment-ground bar as "telecommunication ground bar". Provide a No. 6 AWG, green-insulated, copper, equipment-grounding cable, in a 1/2" PVC Schedule 40 conduit, from such equipment-ground bar to the incoming electrical-service, system-grounding electrode, and provide the proper grounding connections.
- B. Provide two (2) 2-1/2" empty raceways, with pull wires, from the telecommunication backboard to each, separated, contiguous, accessible, above-ceiling space at each facility main building floor level, for communication use. As a clarification, such raceways shall be such that communication cabling will be able to be routed (presently or in the future) through them from any, project, above-ceiling space (so as to avoid exposed communication cabling).
- C. Locate, at the facility main building, the existing, incoming, communication-service conduit, and extend such conduit to the proper location at the new, telecommunication backboard (verify in advance).
- D. Provide an "all-communication outlet (ACO)", consisting of a single-gang outlet box (which is recessed to the full extent that is practicable) and a blank cover plate, at each location where telephone (voice), computer (data), and/or cable-television/internet service(s) is/are required.
- E. Provide an empty raceway, which is similar to a 1" conduit, with pull wire, from each ACO to an accessible location above the ceiling of the respective, facility, main building, floor level, unless shown on the drawings otherwise.

- F. Communication raceways shall be as that which is specified herein for power with bushed ends. Each raceway shall not contain more than two (2) elbows or 90-degree angle bends between pull points, or more than one hundred (100) feet in length between pull points. Each bend shall be the "long-radius" type. Leave a #9 galvanized pull wire, or a nylon pull cord, in each raceway.
- G. Rod all underground communication raceways (if any; verify), and make certain that such raceways are free of dirt, water, and other debris. Seal all unused underground raceways.
- H. Coordinate fully with the local communication-service company, and with the owner, request them to make an inspection of the work, and make the respective work meet entirely with their approval.

END OF DIVISION 27 00 00

## DIVISION 28 00 00 - ELECTRONIC SAFETY AND SECURITY

### 1.1 BASIC ELECTRICAL REQUIREMENTS

- A. The specifications for the project electrical work are included in Divisions 26 00 00, 27 00 00, and 28 00 00. The separation of the project electrical specifications into such divisions is for the sole purpose of convenience. The specifications of any of these divisions shall hold for all such divisions the same as if they were stated in each division.
- B. The word "shall", where used, is to characterize mandatory requirements, and the word "should", where used, is to characterize advisories. The word "may" is used in the permissive sense.
- C. Unless noted otherwise, the word "provide" shall be interpreted to mean "furnish, install, and connect as required to be complete and ready for the intended use" when referencing connectible items, equipment, and/or materials which are associated with the electrical work; shall be interpreted to mean "furnish and install as required to be complete and ready for the intended use" when referencing unconnectible items, equipment, and/or materials which are associated with the electrical work; and shall be interpreted to mean "furnish as required to be complete and ready for the intended use" when referencing electrical work which is neither installable nor connectible.

### 1.2 FIRE ALARM, CONTROL, AND MONITORING SYSTEM

- A. Submittals of any kind (e.g., shop drawings, prior-approval requests, etc.) which are involved with the "Fire Alarm, Control, and Monitoring System", as specified herein and/or on the drawings, shall include adequate verbiage and/or other information, as required to indicate that all specified characteristics, features, options, etc. will be provided. In addition, the verbiage and/or other information verifying each specified characteristic, feature, option, etc. shall be highlighted and shall be labeled with a number corresponding to the respective paragraph number which is contained in these specifications, or in the respective addendum or change order, for such specified characteristic, feature, option, etc. Submittals which are received without all such required verbiage and/or other information, and/or without all such highlighting and labeling, will not be reviewed and will be considered informal.
- B. Complete shop drawing information (both equipment brochures and drawings) shall be submitted to the architect for review, and all corrections which are required thereto shall be made prior to the submission of such documentation to the state fire marshal's office.
- C. Furnish all documentation (e.g., certification and/or proof of the possession of the proper licensing; shop drawings, system riser diagrams, and battery and power-supply calculations; submittal application forms; etc.) which is required by the state fire marshal's office, and by all other applicable governing authorities.
- D. Provide a complete, 24-volt D.C., fire alarm, control, and monitoring system (which is herein referenced as "the system") where and as shown on the drawings, where and as specified herein, where and as required, and where and as intended.
- E. The system shall be fully-operational; shall be a U.L.-listed, electrically-supervised, analog-addressable (i.e., each initiating device and each monitoring device which is connected to the system shall be a separate addressable point), fully-programmable, multiplex-wired, non-coded system that is arranged for a 120-volts AC power input.
- F. The system shall have all options activated at the time of installation and connection. No codes shall be required to be entered in order to perform tests or repairs unless the

requirement for such codes is approved in advance by the owner. If such codes are required to be entered (as approved in advance by the owner), such codes shall be given to the owner and shall not, in perpetuity, be changed or modified, in any way, without advanced, written consent of the owner.

- G. The system shall, during the times of all general fire-alarm conditions, produce in all areas of the facility main building a general alarm consisting of audible indications (utilizing horns) and visual indications (utilizing strobes which are lettered "fire") that are completely code-approved and approved by the state fire marshal.
- H. In strict accordance with the accessibility requirements of ADA-ABA, the system shall include all accommodations which are required for the future system notification devices that are required (even though not necessarily indicated). As part of this project, such accommodations shall include, but not necessarily be limited to, the required system addressable modules, battery capacity, power-supply capacity; etc. for accommodating all such locations.
- I. The system shall implement all control functions which are required by all applicable codes and governing authorities, whether so indicated on the drawings and/or specified herein, or not. Provide all equipment and items of work which are required to accomplish such, whether so indicated on the drawings and/or specified herein, or not.
- J. The system shall implement remote, general-alarm and trouble-alarm signals from auxiliary, general-alarm and trouble-alarm contacts which are located at the fire-alarm, control, and monitoring system main control panel (that is herein referenced as "the fire-alarm panel"), via the facility telecommunication system, to the remote monitoring station that is selected by the owner (provide all work which is required to accomplish this remote monitoring, including all required relays; all required remote-dialing-and-sending equipment [DACT's], all required raceways and signal cabling, etc.).
- K. The system shall cause recall of the elevator upon activation of any of the smoke detectors which are located in the elevator lobbies, in the elevator shaft, and/or in the elevator machine room.
- L. Whether so indicated on the drawings or not, the system shall cause the required shutdown of all project air-handling units upon activation of the appropriate duct-type, smoke detectors; provide all electrical work, devices, and equipment which are required to accomplish such, including all required control relays, etc.
- M. Whether so indicated on the drawings or not, the system shall, upon activation, cause the closing of all project fire and smoke dampers; provide all electrical work, devices, and equipment which are required to accomplish such, including all required control relays, etc.
- N. Whether so indicated on the drawings or not, the system shall, upon activation, cause the muting of all sound systems at the facility main building; provide all electrical work, devices, and equipment which are required to accomplish such, including all required control relays, etc.
- O. The system, upon activation, shall cause the electric release of all doors at the facility main building which are equipped with electrically-operated locking mechanisms or hold-open devices (that shall be provided), and shall cause the closing of all doors at the facility main building which are equipped with electrically-operated closing mechanisms, via the respective, system, door-release control relays (that shall be provided), whether so indicated on the drawings or not; verify all parameters and requirements in advance, and provide accordingly.

- P. The system shall be in strict accordance with all applicable codes, including, but not limited to, NFPA 70, NFPA 72, NFPA 101, the International Building Code, and the Americans with Disabilities Act (ADA-ABA); and shall be in strict accordance with all requirements of the state fire marshal's office and all other governing authorities, and with all requirements and instructions of the owner.
- Q. Install all interconnecting wiring in raceways which are dedicated for such wiring (i.e., so as to be separate from all other wiring), except that interconnecting wiring that is located above accessible ceilings (only) may be routed without raceways, as long as such wiring is rated for use in spaces for environmental air (plenums) where required, is supported from the true ceilings above (via "J" hooks, etc.) and not from the drop ceilings, does not interfere with the removal of any ceiling tiles, and is totally accessible. As a clarification, only suspended, grid-type ceilings having easily-removal ceiling tiles are considered to be "accessible ceilings" (as referenced in this paragraph).
- R. The system shall be capable of supervising short circuits and open circuits within circuit-wiring loops, and of giving the appropriate trouble indications at the fire-alarm panel, and at the remote annunciation panel (that shall be provided).
- S. Interconnections shall be in strict accordance with wiring diagrams which are supplied by the system manufacturer; request and obtain all relevant information in advance. The conductor sizes shall be as recommended and required by the system manufacturer/supplier, taking voltage drop into account, and shall meet all requirements of Article 760 of the National Electrical Code for fire-alarm use.
- T. The system wiring and equipment, including all circuits which are controlled and powered by the system, shall be installed and connected in accordance with the requirements of NFPA 72 and of NFPA 70, National Electrical Code, Article 760.
- U. Label interconnecting wiring, and termination points, using a method which is approved in advance by the architect. The exact designation which is used for each run of interconnecting wiring, and for each termination point, shall be as approved in advance by the architect.
- V. Locate the fire-alarm panel in the exact location which is stipulated by the architect (subject, of course, to approval by the governing authorities). If located in a finished space, the fire-alarm panel shall be flush mounted or semi-flush mounted; if located in an unfinished space, the fire-alarm panel shall be surface mounted (verify in advance).
- W. The remote annunciation panel shall be flush mounted or semi-flush mounted, and shall be located in the exact location which is stipulated by the architect (subject, of course, to approval by the governing authorities) near the facility entrance that is designated by the local fire authorities. The remote, annunciation panel might not be indicated on the drawings near such particular facility entrance; verify with the local fire authority, in advance, the required facility entrance for the remote, annunciation panel and locate it accordingly.
- X. The fire-alarm panel shall have a see-through, lockable door and shall have the number of addressable modules which is required by all applicable codes and governing authorities; which is dictated by good practice; and which is needed to accommodate all system devices that are indicated on the drawings, specified herein, and required for this project, including the future devices which are referenced herein above, plus at least twenty-five percent (25%) additional, future devices.

- Y. The fire-alarm panel shall be complete with lightning/surge protection against strikes/surges on both power wiring and remote signaling wiring.
- Z. Whenever any initiating device is activated:
1. A red LED at the fire-alarm panel shall light;
  2. A red LED at the remote annunciation panel shall light;
  3. A full LCD readout at the fire-alarm panel and at the remote annunciation panel shall display the respective initiating-device type, the respective initiating-device location, and the date and time of the respective initiating condition;
  4. An audible alarm at the fire-alarm panel shall sound, until manually silenced;
  5. A general alarm which is completely code-approved and approved by the state fire marshal shall occur in all areas of the facility main building;
  6. The muting of all sound systems at the facility main building shall occur;
  7. The electric release of all doors at the facility main building which are equipped with electrically-operated locking mechanisms or hold-open devices, and the closing of all doors at the facility main building which are equipped with electrically-operated closing mechanisms, shall occur;
  8. All other required control functions shall occur; and
  9. The appropriate general-alarm signal shall be sent to the above-referenced, remote monitoring station.
- AA. Whenever trouble is detected by any supervising or monitoring circuit:
1. An amber LED at the fire-alarm panel shall light;
  2. An amber LED at the remote annunciation panel shall light;
  3. A full LCD readout at the fire-alarm panel and at the remote annunciation panel shall display the troubled-device type, the troubled-device location, and the date and time of the trouble condition;
  4. An audible trouble alarm at the fire-alarm panel shall sound, until manually-silenced; and
  5. The appropriate trouble-alarm signal shall be sent to the above-referenced, remote monitoring station.
- BB. Whenever any smoke detector which is located in an elevator lobby, in the elevator shaft, or in the elevator-machine room is activated, it shall, in addition to the actions that are stipulated herein for all initiating devices, cause "recall" of the elevator, in strict accordance with all requirements of all applicable codes and governing authorities.
- CC. The fire-alarm panel shall have rechargeable, long-life, battery backup. Such battery capacity shall be in strict accordance with all applicable codes, including, but not limited to, NFPA 70, NFPA 72, NFPA 101, and the Americans with Disabilities Act (ADA-ABA), and in strict accordance with all requirements of the state fire marshal's office and all other governing authorities, as required to accommodate all system devices which are shown on the drawings, specified herein, and required for this project, including the future devices which are referenced herein above, plus twenty-five percent (25%) spare capacity. Under maximum normal load of the system, plus twenty-five percent (25%) future load, such battery backup shall be sufficient to operate the system for twenty-four (24) hours (longer if so required by any applicable code and/or governing authority; verify in advance) and then, at the end of such period, be sufficient to operate all notification appliances which are used for evacuation or to direct aid to the location of an emergency for five (5) minutes (longer if so required by any applicable code and/or governing authority; verify in advance). Reference NFPA72:1-5.2.5 for additional information.
- DD. The integral power-supply capacity shall be in strict accordance with all applicable codes, including, but not limited to, NFPA 70, NFPA 72, NFPA 101, and the Americans with Disabilities Act (ADA-ABA), and in strict accordance with all requirements of the state fire marshal's office and all other governing authorities, as required to accommodate all

system devices which are shown on the drawings, specified herein, and required for this project, including the future devices which are referenced herein above, plus twenty-five percent (25%) spare capacity.

- EE. Each initiating device and each monitoring device shall be an individual addressable point.
- FF. The outlet box for each smoke detector shall be flush-mounted; each smoke detector shall have an LED indicator; and each smoke detector shall be an individual analog-addressable point.
- GG. Whether so indicated on the drawings or not, provide a smoke detector at the appropriate location near each piece of system equipment including, but not limited to, the main fire-alarm panel, each auxiliary fire-alarm panel, the remote annunciation panel, each remote power supply unit, each battery-booster unit, the telecommunication backboard, etc., in strict accordance with the requirements of all applicable codes and governing authorities. Verify all parameters and requirements, and provide accordingly.
- HH. In each location where a smoke detector is indicated on the drawings and/or specified herein to be provided, and, for any reason, a smoke detector would not operate properly for the application, provide, instead, a heat detector (verify all parameters and requirements in advance, and provide accordingly).
- II. Each duct-type, smoke detector shall be complete with a duct-detector housing, a sampling tube, and contacts as required for alarm initiation and air-handling-unit shutdown, and shall be an individual addressable point. Whether so indicated on the drawings or not, provide a strategically-located, remote signal indicator for each duct-type, smoke detector which is located in an equipment room or in another area that is hidden from normal view.
- JJ. Whether so indicated on the drawings or not, provide a duct-type smoke detector at and for the supply-air duct of each project air-handling unit, and at and for the return-air duct of each project air-handling unit. Also, whether so indicated on the drawings or not, provide additional duct-type smoke detectors at and for the supply-air ducts of each project air-handling unit as required to accommodate air-duct configurations which cannot prudently be accommodated by a single duct-type smoke detector; and at and for the return-air ducts of each project air-handling unit as required to accommodate air-duct configurations which cannot prudently be accommodated by a single duct-type smoke detector. Verify all parameters and requirements in advance, and provide accordingly.
- KK. Each heat detector shall be the rate-of-rise type with a fixed temperature setting of 135 degrees F.
- LL. Where ambient conditions prohibit installation of a smoke detector, provide a heat detector instead.
- MM. Where possible, each alarm-indicating device shall be the flush-mounted type.
- NN. Each visual device shall produce the illumination intensity that is respectively required by all applicable codes (including A.D.A. and NFPA 72) and by all applicable governing authorities for the particular application. Provide visual devices having the illumination intensities which are respectively required to meet such requirements. As a clarification, the locations which are respectively indicated on drawings for the visual devices are presented only as a general guide, with no guaranty as to accuracy. It is this contractor's responsibility to provide visual devices in the proper locations, and having the respectively-proper intensity ratings, which are required for the respective applications, at



- no additional cost to the owner. Verify all parameters and requirements in advance of producing the system shop drawings, and in advance of making the required system-shop-drawing submittal to the fire marshal's office; indicate the respectively-required, visual-alarm-device locations and intensity ratings in such shop drawings; and provide all such required devices accordingly. Provide all additional system visual devices which subsequently become required (e.g., as a result of the fire marshal office's review of the system shop drawings, during the project construction, during and/or following the fire marshal office's project final inspection, etc.), at no additional cost to the owner.
- OO. Provide horns (audible devices) which will produce the sound levels that are respectively required so that they will be heard above all ambient noise. The total sound pressure which is produced by combining the ambient sound pressure level with all audible notification appliances operating shall not exceed 110 dBA at the minimum hearing distance. Where audible appliances are provided in mechanical equipment rooms, the average ambient sound level which is used for design guidance shall be 85 dBA. To ensure that audible signals are clearly heard, they shall have a sound level at least 15 dB above the average ambient sound level or 5 dB above the maximum sound level having a duration of at least sixty (60) seconds, whichever is greater, measured at 5 feet above the floor in the area which is required to be served by the system, using the A-weighted scale (dBA).
- PP. Further, provide audible devices (horns) which are located as respectively required, which are equipped with the respectively-required taps, and which have the respectively-required, sound-producing intensities as necessary to meet all requirements of all applicable codes (including ADA-ABA and NFPA 72) and applicable governing authorities for the particular applications. As a clarification, the locations which are respectively indicated on drawings for the audible devices are presented only as a general guide, with no guaranty as to accuracy. It is this contractor's responsibility to provide audible devices in the proper locations, and having the respectively-proper sound-intensity ratings and characteristics, which are required for the respective applications, at no additional cost to the owner. Verify all parameters and requirements in advance of producing the system shop drawings, and in advance of making the required system-shop-drawing submittal to the fire marshal's office; indicate the respectively-required, audible-alarm-device locations and intensity ratings in such shop drawings; and provide all such required devices accordingly. Provide all additional system audible devices which subsequently become required (e.g., as a result of the fire marshal office's review of the system shop drawings, during the project construction, during and/or following the fire marshal office's project final inspection, etc.), at no additional cost to the owner.
- QQ. Where practicable, provide combination audible-visual-type, alarm-indicating devices in lieu of providing two (2) separate devices.
- RR. To the full extent which is practicable (i.e., where allowed by all applicable codes and governing authorities), provide system devices which are white in color.
- SS. Locate audible-visual type and visual-only type, system alarm-indicating devices in strict accordance with the applicable articles, sections, and paragraphs of NFPA72.
- TT. Wall mount each system pull station at 4'-0" A.F.F.
- UU. For each system pull station which is required to be mounted to the framing of an aluminum-framed or steel-framed, glass wall, provide a pull-station back box (PSB) which is manufactured and rated for the exact application. Each such PSB shall be a SPACE AGE ELECTRONICS, INC. Part No. SSU03171 (Red), Part No. SSU03172 (White), Part No. SSU03173 (Black), or Part No. SSU03174 (Bronze) PSB, depending on the required

color (which shall be as selected in advance by the architect; verify), or approved equivalent.

- VV. Whether indicated on the drawings or not, provide an audible-visual alarm device, or a visual-only alarm device, within fifteen feet (15'-0") of each end of each corridor, as per the requirements of all applicable codes and governing authorities.
  - WW. Provide auxiliary general-alarm and trouble-alarm contacts at the fire-alarm panel, and as needed on the addressable loop(s), for remote signaling. Provide a 1" conduit, and the appropriate signal cables, from the fire-alarm panel to the telecommunication backboard for remote monitoring.
  - XX. Provide (including all required materials and labor) an additional fifteen percent (15%), but no less than one (1), of each different type of initiating device, and of each different type of notification device, being otherwise provided, the exact locations for which will be established before the completion of the project construction. Deliver to the owner for their use as spare devices, and obtain a signed receipt for, all such devices for which locations have not been established before the termination of the project.
  - YY. Fully test and certify the system, including activating all alarm, monitoring, and control initiating devices, and all equipment, under simulated fire and power-failure conditions, prior to acceptance. The tests shall be conducted by the system supplier, and shall be witnessed by the architect and/or the owner, or by their authorized representative (as determined in advance by the architect; schedule all such testing well in advance with the architect). The system shall be proven to operate in strict accordance with the requirements of all applicable codes and governing authorities, with all performance criteria which are stipulated herein and required, and with good practice. The system shall be proven to perform satisfactorily after a single break or ground-fault condition.
  - ZZ. Furnish to the owner, to the owner's complete satisfaction, system orientation and training by authorized factory representatives, at the times and on the dates which are stipulated by the architect and the owner, without limit, until the termination of the project one-year warranty period.
  - AAA. The system shall be manufactured by NOTIFIER, EST, FCI/GAMEWELL, TYCO/SIMPLEX/GRINNELL, FARADAY, SIEMENS, FARENHYT, HOCHIKI, MIRCOM, or JOHNSON CONTROLS, or shall be approved equivalent.
- 1.3 FACILITY SECURITY SYSTEMS (E.G., ACCESS-CONTROL SYSTEM, INTRUSION-ALARM SYSTEM, SURVEILLANCE-CAMERA SYSTEM)
- A. The project, facility security systems (e.g., access-control system, intrusion-alarm system, surveillance-camera system), which are herein after collectively referenced as "the systems", will be contracted separately (i.e., external to Divisions 26 00 00, 27 00 00, and 28 00 00) with a security-system vendor/contractor.
  - B. As per the project owner's mandate, contact directly, and coordinate directly with, such separate, security-system, vendor/contractor; determine exactly which rough-ins and electrical-power connections/circuiting will be required for the systems; and provide, as part of this project construction contract, all such required system rough-ins and electrical-power connections/circuiting. Therefore, and as a further clarification, all project work regarding and/or involved with the rough-ins and electrical-power connections/circuiting which are required for the systems shall fall under the scope and responsibility of the project electrical subcontractor (i.e., under this division of the project).

- C. The rough-ins for the systems shall include, but not be limited to, all required outlet boxes, trim rings, junction boxes, pull boxes, cover plates, raceways, pull wires, etc. (verify all requirement in advance, and provide accordingly).
- D. The electrical-power connections/circuiting for the systems shall include, but not be limited to, all required outlet boxes, trim rings, junction boxes, pull boxes, cover plates, raceways, pull wires, electrical cables, branch circuit breakers, receptacles, terminations, connections, etc. (verify all requirement in advance, and provide accordingly).
- E. Provide all required rough-ins and electrical-power connections/circuiting for the systems in a timely manner, the schedule for which shall be established and/or approved in advance by such separate security-system vendor/contractor, and the owner.
- F. For the purpose of making the project proposal, include in the proposal an allowance of \$6,000.00 for the project work which is associated with the required rough-ins and electrical-power connections/circuiting for the systems, but which is in addition to any system rough-ins and electrical-power connections/circuiting which are indicated on the drawings. The actual amount which will be paid to this contractor for such project work will be adjusted upward (in the form of an additive change order) or downward (in the form of a credit change order) from such figure when the actually-required rough-ins and electrical-power connections/circuiting are established.

END OF DIVISION 28 00 00

SECTION 265100 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior lighting fixtures, lamps, and ballasts.
2. Emergency lighting units.
3. Exit signs.
4. Lighting fixture supports.
5. Retrofit kits for fluorescent lighting fixtures.

B. Related Sections:

1. Division 26 Section "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.
2. Division 26 Sections for architectural dimming and control systems.
3. Division 26 Section "Wiring Devices" for manual wall-box dimmers for incandescent lamps.

1.3 DEFINITIONS

- A. BF: Ballast factor.
- B. CCT: Correlated color temperature.
- C. CRI: Color-rendering index.
- D. HID: High-intensity discharge.
- E. LER: Luminaire efficacy rating.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting fixture, including ballast housing if provided.

## 1.4 SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation.
  - 1. Include data on features, accessories, finishes, and the following:
    - a. Physical description of lighting fixture including dimensions.
    - b. Emergency lighting units including battery and charger.
    - c. Ballast, including BF.
    - d. Energy-efficiency data.
    - e. Life, output (lumens, CCT, and CRI), and energy-efficiency data for lamps.
- B. Shop Drawings: For nonstandard or custom lighting fixtures. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 2. Wiring Diagrams: For power, signal, and control wiring.
- C. Operation and Maintenance Data: Submit maintenance data and parts list for each interior lighting fixture and accessory; including “trouble-shooting” maintenance guide.

## 1.5 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910, complying with the IESNA Lighting Measurements Testing & Calculation Guides.
- C. 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.
- D. Comply with NFPA 70.
- E. FM Global Compliance: Lighting fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

## 1.6 COORDINATION

- A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including wires/cables, electrical boxes and fittings, raceways, HVAC equipment, fire-suppression system, and partition assemblies.
- B. Handle interior lighting fixtures carefully to prevent damage, breaking, and scoring of finishes.

1. Do not install damaged units or components; replace with new.

## 1.7 WARRANTY

- A. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.
  1. Warranty Period for Emergency Lighting Unit Batteries: 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining nine years.
  2. Warranty Period for Emergency Fluorescent Ballast and Self-Powered Exit Sign Batteries: Seven years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining six years.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Products: See Light Fixture Schedule on Drawings.

### 2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Incandescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5A.
- C. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
- D. HID Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5B.
- E. Metal Parts: Free of burrs and sharp corners and edges.
- F. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.
- G. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- H. Diffusers and Globes:
  1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

- a. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
  - b. UV stabilized.
  2. Glass: Annealed crystal glass unless otherwise indicated.
- I. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts.
1. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
  2. Label shall include the following lamp and ballast characteristics:
    - a. "USE ONLY" and include specific lamp type.
    - b. Lamp diameter code (T-4, T-5, T-8, etc.), tube configuration (twin, quad, triple, etc.), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.
    - c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for
    - d. HID luminaires.
    - e. Start type (preheat, rapid start, instant start, etc.) for fluorescent and compact fluorescent luminaires.
    - f. ANSI ballast type (M98, M57, etc.) for HID luminaires.
    - g. CCT and CRI for all luminaires.
- J. Electromagnetic-Interference Filters: Factory installed to suppress conducted electromagnetic interference as required by MIL-STD-461E. Fabricate lighting fixtures with one filter on each ballast indicated to require a filter.

### 2.3 BALLASTS FOR LINEAR FLUORESCENT LAMPS

- A. General Requirements for Electronic Ballasts:
1. Comply with UL 935 and with ANSI C82.11.
  2. Designed for type and quantity of lamps served.
  3. Ballasts shall be designed for full light output unless another BF, dimmer, or bi-level control is indicated.
  4. Sound Rating: Class A.
  5. Total Harmonic Distortion Rating: Less than 10 percent.
  6. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
  7. Operating Frequency: 42 kHz or higher.
  8. Lamp Current Crest Factor: 1.7 or less.
  9. BF: 0.88 or higher.
  10. Power Factor: 0.95 or higher.
  11. Parallel Lamp Circuits: Multiple lamp ballasts shall comply with ANSI C82.11 and shall be connected to maintain full light output on surviving lamps if one or more lamps fail.
- B. Luminaires controlled by occupancy sensors shall have programmed-start ballasts.
- C. Electronic Programmed-Start Ballasts for T8, T5 and T5HO Lamps: Comply with ANSI C82.11 and the following:
1. Lamp end-of-life detection and shutdown circuit for T5 diameter lamps.
  2. Automatic lamp starting after lamp replacement.

- D. Electromagnetic Ballasts: Comply with ANSI C82.1; energy saving, high-power factor, Class P, and having automatic-reset thermal protection.
  - 1. Ballast Manufacturer Certification: Indicated by label.
- E. Single Ballasts for Multiple Lighting Fixtures: Factory wired with ballast arrangements and bundled extension wiring to suit final installation conditions without modification or rewiring in the field.
- F. Ballasts for Low-Temperature Environments:
  - 1. Temperatures 0 Deg F and Higher: Electronic type rated for 0 deg F starting and operating temperature with indicated lamp types.
  - 2. Temperatures Minus 20 Deg F and Higher: Electromagnetic type designed for use with indicated lamp types.
- G. Ballasts for Residential Applications: Fixtures designated as "Residential" may use low-power-factor electronic ballasts having a Class B sound rating and total harmonic distortion of approximately 30 percent.
- H. Ballasts for Low Electromagnetic-Interference Environments: Comply with 47 CFR 18, Ch. 1, Subpart C, for limitations on electromagnetic and radio-frequency interference for consumer equipment.
- I. Ballasts for Dimmer-Controlled Lighting Fixtures: Electronic type.
  - 1. Dimming Range: 100 to 5 percent of rated lamp lumens.
  - 2. Ballast Input Watts: Can be reduced to 20 percent of normal.
  - 3. Compatibility: Certified by manufacturer for use with specific dimming control system and lamp type indicated.
  - 4. Control: Coordinate wiring from ballast to control device to ensure that the ballast, controller, and connecting wiring are compatible.
- J. Ballasts for Bi-Level Controlled Lighting Fixtures: Electronic type.
  - 1. Operating Modes: Ballast circuit and leads provide for remote control of the light output of the associated lamp between high- and low-level and off.
    - a. High-Level Operation: 100 percent of rated lamp lumens.
    - b. Low-Level Operation: 50 percent of rated lamp lumens.
  - 2. Ballast shall provide equal current to each lamp in each operating mode.
  - 3. Compatibility: Certified by manufacturer for use with specific bi-level control system and lamp type indicated.
- K. Ballasts for Tri-Level Controlled Lighting Fixtures: Electronic type.
  - 1. Operating Modes: Ballast circuit and leads provide for remote control of the light output of the associated lamp between high- and low-level and off.
    - a. High-Level Operation: 100 percent of rated lamp lumens.
    - b. Low-Level Operation: 30 and 60 percent of rated lamp lumens.
  - 2. Ballast shall provide equal current to each lamp in each operating mode.



3. Compatibility: Certified by manufacturer for use with specific tri-level control system and lamp type indicated.

#### 2.4 BALLASTS FOR COMPACT FLUORESCENT LAMPS

- A. Description: Electronic-programmed rapid-start type, complying with UL 935 and with ANSI C 82.11, designed for type and quantity of lamps indicated. Ballast shall be designed for full light output unless dimmer or bi-level control is indicated:
  1. Lamp end-of-life detection and shutdown circuit.
  2. Automatic lamp starting after lamp replacement.
  3. Sound Rating: Class A.
  4. Total Harmonic Distortion Rating: Less than 20 percent.
  5. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
  6. Operating Frequency: 20 kHz or higher.
  7. Lamp Current Crest Factor: 1.7 or less.
  8. BF: 0.95 or higher unless otherwise indicated.
  9. Power Factor: 0.95 or higher.
  10. Interference: Comply with 47 CFR 18, Ch. 1, Subpart C, for limitations on electromagnetic and radio-frequency interference for non-consumer equipment.

#### 2.5 EMERGENCY FLUORESCENT POWER UNIT

- A. Internal Type: Self-contained, modular, battery-inverter unit, factory mounted within lighting fixture body and compatible with ballast. Comply with UL 924.
  1. Emergency Connection: Operate one fluorescent lamp(s) continuously at an output of 1100 lumens each. Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
  2. Nightlight Connection: Operate one fluorescent lamp continuously.
  3. Test Push Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.
    - a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
    - b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
  4. Battery: Sealed, maintenance-free, nickel-cadmium type.
  5. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
  6. All emergency fixtures shall have two lamp ballast, parallel circuit.
- B. External Type: Self-contained, modular, battery-inverter unit, suitable for powering one or more fluorescent lamps, remote mounted from lighting fixture. Comply with UL 924.
  1. Emergency Connection Operate one fluorescent lamp continuously. Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
  2. Nightlight Connection: Operate one fluorescent lamp in a remote fixture continuously.
  3. Battery: Sealed, maintenance-free, nickel-cadmium type.
  4. Charger: Fully automatic, solid-state, constant-current type.

5. Housing: NEMA 250, Type 1 enclosure.
6. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
7. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.

## 2.6 BALLASTS FOR HID LAMPS

- A. Electromagnetic Ballast for Metal-Halide Lamps: Comply with ANSI C82.4 and UL 1029. Include the following features unless otherwise indicated:
  1. Ballast Circuit: Constant-wattage autotransformer or regulating high-power-factor type.
  2. Minimum Starting Temperature: Minus 22 deg F for single-lamp ballasts.
  3. Rated Ambient Operating Temperature: 104 deg F.
  4. Open-circuit operation that will not reduce average life.
  5. Low-Noise Ballasts: Manufacturers' standard epoxy-encapsulated models designed to minimize audible fixture noise.
  
- B. Electronic Ballast for Metal-Halide Lamps: Include the following features unless otherwise indicated:
  1. Minimum Starting Temperature: Minus 20 deg F for single-lamp ballasts.
  2. Rated Ambient Operating Temperature: 130 deg F.
  3. Lamp end-of-life detection and shutdown circuit.
  4. Sound Rating: Class A.
  5. Total Harmonic Distortion Rating: Less than 20 percent.
  6. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
  7. Lamp Current Crest Factor: 1.5 or less.
  8. Power Factor: 0.90 or higher.
  9. Interference: Comply with 47 CFR 18, Ch. 1, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.
  10. Protection: Class P thermal cutout.
  11. Bi-Level Dimming Ballast: Ballast circuit and leads provide for remote control of the light output of the associated fixture between high- and low-level and off.
    - a. High-Level Operation: 100 percent of rated lamp lumens.
    - b. Low-Level Operation: 50 percent of rated lamp lumens.
    - c. Compatibility: Certified by ballast manufacturer for use with specific bi-level control system and lamp type indicated. Certified by lamp manufacturer that ballast operating modes are free from negative effect on lamp life and color-rendering capability.
  12. Continuous Dimming Ballast: Dimming range shall be from 100 to 35 percent of rated lamp lumens without flicker.
    - a. Ballast Input Watts: Reduced to a maximum of 50 percent of normal at lowest dimming setting.

## 2.7 QUARTZ LAMP LIGHTING CONTROLLER

- A. General Requirements for Controllers: Factory installed by lighting fixture manufacturer.

1. Comply with UL 1598.
- B. Standby (Quartz Restrike): Automatically switches quartz lamp on when a HID lamp in the fixture is initially energized and during the HID lamp restrike period after brief power outages.
- C. Connections: Designed for a single branch -circuit connection.
- D. Switching Off: Automatically switches quartz lamp off when HID lamp reaches approximately 60 percent light output.

## 2.8 EXIT SIGNS

- A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction and as specified on Light Fixture Schedule.
- B. Internally Lighted Signs:
  1. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.
  2. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
    - a. Battery: Sealed, maintenance-free, nickel-cadmium type.
    - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
    - c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
    - d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
    - e. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
    - f. Remote Test: When specified in Light Fixture Schedule, switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.
    - g. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.
  3. Master/Remote Sign Configurations:
    - a. Master Unit: Comply with requirements above for self-powered exit signs, and provide additional capacity in battery for power connection to remote unit.
    - b. Remote Unit: Comply with requirements above for self-powered exit signs, except omit power supply, battery, and test features. Arrange to receive full power requirements from master unit. Connect for testing concurrently with master unit as a unified system.

## 2.9 EMERGENCY LIGHTING UNITS

- A. General Requirements for Emergency Lighting Units: Self-contained units complying with UL 924.
1. Battery: Sealed, maintenance-free, lead-acid type.
  2. Charger: Fully automatic, solid-state type with sealed transfer relay.
  3. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
  4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
  5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
  6. Wire Guard: When specified on Fixture Schedule, Heavy-chrome-plated wire guard protects lamp heads or fixtures.
  7. Integral Time-Delay Relay: Holds unit on for fixed interval of 15 minutes when power is restored after an outage.
  8. Remote Test: When specified on Fixture Schedule, Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.
  9. Integral Self-Test: When specified on Fixture Schedule, Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

## 2.10 FLUORESCENT LAMPS

- A. T8 rapid-start lamps, rated 32 W maximum, nominal length of 48 inches, 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 4100 K, and average rated life 20,000 hours unless otherwise indicated.
- B. T8 rapid-start lamps, rated 17 W maximum, nominal length of 24 inches, 1300 initial lumens (minimum), CRI 75 (minimum), color temperature 4100 K, and average rated life of 20,000 hours unless otherwise indicated.
- C. T5 rapid-start lamps, rated 28 W maximum, nominal length of 45.2 inches, 2900 initial lumens (minimum), CRI 85 (minimum), color temperature 4100 K, and average rated life of 20,000 hours unless otherwise indicated.
- D. T5HO rapid-start, high-output lamps, rated 54 W maximum, nominal length of 45.2 inches, 5000 initial lumens (minimum), CRI 85 (minimum), color temperature 4100 K, and average rated life of 20,000 hours unless otherwise indicated.
- E. Compact Fluorescent Lamps: 4-Pin, CRI 80 (minimum), color temperature 4100 K, average rated life of 10,000 hours at three hours operation per start unless otherwise indicated. Suitable for use with dimming ballast where specified by Fixture Schedule.

1. 13 W: T4, double or triple tube, rated 900 initial lumens (minimum).
2. 18 W: T4, double or triple tube, rated 1200 initial lumens (minimum).
3. 26 W: T4, double or triple tube, rated 1800 initial lumens (minimum).
4. 32 W: T4, triple tube, rated 2400 initial lumens (minimum).
5. 42 W: T4, triple tube, rated 3200 initial lumens (minimum).
6. 57 W: T4, triple tube, rated 4300 initial lumens (minimum).
7. 70 W: T4, triple tube, rated 5200 initial lumens (minimum).

## 2.11 HID LAMPS

- A. Metal-Halide Lamps: ANSI C78.43, with minimum CRI 65, and color temperature 4000 K.
- B. Pulse-Start, Metal-Halide Lamps: Minimum CRI 65, and color temperature 4000 K.
- C. Ceramic, Pulse-Start, Metal-Halide Lamps: Minimum CRI 80, and color temperature 4000 K.

## 2.12 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.
- E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage.
- F. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- G. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Lighting fixtures:
  1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
  2. Install lamps in each luminaire.
- B. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary.

When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.

- C. Remote Mounting of Ballasts: Distance between the ballast and fixture shall not exceed that recommended by ballast manufacturer. Verify, with ballast manufacturers, maximum distance between ballast and luminaire.
- D. Lay-in Ceiling Lighting Fixtures Supports: Use grid as a support element.
  - 1. Install ceiling support system rods or wires, independent of the ceiling suspension devices, for each fixture. Locate not more than 6 inches from lighting fixture corners.
  - 2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
  - 3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4- inch metal channels spanning and secured to ceiling tees.
  - 4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.
- E. Suspended Lighting Fixture Support:
  - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
  - 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
  - 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
  - 4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.
- F. Connect wiring according to Division 26 Section "Electrical Power Conductors and Cables."
- G. All bulbs per lamp type to be of the same lot number.

### 3.2 IDENTIFICATION

- A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

### 3.3 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

3.4 STARTUP SERVICE

- A. Burn-in all lamps that require specific aging period to operate properly, prior to occupancy by Owner. Burn-in fluorescent and compact fluorescent lamps intended to be dimmed, for at least 100 hours at full voltage.

3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 6 months of date of Substantial Completion, provide on-site assistance in adjusting aimable luminaires to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose. Some of this work may be required after dark.
  - 1. Adjust aimable luminaires in the presence of Architect.

END OF SECTION 265100

## **PART 1 - GENERAL**

### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.02 SUMMARY

- A. This Section includes the following:
  - 1. Protecting existing vegetation to remain.
  - 2. Removing existing trees shrubs groundcovers plants and grass.
  - 3. Clearing and grubbing.
  - 4. Stripping and stockpiling topsoil.
  - 5. Removing above- and below-grade site improvements.
  - 6. Disconnecting and capping or sealing site utilities.
  - 7. Temporary erosion and sedimentation control measures.
- B. RELATED SECTIONS:
  - 1. Division 01 Section "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities, and temporary erosion- and sedimentation-control measures.
  - 2. Division 01 Section "Execution Requirements" for field engineering and surveying.
  - 3. Division 01 Section(s) "Construction Waste Management and Disposal" for additional requirements of selective disposal.

### 1.03 MATERIAL OWNERSHIP

- A. Except for materials indicated to remain on Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

### 1.04 SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
  - 1. Use sufficiently detailed photographs or videotape.
  - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

### 1.05 QUALITY ASSURANCE

- A. Pre-installation Conference: Conduct conference at Project site.

### 1.06 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- C. Utility Locator Service: Notify Louisiana One Call (1-800-222-3020) for area where Project is located before site clearing.
- D. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

## **PART 2 - PRODUCTS (Not Applicable)**

## **PART 3 - EXECUTION**

### 3.01 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.



1. Restore damaged improvements to their original condition, as acceptable to Owner.
- 3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL
- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control Drawings and Specification Section 31 10 05.
  - B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- 3.03 TREE AND PLANT PROTECTION
- A. General: Protect trees and plants remaining on-site according to requirements in Division 01 Section "Temporary Tree and Plant Protection."
  - B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.
- 3.04 UTILITIES
- A. Contact Louisiana One Call (1-800-222-3020) and utility providers marked on ticket.
  - B. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
    1. Arrange with utility companies to shut off indicated utilities.
  - C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
    1. Notify Engineer and Owner not less than three working days in advance of proposed utility interruptions.
    2. Do not proceed with utility interruptions without Owner's written permission.
  - D. Removal of underground utilities is included in Division 2 Sections covering site utilities.
- 3.05 CLEARING AND GRUBBING
- A. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
    1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.
- 3.06 TOPSOIL STRIPPING
- A. Remove sod and grass before stripping topsoil.
  - B. Strip topsoil to whatever depths are encountered (6" minimum) in a manner to prevent intermingling with underlying subsoil or other waste materials.
    1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, cinder, and other objects more than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.
  - C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
    1. Limit height of topsoil stockpiles to 72 inches.
    2. Do not stockpile topsoil within protection zones.
    3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity which may be reused on the project site.
- 3.07 SITE IMPROVEMENTS
- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
  - B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
    1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
    2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed
- 3.08 DISPOSAL
- A. The User shall have first refusal of salvaged materials.
  - B. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

**END OF SECTION**

## Section 31 20 00

### Earthwork

Specifications

31 20 00-1

#### PART 1 - GENERAL

##### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. All references to LADOTD specifications are to the Louisiana Standard Specifications for Roads and Bridges, 2016 Edition unless otherwise noted.
- C. All references EBRP DPW specifications are to the East Baton Rouge Parish Standard Specifications for Public Works Construction, latest edition.

##### 1.02 SUMMARY

- A. This Section includes the following:
  - 1. Preparing subgrades for slabs on grade, walks, pavements, turf and grasses.
  - 2. Base course for concrete walks and pavements.
  - 3. Subbase course and base course for asphalt paving.
  - 4. Excavating and backfilling trenches for utilities and pits for buried utility structures, except sanitary sewer.
  - 5. Erosion-control material(s).
- B. Related Sections include the following:
  - 1. Division 1 Section "Temporary Facilities and Controls.
  - 2. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
  - 3. Division 31 Section "Stone Riprap" for stone used for protection and erosion control around the site area.
  - 4. Division 32 Section "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
  - 5. Division 33 Section "Storm Drainage" for drainage of site areas.

##### 1.03 DEFINITIONS

- A. Backfill: Soil material used to fill an excavation.
  - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
  - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Layer placed between the subbase course or subgrade and paving.
- C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
  - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions changes in the Work.
  - 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
- G. Fill Materials: Materials as described in the Products Section of this specification suitable for fill placement as listed below.
  - 1. Select or Structural Fill: Fill material for all areas other than areas that require fill.
  - 2. Non-Structural Fill: Fill material as an acceptable alternative for only Select or Structural Fill in areas under pile supported structures with a crawl space (void) beneath the lowest floor.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below pavement, drainage fill, or topsoil materials.
- J. Subbase Course: Layer placed between the subgrade and base course for pavement.

## Section 31 20 00

### Earthwork

Specifications

31 20 00-2

- K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within pavement area.
- 1.04 SUBMITTALS
  - A. Product Data: For each type of the following manufactured products required:
    - 1. Geotextiles.
  - B. Samples for Verification: For the following products, in sizes indicated below:
    - 1. Geotextile: 12 by 12 inches .
  - A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
    - 1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
    - 2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for cohesive fill and backfill.
  - B. Product Certificates: For erosion control blanket from manufacturer.
- 1.05 QUALITY ASSURANCE
  - A. Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740, ASTM E 548 and DOTD.
- 1.06 PROJECT CONDITIONS
  - A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
    - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
    - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
  - B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
    - 1. Do not proceed with work on adjoining property until directed by Architect.
  - C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
    - 1. Notify Owner's Representative not less than two days in advance of proposed utility interruptions.
    - 2. Do not proceed with utility interruptions without Owner's Representative's written permission.
    - 3. Contact utility-locator service for area where Project is located before excavating.
  - D. Care must be exercised in order not to damage existing structures.
  - E. Notify Louisiana One Call (1-800-222-3020) for area where Project is located.

## PART 2 - PRODUCTS

- 2.01 SOIL MATERIALS
  - A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
  - B. Satisfactory Soils for Select or Structural Fill: Clean, non-expansive fill material, free from debris, roots and organic content. Materials should consist of lean clays (CL) and clayey sand (SC) with a liquid limit less than 45 and a plasticity index between 10 and 25. The material should be classified in accordance with the United Soil Classification System (USCS).
    - 1. As an alternative, structural fill material could consist of "clean" sand or pumped sand having less than 10 percent fines passing the No. 200 Sieve. It should be compacted to at least 95 percent of Maximum Dry Density at Optimum Moisture Content according to ASTM D-698. In-place density measurements should be taken to assure that this degree of compaction is achieved. This material can also be used as pipe bedding material. This material must be certified and approved by the Geotechnical Engineer prior to its use .
    - 2. On-site lean clay (CL) soils may be used as select fill but require bulk testing at time of construction to ensure they meet the parameters of select fill noted above.

## Section 31 20 00

### Earthwork

Specifications

31 20 00-3

- C. Base Course (Aggregate): Material required under all future pavements shall be granular, free draining, and compacted over the prepared subbase or subgrade.
1. Crushed stone (610) aggregate in accordance with the LA DOTD Standard Specifications Sections 302 and 1003.03 (b), 2016 edition.
    - a. As an alternative to aggregate base course, Cement Stabilization can be performed to a minimum depth of 12 inches to act as a base course material. A minimum of 9% by volume of cement is recommended to use for soil-cement base course. If fat clays are encountered in the upper two feet, then lime treatment shall be performed at a minimum of 2% by volume to reduce the Plasticity Index between 10 and 25 prior to cement stabilization.
- D. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- E. Sandy Backfill: Material required for backfill of trenches beneath roadway pavement or as specified in plans shall be nonplastic siliceous material, graded as follow:

US Sieve	% Passing
1/2"	100
No. 10	75-100
No. 200	0-10

- F. Flowable Fill: Non-excavatable material as listed in Table 710-1 of the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition.
- G. Select Granular Filter Material shall be in accordance with the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Sections 1003.09, and referenced Sections
- 2.02 GEOTEXTILES
- A. Geotextile fabric shall be Class D in accordance with LA DOTD Standard Specifications Section 1019.01, 2016 edition.
  - B. Geogrid: Polymer mesh may be used as directed and approved by Geotechnical Engineer to minimize undercutting of unsuitable subgrade material.
    1. Tensar Tri-axial Geogrids or approved equal by Geotechnical Engineer.
- 2.03 EROSION-CONTROL MATERIALS
- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
    1. Blanket durability: 12 months.

### PART 3 - EXECUTION

#### 3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
  1. Remove all shallow surface organic materials consisting of sod, roots, rubble, wood, etc. from beneath the building footprint and proposed pavement areas. This material shall not be used for backfill.
- B. Prior to the beginning of construction, the Contractor shall provide erosion control as indicated on the Drawings and in accordance with Section 01 57 23 - "STORMWATER POLLUTION PREVENTION".
- C. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Section 31 1 000 - "SITE CLEARING."
- D. Protect and maintain erosion and sedimentation controls, which are specified in Section 01 57 23 - "STORMWATER POLLUTION PREVENTION", during earthwork operations.

#### 3.02 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

## Section 31 20 00

### Earthwork

Specifications

31 20 00-4

- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
    - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
    - 2. Contractor shall provide temporary pumping systems to dewater all excavations that become inundated, within 24 hours.
    - 3. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.
  - C. Correction of damaged soils or constructed site features that are a result of the Contractor's failure to protect the site from temporary drainage conditions shall be performed at no additional cost to the Owner.
    - 1. The method of soil correction will be determined by the Geotechnical Engineer.
- 3.03 EXCAVATION, GENERAL
- A. Excavation outside the project limits is not allowed under any circumstance.
  - B. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions.
    - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
  - C. Excavations at Edges of Tree- and Plant-Protection Zones:
    - 1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
    - 2. Cut and protect roots according to requirements in Division 01 Section "Temporary Tree and Plant Protection."
- 3.04 EXCAVATION FOR TRENCHES (OTHER THAN SANITARY SEWER)
- A. Excavation for Sanitary Sewer Trenches to be in accordance with Section 33 31 00.
  - B. Excavate trenches to indicated gradients, lines, depths, and elevations.
  - C. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
    - 1. Clearance: 18 inches each side of pipe or conduit.
  - D. Excavations deeper than 4 feet in depth shall require temporary shoring, bracing, or sheeting in lieu of unsupported slopes
  - E. Trench Bottoms: Excavate trenches 6 inches deeper than bottom of feature elevation to allow for bedding course.
- 3.05 EXCAVATION FOR STRUCTURES
- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
    - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
      - a. Bottom of excavation shall be free of all soft, loose or disturbed material and water prior to placement of concrete.
      - b. If foundation is not poured the same day the excavation is completed, a thin seal slab of lean concrete shall be placed over the base of the excavation; however, the foundations should not be left open for more than two days. Place a mudmat of lean concrete to seal the bearing stratum of excavations in the event wet conditions are experienced or expected exposure.
    - 2. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
    - 3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

## Section 31 20 00

### Earthwork

Specifications

31 20 00-5

4. Avoid excavations during inclement weather and place concrete within the excavations within 24 hours after completion of the excavations.
- 3.06 EXCAVATION FOR WALKS AND PAVEMENTS
- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.
- 3.07 PREPARATION FOR EROSION-CONTROL MATERIALS
- A. Prepare area as specified in Section 32 92 00, "Grasses".
  - B. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
  - C. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- 3.08 FLOWABLE FILL
- A. Install material in areas indicated and in accordance with the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Section 710, and referenced Sections for Flowable Fill.
- 3.09 APPROVAL OF SUBGRADE
- A. Notify the Geotechnical Engineer when excavations have reached required subgrade.
  - B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Geotechnical Engineer.
  - C. In the presence of the Geotechnical Engineer, proof-roll all building and pavement subgrade areas, plus five feet beyond, a minimum of two complete passes over the entire area with a loaded tandem axle dump truck or other similarly loaded rubber tire vehicle with a minimum weight of 20 tons and a maximum weight of 25 tons to identify soft pockets and areas of excess yielding. Proof-rolling activities shall occur not more than two (2) days prior to commencement of actual paving operations or placement of formwork. Soils which are observed to rut or deflect excessively under the moving load shall be mitigated as determined by the Geotechnical Engineer.
    1. Mitigation may require areas to be undercut and replaced with Satisfactory Soil materials and re-compacted to 95% per ASTM D698;
    2. Or use of Geogrid.
  - D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
  - E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Geotechnical Engineer, without additional compensation.
- 3.10 UNAUTHORIZED EXCAVATION
- A. Fill unauthorized excavation as directed by the Engineer.
- 3.11 STORAGE OF SOIL MATERIALS
- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
    1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
    2. Install silt fencing around perimeter of stockpile for any of the following conditions:
      - a. Material is not used in three days or less from placement;
      - b. Material runoff drains directly into non-treated drainage system;
- 3.12 SELECT SOIL FILL
- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
    1. The first layer of fill should be placed in a relatively uniform horizontal lift and be adequately keyed into the stripped and proof-rolled soils.
  - B. Place and compact select fill material in layers to required elevations as follows:
    1. Under grass and planted areas.
    2. Under walks and pavements.
    3. Under steps and ramps.
    4. Under building slabs.

## Section 31 20 00

### Earthwork

Specifications

31 20 00-6

- 5. Under footings and foundations.
  - C. Place select soil fill on subgrades free of mud, frost, snow, or ice.
- 3.13 SOIL MOISTURE CONTROL
- A. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  - B. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that is below optimum moisture content or greater than 3 percentage points above the optimum moisture content value or is too wet to compact to specified dry unit weight.
  - C. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying.
- 3.14 COMPACTION OF SOIL BACKFILLS AND FILLS
- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
  - B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
  - C. Compact soils within required range of optimum moisture content value.
  - D. Compact soil materials to not less than 95 percent of Standard Proctor density as determined by ASTM D 698.
- 3.15 GRADING
- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
    - 1. Provide a smooth transition between adjacent existing grades and new grades.
    - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
  - B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
    - 1. Turf or Unpaved Areas: Plus or minus 1½ inch.
    - 2. Walks: Plus or minus ½ inch.
    - 3. Pavements: Plus or minus ¼ inch.
  - C. Grading inside Building Lines: Finish subgrade to a tolerance of ½ inch when tested with a 10-foot straightedge.
- 3.16 BACKFILL
- A. Place and compact backfill in excavations promptly, but not before completing the following:
    - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
    - 2. Surveying locations of underground utilities for Record Documents.
    - 3. Testing and inspecting underground utilities.
    - 4. Removing concrete formwork.
    - 5. Removing trash and debris.
    - 6. Removing temporary shoring and bracing, and sheeting.
    - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
  - B. Place backfill on subgrades free of mud, frost, snow, or ice.
- 3.17 UTILITY TRENCH BACKFILL (OTHER THAN SANITARY SEWER)
- A. Backfill for Sanitary Sewer Trenches to be in accordance with Section 33 31 00.
  - B. Place backfill on subgrades free of mud, frost, snow, or ice.
  - C. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
  - D. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 32 Section "Cast-in-Place Concrete."
  - E. Trenches under Roadways: Provide 4-inch thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase course. Concrete is specified in Division 32 Section "Cast-in-Place Concrete."



## Section 31 20 00

### Earthwork

Specifications

31 20 00-7

- F. Provide a minimum 6-inch bedding course below the bottom of the pipe. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
  - G. Backfill voids with satisfactory soil while removing shoring and bracing.
  - H. Place and compact initial backfill of, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
    - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
  - I. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- 3.18 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS
- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
  - B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
    - 1. Place base course material over subbase course under hot-mix asphalt pavement.
    - 2. Shape subbase course and base course to required crown elevations and cross-slope grades.
    - 3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.
- 3.19 FIELD QUALITY CONTROL
- A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and the following special inspections:
    - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
    - 2. Determine that fill material and maximum lift thickness comply with requirements.
    - 3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
    - 4. Establish optimum moisture content and stabilization ratios for subbase.
  - B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
  - C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
  - D. The Contractor shall establish and maintain quality control for construction operations to assure compliance with contract requirements, and maintain records of quality control for all construction operations including but not limited to the following:
    - 1. Equipment: Type, size, and suitability for construction of the prescribed work.
    - 2. Foundation Preparation: Breaking surface in advance of construction and during fill placement when necessary, drainage of foundation and partially completed fill.
    - 3. Materials: Suitability as defined in Section 2.1.
    - 4. Construction: Layout, maintaining existing drainage, moisture control, thickness of layers, spreading and compacting.
    - 5. Grade and Cross Section: Crown width, crown slope, side slopes, and grades.
    - 6. Roads and Ramps: Location of temporary roads, location and placement of fills for ramps in accordance with specified dimensions and grades.
    - 7. Grade Tolerances: Check fills to determine if placement conforms to prescribed grade and cross section.
    - 8. Slides: Location and limits; methods and equipment used where remedial work has been directed.
    - 9. Control Testing.
      - a. On-Site Material Testing. The Owner shall perform all control testing such as soil classification, moisture content, control compaction curves, and in-place density for on-site material placement. The testing agency shall perform as a minimum, the specified number of each of the tests to demonstrate to the satisfaction of the

Owner that the specifications are in compliance. Testing shall be performed by a Material Testing Agency, paid by the Owner. Testing agency results shall be reviewed by the Owner's Geotechnical Engineer. Tests performed by the Material Testing Agency shall be furnished to the Owner's Representative and Geotechnical Engineer for review within 24 hours. No additional payment will be made for control testing required in this paragraph. The following tests are required to provide adequate control:

- 1) In-Place Density Tests. In-place density tests for compacted fill material shall be made in accordance with ASTM D 2922 (Nuclear Method), and shall be made at the following locations and minimum frequencies:
  - a) Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than five tests per layer.
  - b) Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than three tests per layer.
  - c) Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than three tests per layer.
  - d) General Fill: Each lift shall be tested at a frequency of one density test per lift of compacted fill placed in section on a 100 foot grid. The location of the test shall be representative of the area being tested or as directed by the Owner's Representative.
- 2) Soil Classification Tests. Determination of soil classification shall be in accordance with the Unified Soil Classification System (ASTM D 2487). Atterberg Limits Test required for soil classification shall be performed in accordance with ASTM D 4318 Laboratory Soil Testing.
  - a) Each lift shall be tested at a frequency of one soil classification test per 100,000 square feet of compacted fill placed in section. The location of the test shall be representative of the area being tested or as directed by the Owner's Representative.
- 3) Moisture Content Tests. Determination of moisture content shall be performed in accordance with ASTM D 2216.
- 4) In addition to the above frequency of tests, additional tests are required as follows:
  - a) Where the Owner's Representative has reason to doubt the adequacy of the compaction or moisture control.
  - b) Where the Contractor is concentrating fill operations over a relatively small area.
  - c) Where special compaction procedures are being used.
  - d) When embankment materials change substantially, the Owner's Representative may direct additional testing.
  - e) Areas not meeting the specified density shall be retested at no additional cost to the Owner, after corrective measures have been applied.

E. Reporting

1. The original and two copies of these records of inspections and tests, as well as the records of corrective action taken, shall be furnished to the Owner and Owner's Representative weekly.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

G. Geotechnical Engineer shall inspect subgrade upon completion of embankment.

3.20 FAILURES AND SLIDES

- A. Where settlement of the foundation develops to such an extent as to make it inadvisable to continue to add material, the Geotechnical Engineer shall have the right to halt work on that

## Section 31 20 00

### Earthwork

Specifications

31 20 00-9

portion of the embankment or postpone until a later date, considering all attempts to bring that portion of the embankment to full grade and cross section.

- B. Should a slide occur in any part of the embankment during its construction, or after its completion, but prior to its acceptance, the Contractor shall, upon written order of the Geotechnical Engineer, either cut out and remove the slide from the embankment and then rebuild that portion of the embankment as the Geotechnical Engineer shall prescribe. In case the slide is caused through fault of the Contractor, the foregoing operations shall be performed at no additional cost to the Owner. In case the slide is not the fault of the Contractor, the repair shall be made by an equitable adjustment under the "CHANGES" clause of the contract. The method of slide correction will be determined by the Geotechnical Engineer.

#### 3.21 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

#### 3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

**END OF SECTION**

**PART 1 - GENERAL**

- 1.01 SUMMARY
- A. This Section includes exterior cement concrete pavement for the following:
    - 1. Curbs.
    - 2. Walks.
    - 3. Incidental Pavement.
  - B. All references to LADOTD specifications are to the Louisiana Standard Specifications for Roads and Bridges, 2016 Edition unless otherwise noted.
  - C. All references EBRP DPW specifications are to the East Baton Rouge Parish Standard Specifications for Public Works Construction, latest edition.
- 1.02 SUBMITTALS
- A. Product Data: For each type of product indicated.
  - B. Design Mixtures: For each concrete pavement mixture.
- 1.03 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

**PART 2 - PRODUCTS**

- 2.01 STEEL REINFORCEMENT
- A. Materials shall be in accordance with EBRP DPW specification section 1006-1 and referenced Sections.
- 2.02 CONCRETE MATERIALS AND MIXTURES
- A. Materials shall be in accordance with EBRP DPW specification section 1005 and referenced Sections for Class 5.5B3800 concrete mix.
- 2.03 CURING MATERIALS
- A. Materials shall be in accordance with EBRP DPW specification section 1008-1 and referenced Sections.
- 2.04 JOINT FILLER
- A. Materials shall be in accordance with EBRP DPW specification section 1007 and referenced Sections.

**PART 3 - EXECUTION**

- 3.01 EXAMINATION
- A. Proof-roll prepared subgrade surface below concrete pavements in accordance with Specification Section 31 20 00.
- 3.02 PREPARATION, INSTALLATION, CURING AND PROTECTION
- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of standard curbs, walks and incidental concrete pavement. Location and arrangement of concrete take into account design considerations.
  - B. Construct concrete features to sizes and shapes indicated and in accordance with EBRP DPW specification section 907 and referenced sections.
- 3.03 PAVEMENT TOLERANCES
- A. Comply with tolerances of ACI 117 and as follows:
    - 1. Elevation: 1/4 inch.
    - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
    - 3. The maximum variations in surface tolerance shall not exceed 1/4 inch in 10 feet.
    - 4. Differences in elevation across an expansion joint shall not exceed 1/32 inch.
      - a. High spots shall be ground down, and low spots, cracks and grooves shall be filled in within a minimum 5 feet radius in all directions with a cement based leveling compound underlayment.
      - b. Leveling of the concrete slab is the responsibility of the General Contractor or the

Concrete Sub-Contractor.

5. Joint Spacing: 3 inches.
6. Contraction Joint Depth: Plus 1/4 inch, no minus.
7. Joint Width: Plus 1/8 inch, no minus.

3.04 FIELD QUALITY CONTROL

- A. Testing Agency: Owner to select a qualified independent testing and inspection agency at contractor's cost to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.
- B. Testing Services: Testing shall be performed according to the following requirements:
  1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C 172, except modified for slump to comply with ASTM C 94.
  2. Slump: ASTM C 143; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
  3. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air-entrained concrete.
  4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each set of compressive-strength specimens.
  5. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
  6. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yards. One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.
  7. When frequency of testing will provide fewer than five compressive-strength tests for a given class of concrete, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, current operations shall be evaluated and corrective procedures shall be provided for protecting and curing in-place concrete.
  9. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive compressive-strength test results equal or exceed specified compressive strength and no individual compressive-strength test result falls 500 psi below specified compressive strength.
    - a. Concrete with unsatisfactory strength levels shall either be replaced or core tested per ASTM C 42/C42 M. Additional testing and acceptance shall be in accordance with ACI 301-05 sections 1.6 and 1.7.
    - b. Contractor is responsible for all costs of additional testing, evaluation, and replacement of unsatisfactory concrete.
- C. Test results shall be reported in writing to Owner, Engineer, Architect, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests
- D. Concrete that fails to comply with the testing requirements above will be rejected and areas relative to test samples shall be replaced by the contractor at no additional cost to the owner.

3.05 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.
- C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

**END OF SECTION**

**Section 32 92 00**  
**Site Lawns and Grasses**

Specifications

32 92 00-1

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. All references to LADOTD specifications are to the Louisiana Standard Specifications for Roads and Bridges, 2016 Edition unless otherwise noted.
- C. All references EBRP DPW specifications are to the East Baton Rouge Parish Standard Specifications for Public Works Construction, latest edition.

**1.02 SUMMARY**

- A. Section Includes items listed below for areas outside of Landscaping limits:
  - 1. Seeding.
  - 2. Sod.
  - 3. Erosion-control material(s).
- B. Related Sections:
  - 1. Division 31 Section "Site Clearing" for topsoil stripping and stockpiling.
  - 2. Division 31 Section "Earthwork" for excavation, filling and backfilling, and rough grading.

**1.03 DEFINITIONS**

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.
- E. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

**1.04 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
- C. Product Certificates: For erosion control blanket from manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.
  - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
  - 1. Report suitability of topsoil for lawn growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
- D. Do not perform seeding when wind exceeds 15 MPH, or when excessively wet or dry.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

**1.07 PROJECT CONDITIONS**

- A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

**Section 32 92 00**  
**Site Lawns and Grasses**

Specifications

32 92 00-2

**1.08 MAINTENANCE PERIOD**

- A. Initial Lawn Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
1. Seeded Lawns: 90 days from Final Acceptance.
    - a. When initial maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.
  2. Sodded Lawns: 90 days from Final Acceptance.
    - a. When initial maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.

**PART 2 - PRODUCTS**

**2.01 SEED**

- A. Use specified seed products as stated on Landscape drawings.
- B. If product not specified on Landscape drawings, use the following:
1. Grass Seed: Fresh, clean, dry, new-crop seed complying with table 717-1 of LADOTD Specification Section 717, 2016 Edition.
  2. Grass Seed Mix: Seed mix based on the planting dates as follows:
    - a. March to September: Type A
    - b. September to February: Type C
    - c. February to March: Type B

**2.02 SOD**

- A. Use specified sod products as stated on Landscape drawings.
- B. If product not specified on Landscape drawings, use the following:
1. Rolls or slabs of field grown Bermuda grass in accordance with LADOTD Specification Section 714, 2016 Edition.

**2.03 TOPSOIL**

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
    - a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

**2.04 FERTILIZER**

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
  2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

**2.05 MULCHES**

- A. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

**2.06 EROSION-CONTROL MATERIALS**

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
1. Blanket durability: 12 months.



**Section 32 92 00**  
**Site Lawns and Grasses**

Specifications

32 92 00-3

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance.
- B. Areas to receive lawns and grass shall include the following:
  - 1. All disturbed areas not paved.
  - 2. All disturbed areas not specified for groundcover and plantings by landscape plan.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
  - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
  - 2. Protect grade stakes set by others until directed to remove them.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

**3.03 LAWN PREPARATION**

- A. Limit lawn subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
  - 1. Apply Insert type fertilizer directly to subgrade before loosening.
  - 2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
    - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
  - 3. Spread planting soil mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
    - a. Spread approximately 1/2 the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil mix.
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- D. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- E. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

**3.04 PREPARATION FOR EROSION-CONTROL MATERIALS**

- A. Prepare area as specified in "Lawn Preparation" Article.
- B. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- C. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

**3.05 SEEDING**

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
  - 1. Do not use wet seed or seed that is moldy or otherwise damaged.
  - 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 1-2 lb/1000 sq. ft..
- C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes exceeding 1:6 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

**Section 32 92 00**  
**Site Lawns and Grasses**

Specifications

32 92 00-4

- 3.06 HYDROSEEDING
- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
    - 1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
    - 2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.
  - B. Protect hydro-seeded areas with slopes exceeding 1:6 with erosion-control blankets installed and stapled according to manufacturer's written instructions.
- 3.07 SOD
- A. Install rolls or slabs of field grown Bermuda grass sod in accordance with LADOTD Specification Section 714, 2016 Edition.
    - 1. Water and establish sod according to LADOTD Specification Section 714.07 and 714.08, 2016 Edition.
- 3.08 LAWN MAINTENANCE
- A. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.
    - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
  - B. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 4 inches.
    - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
    - 2. Water lawn with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
  - C. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
    - 1. Mow grass to a height of 1/2 inch or less.
  - D. Lawn Postfertilization: Apply fertilizer after initial mowing and when grass is dry.
    - 1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to lawn area.
- 3.09 SATISFACTORY LAWNS
- A. Lawn installations shall meet the following criteria as determined by Architect:
    - 1. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
    - 2. Satisfactory Sodded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
  - B. Use specified materials to reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.
    - 1. Lawns damaged by erosion or construction equipment during maintenance period shall be re-sodded to the satisfaction of the Architect.
- 3.10 CLEANUP AND PROTECTION
- A. Promptly remove soil and debris, created by lawn work, from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
  - B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after lawn is established.
  - C. Remove nondegradable erosion-control measures after grass establishment period.

**END OF SECTION**

**Section 33 41 00**  
**Site Storm Drainage**

Specifications

33 41 00-1

**PART 1 - GENERAL**

- 1.01 RELATED DOCUMENTS
- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
  - B. All references to LADOTD specifications are to the Louisiana Standard Specifications for Roads and Bridges, 2016 Edition.
  - C. All references EBRP DPW specifications are to the East Baton Rouge Parish Standard Specifications for Public Works Construction, latest edition:
- 1.02 SUMMARY
- A. Section Includes:
    - 1. Pipe and Fittings
    - 2. Standard Manholes
    - 3. Yard Drains
    - 4. Trench Drains
    - 5. Underdains Systems
    - 6. Cleanouts.
    - 7. Geotextile Fabric
    - 8. Geocomposite Wall Drains
- 1.03 SUBMITTALS
- A. Product Data: For catch basins; grates, frames, manholes, pipe, wall drains, and fittings.
  - B. Cut sheets for site specific pre-cast catch basins, trench drains and manholes to include:
    - 1. Structure Type & ID
    - 2. Structure top elevation
    - 3. Structure bottom elevation
    - 4. Grate elevation
    - 5. Grate type
    - 6. Invert elevation(s)
    - 7. Inlet/Outlet size(s)
  - C. Field quality-control reports.
- 1.04 DELIVERY, STORAGE, AND HANDLING
- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
  - B. Protect pipe, pipe fittings, and seals from dirt and damage.
  - C. Handle manholes according to manufacturer's written rigging instructions.

**PART 2 - PRODUCTS**

- 2.01 CONCRETE
- A. General: Cast-in-place concrete shall be provided in accordance with EBRP DPW specification section 1005 and referenced sections.
    - 1. Design Mixture: Class 6A4000.
- 2.02 PIPING MATERIALS
- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.
- 2.03 PIPE AND FITTINGS
- A. Storm Drain Pipe (Pipe Conduit): Concrete or Plastic pipe, as indicated on plans, with watertight fittings and connections required for Storm Drain Pipe.
    - 1. Available Products and Manufacturers: Provide products as listed, or pre-approved equal:
      - a. Concrete pipe with watertight fittings and connections required for Storm Drain Pipe in accordance with EBRP DPW specification section 1015-1, 1015-4 and referenced sections.
      - b. Contech A2000 as manufactured by Contech Construction Products, Inc., 1110 Adlai Stevenson Drive, Springfield, IL 62703-4297. Local representative - Contech Construction Products Inc. (225.749.1001).
      - c. Hancor Blue Seal WT as manufactured by Hancor, Inc. Local representative - (225.756.8787).

**Section 33 41 00**  
**Site Storm Drainage**

Specifications

33 41 00-2

**2.04 CATCH BASINS AND MANHOLES**

- A. Cast-in-Place Concrete, Catch Basins and Manholes: Construct structure of reinforced concrete and in accordance with the EBRP DPW Standards as indicated; of depth, shape, dimensions, and appurtenances indicated.
  - 1. Reference EBRP DPW specification section 702 and referenced Sections and standards for materials, fittings and connections required for Catch Basins and Manholes. EBRP DPW Standard Plans and specifications may be purchased from the following address:
    - Department of Public Works, Engineering Office
    - 300 North Boulevard, 4<sup>th</sup> Floor
    - Baton Rouge, LA 70802
    - (225) 389-3158 Office
    - (225) 389-5391 Fax
- B. Grates and frames shall be metal and painted black or color selected by Architect.
- C. Precast Concrete Drainage Units may be used in accordance with EBRP DPW specification section 1017 and referenced sections.
- D. Precast Plastic Drainage Units may be used in accordance with plans and referenced sections.

**2.05 TRENCH DRAINS**

- A. Cast-in-place trench drain in accordance with the plan details. The drains shall be constructed to form a channel for the collection and flow of storm water. Grates shall be installed to allow water to pass into the channel and to allow pedestrian traffic to move over the drains.
  - 1. Construct trench drain of reinforced concrete to depth, shape, dimensions, and appurtenances indicated on plans.
- B. Grates shall be metal and ADA compliant.
  - 1. Paint black or color selected by Architect.

**2.06 UNDERDRAIN SYSTEMS**

- A. Perforated plastic pipe wrapped in geotextile fabric and embedded in granular backfill with nonperforated outlet pipes.
  - 1. Perforated Pipe and Nonperforated Plastic Pipe shall be polyvinyl chloride pipe (PVCP) in accordance with the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Sections 1006.01, and referenced Sections.
  - 2. Geotextile Fabric shall be Type D in accordance with the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Sections 1019.01, and referenced Sections.
  - 3. Select Granular Filter Material shall be in accordance with the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Sections 1003.09, and referenced Sections.

**2.07 GEOCOMPOSITE WALL DRAIN**

- A. Composite wall drain system attached to concrete wall to allow water to pass vertically and laterally through system into adjacent Underdrain System.
  - 1. Composite wall drain system in accordance with the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Sections 1019.02, and referenced Sections.

**2.08 CLEANOUTS**

- A. Metal Cleanouts:
  - 1. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
  - 2. Top-Loading Classification(s): Medium Duty.
  - 3. Pipe Fitting and Riser to Cleanout: PVC Schedule 80 or SDR35 plastic pipe and fittings

**2.09 SOIL MATERIALS**

- A. General: Material for bedding and backfill shall be provided in accordance with EBRP DPW specification section 1001-9 and referenced sections.

**2.10 GEOTEXTILE FABRIC**

- A. The Geotextile Fabric shall conform to Class D as listed in accordance with EBRP DPW specification section 1022-8 and referenced sections.

**Section 33 41 00**  
**Site Storm Drainage**

Specifications

33 41 00-3

**PART 3 - EXECUTION**

- 3.01 EARTHWORK
- A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earthwork."
- 3.02 PIPING INSTALLATION
- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.
- B. General: Join and install pipe and fittings as required by EBRP DPW specification section 701 and referenced sections, unless otherwise indicated.
- C. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- D. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install anchors, gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- E. Contractor shall maintain adequate cover over installed pipe or install anchor system as per manufacturer's recommendations at no additional cost to the Owner.
- 3.03 CATCH BASIN AND MANHOLE INSTALLATION
- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of standard catch basins and manholes. Location and arrangement of drainage structures take into account design considerations.
- B. Construct catch basins and curb inlets to sizes and shapes indicated and in accordance with EBRP DPW specification section 702 and referenced sections.
- 3.04 TRENCH DRAINS – CAST IN PLACE
- A. The minimum width and depth of the drain channel below the drain grate, or minimum required flow rate, will be shown on the plan detail. Connections to structures shall not restrict the hydraulic flow of the drain channel.
- B. The trench drain shall have a smooth interior face.
- C. Concrete shall meet the requirements of Division 03.
- D. Concrete shall be placed in a monolithic pour between inlet structures. Construction joints will only be allowed if approved by the Engineer. If joints are allowed, they shall be constructed with a concrete lug or keyway approved by the Engineer.
- E. Grate retaining devices shall not obstruct the flow of water into the channel or through the channel. The grate shall fit into the frame without rocking.
- F. Frames for cast-in-place drains shall be independent of the channel and shall be anchored into the surrounding concrete by metal extensions attached to the frame at all four corners.
- G. Connection to an existing structure may require the use of a transitional fitting and/or sections of pipe to provide a suitable connection without damage to the grate, drain and structure. Connections to structures shall be approved by the Engineer prior to construction.
- H. When the trench drain begins or terminates without a connection to other pipes or drainage structures, the trench drain end shall be sealed or plugged with a cap suitable to the Engineer. The seal shall provide a waterproof connection.
- I. Excavation shall be kept as nearly as possible to the minimum width, depth, and length shown on the plan detail.
- J. The trench opening shall be protected during installation by a removable wood strip, heavy duty tape, or other suitable material, affixed to the opening to prevent infiltration of material into the drain. After finishing, the protective covering shall be removed and any debris that entered the trench shall be removed.
- K. Drain channels shall be positioned in the excavated trench so that, when finished, the surrounding concrete backfill will encase the channel. Concrete backfill shall be placed in the trench against undisturbed material at the sides and bottom of the trench and in a manner that will prevent floating or shifting of the trench drain components and voids in, or segregation of, the concrete. Where necessary, earth plugs shall be constructed and compacted at the ends of the planned concrete backfill to contain the concrete within the trench. Concrete shall be finished flush with the adjacent finish grade. The surface of the concrete shall be textured with a broom or burlap drag to produce a durable skid-resistant surface.

**Section 33 41 00**  
**Site Storm Drainage**

Specifications

33 41 00-4

- L. Under no circumstances shall any portion of the trench drain slot extend above the paving material or curb and gutter section.
  - M. Grates shall be painted black and with weather-resistant paint.
- 3.05 UNDERDRAIN SYSTEMS
- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underdrain system. Contractor shall field verify location and arrangement of piping and include all necessary fittings.
  - B. General: Join and install pipe and fittings as required by the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Section 703, and referenced Sections for Underdrain Systems, unless otherwise indicated.
  - C. Reference Specification Section 31 20 00 for trenching and backfill requirements of connecting drainage structures and non-perforated pipe.
- 3.06 GEOCOMPOSITE WALL DRAIN
- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underdrain system. Contractor shall field verify location and arrangement of piping and include all necessary fittings.
  - B. General: Join and install wall drain system and fittings as required by the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Sections 703, 802, 1019.02 and referenced Sections for Underdrain Systems, unless otherwise indicated.
  - C. Reference Underdrain System for outfall connection.
- 3.07 CLEANOUT INSTALLATION
- A. Install cleanouts and riser extensions from pipes to cleanouts at grade. Use plastic pipe fittings at branches for cleanouts. Install piping so cleanouts open in direction of flow in pipe.
    - 1. Use Medium-Duty, top-loading classification cleanouts in all areas.
  - B. Areas within pavement:
    - 1. Set cleanout frames and covers flush with pavement surface.
  - C. Areas outside of pavement:
    - 1. Set cleanout frames and covers 1 inch above surrounding grade.
    - 2. Install cast-in-place-concrete block, 18 by 18 by 12 inches deep around frame and flush with top.
- 3.08 FIELD QUALITY CONTROL
- A. General: Provide quality control in accordance with EBRP DPW specification sections 701, 702 and referenced sections for items all storm drainage items except the underdrain system.
  - B. Underdrain System: Provide quality control in accordance with the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2016 Edition, Section 703, and referenced Sections.
  - C. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
  - D. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
  - E. Maintain storm water pollution prevention measures around all drainage structures during entire construction of project. Remove any sedimentation in drainage structures immediately, but do not flush downstream system.
  - F. Provide as-built elevations of pipe inverts at all drainage structures, inlets and outlets.

**END OF SECTION**